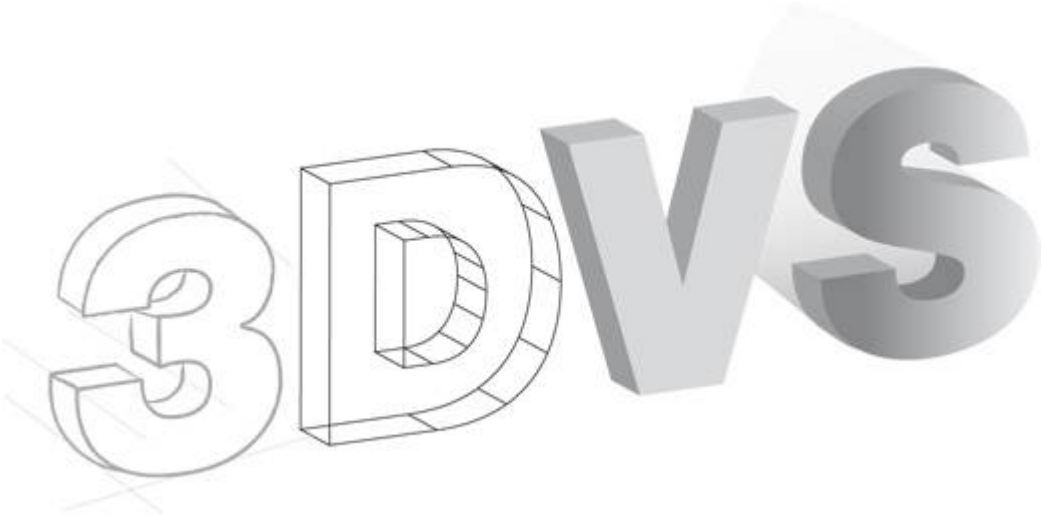


VISUAL IMPACT ASSESSMENT FIELD REPORT

BROADSTONES RESERVOIR

HEPWORTH

12TH JUNE 2012.

THIS REPORT IS PREPARED IN ACCORDANCE WITH THE GUIDELINES IN ' GUIDELINES FOR LANDSCAPE AND VISUAL IMPACT ASSESSMENT. PUBLISHED BY THE LANDSCAPE INSTITUTE & THE INSTITUTE OF ENVIRONMENTAL MANAGEMENT & ASSESSMENT ' & 'VISUAL REPRESENTATION OF WINDFARMS: GOOD PRACTICE GUIDE'. PUBLISHED BY SCOTTISH NATURAL HERITAGE.

Visual Impact Assessment.

1. Introduction

3DVS have undertaken this VIA study on behalf of *Newgen,* which is intended to form part of an application for the determination of the erection of an Endurance wind turbine on land adjacent to Broadstones Reservoir, Hepworth. The report identifies the visual impact of this turbine through photography.

2. Site Context.

Grid Reference	
Lat/Lon:	53 33.038 – 001 42.472
OSGB:	SE19453 - 06040
Landscape Description & Use	Agriculture
Green Belt	Yes
National Park	No
A.O.N.B	No
Planning Authority	Barnsley
Distance from site to nearest residential property owned by customer.	N/A
Distance to nearest property not owned by customer.	861m
Distance from nearest commercial property.	200m
Centres of residence	Hepworth
Public Highways	A616. Hay Slack Lane.
Public Footpaths/Bridleways etc.	Barnsley Boundary Walk.

3. Existing Environment.

A desktop study was undertaken to gather information on the existing baseline landscape conditions, location of visual receptors and geographical context to establish the area over which the wind turbine development may have a visual impact. In addition to the desktop study, site survey work was undertaken to verify the findings of the data collection, to identify specific landscape features and to undertake a detailed visual analysis. Photographs were taken from viewpoints from potential visual receptors.

4. Terrain/Landscape/Site Context.

The site lies in a field north of Brown Edge Road and South of Broadstones Reservoir. The landscape is a series of rectangular fields bounded by dry stone wall. There are a number of farms and other properties nearby. The land slopes gently to the east, however to the west the land falls away steeply along a north south trending escarpment. There are other turbines in the area, in the main Evoco & Proven in manufacture as well as an Iskra. To the west a number of large utility turbines were noted and to the southeast the Spicer Hill Windfarm.

5. Methodology for Assessment of Landscape Resource and Visual Impacts.

The assessment of the visual impacts were conducted in accordance with current guidance or adapted, namely The Landscape Institute and Institute of Environmental Management and Assessment *Guidelines for Landscape and Visual Impact Assessment*, (Second Edition) 2002, as described below.

In defining the landscape visual impact Tables 1, 2 & 3 below have been used as guides.

Table 1. Sensitivity Classification

Sensitivity of Landscape Resource	
Landscape of particularly distinctive, character susceptible to relatively Small changes e.g. National Park	**High**
Landscape with relatively ordinary characteristics reasonably tolerant of changes	**Medium**
Landscape with few features of value or interest, potentially tolerant of Significant change.	**Low**

Note on Table 1, specifically A.O.N.B, National Parks, SSSI and World Heritage sites etc.

This report addresses the visual impact of the proposed site from the viewpoint of an individual or individuals looking towards the site from various viewpoints or 'visual receptors', it does NOT assess the 'physical' impact on the Land e.g. Flora/Fauna, Geology, terrain and land use, therefore the objective terminology used in this report is of a different meaning, and RELATES to visual impact.

For example:

The proposed site may be in a National Park, by definition a high sensitivity landscape. However the site from a particular viewpoint, say a road or footpath may be masked or hidden by trees, from a 'visual' reception point of view this would be classed as 'slight' as the turbine is not in full view to the 'visual' receptor. The same criteria are applied to any properties that may have visual reception to the site.

Issues on the physical change to the landscape (as above) should be addressed by other reports.

Table 2. Magnitude Classification.

Magnitude of Change	
Substantial change in landscape characteristics over an extensive area, ranging to very intensive change over a limited area. Permanent, long term.	**High**
Moderate change in landscape component over a wide area and/or moderate change in localised area.	**Moderate**
Discernable but slight change in any landscape component. Short term, temporary	**Slight**
Virtually imperceptible change. Insignificant scale to affect the integrity of the landscape component	**Negligible**

Table 3. Impact Significance.

	Low Sensitivity	**Medium Sensitivity**	**High Sensitivity**
Substantial Magnitude	Moderate Impact	Substantial Impact	Substantial Impact
Moderate Magnitude	Slight Impact	Moderate Impact	Substantial Impact
Slight Magnitude	Slight Impact	Slight Impact	Moderate Impact
Negligible Magnitude	Negligible Impact	Slight Impact	Slight Impact

Table 4 provides a summary of predicted visual impact upon completion of installation and construction

Table 4. Predicted Visual Impact over the next 5 years.

Activity	**Effect upon landscape resource**	**Sensitivity**	**Magnitude**	**Significance of visual impact.**
Increase in traffic due to construction works and erection of plant	Loss of a small area of grassland	LOW	LOW	SLIGHT
Initial Operation Stage	Continuation of existing conditions – Loss of small area of grassland	LOW	LOW	SLIGHT
Continued full time operation	Continuation of existing conditions – Loss of small area of grassland.	LOW	LOW	SLIGHT

Table 5. Predicted Visual Impacts Upon Completion of Construction.

Activity	**Effect upon Visual Impact**	**Sensitivity**	**Magnitude**	**Significance of visual impact.**
Increased visibility of the site due to the operation of the single wind turbine	Near distance views. Location 1 Location 3 Location 5 Middle Distance Views. Location 2 Location 4 Far distant views.	 Moderate “ Moderate Slight N/A	 Moderate “ Moderate Slight N/A	 Moderate “ Slight Slight N/A

6. Methodology for Assessment of Visual Impact.

Visual impact is the result of a change in view from receptors such as residential property, public rights of way, land with public access and roads. Residential properties are considered the most sensitive receptors to changes in view whereas road users are the least sensitive as their experience is transient. The magnitude of impact is assessed according to the scale of the effect, which will depend largely upon the size and type of the development and the distance of the receptor/s from the site. The significance of visual impact depends upon the sensitivity of the receptor and the magnitude and duration of the effect

Technical Processes Used in Producing this Report.

1. All location photographs and the Turbine position were logged on site using a GARMIN GPS. The accuracy of positions is +/- 3m.
2. Locations were logged on site as OSGB 10 figure co-ordinates. These were then converted back to Latitude – Longitude bearings so that the positions could be accurately marked on the Google Earth Aerial view and the relevant OS Maps.
3. Original Marker Distances on the GPS were cross referenced with the distances from Google Earth and OS Maps for accuracy. Both, co-ordinate sets, elevation and distance from the Turbine position are clearly marked on the images. Terrain Cross Profiles were produced from OS digital maps 1:50.000/1:25000 vertical exaggeration is approximately x 2.
4. The visualisations were produced using 3D STUDIO MAX and Photoshop. This was done by placing the photographs into 3DS Max, placing a 'virtual camera' in the scene at the correct distance from the turbine and then superimposing the turbine into the scene. Scale height calculations were done to ensure total accuracy of turbine height against distance.
5. Final images were then rendered out, saved as .jpg files and then post processed in Photoshop, re-sizing of image for printing purposes.

Note: Consideration is given to all possible visual receptors within the range 0 to 5000m during the desktop study. However, it would be impractical to examine all visual vantage points for a project of this size and we accept that the turbine could be seen from other locations.

Table 6. Sensitivity of Visual Receptors.

Sensitivity of Visual Receptor.	
Residential properties less than 1 km from the development with direct views from ground floor and first floor windows towards the development. Public Rights of Way less than 1 km from the development with direct views.	**HIGH**
Residential properties over 1 km from the development or with more restricted views towards the development. Public Rights of Way more than 1 km from the development, or with restricted views. Local side roads and lanes. Sporting and recreational facilities, allotments.	**Medium**
Offices, commercial developments and industrial sites. Main roads and rail routes.	**Low**

Table 7. Classification of Magnitude of Visual Receptors.

Magnitude of Impact (Scale).	
The majority of viewers affected/major changes over a large proportion of the view.	**Substantial**
Many of the potential viewers affected/ major changes over a smaller proportion of the view/moderate change in view/partial view.	**Moderate**
Few viewers affected / minor change in view/glimpsed view.	**Slight**
Indiscernible change in the view.	**Negligible**

Table 8. Significance of Impact (Relationship Between Sensitivity and Magnitude).

	Low Sensitivity	**Medium Sensitivity**	**High Sensitivity**
Substantial Magnitude	Moderate	Substantial	Substantial
Moderate Magnitude	Slight	Moderate	Substantial
Slight Magnitude	Slight	Slight	Slight
Negligible Magnitude	Neutral	Neutral	Slight

The photomontage images have been produced to predict the proposed views of the site post construction. Photograph Locations 1 to 5 were taken using a Fuji S2950 digital camera at an optical zoom setting of 1.8, which is equivalent to a 50mm lens on a standard 35mm film format SLR. No tripod or monopod was used. All images are 1.9m above ground level; the height of the photographer. The images are comparable to those observed by the human eye; viewing distance for the images should be between 300mm at 500mm from the eye. The photomontages were produced using 3d Studio Max an industry standard visualisation package, part of the Autodesk AutoCAD group and PhotoShop. Photographs 1 to 5 were taken from publicly accessible viewpoints, to illustrate the site on completion.

7. Visual Baseline Conditions.

A visual analysis was undertaken on 12th June 2012, when weather conditions and visibility were considered to be acceptable.

The Zone of Theoretical Visibility (ZTV) is defined as the area from within which the
proposed development would be visible (assuming an eye level of 1.6 m above
ground level). The ZTV and potential visual receptors are shown in Part 2 of this report.

3DVS does not employ the use of Digital Elevation Models or Digital Terrain Models as they are not deemed necessary for a project of this size. 3DVS develops it ZTV from observations on the ground and the use of 3D topographical digital OS maps, giving an accurate ZTV for the study area.

8. Visual Receptors.

The local authority has not asked for any specific locations to be considered. However we are asked to note the cumulative impact of this turbine in conjunction with the others in the area.

There were a number of possible visual receptors identified from the desk top study. These were:

Hey Slack Lane
Dick Edge Lane
Birdsnest Lane
Grime Lane
Hog Close Lane
Whitley Rd
Windmill Lane

All of the above sites were visited on the day.

A total of 5 visual receptors were chosen and photographs taken looking towards the site of the Turbine for assessment on how they might be visually affected by the erection of the proposed turbines.

The receptors are situated between 658m and 1780m away from the site.

All views are within the near/middle distance range for a VIA. Local topography cause line of sight views to be limited. The proposed turbine is only 25m in height.

All photographs were taken from publicly accessible viewpoints. Legally 3DVS cannot access the private land of individuals.

Near Distant Views (inside 1000m)

Location 1
Location 3
Location 5

Middle Distance Views (Between 1000m & 2500m).

Location 2
Location 4

Distant Views (Between 2500m & => 5000m.)

None

Shadow Flicker (10 times blade diameter, 130 deg either side of north) is not relevant.

9. Predicted Visual Impacts.

A summary of the visual impacts from the above receptors, using the methodology
described in Section 6 is summarised in Section 11. The receptor locations are
shown in Part 2 of this report. (GIS Image & Shaded relief OS Map). Terrain Cross Profiles with a vertical exaggeration of approx X2 are also supplied in Part 2 of this report.

The description of the views and the potential impact on individual receptors is summarised as follows below:

Location 1

Looking northeast to the site. The proposed turbine is on the skyline at a distance of 942m from the photo location.

Location 2

A middle distance view of the turbine, looking southeast 1483m (1.48km) from the photo location. Broadstone Reservoir is to the left. Spicer Hill Windfarm is to the right.

Location 3

Looking southeast over Broadstone Reservoir. The riding stables are to the left, Spicer Hill Windfarm can be seen in the background, there are no residential properties nearby.

Location 4

Looking southeast from Windmill Lane. There are a few residential and agricultural properties in this area. The proposed turbine is 1780m (1.78km) from this point.

Location 5

Whitley Rd, looking north to the site. The turbine stands in isolation. The stables are seen to the right and Emley Moor Mast is seen dominating the view in the background.

10. Summary of Predicted Visual Impact.

Fundamental change at the site will result from the erection of the turbine as a new vertical structure in the landscape. Whilst the site sits in a broad landscape, with land gently sloping to the east with sharp drops to the west. The site is hidden from wider views because of the 'bowl' like effect of the local topography. Whilst locally the turbine may 'appear' to be marginally skyline, the angle of view from other positions will not be the case, e.g. from the east and west. There are other turbines in the vicinity.

11. Conclusion.

1. This is an application for a single wind turbine.
2. There are other existing turbines in the area.
3. Views are limited to near/middle distance views (less than 2000m) because of local terrain.
4. There are numerous power lines and poles within the survey area which will detract from the overall impact of this additional turbine.
5. Visual impact will be moderate slight.
6. Cumulative impact is classed as Combined/Sequential
7. There is no effect from Shadow Flicker

It is felt that the erection of this turbine will not create any significant change in cumulative impact, as this is outweighed by the numerous other vertical structures nearby.

Overall, Visual Impact is classed as SLIGHT/MODERATE.


Location 4
Windmill Ln
Location 2
Location 3
Birdsnest Ln
Broadstone Reservoir
Broadstone Rd
Hey Slack Ln
Haddingley Ln
Scar Hole Ln
Meal Hill Ln
Cheese Gate Nab Side
Foster Pl Ln
Slack Top Ln
Barnside Ln
Gate Head Ln
A616
Wood Royd Hill Ln
Hog Close Ln
Grime Ln
Location 1
Turbine
Brown's Edge Rd
Lower Maythorn Ln
Location 5
© 2012 Google
© 2012 Infoterra Ltd & Bluesky
Google earth
Imagery Date: 5/31/2009
2002
53°33'10.42" N 1°43'13.85" W elev 331 m
Eye alt 3.30 km



Location 1. OSGB: SE18521 - 05891 Lat/Lon: 53 32.959 - 001 43.317 Distance to Turbine = 942m. View looking east.



Location 2. OSGB: SE18076 - 06593 Lat/Lon: 53 33.339 - 001 43.717 Distance to Turbine = 1483m. View looking southeast.



Location 3. OSGB: SE19140 - 06621. Lat/Lon: 53 33.352 - 001 42.753. Distance to Turbine = 658m. View looking southeast.



Location 4. OSGB: SE17989 - 07049 Lat/Lon: 53 33.585 - 001 43.794 Distance to Turbine = 1780m View looking southeast.



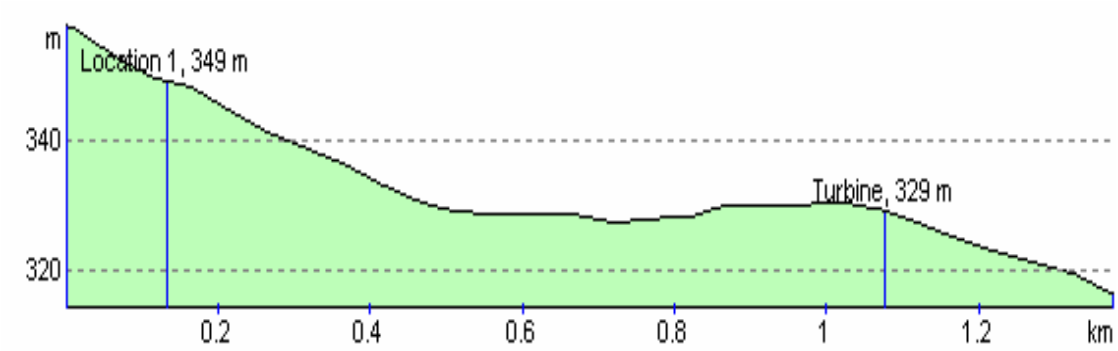
Location 5. OSGB: SE19312 - 05299. Lat/Lon: 53 32.638 - 001 42.602. Distance to Turbine = 765m View looking northeast.

Terrain Profile: Location 1 to Turbine

Summary

Profile Distance: 1.38 km
Total Ascent: 3 m Total Descent: 44 m

Elevation Profile



Waypoints

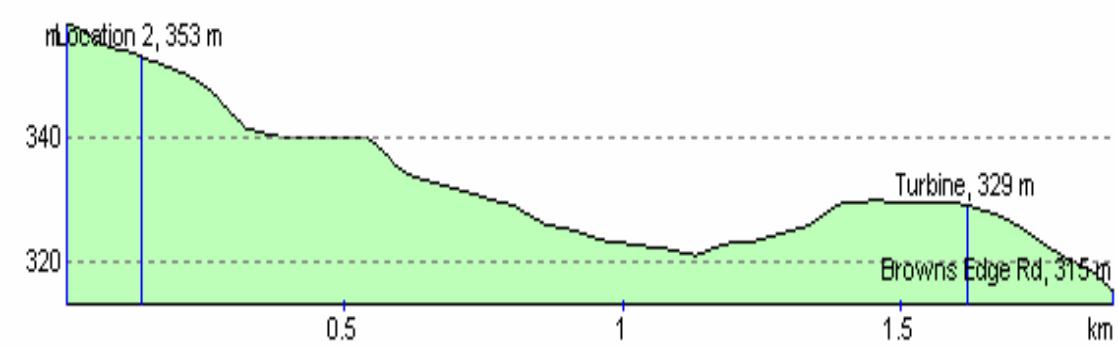
Leg	Name / Position / Elevation	Bearing	Distance	Ascent	Descent	Comments
0	WP0201 SE 18390 05874 357 m					
1	Location 1 SE 18521 05892 349 m	082°T	132 m	0 m	8 m	Location 1. Distance to Turbine = 942m. Profile running east.
2	Turbine SE 19453 06041 329 m	081°T	945 m	3 m	23 m	Turbine
3	WP0204 SE 19750 06091 316 m	080°T	301 m	0 m	13 m	
		Totals:	1.38 km	3 m	44 m	

Terrain Profile: Location 2 to Turbine

Summary

Profile Distance: 1.88 km
Total Ascent: 8 m Total Descent: 51 m

Elevation Profile



Waypoints

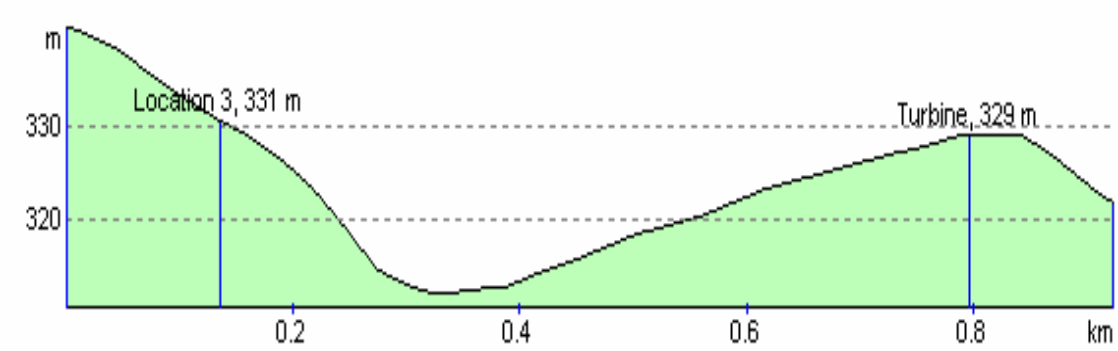
Leg	Name / Position / Elevation	Bearing	Distance	Ascent	Descent	Comments
0	WP0501 SE 17960 06661 358 m					
1	Location 2 SE 18076 06594 353 m	120°T	135 m	0 m	5 m	Location 2. Distance to Turbine = 1483m (1.44km). Profile running southeast.
2	Turbine SE 19453 06041 329 m	112°T	1.48 km	9 m	32 m	Turbine
3	Browns Edge Rd SE 19695 05936 315 m	113°T	263 m	0 m	14 m	Browns Edge Rd.
		Totals:	1.88 km	8 m	51 m	

Terrain Profile: Location 3 to Turbine

Summary

Profile Distance: 923 m
Total Ascent: 17 m Total Descent: 36 m

Elevation Profile



Waypoints

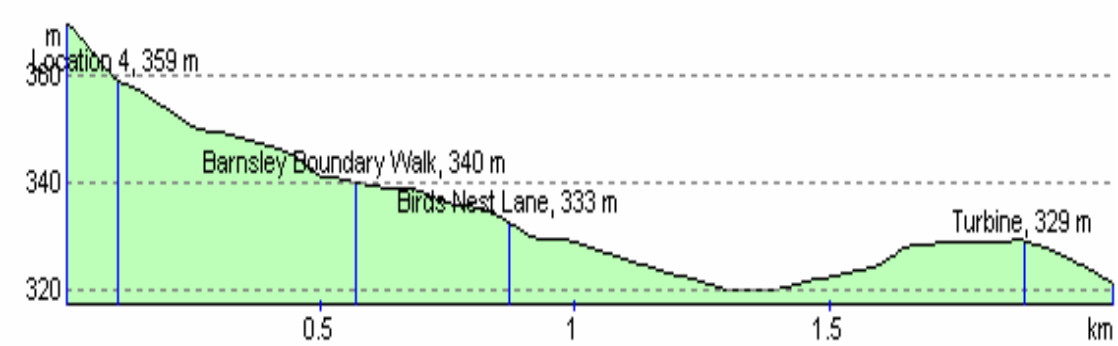
Leg	Name / Position / Elevation	Bearing	Distance	Ascent	Descent	Comments
0	WP0601 SE 19075 06741 341 m					
1	Location 3 SE 19140 06622 331 m	151°T	136 m	0 m	10 m	Location 3. Distance to Turbine = 658m. Profile running south/southeast.
2	Turbine SE 19453 06041 329 m	151°T	660 m	17 m	18 m	Turbine
3	WP0604 SE 19512 05929 322 m	152°T	127 m	0 m	7 m	
		Totals:	923 m	17 m	36 m	

Terrain Profile: Location 4 to Turbine

Summary

Profile Distance: 2.06 km
Total Ascent: 9 m Total Descent: 58 m

Elevation Profile



Waypoints

Leg	Name / Position / Elevation	Bearing	Distance	Ascent	Descent	Comments
0	WP0701 SE 17905 07106 370 m					
1	Location 4 SE 17989 07050 359 m	123°T	102 m	0 m	11 m	Location 4. Distance to Turbine = 1780m (1.78km). Profile running southeast.
2	Barnsley Boundary Walk SE 18350 06754 340 m	129°T	467 m	0 m	19 m	Barnsley Boundary Walk.
3	Birds Nest Lane SE 18592 06571 333 m	127°T	304 m	0 m	7 m	Birds Nest Lane.,
4	Turbine SE 19453 06041 329 m	121°T	1.01 km	9 m	13 m	Turbine
5	WP0706	110°T	177 m	0 m	8 m	

Leg	Name / Position / Elevation	Bearing	Distance	Ascent	Descent	Comments
	SE 19620 05981 321 m					
		Totals:	2.06 km	9 m	58 m	

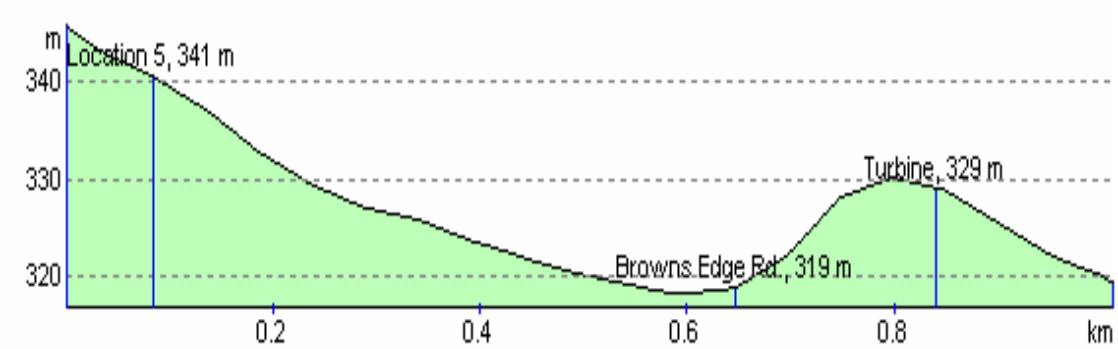
Prepared By 3DVS

Terrain Profile: Location 5 to Turbine

Summary

Profile Distance: 1.01 km
Total Ascent: 12 m Total Descent: 38 m

Elevation Profile



Waypoints

Leg	Name / Position / Elevation	Bearing	Distance	Ascent	Descent	Comments
0	WP0801 SE 19285 05219 346 m					
1	Location 5 SE 19312 05300 341 m	018°T	85.5 m	0 m	0 m	Location 5. Distance to Turbine = 765m. Profile running northeast.
2	Browns Edge Rd. SE 19417 05851 319 m	011°T	562 m	1 m	22 m	Browns Edge Rd.
3	Turbine SE 19453 06041 329 m	010°T	194 m	10 m	0 m	Turbine
4	WP0805 SE 19480 06211 319 m	009°T	172 m	0 m	10 m	
		Totals:	1.01 km	12 m	38 m	