

## 1.0 Site Details: Maerdy Mill

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Gross Head:	3.00 m				Head Loss				10.0 %			
Design Flow:	0.200 m <sup>3</sup> /s				Turbine Flow Split:				100.0 %			
'Hands Off Flow'	0.560 m <sup>3</sup> /s				Bypass Flow Split:				0.0 %			
% PE =	5	10	20	30	40	50	60	70	80	90	95	98
Flow (m <sup>3</sup> /s)	9.039	6.114	3.768	2.598	1.901	1.411	1.014	0.693	0.455	0.272	0.177	0.117
Head (m)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

## 2.0 Turbine Matches: Maerdy Mill

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Selected Turbine Type: Overshot Waterwheel  
Selected Turbine System: Overshot Waterwheel (HM)

## 3.0 Design Summary: Maerdy Mill

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System Type:	Overshot Waterwheel	Design Flow:	0.200 m <sup>3</sup> /s
Power:	<b>3.63 kW</b>	Net Head:	2.70 m
Energy Capture:	<b>22,440 kWh</b> (365 days)	CO <sub>2</sub> Saving:	11.83 tonnes

## 4.0 System Details: Maerdy Mill

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### 4.1 Turbine

Name:	Overshot Waterwheel (HM)	
Manufacturer:	Hydromatch	
	Minimum	Peak
Flow:	0.020 m³/s	0.200 m³/s
Turbine Power:	0.39 kW	4.24 kW
Efficiency:		80 %
Site Adjustment Factor	1.000	

### 4.2 Drive

Name:	Standard Gear and Belt Drive Unit
Manufacturer:	Hydromatch
Efficiency:	92 %

### 4.3 Generator

Name:	IG 7.5 kW	
Manufacturer:	Hydromatch	
	Minimum	Peak
Power:	0.27 kW	3.63 kW
Efficiency:		94.1 %

### 4.4 Controller

Name:	Waterwheel control unit
Manufacturer:	Hydromatch
Efficiency:	99 %

### 4.5 Intake

Name:	No intake screen
Manufacturer:	Hydromatch



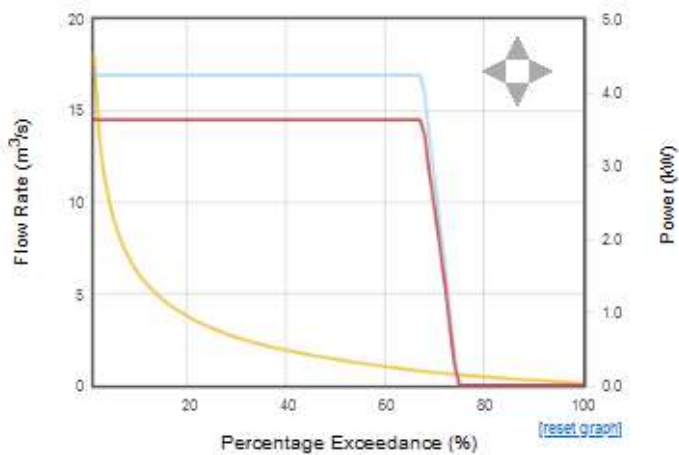
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Further information available at [hydromatch.com/machinery](https://hydromatch.com/machinery)

## 5.0 Operation Details: Maerdy Mill

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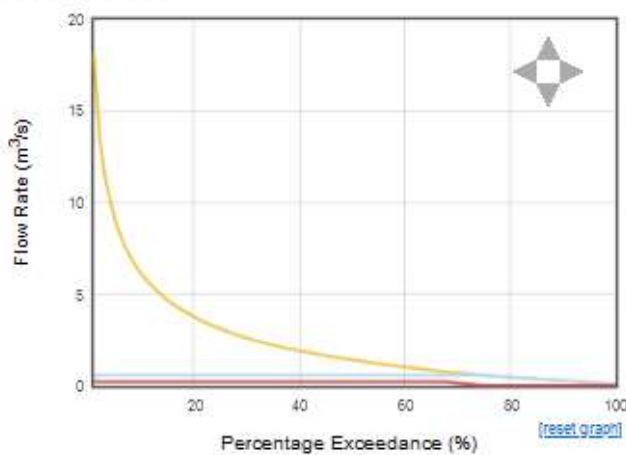
### 5.1 Operation Graph



■ Total Flow (m³/s)  
■ Turbine Power (kW)  
■ Electrical Power (kW)

Operation	Days	(%)
Design	245	67
Variable	26	7
Shutdown	95	26

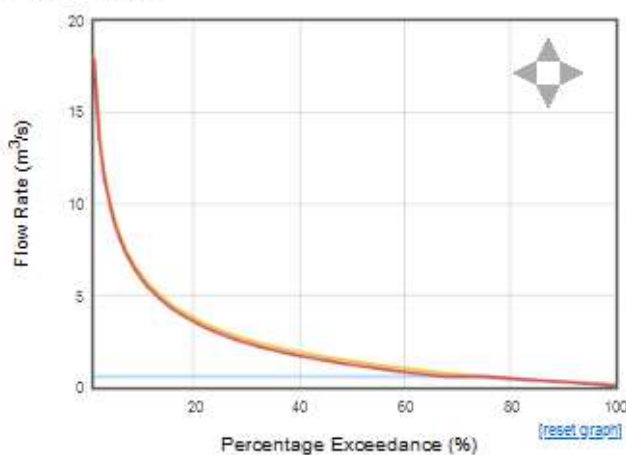
### 5.2 Turbine Flows



■ Total Flow (m³/s)  
■ 'Hands off' Flow (m³/s)  
■ Turbine Flow (m³/s)

Max Inst. Flow	0.200 m³/s
Hourly Abstraction (Vol)	720 m³
Daily Abstraction (Vol)	17,280 m³
Annual Abstraction (Vol)	4,459,506 m³

### 5.3 Bypass Flows



■ Total Flow (m³/s)  
■ 'Hands off' Flow (m³/s)  
■ Total Bypass Flow (m³/s)

'Hands off' Flow	0.560 m³/s
Turbine flow split	100.0 %
Bypass flow split	0.0 %

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## 6.0 Operation Details: Maerdy Mill

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Percentage Exceedance (%)	Total Flow (m <sup>3</sup> /s)	'Hands off' Flow (m <sup>3</sup> /s)	Total Bypass Flow (m <sup>3</sup> /s)	Head (Net) (m)	Turbine Flow (m <sup>3</sup> /s)	Turbine Efficiency (%)	System Efficiency (%)	Power (Electrical) (kW)	Energy Capture (kWh)
5	9.039	0.560	8.839	2.70	0.200	80.0	68.5	3.63	1,590
10	6.114	0.560	5.914	2.70	0.200	80.0	68.5	3.63	1,590
15	4.661	0.560	4.461	2.70	0.200	80.0	68.5	3.63	1,590
20	3.768	0.560	3.568	2.70	0.200	80.0	68.5	3.63	1,590
25	3.104	0.560	2.904	2.70	0.200	80.0	68.5	3.63	1,590
30	2.598	0.560	2.398	2.70	0.200	80.0	68.5	3.63	1,590
35	2.216	0.560	2.016	2.70	0.200	80.0	68.5	3.63	1,590
40	1.901	0.560	1.701	2.70	0.200	80.0	68.5	3.63	1,590
45	1.639	0.560	1.439	2.70	0.200	80.0	68.5	3.63	1,590
50	1.411	0.560	1.211	2.70	0.200	80.0	68.5	3.63	1,590
55	1.198	0.560	0.998	2.70	0.200	80.0	68.5	3.63	1,590
60	1.014	0.560	0.814	2.70	0.200	80.0	68.5	3.63	1,590
65	0.839	0.560	0.639	2.70	0.200	80.0	68.5	3.63	1,590
70	0.693	0.560	0.560	2.70	0.133	80.0	68.4	2.41	1,396
75	0.561	0.560	0.561	2.70	0.000	0.0	0.0	0.00	386
80	0.455	0.560	0.455	2.70	0.000	0.0	0.0	0.00	0
85	0.357	0.560	0.357	2.70	0.000	0.0	0.0	0.00	0
90	0.272	0.560	0.272	2.70	0.000	0.0	0.0	0.00	0
95	0.177	0.560	0.177	2.70	0.000	0.0	0.0	0.00	0
100	0.048	0.560	0.048	2.70	0.000	0.0	0.0	0.00	0