

ANALYTE	FORM	DETERMINAND	UNITS	LQDC	QUOTE TO	START	END	LOCATION OF ANALYSIS	ANALYTICAL METHOD QC	DATA QUALIFIER	FILTRATION	PRESERVATION	METHOD	COMMENT
Aluminum	Dissolved	Al	ug/l	0.6	0.1	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Ammonium	Dissolved	NH4-N	mg/l NH4-N	0.030	0.01	11-Jul-07	27-Jan-09	Lancaster	4	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Automated colorimetry using a Seal discrete analyser. Method based on the Berthelot reaction.SOP 3115b	
Antimony	Dissolved	Sb	ug/l	0.01	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10, 12	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Arsenic	Dissolved	As	ug/l	0.008	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Barium	Dissolved	Ba	ug/l	0.06	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Beryllium	Dissolved	Be	ug/l	0.003	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Boron	Dissolved	B	ug/l	1	1	6-Mar-07	27-Jan-09	Lancaster	3	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Optical Emission Spectrometer using the Perkin Elmer 4300 DV using Standard Operating Procedure 3104	
Bromide	Dissolved	Br	ug/l	2.0	1.0	6-Mar-07	10-Jul-07	Wallingford	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by ion chromatography using a Dionex system.	
Bromide	Dissolved	Br	mg/l	0.010	0.01	11-Jul-07	27-Jan-09	Lancaster	4	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by Ion chromatography using the ICS-2000 system using Standard Operating Procedure 3149	
Cadmium	Dissolved	Cd	ug/l	0.002	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Caesium	Dissolved	Cs	ug/l	0.002	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Calcium	Dissolved	Ca	mg/l	0.01	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Optical Emission Spectrometer using the Perkin Elmer 4300 DV using Standard Operating Procedure 3104	
Cerium	Dissolved	Ce	ug/l	0.02	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Chloride	Dissolved	Cl	mg/l	0.200	0.1	6-Mar-07	10-Jul-07	Wallingford	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by ion chromatography using a Dionex system.	
Chloride	Dissolved	Cl	mg/l	0.200	0.1	11-Jul-07	27-Jan-09	Lancaster	4	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by Ion chromatography using the ICS-2000 system using Standard Operating Procedure 3149	
Chromium	Dissolved	Cr	ug/l	0.04	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Cobalt	Dissolved	Co	ug/l	0.006	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Conductivity	Dissolved	Conductivity	uS/cm @ 25C	0.1	0.1	11-Jul-07	27-Jan-09	Lancaster	3	10	Unfiltered; effectively dissolved	Stored in dark at 4 deg C	Laboratory conductivity meter with auto-temperature correction to 25 deg C	
Copper	Dissolved	Cu	ug/l	0.02	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
DOC	Dissolved	DOC	mg/l	0.5	0.1	6-Mar-07	27-Jan-09	Lancaster	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	NPOC Thermal oxidation and conductivity detection using a Shimadzu TOC-Vph Analyser.	
Fe	Dissolved	Fe	ug/l	1	1	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Fluoride	Dissolved	F	mg/l	0.020	0.01	6-Mar-07	10-Jul-07	Wallingford	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by ion chromatography using a Dionex system.	
Fluoride	Dissolved	F	mg/l	0.020	0.01	11-Jul-09	27-Jan-09	Lancaster	4	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by Ion chromatography using the ICS-2000 system using Standard Operating Procedure 3149	
Gran alkalinity	Dissolved	Gran alkalinity	uEq/l	NA	0.10	6-Mar-07	27-Jan-09	Bangor / Lancaster	3	10	Unfiltered but allowed to settle; effectively dissolved	Stored in dark at 4 deg C	Auto-titration with Metrohm Titrimo using Gran plots; pH tiration in the range 4.5 to 3.0. Titrant 0.1N sulphuric acid	
Iodine	Dissolved	I	ug/l	0.1	0.1	6-Mar-07	10-Jul-07	Wallingford	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Total dissolved iodine determined by automated colorimetry using a Technicon Autoanalyzer I system. Method based on the catalytic effect of iodide on the reaction between ammonium cerium sulphate (IV) and arsenic (III) oxide.	
Lanthanum	Dissolved	La	ug/l	0.01	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Lead	Dissolved	Pb	ug/l	0.06	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	

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Lithium	Dissolved	Li	ug/l	0.003	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Magnesium	Dissolved	Mg	mg/l	0.001	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Optical Emission Spectrometer using the Perkin Elmer 4300 DV using Standard Operating Procedure 3104	
Manganese	Dissolved	Mn	ug/l	0.006	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Molybdenum	Dissolved	Mo	ug/l	0.03	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Nickel	Dissolved	Ni	ug/l	0.01	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Nitrate	Dissolved	NO3-N	mg/l NO3-N	0.100	0.05	6-Mar-07	10-Jul-07	Wallingford	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by ion chromatography using a Dionex system.	
Nitrate	Dissolved	NO3-N	mg/l NO3-N	0.150	0.05	11-Jul-07	27-Jan-09	Lancaster	4	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by Ion chromatography using the ICS-2000 system using Standard Operating Procedure 3149	
Nitrite	Dissolved	NO2-N	mg/l-NO2-N	0.010	0.01	6-Mar-07	10-Jul-07	Wallingford	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by ion chromatography using a Dionex system.	
Nitrite	Dissolved	NO2-N	mg/l-NO2-N	0.010	0.01	11-Jul-07	27-Jan-09	Lancaster	4	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by Ion chromatography using the ICS-2000 system using Standard Operating Procedure 3149	
pH	Dissolved	pH	Dimensionless	NA	0.01	6-Mar-07	27-Jan-09	Bangor / Lancaster	3	10	Unfiltered but allowed to settle; effectively dissolved	Stored in dark at 4 deg C	Electrometric determination using Metrohm pH meter and electrode	Defined as minus the logarithm of the hydrogen ion activity
Potassium	Dissolved	K	mg/l	0.02	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Optical Emission Spectrometer using the Perkin Elmer 4300 DV using Standard Operating Procedure 3104	
Praseodymium	Dissolved	Pr	ug/l	0.03	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Rubidium	Dissolved	Rb	ug/l	0.002	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Scandium	Dissolved	Sc	ug/l	0.05	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Selenium	Dissolved	Se	ug/l	0.03	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Silicon	Dissolved	Si	mg/l Si	0.02	0.01	6-Mar-07	27-Jan-09	Lancaster	3	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Optical Emission Spectrometer using the Perkin Elmer 4300 DV using Standard Operating Procedure 3104	
Sodium	Dissolved	Na	mg/l	0.006	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Optical Emission Spectrometer using the Perkin Elmer 4300 DV using Standard Operating Procedure 3104	
Strontium	Dissolved	Sr	ug/l	0.03	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Sulphate	Dissolved	SO4	mg/l SO4	0.5	0.01	6-Mar-07	10-Jul-07	Wallingford	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by ion chromatography using a Dionex system.	
Sulphate	Dissolved	SO4	mg/l SO4	0.150	0.01	11-Jul-07	27-Jan-09	Lancaster	4	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Determined as the ion by Ion chromatography using the ICS-2000 system using Standard Operating Procedure 3149	
SO4_by_ICP	Dissolved	SO4_by_ICP	mg/l SO4	N/A	N/A	6-Mar-07	27-Jan-09	calculated			PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab		Calculated as mg/l of SO4 ion from measurements of total S by ICP-OES	
Sulphur	Dissolved	S	mg/l	0.04	0.01	6-Mar-07	27-Jan-09	Lancaster	3	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Optical Emission Spectrometer using the Perkin Elmer 4300 DV using Standard Operating Procedure 3104	Total dissolved sulphur, essentially sulphate
TDN	Dissolved	TDN	mg/l N	0.1	0.05	6-Mar-07	27-Jan-09	Lancaster	1	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Stored in dark at 4 deg C	Thermal oxidation and chemiluminescence detection using the Shimadzu TNM-1analyser.	
Tin	Dissolved	Sn	ug/l	0.006	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10, 11	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Titanium	Dissolved	Ti	ug/l	0.04	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Tungsten	Dissolved	W	ug/l	0.01	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10, 11	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Uranium	Dissolved	U	ug/l	0.002	0.001	6-Mar-07	27-Jan-09	Lancaster	2	10, 11	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	

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Vanadium	Dissolved	V	ug/l	0.02	0.01	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Zinc	Dissolved	Zn	ug/l	1	1	6-Mar-07	27-Jan-09	Lancaster	2	10	PALL Lifesciences AcroCap Filter with 0.45um Supor membrane in lab	Acidification to 1% with conc high purity nitric acid	Inductively Coupled Plasma Mass Spectrometer using the Perkin Elmer DRC 11 using Standard Operating Procedure 3504	
Area weighted stream flow		Flow	mm/15min			6-Mar-07	27-Jan-09	Field	6	10	Not applicable	Not applicable	Dip flash measurement from flow gauging structures	Calculated from stream flow measured as cubic meters per second
Area weighted rainfall		Rainfall	mm			6-Mar-07	27-Jan-09	Field	6	10	Not applicable	Not applicable	Tipping bucket rain gauge at Carreg Wen automated weather station	Rainfall is total recorded since last sample was collected
Date		Date	calendar	day, month, year	day	6-Mar-07	27-Jan-09	Field	5	10	Not applicable	Not applicable	Calendar	
Stream flow		Flow cumecs	cumecs			6-Mar-07	27-Jan-09	Field	6	10	Not applicable	Not applicable	Dip flash measurement from flow gauging structures	
Hourly water fluxes		Water flux	mm/hr			6-Mar-07	27-Jan-09	calculated			Not applicable	Not applicable	Calculated by converting runoff from mm/15min to mm/hr, and by dividing rainfall amount (mm) by 7-hour time interval between readings	
Time		Time	hours & minutes	minute	minute	6-Mar-07	27-Jan-09	Field	5	Not applicable	Not applicable	Not applicable	Wristwatch	All times recorded as Greenwich Mean Time

ANALYTICAL METHOD QC CODES

- 1 The accuracy of the Inductively Coupled Plasma Optical Emission Spectrometer element determinations were evaluated using materials supplied by the Aquacheck LGC Interlaboratory Proficiency Testing Scheme.
2 The accuracy of the determinations were evaluated using materials supplied by the Aquacheck LGC Interlaboratory Proficiency Testing Scheme. Methods accredited to ISO 17025
3 The accuracy of the determinations were evaluated using materials supplied by the Aquacheck LGC Interlaboratory Proficiency Testing Scheme. Methods NOT accredited.
4 The accuracy of the determinations were evaluated using materials supplied by the Aquacheck LGC Interlaboratory Proficiency Testing Scheme.The IC method, conductivity and ammonium methods are accredited to ISO 17025:2005
5 Standard GMT time measurements (see notes below on relationship between sampling times and time stamps)
6 Refer to CEH hydrological network

DATA QUALIFIER CODES

- 10 Raw data from the instrument with no LOD and has not been rounded. For quotation to laboratory standards refer to "LQDC" and "Quote To" values
11 Data at or below detection limit for majority of time series.
12 Raw data show very strange patterns that cannot be explained. Removal from database cannot be justified, but treat with extreme caution.

CONVERSION OF STREAM FLOW TO AREA-WEIGHTED RUNOFF

Catchment Area
Site Name Site Code sq. km.
Lower Hafren LHF 3.58
Upper Hafren UHF 1.22
(Upper Hafren drainage area is 122 ha to flow gauging structure and 117 ha to chemistry sampling point)

To convert from Cumecs to mm/15min (flow)
 $mm/15min = cumecs * 0.9 / (catchment\ area\ km^2)$

To convert from mm/15min (flow) to Cumecs
 $cumecs = (mm/15min) * (catchment\ area\ km^2) / 0.9$

SAMPLING TIMES IN RELATION TO DATE/TIME STAMPS

For stream samples (LHF and UHF), the date and time stamp indicates the time that the sample is collected.
For precipitation samples (CR), the date and time stamp indicates the BEGINNING of the 7-hour interval during which the sample is collected.
The columns "Precip sampling starts" and "Precip sampling ends" indicate the precipitation sampling interval explicitly.
The column "Volume-weighted mean sampling time" indicates:
(a) for stream samples: the sampling time
(b) for precipitation samples: the average sampling time, where each hour is weighted by the hourly rainfall recorded by the Carreg Wen automatic weather station.
Rainfall within each hour was attributed to the middle of the hour; no rainfall information on sub-hourly time scales is available.
If no rainfall was recorded during the 7-hour period, the mean sampling time is assumed to be the middle of the 7-hour interval.
This volume-weighted time base (rather than the raw time stamps) should be used if the relative timing of precipitation and runoff is critical.

For the first 8 weeks of sampling (until 2007/05/01), the precipitation autosampler was unloaded and re-set in the late afternoon;
if it was raining at that time, the 7PM sample could contain rain that fell before the 7PM-2AM sampling interval.
Starting on 2007/05/01 the autosampler change-over was moved to 12 Noon, consistent with the boundary between sampling intervals.