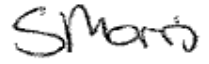




DUBLIN WASTE-TO-ENERGY**CONSTRUCTION PHASE
MONITORING SCHEME****Q1: January – March 2010**

LOCATION	Soft Copy	Hard Copy
1. Jacobs	√	√
2. DCC	None	√
3. Ringsend Office	None	√

	Name	Designation	Signature	Date
Originator	S. Morris	Jacobs		May 2010
Checked	D. Malone	Jacobs		May 2010
Verified	C. Farrell	Jacobs		May 2010

1 Introduction

An environmental monitoring programme has been implemented during the construction stage of the Dublin Waste to Energy (DWtE) Project. In conjunction with the monitoring, a number of controls and procedures have been implemented during construction activities to avoid, or minimise, potential adverse impacts to the environment and local community.

The monitoring programme will assist in demonstrating compliance with the conditions and requirements laid out in An Bord Pleanála Order -29S.EF2022, Condition 13d; *“A scheme for monitoring noise, dust deposition and suspended solids in surface water run-offs and adjacent waters shall be prepared for the construction phase of the development. Details of the scheme shall be made available for inspection at the offices of Dublin City Council and at a local office in the Ringsend/Poolbeg area prior to the commencement of construction works. Monitoring shall be carried out during the construction phase and reports on the monitoring shall be made available for inspection at the offices in question on a 3 monthly basis. The reports shall compare monitored results with standards set out in the environmental impact statement or standards given in recognised national or international guidelines as relevant.”*

Construction of the Dublin Waste to Energy (DWtE) facility commenced on the 14th December 2009 and an environmental monitoring programme in accordance with the with *‘Dublin Waste to Energy - Construction Phase Monitoring Scheme’* September 2009 has been implemented.

Site enabling activities were undertaken during this period which included activities such as construction compound set up, provision of car parking facilities and location of services on site. The Project Environmental Consultant (PEC) was present on site during this period. Although, no environmental measurements were undertaken during this period, daily environmental walkovers and inspections to monitor the works were undertaken by the PEC. Environmental monitoring with regards to noise, dust deposition and suspended solids commenced in January 2010. This Construction Phase Monitoring Scheme Report relates to environmental monitoring undertaken for the construction period of January – March 2010. The PEC was present on site through the December 2009- March 2010 period.

2 Local Environment

The main population centres of Ringsend, Irishtown and Sandymount are located approximately 1km from the boundary of the site. The nearest educational establishments are located approximately 850m and 1km south-west of the site and 1.5km west of the site boundary. Representative sensitive receptors have been monitored throughout the construction period for noise and vibration.

The closest sensitive receptors to the site are the residential properties at Pigeon House Road which are located approximately 800m west of the site boundary.

The identified sensitive locations are shown in Attachment 1. They are as follows:

- Leukos Road (St Lukes Road) (marked “(A)” in Attachment 1);
- Pigeon House Road (marked “(B)” in Attachment 1).
- Beach Avenue (marked “(C)” in Attachment 1);
- Seafort Avenue (marked “(D)” in Attachment 1);
- Walkway south of the Site connecting Sean Moore Park and Irishtown Nature Park (marked “(E)” in Attachment 1); and

3 Noise

Monitoring of noise levels at sensitive locations took place during construction to ensure compliance with the requirements of the Environmental Impact Statement (EIS) and An Bord Pleanála Order -29S.EF2022, Condition 13d.

3.1 Monitoring Method

Monitoring was carried by the PEC and in accordance with ‘Dublin Waste to Energy - Construction Phase Monitoring Scheme’ September 2009.

3.2 Construction Noise Limits at Sensitive Locations

The measured and calculated noise results at the noise sensitive locations during construction are compared against the values identified in NRA Guidance Document entitled ‘Guidelines for the treatment of noise and vibration in National Road Schemes’ as documented in the EIS and presented in Table 1 below:

Table 1: Construction Noise Limits at the Sensitive Locations

Sensitive Receptor	A	B	C	D	E
	Leukos Road	Pigeon House Rd.	Beach Avenue	Seafort Avenue	Irishtown Nature Park Walkway
Monday-Friday 0700 hrs to 1900 hrs Rating level, LAeq(1hr)dB	70	70	70	70	70
Night time 1900 hrs to 2200 hrs Rating level, LAeq(1hr)dB	60	60	60	60	60
Saturday 0800 hrs -1630 hrs Rating level, LAeq(1hr)dB	65	65	65	65	65
Sundays & Bank Holidays 08:00 to 16:30hrs Rating level, LAeq(1hr)dB	60	60	60	60	60

3.3 Noise Monitoring Results

Noise levels were measured at the sensitive receptors during the January monitoring period (see Table 2) and directly compared to the noise emission limits (see Table 1). Full details of the noise monitoring results at the sensitive receptors and boundary locations are presented in Appendix A.

During February and March 2010, the construction activities on site did not include any critical activities or critical periods in the construction schedule. On this basis noise monitoring was focused at the DWTE site boundary locations and was not undertaken at the sensitive receptors during February and March 2010.

The measured noise levels at the sensitive receptors include other contributing sources of noise, such as the road traffic noise and are not representative of the DWtE construction sites contribution to these measured levels.

Accredited Noise Calculations

To establish the contribution of the January - March 2010 DWTE site activities, to the noise levels at the sensitive receptors, the *British Standard 5228-1:2009: Code of practice for noise and vibration control on construction and open sites – Part 1:Noise (Section F.2.2)* was used to calculate the noise levels at the sensitive receptors based on noise levels monitored at the western and southern site boundary locations only.

These boundaries are used as they represent the closest boundaries to the sensitive receptors, and the most accurate calculation of noise levels. On this basis, when both are available, the southern boundary is used to calculate noise levels for the Rehab Institute, Seafort Avenue, Beach Avenue and Irishtown Nature Park. The Western Boundary is used to calculate the noise levels at the Coastguard Cottages and Leukos Road.

Using the BS 5228 Standard calculation, the highest noise result calculated for the months of January to March 2010 at each of the sensitive locations is presented in Table 3. Full details of the noise calculations are presented in Appendix B

Table 2: Noise level measured at Sensitive Locations (January 2010)

Sensitive Receptor	A	B	C	D	E
	Leukos Road	Pigeon House Rd.	Beach Avenue	Seafort Avenue	Irishtown Nature Park Walkway
January 2010 – Noise Survey Results at the Sensitive Receptors LAeq(30 min)dB	57	55	55	65	64

Table 3: The contribution of the DWtE site activities to noise levels at Sensitive Receptors (Accredited Calculations)

Sensitive Receptor	A	B	C	D	E
	Leukos Road	Pigeon House Rd.	Beach Avenue	Seafort Avenue	Irishtown Nature Park Walkway
January 2010 – Highest Noise Level at Sensitive Receptor LAeq(30 min)dB	34	34	34	34	43
February 2010 –Highest Noise Level at Sensitive Receptor LAeq(30 min)dB	32	32	29	31	45
March 2010 – Highest Noise Level at Sensitive Receptor LAeq(30 min)dB	36	37	32	34	53

3.4 Conclusions

During the January – March period the greatest noise level at a residential sensitive receptor was 37dB(A), calculated at the Coastguard Cottages. The greatest noise level at Irishtown Nature Park was calculated as 53dB(A).

These noise levels are significantly lower than the construction noise limits as detailed in Table 1 of 70 dB(A) which apply Monday – Friday 0700 hrs to 1900 hrs when construction activities were occurring and noise monitoring was undertaken.

On this basis, it is concluded that the site activities undertaken during the January – March 2010 construction period are not causing exceedances of the construction noise limit values.

4 Dust Deposition

A scheme for monitoring dust deposition and direction has been developed for the construction phase of the development.

4.1 Monitoring Method

Monitoring was undertaken by the PEC in accordance with the '*Dublin Waste to Energy - Construction Phase Monitoring Scheme*', September 2009.

There are no legislative regulations regarding fugitive dust during construction either in Ireland or the UK. The "Technical Instructions on Air Quality Control – TA Luft" 2002 immission value for dustfall of 350 mg/m²/day is therefore used as the maximum guideline level during construction.

4.2 Monitoring Results

Weather Conditions

The average weather conditions during the January – March 2010 monitoring period are given below;

January 2010

Average Precipitation: 1.5 mm/ day

Average Wind Speed: 20.4km/h

Average Wind Direction: West South West

February 2010

Average Precipitation: 1.3 mm/ day

Average Wind Speed: 15.6km/h

Average Wind Direction: West South West

March 2010

Average Precipitation: 1.79 mm/ day

Average Wind Speed: 2.17 km/h

Average Wind Direction: West south west

Dust Deposition – Bergerhoff Gauges

The dust deposition results from the Bergerhoff gauges are given in Tables 4- 6:

Table 4: Dust Deposition Results – January 2010

Sample Locations	Grid Reference	Date Deployed	Date Collected	Dust Collected mg/gauge	Rate of Dust Deposition mg/m ² /day	TA Luft Limit mg/m ² /day
6 (West)	155921.9883 292988.5150	04.01.10	05.02.10	14	79	350
7 (East)	316296.3955 390446.4475	04.01.10	05.02.10	11	58	350
8 (North)	247617.5548 528997.1164	04.01.10	05.02.10	62	325	350
9 (South)	240393.60.38 212698.7875	04.01.10	05.02.10	9	47	350

Table 5: Dust Deposition Results – February 2010

Sample Locations	Grid Reference	Date Deployed	Date Collected	Dust Collected mg/gauge	Rate of Dust Deposition mg/m ² /day	TA Luft Limit mg/m ² /day
6 (West)	155921.9883 292988.5150	02.02.10	03.03.10	66	358	350
7 (East)	316296.3955 390446.4475	02.02.10	03.03.10	13	70	350
8 (North)	247617.5548 528997.1164	02.02.10	03.03.10	11	60	350
9 (South)	240393.60.38 212698.7875	02.02.10	03.03.10	81	439	350

Table 6: Dust Deposition Results – March 2010

Sample Locations	Grid Reference	Date Deployed	Date Collected	Dust Collected mg/gauge	Rate of Dust Deposition mg/m ² /day	TA Luft Limit mg/m ² /day
6 (West)	155921.9883 292988.5150	03.03.10	01.04.10	45	244	350
7 (East)	316296.3955 390446.4475	03.03.10	01.04.10	16	86	350
8 (North)	247617.5548 528997.1164	03.03.10	01.04.10	22	119	350
9 (South)	240393.60.38 212698.7875	03.03.10	01.04.201	16	86	350

Dust Deposition – Sticky Pads

Using a Sticky Pad Reader the Effective Area Coverage (EAC) is calculated to give %EAC/day. Guidance (Beaman & Kingsbury) indicates the %EAC/day values which are typical of living conditions i.e. rural, industrial etc. which are detailed in Appendix B. The sticky pad results are presented in Table 7 below.

Table 7 – Sticky Pad Results

Sample Location	Date Exposed	Date Collected	Period of Exposure	Exposed Value	Non Exposed/ Reference Value	%EAC/day	Comments
North	16.03.10	22.03.10	7 days	48	60	1.71	Highest build up of dust was observed on the north and west section.
West	16.03.10	22.03.10	7 days	45	57	1.71	Highest build up of dust was observed on the south and west section.
East	16.03.10	22.03.10	7 days	62	65	0.43	Highest build up of dust was observed in the north section.
South	16.03.10	22.03.10	7 days	65	66	0.14	Highest build up of dust was observed in the east section

4.3 Conclusions

Bergerhoff Gauges

The highest rates of dust deposition were recorded during the February 2010 monitoring period, with 358 and 439 mg/m²/day at Location 1 (Western) and Location 4 (Southern) of the site. The dust deposition levels in March 2010 for these locations reduced to 244 and 86 mg/m²/day respectively.

It is considered that the level of dust deposition at these 2 locations in February 2010 was related to the construction / clearance activities which were being undertaken by Dublin City Council in the immediate vicinity of the dust gauges.

Sticky Pads

This method can be susceptible to rainfall and as a significant amount of rain fell during January and February 2010, with maximum levels of 6.1mm/day and 8.13mm/day, therefore no viable results are recorded on the sticky pads for this period. The highest level of EAC reported for March 2010 was 1.71 %EAC/day, recorded at the western and northern boundaries.

The control measures set out in the Environmental Impact Statement (and the 'Dublin Waste to Energy - Construction Phase Monitoring Scheme', September 2009) have been reviewed and will continue to be implemented during the construction phase.

Daily visual monitoring and weekly environmental inspections undertaken for the December - March 2010 period did not identify any significant dust emissions resulting from construction activities on site.

It is not considered that construction activities have had an adverse impact in terms of dust deposition at the sensitive receptors.

5 Surface Water

A scheme for monitoring suspended solids in surface waters adjacent to the site has been prepared for use during the construction phase of the project, as per the EIS requirements and in accordance with An Bord Pleanála Order -29S.EF2022.

5.1 Monitoring Method

Monitoring was carried by the PEC in accordance with '*Dublin Waste to Energy - Construction Phase Monitoring Scheme*' September 2009.

5.2 Monitoring Results

Analysis of suspended solids in surface water at the 4 surface water monitoring locations was undertaken.

A surface water quality trigger level for suspended solids was determined by calculating the 90thile levels from the baseline (preconstruction) monitoring results. The trigger level was determined to be 198mg/litre.

These suspended solids results for January to March 2010 are presented in Table 8 below:

Table 8 – Surface Water Monitoring – Suspended Solids Results

Parameter	Units	Trigger Value	Date	Time	High Tide	Low Tide	SW(01)	SW(02)s	SW(02)d	SW(03)s	SW(03)d	SW(04)
Location	-	-	-	-	-	-	Cooling Water Channel	Fairway West (surface)	Fairway West (deep)	Fairway East (surface)	Fairway East - Pier (deep)	Irishtown Nature Park
Grid Reference	-	-	-	-	-	-	-	53.20N.596 006.12W.170	53.20N.596 006.12W.170	53.20N.606 006.11W.640	53.20N.606 006.11W.640	-
Suspended Solids (January 2010)	mg/l	198	21/01/2010	16:35-17:25	15:09	20:52	105	37	113	89	138	169
Suspended Solids (February 2010)	mg/l	198	25/02/2010	09:00-10:59	08:25	14:26	76	71	126	126	132	85
Suspended Solids (March 2010)	mg/l	198	25/03/2010	08:23-09:30	06:48	13:01	87	98	82	77	96	96

5.3 Conclusions

During preconstruction monitoring (July and August 2009) suspended solids ranged from 67 – 229mg/l. The highest level of suspended solids during the January – March 2010 monitoring period was 169mg/l at the Irishtown Nature Park (SW04).

There were no exceedances of the suspended solids trigger level of 198mg/l during the January to March monitoring period.

Weekly visual monitoring undertaken from the shore for the January - March 2010 period did not identify any emissions to surface water resulting from construction activities on site.

It is considered that construction activities are not resulting in emissions to surface water.



APPENDIX A - NOISE

Monitoring Locations

Table 1 Construction Noise Monitoring Locations

Measurement Location	Irish National Grid Ref. (INGR)	Location Description	Location Type
Location 1 Rehab Institute	232920.391 319164.187	North-west corner of Rehab building, 1.5m from the façade of building.	Attended (30 minutes)
Location 2 Seafort Avenue	232950.574 319097.015	Footpath adjacent to the dividing wall of Herbert cottage and the property south west.	Attended (30 minutes)
Location 3 Beach Avenue	233159.292 318779.701	Footpath adjacent to the dividing wall of No. 10 and No. 11 Beach Avenue.	Attended (30 minutes)
Location 4 Leukos Road	233784.811 318968.806	Grassed area approximately 10m to the west of the front façade of No. 8, St Judes.	Attended (30 minutes)
Location 5 Walkway (Irishtown Nature Park)	233247.98 319653.415	Walkway south of the Site connecting Sean Moore Park and Irishtown Nature Reserve Park.	Attended (30 minutes)
Location 6 Pigeon House Road	233930.086 319038.456	Footpath immediately in front of the Coastguard Cottages	Attended (30 minutes)
Location 7 Western Site Boundary	233537.542 319840.809	Midway down the Western site boundary, 5m from the boundary fence.	Attended (30 minutes)
Location 8 Northern Site Boundary	251415.3854 531174.3547	Midway down the Northern site boundary, 5m from the boundary fence.	Attended (30 minutes)
Location 9 Eastern Site Boundary	317171.6280 377789.7654	Midway down the Eastern site boundary, 3m from the boundary fence.	Attended (30 minutes)
Location 10 Southern Site Boundary	237882.9204 209681.6407	Midway down the Southern site boundary, 3m from the boundary fence.	Attended (30 minutes)

Monitoring Weather Conditions

The noise surveys were not undertaken during heavy rain or when wind speeds were greater than 10mph (4.4m/s) as this. Further detail of the weather conditions during the monitoring is given in Table 2-4 of this Appendix.

Monitoring Measurements

The measurement parameters for construction monitoring included:

- LAeq (30 minutes);
- LA1 (30 minutes);
- LA5 (30 minutes);
- LA10 (30 minutes);
- LA50 (30 minutes);
- LA90 (30 minutes);
- LA95 (30 minutes); and
- LAMax (30 minutes).

Definitions for Measurement Parameters

Environmental noise levels are usually assessed in terms of A-weighted decibels (dB(A)).

dB(A) is the frequency response curve which resembles the normal frequency hearing curve for most people. A meter using this network will give a result which does have some resemblance in level to that level which is experienced by most people.

L_{Aeq} (Equivalent Continuous Sound Level) is the level of a Notional Steady Sound which at the same position and over a defined period of time would have the same "A" Weighted acoustic energy as the fluctuating noise.

L_{A1} is the level which is exceeded for 1% of the time.

L_{A5} is the level which is exceeded for 5% of the time.

L_{A10} is the level which is exceeded for 10% of the time.

L_{A50} is the level which is exceeded for 50% of the time.

L_{A90} is the level which is exceeded for 90% of the time, often referred to as the background noise level.

L_{A95} is the level which is exceeded for 95% of the time

L_{AMAX} is the maximum A-weighted noise level.

Monitoring Calibration

The Pulsar Model 33 Noise Meter was calibrated in accordance with the manufacturer instructions, using the acoustic calibrator, prior to each round of noise monitoring.

Results

Construction Monitoring Noise Survey Results – January 2010

The results of the construction phase noise monitoring for January 2010 at the site boundary locations are presented in Table 2 below;

Table 2 – Construction Noise Monitoring Results – January 2010

Date	Location No.	Location Name	Event	t(tt)_Duration	Start	End	L1	L5	L10	L50	L90	L95	L99	Laeq (LAT)	Lamax (LAFmax)	Weather Conditions
14 January 2010	7	Western Boundary	147	0000:20:00	14/01/2010 11:30:16	14/01/2010 11:50:15	75	67	64	59	57	57	56	63	85	Dry and overcast throughout the monitoring period
14 January 2010	8	Northern Boundary	148	0000:20:01	14/01/2010 15:13:25	14/01/2010 15:33:25	65	62	61	59	58	57	57	59	71	
14 January 2010	9	Eastern Boundary	149	0000:20:37	14/01/2010 15:39:44	14/01/2010 16:00:20	88	84	82	72	66	64	62	78	95	
14 January 2010	10	Southern Boundary	150	0000:20:01	14/01/2010 16:06:04	14/01/2010 16:26:04	64	62	62	59	58	57	56	60	70	
22 January 2010	7	Western Boundary	157	0000:30:21	22/01/2010 10:19:05	22/01/2010 10:49:25	74	69	67	60	56	56	55	63.5	81	Dry and Mild throughout the monitoring period
22 January 2010	8	Northern Boundary	158	0000:30:00	22/01/2010 10:54:59	22/01/2010 11:24:58	69	67	66	61	59	59	58	63	76	
22 January 2010	9	Eastern Boundary	159	0000:30:02	22/01/2010 11:30:19	22/01/2010 12:00:20	71	68	68	65	63	62	62	66	83.6	
22 January 2010	10	Southern Boundary	160	0000:30:07	22/01/2010 12:05:22	22/01/2010 12:35:28	69	66	65	63	62	61	60	64	76	
29 January 2010	1	Rehab Institute	163	0000:30:42	29/01/2010 08:06:30	29/01/2010 08:37:11	65	64	63	60	55	54	52	60	71	Clear and dry with a slight wind in the morning. The wind speed increased as the day progressed – monitoring was called off at 13:38 due to wind speed greater than 4.4m/s occurring
29 January 2010	2	Seafort Avenue	164	0000:31:11	29/01/2010 08:42:14	29/01/2010 09:13:24	76	71	67	60	53	50	48	65	85	
29 January 2010	3	Beach Avenue	165	0000:31:43	29/01/2010 09:19:02	29/01/2010 09:50:44	61	59	57	54	50	49	47	55	68	
29 January 2010	4	Leukos Road	166	0000:30:07	29/01/2010 09:55:45	29/01/2010 10:25:51	61	59	58	56	54	54	53	57	77	
29 January 2010	5	Coastguard Cottages	167	0000:31:31	29/01/2010 10:31:17	29/01/2010 11:02:47	74	69	67	62	59	58	57	64	83	
29 January 2010	6	Irishtown Nature Park	168	0000:30:18	29/01/2010 11:14:22	29/01/2010 11:44:39	64	58	56	52	50	49	48	55	76	
29 January 2010	7	Western Boundary	169	0000:32:21	29/01/2010 11:58:57	29/01/2010 12:31:17	80	76	73	66	62	61	59	70	85	
29 January 2010	8	Northern Boundary	170	0000:30:07	29/01/2010 12:46:12	29/01/2010 13:16:18	71	69	68	64	60	60	59	65	75	
29 January 2010	9	*Eastern Boundary	171	0000:16:04	29/01/2010 13:22:03	29/01/2010 13:38:06	73	71	70	67	65	64	63	Monitoring called off as wind speeds too high		
29 January 2010	10	*Southern Boundary	-	Monitoring called off as wind speeds too high												

Construction Monitoring Noise Survey Results – February 2010

The results of the construction phase noise monitoring for February 2010 at the site boundary locations are presented in Table 3 below;

Table 3 – Construction Noise Monitoring Results - February 2010

Date	Location No.	Location Name	Event	t(tt)_Duration	Start	End	L1	L5	L10	L50	L90	L95	L99	Laeq (LAT)	Lamax (LAFmax)	Weather Conditions
5th February 2010	7	Western Boundary	173	0000:30:16	05/02/2010 10:37:03	05/02/2010 11:07:18	72	70	69	64	61	60	59	66	82	Bright/Calm
5th February 2010	8	Northern Boundary	-	Unsuccessful recording (human error)			-	-	-	-	-	-	-	-	-	
5th February 2010	9	Eastern Boundary	174	0000:30:02	05/02/2010 11:48:55	05/02/2010 12:18:56	64	62	62	61	61	60	60	61	60	
5th February 2010	10	Southern Boundary	175	0000:30:07	05/02/2010 12:24:13	05/02/2010 12:54:19	61	60	59	58	55	54	53	57	74	
12th February 2010	7	Western Boundary	178	0000:30:35	11/02/2010 13:04:46	11/02/2010 13:35:20	71	65	63	59	55	55	54	62	90	Bright, no rain with slight breeze
12th February 2010	8	Northern Boundary	185	0000:31:23	12/02/2010 14:19:27	12/02/2010 14:50:49	69	67	66	63	61	61	60	64	72	
12th February 2010	9	Eastern Boundary	184	0000:30:05	12/02/2010 13:41:25	12/02/2010 14:11:29	81	72	69	65	63	62	62	69	87	
12th February 2010	10	Southern Boundary	182	0000:31:20	12/02/2010 12:34:18	12/02/2010 13:05:37	70	68	67	62	60	60	59	64	76	
12th February 2010	10	*Southern Boundary	183	0000:30:39	12/02/2010 13:05:46	12/02/2010 13:36:24	70	68	67	65	61	60	59	65	75	
19th February 2010	7	Western Boundary	187	0000:32:34	19/02/2010 09:20:36	19/02/2010 09:53:09	71	69	68	61	57	56	55	64	81	Bright, no rain, slight breeze
19th February 2010	8	Northern Boundary	191	0000:30:03	19/02/2010 11:40:37	19/02/2010 12:10:39	73	70	68	63	59	59	58	65	79	
19th February 2010	9	Eastern Boundary	189	0000:30:03	19/02/2010 10:35:06	19/02/2010 11:05:08	70	68	67	63	61	61	60	64	86	
19th February 2010	10	Southern Boundary	188	0000:30:07	19/02/2010 09:59:40	19/02/2010 10:29:46	63	59	58	57	55	55	54	56	77	
26th February 2010	7	Western Boundary	196	0000:30:03	26/02/2010 11:36:11	26/02/2010 12:06:13	66	62	61	57	55	54	54	58	79	Dry, slightly overcast with sunny spells. No Wind
26th February 2010	8	Northern Boundary	195	0000:32:22	26/02/2010 10:55:59	26/02/2010 11:28:20	66	64	62	59	57	57	57	60	76	
26th February 2010	9	Eastern Boundary	194	0000:30:05	26/02/2010 10:19:51	26/02/2010 10:49:55	65	63	63	62	60	60	60	61	74	
26th February 2010	10	**Southern Boundary	193	0000:30:03	26/02/2010 09:38:16	26/02/2010 10:08:18	66	63	61	56	50	49	49	57	74	

*An additional noise survey was undertaken at the southern boundary as piling activities commenced following the initial southern boundary survey on the 12th February 2010.

** As a result of works being undertaken in the in the Phase 2 compound the Southern Boundary monitoring location was relocated to the southern boundary of the Phase 2 compound.

Construction Monitoring Noise Survey Results – March 2010

The results of the construction phase noise monitoring for March 2010 at the site boundary locations are presented in Table 4 below;

Table 3 – Construction Noise Monitoring Results - March 2010

Date	Location No.	Location Name	Event	t(tt)_Duration	Start	End	L1	L5	L10	L50	L90	L95	L99	Laeq (LAT)	Lamax (LAFmax)	Weather Conditions
5th March 2010	7	Western Boundary	200	0000:30:51	05/03/2010 11:17:43	05/03/2010 11:48:33	74	70	68	59	56	55	53	63	80	Calm, clear day
5th March 2010	8	Northern Boundary	201	0000:30:12	05/03/2010 11:54:03	05/03/2010 12:24:14	89	86	84	69	64	63	57	79	92	
5th March 2010	9	Eastern Boundary	202	0000:30:02	05/03/2010 12:30:37	05/03/2010 13:00:38	80	77	75	65	58	57	57	71	84	
5th March 2010	10	Southern Boundary	203	0000:30:03	05/03/2010 13:03:17	05/03/2010 13:33:19	56	54	53	53	52	52	51	53	64	
10 March 2010	10	*Southern Boundary	206	0000:30:27	10/03/2010 14:59:13	10/03/2010 15:29:39	83	80	78	67	56	55	54	73	92	Slightly breezy, dry sunny day
10 March 2010	7	Western Boundary	207	0000:31:40	10/03/2010 15:39:12	10/03/2010 16:10:51	69	65	64	60	57	56	55	61	79	
12 March 2010	8	Northern Boundary	210	0000:30:05	12/03/2010 09:02:57	12/03/2010 09:33:01	68	65	64	61	59	58	58	62	81	Clear, bright, dry, slight wind (2 – 4m/s)
12 March 2010	9	Eastern Boundary	211	0000:30:02	12/03/2010 09:38:22	12/03/2010 10:08:23	73	67	65	63	61	61	61	64	82	
22nd March 2010	7	Western Boundary	214	0000:33:24	22/03/2010 10:10:03	22/03/2010 10:43:26	64	59	56	53	51	51	50	55	83	Sunny, slight breeze (1 – 2 m/s)
22nd March 2010	8	Northern Boundary	215	0000:30:09	22/03/2010 10:49:08	22/03/2010 11:19:16	62	58	58	55	53	52	51	56	73	
25th March 2010	7	Western Boundary	220	0000:30:02	25/03/2010 14:21:05	25/03/2010 14:51:06	80	75	70	57	55	54	53	68	88	Dry, breezy with gusts (3.6 – 4.1m/s)
26th March 2010	10	Southern Boundary	223	0000:30:08	26/03/2010 11:34:28	26/03/2010 12:04:35	65	62	60	57	53	53	52	58	75	Dry and Calm
26th March 2010	9	Eastern Boundary	224	0000:30:18	26/03/2010 12:10:06	26/03/2010 12:40:23	75	68	67	63	62	62	61	65	94	
26th March 2010	8	Northern Boundary	225	0000:38:40	26/03/2010 12:53:26	26/03/2010 13:32:05	74	67	64	56	54	54	54	62	84	

* As a result of works being undertaken in the in the Phase 2 compound the Southern Boundary monitoring location was relocated to the southern boundary of the Phase 2 compound.

Dominant Noise Sources

During the noise surveys, detailed field observation notes are taken at each monitoring location identifying the principal sources and operations occurring on site, a summary of any and descriptions of the plant and operations causing noise emissions. These fields notes are stored in the Construction Monitoring Folder on the DWtE site, under the control of the PEC. A summary of these observations is provided below;

Sensitive Receptors – January 2010

- Seafort Avenue – Road traffic on Beach Road and passing traffic on Seafort Avenue.
- Beach Road – Road traffic on Beach Road.
- Leukos Road – Road traffic on the roundabout leading to/from the Eastlink and residents cars leaving/arriving.
- Irishtown Park – Walkers/dogs walkers/joggers and birds.
- Coastguard Cottages - Road traffic on the roundabout leading to/from the Eastlink and Port activities such as an empty HGV movement, loading/unloading activities.
- Rehab Institute - Road traffic on Beach Road. Note: High wall surrounding monitoring location.

Site Boundary Locations

14th January 2010

- Scrapping back of the ground in preparation for the piling mat – predominant activity.
- Tractor and Trailer loading and dumping loads of tarmac into a skip.
- Reversing sirens of plant operating.

22nd January 2010

- Excavators and Roller Operating on site.
- Road sweeper cleaning the roads.
- HGV arriving with loads, unloading and departing.
- Reversing sirens of plant operating.
- Excavators (tracks and bucket) operating on the piling mat.
- Hammond Lane site loading and moving scrap metal.

29th January 2010

- Tracked Bulldozer and Roller operation on the piling mat north of the guide wall.
- Road sweeper cleaning the roads.
- HGV arriving with loads, unloading and departing.
- Reversing sirens of plant operating.
- Excavators (tracks and bucket) operating on the piling mat.
- Hammond Lane site loading and moving scrap metal.

5th February 2010

- Excavator operating and moving around the site
- HGV arriving with material for the piling mat - loads, unloading and departing.
- Cement Mixer – delivering and mixing loads
- Washing out of Cement Mixer
- Sirens of plant operating
- Hammond Lane site loading and moving scrap metal

12th February 2010

- Hum from Auger Piles
- Road sweeper cleaning the roads.
- NORA site construction/operations
- Drill/Kango Hammer operating (fencing contractor)
- HGV arriving with loads, unloading and departing.
- Reversing sirens of plant operating.
- Tracked Plant operating at the piling mat.
- Excavator - squeaky tracks
- Piling Rig moving
- HGVs entering and exiting the wheel wash

19th February 2010

- Concrete Mixer – mixing and washing out.
- Tracked Excavator operating
- Manual Hammering
- HGV arriving with loads, unloading and departing
- Hammond Lane site loading and moving scrap metal.

26th February 2010

- Excavators levelling out and racking ground in Phase 2 compound – bucket rattling
- Sirens of plant operating - intermittently
- Road sweeper cleaning the roads.
- Strimmer cutting grass adjacent to hording

5th March 2010

- Delivery of Stone (HGVs) – entering, unloading and leaving site
- Excavator moving stone deliveries and scrapping the ground
- Vibrock rolling out stone deliveries
- Hammond Lane site activities
- Alarms and hum in Ringsend WWTP

10th March 2010

- Vibrock
- Bulldozer
- Nora site construction activities
- Excavator pulling up a area of hardstanding
- Sirens
- Scrapping of aggregate in wheel-wash area
- Tractor and trailer being loading/unloaded on piling matt/wheelwash area

12th March 2010

- Dominant noise source is Hammond Land site activities
- Hammering at the Nora site
- HGV unloading metal piling cages - engine noise
- Delivery HGV on Shelly Banks Road
- Sirens

22nd March 2010

- Hum of WWTP including water cleaning/blasting
- NORA site – hammering and banging of metal gates
- Excavator Bucket scrapping ground at the entrance to the site compound
- Excavator sieving out metal fragments from the stockpiles

25th March 2010

- Vibrorock
- Excavator
- HGVs delivering loads
- Bulldozer

26th March 2010

- Hammering at the Nora site
- Excavator sieving out metal fragments from the stockpiles
- Road sweeper
- Dump Truck depositing material into stockpiles
- Excavator bucket (empty) being shaken
- Hammering at the Nora site
- Vibrorock
- Bulldozer
- Siren

Accredited Noise Calculations

To establish the contribution of the January - March 2010 DWTE site activities to the noise levels at the sensitive receptors, the *British Standard 5228-1:2009: Code of practice for noise and vibration control on construction and open sites – Part 1:Noise (Section F.2.2)* was used to calculate the noise levels at the sensitive receptors based on noise levels undertaken at the western and southern site boundary locations only. These boundaries are used as they represent the closest boundaries to the sensitive receptors, and the most accurate calculation of noise levels. On this basis, when both are available, the southern boundary is used to calculate noise levels for the Rehab Institute, Seafort Avenue, Beach Avenue and Irishtown Nature Park. The Western Boundary is used to calculate the noise levels at the Coastguard Cottages and Leukos Road.

The calculation requires the measured Laeq noise level at the boundary noise monitoring location and the distance between the boundary monitoring location and the noise source (plant) location (m). Then the distance between the sensitive receptor location and the noise source (plant) location (m) is included and the noise level at the receptor based on these distances is calculated. A screening correction of 10dB is subtracted from the resultant noise level if the plant is not visible from the sensitive receptor location. This applies in all cases due to screening by Irishtown Nature Park embankments and buildings. Table 5 outlines the results of these calculations.

Table 5 – Noise Level Calculation Results (BS 5228-1:2009: Code of practice for noise and vibration control on construction and open sites – Part 1:Noise - Section F.2.2)

Date	Site Boundary	Noise Level <u>dB(A)</u> (<u>L_{EAQ, 30 mins}</u>)	Distance between boundary monitoring location and noise source location (m)	Distance between receptor location and noise source location (m):						Screening Adjustment <u>dB(A)</u>	Calculated Noise Level at Closest Sensitive Receptors (<u>L_{EAQ, 30 mins}</u>)					
				Rehab Institute	Seafort	Beach	Leukos	Irishtown Nature Park	Coastguard Cottages		Rehab Institute	Seafort	Beach	Leukos	Irishtown Nature Park	Coastguard
14 Jan 2010	Western	63	10	-	-	-	910	-	890	-10	-	-	-	14	-	14
14 Jan 2010	Southern	60	50	920	950	1170	-	290	-	-10	25	25	23	-	35	-
22 Jan 2010	Western	64	40	-	-	-	950	-	930	-10	-	-	-	26	-	27
22 Jan 2010	Southern	64	40	910	930	1150	-	260	-	-10	27	27	25	-	38	-
29 Jan 2010	Western	70	50	1000	1020	1020	950	360	970	-10	34	34	34	34	43	34
5 Feb 2010	Western	66	50	-	-	-	960	-	940	-10	-	-	-	30	-	31
5 Feb 2010	Southern	57	150	1010	1030	1220	-	380	-	-10	30	30	29	-	39	-
12 Feb 2010	Western	62	90	-	-	-	930	-	890	-10	-	-	-	32	-	32
12 Feb 2010	Southern	65	60	940	970	1210	-	250	-	-10	31	31	29	-	43	-
19 Feb 2010	Western	64	20	-	-	-	890	-	880	-10	-	-	-	21	-	21
19 Feb 2010	Southern	56	70	910	930	1140	-	280	-	-10	24	24	22	-	34	-
26 Feb 2010	Western	58	20	-	-	-	890	-	880	-10	-	-	-	15	-	15
26 Feb 2010	Southern	57	60	800	840	1130	-	80	-	-10	25	24	22	-	45	-
5 Mar 2010	Western	63	70	-	-	-	980	-	965	-10	-	-	-	30	-	30
10 Mar 2010	Western	73	30	-	-	-	930	-	920	-10	-	-	-	33	-	33
10 Mar 2010	Southern	61	120	830	860	1120	-	130	-	-10	34	34	32	-	50	-
22 Mar 2010	Western	55	85	-	-	-	910	-	900	-10	-	-	-	24	-	25
22 Mar 2010	Southern	56	80	820	845	1060	-	220	-	-10	26	26	24	-	37	-
25 Mar 2010	Western	68	80	-	-	-	980	-	950	-10	-	-	-	36	-	37
26 Mar 2010	Southern	58	70	910	930	1140	-	285	-	-10	26	26	24	-	36	-



APPENDIX B – Dust Deposition

Monitoring Method

Using a Sticky Pad Reader the Effective Area Coverage (EAC) is calculated to give %EAC/day. Guidance (Beaman & Kingsbury) indicates the %EAC/day values which are typical of living conditions i.e. rural, industrial etc. These values are outlined in Table 1 below.

Table 1: Typical Levels

%EAC/day	Situation
0.01	Rural
0.02	Suburban
0.3-0.4	Urban
0.5	Rural summertime
0.8-1.0	Industrial

This guidance also outlines typical complaint thresholds. These are detailed in Table 2 below.

Table 2: Complaint Thresholds

%EAC/day	Response
0.2	Noticeable
0.5	Possible complaints
0.7	Objectionable
2.0	Probable complaints
5.0	Serious complaints