

**Final Environmental Report**Period Ending: 06<sup>th</sup> January 2009

Compiled By: Aoife Reynolds &amp; Catriona King

Approved By: Tony Doyle

## 1 Monitoring Data

### 1.1 Monitoring Equipment

Axonics	– The Axonic's plant was operational as required during the reporting period.
PO4	– The PO <sub>4</sub> analyser was operational during the reporting period. – The composite sampler was in place to cover any shortfalls in the PO <sub>4</sub> analyser.
TSS	– The TSS analyser was operational during the reporting period.
Composite	– The composite sampler was operational during the reporting period. – Where there is loss of continuous monitoring data due to instrument faults or other issues composite sample data is provided on the graphs.
Noise	– There is a single noise monitoring location currently being used – N1.
Vibration	– There is a single vibration monitoring location currently being used – V1.
Sondes	– The results are displayed graphically. ○ Any unusual values are explained on the relevant graph.
Weather Station	– The data used for this reporting period was taken from the on-site meteorological station.
Weirs	– Weirs were operational during the reporting period. – SP3 will be included in the final report.

### 1.2 Rainfall Data

21/12/2009	3.80	30/12/2009	12.60
22/12/2009	6.40	31/12/2009	1.00
23/12/2009	1.80	01/01/2010	1.80
24/12/2009	0.20	02/01/2010	5.40
25/12/2009	8.20	03/01/2010	0.20
26/12/2009	12.40	04/01/2010	7.00
27/12/2009	4.60	05/01/2010	5.00
28/12/2009	0.00	06/01/2010	1.20
29/12/2009	1.00		
Total Rainfall 72.6 mm			

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### 1.3 Summary

Environment	Comments
Surface Water	There were no exceedances during the reporting period. There is no data for the dissolved oxygen at SP1 during the reporting period due to a fault with the probe. This problem was since rectified.
Groundwater	The groundwater data (Sonde) is within anticipated ranges.
Dust	Damage to D1 & D2 prevented results being obtained. All other results within the limit.
Weather	There was a total of 72.6mm of rainfall during the reporting period, with a temperature range of -6.0°C to 6.0°C.
Noise	Site construction works ceased on the 19 <sup>th</sup> of December 2009 for the Christmas period. Works resumed on the 4 <sup>th</sup> of January, due to the low weather temperature the meter malfunctioned. There are no results available for noise from the 4 <sup>th</sup> to the 6 <sup>th</sup> of January. Attempts were made to mitigate against the low temperatures but this had limited success. Construction works were also limited during this period due to the poor weather conditions.
Vibration	The vibration meter malfunctioned during the reporting period due to the cold weather and low temperatures.

**Note:** All laboratory data generated on site should be considered indicative only.

## 2 Environmental Exceedances / Incidents / Complaints

No exceedances during the reporting period.

Surface Water Monitoring Record Sheet: Accredited Laboratory Results																		
	Date	Cond. µS/cm	Temp °C	Turbidity NTU	DO % Sat	pH pH units	TSS mg l <sup>-1</sup>	Ortho-phosphate as P µg l <sup>-1</sup>	Nitrate as N mg l <sup>-1</sup>	Nitrate as NO <sub>3</sub> mg l <sup>-1</sup>	Total Phosphorus as P mg l <sup>-1</sup>	Ammonia as NH <sub>3</sub> -N mg l <sup>-1</sup>	Nitrite as NO <sub>2</sub> mg l <sup>-1</sup>	Aluminium (dissolved) µg l <sup>-1</sup>	Aluminium (total) µg l <sup>-1</sup>	Phosphate as PO <sub>4</sub> -P mg l <sup>-1</sup>	TDS mg l <sup>-1</sup>	
<b>Action Limits</b>		400		150		<3.5 or >7.5	25	40	1.5	4.00		0.20	0.025	100	135			
<b>Target Limits</b>		500		200		<3 or >8	35	70	2.6	6.00		0.50	0.05	150	200			
<b>SP1</b>	21/12/2009	260		3.6		7.1	<2	18		0.82	0.019	<0.005	<0.017	27	142	0.06	129	
<b>SP3</b>	21/12/2009	283		2.1		6.8	3	<10		0.90	<0.010	<0.005	<0.017	35	156	<0.03	143	
<b>Axonics Monitoring</b>																		
<b>Pre Axonics</b>	21/12/2009	253		21.5		7.0	637	<10		0.99	0.144	0.047	<0.017	27	50810	<0.03	130	
<b>Post Axonics</b>	21/12/2009	271		1.5		6.8	<2	<10		0.90	<0.010	0.050	0.021	<20	370	<0.03	139	
<b>Additional Monitoring</b>																		
<b>Composite</b>	22/12/2009	No sample due to power failure																
<b>Composite</b>	23/12/2009			2.0			<2	<10						34	69			
<b>Composite</b>	24/12/2009			1.5			<2	<10						26	48			
<b>Composite</b>	25/12/2009			1.8			4	<10						27	56			
<b>Composite</b>	26/12/2009			5.8			<2	19						41	149			
<b>Composite</b>	27/12/2009			6.9			7	13						50	200			
<b>Composite</b>	28/12/2009			4.4			4	<10						66	132			
<b>Composite</b>	29/12/2009			4.6			4	10						92	133			
<b>Composite</b>	30/12/2009			3.2			11	<10						98	100			
<b>Composite</b>	31/12/2009			3.7			<2	<10						63	180			
<b>Composite</b>	01/01/2010			3.4			<2	<10						85	88			
<b>Composite</b>	02/01/2010			2.3			6	12						132	177			
<b>Composite</b>	03/01/2010			2.5			2	<10						47	158			
I.P. = In Progress < LOD = Below Limit of Detection > LOD = Above Limit of Detection On site laboratory results included in Appendix 1 Grey shaded areas denote parameters that cannot or were not analysed on-site or the lab.																		

**Groundwater Monitoring Record Sheet**

Location	Date	DO	Temp	Cond.	pH	TDS	BOD	TSS	Total Hardness	Nitrite as NO <sub>2</sub>	Nitrate as NO <sub>3</sub>	Phosphate as PO <sub>4</sub>	Arsenic	Mercury	Lead	Aluminium (total)	Zinc	Chromium	Copper	Cadmium	Iron	Tin	Ammonia	Aluminium, dissolved	Manganese, total
		% Sat	°C	uS/cm	pH Units	mg l <sup>-1</sup>	mg l <sup>-1</sup>	mg l <sup>-1</sup>	mg/l CaCO <sub>3</sub>	mg l <sup>-1</sup>	mg l <sup>-1</sup>	mg l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	mg l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>
<b>MP 1</b>	02/12/2009	29.0	8.9	306	6.1	167	15	6	58.4	<0.017	<0.44	1.61	6.0	<0.05	9.0	75	49	<0.5	3	<0.5	47240	3.0	1.736	<20	798
<b>MP 2</b>	02/12/2009	21.0	8.4	270	6.4	147	10	318	80.2	<0.017	<0.44	0.26	1.0	<0.05	13.0	1492	37	<0.5	4	<0.5	15120	2.0	1.141	<20	259
<b>MP 3</b>	02/12/2009	27.0	9.4	366	5.7	204	8	27	67.8	<0.017	<0.44	1.46	2.0	<0.05	11.0	787	23	<0.5	<1	<0.5	17510	1.0	1.976	<20	210
<b>MP 4</b>	02/12/2009	23.0	9.3	409	6.2	207	7	92	68.4	<0.017	<0.44	0.54	2.0	<0.05	12.0	344	22	<0.5	<1	<0.5	61760	1.0	0.812	247	1687
<b>MP 5</b>	02/12/2009	17.0	11.2	316	6.1	171	22	81	91.6	<0.017	<0.44	0.37	2.0	<0.05	15.0	1151	47	<0.5	2	<0.5	27780	0.8	1.615	<20	485
<b>MP 6</b>	02/12/2009	24.0	8.4	440	6.4	227	11	42	103.7	<0.017	<0.44	0.84	8.0	<0.05	27.0	62	30	<0.5	<1	<0.5	62750	4.0	1.268	<20	1434
<b>MP 7</b>	02/12/2009	14.0	10.3	329	6.1	181	18	25	66.2	<0.017	<0.44	0.57	<0.5	<0.05	27.0	103	24	<0.5	<1	<0.5	46000	1.0	1.840	<20	661
<b>MP 10a</b>	02/12/2009	26.0	8.6	368	5.9	205	2	59	136.7	<0.017	<0.44	<0.03	<0.5	<0.05	28.0	459	24	<0.5	<1	<0.5	6311	<0.5	0.505	<20	2886
<b>MP 11</b>	02/12/2009	26.0	9.1	197	5.5	114	4	20	28.3	0.026	<0.44	<0.03	<0.5	<0.05	6.0	30	13	<0.5	<1	<0.5	516	<0.5	0.016	<20	1195

Graphs provided for MP1, MP2, MP4, MP6 and MP7: Temperature, Conductivity, and pH.

<b>Dust Monitoring Record Sheet</b>							
Determinant Results							
	Date Positioned	Date Removed	Ref. Number	Date Dispatched	Date Returned	Weight (mg/m <sup>2</sup> /day)	Comments
<b>Target (Consent) Limit: 350 mg m<sup>-2</sup> d<sup>-1</sup> on as a 30 day average</b>							
D1	19/06/2009	20/07/2009	221803	20/07/2009	21/07/2009	103	
D2	19/06/2009	20/07/2009	221804	20/07/2009	21/07/2009	69	
D3	19/06/2009	20/07/2009	221805	20/07/2009	21/07/2009	121	
D4	19/06/2009	20/07/2009	221806	20/07/2009	21/07/2009	47	
D1	20/07/2009	20/08/2009	226228	21/08/2009	26/08/2009	54	
D2	20/07/2009	20/08/2009	226229	21/08/2009	26/08/2009	276	Algae present in sample
D3	20/07/2009	20/08/2009	226230	21/08/2009	26/08/2009	110	
D4	20/07/2009	20/08/2009	226231	21/08/2009	26/08/2009	106	
D1	20/08/2009	21/09/2009	230950	23/09/2009	07/10/2009	127	
D2	20/08/2009	21/09/2009	230951	23/09/2009	07/10/2009	89	
D3	20/08/2009	21/09/2009	230952	23/09/2009	07/10/2009	69	
D4	20/08/2009	21/09/2009	230953	23/09/2009	07/10/2009	93	
D1	21/09/2009	21/10/2009	235150	23/10/2009	10/11/2009	79	
D2	21/09/2009	21/10/2009	235151	23/10/2009	10/11/2009	59	
D3	21/09/2009	21/10/2009	235152	23/10/2009	10/11/2009	50	
D4	21/09/2009	21/10/2009	235153	23/10/2009	10/11/2009	59	
D1	21/10/2009	20/11/2009	238813	20/11/2009	25/11/2009	185	
D2	21/10/2009	20/11/2009	N/A	20/11/2009	N/A	No result	No result due to storm damage
D3	21/10/2009	20/11/2009	238814	20/11/2009	25/11/2009	207	
D4	21/10/2009	20/11/2009	238815	20/11/2009	25/11/2009	189	
D1	20/11/2009	21/12/2009					No result due to damage to dust pot
D2	20/11/2009	21/12/2009					No result due to damage to dust pot
D3	20/11/2009	21/12/2009	243515	22/12/2009	08/01/2010	200	
D4	20/11/2009	21/12/2009	243516	22/12/2009	08/01/2010	175	
Monitoring Points are numbered clockwise through the Cardinal Marks (N, E, S, W)							
Monitoring Results will be presented monthly							

<b>Day Time Noise Monitoring Record Sheet</b>												
<b>Determinant Results</b>												
Location	Air Temp. (Min)	Air Temp. (Max)	Start Date	Time	Duration	Serial No.	Wind		Results dB			*Comments
							Speed (m/s)*	Direction (Degrees)	L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	
<b>Action Limit</b>									<b>60</b>			
<b>Target Limit</b>									<b>65</b>			
N1	-6.0	3.8	04/01/2010	08:00:00	14:00:00	2539533	1.0	248.3	Data Not Available			Due to low temperatures during the report period the meter malfunctioned and did not operate. Limited works were undertaken onsite during the period due to the inclement weather.
N1	0.5	4.7	05/01/2010	08:00:00	14:00:00	2539533	4.3	159.0	Data Not Available			
N1	-3.5	3.3	06/01/2010	08:00:00	14:00:00	2539533	2.0	93.8	Data Not Available			

\* Wind speeds in excess of 5 m/s negatively impact noise readings (as per EPA Guidance Note on Noise Measurement).

<b>Night Time Noise Monitoring Record Sheet</b>												
<b>Determinant Results</b>												
Location	Air Temp. (Min)	Air Temp. (Max)	Start Date	Time	Duration	Serial No.	Wind		Results dB			*Comments
							Speed (m/s)*	Direction (Degrees)	L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	
<b>Action Limit</b>									<b>50</b>			
<b>Target Limit</b>									<b>55</b>			
N1	-6.0	3.8	04/01/2010	22:00:00	10:00:00	2539533	1.0	248.3	Data Not Available			Due to low temperatures during the report period the meter malfunctioned and did not operate. Limited works were undertaken onsite during the period due to the inclement weather.
N1	0.5	4.7	05/01/2010	22:00:00	10:00:00	2539533	4.3	159.0	Data Not Available			
N1	-3.5	3.3	06/01/2010	22:00:00	10:00:00	2539533	2.0	93.8	Data Not Available			
* Wind speeds in excess of 5 m/s negatively impact noise readings (as per EPA Guidance Note on Noise Measurement).												

**Flow Weir Record Sheet****Determinant Results**

Date	SP1			SP3		
	Max (l/s)	Min (l/s)	Avg (l/s)	Max (l/s)	Min (l/s)	Avg (l/s)
21/12/2009	52.7	22.0	27.9	9.83	6.50	8.72
22/12/2009	24.1	18.8	20.0	7.73	2.91	5.03
23/12/2009	40.6	11.7	19.2	2.91	1.58	2.17
24/12/2009	11.3	7.4	9.3	1.58	1.03	1.15
25/12/2009	14.2	6.5	7.5	6.50	0.67	1.01
26/12/2009	86.0	14.2	45.9	22.93	3.47	12.26
27/12/2009	65.1	25.7	47.3	21.49	3.87	11.94
28/12/2009	45.7	15.1	25.3	4.07	1.89	2.93
29/12/2009	15.1	12.1	13.2	7.98	1.30	2.30
30/12/2009	57.6	12.7	28.9	19.75	1.44	8.07
31/12/2009	33.1	20.6	23.9	13.58	4.07	10.35
01/01/2010	20.6	15.1	18.8	10.38	6.50	8.77
02/01/2010	15.1	10.2	12.7	6.50	1.58	4.23
03/01/2010	34.3	7.8	11.8	1.58	1.03	1.20
04/01/2010	7.8	4.1	6.6	1.03	0.67	0.88
05/01/2010	17.0	6.4	13.7	3.87	0.90	2.49
06/01/2010	16.7	8.0	13.1	3.10	1.74	2.07

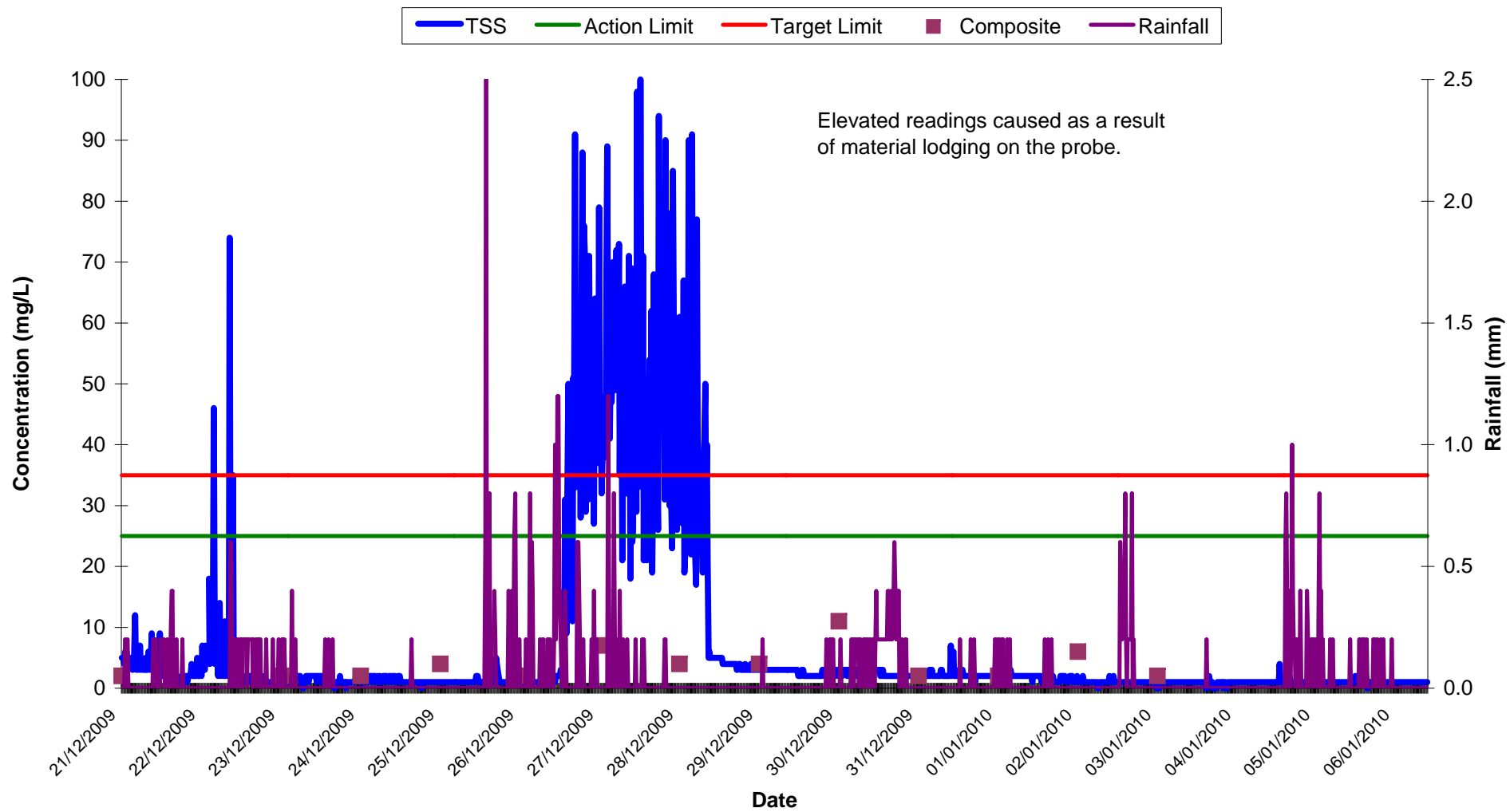
**Note:** Negative values indicate low flow conditions.

**Vibration Monitoring Record Sheet****Determinant Results**

<b>Location</b>	<b>Date Positioned</b>	<b>Date Removed</b>	<b>Event Date</b>	<b>Event Time</b>	<b>Peak Vector Sum</b>	<b>Tran PPV</b>	<b>Vert PPV</b>	<b>Long PPV</b>	<b>Comments</b>
V1	04-Jan-10			8:06					Monitor Started
		06-Dec-10		10:30					Monitor Stopped

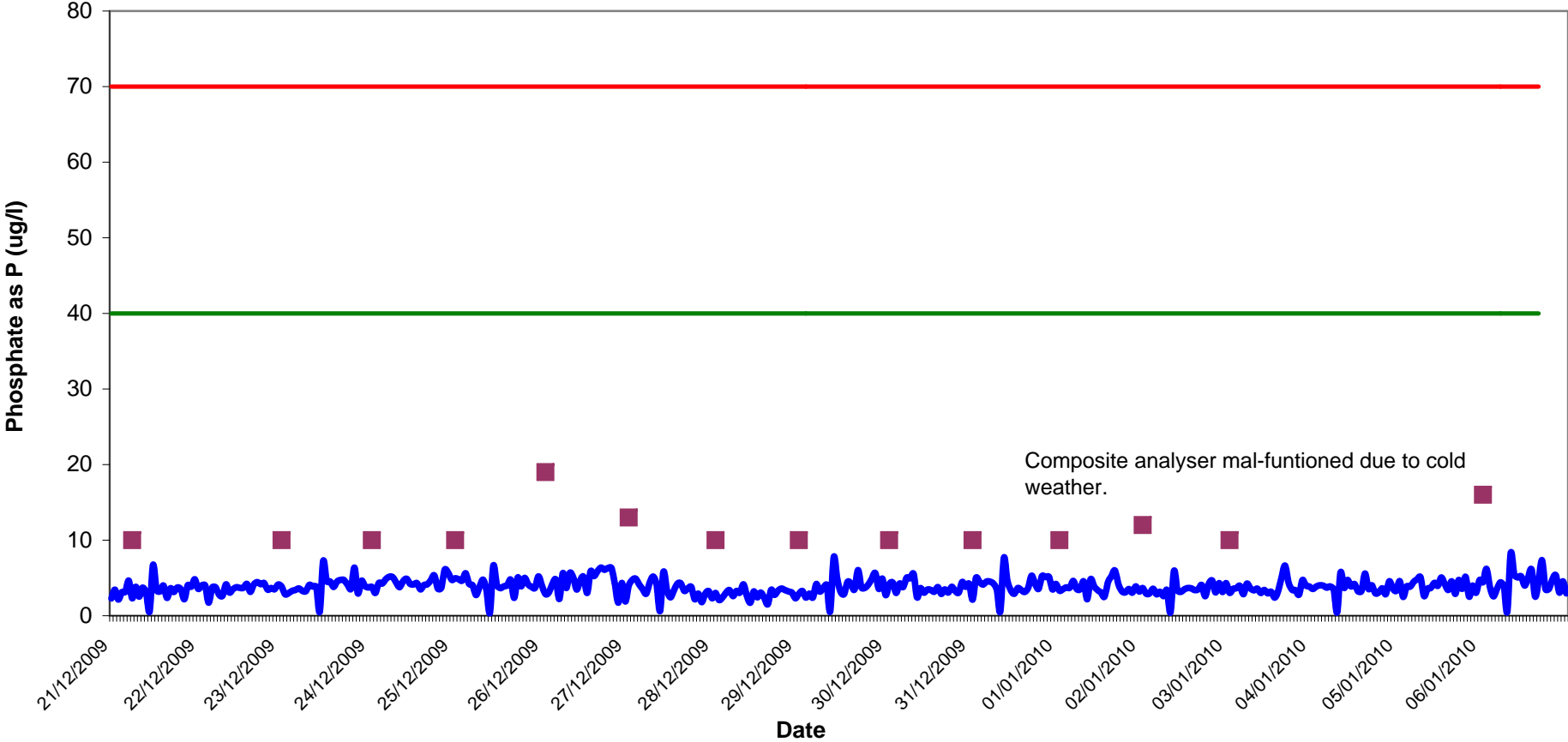
Note: Due to the low temperatures monitor stopped recording.  
Vibration meter located at V1.

### Total Suspended Solids at SP1 Week 51 - 01

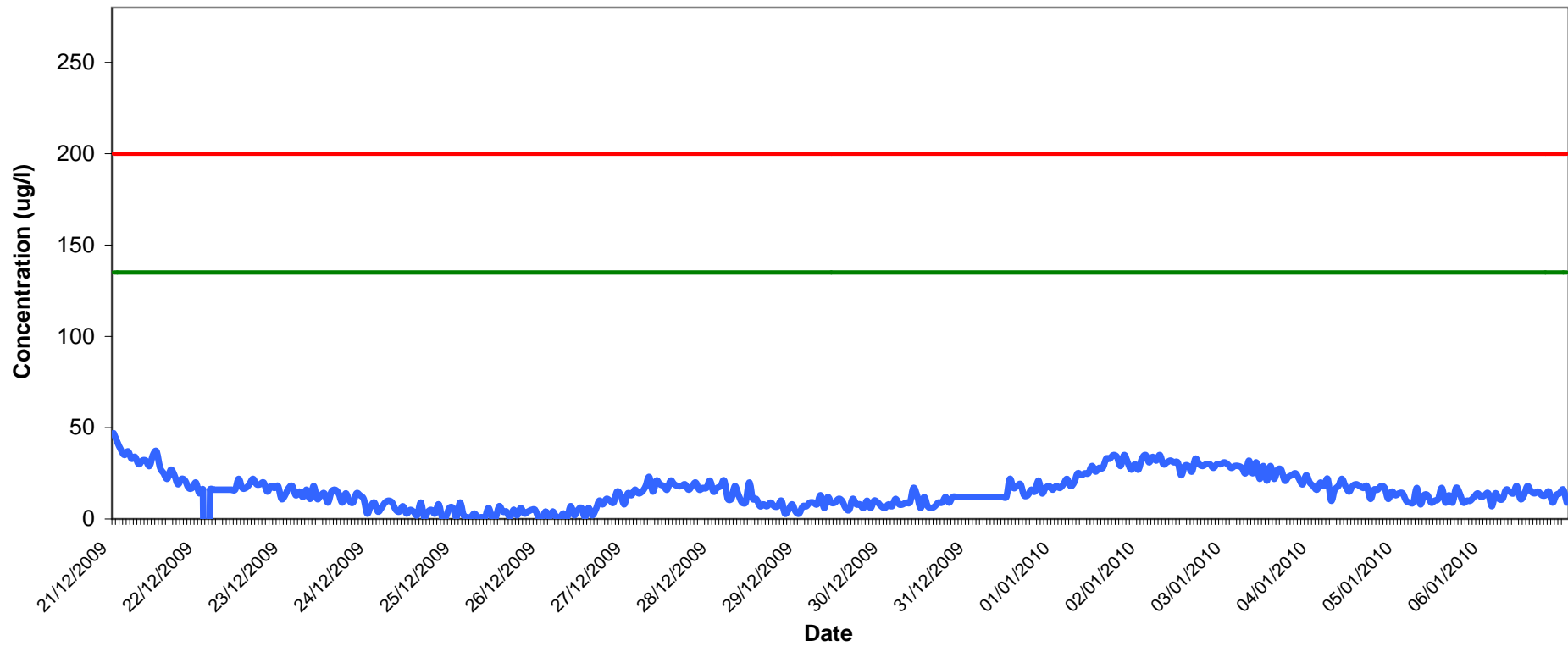


# Orthophosphate Results at SP1 Wk 51-01

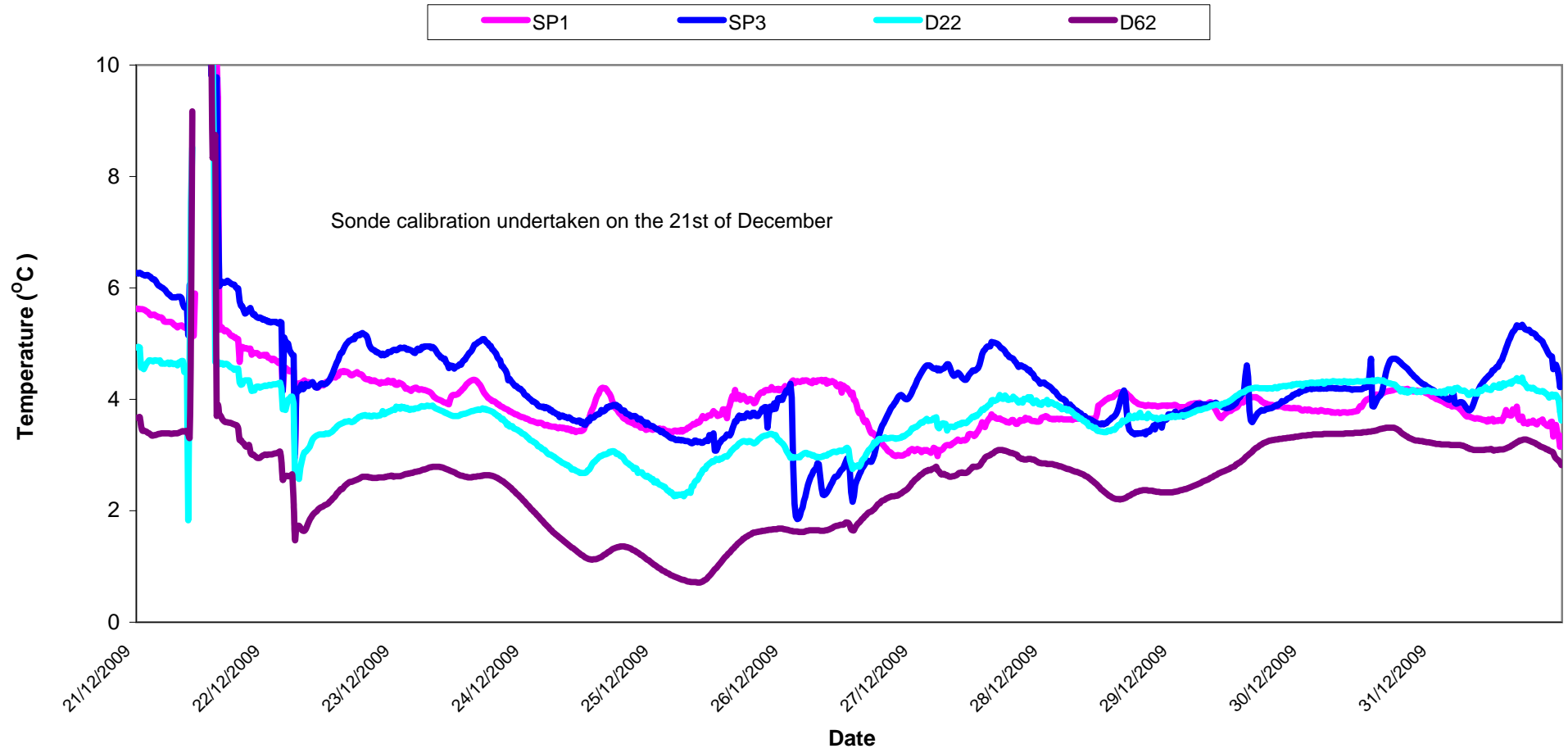
Ortho    Action Limit    Target Limit    Composite



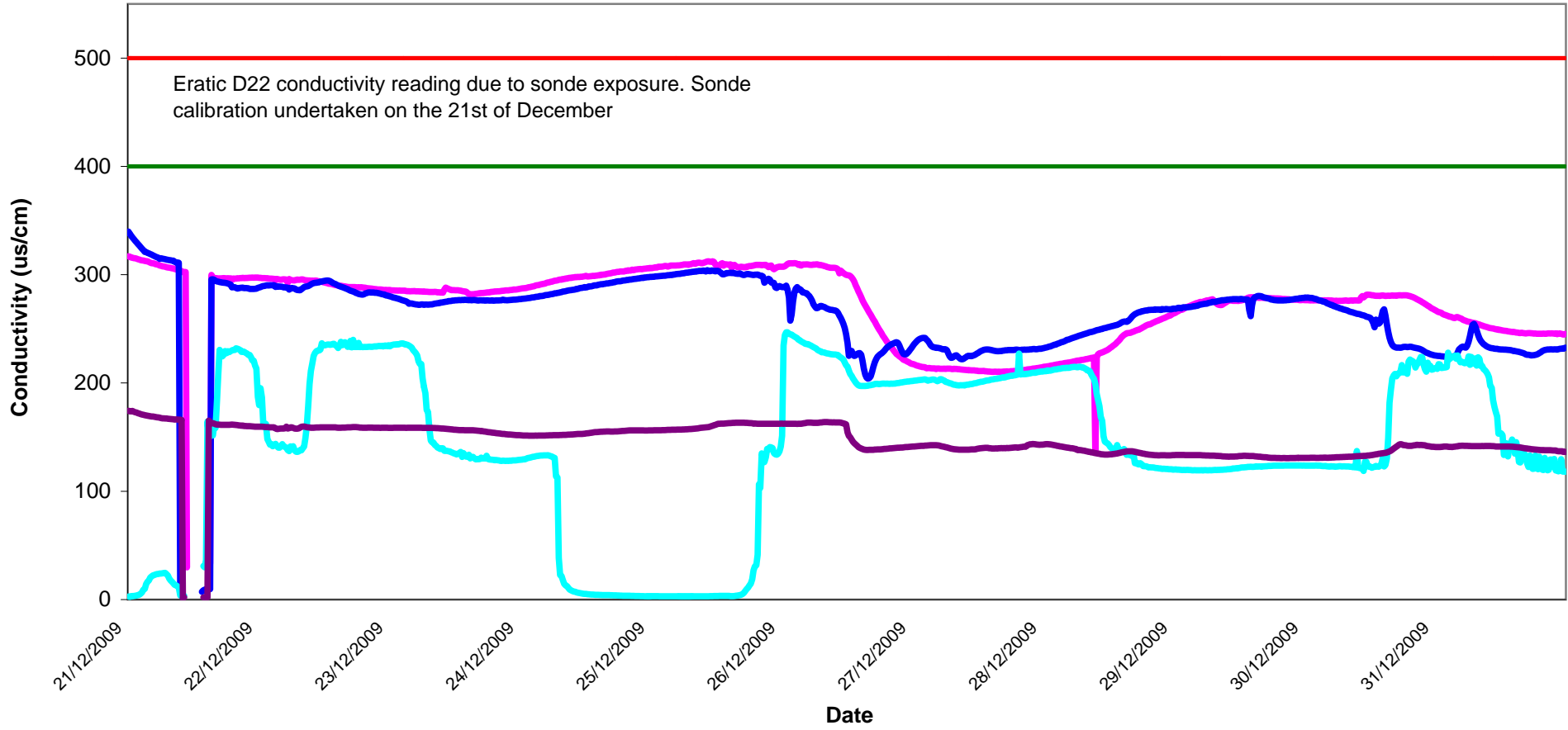
### Aluminium Concentration at SP1 Wk 51-01



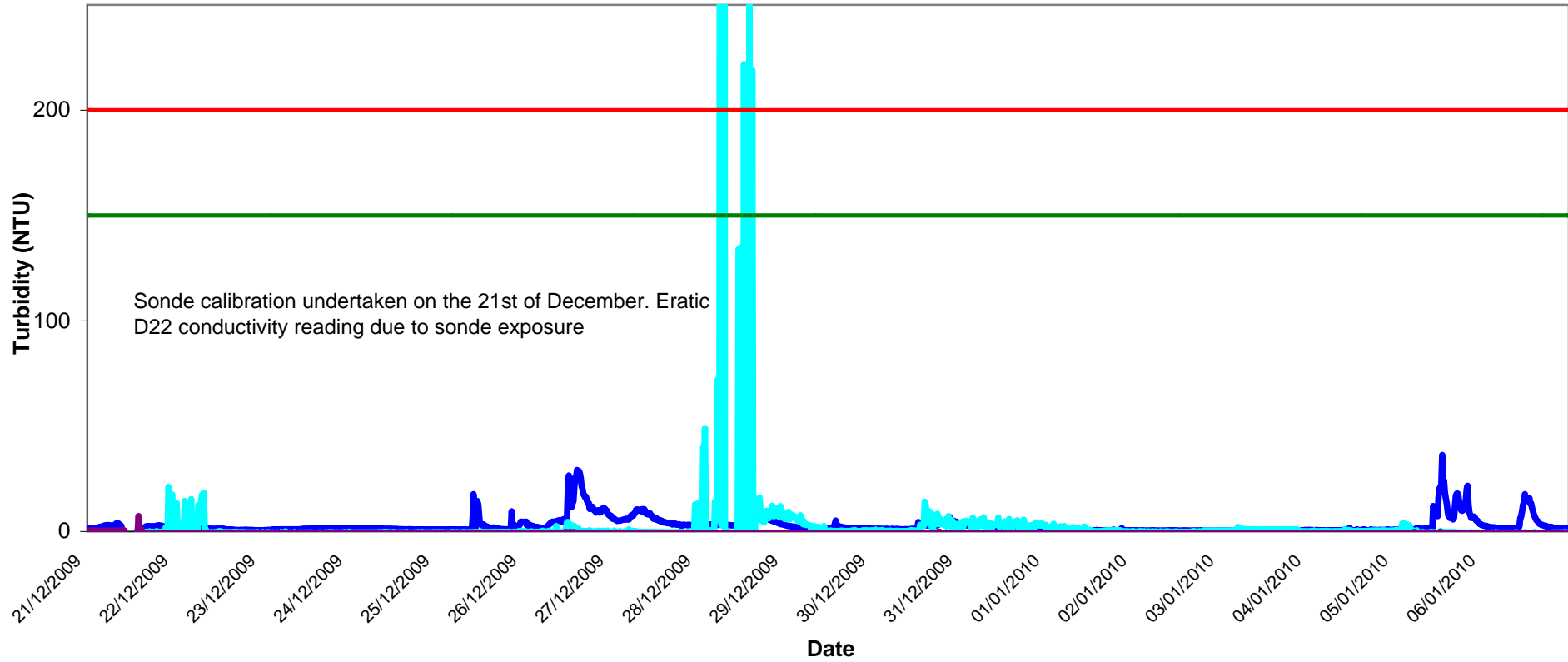
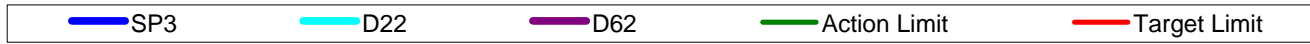
# Temperature - Surface Waters Wk 51-01



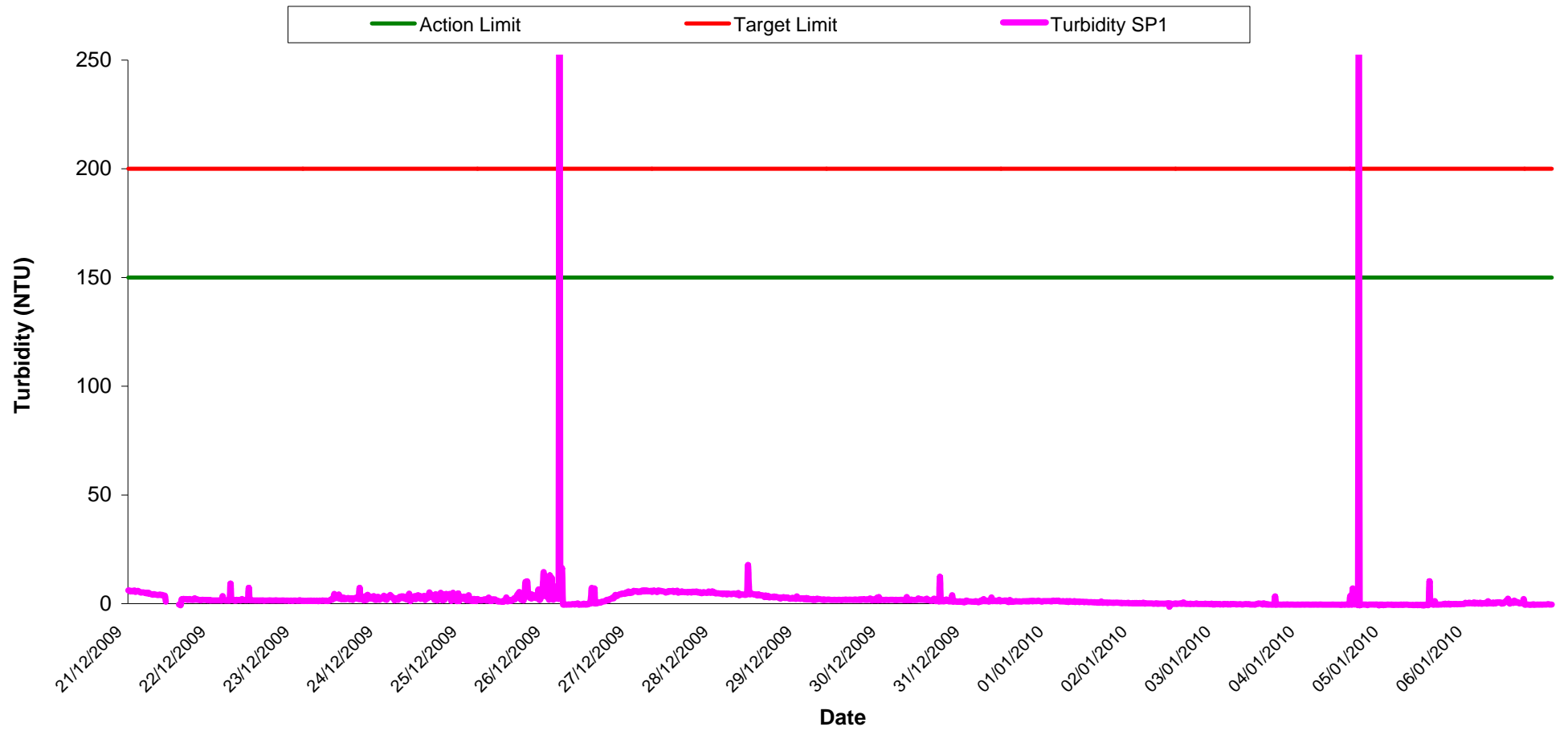
### Conductivity - Surface Waters, Wk 51-01



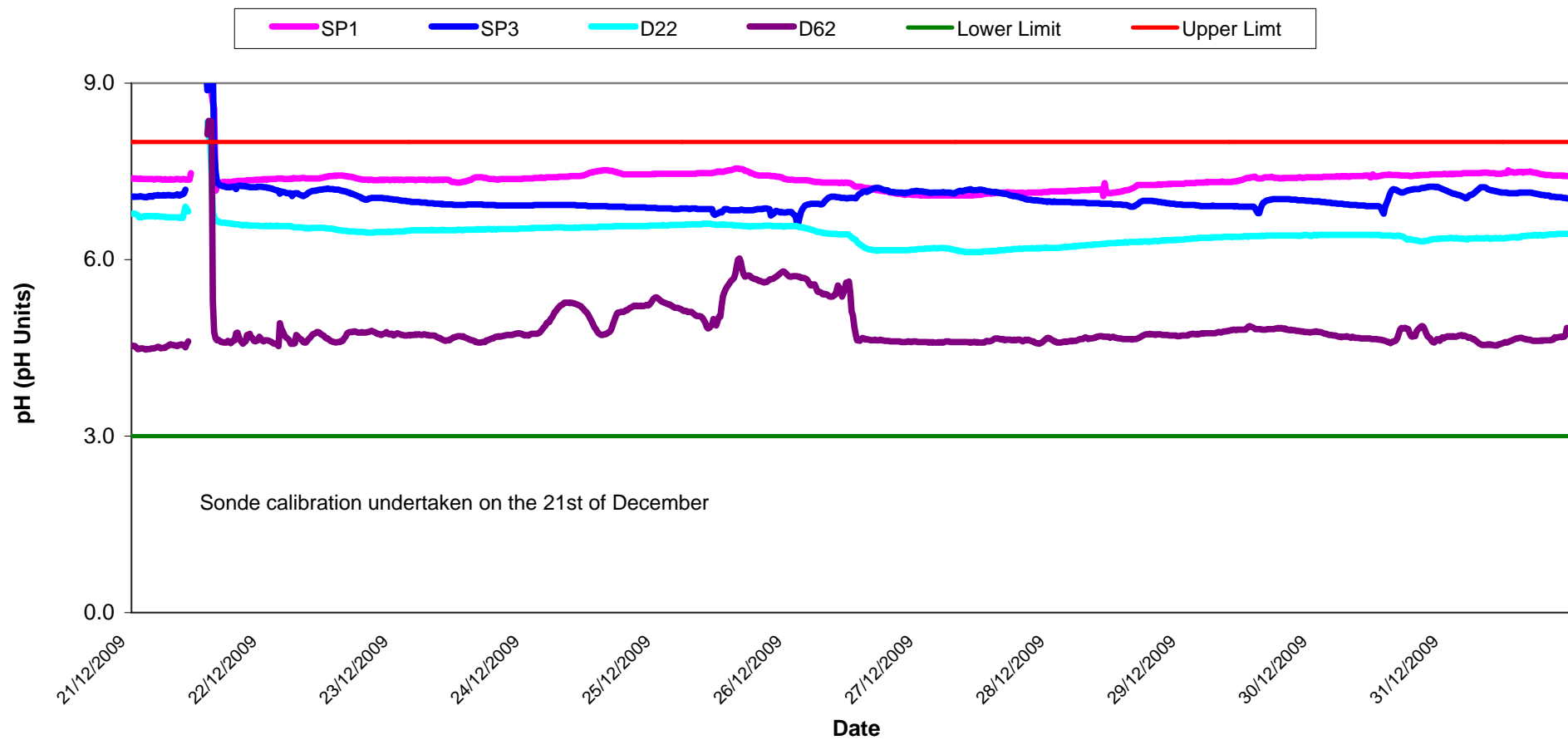
# Turbidity - Surface Waters Wk 51-01



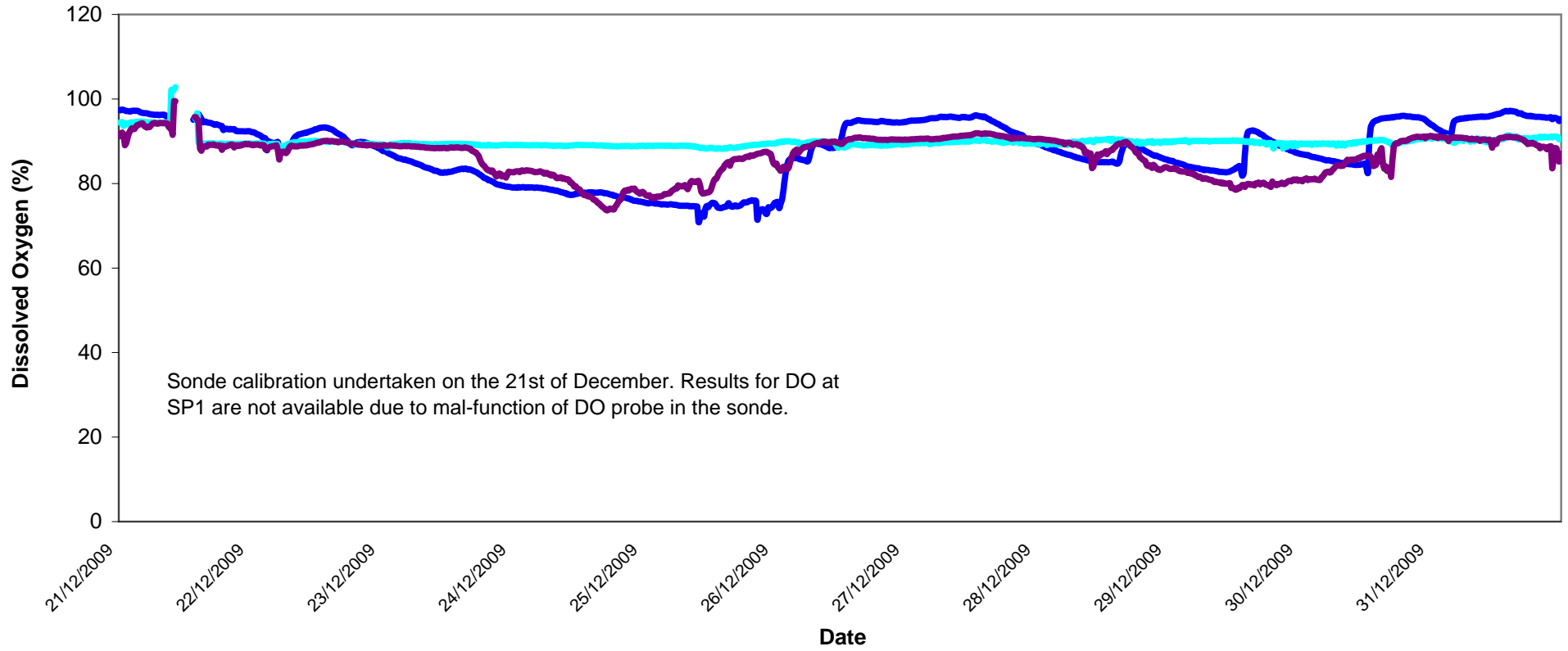
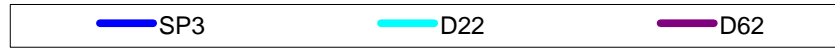
### Turbidity - Surface Waters @ SP1, Wk 51-01



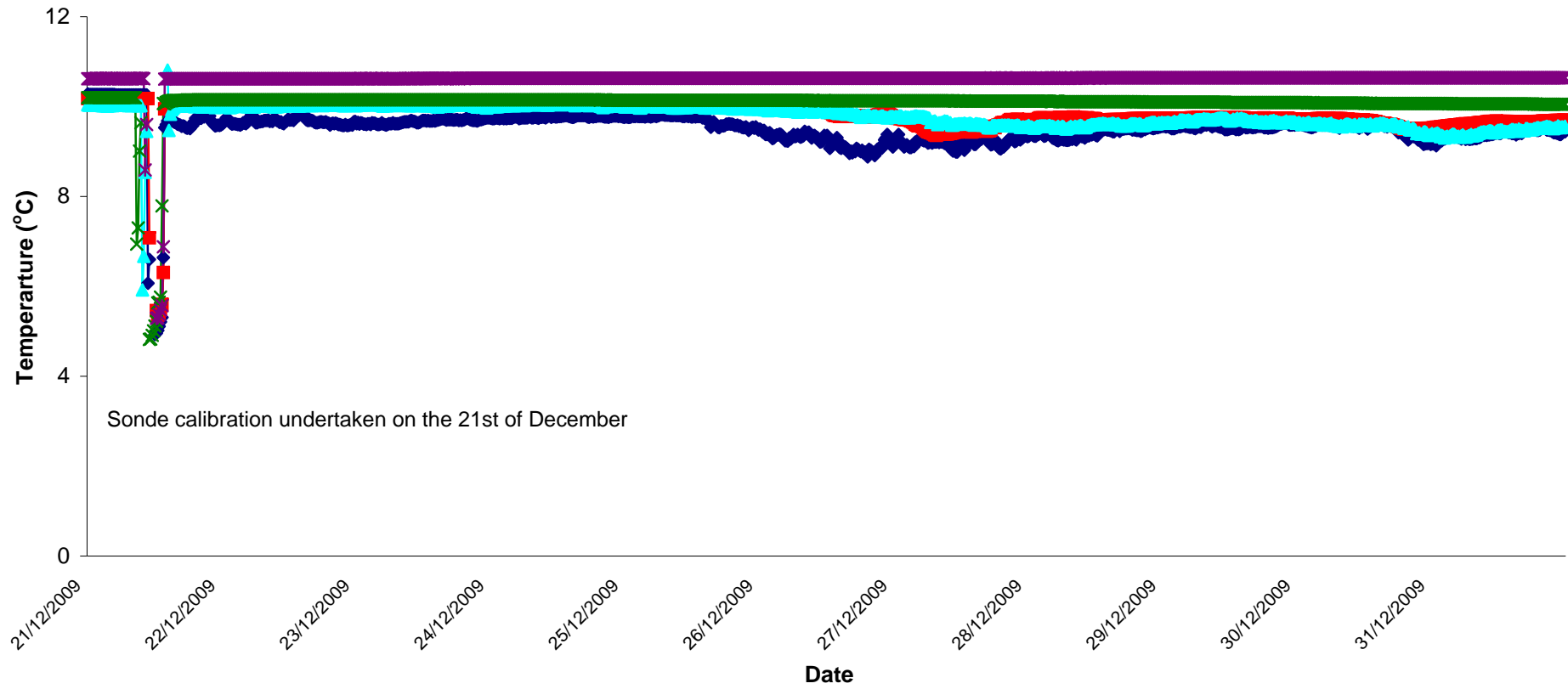
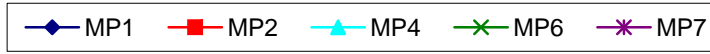
# pH - Surface Waters Wk 51-01



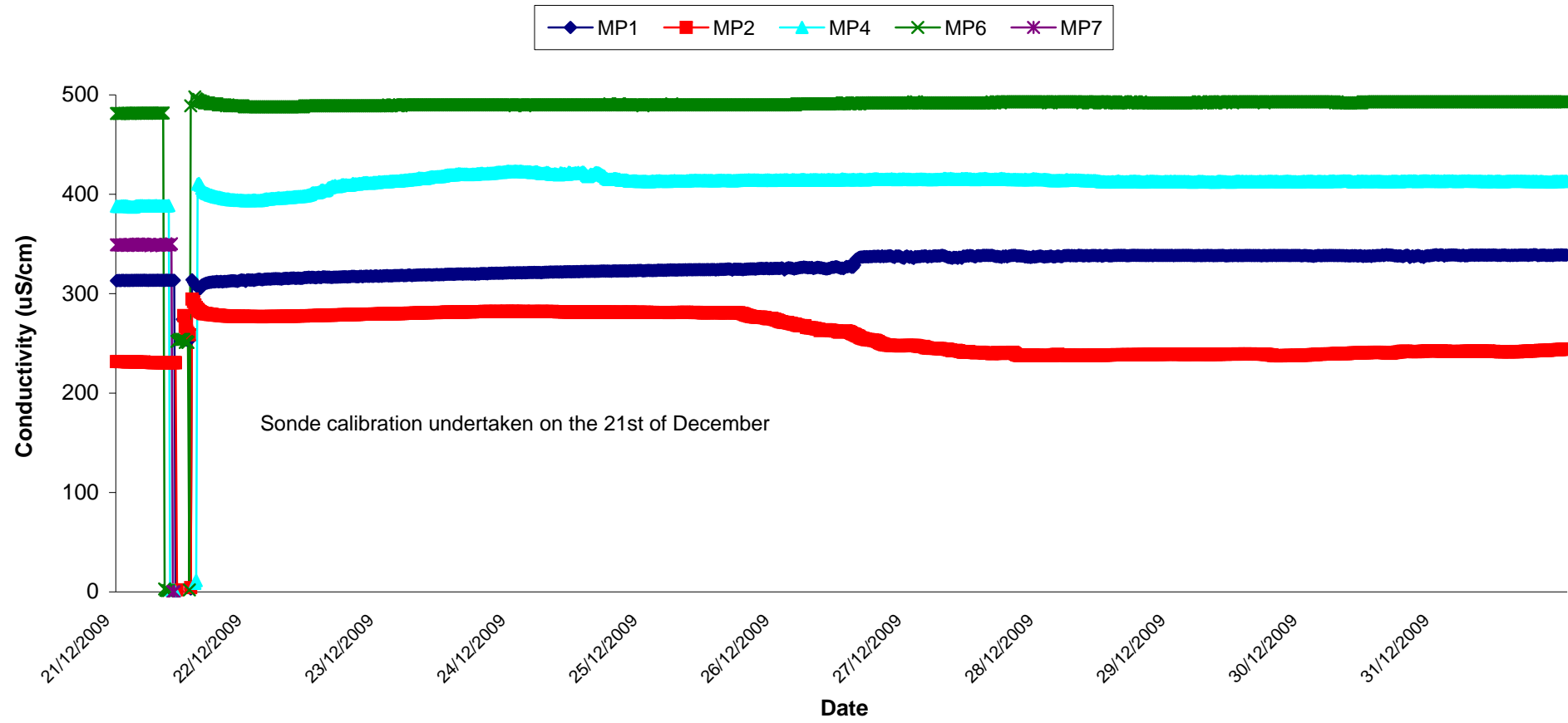
### Dissolved Oxygen - Surface Waters, Wk 51-01



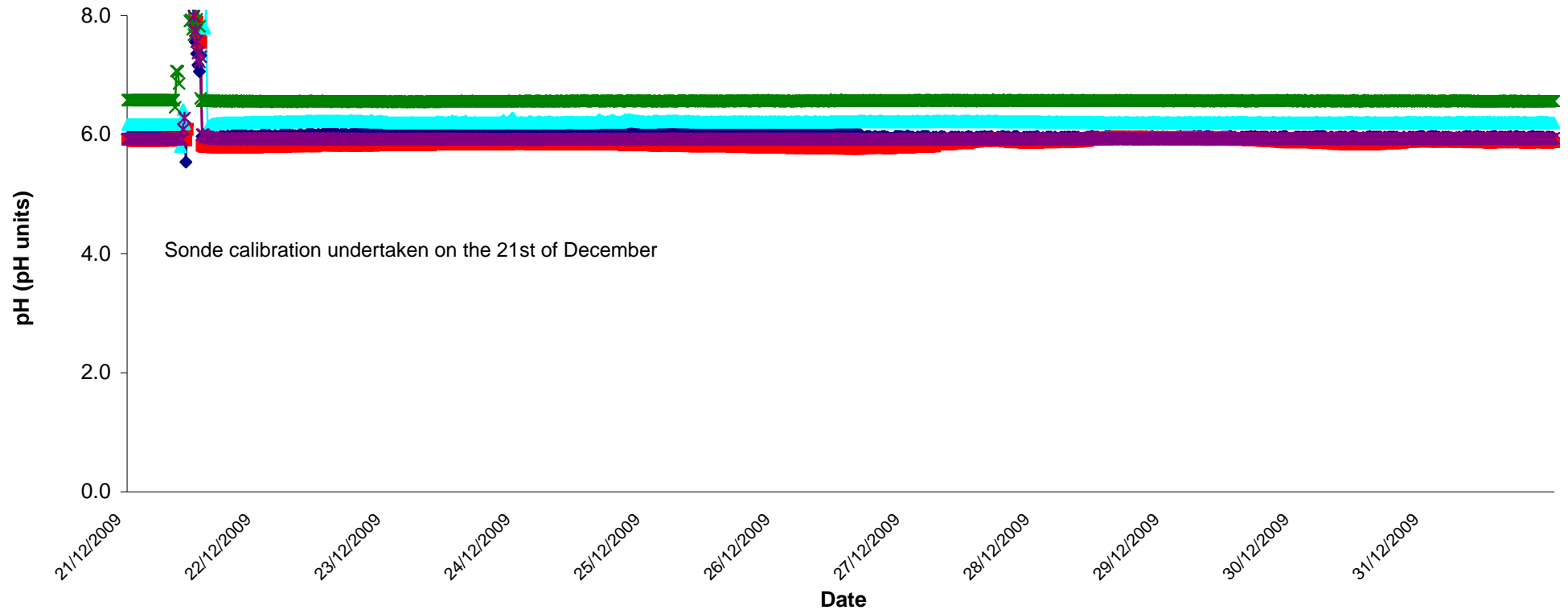
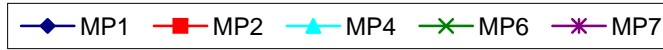
# Temperature - Groundwaters Wk 51-01



# Conductivity - Groundwaters Wk 51-01



# pH - Groundwaters Wk 51-01



# **Appendix 1**

Appendix 1: Surface Water Monitoring Record Sheet- Onsite Monitoring																	
	Date	Cond. µS/cm	Temp oC	Turbidity NTU	DO % Sat	pH	TSS mg l <sup>-1</sup>	Ortho-phosphate as P µg l <sup>-1</sup>	Nitrate as N mg l <sup>-1</sup>	Nitrate as NO <sub>3</sub> mg l <sup>-1</sup>	Total Phosphorus as P mg l <sup>-1</sup>	Ammonia as NH <sub>3</sub> -N mg l <sup>-1</sup>	Nitrite as NO <sub>2</sub> mg/l	Aluminium (dissolved) ug/l	Aluminium (total) ug/l	Phosphate as PO <sub>4</sub> mg/l	Total dissolved solids mg/l
<b>Settlement Pond Monitoring</b>																	
SP1	21/12/2009	276	5.2	7.0	94.7	7.7			<LOD			<LOD		30	87	0.38	174
SP1	22/12/2009	254	5.1	2.8	93.5	7.4			<LOD			<LOD		I.P		<LOD	128
SP1	28/12/2009	201	5.0	11.8	95.8	6.9			<LOD			0.04		35		0.13	125
SP1	30/12/2009	222	4.8	8.9	94.3	6.9			<LOD			0.08		18	110	0.08	142
SP1	02/01/2010	325	4.7	7.9	94.1	6.7			<LOD					<LOD	79	1.24	154
SP1	04/01/2010	292	4.4	6.5	94.2	6.3			0.2			<LOD		25	45	0.18	171
SP1	05/01/2010	237	4.9	4.9	94.7	7.3			<LOD			<LOD		<LOD	63	0.28	163
SP1	06/01/2010	221	4.2	3.8	94.6	7.2			<LOD			<LOD		33	59	0.10	147
SP3	21/12/2009	279	5.7	4.5	95.7	7.4			0.4			<LOD		50		0.45	183
SP3	22/12/2009	273	5.5	1.9	94.7	7.4			<LOD			<LOD		I.P		<LOD	137
SP3	04/01/2010	246	3.6	4.4	77.7	6.9			0.4			<LOD		48		0.04	157
SP3	05/01/2010	230	3.4	17.1	86.9	7.1			<LOD			<LOD		63		0.07	151
SP3	06/01/2010	319	3.6	12.0	88.5	7.1			0.1			<LOD		70		0.02	206
<b>Additional Monitoring</b>																	
D62	21/12/2009	218	4.9	3.6	92.3	7.1			<LOD			<LOD		37		0.01	139
D22	21/12/2009	183	3.5	3.5	93.5	6.1			0.3			0.01		<LOD		1.16	108
<b>Axonics Monitoring</b>																	
Pre	21/12/2009	264		79.0		7.4			<LOD			<LOD		108		0.04	171
Post	21/12/2009	272		3.1		7.2			0.2			<LOD		<LOD	319	0.01	177
Pre	22/12/2009	No sample as plant not operational															
Post	22/12/2009	No sample as plant not operational															
Post	28/12/2009	200		2.0		7.1			<LOD			<LOD		13		<LOD	142
Post	30/12/2009	211		3.5		6.8			0.8			0.09		16	37	0.05	141
Post	02/01/2010	213		5.4		6.4			<LOD			<LOD		<LOD	319	0.09	138
Pre	04/01/2010	No sample as plant not operational															
Post	04/01/2010	No sample as plant not operational															
Pre	05/01/2010	No sample as plant not operational															
Post	05/01/2010	No sample as plant not operational															
Pre	06/01/2010	No sample as plant not operational															
Post	06/01/2010	No sample as plant not operational															
Grey shaded areas denote parameters that cannot or were not analysed on-site.																	
= Indicative Only																	
< LOD = Below Limit of Detection																	
> LOD = Above Limit of Detection																	