The Water Environment (Controlled Activities) (Scotland) Regulations 2011

Licence Application Form D

Surface Water Abstractions and Impoundments

Section 1: Activities applied for

*Please use application form K for the construction of deep boreholes >200m

*Please use application form D1 for Groundwater Abstractions and Construction of boreholes <200m deep

Please indicate how many activities you are applying for under each category.	No:	National Grid Reference (10 character) of abstraction or impoundment	Name of source waterbody or impounded waters	Source type •Watercourse •Reservoir •Loch •Spring •Wetlands
1.1 Surface Water Abstractions:				
Registration — An abstraction of more than 10m^3/day and less than or equal to 50m^3/day		Attach separate application forms for registration to this application		
Simple Licence — An abstraction of more than 50m^3/day and less than or equal to 2000m^3/day		- -		
Complex Licence — An abstraction of more than 2000m^3/day	**1**	**NN 00900 16200**	**Loch Awe**	**Loch**
1.2 Mobile abstraction units used to abstract water under this application				
Mobile Plant — Additional mobile unit abstraction location(s)		- -		
If applicable, please state how many mobile abstraction units are to be used to abstract water applied for under this				

	licence				
1.3 Impoundments:					
Simple Licence	Existing passive weir		- -		
	Existing managed weir less than or equal to 1 metre high		- -		
	Existing raised loch less than or equal to 1 metre high		- -		
	Construction of all new impoundments less than or equal to 1m high that do not affect the passage of salmon or sea trout.		- -		
	Removal or modification of an impoundment authorised under GBR1		- -		
	Removal or modification of a simple licence level impoundment		- -		
Complex Licence	Construction and operation of all other	**1** **2**	**NN 04540 16687** **NN 04939 17478**	**Embankment 1 Unnamed tributary of Allt Beochlich** **Embankment 2 Unnamed tributary of Allt**	**Watercourse** **Watercourse**

	impoundments			**Beochlich**	
	Removal or modification of a complex licence level impoundment		- -		

Section 2: Reasonable need		
2.1 Please indicate your main category or categories of use (if appropriate):		
Agricultural irrigation		Please continue to section 2.2
Agricultural water supply		Please continue to section 2.2
Golf Course irrigation		Please continue to section 2.2
Industry (other than hydropower)		Please continue to section 2.2
Private Water Supply		Please continue to section 2.2 and complete Table A
Public Water Supply		Please continue to section 2.2 and complete Table B
Other (please specify)	Pumped storage hydropower	Please continue to section 2.2 and complete Table C

2.2 All users			
2.2.1 Total Quantities to be authorised Please give the total volume of usage in cubic metres to be authorised from all sources in the periods indicated	Hour (m^3) 1,137,600	Day (m^3) 14,680,000	Year (m^3) 14,680,000 Net Water will be released back to Loch Awe before any further abstraction

2.2.2 Please set out here any other information, e.g. supporting calculations, operational practices or other reasons, in addition to that which you include in the following tables, to show how you have arrived at the quantities set out above that you are seeking to have authorised. (Please continue on a separate sheet were necessary)	A new pumped storage hydro scheme is being proposed, which would abstract water from Loch Awe and store in a new reservoir near Lochan Airigh. The new reservoir would act as the Headpond, while Loch Awe would be the Tailpond. The Headpond will be formed of two embankments. Embankment 1 and Embankment 2 and impound part of an unnamed tributary of Allt Beochlich. The top water level of the Headpond will be 420 mAOD and a bottom water level 374 mAOD. The range of water level is 46m. A new inlet / outlet will be constructed on the banks of Loch Awe which will enable water to be pumped from to the Headpond. Water will be pumped from Loch Awe during periods of excess power in the electricity network up to the Headpond. During periods of high power demand, or when insufficient power is being generated water would flow from the Headpond down to Loch Awe passing through the turbines and generating electricity and feeding into the national grid The Development has a maximum generating capacity of 900 MW, with maximum design flow of up to m3/s from the Headpond to Loch Awe. The full usable volume of the headpond is approximately 14.68 Mm3. This would provide 15 hours of operation at full generation. The maximum pump rate from Loch Awe to the headpond is 316 m3/s. The full volume of the Headpond can be pumped in 15 hours. The maximum daily abstraction from Loch Awe would be 14.68 Mm3. Before any further abstraction can be undertaken water would need to be released from the Headpond into Loch Awe. The net volume of abstraction from Loch Awe will therefore not exceed 14.68 Mm3. Under high and low water levels in Loch Awe the operation of the Development will be curtailed in order not to increased flood risk at Loch Awe and further downstream or to reduce low water levels further. The construction of the impoundment across the unnamed tributary of Allt Beochlich will result in the need for a compensation flow into Allt Beochlich. Based on the existing Beochlich hydro intake located some 2,000m downstream of the embankment a compensation flow will be provided that will replicate the seasonal varying flow in the watercourse and natural flow patterns and volumes. See CAR Licence Supporting document

2.2.3 Please set out here what steps you have taken or intend to introduce to ensure efficient use of water (Please continue on a separate sheet if necessary)	The key to efficient use of water is the site selection and the development of the design of the Proposed Develoment. Pumped storage hydro (PSH) is a very efficient use of stored water, as it can be re-cycled between the lower and upper reservoirs. Water losses from the system are minimal and limited to evaporation or water reentering the naural water system. The Develoment will ensure efficient use of water based on its location and the variation in topography between the Headpond and the Tailpond. The Development utilises Loch Awe as its Tailpond, which provides a naturally suitable lower reservoir without requiring the creation of a second entirely new loch or reservoir. For further information see the CAR Licence Supporting document

Table A – Private Water Supplies – including hospitals, schools, prisons, hotels, industrial premises etc.		
A.1 Please indicate nature of supply (i.e. domestic, agriculture, hospital etc.). Include all components.	The Beochlich hydro is located within the Buinne Dhubh catchment and abstracts water from Allt Beochlich, approximately 2,000m south west of the Headpond.	
A.2 Please give details of the numbers of people being supplied and details of any residential capacity etc.	No of domestic properties served	N/A
	Total population supplied	N/A
	For hospitals, schools, prisons, hotels etc. please provide the maximum number of person-days occupancy provided for in one year.	N/A
	Other (please specify)	Existing micro hydro intake

Table B – Public Water Supplies		
B.1 Please indicate the nature of the abstraction (direct into treatment and supply, raw water storage, river basin transfer etc.)	N/A	
B.2 Please give details of the supply.	B.2.1 Water resource zone to be supplied	N/A

	B.2.2 Total population supplied	N/A
	B.2.3 Components of supply (percentage domestic, industrial, agricultural etc.)	N/A
B.3 Please give details of relevant water resources planning and any other documents relating to this scheme. If the scheme departs from these plans, please give the reasons for this. Please include details of any other current proposals which could have a bearing on the outcome of this application.	N/A	

Table C – Other	
C.1 Please give details of the water use, purpose of abstraction etc.	The purpose of the abstraction is for Pumped Storage Hydropower. Loch Awe will act as the Tailpond for the system and the new reservoir near Lochan Airigh will act as the Headpond. Water will be asbtracted from Loch Awe up to the Headpond during the pumping cycle and then released back into Loch Awe during the generation cycle. The generation and pumping profile will be based on the energy market.

	See CAR Licence Supporting document
C.2 Please give as much detail as possible of the operational regime intended, water storage and conservation provision etc.	During periods of high demand in the national electrictiy grid network (grid), the Development would be used to generate electricity. Water would be released from the Headpond, passing through the turbines and generating energy for export. During periods of low demand in the grid, excess electrictiy would be used to pump water from the Tailpond (Loch Awe) to the Headpond. A total of 14.68 Mm^3 of active storage will be available in the Headpond. Meanwhile, the total volume of the Headpond is 15.0 Mm^3. This 'dead' volume ensures that the Headpind maintains a minimal volume of water such that sediment is not pulled into the system and compensation flows are maintained. The generation and pumping profile will be based on the energy market. See CAR Licence Supporting document

Section 3: Applications Including Abstraction Activities			
Complete this table for all activities you are applying for. If you are applying for a licence which includes more than one abstraction activity please copy, complete and reference a separate table for each licensable activity.			
No. of Section 3 tables completed:	1	Table ref: (e.g.1 of 2, 2 of 2)	1
Abstraction details:			
3.1 Abstraction Point No/Ref/Name (This should correspond to a reference on the site map in 2.4 of Form A):	Tailpond Inlet / Outlet Structure – Loch Awe		
3.2 Name of watercourse or loch (if applicable):	Loch Awe		

Section 3: Applications Including Abstraction Activities			
3.3 National Grid Reference of abstraction. Specify a single point or for mobile abstraction units specify the upstream (u/s) and downstream (d/s) limits.	Single point: NN 00900 16200		
3.4 Please provide a full description of your proposals to construct or alter any surface water intake structure, including plans and cross sections.	Document name / reference:	See CAR Licence Supporting Document Appendix A Figures	
3.5 Please provide method statements describing the method and controls of construction or alteration for any surface water intake structure	Document name / reference:	See CAR Licence Supporting Document Appendix C – Outline CEMP	
3.6 Do you consider this abstraction would qualify as an environmental service?	☒ No ☐ Yes, provide details on separate sheet		
	Document name/ reference:		
3.7 Do you consider this abstraction would qualify for abated charges?	☒ No ☐ Yes, provide details on separate sheet		
	Document name/ reference:		
3.8 What is the maximum proposed rate or volume of abstraction for this abstraction activity? Conversion: 1m^3 = 1000 litres 1m^3 = 220 gallons 1m^3/hour = 0.2778 litres/sec	litres/ second:	cubic metres/ day:	cubic metres/ year:
	316,000 l/s 316 m^3/s	14,680,000 m^3	14,680,000 m^3 Net Water will be released back to Loch Awe before

Section 3: Applications Including Abstraction Activities			
			any further abstraction
3.9 Describe how you propose to monitor the volume of water abstracted?	Document name/ reference:		Abstraction rates will be monitored based on chage in water levels at the Headpond. Daily rates will be limited to the capacity of the Headpond which is in line with the daily asbstractio set out in licence.
3.10 Do you intend to abstract every year or only intermittently? (Intermittent means that it is predictable in which years you will abstract. If you are applying to have the capability to abstract in any year, select annual)	☒ ANNUALLY ☐ INTERMITTENTLY, if so, please provide further details on separate sheet		
	Document name/ reference:		

3.11 Please tick during which months the abstraction takes place and, if available, indicate abstraction volumes (m^3/month).

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
x	x	x	x	x	x	x	x	x	x	x	x

3.12 Is any abstracted water to be discharged back into the water environment? If yes, enter the National Grid Reference (NGR) of the discharge point(s). Please note this discharge may require authorisation as a point source discharge See the CAR Practical Guide for further details.	☐ No ☒ Yes NGR NN 00900 16200	
3.13 Where you have selected 'yes' above specify the water returned as a percentage of take at the above grid reference(s)	NGR: NN 00900 16200 - 100% of abstracted water returned	
3.14 If appropriate, provide information on the proposed operating regime (e.g. abstraction limits, hands off flow etc)	Document name/ reference:	<table><tr><td>Season</td><td>Lower Threshold (mAOD)</td><td>Upper Threshold (mAOD)</td></tr><tr><td>April – Sep</td><td>35.87</td><td>37.2</td></tr><tr><td>Oct - March</td><td>35.56</td><td>37.2</td></tr></table> Further details in CAR Licence Supporting document - Appendix B: Water Resources
3.15 Where a management agreement is in place which influences the abstraction, please provide details.	Document name/ reference:	N/A
3.16 If appropriate, provide information on any inter-relationships between abstraction points applied for as part of this application (see	Document name/ reference:	N/A

section 3 of the guidance)		
3.17 Please provide for mobile spray irrigation abstractions and water transfers a method statement detailing how each activity is to be carried out to prevent the spread of invasive non-native species[1].	Document name/ reference:	N/A

[1] For information see the check, clean, dry procedure as outlined in the GB non-native species secretariat website (http://www.nonnativespecies.org/checkcleandry/biosecurity-for-everyone.cfm) and guidance set out in GPP5 (http://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf?utm_source=website&utm_medium=social&utm_campaign=GPP5%2027112017)

Section 4: Applications Including Impoundment Activities			
Complete this table for all impoundments that you are applying for. If you are applying for a licence which includes more than one impoundment structure please copy, complete and reference a separate table for each activity			
No. of Section 4 tables completed:	2	Table ref: (e.g.1 of 2, 2 of 2)	1 of 2
IMPOUNDMENT DETAILS:			
4.1 Impoundment No/Ref/Name: (This should correspond to the reference on the site map)	Embankment 1		
4.2 Type of original waterbody impounded:	☒ Watercourse ☐ Loch ☐ None		
4.3 Name of watercourse or loch impounded:	Unnamed tributary of Allt Beochlich		
4.4 National Grid Reference of impoundment (from mid-point of impounding structure):	NN 04540 16687		
4.5 Using the look up table in Section 4 of the guidance specify the Purpose Category/Categories for the use of the impounded water. Continue on separate sheet if necessary.	Primary purpose: Pumped Storage Hydro Electric Headpond. Secondary purpose: Emergency Spillway		

4.6 Do you consider this impoundment would qualify as an environmental service?	☒ No ☐ Yes, provide details on separate sheet	
	Document name/ reference:	
4.7 Do you consider this impoundment would qualify for abated charges?	☒ No ☐ Yes, provide details on separate sheet	
	Document name/ reference:	
4.8 Where a management agreement is in place which influences the operation of the impoundment, please provide details.	Document name / reference:	N/A
4.9 Please provide a full description of your proposals to construct, alter or remove the impoundment, including plans and cross sections.	Document name / reference:	See Balliemeanoch PSH CAR Licence Supporting Document
4.10 Please provide method statements describing the method and controls of construction/alteration/removal works	Document name / reference:	See Balliemeanoch PSH Outline Method Methodology
4.11 If applicable, what date do you intend to start construction, alteration or removal works for the impoundment?	Document name / reference:	2026
4.12 Height of impoundment structure:	63 m	

4.13 Please give the level of the overflow or crest of the dam (metres AOD) if this is different to the height of the impoundment structure	Crest level – 423 mAOD, Overflow 420.6 mAOD	
4.14 National Grid Reference of outflow point from impounded waterbody	Valve House / Low Level Outlet NN 04655 16526 Headpond Inlet / Outlet Structure NN 04384 16892	
4.15 Where there is a means of drawing the impounded water down, what is the minimum draw-off level (metres AOD)?	Waterway	The primary means for drawdown is the Waterway through the turbine to Loch Awe Waterway Inlet. Draw off level set at 350 mAOD
4.16 Provide details of ongoing maintenance of this impoundment structure e.g. debris clearance, scour valve operation, fish pass maintenance etc.	Document name / reference:	The impoundment will regularly maintained to ensure the efficiency and safety of the Development. This will include screen cleaning, scour valve operations and monitoring and inspections as set out by the ARPE under the Reservoirs (Scotland) Act 2011
4.17 Please provide details of any sediment management plan associated with this impoundment (see guidance in section 4.17)	Document name / reference:	Sediment load expected to be low based on existing morphology.
4.18 Is there to be provision for fish passage?	☒ No, please provide a justification for this on a separate sheet ☐ Yes, if so, please design details on separate	

	sheet	
	Document name / reference:	The Headpond is located at the head of the catchment and therefore there will be not further watercourse reaches upstream. The water in the impoundment will flow via the pumps and turbines between the Headpond and Loch Awe with significant variation in water levels in the Headpond. Under existing conditions fish passage to the headpond is restricted due to existing inlet downstream of the proposed impoundment.
4.19 Are there to be fish screens or other fish protection measures?	☐ No, please provide a justification for this on a separate sheet ☒ Yes, if so, please design details on separate sheet	
	Document name / reference:	Fish Screen at the Tailpond Inlet / Outlet Structure and Fish Sceens at Headpond Inlet / Outlet Structure Figures 6, 7, 8 and 9.
4.20 Provide information of the proposed operating regime (e.g.	Document name / reference:	Seasonal varied compensation flow to

compensation release, freshets, drawdown)		replicate existing average monthly volumes. Appendix B: Water Resources

No. of Section 4 tables completed:	2	Table ref: (e.g.1 of 2, 2 of 2)	2 of 2
IMPOUNDMENT DETAILS:			
4.1 Impoundment No/Ref/Name: (This should correspond to the reference on the site map)	Embankment 2		
4.2 Type of original waterbody impounded:	☐ Watercourse ☐ Loch ☒ None		
4.3 Name of watercourse or loch impounded:			
4.4 National Grid Reference of impoundment (from mid-point of impounding structure):	NN 04939 17478		
4.5 Using the look up table in Section 4 of the guidance specify the Purpose Category/Categories for the use of the impounded water. Continue on separate sheet if necessary.	Primary purpose: Pumped Storage Hydro Electric Headpond. Secondary purpose: N/A		
4.6 Do you consider this impoundment would qualify as an environmental service?	☒ No ☐ Yes, provide details on separate sheet		
	Document name/ reference:		

4.7 Do you consider this impoundment would qualify for abated charges?	☒ No ☐ Yes, provide details on separate sheet	
	Document name/ reference:	
4.8 Where a management agreement is in place which influences the operation of the impoundment, please provide details.	Document name / reference:	N/A
4.9 Please provide a full description of your proposals to construct, alter or remove the impoundment, including plans and cross sections.	Document name / reference:	See Balliemeanoch PSH CAR Licence Supporting Document
4.10 Please provide method statements describing the method and controls of construction/alteration/removal works	Document name / reference:	See Balliemeanoch PSH Outline Method Methodology
4.11 If applicable, what date do you intend to start construction, alteration or removal works for the impoundment?	Document name / reference:	November 2029
4.12 Height of impoundment structure:	9 m	
4.13 Please give the level of the overflow or crest of the dam (metres AOD) if this is different to the height of the impoundment structure	Crest level – 423mAOD	
4.14 National Grid Reference of outflow point from impounded	Valve House / Low Level Outlet	

waterbody	NN 04655 16526 Headpond Inlet / Outlet Structure NN 04384 16892	
4.15 Where there is a means of drawing the impounded water down, what is the minimum draw-off level (metres AOD)?	Waterway	The primary means for drawdown is the Waterway through the turbine to Loch Awe Waterway Inlet. Draw off level set at 350 mAOD
4.16 Provide details of ongoing maintenance of this impoundment structure e.g. debris clearance, scour valve operation, fish pass maintenance etc.	Document name / reference:	The impoundment will regularly maintained to ensure the efficiency and safety of the Proposed Development. This will include screen cleaning, scour valve operations and monitoring and inspections as set out by the ARPE under the Reservoirs (Scotland) Act 2011
4.17 Please provide details of any sediment management plan associated with this impoundment (see guidance in section 4.17)	Document name / reference:	Sediment load expected to be low based on existing morphology.
4.18 Is there to be provision for fish passage?	☒ No, please provide a justification for this on a separate sheet ☐ Yes, if so, please design details on separate sheet	
	Document name / reference:	The Headpond is loacted at the head of the catchment and therefore there will be not further

		watercourse reaches upstream. The water in the impoundment will flow via the pumps and turbines between the Headpond and Loch Awe with significant variation in water levels in the Headpond. Under existing conditions fish passage to the headpond is restricted due to exisng inlet downstream of the proposed impoundment.
4.19 Are there to be fish screens or other fish protection measures?	☐ No, please provide a justification for this on a separate sheet ☒ Yes, if so, please design details on separate sheet	
	Document name / reference:	Smolt and Fish Screen at the Lower Control Works. Fish Sceens at Upper Control Works Figures 10 - 12
4.20 Provide information of the proposed operating regime (e.g. compensation release, freshets, drawdown)	Document name / reference:	Seasonal varied compensation flow to replicate existing average monthly volumes. Appendix B: Water Resources Assessment

4.21 For reservoirs, the total volume of water to be impounded and, if different total volume of waterbody	Total volume of waterbody: 15,000,000 m3 Volume of active storage: 14,680,000 m3

(where known) (litres or cubic metres): (N.B. this information is not mandatory for schemes less than 25000m^3)			
4.22 Provide details on any interconnections with other impoundments, abstractions or catchments.	Document name / reference:	N/A	
4.23 Is registration required under the Reservoirs (Scotland) Act 2011? (i.e. can the reservoir hold 25,000m^3 or more above the surrounding land?) If yes, answer the following question:	☐ No ☒ Yes		
4.23.1 Have you already registered your reservoir with SEPA under the 2011 Act?	☐ Yes	Confirm reference number?	RES/R/…….
	☒ No	Contact SEPA's Reservoir Regulatory Unit at Reservoirs@sepa.org.uk to register	

4.21 For reservoirs, the total volume of water to be impounded and, if different total volume of waterbody (where known) (litres or cubic metres): (N.B. this information is not mandatory for schemes less than 25000m^3)	Total volume of waterbody: 15,000,000m3 Volume of active storage: 14,680,000 m3		
4.22 Provide details on any interconnections with other impoundments, abstractions or catchments.	Document name / reference:	N/A	
4.23 Is registration required under the Reservoirs (Scotland) Act 2011? (i.e. can the reservoir hold 25,000m^3 or more above the surrounding land?) If yes, answer the following question:	☐ No ☒ Yes		
4.23.2 Have you already registered your reservoir with SEPA under the 2011 Act?	☐ Yes	Confirm reference number?	RES/R/……
	☒ No	Contact SEPA's Reservoir Regulatory Unit at Reservoirs@sepa.org.uk to register	

Section 5: Additional information

5.1 Cumulative Chargeable Abstraction Value

Please specify the combined maximum volume of abstraction from all abstraction points subject to a subsistence charge? (Please see guidance for more details) Conversion: $1m^3$ = 1000 litres $1m^3$ = 220 gallons	14,680,000 m^3/day

5.2 Additional information submitted

Please reference additional supporting documents submitted as part of this application	Document name: Document reference:	Main Report
	Document name: Document reference:	
	Document name: Document reference:	
	Document name: Document reference:	