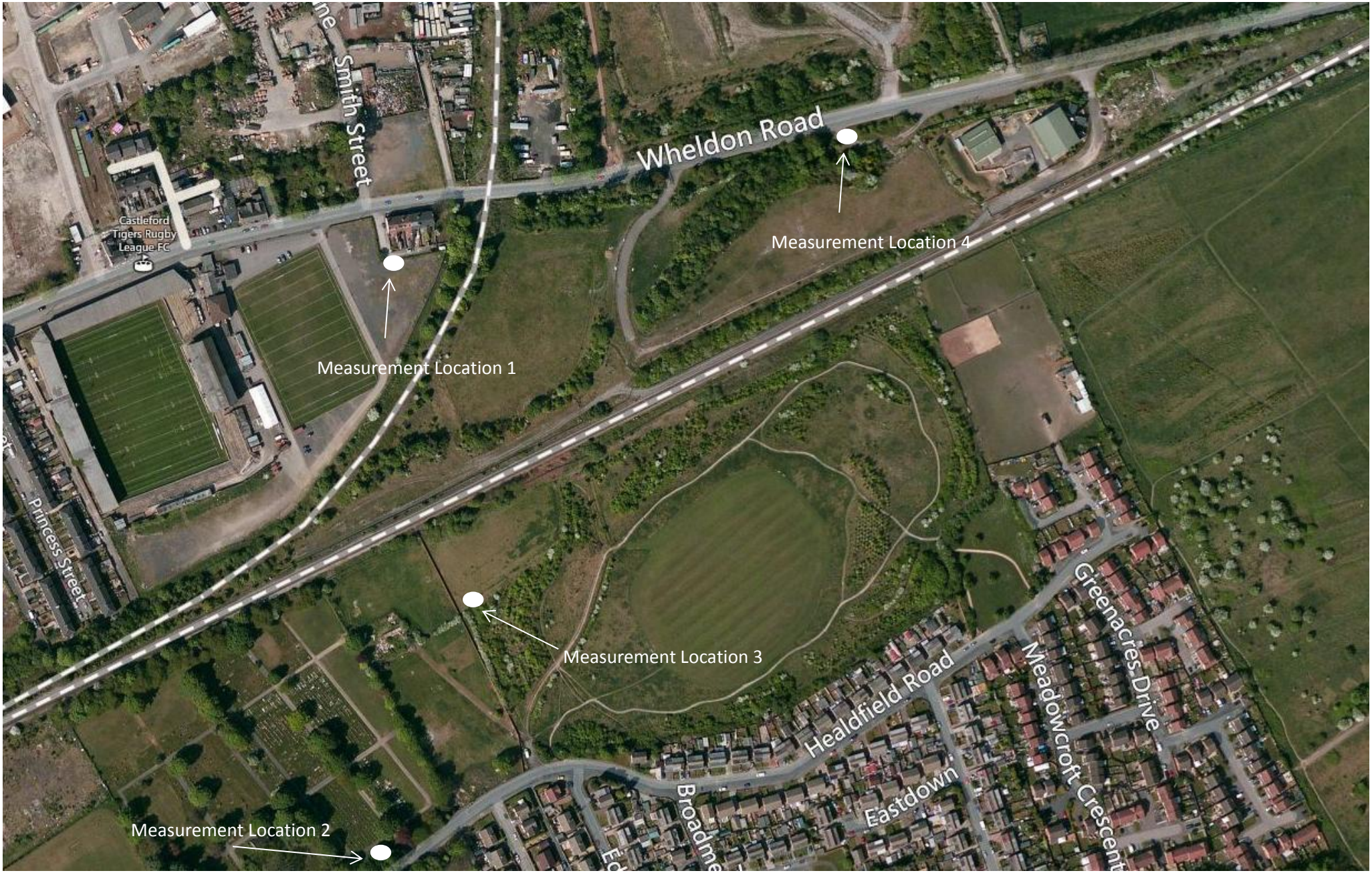
FIGURE 11.1

NOISE MONITORING LOCATION PLAN


Smith Street
Wheldon Road
Castleford Tigers Rugby League FC
Measurement Location 4
Measurement Location 1
Princess Street
Measurement Location 3
Greenacres Drive
Healdfield Road
Meadowcroft Crescent
Eastdown
Measurement Location 2

APPENDIX 11.1

NOISE MONITORING RESULTS

Noise Monitoring Results - 118 Wheldon Road
14th & 15th March 2012

Daytime

Date/Time	LAeq (dB)	LA10 (dB)	LA90 (dB)
(2012/03/14 14:23:26.00)	51.4	54.5	45.3
(2012/03/14 14:28:29.00)	50.7	53.6	44.8
(2012/03/14 14:33:27.00)	50.7	53.4	44.7
(2012/03/14 14:36:26.00)	50.9	54.1	45.0
(2012/03/14 14:41:28.00)	49.4	52.6	44.1
(2012/03/14 14:46:31.00)	48.8	52.7	43.4
(2012/03/14 14:51:34.00)	51.2	54.0	45.6
(2012/03/14 14:56:36.00)	49.2	52.1	45.1

Night-time

Date/Time	LAeq (dB)	LA10 (dB)	LA90 (dB)
(2012/03/15 00:27:11.00)	48.4	49.3	40.0
(2012/03/15 00:32:13.00)	44.5	44.6	42.2
(2012/03/15 00:37:16.00)	44.2	44.1	41.4
(2012/03/15 00:42:19.00)	42.2	43.4	40.6
(2012/03/15 00:47:21.00)	45.8	47.7	37.9
(2012/03/15 00:52:24.00)	44.0	43.8	37.8
(2012/03/15 00:57:27.00)	53.1	59.1	39.1
(2012/03/15 01:02:29.00)	48.2	52.2	39.4
(2012/03/15 01:07:32.00)	47.2	51.2	36.9

Noise Monitoring Results - Cemetery, Healdfield Road and Clarity Development
21st March 2012

Daytime - Cemetery, Healdfield Road

Date/Time	LAeq (dB)	LA10 (dB)	LA90 (dB)
11:28:54	34.9	36.0	33.0
11:33:54	36.2	38.0	34.0
11:38:54	44.5	49.0	35.0
11:43:54	35.5	37.5	33.0
11:48:54	36.5	38.5	33.5
11:53:54	34.3	35.5	32.5
11:58:54	34.2	35.5	31.5
12:03:54	34.4	35.5	32.5
12:08:54	34.1	35.5	32.0
12:13:54	33.6	34.5	31.5
12:18:54	33.4	34.5	31.5
12:23:54	36.0	39.5	31.0
12:28:54	34.4	36.0	32.0
12:33:54	35.9	37.5	32.0
12:38:54	35.3	36.5	32.5
12:43:54	35.5	37.0	33.0
12:48:54	33.8	35.0	32.0
12:53:54	46.5	52.0	33.0
12:58:54	34.6	35.5	31.5
13:03:54	34.6	36.0	32.0
13:08:54	35.1	36.5	33.0
13:13:54	36.2	37.5	33.5
13:18:54	37.1	39.0	33.5
13:23:54	43.8	48.0	33.5
13:28:54	41.4	43.0	34.0

Night-time - Clarity Development

Date/Time	LAeq (dB)	LA10 (dB)	LA90 (dB)
23:37:11	33.5	34.5	31.5
23:42:11	32.1	32.5	31.0
23:47:11	33.1	33.5	32.0
23:52:11	32.6	33.0	31.5

Noise Monitoring Results - Travellers Site
21st March 2012

Daytime

Date/Time	LAeq (dB)	LA10 (dB)	LA90 (dB)
09:57:14	51.2	55.5	33.0
10:02:14	48.6	53.0	32.0
10:07:14	51.7	57.0	33.0
10:12:14	50.4	55.0	33.5
10:17:14	54.0	57.5	34.5
10:22:14	51.2	56.0	35.0
10:27:14	51.5	57.0	33.5
10:32:14	51.6	56.5	33.5
10:37:14	52.1	56.0	34.0
10:42:14	52.4	56.5	36.5
10:47:14	51.9	56.5	35.0
10:52:14	43.2	40.0	33.0

Night-time

Date/Time	LAeq (dB)	LA10 (dB)	LA90 (dB)
23:10:25	44.7	45.5	32.5
23:15:25	47.7	50.5	33.0
23:20:25	40.0	37.0	32.5
23:25:25	43.5	44.0	32.5

APPENDIX 11.2

NOISE CALCULATIONS

NOISE CALCULATIONS WITH MITIGATION

SPL at each location with mitigation

Calculation of SPL at each location due to waste preparation area inside the building

SPL at specified location is:
Reverberant SPL inside building - façade attenuation - 20 * Log(distance from façade) - 17 + 10*log(façade area) - barrier attenuation
Barrier attenuation is zero, façade attenuation is 27 dB (for 1mm profiled steel)

Monitoring Location	Reverberant SPL	Distance from source (m)	Calculation	Predicted noise level at receptor	Attenuation of mitigation measures	Noise level with character correction
Wheldon Road	81.5	135.0	as above	13.5	7.0	18.5
Clarity	81.5	195.0	as above	10.3	7.0	15.3
Travellers	81.5	85.0	as above	17.5	7.0	22.5

noise level within building can be reduced effectively by housing noisy individual items within enclosures and providing absorptive material to the walls to reduce the reverberant SPL within the building

Calculation of SPL at each location due to noise inside autoclave area

Monitoring Location	Reverberant SPL	Distance from source (m)	Calculation	Predicted noise level at receptor	Attenuation of mitigation measures	Noise level with character correction
Wheldon Road	81.3	155.0	as above	13.0	7.0	18.0
Clarity	81.3	230.0	as above	9.6	7.0	14.6
Travellers	81.3	95.0	as above	17.3	7.0	22.3

Calculation of SPL at each location due to noise inside pyrolisis area

Monitoring Location	Reverberant SPL	Distance from source (m)	Calculation	Predicted noise level at receptor	Attenuation of mitigation measures	Noise level with character correction
Wheldon Road	84.3	195.0	as above	14.0	7.0	19.0
Clarity	84.3	290.0	as above	10.6	7.0	15.6
Travellers	84.3	115.0	as above	18.6	7.0	23.6

Calculation of SPL at each location due to noise inside turbine area

Monitoring Location	Reverberant SPL	Distance from source (m)	Calculation	Predicted noise level at receptor	Attenuation of mitigation measures	Noise level with character correction
Wheldon Road	83.5	240.0	as above	4.4	7.0	9.4
Clarity	83.5	310.0	as above	2.2	7.0	7.2
Travellers	83.5	140.0	as above	9.1	7.0	14.1

Calculation of SPL due to pyrolisis and gas flare stack

Monitoring Location	Sound power level of plant	Distance from source (m)	Calculation	Predicted noise level at receptor	Attenuation of mitigation measures	Noise level with character correction
Wheldon Road	90.0	230.0	SWL - 20log(r)-11	10.8	21.0	15.8
Clarity	90.0	290.0	SWL - 20log(r)-11	8.8	21.0	13.8
Travellers	90.0	155.0	SWL - 20log(r)-11	14.2	21.0	19.2

11 dB is used as, due to the height of the stack, spherical propagation is assumed
21 dB is assumed for the reduction provided by an in-stack attenuator to bring in-stack noise level down to 70 dB
It is assumed that the gas flare stack has a potentially high noise level (90dB)

Calculation of SPL due to gas turbine stacks

Monitoring Location	Sound power level of plant (3 stacks @75dB each)	Distance from source (m)	Calculation	Predicted noise level at receptor	Attenuation of mitigation measures	Noise level with character correction
Wheldon Road	79.8	250.0	SWL - 20log(r)-11	10.8	10.0	15.8
Clarity	79.8	330.0	SWL - 20log(r)-11	8.4	10.0	13.4
Travellers	79.8	165.0	SWL - 20log(r)-11	14.5	10.0	19.5

11 dB is used as, due to the height of the stack, spherical propagation is assumed
10 dB is assumed for the reduction provided by an in-stack attenuator to bring in-stack noise level down to 70dB

Calculation of SPL due to waste deliveries
SEL's for refuse vehicles arriving, maneouvring and leaving)

SEL as an SWL	104	
No of events/hr	20	135 vehicles per 12 hr 7-7 operating day. 11.25 per hr but increased to reflect
Time period (s)	3600	worst case as deliveries concentrated in afternoon
SEL to LAeq	**81.4**	

Monitoring Location	Equivalent Sound Power Level	Average distance from source (m)	Calculation	Predicted noise level at receptor	Barrier attenuation	Noise level with character correction
Wheldon Road	81.4	115.0	SWL - 20log(r)-11	24.2	5.0	29.2
Clarity	81.4	200.0	SWL - 20log(r)-11	19.4	5.0	24.4
Travellers	81.4	70.0	SWL - 20log(r)-11	28.5	5.0	33.5

5 dB is assumed for barrier as would be effective in reducing noise emanating from ground level i.e. trucks

Total SPL's daytime

Monitoring Location	Combined noise level with character correction	Background LA90	Difference
Wheldon Road	30.6	44.8	- 14.2
Clarity	26.3	32.7	- 6.4
Travellers	34.8	33.9	0.9

Total SPL's nighttime

Monitoring Location	Combined noise level with character correction	Background LA90	Difference
Wheldon Road	21.7	39.5	- 17.8
Clarity	19.0	31.5	- 12.5
Travellers	25.4	32.6	- 7.2

NOISE CALCULATIONS WITHOUT MITIGATION

SPL at each sensitive receptor without mitigation

Calculation of SPL at each location due to noise inside waste prep area

SPL at specified location is:
Reverberant SPL inside building - façade attenuation - 20 * Log(distance from façade) - 17 + 10*log(façade area) - barrier attenuation
Barrier attenuation is zero, façade attenuation is 27 dB (for 1mm profiled steel)

Monitoring Location	Reverberant SPL	Distance from source (m)	Calculation	Predicted noise level at receptor	Noise level with character correction
Wheldon Road	81.5	135.0	as above	20.5	25.5
Clarity	81.5	195.0	as above	17.3	22.3
Travellers	81.5	85.0	as above	24.5	29.5

Calculation of SPL at each location due to noise inside autoclave area

Monitoring Location	Reverberant SPL	Distance from source (m)	Calculation	Predicted noise level at receptor	Noise level with character correction
Wheldon Road	81.3	155.0	as above	20.0	25.0
Clarity	81.3	230.0	as above	16.6	21.6
Travellers	81.3	95.0	as above	24.3	29.3

Calculation of SPL at each location due to noise inside pyrolisis area

Monitoring Location	Reverberant SPL	Distance from source (m)	Calculation	Predicted noise level at receptor	Noise level with character correction
Wheldon Road	84.3	195.0	as above	21.0	26.0
Clarity	84.3	290.0	as above	17.6	22.6
Travellers	84.3	115.0	as above	25.6	30.6

Calculation of SPL at each location due to noise inside turbine area

Monitoring Location	Reverberant SPL	Distance from source (m)	Calculation	Predicted noise level at receptor	Noise level with character correction
Wheldon Road	83.5	240.0	as above	11.4	16.4
Clarity	83.5	310.0	as above	9.2	14.2
Travellers	83.5	140.0	as above	16.1	21.1

Calculation of SPL due to pyrolisis and gas flare stack

Monitoring Location	Sound power level of plant	Distance from source (m)	Calculation	Predicted noise level at receptor	Noise level with character correction
Wheldon Road	90.0	230.0	SWL - 20log(r)-11	31.8	36.8
Clarity	90.0	290.0	SWL - 20log(r)-11	29.8	34.8
Travellers	90.0	155.0	SWL - 20log(r)-11	35.2	40.2

11 dB is used as, due to the height of the stack, spherical propagation is assumed
It is assumed that the gas flare stack has a potentially high noise level (90dB)

Calculation of SPL due to gas turbine stacks

Monitoring Location	Sound power level of plant (3 stacks @75dB each)	Distance from source (m)	Calculation	Predicted noise level at receptor	Noise level with character correction
Wheldon Road	79.8	250.0	SWL - 20log(r)-11	20.8	25.8
Clarity	79.8	330.0	SWL - 20log(r)-11	18.4	23.4
Travellers	79.8	165.0	SWL - 20log(r)-11	24.5	29.5

11 dB is used as, due to the height of the stack, spherical propagation is assumed

Calculation of SPL due to waste deliveries
SEL's for refuse vehicles arriving, discharging, leaving)

SEL as an SWL	104	
No of events/hr	20	135 vehicles per 12 hr 7-7 operating day. 11.25 per hr but increased to reflect worst
Time period (s)	3600	case as deliveries concentrated in afternoon
SEL to LAeq	**81.4**	

Monitoring Location	Equivalent Sound Power Level	Average distance from source (m)	Calculation	Predicted noise level at receptor	Noise level with character correction
Wheldon Road	81.4	115.0	SWL - 20log(r)-11	29.2	34.2
Clarity	81.4	200.0	SWL - 20log(r)-11	24.4	29.4
Travellers	81.4	70.0	SWL - 20log(r)-11	33.5	38.5

Total SPL's daytime

Monitoring Location	Combined noise level with character correction	Background LA90	Difference
Wheldon Road	39.5	44.8	- 5.3
Clarity	36.6	32.7	3.9
Travellers	43.3	33.9	9.4

Total SPL's nighttime

Monitoring Location	Combined noise level with character correction	Background LA90	Difference
Wheldon Road	38.0	39.5	- 1.5
Clarity	35.7	31.5	4.2
Travellers	41.6	32.6	9.0