

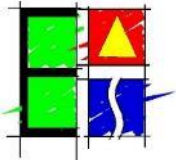
# RIPPON WIND FARM

## Estimated Water Demand



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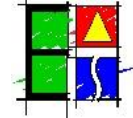
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# Rippon Wind Farm

## Estimated Water Demand



### Construction Phase

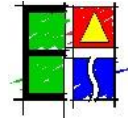
<b>A: Road Construction Requirements</b>	Length (m)	Depth (m)	Width (m)	Volume (m <sup>3</sup> )
New Greenfields Roads (Spine and Access)	13290	0,15	4,5	8970,75
Farm Tracks (Spine and Access)	13290	0,15	4,5	8970,75
District Upgrading	0	0,15	6	0
	<u>26580</u>			<u>17941,5</u>
Water use calc (KI) = (L x W x D x 2.25x 0.07) <b>Total</b>				<b>2825,79</b>
Construction Period	30	months		
Water demand per month @ 22 days per month	94,19	kl /month		
Water demand per day	4,28	kl / day		

<b>B: Platform Layer-works</b>	Length (m)	Depth (m)	Width (m)	Volume (m <sup>3</sup> )
1 Platform	68,5	0,45	35,5	1094,29
Therefore for 36 Platforms	68,5	0,45	35,5	39394,35
Water use calc (KI) = (L x W x D x 2.25x 0.07) <b>Total</b>				<b>6204,61</b>
Construction Period	30	months		
Water demand per month @ 22 days per month	206,82	kl /month		
Water demand per day	9,40	kl / day		



# Rippon Wind Farm

## Estimated Water Demand



<b>C: Foundations Layer-works</b>		Diameter (m)	Depth (m)	Volume (m <sup>3</sup> )
1 Platform	$V = \pi r^2 h$	23	0,45	186,96
Therefore for 36 Platforms				6730,56
Water use calc (kl) = (L x W x D x 2.25x 0.07)		<b>Total</b>		<b>1060,06</b>
Construction Period	30 months			
Water demand per month @ 22 days per month	35,34 kl /month			
Water demand per day	1,61 kl / day			

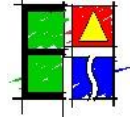
<b>D: Concrete Batching Plant Requirements</b>				
Number of turbines	36			
Construction period	30 months			
Concrete per Foundation	500 m <sup>3</sup>			
Concrete Total	18000 m <sup>3</sup>			
Concrete (m3) required per month	600	@ 200 litres / m <sup>3</sup>		
Water demand per Turbine (kl)	100			
Total water demand (kl)	3600			
Water use calc (kl) = Concrete volume x 200 / 1000		<b>Total</b>		<b>3600</b>
Construction Period	30 months			
Water demand per month @ 22 days per month	120,00 kl / month			
Water demand per day	5,45 kl / day			

<b>Total Estimated Water Demand for Construction</b>			
Total Water demand (A+B+C+D)		13690,46	kl
Total water consumption		20,74	kl / day
Total water abstraction rate required		0,36	l/s



# Rippon Wind Farm

## Estimated Water Demand



<b>E: Staff Accommodation and Estimated Durations</b>	Start Up (2 months)	Growth (12 months)	Peak (12 months)	Commissioning (4 months)	30 Months
Roads Construction Teams	14	23	23	0	
Foundation Construction Teams	0	88	88	0	
Electrical Teams	10	33	33	20	
Crane and Erection Teams	0	0	17	17	
<b>On-site Staff</b>	<b>24</b>	<b>144</b>	<b>161</b>	<b>37</b>	100 litres pppd
<b>Off-site Staff</b>	<b>20</b>	<b>33</b>	<b>33</b>	<b>20</b>	60 litres pppd
<b>Total Number of Staff on Site</b>	<b>44</b>	<b>177</b>	<b>194</b>	<b>57</b>	
Water Demand for <u>on-site staff</u> (litres per day)	2400	14400	16100	3700	
Water Demand for <u>off-site staff</u> (litres per day)	1200	1980	1980	1200	
	<b>Total (kl per day)</b>	3,6	16,38	18,08	4,9
	<b>Total (kl per phase)</b>	158,4	4324,32	4773,12	431,2

Estimated staff figures excludes Truck operators, importing / delivery of materials to site and off-site, and only spending short periods on the construction site. This also exclude all non-permanent skilled / professional staff, performing ad-hoc duties, not being on a daily basis on site.

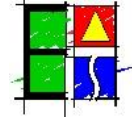
<b>Total Estimated Water Demand For Human Consumption</b>	
Max Water Demand =	18,08 kl / day
Total Water Demand =	9687,04 kl
Average Water consumption = kl / month (avg)	322,90 kl / month
Maximum Water consumption = kl / month (peak)	397,76 kl / month
Max Water consumption = kl / day (peak) [Estimated storage required]	18,08 kl / day
Max Water Abstraction Rate = l/s (based at 16h pump p/d)	0,314 l/s

Water consumption will typically cover all water demands for washing, toilets, showers, food preparation, etc, as the temporary Staff Accommodation Areas and the permanent Control Office facility.



# Rippon Wind Farm

## Estimated Water Demand



<b>F: Staff Sewage</b>	Start Up (2 months)	Growth (12 months)	Peak (12 months)	Commissioning (4 months)	30 Months
Roads Construction Teams	14	23	23	0	
Foundation Construction Teams	0	88	88	0	
Electrical Teams	10	33	33	20	
Crane and Erection Teams	0	0	17	17	
<b>Total Workers living on site</b>	<b>24</b>	<b>144</b>	<b>161</b>	<b>37</b>	Grey Water and Sewage = 85 litres pppd
<b>Off-site Staff</b>	<b>20</b>	<b>33</b>	<b>33</b>	<b>20</b>	Grey Water and Sewage = 51 litres pppd
<b>Total Number of Staff on Site</b>	<b>44</b>	<b>177</b>	<b>194</b>	<b>57</b>	
Sewage for <u>on-site staff</u> (litres per day)	2040	12240	13685	3145	
Sewage for <u>off-site staff</u> (litres per day)	1020	1683	1683	1020	
<b>Total (kl per day)</b>	<b>3,06</b>	<b>13,92</b>	<b>15,37</b>	<b>4,17</b>	
<b>Total (kl per phase)</b>	<b>134,64</b>	<b>3675,67</b>	<b>4057,15</b>	<b>366,52</b>	

### Notes

Length (m)

Width (m)

Depth / Thickness (m)

Density - 2250kg/m<sup>3</sup> or 2.25 (converted to ton or kl)

Moisture - 7% or 0.07

Timeline	Start Up		Growth												Peak												Commissioning			
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27	Month 28	Month 29	Month 30
A: Road Construction (kl)	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19	94.19
B: Platform Layer-works Construction (kl)	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82	206.82
*C: Turbine Foundation Layer-works Construction (kl)	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34
**D: Turbine Concrete Foundation Construction (kl)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00
E: Site Camp and Staff Accommodation Requirements (kl)	79.20	79.20	360.36	360.36	360.36	360.36	360.36	360.36	360.36	360.36	360.36	360.36	360.36	360.36	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76	397.76
Total (kl/month)	535.55	535.55	816.71	816.71	816.71	816.71	816.71	816.71	816.71	816.71	816.71	816.71	816.71	816.71	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11	854.11
Total (kl/day)	24.34	24.34	37.12	37.12	37.12	37.12	37.12	37.12	37.12	37.12	37.12	37.12	37.12	37.12	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82
***Total incl. Unavoidable Losses (kl/day)	26.78	26.78	40.84	40.84	40.84	40.84	40.84	40.84	40.84	40.84	40.84	40.84	40.84	40.84	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71	42.71
Water Abstraction Rate in litres / sec (based on a 16hr / day pumping rate)	0.46	0.46	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74

**Notes**  
 \* C: Turbine Foundation Layerworks Construction (kl) consumption per month will not be spread over the 22 day month but may be over a period of 3 days.  
 \*\*D: Turbine Concrete Foundation Construction (kl) consumption per month will not be spread over the 22 day month but will be over a period of 3 days.  
 \*\*\* 10% Unavoidable losses catering for evaporation, leaks, spillages, etc  
 All groundwater abstraction will be at a constant rate and all attenuation will be catered for in storage reservoirs