Nantwich Waterlogged Deposits
Cheshire

Phase 2 Interim Report No.4
English Heritage HEEP 3839 Main

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1.0 INTRODUCTION

In November 2010, SLR Consulting Limited (SLR) was commissioned by English Heritage and Cheshire East Council to undertake Phase 2 of the Nantwich Waterlogged Deposits Project. The purpose of the project is to develop an effective methodology to monitor the condition of urban waterlogged deposits and to monitor these archaeological deposits within Nantwich as a case study over a three year period. The results of Phase 1 had identified two preservation zones within Nantwch, Zone 1 with good conditions for preservation, and Zone 2 with indications of active decay. The results of the Phase 2 study will enable an update to the strategy for managing such remains effectively, both nationally specifically for Nantwich, within the context of the need for continuing economic development within the historic centre. In September 2013 a variation was agreed by English Heritage, extending the duration of the project for a further two years, so that in total five years of monitoring data will be gathered.

The details relating to Phase 1 of the Nantwich Waterlogged Deposits project are recorded in a separate report[1] completed in November 2009, followed by three annual interim reports[234] which summarised the works undertaken as part of Phase 2 between 2011 and 2013. These previous reports should be read in conjunction with the present report.

This report presents a summary of the fieldwork undertaken as part of the project during 2014, which comprised the following key elements:

- Collecting groundwater samples from each of the fifteen separate dipwell locations for geochemical laboratory analysis;
- Completing quarterly monitoring at all of the eighteen dipwells for depth to groundwater, water quality parameters and ground gas concentrations.

Drawings are presented in Appendix A. Appendix B presents the groundwater and gas monitoring data, Appendix C presents the analytical chemistry results and Appendix D presents the transducer and rain gauge data.

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[1] SLR Consulting Limited (January 2010): *Nantwich Waterlogged Deposits Report No 2: The Character and Extent of Archaeological Preservation*

[2] SLR Consulting Limited (November 2011): *Nantwich Waterlogged Deposits Phase 2 Interim Report 1 (Ref:406.008889.00005)*

[3] SLR Consulting Limited (November 2012): *Nantwich Waterlogged Deposits Phase 2 Interim Report 2 (Ref:406.008889.00005)*

[4] SLR Consulting Limited (December 2013): *Nantwich Waterlogged Deposits Phase 2 Interim Report 3 (Ref:406.008889.00005) – Revised May 2014*

2.0 PROXY INDICATORS AND CHARACTERISING THE BURIAL ENVIRONMENT

Certain chemical species can only exist under specific conditions and hence their presence or absence can be used to help define soils and sediments as to whether they are oxidising or reducing environments. The standard suite of “redox sensitive parameters”, (as they are often referred to) are listed in the table below, along with the class of microbes associated with the type of burial environment. Furthermore, as these chemicals species react with others, the redox reaction that follows (redox is shorthand for reduction/oxidation) generates a transfer of electrons from one chemical species to another, and this transfer can be measured in the field using a specific electrode and mVolt meter.

Table 1
Summary of Principal Redox Indicators

Description	Species present/absent	Redox value (mV)	Microbes present	Decreasing rate of decay
Oxidising	Oxygen	400 and above	Aerobes	
Mildly reducing	Nitrate, Manganese (Mn^{4+}) decline,	100 to 400	Facultative anaerobes	
Reducing	Sulphate, ferric Iron (Fe^{3+}) present	-100 to 100	Facultative anaerobes and obligate anaerobes	
Highly reducing	Sulphate and ferric Iron (Fe^{3+}) disappear Sulphur (S^{2-}), ammonium (NH_4^{+}), ferrous Fe^{2+} and methane present	-400 to -100	Obligate anaerobes	

Facultative anaerobes can survive when oxygen is present or absent, and obligate anaerobes die in the presence of oxygen. The energy produced by obligate anaerobes is much lower than that of aerobes hence decay rates are much slower, almost imperceptible, but it is worth repeating that decay continues in highly reducing deposits.

The detection and measurement of these redox sensitive parameters is now a standard procedure for in situ preservation research, for example the investigations conducted by the Danish and Norwegian teams at Bryggen, Bergen, and elsewhere. Land contamination and remediation programmes, for example, tracing plumes of contaminated groundwater and leachates from landfill sites use these same chemical species as proxy indicators for reducing and oxidising conditions - in fact they were probably the first to employ this chemistry principle when defining the nature of a burial environment.

Mention has been made about our references to the relative amounts (high, low etc.) of these redox sensitive chemicals in previous reports. The work we are conducting at Nantwich is in some respects groundbreaking as there have been few attempts at characterising urban deposits through geochemical assays. Hence when I make reference to the high or low amounts it is within the context of our work and is relative to our ongoing programme in Nantwich rather than to a set of "standard concentrations expected in an urban environment", because none exist. Perhaps it would be beneficial to refer only to the presence and absence of the redox sensitive parameters from now onwards?

3.0 RESULTS OF HYDROGEOLOGICAL ASSESSMENT

3.1.1 Transducer Data: Rainfall and Groundwater Levels

In 2010 SLR installed transducers at six locations to monitor particularly sensitive areas within the waterlogged deposits. This provides a minimum of three transducer points on each side of the River Weaver. Therefore transducers were installed in dipwells F1, N1, P, AB, AE and AF. The transducer was installed in the original dipwell P instead of the multi-level dipwell P1 which was targeted on the organic-rich archaeological deposit, because P1 contained insufficient water. The transducer that was intended for installation in dipwell AG was moved to AB to act as a control point outside the area of archaeological deposit, and because no waterlogged deposits were recorded at the location for AG in Bowers Row Car Park. The locations of the transducers are shown on a plan in Appendix A.

The results of water level measurement from the transducers and rainfall gauge are shown in Appendix D and summarised in Figure 1 below.

Figure 1
Groundwater Level and Rainfall Data Graph (overview of all data)

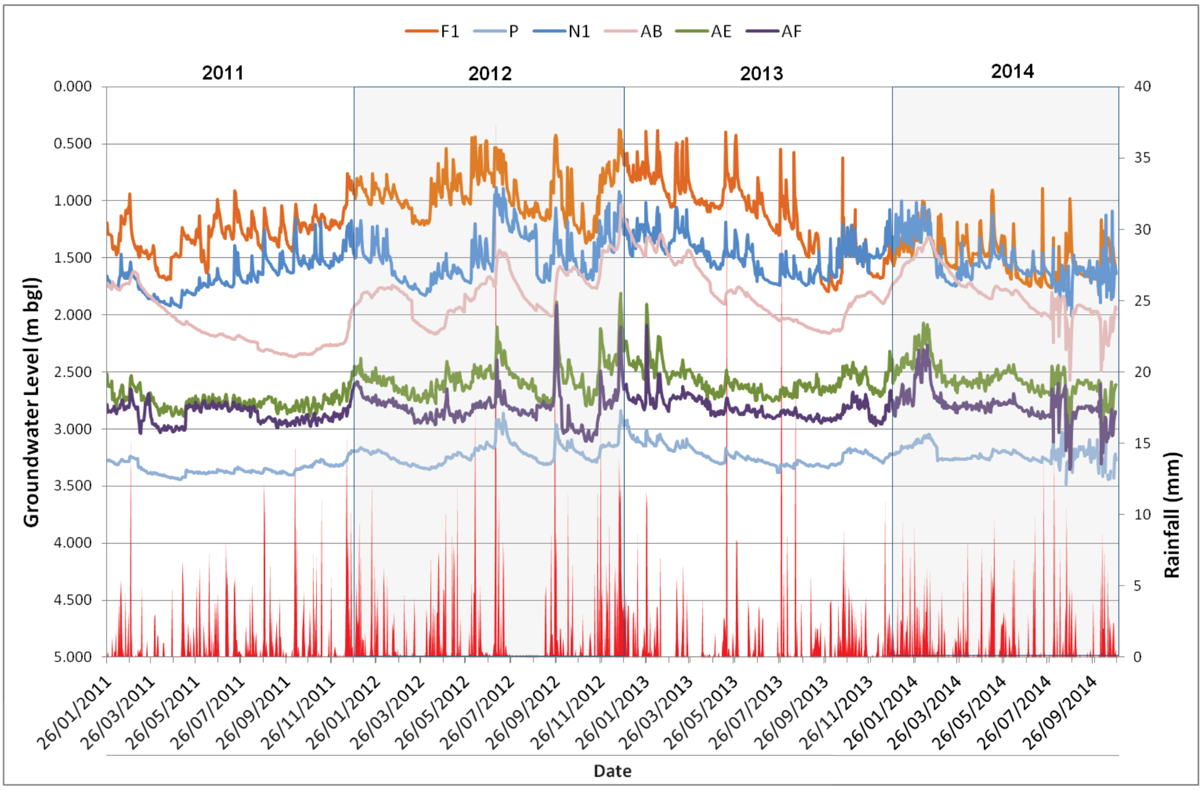
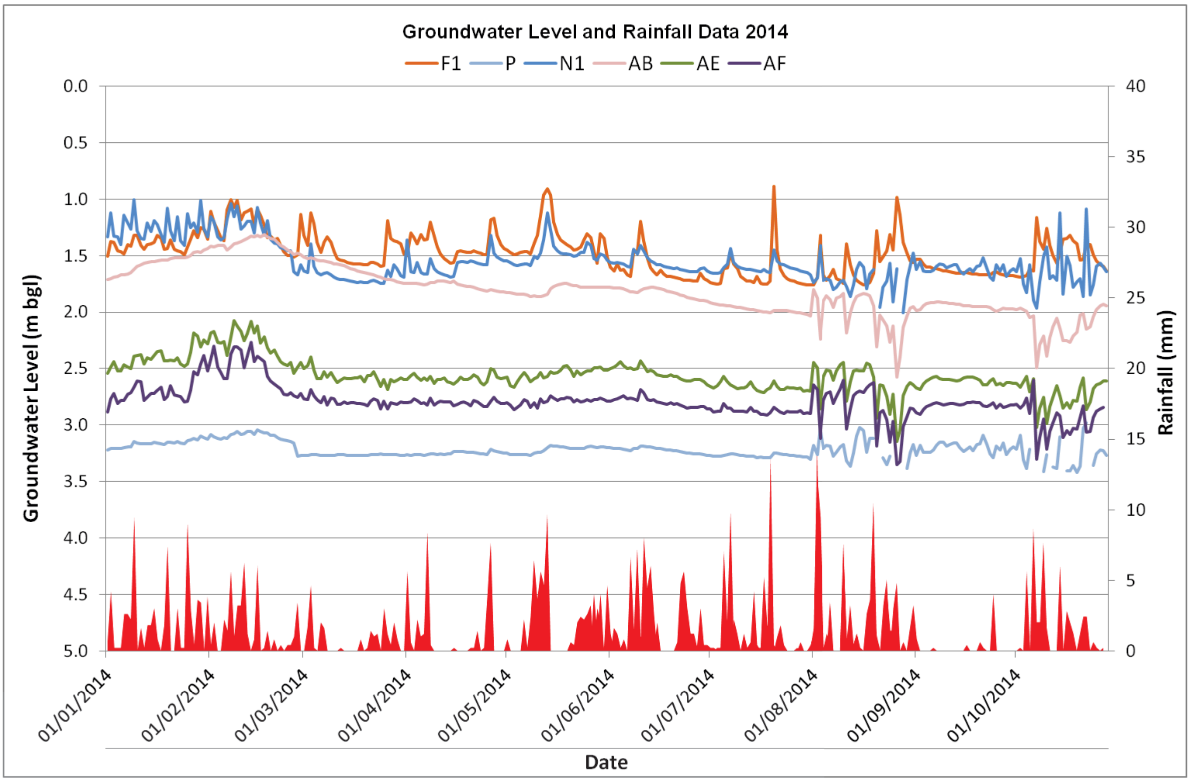


Figure 2
Groundwater Level and Rainfall Data Graph - 2014



The comparison of data from the rainfall gauge and the water level data loggers confirms the direct correlation between the water table and rainfall events (see Figure 1 and Figure 2). Overall, the total rainfall has been fairly low during 2014 compared to previous years. Increased groundwater levels and periods of fluctuation generally coincide with higher levels of effective rainfall during the winter period, although periods of heavy summer rainfall during August also had a similar effect on groundwater levels.

Closer scrutiny of the graph presented in Figure 2 reveals more complex patterns developing. At the start of the year there was a gradual increase in groundwater levels, but in mid February the levels dropped, which shows that from all transducer data there was a rapid response for the reduced levels of rainfall quantity during late February and throughout the spring. In August, and again in October, however, data from all the transducers show considerable fluctuation in response to increased spikes and falls in rainfall, although they return to the same levels as recorded for March – August during the very dry spell in September. It is not immediately apparent why the groundwater level reverted to this depth.

The most stable locations appear to be at dipwells AE, AF and P, locations characterized by sandy deposits at the base of the borehole logs, whereas F1 and N1 are located with very stiff clay at the base of the recorded sequence.

The control location, AB, is more erratic. This is located uphill on sands, and has no archaeological deposit recorded. The data from AB do not seem to respond to the spikes in rainfall, except with the fluctuations in August and October. One possible explanation is that the batteries in the transducers are coming to the end of their reliability period.

Figure 3
Weekly Groundwater Level and Rainfall Data Graph

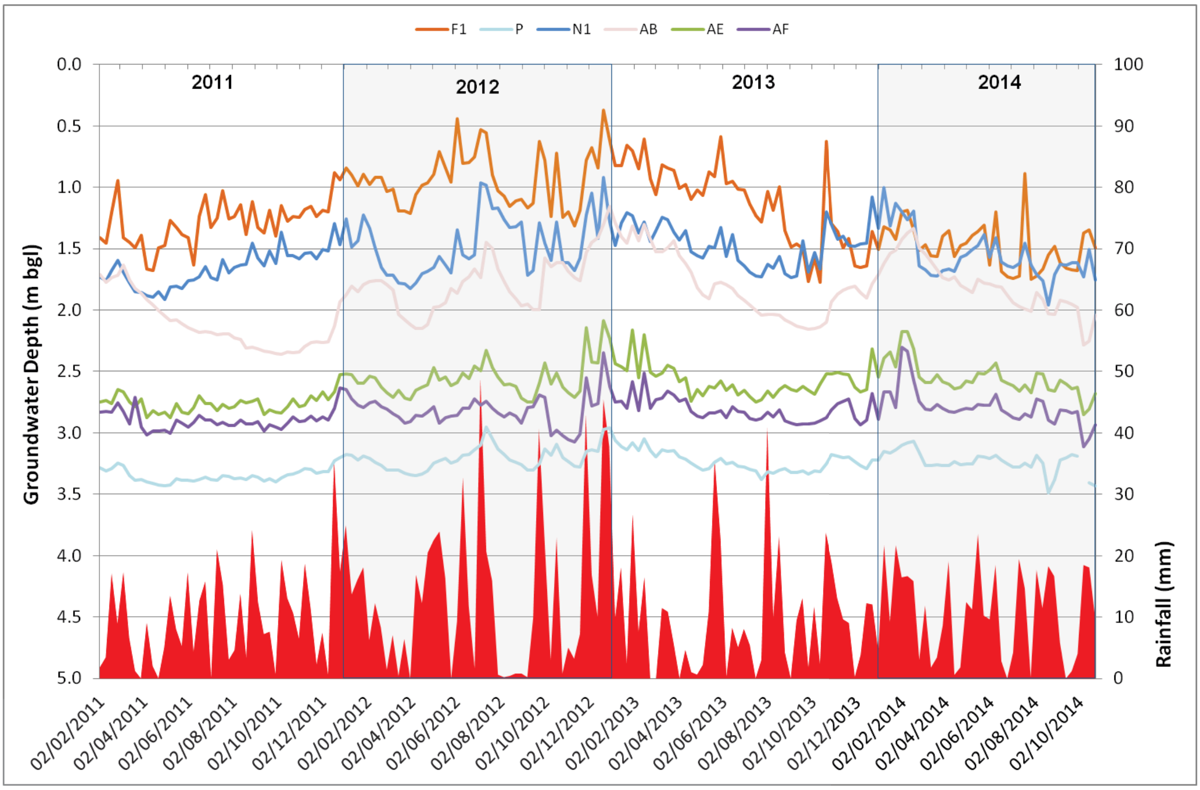


Figure 3 shows the groundwater fluctuations against cumulative weekly rainfall data. The cumulative weekly data shows an even higher level of correlation, as it highlights the periods where extended rainfall events are likely to provide more effective precipitation than the short intense events that typically occur during the summer months. Location AB, however, again shows anomalous readings in the period summer-autumn 2011. It may be possible to calculate that actual level of effective rainfall within Nantwich, but this would require a separate hydrological investigation that falls outside the scope of this project.

3.1.2 Groundwater Monitoring Data

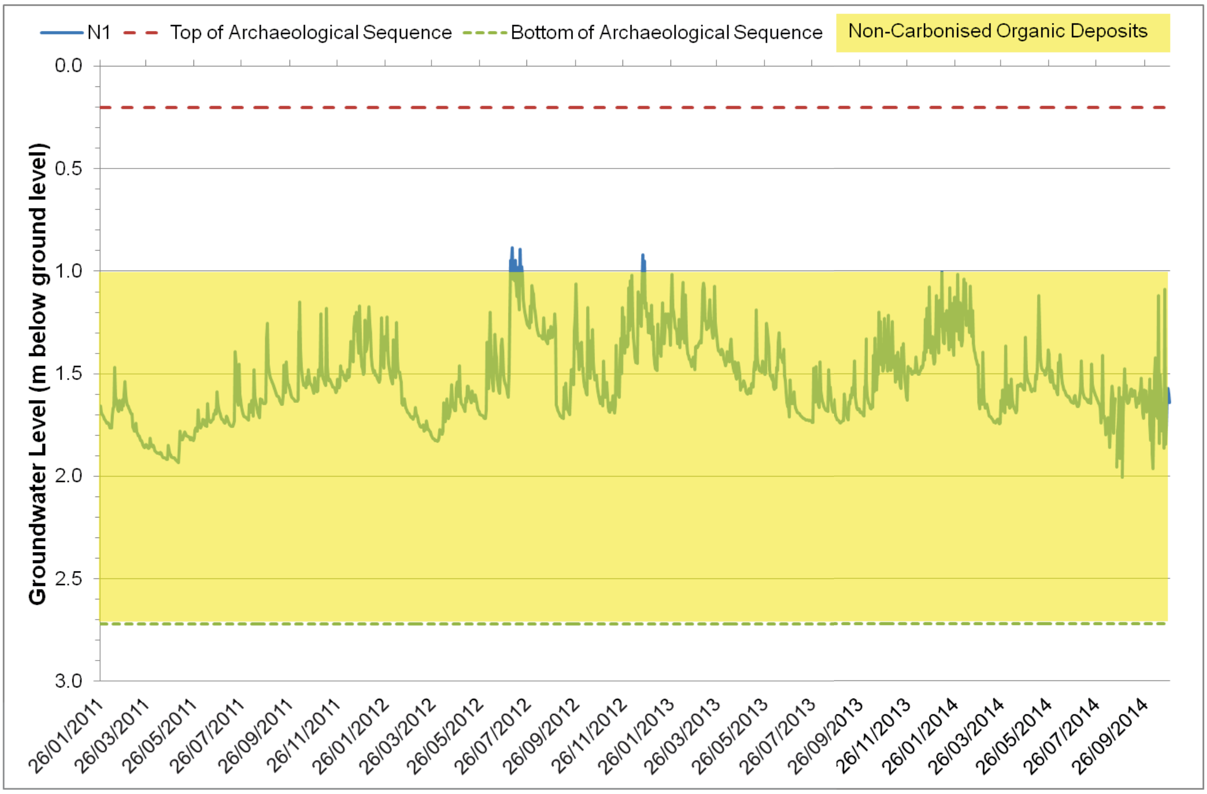
In situ monitoring has been undertaken at seventeen dipwells at quarterly intervals since February 2011. No water has ever been recorded in dipwell P1 because the water table is located below the archaeological deposits specifically targeted by the borehole, and therefore it has not been possible to complete any monitoring at this location. In addition to groundwater depth measurements, dissolved oxygen, conductivity, pH and REDOX potential were also measured using a YSI 556™ water quality meter.

The in situ monitoring results are included in Appendix B, together with plume plots to show the variation of dissolved oxygen and REDOX potential within the waterlogged deposits across Nantwich.

The groundwater monitoring results indicate that groundwater is present between 0.37m and 3.44m below ground level, and the hydraulic gradient indicates that flow direction is toward the River Weaver from both sides of Nantwich.

Hydrographs showing the groundwater levels in relation to the archaeological and non-carbonised organic deposits are shown in Appendix B, and the results from BH N1 are shown in Figure 4 overleaf.

Figure 4
Groundwater Levels within the Archaeological Deposits at BH N1



The results indicate that the non-carbonised organic deposits at BH N1 have remained at least partially saturated since the start of 2011 with the upper organic deposits located within the capillary fringe. The shallower, less vulnerable archaeological deposits (i.e. without evidence for surviving organic content from the cores extracted in 2007 and 2010), are located above the water table. The organic deposits at locations F1, AB, AC, M, O and V also remain well saturated.

The organic deposits at AE and AF are situated above the groundwater level. This suggests that the good levels of preservation historically recorded through archaeological excavation in this area are potentially due to location of the deposits within the capillary zone, otherwise more evidence of decay would be expected if the deposits were actively drying out. The data also confirms that the organic deposits at BH P are situated over 1m above the water table, which would make them vulnerable and prone to accelerated decay.

Dissolved Oxygen

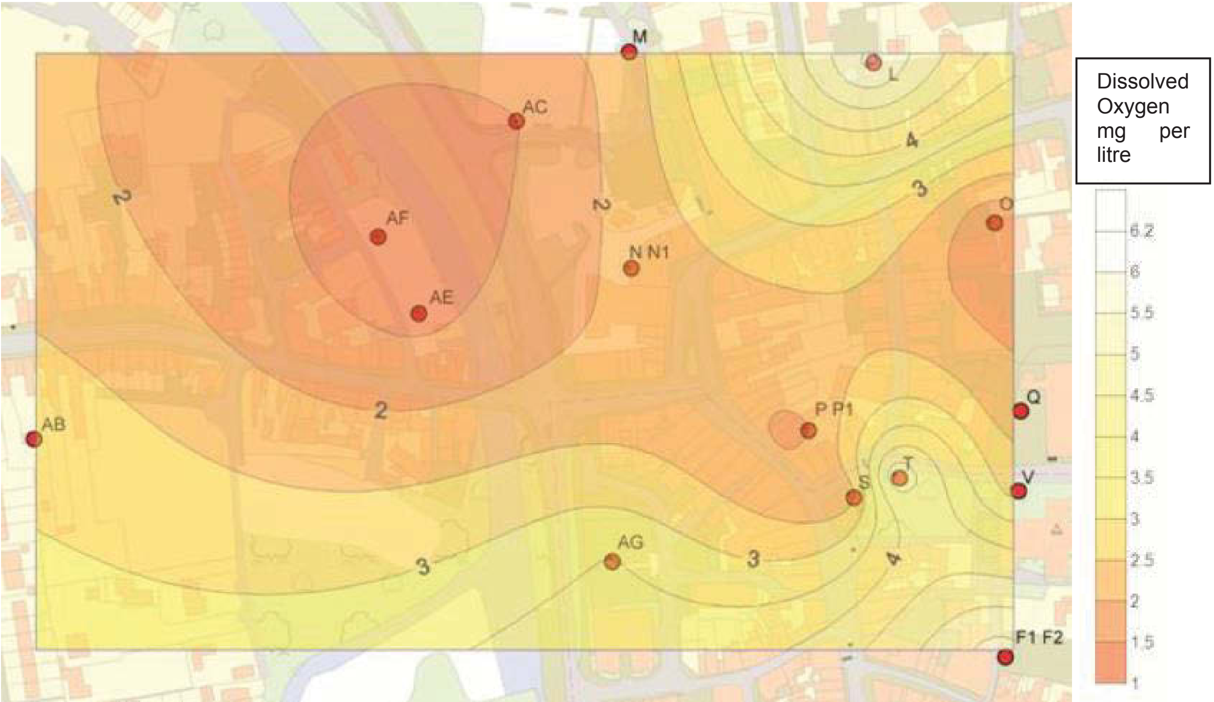


Figure 5
Dissolved Oxygen Plot – February 2014

Figure 5 above indicates that within the northern part of the area being monitored at Nantwich, the lowest concentrations of dissolved oxygen are generally recorded within 100m of the River Weaver. Together with the other indications of reducing conditions generally recorded in that area, this suggests good conditions conducive for preservation exist, despite the organic deposits at AE and AF being located above the water table. The low concentrations can also be seen extending in a band eastwards across the centre of the historic town, with low levels at location P (perhaps surprisingly given other data suggesting decay at P) and at location 0. In contrast further south and to the north-east within the monitored zone, the dissolved oxygen levels rise to the highest concentrations at locations L and F1/F2.

Redox Potential

Figure 6
Redox v. pH graph – 2011 to 2014
(Calibrated to SHE)

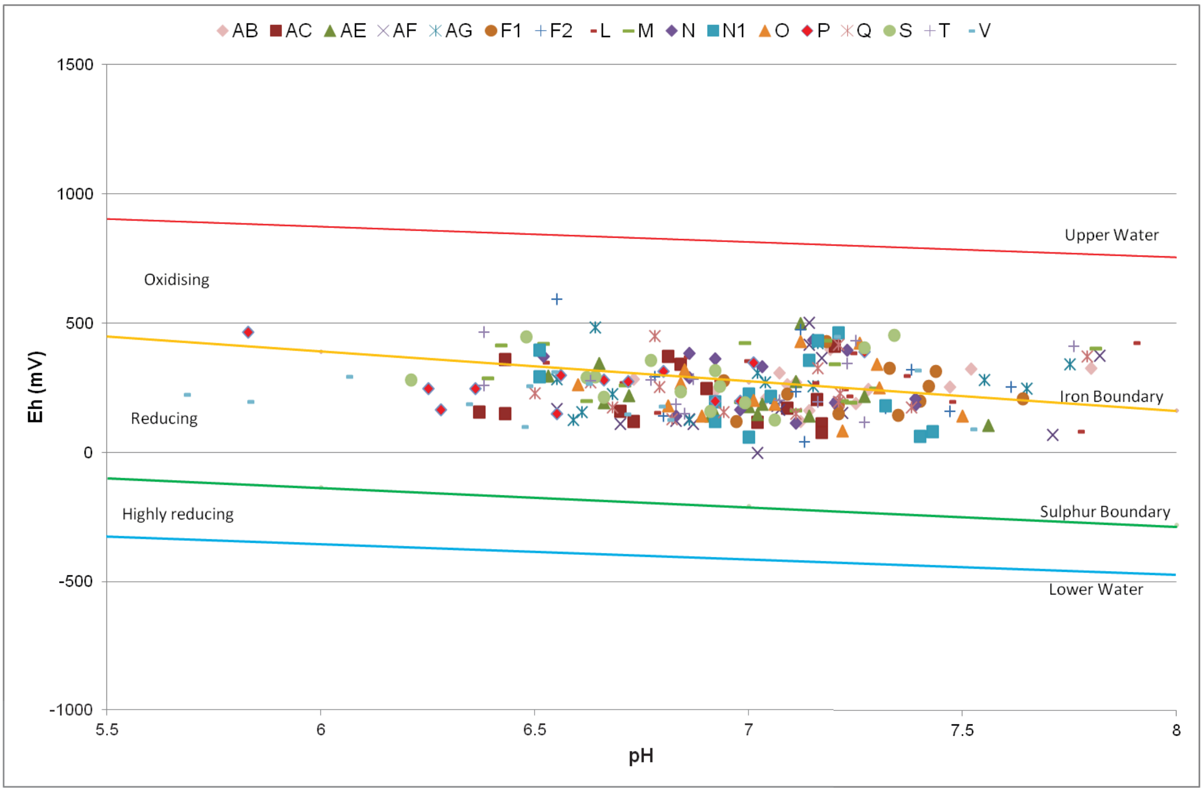


Figure 6 above shows a redox/pH diagram which indicates that the SHE calibrated redox levels are located close to the iron reduction boundary at most of the monitoring points around Nantwich. There is evidence to suggest the reducing and oxidising conditions fluctuate with seasonal variations (see Figures 7 and 8).

Overall, the most reducing conditions (locations AE, AC, AG, N1, P and perhaps Q) correspond with the lowest levels of dissolved oxygen located close to the River Weaver and in a band eastwards across the central part of the monitored area. These results are supported by indications of bacterial activity including methane generation, nitrate reduction and sulphate reduction (see Appendix C) recorded in borehole locations AE, AF and to a lesser extent AC.

Figure 7
Seasonal Redox Fluctuations

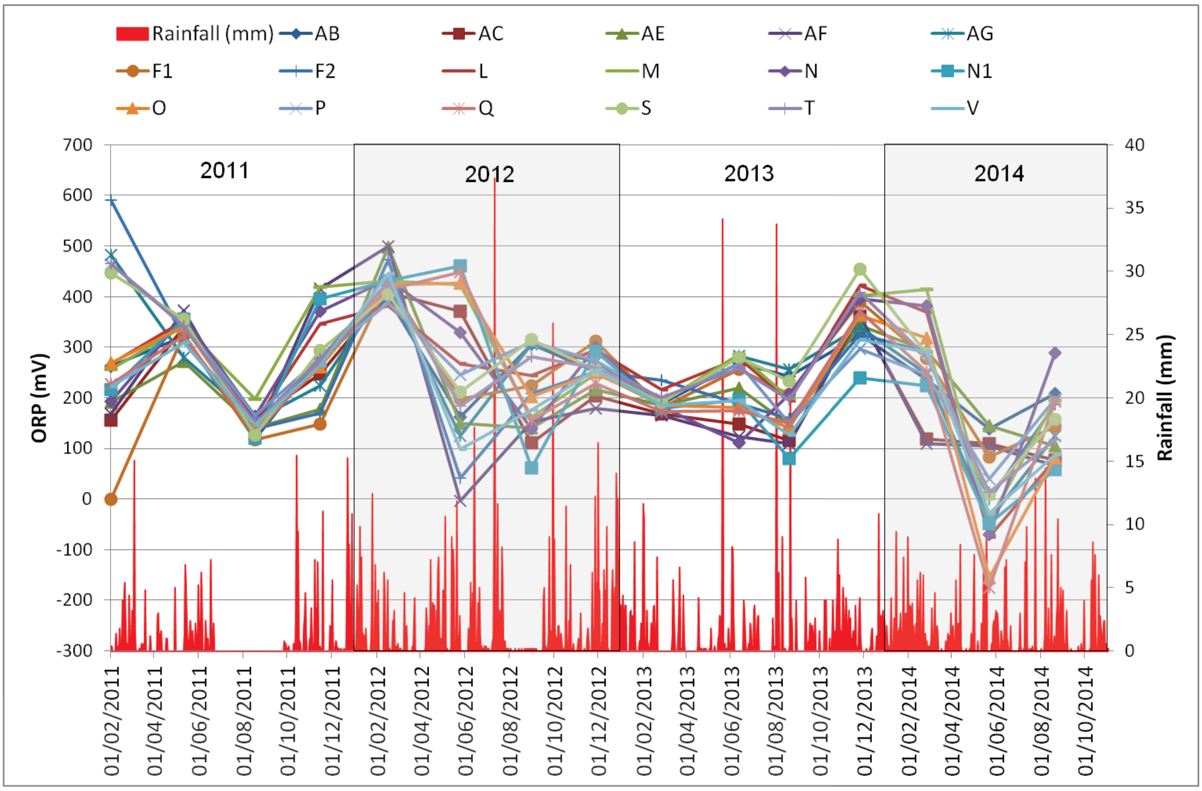


Figure 7 above shows the seasonal fluctuations in redox values between January 2011 and October 2014. The data suggests that there is a general increase in redox values over the winter period when effective rainfall causes an influx of oxygenated water into the ground. This theory is supported by the anomalous readings in spring/summer 2012 which coincide with the un-seasonally high rainfall over that period. The lower redox values recorded in the winter of 2012 to 2013 may be a result of the monitoring data collection occurring before the impact of sustained rainfall 1/12/12, and not again 1/2/13, and it is possible that redox values may have peaked in December 2012 or January 2013.

Conductivity

The results of the electrical conductivity monitoring also follow the pattern of the redox and dissolved oxygen results, with the highest conductivity values also recorded boreholes AE, AF and AG in the vicinity of the River Weaver. Conductivity measurements provide a reliably accurate idea of the source of the water, suggesting that the groundwater in this area is mixed with salt-rich groundwater from natural brine runs. Rainwater probably has a negligible influence. These results complement the geochemical analyses that indicate the presence of sodium and chlorides.

pH

Overall the groundwater samples are near neutral or mildly acidic. However, the pH probe malfunctioned during the May 2014 monitoring round, and this may have influenced the very low redox values recorded during this period.

3.1.3 Groundwater Geochemical Laboratory Analysis

Having established the baseline groundwater chemistry in 2007, SLR has collected groundwater samples on an annual basis from the fifteen separate monitoring points located across Nantwich (5 from Preservation Zone 1 and the remainder in Zone 2) and completed a suite of laboratory tests to record changes in the geochemistry of the groundwater over the monitoring period. Sampling was undertaken during each February between 2011 and 2014 using a peristaltic low flow pump and each dipwell was purged of stagnant water until the water quality parameters stabilised. Samples were despatched to Jones Environmental Forensics of Deeside for analysis,

The results of the chemical analyses undertaken on the collected samples of groundwater are presented in Appendix C and key dissolved phase contaminants are summarised in Table 2.

Table 2
Geochemical Laboratory Analysis - Groundwater

BH	Date	Fe	Mn	$CaCO_3$	NO_3	SO_4	PO_4	S^{2-}	CH_4	Na	C^-	N	pH
AB	20/11/2007	MDL	0.028	530	26	77	10	MDL	MDL	-	-	-	-
	01/02/2011	MDL	0.007	430	25	45	9.9	MDL	MDL	65	91	0.03	8.1
	16/02/2012	MDL	MDL	490	8.5	56	10	MDL	0.006	66	96	MDL	8.4
	27/02/2013	MDL	MDL	500	100	190	9.5	MDL	0.007	110	270	MDL	7.3
	26/02/2014	MDL	MDL	450	53	95	9.4	MDL	MDL	110	210	MDL	7.4
AC	20/11/2007	MDL	3.4	480	MDL	180	MDL	MDL	0.051	-	-	-	-
	01/02/2011	14	3.5	480	5.4	170	MDL	MDL	MDL	510	1100	1.5	7.4
	16/02/2012	MDL	2.1	430	0.4	190	MDL	MDL	0.36	2100	2800	2.6	8
	27/02/2013	9.4	3	530	MDL	170	MDL	MDL	MDL	580	1100	1.9	6.8
	26/02/2014	19	3.2	530	0.75	170	MDL	MDL	MDL	510	920	3	6.9
AE	01/02/2011	0.25	1.7	710	MDL	62	12	MDL	2	150	230	21	7.8
	17/02/2012	0.011	1.2	850	0.9	9.9	11	MDL	5.3	200	310	24	8.3
	27/02/2013	MDL	2.1	830	1.4	180	9.9	MDL	MDL	180	520	12	7
	26/02/2014	0.18	3.9	840	1.7	320	9.2	MDL	MDL	270	790	13	7.1
AF	01/02/2011	0.1	0.92	870	MDL	12	11	MDL	3.4	470	790	46	7.7
	17/02/2012	0.021	0.92	940	MDL	12	8.6	MDL	3.8	410	590	50	8
	27/02/2013	0.03	1.1	860	MDL	8.1	14	MDL	4	400	680	40	7.1
	26/02/2014	5.8	1.7	830	0.8	6.3	12	MDL	0.11	350	600	41	7.3
AG	01/02/2011	0.24	0.54	550	MDL	310	MDL	MDL	0.009	600	1500	5.3	7.5
	17/02/2012	0.021	0.83	560	2.5	270	0.19	MDL	0.012	1700	3000	1.5	7.6
	27/02/2013	0.02	1.2	640	0.8	260	0.74	MDL	MDL	1600	3900	1.4	6.8
	26/02/2014	0.037	0.044	140	2	31	MDL	MDL	MDL	390	490	0.11	7.7
F2	01/02/2011	MDL	1.4	480	MDL	220	0.82	MDL	MDL	180	330	4.7	7.7
	17/02/2012	0.058	0.45	310	MDL	38	14	MDL	0.94	91	100	1.9	8.4
	26/02/2013	MDL	0.77	300	0.3	49	9.8	MDL	MDL	140	250	2.2	7
	26/02/2014	0.04	0.35	280	1.7	44	6.3	MDL	MDL	91	150	1.6	7.3
L	20/11/2007	MDL	0.3	330	66	170	0.78	MDL	0.003	-	-	-	-
	01/02/2011	MDL	0.64	480	9.7	150	0.89	MDL	0.032	150	300	22	7.9
	16/02/2012	0.027	0.5	460	6.4	120	1.4	MDL	MDL	140	220	21	8.3

BH	Date	Fe	Mn	$CaCO_3$	NO_3	SO_4	PO_4	S^{2-}	CH_4	Na	C^-	N	pH
	27/02/2013	MDL	0.033	110	12	49	6.5	MDL	0.012	30	29	5.5	6.8
	26/02/2014	MDL	0.03	88	22	41	6.3	MDL	MDL	21	27	0.54	7
M	20/11/2007	MDL	0.53	310	0.8	41	13	MDL	0.008	-	-	-	-
	01/02/2011	MDL	0.15	350	3.1	100	7.8	MDL	MDL	200	370	0.23	7.5
	17/02/2012	0.03	0.24	390	6	130	7.1	MDL	MDL	210	300	0.09	8.3
	28/02/2013	MDL	0.18	310	11	97	5.7	MDL	MDL	170	290	0.04	7
	26/02/2014	0.037	0.12	350	13	110	2.5	MDL	MDL	150	240	0.033	7.2
N	20/11/2007	MDL	0.61	320	8	58	1.3	MDL	2.9	-	-	-	-
N1	01/02/2011	0.07	0.48	470	1.2	86	0.41	MDL	8.1	110	180	4.5	7.9
	17/02/2012	0.17	0.6	470	1.5	75	0.12	MDL	6.8	64	79	3.5	8.3
	26/02/2013	MDL	1.1	390	MDL	69	0.48	MDL	2.8	22	28	1.2	7.1
	25/02/2014	0.84	0.92	400	0.8	51	0.55	MDL	2.2	24	29	1.3	7.5
O	20/11/2007	MDL	2	600	2	38	2.4	MDL	2.2	-	-	-	-
	01/02/2011	MDL	1.4	590	3.4	42	1.2	MDL	MDL	140	200	10	7.8
	16/02/2012	0.023	1.2	450	0.3	28	5	MDL	MDL	73	76	8.1	8.4
	28/02/2013	MDL	1.3	440	MDL	30	3	MDL	MDL	120	150	9.6	7.1
	26/02/2014	0.029	0.75	260	2.2	32	4.6	MDL	MDL	29	18	1.6	7.5
P	20/11/2007	MDL	6.8	270	27	560	22	MDL	0.004	-	-	-	-
	01/02/2011	MDL	1.3	250	17	470	16	MDL	0.007	15	17	0.12	7
	16/02/2012	MDL	2.3	240	32	880	15	MDL	MDL	23	23	0.4	8.1
	28/02/2013	0.03	3.7	250	9.6	1100	7.9	MDL	MDL	21	27	0.22	6.3
	26/02/2014	0.37	0.47	230	11	520	7.8	MDL	MDL	17	22	0.15	6.7
Q	20/11/2007	MDL	1.4	390	9.3	26	13	MDL	0.001	-	-	-	-
	01/02/2011	MDL	0.15	280	6	59	6	MDL	MDL	660	1100	0.15	7.5
	16/02/2012	0.013	0.034	370	24	58	11	MDL	MDL	550	750	MDL	8.3
	27/02/2013	MDL	0.058	230	12	53	6.7	MDL	MDL	880	1400	0.15	6.9
	25/02/2014	0.27	0.026	280	8.4	25	11	MDL	0.0056	250	290	0.04	7
S	20/11/2007	MDL	0.25	260	5.3	68	4.9	MDL	0.005	-	-	-	-
	01/02/2011	MDL	0.21	340	2	56	7.7	MDL	0.017	100	200	0.29	7.3
	16/02/2012	0.016	0.31	310	16	72	5	MDL	0.005	310	580	0.17	8.1
	28/02/2013	MDL	0.31	370	9.4	80	6.2	MDL	0.011	260	430	0.29	6.9
	25/02/2014	MDL	0.2	330	15	70	4.7	MDL	MDL	240	430	0.41	7.1
T	20/11/2007	MDL	1.6	430	MDL	15	23	MDL	2.6	-	-	-	-
	01/02/2011	MDL	0.79	300	1.8	20	12	MDL	3	31	69	4	7.4
	16/02/2012	0.084	1.1	380	MDL	30	14	MDL	2	45	76	6	8.2
	28/02/2013	MDL	0.5	290	6.3	110	9.8	MDL	MDL	35	52	2.7	6.9
	25/02/2014	0.077	0.084	220	13	45	5.6	MDL	MDL	34	62	0.18	7.1
V	20/11/2007	MDL	2.6	170	0.5	86	0.11	MDL	0.039	-	-	-	-
	01/02/2011	MDL	4	78	MDL	400	MDL	MDL	0.094	18	16	1.2	6.4
	16/02/2012	1.9	8.6	MDL	MDL	970	MDL	MDL	0.026	38	35	1.8	3.4
	27/02/2013	15	1.2	66	MDL	130	18	MDL	0.006	27	22	0.18	5.8
	25/02/2014	0.83	0.31	86	0.97	66	19	MDL	MDL	29	36	0.093	6.2

All concentrations are measured in mg/l rounded to 2 significant figures, except pH.
MDL – Below minimum laboratory detection limits

The results of the geochemical groundwater analysis show that most samples had near-neutral pH values.

The results also indicate that the most reducing conditions appear to remain in the vicinity of the River Weaver, with the samples from AC, AE and AF recording elevated concentrations of sulphate, dissolved manganese, dissolved iron, ferrous iron and ammoniacal nitrogen combined with reduced nitrate concentrations.

Evidence of increased ammoniacal nitrogen and reduced nitrate concentrations in F1 and N1 suggest reduction is also occurring at these locations. BH N1 also recorded the highest concentrations of dissolved methane (2.2mg/l).

BH P which was described as being in active decay when assessed in 2007, continues to record the highest concentrations of sulphate (520 mg/L), although the concentrations have reduced significantly since 2013.

The remaining boreholes generally recorded low concentrations of dissolved iron and manganese and higher concentrations of nitrates. All of the samples recorded elevated concentrations of sodium and chloride, which is conducive with the presence of halite deposits and historic salt working in the area.

4.0 RESULTS OF GROUND GAS MONITORING

Quarterly ground gas monitoring was undertaken in each of the installed eighteen dipwells using a Geotechnical Instruments GA2000 gas analyser. The Gas Analyser is used to measure the concentration of hydrogen sulphide, methane, oxygen, carbon monoxide and dioxide through the gas taps which have been fitted to all dipwells. Methane and hydrogen sulphide are indicators of anaerobic conditions, and even though methane can be generated from the decay of organic debris, the occurrence of this gas indicates reducing conditions with very slow decay rates. Oxygen, carbon monoxide and carbon dioxide are indicators of oxygen-rich deposits.

The results of the ground gas monitoring are shown in Appendix B.

The results of the ground gas monitoring indicate that elevated concentrations of methane and carbon dioxide remain in the areas adjacent to the river, which also correspond with depleted oxygen levels and other indicators of reducing conditions.

The highest concentrations of methane and have been recorded in boreholes AC and AE, indicative of anaerobic processes in a reducing environment. High levels of methane in BH AC and BH AE also correspond with lower concentrations of oxygen which suggest reducing conditions exist at these locations. However, methane gas can travel long distances underground following paths of less resistance and therefore the source of the gas might not be immediately adjacent to the monitoring well locations.

Trace concentrations of hydrogen sulphide were also recorded in five wells, but these are not considered to be significant as they are just above the detection limits of the gas analyser.

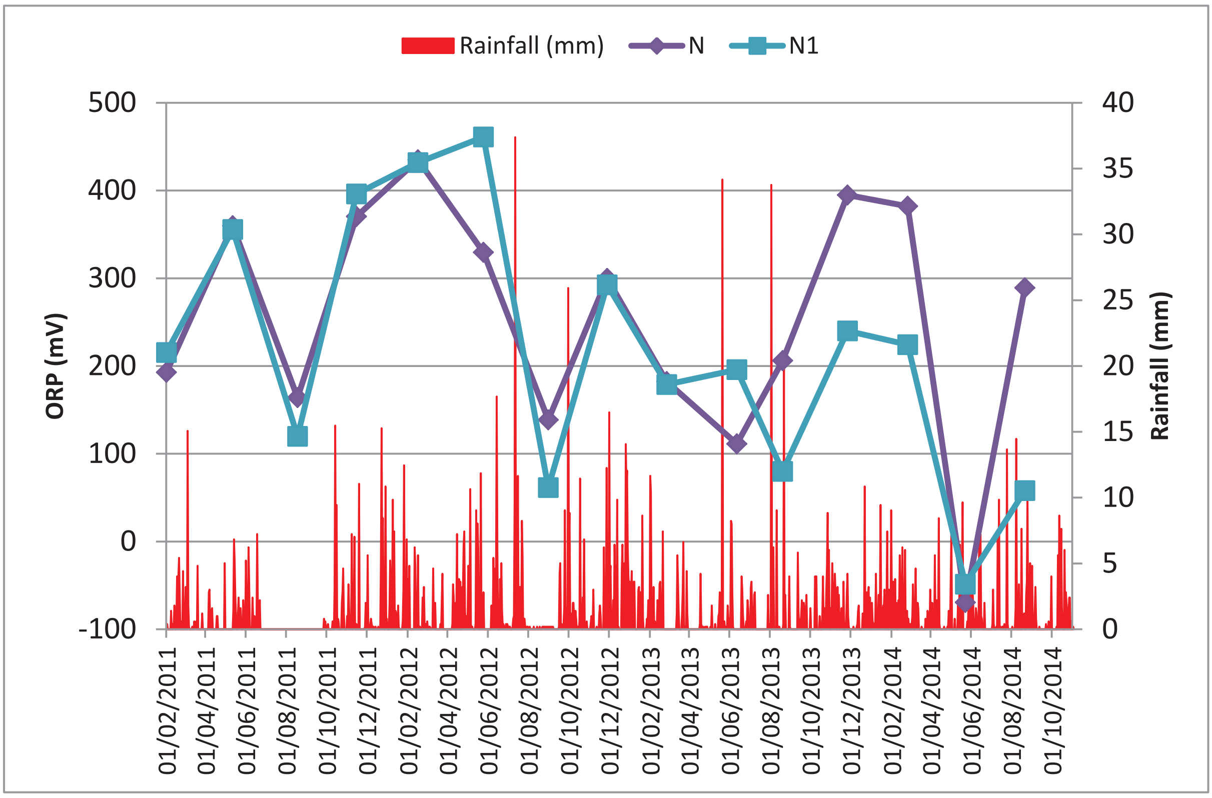
5.0 COMPARISON OF GROUNDWATER AND SOIL MONITORING DATA

The latest round of geochemical testing in Nantwich provides further evidence that the sub-surface deposits continue to fluctuate with seasonal variations. Geochemical analyses of groundwater sub-samples extracted from dipwells continue to demonstrate the presence of chemical species such as sulphates and nitrates, and the absence of sulphur or sulphide species (or at levels below the laboratory detection levels) all tend to indicate mildly reducing to oxidising conditions.

This interpretation is further supported by the results from measuring redox potentials of the groundwater using the YSI 556 water quality meter and flow-cells, with less reducing conditions observed during the winter months when effective rainfall tends to be at its highest.

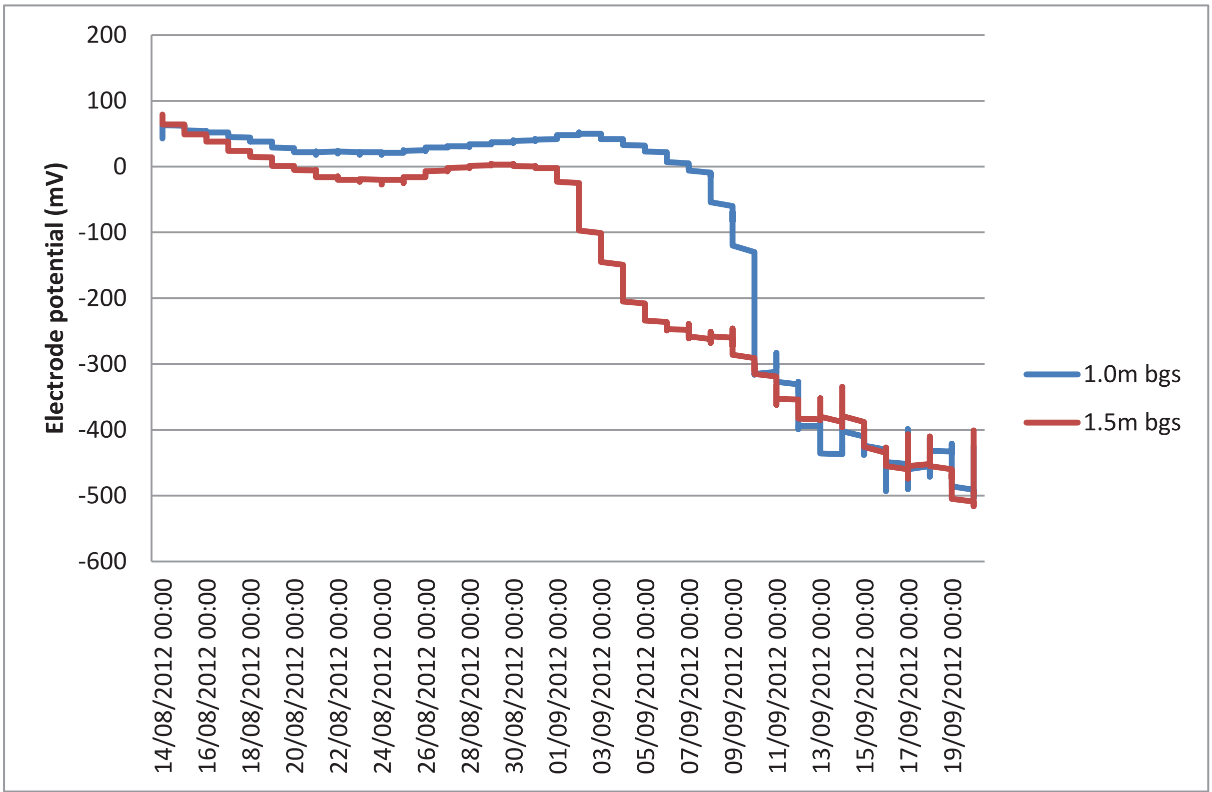
Figure 8 shows the seasonal redox variations at all borehole locations whilst Figure xxxx shows only the data for N and N1 where further English Heritage funded field-trials have taken place testing two additional types of redox probe (English Heritage Project 6524 Preservation in situ guidance - redox potential measurement) as well as Time Domain Reflectometry (TDR) measuring soil moisture content in the vadose zone above the water table (English Heritage Project 6523 Preservation in situ guidance - soil moisture measurement). These additional studies have provided further evidence concerning the characteristics of the archaeological deposits, with the results suggesting that conditions are often highly reducing - at variance with the results from the main monitoring programme.

Figure 8
Seasonal Redox Variations at Boreholes N and N1.



At N and N1 both dipwells are collecting groundwater from a relatively large response zone, although N1 was installed specifically to allow monitoring of the non-carbonised organic-rich deposit between 1.07 and 2.72 m below ground level (bgl). A rigid GRP probe with platinum sensors measuring redox potential at 1.0m bgl and 1.5m bgl was installed adjacent to the dipwells and connected to a datalogger programmed to collect measurements at hourly intervals (see Figure 9 for the raw redox data).

Figure 9
Uncalibrated redox potential data from GRP/platinum probe



Highly reducing conditions were established at both locations around two weeks following installation, and maintained thereafter until the datalogger ceased to function following the ingress of surface water (the datalogger case was not as watertight as previously thought). Subsequent readings were collected manually using a WTW pH3110 meter as part of the usual round of monitoring and the results (shown in Table 3) demonstrate that highly reducing conditions still exist at 1.5m bgl. However conditions at 1.0m bgl appear to be more dynamic, where oxidising conditions were recorded on two occasions, possibly as a result of the ingress of rainwater.

Table 3
Calibrated Eh values from the rigid GRP/Platinum probe

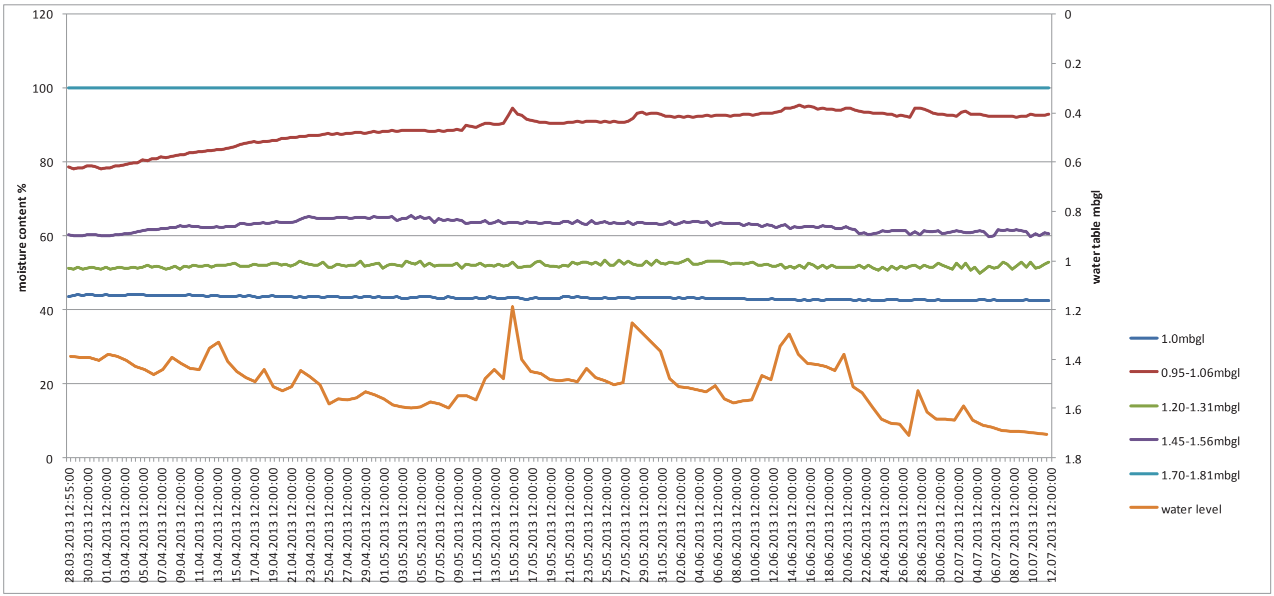
	Calibrated Eh values (mV)	
DATE	**1.0m**	**1.5m**
26/02/2013	-217.2	-172.6
22/03/2013	-138.9	-190.3
23/04/2013	567.4	-177.3
31/05/2013	-201.8	-182.3
27/06/2013	559.8	-129.6

Three heavy gauge copper wire/platinum tipped probes were also installed at the same location at around 1.0m bgl and the results, based on the average of the three probes, were broadly in line with the results provided by the flow-through cell and YSI meter, that is, conditions fluctuated between mildly reducing and oxidising.

The soil moisture content at BH N was measured using an IMKO TRIME™ Profile probe which was permanently installed into a dry access tube and connected to a datalogger with telemetry, with soil moisture readings collected at 12 hourly intervals. The intention was to collect 12 months soil moisture data from March 2013 but following a couple of nights of intense summer rain the access tube flooded and the TDR sensor failed to operate as a result. Attempts to bail out the water and re-seal the access tube proved unsuccessful. However, the results, although limited in duration, do provide some useful insights into the sub-surface deposits (see Figure 10).

Full saturation (100% soil moisture content) was recorded within deposits at a depth of between 1.70 and 1.81 m bgl (each TDR sensor measures a volume of soil 11 cm high) throughout the monitoring period. These deposits lie within the water table, and are likely to be fully saturated at all times. Based on the transducer data, the height of the water table during the field trial period fluctuated between 1.2m bgl and 1.6m bgl. The corresponding soil moisture contents derived from the TDR probes was between 50 and 65%. The uppermost level of the archaeological horizon, around 1.0m bgl had a soil moisture content of around 40% throughout.

Figure 10
Soil moisture content from TRIME™-PICO and TRIME™ Profile Probes from BH N1



The TDR data implies a soil profile where a degree of stability exists within the deposits despite the seasonal variations in the height of the water table. Furthermore reducing conditions appear to be maintained at soil moisture contents of 60% and above (based on the data recorded by the rigid resin/platinum redox probe installed at a depth of 1.5m bgl) and predominantly oxidising conditions at 40% or less (according to the data from the copper/platinum probes installed at 1.0m bgl). The non-carbonised, organic-rich deposits at N1 are located at 1.07 – 2.72m bgl.

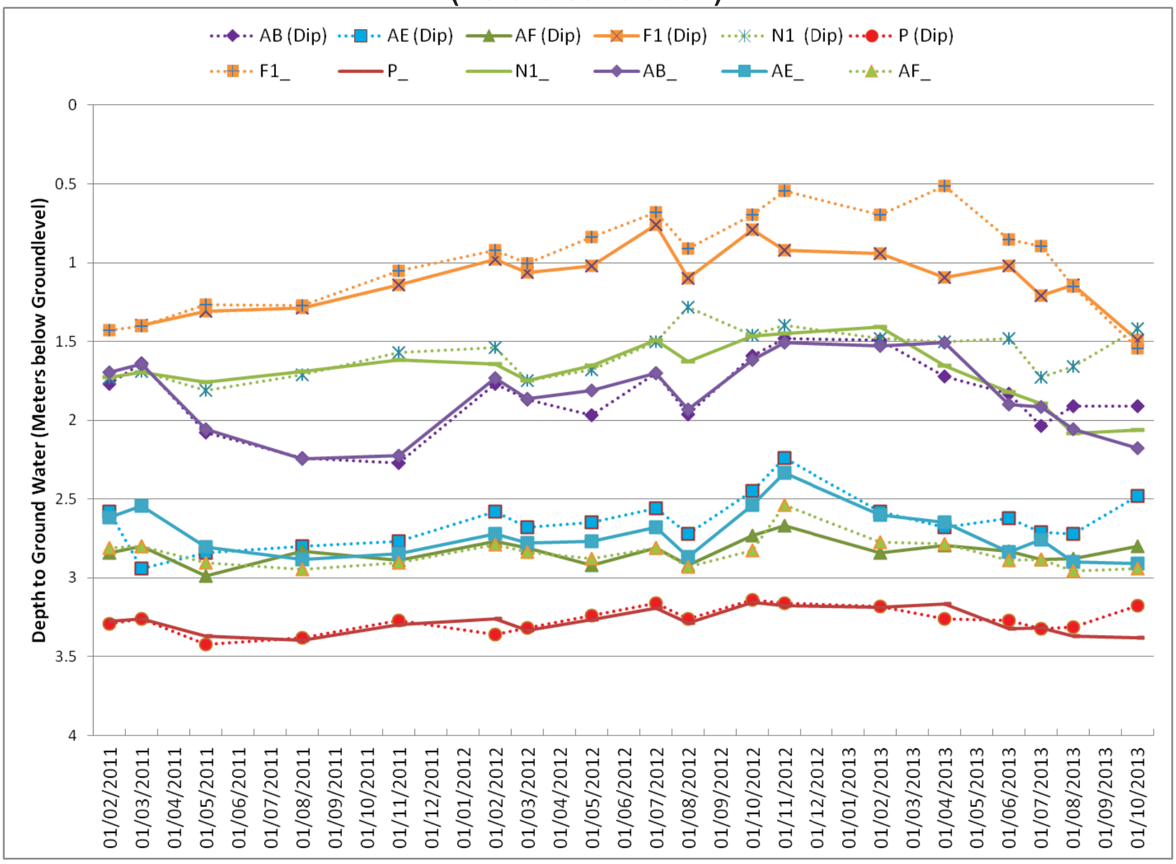
6.0 METHODOLOGICAL IMPROVEMENTS

Since the start of the regular monitoring programme in February 2011 several improvements have been implemented to improve the reliability and frequency of the data collection process.

If deposit monitoring is to continue at Nantwich then it is recommended that a number of rigid resin/platinum redox probes are installed to enable the direct in situ measurement of redox potentials, rather than using groundwater samples as proxy indicators. Indirect measurements on groundwater samples tend to produce results indicative of mildly reducing/oxidising conditions (not unexpected as each dipwell will contain oxygen which will react with any reduced chemical species dissolved in the groundwater) whereas in situ redox probes, if installed correctly, should provide more reliable data. Furthermore, installed redox probes will take readings from single-spot locations, whereas the dipwells are sampling water from a much larger catchment area.

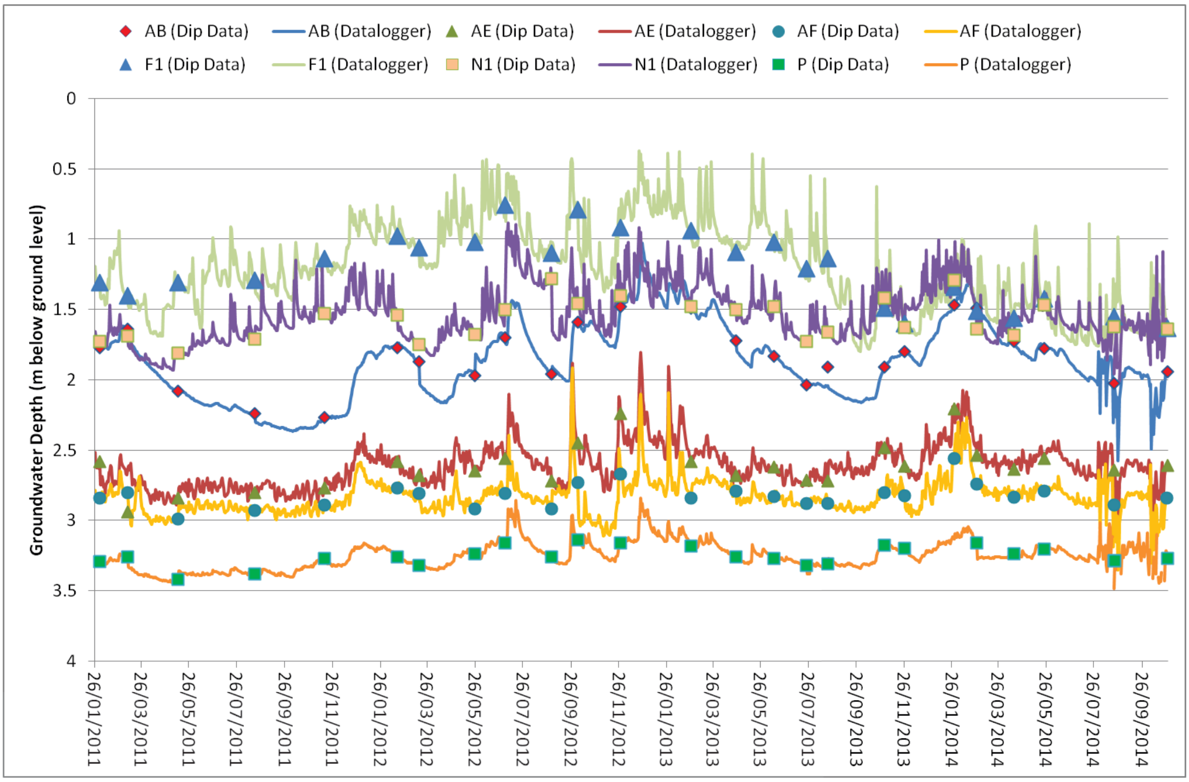
Ideally the redox probes should be connected to dataloggers to permit the collection of continuous data. However, as each monitoring location would require its own datalogger, the cost of this is likely to be too prohibitive. Therefore the option is manual recording on a monthly basis.

Figure 11
Groundwater Measurements with Datalogging Transducer v. Dip Meter (Before Calibration)



A comparison of the manual dip data against the ground water level information from the data loggers revealed that significant variations were occurring due to the regular disturbance of the tranducers during monitoring (see Figure 11). In order to account for these variations in transducer placement the transducer data is now calibrated following every monitoring event which has resulted in a significant improvement in accuracy (see Figure 12). Any potential discrepancies between the two data sets are now dependent on the reliability of the data loggers and human error (e.g. dip data collected from BH AB in August 2013).

Figure 12
Groundwater Measurements with Datalogging Transducer v. Dip Meter
(After Calibration)



The data from the transducers also indicates that the reliability of the data loggers is gradually reducing overtime, resulting in occasional gaps in the dataset, particularly in BH P and BH N1. Although erratic data has been recorded since the start of the project, the collection of backup readings has enabled a continuous data set to be collected. However, the frequency of the erroneous readings means that this is no longer possible and therefore the number of daily readings should be increased to provide additional data security. If the reliability issues persist it may be prudent to install additional transducers in the problematic monitoring locations to assess the validity of the information being recorded.

The condition of the monitoring well covers and gas taps has also deteriorated over time, and consideration should be given to replacing the defective covers and gas taps. The areas with high traffic volumes are in very poor condition, particularly at locations AG and AC.

There are also several additional techniques that have been discussed previously and may provide additional information for the Nantwich project or other similar monitoring programmes in future. These include:

- Collect a sample of methane gas for radiocarbon analysis to determine if the methane is related to the decay of ancient organic remains or an alternative modern origin;
- Installing additional data loggers to evaluate the possible connection between groundwater fluctuation and permeability;
- Additional geotechnical testing during future investigations (e.g. developer-funded projects) to provide further information on the physical characteristics of the deposits;
- Undertake geophysical investigations to correlate information from the boreholes and assess the extent and distribution of the deposits over a wider area.

Future consideration should be given to undertaking a comparison results from field parameters (dissolved oxygen and redox) and geochemical analysis for the principal redox species. It would also be beneficial if the assessment compared the results from soil and groundwater. This assessment could then be used to determine the most suitable method of assessing preservation conditions within waterlogged archaeological deposits for future investigations.

7.0 CONCLUSIONS

This interim report enhances the preliminary findings from previous years, and is helping to establish a better understanding of the burial conditions and the state of continued preservation of organic remains within Nantwich. It has also identified enhancements and alterations to the methodology through a rigorous practical application of the techniques and equipment originally designed for the monitoring programme, as well as benefitting from add-on research commissioned by English Heritage into redox and soil moisture content. Such details will assist future projects for effective monitoring of similar waterlogged deposits in other urban centres.

The preservation zones (Figure 13) suggested at the end of Phase 1 remain broadly valid as two areas with differential preservation according to the results from proxy indicators used by the monitoring. Within this general statement, detailed study suggests complexities and sometimes conflicting evidence from individual locations, and more interpretation of the complementary data collected during monitoring, would benefit specific outcomes for the management of Nantwich’s waterlogged deposits.

The project is now ready to publicize its achievements to an international audience at PARIS 5 in April 2015, if a variation for funding can be agreed with English Heritage. The wealth of data and feedback on testing methodologies and equipment should be profiled so that colleagues nationally and internationally can benefit from the results of the project. With a final year of data collection and the production of a synthesis article for an academic journal in 2016, the project is well on target for achieving its aims and objectives in a timely manner.

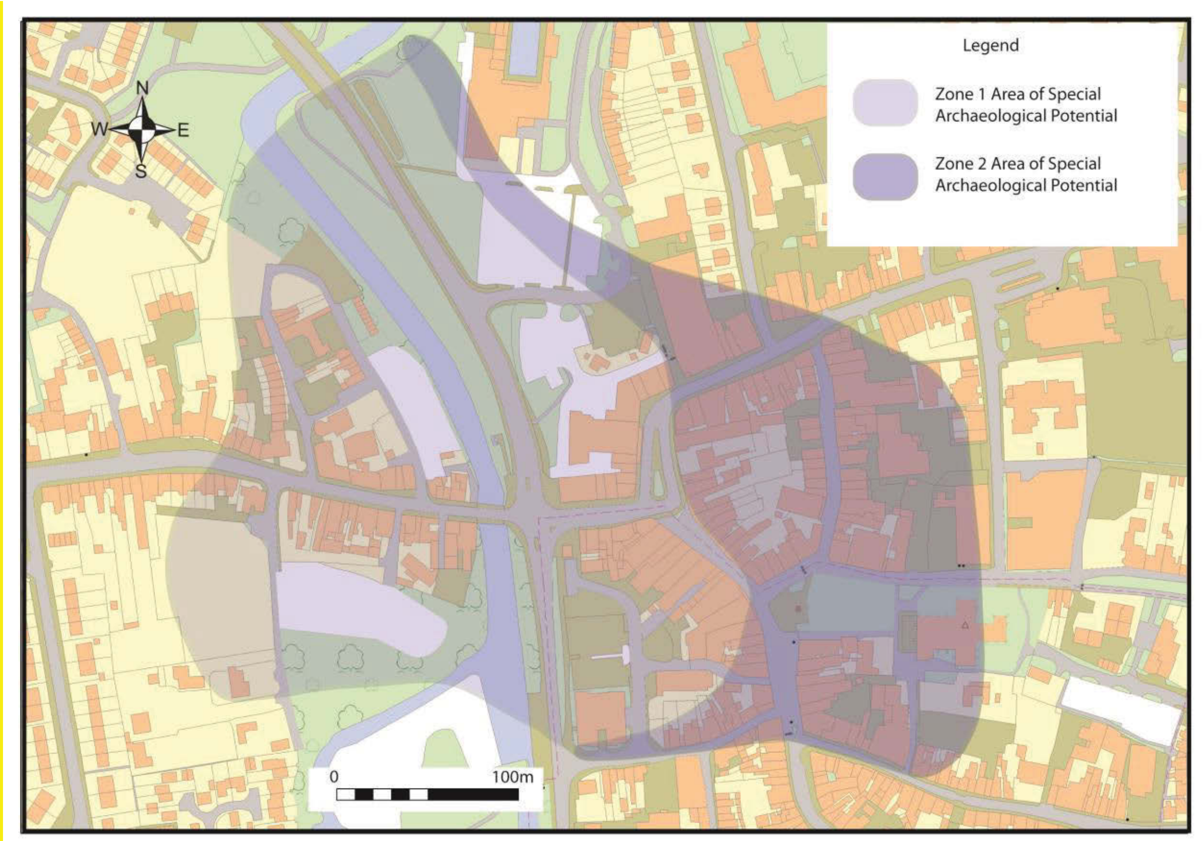
8.0 CLOSURE

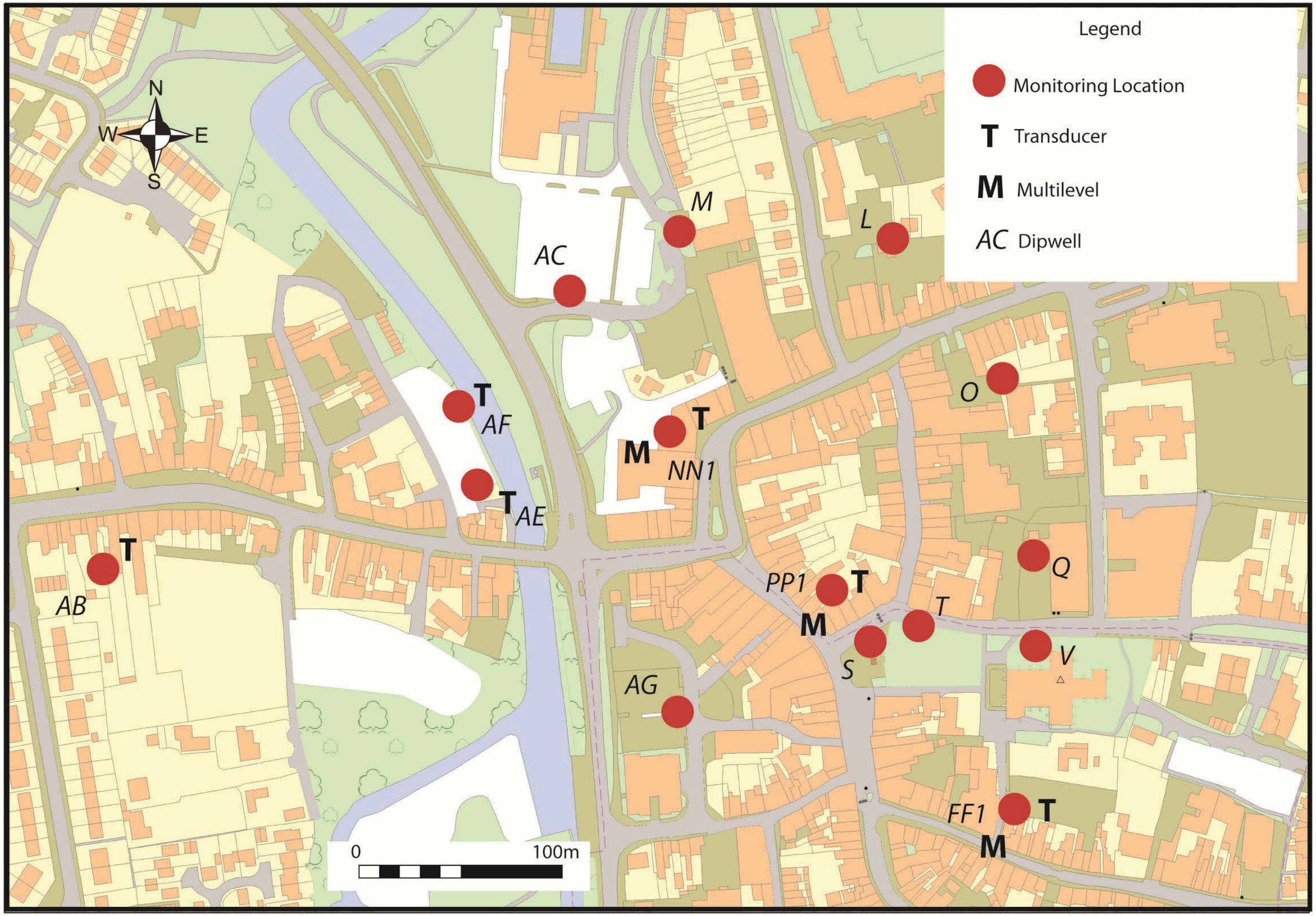
This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Cheshire East Council and English Heritage; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

Figure 13
Preservation Zones




Legend
Monitoring Location
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M Multilevel
AC Dipwell
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M

Groundwater Monitoring Data - 2014

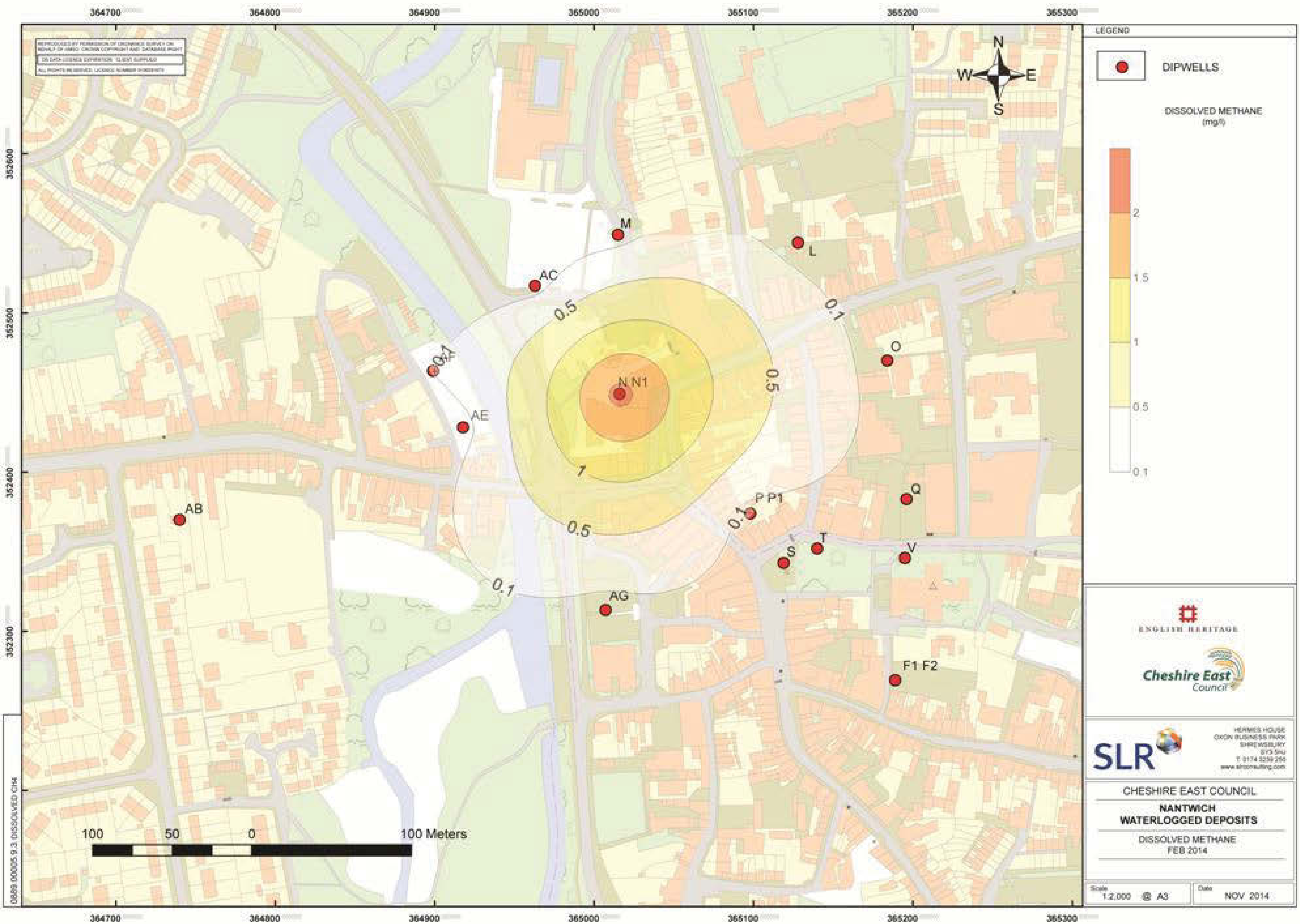
Well No	Screened interval (m)	Surface elevation (m AOD)	Date	Depth to water below Ground (m)	Water elevation (m AOD)	Dissolved Oxygen (mg/l)	REDOX (mV)	pH	Conductivity (µS/CM)	Temp (˚C)
AB	1.0-3.0	37.93	26/02/14	1.49	36.44	2.85	237	6.92	1859	4.85
			23/05/14	1.78	36.15	3.26	138	-	1519	10.4
			21/08/14	2.03	35.90	0.21	209	7.04	2336	12.8
			26/11/14	1.86	36.07	2.44	72	7.11	1148	9.19
AC	1.0-4.0	36.42	25/02/14	2.34	34.08	1.48	118	6.73	4338	5.46
			23/05/14	2.54	33.88	2.7	109	-	4425	12.1
			21/08/14	2.74	33.68	0.73	77	7.17	5669	15.7
			26/11/14	2.62	33.80	2.03	330	7.1	2944	11.91
AE	1.0 – 4.0	35.19	26/02/14	2.54	32.65	1.33	294	6.53	5369	7.91
			23/05/14	2.56	32.63	3.23	145	9.89	2834	12.5
			21/08/14	2.64	32.55	0.86	104	7.56	3067	15.1
			26/11/14	2.48	32.71	1.63	91	7.17	2518	11.79
AF	1.0 – 4.0	34.89	26/02/14	2.74	32.15	1.24	110	6.7	4142	7.66
			23/05/14	2.79	32.10	2.63	105	-	3014	12.2
			21/08/14	2.89	32.00	0.58	66	7.71	4419	15.1
			26/11/14	2.83	32.06	1.69	68	7.07	2586	12.29
AG	1.0 – 4.0	37.03	26/02/14	0.91	36.12	3.52	247	7.65	2262	6.73
			23/05/14	1.35	35.68	1.44	-40	-	8762	12.2
			21/08/14	1.25	35.78	0.27	125	6.59	7562	17.2
			26/11/14	0.91	36.12	1.41	125	7.21	7216	10.87
F1	1.3 – 2.0	39.69	26/02/14	1.51	38.18	5.78	277	6.94	917	5.57
			23/05/14	1.42	38.27	4.66	82	-	812	12.9
			21/08/14	1.55	38.14	2.89	144	7.35	1121	15.43
			26/11/14	1.42	38.27	4.61	86	7.07	431	9.46
F2	1.0 – 4.0	39.69	26/02/14	1.55	38.14	2.48	291	6.78	1349	6.52
			23/05/14	1.54	38.16	1.87	0	-	1939	11.6
			21/08/14	1.62	38.08	2.11	187	7.06	1709	16.6
			26/11/14	1.65	38.04	1.81	67	7.08	1857	10.44
L	1.0-4.0	38.71	26/02/14	2.12	36.59	6.14	369	6.85	822	4.56
			23/05/14	2.13	36.58	0.78	-74	-	1908	10.6
			21/08/14	2.25	36.46	0.66	78	7.77	4018	13.4
			26/11/14	2.23	36.49	1.77	405	6.49	1594	9.84
M	1.0-3.0	37.81	26/02/14	1.47	36.34	2.24	414	6.42	1771	3.78
			23/05/14	1.48	36.33	2.04	-43	-	2058	10.8
			21/08/14	1.55	36.26	0.63	194	6.98	2637	14.4
			26/11/14	1.46	36.36	2.38	343	6.49	1551	10.14
N	1.0-4.0	39.17	25/02/14	1.57	37.60	2.15	382	6.86	1085	8.14
			23/05/14	1.53	37.63	1.24	-69	-	1021	12.4
			21/08/14	1.55	37.61	1.65	289	6.86	754	15.2
			26/11/14	1.33	37.83	2.05	94	7.13	765	10.77
N1	1.0 – 3.0	39.16	25/02/14	1.64	37.52	1.83	224	7	996	6.81
			23/05/14	1.47	37.68	2.42	-49	-	1016	12.3
			21/08/14	1.63	37.53	0.9	58	7	1732	15.5
			26/11/14	1.37	37.78	1.64	87	7.32	665	9.94
O	1.0-4.0	39.64	26/02/14	1.38	38.26	1.56	318	6.85	734	6.24
			23/05/14	1.45	38.20	0.78	-155	-	1677	12.4
			21/08/14	1.42	38.22	0.54	81	7.22	1554	15.6
			26/11/14	1.39	38.25	1.57	357	7.05	1036	10.69
P	1.0-3.8	39.93	26/02/14	3.16	36.77	1.94	246	6.25	1623	7.37
			23/05/14	3.20	36.72	2.12	40	-	1260	12.6
			21/08/14	3.29	36.64	0.92	198	6.98	2184	14.5

Well No	Screened interval (m)	Surface elevation (m AOD)	Date	Depth to water below Ground (m)	Water elevation (m AOD)	Dissolved Oxygen (mg/l)	REDOX (mV)	pH	Conductivity (µS/CM)	Temp (˚C)
			26/11/14	3.23	36.70	1.46	360	6.71	916	11.44
Q	1.0-4.0	39.22	25/02/14	1.95	37.27	2.13	252	6.79	1978	6.34
			23/05/14	1.84	37.37	0.58	-175	-	1453	12.2
			21/08/14	1.85	37.36	0.42	193	7.21	2082	16.6
			26/11/14	1.63	37.59	2.03	345	6.42	1498	11.08
S	1.0-4.0	39.77	25/02/14	3.15	36.62	2.14	287	6.62	2437	8.04
			23/05/14	3.22	36.55	2.62	9	-	2680	11.7
			21/08/14	3.29	36.48	0.4	157	6.91	2935	14.5
			26/11/14	3.23	36.54	1.72	352	6.74	1173	10.49
T	1.0-4.0	39.5	25/02/14	2.96	36.54	4.95	281	6.77	689	5.34
			23/05/14	3.05	36.44	3.47	14	-	693	10.3
			21/08/14	3.14	36.36	0.43	117	7.27	1282	12.7
			26/11/14	3.02	36.47	5.55	301	6.88	394	9.32
V	1.0-3.0	39.39	25/02/14	1.47	37.92	2.78	291	6.06	421	6.55
			23/05/14	1.93	37.46	1.9	-29	-	1005	10.3
			21/08/14	2.10	37.29	0.3	88	7.52	1475	13.3
			26/11/14	1.91	37.48	1.72	258	6.33	779	9.8

Ground Gas Monitoring Results - 2014

BH	Date	Methane (%)	Hydrogen Sulphide (ppm)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)
AB	28/01/2014	0.2	0	1.2	20.3	0
	15/04/2014	0	0	1.3	20.1	0
	31/07/2014	0.2	0	2.8	20.3	0
	28/10/2014	0	0	10.5	3.4	0
AC	28/01/2014	7.3	0	4.5	1.7	0
	15/04/2014	2.8	0	2.6	9.9	0
	31/07/2014	5.4	0	6.2	1.9	0
	28/10/2014	5.1	0	4.6	3.5	0
AE	28/01/2014	0.2	0	10.2	7.6	0
	15/04/2014	0	0	11.3	10	0
	31/07/2014	4.7	0	14.4	5.2	0
	28/10/2014	0.2	0	1.5	18.1	0
AF	28/01/2014	6.1	0	3.6	14.6	0
	15/04/2014	0	0	2.3	19.2	0
	31/07/2014	0.8	0	11.9	18.7	0
	28/10/2014	0	0	9.7	8.4	0
AG	28/01/2014	0.2	0	0.6	19.6	0
	15/04/2014	0	0	4.7	14.3	0
	31/07/2014	0	0	1.7	20.5	0
	28/10/2014	0.3	0	6.4	7.8	0
F1	28/01/2014	0.2	0	0.7	20.8	0
	15/04/2014	0	0	1.8	16.8	0
	31/07/2014	0	1	2	17.6	0
	28/10/2014	0	0	0.1	20.6	0
F2	28/01/2014	0.3	0	1.5	19	0
	15/04/2014	0	0	3	18.5	0
	31/07/2014	0	1	2.5	17.1	0
	28/10/2014	0	1	2	18.3	0
L	28/01/2014	0.2	0	1.6	20.9	0
	15/04/2014	0	0	1.2	20.5	0
	31/07/2014	0	0	2.2	18.3	0
	28/10/2014	0	0	2.4	18.9	0
M	28/01/2014	0.2	0	0.9	21.1	0
	15/04/2014	2	0	1.9	12.5	0
	31/07/2014	0	0	2.3	18.6	0
	28/10/2014	4.4	0	4.8	14.1	0
N	28/01/2014	0.3	0	0.6	20.9	0
	15/04/2014	0	0	0.2	19.2	0
	31/07/2014	0	0	2	19.9	0
	28/10/2014	0	0	2.2	19	0
N1	28/01/2014	0.2	0	1.6	20.7	0
	15/04/2014	0.1	0	2	19	0
	31/07/2014	0	0	2.4	17.8	0
	28/10/2014	0	0	1.7	19.8	0
O	28/01/2014	0.2	0	0.5	21.8	0
	15/04/2014	0	0	0.4	20.7	0
	31/07/2014	0.1	1	0.2	20.1	0
	28/10/2014	0	0	0.7	20.5	0

BH	Date	Methane (%)	Hydrogen Sulphide (ppm)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)
P	28/01/2014	0.2	0	3.7	17.6	0
	15/04/2014	0	0	0.3	21.1	0
	31/07/2014	0	0	1.5	19.1	0
	28/10/2014	0	0	0.9	20	0
P1	28/01/2014	0.2	0	0.2	22	0
	15/04/2014	0	0	2.2	18.5	0
	31/07/2014	0	0	1.9	20.3	0
	28/10/2014	0	0	2.3	18.2	0
Q	28/01/2014	0.2	0	5	16.9	0
	15/04/2014	0	0	0.7	20.4	0
	31/07/2014	0	0	0.5	20.7	0
	28/10/2014	0	0	3.3	15.8	0
S	28/01/2014	0.2	0	3.8	17.8	0
	15/04/2014	0	0	2	18.1	0
	31/07/2014	0	0	1.7	18.5	0
	28/10/2014	0	0	2.8	18	0
T	28/01/2014	0.2	0	1.7	20.6	0
	15/04/2014	0	0	4	15.3	0
	31/07/2014	0	1	2.6	19.5	0
	28/10/2014	0	0	2.8	18.6	0
V	28/01/2014	2.1	0	2	20.9	0
	15/04/2014	0	0	3.5	17.8	0
	31/07/2014	0	1	2.7	18.1	0
	28/10/2014	0	0	3.5	18.1	0



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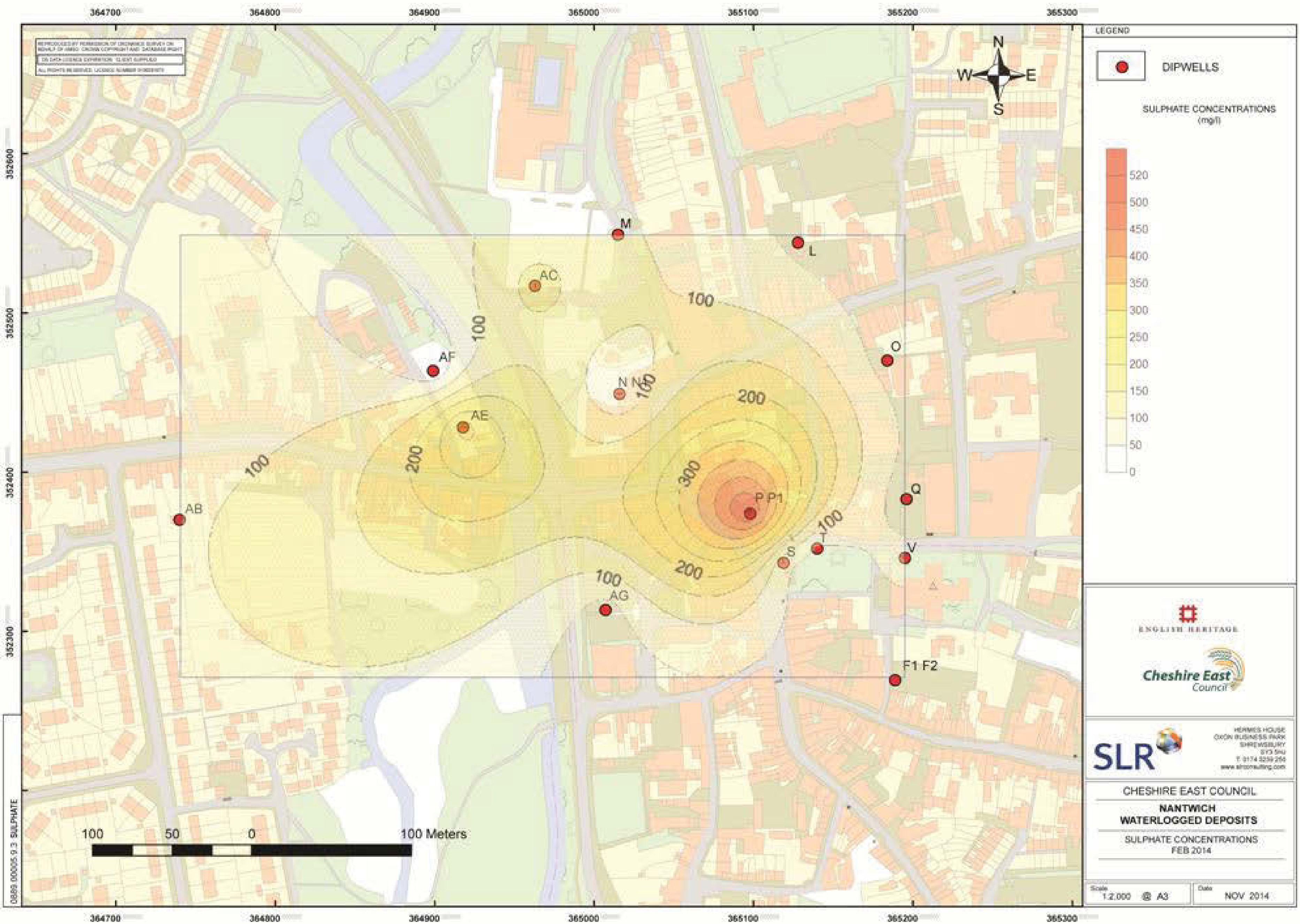
LEGEND
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OXON BUSINESS PARK
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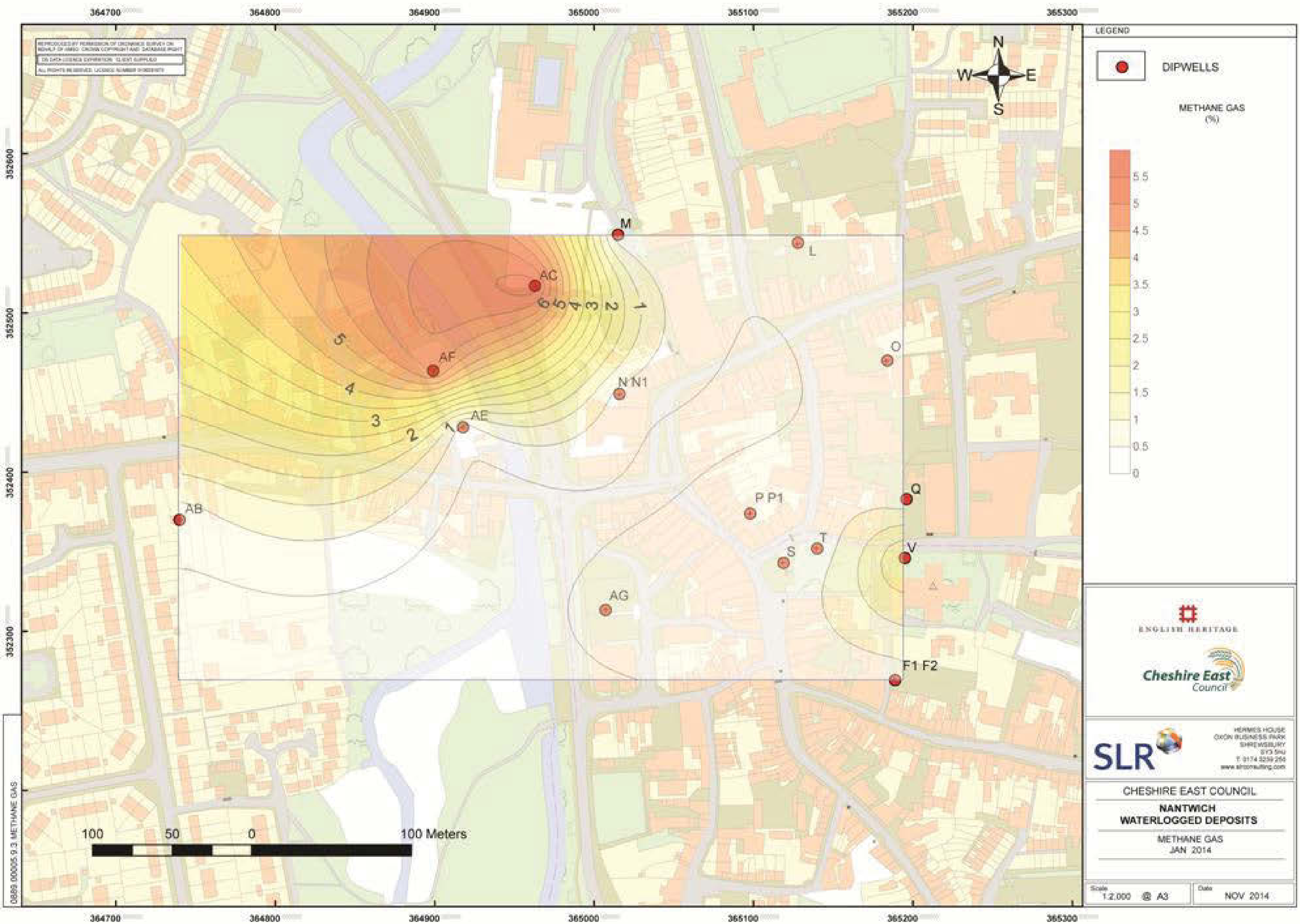
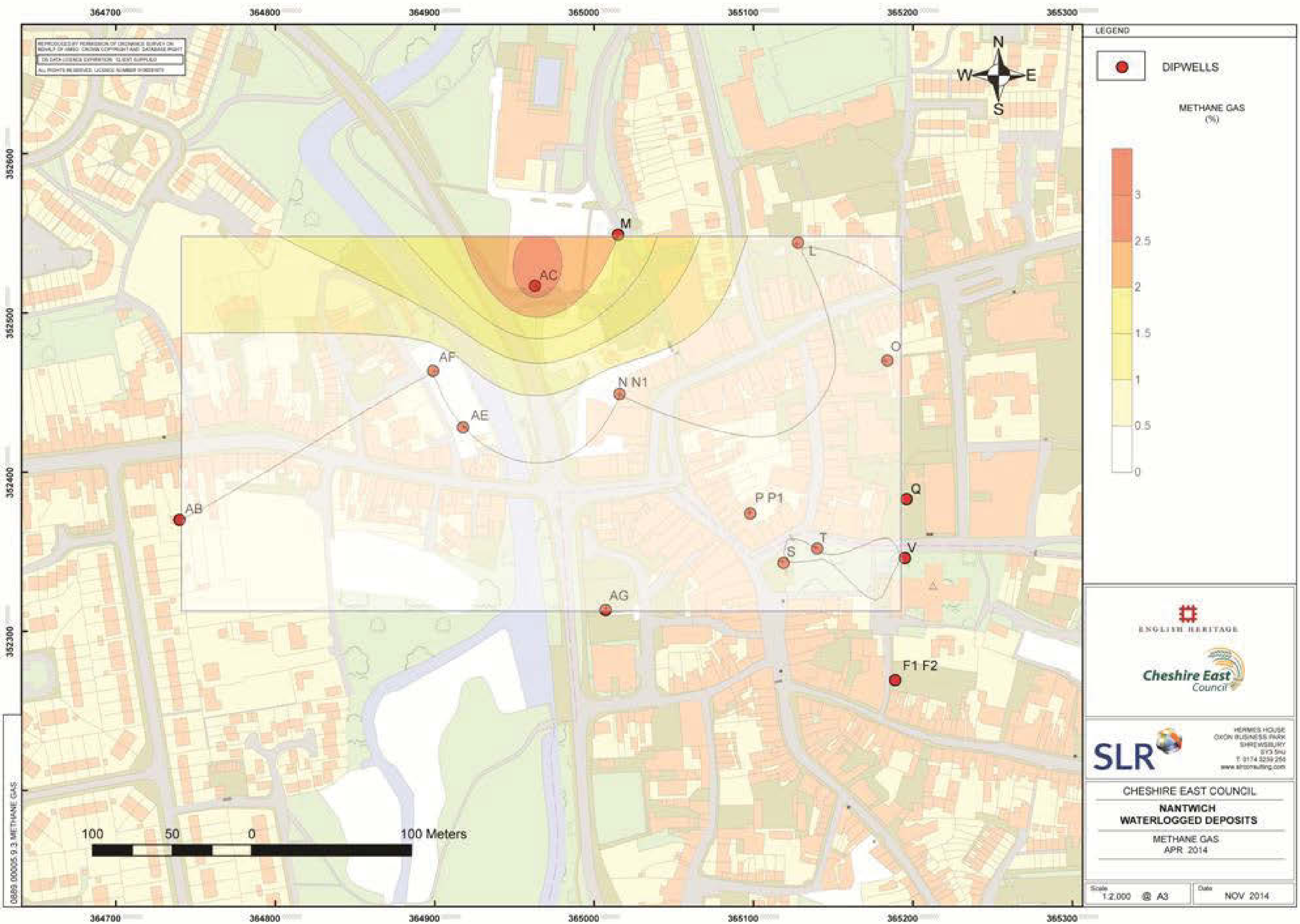
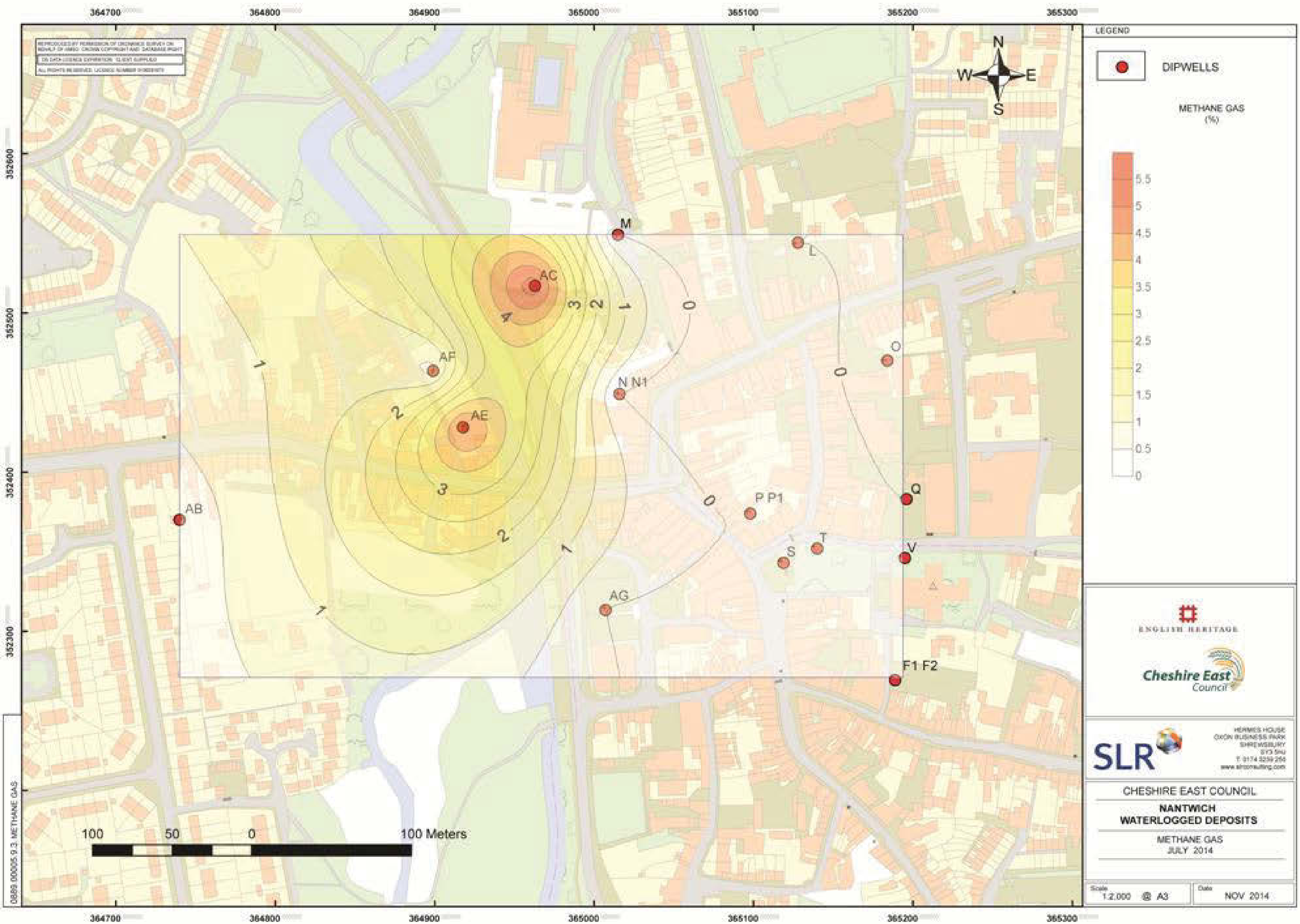
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
SULPHATE CONCENTRATIONS
FEB 2014
Scale
1:2,000 @ A3
Date
NOV 2014
SULPHATE

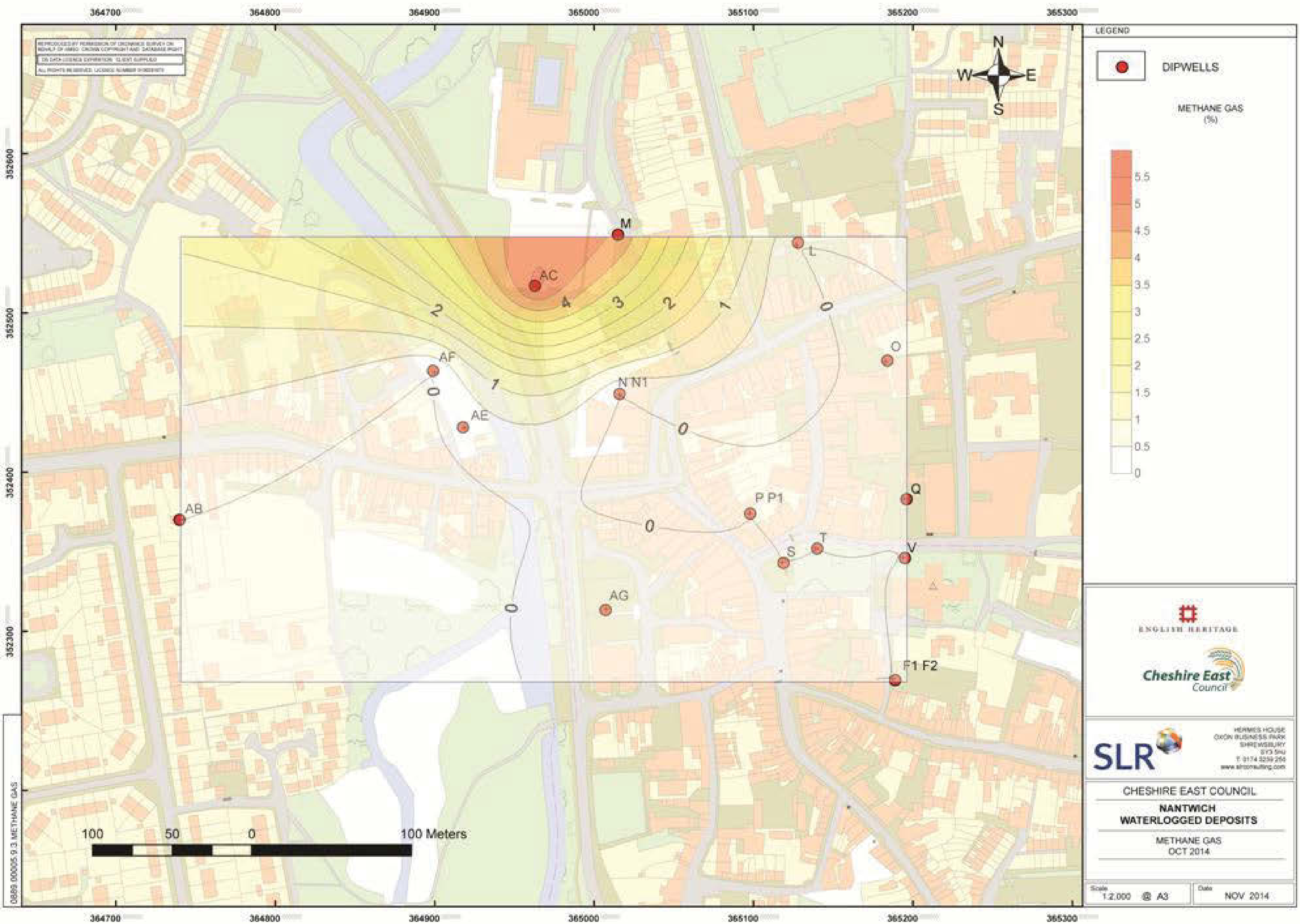

LEGEND
DIPWELLS
METHANE GAS (%)
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
N
E
S
W
M
L
AC
AF
AE
N N1
O
AB
P P1
Q
T
S
V
AG
F1 F2
100
50
0
100 Meters
364700
364800
364900
365000
365100
365200
365300
352600
352500
352400
352300
0889 00005.9.3 METHANE GAS
ENGLISH HERITAGE
Cheshire East Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
METHANE GAS
JAN 2014
Scale
1:2,000 @ A3
Date
NOV 2014

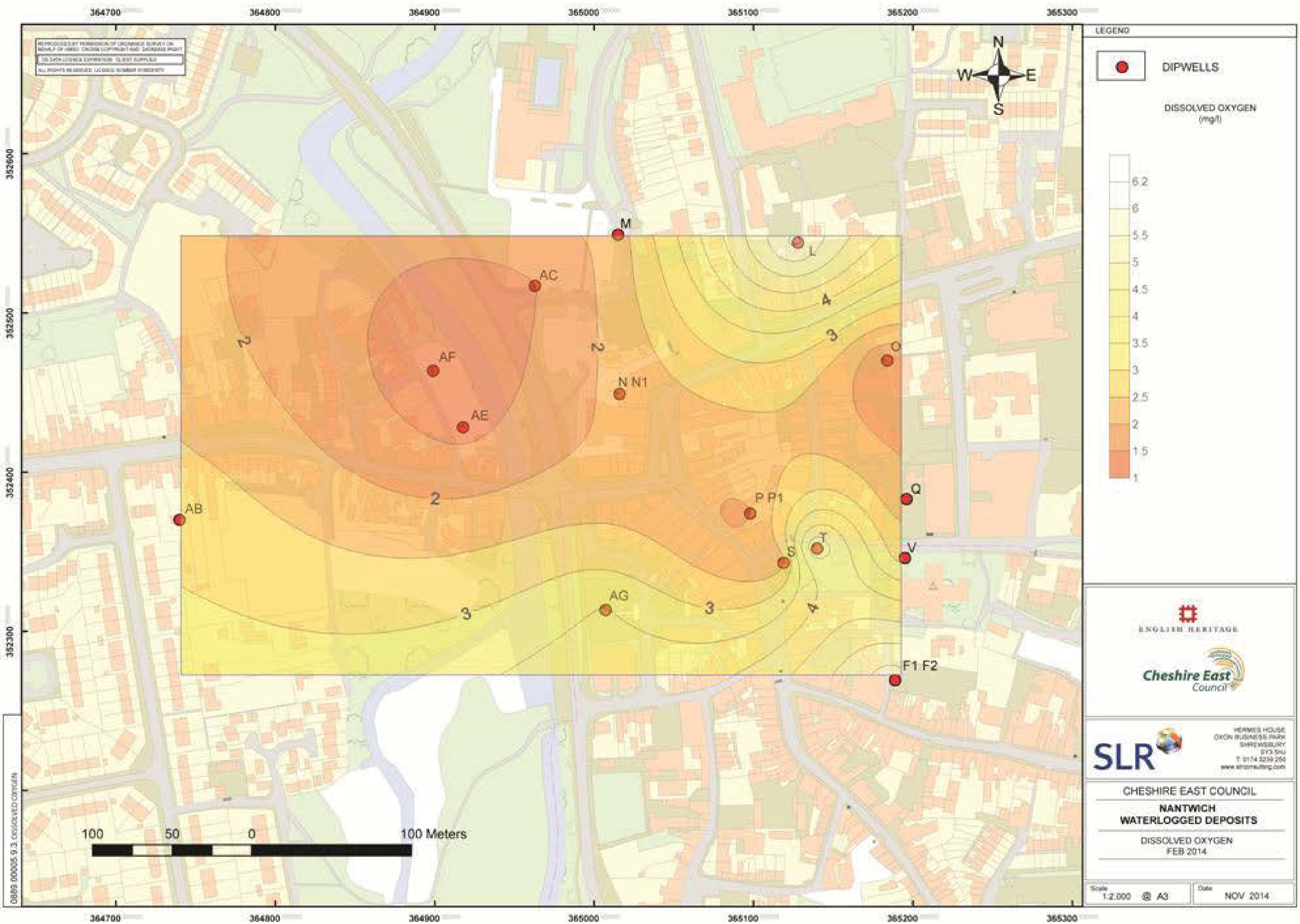


364700
364800
364900
365000
365100
365200
365300
352600
352500
352400
352300
LEGEND
DIPWELLS
METHANE GAS
(%)
3
2.5
2
1.5
1
0.5
0
N
S
W
E
M
AC
L
O
AF
N N1
AE
AB
P P1
Q
T
S
V
AG
F1 F2
100
50
0
100 Meters
ENGLISH HERITAGE
Cheshire East Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
METHANE GAS
APR 2014
Scale
1:2,000 @ A3
Date
NOV 2014
0889.00005.9.3 METHANE GAS



LEGEND
DIPWELLS
METHANE GAS (%)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
N
S
E
W
M
L
AC
AF
N N1
O
AE
AB
Q
P P1
T
S
V
AG
F1 F2
100 50 0 100 Meters
364700
364800
364900
365000
365100
365200
365300
352300
352400
352500
352600
ENGLISH HERITAGE
Cheshire East Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
METHANE GAS
JULY 2014
Scale
1:2,000 @ A3
Date
NOV 2014
0889.00005.9.3 METHANE GAS


LEGEND
DIPWELLS
METHANE GAS
(%)
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
N
W
E
S
364700
364800
364900
365000
365100
365200
365300
352600
352500
352400
352300
M
AC
L
AF
AE
N N1
O
AB
P P1
Q
S
T
V
AG
F1 F2
100
50
0
100 Meters
ENGLISH HERITAGE
Cheshire East
Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
T: 01743 239 250
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
METHANE GAS
OCT 2014
Scale
1:2,000 @ A3
Date
NOV 2014
0889 00005 9 3 METHANE GAS



LEGEND
DIPWELLS
DISSOLVED OXYGEN (mg/l)
6.2
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
N
E
S
W
M
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AC
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N N1
O
Q
AB
P P1
T
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V
AG
F1 F2
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2
3
3
3
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4
4
364700
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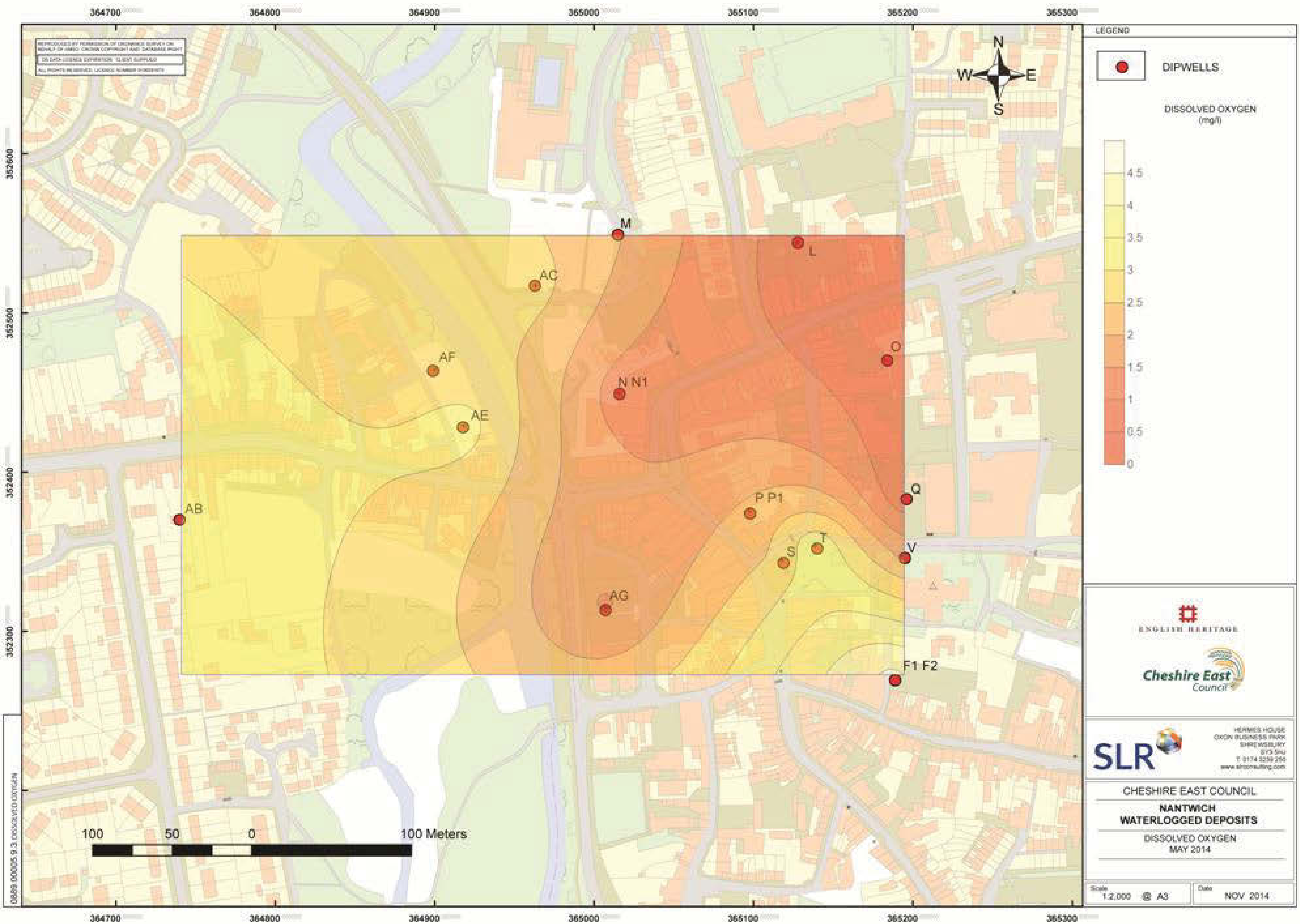
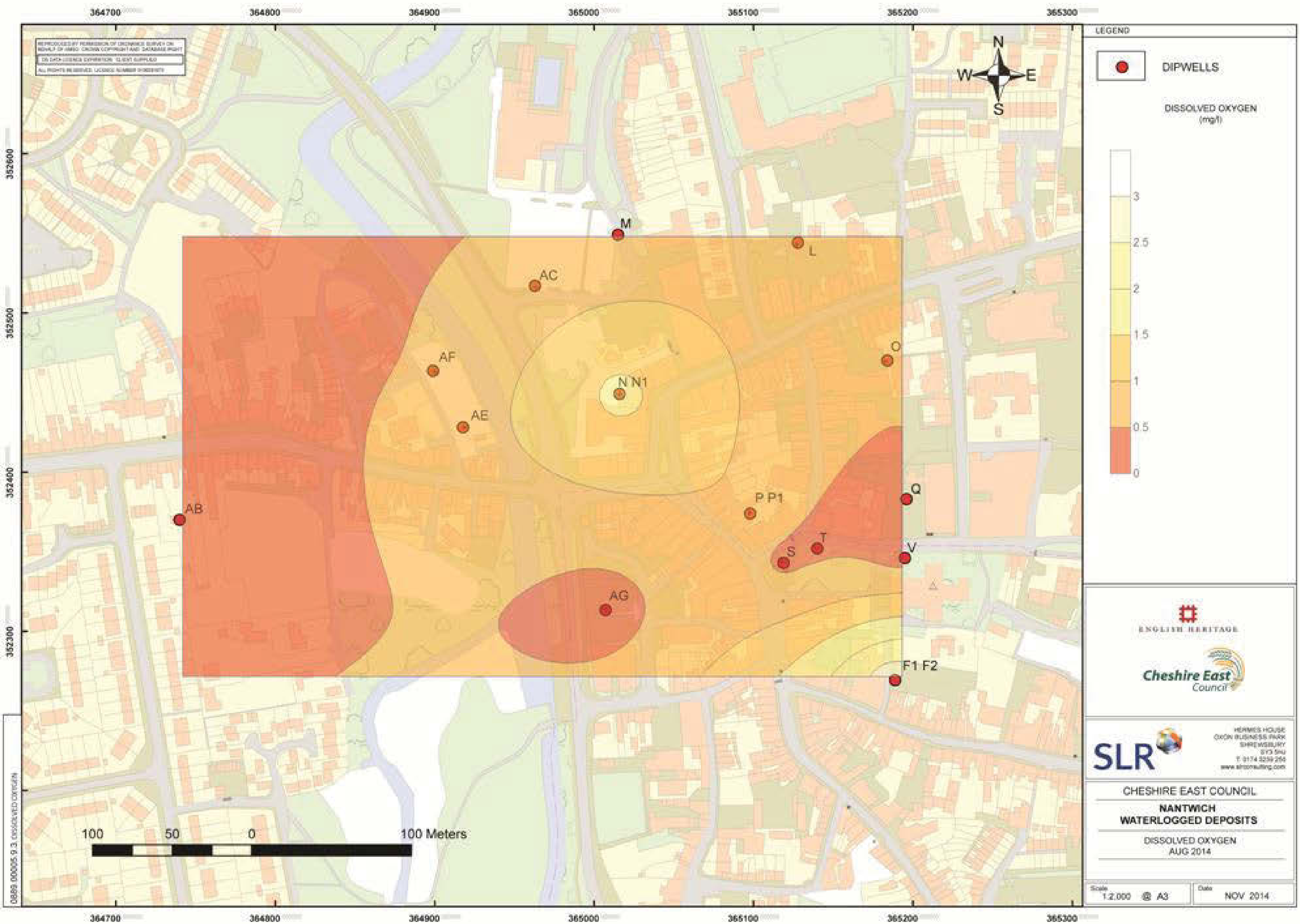
364900
365000
365100
365200
365300
352600
352500
352400
352300
100
50
0
100 Meters
ENGLISH HERITAGE
Cheshire East Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
www.slrconsulting.com
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
DISSOLVED OXYGEN
FEB 2014
Scale
1:2,000 @ A3
Date
NOV 2014



LEGEND
DIPWELLS
DISSOLVED OXYGEN (mg/l)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
N
E
S
W
M
L
AC
AF
N N1
AE
O
AB
Q
P P1
T
S
V
AG
F1 F2
100
50
0
100 Meters
364700
364800
364900
365000
365100
365200
365300
352600
352500
352400
352300
ENGLISH HERITAGE
Cheshire East Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
DISSOLVED OXYGEN
MAY 2014
Scale
1:2,000 @ A3
Date
NOV 2014



364700
364800
364900
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365100
365200
365300
352600
352500
352400
352300
LEGEND
DIPWELLS
DISSOLVED OXYGEN
(mg/l)
3
2.5
2
1.5
1
0.5
0
N
S
W
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M
L
AC
AF
N N1
AE
O
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P P1
Q
T
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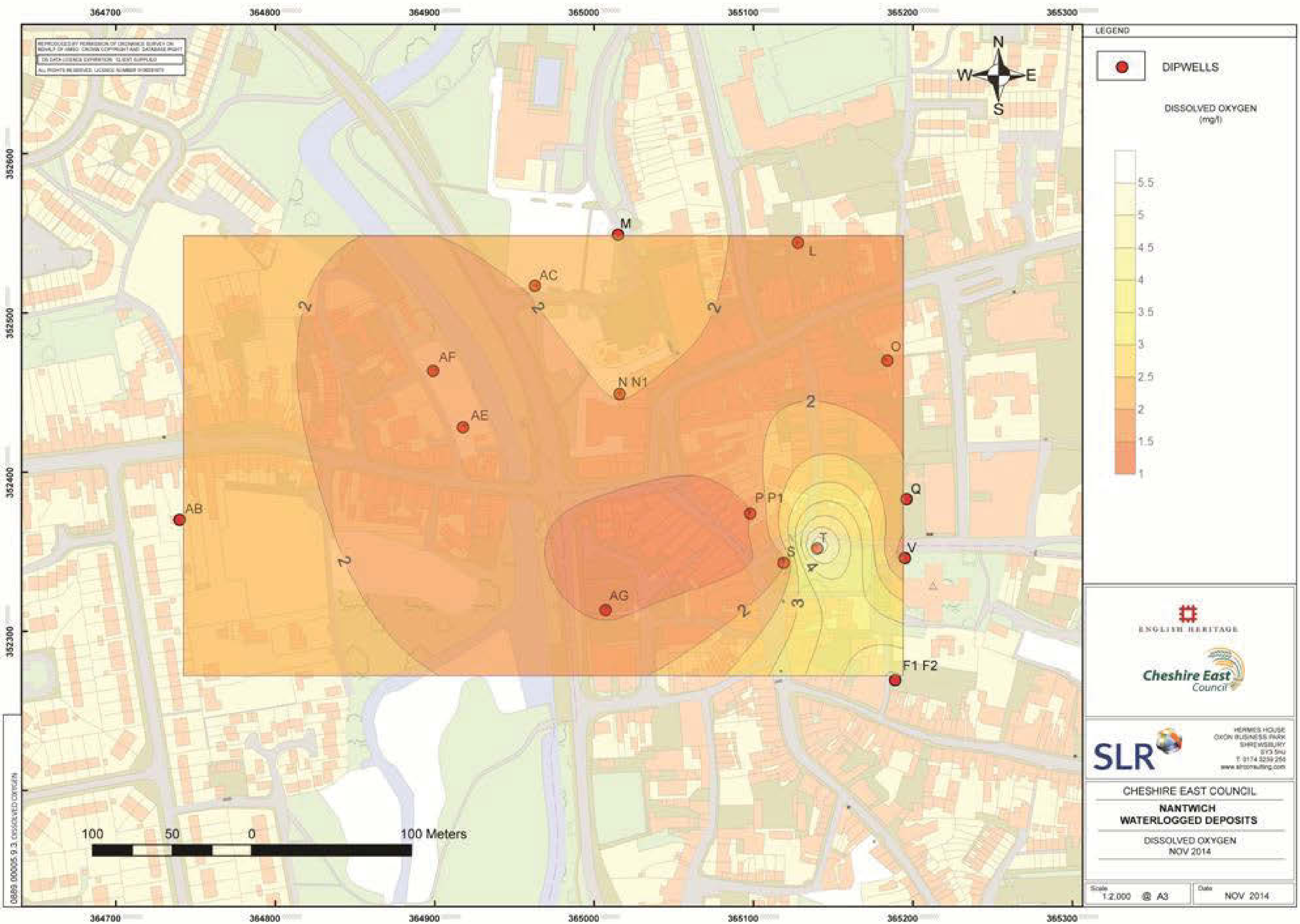
V
AG
F1 F2
100
50
0
100 Meters
ENGLISH HERITAGE
Cheshire East
Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
DISSOLVED OXYGEN
AUG 2014
Scale
1:2,000 @ A3
Date
NOV 2014



LEGEND
DIPWELLS
DISSOLVED OXYGEN (mg/l)
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
N
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AG
F1 F2
100
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0
100 Meters
364700
364800
364900
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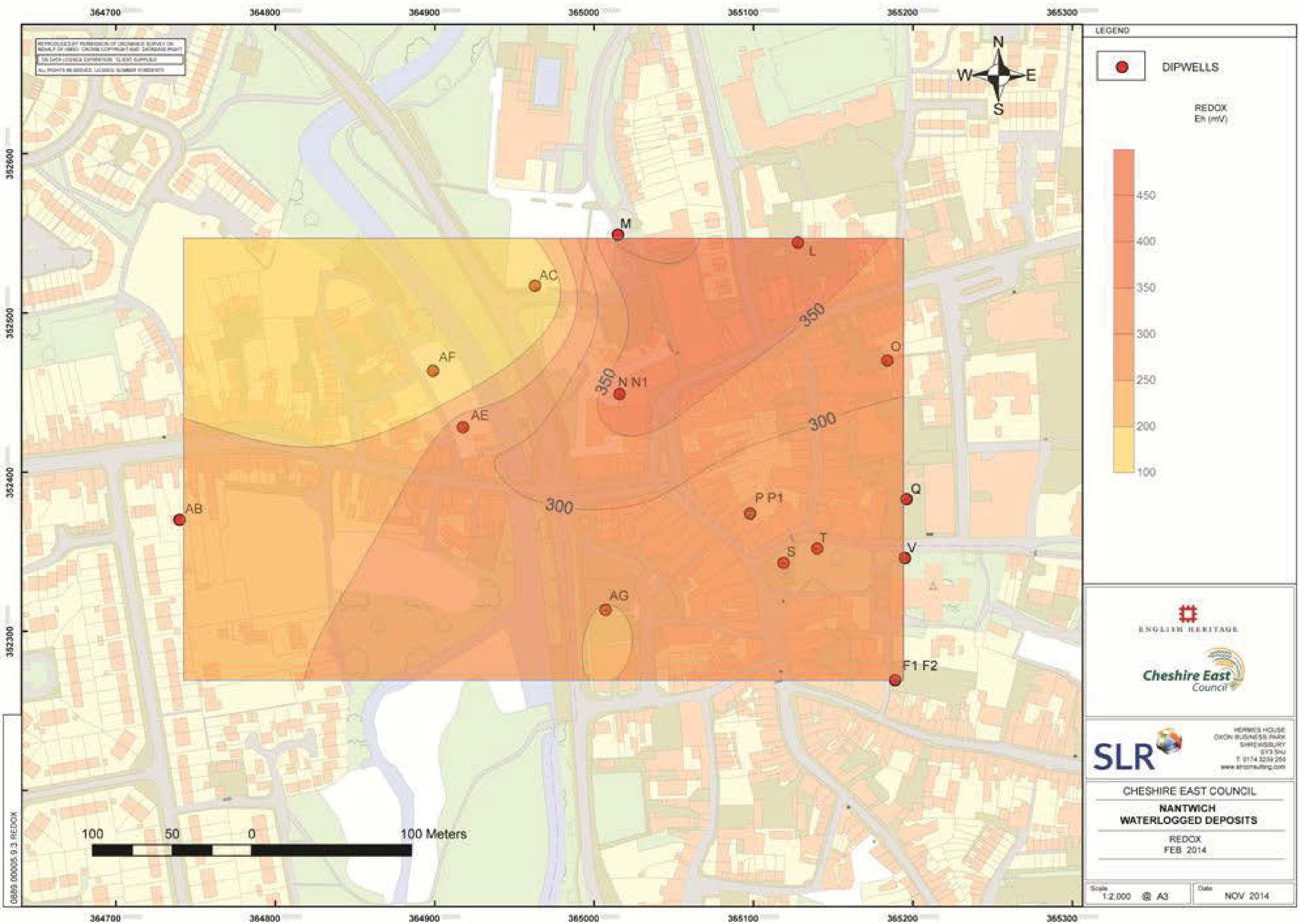
365100
365200
365300
352600
352500
352400
352300
ENGLISH HERITAGE
Cheshire East Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
DISSOLVED OXYGEN
NOV 2014
Scale
1:2,000 @ A3
Date
NOV 2014
0889.00005.9.3. DISSOLVED OXYGEN



364700
364800
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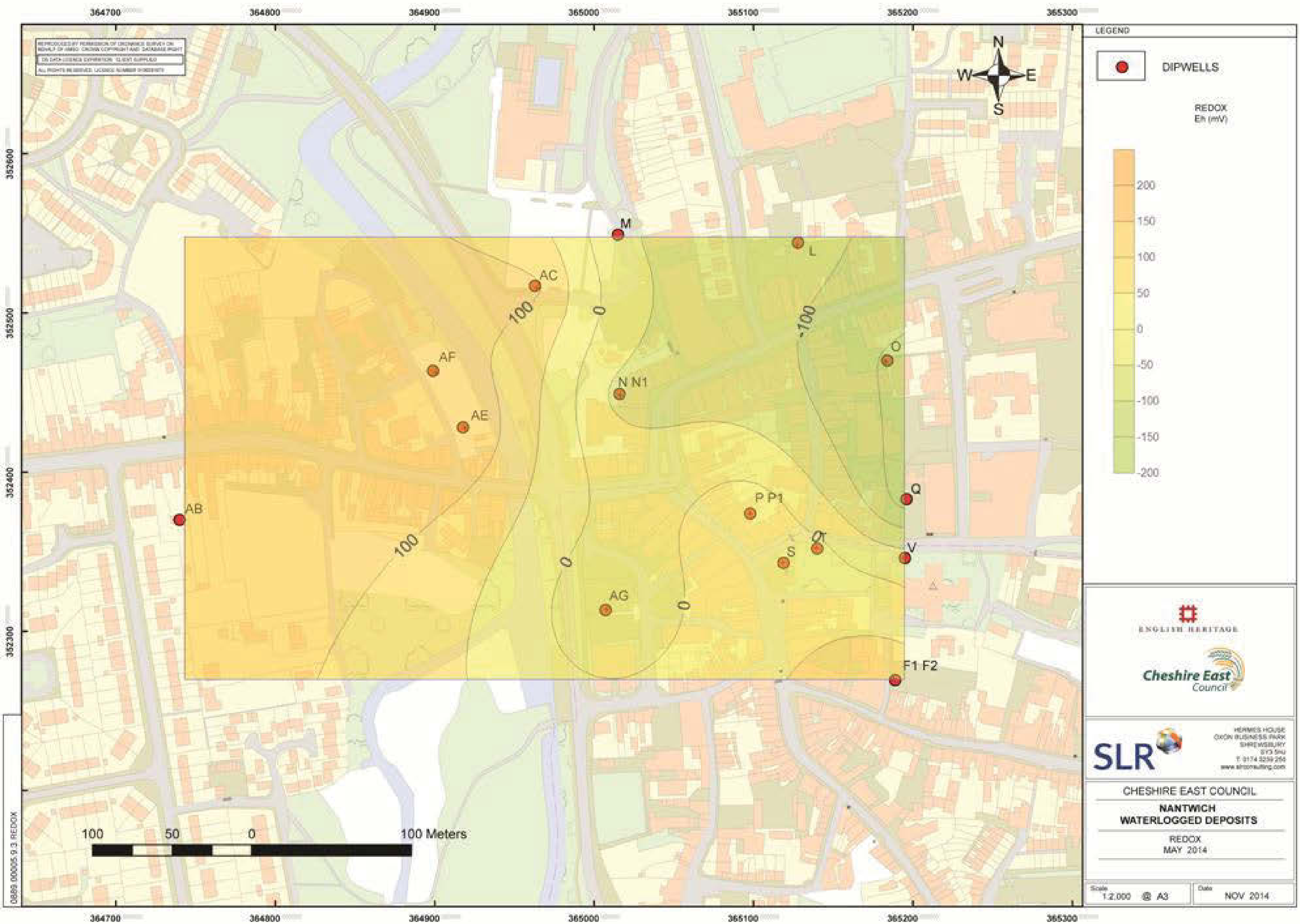
365100
365200
365300
352600
352500
352400
352300
LEGEND
DIPWELLS
REDOX
Eh (mV)
450
400
350
300
250
200
100
N
W
E
S
M
L
AC
AF
N N1
AE
O
350
300
AB
P P1
Q
T
S
V
AG
F1 F2
100
50
0
100 Meters
0889.00005.9.3.REDOX
ENGLISH HERITAGE
Cheshire East Council
SLR
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
REDOX
FEB 2014
Scale
1:2,000 @ A3
Date
NOV 2014


LEGEND
DIPWELLS
REDOX
Eh (mV)
200
150
100
50
0
-50
-100
-150
-200
N
W
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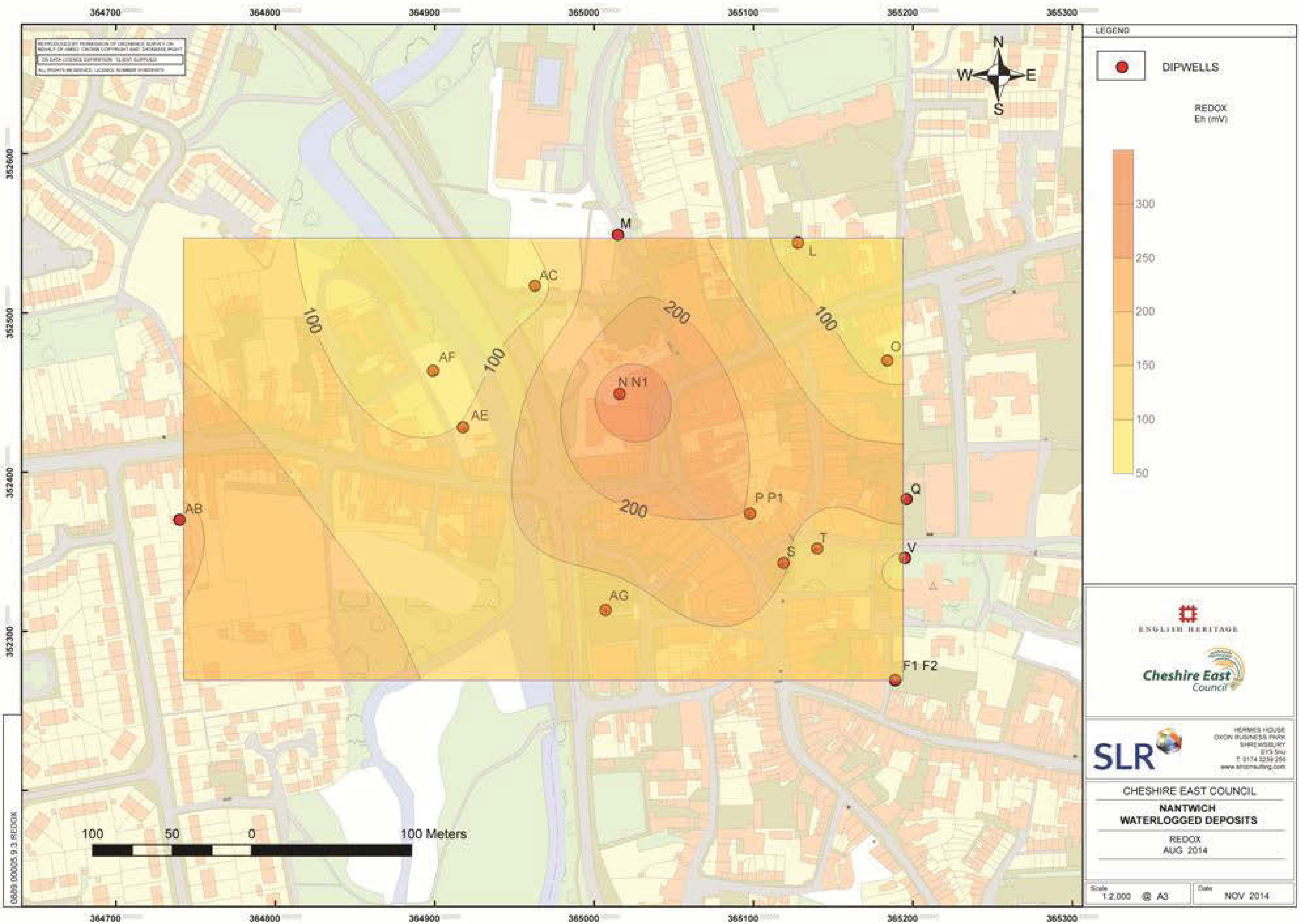
M
L
AC
AF
AE
N N1
O
Q
AB
P P1
S
T
V
AG
F1 F2
100
0
-100
100 50 0 100 Meters
364700
364800
364900
365000
365100
365200
365300
352600
352500
352400
352300
ENGLISH HERITAGE
Cheshire East Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
REDOX
MAY 2014
Scale
1:2,000 @ A3
Date
NOV 2014
0889.00005.9.3 REDOX



LEGEND
DIPWELLS
REDOX
Eh (mV)
300
250
200
150
100
50
N
S
W
E
M
L
AC
AF
AE
O
N N1
P P1
Q
AB
T
S
V
AG
F1 F2
100
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100 50 0 100 Meters
364700
364800
364900
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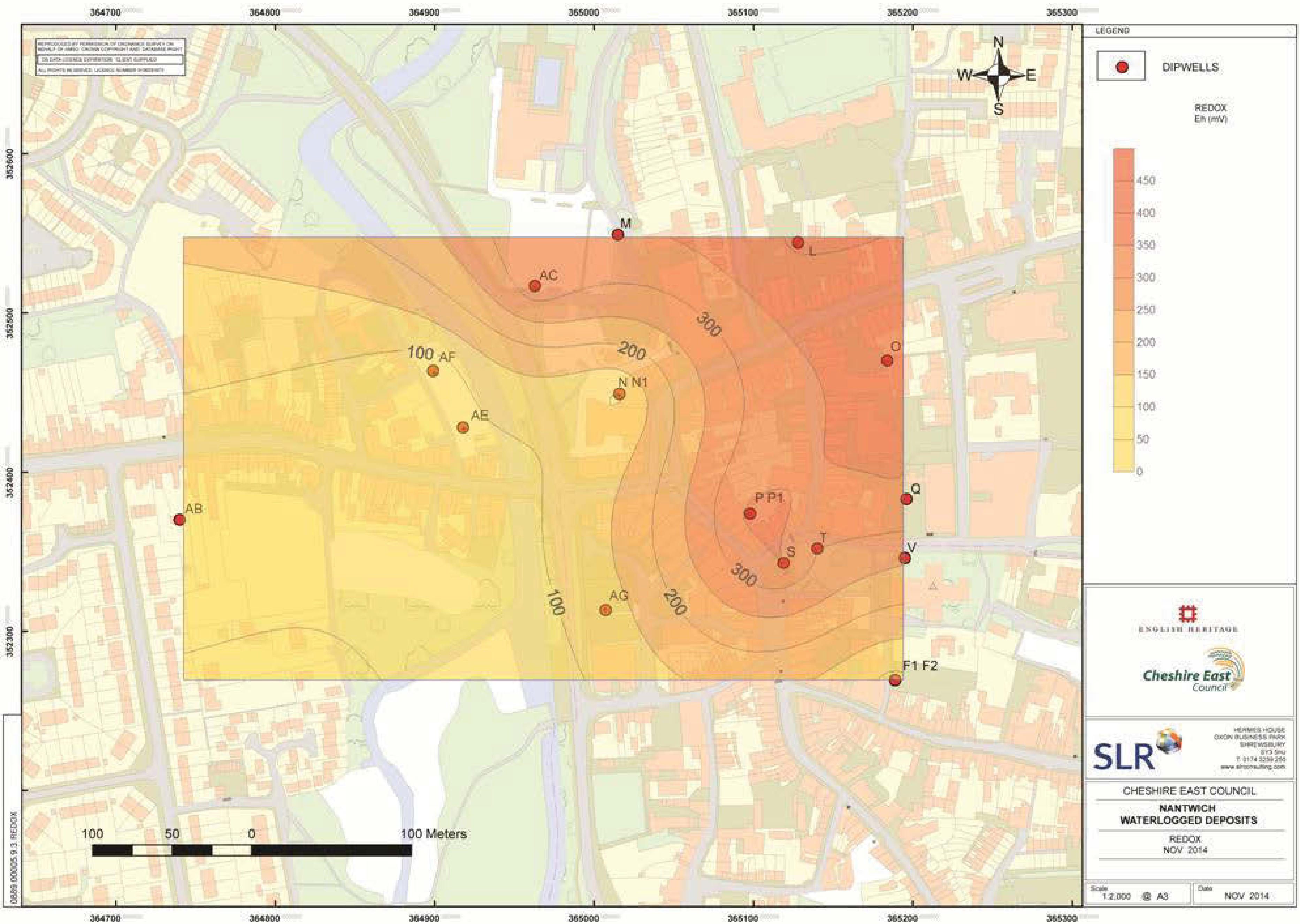
365200
365300
352600
352500
352400
352300
ENGLISH HERITAGE
Cheshire East Council
SLR
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
REDOX
AUG 2014
Scale
1:2,000 @ A3
Date
NOV 2014


364700
364800
364900
365000
365100
365200
365300
352600
352500
352400
352300
LEGEND
DIPWELLS
REDOX
Eh (mV)
450
400
350
300
250
200
150
100
50
0
N
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E
S
M
L
AC
O
AF
N N1
AE
AB
Q
P P1
T
S
V
AG
F1 F2
100
200
300
100 Meters
50
0
ENGLISH HERITAGE
Cheshire East Council
SLR
HERMES HOUSE
OXON BUSINESS PARK
SHREWSBURY
SY3 5HJ
CHESHIRE EAST COUNCIL
NANTWICH
WATERLOGGED DEPOSITS
REDOX
NOV 2014
Scale
1:2,000 @ A3
Date
NOV 2014
0889.00005.9.3 REDOX

Jones Environmental Laboratory

Client Name: SLR Consulting Ltd
Reference: 406.00889.00005
Location: Nantwich
Contact: Mark Swain
JE Job No.: 14/3458

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=HNO_3

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-6	7-12	13-18	19-24	25-30	31-36	37-42	43-48	49-54	55-60			
Sample ID	AB	AC	AE	AF	AG	F2	L	M	N1	O			
Depth	2.65	3.2	3.25	3.25	2.3	2.65	2.9	2.6	2.2	2.45			
COC No / misc													
Containers	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P			
Sample Date	26/02/2014	26/02/2014	26/02/2014	26/02/2014	26/02/2014	26/02/2014	26/02/2014	26/02/2014	25/02/2014	26/02/2014			
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD	Units	Method No.
Date of Receipt	01/03/2014	01/03/2014	01/03/2014	01/03/2014	01/03/2014	01/03/2014	01/03/2014	01/03/2014	01/03/2014	01/03/2014			
Total Dissolved Iron	<0.02	19	0.18	5.8	0.037	0.04	<0.02	0.037	0.84	0.029	<0.02	mg/l	TM30/PM14
Dissolved Manganese	<0.002	3.2	3.9	1.7	0.044	0.35	0.03	0.12	0.92	0.75	<0.002	mg/l	TM30/PM14
Dissolved Potassium	15	51	65	57	5.2	30	14	24	11	17	<0.1	mg/l	TM30/PM14
Dissolved Sodium	110	510	270	350	390	91	21	150	24	29	<0.1	mg/l	TM30/PM14
Sulphate	95	170	320	6.3	31	44	41	110	51	32	<0.05	mg/l	TM38/PM0
Chloride	210	920	790	600	490	150	27	240	29	18	<0.3	mg/l	TM38/PM0
Nitrate as NO3	53	0.75	1.7	0.80	2.0	1.7	22	13	0.80	2.2	<0.2	mg/l	TM38/PM0
Ortho Phosphate as PO4	9.4	<0.06	9.2	12	<0.06	6.3	6.3	2.5	0.55	4.6	<0.06	mg/l	TM38/PM0
Ammoniacal Nitrogen as NH4	<0.03	3.0	13	41	0.11	1.6	0.54	0.033	1.3	1.6	<0.03	mg/l	TM38/PM0
Dissolved Methane	<0.001	<0.001	<0.001	0.11	<0.001	<0.001	<0.001	<0.001	2.2	<0.001	<0.001	mg/l	TM25/PM0
Total Alkalinity as CaCO3	450	530	840	830	140	280	88	350	400	260	<1	mg/l	TM75/PM0
Manganese II	20	3.9	4.6	1.4	<0.02	0.36	0.023	0.11	0.97	0.75	<0.02	mg/l	TM62/PM0
pH	7.4	6.9	7.1	7.3	7.7	7.3	7.0	7.2	7.5	7.5	<0.01	pH units	TM73/PM0
Sulphide	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM106/PM0
Dissolved Iron II	0.30	0.03	0.05	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/l	TM48/PM0
Dissolved Iron III	<0.02	18.97	0.13	5.77	0.04	0.04	<0.02	0.04	0.84	0.03	<0.02	mg/l	TM30/TM48/PM0
Manganese IV (by calculation)	<0.40	<0.10	<0.10	0.30	0.22	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	mg/l	TM62/TM30/PM0

Jones Environmental Laboratory

Client Name: SLR Consulting Ltd
Reference: 406.00889.00005
Location: Nantwich
Contact: Mark Swain
JE Job No.: 14/3458

Report : **Liquid**

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HNO_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	61-66	67-72	73-78	79-84	85-90						LOD	Units	Method No.
Sample ID	P	Q	S	T	V								
Depth	3.5	2.75	3.4	3.5	2.7								
COC No / misc													
Containers	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P	V H HN Z P								
Sample Date	26/02/2014	25/02/2014	25/02/2014	25/02/2014	25/02/2014								
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid								
Batch Number	1	1	1	1	1								
Date of Receipt	01/03/2014	01/03/2014	01/03/2014	01/03/2014	01/03/2014								
Total Dissolved Iron	0.37	0.27	<0.02	0.077	0.83						<0.02	mg/l	TM30/PM14
Dissolved Manganese	0.47	0.026	0.20	0.084	0.31						<0.002	mg/l	TM30/PM14
Dissolved Potassium	32	11	29	11	0.46						<0.1	mg/l	TM30/PM14
Dissolved Sodium	17	250	240	34	29						<0.1	mg/l	TM30/PM14
Sulphate	520	25	70	45	66						<0.05	mg/l	TM38/PM0
Chloride	22	290	430	62	36						<0.3	mg/l	TM38/PM0
Nitrate as NO3	11	8.4	15	13	0.97						<0.2	mg/l	TM38/PM0
Ortho Phosphate as PO4	7.8	11	4.7	5.6	19						<0.06	mg/l	TM38/PM0
Ammoniacal Nitrogen as NH4	0.15	0.04	0.41	0.18	0.093						<0.03	mg/l	TM38/PM0
Dissolved Methane	<0.001	0.0056	<0.001	<0.001	<0.001						<0.001	mg/l	TM25/PM0
Total Alkalinity as CaCO3	230	280	330	220	86						<1	mg/l	TM75/PM0
Manganese II	0.62	0.036	0.22	0.15	0.26						<0.02	mg/l	TM62/PM0
pH	6.7	7.0	7.1	7.1	6.2						<0.01	pH units	TM73/PM0
Sulphide	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/l	TM106/PM0
Dissolved Iron II	<0.02	<0.02	<0.02	<0.02	0.02						<0.02	mg/l	TM48/PM0
Dissolved Iron III	0.37	0.27	<0.02	0.08	0.81						<0.02	mg/l	TM30/TM48/PM0
Manganese IV (by calculation)	<0.02	<0.02	0.02	<0.02	0.06						<0.02	mg/l	TM62/TM30/PM0

Date	Groundwater Depth (m below ground level)						Rainfall (mm)	Rainfall (mm) Data From Liverpool John Moores University
	F1	P	N1	AB	AE	AF		
26/01/2011	1.191	3.27147	1.658	1.72983	2.517	2.784	0	
27/01/2011	1.273	3.28025	1.689	1.74794	2.617	2.850	0.402	
28/01/2011	1.299	3.27382	1.699	1.74481	2.624	2.849	0	
29/01/2011	1.298	3.27454	1.704	1.75165	2.611	2.839	0	
30/01/2011	1.298	3.2794	1.712	1.75907	2.623	2.845	0	
31/01/2011	1.305	3.28611	1.721	1.76605	2.631	2.851	0	
01/02/2011	1.309	3.28742	1.726	1.77287	2.581	2.841	0	
02/02/2011	1.413	3.28416	1.732	1.70773	2.746	2.829	1.407	
03/02/2011	1.425	3.29351	1.741	1.72298	2.746	2.834	0	
04/02/2011	1.406	3.29413	1.737	1.72627	2.688	2.798	0	
05/02/2011	1.419	3.29734	1.742	1.73566	2.716	2.812	0.402	
06/02/2011	1.400	3.30278	1.751	1.75063	2.766	2.843	0.402	
07/02/2011	1.422	3.30351	1.755	1.75098	2.743	2.828	1.809	
08/02/2011	1.471	3.31245	1.764	1.76653	2.807	2.867	0	
09/02/2011	1.450	3.30596	1.761	1.76451	2.747	2.833	0	
10/02/2011	1.456	3.31055	1.763	1.77312	2.734	2.824	0.804	
11/02/2011	1.337	3.3001	1.704	1.77588	2.722	2.818	4.02	
12/02/2011	1.280	3.28985	1.669	1.78192	2.724	2.820	0.402	
13/02/2011	1.351	3.28717	1.659	1.77077	2.661	2.784	4.02	
14/02/2011	1.132	3.27127	1.467	1.76427	2.649	2.784	5.427	
15/02/2011	1.150	3.26598	1.610	1.74371	2.610	2.744	2.613	
16/02/2011	1.164	3.27391	1.628	1.73933	2.618	2.753	0	
17/02/2011	1.194	3.28095	1.651	1.73478	2.706	2.799	0.603	
18/02/2011	1.209	3.28757	1.676	1.73428	2.759	2.831	0	
19/02/2011	1.176	3.28321	1.683	1.72602	2.717	2.804	0	
20/02/2011	1.085	3.28242	1.629	1.72967	2.748	2.823	4.422	
21/02/2011	1.097	3.28383	1.660	1.72396	2.721	2.802	0	
22/02/2011	1.101	3.28463	1.670	1.72266	2.725	2.802	0.201	
23/02/2011	1.113	3.28604	1.678	1.72527	2.725	2.801	1.005	
24/02/2011	1.061	3.2836	1.626	1.72805	2.741	2.814	3.216	
25/02/2011	1.082	3.28825	1.658	1.72619	2.737	2.808	0	
26/02/2011	0.942	3.24676	1.595	1.71505	2.647	2.754	0	
27/02/2011	1.131	3.23903	1.536	1.68043	2.553	2.646	15.075	
28/02/2011	1.249	3.24495	1.604	1.65724	2.534	2.654	1.809	
01/03/2011	1.305	3.24954	1.633	1.64106	2.589	2.716	0.201	
02/03/2011	1.338	3.24852	1.651	1.62769	2.605	2.753	0	
03/03/2011	1.365	3.25071	1.658	1.61986	2.617	2.784	0	
04/03/2011	1.388	3.25444	1.670	1.62332	2.632	2.798	0	
05/03/2011	1.411	3.2546	1.677	1.6239	2.635	2.804	0	
06/03/2011	1.409	3.26296	1.688	1.63196	2.668	2.823	0.201	
07/03/2011	1.430	3.26254	1.696	1.63844	2.675	2.826	0	
08/03/2011	1.402	3.26041	1.695	1.642	2.641	2.802	0	
09/03/2011	1.4734	3.3329	1.7612	1.697	2.6124	2.8873	0.603	
10/03/2011	1.4897	3.3388	1.7678	1.7096	2.6087	2.9474	0.201	
11/03/2011	1.4918	3.3368	1.7785	1.7177	2.6404	2.9352	0.402	
12/03/2011	1.4897	3.3402	1.7702	1.7259	2.5947	3.0296	0.603	
13/03/2011	1.401	3.336	1.7428	1.7425	2.6659	3.0396	0	
14/03/2011	1.4451	3.3511	1.7827	1.7563	2.747	2.9292	4.824	
15/03/2011	1.442	3.3499	1.7915	1.7591	2.7107	2.9293	0	
16/03/2011	1.4469	3.3521	1.8011	1.7664	2.7068	2.9302	0	
17/03/2011	1.4549	3.3617	1.8043	1.7791	2.7159	2.9195	0	
18/03/2011	1.4585	3.3692	1.8132	1.7891	2.7473	2.852	0	
19/03/2011	1.463	3.3701	1.8251	1.7974	2.7725	2.7705	0	
20/03/2011	1.4358	3.3706	1.8245	1.8017	2.7356	2.7839	0	
21/03/2011	1.4516	3.3804	1.8382	1.814	2.7636	2.757	1.206	
22/03/2011	1.4927	3.3854	1.85	1.822	2.7844	2.712	0	
23/03/2011	1.5079	3.3868	1.857	1.8296	2.7681	2.6885	0	
24/03/2011	1.492	3.3868	1.8582	1.8307	2.7202	2.7267	0	
25/03/2011	1.4729	3.3846	1.8479	1.8359	2.6792	2.8401	0	
26/03/2011	1.4641	3.3837	1.8434	1.8372	2.7022	2.8947	0	
27/03/2011	1.4628	3.3876	1.8526	1.8457	2.7255	2.9166	0	
28/03/2011	1.4615	3.3918	1.8611	1.8534	2.7483	2.9157	0	
29/03/2011	1.453	3.3946	1.8621	1.8612	2.7302	2.9575	0	
30/03/2011	1.3912	3.3822	1.8588	1.861	2.7228	2.9555	0	
31/03/2011	1.4278	3.3869	1.814	1.8767	2.774	2.9534	2.814	
01/04/2011	1.5257	3.3828	1.8391	1.8791	2.7843	2.9699	3.015	
02/04/2011	1.5793	3.3901	1.8459	1.887	2.7789	2.956	0.201	
03/04/2011	1.6108	3.3948	1.8555	1.8944	2.8042	2.9709	0	
04/04/2011	1.5832	3.3859	1.8473	1.8899	2.8067	2.9885	1.407	
05/04/2011	1.6286	3.3978	1.8592	1.9036	2.8233	2.9762	1.608	
06/04/2011	1.6524	3.4001	1.8752	1.9111	2.8518	3.0071	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
07/04/2011	1.6677	3.4009	1.8805	1.9151	2.8775	3.0191	0	
08/04/2011	1.6675	3.4033	1.8849	1.9226	2.8438	3.0297	0	
09/04/2011	1.6653	3.4033	1.8856	1.9269	2.8185	3.0081	0	
10/04/2011	1.6745	3.4063	1.8875	1.9318	2.8222	2.9958	0	
11/04/2011	1.6577	3.4052	1.8857	1.9342	2.8146	2.9952	0	
12/04/2011	1.6602	3.411	1.8914	1.9423	2.859	3.0031	1.005	
13/04/2011	1.6558	3.404	1.8815	1.9414	2.7799	3.0084	1.005	
14/04/2011	1.6699	3.4081	1.8878	1.9473	2.7984	2.9676	0	
15/04/2011	1.6764	3.4113	1.8967	1.9553	2.8188	2.9817	0	
16/04/2011	1.6878	3.416	1.9045	1.9628	2.8437	2.994	0	
17/04/2011	1.6913	3.4189	1.9093	1.9681	2.8491	3.0085	0	
18/04/2011	1.6755	3.4168	1.9083	1.9715	2.7984	3.0071	0	
19/04/2011	1.6677	3.4234	1.9117	1.9784	2.8089	2.9725	0	
20/04/2011	1.6869	3.4251	1.9152	1.9858	2.8219	2.9857	0	
21/04/2011	1.6897	3.4249	1.9182	1.9915	2.8172	2.9928	0	
22/04/2011	1.6895	3.4296	1.9195	1.9986	2.8016	2.9834	0	
23/04/2011	1.4951	3.4241	1.8496	2.0018	2.8513	2.9814	0	
24/04/2011	1.497	3.4242	1.8723	2.0081	2.8794	3.0097	5.025	
25/04/2011	1.4938	3.4306	1.889	2.0138	2.8843	3.0242	0	
26/04/2011	1.4847	3.426	1.895	2.0147	2.8729	3.0274	0	
27/04/2011	1.4819	3.4306	1.9047	2.021	2.8565	3.0183	0	
28/04/2011	1.4684	3.432	1.9071	2.0253	2.8231	3.0099	0	
29/04/2011	1.4617	3.4333	1.9099	2.032	2.8046	2.9795	0	
30/04/2011	1.4662	3.4348	1.9091	2.0419	2.8164	2.9735	0	
01/05/2011	1.4716	3.4338	1.9115	2.0445	2.8302	2.9789	0	
02/05/2011	1.4789	3.4265	1.9181	2.0514	2.8477	2.9869	0	
03/05/2011	1.4875	3.4369	1.9229	2.0573	2.8679	2.9995	0	
04/05/2011	1.4931	3.44	1.9271	2.0601	2.8711	3.0107	0	
05/05/2011	1.4888	3.4415	1.9304	2.063	2.8472	3.0042	0	
06/05/2011	1.4719	3.444	1.9341	2.0698	2.8469	2.98	0	
07/05/2011	1.3277	3.4336	1.8656	2.0725	2.8268	2.985	1.407	
08/05/2011	1.2307	3.4248	1.7798	2.0777	2.8514	2.9731	6.834	
09/05/2011	1.27	3.4228	1.8102	2.084	2.8782	3.0015	5.226	
10/05/2011	1.2731	3.4222	1.8205	2.0875	2.89	3.0126	2.613	
11/05/2011	1.2994	3.4246	1.8231	2.084	2.8539	3.0137	1.005	
12/05/2011	1.3083	3.4216	1.8113	2.0807	2.8445	2.9927	0	
13/05/2011	1.3232	3.3607	1.7951	2.0603	2.7697	2.8951	0.201	
14/05/2011	1.3335	3.3596	1.7814	2.0604	2.7566	2.898	0	
15/05/2011	1.3004	3.366	1.7927	2.0678	2.7961	2.9168	1.206	
16/05/2011	1.3174	3.3719	1.8039	2.0759	2.7786	2.9061	2.412	
17/05/2011	1.3255	3.373	1.8036	2.079	2.7602	2.8964	0.603	
18/05/2011	1.3337	3.3741	1.8053	2.0838	2.7381	2.885	0.201	
19/05/2011	1.3348	3.3759	1.8058	2.0849	2.7745	2.9068	1.608	
20/05/2011	1.3512	3.3766	1.8115	2.092	2.7692	2.9057	0	
21/05/2011	1.3727	3.3775	1.8199	2.0938	2.7905	2.9052	0	
22/05/2011	1.3403	3.3751	1.811	2.0984	2.7313	2.8955	0	
23/05/2011	1.3499	3.3817	1.8212	2.1055	2.7997	2.9153	2.211	
24/05/2011	1.3513	3.3853	1.8153	2.1081	2.8085	2.9398	1.206	
25/05/2011	1.3832	3.3831	1.8254	2.1128	2.8296	2.9217	0	
26/05/2011	1.3467	3.3806	1.8124	2.1156	2.7068	2.8671	0	
27/05/2011	1.2597	3.3801	1.7738	2.1209	2.7921	2.9207	5.226	
28/05/2011	1.2473	3.3773	1.7639	2.124	2.7558	2.8921	2.01	
29/05/2011	1.2765	3.3854	1.7761	2.1299	2.739	2.889	0.201	
30/05/2011	1.3197	3.3885	1.7801	2.1355	2.7728	2.9069	0	
31/05/2011	1.1338	3.3717	1.6745	2.1326	2.7802	2.9248	6.231	
01/06/2011	1.2968	3.3793	1.7359	2.1369	2.8311	2.9456	3.417	
02/06/2011	1.4115	3.3889	1.7579	2.1456	2.8447	2.9535	0.201	
03/06/2011	1.4956	3.3883	1.7633	2.1472	2.8319	2.9369	0	
04/06/2011	1.5346	3.3895	1.757	2.1507	2.7857	2.9034	0	
05/06/2011	1.4962	3.3848	1.7451	2.1516	2.7463	2.8687	0	
06/06/2011	1.43	3.3792	1.7214	2.1544	2.7006	2.8537	2.412	
07/06/2011	1.5058	3.3813	1.7239	2.1549	2.7003	2.85	0.804	
08/06/2011	1.5391	3.3858	1.7268	2.1572	2.7136	2.8667	0	
09/06/2011	1.6045	3.3925	1.7437	2.1628	2.7801	2.9142	1.005	
10/06/2011	1.6316	3.3895	1.7513	2.1631	2.7946	2.9176	0	
11/06/2011	1.6334	3.3915	1.7521	2.1657	2.7896	2.9189	0.201	
12/06/2011	1.5821	3.3874	1.7554	2.1668	2.7892	2.8956	0	
13/06/2011	1.2225	3.3712	1.6461	2.1718	2.7172	2.8942	7.236	
14/06/2011	1.3075	3.3794	1.7092	2.1718	2.8015	2.9188	2.211	
15/06/2011	1.3152	3.3839	1.7286	2.1773	2.7598	2.888	0.201	
16/06/2011	1.3046	3.383	1.7325	2.1774	2.743	2.8821	0.603	
17/06/2011	1.2712	3.3814	1.736	2.1785	2.7481	2.8684	2.211	

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18/06/2011	1.2354	3.3774	1.7291	2.1791	2.6983	2.8588		1.2
19/06/2011	1.2241	3.3846	1.7245	2.1819	2.7707	2.9131		0.8
20/06/2011	1.2274	3.3839	1.7203	2.1828	2.7842	2.9054		0
21/06/2011	1.1222	3.3841	1.6965	2.1876	2.737	2.8856		4
22/06/2011	1.1353	3.3802	1.6989	2.1858	2.7304	2.8861		1.2
23/06/2011	1.1101	3.3801	1.6771	2.1841	2.7631	2.913		4
24/06/2011	1.1526	3.3816	1.6946	2.1794	2.8004	2.9257		0
25/06/2011	0.9898	3.3525	1.5875	2.1782	2.7363	2.8961		4.6
26/06/2011	1.0572	3.3625	1.643	2.1729	2.7629	2.8951		1.2
27/06/2011	1.0996	3.3633	1.6696	2.1721	2.723	2.8706		0
28/06/2011	1.1256	3.3642	1.6833	2.1689	2.7519	2.8883		0
29/06/2011	1.1799	3.3635	1.695	2.1664	2.7696	2.905		0
30/06/2011	1.2299	3.3669	1.7091	2.1661	2.7849	2.9156		0
01/07/2011	1.2738	3.37	1.7208	2.1711	2.7919	2.9163		0
02/07/2011	1.2896	3.3704	1.7227	2.1701	2.7631	2.8913		0
03/07/2011	1.3032	3.3767	1.7285	2.1779	2.75	2.8919		0
04/07/2011	1.3239	3.3801	1.736	2.1816	2.7624	2.8964		0
05/07/2011	1.3316	3.3817	1.7395	2.1862	2.7485	2.8833		0
06/07/2011	1.2954	3.3726	1.7323	2.1875	2.7129	2.8664		8
07/07/2011	1.2263	3.3704	1.7073	2.1884	2.6958	2.8649		4.4
08/07/2011	1.2502	3.3775	1.7138	2.1929	2.7387	2.8803		6
09/07/2011	1.2329	3.3741	1.7279	2.1955	2.7716	2.9149		2.6
10/07/2011	1.2217	3.3798	1.7389	2.1955	2.8229	2.9402		0
11/07/2011	1.2209	3.3812	1.7474	2.1962	2.8296	2.9438		0
12/07/2011	1.2518	3.3847	1.7515	2.201	2.8204	2.9361		0
13/07/2011	1.2835	3.3872	1.7546	2.2042	2.8161	2.9331		0
14/07/2011	1.3172	3.389	1.7556	2.2068	2.8093	2.9282		0
15/07/2011	1.3382	3.3912	1.7548	2.21	2.7993	2.9169		0
16/07/2011	1.3328	3.387	1.7438	2.2153	2.7301	2.8638		0.6
17/07/2011	1.2629	3.3851	1.7286	2.2168	2.7003	2.8619		4.8
18/07/2011	0.9101	3.3509	1.3904	2.2132	2.7197	2.884		5.6
19/07/2011	0.929	3.347	1.4402	2.2044	2.7394	2.9021		3
20/07/2011	1.0244	3.3471	1.5898	2.1936	2.7706	2.9137		1.2
21/07/2011	1.1199	3.3502	1.6292	2.1906	2.782	2.9242		1.2
22/07/2011	1.1828	3.355	1.654	2.19	2.8043	2.9287		0.2
23/07/2011	1.0747	3.3366	1.4535	2.1815	2.761	2.9009		0.4
24/07/2011	1.103	3.339	1.6005	2.1813	2.7319	2.8867		0.4
25/07/2011	1.1377	3.3404	1.6287	2.1824	2.7285	2.8869		0.4
26/07/2011	1.1876	3.3492	1.6585	2.1878	2.7639	2.9138		0.2
27/07/2011	1.232	3.3555	1.6811	2.1934	2.8058	2.9365		0.2
28/07/2011	1.2591	3.3569	1.695	2.1941	2.8017	2.9388		0
29/07/2011	1.2876	3.3613	1.7074	2.2001	2.8054	2.9367		0
30/07/2011	1.298	3.3616	1.7111	2.2012	2.7927	2.9243		0
31/07/2011	1.3014	3.3644	1.7102	2.206	2.7565	2.9011		0
01/08/2011	1.3178	3.3718	1.7153	2.2131	2.7601	2.9057		0
02/08/2011	1.3308	3.3748	1.7167	2.2141	2.7742	2.9189		2.2
03/08/2011	1.3417	3.3764	1.723	2.2193	2.7958	2.926		1.2
04/08/2011	1.3468	3.3774	1.7241	2.2229	2.7726	2.9126		0
05/08/2011	1.2392	3.3744	1.6502	2.2256	2.7867	2.9371		1.2
06/08/2011	1.2684	3.3695	1.6793	2.2264	2.766	2.9122		0.2
07/08/2011	1.2849	3.3755	1.6859	2.2278	2.7407	2.9079		0.6
08/08/2011	1.2597	3.3751	1.6288	2.2295	2.7726	2.9382		4.2
09/08/2011	1.2939	3.384	1.676	2.2354	2.8613	2.9955		0.2
10/08/2011	1.3228	3.3805	1.707	2.2321	2.8556	2.9641		0.2
11/08/2011	1.0916	3.3636	1.4788	2.2379	2.7542	2.9099		5.2
12/08/2011	1.1301	3.3674	1.6066	2.2367	2.7707	2.9187		1.8
13/08/2011	1.1451	3.3653	1.6345	2.2369	2.734	2.8971		1.4
14/08/2011	1.1897	3.3709	1.6512	2.2376	2.752	2.913		0
15/08/2011	1.2472	3.3751	1.672	2.238	2.8018	2.9427		1
16/08/2011	1.2632	3.3739	1.6921	2.242	2.7949	2.9394		1.8
17/08/2011	1.2684	3.379	1.703	2.2427	2.8119	2.9507		0.4
18/08/2011	1.2932	3.3802	1.7126	2.2425	2.8021	2.9376		0
19/08/2011	1.3791	3.3772	1.6201	2.2999	2.7801	2.9363		0
20/08/2011	1.3908	3.3822	1.6255	2.3045	2.7784	2.9316		0
21/08/2011	1.3842	3.3814	1.6273	2.3057	2.7579	2.9257		0
22/08/2011	1.41	3.3881	1.6393	2.3086	2.8098	2.9562		0.6
23/08/2011	1.4144	3.3895	1.6461	2.3142	2.793	2.9352		0
24/08/2011	1.4268	3.3891	1.6433	2.3146	2.7681	2.9273		0
25/08/2011	1.4369	3.3824	1.6436	2.3164	2.7681	2.9304		0.4
26/08/2011	1.3909	3.3819	1.6357	2.3168	2.7591	2.9201		1.2
27/08/2011	1.2814	3.3705	1.3241	2.3206	2.7763	2.9422		12.4
28/08/2011	1.065	3.3498	1.2518	2.3104	2.7374	2.9294		9.4

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
29/08/2011	1.1196	3.3477	1.4536	2.3053	2.7421	2.9251		0.2
30/08/2011	1.1532	3.3477	1.4854	2.3039	2.7403	2.9181		1.2
31/08/2011	1.2042	3.3481	1.507	2.3032	2.7343	2.9086		0.4
01/09/2011	1.2469	3.3523	1.522	2.3057	2.7369	2.9031		0
02/09/2011	1.268	3.3536	1.5301	2.3068	2.717	2.8964		0
03/09/2011	1.2961	3.3562	1.5428	2.3117	2.715	2.891		0
04/09/2011	1.3196	3.364	1.5476	2.3129	2.722	2.8928		6.8
05/09/2011	1.334	3.3619	1.559	2.3118	2.7207	2.9091		0.8
06/09/2011	1.3257	3.3598	1.5734	2.3139	2.7259	2.9073		3.2
07/09/2011	1.3333	3.3718	1.5841	2.3173	2.7641	2.9291		0.4
08/09/2011	1.3283	3.3685	1.5959	2.3199	2.7599	2.9255		1.2
09/09/2011	1.3477	3.374	1.6066	2.3257	2.7712	2.9351		0.2
10/09/2011	1.3233	3.3745	1.6122	2.3293	2.7533	2.9091		0
11/09/2011	1.3311	3.3783	1.6123	2.3284	2.7474	2.918		0.4
12/09/2011	1.3214	3.3733	1.6181	2.3309	2.7359	2.9224		1.4
13/09/2011	1.3423	3.3858	1.6321	2.3324	2.8283	2.9665		2.6
14/09/2011	1.3686	3.3901	1.6405	2.3326	2.8497	2.9868		1
15/09/2011	1.3951	3.3901	1.6494	2.3361	2.8654	2.9923		0
16/09/2011	1.4028	3.3909	1.6478	2.3385	2.832	2.9509		0
17/09/2011	1.308	3.3828	1.6052	2.3416	2.7692	2.9182		4.2
18/09/2011	1.2369	3.3759	1.4581	2.3377	2.7609	2.9253		1.4
19/09/2011	1.2773	3.3871	1.565	2.3431	2.8152	2.9527		1.4
20/09/2011	1.0396	3.3903	1.5925	2.3429	2.825	2.9606		0
21/09/2011	1.1054	3.3705	1.4426	2.3384	2.8111	2.9544	0	
22/09/2011	1.1892	3.3744	1.5168	2.3406	2.8096	2.9362	0.603	
23/09/2011	1.2102	3.3764	1.5475	2.3403	2.8117	2.9475	0	
24/09/2011	1.2449	3.3787	1.5544	2.342	2.7818	2.9256	0	
25/09/2011	1.2825	3.3828	1.5671	2.3441	2.7973	2.9201	0.201	
26/09/2011	1.3427	3.39	1.5844	2.3476	2.8175	2.9259	0.402	
27/09/2011	1.3599	3.3915	1.6046	2.3463	2.865	2.9734	0	
28/09/2011	1.3705	3.3963	1.616	2.3523	2.853	2.9741	0	
29/09/2011	1.3831	3.3965	1.6174	2.3539	2.8333	2.9575	0	
30/09/2011	1.3955	3.3991	1.6213	2.3565	2.8295	2.9524	0	
01/10/2011	1.4117	3.3997	1.6269	2.3581	2.8472	2.956	0	
02/10/2011	1.4204	3.4001	1.6328	2.3591	2.8522	2.9664	0	
03/10/2011	1.4077	3.401	1.6328	2.3623	2.8253	2.9498	0	
04/10/2011	1.438	3.4025	1.6346	2.3609	2.8429	2.9319	0.603	
05/10/2011	1.4331	3.4003	1.6333	2.3644	2.821	2.9503	0	
06/10/2011	1.3867	3.3993	1.624	2.3628	2.7957	2.927	0	
07/10/2011	1.239	3.3815	1.2906	2.3627	2.8339	2.9479	3.216	
08/10/2011	1.1508	3.3693	1.3664	2.3624	2.8381	2.9703	15.477	
09/10/2011	1.0249	3.3565	1.1511	2.3638	2.7806	2.9342	2.211	
10/10/2011	1.0877	3.3504	1.3792	2.3529	2.7529	2.9007	9.447	
11/10/2011	1.1504	3.3547	1.4658	2.354	2.7692	2.901	0	
12/10/2011	1.1736	3.3546	1.5045	2.349	2.7987	2.9214	0.804	
13/10/2011	1.2083	3.355	1.5355	2.3454	2.839	2.9433	0.603	
14/10/2011	1.2215	3.3521	1.5552	2.346	2.8427	2.9613	0	
15/10/2011	1.2419	3.3464	1.5552	2.3404	2.8111	2.9384	0	
16/10/2011	1.2776	3.3433	1.5586	2.3406	2.7885	2.9196	0	
17/10/2011	1.2448	3.3465	1.5696	2.3438	2.7882	2.9196	0	
18/10/2011	1.1931	3.3329	1.5134	2.3407	2.7422	2.8878	2.01	
19/10/2011	1.2217	3.3382	1.5512	2.3424	2.8007	2.9019	2.814	
20/10/2011	1.1933	3.3263	1.4797	2.339	2.8514	2.9522	4.623	
21/10/2011	1.1954	3.3252	1.5179	2.3408	2.8068	2.9459	1.206	
22/10/2011	1.1963	3.3277	1.5457	2.3412	2.785	2.9187	0	
23/10/2011	1.2252	3.3293	1.5502	2.3423	2.7416	2.882	0	
24/10/2011	1.2383	3.3324	1.5559	2.3449	2.7208	2.8717	0	
25/10/2011	1.2578	3.3319	1.5644	2.3437	2.7386	2.8709	0	
26/10/2011	1.2858	3.3313	1.5799	2.343	2.8008	2.9122	1.005	
27/10/2011	1.2667	3.3308	1.595	2.3438	2.8345	2.9386	0.201	
28/10/2011	1.2113	3.3269	1.5171	2.3462	2.8885	2.9676	3.417	
29/10/2011	1.2101	3.3204	1.5623	2.3403	2.8547	2.9744	1.407	
30/10/2011	1.2532	3.3299	1.5711	2.3433	2.8206	2.9351	0	
31/10/2011	1.2511	3.3323	1.5864	2.3464	2.8121	2.9358	0.201	
01/11/2011	1.2451	3.3182	1.5826	2.3412	2.7853	2.9075	0.201	
02/11/2011	1.1371	3.3056	1.4788	2.3334	2.7881	2.9185	7.236	
03/11/2011	1.1365	3.3103	1.5101	2.3336	2.7197	2.8656	0	
04/11/2011	1.0867	3.2977	1.4609	2.3272	2.7363	2.8622	3.417	
05/11/2011	1.0316	3.2844	1.2081	2.3211	2.8075	2.9111	0.603	
06/11/2011	1.1077	3.288	1.4546	2.3106	2.8679	2.9565	7.035	
07/11/2011	1.1461	3.2818	1.5093	2.2962	2.8508	2.9683	0	
08/11/2011	1.1536	3.2865	1.5264	2.3017	2.7831	2.9175	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
09/11/2011	1.1793	3.288	1.5342	2.2978	2.7764	2.9004	0.402	
10/11/2011	1.193	3.2955	1.5508	2.3001	2.8042	2.9128	0	
11/11/2011	1.2276	3.2923	1.5572	2.2945	2.7987	2.9202	0.201	
12/11/2011	1.1433	3.2615	1.1815	2.2924	2.8066	2.914	0	
13/11/2011	1.1146	3.2731	1.4619	2.2836	2.8263	2.9448	11.055	
14/11/2011	1.1204	3.2737	1.5091	2.2761	2.7887	2.9155	0	
15/11/2011	1.1412	3.2744	1.5321	2.2726	2.768	2.8926	0	
16/11/2011	1.1393	3.294	1.5259	2.2671	2.7014	2.871	0	
17/11/2011	1.1572	3.2951	1.5332	2.2653	2.6983	2.8643	0	
18/11/2011	1.1863	3.3024	1.5455	2.2667	2.7113	2.8736	0	
19/11/2011	1.21	3.3067	1.5543	2.2677	2.7231	2.8813	0	
20/11/2011	1.2317	3.3062	1.5633	2.2617	2.7439	2.8956	0	
21/11/2011	1.2328	3.3104	1.5661	2.2656	2.7232	2.8893	0	
22/11/2011	1.2276	3.3118	1.5683	2.2682	2.7348	2.8915	0.201	
23/11/2011	1.2384	3.3099	1.5758	2.2632	2.7774	2.9207	2.01	
24/11/2011	1.2549	3.3217	1.5929	2.2718	2.7798	2.9289	0	
25/11/2011	1.2381	3.3264	1.5836	2.2586	2.7368	2.9047	0	
26/11/2011	1.1791	3.3147	1.5262	2.2657	2.7713	2.9259	5.628	
27/11/2011	1.1629	3.3169	1.5391	2.2703	2.6982	2.8912	0	
28/11/2011	1.2206	3.3203	1.5682	2.2629	2.7855	2.9347	0	
29/11/2011	1.1881	3.3259	1.5576	2.2726	2.6891	2.8794	0	
30/11/2011	1.2059	3.3174	1.4589	2.2639	2.7647	2.8559	0.402	
01/12/2011	1.1733	3.3258	1.5017	2.2633	2.6741	2.8867	0.804	
02/12/2011	1.1896	3.3146	1.4858	2.2604	2.7279	2.8956	0.402	
03/12/2011	1.1861	3.3137	1.5032	2.267	2.6631	2.8681	0.201	
04/12/2011	1.1963	3.3167	1.5077	2.2619	2.7064	2.8701	0	
05/12/2011	1.2064	3.3177	1.5232	2.2602	2.7198	2.8675	0.201	
06/12/2011	1.2199	3.3194	1.5303	2.2622	2.7277	2.8898	0	
07/12/2011	1.2191	3.3242	1.534	2.26	2.7016	2.8805	0	
08/12/2011	1.2379	3.3141	1.5066	2.2593	2.7815	2.9152	0.201	
09/12/2011	1.1851	3.3158	1.4811	2.2592	2.7315	2.8701	0	
10/12/2011	1.2065	3.3144	1.5173	2.2559	2.76	2.8998	0	
11/12/2011	1.1995	3.3169	1.5162	2.2588	2.7268	2.8941	0	
12/12/2011	1.1562	3.3115	1.4353	2.2523	2.6949	2.8566	0.201	
13/12/2011	1.0923	3.3009	1.3431	2.2487	2.5963	2.8189	0	
14/12/2011	1.0567	3.2932	1.371	2.2405	2.65	2.8225	0	
15/12/2011	1.0685	3.2886	1.4209	2.2325	2.6481	2.8295	0.804	
16/12/2011	1.0377	3.2797	1.4428	2.217	2.6466	2.8207	5.025	
17/12/2011	1.0348	3.2752	1.2782	2.2036	2.7544	2.8878	15.276	
18/12/2011	0.7608	3.2421	1.2189	2.1614	2.7145	2.8628	5.829	
19/12/2011	0.8777	3.2296	1.2923	2.1313	2.6627	2.7982	8.442	
20/12/2011	0.7862	3.2223	1.201	2.1042	2.613	2.7996	1.407	
21/12/2011	0.8358	3.2121	1.2254	2.064	2.5951	2.7898	3.618	
22/12/2011	0.8614	3.2176	1.3364	2.0419	2.6428	2.8023	0	
23/12/2011	0.9025	3.2153	1.3982	2.0164	2.5772	2.7496	10.854	
24/12/2011	0.8231	3.1887	1.1694	1.9814	2.5715	2.7271	0.603	
25/12/2011	0.864	3.1891	1.3154	1.9564	2.4965	2.6636	0.804	
26/12/2011	0.9146	3.1974	1.4162	1.9472	2.5265	2.6579	0	
27/12/2011	0.9378	3.1986	1.4642	1.9323	2.5271	2.6341	0	
28/12/2011	0.9048	3.1875	1.4761	1.9126	2.4467	2.5971	0	
29/12/2011	0.9798	3.1982	1.5015	1.9126	2.5259	2.6132	1.809	
30/12/2011	0.9393	3.1974	1.4925	1.9094	2.5122	2.6034	5.226	
31/12/2011	0.803	3.1906	1.2399	1.9041	2.4582	2.5872	3.015	
01/01/2012	0.8488	3.1946	1.3918	1.9007	2.4542	2.5847	2.211	
02/01/2012	0.8653	3.1886	1.381	1.8913	2.4685	2.6259	2.613	
03/01/2012	0.8473	3.1767	1.3465	1.8783	2.4409	2.6274	9.849	
04/01/2012	0.8407	3.1772	1.2562	1.877	2.5171	2.6475	0.201	
05/01/2012	0.7898	3.1623	1.1738	1.8547	2.3818	2.6318	7.437	
06/01/2012	0.8644	3.1683	1.2544	1.8419	2.5354	2.688	0.402	
07/01/2012	0.8408	3.1664	1.3044	1.8256	2.4695	2.6769	1.407	
08/01/2012	0.8865	3.1722	1.4147	1.8171	2.5189	2.7027	1.206	
09/01/2012	0.8967	3.1758	1.4613	1.8089	2.534	2.7233	1.206	
10/01/2012	0.9028	3.1794	1.4817	1.8056	2.5617	2.7324	0	
11/01/2012	0.9249	3.1871	1.4956	1.8061	2.5574	2.731	1.809	
12/01/2012	0.8968	3.185	1.4844	1.8038	2.5259	2.7209	0.201	
13/01/2012	0.9518	3.1924	1.5067	1.8062	2.5869	2.744	0	
14/01/2012	0.9566	3.1873	1.5018	1.7987	2.5661	2.7243	0	
15/01/2012	0.9762	3.1916	1.5147	1.8035	2.5414	2.7161	0	
16/01/2012	1.0055	3.2	1.5263	1.8124	2.5629	2.7334	0	
17/01/2012	1.0277	3.2066	1.5336	1.8194	2.5864	2.7487	0	
18/01/2012	1.0305	3.2113	1.5408	1.8267	2.5672	2.752	0.603	
19/01/2012	1.0363	3.2213	1.5275	1.8378	2.5775	2.7574	3.015	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
20/01/2012	0.9887	3.2191	1.4353	1.8486	2.5932	2.7716	12.462	
21/01/2012	0.7584	3.1933	1.227	1.8328	2.4967	2.7257	0.804	
22/01/2012	0.8671	3.1975	1.3761	1.824	2.5053	2.7346	0.201	
23/01/2012	0.9238	3.2051	1.4354	1.8216	2.5491	2.7526	0	
24/01/2012	0.9457	3.2067	1.4722	1.8145	2.5712	2.7544	6.834	
25/01/2012	0.851	3.2002	1.3202	1.8083	2.5237	2.7304	0.201	
26/01/2012	0.8456	3.1936	1.3189	1.7968	2.4632	2.7035	3.819	
27/01/2012	0.8919	3.2007	1.3832	1.7997	2.5357	2.7541	1.407	
28/01/2012	0.892	3.1902	1.2219	1.7933	2.5957	2.7919	4.824	
29/01/2012	0.8933	3.1816	1.3859	1.7705	2.5729	2.7567	0	
30/01/2012	0.9047	3.1868	1.4532	1.7659	2.5431	2.7411	0	
31/01/2012	0.924	3.1871	1.478	1.7588	2.5357	2.7473	0	
01/02/2012	0.9769	3.1971	1.5048	1.7611	2.5989	2.7829	0	
02/02/2012	0.9992	3.1989	1.5239	1.7606	2.6134	2.7881	0	
03/02/2012	1.0152	3.2081	1.5364	1.7647	2.6173	2.7913	0	
04/02/2012	1.0202	3.2094	1.5476	1.7629	2.608	2.7691	0	
05/02/2012	0.9733	3.208	1.3324	1.7698	2.5355	2.7566	6.231	
06/02/2012	0.9564	3.2098	1.3363	1.7768	2.5945	2.786	4.824	
07/02/2012	0.8903	3.2138	1.4068	1.7714	2.619	2.8033	0.804	
08/02/2012	0.8961	3.2184	1.4776	1.7674	2.6211	2.7919	0	
09/02/2012	0.8976	3.2239	1.52	1.767	2.5882	2.7688	0.603	
10/02/2012	0.7705	3.2195	1.2481	1.7674	2.5636	2.7648	5.628	
11/02/2012	0.8476	3.2245	1.4129	1.7625	2.5574	2.7614	0	
12/02/2012	0.9007	3.2342	1.4888	1.7627	2.564	2.7611	0.201	
13/02/2012	0.9168	3.2408	1.4905	1.762	2.5536	2.7442	0.201	
14/02/2012	0.9356	3.2483	1.491	1.7649	2.5507	2.7513	0	
15/02/2012	0.955	3.2559	1.5212	1.7673	2.5547	2.7644	0	
16/02/2012	0.9827	3.262	1.5422	1.773	2.5813	2.7686	0	
17/02/2012	0.9633	3.2552	1.6445	1.7445	2.5998	2.7569	2.412	
18/02/2012	0.9023	3.2529	1.6525	1.7407	2.5444	2.7284	1.809	
19/02/2012	0.8579	3.2593	1.6396	1.7533	2.62	2.799	3.216	
20/02/2012	0.8986	3.2595	1.6213	1.7535	2.6672	2.7958	0.402	
21/02/2012	0.9192	3.2677	1.6533	1.7574	2.628	2.7839	0.402	
22/02/2012	0.9361	3.2738	1.6679	1.7582	2.6171	2.7561	0.402	
23/02/2012	0.9611	3.2801	1.6769	1.7693	2.6309	2.7941	0	
24/02/2012	0.9837	3.2837	1.6886	1.7722	2.6592	2.8123	0.603	
25/02/2012	0.9927	3.2799	1.6903	1.7717	2.6783	2.8087	0	
26/02/2012	1.0092	3.287	1.6956	1.7766	2.6705	2.8075	0	
27/02/2012	1.0057	3.2902	1.7017	1.7806	2.6494	2.79	0.201	
28/02/2012	1.021	3.2971	1.7086	1.7901	2.6584	2.8007	0.201	
29/02/2012	1.0332	3.3012	1.7141	1.7948	2.6694	2.8089	0	
01/03/2012	1.0409	3.2991	1.7114	1.7967	2.6751	2.8155	0	
02/03/2012	1.0592	3.3015	1.7205	1.8045	2.6977	2.8191	0	
03/03/2012	1.0287	3.2996	1.7086	1.8048	2.6328	2.7894	0.201	
04/03/2012	1.0521	3.304	1.7074	1.8136	2.6602	2.8061	4.623	
05/03/2012	1.0028	3.2979	1.6639	1.8207	2.696	2.8313	0.201	
06/03/2012	1.0226	3.3011	1.6963	1.8256	2.6999	2.8253	0	
07/03/2012	0.9922	3.2968	1.7015	1.8239	2.6227	2.7915	2.01	
08/03/2012	1.0115	3.3026	1.7146	1.8392	2.7112	2.846	0	
09/03/2012	1.035	3.3126	1.7361	1.8501	2.7289	2.8507	0	
10/03/2012	1.0555	3.3199	1.746	1.8604	2.7406	2.8624	0	
11/03/2012	1.0657	3.3214	1.7549	1.8632	2.745	2.8544	0	
12/03/2012	1.0644	3.3236	1.759	1.8663	2.7245	2.8412	0	
13/03/2012	1.0698	3.3271	1.7606	1.8713	2.7215	2.8463	0	
14/03/2012	1.0711	3.3252	1.7564	1.873	2.7093	2.8328	0	
15/03/2012	1.0653	3.321	1.7491	1.8719	2.6812	2.8168	0.402	
16/03/2012	1.1947	3.3031	1.7785	2.032	2.655	2.8705	0	
17/03/2012	1.1975	3.3052	1.7746	2.0404	2.6379	2.8675	2.211	
18/03/2012	1.178	3.3125	1.7713	2.0484	2.6656	2.9069	4.221	
19/03/2012	1.1311	3.3137	1.7306	2.0531	2.751	2.9459	0	
20/03/2012	1.1631	3.3197	1.7543	2.0598	2.7457	2.9406	0	
21/03/2012	1.1804	3.3258	1.7711	2.0694	2.7502	2.9391	0	
22/03/2012	1.1719	3.3228	1.7723	2.0659	2.7243	2.9203	0	
23/03/2012	1.1773	3.3285	1.7784	2.0757	2.701	2.9132	0	
24/03/2012	1.1947	3.3304	1.7843	2.0803	2.7167	2.9208	0	
25/03/2012	1.2095	3.3362	1.7981	2.0887	2.7482	2.9431	0	
26/03/2012	1.2053	3.3375	1.8067	2.0917	2.7642	2.9459	0	
27/03/2012	1.1894	3.3396	1.813	2.0951	2.7566	2.9412	0	
28/03/2012	1.1748	3.3377	1.8165	2.0985	2.7399	2.927	0	
29/03/2012	1.1758	3.3398	1.8192	2.1021	2.723	2.9203	0	
30/03/2012	1.1858	3.345	1.826	2.1118	2.7215	2.9139	0	
31/03/2012	1.1741	3.3442	1.8255	2.1135	2.6883	2.901	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
01/04/2012	1.2101	3.3429	1.8259	2.1144	2.7295	2.911	0	
02/04/2012	1.1997	3.346	1.829	2.1192	2.6846	2.8827	0.402	
03/04/2012	1.1845	3.347	1.8243	2.1244	2.6581	2.8685	3.417	
04/04/2012	1.1713	3.348	1.8119	2.1303	2.6876	2.9143	2.412	
05/04/2012	1.195	3.3493	1.7715	2.1388	2.7715	2.9461	0	
06/04/2012	1.1961	3.3472	1.785	2.1357	2.7352	2.912	0	
07/04/2012	1.1885	3.353	1.79	2.1448	2.6949	2.91	2.01	
08/04/2012	1.1574	3.3536	1.7945	2.1507	2.7175	2.9156	1.407	
09/04/2012	1.0581	3.3464	1.7786	2.1479	2.6543	2.8557	7.236	
10/04/2012	0.801	3.3304	1.6412	2.1492	2.5835	2.8574	0	
11/04/2012	0.9818	3.3365	1.7045	2.1547	2.6713	2.9082	1.608	
12/04/2012	1.0294	3.3428	1.7321	2.1615	2.7176	2.9313	3.819	
13/04/2012	0.9787	3.3344	1.6923	2.1593	2.7194	2.9262	0	
14/04/2012	0.848	3.3349	1.6228	2.1648	2.7206	2.9388	3.618	
15/04/2012	0.98	3.3398	1.682	2.1651	2.7657	2.965	0	
16/04/2012	1.0484	3.3433	1.7183	2.1643	2.7803	2.9539	0	
17/04/2012	0.9846	3.3324	1.7062	2.1506	2.6291	2.8645	3.216	
18/04/2012	0.8751	3.3253	1.683	2.1528	2.5643	2.8273	3.015	
19/04/2012	0.8307	3.3256	1.6218	2.1626	2.6116	2.8703	6.432	
20/04/2012	0.669	3.3105	1.5525	2.1525	2.6319	2.8853	7.437	
21/04/2012	0.8471	3.3092	1.631	2.14	2.6199	2.8815	1.608	
22/04/2012	0.9272	3.3122	1.6608	2.1344	2.6522	2.8915	0.201	
23/04/2012	0.9421	3.3107	1.6675	2.1255	2.6309	2.8664	1.005	
24/04/2012	0.9722	3.3171	1.6796	2.1279	2.6491	2.8822	0	
25/04/2012	0.9646	3.3086	1.6815	2.1171	2.6083	2.8315	0.804	
26/04/2012	0.7243	3.3025	1.5686	2.1201	2.5763	2.862	4.824	
27/04/2012	0.7408	3.2993	1.5402	2.1215	2.6732	2.916	4.623	
28/04/2012	0.76	3.2915	1.5359	2.104	2.6424	2.8405	1.809	
29/04/2012	0.8486	3.2865	1.6107	2.08	2.5708	2.7879	10.653	
30/04/2012	0.5431	3.2436	1.4596	2.0373	2.4753	2.7424	0.402	
01/05/2012	0.7737	3.2488	1.5978	2.0084	2.4084	2.6499	0	
02/05/2012	0.886	3.248	1.6426	1.9901	2.465	2.7502	0.201	
03/05/2012	0.8926	3.2464	1.6494	1.9755	2.4658	2.7865	0	
04/05/2012	0.9069	3.2469	1.6521	1.9659	2.4593	2.8117	0	
05/05/2012	0.9726	3.2517	1.6635	1.9626	2.531	2.8539	0	
06/05/2012	1.0119	3.2562	1.6728	1.9619	2.5628	2.879	0	
07/05/2012	1.0364	3.2591	1.683	1.9621	2.5832	2.8814	0.402	
08/05/2012	0.846	3.2414	1.6196	1.9634	2.54	2.8701	9.045	
09/05/2012	0.9118	3.2506	1.6385	1.971	2.5611	2.8856	0.201	
10/05/2012	0.6391	3.2217	1.5609	1.9707	2.5183	2.8703	8.04	
11/05/2012	0.7096	3.2299	1.5616	1.9718	2.5723	2.9236	6.231	
12/05/2012	0.8367	3.2248	1.5927	1.9606	2.6619	2.9446	0	
13/05/2012	0.8992	3.2252	1.619	1.949	2.6092	2.8857	0	
14/05/2012	0.8868	3.2285	1.6265	1.9465	2.5119	2.8482	0.402	
15/05/2012	0.913	3.2292	1.6393	1.9483	2.5394	2.8759	11.859	
16/05/2012	0.7639	3.2039	1.5838	1.941	2.5889	2.8985	0	
17/05/2012	0.8349	3.2079	1.6123	1.9334	2.5568	2.8615	1.206	
18/05/2012	0.8333	3.2074	1.6188	1.9323	2.505	2.842	0	
19/05/2012	0.8444	3.2082	1.6341	1.9359	2.5472	2.8733	2.814	
20/05/2012	0.7586	3.2111	1.6047	1.9348	2.578	2.8801	0	
21/05/2012	0.8545	3.2195	1.6208	1.9372	2.5718	2.8836	0	
22/05/2012	0.9316	3.2298	1.6398	1.9458	2.6103	2.9086	0	
23/05/2012	0.9889	3.239	1.669	1.9583	2.6593	2.9327	0	
24/05/2012	1.0237	3.2429	1.6783	1.9654	2.6707	2.9318	0	
25/05/2012	1.027	3.2447	1.6835	1.9729	2.6507	2.9189	0	
26/05/2012	0.969	3.2413	1.6998	1.8136	2.6272	2.8658	0	
27/05/2012	0.9602	3.2445	1.6989	1.8234	2.616	2.8603	0	
28/05/2012	0.9714	3.2512	1.7027	1.836	2.617	2.8608	0	
29/05/2012	0.9813	3.2562	1.7045	1.8452	2.6311	2.8654	0	
30/05/2012	0.9911	3.2593	1.7068	1.8543	2.6273	2.8657	0	
31/05/2012	1.0102	3.2646	1.7127	1.8637	2.6431	2.8753	1.809	
01/06/2012	1.0178	3.2682	1.7162	1.8719	2.6443	2.8783	0.201	
02/06/2012	1.029	3.2708	1.7192	1.8791	2.6368	2.8628	0.201	
03/06/2012	0.8298	3.2557	1.6771	1.8787	2.5838	2.8417	5.427	
04/06/2012	0.4413	3.2237	1.3459	1.8611	2.5913	2.8561	1.608	
05/06/2012	0.7469	3.2302	1.5439	1.8584	2.5831	2.8272	0	
06/06/2012	0.7937	3.2306	1.5735	1.8559	2.4882	2.7871	4.623	
07/06/2012	0.7855	3.2312	1.5494	1.8633	2.5267	2.7902	4.422	
08/06/2012	0.5554	3.2091	1.3619	1.8494	2.4369	2.7841	17.688	
09/06/2012	0.4351	3.1717	1.2003	1.8242	2.511	2.8217	6.03	
10/06/2012	0.5638	3.1695	1.41	1.7805	2.4865	2.7754	0	
11/06/2012	0.7067	3.1754	1.5077	1.7678	2.4647	2.7692	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
12/06/2012	0.8012	3.1831	1.5485	1.7673	2.5156	2.7991	0	
13/06/2012	0.8548	3.1901	1.5818	1.7678	2.5538	2.8148	3.819	
14/06/2012	0.8273	3.1694	1.4482	1.7558	2.5398	2.797	0.402	
15/06/2012	0.5337	3.1502	1.3078	1.7464	2.4608	2.7569	5.025	
16/06/2012	0.51	3.1487	1.3861	1.738	2.4454	2.7559	1.407	
17/06/2012	0.6467	3.1567	1.4241	1.7353	2.5265	2.8109	0.402	
18/06/2012	0.7709	3.1636	1.525	1.7274	2.5384	2.8071	0.402	
19/06/2012	0.7753	3.1705	1.558	1.7282	2.5458	2.808	0.201	
20/06/2012	0.8006	3.1755	1.5842	1.7296	2.5571	2.8027	0.201	
21/06/2012	0.8229	3.1779	1.5946	1.7286	2.5138	2.7717	0	
22/06/2012	0.7406	3.1684	1.4956	1.7303	2.4868	2.7855	0.402	
23/06/2012	0.5161	3.1544	1.3615	1.73	2.5519	2.8178	0.201	
24/06/2012	0.4712	3.1318	1.3313	1.7161	2.4839	2.7865	0.402	
25/06/2012	0.4757	3.1171	1.3944	1.6842	2.4779	2.7648	0.201	
26/06/2012	0.6956	3.1309	1.5055	1.6748	2.4833	2.7525	0	
27/06/2012	0.7397	3.1346	1.5331	1.6694	2.4842	2.7523	0.201	
28/06/2012	0.7533	3.1395	1.5501	1.666	2.4524	2.7237	0.201	
29/06/2012	0.7599	3.1471	1.5573	1.6682	2.4418	2.745	0	
30/06/2012	0.7537	3.1538	1.5715	1.6792	2.5055	2.7828	0	
01/07/2012	0.7758	3.1576	1.598	1.686	2.5454	2.8124	0	
02/07/2012	0.8453	3.164	1.6158	1.6952	2.5564	2.8092	0.201	
03/07/2012	0.759	3.1625	1.494	1.703	2.558	2.808	0.804	
04/07/2012	0.876	3.171	1.2019	1.745	2.519	2.791	1.005	
05/07/2012	0.535	3.1469	0.9454	1.751	2.528	2.802	9.447	
06/07/2012	0.532	3.1013	0.9608	1.736	2.491	2.772	37.386	
07/07/2012	0.534	2.9198	0.8833	1.586	2.303	2.555	0.402	
08/07/2012	0.634	2.9464	1.0372	1.518	2.104	2.393	0.201	
09/07/2012	0.600	2.9426	0.9762	1.496	2.252	2.620	4.02	
10/07/2012	0.725	2.9754	1.0471	1.491	2.331	2.717	11.658	
11/07/2012	0.556	2.9167	0.9478	1.448	2.271	2.622	0.804	
12/07/2012	0.676	2.9605	1.06	1.436	2.233	2.582	0	
13/07/2012	0.751	2.9858	1.1235	1.441	2.262	2.665	3.216	
14/07/2012	0.555	2.9555	0.9798	1.448	2.331	2.742	0.402	
15/07/2012	0.732	3.0107	1.1255	1.467	2.407	2.777	0	
16/07/2012	0.858	3.046	1.1874	1.487	2.442	2.783	8.241	
17/07/2012	0.590	2.8569	0.8929	1.473	2.424	2.772	5.628	
18/07/2012	0.700	2.9594	1.0698	1.454	2.314	2.662	0	
19/07/2012	0.703	2.9265	0.9783	1.458	2.322	2.712	0.804	
20/07/2012	0.665	2.9637	1.0249	1.460	2.399	2.770	0.804	
21/07/2012	0.823	3.0108	1.1344	1.476	2.448	2.790	0.201	
22/07/2012	0.900	3.047	1.1744	1.499	2.470	2.799	0.201	
23/07/2012	0.916	3.0706	1.2015	1.522	2.462	2.798	0	
24/07/2012	0.940	3.0861	1.2177	1.545	2.471	2.801	0.201	
25/07/2012	0.970	3.1017	1.2399	1.570	2.493	2.820	0.201	
26/07/2012	1.004	3.114	1.2583	1.592	2.521	2.827	0	
27/07/2012	1.013	3.1219	1.266	1.609	2.509	2.820	0	
28/07/2012	1.019	3.1271	1.2678	1.627	2.506	2.812	0.201	
29/07/2012	1.040	3.1376	1.275	1.646	2.513	2.826	0	
30/07/2012	1.029	3.1283	1.1694	1.662	2.542	2.840	0	
31/07/2012	1.040	3.1398	1.2487	1.679	2.549	2.835	0	
01/08/2012	0.814	3.1224	1.0698	1.688	2.521	2.810	0	
02/08/2012	0.880	3.1312	1.1002	1.702	2.527	2.827	0	
03/08/2012	0.820	3.1336	1.1132	1.715	2.552	2.832	0.201	
04/08/2012	0.914	3.1474	1.1731	1.727	2.542	2.825	0	
05/08/2012	0.961	3.1567	1.1942	1.736	2.543	2.824	0	
06/08/2012	1.006	3.1677	1.2268	1.748	2.552	2.840	0	
07/08/2012	1.070	3.1765	1.2636	1.764	2.611	2.871	0	
08/08/2012	1.083	3.1822	1.2874	1.774	2.630	2.877	0.201	
09/08/2012	1.106	3.1903	1.3043	1.787	2.638	2.880	0	
10/08/2012	1.114	3.1951	1.3149	1.799	2.639	2.873	0	
11/08/2012	1.113	3.1996	1.3152	1.808	2.609	2.849	0	
12/08/2012	1.109	3.2014	1.3132	1.817	2.566	2.831	0.201	
13/08/2012	1.105	3.2059	1.3169	1.828	2.565	2.835	0	
14/08/2012	1.132	3.2142	1.3246	1.839	2.590	2.855	0	
15/08/2012	1.154	3.2194	1.3288	1.850	2.604	2.841	0	
16/08/2012	1.007	3.2081	1.2262	1.856	2.595	2.865	0.201	
17/08/2012	1.048	3.2151	1.2914	1.866	2.598	2.857	0	
18/08/2012	1.047	3.2211	1.3279	1.873	2.605	2.865	0.201	
19/08/2012	1.095	3.2282	1.3398	1.881	2.642	2.873	0	
20/08/2012	1.107	3.2322	1.3454	1.887	2.642	2.880	0.201	
21/08/2012	1.131	3.2346	1.3527	1.896	2.644	2.869	0	
22/08/2012	1.074	3.2333	1.2889	1.900	2.614	2.860	0.201	

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23/08/2012	1.108	3.24	1.3201	1.910	2.623	2.863	0	
24/08/2012	1.113	3.2406	1.3268	1.913	2.585	2.834	0.201	
25/08/2012	1.071	3.2393	1.2694	1.922	2.557	2.831	0	
26/08/2012	1.144	3.2524	1.3031	1.935	2.669	2.896	0.201	
27/08/2012	1.135	3.2479	1.322	1.936	2.662	2.868	0	
28/08/2012	1.047	3.2509	1.2709	1.944	2.622	2.872	0.201	
29/08/2012	1.079	3.2549	1.3081	1.952	2.638	2.867	0	
30/08/2012	1.016	3.2539	1.2059	1.956	2.626	2.894	0.201	
31/08/2012	1.099	3.2572	1.2798	1.963	2.718	2.920	0	
01/09/2012	1.021	3.2807	1.654	1.906	2.739	2.788	0.201	
02/09/2012	1.044	3.2854	1.6625	1.916	2.720	2.790	0	
03/09/2012	1.099	3.289	1.6815	1.920	2.759	2.799	0	
04/09/2012	1.100	3.2928	1.6855	1.927	2.732	2.795	0	
05/09/2012	1.135	3.2966	1.6958	1.933	2.766	2.814	0	
06/09/2012	1.153	3.2971	1.7049	1.935	2.772	2.802	0	
07/09/2012	1.147	3.3012	1.7066	1.944	2.743	2.795	0	
08/09/2012	1.168	3.3033	1.7155	1.951	2.749	2.790	0	
09/09/2012	1.149	3.2997	1.713	1.953	2.702	2.755	0	
10/09/2012	1.162	3.3099	1.7173	1.963	2.701	2.770	0.201	
11/09/2012	1.169	3.3057	1.564	1.968	2.738	2.803	4.221	
12/09/2012	1.174	3.3035	1.6723	1.969	2.766	2.801	5.025	
13/09/2012	1.098	3.3039	1.5464	1.977	2.792	2.818	0	
14/09/2012	1.079	3.3014	1.6343	1.984	2.720	2.791	0.402	
15/09/2012	1.136	3.3105	1.6681	1.990	2.781	2.813	0	
16/09/2012	1.131	3.3064	1.68	1.994	2.747	2.788	0	
17/09/2012	1.146	3.3082	1.6865	1.997	2.756	2.799	0.402	
18/09/2012	1.160	3.3058	1.6972	2.003	2.752	2.810	1.608	
19/09/2012	1.134	3.3087	1.5885	2.007	2.810	2.836	9.045	
20/09/2012	0.837	3.291	1.4812	2.008	2.763	2.800	1.608	
21/09/2012	0.829	3.2863	1.5101	2.007	2.729	2.787	1.608	
22/09/2012	0.826	3.2866	1.4777	2.006	2.756	2.801	0.201	
23/09/2012	0.931	3.2818	1.5522	2.005	2.726	2.761	0.201	
24/09/2012	0.627	3.2532	1.2893	1.996	2.596	2.689	25.929	
25/09/2012	0.450	3.1129	1.2191	1.854	2.381	2.422	6.03	
26/09/2012	0.425	2.966	1.0611	1.773	1.984	2.028	8.844	
27/09/2012	0.461	2.9639	1.211	1.685	1.882	1.916	1.206	
28/09/2012	0.655	3.031	1.3788	1.634	2.028	2.201	1.206	
29/09/2012	0.736	3.0756	1.3859	1.605	2.227	2.491	0.402	
30/09/2012	0.787	3.1046	1.4806	1.588	2.332	2.596	0	
01/10/2012	0.788	3.0986	1.3516	1.578	2.380	2.687	2.01	
02/10/2012	0.777	3.1299	1.4536	1.578	2.429	2.708	2.01	
03/10/2012	0.738	3.1274	1.3446	1.578	2.4256	2.719	0.603	
04/10/2012	0.794	3.1443	1.4635	1.589	2.4561	2.7352	0	
05/10/2012	1.078	3.1417	1.474	1.5925	2.4611	2.9822	1.407	
06/10/2012	1.058	3.1552	1.4928	1.6077	2.5366	3.0165	0.804	
07/10/2012	1.099	3.1686	1.5369	1.621	2.5981	3.039	0	
08/10/2012	1.150	3.1693	1.5631	1.6241	2.5786	3.0107	0.201	
09/10/2012	1.197	3.1788	1.5711	1.637	2.5897	3.0265	0	
10/10/2012	1.236	3.1849	1.5946	1.6453	2.6005	3.0241	0	
11/10/2012	1.230	3.1909	1.6047	1.6546	2.5702	3.002	0.603	
12/10/2012	0.706	3.104	1.1769	1.6524	2.5409	3.0097	11.457	
13/10/2012	0.856	3.122	1.4075	1.6228	2.3967	2.7945	0.201	
14/10/2012	1.038	3.1455	1.4767	1.6127	2.3918	2.8622	0	
15/10/2012	1.121	3.1616	1.5223	1.6136	2.4678	2.9489	0	
16/10/2012	1.056	3.1512	1.3367	1.616	2.4527	2.9691	2.412	
17/10/2012	1.041	3.1575	1.4754	1.6168	2.5086	2.9835	1.407	
18/10/2012	0.722	3.0955	1.2842	1.6135	2.5137	2.9793	6.834	
19/10/2012	0.925	3.1445	1.4396	1.5955	2.5381	2.9542	0.201	
20/10/2012	1.094	3.1625	1.4993	1.586	2.5589	2.9926	0	
21/10/2012	1.174	3.1764	1.5313	1.5845	2.6062	3.013	0	
22/10/2012	1.213	3.1851	1.513	1.5846	2.6158	3.0206	0.603	
23/10/2012	1.214	3.1917	1.5075	1.5951	2.6453	3.0326	0	
24/10/2012	1.214	3.1962	1.5623	1.5992	2.6288	3.0194	0	
25/10/2012	1.224	3.2021	1.5886	1.6061	2.6207	3.0203	0	
26/10/2012	1.247	3.204	1.6118	1.6145	2.6268	3.0198	0	
27/10/2012	1.265	3.206	1.6257	1.6214	2.6356	3.0369	0	
28/10/2012	1.280	3.2101	1.6433	1.6294	2.6331	3.0151	0.402	
29/10/2012	1.256	3.2157	1.6207	1.6429	2.5989	3.0144	1.005	
30/10/2012	1.244	3.2223	1.6106	1.6509	2.6319	3.0161	0.402	
31/10/2012	1.206	3.2189	1.6569	1.6522	2.5567	2.9622	0.201	
01/11/2012	1.022	3.206	1.4372	1.6549	2.5199	2.9726	3.015	
02/11/2012	1.114	3.2286	1.5586	1.6738	2.6134	3.0225	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
03/11/2012	1.203	3.2346	1.6162	1.6825	2.6706	3.0528	0	
04/11/2012	1.247	3.2375	1.6026	1.6867	2.6823	3.046	0	
05/11/2012	1.297	3.2501	1.5405	1.6994	2.7227	3.0832	0	
06/11/2012	1.361	3.2542	1.6084	1.7083	2.7903	3.1083	0.201	
07/11/2012	1.373	3.2658	1.6639	1.7232	2.7951	3.1068	0	
08/11/2012	1.347	3.2657	1.6824	1.7262	2.7365	3.0764	0	
09/11/2012	1.336	3.2653	1.6867	1.7252	2.7008	3.0402	0	
10/11/2012	1.269	3.2601	1.6423	1.7286	2.6335	3.0131	1.206	
11/11/2012	1.311	3.2693	1.6762	1.7381	2.7087	3.0741	1.809	
12/11/2012	1.345	3.2743	1.6446	1.7483	2.7815	3.0956	1.005	
13/11/2012	1.297	3.2796	1.6075	1.7577	2.7768	3.1015	0	
14/11/2012	1.322	3.2844	1.6734	1.7627	2.7857	3.1036	0	
15/11/2012	1.324	3.2845	1.6918	1.7634	2.7619	3.0756	0	
16/11/2012	1.312	3.2827	1.6529	1.7608	2.7135	3.0451	0	
17/11/2012	1.162	3.2688	1.3627	1.7601	2.6555	3.0282	6.231	
18/11/2012	1.131	3.2697	1.5238	1.7593	2.692	3.0484	0	
19/11/2012	1.186	3.2749	1.5738	1.7575	2.6568	3.013	0	
20/11/2012	1.235	3.2866	1.603	1.766	2.6686	3.0289	0.201	
21/11/2012	1.275	3.2908	1.6157	1.7701	2.7038	3.053	12.261	
22/11/2012	1.032	3.2599	1.431	1.74	2.6264	2.9502	0	
23/11/2012	0.958	3.2515	1.3271	1.7216	2.5212	2.9061	5.427	
24/11/2012	1.117	3.2515	1.4974	1.6964	2.5211	2.8702	0	
25/11/2012	0.874	3.2184	1.1751	1.6557	2.4059	2.8723	16.482	
26/11/2012	0.777	3.1683	1.2796	1.5817	2.1189	2.4903	3.819	
27/11/2012	0.778	3.1492	1.2247	1.5298	2.1448	2.5503	4.824	
28/11/2012	0.923	3.164	1.3987	1.4834	2.2446	2.6707	0.402	
29/11/2012	0.715	3.1384	1.3157	1.4357	2.2735	2.6261	0	
30/11/2012	0.793	3.1393	1.3549	1.4317	2.3201	2.7125	0	
01/12/2012	0.852	3.1499	1.3701	1.438	2.4103	2.8039	2.211	
02/12/2012	0.842	3.1524	1.3586	1.4484	2.4539	2.8271	0	
03/12/2012	0.786	3.1462	1.0798	1.4497	2.4146	2.8095	6.432	
04/12/2012	0.720	3.1494	1.2877	1.4476	2.4001	2.7718	3.015	
05/12/2012	0.675	3.1387	1.0468	1.4459	2.4213	2.7834	4.824	
06/12/2012	0.751	3.142	1.265	1.4251	2.4673	2.7579	0	
07/12/2012	0.657	3.1221	1.0203	1.4093	2.3537	2.755	9.849	
08/12/2012	0.717	3.1326	1.2271	1.3985	2.4608	2.7679	0	
09/12/2012	0.767	3.1373	1.3236	1.3836	2.4234	2.74	0.201	
10/12/2012	0.805	3.1461	1.3674	1.3884	2.4561	2.7875	0	
11/12/2012	0.870	3.1504	1.423	1.3964	2.5209	2.816	0	
12/12/2012	0.861	3.1491	1.4444	1.4042	2.4828	2.7873	0	
13/12/2012	0.844	3.1516	1.4168	1.4124	2.4277	2.7614	0	
14/12/2012	0.843	3.1541	1.45	1.4256	2.4007	2.703	4.623	
15/12/2012	0.641	3.1398	1.1011	1.4339	2.3855	2.7491	6.432	
16/12/2012	0.684	3.1474	1.2208	1.4327	2.3506	2.6539	0.603	
17/12/2012	0.720	3.1502	1.2529	1.4226	2.3443	2.6869	3.417	
18/12/2012	0.689	3.1436	1.1146	1.428	2.4408	2.7523	5.025	
19/12/2012	0.740	3.1399	1.2704	1.4008	2.4111	2.7023	0.402	
20/12/2012	0.630	3.1199	1.0586	1.3794	2.3475	2.6708	14.07	
21/12/2012	0.374	2.9726	0.9186	1.3001	2.0839	2.3464	10.854	
22/12/2012	0.557	2.9859	1.1536	1.2092	1.9073	2.1576	12.06	
23/12/2012	0.392	2.8391	0.9497	1.1009	1.8075	2.1034	6.03	
24/12/2012	0.579	2.9078	1.1789	1.0375	1.8951	2.2029	4.02	
25/12/2012	0.455	2.8806	1.1522	1.0295	2.0054	2.4227	3.216	
26/12/2012	0.607	2.9337	1.2243	1.0699	2.1484	2.5333	3.618	
27/12/2012	0.560	2.9313	1.2051	1.0985	2.1835	2.6046	1.608	
28/12/2012	0.686	2.9744	1.2989	1.1441	2.3175	2.6548	2.814	
29/12/2012	0.619	2.9601	1.2841	1.1562	2.2291	2.619	4.422	
30/12/2012	0.589	2.9311	1.2071	1.1701	2.2481	2.6469	0	
31/12/2012	0.690	2.9629	1.3022	1.1856	2.2307	2.6029	2.412	
01/01/2013	0.582	2.9214	1.1638	1.2048	2.2784	2.6747	3.618	
02/01/2013	0.743	2.995	1.3338	1.2311	2.348	2.6908	3.618	
03/01/2013	0.693	2.9795	1.2685	1.2424	2.3917	2.7325	0	
04/01/2013	0.771	3.0232	1.4073	1.2595	2.4323	2.7453	0	
05/01/2013	0.791	3.0422	1.4537	1.2736	2.428	2.746	0	
06/01/2013	0.823	3.0605	1.4762	1.2917	2.4388	2.7476	0	
07/01/2013	0.827	3.0695	1.4808	1.3069	2.4256	2.7427	0	
08/01/2013	0.838	3.0831	1.4851	1.3313	2.4388	2.7581	3.015	
09/01/2013	0.685	3.0502	1.2562	1.3401	2.4584	2.7641	3.216	
10/01/2013	0.761	3.0738	1.3704	1.3436	2.4023	2.7217	0	
11/01/2013	0.809	3.0918	1.4001	1.3663	2.4386	2.7513	2.814	
12/01/2013	0.756	3.0904	1.3415	1.3745	2.4211	2.749	0.402	
13/01/2013	0.807	3.1062	1.4162	1.3911	2.4816	2.7791	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
14/01/2013	0.822	3.1112	1.2884	1.4005	2.4613	2.7446	8.643	
15/01/2013	0.572	3.0708	1.1529	1.3906	2.4101	2.739	0.804	
16/01/2013	0.720	3.0927	1.2976	1.383	2.3674	2.7051	0	
17/01/2013	0.807	3.1133	1.3519	1.3993	2.429	2.7369	0	
18/01/2013	0.814	3.1128	1.2896	1.4003	2.4029	2.7145	0	
19/01/2013	0.816	3.116	1.2086	1.4136	2.4027	2.738	0	
20/01/2013	0.714	3.1228	1.2489	1.4271	2.451	2.753	0.201	
21/01/2013	0.692	3.1276	1.2492	1.4376	2.4322	2.7544	0.804	
22/01/2013	0.657	3.1365	1.2083	1.4574	2.4953	2.7986	0.402	
23/01/2013	0.768	3.1472	1.2719	1.4723	2.5556	2.8183	2.211	
24/01/2013	0.724	3.151	1.2823	1.482	2.5633	2.8321	1.407	
25/01/2013	0.799	3.15	1.362	1.485	2.5646	2.7967	0.201	
26/01/2013	0.736	3.1457	1.1389	1.4902	2.4627	2.7732	11.658	
27/01/2013	0.389	3.0272	1.0142	1.4272	2.3435	2.7096	10.452	
28/01/2013	0.557	3.0079	1.1771	1.3295	1.9051	2.0895	0.201	
29/01/2013	0.643	3.0529	1.2002	1.3151	1.9996	2.3356	0.402	
30/01/2013	0.705	3.0827	1.2336	1.3174	2.1604	2.5802	0.201	
31/01/2013	0.785	3.1002	1.2777	1.3241	2.3082	2.6826	3.216	
01/02/2013	0.760	3.0896	1.2794	1.325	2.3237	2.6921	0	
02/02/2013	0.819	3.1151	1.2904	1.354	2.4171	2.7863	0.603	
03/02/2013	0.850	3.1169	1.3492	1.3619	2.463	2.772	0	
04/02/2013	0.830	3.1266	1.3515	1.3797	2.4119	2.7634	0	
05/02/2013	0.824	3.1223	1.3527	1.3823	2.3915	2.7321	0.402	
06/02/2013	0.753	3.1309	1.2344	1.4138	2.4409	2.8056	2.211	
07/02/2013	0.851	3.1459	1.3707	1.4343	2.5518	2.8205	1.005	
08/02/2013	0.791	3.1474	1.2914	1.4455	2.5257	2.8208	0.402	
09/02/2013	0.813	3.1502	1.3291	1.455	2.5226	2.8044	3.417	
10/02/2013	0.626	3.1152	1.1319	1.4297	2.3932	2.7108	3.618	
11/02/2013	0.380	3.0555	1.0522	1.3917	2.2898	2.6715	1.608	
12/02/2013	0.717	3.0839	1.2664	1.362	2.1862	2.5167	0	
13/02/2013	0.798	3.1005	1.3484	1.3512	2.313	2.6511	0	
14/02/2013	0.570	3.0631	1.1163	1.3399	2.2924	2.6779	7.437	
15/02/2013	0.608	3.0457	1.2794	1.3043	2.1974	2.5141	0	
16/02/2013	0.749	3.0694	1.3638	1.29	2.2622	2.6315	0	
17/02/2013	0.790	3.0864	1.4048	1.2966	2.3327	2.6859	0	
18/02/2013	0.823	3.097	1.4099	1.3107	2.3773	2.7232	0	
19/02/2013	0.849	3.1059	1.4316	1.3318	2.4197	2.744	0	
20/02/2013	0.884	3.1204	1.4291	1.3593	2.4616	2.777	0	
21/02/2013	0.911	3.1276	1.4461	1.3808	2.4963	2.7852	0	
22/02/2013	0.918	3.1342	1.4663	1.4017	2.4952	2.7891	0	
23/02/2013	0.932	3.1419	1.4428	1.4225	2.5054	2.799	0	
24/02/2013	0.960	3.1534	1.4195	1.4471	2.5422	2.8196	0	
25/02/2013	0.973	3.1593	1.4231	1.465	2.5624	2.8301	0	
26/02/2013	0.9412	3.1805	1.48	1.4896	2.6029	2.8438	0	
27/02/2013	1.0075	3.1747	1.3676	1.472	2.5632	2.772	0	
28/02/2013	1.0228	3.1788	1.3655	1.487	2.5421	2.7382	0	
01/03/2013	1.0531	3.1847	1.3735	1.498	2.5596	2.7398	0	
02/03/2013	1.0504	3.1879	1.3629	1.5101	2.5402	2.7431	0	
03/03/2013	1.0578	3.1918	1.3534	1.5217	2.5398	2.7294	0	
04/03/2013	1.03	3.1868	1.3461	1.5262	2.4942	2.7257	0	
05/03/2013	1.0244	3.194	1.3364	1.5412	2.4932	2.7007	0	
06/03/2013	1.047	3.1957	1.3484	1.5558	2.5228	2.7162	0	
07/03/2013	1.0087	3.1848	1.2601	1.5634	2.5099	2.7293	1.206	
08/03/2013	0.602	3.156	1.0918	1.566	2.5323	2.7211	5.628	
09/03/2013	0.4945	3.1251	1.0587	1.5587	2.5149	2.736	3.417	
10/03/2013	0.5088	3.1095	1.0842	1.5416	2.5033	2.7188	1.206	
11/03/2013	0.8139	3.1362	1.2412	1.5268	2.5097	2.7154	0	
12/03/2013	0.8794	3.1468	1.242	1.5267	2.5162	2.7204	0	
13/03/2013	0.9194	3.1638	1.2848	1.5346	2.5297	2.7209	0	
14/03/2013	0.9421	3.1701	1.2661	1.5376	2.5475	2.7395	0	
15/03/2013	0.8875	3.1651	1.278	1.5356	2.4712	2.7226	1.206	
16/03/2013	0.5701	3.1543	1.2004	1.5446	2.4577	2.6932	2.814	
17/03/2013	0.4806	3.0968	1.1401	1.5152	2.4	2.6835	6.633	
18/03/2013	0.7736	3.1335	1.2343	1.501	2.3923	2.6254	0	
19/03/2013	0.845	3.1476	1.2647	1.4904	2.4474	2.6583	0.201	
20/03/2013	0.9117	3.1635	1.2988	1.4956	2.5346	2.6886	0	
21/03/2013	0.9246	3.163	1.3259	1.4919	2.5556	2.7324	0	
22/03/2013	0.8994	3.1609	1.3108	1.4869	2.5113	2.7115	4.422	
23/03/2013	0.4497	3.0879	1.0736	1.461	2.4843	2.6954	1.206	
24/03/2013	0.6208	3.1174	1.2447	1.4376	2.4804	2.6827	0	
25/03/2013	0.7917	3.132	1.2906	1.4315	2.4863	2.6825	0	
26/03/2013	0.8375	3.1392	1.3226	1.4316	2.4857	2.6933	0	

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27/03/2013	0.8613	3.1424	1.3631	1.4378	2.4773	2.6905	0	
28/03/2013	0.8946	3.1519	1.387	1.4497	2.4947	2.6935	0	
29/03/2013	0.9137	3.1609	1.3924	1.4638	2.5052	2.7041	0	
30/03/2013	0.9268	3.1645	1.3919	1.4789	2.509	2.7003	0	
31/03/2013	0.9645	3.1738	1.406	1.4956	2.5491	2.7265	0	
01/04/2013	0.9606	3.1801	1.3813	1.5091	2.5368	2.7175	0	
02/04/2013	0.9828	3.1875	1.3879	1.526	2.5673	2.732	0	
03/04/2013	1.0111	3.1939	1.4047	1.543	2.6006	2.7483	0	
04/04/2013	1.0074	3.1972	1.4306	1.5542	2.584	2.7436	0	
05/04/2013	0.9987	3.2007	1.443	1.5638	2.5807	2.7379	0	
06/04/2013	1.0292	3.2074	1.4618	1.5755	2.6197	2.7554	0	
07/04/2013	1.0243	3.2075	1.4423	1.5813	2.5999	2.7499	0	
08/04/2013	0.9997	3.2094	1.3925	1.5872	2.5378	2.7193	0	
09/04/2013	0.9918	3.208	1.4151	1.5943	2.5214	2.7076	0	
10/04/2013	1.0345	3.2169	1.4372	1.6106	2.5874	2.7383	0	
11/04/2013	1.0143	3.2182	1.4413	1.6174	2.5601	2.7279	0.402	
12/04/2013	0.9784	3.2127	1.3554	1.623	2.5514	2.7227	4.221	
13/04/2013	1.0016	3.2175	1.3308	1.6387	2.6493	2.7748	0.402	
14/04/2013	1.0119	3.2298	1.4081	1.6523	2.6265	2.7684	0.201	
15/04/2013	1.0314	3.236	1.4515	1.6579	2.6465	2.7719	0	
16/04/2013	1.0096	3.2332	1.4731	1.6609	2.6147	2.7565	0.201	
17/04/2013	1.0423	3.2384	1.49	1.6699	2.6667	2.7965	0	
18/04/2013	1.0025	3.2408	1.4407	1.676	2.5853	2.7338	0	
19/04/2013	1.078	3.249	1.5124	1.6887	2.7103	2.8021	0.201	
20/04/2013	1.0953	3.2442	1.5272	1.6897	2.7412	2.8282	0	
21/04/2013	1.0544	3.24	1.5111	1.6912	2.6542	2.7797	0.201	
22/04/2013	1.0385	3.2443	1.4439	1.6983	2.6176	2.7538	0.201	
23/04/2013	1.0653	3.2504	1.4721	1.7098	2.643	2.7624	0	
24/04/2013	1.0951	3.2576	1.5038	1.7253	2.684	2.7917	0	
25/04/2013	1.0213	3.274	1.5809	1.796	2.6772	2.882	0	
26/04/2013	1.0189	3.2723	1.5604	1.8043	2.6593	2.8635	0	
27/04/2013	1.0406	3.2789	1.565	1.8096	2.6926	2.8436	0.201	
28/04/2013	1.0209	3.2784	1.5556	1.8158	2.6453	2.8655	0	
29/04/2013	1.0392	3.2854	1.5321	1.8283	2.7032	2.8432	1.809	
30/04/2013	1.0642	3.2883	1.5463	1.8342	2.7372	2.8879	0	
01/05/2013	1.0513	3.2891	1.5594	1.8404	2.7069	2.8855	0	
02/05/2013	1.0546	3.2918	1.5861	1.8454	2.7035	2.8724	0	
03/05/2013	1.0472	3.2935	1.5955	1.8515	2.6714	2.8628	0	
04/05/2013	1.0531	3.2952	1.5984	1.8556	2.6795	2.8427	0.402	
05/05/2013	1.0724	3.3019	1.5953	1.8664	2.7193	2.8723	0	
06/05/2013	1.0675	3.3027	1.5737	1.8725	2.6994	2.8754	0	
07/05/2013	1.0596	3.3036	1.5802	1.8785	2.6839	2.8683	0	
08/05/2013	1.0406	3.3057	1.5962	1.8808	2.6365	2.8392	0	
09/05/2013	1.0338	3.2987	1.5503	1.8802	2.6225	2.8539	1.005	
10/05/2013	1.0406	3.3074	1.5467	1.8955	2.7165	2.8385	1.206	
11/05/2013	0.9915	3.2966	1.5644	1.8941	2.6887	2.8691	2.814	
12/05/2013	0.9057	3.292	1.4787	1.8992	2.6885	2.8761	2.613	
13/05/2013	0.8928	3.2993	1.4407	1.9092	2.6734	2.8582	2.01	
14/05/2013	0.8729	3.2908	1.48	1.9069	2.6207	2.8404	1.206	
15/05/2013	0.3964	3.1686	1.1886	1.8323	2.5379	2.7786	34.17	
16/05/2013	0.6621	3.1908	1.4022	1.8126	2.4822	2.7277	0	
17/05/2013	0.7774	3.212	1.4483	1.8028	2.5516	2.7311	0.603	
18/05/2013	0.7628	3.2136	1.46	1.7939	2.5416	2.7712	0.603	
19/05/2013	0.8123	3.2263	1.4842	1.7919	2.598	2.7879	0	
20/05/2013	0.8365	3.2317	1.4859	1.7883	2.6027	2.8184	0.201	
21/05/2013	0.8842	3.237	1.4823	1.7845	2.6273	2.8318	0	
22/05/2013	0.9152	3.2407	1.4907	1.7851	2.6357	2.8365	0	
23/05/2013	0.8048	3.2354	1.4371	1.7852	2.5939	2.8218	1.809	
24/05/2013	0.8564	3.2454	1.4738	1.7908	2.6147	2.8153	0.804	
25/05/2013	0.8928	3.2527	1.4853	1.8024	2.6588	2.8551	0	
26/05/2013	0.887	3.2544	1.5018	1.8068	2.6255	2.8477	0	
27/05/2013	0.8679	3.2548	1.4951	1.8079	2.5614	2.8213	1.005	
28/05/2013	0.5159	3.229	1.2528	1.81	2.5661	2.8087	8.241	
29/05/2013	0.4259	3.2042	1.2899	1.7879	2.5753	2.8112	8.04	
30/05/2013	0.5887	3.2053	1.3298	1.7712	2.5786	2.8165	2.814	
31/05/2013	0.7974	3.2128	1.3685	1.7649	2.6074	2.8291	0.201	
01/06/2013	0.829	3.2183	1.4781	1.7569	2.6282	2.8546	0	
02/06/2013	0.8806	3.2265	1.5111	1.7581	2.65	2.8677	0	
03/06/2013	0.9041	3.2322	1.5137	1.7619	2.6495	2.8766	0	
04/06/2013	0.9017	3.236	1.5257	1.7666	2.6263	2.8732	0	
05/06/2013	0.9079	3.2384	1.534	1.7694	2.6064	2.8584	0	
06/06/2013	0.948	3.2451	1.5075	1.78	2.6337	2.8572	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
07/06/2013	0.9689	3.2529	1.5628	1.792	2.6505	2.8739	0	
08/06/2013	0.9649	3.2539	1.577	1.7996	2.6345	2.8711	0	
09/06/2013	0.9682	3.2571	1.5674	1.8086	2.6196	2.8547	0	
10/06/2013	0.9859	3.2607	1.5671	1.8168	2.6249	2.8462	0	
11/06/2013	0.9986	3.2622	1.4684	1.8258	2.6143	2.8407	0	
12/06/2013	1.0214	3.269	1.4841	1.838	2.6218	2.834	0	
13/06/2013	1.0859	3.2497	1.3462	1.8052	2.6476	2.7919	4.02	
14/06/2013	1.0307	3.2378	1.2989	1.8136	2.6349	2.8389	3.015	
15/06/2013	0.9528	3.2417	1.3817	1.8215	2.6077	2.7887	1.206	
16/06/2013	1.0355	3.2551	1.4171	1.8359	2.6648	2.8168	0.201	
17/06/2013	1.0631	3.2605	1.421	1.844	2.678	2.8459	0	
18/06/2013	1.073	3.2652	1.4305	1.8521	2.6628	2.8495	0	
19/06/2013	1.0938	3.2688	1.4442	1.8616	2.6827	2.8496	0.201	
20/06/2013	1.0731	3.2666	1.3789	1.8643	2.6375	2.8485	0.603	
21/06/2013	1.0962	3.2739	1.5125	1.8723	2.6571	2.8288	0.201	
22/06/2013	1.0026	3.2668	1.5354	1.8764	2.6081	2.8324	2.211	
23/06/2013	1.0124	3.2739	1.5955	1.8845	2.6921	2.8238	1.608	
24/06/2013	1.1091	3.2819	1.6426	1.894	2.7493	2.878	0	
25/06/2013	1.1349	3.2862	1.6589	1.9023	2.7508	2.8961	0	
26/06/2013	1.1482	3.2874	1.6649	1.9077	2.7422	2.8941	0	
27/06/2013	1.1333	3.2818	1.7092	1.9071	2.6979	2.8839	3.216	
28/06/2013	0.796	3.2621	1.5283	1.9113	2.6397	2.8474	3.618	
29/06/2013	0.8772	3.2713	1.6143	1.917	2.6783	2.8461	0.603	
30/06/2013	0.9523	3.2749	1.6444	1.919	2.6497	2.8515	0	
01/07/2013	1.0236	3.2773	1.6419	1.9223	2.6544	2.8303	0.603	
02/07/2013	1.0273	3.2761	1.6459	1.9213	2.6041	2.8387	2.613	
03/07/2013	0.9287	3.2749	1.5882	1.93	2.6658	2.7962	2.814	
04/07/2013	1.0143	3.2835	1.6465	1.9372	2.7037	2.8545	0	
05/07/2013	1.0787	3.2873	1.6696	1.9429	2.7455	2.8888	0	
06/07/2013	1.0999	3.2907	1.6766	1.9492	2.7223	2.8865	0	
07/07/2013	1.1331	3.2949	1.6877	1.9539	2.7447	2.8958	0	
08/07/2013	1.1397	3.296	1.6923	1.9568	2.7333	2.8978	0	
09/07/2013	1.1336	3.295	1.6908	1.9593	2.7043	2.8853	0	
10/07/2013	1.1539	3.2972	1.696	1.9644	2.7116	2.8725	0	
11/07/2013	1.1668	3.2984	1.701	1.9676	2.7156	2.8851	0	
12/07/2013	1.1814	3.3002	1.7054	1.9733	2.7181	2.8818	0	
13/07/2013	1.199	3.3054	1.7117	1.9792	2.7287	2.8823	0	
14/07/2013	1.2061	3.3053	1.7147	1.9817	2.727	2.8927	0	
15/07/2013	1.2138	3.3093	1.7168	1.9883	2.7258	2.8896	0	
16/07/2013	1.2262	3.3097	1.7187	1.9933	2.7343	2.8929	0	
17/07/2013	1.2341	3.3121	1.7219	1.9998	2.7507	2.8974	0	
18/07/2013	1.247	3.3147	1.7242	2.0067	2.7563	2.9063	0	
19/07/2013	1.2618	3.3158	1.725	2.0111	2.7488	2.9074	0	
20/07/2013	1.2612	3.3175	1.725	2.0159	2.748	2.9073	0	
21/07/2013	1.2661	3.3162	1.7263	2.0183	2.7303	2.9005	0	
22/07/2013	1.2803	3.3178	1.7292	2.0238	2.7178	2.8911	0	
23/07/2013	1.2096	3.3247	1.7273	2.0302	2.719	2.8848	2.613	
24/07/2013	1.2719	3.378	1.7312	2.0396	2.737	2.8788	0	
25/07/2013	1.2808	3.3789	1.7289	2.0425	2.7313	2.8826	0.402	
26/07/2013	1.2992	3.3821	1.7358	2.0475	2.7515	2.8867	0	
27/07/2013	1.2932	3.3812	1.7384	2.0504	2.7237	2.8872	0	
28/07/2013	0.5474	3.3147	1.4704	2.0378	2.6533	2.8529	33.768	
29/07/2013	0.9499	3.318	1.6103	2.0372	2.6674	2.8415	0.402	
30/07/2013	1.047	3.3195	1.6368	2.0352	2.6778	2.8608	0.201	
31/07/2013	0.955	3.3147	1.4651	2.0308	2.6888	2.86	6.231	
01/08/2013	0.9586	3.3103	1.6037	2.0298	2.6329	2.8478	0.201	
02/08/2013	1.0369	3.3192	1.6249	2.0322	2.6576	2.8315	0	
03/08/2013	1.1292	3.326	1.6523	2.0373	2.7183	2.8425	0	
04/08/2013	1.1565	3.3246	1.6639	2.0367	2.706	2.8739	0	
05/08/2013	0.8156	3.3058	1.4429	2.0298	2.6382	2.855	9.045	
06/08/2013	0.9546	3.3048	1.579	2.0276	2.6697	2.8499	0.402	
07/08/2013	1.051	3.3115	1.6109	2.0279	2.673	2.8344	0	
08/08/2013	1.1023	3.3179	1.633	2.0307	2.6901	2.8541	0	
09/08/2013	1.1537	3.3222	1.6437	2.0317	2.7157	2.8458	0.201	
10/08/2013	1.1848	3.3257	1.6611	2.0346	2.713	2.8719	0	
11/08/2013	1.1945	3.3264	1.6666	2.0375	2.6902	2.8538	0	
12/08/2013	1.2291	3.3318	1.6752	2.0403	2.7019	2.8569	0	
13/08/2013	1.2445	3.3366	1.6792	2.0452	2.7326	2.8703	0	
14/08/2013	1.2403	3.3396	1.6813	2.0495	2.7202	2.8796	0	
15/08/2013	1.2355	3.3442	1.6822	2.054	2.6984	2.8607	0.402	
16/08/2013	0.5717	3.3034	1.4798	2.0524	2.6627	2.8469	19.899	
17/08/2013	0.9608	3.3022	1.5708	2.0416	2.5928	2.841	0.201	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
18/08/2013	0.9951	3.3021	1.5647	2.0441	2.6437	2.8118	2.613	
19/08/2013	1.0879	3.3125	1.6208	2.0458	2.722	2.8446	0	
20/08/2013	1.1386	3.3144	1.658	2.0436	2.7247	2.8821	0	
21/08/2013	1.2991	3.2723	1.6759	2.0606	2.5859	2.8976	0	
22/08/2013	1.3198	3.278	1.686	2.0646	2.5772	2.882	0	
23/08/2013	1.3357	3.2804	1.6868	2.068	2.5684	2.8801	0	
24/08/2013	1.2816	3.2774	1.6266	2.0683	2.5811	2.8744	4.02	
25/08/2013	1.3282	3.2851	1.6789	2.0754	2.6063	2.8785	0.201	
26/08/2013	1.3545	3.2903	1.7046	2.0794	2.6177	2.9042	0	
27/08/2013	1.3726	3.2941	1.7123	2.0798	2.6146	2.8966	0	
28/08/2013	1.3941	3.2993	1.7238	2.084	2.634	2.9084	0	
29/08/2013	1.4037	3.3019	1.7249	2.0887	2.6085	2.902	0	
30/08/2013	1.4279	3.3062	1.7289	2.0934	2.5961	2.8978	0	
31/08/2013	1.4575	3.312	1.7382	2.0961	2.6667	2.9153	0	
01/09/2013	1.4705	3.3157	1.7421	2.1002	2.659	2.929	0	
02/09/2013	1.4728	3.3194	1.7387	2.1043	2.6444	2.912	0	
03/09/2013	1.4888	3.3209	1.7325	2.1077	2.6462	2.9179	0	
04/09/2013	1.4838	3.3212	1.7286	2.1095	2.6088	2.91	0	
05/09/2013	1.4937	3.3238	1.7292	2.113	2.6011	2.8869	0	
06/09/2013	1.2639	3.3127	1.6002	2.1131	2.5893	2.8906	5.829	
07/09/2013	1.3795	3.3133	1.6464	2.1177	2.6282	2.8838	1.407	
08/09/2013	1.4052	3.3165	1.6798	2.1189	2.6396	2.9173	0	
09/09/2013	1.425	3.3192	1.6974	2.1221	2.6446	2.912	0.603	
10/09/2013	1.4504	3.3239	1.7165	2.1272	2.6771	2.9308	0.603	
11/09/2013	1.4617	3.3235	1.7239	2.1288	2.6587	2.9341	1.005	
12/09/2013	1.3719	3.3162	1.6377	2.133	2.631	2.9128	2.211	
13/09/2013	1.3436	3.3165	1.6486	2.1345	2.6409	2.9062	1.005	
14/09/2013	1.2862	3.3128	1.6019	2.1336	2.6331	2.8973	2.01	
15/09/2013	1.2798	3.303	1.6178	2.1307	2.5155	2.9059	2.01	
16/09/2013	1.2945	3.3095	1.5696	2.1369	2.5716	2.8633	1.206	
17/09/2013	1.3304	3.3046	1.6038	2.1327	2.5574	2.8817	0.603	
18/09/2013	1.4626	3.3135	1.5546	2.1382	2.6436	2.8791	1.407	
19/09/2013	1.4964	3.3091	1.4384	2.1403	2.618	2.9298	2.613	
20/09/2013	1.5923	3.3168	1.6148	2.145	2.6919	2.9286	0	
21/09/2013	1.6544	3.3214	1.6432	2.1473	2.6851	2.9419	0	
22/09/2013	1.7157	3.327	1.6693	2.1503	2.7035	2.9465	0	
23/09/2013	1.7265	3.3238	1.6753	2.1467	2.6621	2.9386	0	
24/09/2013	1.7376	3.3269	1.6727	2.1502	2.6286	2.9153	0	
25/09/2013	1.7403	3.3248	1.6725	2.1487	2.6267	2.9021	1.608	
26/09/2013	1.7586	3.3292	1.6862	2.1492	2.6715	2.9191	0	
27/09/2013	1.7687	3.3323	1.6909	2.1529	2.6554	2.9259	0	
28/09/2013	1.7735	3.3333	1.6887	2.155	2.6336	2.9137	0	
29/09/2013	1.791	3.3344	1.6949	2.1564	2.6432	2.9064	0	
30/09/2013	1.7921	3.3384	1.7008	2.1583	2.652	2.9113	0	
01/10/2013	1.7995	3.3404	1.7066	2.1597	2.6698	2.9238	0	
02/10/2013	1.7237	3.3291	1.5658	2.1606	2.6633	2.9206	4.02	
03/10/2013	1.6564	3.3181	1.5551	2.1587	2.6171	2.9207	3.618	
04/10/2013	1.5184	3.3125	1.3291	2.1564	2.6367	2.8991	4.02	
05/10/2013	1.5741	3.3072	1.5335	2.1517	2.6826	2.9194	0	
06/10/2013	1.6542	3.3071	1.6064	2.1439	2.6707	2.9377	0	
07/10/2013	1.7054	3.3113	1.6266	2.1401	2.6595	2.9256	0	
08/10/2013	1.7381	3.3142	1.6469	2.1386	2.6653	2.9156	0	
09/10/2013	1.7438	3.309	1.6476	2.1284	2.6227	2.9223	1.005	
10/10/2013	1.7655	3.3125	1.6677	2.1348	2.6701	2.9038	0	
11/10/2013	1.7787	3.3164	1.6711	2.1363	2.6743	2.917	0	
12/10/2013	1.785	3.318	1.6573	2.1384	2.6496	2.9231	0	
13/10/2013	1.7745	3.3137	1.6654	2.1336	2.6051	2.9042	1.206	
14/10/2013	1.7218	3.3034	1.4094	2.1359	2.5961	2.8763	4.02	
15/10/2013	1.7044	3.3087	1.5857	2.1374	2.6249	2.8824	0.201	
16/10/2013	1.7093	3.2977	1.3283	2.1291	2.5501	2.9035	1.608	
17/10/2013	1.7003	3.3044	1.5261	2.1362	2.6356	2.8815	1.005	
18/10/2013	1.7229	3.3009	1.5809	2.1304	2.6142	2.9092	0.201	
19/10/2013	1.6504	3.2928	1.4654	2.1274	2.559	2.8675	3.015	
20/10/2013	1.6347	3.2876	1.503	2.1203	2.5651	2.8684	4.824	
21/10/2013	0.624	3.2501	1.2015	2.0982	2.5187	2.876	8.844	
22/10/2013	1.2735	3.2319	1.3079	2.075	2.4477	2.8321	1.809	
23/10/2013	1.1466	3.2127	1.2467	2.0467	2.5034	2.7847	6.03	
24/10/2013	1.4275	3.2124	1.4553	2.0218	2.5391	2.853	0	
25/10/2013	1.4682	3.2012	1.3676	1.9975	2.4515	2.8227	1.608	
26/10/2013	1.4732	3.2038	1.4885	1.9803	2.4726	2.8156	0	
27/10/2013	1.4579	3.2036	1.4731	1.9649	2.4418	2.798	1.407	
28/10/2013	1.2362	3.1837	1.231	1.9515	2.4783	2.7924	5.025	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
29/10/2013	1.2961	3.175	1.3045	1.935	2.5203	2.8118	3.216	
30/10/2013	1.4211	3.1731	1.4454	1.9135	2.4839	2.8172	0.201	
31/10/2013	1.4903	3.172	1.4218	1.9025	2.4843	2.8051	1.005	
01/11/2013	1.3731	3.2082	1.4883	1.9297	2.5587	2.8118	4.221	
02/11/2013	1.2477	3.1853	1.2134	1.9153	2.5013	2.8109	2.613	
03/11/2013	1.2139	3.1876	1.386	1.8999	2.4551	2.6971	1.407	
04/11/2013	1.2717	3.1837	1.4311	1.8843	2.4152	2.6763	0	
05/11/2013	1.4001	3.1889	1.4843	1.8786	2.4784	2.7605	3.216	
06/11/2013	1.359	3.1881	1.4213	1.8717	2.508	2.7615	0.402	
07/11/2013	1.076	3.1759	1.2448	1.8662	2.5098	2.738	2.613	
08/11/2013	1.2753	3.1779	1.4285	1.8507	2.4706	2.7145	0	
09/11/2013	1.407	3.1842	1.4728	1.8417	2.4845	2.7367	0.201	
10/11/2013	1.4912	3.1901	1.4463	1.8391	2.5216	2.7116	1.005	
11/11/2013	1.5516	3.1986	1.5426	1.8399	2.586	2.8143	1.608	
12/11/2013	1.4909	3.1976	1.4114	1.8429	2.5896	2.7952	0.603	
13/11/2013	1.4991	3.2002	1.5255	1.8369	2.6159	2.8271	0	
14/11/2013	1.4943	3.2005	1.3952	1.8356	2.5167	2.7441	3.618	
15/11/2013	1.4352	3.1976	1.4485	1.8351	2.6019	2.8126	0	
16/11/2013	1.4879	3.2079	1.519	1.8369	2.57	2.8049	0	
17/11/2013	1.5268	3.2107	1.5607	1.8339	2.5482	2.7971	0.201	
18/11/2013	1.5456	3.215	1.574	1.8327	2.4918	2.7778	0.603	
19/11/2013	1.5384	3.2091	1.3723	1.8313	2.5137	2.7471	2.814	
20/11/2013	1.4755	3.1985	1.4779	1.8288	2.5038	2.8177	4.221	
21/11/2013	1.3374	3.1822	1.3527	1.822	2.4532	2.6946	1.005	
22/11/2013	1.4145	3.1952	1.4713	1.8191	2.5245	2.7256	0.201	
23/11/2013	1.4918	3.1961	1.5317	1.8083	2.5388	2.7489	0	
24/11/2013	1.5461	3.2067	1.5713	1.806	2.5703	2.7751	0	
25/11/2013	1.5833	3.2161	1.6153	1.8071	2.6102	2.8077	0	
26/11/2013	1.6	3.219	1.6305	1.806	2.6102	2.8218	0	
27/11/2013	1.6305	3.2226	1.4648	1.7967	2.634	2.906	0	
28/11/2013	1.6412	3.2301	1.4816	1.8023	2.6512	2.9252	0	
29/11/2013	1.6344	3.2266	1.4804	1.7998	2.6295	2.9334	0.201	
30/11/2013	1.642	3.2318	1.4776	1.8063	2.6261	2.8832	0	
01/12/2013	1.6525	3.2396	1.4918	1.8152	2.6725	2.9261	0	
02/12/2013	1.6658	3.2476	1.5039	1.822	2.696	2.9515	0	
03/12/2013	1.6601	3.2491	1.4983	1.8265	2.6634	2.9401	0	
04/12/2013	1.6591	3.2526	1.4892	1.8298	2.6419	2.8923	0.201	
05/12/2013	1.6688	3.253	1.4955	1.8356	2.6688	2.9715	0.402	
06/12/2013	1.6643	3.2572	1.4869	1.842	2.6827	2.9233	1.407	
07/12/2013	1.6368	3.2578	1.4194	1.8524	2.6829	2.9445	1.809	
08/12/2013	1.6514	3.2643	1.4624	1.8572	2.664	2.9311	0	
09/12/2013	1.6728	3.2729	1.4946	1.8678	2.6948	2.9344	0	
10/12/2013	1.6757	3.2751	1.5014	1.8714	2.7065	2.942	0	
11/12/2013	1.6815	3.2802	1.5012	1.8768	2.7143	2.9571	0	
12/12/2013	1.6719	3.2799	1.4867	1.8781	2.6746	2.9325	0	
13/12/2013	1.6721	3.2847	1.4832	1.8873	2.6717	2.9425	1.206	
14/12/2013	1.6735	3.2864	1.4656	1.8918	2.7035	2.959	0.201	
15/12/2013	1.6705	3.2956	1.4704	1.8984	2.6855	2.9309	0	
16/12/2013	1.6407	3.2891	1.4554	1.9002	2.6446	2.8948	10.854	
17/12/2013	1.5073	3.2701	1.3974	1.8904	2.6718	2.924	0.201	
18/12/2013	1.5419	3.2635	1.4358	1.8722	2.5777	2.9047	0	
19/12/2013	1.5012	3.2495	1.2337	1.8586	2.5004	2.7889	2.814	
20/12/2013	1.5287	3.2533	1.3965	1.8469	2.5754	2.7916	0.804	
21/12/2013	1.5503	3.2515	1.1793	1.8415	2.5411	2.8313	2.613	
22/12/2013	1.4792	3.241	1.2779	1.8258	2.4987	2.7831	3.216	
23/12/2013	1.4711	3.2371	1.3708	1.8093	2.4989	2.8477	0	
24/12/2013	1.361	3.2175	1.0767	1.785	2.3166	2.6769	2.412	
25/12/2013	1.4186	3.217	1.3275	1.7657	2.3895	2.6642	0.603	
26/12/2013	1.5081	3.2244	1.3991	1.7543	2.4818	2.7485	0	
27/12/2013	1.5314	3.2142	1.3529	1.736	2.3894	2.7449	2.01	
28/12/2013	1.4669	3.2148	1.319	1.7356	2.5051	2.7646	0.603	
29/12/2013	1.5334	3.2218	1.4185	1.7243	2.5972	2.8196	0.402	
30/12/2013	1.5698	3.2244	1.4535	1.7202	2.5552	2.8593	0	
31/12/2013	1.5345	3.2241	1.4409	1.7132	2.5696	2.8823	0.201	
01/01/2014	1.508	3.2223	1.3349	1.7098	2.5441	2.8861	0.603	
02/01/2014	1.3725	3.205	1.1194	1.7058	2.4841	2.7685	4.221	
03/01/2014	1.3787	3.2066	1.3252	1.6891	2.4401	2.7205	0.201	
04/01/2014	1.4596	3.206	1.3333	1.6834	2.5176	2.8108	0.201	
05/01/2014	1.4658	3.2091	1.4008	1.6713	2.5234	2.7813	0.201	
06/01/2014	1.4828	3.1995	1.1439	1.6691	2.4642	2.7793	2.613	
07/01/2014	1.4032	3.195	1.2129	1.6646	2.4859	2.726	2.613	
08/01/2014	1.4184	3.1901	1.267	1.6489	2.499	2.7096	2.211	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
09/01/2014	1.3217	3.1482	1.0031	1.6215	2.3903	2.6631	9.447	
10/01/2014	1.3225	3.1601	1.2809	1.5942	2.3824	2.608	0	
11/01/2014	1.4108	3.1689	1.3499	1.579	2.3761	2.6164	1.608	
12/01/2014	1.4453	3.1648	1.3548	1.5656	2.4619	2.7849	0.201	
13/01/2014	1.3993	3.1627	1.2074	1.56	2.4072	2.7535	1.809	
14/01/2014	1.3945	3.1649	1.2864	1.5551	2.4174	2.7201	1.809	
15/01/2014	1.3834	3.1549	1.1909	1.551	2.3856	2.7165	3.015	
16/01/2014	1.3184	3.1583	1.2258	1.5443	2.349	2.6908	0.804	
17/01/2014	1.3493	3.164	1.3126	1.5378	2.3392	2.6628	0	
18/01/2014	1.4459	3.1712	1.3822	1.5414	2.4321	2.7769	1.809	
19/01/2014	1.4381	3.1492	1.08	1.5416	2.4335	2.7486	7.437	
20/01/2014	1.3648	3.1489	1.2815	1.5276	2.4219	2.6478	0	
21/01/2014	1.4432	3.1569	1.3668	1.5218	2.4334	2.7355	0	
22/01/2014	1.456	3.1448	1.1568	1.5192	2.4067	2.7404	3.015	
23/01/2014	1.4618	3.1619	1.3698	1.5178	2.4618	2.7485	0.201	
24/01/2014	1.4926	3.1636	1.4123	1.517	2.4766	2.7973	0.201	
25/01/2014	1.4204	3.1362	1.1283	1.5142	2.4593	2.791	9.045	
26/01/2014	1.3563	3.1335	1.2486	1.4955	2.3589	2.6901	2.814	
27/01/2014	1.2817	3.1164	1.2096	1.4741	2.1878	2.5251	0.402	
28/01/2014	1.3406	3.1312	1.2937	1.4671	2.2092	2.553	3.618	
29/01/2014	1.2508	3.0956	1.0149	1.472	2.305	2.461	3.417	
30/01/2014	1.263	3.1137	1.2591	1.4491	2.2487	2.3831	0	
31/01/2014	1.3516	3.1232	1.3343	1.4359	2.2773	2.5203	3.819	
01/02/2014	1.1061	3.0864	1.1537	1.4154	2.1856	2.4194	0.402	
02/02/2014	1.201	3.102	1.1975	1.4218	2.1726	2.3033	2.01	
03/02/2014	1.2824	3.1176	1.3312	1.4125	2.2647	2.4858	0	
04/02/2014	1.3435	3.1233	1.3646	1.4111	2.2749	2.5319	0	
05/02/2014	1.3672	3.1116	1.3382	1.409	2.2578	2.5919	2.211	
06/02/2014	1.0905	3.1182	1.1794	1.4472	2.3853	2.5918	1.407	
07/02/2014	1.0019	3.0818	1.0385	1.4232	2.2158	2.3719	5.628	
08/02/2014	1.0704	3.0799	1.1567	1.3937	2.0731	2.3055	1.005	
09/02/2014	1.0127	3.0567	1.0564	1.387	2.1242	2.3113	3.216	
10/02/2014	1.1864	3.0816	1.2637	1.373	2.1743	2.3372	3.216	
11/02/2014	1.1246	3.0749	1.2351	1.3642	2.2547	2.4901	6.231	
12/02/2014	1.106	3.0589	1.196	1.3456	2.1924	2.3935	1.206	
13/02/2014	1.0893	3.0549	1.1995	1.3259	2.084	2.2659	0	
14/02/2014	1.2351	3.0827	1.3008	1.3328	2.1869	2.4419	0.804	
15/02/2014	1.09	3.044	1.0745	1.3213	2.1262	2.3894	6.03	
16/02/2014	1.1428	3.0532	1.2118	1.3331	2.2726	2.4114	0	
17/02/2014	1.2298	3.0672	1.3195	1.3131	2.2208	2.4393	0.201	
18/02/2014	1.3439	3.0697	1.191	1.3313	2.3147	2.5675	1.407	
19/02/2014	1.3279	3.0911	1.3542	1.3486	2.3648	2.6111	0	
20/02/2014	1.3612	3.0906	1.3875	1.3579	2.3365	2.636	0.804	
21/02/2014	1.3499	3.1086	1.3981	1.3814	2.393	2.6605	0	
22/02/2014	1.4114	3.1218	1.4267	1.4072	2.4366	2.6756	0.402	
23/02/2014	1.4626	3.1327	1.4392	1.4258	2.4582	2.727	0	
24/02/2014	1.4962	3.1404	1.4586	1.4478	2.4736	2.7319	0.402	
25/02/2014	1.499	3.1457	1.458	1.4609	2.4475	2.7116	0.402	
26/02/2014	1.5097	3.1584	1.6406	1.4896	2.5443	2.7413	1.005	
27/02/2014	1.4899	3.2752	1.6726	1.4801	2.4832	2.7556	3.417	
28/02/2014	1.1353	3.2711	1.5794	1.4897	2.442	2.7199	0	
01/03/2014	1.3169	3.2665	1.6378	1.5123	2.4985	2.7644	0	
02/03/2014	1.4071	3.2664	1.6472	1.5232	2.4711	2.7731	1.608	
03/03/2014	1.1204	3.263	1.3964	1.5177	2.3969	2.6832	4.623	
04/03/2014	1.2189	3.2606	1.5948	1.5286	2.5131	2.7431	0.201	
05/03/2014	1.3834	3.2611	1.6474	1.5399	2.587	2.7754	0	
06/03/2014	1.4693	3.2673	1.6694	1.5451	2.5895	2.8038	2.01	
07/03/2014	1.3822	3.2703	1.659	1.548	2.5309	2.7505	1.608	
08/03/2014	1.3306	3.2673	1.6477	1.5541	2.579	2.8216	0	
09/03/2014	1.384	3.2671	1.6696	1.5615	2.5315	2.7623	0	
10/03/2014	1.4663	3.2675	1.6887	1.5732	2.5822	2.766	0	
11/03/2014	1.5252	3.2638	1.7047	1.5773	2.6267	2.8157	0	
12/03/2014	1.5396	3.2647	1.7097	1.5837	2.6059	2.8171	0.201	
13/03/2014	1.5441	3.2621	1.7096	1.5903	2.5823	2.7932	0	
14/03/2014	1.5573	3.2653	1.7174	1.6005	2.5901	2.8117	0	
15/03/2014	1.5653	3.2692	1.723	1.6172	2.5891	2.8032	0	
16/03/2014	1.573	3.2683	1.7307	1.6253	2.5854	2.805	0	
17/03/2014	1.5742	3.2686	1.7354	1.6356	2.5852	2.8097	0	
18/03/2014	1.5731	3.2669	1.7327	1.6412	2.5655	2.8069	0.804	
19/03/2014	1.5815	3.2658	1.7401	1.6522	2.6136	2.816	0	
20/03/2014	1.5828	3.2681	1.7373	1.6573	2.5636	2.8271	0.201	
21/03/2014	1.5623	3.2599	1.7271	1.6651	2.562	2.787	1.407	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
22/03/2014	1.5609	3.2613	1.7205	1.6708	2.5278	2.7697	1.005	
23/03/2014	1.5773	3.2586	1.7325	1.6842	2.593	2.7824	1.206	
24/03/2014	1.5972	3.2573	1.7454	1.6934	2.6604	2.8558	0	
25/03/2014	1.5876	3.261	1.7422	1.701	2.5936	2.7918	3.015	
26/03/2014	1.1876	3.2619	1.6297	1.7142	2.6824	2.8571	1.206	
27/03/2014	1.3478	3.2621	1.6825	1.7109	2.5976	2.8029	0.402	
28/03/2014	1.3713	3.2592	1.5814	1.7192	2.616	2.811	2.01	
29/03/2014	1.3767	3.2631	1.6142	1.7288	2.6008	2.8154	0.804	
30/03/2014	1.3968	3.2665	1.6752	1.737	2.583	2.7971	0	
31/03/2014	1.4825	3.267	1.6925	1.7425	2.5963	2.8021	0	
01/04/2014	1.5011	3.2645	1.3643	1.7461	2.593	2.8035	5.628	
02/04/2014	1.302	3.2661	1.6415	1.7427	2.559	2.796	0.603	
03/04/2014	1.3408	3.265	1.6481	1.7464	2.5433	2.7712	0	
04/04/2014	1.3946	3.2624	1.5585	1.7489	2.5773	2.7782	2.211	
05/04/2014	1.3135	3.2623	1.6507	1.7519	2.6012	2.8067	1.005	
06/04/2014	1.3626	3.2666	1.6662	1.7565	2.5845	2.801	1.206	
07/04/2014	1.3547	3.2636	1.6646	1.7548	2.6003	2.8228	8.442	
08/04/2014	1.2053	3.2561	1.5262	1.7409	2.5718	2.7605	0.402	
09/04/2014	1.3303	3.2579	1.6141	1.7372	2.6289	2.8197	0	
10/04/2014	1.4237	3.2601	1.644	1.7268	2.5992	2.8021	0	
11/04/2014	1.4867	3.257	1.659	1.7232	2.5988	2.7887	0	
12/04/2014	1.5291	3.2598	1.6716	1.7228	2.5841	2.7984	0	
13/04/2014	1.5485	3.2569	1.6796	1.7301	2.6154	2.7935	0	
14/04/2014	1.5671	3.258	1.6918	1.7389	2.6204	2.7928	0	
15/04/2014	1.5632	3.2355	1.681	1.7261	2.6382	2.8311	0.201	
16/04/2014	1.4614	3.2362	1.558	1.7536	2.6093	2.8166	0	
17/04/2014	1.458	3.2357	1.556	1.7606	2.573	2.8024	0	
18/04/2014	1.4654	3.2377	1.5561	1.7651	2.5937	2.796	0	
19/04/2014	1.4698	3.2394	1.5607	1.771	2.5987	2.8116	0	
20/04/2014	1.469	3.2393	1.5496	1.7748	2.5821	2.8263	0.201	
21/04/2014	1.4597	3.2441	1.5521	1.7823	2.5552	2.7797	0.201	
22/04/2014	1.4727	3.25	1.5652	1.7915	2.5766	2.7971	1.407	
23/04/2014	1.4763	3.2564	1.5717	1.7998	2.6244	2.8141	0	
24/04/2014	1.4894	3.2573	1.5786	1.8046	2.6435	2.833	0.201	
25/04/2014	1.4926	3.2601	1.5783	1.8133	2.6186	2.8391	3.819	
26/04/2014	1.1827	3.2151	1.3235	1.7984	2.5011	2.7865	7.638	
27/04/2014	1.1699	3.2254	1.4769	1.8065	2.5155	2.7537	0	
28/04/2014	1.3204	3.2357	1.5139	1.812	2.5783	2.791	0	
29/04/2014	1.401	3.2431	1.5306	1.8186	2.5891	2.8063	0	
30/04/2014	1.4361	3.2501	1.5436	1.8236	2.5859	2.8104	0	
01/05/2014	1.4531	3.251	1.5474	1.8246	2.5736	2.7991	0.804	
02/05/2014	1.4728	3.2588	1.5624	1.8299	2.6485	2.82	0	
03/05/2014	1.4884	3.2607	1.5782	1.8339	2.6664	2.8621	0	
04/05/2014	1.4845	3.2618	1.5878	1.841	2.6185	2.842	0	
05/05/2014	1.4737	3.262	1.5815	1.8411	2.5741	2.825	0	
06/05/2014	1.4634	3.2602	1.5753	1.845	2.5333	2.7737	2.211	
07/05/2014	1.4621	3.2632	1.5734	1.85	2.5676	2.787	0.201	
08/05/2014	1.4852	3.2699	1.5851	1.8603	2.6143	2.8458	2.412	
09/05/2014	1.3878	3.2513	1.5062	1.8585	2.5882	2.8038	6.432	
10/05/2014	1.3203	3.2444	1.5247	1.8602	2.5778	2.8535	3.618	
11/05/2014	1.1455	3.2391	1.4807	1.8603	2.5355	2.7663	5.628	
12/05/2014	0.962	3.228	1.3622	1.8577	2.5835	2.8031	4.623	
13/05/2014	0.907	3.1999	1.1194	1.8403	2.5711	2.7858	9.648	
14/05/2014	0.9632	3.1778	1.2749	1.7947	2.5305	2.7375	0	
15/05/2014	1.2033	3.1884	1.4179	1.7724	2.5436	2.7605	0	
16/05/2014	1.3107	3.188	1.4591	1.7588	2.5379	2.7794	0	
17/05/2014	1.3606	3.1914	1.4758	1.7496	2.5106	2.7709	0	
18/05/2014	1.381	3.1915	1.4824	1.7451	2.4777	2.7658	0	
19/05/2014	1.3999	3.1973	1.4828	1.7466	2.4735	2.7536	0	
20/05/2014	1.4261	3.2041	1.4917	1.7571	2.5131	2.7588	0.603	
21/05/2014	1.4508	3.2092	1.5057	1.765	2.5688	2.7927	0.402	
22/05/2014	1.4456	3.2087	1.5014	1.7691	2.5219	2.774	2.01	
23/05/2014	1.4221	3.2056	1.4721	1.7791	2.5562	2.7943	2.412	
24/05/2014	1.3582	3.2038	1.4708	1.7824	2.5378	2.7881	2.211	
25/05/2014	1.3047	3.1933	1.3835	1.7818	2.5201	2.776	2.613	
26/05/2014	1.3397	3.1869	1.4076	1.7803	2.5191	2.787	3.216	
27/05/2014	1.4674	3.1912	1.5239	1.7791	2.4942	2.7779	0	
28/05/2014	1.5662	3.1966	1.543	1.7798	2.4904	2.777	3.015	
29/05/2014	1.3099	3.1909	1.4855	1.7777	2.4875	2.7623	1.809	
30/05/2014	1.3448	3.1914	1.4958	1.7782	2.5128	2.7713	0	
31/05/2014	1.5138	3.1969	1.5426	1.7778	2.5124	2.7855	0	
01/06/2014	1.6037	3.2008	1.5579	1.7778	2.5028	2.785	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
02/06/2014	1.6334	3.2059	1.5703	1.7848	2.4845	2.7745	1.608	
03/06/2014	1.5736	3.2044	1.5601	1.7865	2.4677	2.7652	1.206	
04/06/2014	1.6315	3.2069	1.5695	1.789	2.4403	2.757	0.201	
05/06/2014	1.6213	3.2116	1.573	1.794	2.4739	2.743	0.804	
06/06/2014	1.671	3.2192	1.5928	1.806	2.5033	2.7678	0	
07/06/2014	1.6837	3.2268	1.6017	1.8183	2.4929	2.7633	6.633	
08/06/2014	1.4697	3.208	1.4467	1.8205	2.5073	2.7674	1.407	
09/06/2014	1.459	3.2078	1.488	1.8255	2.5007	2.7796	7.236	
10/06/2014	1.1967	3.1847	1.408	1.8042	2.4322	2.6873	1.005	
11/06/2014	1.369	3.1881	1.4585	1.7922	2.4746	2.7137	0.804	
12/06/2014	1.5263	3.191	1.5169	1.7848	2.5248	2.7767	0	
13/06/2014	1.6084	3.1956	1.5472	1.7805	2.5173	2.7794	0	
14/06/2014	1.6424	3.2019	1.5635	1.7816	2.5259	2.7767	0	
15/06/2014	1.672	3.2083	1.5803	1.79	2.5553	2.7941	2.01	
16/06/2014	1.6295	3.2073	1.5838	1.7917	2.5603	2.8012	0	
17/06/2014	1.6665	3.2119	1.5959	1.8006	2.5695	2.8074	0	
18/06/2014	1.6829	3.218	1.6049	1.8123	2.5685	2.8127	0	
19/06/2014	1.6836	3.2213	1.6077	1.8213	2.5578	2.8054	0	
20/06/2014	1.6907	3.2248	1.6126	1.8291	2.5691	2.8139	0	
21/06/2014	1.696	3.2281	1.6099	1.8375	2.5662	2.811	0	
22/06/2014	1.7051	3.2357	1.6194	1.8476	2.5865	2.8224	0	
23/06/2014	1.717	3.2411	1.6286	1.8585	2.6056	2.8368	0	
24/06/2014	1.7182	3.2455	1.6355	1.8682	2.6093	2.847	0	
25/06/2014	1.7206	3.2498	1.6395	1.874	2.607	2.8448	0	
26/06/2014	1.7267	3.2548	1.6411	1.8816	2.5977	2.8412	0	
27/06/2014	1.7262	3.256	1.6436	1.8881	2.594	2.8402	0.402	
28/06/2014	1.6563	3.2554	1.6126	1.8931	2.5974	2.8354	3.015	
29/06/2014	1.7071	3.2593	1.6076	1.8981	2.6162	2.8392	0.402	
30/06/2014	1.7208	3.2656	1.6344	1.905	2.6421	2.86	0	
01/07/2014	1.7394	3.2705	1.6503	1.9157	2.6548	2.8595	0	
02/07/2014	1.7488	3.2726	1.6593	1.923	2.6713	2.8854	0	
03/07/2014	1.7491	3.2772	1.6597	1.9311	2.6517	2.8787	0.201	
04/07/2014	1.7427	3.2761	1.6491	1.9361	2.6151	2.877	0.201	
05/07/2014	1.6151	3.2704	1.6113	1.9383	2.571	2.8092	7.035	
06/07/2014	1.6078	3.2638	1.5773	1.9438	2.6191	2.8493	2.01	
07/07/2014	1.4749	3.2526	1.4388	1.9448	2.6423	2.8513	9.849	
08/07/2014	1.5707	3.2557	1.5599	1.9505	2.6592	2.8747	0.201	
09/07/2014	1.6151	3.262	1.5926	1.9572	2.6808	2.8772	0.201	
10/07/2014	1.6836	3.2655	1.6078	1.9616	2.6701	2.8802	0	
11/07/2014	1.7064	3.2714	1.617	1.9677	2.6695	2.8807	0	
12/07/2014	1.724	3.2747	1.6212	1.9726	2.6579	2.8859	0.201	
13/07/2014	1.7243	3.2732	1.6213	1.9774	2.6164	2.8434	0.201	
14/07/2014	1.7353	3.2786	1.6302	1.9818	2.6683	2.8768	0	
15/07/2014	1.682	3.2868	1.639	1.9879	2.691	2.8758	0.402	
16/07/2014	1.7489	3.2839	1.6402	1.9914	2.7071	2.9066	0	
17/07/2014	1.754	3.2882	1.6247	1.9978	2.7129	2.9044	0	
18/07/2014	1.7551	3.2907	1.6402	2.0022	2.6848	2.9113	0	
19/07/2014	1.7253	3.2918	1.6468	2.0075	2.671	2.8888	13.668	
20/07/2014	0.889	3.2453	1.4517	1.9876	2.611	2.8431	0.402	
21/07/2014	1.4514	3.25	1.5473	1.9828	2.6583	2.863	0	
22/07/2014	1.6143	3.2558	1.5716	1.9829	2.6875	2.8869	0	
23/07/2014	1.6759	3.2596	1.5843	1.9852	2.6848	2.8983	0	
24/07/2014	1.7013	3.2635	1.5952	1.9884	2.6666	2.8799	0	
25/07/2014	1.7199	3.2677	1.6085	1.9946	2.6749	2.8857	0	
26/07/2014	1.7257	3.2717	1.6155	1.9994	2.6744	2.8817	0	
27/07/2014	1.7416	3.2754	1.6246	2.0046	2.6798	2.8815	0.201	
28/07/2014	1.7449	3.2769	1.6339	2.0081	2.6739	2.8728	0	
29/07/2014	1.7551	3.2826	1.6439	2.0134	2.6987	2.8953	0	
30/07/2014	1.7562	3.2857	1.6487	2.0172	2.6916	2.8944	0	
31/07/2014	1.7597	3.3033	1.6692	2.0368	2.7022	2.8959	0.201	
01/08/2014	1.7605	3.1805	1.741	1.8012	2.4463	2.6443	1.608	
02/08/2014	1.6938	3.2606	1.7008	1.8727	2.4917	2.6868	14.472	
03/08/2014	1.3214	3.0159	1.411	2.2409	2.8551	3.1168	1.407	
04/08/2014	1.6703	3.2099	1.7154	1.9031	2.5777	2.7789	0	
05/08/2014	1.7192	3.1815	1.7066	1.8559	2.5132	2.7218	0	
06/08/2014	1.6788	3.1874	1.7207	1.8928	2.5183	2.7076	3.417	
07/08/2014	1.6227	3.274	1.7992	1.9553	2.6037	2.8069	0	
08/08/2014	1.7013	3.241	1.7789	1.8785	2.5216	2.7499	0	
09/08/2014	1.7181	3.1962	1.7291	1.8644	2.463	2.6811	0	
10/08/2014	1.7484	3.1752	1.7157	1.8371	2.4445	2.6004	7.638	
11/08/2014	1.3961	3.3199	1.7721	2.1854	2.788	3.0343	0	
12/08/2014	1.5784	3.3621	1.8596	2.004	2.617	2.8537	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
13/08/2014	1.6672	3.2479	1.7617	1.915	2.521	2.7411	0.402	
14/08/2014	1.7203	3.095	1.6245	1.865	2.5108	2.7147	1.206	
15/08/2014	1.7388	3.0215	1.562	1.8514	2.52	2.6992	0	
16/08/2014	1.758	3.0489	1.601	1.8348	2.5223	2.7132	0	
17/08/2014	1.7551	3.2387	1.7913	1.8391	2.4533	2.6726	2.613	
18/08/2014	1.7365	3.1146	1.6648	1.8582	2.4656	2.6471	3.618	
19/08/2014	1.6549	3.1181	1.6209	1.9422	2.5773	2.6214	10.452	
20/08/2014	1.2806			2.3062	2.9359	3.1886	0.402	
21/08/2014	1.5502		1.9564	2.0262	2.6465	2.8929	0	
22/08/2014	1.515	3.2887	1.7803	2.0664	2.6527	2.8718	3.216	
23/08/2014	1.4581	3.3512	1.7276	2.1205	2.746	2.9525	5.025	
24/08/2014	1.3121	3.2764	1.568	2.2661	2.9039	3.1546	0	
25/08/2014	1.4488		1.9132	2.125	2.7253	2.9688	3.015	
26/08/2014	0.9819	3.1295	1.6143	2.575	3.1447	3.352	4.824	
27/08/2014	1.1423			2.3947	3.0421	3.3238	0	
28/08/2014	1.3853		2.0072	2.1369	2.737	3.017	0.603	
29/08/2014	1.4796	3.3823	1.7118	2.0353	2.6614	2.9247	0	
30/08/2014	1.5458	3.2475	1.5973	1.9655	2.6249	2.8534	1.608	
31/08/2014	1.5576	3.1751	1.4753	1.9546	2.6442	2.8562	3.216	
01/09/2014	1.5305	3.2654	1.6208	1.9824	2.6686	2.8943	0.804	
02/09/2014	1.5349	3.1761	1.555	1.9767	2.6879	2.9081	0	
03/09/2014	1.5756	3.2414	1.6384	1.9416	2.6405	2.8658	0	
04/09/2014	1.5985	3.2407	1.6438	1.9223	2.6072	2.8388	0	
05/09/2014	1.6049	3.2381	1.6425	1.919	2.5874	2.8233	0	
06/09/2014	1.6125	3.2183	1.626	1.9168	2.573	2.8111	0.201	
07/09/2014	1.6175	3.1806	1.5925	1.9126	2.5697	2.8042	0	
08/09/2014	1.6242	3.1544	1.5744	1.9122	2.5888	2.8107	0	
09/09/2014	1.633	3.1534	1.5777	1.914	2.5987	2.8216	0	
10/09/2014	1.6365	3.1853	1.6113	1.9193	2.5942	2.8178	0	
11/09/2014	1.6434	3.1704	1.5932	1.9227	2.5936	2.8068	0	
12/09/2014	1.648	3.1577	1.5828	1.9244	2.6034	2.8086	0	
13/09/2014	1.6531	3.1572	1.5818	1.9294	2.6129	2.8162	0	
14/09/2014	1.6568	3.2022	1.6339	1.9332	2.6034	2.8213	0	
15/09/2014	1.6497	3.2344	1.663	1.9422	2.5827	2.8161	0	
16/09/2014	1.6521	3.2137	1.6366	1.9478	2.5723	2.8009	0.402	
17/09/2014	1.6588	3.1919	1.6166	1.9473	2.5775	2.8014	0	
18/09/2014	1.6602	3.2253	1.6458	1.9499	2.5723	2.7969	0	
19/09/2014	1.663	3.173	1.5947	1.9509	2.5889	2.8042	0	
20/09/2014	1.6689	3.1639	1.5849	1.9503	2.6056	2.801	0.603	
21/09/2014	1.6694	3.0898	1.5212	1.9518	2.647	2.8264	0.201	
22/09/2014	1.6707	3.1746	1.6154	1.9499	2.6414	2.8395	0	
23/09/2014	1.6686	3.2524	1.6938	1.9568	2.6103	2.8241	0	
24/09/2014	1.6475	3.2891	1.7192	1.9808	2.5916	2.7991	4.02	
25/09/2014	1.6393	3.1853	1.5804	1.9923	2.6447	2.8499	0	
26/09/2014	1.6611	3.2203	1.6324	1.9786	2.6311	2.8144	0	
27/09/2014	1.6725	3.1585	1.5825	1.9672	2.6536	2.8415	0	
28/09/2014	1.6754	3.2585	1.6856	1.9707	2.6237	2.8343	0	
29/09/2014	1.6784	3.2105	1.6376	1.9708	2.6222	2.824	0	
30/09/2014	1.6796	3.19	1.617	1.9741	2.6298	2.8233	0	
01/10/2014	1.6837	3.2169	1.645	1.9755	2.6326	2.8137	0	
02/10/2014	1.6921	3.0912	1.5279	1.9656	2.6663	2.8468	0.201	
03/10/2014	1.6836	3.3103	1.7506	1.9789	2.6159	2.8252	0	
04/10/2014	1.6755	3.3859	1.8255	1.992	2.5707	2.7603	5.628	
05/10/2014	1.6194	3.2124	1.5826	2.0468	2.7039	2.8963	0	
06/10/2014	1.6359		1.8942	2.0314	2.5925	2.6038	8.643	
07/10/2014	1.1652		1.9622	2.4921	3.019	3.3032	2.01	
08/10/2014	1.3717		1.7306	2.2862	2.8505	3.1117	2.01	
09/10/2014	1.4407	3.4123	1.5078	2.2136	2.7518	2.9471	7.638	
10/10/2014	1.2619	3.2584	1.4217	2.3901	2.9899	3.2125	1.608	
11/10/2014	1.4122		1.7073	2.2269	2.8349	3.0578	0	
12/10/2014	1.4981	3.3683	1.6759	2.1327	2.7567	2.9809	0	
13/10/2014	1.5686	3.3832	1.7173	2.0561	2.6523	2.8915	0	
14/10/2014	1.4771	3.1024	1.121	2.1415	2.7429	2.9178	6.03	
15/10/2014	1.356		1.8426	2.2557	2.8477	3.1126	0	
16/10/2014	1.3466	3.4032	1.5032	2.2526	2.8034	3.0463	2.814	
17/10/2014	1.3215	3.4083	1.5903	2.2699	2.8497	3.0826	2.01	
18/10/2014	1.3709	3.3566	1.7805	2.2113	2.7849	3.0282	1.206	
19/10/2014	1.3957	3.4177	1.7328	2.1763	2.7864	3.0365	0	
20/10/2014	1.5364	3.367	1.7059	2.0237	2.6661	2.9307	1.206	
21/10/2014	1.535	3.0318	1.8647	2.0134	2.5855	2.8286	2.412	
22/10/2014	1.396	2.9794	1.0874	2.1485	2.8655	3.0603	2.412	
23/10/2014	1.4053		1.846	2.132	2.792	3.0527	0	

Date	F1	P	N1	AB	AE	AF	Rainfall (mm)	Liverpool John Moores University
24/10/2014	1.4911	3.3593	1.7573	2.0407	2.6808	2.9358	0.603	
25/10/2014	1.5443	3.2567	1.5938	1.9791	2.644	2.8787	0.201	
26/10/2014	1.5793	3.2177	1.5704	1.9438	2.628	2.8585	0	
27/10/2014	1.5952	3.2294	1.6008	1.9283	2.6117	2.8431	0.201	
28/10/2014	1.6336	3.2684	1.6417	1.9444	2.6107			

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