Balliemeanoch Pumped Storage Hydro

Environmental Impact Assessment Report
Volume 5: Appendices
Appendix 11.1 Walkover and Water Quality Results

ILI (Borders PSH) Ltd

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Quality information

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1. Introduction and background

The following provides a summary of a walkover of the site and water quality sampling of Beochlich Lochan, Loch Airigh and Allt Beochlich (upstream and downstream of Beoclich Lochan) collected at the same time. This data is to inform the water environment baseline for the Environmental Impact Assessment Report (EIAR) for the Balliemeanoch Hydro Pumped Storage (herein 'the Development').

This technical appendix outlines the results from the site walkover and water quality sampling carried out on 9th and 10th of August 2023. On the day of sampling, it was a relatively mild day with sunny spells. There were periods of light rainfall the night beforehand and throughout the day of survey.

The aim of the site walkover was to identify and make observations of the quality, form and character of water features. While on site some limited water quality sampling was carried out to further inform the understanding of baseline conditions.

2. Water Quality Sampling

The walkover focused on the Allt Beochlich, Beochlich Lochan, Lochan Airigh and Loch Awe as the principal water features within the site and study area as defined in *Chapter 11: Water Environment* of the EIAR. Other water features were visited but are not reported here. Further information may be available upon request.

The Allt Beochich is sourced from Lochan Dubh (National Grid Reference (NGR) NN 06699 16031) located upstream of the Development and flows down into Beochlich Lochan. Allt Beochlich has an overall moderate WFD classification. It is at risk of being affected by pollutants and sediment build up from the scheme.

At Beochlich Lochan there is dam on its western end at NN 02926 15391 and flow downstream is influenced by a small community hydropower scheme. Thereafter, the Allt Beochlich flows down into Loch Awe.

Lochan Airigh is a small lochan (approximately 23,700 m^2 in area) and is located at NN 04278 16440. A small watercourse originates from Lochan Airigh and flows into Allt Beochlich. More baseline information can be found in *Chapter 11: Water Environment*.

Sampling Locations

Table 1 Sampling Points identifies the locations of four water quality sampling locations. Please refer to *Figure 11.3* EIAR *(Volume 3: Figures)* for locations.

Table 1 Sampling Points

Location	Description	NGR	Justification and other comments
LochA	Beochlich Lochan (referenced at LA8 in *Chapter 11 EIAR Volume 2: Main Report*).	NN 02925 15404	This loch is located close to the permanent and temporary works and several access tracks (TC07 is located 40 m upstream). Allt Beochlich travels from Lochan Airigh under access tracks and into Beochlich Lochan. The loch is situated downstream from the main Headpond area. The western end of this loch is dammed. Therefore, this loch will intercept flows, sediment and pollutants carried by the watercourses which pass through the Headpond area. Pollutants and sediment may build up within the loch during construction and operation.
LochB	Lochan Airigh (referenced at LA7 in *Chapter 11 EIAR Volume 2: Main Report*).	NN 04241 16366	The Headpond is located across Lochan Airigh, which will be lost to Development. This sample point is to gather an initial record of baseline water quality.

RiverA	Allt Beochlich downstream of Beochlich Lochan (referenced at LA6 in *Chapter 11 EIAR Volume 2: Main Report*).	NN 02518 15125	The sample location is downstream of Beochlich Lochan, Lochan Airigh and the proposed Headpond.
RiverB	Allt Beochlich upstream of Beochlich Lochan (referenced at LA6 in *Chapter 11 EIAR Volume 2: Main Report*).	NN 04199 16152	Upstream of Beochlich Lochan and situated within the Headpond area. Allt Beochlich has an overall moderate WFD classification. It is at risk of being affected by pollutants and sediment build up from the scheme

2.1 Sampling Method

A total of four sampling locations were selected based upon the justifications outlined in the table above. A description of each of the points are displayed in *Table 1* above.

Sample bottles were filled directly from the watercourse/body.

All water samples were collected by suitably trained AECOM Water Scientists, stored and transported in accordance with British Standards (BS) Institution ISO 5667, particularly the following parts:

- BS EN ISO 5667-3:2018 Water quality. Sampling. Preservation and handling of water samples;
- BS EN ISO 5667-6:2016 Water quality. Sampling. Guidance on sampling of rivers and streams;
- BS EN ISO 5667-14:2018 Water quality. Sampling. Guidance on quality assurance and quality control of environmental water sampling and handling.

Due to the type of monitoring no blanks or duplicates are proposed.

Samples were delivered to I2 Analytical in East Kilbride where lab analysis was completed.

2.2 Limitations

Water samples were collected at Allt Beochlich, Beochlich Lochan and Lochan Airigh on the 9th of August 2023 as part from the Development Site walkover survey. A single water sample from each sampling location was collected. This only provides a ‘snapshot’ of water quality at the time it was taken, including the flow conditions, and the suite of analysis was for key parameters only.

2.3 Results

Walkover Observations

Table 2 provides a summary of the observations made at the four sampling locations:

Table 2 Sampling Point Descriptions

Sampling Location	Description	Photo
LochA	*Beochlich* • Damned at the southwest corner. The bed of the loch is silty. Water level within the loch appeared to be low. • Water is clear with no odour. No evidence of pollution (e.g. oil, sheens or foam). • Water likely to be oligotrophic with low primary productivity.	
LochB	*Lochan Airigh* • Gravel and cobbles noted on the bed of the loch. • Water is clear with no odour. No evidence of pollution (e.g. oil, sheens or foam). • Water likely to be oligotrophic with low primary productivity.	
RiverA	*Allt Beochlich* • High gradient river with bedrock typology. Channel is characterised by numerous, steps and pools, waterfalls and rocky rapids. Some deposition of gravel and cobbles within the channel. • Water is clear with a slight brown tinge reflecting humic acids leached from the peaty soils, with no obvious evidence of water pollution (e.g. odour, oil sheens, foams etc.).	

Sampling Location	Description	Photo
RiverB	*Allt Beochlich* • Lower gradient reach compared to RiverA sampling point. The channel has a bedrock typology with some gravel and cobble deposition. Algae present on cobbles, indicating they are stable, and not regularly moved. • Water is clear with a slight brown tinge reflecting humic acids leached from the peaty soils, with no obvious evidence of water pollution (e.g. odour, oil sheens, foams etc.).	

Majority of water courses within the Loch Catchment were characterised by bedrock typology which deposition of gravel and cobbles. Water tends to reflect leached humic acids from peaty soils with a slight brown tinge. None of the water features visited had any evidence of water pollution (e.g. odour, oil sheens, foams etc.).

Below are descriptions of other water features visited during the walkover survey.

Table 3 Descriptions of Water Features visited during the site walkover survey

Description	Photo
Loch Awe • Photo was taken where Allt Beochlich enters Loch Awe. • Large loch with deposition of pebbles and cobbles along the beach	
Allt a' Gheataidh • High gradient river with bedrock typology. Some deposition of gravel and cobbles within the channel. • Water is clear with a slight brown tinge reflecting humic acids leached from the peaty soils, with no obvious evidence of water pollution (e.g. odour, oil sheens, foams etc.).	
Allt a' Chroisaid • High gradient river with bedrock typology. Some deposition of gravel and cobbles within the channel. • Water is clear with a slight brown tinge reflecting humic acids leached from the peaty soils, with no obvious evidence of water pollution (e.g. odour, oil sheens, foams etc.).	

Description	Photo
Claddich River • Wide River with deposition of gravel, cobble and sands within the channel. Some evidence of underlying bedrock. • Water is clear with a slight brown tinge reflecting humic acids leached from the peaty soils, with no obvious evidence of water pollution (e.g. odour, oil sheens, foams etc.).	
Crom Allt • River with a bedrock typology and some deposition of gravel and cobbles within the channel. • Water is clear with a slight brown tinge reflecting humic acids leached from the peaty soils, with no obvious evidence of water pollution (e.g. odour, oil sheens, foams etc.).	

Water Quality Results

Table 4 displays the chemistry results from each of the locations.

Table 4 Water Quality Results

Determinand	Units	Environmental Quality Standard (Annual Average)	River A	River B	Loch A	Loch B
General Inorganics						
pH in water (L005F)	pH Units		7.5	7.5	7.3	7.3
Temperature on Receipt	oC		22	22	22	22
Electrical conductivity of water (L031F)	µS/cm		72	65	69	30
Turbidity	NTU		4.8	<1.0	1.2	1.1
Sulphate as SO4	mg/l	400[1]	1.83	1.58	1.67	1.22
Chloride	mg/l	250000[1]	4.6	4	4.1	4.9
Dissolved Phosphate as PO4	µg/l		<62	<62	<62	<62
Ammoniacal Nitrogen as N	µg/l		<15	<15	22	17
Ammonia as NH3	µg/l		15	16	27	21
Dissolved Organic Carbon (DOC)	mg/l		10.8	9	11	5.19
Nitrate as N	mg/l		0.17	0.16	0.16	0.08
Nitrate as NO3	mg/l		0.76	0.71	0.71	0.36
Nitrite as N	µg/l		<1.0	<1.0	U/S[2]	< 1.0
Nitrite as NO2	µg/l		<5.0	<5.0	U/S[2]	< 5.0

[1] Non-Statutory Standard
[2] U/S = Unsuitable to Sample

Determinand	Units	Environmental Quality Standard (Annual Average)	River A	River B	Loch A	Loch B
Alkalinity as CaCO3 (titration)	mg/l		33	32	34	13
Alkalinity as CaCO3	mg/l		29	27	28	14
BOD (Biochemical Oxygen Demand) (Total) - PL (L086B)	mg/l		1.2	<1.0	1.2	1.1
Total Suspended Solids (L004B)	mg/l		<2.0	<2.0	3	2
Bicarbonate as HCO3 (titration)	mg/l		41	39	42	15
Dissolved Oxygen	mg/l		9.1	9.1	9	8.7
Speciated PAHs						
Naphthalene	µg/l	2	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	µg/l		<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/l		<0.01	<0.01	<0.01	<0.01
Fluorene	µg/l		<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/l		<0.01	<0.01	<0.01	<0.01
Anthracene	µg/l	0.1	<0.01	<0.01	<0.01	<0.01
Fluoranthene	µg/l	0.0063	<0.01	<0.01	<0.01	<0.01
Pyrene	µg/l		<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	µg/l		<0.01	<0.01	<0.01	<0.01
Chrysene	µg/l		<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/l	0.017	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/l	0.017	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/l	0.00017	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/l		<0.01	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/l		<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	µg/l	8.2 x 10	<0.01	<0.01	<0.01	<0.01
Total PAH						
Total EPA-16 PAHs	µg/l		<0.16	<0.16	<0.16	<0.16
Metals						
Calcium (dissolved)	mg/l		10	7.9	9.8	1.9
Iron (dissolved)	mg/l		0.57	0.39	0.52	0.021
Magnesium (dissolved)	mg/l		1.5	1.4	1.5	0.91
Potassium (dissolved)	mg/l		0.32	0.21	0.33	0.27
Sodium (dissolved)	mg/l		3.9	3.4	3.7	3.2
Iron (total)	mg/l		0.78	0.6	0.88	0.041
Manganese (total)	µg/l		26	22	140	13
Phosphorus (total)	µg/l		<20	<20	<20	<20
Arsenic (dissolved)	µg/l	50	0.58	0.35	0.57	<0.15
Cadmium (dissolved)	µg/l		<0.02	<0.02	<0.02	<0.02
Chromium (dissolved)	µg/l		0.3	0.2	0.2	0.3
Copper (dissolved)	µg/l	1	2.2	1.9	1.9	1.3
Lead (dissolved)	µg/l	1.2	<0.2	<0.2	<0.2	<0.2
Manganese (dissolved)	µg/l		8.5	4.3	46	0.64
Mercury (dissolved)	µg/l	0.07[3]	<0.05	<0.05	<0.05	<0.05
Nickel (dissolved)	µg/l	4	<0.05	<0.05	<0.05	<0.05
Selenium (dissolved)	µg/l		<0.6	<0.6	<0.6	<0.6
Zinc (dissolved)	µg/l	10.9	1.1	1.4	1.1	0.6
Monoaromatics & Oxygenates						
Benzene	µg/l	10	<3.0	<3.0	<3.0	<3.0

Determinand	Units	Environmental Quality Standard (Annual Average)	River A	River B	Loch A	Loch B
Toluene	µg/l	74	<3.0	<3.0	<3.0	<3.0
Ethylbenzene	µg/l	20	<3.0	<3.0	<3.0	<3.0
p & m-xylene	µg/l		<3.0	<3.0	<3.0	<3.0
o-xylene	µg/l		<3.0	<3.0	<3.0	<3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l		<3.0	<3.0	<3.0	<3.0
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >C5 - C6	µg/l		<1.0	<1.0	<1.0	<1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l		<1.0	<1.0	<1.0	<1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l		<1.0	<1.0	<1.0	<1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l		<10	<10	<10	<10
TPH-CWG - Aliphatic >C12 - C16	µg/l		<10	<10	<10	<10
TPH-CWG - Aliphatic >C16 - C21	µg/l		<10	<10	<10	<10
TPH-CWG - Aliphatic >C21 - C35	µg/l		<10	<10	<10	<10
TPH-CWG - Aliphatic (C5 - C35)	µg/l		<10	<10	<10	<10
TPH-CWG - Aromatic >C5 - C7	µg/l		<1.0	<1.0	<1.0	<1.0
TPH-CWG - Aromatic >C7 – C8	µg/l		<1.0	<1.0	<1.0	<1.0
TPH-CWG - Aromatic >C8 - C10	µg/l		<1.0	<1.0	<1.0	<1.0
TPH-CWG - Aromatic >C10 - C12	µg/l		<10	<10	<10	<10
TPH-CWG - Aromatic >C12 - C16	µg/l		<10	<10	<10	<10
TPH-CWG - Aromatic >C16 - C21	µg/l		<10	<10	<10	<10
TPH-CWG - Aromatic >C21 - C35	µg/l		<10	<10	<10	<10
TPH-CWG - Aromatic (C5 - C35)	µg/l		<10	<10	<10	<10
VOCs						
Chloromethane	µg/l		<3.0	<3.0	<3.0	<3.0
Chloroethane	µg/l		<3.0	<3.0	<3.0	<3.0
Bromomethane	µg/l		<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	µg/l		<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane	µg/l		<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene	µg/l		<3.0	<3.0	<3.0	<3.0
1,1,2-Trichloro-1,2,2-trifluoroethane##	µg/l		<3.0	<3.0	<3.0	<3.0
Trans 1,2-dichloroethylene	µg/l		<3.0	<3.0	<3.0	<3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l		<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane	µg/l	10	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	µg/l		<3.0	<3.0	<3.0	<3.0
Chloroform	µg/l	2.5	<3.0	<3.0	<3.0	<3.0
1,1,1-Trichloroethane	µg/l		<3.0	<3.0	<3.0	<3.0
1,2-Dichloroethane	µg/l	10	<3.0	<3.0	<3.0	<3.0
1,1-Dichloropropene	µg/l		<3.0	<3.0	<3.0	<3.0
Cis-1,2-dichloroethene	µg/l		<3.0	<3.0	<3.0	<3.0
Benzene	µg/l		<3.0	<3.0	<3.0	<3.0
Carbontetrachloride	µg/l	12	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane	µg/l		<3.0	<3.0	<3.0	<3.0
Trichloroethene	µg/l		<3.0	<3.0	<3.0	<3.0
Dibromomethane	µg/l		<3.0	<3.0	<3.0	<3.0
Bromodichloromethane	µg/l		<3.0	<3.0	<3.0	<3.0

Determinand	Units	Environmental Quality Standard (Annual Average)	River A	River B	Loch A	Loch B
Cis-1,3-dichloropropene	µg/l		<3.0	<3.0	<3.0	<3.0
Trans-1,3-dichloropropene	µg/l		<3.0	<3.0	<3.0	<3.0
Toluene	µg/l		<3.0	<3.0	<3.0	<3.0
1,1,2-Trichloroethane	µg/l		<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane	µg/l		<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	µg/l		<3.0	<3.0	<3.0	<3.0
Tetrachloroethene	µg/l	140	<3.0	<3.0	<3.0	<3.0
1,2-Dibromoethane	µg/l		<3.0	<3.0	<3.0	<3.0
Chlorobenzene	µg/l		<3.0	<3.0	<3.0	<3.0
1,1,1,2-Tetrachloroethane	µg/l		<3.0	<3.0	<3.0	<3.0
Ethylbenzene	µg/l	20	<3.0	<3.0	<3.0	<3.0
p & m-Xylene	µg/l		<3.0	<3.0	<3.0	<3.0
Styrene	µg/l		<3.0	<3.0	<3.0	<3.0
Bromoform	µg/l		<3.0	<3.0	<3.0	<3.0
o-Xylene	µg/l		<3.0	<3.0	<3.0	<3.0
Isopropylbenzene	µg/l		<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	µg/l		<3.0	<3.0	<3.0	<3.0
Bromobenzene	µg/l		<3.0	<3.0	<3.0	<3.0
n-Propylbenzene	µg/l		<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene	µg/l		<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene	µg/l		<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene	µg/l		<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene	µg/l		<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene	µg/l		<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene##	µg/l		<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene	µg/l		<3.0	<3.0	<3.0	<3.0
p-Isopropyltoluene	µg/l		<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene	µg/l		<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene	µg/l		<3.0	<3.0	<3.0	<3.0
Butylbenzene##	µg/l		<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	µg/l		<3.0	<3.0	<3.0	<3.0
1,2,4-Trichlorobenzene	µg/l		<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	µg/l	0.6[3]	<3.0	<3.0	<3.0	<3.0
1,2,3-Trichlorobenzene	µg/l		<3.0	<3.0	<3.0	<3.0
SVOCs						
Aniline	µg/l		<0.05	<0.05	<0.05	<0.05
Phenol	µg/l		<0.05	<0.05	<0.05	<0.05
2-Chlorophenol	µg/l		<0.05	<0.05	<0.05	<0.05
Bis(2-chloroethyl)ether	µg/l		<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	µg/l		<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	µg/l		<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	µg/l		<0.05	<0.05	<0.05	<0.05
Bis(2-chloroisopropyl)ether	µg/l		<0.05	<0.05	<0.05	<0.05
2-Methylphenol	µg/l		<0.05	<0.05	<0.05	<0.05
Hexachloroethane	µg/l		<0.05	<0.05	<0.05	<0.05
Nitrobenzene	µg/l		<0.05	<0.05	<0.05	<0.05
4-Methylphenol	µg/l		<0.05	<0.05	<0.05	<0.05

Determinand	Units	Environmental Quality Standard (Annual Average)	River A	River B	Loch A	Loch B
Isophorone	µg/l		<0.05	<0.05	<0.05	<0.05
2-Nitrophenol	µg/l		<0.05	<0.05	<0.05	<0.05
2,4-Dimethylphenol	µg/l		<0.05	<0.05	<0.05	<0.05
Bis(2-chloroethoxy)methane	µg/l		<0.05	<0.05	<0.05	<0.05
1,2,4-Trichlorobenzene	µg/l		<0.05	<0.05	<0.05	<0.05
Naphthalene	µg/l	2	<0.01	<0.01	<0.01	<0.01
2,4-Dichlorophenol	µg/l		<0.05	<0.05	<0.05	<0.05
4-Chloroaniline	µg/l		<0.05	<0.05	<0.05	<0.05
Hexachlorobutadiene	µg/l		<0.05	<0.05	<0.05	<0.05
4-Chloro-3-methylphenol	µg/l		<0.05	<0.05	<0.05	<0.05
2,4,6-Trichlorophenol	µg/l		<0.05	<0.05	<0.05	<0.05
2,4,5-Trichlorophenol	µg/l		<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	µg/l		<0.05	<0.05	<0.05	<0.05
2-Chloronaphthalene	µg/l		<0.05	<0.05	<0.05	<0.05
Dimethylphthalate	µg/l		<0.05	<0.05	<0.05	<0.05
2,6-Dinitrotoluene	µg/l		<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/l		<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/l		<0.05	<0.05	<0.05	<0.05
2,4-Dinitrotoluene	µg/l		<0.05	<0.05	<0.05	<0.05
Dibenzofuran	µg/l		<0.05	<0.05	<0.05	<0.05
4-Chlorophenyl phenyl ether	µg/l		<0.05	<0.05	<0.05	<0.05
Diethyl phthalate	µg/l		<0.05	<0.05	<0.05	<0.05
4-Nitroaniline	µg/l		<0.05	<0.05	<0.05	<0.05
Fluorene	µg/l		<0.01	<0.01	<0.01	<0.01
Azobenzene	µg/l		<0.05	<0.05	<0.05	<0.05
Bromophenyl phenyl ether	µg/l		<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene	µg/l	0.05[3]	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/l		<0.01	<0.01	<0.01	<0.01
Anthracene	µg/l		<0.01	<0.01	<0.01	<0.01
Carbazole	µg/l		<0.05	<0.05	<0.05	<0.05
Dibutyl phthalate	µg/l		<0.05	<0.05	<0.05	<0.05
Anthraquinone	µg/l		<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/l	0.0063	<0.01	<0.01	<0.01	<0.01
Pyrene	µg/l		<0.01	<0.01	<0.01	<0.01
Butyl benzyl phthalate	µg/l		<0.05	<0.05	<0.05	<0.05
Benzo(a)anthracene	µg/l		<0.01	<0.01	<0.01	<0.01
Chrysene	µg/l		<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/l		<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/l		<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/l	0.00017	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/l		<0.01	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/l		<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	µg/l		<0.01	<0.01	<0.01	<0.01

[3] Maximum Allowable Concentration

Overall, from the results the following points can be raised:

- Samples were compared to their corresponding Environmental Quality Standard[4] (EQS). All samples which had a EQS were below the level or were at their limit of detection.
- Each of the locations have a similar overall chemistry with a neutral pH and a relatively low electrical conductivity.
- Beochlich Lochan, Lochan Airigh and Allt Beochlich (downstream of Beochlich Lochan) all had a low turbidity ranging from <1.0 NTU to 1.2 NTU. While the Sample collected from Allt Beochlich upstream of Beochlich Lochan was slightly higher at 4.8 NTU. Both river samples were recorded at <2 mg/l for Total Suspended Solids (TSS) while the loch samples had a slightly higher TSS measured as 3 mg/l.
- Biochemical Oxygen Demand (BOD) at the sampling locations was low between <1.0 mg/l to 1.2 mg/l suggesting no pollution from organic waste.
- Dissolved Organic Carbon (DOC) ranged from 9 mg/l to 11 mg/l.
- Nitrate as NO_3 at the sampling locations ranged between 0.71 mg/l to 0.76 mg/l, which is low.
- Ammoniacal nitrogen at the loch samples were measured as 22 µg/l, which is higher than at Allt Beochlich which was measured at 15 µg/l.
- The majority of heavy metals arsenic, chromium, cadmium, lead, mercury and nickel are below their limit of detection.
- All soluble volatile organic compounds (SVOCs), volatile organic compounds (VOCs), Petroleum Hydrocarbons, Monoaromatics and Oxygenates were below their limit of detection.

From the results it can be concluded that Beochlich Lochan, Lochan Airigh and Allt Beochlich are all in good condition with no signs of chemical contamination.

A single water sample from each sampling location only provides a ‘snapshot’ of water quality at the time it was taken, including the flow conditions, and the suite of analysis was for key parameters only. However, as a whole, the data suggest the quality of water in water features in the study area is generally very good and unpolluted, as would be expected in a rural, upland area such as this.

[4] https://www.sepa.org.uk/media/152957/wat-sg-53-environmental-quality-standards-for-discharges-to-surface-waters.pdf

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