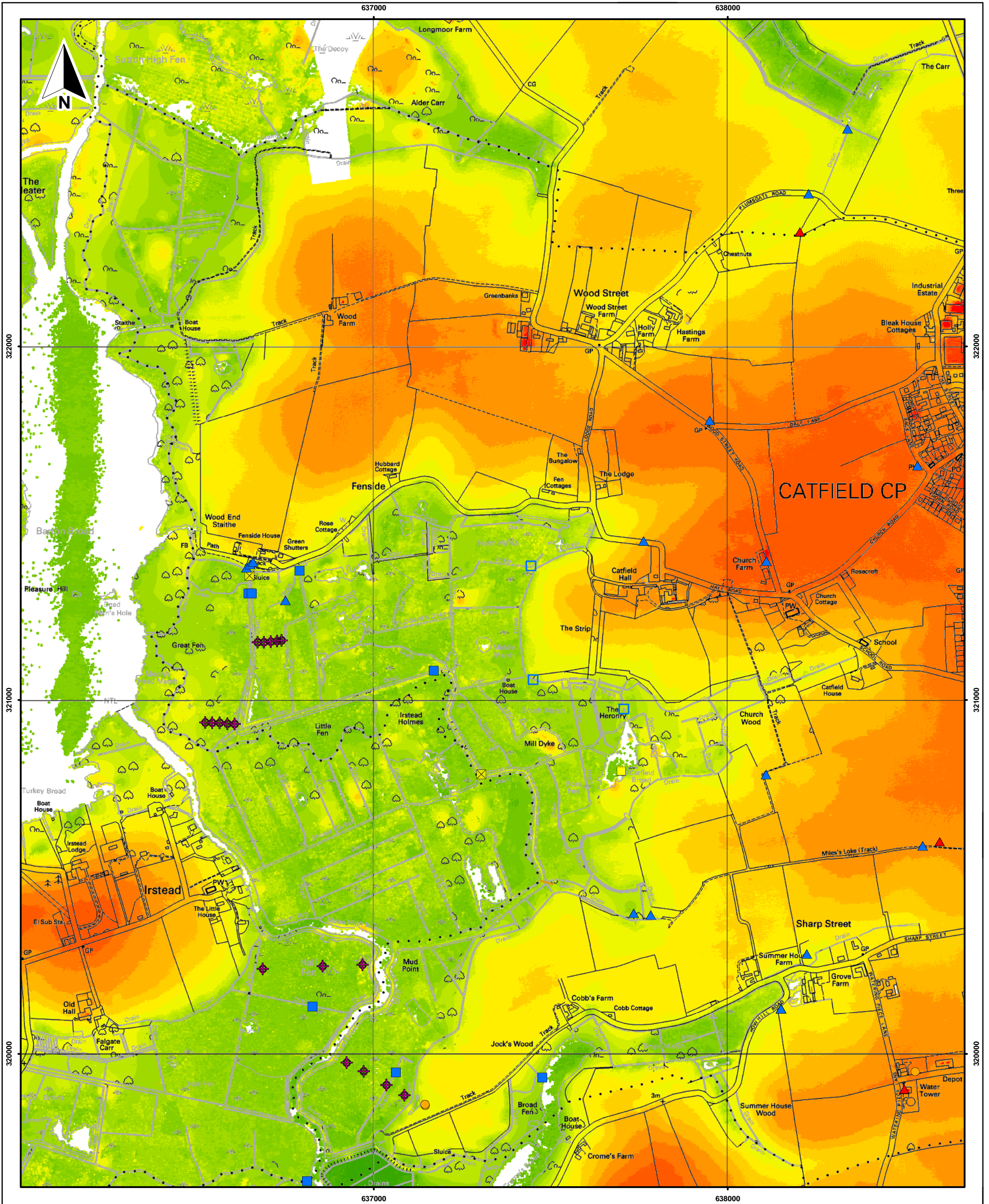


Figure D1 Topographic Survey Data (from University of Birmingham, 1989)



Key:

LIDAR (m)		
	<-0.2	
	-0.2 - 0.0	
	0.0 - 0.2	
	0.2 - 0.4	
	0.4 - 0.6	
	0.6 - 0.8	
	0.8 - 1.0	
	1.0 - 1.2	
	1.2 - 2.0	
	2.0 - 3.0	
	3.0 - 4.0	
	4.0 - 5.0	
	5.0 - 6.0	
	6.0 - 7.0	
	7.0 - 8.0	
	8.0 - 9.0	
	9.0 - 10.0	
	>10.0	

Existing Installations

	Agency Gaugeboard		Licensed Groundwater Abstraction
	Catfield Hall Gaugeboard		Licensed Surface Water Abstraction
	Dipwell		Water Control Structure/Sluice
	Piezometer		Bund
	Borehole		

0 100 200 300 400 500 Metres

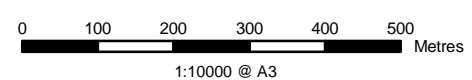
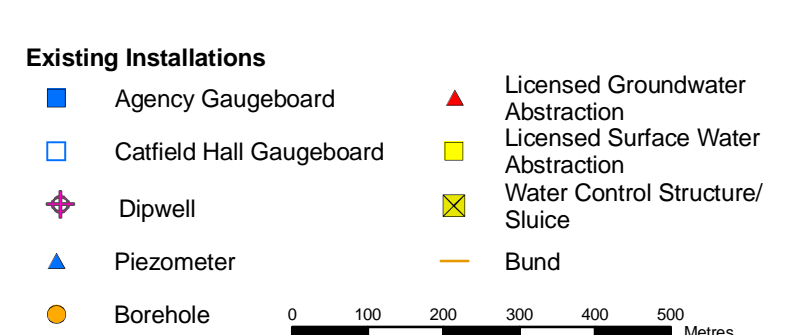
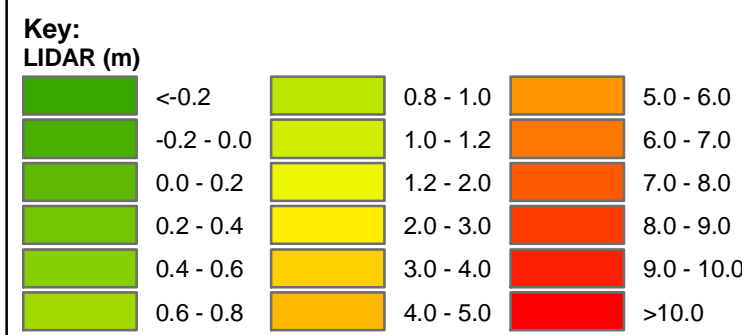
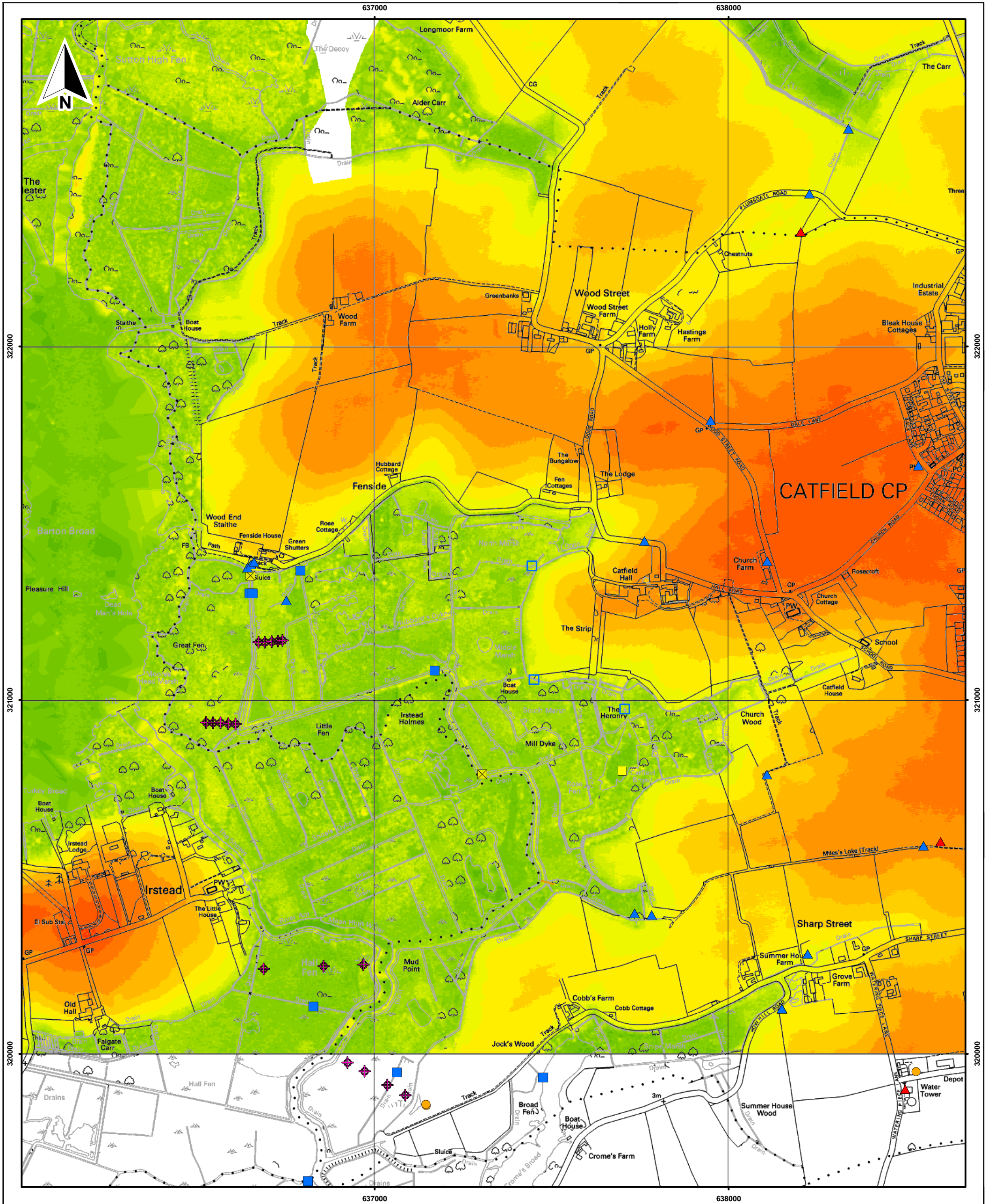
1:10000 @ A3

Environment Agency Anglian Region
Catfield Fen Investigation

Figure D2
Topography determined from LIDAR
(Date flown March/April 1999)

March 2012
30321-S03 wills

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Environment Agency Anglian Region
 Catfield Fen Investigation

Figure D3
Topography determined from LIDAR
(Date flow 18th - 20th January 2009)

(Data coverage not available south of northing 320000)

Project Path: G:/MODEL/PROJECTS/HM-250/30321/ArcGIS/Figures/30321s06_FigureD3.mxd

March 2012
 30321-S06 wills



Table D1 Installations Monitored by the Environment Agency, Past and Present, with Survey Data

(Note – The 2011 survey largely took place on 20 October 2011. Only the Catfield Hall Estate gaugeboards, of which TG32/710 is one, and piezometers NTG3270P4 and NTG3270P5 were surveyed on 21 October. The survey on 20 October also included Alston Obs 3.5m and Alston Obs 15m (which are monitored by Mr Alston), and Alston Obs 3 (Clarke) which is not currently monitored.

Agency id	Alternative name	Installation type	Location: Fen or "uplands"	NGR (from WISKI and Entec (2010))	SURVEY DATA FROM SURVEYS PRIOR TO 2011						SURVEY DATA FROM SURVEY OF 20 & 21 OCTOBER 2011					Difference between 2011 and Previous Survey Ground Levels (m)	On WISKI?	Monitored by:	Logger Currently Installed?
					Survey Date	Surveyed Easting	Surveyed Northing	Surveyed Datum	Surveyed Level (mAOD)	Ground Level (mAOD)	Surveyed Easting	Surveyed Northing	Surveyed Datum	Surveyed Level/Monitoring Datum (mAOD)	Surveyed Ground Level/Bed Level (mAOD)				
NTG3261G1	ABM-13	GB	Fen	636654 321302	07/12/2006 (Atkins)	636654	321302	Top of 1m gauge plate	0.908	-0.225	636654	321302	Top pf 1m gauge plate	0.990	-0.246	-0.021	Y	EA (Entec/Mouchel)	Y
NTG3261G2	ABM-17a	GB	Fen	636646 321302	07/12/2006 (Atkins)	636646	321302	Top of 1.3m gauge plate	1.161	0.039	636646	321302	Top pf 1.3m gauge plate	1.266	-0.157	-0.196	Y	EA (Entec/Mouchel)	N
NTG3261G3		GB	Fen	63678 32138	WISKI data (survey date not known, though GB installed by HSI in 1996/97. NB WISKI datum is the same as for G2, therefore questionable)	63678	32138	Top of 1m gauge plate (presumed)	1.161		636788	321374	Top pf 1m gauge plate	0.904	0.086		Y	EA (Entec/Mouchel)	N
TG32/711	ABM-17b	GB	Fen	637170 321079	07/12/2006 (Atkins)	637170	321079	Top of gauge plate - the 1.7m graduation	1.525	-0.449	637170	321079	Top pf gauge plate - the 1.7m graduation	1.617	-0.276	0.173	Y	EA (Entec/Mouchel)	Y
TG32/710	Ballscroft gaugeboard, GB-A, (In WISKI as BALLS CROFT GB/TG32/710)	GB	Fen	c.637440 321066							637450	321058	Top of gaugeplate (same as datum used for EA logger)	2.058	0.182		Y	Catfield Hall & EA (Area)	Y
TG32/617	ABM-18a	DW	Fen (Butterfly Conservation land)	636740 321169	07/12/2006 (Atkins)	636740	321169	Top Outer Casing	1.503	0.309							Y		N
TG32/617a	ABM-18b	DW	Fen (Butterfly Conservation land)	636727 321167	07/12/2006 (Atkins)	636727	321167	Top Outer Casing	1.480	0.337							Y		N
TG32/617b	ABM-18c	DW	Fen (Butterfly Conservation land)	636709 321166	07/12/2006 (Atkins)	636709	321166	Top Outer Casing	1.531	0.414	636709	321166	Top Outer Casing	1.568	0.371	-0.043	Y	EA (Entec/Mouchel)	Y
TG32/616a	ABM-18d	DW	Fen (Butterfly Conservation land)	636690 321164	07/12/2006 (Atkins)	636690	321164	Top Outer Casing	1.380	0.324							Y		N
TG32/616b	ABM-18e	DW	Fen (Butterfly Conservation land)	636672 321164	07/12/2006 (Atkins)	636672	321164	Top Outer Casing	1.446	0.314							Y		N
TG32/605	ABM-14b	DW	Fen (Great Fen)	636586 320934	07/12/2006 (Atkins)	636586	320934	Top Outer Casing	1.322	0.273							Y		N
TG32/605b	ABM-14d	DW	Fen (Great Fen)	636543 320936	07/12/2006 (Atkins)	636543	320936	Top Outer Casing	1.371	0.228							Y		N

Table D1 (continued) Installations Monitored by the Environment Agency, Past and Present, with Survey Data

Agency id	Alternative name	Installation type	Location: Fen or "uplands"	NGR (from WISKI and Entec (2010))	SURVEY DATA FROM SURVEYS PRIOR TO 2011						SURVEY DATA FROM SURVEY OF 20 & 21 OCTOBER 2011					Difference between 2011 and Previous Survey Ground Levels (m)	On WISKI?	Monitored by:	Logger Currently Installed?
					Survey Date	Surveyed Easting	Surveyed Northing	Surveyed Datum	Surveyed Level (mAOD)	Ground Level (mAOD)	Surveyed Easting	Surveyed Northing	Surveyed Datum	Surveyed Level/Monitoring Datum (mAOD)	Surveyed Ground Level/Bed Level (mAOD)				
TG32/605c	ABM-14e	DW	Fen (Great Fen)	636524 320937	07/12/2006 (Atkins)	636524	320937	Top Outer Casing	1.370	0.260						Y	EA (Entec/Mouchel)	N	
TG32/606	ABM-14a	DW	Fen (Great Fen)	636607 320933	07/12/2006 (Atkins)	636607	320933	Top Outer Casing	1.367	0.277						Y		N	
TG32/605a	ABM-14c	DW	Fen (Great Fen)	636564 320936	07/12/2006 (Atkins)	636564	320936	Top Outer Casing	1.293	0.283	636564	320936	Top Outer Casing	1.404	0.358	0.075	Y	EA (Entec/Mouchel)	Y
TG32/616d	ABM-20	BH	Adjacent to Fen	636662 321383	07/12/2006 (Atkins)	636662	321383	Top Outer Casing	1.872	0.820	636662	321384	Top Outer Casing	2.111	1.102	0.282	Y	EA (Entec/Mouchel)	Y
NTG3261P1		BH	Adjacent to Fen	636650 321370	28/2/96 (HSI)	636650	321370	Top Outer Casing	2.127	1.047	636657	321375	Top Outer Casing	2.015	1.055	0.008	Y	EA (Entec/Mouchel)	Y
NTG3261P2		BH	Adjacent to Fen	636650 321370	28/2/96 (HSI)	636650	321370	Top Outer Casing	2.129	0.979	636658	321377	Top Outer Casing	2.072	0.799	-0.180	Y	EA (Entec/Mouchel)	N
NTG3261P3		BH	Fen	636750 321310	28/2/96 (HSI)	636750	321310	Top Outer Casing	1.506	0.421	636758	321302	Top Outer Casing	1.436	0.398	-0.023	Y	EA (Entec/Mouchel)	N
NTG3270P4		BH	Adjacent to Fen	637770 320390	10/11/97 (HSI)	637770	320390	Top Outer Casing	2.568	1.477	637783	320393	Top Outer Casing	2.140	1.058	-0.419	Y	EA (Entec/Mouchel)	Y
NTG3270P5		BH	Fen	637730 320420	10/11/97 (HSI)	637730	320420	Top Outer Casing	1.590	0.340	637734	320398	Top Outer Casing	1.997	0.854	0.514	Y	EA (Entec/Mouchel)	Y
TG32/815	Catfield P1	BH	"Uplands"	638540 321680	25/2/1992 (Solo Designs in LWRC, 1992)	638540	321680	Top Outer Casing (presumed)	7.074							Y	EA (Area)	Y	
TG32/815A	Catfield P2	BH	"Uplands"	638120 321390	25/2/1992 (Solo Designs in LWRC, 1992)	638120	321390	Top Outer Casing (presumed)	7.405		638116	321403	Top Outer Casing	7.500	7.503		Y	EA (Area)	Y
TG32/815B	Catfield P3	BH	"Uplands"	637760 321440	25/2/1992 (Solo Designs in LWRC, 1992)	637760	321440	Top Outer Casing (presumed)	4.505		637762	321450	Top Outer Casing	4.494	4.477		Y	Either E Area or Mouchel	Y

Table D1 (continued) Installations Monitored by the Environment Agency, Past and Present, with Survey Data

Agency id	Alternative name	Installation type	Location: Fen or "uplands"	NGR (from WISKI and Entec (2010))	SURVEY DATA FROM SURVEYS PRIOR TO 2011						SURVEY DATA FROM SURVEY OF 20 & 21 OCTOBER 2011					Difference between 2011 and Previous Survey Ground Levels (m)	On WISKI ?	Monitored by:	Logger Currently Installed ?
					Survey Date	Surveyed Easting	Surveyed Northing	Surveyed Datum	Surveyed Level (mAOD)	Ground Level (mAOD)	Surveyed Easting	Surveyed Northing	Surveyed Datum	Surveyed Level/ Monitoring Datum (mAOD)	Surveyed Ground Level/Bed Level (mAOD)				
TG32/815C	Catfield P4	BH	"Uplands"	637940 321780	25/2/1992 (Solo Designs in LWRC, 1992)	637940	321780	Top Outer Casing (presumed)	6.754		637942	321783	Top of plank at cabinet base (Top inner casing level subsequently measured and its value as the monitoring datum is given here)	6.696	6.574		Y	EA (Area)	Y
TG32/815D	Catfield P5	BH	"Uplands"	638230 322430	25/2/1992 (Solo Designs in LWRC, 1992)	638230	322430	Top Outer Casing (presumed)	1.630		638229	322432	Top Outer Casing	0.984	1.025		Y	EA (Area)	Y
TG32/805	Catfield Pump piezo. Also called Alston OB1	BH	"Uplands"	638528 320588	WISKI data	638528	320588	Datum not surveyed			638529	320581	Top of cabinet (Top outer casing level subsequently measured and its value is given here)	6.257	5.773		Y	EA (Area) (also Mr Alston)	Y
TG32/801	Catfield Hall piezo. Also called Alston OB2	BH	"Uplands"	638100 320798	WISKI data	638100	320798	Datum not surveyed			638102	320790	Top of cabinet (Top outer casing level subsequently measured and its value is given here)	4.271	3.764		Y	EA (Area)	Y
TG31/790	ABM-22	GB	Sharp Street Fens	637062 319947	7/12/2006 (Atkins)	637062	319947	Top of 2m gauge plate	1.218	-1.200									
TG31/697c	ABM-31b	GB	Reedham Marshes	636725 319483	7/12/2006 (Atkins)	636725	319483	Top of 2m gauge plate	1.337	-0.807									
TG31/791	ABM-42a	BH	Adjacent to Sharp Street Fens	637145 319854	22/2/2008 (Atkins)	637145	319854	Top Outer Casing	2.353	1.307									

Table D1 (continued) Installations Monitored by the Environment Agency, Past and Present, with Survey Data

Agency id	Alternative name	Installation type	Location: Fen or "uplands"	NGR (from WISKI and Entec (2010))	SURVEY DATA FROM SURVEYS PRIOR TO 2011						SURVEY DATA FROM SURVEY OF 20 & 21 OCTOBER 2011					Difference between 2011 and Previous Survey Ground Levels (m)	On WISKI?	Monitored by:	Logger Currently Installed?
					Survey Date	Surveyed Easting	Surveyed Northing	Surveyed Datum	Surveyed Level (mAOD)	Ground Level (mAOD)	Surveyed Easting	Surveyed Northing	Surveyed Datum	Surveyed Level/Monitoring Datum (mAOD)	Surveyed Ground Level/Bed Level (mAOD)				
TG31/791a	ABM-42b	BH	Adjacent to Sharp Street Fens	637144 319858	22/2/2008 (Atkins)	637144	319858	Top Outer Casing	2.341	1.289									

Details and Location Diagrams Relating to the Atkins 2011 Topographic Survey

The Atkins 2011 survey was undertaken using GNSS Smartnet. This method of GPS RTK uses nearby OS reference stations as the 'base' for the survey, negating the need to set up a local base station.

As a quality check whilst on site, Atkins surveyed the position & level of nearby EA base stations at the beginning and end each day. The results of these checks can be found in the Table below:

EA Base Station	Date / Time	Measured Height(m)	Difference in Height Compared to Published Values (m)
E20531378	20/10/2011 08:10:19	2.664	0.014
E20530854	20/10/2011 13:11:25	1.154	0.010
E20531378	21/10/2011 07:44:44	2.672	0.006
E20530854	21/10/2011 14:37:02	1.150	0.014
Published Base Station Values	E20531378	2.678	
	E20530854	1.164	

The table above shows the difference between the observed and the published values of the EA base stations in the vicinity of Catfield Fen.