Abergwynant Hydro Scheme Refurbishment **New NRW Ref: WROWENRENEWABLES~~2403~~ 2002** **Original NRW Ref: WA/064/0005/017**

Calculation Sheet Reference: AHC01 **Revision B** **Date: 12th Feb 2026** Sheet 1 of 1

Intake Design for Minimum Residual of 245 l/s (~Q77) + variable residual

Residual Flow notch

Level (m)	0
Width (m)	1.5
Discharge co-efficient (Ref 1)	1.75

Coanda Screen Notch (flow to turbine)

Level relative to HoF notch (m)	0.15	
Width (m)	3.56	
Discharge Coefficient	1.6	Broad crest, rounded edge

Main Weir Crest

Level relative to HoF notch (m)	0.5	
Width (m)	9.6	(4.8m on main weir, 4.8m on bypass channel)
Discharge Co-efficient	2	Round overfall

	Level above Residual Flow Notch	Flow in HoF notch	Level above Screen notch	Flow to screens	Abstracted Flow	Level Above Main Weir	Flow over Main Weir	Total River Flow	Total Residual Flow	% residual flow left after Q95	Flow in Fish Bypass Channel	Bypass flow as %age of Residual Flow
	m	l/s	m	l/s	l/s	m	l/s	l/s	l/s		l/s	
Q95	0.122	112	-0.028	0	0	-0.378	0	**112**	112	100%	112	100%
Q75	0.192	221	0.042	49	0	-0.308	0	**270**	270	100%	221	82%
Q70	0.206	245	0.056	75	75	-0.294	0	**321**	245	64%	245	100%
Q65	0.218	267	0.068	101	101	-0.282	0	**368**	267	61%	267	100%
Q60	0.234	297	0.084	139	139	-0.266	0	**436**	297	57%	297	100%
Q55	0.250	328	0.100	180	180	-0.250	0	**508**	328	55%	328	100%
Q50	0.269	366	0.119	234	234	-0.231	0	**600**	366	52%	366	100%
Q45	0.289	408	0.139	295	295	-0.211	0	**703**	408	50%	408	100%
Q40	0.313	460	0.163	375	375	-0.187	0	**835**	460	48%	460	100%
Q35	0.339	518	0.189	468	468	-0.161	0	**986**	518	47%	518	100%
Q30	0.369	588	0.219	584	584	-0.131	0	**1172**	588	45%	588	100%
Q25	0.402	669	0.252	721	721	-0.098	0	**1390**	669	44%	669	100%
Q20	0.449	790	0.299	931	931	-0.051	0	**1721**	790	42%	790	100%
Q17 Turbine max flow	0.485	887	0.335	1104	1100	-0.015	0	**1991**	891	41%	887	100%
Q15	0.502	934	0.352	1190	1100	0.002	2	**2125**	1025	45%	935	91%
Q10	0.562	1106	0.412	1506	1100	0.062	296	**2909**	1809	61%	1254	69%
Q5	0.642	1350	0.492	1966	1100	0.142	1027	**4343**	3243	74%	1864	57%

Abstracted Volume Calculations

Max Instantaneous Flow (l/s)	1100	
Max Hourly Flow (m3/s)	3,960	
Max Daily Flow (m3/s)	95,040	
Average Annual Abstracted Volume (m3)	11,553,628	
Maximum Annual Abstraction (m3)	20,796,530	Annual average volume x 1.8 to allow for a very wet year

Q95	111	l/s	
Min Turbine Flow (l/s)	75	6.8%	of max turbine flow
Max Turbine Flow (l/s)	1100		

Ref 1:Residual Flow Notch Calculations: From NRW Fish Pass Manual, pages 67 and 68.

General weir discharge caclulation: Flow (Q) in m3/s = C.b.h b = notch width (m) h = water level above weir notch crest (m)

And C = notch discharge co-efficient = Cd.(2g)^0.5. Cd “usually near to 0.4” , so C = 0.4. (19.62)^0.5 = 1.75