

Buckland wind farm

This report documents a comparison of site modelling projections using WAsP software with evaluations using two reference points: the village Site 5062 met tower and the west hills Site 5063 met tower.

Interpretation

Modelled turbine is a NW100 at 37 meter hub height and with 100% availability.

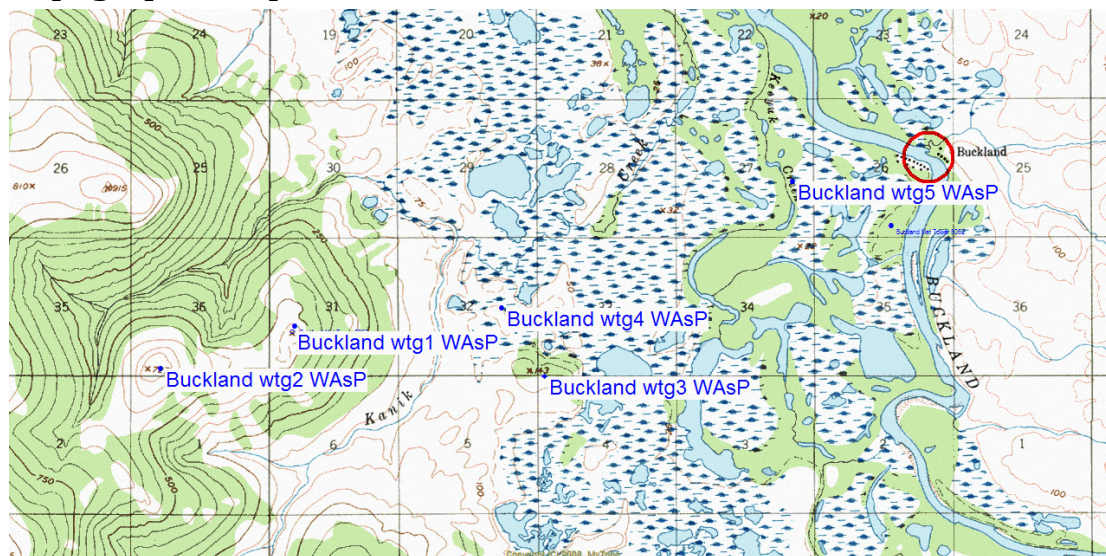
These models use met tower 5062 (village site) and met tower 5063 (west hills site) data for calculations. Turbine wtg1 is at location of west hills met tower. Turbine wtg2 is on the higher hill about 1 mile west of the west hills met tower. Turbines wtg3 and 4 are on the flats about 1 mile east of the quarry about in the area proposed by Matt Bergan as possessing possibly higher winds. Turbine wtg5 is near the airport and fairly near met tower 5062 (village site).

The models cross-correlate very well in that one met tower predicts the wind resource at the other within a few percentage points. One may conclude then that the WAsP software accurately models wind turbine performance in Buckland at the turbine locations noted.

WAsP model turbine site correlation

	Met tower 5062 data Net AEP	Met tower 5063 data Net AEP	Absolute difference (%)
Turbine	[MWh]	[MWh]	
wtg1	216.9	219.4	1.18%
wtg2	240.0	243.2	1.32%
wtg3	160.1	167.4	4.52%
wtg4	157.9	162.9	3.18%
wtg5	165.0	167.8	1.69%

Topographic Map, Turbine locations

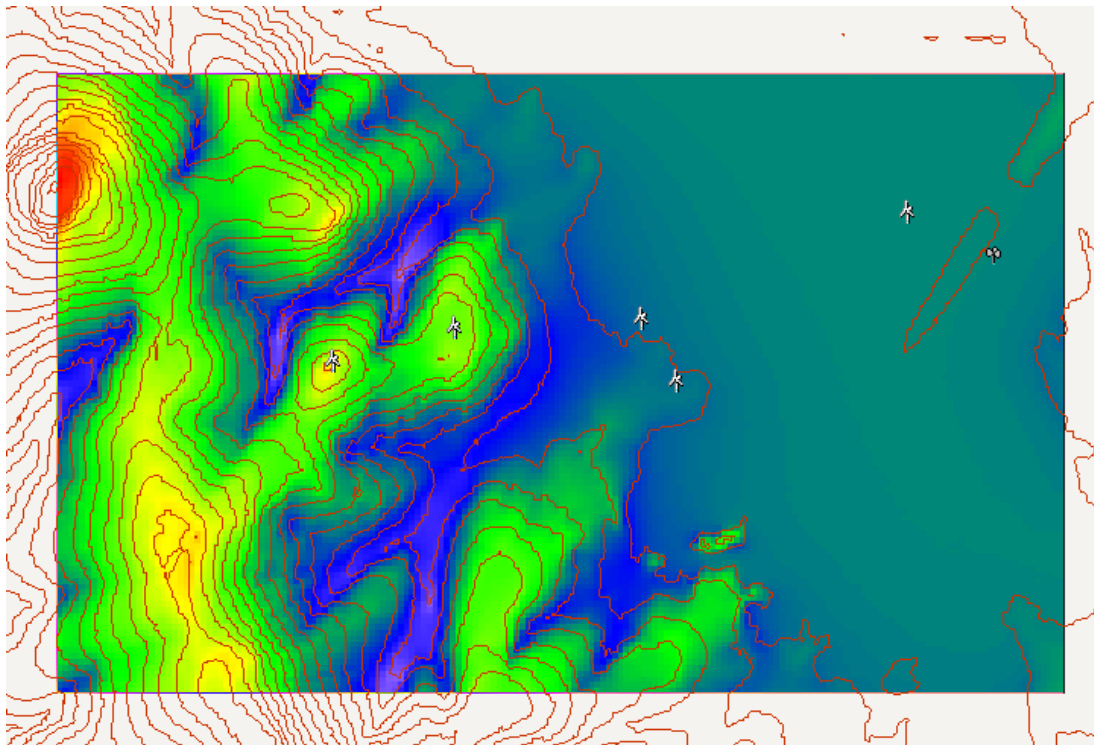


Village Site 5062**Summary results**

Site	Location [m]	Turbine	Elevation [m a.s.l.]	Height [m a.g.l.]	Net AEP [MWh]	CF [%]
wtg1	(396147, 7317572)	NWP 100	149.6616	37	216.875	24.7
wtg2	(394566, 7317131)	NWP 100	215.6968	37	240.031	27.4
wtg3	(399014, 7316881)	NWP 100	23.86672	37	160.130	18.3
wtg4	(398556, 7317697)	NWP 100	20	37	157.858	18.0
wtg5	(402004, 7319074)	NWP 100	20	37	165.017	18.8

Site wind climates

Site	Location [m]	Height [m a.g.l.]	A [m/s]	k	U [m/s]	E [W/m ²]	RIX [%]	dRIX [%]
wtg1	(396147, 7317572)	37	6.5	1.53	5.82	318	0.1	0.1
wtg2	(394566, 7317131)	37	6.8	1.52	6.17	385	0.0	0.0
wtg3	(399014, 7316881)	37	5.5	1.54	4.98	199	0.0	0.0
wtg4	(398556, 7317697)	37	5.5	1.53	4.95	196	0.0	0.0
wtg5	(402004, 7319074)	37	5.6	1.52	5.05	211	0.0	0.0

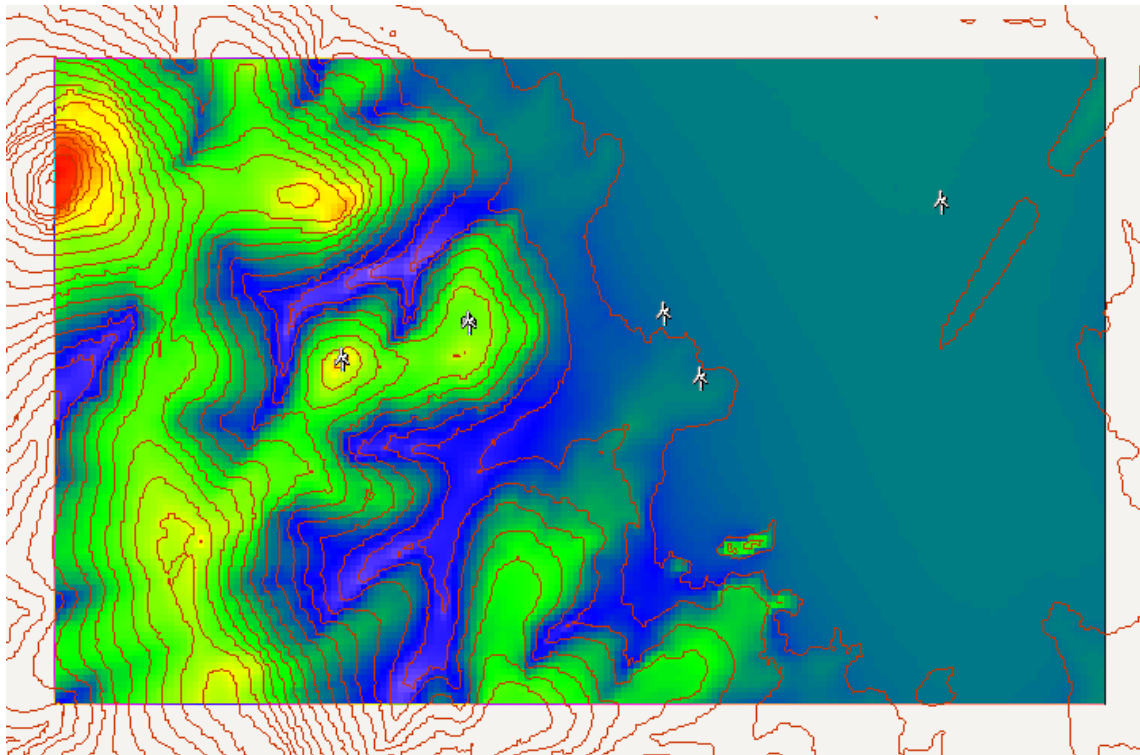
Mean wind speed map (village site met tower 5062)

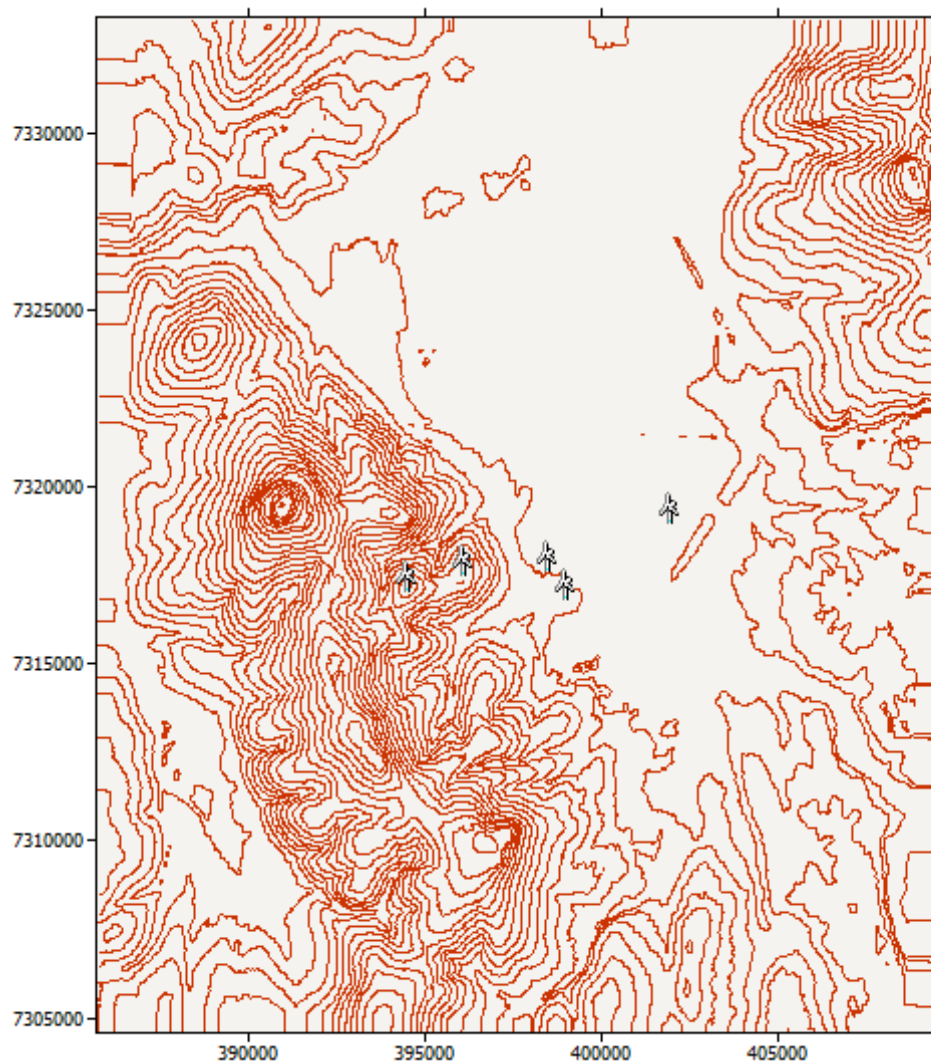
West Hills Site 5063**Summary results**

Site	Location [m]	Turbine	Elevation [m a.s.l.]	Height [m a.g.l.]	Net AEP [MWh]	Wake loss [%]
wtg1	(396147, 7317572)	NWP 100	149.6616	37	219.437	25.0
wtg2	(394566, 7317131)	NWP 100	215.6968	37	243.188	27.7
wtg3	(399014, 7316881)	NWP 100	23.86672	37	167.372	19.1
wtg4	(398556, 7317697)	NWP 100	20	37	162.884	18.6
wtg5	(402004, 7319074)	NWP 100	20	37	167.812	19.1

Site wind climates

Site	Location [m]	Height [m a.g.l.]	A [m/s]	k	U [m/s]	E [W/m ²]	RIX [%]	dRIX [%]
wtg1	(396147, 7317572)	37	6.6	1.57	5.97	331	0.1	0.0
wtg2	(394566, 7317131)	37	7.1	1.56	6.34	399	0.0	-0.1
wtg3	(399014, 7316881)	37	5.8	1.58	5.19	216	0.0	-0.1
wtg4	(398556, 7317697)	37	5.7	1.58	5.13	209	0.0	-0.1
wtg5	(402004, 7319074)	37	5.8	1.56	5.20	221	0.0	-0.1

Mean wind speed map (west hills site met tower 5063)

Digital elevation map for WASP model, UTM coordinates*Google Earth image of Buckland and met tower sites*