ANNUAL ENVIRONMENTAL REPORT 2013

KMK METALS RECYCLING LTD

WASTE LICENCE REF: W0113-03

Cappincur Industrial Estate,
Daingean Road, Tullamore, Co. Offaly

REPORT PERIOD:
JANUARY 2013-DECEMBER 2013

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1.0 REPORTING PERIOD

The reporting period for this Annual Environmental Report is 1st January 2013 to 31st of December 2013.

2.0 EMISSIONS FROM THE FACILITY

A summary and interpretation of all emissions monitoring carried out at the facility during 2013 is discussed in detail below.

2.1 Dust

The full Ambient Dust Monitoring Report is included in Appendix 1 of this AER, a summary of which is provided below.

Dust deposition assessment was carried out at the site from the 31st July to the 29th August 2013 by Nally Environmental, in accordance with Waste Licence Requirements (Table 1).

Table 1: Dust Monitoring Licence Requirements

Stations	Parameter ($mg/m^2/day$)	Monitoring frequency	Analysis Method/ Technique
A2-1, A2-2, A2-3, A2-4, A2-5, A2-6	Total Dust Deposition Metal content Note2	Annually Note1 Annually	Standard method Note3 Standard method

Note 1: During the period May to September, or otherwise specified in writing by the Agency.
Note 2: Analysis to include the following metals: Al, As, Cd, Cr, Cu, Fe, Hg, Ni, Pb and Zn.
Note 3: Standard VDI 2119 (Measurement of dustfall, Determination of dustfall using Bergerhoff Instrument (Standard Method) German Engineering Institute). Any modifications to eliminate interference due to algae growth in the gauge should be reported to the Agency.

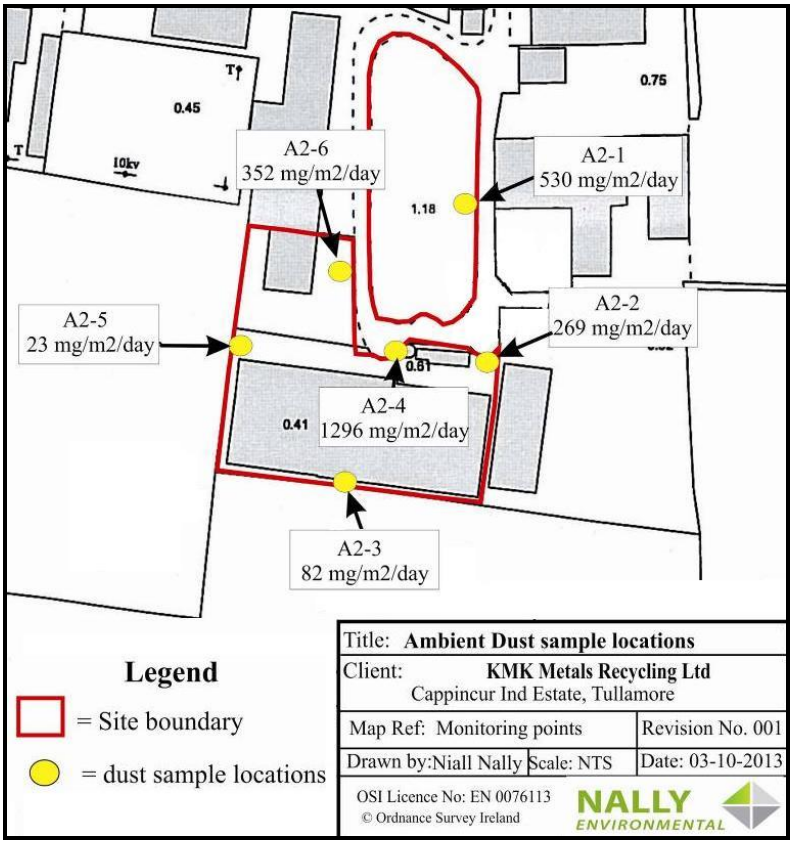
Weather conditions can have a notable impact upon dust creation and entrainment in the air and these have to be taken into account when assessing dust monitoring results. Monitoring took place in August 2013; the period of monitoring was a typical operational month at KMK with below average rainfall and above average wind.

The effects of weather conditions on dust generation and entrainment is as follows:

- Drier weather will lighten small particulates and increase ambient dust. Met Eireann data from the Gurteen Synoptic Station shows that August had lower levels of rainfall than normal with very low rainfall in the months preceding August.
- Wind strength will determine the size of particles that can be entrained in the air and the distance they can travel. Met Eireann data from the Gurteen Synoptic Station shows the average wind strength was 7.6. In general, the wind strength pattern was unsettled and moderately high for August 2013 with the effect of increased dust entrainment in the ambient air at and around the site.

The results are presented in Figure 1, below. There were two notable exceedences; one in the centre of KMK's operations and one just north west of it. There was one other very slight exceedence (2mg/m2/day above the 350mg/m2/day limit). A2-1 to -5 (North, East, South and West boundaries) were within the 350mg/m2/day Limit Value.

Figure 1: KMK Dust Monitoring Locations and Results 2013



During periods of dry weather KMK yard operatives dampen down roads, yard areas and buildings in order to suppress dust and keep yards clean. It is likely that the extraordinarily dry and windy weather during August 2013 caused yard areas to dry out very quickly and that the erratic wind patterns lifted and deposited more dust than is typical, and not necessarily from KMK's site.

In addition to Total Dust Deposition, metals are also analysed during dust monitoring events. All metals content parameters in microgram levels were below the laboratory limits of detection with the exception of (very low) trace levels of copper and zinc detected in the dust samples. A comparison of the metals content in August 2013 with that of the previous August 2012 period, shows that the actual metals content of all samples in 2013 were significantly lower in detectible levels when compared with 2012 results.

2.2 Stack Emission Point Monitoring.

The Waste Licence requirements for stack emission monitoring are presented in Table 2 below.

Table 2: Licence Requirements for Stack Monitoring

Emission point ref no.	Parameter	Monitoring frequency	Analysis Method/ Technique
A2-8	Total particulates and metals including Al, As, Cd, Cr, Cu, Fe, Hg, Ni, Pb and Zn	Monthly for 3 months and quarterly thereafter	Standard Methods

Monitoring of A2-8 was performed for the parameters listed below over three separate monitoring events during 2013: Q2, Q3 and Q4:

- Airflow rate
- Total particulates
- Moisture content
- Specified metals (particulate bound and gaseous based metals)

The plant was in use during monitoring, and the samples were taken as discharged from the emission stack after treatment by the bag house filter unit.

Q1 stack monitoring was not conducted for the following reason: Condition 6.7 of the waste licence W0113-03 which states 'The frequency, location, methods and scope of monitoring, sampling and analyses, as set out in this licence, may be amended with the agreement of the Agency following evaluation of test results'. KMK made a formal request on the 15th February 2013 to the EPA to reduce the frequency of sampling of the stack emission point A2-8 from Quarterly to Annually. The basis of this request was that: 1) all five separate stack emissions monitoring exercises conducted during 2012 were below license limits, 2) the WEEE treatment process remained unchanged, 3) a monitoring probe (connected to a warning alarm) was installed to effectively monitor real time emissions from the stack and 4) a cyclone abatement system was installed to give extra emissions abatement control. KMK considered the a reasonable request and had believed the request would be granted, however it was formally refused by the EPA after the Q1 time period elapsed and hence the opportunity to monitor during Quarter 1 was missed.

The individual monitoring reports are included in Appendix 2 and are summarised below (Table 3) in terms of dates and total particulate results obtained.

Table 3: Stack Monitoring Results 2013

Date	Company	Ref	Result (mg/Nm3)	Limit Value (mg/Nm3)
Not done	Glenside Environmental	Q1	Not conducted due to cross-over of communications between KMK and the EPA.	
21-05-2013		Q2	0.4	12.5
17-09-2013		Q3	0.97	12.5
10-12-2013		Q4	0.44	12.5

As can be seen from the Table 5 results are consistently low throughout 2013, representing a consistent manner of air emissions treatment by the infrastructure on-site.

KMK will continue to conduct stack air emissions in accordance with the Waste Licence Requirements and make use of the continuous particulates monitoring probe as installed on the stack A2-8 on 5th April 2013. The probe is pre-set to warn management (by an alarm system) in the event of any increase so that action may be taken prior to (and thus preventing) any breach of an Emission Limit Value.

Stack emissions continue to be consistently low, of minor significance, self regulated and similar over a typical year with no seasonal changes.

2.3 Noise

Waste Licence (W0113-03) requirements for noise monitoring are presented in Table 4.

Table 4: Noise Monitoring Licence Requirements

Stations	Parameter	Monitoring frequency	Analysis Method / Technique
NE1, NE2, NE3, NE4, NE5, NE6	L(A)eq [30 minutes], $L(A)_{10}$ [30 minutes], $L(A)_{90}$ [30 minutes] and 1/3 Octave Band Analysis	Annually	Standard Method[Note1]

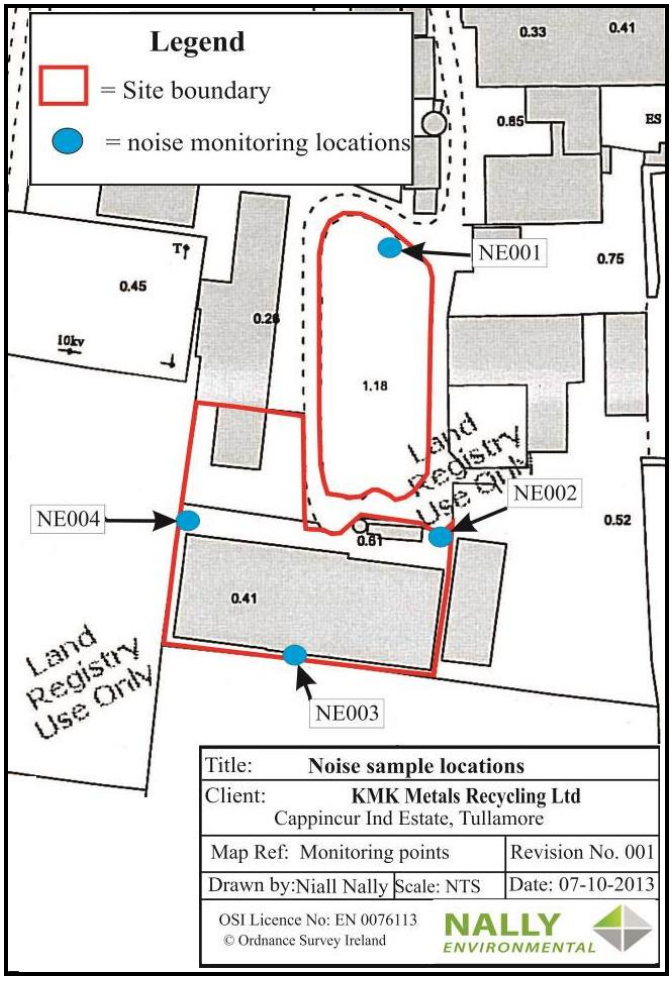
Note 1: International Standards Organisation, ISO 1996 Acoustics – Description and Measurement of Environmental Noise. Parts 1,2 & 3.

This monitoring event took into account the released EPA guidance document NG4 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities' released in April 2012, which seeks a notable increase in the repetitiveness of monitoring during the annual event. A request was submitted to the EPA and approved, requesting the reduction in monitoring stations on site from the licensed 6 stations to 4. This alteration enables a reasonable monitoring time on site, reduces unnecessary repetitiveness of close proximity monitoring stations and gives a fair indication of noise arising from site activities during a normal operating day (hours of operation being between 6am-10pm Monday to Friday and 6am - 1pm Saturday, as per Waste Licence). The monitoring locations were thus as follows:

- NE001: Car park at fence boundary – northern boundary
- NE002: Eastern boundary, beside a port-cabin
- NE003: Rear of the facility buildings – Southern boundary
- NE004: Adjacent the working yard area – Western boundary

Noise monitoring was carried out on Tuesday 24th September 2013. Each monitoring location is identified on the map shown in Figure 2 below. Weather conditions during sampling were mild with gentle wind and no rainfall.

Figure 2: KMK Noise Monitoring Locations 2013



Noise monitoring was carried out between the hours of 5.50am and 3.30pm on the same day (to incorporate night time and day time). The complete set of noise measurement results are included in the Noise Monitoring Survey (Appendix 3).

Noise sources from the facility, audible at the site boundaries have been identified as:

- Work associated with the short term Waste Water Treatment Plant upgrade project
- Noise from the Bag House dust emissions treatment system (due to temporary rubbing motor, corrected during a subsequent service of the system)
- Staff and Operational vehicles entering/leaving the site
- Unloading and loading of trucks and delivery / removal of skips
- Tipping of WEEE under cover in the Hanger building
- Reversing alarms from forklift trucks
- WEEE processing operations within buildings

Station NE001, located on the northern boundary, had the lowest noise levels. Site activities at this station were audible but not typically intrusive. LAeq(30 minute) values ranged from 56-59 dB at NE 001 during the day.

During the Daytime measurements, maximum noise levels of LAeq(30 minute) varied between 56-66dB at boundary locations. The highest levels were noted at station NE002 (66, 64 and 63dB) and these were due to abnormal activities associated with the short term Waste Water Treatment upgrade project.

Station NE003, located on the south boundary behind the WEEE building, resulted in LAeq(30 minute) values ranging from 60-62 dB during the day. Noise was dominated here by the nearby dust extraction system used to treat dusts from the WEEE Plant with contributing noise from materials processing inside the same building and audible background noise from traffic on the nearby Tullamore by-pass. Since the noise Survey took place, servicing of the Stack found a motor was rubbing within the Stack causing abnormal noise – this was fixed and it is hope that Noise Monitoring results will be improved at this location as a result.

Station NE004, located on the west boundary, resulted in LAeq(30 minute) values ranging from 58-61 dB during the day. Noise here was primarily due to typical sites activities (traffic movements associated with loading and unloading and CRT dismantling in D4). In addition, household battery sorting was being carried out close by at D4-R (an activity which takes place over a few days once approximately every two months).

Night-time measurements were taken between 6am and 7am and were representative of normal activities. The highest noise level in LAeq(15 minute) was 67dB at NE003 whilst the lowest noise level in LAeq(15 minute) was 51dB at NE002. In relation to NE002 (6-7am) there was no activity associated with the short term Waste Water Treatment Plant upgrade hence the lower noise level compared to highest daytime level of 66dB at the ame location. The noise at NE003 (from 6-7am) of 67dB was most likely due to start-up of the dust extraction system plant.

Due to the affect of noise dissipation over distance (a decrease in 6dB(A) for every doubling in distance – see Table below) and taking into account the location and abnormal nature of noises at KMK during this monitoring event, it is not likely that noise is a source of disturbance to neighbouring properties during normal activities (abnormal noises being generated by a short term infrastructure improvement project and rubbing motor in the Stack, which has since been fixed).

Table 5: Attenuation of Noise over Distance for point source emissions

Distance m	Noise level dB	Noise Level dB
10	70	65
20	64	59
40	58	53
80	52	47
160	46	41

1/3 Octave analysis (analysis of recorded sound pressures to identify if tonal features are present) was carried out on the same day. There were some isolated tones identified during the survey. These are summarised in the following table:

Table 6: Tonal Features Identification

Monitoring Station	**Day-time Tonal Features** (Frequency & Pressure)	**Night-time Tonal Features** (Frequency & Pressure)	**Comments**	**Rating Level** ($L_{ar,T}$) as adjusted by adding 5dB to the relevant L_{Aeq}
NE001	No identified tones	No identified tones	No tones identified	Not applicable
NE002	60dB at 3.15kHz, at 07:48	No identified tones	Arising from work associated with the Waste Water Treatment Plant (short term) upgrade project - revving which lasted 15mins.	71dB
NE003	54dB at 3.15kHz at 11:15	60dB at 1.25kHz at 06:41	Tones associated with the dust extraction plant at this location (not likely to be experience by noise sensitive receptors due to the apex side of the building acting as a sound barrier). Note: the direct affected area of noise influence is a field and then the Tullamore by-pass some distance away.	67dB – daytime 72dB – night-time
NE004	31dB and 34dB at 8kHz at 11:47 & 14:51 respectively	No identified tones	This tone was most probably as a result of impulsive noise at the facility.	63dB and 64dB respectively.

In conclusion:

- The tone identified at NE002 was due to an off-site contractor related to construction and development works which were temporary and which have since ceased.
- The tones at NE003, were due to the dust extraction abatement plant (which at the time had an undetected rubbing motor, which has since been fixed) - the location of this tone source, attenuation of the sound over distance and field of influence dictates that this tone will not be experienced by noise sensitive receptors.
- The tone at NE004, was due to the occasional use of the battery sorter only during daytime periods. The attenuation of the sound over distance means that this tone is unlikely to be experienced by noise sensitive receptors.

2.4 Surface Water

Waste Licence requirements (ref. W0113-03) for storm water monitoring are as follows:

Table 7: Storm Water Monitoring Licence Requirements

Locations	Parameter	Monitoring frequency	Analysis Method/ Technique
CX DX	pH, COD, Ammonia, Conductivity, Suspended solids, Mineral oils	Quarterly	Standard Methods[Note1]
CX DX	Metals (Al, As, Cr, Fe, Hg, Ni, Pb & Zn)	Bi-annually	Standard Methods

Note 1: Chloride is also taken on a quarterly basis for interpretation reasons

Storm water samples were taken directly from the outlets CX and DX for all parameters applicable under the licence limits (see Table 8). Test certificates are included in Appendix 4 of this AER.

Table 8: Storm Water Monitoring Summary

Date	Sample taken		Laboratory	Lab Reference
	CX	DX		
11th Feb 13	Yes	Yes	Alcontrol Laboratories	212228
13th Jun 13	Yes	Yes	Alcontrol Laboratories	229752
1st Aug 13	Yes	Yes	Alcontrol Laboratories	236585
30th Oct 13	Yes	Yes	Oldcastle Laboratories	228651 & 228652

Surface Water Results throughout 2013 are tabulated in Table 9.

Table 9: Storm Water Monitoring Results

Date	11-02-2013		13-06-2013		01-08-2013		30-10-2013		Trigger level	Action level
Parameter	**CX**	**DX**	**CX**	**DX**	**CX**	**DX**	**CX**	**DX**		
Suspended Solids (mg/l)	<2	16	4.5	315	3	128	3.6	1.6	50	100
Conductivity (µS/cm)	1230	183	490	402	230	385	278	486	1000	1000
Ammonia NH_3 (mg/l)	16.5	0.474	14.9	0.985	2.18	0.265	0.4	1.64	0.2	4.0
pH (units)	7.85	8.10	7.95	7.98	7.55	7.76	7.23	7.4	6.0 – 9.0	5.5 – 9.0
COD (mg/l)	14.1	29.8	20.8	306	12.3	128	10	22	40	40
Iron (mg/l)	0.101	0.0366	0.087	0.0936	<0.019	0.103	0.25	0.58	0.2	2.0
Arsenic (mg/l)	0.00123	0.00047	0.000846	0.00083	0.000328	0.00126	0.0004	0.0004	0.05	0.10
Zinc (mg/l)	0.0536	0.0409	0.0608	0.0915	0.089	0.0672	1.45	0.00117	3.0	5.0
Chromium (mg/l)	0.00162	0.00099	0.00143	0.00136	0.00108	0.00188	<0.2	<0.2	0.032	0.05
Nickel (mg/l)	0.00622	0.00313	0.00328	0.0111	0.00965	0.0108	<0.2	<0.2	3.0	5.0
Aluminium (mg/l)	0.00315	0.0868	0.0108	0.089	0.005	0.119	<0.2	<0.2	3.0	5.0
Lead (mg/l)	0.000914	0.00966	0.00596	0.0306	0.0014	0.0257	<0.002	0.010	0.05	0.05
Mercury (mg/l)	<0.00001	0.00004	<0.00001	0.000028	<0.00001	0.000059	0.0004	0.0008	0.00007	0.001
Mineral Oil (mg/l)	<0.01	0.563	<0.01	7.65	0.351	2.37	<0.001	<0.001	1.0	2.0
Chloride (mg/l)	298	23.2	88.2	56.9	50.3	69.2	14.4	26.8	None proposed	

Interpretation of Quarterly Results 2013

The Trigger and Action Limits set for the surface water discharge to drain from the facility (CX and DX) are established under the May 2010, TRIGGER & ACTION LEVELS FOR SURFACE WATER DISCHARGES report as previously submitted to the EPA. This report will be revised within 6 months of the date of grant of the new Waste Licence (as per Condition 6.10.3 of W0113-04) and giving regard to the EPA guide on the setting of storm water trigger levels as published in September 2012.

Discharges from CX: throughout the four quarterly sampling events, there were elevated readings for ammonia in all quarters (reducing over time and being lowest being for Q4) with a high conductivity reading for Q1 which was linked to the high ammonia value for that sample. There were isolated elevated levels of iron and mercury for Q4 which is not typical of other qualitative data throughout the year and which are deemed to be insignificant in environmental terms.

The increase in ammonia levels was thoroughly investigated throughout 2013.

- Initially, a possible source of ammonia was identified as a damaged/blocked foul sewer pipe outside the operative's canteen which had caused over-ground flow to CX drainage network. The collapsed pipe was repaired within five working days on the 22nd January 2013 and it was expected that an improvement in storm water quality would ensue.
- In March, the drainage lines and gully manhole points feeding the CX interceptor were investigated using a portable pH/conductivity meter and grab sampling conducted on 22-03-2013 by Nally Environmental. The laboratory results from sampling on the 22-03-2013 confirmed ammonia in one drain which had two land drainage pipes feeding into it, for drainage of the ground along KMK's east boundary and near the (now replaced) Waste Water Treatment system.
- A plan was made and relayed to the EPA, which was; *'The existing percolation area is to be removed and replaced by a WWTS and biofilter unit as per recent final grant of planning permission received by KMK on 4th April 2013. The schedule for this works is May to June 2013. KMK were also awaiting final grant of the waste licence review application ref: W0113-04 for final authorisation to proceed with the installation of the new WWTS and biofilter*'. Subsequently, KMK also was required to await final approval for the installation of the new WWTS and biofilter as submitted in a Specified Engineering Works (SEW) submission to the EPA in mid July 2013.
- The percolation area was removed in September 2013 and the new WWTS & biofilter was fully installed and commissioned by mid November.
- Silt and water was removed from the surface water gullies and interceptors in December 2013 to ensure any residues from within the drainage network were removed.
- KMK sought quotations for a CCTV in September 2013 and agreed with a contractor for a CCTV survey for CX, DX and E yard gullies to be carried out in January 2014, to identify any leaks or pipe faults.

Discharges from DX outlet: throughout the four quarterly sampling events in 2013, there were elevated levels of ammonia in all quarters (exceeding trigger levels only) and elevated fluctuations in suspended solids, COD and mineral oils for two quarters. There was also a slightly elevated level of mercury and iron in the final quarter, although these levels were not typical of other qualitative data throughout the year and also not significant.

The ammonia levels for DX exceeded the trigger levels only. The levels in general for Q1 and Q3 were deemed typical of storm water quality from the majority of industrial/waste management yards i.e. <0.5mg/l N. However, higher levels for Q2 and Q4 were most likely due to residual ammonia in water left inside the interceptor following its clean-out (and associated gully lines feeding into the same interceptor). KMK thus revised their interceptor maintenance program by cleaning out the gully lines first followed by interceptor cleaning second. Furthermore, a maintenance contract is in place with an outside company to periodically visit KMK and inspect the interceptors and validate their operations so as to ensure that they are working correctly and efficiently.

In terms of the suspended solids, COD and mineral oils for Q2: it was shown that the levels were due to deterioration of water quality due to the length of time since the last emptying event (22nd August 2012). The Q3 suspended solids, COD and mineral oils were lower in strength but still elevated; this was due to a too close a time between interceptor empting and sampling as large interceptors normally take up to 6 weeks to settle following emptying (according to the maintenance company). The was proven as the Q4 sampling event showed all suspended solids, COD and mineral oils below Trigger levels and much improved in quality. Inspections are carried out twice per year (approximately December and June) and emptying was scheduled based on need, as identified during Inspections, but has been revised to now take place approximately once every 6 months and at least 6 weeks prior to any subsequent sampling event for both CX and DX interceptors.

As a measure of further investigation, a CCTV survey of the drainage lines (foul and storm water) was arranged for Mid January 2014 by an outside specialist company in order to determine if there were any faults in the drainage lines on-site.

Aside from the quarterly monitoring, it is important to note the conclusions of a report on an investigation of impacts to the land drain from CX and DX completed in August 2011 at KMK which included sampling up-stream and down-stream of the discharge outlets CX and DX, which concluded that there is little to no reduction in the water quality of the land drain downstream of the discharge points CX and DX. Conversely, the quality appears to improve somewhat downstream of the KMK discharge for most parameters; this is due to the following reasons:

- The quality of the discharges at CX and DX are controlled and treated by the facility interceptor units. There interceptors are maintained and operated correctly.
- All clean roof rain water run-off from the buildings (apart from buildings A,B & C which are flowing to CX outlet) are being discharged to the land drain directly. This clean water is diluting any possible contamination within the drain body. Similarly the clean roof rain water run-off from buildings A, B & C are diluting the discharge at the CX outlet.

- The volume and flow of water being discharged from KMK via CX and DX discharges is controlled and partially attenuated by the additional sampling/holding chamber at the outlets but also more influenced by climatic rainfall.
- The impact from the CX and DX discharges is quite negligible in terms of increases in all parameters on the day of investigation.
- Taking into consideration the average daily rainfall for August i.e. 2.4mm, this would increase the flows and also the loadings from CX and DX by virtue of an increase in volume being discharged from the outlets. This also is not considered as a significant impact to the drain due to the fact that an increase in rainfall also equates to an increase in clean roof water run-off being discharged to the land drain and KMK have considerably increased the roof areas on-site in the past few years.

Based on the quarterly analysis data, nature of activity at the site and the drain impact investigation, it is considered that KMK discharge is not resulting in a significant negative effect on the land drain and the site interceptors are operating adequately (removal of silts, metals, physical debris etc).

2.5 Groundwater

KMK has two wells: GW1 and GW2, both of which are tapped onsite and were sampled on 21st November 2013; the full report is included as Appendix 5 of this AER. Monitoring is carried out annually, in accordance with Waste Licence (W0113-03) requirements.

Table 10: Groundwater Monitoring Licence Requirements

Ref	Parameters	Monitoring frequency	Analysis Method / Technique
GW1 GW2	pH, Conductivity, groundwater level, total faecal coliforms, total nitrogen, chloride, organohalogens, metals	Annually	Standard Methods

All results were below the recommended guideline limits set by EC Groundwater Regs. S.I. 9/2010 and the EC Drinking Water Guideline SI 278/2007, with the exception of Nickel (31.9µg/l) and Arsenic (19.14µg/l) – both of which are known to be in soils and rock naturally.

Nickel is present in soils naturally, and has been found in KMK samples since 2006 (with the exception of 2009). According to the 'Soils of Co. Offaly' National Soil Survey of Ireland by Teagasc 2003, the typical levels of trace nickel in agricultural soils ranges from 0.5 to 100 mg/kg. The natural occurrence of arsenic in rock veins is also well documented across the world. In the absence of specific data for arsenic in Offaly, another close licensee was reviewed in terms of their groundwater monitoring i.e. AES Ireland Ltd, Cappincur Ind. Estate, Tullamore. It was noted in their 2012 AER that arsenic was also found in one of their boreholes GW2 (see Section 4 of report in Appendix 5 for further details); the two boreholes are approximately 300m apart. This presence confirms naturally occurring arsenic in the groundwater because the levels are very similar and yet the two associated businesses are very different, AES being a general waste transfer and recycling station and KMK being a metals and WEEE Recycler.

3.0 WASTE ACTIVITIES CARRIED OUT AT THE FACILITY

The principal class of activity is:

Class 13 *of the Fourth Schedule (Waste Recovery Activities) of the Waste Management Act (1996): Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.*

Non Technical Description: Temporary storage and processing of waste materials at the facility prior to removal off site for further metals recovery at an alternative facility.

Consequently, other activities carried out on site include:

Class 3 *of the Fourth Schedule (Waste Recovery Activities) of the Waste Management Act (1996): Recycling or reclamation of metals and metal compounds.*

Non Technical Description: Collection, acceptance and processing of metallic wastes (hazardous and non hazardous including electronic and electrical wastes and liquids containing dissolved metals) as part of waste loads arriving at the facility prior to removal off site for recycling or recovery.

Class 4 *of the Fourth Schedule (Waste Recovery Activities) of the Waste Management Act (1996): Recycling or reclamation of other inorganic materials.*

Non Technical Description: Acceptance of plastic components and packaging as part of incoming waste loads.

Class 6 *of the Fourth Schedule (Waste Recovery Activities) of the Waste Management Act (1996): Recovery of components used for pollution abatement.*

Non Technical Description: Acceptance of auto catalysts, filters etc.

Class 7 *of the Fourth Schedule (Waste Recovery Activities) of the Waste Management Act (1996): Recovery of components from catalysts.*

Non Technical Description: Recovery of metals from catalysts in manufacturing processes (this applies to liquids and solids)

Class 11 *of the Fourth Schedule (Waste Recovery Activities) of the Waste Management Act (1996): Use of waste obtained from any activity referred to in a preceding paragraph of this schedule.*

Non Technical Description: Re-use of some waste materials e.g. metal drums, IBCs, cardboard boxes and textile IBC bulk bags as waste receptacles.

Class 12 *of the Fourth Schedule (Waste Recovery Activities) of the Waste Management Act (1996): Exchange of waste for submission to any activity referred to in a preceding paragraph of this schedule.*

Non Technical Description: Trading activities in waste management.

4.0 QUANTITY AND COMPOSITION OF WASTE RECOVERED, RECEIVED AND DISPOSED OF DURING THE REPORTING PERIOD INCLUDING EWC CODES

This specific and detailed information is presented in Appendix 6 of this report.

5.0 WASTE MANAGEMENT RECORD

5.1 Waste Received in 2013

Waste is received in the KMK facility from the following sources: civic amenity sites, commercial customers, industrial customers and transfer station waste management sites. A summary of all waste received during 2013 is given below:

Table 11: Summary of Waste Received in 2013

Source of waste accepted.	Total quantities (tonnes)
Civic amenity sites	7,255.877
Commercial	8,054.729
Industrial	693.607
Transfer Stations	5,338.028
Total	21,342.241

A full breakdown of waste types and quantities accepted for 2013 is included in Appendix 6 attached to this AER. It is estimated that approximately 85% of the total waste intake in 2013 was waste electrical and electronic equipment (WEEE).

The total quantity received was 21342.241tonnes for 2013. On 20th October 2009 KMK applied to the EPA for a Waste Licence Review, the principal reason for which was a forecasted increase in tonnage. On 26th September 2013 the EPA issued a Proposed Decision to grant KMK's New Licence W0113-04. KMK formally objected to some of the conditions on 17th October 2013, and the final Licence was issued on 20th December 2013 thus permitting KMK to accept 35,000tonnes per year from that date onwards.

5.2 Waste Despatched from the Facility for Recovery in 2013

The total quantity of waste despatched from the facility in 2013 was 20,472.932 tonnes. A summary of all waste despatched during 2013 is included in Appendix 6 attached to this AER. Please note that there is a carry-over of waste material from the year ending 2013 into the beginning of 2014 (993.063 tonnes) and this is stock pending processing and stock pending dispatch (see Appendix 6).

6.0 WASTE RECOVERY REPORT

All waste accepted at KMK is treated for recovery and recycling. There is a 'no waste to landfill' policy on-site. KMK also acknowledges and complies with the most recent WEEE Regulations whereby recovery targets are calculated and achieved. See letter statement below.

KMK METALS·RECYCLING

KMK Metals Recycling Ltd.
Precious and Non-Ferrous Metals
Electronic Scrap & Metallic Residues
Hazardous Metal Waste

Cappincur Ind. Est.
Daingean Road
Tullamore
Co. Offaly
Ireland

Telephone
057-934 1634

Telefax
057-932 2729

E-Mail
info@kmk.ie

Website
www.kmk.ie

EPA Waste Licence:
W0113-03

24 January 2014

To whom it may concern,

I confirm that **KMK Metals Recycling Ltd** acts as your company's waste contractor for battery waste and electrical waste which we are authorised to accept.

Our facility at **Tullamore, Co Offaly** is licensed **(EPA Waste License No. W0113-04)** to accept and recover Waste Electrical & Electronic Equipment (WEEE). Our recently amended license now allows us to manage 35,000t per annum.

With reference to Article 22 of the WEEE regulations, I can confirm that we shall comply with the Seventh Schedule and the requirements for the removal and selective treatment of certain substances, preparations and components, such as batteries, cathode ray tubes, external electric cables etc.

With reference to Article 23, KMK will achieve and expect to exceed the minimum recovery targets and any minimum component, material and substance reuse and recycling targets over the next three years.

Our current recovery rates are as follows:

Large Household Appliances	**82%**
Refrigeration Appliances	**88%**
Small Household Appliances	**92%**
IT & Telecommunication Equipment	**92%**
CRT (Televisions & Monitors)	**93%**
Lighting (FL's and CFL's)	**95%**
Batteries Portable/Household	**63%**
Batteries Lead-Acid	**99%**

We have a 'no-waste to landfill' policy, with any waste generated going to Waste to Energy facility in Ireland.

If I can be of any further help, please do not hesitate to contact me.

Kind regards,

KMK Metals Recycling Ltd
Works: Cappincur Industrial Estate
Road, Tullamore, Co. Offaly
Fax: 057 9322729
metalsrecycling.ie

Kai Meyer

In addition, KMK is working towards compliance with EN50625 WEEE Treatment Standard / the WEEELABEX Standard, which prescribes methods for conducting Batch Tests and for the subsequent Calculating Recycling and Recovery Targets.

7.0 RESOURCE CONSUMPTION SUMMARY

Electricity, green diesel and kerosene are used at the facility. The following tables summarise the electricity and fuel consumption and CO_2 emission at the facility from 2012 to 2013 inclusive and for comparison purposes.

Table 12: Breakdown of the Energy Consumption for the Year

	Consumption, kWh*			
	2012	**%**	**2013**	**%**
Electricity	392,045	37.2	663,720	47.2
Kerosene	38,178	0.7	64,199	4.6
Green Diesel	622,145	59.1	676,728	48.2
Total	**1,052,368**	**100**	**1,404,647**	**100**

*Energy conversion factors: kerosene 10.4kWh/l and green diesel 10.8kWh/l.

Table 13: Breakdown of the Energy Costs for the Year

	Total Annual Cost, €			
	2012	**%**	**2013**	**%**
Electricity	59,926	53	92,348	58.4
Kerosene	3,417	3	6,444	4
Green Diesel	49,967	44	59,446	37.6
Total	**113,310**	**100**	**158,238**	**100**

Table 14: CO_2 Emissions for Year

	CO_2 emissions, tonnes*			
	2012	**%**	**2013**	**%**
Electricity	304.2	63.6	515	72.5
Kerosene	9.8	2	16.5	2.3
Green Diesel	164.2	34.4	178.7	25.2
Total	**478.28**	**100**	**710.2**	**100**

*Energy to Carbon conversion factors: electricity 0.776kg CO_2 /kWh, Kerosene 0.257 kg CO_2 /kWh and Green Diesel 0.264 kg CO_2 / kWh

In summary, the following trends are noted:

Electricity consumption increased by 69% (2012 to 2013) and Kerosene increased by 68% whereas Green Diesel only increased by 9%. The reasons for this are that:

- the WEEE Plant comprised of more equipment and was operational more of the time throughout 2013. Whilst Energy Consumption continues to increase in KMK, more recycling is happening in Ireland, whereas previously these activities were carried out overseas.
- Kerosene is used for heating and it is expected that this increase is due to the creation of a second office space (Weighbridge Office) which is similar in footprint area as the existing (Tower) office.
- Neither the WEEE Plant nor the additional Office space has any impact on the use of Green Diesel, however waste intake does, and this was slightly higher in 2013 than it was in 2012 hence the small increase in usage; KMK also now makes good use of the relatively new E Area hence forklifts in some cases are travelling further.

The costs of resources (€) was significantly more for all Energy Types in 2013 compared to 2012 due to price increases in the market.

There was a net increase in CO_2 emissions in 2013 compared to the previous year in 2012 by virtue of the increase in energy consumption on-site mostly attributable to the increase in electricity usage.

8.0 FULL TITLE AND WRITTEN SUMMARY OF ANY PROCEDURES DEVELOPED BY LICENSEE IN 2013 RELATING TO FACILITY OPERATIONS.

There were no new procedures developed in 2013 in connection with the waste licence activity. All existing procedures are applicable and relevant to the waste licence.

9.0 REVIEW OF NUISANCE CONTROLS

The types of nuisances which could be expected at a Waste Management Facility in general are litter, vermin, birds, flies, mud, dust and odours.

Due to the dry solid and non-food related origin of materials recycled at KMK, the activities carried out onsite are not conducive to flies, birds, odours, and vermin - there are however canteens onsite, and associated businesses nearby, therefore KMK employs a pest control company to ensure rodents are controlled.

All waste processing activities are carried out within buildings; all materials prior to processing are not able to create a windblown nuisance (as they are solid / intact and too large to be blown), and all fractions generated by the activities of KMK are stored under cover.

All site surfaces are concreted for minimisation of dirt/dust onsite, however dust is entrained or deposited onsite and controls are in place in the form of yard dampening as necessary - as often as twice per day in summer time, plus KMK uses a road sweeper on smooth floor surfaces for example in the WEEE Plant. Dust levels at Northerly-, Easterly-, Southerly- and Westerly-most boundary locations did not exceed licence limits during the 2013 monitoring event.

Dust remains KMK's only evident nuisance requiring active control by employees of KMK, and control will continue throughout 2014 with additional effort being made during summer months.

10.0 SCHEDULE OF ENVIRONMENTAL OBJECTIVES AND TARGETS AND ENVIRONMENTAL MANAGEMENT PROGRAMME

The schedule of Objectives and Targets / Environmental Management Programme for 2013 and their current status is included below in Table 15 as part of the company IMS. Most of the scheduled objectives and targets were achieved in 2013; some were carried forward and where this is the case a note is made to that effect in 'Status'.

A new schedule of objectives and targets / EMP proposed for year ending 2014 is also presented in Table 16.

Table 15: Environmental Objectives and Targets 2013

NO	OBJECTIVES & TARGETS		STEPS TO ACHIEVE TARGET	TIME-SCALE	RESPONS-IBILITY	STATUS
1	Improve water quality	Fully compliant Ammonia results on at least two occasions from CX by December 2013	Initiate a thorough investigation of the sources of ammonia contamination in CX discharge.	March	Amy Jackson	Complete
			Confirm the source of ammonia contamination.	End March	Niall Nally	Complete
			Initiate improvement measures: - clean roof gutters, remove any potential sources of contamination - upgrade KMKs Waste Water Treatment System (WWTS)	May-June	Kurt Kyck, Max Kyck	Complete
			Repeat sampling to confirm improved ammonia levels once the new WWTS is commissioned	July-Sept	Niall Nally	Ongoing Quarterly (improving). Latest sample taken Q3 2013.
2	Improved control of noise emissions during early morning and late night operating hours	5% reduction in average ambient noise when compared to 2012 monitoring results, during night-time hours.	Review previous 2012 noise report.	March	Kurt Kyck, Niall Nally	Complete
			Hold internal review and engage with Cappincur residents' spokesperson on-site and discuss noise emissions.	March		Complete
			Instigate improvement measures by agreement of Management e.g. Community Noise Control Policy for noise reductions during priority day/night hours	March	Max Kyck	Complete
			Monitor effectiveness of controls by scheduled environmental noise monitoring event in 2013.	~~May July~~ Aug 2013	Niall Nally	Complete – review in 2014, see: '13-2
3	Develop a new process employing BATRRT for LCD Television dismantling		Research into new technology for on-site dismantling of LCD flat panel displays, to comply with BATRRT.	Jan 2013	Kurt Kyck	Complete
			Decide on new technology; submit a request for authorization from EPA for same. Process EPA decision thereafter.	Mar 2013	Kurt Kyck, Niall Nally	Complete
			Install new LCD technology at KMK and commission same.	~~April~~ Nov 2013	Kurt Kyck, Max Kyck	Carried Forward, see: '13-3
4	Maximise recovery of fractions from WEEE Mill and minimise dust		Investigate and install a new process (Sieve and Cyclone system) in the WEEE plant to maximise recovery of fractions by size, including dust containing recoverable metals	March	Kurt Kyck, Enda Thornton	Complete
			Commission new systems and monitor effectiveness.	April	Enda Thornton	Complete

NO	OBJECTIVES & TARGETS	STEPS TO ACHIEVE TARGET	TIME-SCALE	RESPONS-IBILITY	STATUS
5	Review options for improved Energy Efficiency / Sustainability (if appropriate) at KMK	Engage with the Sustainable Energy Authority of Ireland (SEAI) for sustainability / energy efficiency mentoring and advice	April 2013	Amy Jackson	Complete
		Prioritise recommendations from review by SEAI and agree actions, if any, with KMK Management	June 2013	Amy Jackson	Complete
		Implement any actions arising from the above Management Meeting	July 2013	Amy Jackson / Max Kyck	Carried Forward, see: '13-5
		Monitor effectiveness of improvements	Nov 2013		
6	Verify the Recycling Rates provided to KMK by all Outlets used by KMK and continue KMK's Outlet Auditing Schedule	Documentation review of information from all active outlets	~~June 2013~~ Feb 2014	Amy Jackson / Edel Lynch	Complete
		Audit in person at least 1 in-state ~~and 1 out-of-state facility~~ during 2013	Dec 2013	Amy Jackson / Kai Meyer	Carried Forward, see: '13-6
7	Be "WEEELABEX ready" by December 2014	Conduct Test Audit 1 March-April 2013 and implement all necessary actions arising as a result by 30th June 2013	June 2013	Amy Jackson / Kai Meyer	Audit: Complete Actions: In Progress
		Conduct Test Audit 2 July-August 2013 and implement all necessary actions arising as a result by 30th December 2013	Dec 2013	Amy Jackson / Kai Meyer	Complete.
8	Maintain the Training Programme as necessary to ensure effective operations	Emergency Spill Response training (scenario based) for Van Drivers Emergency Spill Response training (scenario based) for General Operatives	May 2013	Kai Meyer, Max Kyck	Carried Forward: '13-8
		Conduct training as scheduled: the only external training required during 2013 is Manual Handling (due August)	Aug 2013	Amy Jackson	Completed (+Abr Wheels and H&S)
		Train employees in Capacitors Sorting procedure to divert PCB-Free capacitors from Waste Disposal to Recycling	Feb 2013	Amy Jackson	Completed
		Flat Panel Displays processing: procedure to be written and employee(s) (as applicable) to be trained on how to operate the new process	~~May~~ Nov 2013	Amy Jackson	Carried forward , see: '13-3
9	Review the Maintenance register	Review the Maintenance Register: - Ensure all items of plant / machinery critical to ensuring environmental control are subject to a schedule for planned (i.e. services) and preventive (i.e. oiling) maintenance - Check records on file for evidence of planned and preventive maintenance	~~May 2013~~ Jan 2014	Edel Lynch	Review in 2014, see: '13-9

NO	OBJECTIVES & TARGETS	STEPS TO ACHIEVE TARGET	TIME-SCALE	RESPONS-IBILITY	STATUS
10	Maintain KMK's three Management Standards and associated Systems	ISO 14001:2004 Surveillance Audit	Oct 2013	Amy Jackson	Complete
		ISO 9001:2008 Re-Certification Audit			
		OHSAS 18001:2007 Surveillance Audit			
11	Motivate and facilitate staff and the local community to recycle more	Arrange and promote at least one Recycling Day for staff of KMK, the Cappincur Industrial Estate, and the local Community. The KMK Facility will be an 'Open House' on this day and all attendees will be permitted access to learn about the activities carried out at KMK.	Aug 2013	Max Kyck, Kai Meyer, Amy Jackson	Completed 17/08/2013 (€3,500 raised for local GAA)

Table 16: Environmental Objectives and Targets 2014

ID	OBJECTIVES AND TARGETS	Timescale	Resp	Status
CARRIED FORWARD FROM 2013				
'13-3	Install new BAT (as agreed with the EPA) for Flat Panel Display dismantling at KMK. Document the new Process (including quality, health and safety, maintenance requirements, and risk assessment) based on material from the Manufacturer, and train employees on same.	Sep 2014	KMK	Final Testing
'13-5	Implement an **Energy Management Plan** (which may span a number of months and into 2015) based on recommendations arising from the SEAI Audit and Mentoring sessions during 2013.	Jun 2014	EL	In progress
2014: QUALITY				
'14-Q-1	Work in accordance with a documented **EN50625 Conformance Work Programme** for achievement of conformance to all requirements of EN50625 - before end Dec 2014. EN50625 (aka WEEELABEX) is a standard for Excellence in WEEE Recycling; it touches on all aspects of KMK's current Standards (Quality, Environment, and Health and Safety) and is our most significant Compliance Scheme requirement for 2014.	Dec 2014	AJ	In progress
'14-Q-2	Develop '**Process Performance Assessments**' as a template for SMART evaluation of IMS performance in each Process Area / Building (to include QESH aspects and controls, as applicable)	May 2014	AJ & SS's	Not started
'14-Q-3	Review and rationalize KMK's existing Management System (including rewriting the Manual) to focus only on the specific clauses of: OHSAS 18001, ISO 14001, ISO 9001, EN50625, KMK's Waste Licence W0113-04, and KMK's Waste Collection Permit WCP-OY-08-00607-01 - which will include customer requirements.	Feb 2015	AJ	Not started
2014: HEALTH AND SAFETY				
'14-S-1	Investigate the potential use of Safety Mirrors in KMK to improve safety regarding Vehicle / Pedestrian Interactions *(Update: 1 Convex Mirror purchased and installed in Nov 2013; 4 more purchased and installed in Dec 2013)*	Nov 2014	AJ / SS's	Complete (12/2013)
'14-S-2	Car Park Signage *(Update: more than 30 traffic signs were installed in March 2014)*	Nov 2014	MK	Complete (03/2014)
'14-S-3	Pedestrian Crossings to be marked for crossing the pubic road / busy area of the Site (from Visitors Car Park to Reception and from Weighbridge to Operatives canteen)	Jul 2014	MK	Complete (03/2014)
2014: ENVIRONMENT				
'14-E-1	(NEW) EPA Waste Licence: plan work in accordance with KMKs **Environmental Compliance Work Programme** for compliance with new Waste Licence conditions, monitoring requirements, installations, reports for review / approval and signage, incl. the following priorities: 1. Interceptor Upgrade (to be carried out in dryer weather) 2. Flow Meter installation to F 3. Trigger Level proposal (Jun 2014) for agreement with EPA	 1.Jun 2014 2.May 2014 3.Jun 2014	 AJ	ECWP written 1.Quotes rec'd 2.Quote rec'd 3.Quote rec'd
'14-E-2	Focus on EPA Priority Issues for 2014: 1. Waste Storage and Fire Prevention: adopt relevant recommendations from EPA Workshop in 2013 (Athlone) and IWMA/CIWM event in 2014 (3rd April, in Tullamore) into Facility Fire Prevention procedure / practice (include Isolation of Electrical Supply (and Notice for same); access to water supplies and volumes (10,000L KMK, ~40,000L Ind Est, & Rainwater Tanks); keys to electrical switch room) 2. Integrity of Bunds, tanks and pipelines: Camera Survey, Fixes, and Verification Survey (Mar 2014) & subsequent Pressure Test (Sept 2014) 3. Waste Classification and Records: review and document the classification, names and EWC codes for all principal waste types in KMK (to be included in process flows).	 1.Jun 2014 2.Mar 2014 3.Dec 2014	 AJ	 1.Started 2.Complete 3.Not started
'14-E-3	Reissue the Community Noise Control Policy (as issued during 2013).	July 2014	AJ	
'14-E-4	Repeat the Community Awareness Day / Open Day at KMK (as was held in 2013; Item #11 of 2013) for: staff of KMK, the Cappincur Industrial Estate and Community, and all other interested parties, whereby KMK will be an 'Open House' and all attendees will be granted access to learn about KMK's activities and recycle their WEEE and Scrap Metals for free.	Oct 2014	BG	

11.0 POLLUTANT RELEASE AND TRANSFER REGISTER – REPORT FOR PREVIOUS YEAR

The PRTR report is specifically generated every reporting year using the EPA Guidance to completing the PRTR excel based workbook. The content of the PRTR for KMK is quite minimal in that the waste activity only has to enter in data for: 1) general facility data 2) emissions to air and 3) onsite treatment and off-site transfers of waste. KMK also have obtained a confidentiality status in relation to off-site waste transfer outlets (recovery and disposal) from the EPA since 2010 and therefore is not required to give actual names and addresses of such final transfer facilities.

The full PRTR report for 2013 forms Appendix 7 of this AER report.

12.0 POLLUTANT RELEASE AND TRANSFER REGISTER – PROPOSAL FOR CURRENT YEAR

KMK's reportable PRTR is generally similar from year to year and emissions are confined to air media for the facility, hence there is no requirement to generate any actual PRTR proposal for the forthcoming year (which differs from IPPC licensees).

13.0 NOISE MONITORING REPORT SUMMARY

A summary of the noise monitoring for 2013 on-site is presented in Section 2.3 of this AER and the full noise monitoring report is in Appendix 3.

14.0 AMBIENT MONITORING REPORT SUMMARY

A summary of the ambient dust monitoring for 2013 on-site is presented in Section 2.1 of this report and the full noise monitoring report is in Appendix 1.

15.0 TANK AND PIPELINE TESTING AND INSPECTION REPORT

15.1 Bund Assessments.

A full assessment of the bunds storage structures was completed by Nally Environmental between the 22nd and 25th February 2013; the full report is presented in Appendix 8. The summary conclusions are presented in Table 17 below. This bund assessment methodology and report made reference to the following relevant documents:

- The Environmental Protection Agency (EPA) guidelines 'The Storage and Transfer of Materials for Scheduled Activities' (2004)
- Updated bund integrity test template: http://www.epa.ie/downloads/advice/licensee/name,50899,en.html

Table 17: Bund Assessment Recommendations

Bund Ref	Hydrostatic result	Capacity result	Recommendations
Bund 01 Radiator oil draining area	Pass	Fail – there was < 110% storage capacity on this bund in the form of an IBC. The bund is located indoors, regularly checked and not deemed a significant risk to the environment.	• Ensure daily visual inspections of the bund and tank inside the bund to ensure no leaks or spills occurring. • Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present). • Conduct a re-test in three years time.
Bund 02 Kerosene & diesel tank store	Pass	Pass	• Ensure daily visual inspections of the bund and tank inside the bund to ensure no leaks or spills occurring. • Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present). • Conduct a re-test in three years time.
Bund 03 A, B inside areas and sump at B area	Not applicable - due to the internal status of it and the absence of vessels being stored at this location. It is also impractical to flood the area.	Pass	• Ensure daily visual inspections of the spill pallet and floor area to ensure no leaks or spills occurring on the ground. Check the sump and drainage channel also at weekly intervals. • Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present). • Conduct a re-test in three years time.

Please note that Bund 02 was replaced by two separate purpose-built self-bunded mobile tanks in scheduled in Mid November 2013. The EPA formally agreed to this change in bunding arrangements by a notification on ALDER dated 6th November 2013 in response to the specified engineering works proposal by KMK submitted to the EPA on 15-10-2013.

These new structures do not require hydrostatic assessment but will be subject to checking throughout 2014. The old Bund 02 was fully decommissioned (fuel contents removed and used on-site). The resultant metal tanks and the bund structure were sold as fully working units for re-use to off-site business.

15.2 Pipeline inspections and testing

In 2013 a CCTV survey for the drainage and foul underground lines was scheduled for March 2014; the results of this inspection and assessment will be detailed in the AER for year ending 2014.

16.0 REPORTED INCIDENTS SUMMARY

There were six Category 1 reportable incidents during 2013 at the facility, summarised below

Table 18: Incidents Report Table during 2013

Alder Ref no	Incident reported date	Incident cause/description	Summary of Actions throughout the course of this incident history.	Incident Status
000837	18th February 2013	Breach of Trigger and Action levels (self imposed ELVs) for storm water outlet at CX. Elevated levels for CX – ammonia as NH_3 (16.5mg/l) Conductivity 1230(µS/cm)	Clarification received from laboratory on 19-02-2013 that results were true. Interceptor contents removed by ENVA on 26-02-2013. Further investigation on-site by Nally Env and KMK on 07-03-2013 using portable hand-held pH & conductivity meter to check conductivity of drainage lines at C in order to pin-point source of ammonia on-site. Various samples taken at C area on 22-03-2013. Investigation results; the elevated ammonia at CX outlet was determined to be sourced from background concentrations as a result of seepage from the percolation area on-site and other possible septic tanks in the immediate vicinity of KMK. Actions: planning permission granted on 04-04-2013 to remove the percolation area and replace with a new on-site waste water treatment plant. This significant project was forecasted for completion in late summer 2013.	Closed
001118	28th March 2013	Breach of permitted waste tonnage accepted to the facility for the year ending 2012. Permitted tonnage is: 20,000 tonnes Actual tonnage accepted: 20,410.239 tonnes	A waste licence review application was pending approval during 2013 subject to planning permission (a planning application was submitted to OCC in 2012) and the final grant was secured in 4th April 2013. The PD licence W0113-04 was granted on 26-09-2013. KMK formally objected to some conditions of the licence on the 17-10-2013. A revised final licence was issued on the 20-12-2013 allowing KMK to accept 35,000 tonnes waste per annum. Therefore this type of incident will not occur again.	Closed

Alder Ref no	Incident reported date	Incident cause/description	Summary of Actions throughout the course of this incident history.	Incident Status
001725	25th June 2013	Breach of Trigger & Action levels (self imposed ELVs) for certain parameters concerning storm water discharges from CX & DX outlets. Elevated levels of grab samples as follows; CX – ammonia as NH_3 (14.9mg/l) DX – ammonia as NH_3 (0.985mg/l) - Suspended solids (315mg/l) - COD (306mg/l) - Min oils (7.65 mg/l)	CX: Previous laboratory results from sampling on the 22-03-2013 confirmed the ammonia source on-site as being from seepage from the percolation area and other possible septic tanks surrounding KMK and not from waste management activities above ground. The existing percolation area was removed and replaced by a WWTS and biofilter unit as per planning permission in late October 2013, Q4. DX: It is believe that the levels are due to deterioration of water quality due to the length of time since the last inspection (Dec. 2012) and emptying event (April 2012). KMK arranged the inspections company on-site on 28th June'13 including a full emptying and cleaning of the Interceptor and inspection Chambers by Enva on the same date. Twice yearly emptying was agreed going forward.	Open
002419	30th September 2013	Elevated ambient dust ELVs at some locations; Results: A2-1 – 530mg/m^2/day A2-4 - 1296mg/m^2/day A2-6 - 352mg/m^2/day	All metals analyses were below the laboratory limits of detection with exception of copper in the µg range. A combination of exception dry weather month during August 2013 and insufficient dust control at times during the 30day composite monitoring period of ambient dust fall around the site. There was also an impact of dust from the public road at the closest monitoring stations. Existing dust control measures were increased and using site road sweeper, manual sweeping and dampening yard affected areas with water including the access roads.	Closed

Alder Ref no	Incident reported date	Incident cause/description	Summary of Actions throughout the course of this incident history.	Incident Status
002095	7th August 2013	Breach of trigger & action levels (self imposed ELVs) for certain parameters concerning storm water discharges from CX & DX outlets as follows; CX – ammonia as NH_3 (2.19mg/l) DX – ammonia as NH_3 (0.265mg/l) - Suspended solids (128mg/l) - COD (128mg/l) - Min oils (2.37mg/l)	Service engineer visited site to check the working efficiency of the interceptors. Engineer confirmed that large interceptors (i.e. DX interceptor) may need up to 6weeks to settle out after a significant clean out such as that of the 28-06-14. Hence the elevated levels of DX were due to inefficiencies of interceptor treatment and will have improved thereafter. In relation to CX, as previously confirmed, the ammonia source on-site as being from seepage from the percolation area and other possible septic tanks surrounding KMK and not from waste management activities above ground. This issue will be addressed by way of the percolation area removal and installation of the new WWTP in Q4 of 2014.	Open

Alder Ref no	Incident reported date	Incident cause/description	Summary of Actions throughout the course of this incident history.	Incident Status
002766	15th November 2013	Breach of Trigger levels (self imposed ELVs) for certain parameters concerning storm water discharges from CX & DX outlets as follows; CX – ammonia as NH_3 (0.4mg/l) – iron (0.25mg/l) DX – ammonia as NH_3 (1.64mg/l) - iron (0.58mg/l)	CX & DX interceptors were emptied, cleaned and serviced in Dec 2013 including the drainage lines. KMK also checked ammonia levels in groundwater and results were not indicative of contamination source. Residual elevated iron levels were not typical and understood to be an aberration at that time. A CCTV survey was undertaken at KMK to investigate the drainage lines condition and survey submitted to EPA on 13-02-14. Some defects were detected on the drainage lines and a schedule of repairs was submitted to the EPA on 19-02-14. The repairs were subsequently completed on the 26-03-14. The repairs to the drainage lines should improve the quality of stormwater by preventing any ingress of soil/shallow groundwater into the underground pipes and thus the overall quality to the interceptor for treatment. A leak test of the drainage lines was planned for completion immediately thereafter this date and the results will be submitted to the EPA when available.	Open

All incidents will continue to be addressed in a timely manner and reported using the new ALDER online reporting portal system, as adopted by the EPA, and in accordance with Guidance and Waste Licence requirements on same.

17.0 COMPLAINTS SUMMARY

There were no complaints received at KMK during 2013 for the facility.

18.0 ENERGY EFFICIENCY AUDIT REPORT SUMMARY

Please refer to Section 7 of this report for energy usage data and information.

Whilst the energy usage has increased from 2012 values, the reason for this is the increased recycling on-site hence reduced export of activities which are now carried out in Ireland. If this is considered on a broader basis the increased energy used by KMK is off-set against a) the increase in energy that would have been used at an alternative facility in order to further recover the materials from the waste inputs, and b) the reduction in emissions created by haulage (material is more uniform and smaller in particle size hence loads are more efficient) – therefore, the increased energy consumption is positive for Irelands economy and the wider environment.

19.0 VOLUME OF TRADE EFFLUENT/LEACHATE AND/OR CONTAMINATED STORMWATER PRODUCED AND VOLUME TRANSPORTED OFF-SITE

There is no trade effluent or leachate produced at KMK.

In terms of stormwater, this is discharged off-site via CX, DX and E outlets. The site interceptors are routinely emptied and maintained throughout the year and the following off-site disposals of same occurred during 2013:

Table 19: Storm Water Transported Off-Site

No. of collection events	Ref	EWC	Description	Quantity (kg)
2	CX	13 05 07*	Interceptor and associated drains contents, jetting & washing cleanings and silts removal	15540
2	DX	13 05 07*	Interceptor and associated drains contents, jetting & washing cleanings and silts removal	17940

20.0 REPORT ON THE ASSESSMENT OF THE EFFICIENCY OF USE OF RAW MATERIALS IN PROCESSES AND THE REDUCTION IN WASTE GENERATED.

The raw materials used at KMK for the recycling process are metallic and WEEE waste inputs. Please refer to Section 6 previously for information relating to the recovery efficiency of KMK's activities.

KMK does not landfill; all residual wastes are sent for recycling (for example Timber Waste and Dry Recyclables) or energy recovery (only those wastes which are not clean / dry recyclables and which are unsuitable for recycling).

21.0 REPORT ON PROGRESS MADE AND PROPOSALS BEING DEVELOPED TO MINIMISE WATER DEMAND AND THE VOLUME OF TRADE EFFLUENT DISCHARGE.

This section is not applicable to KMK as there is no trade effluent discharge from the facility in 2013.

22.0 DEVELOPMENT / INFRASTRUCTURAL WORKS SUMMARY (COMPLETED IN PREVIOUS YEAR OR PREPARED FOR CURRENT YEAR).

Any relevant such works are already presented Section 10 of this report.

23.0 REPORT ON THE FINANCIAL PROVISION MADE UNDER THIS LICENCE, MANAGEMENT AND STAFFING STRUCTURE OF THE FACILITY, AND A PROGRAMME FOR PUBLIC INFORMATION.

- Financial Provision: KMK confirms that adequate financial provisions are in place for all proposed environmental improvements and controls for the forthcoming year and thereafter. In particular, KMK has 'Pollution Liability' of €6.5 million included in their company insurance document. This is more than adequate to cover any pollution incidence of environmental significance as requested in the Environmental Liability Directive.

  In addition, a letter dated 8th November 2010 from the EPA acknowledges in principal, the adequate financial provision of €64,000. KMK have a bond provider (Ulster Bank) and an agreement is now established as dated 26-03-2012 whereby the agreed financial guarantee of €64,000 is now in place in the favour of the EPA (formerly in place with Offaly County Council).
- Organisational Chart: of the Management Structure at KMK Metals Recycling Ltd is presented below.
- Programme for Public Information
  - KMK provides information about the facility opening hours, website address and contact details on the Facility Notice Board which was updated in 2014 and which is located at the main gates of the facility.
  - KMK provides a website: www.kmk.ie (complete with 'Audit Us' section and videos of waste management processes) to make relevant information readily available for interested parties. The website is updated by company employees as and when documents change, thanks to its user friendly interface.
  - KMK maintains documents and records on file within the company IMS (Integrated Management System) as necessary for Waste Licence Compliance (W0113-04) and ISO 14001

- KMK accommodated several customer audits in 2013 including one by an association called CHWMEG, which audits facilities, writes a report, and makes the report available to interested and subscribed members. KMK endorses this auditing style as it maximises auditing efficiency for both the customer and KMK.
- KMK accommodated (non-Audit) visitor Groups / Tours in 2013:
  - Chartered Institute of Waste Management (CIWM) Tour: 23/04/2013
  - National Waste Collection Permit Office (NWCPO) Team Visit to KMK on 12/12/2013
  - Ard Scoil Chiaráin (leaving cert. Geography field trip): 09/12/2013
  - Irish Motor Vehicle Recyclers Association:10/04/2013
- KMK welcomed a number of Industrial Tourists in 2013, from:
  - Germany
  - Italy
  - Japan, and
  - The USA
- KMK held a successful Open Day in 2013, which is planned again for 2014. A post event Press Release reads:
  - *"Over 200 cars, vans, tractors and trailers passed through the gates of the KMK Metals Recycling Plant in the Cappincur Industrial Estate on Saturday August17th, depositing more than 25 tonnes of old electrical waste and scrap metal, with the €3,500 proceeds donated to the Cappincur GAA Club"*

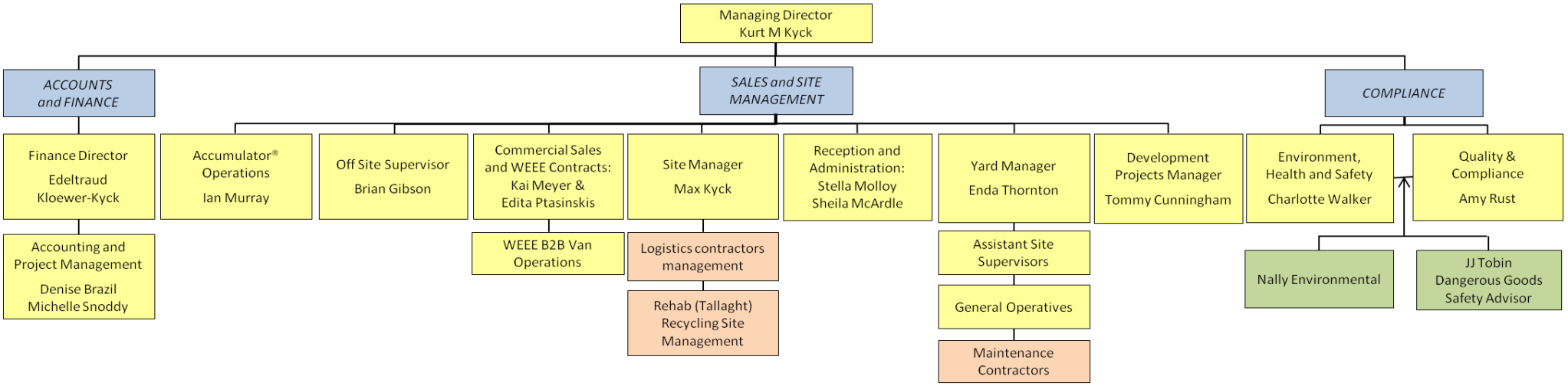
Event flyers:

Event Photos:

News Item: http://www.kmk.ie/news/kmk-open-day-raises-a-3-500-for-cappincur-gaa?view=archive

KMK Metals Recycling Ltd Organisational Chart

(*for 2013, hence as at January 2013)*



24.0 REVIEW OF DECOMMISSIONING PLAN

Condition 10.2.1 of the licence states that: '*the licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for the decommissioning or closure of the site or part thereof. This plan shall be submitted to the Agency for agreement within six months of the date of grant of this licence.*

The completed decommissioning or closure plan shall provide vital information which will be used to form the basis for the Environmental Liabilities Risk Assessment (ELRA) required by Condition 12.3 of this licence (W0113-03) concerning environmental liabilities at the facility.

In particular conditions 12.3.2 of the waste licence which states that: *The licensee shall arrange for the completion, by an independent and appropriately qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA), which addresses the liabilities from past and present activities. The assessment shall include those liabilities and costs identified in condition 10 for execution of the Decommissioning Plan. A report on this assessment shall be submitted to the Agency for agreement within 12 months of date of grant of this licence.*

Therefore a revised Decommissioning Plan was prepared by Nally Environmental in July 2013. The KMK facility decommissioning plan has fully incorporated all factors which may arise in order to achieve successful clean closure. The guarantee bond currently in place is sufficient to facilitate any predicted and unpredicted costs which may be incurred during and post closure at the KMK facility. The following table provides a summary of the overall assets; negative value material and expenditure costs associated with clean closure operations at the facility.

25.0 STATEMENT OF MEASURES IN RELATION TO PREVENTION OF ENVIRONMENTAL DAMAGE AND REMEDIAL ACTIONS (ENVIRONMENTAL LIABILITIES)

ELRA annual statement:

Condition 12.3.1 of the waste licence states that: '*The licensee shall as part of the AER provide an annual statement as to the measures taken or adopted at the site in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated events (including closure) or accidents/incidents, as may be associated with the carrying out of the activity'.*

A full Environmental Liabilities Risk Assessment (ELRA) was prepared in May 2009 and submitted to the EPA.

This ELRA report was revised in July 2013 by Nally Environmental to reflect the changes to the facility since 2009 both in terms of activities and infrastructure in place.

These changes at KMK since the 2009 ELRA report included:

1) The installation and operation of the new WEEE-Plant building on-site for WEEE treatment finished on November 2011.

2) Battery recycling using a battery sorter machine.

3) On-going development of E area in terms of building construction and related services, completed during 2012.

4) Significant investments made in the installation of WEEE recovery plant within the WEEE building (referred to as a Smasher Plant) including the dust extraction abatement plant and final emissions point A2-8 in 2012.

5) Flat Panel Display (FPD) de-pollution equipment agreed in 2013 (installation pending)

In relation to prevention of environmental damage, this is ensured by:

- Existing EPA Waste Licensed activities at a serviced site with appropriate facility infrastructure and technology
- Improvements and development works are ongoing as arising from KMK's Management System recommendations, Planning Permission Conditions, Waste Licence (W0113-04) Conditions, and upgrades to apply best available technologies including those designed purposefully for compliance with the WEEE Directive at the same time as ensuring quality control and workplace health and safety
- KMK has been certified to ISO 14001 since 2001, ISO 9001 since 2010, OHSAS 18001 since 2011, and is now working towards the industry specific WEEE Treatment (European) Standard, which started off as WEEELABEX (**WEEE**-**Lab**el-of-**Ex**cellence) and which is currently being transcribed by Cenelec into EN50625-series
- Work focused on a priority basis and in accordance with a documented work programme and schedule of the Environmental Objectives & Targets (as included in previous sections of this AER and which includes reference to new technologies, site development works, and infrastructure)

26.0 DEVELOPMENT WORKS

26.1 Development works in 2012

Please refer to Section 10 for an update on all scheduled development works.

26.2 Proposed Development for 2013

Please refer to Section 10 for a schedule of all planned development works.

27.0 ENVIRONMENTAL LIABILITIES RISK ASSESSMENT REVIEW

Please refer to the previous Section 27 above.

28.0 OTHER ITEMS

There are no further items included in this Annual Environmental Report.

APPENDICES

APPENDIX 1

Ambient Dust Monitoring Report 2013

AMBIENT DUST MONITORING REPORT 2013

FOR

KMK METALS RECYCLING LTD.

AT

CAPPINCUR INDUSTRIAL ESTATE, DAINGEAN ROAD,

TULLAMORE, CO OFFALY

3rd October 2013

Report by:

Niall Nally

Senior Environmental Consultant
B.Sc, M.Sc, AIEMA, MCIWM

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5.0 CONCLUSIONS

1.0 INTRODUCTION

Nally Environmental was commissioned by KMK to conduct the annual ambient dust survey at the KMK facility at Cappincur Industrial Estate, Tullamore, Co Offaly, as part of compliance with waste licence W0113-03. The KMK Metals facility is located in the Cappincur Industrial Estate towards the east of Tullamore town, off the L-02025 road to Daingean – Figure 1.

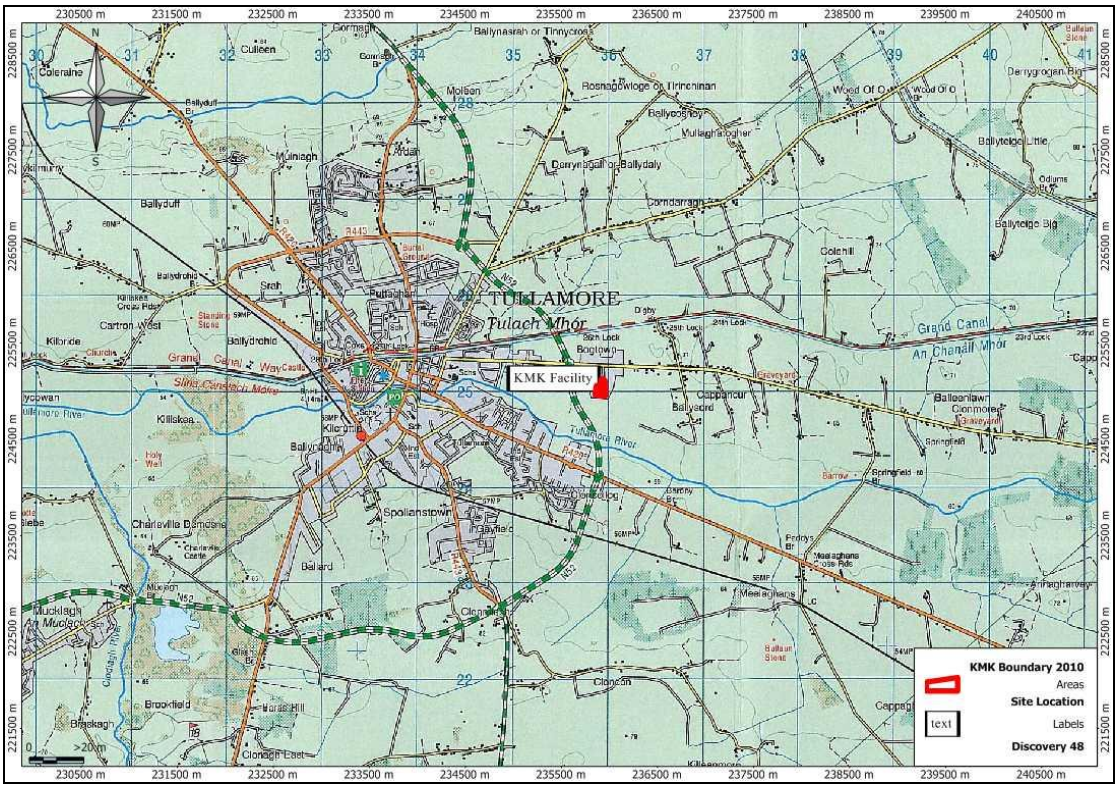

Fig 1: Site Location map for KMK's facility.

Ambient dust monitoring occurred from the 31st July to the 29th August 2013 during normal activity at the facility. A total of 6 locations were set up for the annual monitoring, which form part of the compliance requirements of KMK's waste licence.

2.0 AMBIENT DUST COMPOSITE SAMPLING METHOD

The dust monitoring method used was based on a modified version of the Bergerhoff Method VID 2119 'Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method)'. This involved the placement of clean open top plastic jars inside secure metal gauges which were located around the facility boundaries. The dust monitoring map (Figure 2 below) identifies the locations for the 6 monitoring stations.

The Bergerhoff Gauge stations were left in-situ for 30 days in order to achieve a 30day composite sample and were inspected at least twice during this time period for quality control and supervision purposes. There were no problems encountered in terms of sample interference or apparatus damage. All stations were accessible during both set up and collection. During collection of each sample jar, they were sealed on-site, labelled and delivered to a laboratory for subsequent analysis.

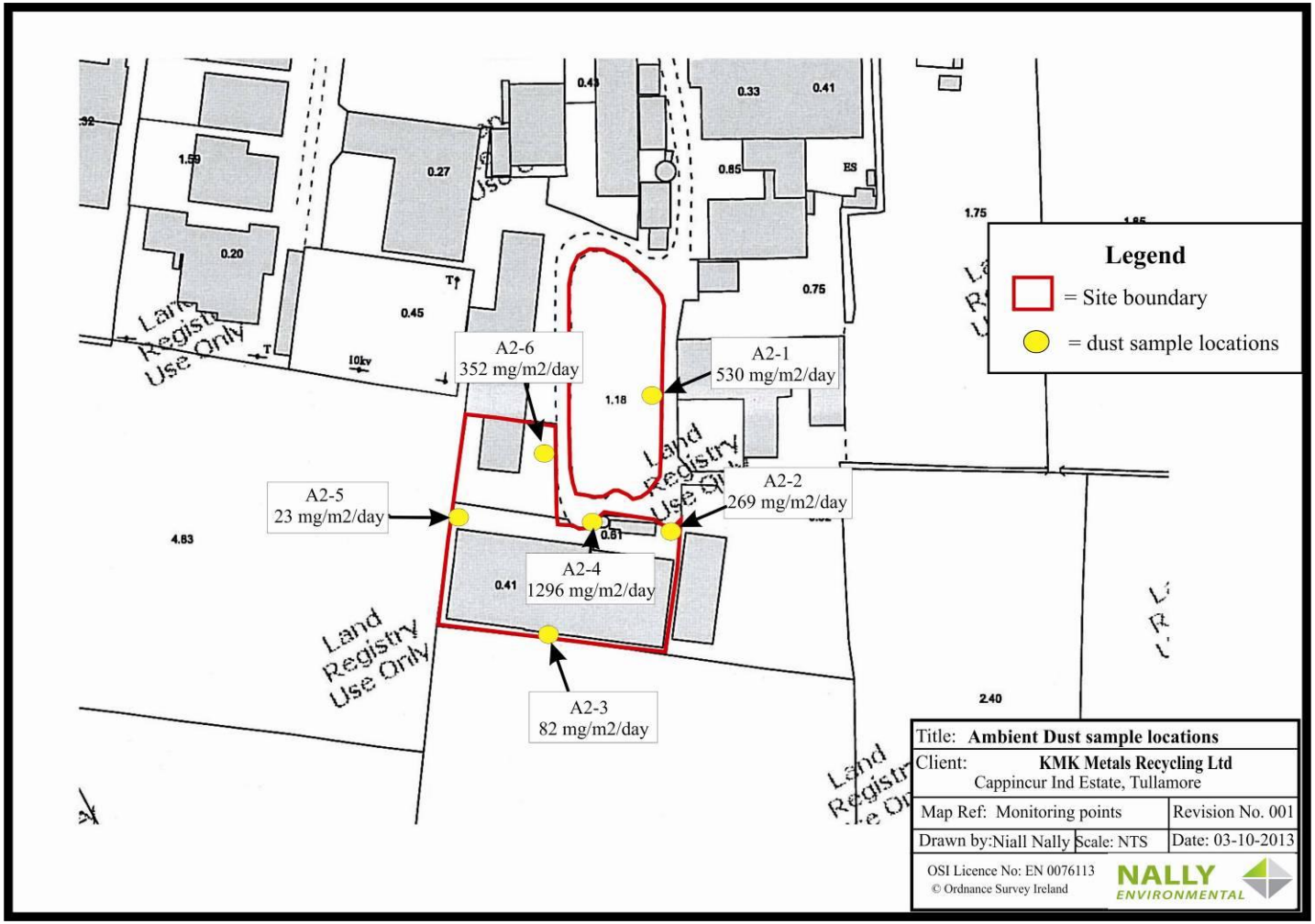

Figure 2 shows the location of each of the stations and total dust deposition result for the samples.

3.0 RESULTS

After 30 days of monitoring, each of the dust stations was disassembled and the samples were sent to an Accredited Laboratory for analysis (BHP Laboratory). The Certificates of Analysis are presented in Appendix A.

The results from the monitoring are shown in table 3.1 and 3.2. These levels are compared to the EPA emission limit values for nuisance dust (table 3.1 only).

Table 3.1 - Results of Composite Ambient Dustfall in samples

Station I.D.	**Monitoring Location**	**Irish Grid Ref. (ITM)**		**Dust Deposition** (Aug 2013) **mg/m^2/day**	**EPA licence Limits mg/m^2/day**
		Easting	**Northing**		
A2-1	Car Park at Fence Boundary	0635888	0725079	530	350
A2-2	Eastern boundary, close to port-a-cabin	0635900	0725035	269	350
A2-3	Fence at southern boundary	0635825	0724990	82	350
A2-4	Site Entrance facility public road	0635867	0725029	1296	350
A2-5	Western Boundary	0635798	0725037	23	350
A2-6	Northern Boundary	0635853	0725059	352	350

Table 3.2 - Results of Metallic Species in Composite Dust samples

Parameters	Metallic content in dust samples (µg)					
	A2-1	**A2-2**	**A2-3**	**A2-4**	**A2-5**	**A2-6**
Aluminium (Al)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper (Cu)	0.08	0.02	0.02	0.04	0.02	0.03
Arsenic (As)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron (Fe)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury (Hg)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel (Ni)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc (Zn)	<0.01	<0.01	0.01	0.01	0.01	<0.01

Weather conditions can have a noticeable impact upon dust creation and dust entrainment in the air. Drier weather will increase the ambient dust on the ground and will lighten small particulates. Wind strength will determine the size of particles that can be entrained in the air and the distance they will be transported. The Met Eireann data from the Gurteen Synoptic Station for the August monitoring events show that August had lower levels of rainfall than normal (and compared with Aug 2012) with very low rainfall in the preceeding months up to August also. Tables 3.3 and 3.4 below give the monthly and annual averages for both rainfall and temperature from the closest Met Eireann Synoptic Station – Gurteen College.

Table 3.3 Rainfall (mm) Data from the Gurteen Synoptic Station

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2013	88.2	39.7	35.8	59.6	51.3	54.4	42.1	74.0	30.2	34.1			509.4
2012	94.2	32.2	28.7	80.4	49.6	199.7	132.2	103.0	56.8	119.5	77.1	88.2	1061.6
mean	96.4	66.2	74.5	59.8	68.0	71.8	66.7	84.9	74.8	103.8	89.8	91.5	948.2

Table 3.4 Temperature (ºC) Data from the Gurteen Synoptic Station

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2013	4.9	4.5	3.3	7.0	9.9	13.1	17.5	15.2	13.2	16.7			9.9
2012	6.6	7.0	8.1	6.5	10.6	13.1	14.1	15.6	11.9	8.3	5.8	5.3	9.4
mean	5.4	5.2	6.9	8.2	11.1	13.8	15.6	15.3	13.2	10.2	7.4	5.8	9.8

Note: data for the most recent months are provisional.
All means are for the period 1981-2010.

In terms of wind data, table 3.5 below summarises the daily wind strengths for Gurteen station.

Table 3.5 Wind (knotts) Levels from the Gurteen Synoptic Station for Month of August 2013

Date	**Mean Wind Speed (knots)**	**Date**	**Mean Wind Speed (knots)**
31/07/2013	8.7	15/08/2013	8.4
01/08/2013	10.9	16/08/2013	8.2
02/08/2013	11.2	17/08/2013	12.4
03/08/2013	8.7	18/08/2013	8.5
04/08/2013	4.5	19/08/2013	7.7
05/08/2013	7.8	20/08/2013	10.1
06/08/2013	6.8	21/08/2013	10.8
07/08/2013	2.7	22/08/2013	5.7
08/08/2013	8.5	23/08/2013	8.2
09/08/2013	7.7	24/08/2013	5.5
10/08/2013	7.4	25/08/2013	5.3
11/08/2013	8.7	26/08/2013	2.6
12/08/2013	8.4	27/08/2013	5.4
13/08/2013	6.5	28/08/2013	5.2
14/08/2013	7.6	29/08/2013	8.0

The average wind strength was thus 7.6 and this is compared to the Beaufort Scale below.

Table 3.6 Beaufort Scale of Wind Force

Wind Force	**Short Description**	**Specifications for use on Land**	**Wind Speed at 10 metres above Level Ground**		
			Knots	**Metres per second**	**KM per hour**
0	Calm	Smoke rises vertically	<1	<0.3	<1
1	Light Air	Direction of wind shown by smoke but not by wind vanes	1-3	0.3-1.5	1-5
2	Light breeze	Wind felt on face, leaves rustle, ordinary vanes moved by wind	4-6	1.6-3.3	6-11
3	Gentle breeze	Leaves and small twigs in constant motion, wind extends light flag	7-10	3.4-5.4	12-19
4	Moderate breeze	Raises dust and loose paper, small branches are moved	11-16	5.5-7.9	20-28
5	Fresh breeze	Small trees in leaf begin to sway, crested wavelets form on inland waters	17-21	8.0-10.7	29-38
6	Strong breeze	Large branches in motion, whistling heard in telegraph wires; umbellas used with difficulty	22-27	10.8-13.8	39-49
7	Near gale	Whole trees in motion, inconvenience walking against the wind	28-33	13.9-17.1	50-61

8	Gale	Breaks twigs off trees, generally impedes progress	34-40	17.2-20.7	62-74
9	Strong gale	Slight structural damage occurs (chimney pots and slates removed)	41-47	20.8-24.4	75-88
10	Storm	Seldom experienced inland, trees uprooted, considerable structural damage occurs	48-55	24.5-28.4	89-102
11	Violent storm	Very rarely experienced, accompanied by widespread damage	56-63	28.5-32.6	103-117
12	Hurricane	-	64 and over	32.7 and over	117 and over

Table 3.5 provides an overview of the wind levels throughout the 30 day period the dust jars were in position. Based on the Beaufort Scale of Wind Force (see Table 3.6 above) it is clear that during the August event for 15 of the 30 days wind in the area was less than between 7 to 10knotts, which could be classified as a wind force of 3 (Gentle Breeze) – leaves and twigs in constant movement. There were two recorded incidents of between 11 to 16knotts which is classed as a moderate breeze.
In general, the wind strength pattern was indeed unsettled and moderately high for this August which will have certainly increased dust entrainment in the ambient air at and around the site.

4.0 DISCUSSION AMBIENT DUSTS

4.1 Ambient total dust deposition.

Dust monitoring was conducted during the month of August 2013. The event occurred during the end of a particularly dry summer period and within the May to September period as required in the waste licence. The period of monitoring was a typical operational month at KMK with unsettled wind conditions and below average rainfall. Hence the climatic conditions for dust creation was favourable.

Dust monitoring around the boundaries of the KMK site shows that three dust deposition results were above the EPA recommendation limit of 350mg/m^2/day.

These were; A2-1 at 530mg/m^2/day, A2-4 at 1296mg/m^2/day and A2-6 at 352 mg/m^2/day. The last result was only just above the licence ELV of 350 mg/m^2/day.

In relation to the particular results for A2-1 and A2-4, it is important to acknowledge the following details;

- Dust station A2-4 is close to the most utilised entrance to KMK at the D-Hanger building and close to E and DX yard entrances. The public road also has an impact at this location in terms of dust generation and capture. Other users of the industrial estate include a farm machinery business next to KMK, a solid fuel merchant and an ATF dismantling yard. All these estate users have access on the public road at and around KMK and as such will contribute to dust creation by vehicular traffic.

- Dust station A2-1 is located inside the boundary wall at E area. There is approximately 1meter additional height of the concrete wall at this location thus preventing dust from escaping the E yard at this station.

It is acknowledged that during periods of dry weather, KMK yard operatives routinely dampen down all internal roads and yard areas in order to prevent dust generation. This activity will be extended to include the public roadway between the entrances at KMK's facility.

4.2 Ambient dust fall metals content.

An analysis of the metals content in all six dust samples was also carried out over the same 30 day period using the same sampling methods as those for the total dust deposition. All metals content parameters in microgram levels were deemed below the laboratory limits of detection with the exception of trace levels of copper and zinc detected in the dust samples (see results section Table 3.2).

Zinc was detected in trace levels for only at 3 stations – A2-3, A2-4 and A2-5.
Copper was detected in trace levels at all dust monitoring stations.

It is important to compare the metals content in August 2013 with that of the previous August 2012 period. This is illustrated in Table 4.2 below;

Table 4.2 Comparison of metal content in dust samples 2012 to 2013

Monitoring Station	**Metals Content (µg)**		
A2-1		**2012**	**2013**
	Aluminium	1642	<0.01
	Arsenic	<1	<0.2
	Cadmium	6	<0.01
	Chromium	57	<0.01
	Copper	<1	0.08
	Iron	<1	<0.01
	Mercury	<1	<0.2
	Nickel	<1	<0.01
	Lead	<1	<0.01
	Zinc	1586	<0.01
A2-2		**2012**	**2013**
	Aluminium	842	<0.01
	Arsenic	<1	<0.2
	Cadmium	<1	<0.01
	Chromium	<1	<0.01
	Copper	158	0.02
	Iron	263	<0.01
	Mercury	<1	<0.2
	Nickel	<1	<0.01
	Lead	<1	<0.01
	Zinc	53	<0.01

Monitoring Station	Metals Content (µg)		
A2-3		2012	2013
	Aluminium	1028	<0.01
	Arsenic	<1	<0.2
	Cadmium	<1	<0.01
	Chromium	<1	<0.01
	Copper	37	0.02
	Iron	222	<0.01
	Mercury	<1	<0.2
	Nickel	<1	<0.01
	Lead	<1	<0.01
	Zinc	1443	0.01
A2-4		2012	2013
	Aluminium	500	<0.01
	Arsenic	<1	<0.2
	Cadmium	272	<0.01
	Chromium	295	<0.01
	Copper	<1	0.04
	Iron	<1	<0.01
	Mercury	<1	<0.2
	Nickel	<1	<0.01
	Lead	<1	<0.01
	Zinc	295	0.01
A2-5		2012	2013
	Aluminium	1534	<0.01
	Arsenic	<1	<0.2
	Cadmium	<1	<0.01
	Chromium	<1	<0.01
	Copper	<1	0.02
	Iron	<1	<0.01
	Mercury	<1	<0.2
	Nickel	<1	<0.01
	Lead	<1	<0.01
	Zinc	<1	0.01
A2-6		2012	2013
	Aluminium	650	<0.01
	Arsenic	<1	<0.2
	Cadmium	<1	<0.01
	Chromium	17	<0.01
	Copper	<1	0.03
	Iron	<1	<0.01
	Mercury	<1	<0.2
	Nickel	<1	<0.01
	Lead	<1	<0.01
	Zinc	<1	<0.01

As can be seen from the previous tables, the actual metals content of all samples in 2013 were significantly lower in detectible levels when compared with 2012 results.

In terms of comparison of metals in ambient air samples to relevant standards where relevant, this can be only be achieved by conducting a PM10 sampling event for industrial operations (i.e. measurement of breathable dusts in the air) which metallic speciation of the samples. This sampling event is strongly health and safety orientated with emphasis on sampling methods, times, set back distances from roads and specialised equipment to be used. The regulation S.I No 58 of 2009 (Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009) covers this process. However, for the purpose of this report, PM10 sampling is not sought or required.

5.0 CONCLUSIONS

Monitoring of ambient dust deposition occurred at six stations around the site during August 2013. Three out of six deposition results were not in compliance with the waste license emission limit values.

There were trace detectable levels of metallic species (copper in all samples and zinc in three samples) within the same dust samples but these levels are not considered significant and when compared to August 2012, the levels were multiples lower in quantitative terms.

Appendix A

- **Dust Results report from laboratory**

BHP/CEM/23/A

Analysing
Testing
Consulting
Calibrating

TEST REPORT 110545

Client:
Nally Environmental
Drumcree
Collinstown
Mullingar
Co. Westmeath

BHP Ref No.: 13/09/025-030
Order No.:
Date Received: 03/09/2013
Date Tested: 25/09/2013
Test Specification: Nil

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FAO Niall Nally

Item: Dust deposition results for monitoring period August 2013 using Dust deposit gauges as per VDI 4320 Part 2, at the KMK site.

For and on behalf of BHP Ltd.

Paul O'Sullivan
Date Issued: 25th September 2013
Supplement to report No. N/A

1.0 Introduction

At the request of Niall Nally, of Nally Environmental, BHP conducted dust analysis from the KMK site.

All sampling was conducted by Nally Environmetal using Bergerhoff dust deposition gauges and analysis was conducted by BHP Laboratories in accordance with Germany Standard VDI 4320.

The EPA Publication 'draft guidelines on the information to be contained in environmental impact statements' has been used as a reference for this report.

2.0 Sampling

The sampling was carried out by Nally Environmental in accordance with VDI 4320 Part 2 using Bergerhoff dust deposition gauges. The gauges were in place from 31/07/13-29/08/13, i.e. 30 days.

3.0 Analysis

Analysis was conducted in accordance with VDI 4320 Part 2. Final residue was reconstituted in aqueous Nitric Acid and analysed by ICP-OES, as per APHA-3120-B, for the metals specified in the results section below.

4.0 Results

The results are presented in the following table.

Monitoring Station KMK Site	Dust Deposition* $mg/m^2/day$	Dust Residue mg	Metal content µg	
A2-1	530	119.9	Aluminium	<0.01
			Arsenic	<0.2
			Cadmium	<0.01
			Chromium	<0.01
			Copper	0.08
			Iron	<0.01
			Mercury	<0.2
			Nickel	<0.01
			Lead	<0.01
			Zinc	<0.01
A2-2	269	60.8	Aluminium	<0.01
			Arsenic	<0.2
			Cadmium	<0.01
			Chromium	<0.01
			Copper	0.02
			Iron	<0.01
			Mercury	<0.2
			Nickel	<0.01
			Lead	<0.01
			Zinc	<0.01
A2-3	82	18.6	Aluminium	<0.01
			Arsenic	<0.2
			Cadmium	<0.01
			Chromium	<0.01
			Copper	0.02
			Iron	<0.01
			Mercury	<0.2
			Nickel	<0.01
			Lead	<0.01
			Zinc	0.01

* Based on sampling period provided by Nally Environmental

Results continued on following page.

Monitoring Station KMK Site	Dust Deposition* $mg/m^2/day$	Dust Residue mg	Metal content µg	
A2-4	1296	293.1	Aluminium	<0.01
			Arsenic	<0.2
			Cadmium	<0.01
			Chromium	<0.01
			Copper	0.04
			Iron	<0.01
			Mercury	<0.2
			Nickel	<0.01
			Lead	<0.01
			Zinc	0.01
A2-5	23	5.2	Aluminium	<0.01
			Arsenic	<0.2
			Cadmium	<0.01
			Chromium	<0.01
			Copper	0.02
			Iron	<0.01
			Mercury	<0.2
			Nickel	<0.01
			Lead	<0.01
			Zinc	0.01
A2-6	352	79.6	Aluminium	<0.01
			Arsenic	<0.2
			Cadmium	<0.01
			Chromium	<0.01
			Copper	0.03
			Iron	<0.01
			Mercury	<0.2
			Nickel	<0.01
			Lead	<0.01
			Zinc	<0.01

* Based on sampling period provided by Nally Environmental

5.0 References

1) Measurement of Particulate Precipitations: Determination of Dust Precipitation with collecting pots made of glass (Bergerhoff Method) or Plastic: VDI 4320: Part 2.

APPENDIX 2

Stack Emissions Monitoring Reports 2013

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Stack Emissions Monitoring Report

for

KMK Metals Recycling Ltd.

Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly

EPA IPPC Licence REF: W0113-03

Report No: 013-022-02

Monitoring Date:
21st May 2013

Report Summary:	
Job Quotation No:	**QGE13-016**
Operator Licence No:	**W0113-03**
Operator Name:	**KMK Metals Recycling Ltd.**
Installation:	**Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly**
Contact Name:	**Mr. Niall Nally**
Phone No:	**044 9666773, 086 8547071**
Monitoring dates:	**21/05/2013**
Monitoring Organisation:	**Glenside Environmental Cuil Greine House Link Road Ballincollig Cork**
Phone No:	**(021) 4810016**
Email:	**info@glenenv.ie**
Report Date:	**10/08/2012**
Report written by:	**Ewa Piatek**
MCERTS reg No:	**MM07 799**
Competency:	**Level 2**
Function:	**Team Leader**
Endorsements:	**TE1, TE2, TE3, TE4**
Signed:	
Report approved by:	**Ewa Piatek**
MCERTS reg No:	**MM07 799**
Competency:	**Level 2**
Function:	**Team Leader**
Endorsements:	**TE1, TE2, TE3, TE4**
Signed:	

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1. Introduction

Glenside Environmental was commissioned by KMK Metals Recycling Ltd to perform air emission monitoring at their facility in Cappincur Industrial Estate, Dalngean Road, Tullamore, Co. Offaly. The monitoring was carried out in accordance with requirements of Waste Licence W0113-03. This report presents details of this monitoring programme.

2. Objectives

2.1. Substances to be monitored at each emission point

Sample Locations	Parameter
A2-8	Particulates
	Metals (Total of Cd+Tl)
	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)
	Chromium
	Lead
	Mercury
	Aluminium
	Arsenic
	Cadmium
	Copper
	Iron
	Nickel
	Zinc

2.2. Special Requirements

There were no special requirements for this monitoring campaign.

3. Materials and Methods

This section provides brief details of the methodologies employed to perform the air emission monitoring.

3.1. Particulates

A sample stream of gas is extracted from the main gas stream at representative sampling points for 30 minutes, with an isokinetically controlled flow rate and measured volume. The dust entrained in the gas sample is separated by a pre-weighed filter, which is then dried and reweighed. Deposits upstream of the filter in the sampling equipment are also recovered and weighed. The increase of mass of the filter and the deposited mass upstream of the filter are attributed to dust collected from the sampled gas, which allows the dust concentration to be calculated.

3.2. Metals

A known volume of flue gas is extracted representatively from a duct or a chimney during a certain period of time at a controlled flow rate following EN13284-1:2004 (Particulates Standard). The dust in the sampled gas volume is collected on a filter. Thereafter, the gas stream is passed through a series of absorbers containing absorption solutions and the filter passing fractions of the specific elements are collected within these solutions.

The results are calculated from the laboratory results divided by air volume sampled and are converted to mg/m3. Results in kg/hr are calculated from concentration of pollutant and stack flow rate. All results are corrected to Standard Temperature and Pressure. LOD values are obtained from laboratory LOD and the same calculations as per results.

3.3. Volumetric Flow Rate

The volumetric airflow rate was determined from stack velocity measurements calculated in accordance with BS EN 13284. Airflow rate and temperature profiles were performed at pre-calculated intervals across the stack in order to determine the average velocity profile across the stack diameters. Results are presented in table 4.3.

4. Monitoring Results

Tables 4.1 present results of the air emission monitoring sampling program carried out at the emission stacks listed below.

4.1. Monitoring Results

Results reported are corrected to reference conditions as per IPPC Licence requirements.

Emission Point	Substances	ELV mg/Nm^3	CEMS Results	LOD mg/Nm^3	Results mg/Nm^3	Results kg/hr	Uncertainty mg/m^3	Date of Monitoring	Start –End Time of Monitoring
A2-8	Particulates	12.5	n/a	0.24	0.4	0.01	0.27	21/05/2013	11:47-12:17
A2-8	Metals (Total of Cd+Tl)	n/a	n/a	0.0018	<0.0018	n/a	n/a	21/05/2013	13:04-13:34
A2-8	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)	n/a	n/a	0.0140	0.0279	0.0007	n/a	21/05/2013	13:04-13:34
A2-8	Chromium	n/a	n/a	0.0025	0.0031	0.0001	n/a	21/05/2013	13:04-13:34
A2-8	Lead	n/a	n/a	0.0009	0.0107	0.0003	n/a	21/05/2013	13:04-13:34
A2-8	Mercury	n/a	n/a	0.0003	0.0010	n/a	n/a	21/05/2013	14:00-14:30
A2-8	Aluminium	n/a	n/a	0.0014	0.0455	0.0011	n/a	21/05/2013	13:04-13:34
A2-8	Arsenic	n/a	n/a	0.0008	<0.0008	n/a	n/a	21/05/2013	13:04-13:34
A2-8	Cadmium	n/a	n/a	0.0009	<0.0009	n/a	n/a	21/05/2013	13:04-13:34
A2-8	Copper	n/a	n/a	0.0010	0.0021	n/a	n/a	21/05/2013	13:04-13:34
A2-8	Iron	n/a	n/a	0.0008	0.0140	0.0003	n/a	21/05/2013	13:04-13:34
A2-8	Nickel	n/a	n/a	0.0024	0.0032	0.0001	n/a	21/05/2013	13:04-13:34
A2-8	Zinc	n/a	n/a	0.0008	2.1024	0.0506	n/a	21/05/2013	13:04-13:34

Emission Point	Substances	ELV mg/Nm^3	CEMS Results	LOD mg/Nm^3	Results mg/Nm^3	Results kg/hr	Uncertainty mg/m^3	Date of Monitoring	Start –End Time of Monitoring
Blank	Particulates	n/a	n/a	0.24	<0.24	n/a	0.02	21/05/2013	11:25-11:29
Blank	Metals (Total of Cd+Tl)	n/a	n/a	0.0018	<0.0018	n/a	n/a	21/05/2013	12:33-12:30
Blank	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)	n/a	n/a	0.0140	0.0152	n/a	n/a	21/05/2013	12:33-12:30
Blank	Chromium	n/a	n/a	0.0025	<0.0025	n/a	n/a	21/05/2013	12:33-12:30
Blank	Lead	n/a	n/a	0.0009	0.00013	n/a	n/a	21/05/2013	12:33-12:30
Blank	Mercury	n/a	n/a	0.0003	<0.0003	n/a	n/a	21/05/2013	13:43-14:49
Blank	Aluminium	n/a	n/a	0.0014	0.0026	n/a	n/a	21/05/2013	12:33-12:30
Blank	Arsenic	n/a	n/a	0.0008	<0.0008	n/a	n/a	21/05/2013	12:33-12:30
Blank	Cadmium	n/a	n/a	0.0009	<0.0008	n/a	n/a	21/05/2013	12:33-12:30
Blank	Copper	n/a	n/a	0.0010	<0.0010	n/a	n/a	21/05/2013	12:33-12:30
Blank	Iron	n/a	n/a	0.0008	0.0039	n/a	n/a	21/05/2013	12:33-12:30
Blank	Nickel	n/a	n/a	0.0024	0.0025	n/a	n/a	21/05/2013	12:33-12:30
Blank	Zinc	n/a	n/a	0.0008	0.0023	n/a	n/a	21/05/2013	12:33-12:30

4.2. Reference Conditions

Emission Point	Reference Temperature	Reference Pressure	Reference Moisture	Reference Oxygen
A2-8	273 K	101.3 kPa	No correction	No correction

4.3. Volumetric Flow Rate

Emission Point	Actual Moist Flow Rate	Moist Flow Rate at STP	Dry Flow Rate at STP	Emission Limit Value	Units
A2-8	25287.89	24056.46	n/a	40 000	m^3/Hr

4.4. Methods and Accreditation Status

Emission Point	Substances	Method	SOP Number	Accreditation Status	Analysis Laboratories	Accreditation Status
A2-8	Flow, Temperature and Pressure	BS EN 13284-2002	GEN3-001	n/a	n/a	n/a
A2-8	Particulates	BS EN 13284-2002	GEN3-001	n/a	SAL Laboratories Manchester	UKAS
A2-8	Metals	BS EN 14385:2004	GEN3-014	n/a	SAL Laboratories Manchester	n/a

5. Operating Information

Emission Point	Process Status Load /Feedstock	Process Details	Fuel /Feedstock	Abatement System	Status of Abatement System
A2-8	Normal Operation	Full Load	n/a	Filter	In Operation

6. Monitoring Deviation

Requirements	Comments
Substances were monitored as per monitoring objectives	Yes
Substances were monitored in accordance with the monitoring stated in AG2 (Air Emissions Monitoring Guidance Note#2)	Yes
All monitoring substances were carried out as per Standard/Methods requirements.	Yes

Sampling Location Summary

Requirements	Comments
Stack Shape	Circular
Dimensions	0.8
Recommended 5 hydraulic diameters straight length before sampling plane	Yes
Recommended 2 hydraulic diameters straight length after sampling plane	No
Sufficient ports number Small stacks(<0.7) – 1 port 0.7-1.5m – 2 ports >1.5m – 4 ports	1 port
Appropriate port size	Yes
Suitable working platform	Yes
Safe and clean working environment	Yes

7. Annex 1

7.1. Personnel

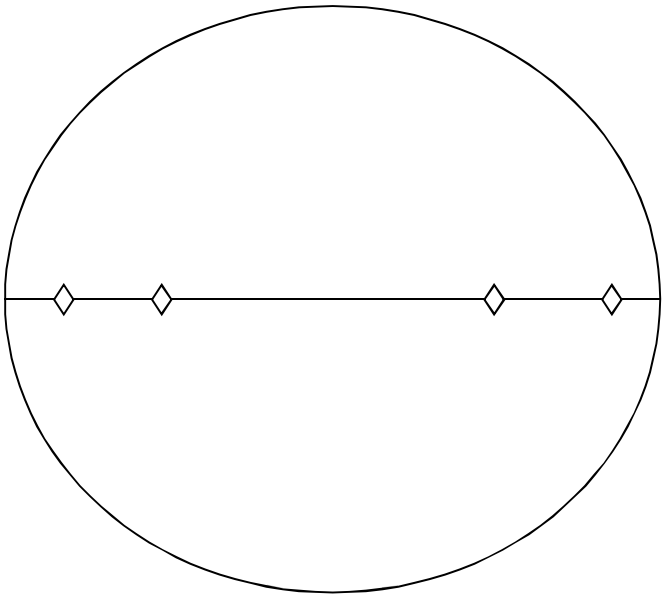
Scientist/Technician Name	Position	Qualification	Technical Endorsements	MCERTS Number
Ewa Piatek	Technician	Level 2	TE1, TE2, TE3, TE4	MM07 799
Patrick Power	Technician	Trainee	-	MM12 1183

7.2. Equipment used

Equipment	GEN Equipment No
Millennium Instruments Method 5 Sampler	EQ069
Impinger System	
Probe	
Pitot tube	
Nozzles	
Filters	Laboratory supplied

8. Annex 2

8.1. Diagrams of the stack



8.2. Sampling measurements

Determinant	Result	Units
Number of Ports Sampled	1	-
Number of Points Sampled	4	-
Average Velocity v'a	13.97	m/s
Average Pressure	101.3	kPa
Average Temperature	22.35	°C
Stack Diameter	0.8	m
T Reference	273	Deg K
P Reference	101.3	kPa
Isokinetic condition	Part 92.07 Metals 105.01 Mercury 91.40	%
Oxygen	n/a	%
Water vapour	n/a	%

9. Annex 3

9.1. Results and uncertainty calculations, certificates of analysis

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Quarter 3 of 2013
Stack Emissions Monitoring Report

for

KMK Metals Recycling Ltd.

Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly

EPA IPPC Licence REF: W0113-03

Report No: 013-050-02

Monitoring Date:
17th September 2013

Report Summary:	
Job Quotation No:	**QGE13-016**
Operator Licence No:	**W0113-03**
Operator Name:	**KMK Metals Recycling Ltd.**
Installation:	**Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly**
Contact Name:	**Niall Nally**
Phone No:	**044 9666773, 086 3547071**
Monitoring dates:	**17/09/2013**
Monitoring Organisation:	**Glenside Environmental, Cuil Greine House Link Road, Ballincollig, Cork**
Phone No:	**(021) 4810016**
Email:	**info@glenenv.ie**
Report Date:	**14/10/2013**
Report written by:	**Ewa Piatek**
MCERTS reg No:	**MM07 799**
Competency:	**Level 2**
Function:	**Team Leader**
Endorsements:	**TE1, TE2, TE3, TE4**
Signed:	X Ewa Piatek Signed by: Ewa Piatek
Report approved by:	**Ewa Piatek**
MCERTS reg No:	**MM07 799**
Competency:	**Level 2**
Function:	**Team Leader**
Endorsements:	**TE1, TE2, TE3, TE4**
Signed:	X

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8. ANNEX 3 9

8.1. RESULTS AND UNCERTAINTY CALCULATIONS, CERTIFICATES OF ANALYSIS 9

1. Introduction

Glenside Environmental was commissioned by KMK Metals Recycling Ltd to perform air emission monitoring at the facility in Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly. The monitoring was carried out as required by Waste Licence W0113-03. This report presents details of this monitoring programme.

2. Objectives

2.1. Substances to be monitored at each emission point

Sample Locations	Parameter
A2-8	Particulates
	Metals (Total of Cd+Tl)
	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)
	Chromium
	Lead
	Mercury
	Aluminium
	Arsenic
	Cadmium
	Copper
	Iron
	Nickel
	Zinc

2.2. Special Requirements

There were no special requirements for this monitoring campaign.

3. Materials and Methods

This section provides brief details of the methodologies employed to perform the air emission monitoring.

3.1. Particulates

A sample stream of gas is extracted from the main gas stream at representative sampling points for 30 minutes, with an isokinetically controlled flow rate and measured volume. The dust entrained in the gas sample is separated by a pre-weighed filter, which is then dried and reweighed. Deposits upstream of the filter in the sampling equipment are also recovered and weighed. The increase of mass of the filter and the deposited mass upstream of the filter are attributed to dust collected from the sampled gas, which allows the dust concentration to be calculated.

3.2. Metals

A known volume of flue gas is extracted representatively from a duct or a chimney during a certain period of time at a controlled flow rate following EN13284-1:2004 (Particulates Standard). The dust in the sampled gas volume is collected on a filter. Thereafter, the gas stream is passed through a series of absorbers containing absorption solutions and the filter passing fractions of the specific elements are collected within these solutions.

The results are calculated from the laboratory results divided by air volume sampled and are converted to mg/m^3. Results in kg/hr are calculated from concentration of pollutant and stack flow rate. All results are corrected to Standard Temperature and Pressure. LOD values are obtained from laboratory LOD and the same calculations as per results.

3.3. Volumetric Flow Rate

The volumetric airflow rate was determined from stack velocity measurements calculated in accordance with ISO 16911-1:2013. Airflow rate and temperature profiles were performed at pre-calculated intervals across the stack in order to determine the average velocity profile across the stack diameters. Results are presented in table 4.3.

4. Monitoring Results

Table 4.1 present results of the air emission monitoring sampling program carried out at the emission stacks listed below.

4.1. Monitoring Results

Results reported are corrected to reference conditions as per Waste Licence requirements.

Emission Point	Substances	ELV mg/Nm^3	CEMS Results	LOD mg/Nm^3	Results mg/Nm^3	Results kg/hr	Uncertainty mg/m^3	Date of Monitoring	Start –End Time of Monitoring
Blank	Particulates	12.5	n/a	0.97	<0.97	n/a	0.03	17/09/2013	10:45-10:48
A2-8	Particulates	n/a	n/a	0.97	<0.97	n/a	0.03	17/09/2013	10:55-11:25
Blank	Metals (Total of Cd+Tl)	n/a	n/a	0.0064	<0.0064	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Metals (Total of Cd+Tl)	n/a	n/a	0.0064	0.0066	0.0002	n/a	17/09/2013	12:26-12:56
Blank	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)	n/a	n/a	0.0509	<0.0509	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)	n/a	n/a	0.0509	0.0693	0.0021	n/a	17/09/2013	12:26-12:56
Blank	Aluminium	n/a	n/a	0.0309	<0.0309	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Aluminium	n/a	n/a	0.0309	0.0694	0.0021	n/a	17/09/2013	12:26-12:56
Blank	Arsenic	n/a	n/a	0.0030	<0.0030	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Arsenic	n/a	n/a	0.0030	0.0032	0.0001	n/a	17/09/2013	12:26-12:56
Blank	Cadmium	n/a	n/a	0.0033	<0.0033	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Cadmium	n/a	n/a	0.0033	<0.0033	n/a	n/a	17/09/2013	12:26-12:56
Blank	Chromium	n/a	n/a	0.0076	<0.0076	n/a	n/a	17/09/2013	11:55-11:58

Company Name: KMK Metals Recycling Ltd.
Licence No: W0113-03
Year: 2013, Visit No: 2
Report No: 013-050-02

Emission Point	Substances	ELV mg/Nm^3	CEMS Results	LOD mg/Nm^3	Results mg/Nm^3	Results kg/hr	Uncertainty mg/m^3	Date of Monitoring	Start –End Time of Monitoring
A2-8	Chromium	n/a	n/a	0.0076	0.0129	0.0004	n/a	17/09/2013	12:26-12:56
Blank	Copper	n/a	n/a	0.0037	<0.0037	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Copper	n/a	n/a	0.0037	0.0046	0.0001	n/a	17/09/2013	12:26-12:56
Blank	Lead	n/a	n/a	0.0031	<0.0031	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Lead	n/a	n/a	0.0031	0.0123	0.0004	n/a	17/09/2013	12:26-12:56
Blank	Iron	n/a	n/a	0.0066	0.0229	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Iron	n/a	n/a	0.0066	0.1869	0.0056	n/a	17/09/2013	12:26-12:56
Blank	Nickel	n/a	n/a	0.0103	<0.0103	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Nickel	n/a	n/a	0.0103	<0.0103	0.0003	n/a	17/09/2013	12:26-12:56
Blank	Zinc	n/a	n/a	0.0323	<0.0323	n/a	n/a	17/09/2013	11:55-11:58
A2-8	Zinc	n/a	n/a	0.0323	0.3395	0.0101	n/a	17/09/2013	12:26-12:56
Blank	Mercury	n/a	n/a	0.0003	<0.0003	n/a	n/a	17/09/2013	13:21-13:24
A2-8	Mercury	n/a	n/a	0.0003	0.0012	0.0000	n/a	17/09/2013	13:55-14:25

4.2. Reference Conditions

Emission Point	Reference Temperature	Reference Pressure	Reference Moisture	Reference Oxygen
A2-8	273 K	101.3 kPa	No correction	No correction

4.3. Volumetric Flow Rate

Emission Point	Actual Moist Flow Rate	Moist Flow Rate at STP	Dry Flow Rate at STP	Emission Limit Value	Units
A2-8	31770.57	29890.36	n/a	40 000	m^3/Hr

4.4. Methods and Accreditation Status

Emission Point	Determinant	Reference Method	SOP Number	Accreditation Status	Analytical Method Description	Subcontracted Laboratory	Laboratory Accreditation Status
A2-8	Flow, Temperature, Pressure	ISO 16911-1:2013	GEN3-019	n/a	n/a	n/a	n/a
A2-8	Mercury	IS EN 13211	GEN3-014	n/a	AFS	SAL	UKAS
A2-8	Metals	IS EN 14385	GEN3-014	n/a	ICP MS	SAL	UKAS

Substances were monitored as per monitoring objectives.
Substances were monitored in accordance with the monitoring stated in AG2 (Air Emissions Monitoring Guidance Note#2)

5. Operating Information

Emission Point	Process Status Load /Feedstock	Process Details	Fuel /Feedstock	Abatement System	Status of Abatement System
A2-8	Normal Operation	Full Load	n/a	Filter	In Operation

6. Monitoring Deviation

Requirements of IS EN 15259 for sampling points	Comments
Measuring plane is located as far downstream and upstream from any disturbances, which could change direction of flow (bends, fans, partially closed dumpers).	Yes
Measuring Plane is located in a section of duct with at least five hydraulic diameters of straight duct upstream of the sampling plane.	Yes
Measuring Plane is located in a section of duct with at least two hydraulic diameters of straight duct downstream of the sampling plane (five hydraulic diameters from top of the stack).	No
Measuring Plane is located in a section of duct with constant shape and cross-sectional area.	Yes
Measurement section is clearly identified and labelled.	Yes
Requirements of IS EN 15259 for platform, working space and ports size.	**Comments**
Appropriate working area.	Yes
Safe access to monitoring point.	Yes
Sufficient ports number Small stacks(<0.7) – 1 port 0.7-1.5m – 2 ports >1.5m – 4 ports	1 port
Appropriate port size.	Yes
Requirements of ISO 16911-1:2013 for flow, temperature and pressure profile of the stack	**Comments**
Required number of points were sampled as per ISO 16911-1 requirements.	Yes
No negative flow.	Yes
All points sampled swirl check was below 15°	Yes
Differential pressure higher than 5Pa measured with pitot tube.	Yes
The ratio of highest to lowest local gas velocity is outside (higher than 3:1) of requirements	Yes
Requirements of IS EN 13248-1 for Particulates	**Comments**
The LOD is less than 10% of ELV (for ELV >5 mg/m3) (MID 13248-1section 10.6)	Yes
The blank reading meet the required target of <10% of the daily limit value (for ELV >10 mg/m3) (section 10.6)	Yes

.

7. Annex 1

7.1. Personnel

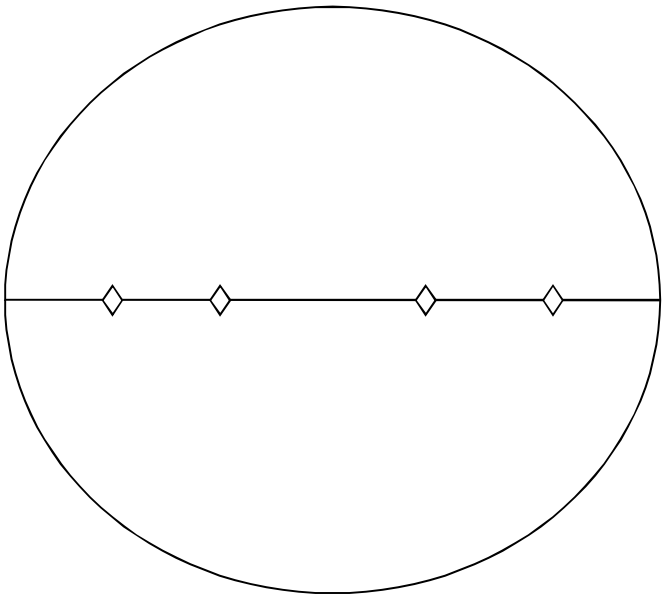
Scientist/Technician Name	Position	Qualification	Technical Endorsements	MCERTS Number
Ewa Piatek	Team Leader	Level 2	TE1, TE2, TE3, TE4	MM07 799
Patrick Power	Technician	Trainee	-	MM12 1183
Jim Nelligh	Technician	Trainee	-	n/a

7.2. Equipment used

Equipment	GEN Equipment No
Millenium 5 Pump	EQ064
Millenium Nozzle Set	EQ087
Millenium Probe	EQ071
Millenium Pitot tube	EQ081
Millenium Impingers	EQ072
Filters	Laboratory supplied
Distance Meter	EQ089
Measuring Tape	EQ090
KIMO Pitot Tube	EQ080
KIMO Flow Meter	EQ079
Caliper	EQ082

8. Annex 2

8.1. Diagrams of the stack



8.2. Sampling measurements

Determinant	Result	Units
Number of Ports Sampled	1	-
Number of Points Sampled	4	-
Average Velocity v'a	17.65	m/s
Average Pressure	101.465	kPa
Average Temperature	18.5	°C
Stack Diameter	0.8	m
T Reference	273	Deg K
P Reference	101.3	kPa
Isokinetic condition	Particulates -0.84 Metals -0.85 Mercury 1.22	%
Oxygen	n/a	%
Water vapour	n/a	%

9. Annex 3

9.1. Results and uncertainty calculations, certificates of analysis

Scientific Analysis Laboratories is a
limited company registered in England and
Wales (No 2514788) whose address is at
Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2404

Report Number: 351602-1

Date of Report: 03-Oct-2013

Customer: Glenside Environmental
Cuil Greine House
Ballincollig Commercial Park
Link Road
Ballincollig.
CO. CORK.

Customer Contact: Mr Patrick Power

Customer Job Reference: KMK METALS
Customer Purchase Order: 013-050 KMK STACK
Date Job Received at SAL: 23-Sep-2013
Date Analysis Started: 24-Sep-2013
Date Analysis Completed: 03-Oct-2013

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with QP22

UKAS TESTING
1549

Report checked
and authorised by :
Mary Drury
Project Manager

Issued by :
Mary Drury
Project Manager

SAL Reference: 351602
Customer Reference: KMK METALS

Filter GFA 47mm Analysed as Filter GFA 47mm
Miscellaneous

SAL Reference	**351602 001**	**351602 002**
Customer Sample Reference	**050-02-01 RUN 1 FILTER RUN**	**050-02-02 FILTER BLANK**
Test Sample	**AR**	**AR**

Determinand	Method	LOD	Units	Symbol		
Particulates (Total)	Grav (5 Dec)	0.05	mg	U	<0.05	<0.05

SAL Reference: 351602
Customer Reference: KMK METALS

Wash(DI) Analysed as Wash(DI)
Miscellaneous

SAL Reference	**351602 003**	**351602 004**
Customer Sample Reference	**050-02-03 RUN 1 NOZZLE WASH**	**050-02-04 NOZZLE WASH BLANK**
Test Sample	**AR**	**AR**

Determinand	Method	LOD	Units	Symbol		
Particulates (Total)	Grav	0.3	mg	U	<0.3	<0.3

SAL Reference: 351602
Customer Reference: KMK METALS

Impinger (5%HNO3/5%H2O2) Analysed as Impinger (3.3%HNO3/1.5%H2O2)
Miscellaneous

SAL Reference	**351602 005**	**351602 006**	**351602 007**	**351602 008**
Customer Sample Reference	**050-02-05 RUN 2 METALS IMPINGER 1**	**050-02-06 RUN 2 METALS IMPINGER 2**	**050-02-07 RUN 2 METALS IMPINGER 3**	**050-02-08 METALS IMPINGER BLANK**
Test Sample	**AR**	**AR**	**AR**	**AR**

Determinand	Method	LOD	Units	Symbol				
Volume	ICPMS (BS EN 14385)	1	ml	U	**100**	**110**	**100**	**200**

SAL Reference: 351602
Customer Reference: KMK METALS

Impinger (5%HNO3/5%H2O2) Analysed as Impinger (3.3%HNO3/1.5%H2O2)
Suite C

SAL Reference	**351602 005**	**351602 006**	**351602 007**	**351602 008**
Customer Sample Reference	**050-02-05 RUN 2 METALS IMPINGER 1**	**050-02-06 RUN 2 METALS IMPINGER 2**	**050-02-07 RUN 2 METALS IMPINGER 3**	**050-02-08 METALS IMPINGER BLANK**
Test Sample	**AR**	**AR**	**AR**	**AR**

Determinand	Method	LOD	Units	Symbol				
Aluminium	ICPMS (BS EN 14385)	1	µg/l	N	(26,64) <30	(26,64) <30	(64,26) <30	(26,64) <30
Antimony	ICPMS (BS EN 14385)	0.5	µg/l	U	<0.5	<0.5	<0.5	<0.5
Arsenic	ICPMS (BS EN 14385)	0.2	µg/l	U	**0.4**	**0.3**	**0.4**	<0.2
Beryllium	ICPMS (BS EN 14385)	0.5	µg/l	U	<0.5	<0.5	<0.5	<0.5
Cadmium	ICPMS (BS EN 14385)	0.5	µg/l	U	**0.7**	**0.8**	<0.5	<0.5
Chromium	ICPMS (BS EN 14385)	0.5	µg/l	U	**2.1**	**0.9**	**2.0**	<0.5
Cobalt	ICPMS (BS EN 14385)	0.2	µg/l	U	(13) <0.2	(13) <0.2	(13) <0.2	(13) <0.2
Copper	ICPMS (BS EN 14385)	1	µg/l	U	**2**	**1**	**3**	<1
Iron	ICPMS (BS EN 14385)	1	µg/l	N	**(26,64) 250**	**(26,64) 140**	**(64,26) 140**	(26,64) <30
Lead	ICPMS (BS EN 14385)	0.3	µg/l	U	**9.5**	**9.6**	**13**	**0.7**
Manganese	ICPMS (BS EN 14385)	2	µg/l	U	**(13) 5**	**(13) 7**	**(13) 5**	(13) <2
Nickel	ICPMS (BS EN 14385)	2	µg/l	U	<2	<2	<2	<2
Thallium	ICPMS (BS EN 14385)	0.3	µg/l	U	<0.3	<0.3	<0.3	<0.3
Vanadium	ICPMS (BS EN 14385)	0.3	µg/l	U	(13) <0.3	(13) <0.3	(13) <0.3	(13) <0.3
Zinc	ICPMS (BS EN 14385)	1	µg/l	N	**(64,26) 320**	**(64,26) 280**	**(26,64) 470**	(64,26) <30

SAL Reference: 351602
Customer Reference: KMK METALS

Probe Wash (27.5%HNO3) Analysed as Probe Wash (27.5%HNO3)
Suite B

					SAL Reference	351602 009	351602 010
					Customer Sample Reference	050-02-09 METALS PROBE WASH	050-02-10 METALS PROBE WASH BLANK
					Test Sample	AR	AR
Determinand	**Method**	**LOD**	**Units**	**Symbol**			
Aluminium	ICPMS (HF BS EN 14385)	1	µg	N		(64) <1	(64) <1
Antimony	ICPMS (HF BS EN 14385)	1	µg	U		<1	<1
Arsenic	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Beryllium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Cadmium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Chromium	ICPMS (HF BS EN 14385)	2	µg	U		<2	<2
Cobalt	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Copper	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Iron	ICPMS (HF BS EN 14385)	1	µg	N		**(64) 1**	(64) <1
Lead	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Manganese	ICPMS (HF BS EN 14385)	2	µg	U		<2	<2
Nickel	ICPMS (HF BS EN 14385)	2	µg	U		<2	<2
Thallium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Vanadium	ICPMS (HF BS EN 14385)	0.5	µg	U		(13) <0.5	**(13) 1.0**
Zinc	ICPMS (HF BS EN 14385)	1	µg	N		(64) <1	(64) <1

SAL Reference: 351602
Customer Reference: KMK METALS

Filter Analysed as Filter
Filter suite 3

					SAL Reference	351602 011	351602 012
					Customer Sample Reference	050-02-11 METALS FILTER	050-02-12 METALS FILTER BLANK
					Test Sample	AR	AR
Determinand	**Method**	**LOD**	**Units**	**Symbol**			
Aluminium	ICPMS (HF BS EN 14385)	0.5	µg	N		**(64) 14**	**(64) 19**
Antimony	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Arsenic	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Beryllium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Cadmium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Chromium	ICPMS (HF BS EN 14385)	1	µg	U		**2**	<1
Cobalt	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Copper	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Iron	ICPMS (HF BS EN 14385)	1	µg	N		**(13,64) 10**	(13,64) <1
Lead	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Manganese	ICPMS (HF BS EN 14385)	0.5	µg	U		**(13) 0.5**	**(13) 0.9**
Nickel	ICPMS (HF BS EN 14385)	1.0	µg	U		<1.0	<1.0
Thallium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Vanadium	ICPMS (HF BS EN 14385)	0.5	µg	U		(13) <0.5	(13) <0.5
Zinc	ICPMS (HF BS EN 14385)	1	µg	N		**(13,64) 8**	(64,13) <1

SAL Reference: 351602
Customer Reference: KMK METALS

Impinger (2%KMnO4/10%H2SO4) Analysed as Impinger (2%KMnO4/10%H2SO4)
Miscellaneous

					SAL Reference	351602 013	351602 014	351602 015
					Customer Sample Reference	050-02-13 RUN 3 MERCURY IMPINGER 1	050-02-14 RUN 3 MERCURY IMPINGER 2	050-02-15 RUN 3 MERCURY IMPINGER BLANK
					Test Sample	AR	AR	AR
Determinand	**Method**	**LOD**	**Units**	**Symbol**				
Mercury	CVAFS (BS EN 13211)	0.5	µg/l	U		**4.2**	<0.5	<0.5
Volume	CVAFS (BS EN 13211)	1	ml	U		**100**	**110**	**100**

SAL Reference: 351602
Customer Reference: KMK METALS

Probe Wash (27.5%HNO3) Analysed as Probe Wash (27.5%HNO3)
Miscellaneous

SAL Reference	**351602 016**
Customer Sample Reference	**050-02-16 MERCURY PROBE WASH**
Test Sample	**AR**

Determinand	Method	LOD	Units	Symbol	
Mercury	CVAFS (HF Digest BS EN 13211)	0.01	µg	U	<0.01

SAL Reference: 351602
Customer Reference: KMK METALS

Filter Analysed as Filter
Miscellaneous

SAL Reference	**351602 017**
Customer Sample Reference	**050-02-17 RUN 3 FILTER MERCURY**
Test Sample	**AR**

Determinand	Method	LOD	Units	Symbol	
Mercury	CVAFS (HF Digest BS EN 13211)	0.01	µg	U	<0.01

Index to symbols used in 351602-1

Value	Description
AR	As Received
64	Analysis was performed by an alternative technique
13	Results have been blank corrected.
26	LOD raised because the analysis was performed by an alternative technique
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Glenside Environmental Services
Environmental and Engineering Consultants

Company Name:	KMK Metals	Technicians:	EP/PP
Site Name:	KMK Metals	MCERTS No:	MM07 799
Stack ID:	Dust Filtration Plant- Exhaust Stack	TE's:	TE1, TE2, TE3, TE4
Date:	24/05/2012		

Run

Lab Results	LOD Filter µg	LOD Probe Wa µg	LOD Impingers µg/l	Filter µg	Rince µg	Impinger 1 µg/l	Impinger 2 µg/l	Impinger 3 µg/l	Impinger 5 µg/l	Impnger 6 µg/l
Aluminium	0.5	1	30	14	1	30	30	30	n/a	n/a
Antimony	0.5	1	0.5	0.5	1	0.5	0.5	0.5	n/a	n/a
Arsenic	0.5	0.5	0.2	0.5	0.5	0.4	0.3	0.4	n/a	n/a
Barium									n/a	n/a
Beryllium	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	n/a	n/a
Boron									n/a	n/a
Cadmium	0.5	0.5	0.5	0.5	0.5	0.7	0.8	0.5	n/a	n/a
Chromium	0.5	2	0.5	2	2	2.1	0.9	2.0	n/a	n/a
Cobalt	0.5	0.5	0.2	0.5	0.5	0.2	0.2	0.2	n/a	n/a
Copper	0.5	0.5	1	0.5	0.5	2.0	1.0	3.0	n/a	n/a
Iron	1	1	1	10	1	250.0	140.0	140.0	n/a	n/a
Lead	0.5	0.5	0.3	0.5	0.5	9.5	9.6	13.0	n/a	n/a
Manganese	0.5	2	2	0.5	2	5.0	7.0	5.0	n/a	n/a
Nickel	1	2	2	1	2	2.0	2.0	2.0	n/a	n/a
Selenium									n/a	n/a
Silver									n/a	n/a
Thallium	0.5	0.5	0.3	0.5	0.5	0.3	0.3	0.3	n/a	n/a
Tin									n/a	n/a
Vanadium	0.5	0.5	0.3	0.5	0.50	0.3	0.3	0.3	n/a	n/a
Zinc	1	1	30	8	1	320	280	470	n/a	n/a
Mercury	0.01	0.01	1	**0.01**	**0.01**				**4.2**	**0.5**

Blank

Lab Results	Filter µg	Rince µg	Impinger 1 µg/l	Impinger 2 µg/l	Impinger 3 µg/l	Impinger 5 µg/l	Impnger 6 µg/l
Aluminium	0.5	1	30			n/a	n/a
Antimony	0.5	1	0.5			n/a	n/a
Arsenic	0.5	0.5	0.2			n/a	n/a
Barium						n/a	n/a
Beryllium	0.5	0.5	0.5			n/a	n/a
Boron						n/a	n/a
Cadmium	0.5	0.5	0.5			n/a	n/a
Chromium	0.5	2	0.5			n/a	n/a
Cobalt	0.5	0.5	0.2			n/a	n/a
Copper	0.5	0.5	1.0			n/a	n/a
Iron	1	1	30.0			n/a	n/a
Lead	0.5	0.5	0.7			n/a	n/a
Manganese	0.5	2	2.0			n/a	n/a
Nickel	1	2	2.0			n/a	n/a
Selenium						n/a	n/a
Silver						n/a	n/a
Thallium	0.5	0.5	0.3			n/a	n/a
Tin						n/a	n/a
Vanadium	0.5	1.00	0.3			n/a	n/a
Zinc	1	1	30			n/a	n/a
Mercury	0.01	**0.01**				**0.5**	

	Run					Blank				
Solutions Volume ml	**Impinger 1** 100	**Impinger 2** 110	**Impinger 3** 100	**Impinger 4** 100	**Impinger 5** 110	**Impinger 1** 200	**Impinger 2**	**Impinger 3**	**Impinger 4** 100	**Impinger 5**

	Metals		**Mercury**	
Air Volume corrected to STP:	0.349974278	m3	0.36	m3
Air Volume corrected to STP and Moisture:	0.349974278	m3		

Average Temperature:	290.6453204	K
Average Pressure:	101.465	kPa
Average Moisture:	0	%
Average Oxygen:	0	%
Volumertic Flow Rate corrected to STP O2 ref and Moisture	29890.36	m3/hr

Reference Conditions:

Reference Temperature:	273.15	K
Reference Pressure:	101.325	kPa
Reference Oxygen:	0	%
Reference Moisture:	0	%

If one of the metal elements in the last impinger is more than 10% of the total combined metals (i.e. the filter, probe rinse and impingers) collected then the result shall be rejected, unless the total result is less than 30% of the ELV.

Efficiency Check

Results :	**mg in sampling train** LOD	**mg in sampling train** Run	**mg in sampling train** Blank	**mg/m3 at STP/Dry** LOD	**mg/m3 at STP/Dry** Run	**mg/m3 at STP/Dry** Blank	**Corrected to reference oxygen** LOD	**Corrected to reference oxygen** Run	**Corrected to reference oxygen** Blank	**kg/hr** LOD	**kg/hr** Run	**kg/hr** Blank	**Efficiency**	**Efficiency Requirements** %	**ELV**	**Result as percentage of ELV**
Aluminium	0.0108	0.0243	0.0075	0.0309	0.0694	0.0214	0.0309	0.0694	0.0214	0.0009	0.0021	0.0006	12.35	10		#DIV/0!
Antimony	0.0017	0.0017	0.0016	0.0047	0.0047	0.0046	0.0047	0.0047	0.0046	0.0001	0.0001	0.0001	3.02	10		#DIV/0!
Arsenic	0.0011	0.0011	0.0010	0.0030	0.0032	0.0030	0.0030	0.0032	0.0030	0.0001	0.0001	0.0001	3.59	10		#DIV/0!
Barium	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	#DIV/0!	10		#DIV/0!
Berylium	0.0012	0.0012	0.0011	0.0033	0.0033	0.0031	0.0033	0.0033	0.0031	0.0001	0.0001	0.0001	4.33	10		#DIV/0!
Boron	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	#DIV/0!	10		#DIV/0!
Cadmium	0.0012	0.0012	0.0011	0.0033	0.0035	0.0031	0.0033	0.0035	0.0031	0.0001	0.0001	0.0001	4.14	10		#DIV/0!
Chromium	0.0027	0.0045	0.0026	0.0076	0.0129	0.0074	**0.0076**	**0.0129**	**0.0074**	0.0002	0.0004	0.0002	4.44	10		#DIV/0!
Cobalt	0.0011	0.0011	0.0010	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0001	0.0001	0.0001	1.88	10		#DIV/0!
Copper	0.0013	0.0016	0.0012	0.0037	0.0046	0.0034	0.0037	0.0046	0.0034	0.0001	0.0001	0.0001	18.63	10		#DIV/0!
Iron	0.0023	0.0654	0.0080	0.0066	0.1869	0.0229	0.0066	0.1869	0.0229	0.0002	0.0056	0.0007	21.41	10		#DIV/0!
Lead	0.0011	0.0043	0.0011	0.0031	0.0123	0.0033	**0.0031**	**0.0123**	**0.0033**	0.0001	0.0004	0.0001	30.19	10		#DIV/0!
Manganese	0.0031	0.0043	0.0029	0.0089	0.0122	0.0083	0.0089	0.0122	0.0083	0.0003	0.0004	0.0002	11.71	10		#DIV/0!
Nickel	0.0036	0.0036	0.0034	0.0103	0.0103	0.0097	0.0103	0.0103	0.0097	0.0003	0.0003	0.0003	5.52	10		#DIV/0!
Selenium	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	#DIV/0!	10		#DIV/0!
Silver	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	#DIV/0!	10		#DIV/0!
Thallium	0.0011	0.0011	0.0011	0.0031	0.0031	0.0030	0.0031	0.0031	0.0030	0.0001	0.0001	0.0001	2.74	10		#DIV/0!
Tin	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	#DIV/0!	10		#DIV/0!
Vanadium	0.0011	0.0011	0.0016	0.0031	0.0031	0.0045	0.0031	0.0031	0.0045	0.0001	0.0001	0.0001	2.74	10		#DIV/0!
Zinc	0.0113	0.1188	0.0080	0.0323	0.3395	0.0229	0.0323	0.3395	0.0229	0.0010	0.0101	0.0007	39.56	10		#DIV/0!
Mercury	0.0001	0.0004	0.0001	0.0003	0.0012	0.0002	**0.0003**	**0.0012**	**0.0002**	0.0000	0.0000	0.0000	11.11	10		#DIV/0!

Total of Metals	0.0445	0.2352	0.0432	0.1271	0.6720	0.1236	**0.1271**	**0.6720**	**0.1236**	0.0038	0.0201	0.0037	
Total of Cd and Tl	0.0022	0.0023	0.0022	0.0064	0.0066	0.0062	**0.0064**	**0.0066**	**0.0062**	0.0002	0.0002	0.0002	
Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be	0.0178	0.0244	0.0176	0.0509	0.0697	0.0502	**0.0509**	**0.0697**	**0.0502**	0.0015	0.0021	0.0015	

For example ELVs for metals may be:
- Cd and Tl combined – 0.05 mg/m3
- Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V combined – 0.5 mg/m3
- mercury – 0.05 mg/m3

For Cd and Tl combined it would not be necessary to comply with the less than 10% in the last impinger criteria, provided the overall combined Cd and Tl result for the sample train was below 0.015 mg/m3.
For combined metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V) it would not be necessary for each individual element to comply with the less than 10% in the last impinger criteria, provided that the overall combined result for the sample train was below 0.15 mg/m3.
For mercury it would not be necessary to comply with the less than 10% in the last impinger criteria, provided the overall mercury result for the sample train was below 0.015 mg/m3.

Company Name:	KMK	Technicians:	Ewa Piatek, Pat Power
Site Name:	KMK	MCERTS No:	MM07 799, MM12 1183
Stack ID:	A2-8	TE's:	TE1, TE2, TE3, TE4
Monitoring Date:	17/09/2013		

Paticulates Data:

Certs Results:	mg	Certs No
LOD Filter:	0.05	
LOD Nozzle Wash:	0.3	
Blank Filter:	**0.05**	351602 002
Blank Nozzle Wash:	**0.3**	351602 004
Run Filter:	**0.05**	351602 001
Run Nozzle Wash:	**0.3**	351602 003
	0.35	
Blank	0.35	
Run	0.35	

Air Volume corrected to STP:	0.359091338	m3
Moisture:	0	%
Air Volume corrected to Moisture:	0.359091338	m3

Stack Conditions

Average Temperature:	290.6453204	K
Average Pressure:	101.465	kPa
Average Moisture:	0	%
Average Oxygen:	0	%
Volumertic Flow Rate corrected to STP O2 ref and Moisture	29890.36	m3/hr

Reference Conditions

$$c = \frac{m}{V} f_c$$

Reference Temperature:	273.15	K
Reference Pressure:	101.325	kPa
Reference Oxygen:	0	%
Reference Moisture:	0	%

Particulates Results :

	mg/m3	mg/m3 corrected to O2	kg/hr	Uncertainty mg/m3
LOD	0.97	0.97	0.03	n/a
Blank	0.97	0.97	0.03	0.03
Run	0.97	0.97	0.03	0.03

Note: Blank result should be < 10% of ELV
<20% for ELV 5mg/m3 or lower
Blank result is: 8 % of ELV
If the blank result is higher than requirements of ELV result should be rejected

Particulates Uncertainty Run Calculations

Uncertainty calculation for EN 13284 Determination of low range mass concentration of dust, Manual Gravimetric Method

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$$f_s = \frac{(100 - H_m)}{100} \frac{273}{T_m} \frac{\rho_m}{101.3}$$

$$V = V_m f_s$$

Measurement Equation

$$f_c = \frac{21 - O_{2,ref}}{21 - O_{2,m}}$$

Limit value (ELV)	12.5	**mg.m-3**	**Reference oxygen**	0	**%by volume**
Measured concentration	1.0	**mg.m-3 (at reference conditions)**			

Measured Quantities	**Symbol**	**Value**	**Standard uncertainty**		**Units**	**Uncertaint**	**Uncertaint**	**Requirement of std**
Sampled Volume	Vm	0.359091338	uVm	0.001	**m3**	0.28		<=2%
Sampled gas Temperature	Tm	290.6453204	uTm	2	k	0.69		<=1%
Sampled gas Pressure	ρm	101.465	uρm	1	**kPa**	0.99		<=1%
Sampled gas Humidity	Hm	0	uHm	1	**%by volume**	1.00		<=1%
Oxygen content	O2,m	0	uO2,m	0.1	**%by volume**	#DIV/0!		<=5%
Mass particulate	m	0.35	um	0.00	**mg**	0.00	0.00	<5% of limit value
Note - Sampled gas humidity, temperature and pressure are values at the gas meter								
Leak	L	0			**%**	0.00		<=2%
Uncollected Mass (Instack filter - no rinse)	UCM	0			**mg**	0		<=10%

Intermediate calculations						
Factor for std conds	fs	0.94				
uncertainty components	symbol	**sensitivity coeff**		**u (in units of fs)**		
	ρm	0.009		0.009		
	Hm	0.009		0.009		
	Tm	0.003		0.006		
	ufs			0.015		1.56
Corrected volume	V	0.34	uV	0.005	**m3**	1.59
Factor for O2 correction	fc	1.00				
uncertainty components	symbol	**sensitivity coeff**		**u**		
	O2,m	0.05		0.005		
Factor for O2 Correction	ufc	1.00		0.005		0.48

$$c = \frac{m}{V} f_c$$

Parameter		**Value**	**Units**	**Sensitivity c**	**Uncertainty contribution**		**Uncertainty as %**	
Corrected Volume (standard cond	V	0.34	m3	2.89	0.02	mg.m-3	0.12	%
Mass	m	0.35	mg	2.78	0.00	mg.m-3	0.00	%
Factor for O2 Correction	fc	1.00		0.97	0.00	mg.m-3	0.04	%
Leak	L	0.00	mg.m-3	1.00	0.00	mg.m-3	0.00	%
Uncollected mass	UCM	0.00	mg	2.78	0.00	mg.m-3	0.00	%
Combined measurement uncertainty					**0.02**	mg.m-3		

Expanded uncertainty as percentage of measured value	**3.32**	**% measured of value**	**expressed with a level of confidence of 95%**
Expanded uncertainty in units of measurement	**0.03**	**mg.m-3**	**(Using a coverage factor k=2)**
Expanded uncertainty as percentage of limit value	**0.3**	**%ELV**	

Requirement in standard is for uncertainty to be < 30%at ELV at standard conditions

Particulates Uncertainty Blank Calculations

Uncertainty calculation for EN 13284 Determination of low range mass concentration of dust, Manual Gravimetric Method

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Measurement Equation

Limit value (ELV)	1.25	**mg.m-3**	**Reference oxygen**	0	**% by volume**
Measured concentration	1.0	**mg.m-3 (at reference conditions)**			

Measured Quantities	**Symbol**	**Value**	**Standard uncertainty**		**Units**	**Uncertaint**	**Uncertaint**	**Requirement of std**
Sampled Volume	Vm	0.359091338	uVm	0.001	**m3**	0.28		<=2%
Sampled gas Temperature	Tm	290.6453204	uTm	2	k	0.69		<=1%
Sampled gas Pressure	ρm	101.465	uρm	1	**kPa**	0.99		<=1%
Sampled gas Humidity	Hm	0	uHm	1	**% by volume**	1.00		<=1%
Oxygen content	O2,m	0	uO2,m	0.1	**% by volume**	#DIV/0!		<=5%
Mass particulate	m	0.35	um	0.00	**mg**	0.00	0.00	<5% of limit value
Note - Sampled gas humidity, temperature and pressure are values at the gas meter								
Leak	L	0			**%**	0.00		<=2%
Uncollected Mass (Instack filter - no rinse)	UCM	0			**mg**	0		<=10%

Intermediate calculations						
Factor for std conds	fs	0.94				
uncertainty components	symbol	**sensitivity coeff**		**u (in units of fs)**		
	ρm	0.009		0.009		
	Hm	0.009		0.009		
	Tm	0.003		0.006		
	ufs			0.015		1.56
Corrected volume	V	0.34	uV	0.005	**m3**	1.59
Factor for O2 correction	fc	1.00				
uncertainty components	symbol	**sensitivity coeff**		**u**		
	O2,m	0.05		0.005		
Factor for O2 Correction	ufc	1.00		0.005		0.48

Parameter		**Value**	**Units**	**Sensitivity c**	**Uncertainty contribution**		**Uncertainty as %**	
Corrected Volume (standard con	V	0.34	m3	2.89	0.02	mg.m-3	1.24	%
Mass	m	0.35	mg	2.78	0.00	mg.m-3	0.00	%
Factor for O2 Correction	fc	1.00		0.97	0.00	mg.m-3	0.37	%
Leak	L	0.00	mg.m-3	1.00	0.00	mg.m-3	0.00	%
Uncollected mass	UCM	0.00	mg	2.78	0.00	mg.m-3	0.00	%
Combined measurement uncertainty					**0.02**	mg.m-3		

Expanded uncertainty as percentage of measured value	**3.32**	**% measured of value**	**expressed with a level of confidence of 95%** **(Using a coverage factor k=2)**
Expanded uncertainty in units of measurement	**0.03**	**mg.m-3**	
Expanded uncertainty as percentage of limit value	**2.6**	**% ELV**	

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Quarter 4 of 2013
Stack Emissions Monitoring Report

for

KMK Metals Recycling Ltd.

Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly

EPA IPPC Licence REF: W0113-03

Report No: 013-065

Monitoring Date:
10th December 2013

Report Summary:	
Job Quotation No:	**QGE13-016**
Operator Licence No:	**W0113-03**
Operator Name:	**KMK Metals Recycling Ltd.**
Installation:	**Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly**
Contact Name:	**Niall Nally**
Phone No:	**044 9666773, 086 3547071**
Monitoring dates:	**10/12/2013**
Monitoring Organisation:	**Glenside Environmental, Cuil Greine House Link Road, Ballincollig, Cork**
Phone No:	**(021) 4810016**
Email:	**info@glenenv.ie**
Report Date:	**09/01/2014**
Report written by:	**Ewa Piatek**
MCERTS reg No:	**MM07 799**
Competency:	**Level 2**
Function:	**Team Leader**
Endorsements:	**TE1, TE2, TE3, TE4**
Signed:	X Ewa Piatek Signed by: Ewa Piatek

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3.1. MONITORING RESULTS 6
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1. Introduction

Glenside Environmental was commissioned by KMK Metals Recycling Ltd to perform air emission monitoring at the facility in Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly. The monitoring was carried out as required by Waste Licence W0113-03. This report presents details of this monitoring programme.

2. Objectives

2.1. Substances to be monitored at each emission point

Sample Locations	Parameter
A2-8	Particulates
	Metals (Total of Cd+Tl)
	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)
	Chromium
	Lead
	Mercury
	Aluminium
	Arsenic
	Cadmium
	Copper
	Iron
	Nickel
	Zinc

2.2. Special Requirements

There were no special requirements for this monitoring campaign.

3. Materials and Methods

This section provides brief details of the methodologies employed to perform the air emission monitoring.

3.1. Particulates

A sample stream of gas is extracted from the main gas stream at representative sampling points for 30 minutes, with an isokinetically controlled flow rate and measured volume. The dust entrained in the gas sample is separated by a pre-weighed filter, which is then dried and reweighed. Deposits upstream of the filter in the sampling equipment are also recovered and weighed. The increase of mass of the filter and the deposited mass upstream of the filter are attributed to dust collected from the sampled gas, which allows the dust concentration to be calculated.

3.2. Metals

A known volume of flue gas is extracted representatively from a duct or a chimney during a certain period of time at a controlled flow rate following EN13284-1:2004 (Particulates Standard). The dust in the sampled gas volume is collected on a filter. Thereafter, the gas stream is passed through a series of absorbers containing absorption solutions and the filter passing fractions of the specific elements are collected within these solutions.

The results are calculated from the laboratory results divided by air volume sampled and are converted to mg/m^3. Results in kg/hr are calculated from concentration of pollutant and stack flow rate. All results are corrected to Standard Temperature and Pressure. LOD values are obtained from laboratory LOD and the same calculations as per results.

3.3. Volumetric Flow Rate

The volumetric airflow rate was determined from stack velocity measurements calculated in accordance with ISO 16911-1:2013. Airflow rate and temperature profiles were performed at pre-calculated intervals across the stack in order to determine the average velocity profile across the stack diameters. Results are presented in table 4.3.

4. Monitoring Results

Table 4.1 present results of the air emission monitoring sampling program carried out at the emission stacks listed below.

4.1. Monitoring Results

Results reported are corrected to reference conditions as per Waste Licence requirements.

Emission Point	Substances	ELV mg/Nm^3	CEMS Results	LOD mg/Nm^3	Results mg/Nm^3	Results kg/hr	Uncertainty mg/m^3	Date of Monitoring	Start –End Time of Monitoring
Blank	Particulates	12.5	n/a	0.44	0.44	n/a	0.01	10/12/2013	11:01-11:04
A2-8	Particulates	n/a	n/a	0.44	0.44	n/a	0.01	10/12/2013	11:21-11:53
Blank	Metals (Total of Cd+Tl)	n/a	n/a	0.0029	<0.0029	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Metals (Total of Cd+Tl)	n/a	n/a	0.0029	<0.0029	n/a	n/a	10/12/2013	12:45-13:17
Blank	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)	n/a	n/a	0.0236	<0.0236	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Metals (Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be)	n/a	n/a	0.0236	0.0647	0.0019	n/a	10/12/2013	12:45-13:17
Blank	Aluminium	n/a	n/a	0.0023	0.020	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Aluminium	n/a	n/a	0.0023	0.043	0.0013	n/a	10/12/2013	12:45-13:17
Blank	Arsenic	n/a	n/a	0.0014	<0.0014	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Arsenic	n/a	n/a	0.0014	<0.0014	n/a	n/a	10/12/2013	12:45-13:17
Blank	Cadmium	n/a	n/a	0.0015	<0.0015	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Cadmium	n/a	n/a	0.0015	<0.0015	n/a	n/a	10/12/2013	12:45-13:17
Blank	Chromium	n/a	n/a	0.0040	<0.0040	n/a	n/a	10/12/2013	12:27-12:29

Company Name: KMK Metals Recycling Ltd.
Licence No: W0113-03
Year: 2013, Visit No: 4
Report No: 013-065

Emission Point	Substances	ELV mg/Nm^3	CEMS Results	LOD mg/Nm^3	Results mg/Nm^3	Results kg/hr	Uncertainty mg/m^3	Date of Monitoring	Start –End Time of Monitoring
A2-8	Chromium	n/a	n/a	0.0040	0.0046	0.0001	n/a	10/12/2013	12:45-13:17
Blank	Copper	n/a	n/a	0.0017	<0.0017	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Copper	n/a	n/a	0.0017	0.0069	0.0002	n/a	10/12/2013	12:45-13:17
Blank	Lead	n/a	n/a	0.0014	0.0016	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Lead	n/a	n/a	0.0014	0.0180	0.0005	n/a	10/12/2013	12:45-13:17
Blank	Iron	n/a	n/a	0.0030	0.0104	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Iron	n/a	n/a	0.0030	0.366	0.0011	n/a	10/12/2013	12:45-13:17
Blank	Nickel	n/a	n/a	0.0047	<0.0047	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Nickel	n/a	n/a	0.0047	0.0064	0.0002	n/a	10/12/2013	12:45-13:17
Blank	Zinc	n/a	n/a	0.0030	0.0041	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Zinc	n/a	n/a	0.0030	0.1629	0.0048	n/a	10/12/2013	12:45-13:17
Blank	Mercury	n/a	n/a	0.0001	<0.0001	n/a	n/a	10/12/2013	12:27-12:29
A2-8	Mercury	n/a	n/a	0.0001	0.0003	0.0000	n/a	10/12/2013	12:45-13:17

4.2. Reference Conditions

Emission Point	Reference Temperature	Reference Pressure	Reference Moisture	Reference Oxygen
A2-8	273 K	101.3 kPa	No correction	No correction

4.3. Volumetric Flow Rate

Emission Point	Actual Moist Flow Rate	Moist Flow Rate at STP	Dry Flow Rate at STP	Emission Limit Value	Units
A2-8	30844.86	29261.85	n/a	40 000	m^3/Hr

4.4. Methods and Accreditation Status

Emission Point	Determinant	Reference Method	SOP Number	Accreditation Status	Analytical Method Description	Subcontracted Laboratory	Laboratory Accreditation Status
A2-8	Flow, Temperature, Pressure	ISO 16911-1:2013	GEN3-019	n/a	n/a	n/a	n/a
A2-8	Mercury	IS EN 13211	GEN3-014	n/a	AFS	SAL	UKAS
A2-8	Metals	IS EN 14385	GEN3-014	n/a	ICP MS	SAL	UKAS

Substances were monitored as per monitoring objectives.
Substances were monitored in accordance with the monitoring stated in AG2 (Air Emissions Monitoring Guidance Note#2)

5. Operating Information

Emission Point	Process Status Load /Feedstock	Process Details	Fuel /Feedstock	Abatement System	Status of Abatement System
A2-8	Normal Operation	Full Load	n/a	Filter	In Operation

6. Monitoring Deviation

Requirements of IS EN 15259 for sampling points	Comments
Measuring plane is located as far downstream and upstream from any disturbances, which could change direction of flow (bends, fans, partially closed dumpers).	Yes
Measuring Plane is located in a section of duct with at least five hydraulic diameters of straight duct upstream of the sampling plane.	Yes
Measuring Plane is located in a section of duct with at least two hydraulic diameters of straight duct downstream of the sampling plane (five hydraulic diameters from top of the stack).	No
Measuring Plane is located in a section of duct with constant shape and cross-sectional area.	Yes
Measurement section is clearly identified and labelled.	Yes
Requirements of IS EN 15259 for platform, working space and ports size.	**Comments**
Appropriate working area.	Yes
Safe access to monitoring point.	Yes
Sufficient ports number Small stacks(<0.7) – 1 port 0.7-1.5m – 2 ports >1.5m – 4 ports	1 port
Appropriate port size.	Yes
Requirements of ISO 16911-1:2013 for flow, temperature and pressure profile of the stack	**Comments**
Required number of points were sampled as per ISO 16911-1 requirements.	Yes
No negative flow.	Yes
All points sampled swirl check was below 15°	Yes
Differential pressure higher than 5Pa measured with pitot tube.	Yes
The ratio of highest to lowest local gas velocity is outside (higher than 3:1) of requirements	Yes
Requirements of IS EN 13248-1 for Particulates	**Comments**
The LOD is less than 10% of ELV (for ELV >5 mg/m3) (MID 13248-1section 10.6)	Yes
The blank reading meet the required target of <10% of the daily limit value (for ELV >10 mg/m3) (section 10.6)	Yes

.

7. Annex 1

7.1. Personnel

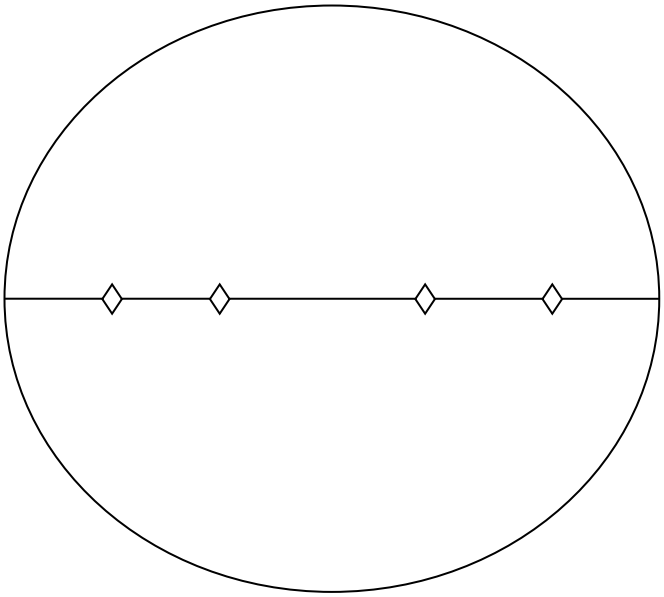
Scientist/Technician Name	Position	Qualification	Technical Endorsements	MCERTS Number
Ewa Piatek	Team Leader	Level 2	TE1, TE2, TE3, TE4	MM07 799
Patrick Power	Technician	Trainee	-	MM12 1183
Jim Nelligh	Technician	Trainee	-	n/a

7.2. Equipment used

Equipment	GEN Equipment No
Millenium 5 Pump	EQ064
Millenium Nozzle Set	EQ087
Millenium Probe	EQ071
Millenium Pitot tube	EQ081
Millenium Impingers	EQ072
Filters	Laboratory supplied
Distance Meter	EQ089
Measuring Tape	EQ090
KIMO Pitot Tube	EQ080
KIMO Flow Meter	EQ079
Caliper	EQ082

8. Annex 2

8.1. Diagrams of the stack



8.2. Sampling measurements

Determinant	Result	Units
Number of Ports Sampled	1	-
Number of Points Sampled	4	-
Average Velocity v'a	17.05	m/s
Average Pressure	102.132	kPa
Average Temperature	18.32	°C
Stack Diameter	0.8	m
T Reference	273	Deg K
P Reference	101.3	kPa
Isokinetic condition	Particulates 2.26 Metals 0.65	%
Oxygen	n/a	%
Water vapour	n/a	%

9. Annex 3

9.1. Results and uncertainty calculations, certificates of analysis

Scientific Analysis Laboratories is a
limited company registered in England and
Wales (No 2514788) whose address is at
Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2404

Report Number: 367081-1

Date of Report: 07-Jan-2014

Customer: Glenside Environmental
Cuil Greine House
Ballincollig Commercial Park
Link Road
Ballincollig.
CO. CORK.

Customer Contact: Mr Patrick Power

Customer Job Reference: 013-065 KMK STACK
Customer Purchase Order: 013-065 KMK STACK
Customer Site Reference: KMK METALS
Date Job Received at SAL: 16-Dec-2013
Date Analysis Started: 24-Dec-2013
Date Analysis Completed: 07-Jan-2014

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with QP22

UKAS TESTING
1549

Report checked
and authorised by :
Mary Drury
Project Manager

Issued by :
Mary Drury
Project Manager

SAL Reference: 367081
Project Site: KMK METALS
Customer Reference: 013-065 KMK STACK

Impinger (5%HNO3/5%H2O2) Analysed as Impinger (3.3%HNO3/1.5%H2O2)
Miscellaneous

				SAL Reference	**367081 005**	**367081 006**	**367081 007**	**367081 008**
				Customer Sample Reference	**065-02-05**	**065-02-06**	**065-02-07**	**065-02-08**
				Test Sample	**AR**	**AR**	**AR**	**AR**
Determinand	**Method**	**LOD**	**Units**	**Symbol**				
Mercury	CVAFS (BS EN 13211)	0.5	µg/l	U	<0.5	<0.5	<0.5	<0.5
Volume	ICPMS (BS EN 14385)	1	ml	U	**100**	**110**	**110**	**170**

SAL Reference: 367081
Project Site: KMK METALS
Customer Reference: 013-065 KMK STACK

Probe Wash (27.5%HNO3) Analysed as Probe Wash (27.5%HNO3)
Miscellaneous

				SAL Reference	**367081 009**	**367081 010**
				Customer Sample Reference	**065-02-09**	**065-02-10**
				Test Sample	**AR**	**AR**
Determinand	**Method**	**LOD**	**Units**	**Symbol**		
Mercury	CVAFS (HF Digest BS EN 13211)	0.01	µg	U	(13) <0.01	(13) <0.01

SAL Reference: 367081
Project Site: KMK METALS
Customer Reference: 013-065 KMK STACK

Impinger (2%KMnO4/10%H2SO4) Analysed as Impinger (2%KMnO4/10%H2SO4)
Miscellaneous

				SAL Reference	**367081 013**	**367081 014**	**367081 015**
				Customer Sample Reference	**065-02-13**	**065-02-14**	**065-02-15**
				Test Sample	**AR**	**AR**	**AR**
Determinand	**Method**	**LOD**	**Units**	**Symbol**			
Mercury	CVAFS (BS EN 13211)	0.5	µg/l	U	<0.5	<0.5	<0.5
Volume	CVAFS (BS EN 13211)	1	ml	U	**99**	**100**	**160**

SAL Reference: 367081
Project Site: KMK METALS
Customer Reference: 013-065 KMK STACK

Wash(DI) Analysed as Wash(DI)
Miscellaneous

				SAL Reference	**367081 003**	**367081 004**
				Customer Sample Reference	**065-02-03**	**065-02-04**
				Test Sample	**AR**	**AR**
Determinand	**Method**	**LOD**	**Units**	**Symbol**		
Particulates (Total)	Grav	0.3	mg	U	<0.3	**0.3**

SAL Reference: 367081
Project Site: KMK METALS
Customer Reference: 013-065 KMK STACK

Filter GFA 47mm Analysed as Filter GFA 47mm
Miscellaneous

				SAL Reference	**367081 001**	**367081 002**
				Customer Sample Reference	**065-02-01**	**065-02-02**
				Test Sample	**AR**	**AR**
Determinand	**Method**	**LOD**	**Units**	**Symbol**		
Particulates (Total)	Grav (5 Dec)	0.05	mg	U	**0.05**	<0.05

SAL Reference: 367081
Project Site: KMK METALS
Customer Reference: 013-065 KMK STACK

Filter Analysed as Filter
BS EN 14385 Metals Suite

					SAL Reference	367081 011	367081 012
					Customer Sample Reference	065-02-11	065-02-12
					Test Sample	AR	AR
Determinand	**Method**	**LOD**	**Units**	**Symbol**			
Antimony	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Aluminium	ICPMS (HF BS EN 14385)	0.5	µg	N		(13,64) **3.0**	(64,13) <0.5
Mercury	CVAFS (HF Digest BS EN 13211)	0.01	µg	U		(13) <0.01	(13) <0.01
Zinc	ICPMS (HF BS EN 14385)	1	µg	N		**4**	**2**
Iron	ICPMS (HF BS EN 14385)	1	µg	N		(64,13) **9**	(64,13) **2**
Arsenic	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Beryllium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Cadmium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Chromium	ICPMS (HF BS EN 14385)	1	µg	U		**1**	<1
Cobalt	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Copper	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Lead	ICPMS (HF BS EN 14385)	0.5	µg	U		**1.3**	<0.5
Manganese	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Nickel	ICPMS (HF BS EN 14385)	1.0	µg	U		<1.0	<1.0
Thallium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Vanadium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5

SAL Reference: 367081
Project Site: KMK METALS
Customer Reference: 013-065 KMK STACK

Probe Wash (27.5%HNO3) Analysed as Probe Wash (27.5%HNO3)
Suite B

					SAL Reference	367081 009	367081 010
					Customer Sample Reference	065-02-09	065-02-10
					Test Sample	AR	AR
Determinand	**Method**	**LOD**	**Units**	**Symbol**			
Aluminium	ICPMS (HF BS EN 14385)	1	µg	N		(13,64,3) <10	(13,64,3) <10
Antimony	ICPMS (HF BS EN 14385)	1	µg	U		<1	<1
Arsenic	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Beryllium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Cadmium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Chromium	ICPMS (HF BS EN 14385)	2	µg	U		<2	<2
Cobalt	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Copper	ICPMS (HF BS EN 14385)	0.5	µg	U		**0.9**	<0.5
Iron	ICPMS (HF BS EN 14385)	1	µg	N		(13,64) **2**	(64,13) <1
Lead	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Manganese	ICPMS (HF BS EN 14385)	2	µg	U		<2	<2
Nickel	ICPMS (HF BS EN 14385)	2	µg	U		<2	<2
Thallium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Vanadium	ICPMS (HF BS EN 14385)	0.5	µg	U		<0.5	<0.5
Zinc	ICPMS (HF BS EN 14385)	1	µg	N		**1**	<1

SAL Reference: 367081
Project Site: KMK METALS
Customer Reference: 013-065 KMK STACK

Impinger (5%HNO3/5%H2O2) Analysed as Impinger (3.3%HNO3/1.5%H2O2)

Suite C

	SAL Reference	367081 005	367081 006	367081 007	367081 008
	Customer Sample Reference	065-02-05	065-02-06	065-02-07	065-02-08
	Test Sample	AR	AR	AR	AR
Determinand	**Method**	**LOD**	**Units**	**Symbol**	
Aluminium	ICPMS (BS EN 14385)	1	µg/l	N	**(26,13) 140**	(26,13) <30	(13,26) <30	(13,26) <30
Antimony	ICPMS (BS EN 14385)	0.5	µg/l	U	<0.5	<0.5	<0.5	<0.5
Arsenic	ICPMS (BS EN 14385)	0.2	µg/l	U	**0.5**	<0.2	<0.2	<0.2
Beryllium	ICPMS (BS EN 14385)	0.5	µg/l	U	<0.5	<0.5	<0.5	<0.5
Cadmium	ICPMS (BS EN 14385)	0.5	µg/l	U	**0.6**	<0.5	<0.5	<0.5
Chromium	ICPMS (BS EN 14385)	0.5	µg/l	U	**5.2**	<0.5	<0.5	<0.5
Cobalt	ICPMS (BS EN 14385)	0.2	µg/l	U	**0.7**	**0.5**	**0.2**	<0.2
Copper	ICPMS (BS EN 14385)	1	µg/l	U	**(13) 38**	**(13) 1**	(13) <1	(13) <1
Iron	ICPMS (BS EN 14385)	1	µg/l	N	**(13,26) 110**	(13,26) <30	(13,26) <30	(13,26) <30
Lead	ICPMS (BS EN 14385)	0.3	µg/l	U	**64**	**37**	**16**	**1.3**
Manganese	ICPMS (BS EN 14385)	2	µg/l	U	**26**	**45**	**57**	<2
Nickel	ICPMS (BS EN 14385)	2	µg/l	U	**12**	**4**	**3**	<2
Thallium	ICPMS (BS EN 14385)	0.3	µg/l	U	<0.3	<0.3	<0.3	<0.3
Vanadium	ICPMS (BS EN 14385)	0.3	µg/l	U	<0.3	<0.3	<0.3	<0.3
Zinc	ICPMS (BS EN 14385)	1	µg/l	N	**870**	**210**	**110**	<1

Index to symbols used in 367081-1

Value	Description
AR	As Received
13	Results have been blank corrected.
3	LOD Raised Due to Elevated Blank
26	LOD raised because the analysis was performed by an alternative technique
64	Analysis was performed by an alternative technique
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Company Name:	KMK	Technicians:	Ewa Piatek, Pat Power, Jim Nellig!
Site Name:	KMK	MCERTS No:	MM07 799, MM12 1183
Stack ID:	A2-8	TE's:	TE1, TE2, TE3, TE4
Monitoring Date:	10/12/2013	Doc No	GEN2-002 rev9

Equipment Used:

Millenium 5 consol	EQ069			Rule:	EQ083
Probe:	EQ071	Pitot Tube:	EQ081		
KIMO - Flow Test	EQ079	Kimo Pitot Tube	EQ080		

Stack	Circular with central point	Circular no central point (tangential)	
Diameter Measurements		0.8	
		0.8	
		0.8	
Diameter Average:	#DIV/0!	0.8	m
			m
Stack Area	#DIV/0!	0.50	m2
Samplino Line		1	
Sampling Points		4	
Points Calculations for			

Rectangular Stack	Port Side	Deep Side
1		
2		
3		
Port Side Ave	#DIV/0!	m
Deep Side Ave	#DIV/0!	m
	#DIV/0!	m2
Port Number		
Point Number per line		
Distance beetwen points in %	100	%

Circular no central point

Point Number	Point position in stack (m)	Point position as %
1	0.05	6.7
2	0.20	25.0
3	0.60	75.0
4	0.75	93.3

Table 1 — Minimum number of sampling points for circular ducts

Range of sampling plane areas m^2	Range of duct diameters m	Minimum number of sampling lines (diameters)	Minimum number of sampling points per plane
≤ 0,1	≤ 0,35	–	1 a
0,1 to 1,0	0,35 to 1,1	2	4
1,1 to 2,0	1,1 to 1,6	2	8
> 2,0	> 1,6	2	at least 12 and 4 per m^2 b

a Using only one sampling point may give rise to errors greater than those specified in this standard.
b For large ducts, a number of 20 sampling points is generally sufficient.

Table 2 — Minimum number of sampling points for rectangular ducts

Range of sampling plane areas m^2	Minimum number of side divisions a	Minimum number of sampling points
≤ 0,1	–	1 b
0,1 to 1,0	2	4
1,1 to 2,0	3	9
> 2,0	≥3	at least 12 and 4 per m^2 c

a Other side divisions may be necessary, for example if the longest duct side length is more than twice the length of the shortest side (see C.3).
b Using only one sampling point may give rise to errors greater than those specified in this standard.
c For large ducts, a number of 20 sampling points is generally sufficient.

Pitot Tube Checks:	Comments	KIMO Pitot EQ080	Mill 5 Pitot EQ081
Deformities, Burrs, Damage		no	no
Blockage of Pressure Taps		no	no
Inernal Leakage Check			
Static oressure of the stack:		140	14
Pressuriezed pressure:		170	16
Time of leak check:		5 min	5 min
Leak Check Result:		Pass	Pass
Check on stagnation and reference pressure taps:		ok	ok

Note: Sampling point should be located either >3% of the sampling point length or more tha n5 cm whichever is the greater value from the inner duct wall.

Note: Pressurizing the tube at least as high as the static pressure in the stack and sealing the pressure taps. The pressure reading device should indicate no drop in pressure over a 5 min period.

S-tupe pitot tube shall be positioned perpendicular to the direction of the flow. The static pressure is than measured using both taps. The difference in the measured static pressure should be < 10Pa

Swirl Check:	°	Within requirements <15°
Point 1	1.00	Y
Point 2	2.00	Y
Point 3	2.00	Y
Point 4	1.00	Y

If Swirl Check is outside requiremnts the correction has to be applied.

Static Pressure:	mmH2O	Pa	mmH2O	Line 2	Note: At least once per line.
Reading 1	14	140.00		0.00	Pa
Reading 2	14	140.00		0.00	Pa
Reading 3	14	140.00		0.00	Pa
Reading 4	14	140.00		0.00	Pa
Reading 5	14	140.00		0.00	Pa
Average:	14.28117444	140		0	Pa

Unc of static pressure calculations

St Dev:	0.00	0.00	
	0.00	0.00	
Unc	1.52	1.52	1.08

Absolute pressure of the stack gas:

$$P_s = P_b + \frac{P_{static}}{13.6}$$

The absolute pressure in the duct is given by the measurement of the atmospheric pressure on the site and the static pressure measured in the duct.

Barometric (Atmospheric Pressure)Pb	765	mmHg
Pstatic	14.28117444	mmH2O
Conversion form mmH2O to mmHg	13.6	
Ps =	766.0500864	mmHg
	102131.6118	Pa

Note: 1mb = 0.75 mmHg (Since1 atmosphere=1013.25 mb = 760 mmHg)
760 mmHg = 101325 Pa

Absolute Pressure of stack

Atmospheric Temperature: 8.00 C°

Molecular Weigh of Dry Gas Stream:

$$M_d = 44\frac{\%CO2}{100} + 32\frac{\%O2}{100} + 28\frac{\%CO + \%N2}{100}$$

CO2	0.06	%
O2	20.80	%
CO	0.00	%
N2	79.14	%
Md=	28.84	

Molecular weight of stack gas (wet):

$$M_s = M_d(1 - B_{wo}) + 18(B_{wo})$$

Bwo	0.017
Md	28.84
Molecular weight o	18
Ms=	**28.66**

Pitot Cooficiencv				
Calibration Date:	05/08/2013			05/08/2013
EQ080		EQ081		
m/sec	Cp	m/sec	Cp	
3.02	0.857	3.04	0.819	
5.23	0.849	5.23	0.815	
10.35	0.84	10.15	0.833	
15.4	0.84	15	0.834	
20.22	0.839	20.37	0.84	
26.17	0.834	25.89	0.836	

Pitot Cooficiency used for calculatior 0.8340

Repeatability Test:

	Velocity by Mill 5		Velocity	Temperature	Velocity by KIMO	Difference of readings		Differenciala Pressure		
	ΔPs mmH2O	√ΔPs mmH2O	m/s		m/s					
1	26	5.099	17.13	18.3	16.3	0.83		1	254.88	Pa
2	26	5.099	17.13	18.3	16.9	0.23		2	254.88	Pa
3	26	5.099	17.13	18.3	17	0.13		3	254.88	Pa
4	26	5.099	17.13	18.4	17.6	-0.47		4	254.88	Pa
5	26	5.099	17.13	18.3	17.8	-0.67		5	254.88	Pa
6	26	5.099	17.13	18.4	18.5	-1.37		6	254.88	Pa
7	26	5.099	17.13	18.3	18.4	-1.27	Note: Field	7	254.88	Pa
8	26	5.099	17.13	18.3	18.2	-1.07	repeatability	8	254.88	Pa
9	26	5.099	17.13	18.3	18	-0.87	requirements is ≤5	9	254.88	Pa
10	26	5.099	17.13	18.3	18.1	-0.97	% of velocity	10	254.88	Pa
			17.13		17.68		Repeatability as %	Average:	255	Pa
					Standard Deviation:	0.73	4.2			

Time Start: 10:13 Time End: 10:21

				Velocity by Mill 5	Velocity	Temperature	Pressure of Stack	Average at each point:			
		ΔPs Pa	ΔPs mmH2O	√ΔPs mmH2O	m/s		kPa	Dynamic Pressure	Velocity	Temperature	Pressure
Point 1	1	254.88	26	5.099	17.13	18.3	102.1316118				
	2	254.88	26	5.099	17.13	18.3	102.1316118				
	3	254.88	26	5.099	17.13	18.3	102.1316118				
	4	254.88	26	5.099	17.13	18.4	102.1316118	254.88	17.13	18.32	102.1316
	5	254.88	26	5.099	17.13	18.3	102.1316118				
Point 2	1	254.88	26	5.099	17.13	18.4	102.1316118				
	2	254.88	26	5.099	17.13	18.3	102.1316118				
	3	254.88	26	5.099	17.13	18.3	102.1316118				
	4	254.88	26	5.099	17.13	18.3	102.1316118	254.88	17.13118	18.32	102.1316
	5	254.88	26	5.099	17.13	18.3	102.1316118				
Point 3	1	254.88	26	5.099	17.13	18.3	102.1316118				
	2	254.88	26	5.099	17.13	18.3	102.1316118				
	3	254.88	26	5.099	17.13	18.3	102.1316118				
	4	254.88	26	5.099	17.13	18.4	102.1316118	254.88	17.13118	18.32	102.1316
	5	254.88	26	5.099	17.13	18.3	102.1316118				
Point 4	1	254.88	26	5.099	17.13	18.4	102.1316118				
	2	254.88	26	5.099	17.13	18.3	102.1316118				
	3	254.88	26	5.099	17.13	18.3	102.1316118				
	4	254.88	26	5.099	17.13	18.3	102.1316118	254.88	17.13118	18.32	102.1316
	5	254.88	26	5.099	17.13	18.3	102.1316118				
Total Average:			**26**						**17.13118**	**18.32**	**102.1316**

Higes to Lowest flow ratio: 1.000137299 :1 Max flow: 17.13353465

Requirement is Duct Flow ratio of max. to min. <3:1 Min. Flow: 17.13118256

Uncertainty Calc

0.00	Std Dev	31.93	2√ΔP
0.00		15.96499	√ΔP
1.52	UΔp	########	U2Δp
0.66	Uvi	0.002275	U2Δp/4Δp
0.17			
0.00	Std Dev	31.93	2√ΔP
0.00		15.96499	√ΔP
1.52	UΔp	2.32	U2Δp
0.66		0.002275	U2Δp/4Δp
0.17			
0.00	Std Dev	31.93	2√ΔP
0.00		15.96499	√ΔP
1.52	UΔp	2.32	U2Δp
0.66		0.002275	U2Δp/4Δp
0.17			
0.00	Std Dev	31.93	2√ΔP
0.00		15.96499	√ΔP
1.52	UΔp	2.32	U2Δp
0.66		0.002275	U2Δp/4Δp
0.17			
		0.0091	∑U2Δp/4Δp
		4078	(∑√Δp)2

Pitot Tube Checks:	Comments	
	KIMO Pitot EQ080	Mill 5 Pitot EQ081
Deformities, Burrs, Damage	no	
Blockage of Pressure Taps	no	
Inernal Leakage Check		
Static pressure of the stack:	140	14
Pressuriezed pressure:	165	17
Time of leak check:	5 min	5 min
Leak Check Result:	Pass	Pass
Check on stagnation and reference pressure taps:	ok	ok

Note: Pressurizing the tube at least as high as the static pressure in the stack and sealing the pressure taps. The pressure reading device should indicate no drop in pressure over a 5 min period.

S-tupe pitot tube shall be positioned perpendicular to the direction of the flow. The static pressure is than measured using both taps. The difference in the measured static pressure should be < 10Pa

Results:

used without	without taking wall effect measurements.
WAF Wall effect correction factor:	
Smooth walled ducts	0.995
Rough Walled ducts	0.99 bricks, mortar

Circular Stack

Stak Diameter:	0.8	m
Average flow:	17.13	m/s
	0.995	
Average Flow corrected for wall effect:	17.05	m/s
Average Temperature:	290.13	K
Average Pressure:	102.132	kPa
Average Moisture:		%
Average Oxygen:		%

Reeference Conditions:

Reference Temperature:	273.15	K
Reference Pressure:	101.325	kPa
Reference Oxygen:	0	%
Reference Moisture:	0	%

Mass Emissions Calculations:

Volumetric Flow Rate	8.57	m3/s
Volumetric Flow Rate	30844.86	m3/hr
Volumetric Flow Rate corrected to STP	29261.85	m3/hr
Volumetric Flow Rate corrected to STP and O2 ref	29261.85	m3/hr
Volumetric Flow Rate corrected to STP, O2 ref and Moisture	29261.85	m3/hr

Uncertainty Calculations:

Input Quantities:

		Unit				
Diameter of Stack	0.8	m	2	%	Max permissible error	
Number of points measured:	4					
Temperature:	291.32	K	1	%	Accuracy	
Atmospheric Pressure:	102131.6118	Pa	300	Pa	Max permissible error estimated at	20 Pa
Oxygen content:	20.80	% dry	6	± %	Volume fraction on c	20.4 % wet
CO2 content:	0.06	% dry	6	± %	Volume fraction on c	0.1 % wet
H2O content	1.7	%	20	± %	Volume fraction on dry gas	
Density of Gas	1.21	kg/m3				
Absolute pressure	102131.6118	Pa				
average Velocity	17.13118256	m/s				
Pitot Tube characteristic	1.01	K	0.02	±		
Standard unc on the coefficient of th	0.01	u(K)				
Range: 0	1000	Pa				
Resolution	1	Pa				
Calibration Uncertainty	2	Pa	2	coverage factor		
Drift	0.1	% of the range between 2 calibration				
Lack of fit	0.06	% of the range				
Mollar Mass Wet (I 0.286716		kg/mol				
unc H2O 0.17 %						
unc O2 0.61 %						
unc CO2 0.00 %						
unc Molar Weight 0.00004 Kg/mol						
unc Temp 1.46 K						
Abs press unc 174.38 Pa						
unc Patm 173.30 Pa						
std unc associated with the density u(ρ)		0.0045	kg/m3			
		0.25	m/s			
Expanded uncerti expressed with a level of confidence of 9		**0.49**	**±m/s**			
Expanded uncerti expressed with a level of confidence of 9		**2.90**	**±%**			

Company N	KMK	Technicians:	Ewa Piatek, Pat Power, Jim Nelligh
Stite Name:	KMK	MCERTS No:	MM07 799, MM12 1183
Stack ID:	A2-8	TE's:	TE1, TE2, TE3, TE4
Monitoring I	10/12/2013	Doc No	GEN2-002 rev9

Millenium 5 cons	EQ069	Stainels Steel Filter	EQ084	Glass Filter Holder	EQ085
Probe:	EQ071	Pitot Tube:	EQ081		
Impingers:	EQ072	Nozzle:	EQ087		
Sampling Line:	EQ070	Run Filter Number:		Blank Filter Number:	

Notes: Do not sample point with higher than 15° flow direction from stack axis.
If the negative flow was founs point aroud it should not be sampled
If the suitable sampling location could not be found double number od sampling point.

Determination of Nozzle size:

$$D_n^{\,2} = \frac{V_{desired}\sqrt{\frac{M_s(T_s+273)}{P_s}}}{(5.9195*10^{-4})C_p\theta(1-B_{wo})(\sqrt{\Delta P})ave}$$

Vdessired	0.5	m3
Ts	18.32	°C
Ps	766.050086	mmHg
Cp	0.84	S-type pitot tube constant
θ	30	minutes
Bwo	0.02	
$(\sqrt{(\Delta P)})\ ave$	5.10	
ΔP	26	mmH2O
Dn2=	22.08	mm2

Pitot Cooficiency Calibration Date: 05/08/2013

EO080 KIMO m/sec	Cp
3.02	0.857
5.23	0.849
10.35	0.84
15.4	0.84
20.22	0.839
26.17	0.834

EQ081 Mill	05/08/2013
3.04	0.819
5.23	0.815
10.15	0.833
15	0.834
20.37	0.84
25.89	0.836

				Availlable Nozzle sizes
Dn=	4.70	mm	Calculated nozzle size	2.73
Nozzle Measurements:	5.98	mm		4.29
	5.98	mm		5.98
	5.98	mm		7.43
Dn=	5.98	mm	Used nozzle size	9.29
Cross sectional Area of the nozzle:	28.09	mm2		12.49

K factor:

$$K = 8.04*10^{-5}*C_p^{\,2}*\Delta H@\left(\frac{T_m+273}{T_s+273}\right)*\left(\frac{P_s}{P_b}\right)*\left(\frac{M_d}{M_s}\right)*(1-B_{wo})(D_n)^4$$

ΔH@	45.69	mmHg	from calibration cert
Tm	21	°C	Meter Temperature estimated
K=	3.31		

Eastimated Volume Metered:

$$EstV_{mstd} = (5.9195*10^{-4})*C_p\sqrt{\frac{P_s}{M_s(273+T_s)}}*(\sqrt{\Delta P})ave*D_n^{\,2}\theta(1-B_{wo})$$

EstVmstd=	0.80994	m3		
Estimated sampling rate:	27.0	l/min	1.6199	m3/hr

Estimated Gas Sample Volume:

Ater 1 min:	1257.0
Ater 2 min:	1284.0
Ater 3 min:	1311.0
Ater 4 min:	1338.0
Ater 5 min:	1365.0

Calibration Date: 20/08/2013

Nominal Flow Rates m3/hr	Correction Factor
0.25	0.9925
0.5	1.0133
1	1.0355
1.5	1.0525
2	1.0732
2.5	1.0898

Volume Correctio n Factor	1.0525	from calibration cert

Allowable leak check less than: 0.539961404 L/min

Leak Check:

	Vacum Press	L/min	Time	Pass/Fail
Before Blank	10	0.1	2 min	Pass
After Blank	8	0.1	2 min	Pass
Before Run:	12	0	2 min	Pass
Afrer Run:	10	0.1	2 min	Pass

Sampling:

Stack Diameter	0.8	m
Cross sectional Area of the stack:	0.503	m2

Start Time: 11:21:00 End Time: 11:53:00

Points number 4 Sampling time at each point calc 8 min.

Traverse point number	Clock Time	Pump Vacuum	Velocity Heads	Sqr roots Velocity Heads	Orfice Settings Calculated	Orfice Settings Readings	Gas Sample Volume	Stack Temp	Probe Temp	Impinger Temp Tc	Filter Temp	Gas Sample Temperature at Dry Gas Meter		K Factor Calculated	Velocity of the stack	Actual Flow Of Stack	Vmstd at the time of measuring	Isokinetic Ratio
		mmHg	ΔPs	√ΔPs	ΔH	ΔH	Vm (m3/1000) (liters)	°C	°C	°C	°C	Inlet °C	Outlet °C		m/s	m3/min	m3	%
	0	-2.5	21	4.583	69.433	60	1230	18	18	4		20	20	3.31	15.50	467.42		
1	4	-2.5	21	4.583	69.433	60	1305	18	18	4		20	20	3.31	15.50	467.42	0.0745	76.78
1	8	-5	21	4.583	69.433	75	1391	18	18	4		20	20	3.31	15.50	467.42	0.1599	82.45
2	12	-7	21	4.583	69.433	80	1493	18	18	4		20	20	3.31	15.50	467.42	0.2613	89.82
2	16	-7	21	4.583	69.433	80	1643	18	18	4		20	20	3.31	15.50	467.42	0.4104	105.81
3	20	-7	21	4.583	69.433	80	1702	18	18	4		20	20	3.31	15.50	467.42	0.4691	96.76
3	24	-7	21	4.583	69.433	80	1811	18	18	4		20	20	3.31	15.50	467.42	0.5775	99.26
4	28	-7	21	4.583	69.433	80	1919	18	18	4		20	20	3.31	15.50	467.42	0.6850	100.90
4	32	-7	21	4.583	69.433	80	2028	18	18	4		20	20	3.31	15.50	467.42	0.7934	102.26
Average:			**21.00**	**4.58**		**75.00**		**18.00**	**18.00**	**4.00**		**20.00**	**20.00**		**15.50**	**467.42**		2.26
							798.00											

Moisture: The temperature at the outlet of trapping unit shall not be greater than 4 °C or by checking visually the amount of silica gel having faded in the last impinger or cartridge. This amount shall not exceed 50 %.

Company N	KMK		Technicians:	Ewa Piatek, Pat Power, Jim Nelligh	
Stite Name:	KMK		MCERTS No:	MM07 799, MM12 1183	
Stack ID:	A2-8		TE's:	TE1, TE2, TE3, TE4	
Monitoring [	10/12/2013		Doc No	GEN2-002 rev9	

Millenium 5 cont	EQ069	Stainels Steel Filter	EQ084	Glass Filter Holder	EQ085
Probe:	EQ071	Pitot Tube:	EQ081		
Impingers:	EQ072	Nozzle:	EQ087		
Sampling Line:	EQ070	Run Filter Number:		Blank Filter Number:	

Notes: Do not sample point with higher than 15° flow direction from stack axis.
If the negative flow was founs point aroud it should not be sampled
If the suitable sampling location could not be found double number od sampling point.

Determination of Nozzle size:

$$D_n^{\,2} = \frac{V_{desired}\sqrt{\frac{M_s(T_s+273)}{P_s}}}{(5.9195*10^{-4})C_p\theta(1-B_{wo})(\sqrt{\Delta P})ave}$$

Vdessired	0.5	m3	
Ts	18.32	°C	
Ps	766.050086	mmHg	
Cp	0.84	S-type pitot tube constant	
θ	30	minutes	
Bwo	0.02		
$(\sqrt{(\Delta P)})\ ave$	5.10		
ΔP	26	mmH2O	
Dn2=	22.08	mm2	

Dn=	4.70	mm	Calculated nozzle size
Nozzle Measurements:	5.98	mm	
	5.98	mm	
	5.98	mm	
Dn=	5.98	mm	Used nozzle size
Cross sectional Area of the nozzle:	28.09	mm2	

Pitot Cooficiency
Calibration Date: 05/08/2013
EQ080 KIMO

m/sec	Cp
3.02	0.857
5.23	0.849
10.35	0.84
15.4	0.84
20.22	0.839
26.17	0.834

EQ081 Mill 05/08/2013

3.04	0.819
5.23	0.815
10.15	0.833
15	0.834
20.37	0.84
25.89	0.836

Availlable Nozzle sizes

2.73
4.29
5.98
7.43
9.29
12.49

K factor:

$$K = 8.04*10^{-5}*{C_p}^2*\Delta H@\left(\frac{T_m+273}{T_s+273}\right)*\left(\frac{P_s}{P_b}\right)*\left(\frac{M_d}{M_s}\right)*(1-B_{wo})(D_n)^4$$

ΔH@	45.69	mmHg	from calibration cert
Tm	21	°C	Meter Temperature estimated
K=	3.31		

Eastimated Volume Metered:

$$EstV_{mstd} = (5.9195*10^{-4})*C_p\sqrt{\frac{P_s}{M_d(273+T_s)}}*(\sqrt{\Delta P})ave*{D_n}^2\theta(1-B_{wo})$$

EstVmstd=	0.80994	m3	
Estimated sampling rate:	27.0	l/min	1.6199 m3/hr

Estimated Gas Sample Volume:

Ater 1 min:	2055.0
Ater 2 min:	2082.0
Ater 3 min:	2109.0
Ater 4 min:	2136.0
Ater 5 min:	2163.0

Calibration Date: 20/08/2013

Nominal Flow Rates m3/hr	Correction Factor
0.25	0.9925
0.5	1.0133
1	1.0355
1.5	1.0525
2	1.0732
2.5	1.0898

Volume Correction Factor 1.0525 from calibration cert

Allowable leak check less than: 0.539961404 L/min

Leak Check:

	Vacum Press	L/min	Time	Pass/Fail
Before Blank	12	0	2 min	Pass
After Blank	10	0	2 min	Pass
Before Run:	8	0.1	2 min	Pass
Afrer Run:	8	0.1	2 min	Pass

Sampling:

Stack Diameter 0.8 m

Cross sectional Area of the stack: 0.503 m2

Start Time: 12:45:00 End Time: 13:17:00

Points number 4 Sampling time at each point calc 8 min.

Traverse point number	Clock Time	Pump Vacuum	Velocity Heads	Sqr roots Velocity Heads	Orfice Settings Calculated	Orfice Settings Readings	Gas Sample Volume	Stack Temp	Probe Temp	Impinger Temp Tc	Filter Temp	Gas Sample Temperature at Dry Gas Meter		K Factor Calculated	Velocity of the stack	Actual Flow Of Stack	Vmstd at the time of measuring	Isokinetic Ratio
		mmHg	ΔPs	√ΔPs	ΔH	ΔH	Vm (m3/1000) (liters)	°C	°C	°C	°C	Inlet °C	Outlet °C		m/s	m3/min	m3	%
	0	-2.5	21	4.583	69.433	80	2028	18	18	4		20	20	3.31	15.50	467.42		
1	4	-2.5	21	4.583	69.433	80	2115	18	18	4		20	20	3.31	15.50	467.42	0.0865	89.24
1	8	-5	21	4.583	69.433	80	2209	18	18	4		20	20	3.31	15.50	467.42	0.1800	92.83
2	12	-7	21	4.583	69.433	80	2309	18	18	4		20	20	3.31	15.50	467.42	0.2795	96.07
2	16	-7	21	4.583	69.433	80	2414	18	18	4		20	20	3.31	15.50	467.42	0.3839	98.98
3	20	-7	21	4.583	69.433	80	2507	18	18	4		20	20	3.31	15.50	467.42	0.4764	98.26
3	24	-7	21	4.583	69.433	80	2615	18	18	4		20	20	3.31	15.50	467.42	0.5839	100.35
4	28	-7	21	4.583	69.433	80	2720	18	18	4		20	20	3.31	15.50	467.42	0.6883	101.40
4	32	-7	21	4.583	69.433	80	2813	18	18	4		20	20	3.31	15.50	467.42	0.7808	100.65
Average:			**21.00**	**4.58**		**80.00**	**785.00**	**18.00**	**18.00**	**4.00**	**#DIV/0!**	**20.00**	**20.00**		**15.50**	**467.42**		0.65

Moisture: The temperature at the outlet of trapping unit shall not be greater than 4 °C or by checking visually the amount of silica gel having faded in the last impinger or cartridge. This amount shall not exceed 50 %.

Glenside Environmental Services

Company Name:	KMK	Technicians:	Ewa Piatek, Pat Power, Jim Nelligł
		MCERTS No:	MM07 799, MM12 1183
Stack ID:	A2-8	TE's:	TE1, TE2, TE3, TE4
Monitoring Date:	10/12/2013		

Millenium 5 console:	EQ069	Balance:	EQ056		
Probe:	EQ071	Pitot Tube:	EQ081		
Impingers:	EQ072	Nozzle:	EQ087		
Sampling Line:	EQ070	Weights:	EQ063		

Balance Check:

Initial Weight:	Balance Reading:
100g	100
500g	500
800g (combined 100g,200g,800g)	800

Note: If balance is moved to other location balance check has to be repeated.

Readings:	Before Impinger 1+Connection	Impinger 2+Connection	Impinger 3+Connection	Impinger 4+Connection	Sum:
1	734.4	793.3	784.9	1005.8	3318.4
2	734.4	793.3	784.9	1005.8	3318.4
3	734.4	793.3	784.9	1005.8	3318.4
4	734.4	793.3	784.9	1005.8	3318.4
5	734.4	793.3	784.9	1005.8	3318.4
6	734.4	793.3	784.9	1005.8	3318.4
7	734.4	793.3	784.9	1005.8	3318.4
8	734.4	793.3	784.9	1005.8	3318.4
9	734.4	793.3	784.9	1005.8	3318.4
10	734.4	793.3	784.9	1005.8	3318.4
Standard Deviation:	0	0	0	0	0
Averge:	734.4	793.3	784.9	1005.8	3318.4

The temperature at the outlet of trapping unit shall not be greater than 4 °C or by checking visually the amount of silica gel having faded in the last impinger or cartridge. This amount shall not exceed 50 %.

Readings:	After Impinger 1+Connection	Impinger 2+Connection	Impinger 3+Connection	Impinger 4+Connection	Sum:
1	740.1	798.1	785.1	1006.1	3329.4
2	740.1	798.1	785.1	1006.1	3329.4
3	740.1	798.1	785.1	1006.1	3329.4
4	740.1	798.1	785.1	1006.1	3329.4
5	740.1	798.1	785.1	1006.1	3329.4
6	740.1	798.1	785.1	1006.1	3329.4
7	740.1	798.1	785.1	1006.1	3329.4
8	740.1	798.1	785.1	1006.1	3329.4
9	740.1	798.1	785.1	1006.1	3329.4
10	740.1	798.1	785.1	1006.1	3329.4
Standard Deviation:	0	0	0	0	0
Averge:	740.1	798.1	785.1	1006.1	3329.4

Air Volume corrected to STP:	0.79336792	m3

Efficiency:	97.27	%

Stack Conditions

Average Temperature:	290.1311826	K
Average Pressure:	102.1316118	kPa
Average Moisture:	0	%
Average Oxygen:	0	%
Volumertic Flow Rate corrected to STP O2 ref and Moisture	29261.85	m3/hr

Reference Conditions:

Reference Temperature:	273.15	K
Reference Pressure:	101.325	kPa
Reference Oxygen:	0	%
Reference Moisture:	0	%

Results :

	At Standard Temperature and Pressure	corrected O2 ref	Uncertainty
g/m3	13.9	13.9	3.0
%	1.7	1.7	0.4

Note: Overall uncertainty should be lower than +/-20% of the measured value
Overall uncertainty is 21.55 % of the measured value

Moisture Uncertainty Calculations

Measured concentration	1.7	**% (at STP)**

Measured Quantities	**Symbol**	**Value**	**Standard uncertainty**		**Units**
Sampled Volume	Vm	0.79336792	uVm	0.001	**m3**
Sampled gas Temperature	Tm	290.1311826	uTm	2	k
Sampled gas Pressure	ρm	102.1316118	uρm	1	**kPa**
Efficiency	Ɛ	97.27			**%**
Oxygen content	O2,m	0	uO2,m	0.1	**% by volume**
Water collected in condensation stage		11.00			
Water collected in adsorption stage		0			
Wate collected in addidional unit		0.3			
Water collected in trapping unit	m	11.30	um	0.00	**g**

Intermediate calculations

Vwc	179.336792		^2	
	15.6		242.9	
	-1.8		3.3	
	-1.2		1.4	
			√	
		water in trapping unit	3.4	
		water in adsorption stage	0.0	
Uncertainty Efficiency^2			0.2	
Volume ^2			0.9	
Sensityvity coefficiency			818.7	

	Efficiency uncertainty	0.24
	support	0.24
	calculations	0.00

Uncertainty efficiency		0.06
	Repatability standard dev	
Weight in the field st	0.0	0.0
Sampled Volume	0.002	0.0
Sampled gas Temperature	0.02	0.0
Sampled gas Pressure	0.3	0.2
Combined measurement uncertainty		**0.18** %

Expanded uncertainty as percentage of measured value **21.55** **% measured of value** **expressed with a level of confidence of 95%**
(Using a coverage factor k=2)

Expanded uncertainty in units of measurement **0.37** **% of water vapour**

Company Name:	KMK	Technicians:	Ewa Piatek, Pat Power, Jim Nelligh
Site Name:	KMK	MCERTS No:	MM07 799, MM12 1183
Stack ID:	A2-8	TE's:	TE1, TE2, TE3, TE4
Monitoring Date:	10/12/2013		

Paticulates Data:

Certs Results:	mg	Date analysis completed:
LOD Filter:	0.05	
		SAL Sample reference number:
LOD Nozzle Wash:	0.3	
Blank Filter:	0.05	367081 002
Blank Nozzle Wash:	**0.3**	367081 004
Run Filter:	**0.05**	367081 001
Run Nozzle Wash:	0.3	367081 003
	0.35	
Blank	0.35	
Run	0.35	

Air Volume corrected to STP:	0.79336792	m3
Moisture:	0	%
Air Volume corrected to Moisture:	0.79336792	m3

Stack Conditions

Average Temperature:	290.1311826	K
Average Pressure:	102.1316118	kPa
Average Moisture:	0	%
Average Oxygen:	0	%
Volumertic Flow Rate corrected to STP O2 ref and Moisture	29261.85	m3/hr

Reference Conditions

Reference Temperature:	273.15	K
Reference Pressure:	101.325	kPa
Reference Oxygen:	0	%
Reference Moisture:	0	%

Particulates Results :

	mg/m3	mg/m3 corrected to O2	kg/hr	Uncertainty mg/m3
LOD	0.44	0.44	0.01	n/a
Blank	0.44	0.44	0.01	0.01
Run	0.44	0.44	0.01	0.01

Note: Blank result should be < 10% of ELV
<20% for ELV 5mg/m3 or lower
Blank result is: 4 % of ELV
If the blank result is higher than requirements of ELV result should be rejected

Particulates Uncertainty Run Calculations

Uncertainty calculation for EN 13284 Determination of low range mass concentration of dust, Manual Gravimetric Method

v14

Limit value (ELV)	12.5	**mg.m-3**	**Reference oxygen**	0	**% by volume**
Measured concentration	0.4	**mg.m-3 (at reference conditions)**			

Measurement Equation

$$c = \frac{m}{V} f_c$$

Measured Quantities	**Symbol**	**Value**	**Standard uncertainty**		**Units**	**Uncertaint**	**Uncertaint**	**Requirement of std**
Sampled Volume	Vm	0.79336792	uVm	0.001	**m3**	0.13		<=2%
Sampled gas Temperature	Tm	290.1311826	uTm	2	k	0.69		<=1%
Sampled gas Pressure	ρm	102.1316118	uρm	1	**kPa**	0.98		<=1%
Sampled gas Humidity	Hm	0	uHm	1	**% by volume**	1.00		<=1%
Oxygen content	O2,m	0	uO2,m	0.1	**% by volume**	#DIV/0!		<=5%
Mass particulate	m	0.35	um	0.00	**mg**	0.00	0.00	<5% of limit value
Note - Sampled gas humidity, temperature and pressure are values at the gas meter								
Leak	L	0			**%**	0.00		<=2%
Uncollected Mass (Instack filter - no rinse)	UCM	0			**mg**	0		<=10%

Intermediate calculations							
Factor for std conds	fs	0.95					
uncertainty components	symbol	**sensitivity coeff**		**u (in units of fs)**			
	ρm	0.009		0.009			
	Hm	0.009		0.009		$f_s = \frac{(100 - H_m)}{100} \frac{273}{T_m} \frac{\rho_m}{101.3}$	
	Tm	0.003		0.007			
	ufs			0.015			1.56
Corrected volume	V	0.75	uV	0.012	**m3**	$V = V_m f_s$	1.57
Factor for O2 correction	fc	1.00					
uncertainty components	symbol	**sensitivity coeff**		**u**		$f_c = \frac{21 - O_{2,ref}}{21 - O_{2,m}}$	
	O2,m	0.05		0.005			
Factor for O2 Correction	ufc	1.00		0.005			0.48

Parameter		**Value**	**Units**	**Sensitivity c**	**Uncertainty contribution**	**Uncertainty as %**
Corrected Volume (standard cond	V	0.75	m3	0.59	0.01 mg.m-3	0.06 %
Mass	m	0.35	mg	1.26	0.00 mg.m-3	0.00 %
Factor for O2 Correction	fc	1.00		0.44	0.00 mg.m-3	0.02 %
Leak	L	0.00	mg.m-3	1.00	0.00 mg.m-3	0.00 %
Uncollected mass	UCM	0.00	mg	1.26	0.00 mg.m-3	0.00 %
Combined measurement uncertainty					**0.01** mg.m-3	

Expanded uncertainty as percentage of measured value	**3.27**	**% measured of value**	**expressed with a level of confidence of 95% (Using a coverage factor k=2)**
Expanded uncertainty in units of measurement	**0.01**	**mg.m-3**	
Expanded uncertainty as percentage of limit value	**0.1**	**% ELV**	

Requirement in standard is for uncertainty to be < 30% at ELV at standard conditions

Particulates Uncertainty Blank Calculations

Uncertainty calculation for EN 13284 Determination of low range mass concentration of dust, Manual Gravimetric Method

v14

Limit value (ELV)	1.25	**mg.m-3**	**Reference oxygen**	0	**% by volume**
Measured concentration	0.4	**mg.m-3 (at reference conditions)**			

Measurement Equation

$$c = \frac{m}{V} f_c$$

Measured Quantities	**Symbol**	**Value**	**Standard uncertainty**		**Units**	**Uncertaint**	**Uncertaint**	**Requirement of std**
Sampled Volume	Vm	0.79336792	uVm	0.001	**m3**	0.13		<=2%
Sampled gas Temperature	Tm	290.1311826	uTm	2	k	0.69		<=1%
Sampled gas Pressure	ρm	102.1316118	uρm	1	**kPa**	0.98		<=1%
Sampled gas Humidity	Hm	0	uHm	1	**% by volume**	1.00		<=1%
Oxygen content	O2,m	0	uO2,m	0.1	**% by volume**	#DIV/0!		<=5%
Mass particulate	m	0.35	um	0.00	**mg**	0.00	0.00	<5% of limit value
Note - Sampled gas humidity, temperature and pressure are values at the gas meter								
Leak	L	0			**%**	0.00		<=2%
Uncollected Mass (Instack filter - no rinse)	UCM	0			**mg**	0		<=10%

Intermediate calculations						
Factor for std conds	fs	0.95				
uncertainty components	symbol	**sensitivity coeff**		**u (in units of fs)**		
	ρm	0.009		0.009	$f_s = \frac{(100 - H_m)}{100} \frac{273}{T_m} \frac{\rho_m}{101.3}$	
	Hm	0.009		0.009		
	Tm	0.003		0.007		
	ufs			0.015	$V = V_m f_s$	1.56
Corrected volume	V	0.75	uV	0.012 **m3**		1.57
Factor for O2 correction	fc	1.00			$f_c = \frac{21 - O_{2,ref}}{21 - O_{2,m}}$	
uncertainty components	symbol	**sensitivity coeff**		**u**		
	O2,m	0.05		0.005		
Factor for O2 Correction	ufc	1.00		0.005		0.48

Parameter		**Value**	**Units**	**Sensitivity c**	**Uncertainty contribution**	**Uncertainty as %**
Corrected Volume (standard cond	V	0.75	m3	0.59	0.01 mg.m-3	0.55 %
Mass	m	0.35	mg	1.26	0.00 mg.m-3	0.00 %
Factor for O2 Correction	fc	1.00		0.44	0.00 mg.m-3	0.17 %
Leak	L	0.00	mg.m-3	1.00	0.00 mg.m-3	0.00 %
Uncollected mass	UCM	0.00	mg	1.26	0.00 mg.m-3	0.00 %
Combined measurement uncertainty					**0.01** mg.m-3	

Expanded uncertainty as percentage of measured value	**3.27**	**% measured of value**	**expressed with a level of confidence of 95% (Using a coverage factor k=2)**
Expanded uncertainty in units of measurement	**0.01**	**mg.m-3**	
Expanded uncertainty as percentage of limit value	**1.2**	**% ELV**	

Company Name:	KMK Metals	Technicians:	EP/PP
Site Name:	KMK Metals	MCERTS No:	MM07 799
Stack ID:	A2-8	TE's:	TE1, TE2, TE3, TE4
Date:	10/12/2013		

Run

Lab Results	LOD Filter µg	LOD Probe W µg	LOD Impingers µg/l	Filter µg	Rince µg	Impinger 1 µg/l	Impinger 2 µg/l	Impinger 3 µg/l	Impinger 5 µg/l	Impinger 6 µg/l
Aluminium	0.5	1	1	3	10	140	30	30	n/a	n/a
Antimony	0.5	1	0.5	0.5	1	0.5	0.5	0.5	n/a	n/a
Arsenic	0.5	0.5	0.2	0.5	0.5	0.5	0.2	0.2	n/a	n/a
Barium									n/a	n/a
Berylium	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	n/a	n/a
Boron									n/a	n/a
Cadmium	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	n/a	n/a
Chromium	1	2	0.5	1	2	5.2	0.5	0.5	n/a	n/a
Cobalt	0.5	0.5	0.2	0.5	0.5	0.7	0.5	0.2	n/a	n/a
Copper	0.5	0.5	1	0.5	0.9	38.0	1.0	1.0	n/a	n/a
Iron	1	1	1	9	2	110.0	30.0	30.0	n/a	n/a
Lead	0.5	0.5	0.3	1.3	0.5	64.0	37.0	16.0	n/a	n/a
Manganese	0.5	2	2	0.5	2	26.0	45.0	57.0	n/a	n/a
Nickel	1	2	2	1	2	12.0	4.0	3.0	n/a	n/a
Selenium									n/a	n/a
Silver									n/a	n/a
Thallium	0.5	0.5	0.3	0.5	0.5	0.3	0.3	0.3	n/a	n/a
Tin									n/a	n/a
Vanadium	0.5	0.5	0.3	0.5	0.50	0.3	0.3	0.3	n/a	n/a
Zinc	1	1	1	4	1	870	210	110	n/a	n/a
Mercury	0.01	0.01	0.5	**0.01**	**0.01**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**

Blank

Lab Results	Filter µg	Rince µg	Impinger 1 µg/l	Impinger 2 µg/l	Impinger 3 µg/l	Impinger 5 µg/l	Impinger 6 µg/l
Aluminium	0.5	10	30			n/a	n/a
Antimony	0.5	1	0.5			n/a	n/a
Arsenic	0.5	0.5	0.2			n/a	n/a
Barium						n/a	n/a
Berylium	0.5	0.5	0.5			n/a	n/a
Boron						n/a	n/a
Cadmium	0.5	0.5	0.5			n/a	n/a
Chromium	1	2	0.5			n/a	n/a
Cobalt	0.5	0.5	0.2			n/a	n/a
Copper	0.5	0.5	1.0			n/a	n/a
Iron	2	1	30.0			n/a	n/a
Lead	0.5	0.5	1.3			n/a	n/a
Manganese	0.5	2	2.0			n/a	n/a
Nickel	1	2	2.0			n/a	n/a
Selenium						n/a	n/a
Silver						n/a	n/a
Thallium	0.5	0.5	0.3			n/a	n/a
Tin						n/a	n/a
Vanadium	0.5	0.50	0.3			n/a	n/a
Zinc	2	1	1			n/a	n/a
Mercury	0.01	**0.01**	**0.01**			**0.5**	**0.5**

	Run					Blank				
Solutions Volume	**Impinger 1**	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**	**Impinger 1**	**Impinger 2**	**Impinger 3**	**Impinger 4**	**Impinger 5**
ml	**100**	**110**	**110**	**99**	**100**	**170**			**160**	

	Metals		**Mercury**	
Air Volume corrected to STP:	0.78081576	m3	0.780815764	m3
Air Volume corrected to STP and Moisture:	0.78081576	m3		

Average Temperature:	290.1311826	K
Average Pressure:	102.1316118	kPa
Average Moisture:	0	%
Average Oxygen:	0	%
Volumertic Flow Rate corrected to STP O2 ref and Moisture	29261.85	m3/hr

Reference Conditions:

Reference Temperature:	273.15	K
Reference Pressure:	101.325	kPa
Reference Oxygen:	0	%
Reference Moisture:	0	%

If one of the metal elements in the last impinger is more than 10% of the total combined metals (i.e. the filter, probe rinse and impingers) collected then the result shall be rejected, unless the total result is less than 30% of the ELV.

Results :	mg in sampling train LOD	mg in sampling train Run	mg in sampling train Blank	mg/m3 at STP/Dry LOD	mg/m3 at STP/Dry Run	mg/m3 at STP/Dry Blank	Corrected to reference oxygen LOD	Corrected to reference oxygen Run	Corrected to reference oxygen Blank	kg/hr LOD	kg/hr Run	kg/hr Blank
Aluminium	0.0018	0.0336	0.0156	0.0023	0.0430	0.0200	0.0023	0.0430	0.0200	0.0001	0.0013	0.0006
Antimony	0.0017	0.0017	0.0016	0.0021	0.0021	0.0020	0.0021	0.0021	0.0020	0.0001	0.0001	0.0001
Arsenic	0.0011	0.0011	0.0010	0.0014	0.0014	0.0013	0.0014	0.0014	0.0013	0.0000	0.0000	0.0000
Barium	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Berylium	0.0012	0.0012	0.0011	0.0015	0.0015	0.0014	0.0015	0.0015	0.0014	0.0000	0.0000	0.0000
Boron	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cadmium	0.0012	0.0012	0.0011	0.0015	0.0015	0.0014	0.0015	0.0015	0.0014	0.0000	0.0000	0.0000
Chromium	0.0032	0.0036	0.0031	0.0040	0.0046	0.0040	**0.0040**	**0.0046**	**0.0040**	0.0001	0.0001	0.0001
Cobalt	0.0011	0.0011	0.0010	0.0014	0.0015	0.0013	0.0014	0.0015	0.0013	0.0000	0.0000	0.0000
Copper	0.0013	0.0054	0.0012	0.0017	0.0069	0.0015	0.0017	0.0069	0.0015	0.0000	0.0002	0.0000
Iron	0.0023	0.0286	0.0081	0.0030	0.0366	0.0104	0.0030	0.0366	0.0104	0.0001	0.0011	0.0003
Lead	0.0011	0.0140	0.0012	0.0014	0.0180	0.0016	**0.0014**	**0.0180**	**0.0016**	0.0000	0.0005	0.0000
Manganese	0.0031	0.0163	0.0028	0.0040	0.0209	0.0036	0.0040	0.0209	0.0036	0.0001	0.0006	0.0001
Nickel	0.0036	0.0050	0.0033	0.0047	0.0064	0.0043	0.0047	0.0064	0.0043	0.0001	0.0002	0.0001
Selenium	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Silver	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Thallium	0.0011	0.0011	0.0011	0.0014	0.0014	0.0013	0.0014	0.0014	0.0013	0.0000	0.0000	0.0000
Tin	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vanadium	0.0011	0.0011	0.0011	0.0014	0.0014	0.0013	0.0014	0.0014	0.0013	0.0000	0.0000	0.0000
Zinc	0.0023	0.1272	0.0032	0.0030	0.1629	0.0041	0.0030	0.1629	0.0041	0.0001	0.0048	0.0001
Mercury	0.0001	0.0003	0.0001	0.0001	0.0003	0.0001	**0.0001**	**0.0003**	**0.0001**	0.0000	0.0000	0.0000

Total of Metals	0.0271	0.2422	0.0465	0.0347	0.3102	0.0595	**0.0347**	**0.3102**	**0.0595**	0.0010	0.0091	0.0017
Total of Cd and Tl	0.0023	0.0023	0.0021	0.0029	0.0029	0.0027	**0.0029**	**0.0029**	**0.0027**	0.0001	0.0001	0.0001
Total of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Be	0.0184	0.0505	0.0174	0.0236	0.0647	0.0223	**0.0236**	**0.0647**	**0.0223**	0.0007	0.0019	0.0007

Efficiency Check

	Efficiency	Efficiency Requirements %	ELV	Result as percentage of ELV
Aluminium	9.82	10		#DIV/0!
Antimony	3.31	10		#DIV/0!
Arsenic	2.01	10		#DIV/0!
Barium	#DIV/0!	10		#DIV/0!
Berylium	4.74	10		#DIV/0!
Boron	#DIV/0!	10		#DIV/0!
Cadmium	4.70	10		#DIV/0!
Chromium	1.52	10		#DIV/0!
Cobalt	1.92	10		#DIV/0!
Copper	2.03	10		#DIV/0!
Iron	11.54	10		#DIV/0!
Lead	12.54	10		#DIV/0!
Manganese	38.42	10		#DIV/0!
Nickel	6.64	10		#DIV/0!
Selenium	#DIV/0!	10		#DIV/0!
Silver	#DIV/0!	10		#DIV/0!
Thallium	3.01	10		#DIV/0!
Tin	#DIV/0!	10		#DIV/0!
Vanadium	3.01	10		#DIV/0!
Zinc	9.51	10		#DIV/0!
Mercury	17.89	10		#DIV/0!

For example ELVs for metals may be:
- Cd and Tl combined – 0.05 mg/m3
- Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V combined – 0.5 mg/m3
- mercury – 0.05 mg/m3

For Cd and Tl combined it would not be necessary to comply with the less than 10% in the last impinger criteria, provided the overall combined Cd and Tl result for the sample train was below 0.015 mg/m3.
For combined metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V) it would not be necessary for each individual element to comply with the less than 10% in the last impinger criteria, provided that the overall combined result for the sample train was below 0.15 mg/m3.
For mercury it would not be necessary to comply with the less than 10% in the last impinger criteria, provided the overall mercury result for the sample train was below 0.015 mg/m3.

APPENDIX 3

Noise Monitoring Report 2013

ANNUAL NOISE MONITORING REPORT 2013

FOR

KMK METALS RECYCLING LTD.

AT

CAPPINCUR IND. ESTATE, TULLAMORE, CO OFFALY,

7th October 2013

Report by:

Niall Nally

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1.0 INTRODUCTION

Nally Environmental was commissioned by KMK to conduct the annual noise survey at the KMK facility at Cappincur Industrial Estate, Tullamore, Co Offaly, as part of compliance with waste licence W0113-03. The KMK Metals facility is located in the Cappincur Industrial Estate towards the east of Tullamore town, off the L-02025 road to Daingean – Figure 1.

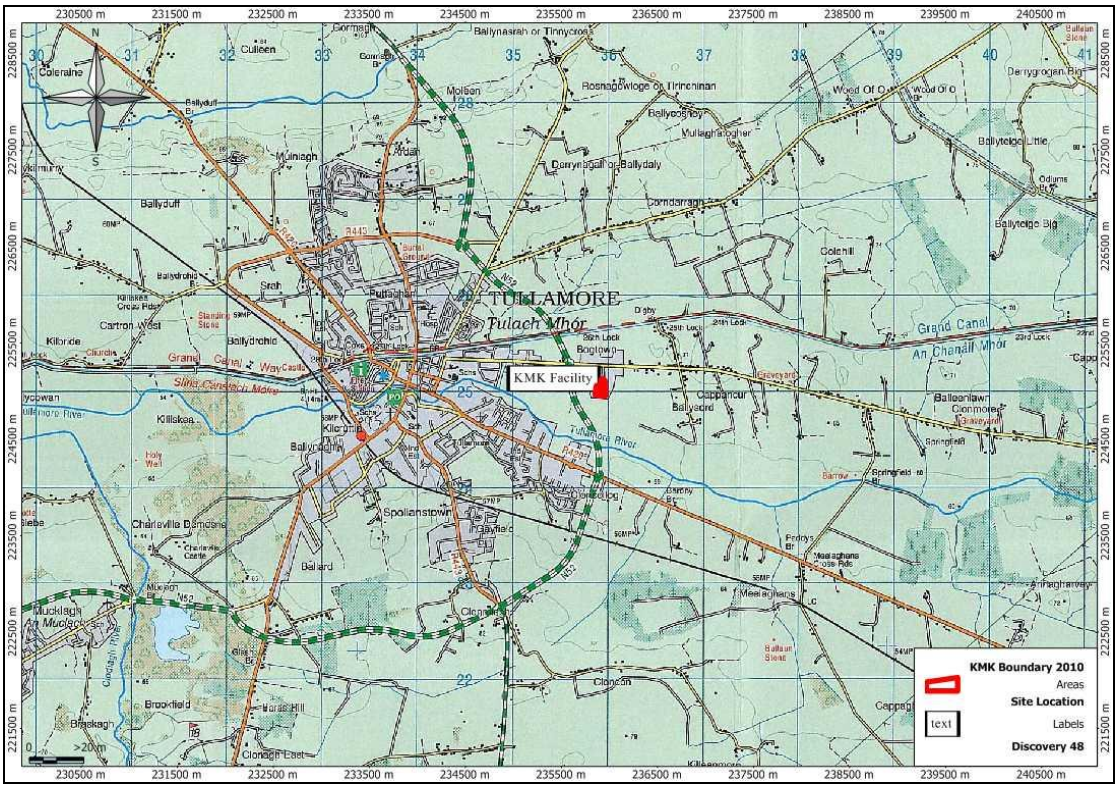


Figure 1: General site location map for KMK

The objectives of the environmental noise survey were to:

- Assess the current levels of noise arising from the operations at the facility.
- Determine the noise levels at KMK in line with Condition 6.11 of the licence and its related Schedules of the licence.
- Assess the noise emissions in terms of nuisance or pollution potential on the immediate environment around the KMK facility.

3.1 ENVIRONMENTAL NOISE MONITORING

Daytime monitoring was carried out mid-week on Tuesday 24th September between the hours of 6am to 4 pm. The facility does not have operations 'over night', activities do commence at 6am, which under their licence terms is 'night –time'. For this reason early morning measurements were conducted to assess if the night time limits were likely to be breached by these activities. Four noise monitoring stations were established at site boundaries as illustrated on Figure 2 below. All monitoring stations were pre-selected as part of the existing license.

This noise monitoring programme is referred to in Condition 6.11 which states:
6.11.1 The licensee shall carry out a noise survey of the site operations annually. The survey programme shall be undertaken in accordance with the methodology specified in the 'Environmental Noise Survey Guidance Document' as published by the Agency.

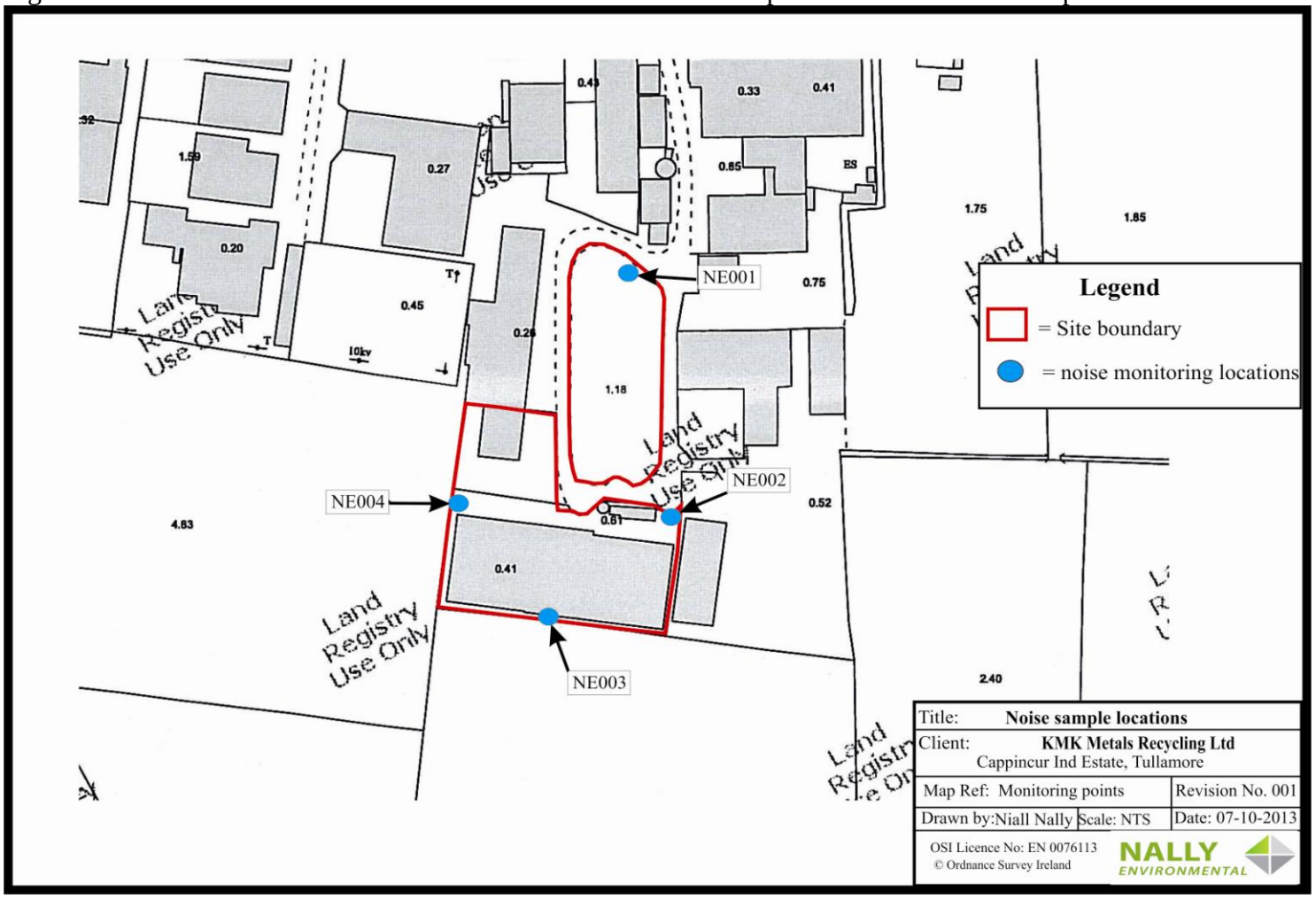
6.11.2 The licensee shall implement any noise attenuation measures as required by the Agency, having regard to the principles of BAT, to ensure compliance with the noise limits specified in this licence.

Schedule B.4 Noise Emissions, states that daytime measurements must be within a $L_{Aeq\ (30\ minute)}$ emission level of 55, and night-time measurements must be within a $L_{Aeq\ (30\ minute)}$ emission level of 45, with no clearly audible tonal component or impulsive component in the noise emission from the activity at any boundary location.

Schedule C5 identifies the locations NE1 – NE5, and the following parameters to be reported on: $L_{(A)eq[30\ minute]}$, $L_{(A)10[30\ minute]}$, $L_{(A)90[30\ minute]}$ and 1/3 Octave Band analysis to be monitored on an annual basis from the facility.

To ensure that all monitoring positions could be adequately monitored, and based upon normal best practice for night-time measurements, as issued by the EPA and others, the night time measurement period was reduced from the issued 30 minute to a 15 minute period. This monitoring event took into account the released EPA guidance document NG4 *'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities' released in April 2012*'. This document seeks a notable increase in the repetitiveness of monitoring during the annual event. A request was submitted to the EPA and approved in 2012, requesting the reduction in monitoring stations on site from the licensed 6 stations to 4. Therefore, this monitoring event adapted this new previously agreed monitoring schedule.

Figure 2 shows the location of each of the stations and total dust deposition result for the samples



4.0 NOISE SURVEY

All four noise monitoring locations were accessible and monitored throughout the course of the event without any problems. The methodology is described below;

4.1 METHODOLOGY

Noise monitoring was carried out as per Section 4 and 6 of the Agency's *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2012)*, using a Type 1 Bruel Kjaer 2250 Sound Level Meter with outdoor equipment that was fully calibrated prior to and after the monitoring event. The meter was set to Fast Response with an effective averaging time of 0.25sec during noise monitoring. All noise monitoring was 'A' weighted which attenuates low frequencies strongly so noise measuring is more specific to human hearing and environmental noise.

Weather conditions during sampling were; mild with gentle wind and no rainfall throughout all monitoring (see summary of a weather for Gurteen station below which is the closest to the Tullamore site).

Table 2.1 – Summary of daily statistics at Gurteen College on 24-09-2013

GURTEEN COLLEGE weather station							
Date	Rainfall (mm)	Max Temp (°C)	Min Temp (°C)	Grass Min Temp (°C)	Mean Wind Speed (knots)	Gusts (if >= 34 knots)	Sunshine (hours)
24/9/2013	0	17	13.4	10.4	6.1	0	0

The monitoring equipment was manned throughout the sampling period and comments/notes taken to assist the interpretation and assessment of results. Noise monitoring was carried out at 4 boundary locations as summarised below:

Table 2.2 – Noise monitoring locations at KMK

Monitoring ref	**Description**	**Grid Reference (IG)**	
		Easting	**Northing**
NE001	North boundary	235934	225122
NE002	Boundary at entrance to C yard	235958	225003
NE003	South boundary	235888	224954
NE004	Boundary along west area of site	235856	224998

5.0 RESULTS

The complete set of noise measurement results is included in Appendix A. These are summarised and discussed below in tables 3.1 to 3.3.

Table 3.1 Broadband Noise results recorded at each Monitoring Station

Receiver	NE001 site boundary location					
Period	**Time**	**Measured Noise Levels (dB re. $2x10^{-5}$ Pa)**				**Comments**
		L_{Aeq}	**L_{AFmax}**	**L_{AF90}**	**L_{AF10}**	
Daytime, 07:00 to 19:00	07:15 – 07:45	56	-	40	54	Normal site activities. AES hook loader trucks arriving and collecting skips for weighbridge and transfer to KMK yards (between 10:00 10:30). Employees arriving/exiting throughout the day. Background noise: Ravenhill Couriers trucks passing and Condrons recovery trucks parking outside walls
	10:07 – 10:37	59	83	44	59	
	13:13 – 13:43	56	82	39	58	
	Average	57				
Evening, 19:00 to 23:00	Not required under Waste Licence W0113-03					Not applicable
Night-time 23:00 to 07:00						Two Ravenhill Couriers trucks loaded and leaving their site across road. Five employee cars arriving at car park.
		L_{Aeq}	**L_{AFmax}**	**L_{AF90}**	**L_{AF10}**	
	05:53 – 06:08	55	73	33	58	
Reported by	Name (Block Letters): Niall Nally					
	Position : Environmental Consultant					
	Signed: Niall Nally					

Receiver	NE002 site boundary location					
Period	**Time**	**Measured Noise Levels (dB re. $2x10^{-5}$ Pa)**				**Comments**
		L_{Aeq}	**L_{AFmax}**	**L_{AF90}**	**L_{AF10}**	
Daytime, 07:00 to 19:00	07:48 – 08:18	66	88	48	70	A sewage cleaning truck arrived at 07:52 and stayed with engine idle for 10mins before emptying the temporary holding tanks at this location. Fork trucks driving around C yard area. From 10am onwards, dismantling activity at C building of E-scrap.
	10:39 – 11:09	63	81	53	67	
	13:47 – 14:17	64	87	55	67	
	Average	64				
Evening, 19:00 to 23:00	Not required under Waste Licence W0113-03					Not applicable
Night-time 23:00 to 07:00						No activity in C yard area. Audible reverse beeps from fork trucks at DX yard loading and unloading trucks.
		L_{Aeq}	**L_{AFmax}**	**L_{AF90}**	**L_{AF10}**	
	06:19 – 06:34	52	72	42		
Reported by	Name (Block Letters): Niall Nally					
	Position : Environmental Consultant					
	Signed: Niall Nally					

Receiver	NE003 site boundary location					
Period	**Time**	**Measured Noise Levels (dB re. $2x10^{-5}$ Pa)**				**Comments**
		L_{Aeq}	**L_{AFmax}**	**L_{AF90}**	**L_{AF10}**	
Daytime, 07:00 to 19:00	08:24 – 08:54	61	81	59	62	Noise from dust extraction plant running is audible at this location. WEEE processing activities inside D-WEEE building were audible. Background noise from traffic on by-pass road is faintly audible.
	11:15 – 11:45	62	79	59	63	
	14:19 – 14:49	60	84	59	62	
	Average	61				
Evening, 19:00 to 23:00	Not required under Waste Licence W0113-03					Not applicable
Night-time 23:00 to 07:00						Noise from dust extraction plant running is audible at this location. Background noise from traffic on by-pass road is faintly audible also.
		L_{Aeq}	**L_{AFmax}**	**L_{AF90}**	**L_{AF10}**	
	06:41 – 06:56	67	75	58	73	
Reported by	Name (Block Letters): Niall Nally					
	Position : Environmental Consultant					
	Signed: Niall Nally					

Receiver	NE004 site boundary location					
Period	**Time**	**Measured Noise Levels (dB re. $2x10^{-5}$ Pa)**				**Comments**
		L_{Aeq}	**L_{AFmax}**	**L_{AF90}**	**L_{AF10}**	
Daytime, 07:00 to 19:00	08:56 – 09:26	61	79	55	63	Normal site activities – battery sorting in staged process. DX yard vehicular activities – loading and unloading truck trailers. CRT processing in D4 was audible also.
	11:47 – 12:17	58	76	54	59	
	14:51 – 15:21	59	71	54	62	
	Average	59				
Evening, 19:00 to 23:00	Not required under Waste Licence W0113-03					Not applicable
Night-time 23:00 to 07:00						Fork truck loading portable batteries to sorter at D4-L building. DX yards activities were normal.
		L_{Aeq}	**L_{AFmax}**	**L_{AF90}**	**L_{AF10}**	
	06:57 – 07:12	62	82	52	61	
Reported by	Name (Block Letters): Niall Nally					
	Position : Environmental Consultant					
	Signed: Niall Nally					

Table 3.2 1/3 Octave Noise results **Daytime** recorded at Monitoring Stations NE001 to NE004

Frequency (Hz)	Project Name	NE001	NE001	NE001	NE002	NE002	NE002	NE003	NE003	NE003	NE004	NE004	NE004
	Start Time	07:15	10:07	13:13	07:48	10:39	13:47	08:24	11:15	14:19	08:56	11:47	14:51
	12.5	-12.03	-7.4	-6.73	-9.95	-9.64	-10.25	0.69	1.5	0.96	-0.43	-0.87	1.88
	16	-3.83	2.56	1.97	-1.79	7.16	8.2	14.63	13.38	13.27	25.59	4.14	28.05
	20	1.42	11.63	11.13	4.6	1.14	6.77	17.96	17.73	17.55	14.2	12.1	16.44
	31.5	17.26	19.22	24.47	24.4	20.91	29.05	31.43	30.11	30.04	27.43	28.08	28.05
	40	25.4	23.73	27.09	23.96	21.41	33.24	32.98	33.3	32.96	30.23	33.33	28.99
	50	30.35	26.94	29.41	43.03	20.79	27.74	36.83	36.89	36.94	32.35	34.37	31.65
	100	32.64	33.13	31.83	44.82	29.27	35.44	41.51	40.62	40.7	39.12	38.16	38.95
	125	34.63	35.39	33.23	41.32	33.99	36.98	43.59	42.76	42.85	39.4	37.94	39.11
	160	37.23	37.97	37.09	46.34	39.52	41.15	48.9	49.16	49.38	44.27	41.77	42.57
	200	39.07	40.32	38.11	45.48	41.27	42.31	44.69	44.57	43.93	43.88	42.7	42.86
	250	39.94	41.08	38.91	47.23	44.78	46.36	44.51	45.46	44.86	44.96	46	45.05
	315	42.41	42.72	40.94	50.32	45.56	45.8	45.85	48.48	48.51	46.42	45.85	45.47
	400	44.7	45.15	43.03	52.83	46.95	47.96	45.76	46.84	45.79	48.17	46.38	47.05
	500	45.3	46.86	43.53	53.49	50.59	52.16	48.56	49.88	48.73	49.06	46.67	48.08
	630	45.51	47.97	44.54	53.61	51.12	52.34	48.43	49.37	47.49	49.47	47.03	48.67
	800	45.82	48.99	46	53.73	52.17	52.45	49.73	50.5	47.93	49.67	47.25	48.35
	1k	45.62	49.65	47.26	55.82	52.99	53.5	51.33	52.03	48.83	50.11	45.94	49.03
	1.25k	46.21	49.3	46.96	56.95	53.69	54.75	51.35	51.4	50.17	51.2	46.12	51.63
	1.6k	45.27	49.51	46.23	55.25	53.24	53.76	47.45	48.84	47.33	49.82	44.93	47.13
	2k	44.25	47.38	45.08	53.64	53.16	53.61	46.98	48.93	47.36	50.66	45.02	48.4
	2.5k	42.73	45.73	42.74	53.43	52.69	53.35	48.42	49.18	48.08	49.85	45.36	47.16
	3.15k	42.32	46.73	43.58	59.83	54.86	57.03	53.85	53.56	52.34	49.11	44.58	45.02

Table 3.2 1/3 Octave Noise results **Daytime** recorded at Monitoring Stations NE001 to NE004

	Project Name	NE001	NE001	NE001	NE002	NE002	NE002	NE003	NE003	NE003	NE004	NE004	NE004
	Start Time	07:15	10:07	13:13	07:48	10:39	13:47	08:24	11:15	14:19	08:56	11:47	14:51
	4k	38.62	44.1	39.56	48.86	50.2	50.38	41.63	42.74	41.54	43.51	40	43.13
	5k	36.13	41.63	36.72	45.41	47.73	49.78	40.45	40.73	39.91	40.77	37.64	40.1
	6.3k	32.71	38.25	33.53	43.77	45.39	45.19	38.55	39.21	39.15	37.77	36.57	39.57
	8k	27.86	34.4	29.14	40.33	41.29	40.88	34.13	34.39	34.2	33.46	31.17	34.2
	10k	23.36	31.24	23.95	36.71	36.27	35.76	27.66	26.91	26.4	28.18	25.95	26.17
	12.5k	17.49	24.97	18.92	32.8	29.61	29.43	23.75	22.43	22.25	21.92	20.29	18.82
	16k	11.45	18.31	13.77	28.09	21.56	21.67	18.55	16.74	16.79	15.37	14	11.39

Table 3.3 1/3 Octave Noise results **Night-time** recorded at Monitoring Stations NE001 to NE004

Frequency (Hz)	Project Name	NE001	NE002	NE003	NE004
	Start Time	05:53	06:19	06:41	06:57
	12.5	-3.29	-15.22	1.81	-10.42
	16	1.8	-7.4	9.04	3.09
	20	9	-3.76	19.66	6.18
	31.5	25.16	13.44	35.11	21.87
	40	33.8	21.38	36.83	31.05
	50	33.66	21.6	39.41	31.9
	100	30.17	30.73	42.65	38.71
	125	32.83	30.69	46.11	41.32
	160	34.17	35.03	48.67	42.66
	200	37.05	36.09	44.76	41.61
	250	37.3	37.23	46.37	43.64
	315	38.64	38.05	47.08	44.32
	400	40.01	37.78	47.35	46.56
	500	42.12	38.36	51.31	48.13
	630	43.64	39.89	51.38	48.31
	800	44.02	39.16	50.52	48.34
	1k	46.9	40.83	53.02	49.55
	1.25k	47.22	43.9	60.07	50.79
	1.6k	46.02	38.59	52.18	50.5
	2k	44.6	37.65	53.48	52.16
	2.5k	43.13	37.56	57.56	53.23
	3.15k	37.77	40.6	62.48	52.38
	4k	37.26	33.43	46.66	49.06
	5k	32.73	29.89	46.94	46.85
	6.3k	29.61	27.31	46.84	43.99
	8k	26.41	22.72	42.34	40.84
	10k	22.44	16.99	33.53	36.09
	12.5k	17.45	12.04	28.58	30.59
	16k	14.36	7.72	21.87	24.32

6.0 DISCUSSION AMBIENT NOISE

Noise has many sources, both manmade and environmental. Noise is observer defined, as levels unacceptable to one person may be perceived as necessary or enjoyable to another. As such the monitoring of noise is primarily an observational discipline requiring a full identification of the sources of possible noise and the type of sound that is been emitted (continuous, intermittent, tonal, broad-spectrum, single source, multiple source).

The EPA documents *'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*, released in April 2012, and the subsequent EPA *'Frequently Asked Questions (FAQ's) on NG4'* have been reviewed in the preparation of monitoring on site and this report.

The revised guidance note on noise for licensed activities (NG4), requires additional monitoring to be conducted at all licensed facilities as follows; Daytime, a minimum of 3 monitoring periods per station, Evening time (where required in the specific licence), a minimum of 1 monitoring period per station and finally for Night-time, a minimum of 2 monitoring periods per station.

Daytime is defined as a time period between: 07:00 to 19:00
Evening time is defined as a time period between: 19:00 to 23:00
Night-time is defined as a time period between: 23:00 to 07:00

Noise monitoring was carried out between the hours of 5.50am and 3.30pm on the same day. Noise sources from the facility, audible at the site boundaries have been identified as:

- Vehicles entering/leaving the site
- Personnel entering/leaving buildings, car park area
- Unloading and loading of trucks with waste materials and processed materials using fork lift trucks
- Tipping of WEEE under cover in the Hanger building
- Reversing alarms from forklift trucks
- WEEE processing operations within buildings.

The KMK facility is located within the Cappincur Industrial Estate, Tullamore. This industrial estate includes warehousing, commercial/industrial and waste management operations with Tullamore Steel, Midland Farm Machinery, Modified Motors, Ravenhill Couriers, Robedesign and Condron Car Dismantlers and a number of other businesses, all located within a relatively close proximity to the KMK site. These other occupants all have noise associated with their activities and this results in a cumulative noise impact within the industrial estate e.g. all warehousing environments require controlled ventilation and air supply, and therefore there is noise associated with these fans, car dismantlers use angle grinders, manual tools, fork lift trucks and other ancillary activities e.g. vehicle movements. Machinery yards have HGV movements delivering and removing machinery etc.

During the Daytime measurements, maximum noise levels of $L_{Aeq(30\ minute)}$ varied between 56-66dB at boundary locations. The highest levels were noted at station NE002 (66, 64 and 63dB). The result of 66dB was certainly elevated by the presence of an outside contractor that was emptying the domestic sewerage at a holding tank at within 3metres of this location during the early morning measurement. This activity at KMK is related to the short term construction project associated with the installation of the new Waste water Treatment System. Therefore this noise related activity will cease after construction has finished. Site activities adding to this noise included fork lift trucks accessing building areas A,B,C and trucks entering and leaving the associated entrance.

Station NE001, located on the northern boundary, had the lowest noise levels. Site activities at this station were audible but not typically intrusive. $L_{Aeq(30\ minute)}$ values ranged from 56-59 dB at NE 001 during the day.

Station NE003, located on the south boundary behind the WEEE building, resulted in $L_{Aeq(30\ minute)}$ values ranging from 60-62 dB during the day. Noise was dominated here by the nearby dust extraction system used to treat dusts from the WEEE processing building and also noise from materials being processed inside the same building. There was also audible background noise coming from traffic on the nearby Tullamore by-pass at this location.

Station NE004, located on the west boundary, resulted in $L_{Aeq(30\ minute)}$ values ranging from 58-61 dB during the day. Noise was dominated here by typical sites activities; DX yard vehicular activities – loading and unloading truck trailers and CRT processing in D4 was audible also. In addition, household battery sorting was been carried out close by at D4-R. It is understood that this activity only occurs once every month when sufficient quantities of batteries are available.

The night-time measurements were taken between 6am and 7am and coincided with normal site activities at KMK. The highest noise level in $L_{Aeq(15\ minute)}$ was 67dB at NE003 boundary location whilst the lowest noise level in $L_{Aeq(15\ minute)}$ was 51dB at NE002 boundary location. In relation to NE002, it is noted that there was no outside contractor emptying the temporary sewerage tank during this monitoring time and therefore this explains the lower noise level compared to highest daytime level of 66dB at this station. The noise at NE003 of 67dB was most likely due to start up of the dust extraction system plant.

The noise generated during these operations is not likely to be a source of disturbance to neighbouring properties as it is known that noise dissipates over distance, and for point source emissions, there is a decrease in 6dB(A) for every doubling in distance away (see table 4.1 below).

Table 4.1 Attenuation of Noise over Distance for point source emissions e.g. industrial sources

Distance m	Noise level dB	Noise Level dB
10	70	65
20	64	59
40	58	53
80	52	47
160	46	41

The noise levels on site range from a night-time $L_{Aeq\ (15\ minute)}$ of 51 dB to a $L_{Aeq(15\ minute)}$ of 67 dB. This is equivalent to the noise arising from roadside traffic at 15 meters. The KMK facility is located within an urban zone of acoustic influence. There are no notable housing estates within close proximity to the Cappincur Industrial Estate, nor is there identified houses positioned at significant distance from local road infrastructure, that would bring said dwellings closer to the Cappincur Industrial Estate. It is therefore

reasoned that dwellings located along the local road to the north experience noise from the urban traffic movements in/out of Tullamore Town, vehicle movements associated with the Cappincur Industrial Estate, and the daily movement of traffic on the National N52 by-pass road of Tullamore, located to the west of the Cappincur Industrial Estate.

Approximate distances from the peak $L_{Aeq\ (30minute)}$ station to the closest dwelling, located northeast, is 240metres. Distances from the closest operational zones, the E-Area, located along the northern section of the site, is approximately 200m to the closest dwelling, again located to the northeast.

The table below is a standardised acoustic ratings table, utilised to characterise the dB scale to those not familiar with the logarithmic nature of the scale or the standarised reference values of 'Threshold of hearing or pain'.

Table 4.2: Sound Levels from Typical Sources

Sound Pressure level dB(A)	Typical source
120	Jet take off at 50m
100	Pneumatic Drill
90	Generator hall
80	Light machine shop, Heavy Truck at 15m
70 – 60	Light traffic (cars) at 15m
60	Office Noise
40	Library
20	Rural evening

6.1 DISCUSSION OCTAVE BAND ANALYSIS

Octave band analysis of noise is the breakdown of the sound pressure readings, as recorded on site, into specific frequency band widths. This enables a greater understanding of the type of noise evident at a site and can give indications to where tonal noise is present. There are two common forms of octave analysis. Full octave analysis groups sound pressure readings into frequency readings that cover a full octave. This type of monitoring gives a good general description of how people will perceive a sound/noise. One third octave analysis, further separates the noise reading into $^1/_3$ octave frequency groupings. Each frequency reading is given in Hz. The frequency reading is the central frequency for each band that is been monitored (i.e. Frequency band 250 Hz covers all sound pressure readings recorded between 167Hz to 333Hz). 1/3 octave analysis of noise enables the identification of tonal components present at a site. Long duration tonal noise is typically found as more aggravating to nearby sensitive receivers than broad spectrum noise sources and control measures can be used to minimise the annoyance caused by tonal sources.

6.2 1/3 Octave Analysis

1/3 Octave analysis is a method of analysing the recorded sound pressures to identify if tonal features are present. Tones are investigated because it is widely accepted that noise with tonal or impulsive characteristics is likely to be more annoying than noise without such characteristics. For this reason that tonal noise is more noticeable than broadband noise and can therefore be more intrusive, it is appropriate to penalise tonal noise in assessments by applying a correction factor to the measured noise level in order to arrive at a 'rating level'. The rating level ($L_{ar,T}$) is therefore calculated by adding a 5dB value to the sound pressure for the L_{Aeq} at that location and time period.

NG4 guidance document states that tonal elements can be identified by the variation in one 1/3 octave band to its neighbouring two bands by a minimum value. These minima vary depending upon the frequency band, mid and higher frequency tones been more audible than lower frequency bands. The variation is given as:

- 15dB in low-frequency one-third-octave bands (25Hz to 125 Hz)
- 8dB in middle-frequency one-third-octave bands (160Hz to 400Hz)
- 5dB in high-frequency one-third-octave bands (500Hz to 10,000Hz)

Reviewing the 1/3 octave data for the site stations, there were some tones identified under this guidance as can be seen from the data sets labelled in the corresponding charts.

In relation to impulsive noise, this is usually described as something with a thumping, banging or impact noise that is clearly audible above everything else. There was such noise experienced at station NE004, possibly due to the battery sorter being loaded at these intervals.

Tones identified are summarised below;

The table below lists the tones identified from the monitoring.

Table 4.3: Tonal Features Identification

Monitoring Station	**Day-time Tonal Features (Frequency & Pressure)**	**Night-time Tonal Features (Frequency & Pressure)**	**Comments**	Rating level ($L_{ar,T}$) as adjusted by adding 5dB to the relevant L_{Aeq}
NE001	No identified tones	No identified tones	No tones identified	Not applicable
NE002	60dB at 3.15kHz, at 07:48	No identified tones	This tone was as a result of the outside contractor collecting the sewerage waste from the temporary holding tank at this location. There was a loud engine revving noise from this process which lasted 15mins.	71dB
NE003	54dB at 3.15kHz at 11:15	60dB at 1.25kHz at 06:41	These tones are due to the operational noise associated with the dust extraction plant at this location. Tones are not likely to be experience by noise sensitive receptors due to the apex side of the building acting as a noise barrier. Also the direct affected area of noise influence is a field and then the Tullamore by-pass some distance away.	67dB – daytime 72dB – night-time
NE004	31dB and 34dB at 8kHz at 11:47 & 14:51 respectively	No identified tones	This tone was most probably as a result of impulsive noise at the facility.	63dB and 64dB respectively.

7.0 CONCLUSIONS

- Baseline environmental noise monitoring occurred at KMK on Tuesday 24th September 2013.
- 4 boundary locations were assessed as per licence requirements.
- Activities at the KMK facility were deemed normal throughout the day.
- The general acoustic environment at and around the facility is dominated by facility operations and also off-site activities within the industrial estate due to neighbouring commercial premises.
- The noise measured in L_{Aeq} at all boundary locations exceeded the licence requirements for day and night as specified in B.4 emission limits of the licence. There was tonal noise identified at NE002 and NE003 although NE002 was due to an outside contractor only. There was impulsive noise identified at NE004.

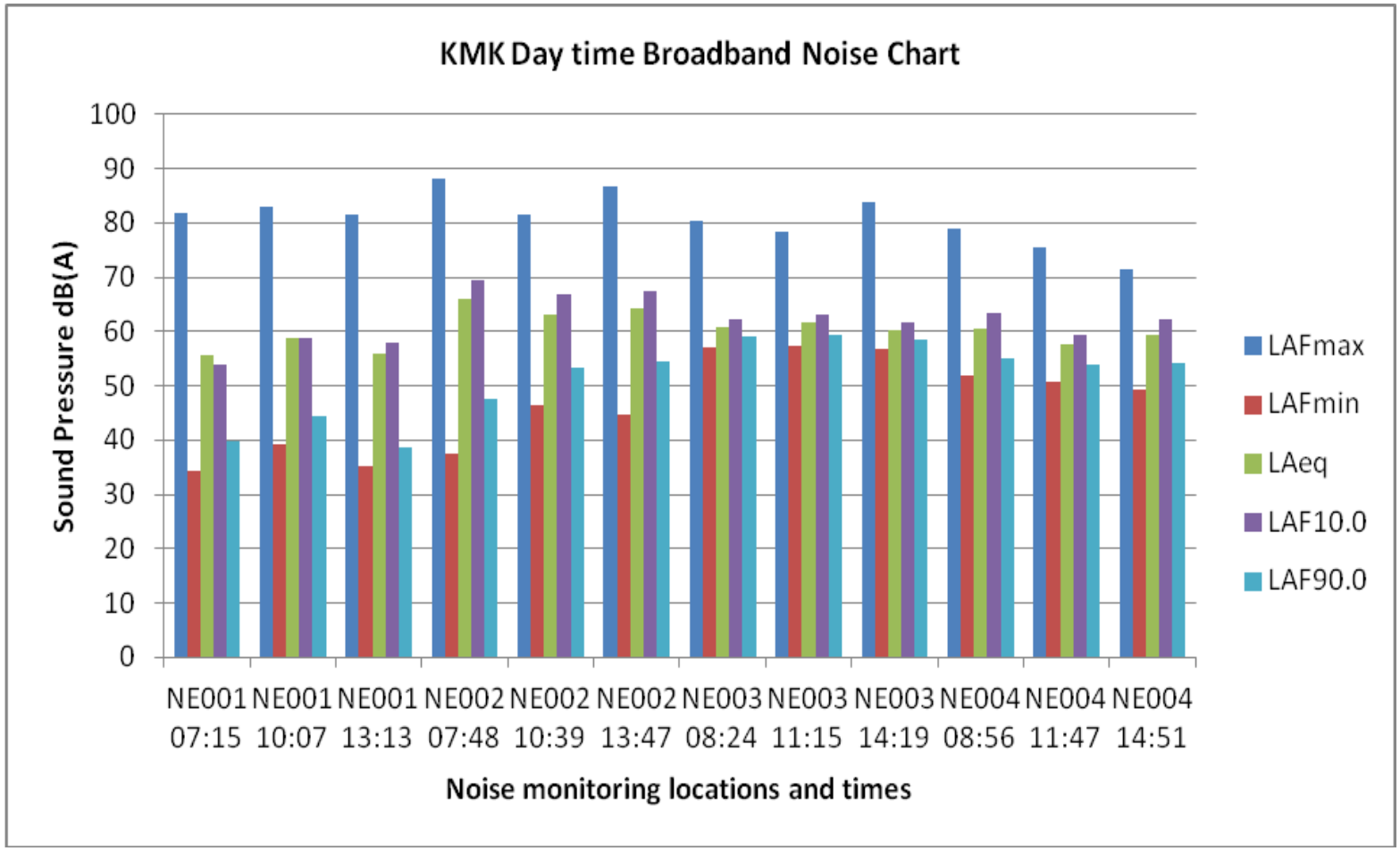
Appendix A

- **Noise Results & Charts**

Full Broad band Noise Results table (all time periods are in chronological order).

Noise	Start Time	LAFmax	LAFmin	LAeq	LAF10.0	LAF90.0
NE001	05:53	73	28	55	58	33
NE002	06:19	72	36	51	54	42
NE003	06:41	75	56	67	73	58
NE004	06:57	82	48	62	60	52
NE001	07:15	82	34	56	54	40
NE002	07:48	88	37	66	70	48
NE003	08:24	80	57	61	62	59
NE004	08:56	79	52	61	63	55
NE001	10:07	83	39	59	59	44
NE002	10:39	81	46	63	67	53
NE003	11:15	78	57	62	63	59
NE004	11:47	76	51	58	59	54
NE001	13:13	81	35	56	58	39
NE002	13:47	87	45	64	67	55
NE003	14:19	84	57	60	62	59
NE004	14:51	71	49	59	62	54

These results are illustrated below in the following two graphs.


KMK Day time Broadband Noise Chart
Sound Pressure dB(A)
100
90
80
70
60
50
40
30
20
10
0
NE001 07:15
NE001 10:07
NE001 13:13
NE002 07:48
NE002 10:39
NE002 13:47
NE003 08:24
NE003 11:15
NE003 14:19
NE004 08:56
NE004 11:47
NE004 14:51
Noise monitoring locations and times
LAFmax
LAFmin
LAeq
LAF10.0
LAF90.0

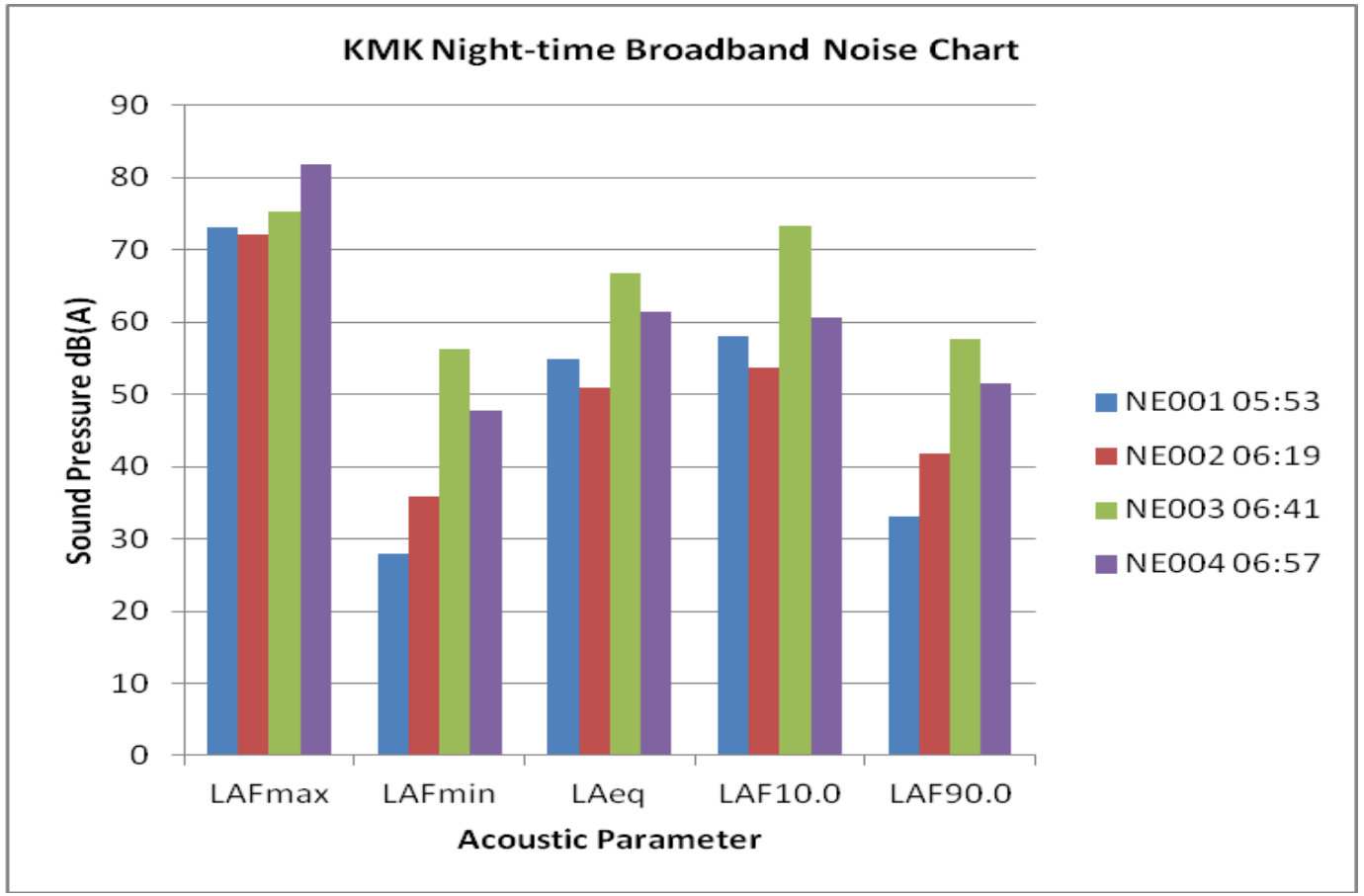

KMK Night-time Broadband Noise Chart
Sound Pressure dB(A)
90
80
70
60
50
40
30
20
10
0
LAFmax
LAFmin
LAeq
LAF10.0
LAF90.0
Acoustic Parameter
NE001 05:53
NE002 06:19
NE003 06:41
NE004 06:57

Table 3.2 1/3 Octave Noise results **Daytime** recorded at Monitoring Stations NE001 to NE004

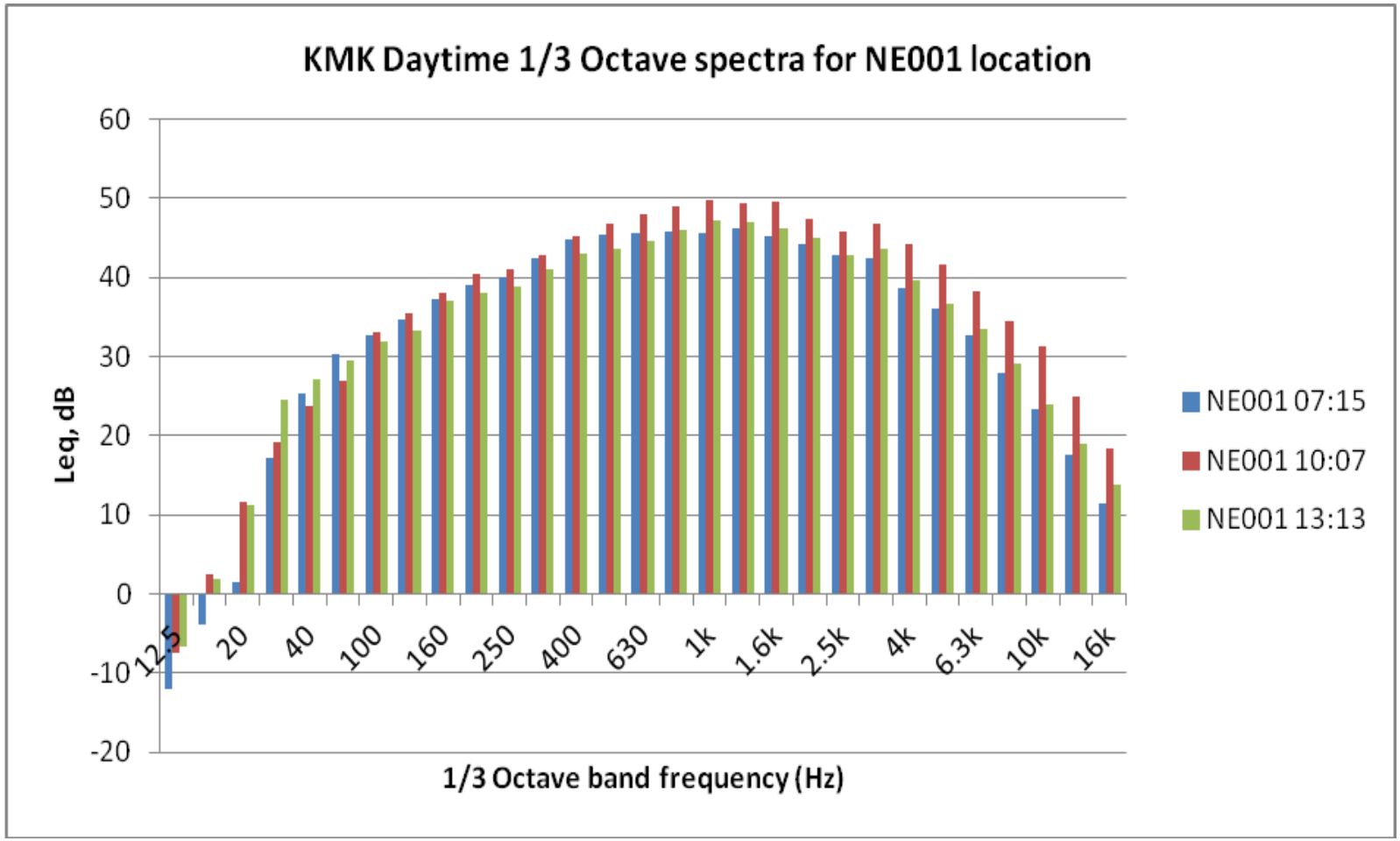
Frequency (Hz)	Project Name	NE001	NE001	NE001	NE002	NE002	NE002	NE003	NE003	NE003	NE004	NE004	NE004
	Start Time	07:15	10:07	13:13	07:48	10:39	13:47	08:24	11:15	14:19	08:56	11:47	14:51
	12.5	-12.03	-7.4	-6.73	-9.95	-9.64	-10.25	0.69	1.5	0.96	-0.43	-0.87	1.88
	16	-3.83	2.56	1.97	-1.79	7.16	8.2	14.63	13.38	13.27	25.59	4.14	28.05
	20	1.42	11.63	11.13	4.6	1.14	6.77	17.96	17.73	17.55	14.2	12.1	16.44
	31.5	17.26	19.22	24.47	24.4	20.91	29.05	31.43	30.11	30.04	27.43	28.08	28.05
	40	25.4	23.73	27.09	23.96	21.41	33.24	32.98	33.3	32.96	30.23	33.33	28.99
	50	30.35	26.94	29.41	43.03	20.79	27.74	36.83	36.89	36.94	32.35	34.37	31.65
	100	32.64	33.13	31.83	44.82	29.27	35.44	41.51	40.62	40.7	39.12	38.16	38.95
	125	34.63	35.39	33.23	41.32	33.99	36.98	43.59	42.76	42.85	39.4	37.94	39.11
	160	37.23	37.97	37.09	46.34	39.52	41.15	48.9	49.16	49.38	44.27	41.77	42.57
	200	39.07	40.32	38.11	45.48	41.27	42.31	44.69	44.57	43.93	43.88	42.7	42.86
	250	39.94	41.08	38.91	47.23	44.78	46.36	44.51	45.46	44.86	44.96	46	45.05
	315	42.41	42.72	40.94	50.32	45.56	45.8	45.85	48.48	48.51	46.42	45.85	45.47
	400	44.7	45.15	43.03	52.83	46.95	47.96	45.76	46.84	45.79	48.17	46.38	47.05
	500	45.3	46.86	43.53	53.49	50.59	52.16	48.56	49.88	48.73	49.06	46.67	48.08
	630	45.51	47.97	44.54	53.61	51.12	52.34	48.43	49.37	47.49	49.47	47.03	48.67
	800	45.82	48.99	46	53.73	52.17	52.45	49.73	50.5	47.93	49.67	47.25	48.35
	1k	45.62	49.65	47.26	55.82	52.99	53.5	51.33	52.03	48.83	50.11	45.94	49.03
	1.25k	46.21	49.3	46.96	56.95	53.69	54.75	51.35	51.4	50.17	51.2	46.12	51.63
	1.6k	45.27	49.51	46.23	55.25	53.24	53.76	47.45	48.84	47.33	49.82	44.93	47.13
	2k	44.25	47.38	45.08	53.64	53.16	53.61	46.98	48.93	47.36	50.66	45.02	48.4
	2.5k	42.73	45.73	42.74	53.43	52.69	53.35	48.42	49.18	48.08	49.85	45.36	47.16
	3.15k	42.32	46.73	43.58	59.83	54.86	57.03	53.85	53.56	52.34	49.11	44.58	45.02

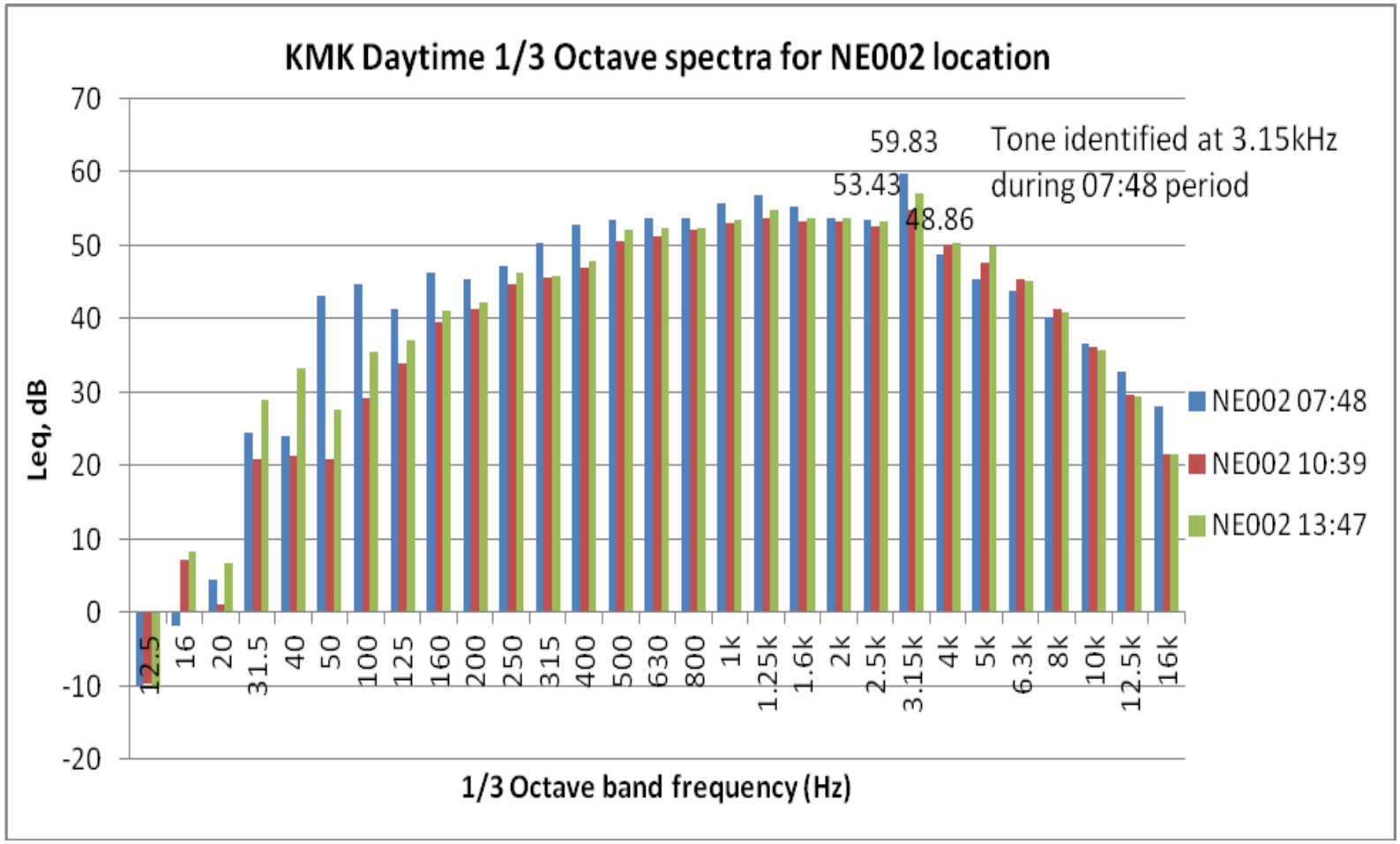
Table 3.2 1/3 Octave Noise results **Daytime** recorded at Monitoring Stations NE001 to NE004

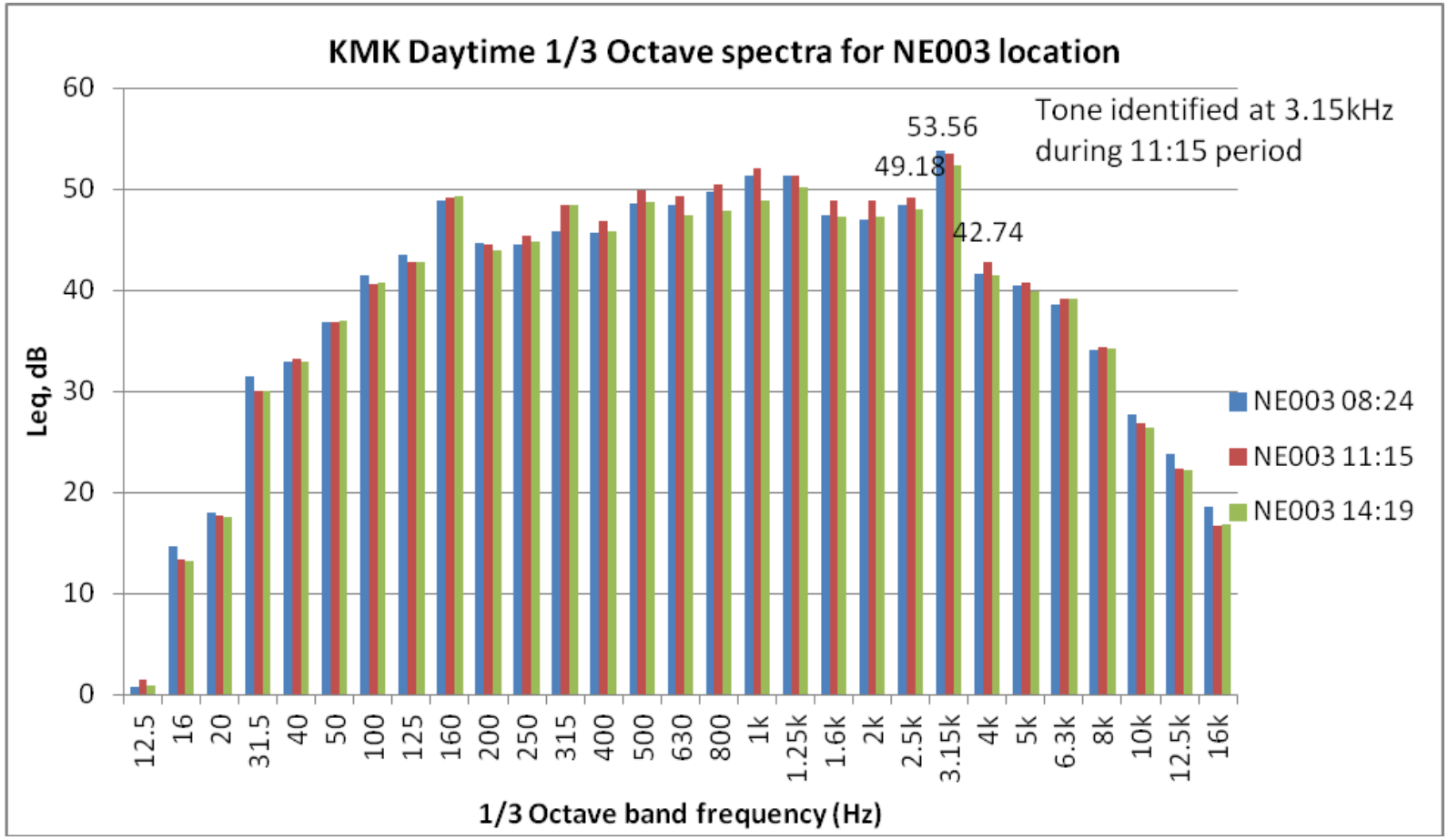
	Project Name	NE001	NE001	NE001	NE002	NE002	NE002	NE003	NE003	NE003	NE004	NE004	NE004
	Start Time	07:15	10:07	13:13	07:48	10:39	13:47	08:24	11:15	14:19	08:56	11:47	14:51
	4k	38.62	44.1	39.56	48.86	50.2	50.38	41.63	42.74	41.54	43.51	40	43.13
	5k	36.13	41.63	36.72	45.41	47.73	49.78	40.45	40.73	39.91	40.77	37.64	40.1
	6.3k	32.71	38.25	33.53	43.77	45.39	45.19	38.55	39.21	39.15	37.77	36.57	39.57
	8k	27.86	34.4	29.14	40.33	41.29	40.88	34.13	34.39	34.2	33.46	31.17	34.2
	10k	23.36	31.24	23.95	36.71	36.27	35.76	27.66	26.91	26.4	28.18	25.95	26.17
	12.5k	17.49	24.97	18.92	32.8	29.61	29.43	23.75	22.43	22.25	21.92	20.29	18.82
	16k	11.45	18.31	13.77	28.09	21.56	21.67	18.55	16.74	16.79	15.37	14	11.39

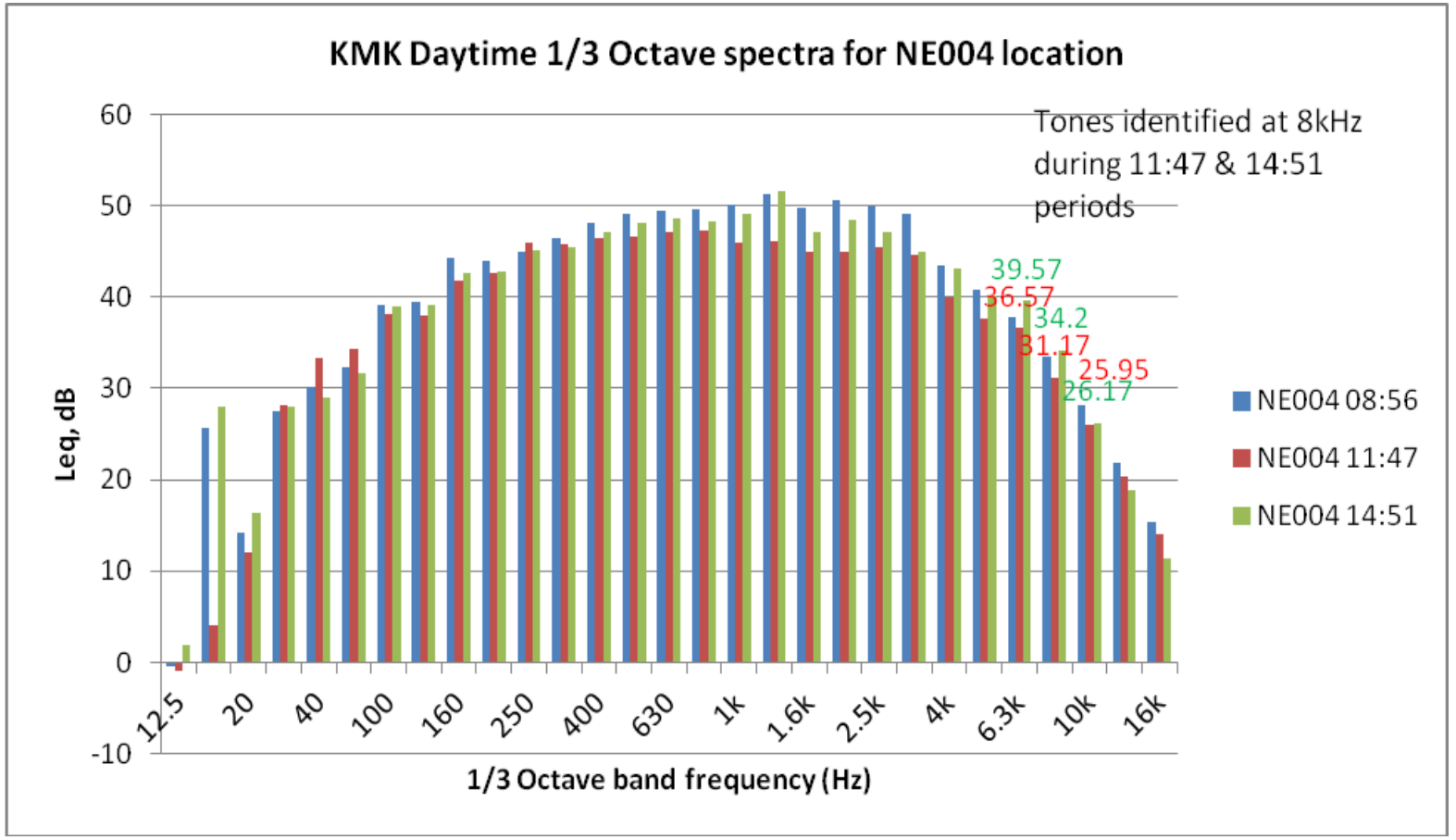
Table 3.3 1/3 Octave Noise results **Night-time** recorded at Monitoring Stations NE001 to NE004

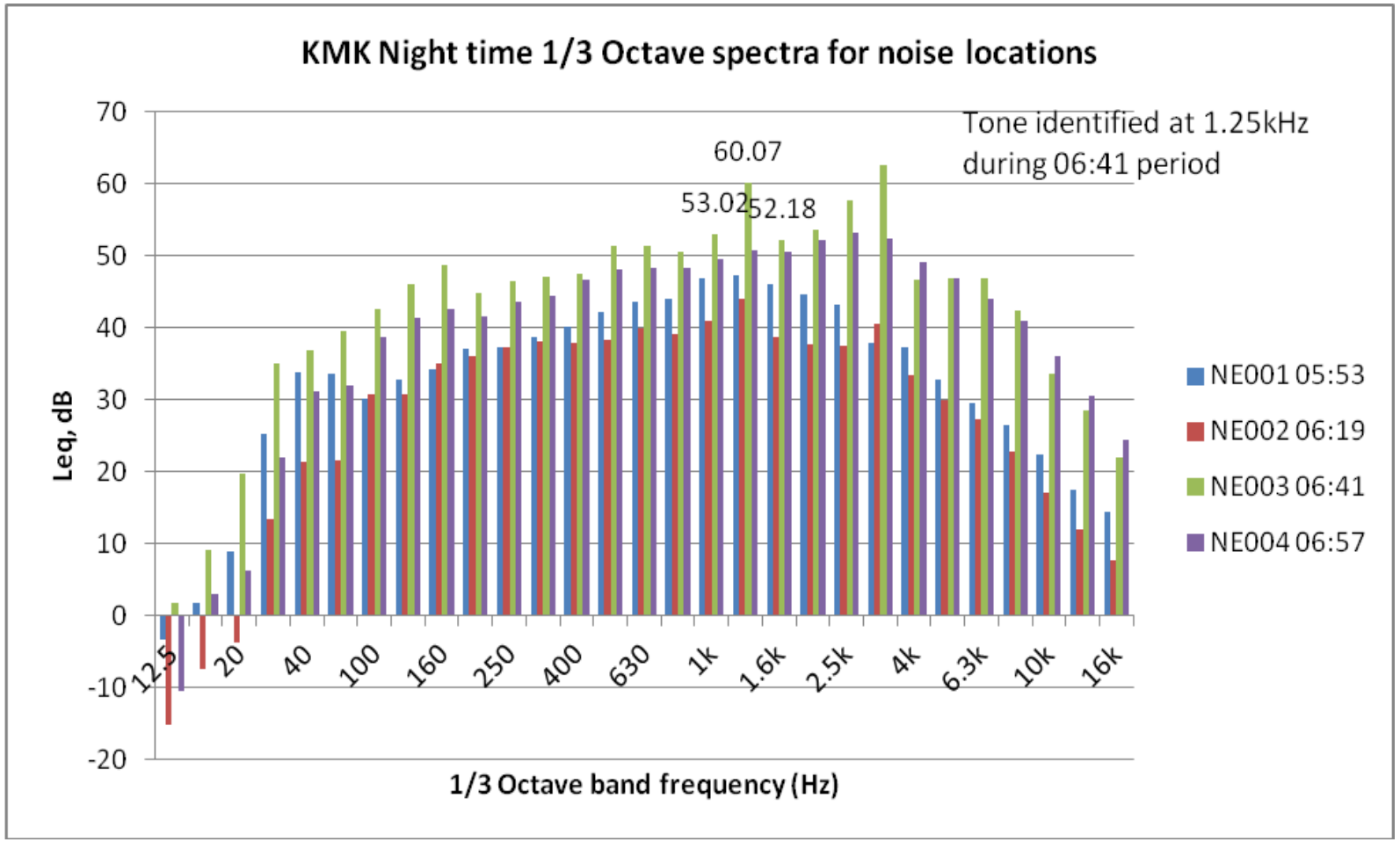
Frequency (Hz)	Project Name	NE001	NE002	NE003	NE004
	Start Time	05:53	06:19	06:41	06:57
	12.5	-3.29	-15.22	1.81	-10.42
	16	1.8	-7.4	9.04	3.09
	20	9	-3.76	19.66	6.18
	31.5	25.16	13.44	35.11	21.87
	40	33.8	21.38	36.83	31.05
	50	33.66	21.6	39.41	31.9
	100	30.17	30.73	42.65	38.71
	125	32.83	30.69	46.11	41.32
	160	34.17	35.03	48.67	42.66
	200	37.05	36.09	44.76	41.61
	250	37.3	37.23	46.37	43.64
	315	38.64	38.05	47.08	44.32
	400	40.01	37.78	47.35	46.56
	500	42.12	38.36	51.31	48.13
	630	43.64	39.89	51.38	48.31
	800	44.02	39.16	50.52	48.34
	1k	46.9	40.83	53.02	49.55
	1.25k	47.22	43.9	60.07	50.79
	1.6k	46.02	38.59	52.18	50.5
	2k	44.6	37.65	53.48	52.16
	2.5k	43.13	37.56	57.56	53.23
	3.15k	37.77	40.6	62.48	52.38
	4k	37.26	33.43	46.66	49.06
	5k	32.73	29.89	46.94	46.85
	6.3k	29.61	27.31	46.84	43.99
	8k	26.41	22.72	42.34	40.84
	10k	22.44	16.99	33.53	36.09
	12.5k	17.45	12.04	28.58	30.59
	16k	14.36	7.72	21.87	24.32


KMK Daytime 1/3 Octave spectra for NE001 location
Leq, dB
60
50
40
30
20
10
0
-10
-20
12.5
20
40
100
160
250
400
630
1k
1.6k
2.5k
4k
6.3k
10k
16k
1/3 Octave band frequency (Hz)
NE001 07:15
NE001 10:07
NE001 13:13


KMK Daytime 1/3 Octave spectra for NE002 location
Leq, dB
70
60
50
40
30
20
10
0
-10
-20
59.83
53.43
48.86
Tone identified at 3.15kHz
during 07:48 period
12.5
16
20
31.5
40
50
100
125
160
200
250
315
400
500
630
800
1k
1.25k
1.6k
2k
2.5k
3.15k
4k
5k
6.3k
8k
10k
12.5k
16k
1/3 Octave band frequency (Hz)
NE002 07:48
NE002 10:39
NE002 13:47


KMK Daytime 1/3 Octave spectra for NE003 location
Tone identified at 3.15kHz during 11:15 period
53.56
49.18
42.74
Leq, dB
60
50
40
30
20
10
0
12.5
16
20
31.5
40
50
100
125
160
200
250
315
400
500
630
800
1k
1.25k
1.6k
2k
2.5k
3.15k
4k
5k
6.3k
8k
10k
12.5k
16k
1/3 Octave band frequency (Hz)
NE003 08:24
NE003 11:15
NE003 14:19


KMK Daytime 1/3 Octave spectra for NE004 location
Tones identified at 8kHz during 11:47 & 14:51 periods
39.57
36.57
34.2
31.17
25.95
26.17
Leq, dB
60
50
40
30
20
10
0
-10
12.5
20
40
100
160
250
400
630
1k
1.6k
2.5k
4k
6.3k
10k
16k
1/3 Octave band frequency (Hz)
NE004 08:56
NE004 11:47
NE004 14:51


KMK Night time 1/3 Octave spectra for noise locations
Tone identified at 1.25kHz during 06:41 period
60.07
53.02
52.18
Leq, dB
70
60
50
40
30
20
10
0
-10
-20
12.5
20
40
100
160
250
400
630
1k
1.6k
2.5k
4k
6.3k
10k
16k
1/3 Octave band frequency (Hz)
NE001 05:53
NE002 06:19
NE003 06:41
NE004 06:57

Calibration information;

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

ilac-MRA DANAK CAL Reg nr. 307

CERTIFICATE OF CALIBRATION

No: C1205391 Page 1 of 10

CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 2250 Light	No: 2754170 Id: -
Microphone:	Brüel & Kjær Type 4950	No: 2737145
Preamplifier:	Brüel & Kjær Type ZC-0032	No: 15966
Supplied Calibrator:	None	
Software version:	BZ7130 Version 4.0	Pattern Approval: PENDING
Instruction manual:	BE1774-14	

CUSTOMER

Enfonic Ltd
Tecpro House, IDA Business & Technology Park, Clonshaugh
Clonshaugh
Dublin 17
Ireland

CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23°C ± 3°C
Environment conditions: *See actual values in **Environmental conditions** sections.*

SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2250 Light has been calibrated in accordance with the requirements as specified in IEC61672-1:2002 class 1. Procedures from IEC 61672-3:2006 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 4.7 - DB: 4.70) by using procedure 2250-L-4950.

RESULTS

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2012-07-20 Date of issue: 2012-07-20

Steen Vodstrup Andersen
Calibration Technician

Nils Johansen
Approved Signatory

APPENDIX 4

Water Quality Laboratory Test Certificates 2013

ALcontrol Laboratories

Unit 18A
Rosemount Business Park
Ballycoolin
Dublin 11
Tel : (0035) 3188 29893

Nally Environmental
Drumcree
Collinstown
Mullinger
Co. Westmeath

Attention: Niall Nally

CERTIFICATE OF ANALYSIS

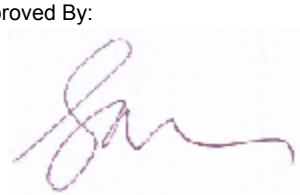
Date:	15 February 2013
Customer:	D_NALLYENV_MUL
Sample Delivery Group (SDG):	130212-14
Your Reference:	KMK
Location:	
Report No:	212228

We received 2 samples on Monday February 11, 2013 and 2 of these samples were scheduled for analysis which was completed on Friday February 15, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130212-14	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	212228
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6902450	CX			11/02/2013
6902451	DX			11/02/2013

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130212-14	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	212228
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	6902450	6902451
			Customer Sample Reference	CX	DX
			AGS Reference		
			Depth (m)		
			Container	1l green glass bottle	1lplastic (ALE221)	H2SO4 (ALE244)	1lplastic (ALE221)	H2SO4 (ALE244)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 2			X		X
Anions by Kone (w)	All	NDPs: 0 Tests: 2		X		X	
COD Unfiltered	All	NDPs: 0 Tests: 2		X		X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2		X		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2		X		X	
Mercury Dissolved	All	NDPs: 0 Tests: 2	X			X	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 2		X		X	
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2	X			X	
pH Value	All	NDPs: 0 Tests: 2		X		X	
Suspended Solids	All	NDPs: 0 Tests: 2		X		X	

CERTIFICATE OF ANALYSIS

SDG:	130212-14	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	212228
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	CX	DX				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	11/02/2013	11/02/2013				
			Sample Time	.	.				
			Date Received	11/02/2013	11/02/2013				
			SDG Ref	130212-14	130212-14				
			Lab Sample No.(s)	6902450	6902451				
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		<2 #	16 #				
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099		16.5 #	0.474 #				
COD, unfiltered	<7 mg/l	TM107		14.1 #	29.8 #				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		1.23 #	0.183 #				
Aluminium (diss.filt)	<2.9 µg/l	TM152		3.15 #	86.8 #				
Arsenic (diss.filt)	<0.12 µg/l	TM152		1.23 #	0.474 #				
Chromium (diss.filt)	<0.22 µg/l	TM152		1.62 #	0.994 #				
Lead (diss.filt)	<0.02 µg/l	TM152		0.914 #	9.66 #				
Nickel (diss.filt)	<0.15 µg/l	TM152		6.22 #	3.13 #				
Zinc (diss.filt)	<0.41 µg/l	TM152		53.6 #	40.9 #				
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172		<10	563				
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	0.043 #				
Chloride	<2 mg/l	TM184		298 #	23.2 #				
Iron (diss.filt)	<0.019 mg/l	TM228		0.101 #	0.0366 #				
pH	<1 pH Units	TM256		7.85 #	8.1 #				

CERTIFICATE OF ANALYSIS

SDG:	130212-14	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	212228
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130212-14	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	212228
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6902450	6902451
Customer Sample Ref.	CX	DX
AGS Ref.		
Depth		
Type	LIQUID	LIQUID
Ammoniacal Nitrogen	15-Feb-2013	15-Feb-2013
Anions by Kone (w)	14-Feb-2013	14-Feb-2013
COD Unfiltered	13-Feb-2013	13-Feb-2013
Conductivity (at 20 deg.C)	13-Feb-2013	13-Feb-2013
Dissolved Metals by ICP-MS	13-Feb-2013	13-Feb-2013
Mercury Dissolved	14-Feb-2013	14-Feb-2013
Metals by iCap-OES Dissolved (W)	13-Feb-2013	13-Feb-2013
Mineral Oil C10-40 Aqueous (W)	14-Feb-2013	14-Feb-2013
pH Value	13-Feb-2013	13-Feb-2013
Suspended Solids	13-Feb-2013	13-Feb-2013

SDG:	130212-14	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	212228
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

c/o Aramex
Bellinstown
Ballyboughal
Co Dublin
Tel : +353 (0)184 33033 (Opt 2)

Nally Environmental
Drumcree
Collinstown
Mullinger
Co. Westmeath

Attention: Niall Nally

CERTIFICATE OF ANALYSIS

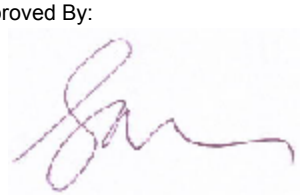
Date:	20 June 2013
Customer:	D_NALLYENV_MUL
Sample Delivery Group (SDG):	130614-73
Your Reference:	KMK
Location:	
Report No:	229752

We received 2 samples on Thursday June 13, 2013 and 2 of these samples were scheduled for analysis which was completed on Thursday June 20, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130614-73	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	229752
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7588437	CX			13/06/2013
7588441	DX			13/06/2013

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130614-73	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	229752
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	7588437	7588441
			Customer Sample Reference	CX	DX
			AGS Reference		
			Depth (m)		
			Container	1l Glass bottle (ALE	1lplastic (ALE221)	H2SO4 (ALE244)	1l Glass bottle (ALE	1lplastic (ALE221)	H2SO4 (ALE244)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 2			X			X
Anions by Kone (w)	All	NDPs: 0 Tests: 2		X			X	
COD Unfiltered	All	NDPs: 0 Tests: 2		X			X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2		X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2		X			X	
Mercury Dissolved	All	NDPs: 0 Tests: 2	X			X		
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 2		X			X	
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2	X			X		
pH Value	All	NDPs: 0 Tests: 2		X			X	
Suspended Solids	All	NDPs: 0 Tests: 2		X			X	

CERTIFICATE OF ANALYSIS

SDG:	130614-73	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	229752
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	CX	DX				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	13/06/2013	13/06/2013				
			Sample Time	.	.				
			Date Received	13/06/2013	13/06/2013				
			SDG Ref	130614-73	130614-73				
			Lab Sample No.(s)	7588437	7588441				
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		4.5 #	315 #				
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099		14.9 #	0.985 #				
COD, unfiltered	<7 mg/l	TM107		20.8 #	306 #				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.49 #	0.402 #				
Aluminium (diss.filt)	<2.9 µg/l	TM152		10.8 #	89 #				
Arsenic (diss.filt)	<0.12 µg/l	TM152		0.846 #	0.83 #				
Chromium (diss.filt)	<0.22 µg/l	TM152		1.43 #	1.36 #				
Lead (diss.filt)	<0.02 µg/l	TM152		5.96 #	30.6 #				
Nickel (diss.filt)	<0.15 µg/l	TM152		3.28 #	11.1 #				
Zinc (diss.filt)	<0.41 µg/l	TM152		60.8 #	91.5 #				
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172		<10	7650				
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	0.0287 #				
Chloride	<2 mg/l	TM184		88.2 #	56.9 #				
Iron (diss.filt)	<0.019 mg/l	TM228		0.087 #	0.0936 #				
pH	<1 pH Units	TM256		7.95 #	7.98 #				

CERTIFICATE OF ANALYSIS

SDG:	130614-73	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	229752
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130614-73	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	229752
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7588437	7588441
Customer Sample Ref.	CX	DX
AGS Ref.		
Depth		
Type	LIQUID	LIQUID
Ammoniacal Nitrogen	19-Jun-2013	19-Jun-2013
Anions by Kone (w)	20-Jun-2013	20-Jun-2013
COD Unfiltered	16-Jun-2013	16-Jun-2013
Conductivity (at 20 deg.C)	19-Jun-2013	19-Jun-2013
Dissolved Metals by ICP-MS	18-Jun-2013	18-Jun-2013
Mercury Dissolved	18-Jun-2013	18-Jun-2013
Metals by iCap-OES Dissolved (W)	17-Jun-2013	17-Jun-2013
Mineral Oil C10-40 Aqueous (W)	20-Jun-2013	20-Jun-2013
pH Value	17-Jun-2013	17-Jun-2013
Suspended Solids	17-Jun-2013	17-Jun-2013

SDG:	130614-73	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	229752
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

c/o Aramex
Bellinstown
Ballyboughal
Co Dublin
Tel : +353 (0)184 33033 (Opt 2)

Nally Environmental
Drumcree
Collinstown
Mullinger
Co. Westmeath

Attention: Niall Nally

CERTIFICATE OF ANALYSIS

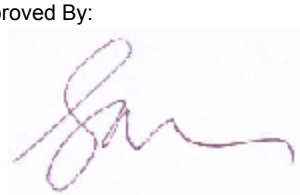
Date:	07 August 2013
Customer:	D_NALLYENV_MUL
Sample Delivery Group (SDG):	130802-62
Your Reference:	KMK
Location:	
Report No:	236585

We received 2 samples on Thursday August 01, 2013 and 2 of these samples were scheduled for analysis which was completed on Wednesday August 07, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130802-62	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	236585
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7864480	CX			01/08/2013
7864481	DX			01/08/2013

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130802-62	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	236585
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)						Customer Sample Reference						AGS Reference						Depth (m)						Container					
			7864480						CX																		1l Glass bottle (ALE	500ml Plastic (ALE2	H2SO4 (ALE244)	1l Glass bottle (ALE	500ml Plastic (ALE2	H2SO4 (ALE244)
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 2																										X				X
Anions by Kone (w)	All	NDPs: 0 Tests: 2																										X			X	
COD Unfiltered	All	NDPs: 0 Tests: 2																										X			X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2																										X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2																										X			X	
Mercury Dissolved	All	NDPs: 0 Tests: 2																									X			X		
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 2																										X			X	
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2																									X			X		
pH Value	All	NDPs: 0 Tests: 2																										X			X	
Suspended Solids	All	NDPs: 0 Tests: 2																										X			X	

CERTIFICATE OF ANALYSIS

SDG:	130802-62	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	236585
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	CX	DX				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	01/08/2013	01/08/2013				
			Sample Time	.	.				
			Date Received	01/08/2013	01/08/2013				
			SDG Ref	130802-62	130802-62				
			Lab Sample No.(s)	7864480	7864481				
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		3 #	128 #				
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099		2.18 #	0.265 #				
COD, unfiltered	<7 mg/l	TM107		12.3 #	128 #				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.23 #	0.385 #				
Aluminium (diss.filt)	<2.9 µg/l	TM152		5.06 #	119 #				
Arsenic (diss.filt)	<0.12 µg/l	TM152		0.328 #	1.26 #				
Chromium (diss.filt)	<0.22 µg/l	TM152		1.08 #	1.88 #				
Lead (diss.filt)	<0.02 µg/l	TM152		1.4 #	25.7 #				
Nickel (diss.filt)	<0.15 µg/l	TM152		9.65 #	10.8 #				
Zinc (diss.filt)	<0.41 µg/l	TM152		89 #	67.2 #				
Mineral oil >C10 C40 (aq)	<10 µg/l	TM172		351	2370				
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	0.0593 #				
Chloride	<2 mg/l	TM184		50.3 #	69.2 #				
Iron (diss.filt)	<0.019 mg/l	TM228		<0.019 #	0.103 #				
pH	<1 pH Units	TM256		7.55 #	7.76 #				

CERTIFICATE OF ANALYSIS

SDG:	130802-62	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	236585
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130802-62	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	236585
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7864480	7864481
Customer Sample Ref.	CX	DX
AGS Ref.		
Depth		
Type	LIQUID	LIQUID
Ammoniacal Nitrogen	06-Aug-2013	06-Aug-2013
Anions by Kone (w)	06-Aug-2013	06-Aug-2013
COD Unfiltered	04-Aug-2013	04-Aug-2013
Conductivity (at 20 deg.C)	05-Aug-2013	05-Aug-2013
Dissolved Metals by ICP-MS	05-Aug-2013	05-Aug-2013
Mercury Dissolved	06-Aug-2013	06-Aug-2013
Metals by iCap-OES Dissolved (W)	06-Aug-2013	06-Aug-2013
Mineral Oil C10-40 Aqueous (W)	07-Aug-2013	07-Aug-2013
pH Value	05-Aug-2013	05-Aug-2013
Suspended Solids	05-Aug-2013	05-Aug-2013

SDG:	130802-62	**Location:**		**Order Number:**	
Job:	D_NALLYENV_MUL-2	**Customer:**	Nally Environmental	**Report Number:**	236585
Client Reference:	KMK	**Attention:**	Niall Nally	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath, Ireland.
Tel: (049) 8541160 , Fax: (049) 8541755
Email: info@oldcastlelabs.ie Website: www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 228652
Date Received: 31st October 2012
Customer Name: Nally Environmental
Address: Drumcree, Collinstown, Co Westmeath
Reporting Method: Email **Email Address:** info@nallyenvironmental.ie
Sample Reference: Effluent Sample Ref: D X
Type of Sample: ○ Drinking Water ◉ Surface Water/ Effluent
Condition of Sample: Satisfactory
Commencement Date: 31st October 2013
Certificate Date: 21st November 2013

Test	Units	Result	Method
COD	mg/l	22	TM2123
Total Suspended Solids	mg/l	1.6	TM2124
pH	pH @ 20°C	7.4	TM2128
Conductivity	µS/cm@20°C	486	TM2132
Chloride	mg/l	26.8	TM2133
Mineral Oil	mg/l	<0.001	*
Ammonia	mg/l NH3-N	1.64	TM2118
Aluminium	mg/l	<0.2	*
Iron	µg/l	580	TM2114
Lead	µg/l	10	TM2136
Zinc	µg/l	1.17	TM2218
Nickel	µg/l	<200	*
Chromium	µg/l	<200	*
Mercury	µg/l	0.8	*
Arsenic	µg/l	0.4	*

** = Subcontracted Test*

Signed : Peter Reynolds
Analyst

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath, Ireland.
Tel: (049) 8541160 , Fax: (049) 8541755
Email: info@oldcastlelabs.ie Website: www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 228651
Date Received: 31st October 2012
Customer Name: Nally Environmental
Address: Drumcree, Collinstown, Co Westmeath
Reporting Method: Email **Email Address:** info@nallyenvironmental.ie
Sample Reference: Effluent Sample Ref: C X
Type of Sample: ○ Drinking Water ◉ Surface Water/ Effluent
Condition of Sample: Satisfactory
Commencement Date: 31st October 2013
Certificate Date: 21st November 2013

Test	Units	Result	Method
COD	mg/l	10	TM2123
Total Suspended Solids	mg/l	3.6	TM2124
pH	pH @ 20°C	7.23	TM2128
Conductivity	µS/cm@20°C	278	TM2132
Chloride	mg/l	14.4	TM2133
Mineral Oil	mg/l	<0.001	*
Ammonia	mg/l NH3-N	0.4	TM2118
Aluminium	mg/l	<0.2	*
Iron	µg/l	250	TM2114
Lead	µg/l	<2	TM2136
Zinc	µg/l	1450	TM2218
Nickel	µg/l	<200	*
Chromium	µg/l	<200	*
Mercury	µg/l	0.4	*
Arsenic	µg/l	0.4	*

** = Subcontracted Test*

Signed : Peter Reynolds
Analyst

APPENDIX 5

Groundwater Monitoring Report 2013

ANNUAL GROUND WATER MONITORING REPORT

FOR

KMK METALS RECYCLING LTD.

W0113-03

AT

CAPPINCUR INDUSTRIAL ESTATE,

DAINGEAN ROAD, TULLAMORE,

CO. OFFALY

9th December 2013

SIGNED:

Nally Environmental
Drumcree,
Collinstown
Mullingar
Co Westmeath
Tel : (044 96 66773)
E-mail: info@nallyenvironmental.ie
Website : www.nallyenvironmental.ie

1.0 INTRODUCTION

1.1 **Nally Environmental** were commissioned by KMK to take two separate ground water samples at the facility and test for parameters as per the waste licence ref: W0113-03.

2.0 GROUND WATER SAMPLING METHODOLOGY

2.1 Both GW1 and GW2 wells are tapped on-site. GW1 well is used as the main water source on-site for domestic supply and therefore there is a good draw on this source throughout the year. GW2 well is not used routinely on-site. Therefore in order to adequately flush out the well head for GW2, this tap was allowed to run and fill two 1,000litre IBC containers during two days before the sampling occurred. The time between well flushing and sampling was deemed adequate for full recharge of the supply at GW2 for subsequent sampling.

2.2 In terms of bacteria samples, on the day, both GW1 and GW2 tap heads were cleaned and sterilised using alcohol wipes (as required for microbial sampling only after all other test parameter samples were first taken). Each tap nozzle was then flamed briefly using a lighter to eliminate any residual alcohol where present. The taps were then allowed to run with water for a few minutes prior to sampling.

2.3 Samples were sent to the Accredited laboratory for analysis. All samples were placed into a cooler box with ice packs to maintain a temperature below 5°C. The results of the analysis from the laboratory can be seen in Table 3.1 with copies of laboratory analyses in Appendix A.

3.0 WATER SURVEY RESULTS

3.1 The results from the sampling event are tabulated and discussed below.

Sample Location: KMK Metals Recycling Ltd. at Cappincur Industrial Estate, Daingean Road, Tullamore, Co. Offaly
Waste Licence : W0113-03
Type of Sample: Two groundwater water samples ref; GW1, GW2
Sample Date: 21st November 2013
Laboratories Used: Fitz Scientific (Accredited laboratory)

Results from Euro Environmental Management Ltd T/A Fitz Scientific labs

Parameter	**GW1**	**GW2**	**EC Drinking Water Guidelines[1]**	**Groundwater Threshold Values EC Environmental Objectives (Groundwater) Regulations, SI 9/2010[2]**
Conductivity @ 20C (µS/cm)	454	451	2500	800 - 1875
pH (pH units)	7.3	7.2	NRG*	6.5-9.5
E. Coli (cfu/100mls)	0	0	0	0
VOCs (EPA 524.2) List I/II Screen (µg/l)	VOCs - <1 1,2 – Dichloroethane – <0.45 Vinyl chloride – <0.50 Benzene – <0.35 Trichloroethene – 0.482 Tetrachloroethene – <0.33	VOCs - <1 1,2 – Dichloroethane – <0.45 Vinyl chloride – <0.50 Benzene – <0.35 Trichloroethene - <0.23 Tetrachloroethene – <0.33	NRG*	NRG except for following; 1,2 – Dichloroethane – 2.25 Vinyl chloride – 0.375 Benzene – 0.75 Total for Trichloroethene & Tetrachloroethene – 7.5
Total Nitrogen (as N) (mg/l)	<1	<1	50	NRG*
Chloride (mg/l)	14.07	18.85	250	24 – 187.5
Nickel (µg/l)	3.4	31.9	20	15
Lead (µg/l)	0.29	<0.02	25	18.75
Iron (µg/l)	135	69.26	200	NRG*
Chromium (µg/l)	<2.14	<2.14	50	37.5
Arsenic (µg/l)	0.231	19.14	10	7.5
Aluminium (µg/l)	<0.79	<0.79	200	150
Mercury (µg/l)	<0.04	<0.04	1	0.75

***NRG** = No Reference Given. [1 & 2] EC Drinking Water Regs. S.I. 278/2007 and EC Groundwater Regs. S.I. 9/2010 were used here in the absence of any limits specified in the waste licence.

4.0 DISCUSSION

4.1 Arsenic and nickel metal parameters highlighted in red exceeded both the recommended guideline limits set by EC Groundwater Regs. S.I. 9/2010 and the EC Drinking Water Guideline SI 278/2007 for sample GW2. Levels for arsenic 19.14(μg/l) and nickel at 31.9(μg/l) were detected. There have been elevated nickel levels between the range 24 to 135 μg/l from 2006 to 2011 apart from 2009 where nickel levels were 13 μg/l and therefore below the EC Environmental Objectives (Groundwater) Regulations, S.I. 9/2010 threshold values.

4.2 In determination of the significance or otherwise of the metallic parameters detected in GW2, it is important to consider that the other metallic species i.e. lead, iron, chromium, mercury and aluminium were below both the Drinking Water guidelines and the Groundwater Threshold Values EC Environmental Objectives (Groundwater) Regulations, SI 9/2010. Nickel is naturally present in much soils and rocks in general, and this broad fact is generally well documented. For example according to the 'Soils of Co. Offaly' National Soil Survey of Ireland by Teagasc 2003, the typical levels of trace nickel in agricultural soils ranges from 0.5 to 100 mg/kg. The natural occurrence of arsenic in rock veins is also well documented across the world. In the absence of specific data for arsenic in Offaly, another close licensee was reviewed in terms of their groundwater monitoring i.e. AES Ireland Ltd, Cappincur Ind. Estate, Tullamore. It was noted in their 2012 AER that arsenic was also found in one of their boreholes GW2 (see attached extracts from the 2012 AER below). Both boreholes are approximately 300m apart. This presence confirms naturally occurring arsenic in the groundwater because the levels are very similar and also the two associated businesses are very different i.e. a general waste transfer and recycling station and a KMK operates a hazardous and non hazardous recycling facility.

4.3 Therefore there are no artificial or manmade sources of metallic contamination entering the groundwater from KMK site activities above ground. Hence, the presence of arsenic and nickel can be attributed to background levels in the groundwater from rock ores and soils.

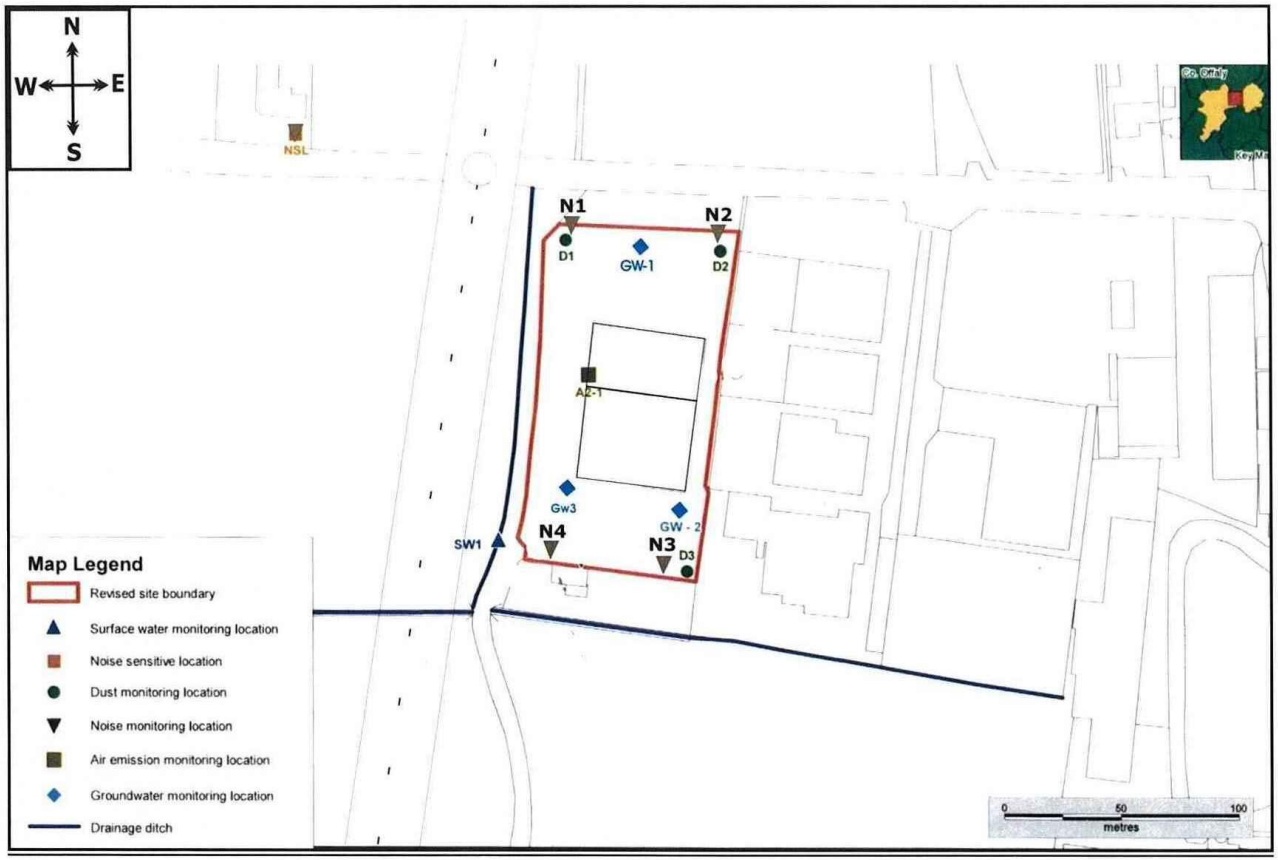
4.4 There were no VOCs detected in both GW1 and GW2 apart from Trichloroethene (0.482μg/l) which was below guideline limits. It is important to also note the improved limit of detection for VOCs of <1(μg/l) for Fitz Scientific Labs.

Conductivity (µS/cm)	572	549	534	534	***800-1875***
Ammonia as N (mg/l)	0.06	**0.03**	0.04	0.04	***0.05-0.136****
DRO (mg/l)	<0.01	<0.01	<0.01	<0.01	-
Mineral oil (mg/l)	<0.01	<0.01	<0.01	<0.01	-
GW-2					
Report Ref.	**ECS4123**	**ECS4124**	**ECS4125**	**ECS4126**	**GTV's** Note1
Parameter	**Round 1**	**Round 2**	**Round 3**	**Round 4**	
pH (pH units)	7.4	7.5	7.35	7.63	***6.5-9.5***
Temperature (°C)	12.1	10.7	11.5	12.0	-
Odour	No Odour	No Odour	Faint Odour	No Odour	-
Conductivity (µS/cm)	562	561	557	556	***800-1875***
Ammonia as N (mg/l)	<0.02	**0.07**	0.05	0.04	***0.05-0.136****
DRO (mg/l)	<0.01	<0.01	<0.01	<0.01	-
Mineral oil (mg/l)	<0.01	<0.01	<0.01	<0.01	-
GW-3					
Report Ref.	**ECS4123**	**ECS4124**	**ECS4125**	**ECS4126**	GTV's Note1
Parameter	**Round 1**	**Round 2**	**Round 3**	**Round 4**	
pH (pH units)	7.3	7.6	7.35	7.59	***6.5-9.5***
Temperature (°C)	12	11.3	12.3	12.9	-
Odour	No Odour	No Odour	No Odour	No Odour	-
Conductivity (µS/cm)	540	534	535	539	***800-1875***
Ammonia as N (mg/l)	0.02	0.03	0.03	0.03	***0.05-0.136****
DRO (mg/l)	<0.01	<0.01	<0.01	<0.01	-
Mineral oil (mg/l)	<0.01	<0.01	<0.01	<0.01	-

Table 6-7: Annual Groundwater Monitoring Results 2012 ECS4123

Parameter	**GW-1**	**GW-2**	**GW 3**	***IGV Note1***
Nitrate-N (mg/l)	<0.2	<0.2	<0.2	-
Nitrate as NO_3 (mg/l)	<0.89	<0.89	<0.89	***25***
Total Nitrogen (mg/l)	2.15	2.06	2.06	-
Chloride (mg/l)	13	13	13	***30***
Fluoride (mg/l)	0.18	0.17	0.20	***1.0*** Note 2
Arsenic (mg/l)	0.003	**0.018**	0.009	***0.01***
Mercury (mg/l)	<0.001	<0.001	<0.001	***0.001***
Sulphate (mg/l)	8.36	10.27	11.16	***200***
COD (mg/l)	<10	<10	<10	-
TOC (mg/l)	<5	<5	<5	-
Faecal Coliforms (cfu/100ml)	0	0	0	-
Total Coliforms (cfu/100ml)	>100	22	4	-
VOC's (µg/l)	<10	<10	<10	***10*** Note 2
Pesticides Suite (µg/l)	<0.01	<0.01	<0.01	***0.5***
SVOC's (µg/l) Bis(2-ethylhexyl)phthalate	3.07	3.21	2.90	-
All other SVOC's (µg/l)	<1	<1	<1	-

Note 1: GTV = Groundwater Threshold Values refers to "*European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010)*". "Threshold Values" have been established for pollutants that are causing a risk to groundwater bodies. Exceedance of a relevant threshold value at a representative monitoring point triggers further investigation to confirm whether the criteria for poor groundwater chemical status are being met.


N
W
E
S
NSL
N1
N2
D1
GW-1
D2
AZ-1
Gw3
GW - 2
SW1
N4
N3
D3
Co. Offaly
Key Map
Map Legend
Revised site boundary
Surface water monitoring location
Noise sensitive location
Dust monitoring location
Noise monitoring location
Air emission monitoring location
Groundwater monitoring location
Drainage ditch
0
50
100
metres

APPENDIX A

LABORATORY TEST CERTIFICATES.

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Customer	**Niall Nally** **Nally Environmental** **Drumcree** **Collinstown** **Co. Westmeath**	***Lab Report Ref. No.***	**2925/001/03**
		Date of Receipt	**21/11/2013**
		Sampled On	**21/11/2013**
		Date Testing Commenced	**21/11/2013**
		Received or Collected	**By Fitz: Noel**
		Condition on Receipt	**Acceptable**
Customer PO		***Date of Report***	**10/12/2013**
Customer Ref	**GW1**	***Sample Type***	**Groundwater**
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
1,1,1,2-Tetrachloroethane (Ground	154	GCMS	<0.46	ug/L	UKAS
1,1,1-Trichloroethane (Ground Water	154	GCMS	<0.43	ug/L	UKAS
1,1,2,2-Tetrachloroethane (Ground	154	GCMS	<5.00	ug/L	
1,1,2-Trichloroethane (Ground Water	154	GCMS	<1.67	ug/L	UKAS
1,1-Dichloroethane (Ground Water)	154	GCMS	<0.42	ug/L	UKAS
1,1-Dichloroethene (Ground Water)	154	GCMS	<0.41	ug/L	UKAS
1,1-Dichloropropene (Ground Water)	154	GCMS	<0.39	ug/L	UKAS
1,2,3-Trichlorobenzene (Ground Wat	154	GCMS	<0.34	ug/L	UKAS
1,2,3-Trichloropropane (Ground Wate	154	GCMS	<0.61	ug/L	UKAS
1,2,4-Trichlorobenzene (Ground Wat	154	GCMS	<0.51	ug/L	UKAS
1,2,4-Trimethylbenzene (Ground Wat	154	GCMS	<0.52	ug/L	UKAS
1,2-Dibromo-3-chloropropane (Groun	154	GCMS	<0.63	ug/L	UKAS
1,2-Dibromoethane (Ground Water)	154	GCMS	<0.63	ug/L	UKAS
1,2-Dichlorobenzene (Ground Water)	154	GCMS	<0.51	ug/L	UKAS
1,2-Dichloroethane (Ground Water)	154	GCMS	<0.45	ug/L	UKAS
1,2-Dichloropropane (Ground Water)	154	GCMS	<0.75	ug/L	UKAS
1,3,5-Trimethylbenzene (Ground Wat	154	GCMS	<0.33	ug/L	UKAS
1,3-Dichlorobenzene (Ground Water)	154	GCMS	<0.47	ug/L	UKAS
1,3-Dichloropropane (Ground Water)	154	GCMS	<0.64	ug/L	UKAS
1,4-Dichlorobenzene (Ground Water)	154	GCMS	<1.21	ug/L	UKAS
2,2-Dichloropropane (Ground Water)	154	GCMS	<5.00	ug/L	
2-Chlorotoluene (Ground Water)	154	GCMS	<0.55	ug/L	UKAS
4-Chlorotoluene (Ground Water)	154	GCMS	<0.43	ug/L	UKAS
Aluminium (Ground Water)	177	ICPMS	<0.79	ug/L	UKAS
Arsenic (Ground Water)	177	ICPMS	0.231	ug/L	UKAS

Signed : A Harmon ***Date : 10/12/2013***

Aoife Harmon - Technical Supervisor

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results contained in this report relate only to the samples tested
**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

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Customer	**Niall Nally** **Nally Environmental** **Drumcree** **Collinstown** **Co. Westmeath**	***Lab Report Ref. No.***	**2925/001/03**
		Date of Receipt	**21/11/2013**
		Sampled On	**21/11/2013**
		Date Testing Commenced	**21/11/2013**
		Received or Collected	**By Fitz: Noel**
		Condition on Receipt	**Acceptable**
Customer PO		***Date of Report***	**10/12/2013**
Customer Ref	**GW1**	***Sample Type***	**Groundwater**
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Benzene (Ground Water)	154	GCMS	<0.35	ug/L	UKAS
Bromobenzene (Ground Water)	154	GCMS	<0.40	ug/L	UKAS
Bromochloromethane (Ground Water	154	GCMS	<0.76	ug/L	UKAS
Bromodichloromethane (Ground Wat	154	GCMS	<0.63	ug/L	UKAS
Bromoform (Ground Water)	154	GCMS	<1.31	ug/L	UKAS
Bromomethane (Ground Water.)	154	GCMS	<5.00	ug/L	
Carbon tetrachloride (Ground Water.)	154	GCMS	<0.41	ug/L	UKAS
Chloride (Ground Water)	100	Colorimetry	14.07	mg/L	UKAS
Chlorobenzene (Ground Water.)	154	GCMS	<0.49	ug/L	UKAS
Chloroethane (Ground Water)	154	GCMS	<5.00	ug/L	
Chloroform (Ground Water)	154	GCMS	<0.32	ug/L	UKAS
Chloromethane (Ground Water)	154	GCMS	<5.00	ug/L	
Chromium (Ground Water)	177	ICPMS	<2.14	ug/L	UKAS
cis-1,2-Dichloroethene (Ground Wate	154	GCMS	<0.56	ug/L	UKAS
cis-1,3-Dichloropropene (Ground Wat	154	GCMS	<0.69	ug/L	UKAS
Conductivity (Ground Water at 20C)	112	Electrometry	454	uscm -1@20C	UKAS
Dibromochloromethane (Ground Wat	154	GCMS	<0.47	ug/L	UKAS
Dibromomethane (Ground Water)	154	GCMS	<0.86	ug/L	UKAS
Dichlorodifluoromethane (Ground Wa	154	GCMS	<5.00	ug/L	
Dichloromethane (Ground Water)	154	GCMS	<5.00	ug/L	
E. coli	157	Filtration/ Incubation 37C/ 24H	0	cfu/ 100ml	
Ethylbenzene (Ground Water)	154	GCMS	<0.42	ug/L	UKAS
Hexachlorobutadiene (Ground Water)	154	GCMS	<0.36	ug/L	UKAS
Iron (Ground Water)	177	ICPMS	135.3	ug/L	UKAS
Isopropylbenzene (Ground Water)	154	GCMS	<0.42	ug/L	UKAS

Signed : A Harmon ***Date : 10/12/2013***

Aoife Harmon - Technical Supervisor

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
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Customer	**Niall Nally** **Nally Environmental** **Drumcree** **Collinstown** **Co. Westmeath**	***Lab Report Ref. No.***	**2925/001/03**
		Date of Receipt	**21/11/2013**
		Sampled On	**21/11/2013**
		Date Testing Commenced	**21/11/2013**
		Received or Collected	**By Fitz: Noel**
		Condition on Receipt	**Acceptable**
Customer PO		***Date of Report***	**10/12/2013**
Customer Ref	**GW1**	***Sample Type***	**Groundwater**
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Lead (Ground Water)	177	ICPMS	0.297	ug/L	UKAS
m- + p-Xylene (Ground Water)	154	GCMS	<0.49	ug/L	UKAS
Mercury (Ground water)	178	ICPMS	<0.04	ug/L	UKAS
Naphthalene (Ground Water)	154	GCMS	<0.43	ug/L	UKAS
n-Butylbenzene (Ground Water)	154	GCMS	<0.35	ug/L	UKAS
Nickel (Ground Water)	177	ICPMS	3.412	ug/L	UKAS
Nitrogen (Total Kjeldahl)	104	Digestion/ Distillation/ Titrimetr	<1.00	mg/L as N	
Nitrogen (Total Oxidised) (Ground W	151	Colorimetry	<0.28	mg/L as N	UKAS
Nitrogen (Total)	0	Calculation	<1.00	mg/L as N	
n-Propylbenzene (Ground Water)	154	GCMS	<0.39	ug/L	UKAS
o-Xylene (Ground Water)	154	GCMS	<0.33	ug/L	UKAS
pH (Ground Water)	110	Electrometry	7.3	pH Units	UKAS
p-Isopropyltoluene (Ground Water)	154	GCMS	<0.40	ug/L	UKAS
sec-Butylbenzene (Ground Water)	154	GCMS	<0.48	ug/L	UKAS
SemiVolatile Organic Compounds	155	GCMS	<0.5	ug/L	
Styrene (Ground Water)	154	GCMS	<0.26	ug/L	UKAS
tert-Butylbenzene (Ground Water)	154	GCMS	<0.59	ug/L	UKAS
Tetrachloroethene (Ground Water)	154	GCMS	<0.33	ug/L	UKAS
Toluene (Ground Water)	154	GCMS	<0.40	ug/L	UKAS
Total Xylene (Ground Water)	154	GCMS	<0.49	ug/L	UKAS
trans-1,2-Dichloroethene (Ground W	154	GCMS	<0.34	ug/L	UKAS
trans-1,3-Dichloropropene (Ground	154	GCMS	<1.19	ug/L	UKAS
Trichloroethene (Ground Water)	154	GCMS	0.482	ug/L	UKAS
Trichlorofluoromethane (Ground Wat	154	GCMS	<0.52	ug/L	UKAS
Vinyl chloride (Ground Water)	154	GCMS	<0.50	ug/L	UKAS

Signed : A Harmon ***Date : 10/12/2013***

Aoife Harmon - Technical Supervisor

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
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Customer	**Niall Nally** **Nally Environmental** **Drumcree** **Collinstown** **Co. Westmeath**	***Lab Report Ref. No.***	**2925/001/03**
		Date of Receipt	**21/11/2013**
		Sampled On	**21/11/2013**
		Date Testing Commenced	**21/11/2013**
		Received or Collected	**By Fitz: Noel**
		Condition on Receipt	**Acceptable**
Customer PO		***Date of Report***	**10/12/2013**
Customer Ref	**GW1**	***Sample Type***	**Groundwater**
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Volatile Organic Compounds	154	GCMS	<1	ug/L	

Signed : A Harmon ***Date : 10/12/2013***

Aoife Harmon - Technical Supervisor

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
All organic results are analysed as received and all results are corrected for dry weight at 104 C

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Customer	**Niall Nally** **Nally Environmental** **Drumcree** **Collinstown** **Co. Westmeath**	***Lab Report Ref. No.***	**2925/001/04**
		Date of Receipt	**21/11/2013**
		Sampled On	**21/11/2013**
		Date Testing Commenced	**21/11/2013**
		Received or Collected	**By Fitz: Noel**
		Condition on Receipt	**Acceptable**
Customer PO		***Date of Report***	**10/12/2013**
Customer Ref	**GW2**	***Sample Type***	**Groundwater**
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
1,1,1,2-Tetrachloroethane (Ground	154	GCMS	<0.46	ug/L	UKAS
1,1,1-Trichloroethane (Ground Water	154	GCMS	<0.43	ug/L	UKAS
1,1,2,2-Tetrachloroethane (Ground	154	GCMS	<5.00	ug/L	
1,1,2-Trichloroethane (Ground Water	154	GCMS	<1.67	ug/L	UKAS
1,1-Dichloroethane (Ground Water)	154	GCMS	<0.42	ug/L	UKAS
1,1-Dichloroethene (Ground Water)	154	GCMS	<0.41	ug/L	UKAS
1,1-Dichloropropene (Ground Water)	154	GCMS	<0.39	ug/L	UKAS
1,2,3-Trichlorobenzene (Ground Wat	154	GCMS	<0.34	ug/L	UKAS
1,2,3-Trichloropropane (Ground Wate	154	GCMS	<0.61	ug/L	UKAS
1,2,4-Trichlorobenzene (Ground Wat	154	GCMS	<0.51	ug/L	UKAS
1,2,4-Trimethylbenzene (Ground Wat	154	GCMS	<0.52	ug/L	UKAS
1,2-Dibromo-3-chloropropane (Groun	154	GCMS	<0.63	ug/L	UKAS
1,2-Dibromoethane (Ground Water)	154	GCMS	<0.63	ug/L	UKAS
1,2-Dichlorobenzene (Ground Water)	154	GCMS	<0.51	ug/L	UKAS
1,2-Dichloroethane (Ground Water)	154	GCMS	<0.45	ug/L	UKAS
1,2-Dichloropropane (Ground Water)	154	GCMS	<0.75	ug/L	UKAS
1,3,5-Trimethylbenzene (Ground Wat	154	GCMS	<0.33	ug/L	UKAS
1,3-Dichlorobenzene (Ground Water)	154	GCMS	<0.47	ug/L	UKAS
1,3-Dichloropropane (Ground Water)	154	GCMS	<0.64	ug/L	UKAS
1,4-Dichlorobenzene (Ground Water)	154	GCMS	<1.21	ug/L	UKAS
2,2-Dichloropropane (Ground Water)	154	GCMS	<5.00	ug/L	
2-Chlorotoluene (Ground Water)	154	GCMS	<0.55	ug/L	UKAS
4-Chlorotoluene (Ground Water)	154	GCMS	<0.43	ug/L	UKAS
Aluminium (Ground Water)	177	ICPMS	<0.79	ug/L	UKAS
Arsenic (Ground Water)	177	ICPMS	19.14	ug/L	UKAS

Signed : A Harmon ***Date : 10/12/2013***

Aoife Harmon - Technical Supervisor

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results contained in this report relate only to the samples tested
**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

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Customer	**Niall Nally** **Nally Environmental** **Drumcree** **Collinstown** **Co. Westmeath**	***Lab Report Ref. No.***	**2925/001/04**
		Date of Receipt	**21/11/2013**
		Sampled On	**21/11/2013**
		Date Testing Commenced	**21/11/2013**
		Received or Collected	**By Fitz: Noel**
		Condition on Receipt	**Acceptable**
Customer PO		***Date of Report***	**10/12/2013**
Customer Ref	**GW2**	***Sample Type***	**Groundwater**
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Benzene (Ground Water)	154	GCMS	<0.35	ug/L	UKAS
Bromobenzene (Ground Water)	154	GCMS	<0.40	ug/L	UKAS
Bromochloromethane (Ground Water	154	GCMS	<0.76	ug/L	UKAS
Bromodichloromethane (Ground Wat	154	GCMS	<0.63	ug/L	UKAS
Bromoform (Ground Water)	154	GCMS	<1.31	ug/L	UKAS
Bromomethane (Ground Water.)	154	GCMS	<5.00	ug/L	
Carbon tetrachloride (Ground Water.)	154	GCMS	<0.41	ug/L	UKAS
Chloride (Ground Water)	100	Colorimetry	18.85	mg/L	UKAS
Chlorobenzene (Ground Water.)	154	GCMS	<0.49	ug/L	UKAS
Chloroethane (Ground Water)	154	GCMS	<5.00	ug/L	
Chloroform (Ground Water)	154	GCMS	<0.32	ug/L	UKAS
Chloromethane (Ground Water)	154	GCMS	<5.00	ug/L	
Chromium (Ground Water)	177	ICPMS	<2.14	ug/L	UKAS
cis-1,2-Dichloroethene (Ground Wate	154	GCMS	<0.56	ug/L	UKAS
cis-1,3-Dichloropropene (Ground Wat	154	GCMS	<0.69	ug/L	UKAS
Conductivity (Ground Water at 20C)	112	Electrometry	451	uscm -1@20C	UKAS
Dibromochloromethane (Ground Wat	154	GCMS	<0.47	ug/L	UKAS
Dibromomethane (Ground Water)	154	GCMS	<0.86	ug/L	UKAS
Dichlorodifluoromethane (Ground Wa	154	GCMS	<5.00	ug/L	
Dichloromethane (Ground Water)	154	GCMS	<5.00	ug/L	
E. coli	157	Filtration/ Incubation 37C/ 24H	0	cfu/ 100ml	
Ethylbenzene (Ground Water)	154	GCMS	<0.42	ug/L	UKAS
Hexachlorobutadiene (Ground Water)	154	GCMS	<0.36	ug/L	UKAS
Iron (Ground Water)	177	ICPMS	69.26	ug/L	UKAS
Isopropylbenzene (Ground Water)	154	GCMS	<0.42	ug/L	UKAS

Signed : A Harmon ***Date : 10/12/2013***

Aoife Harmon - Technical Supervisor

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Results contained in this report relate only to the samples tested
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Customer	**Niall Nally** **Nally Environmental** **Drumcree** **Collinstown** **Co. Westmeath**	***Lab Report Ref. No.***	**2925/001/04**
		Date of Receipt	**21/11/2013**
		Sampled On	**21/11/2013**
		Date Testing Commenced	**21/11/2013**
		Received or Collected	**By Fitz: Noel**
		Condition on Receipt	**Acceptable**
Customer PO		***Date of Report***	**10/12/2013**
Customer Ref	**GW2**	***Sample Type***	**Groundwater**
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Lead (Ground Water)	177	ICPMS	<0.02	ug/L	UKAS
m- + p-Xylene (Ground Water)	154	GCMS	<0.49	ug/L	UKAS
Mercury (Ground water)	178	ICPMS	<0.04	ug/L	UKAS
Naphthalene (Ground Water)	154	GCMS	<0.43	ug/L	UKAS
n-Butylbenzene (Ground Water)	154	GCMS	<0.35	ug/L	UKAS
Nickel (Ground Water)	177	ICPMS	31.91	ug/L	UKAS
Nitrogen (Total Kjeldahl)	104	Digestion/ Distillation/ Titrimetr	<1.00	mg/L as N	
Nitrogen (Total Oxidised) (Ground W	151	Colorimetry	<0.28	mg/L as N	UKAS
Nitrogen (Total)	0	Calculation	<1.00	mg/L as N	
n-Propylbenzene (Ground Water)	154	GCMS	<0.39	ug/L	UKAS
o-Xylene (Ground Water)	154	GCMS	<0.33	ug/L	UKAS
pH (Ground Water)	110	Electrometry	7.2	pH Units	UKAS
p-Isopropyltoluene (Ground Water)	154	GCMS	<0.40	ug/L	UKAS
sec-Butylbenzene (Ground Water)	154	GCMS	<0.48	ug/L	UKAS
SemiVolatile Organic Compounds	155	GCMS	<0.5	ug/L	
Styrene (Ground Water)	154	GCMS	<0.26	ug/L	UKAS
tert-Butylbenzene (Ground Water)	154	GCMS	<0.59	ug/L	UKAS
Tetrachloroethene (Ground Water)	154	GCMS	<0.33	ug/L	UKAS
Toluene (Ground Water)	154	GCMS	<0.40	ug/L	UKAS
Total Xylene (Ground Water)	154	GCMS	<0.49	ug/L	UKAS
trans-1,2-Dichloroethene (Ground W	154	GCMS	<0.34	ug/L	UKAS
trans-1,3-Dichloropropene (Ground	154	GCMS	<1.19	ug/L	UKAS
Trichloroethene (Ground Water)	154	GCMS	<0.23	ug/L	UKAS
Trichlorofluoromethane (Ground Wat	154	GCMS	<0.52	ug/L	UKAS
Vinyl chloride (Ground Water)	154	GCMS	<0.50	ug/L	UKAS

Signed : A Harmon ***Date : 10/12/2013***

Aoife Harmon - Technical Supervisor

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results contained in this report relate only to the samples tested
**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

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Customer	**Niall Nally** **Nally Environmental** **Drumcree** **Collinstown** **Co. Westmeath**	***Lab Report Ref. No.***	**2925/001/04**
		Date of Receipt	**21/11/2013**
		Sampled On	**21/11/2013**
		Date Testing Commenced	**21/11/2013**
		Received or Collected	**By Fitz: Noel**
		Condition on Receipt	**Acceptable**
Customer PO		***Date of Report***	**10/12/2013**
Customer Ref	**GW2**	***Sample Type***	**Groundwater**
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Volatile Organic Compounds	154	GCMS	<1	ug/L	

Signed : A Harmon ***Date : 10/12/2013***

Aoife Harmon - Technical Supervisor

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results contained in this report relate only to the samples tested
**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

APPENDIX 6

Waste Received in 2013

Table 1: Total Civic Amenity waste received in 2013 at KMK Metals Recycling Ltd.

Point of Collection	Description Of Waste	EWC Code	Qty Tonnes
Civic Amenity Site	Batteries (Lead)	16 06 01*	48.912
Civic Amenity Site	Batteries (Nickel Cadmium)	16 06 02*	0.017
Civic Amenity Site	Batteries (Fence)	16 06 04	21.483
Civic Amenity Site	Batteries (Alkaline)	16 06 04	34.217
Civic Amenity Site	Fluorescent tubes and other mercury-containing waste	20 01 21*	57.130
Civic Amenity Site	Discarded equipment containing chlorofluorocarbons	20 01 23*	777.436
Civic Amenity Site	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*	3.901
Civic Amenity Site	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	2129.812
Civic Amenity Site	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	20 01 36	4182.969
TOTAL			**7,255.877**

Table 2: Total Commercial waste received in 2013 at KMK Metals Recycling Ltd.

Point of Collection	Description Of Waste	EWC Code	Qty Tonnes
Commercial	Sludges (other than 06 05 02*)	06 05 03	0.464
Commercial	Ferrous metal filings and materials	12 01 01	206.868
Commercial	Ferrous metal dust and particles	12 01 02	5.349
Commercial	Non-ferrous metal filings and turnings	12 01 03	198.849
Commercial	Non-ferrous metal dust and particles	12 01 04	20.445
Commercial	Welding wastes (solder dross)	12 01 13	3.769
Commercial	Oxide Powders	12 01 17	6.457
Commercial	Spent grinding bodies, dusts and powders	12 01 20*	0.144
Commercial	Non hazardous Spent grinding bodies	12 01 21	3.704
Commercial	Cardboard Packaging	15 01 01	10.209
Commercial	Plastic Packaging	15 01 02	0.857
Commercial	Timber (Pallets & Packaging)	15 01 03	1.616
Commercial	Mixed packaging	15 01 06	3.165
Commercial	Wiping cloths	15 02 03	0.423
Commercial	Engines from ELV (cars)	16 01 22	31.299
Commercial	Capacitors potentially containing PCB's	16 02 09*	0.505
Commercial	Discarded equipment containing chlorofluorocarbons, HCFC, HFC	16 02 11*	45.633
Commercial	Discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	16 02 13*	235.847
Commercial	Discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14	718.111
Commercial	Components removed from discarded equipment other than those mentioned in 16 02 15	16 02 16	864.828

Table 2: Total Commercial waste received in 2013 at KMK Metals Recycling Ltd.

Point of Collection	Description Of Waste	EWC Code	Qty Tonnes
Commercial	Inorganic wastes other than those mentioned in 16 03 03	16 03 04	9.242
Commercial	Batteries (Lead)	16 06 01*	362.122
Commercial	Batteries (Nickel Cadmium)	16 06 02*	6.079
Commercial	Batteries (Alkaline)	16 06 04	141.919
Commercial	Other batteries and accumulators	16 06 05	3.112
Commercial	Spent catalysts containing precious metals	16 08 01	0.267
Commercial	Non-ferrous metal	19 12 03	28.510
Commercial	Plastic and rubber	19 12 04	0.085
Commercial	Fluorescent tubes and other mercury-containing waste	20 01 21*	32.374
Commercial	Discarded equipment containing chlorofluorocarbons	20 01 23*	859.587
Commercial	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*	13.932
Commercial	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	862.150
Commercial	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	20 01 36	3337.706
Commercial	Metals	20 01 40	39.034
Commercial	Other fractions not otherwise specified	20 01 99	0.068
TOTAL			**8,054.729**

Table 3: Total Industrial waste received in 2013 at KMK Metals Recycling Ltd.

Point of Collection	Description Of Waste	EWC Code	Qty Tonnes
Industrial	Metal alloys and stainless steel materials	06 04 99	50.935
Industrial	Sludges containing dangerous substances	06 05 02*	11.801
Industrial	Wastes not otherwise specified	06 13 99	1.933
Industrial	Filter Cake	07 07 10*	26.687
Industrial	Casting cores and moulds	10 10 08	38.143
Industrial	Sludges and filter cakes containing dangerous substances	11 01 09*	2.961
Industrial	Ferrous metal filings and materials	12 01 01	18.200
Industrial	Non-ferrous metal filings and turnings	12 01 03	123.124
Industrial	Non-ferrous metal dust and particles	12 01 04	113.115
Industrial	Welding wastes (solder dross)	12 01 13	3.306
Industrial	Waste blasting material containing dangerous substances	12 01 16*	1.011
Industrial	Oxide Powders	12 01 17	53.456
Industrial	Spent grinding bodies, dusts and powders	12 01 20*	1.208
Industrial	Non hazardous Spent grinding bodies	12 01 21	1.560
Industrial	Waste Oil from WEEE (Radiators)	13 02 08*	0.290
Industrial	Plastic Packaging	15 01 02	0.435
Industrial	Timber (Pallets & Packaging)	15 01 03	0.224
Industrial	Mixed packaging	15 01 06	0.383
Industrial	Wiping cloths	15 02 03	0.462
Industrial	Discarded equipment containing chlorofluorocarbons, HCFC, HFC	16 02 11*	2.429
Industrial	Discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	16 02 13*	41.551
Industrial	Discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14	72.228
Industrial	Components removed from discarded equipment other than those mentioned in 16 02 15	16 02 16	89.978
Industrial	Batteries (Lead)	16 06 01*	3.055
Industrial	Batteries (Nickel Cadmium)	16 06 02*	0.007
Industrial	Batteries (Alkaline)	16 06 04	1.761

Table 3: Total Industrial waste received in 2013 at KMK Metals Recycling Ltd.

Point of Collection	Description Of Waste	EWC Code	Qty Tonnes
Industrial	Other batteries and accumulators	16 06 05	0.191
Industrial	Non-ferrous metal	19 12 03	3.751
Industrial	Fluorescent tubes and other mercury-containing waste	20 01 21*	1.364
Industrial	Discarded equipment containing chlorofluorocarbons	20 01 23*	1.203
Industrial	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*	0.648
Industrial	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	0.379
Industrial	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	20 01 36	4.151
Industrial	Metals	20 01 40	21.677
TOTAL			**693.607**

Table 4: Total Transfer Station waste received in 2013 at KMK Metals Recycling Ltd.

Point of Collection	Description Of Waste	EWC Code	Qty Tonnes
Transfer Station	Ferrous metal filings and materials	12 01 01	291.321
Transfer Station	Non-ferrous metal filings and turnings	12 01 03	14.201
Transfer Station	Welding wastes (solder dross)	12 01 13	7.751
Transfer Station	Timber (Pallets & Packaging)	15 01 03	8.753
Transfer Station	Aluminium Blister Pack Shred	15 01 04	6.814
Transfer Station	Mixed packaging	15 01 06	8.918
Transfer Station	Capacitors potentially containing PCB's	16 02 09*	1.224
Transfer Station	Discarded equipment containing chlorofluorocarbons, HCFC, HFC	16 02 11*	7.453
Transfer Station	Discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	16 02 13*	157.471
Transfer Station	Discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14	1973.360
Transfer Station	Hazardous components removed from discarded equipment	16 02 15*	0.120
Transfer Station	Components removed from discarded equipment other than those mentioned in 16 02 15	16 02 16	238.204
Transfer Station	Batteries (Lead)	16 06 01*	55.919
Transfer Station	Batteries (Nickel Cadmium)	16 06 02*	15.799
Transfer Station	Batteries (Fence)	16 06 04	6.681
Transfer Station	Batteries (Nickel Metal Hydride)	16 06 05	3.005
Transfer Station	Non-ferrous metal	19 12 03	0.846
Transfer Station	Plastic and rubber	19 12 04	97.989
Transfer Station	Fluorescent tubes and other mercury-containing waste	20 01 21*	35.786
Transfer Station	Discarded equipment containing chlorofluorocarbons	20 01 23*	443.554
Transfer Station	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	20 01 33*	1.636
Transfer Station	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	20 01 35*	494.517
Transfer Station	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	20 01 36	1466.706
TOTAL			**5,338.028**

Waste Despatched in 2013

Table 1: Waste despatched in 2013 at KMK Metals Recycling Ltd.

Description Of Waste	**EWC Code**	**Qty Tonnes**
Sludges containing dangerous substances	06 05 02*	145.150
Filter Cake containing dangerous substances	07 07 10*	21.880
Welding waste (non-ferrous metal)	12 01 13	10.847
Spent grinding bodies and grinding materials containing dangerous substances	12 01 20*	164.269
Waste oil for recovery	13 02 08*	24.850
Packaging for Recycling (Plastic)	15 01 02	7.280
Packaging for Recycling (Timber)	15 01 03	26.230
Packaging for Recycling (Mixed)	15 01 06	152.690
Discarded Equipment (Fridges)	16 02 11*	2,088.740
Discarded Equipment (Flat Screens)	16 02 13*	17.228
Discarded Equipment (from Small Domestic Appliances)	16 02 13*	472.140
Discarded Equipment (IT / CPUs)	16 02 14	591.558
Discarded Equipment (Light Iron)	16 02 14	1,150.408
Discarded Equipment (Steel from Large Appliances)	16 02 14	6,496.020
Discarded Equipment (Glass from CRT TV's and Monitors)	16 02 15*	2,057.480
Discarded Equipment (Non-ferrous metal)	16 02 16	2,716.591
Discarded Equipment (Plastics from WEEE)	16 02 16	1,265.940
Batteries (Lead Acid)	16 06 01*	459.300
Batteries (Ni-Cd)	16 06 02*	18.410
Batteries (Alkaline)	16 06 04	270.572
Wastes from mechanical treatment - Ferrous Metal	19 12 02	179.533
Wastes from mechanical treatment - Non-ferrous metal	19 12 03	1,352.902
Wastes from mechanical treatment - Mineral Waste	19 12 09	17.838
Wastes from mechanical treatment - Waste to Energy	19 12 12	669.069
Fluorescent Tubes & Bulbs	20 01 21*	87.048
Batteries (Unsorted)	20 01 33*	2.500
Batteries (Unsorted Button Cells)	20 01 33*	6.459
TOTAL		**20,472.932**

Waste in Stock in 2013

Table 1: Waste in stock at end of 2013 at KMK Metal Recycling Ltd.

Description Of Waste	EWC Code	Qty Tonnes
Sludges containing dangerous substances	06 05 02*	8.770
Waste not specified (graphite)	06 13 99	2.526
Ferrous metal filings and turnings	12 01 01	0.184
Non-ferrous metal filings and turnings	12 01 03	63.971
Non-ferrous metal dust and particles	12 01 04	16.447
Waste blasting material containing dangerous substances	12 01 16*	0.722
Waste blasting material other than those mentioned in 12 01 16	12 01 17	16.671
Spent grinding bodies and grinding materials	12 01 21	14.145
Waste oil for recovery	13 02 08*	1.930
Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	15 02 03	2.084
Discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	16 02 13*	144.230
Discarded equipment other than those mentioned in 16 02 09 to 16 02 13	16 02 14	100.719
Discarded equipment (CRT Glass)	16 02 15*	9.000
Components removed from discarded equipment other than those mentioned in 16 02 15	16 02 16	145.722
Discarded inorganic chemicals containing dangerous substances (CRT phosphorus powder)	16 05 07*	1.494
Batteries (Lead)	16 06 01*	34.350
Batteries (Nickel Cadmium)	16 06 02*	4.776
Batteries (Mercury containing)	16 06 03*	1.506
Batteries (Alkaline)	16 06 04	9.971
Batteries (Other)	16 06 05	9.617
Spent catalysts	16 08 01	0.008
Ferrous metal	19 12 02	8.500
Non-ferrous metal	19 12 03	4.176
Other wastes (including mixtures of materials) from mechanical treatment	19 12 12	183.500
Fluorescent Tubes & Bulbs	20 01 21*	3.500
Discarded equipment containing chlorofluorocarbons	20 01 23*	24.000
Batteries (Unsorted)	20 01 33*	8.544
Discarded electrical and electronic equipment	20 01 36	172.000
TOTAL		**993.063**

APPENDIX 7

PRTR Report 2013

| PRTR# : W0113 | Facility Name : KMK Metals Recycling Limited | Filename : W0113_2013 KMK 02-04-2014.xls | Return Year : 2013 |

Environmental Protection Agency

Guidance to completing the PRTR workbook

AER Returns Workbook

REFERENCE YEAR	2013

1. FACILITY IDENTIFICATION

Parent Company Name	KMK Metals Recycling Limited
Facility Name	KMK Metals Recycling Limited
PRTR Identification Number	W0113
Licence Number	W0113-04

Waste or IPPC Classes of Activity

No.	class_name
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.12	Exchange of waste for submission to any activity referred to in a preceding paragraph of this Schedule.
4.3	Recycling or reclamation of metals and metal compounds.
4.4	Recycling or reclamation of other inorganic materials.
4.6	Recovery of components used for pollution abatement.
4.7	Recovery of components from catalysts.
Address 1	Cappincur Industrial Estate
Address 2	Daingean Road
Address 3	Tullamore
Address 4	Co Offaly
	Offaly
Country	Ireland
Coordinates of Location	-7.462581076 53.27421423
River Basin District	IEGBNISH
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Niall Nally
AER Returns Contact Email Address	info@nallyenvironmental.ie
AER Returns Contact Position	Environmental Consultant
AER Returns Contact Telephone Number	04496 66773
AER Returns Contact Mobile Phone Number	086 8547071
AER Returns Contact Fax Number	none
Production Volume	35000.0
Production Volume Units	tonnes
Number of Installations	1
Number of Operating Hours in Year	4848
Number of Employees	70
User Feedback/Comments	Please note that on tab 'treatment & transfers of waste' all data is to be taken as confidential. New hazardous waste entries were entered in on rows 28 & 32 and Belgium was entered in under abroad destination as a way of completion of the PRTR but only as an example.
Web Address	www.kmk.ie

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
5(a)	Installations for the recovery or disposal of hazardous waste
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
Have you been granted an exemption ?	No
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	Not applicable
Is the reduction scheme compliance route being used ?	Not applicable

4. WASTE IMPORTED/ACCEPTED ONTO SITE **Guidance on waste imported/accepted onto site**

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	

4.1 RELEASES TO AIR Link to previous years emissions data

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
		Method Used						
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
		Method Used						
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
		Method Used			A2-9			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
244	Total Particulates	M	EN 14385:2004	Stack Emission Point	85.65	85.65	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: KMK Metals Recycling Limited

Please enter summary data on the quantities of methane flared and / or utilised	T (Total) kg/Year	M/C/E	Method Used: Method Code	Method Used: Designation or Description	Facility Total Capacity m3 per hour	
Total estimated methane generation (as per site model)	0.0				N/A	
Methane flared	0.0				0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	0.0				N/A	

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes

0

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
To Other Countries	06 05 02	Yes	145.15	sludges from on-site effluent treatment containing dangerous solutions	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,Ireland	,,,,,,,Ireland
To Other Countries	12 01 13	No	10.847	welding wastes	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
To Other Countries	12 01 20	Yes	164.269	spent grinding bodies and grinding materials containing dangerous substances	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,Ireland	,,,,,,,Ireland
Within the Country	13 02 08	Yes	24.85	other engine, gear and lubricating oils	R3	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,Ireland	,,,,,,,Ireland
Within the Country	15 01 03	No	26.23	wooden packaging	R3	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	15 01 06	No	152.69	mixed packaging	R5	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
To Other Countries	16 02 11	Yes	1873.8	discarded equipment containing chlorofluorocarbons, HCFC, HFC	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,Ireland	,,,,,,,Ireland
To Other Countries	16 02 13	Yes	472.14	discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,Ireland	,,,,,,,Ireland
Within the Country	16 02 13	Yes	17.228	discarded equipment containing hazardous components (16) other than those mentioned in 16 02 09 to 16 02 12	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,Ireland	,,,,,,,Ireland
To Other Countries	16 02 14	No	7170.906	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
To Other Countries	16 02 15	Yes	2057.48	hazardous components removed from discarded equipment	R5	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,Ireland	,,,,,,,Ireland
To Other Countries	16 02 16	No	2895.689	components removed from discarded equipment other than those mentioned in 16 02 15	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	16 02 16	No	1086.842	components removed from discarded equipment other than those mentioned in 16 02 15	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
To Other Countries	16 06 01	Yes	459.3	lead batteries	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,Ireland	,,,,,,,Ireland

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
To Other Countries	16 06 04	No	259.684	alkaline batteries (except 16 06 03)	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	16 06 04	No	10.888	alkaline batteries (except 16 06 03)	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
To Other Countries	19 12 02	No	107.953	ferrous metal	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	19 12 02	No	71.58	ferrous metal	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	19 12 03	No	1011.99	non-ferrous metal	R5	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	19 12 09	No	17.838	minerals (for example sand, stones)	R5	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	19 12 12	No	669.069	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	20 01 21	Yes	87.048	fluorescent tubes and other mercury-containing waste	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,,Ireland	,,,,,,,Ireland
Within the Country	20 01 33	Yes	8.959	batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,,Ireland	,,,,,,,Ireland
To Other Countries	07 07 10	Yes	21.88	other filter cakes and spent sbsorbents	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,,Belgium	,,,,,,,Belgium
Within the Country	15 01 02	No	7.28	plastic packaging	R3	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
Within the Country	16 02 11	Yes	214.94	discarded equipment containing chlorofluorocarbons, HCFC, HFC	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,,Ireland	,,,,,,,Ireland
Within the Country	16 02 14	No	1067.08	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	R4	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		
To Other Countries	16 06 02	Yes	18.41	Ni-Cd batteries	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland	Confidential Information,,,,,,,,,,Belgium	,,,,,,,Belgium
To Other Countries	19 12 03	No	340.912	non-ferrous metal	R4	M	Weighed	Abroad	KMK Metals Recycling Ltd ,W0113-03	Cappincur Industrial Estate,Daingean Road,Tullamore,Co Offaly,Ireland		

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					

APPENDIX 8

Bund Assessment Report 2013

NALLY ENVIRONMENTAL

Environmental
& Waste Management
Consultancy

BUND ASSESSMENT REPORT

FOR

KMK METALS RECYCLING LTD.

Waste License ref: W0113-03

AT

CAPPINCUR IND. ESTATE, TULLAMORE, CO OFFALY,

4th March 2013

SIGNED: Niall Nally

Niall Nally B.Sc, M.Sc, AIEMA, MCIWM

Senior Environmental Consultant

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2.0 BUND ASSESSMENT 4
2.1 The following bunded areas were investigated on-site; 4
2.2 Bund assessments 4
3.0 CONCLUSIONS 13

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Table 3.1 Bund Assessment Recommendations

1.0 INTRODUCTION

This report has been produced by Nally Environmental on behalf of KMK Metals Recycling Ltd (KMK), Cappincur Industrial Estate, Daingean Road, Tullamore, Co Offaly.

1.1 RELEVANT LEGAL GUIDANCE AND CONTEXT.

This bund assessment makes reference to the following relevant documents;

- The Environmental Protection Agency (EPA) guidelines 'The Storage and Transfer of Materials for Scheduled Activities' (2004)
- Updated bund integrity test template: http://www.epa.ie/downloads/advice/licensee/name,50899,en.html

1.2 GENERAL BUNDS DESCRIPTIONS AND CONSIDERATIONS

Bunds are regarded as secondary containment systems and are used to prevent oil and liquids escaping to the environment in the event of a leakage from the tanks or ancillary equipment stored inside.

A typical bund consists of a mass concrete base and walled enclosure. The bund walls are usually half a meter to a meter high. For bunds to be effective, the following items are necessary:

- The bund must be of adequate size to contain the liquids stored inside.
- The bund walls have to be strong enough to contain the contents of the tank without danger of collapse. Therefore reinforced mass concrete instead of bricks and hollow blocks should be used.
- The bund walls have to be high enough to avoid jetting failure (jets of liquid out over the bund structure).
- Finally the bund has to be impervious to the liquid stored in the tank and to water.

Furthermore, according to the EPA guidelines (2004) previously referred in relation to bunds, the following items apply;

- The sealed surface providing the retention must be impermeable to the liquid being retained. This applies also to any connecting elements, such as pipes, penetrating the structure, the sealing of which must provide the same level of retention as the bund itself;

- There must be no adverse chemical reaction that could occur between different liquids in a bund that would impact on the integrity of the bund or the safety of personnel in its vicinity;

- In general bund walls should not exceed 1.5m in height so that:
  - Fire-fighting operations are not hindered
  - Egress from a bunded area in event of an emergency is relatively easy
  - Natural ventilation of the bunded area is encouraged.

- It is important that, where practicable, pumps, valves, couplings, delivery nozzles and other items associated with the operation of a tank are located inside the bund, although health and safety implications must be taken into account where pumps and other electrical equipment operate in bunds where flammable vapours may collect. Items not connected with the operation of the tanks should not be located within the bunded area;

- The overflow vent from a storage tank being overfilled should be contained within the bund;

- It is strongly recommended that all pipe work leading to or from tanks within a bund is routed over the top of the bund in order to avoid the need to breach the walls;

- Bunds may be filled with liquid in event of a spillage or may be deliberately filled with liquid during testing; electrical equipment should therefore ideally be placed above the maximum liquid height or designed for submersion;

- Bulk chemical storage bunds should be designed to contain 110% of the capacity of the largest storage vessel located within the bund;

- Bund design should take into account the capture of spigot flow from ruptured tanks;

- Valved drainage from bunds should be avoided;

- Individual bunding is preferred to common bunding;

- Where two or more tanks are installed within the same bund, the recommended capacity of the bund is the greater of:

  - 110% of the capacity of the largest tank within the bund, or

- 25% of the total capacity of all of the tanks within the bund, except where tanks are hydraulically linked in which case they should be treated as if they were a single tank.

2.0 BUND ASSESSMENT

2.1 The following bunded areas were investigated on-site;

- Bund 01 - Mobile Bund used for Radiator Oil Draining
- Bund 02 - Mobile Bund used for Diesel and Kerosene Tanks
- Bund 03 - A, B building floor, including sump in B area

2.2 BUND ASSESSMENTS

The details of the bund assessments are provided in the data sheets below:

DATA SHEET: BUNDING STRUCTURES – Bund 01

Company: KMK	**Photo / sketch** Photos 1 & 2
Site: Cappincur Ind Estate, Tullamore	
Bund Ref No: Bund 01 Radiator oil draining area	
Bund Location: Inside D-WEEE plant building	
Bund Dimensions: L = 4.0m, W = 2.5m, H = 0.07m	**Vessel(s) – Materials of Construction:** 1 x plastic IBC tank
Bund Construction Material: Steel construction mobile unit	**Vessel(s) – Total Storage Volume:** Vessel 1 –1m^3 , actual storage 900litres
Bund Lining Material: None – all steel construction	**Vessel(s) – 110% of Volume of Largest Vessel:** 1.1m^3 or 1,100 litres 110% of actual storage volume: **0.99m^3**
Bund Retention Volume: 0.7m^3 or **700litres**	**Vessel(s) – 25% of Total Storage Volume**: 0.25m^3 25% of actual storage volume: 225litres
Bund Capacity test pass/fail? Fail	
Tank Contents: Used radiator oils from draining of domestic oil filled radiators	**WGK Class & R Phrases:** WGK Class: Possible 2 (waste synthetic oil substance) Risk Phrases: unknown
Deemed practicable / safe to conduct hydrostatic test? Yes	
If no, give reasons: none	
Description and Results of Hydrostatic Test:	**Date of Hydrostatic test:**
Bund filled with water on 22-02-13 to the top of metal grid. Left over the weekend. Bund retained water inside with no	From 22-02-13 to 25-02-2013.

evidence of drop in water level or leaking from steel bund unit. See below:	

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	No – not required for small mobile unit inside a building.
Fill Rate	50litres/minute (using drum and fork lift truck)
Stabilisation Period	30mins
Duration of the Test	22-02-2013 to 25-02-2013
Acceptance Criteria (Total permissible drop in water level)	none
Water Level Change in Reference Vessel	none

Date and Time	Water Level in Bund	Water Level in Reference Vessel
11.30, 22-02	0.07m	No reference vessel used or required. A leak from the bund would be immediately noticeable
11.30, 25-02	0.07m	As above

Result (Pass/Fail)	**PASS**
Description and Results of Visual Inspection:	**Date of Visual Inspection:** 22-02-2013 & 25-02-2013

- Steel bund unit was fully empty and cleaned out prior to inspection.
- Bund in good condition with no obvious defects.
- IBC tank positioned on top of metal grate of steel bund unit
- No evidence of water leakage from flooding procedure.

Bund Contents: Low Risk	**Bund Condition**: Good	**Action**: Carry out recommendations

Recommendations:

- Ensure daily visual inspections of the bund and tank inside the bund to ensure no leaks or spills occurring.
- Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present).
- Conduct a re-test in three years time.

Signed: Niall Nally	**Qualification:** Environmental Consultant	**Date:** 04/03/13

Photos 1&2 – Radiator oil storage bund 01 inside D-WEEE plant building.

Photo 1 – overview of bunded unit

Photo 2 – base of bund

Photo 3 – close-up of radiator draining unit

DATA SHEET: BUNDING STRUCTURES – Bund 02

Company: KMK	**Photo / sketch**
Site: Cappincur Ind Estate, Tullamore	Photos 4, 5 & 6
Bund Ref No: Bund 02 Kerosene & diesel tank store	
Bund Location: Inside D-WEEE plant building	
Bund Dimensions: L = 4.2m, W = 2.5m, H = 0.40m	**Vessel(s) – Materials of Construction:** 2 x plastic tanks (double skinned type)
Bund Construction Material: Steel construction mobile unit	**Vessel(s) – Total Storage Volume:** Vessel 1 – Diesel (gas oil) marked tank $3.2m^3$, actual storage 3,200litres (max) Vessel 2 – Kerosene marked tank, $1.1m^3$, actual storage 1,100litres (max)
Bund Lining Material: None – all steel construction	**Vessel(s) – 110% of Volume of Largest Vessel:** $3.2m^3$ or 3,200 litres 110% of max storage volume: **$3.52m^3$**
Bund Retention Volume: $4.2m^3$ or 4,200 litres	**Vessel(s) – 25% of Total Storage Volume**: $1.075m^3$
Bund Capacity test pass/fail? Pass	
Tank Contents: Separate tanks for Diesel and Kerosene	**WGK Class & R Phrases:** Kerosene: WGK Class: 1 Risk Phrases: R10, R38, R51/53, R65 Diesel (marked gas oil): WGK Class: 2 Risk Phrases: R20, R65, R66, R51/53
Deemed practicable / safe to conduct hydrostatic test? Yes	
If no, give reasons: none	
Description and Results of Hydrostatic Test:	**Date of Hydrostatic test:**
Bund flooding with water on 22-02-13 to a height of 0.34cm. Left over the weekend. Bund retained water inside with no evidence of drop in water level or leaking from steel bund unit. See below:	From 22-02-13 to 25-02-2013.

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	No – not required for steel construction mobile unit permanently inside a building.
Fill Rate	50litres/minute (using two water supply hoses)
Stabilisation Period	30mins
Duration of the Test	22-02-2013 to 25-02-2013
Acceptance Criteria (Total permissible drop in water level)	none
Water Level Change in Reference Vessel	none

Date and Time	Water Level in Bund	Water Level in Reference Vessel
12.00, 22-02	0.34m	No reference vessel used or required. A leak from the bund would be immediately noticeable
12.00, 25-02	0.34m	As above

Result (Pass/Fail)	**PASS**
Description and Results of Visual Inspection:	**Date of Visual Inspection:** 22-02-13 & 25-02-2013

- 2 x tanks (vessels), diesel pump & pipes in bund are in good condition. Both tanks are double skinned so any possible leak of the first tank will be contained inside the second outer plastic case. This gives additional leak/spill protection.
- Bund in good condition and fully contained in steel construction inside building.
- A tape measure was used to dip inside between the two tank skins. This resulted in a clean tape with no obvious liquid leaks inside.
- The tanks and associated fuelling pumps are located inside the bund walls (photo 4) to prevent spills.

Bund Contents: Medium Risk from the proposed storage of Gas oil and Kerosene	**Bund Condition**: Good	**Action**: Carry out recommendations

Recommendations:

- Ensure daily visual inspections of the bund and tank inside the bund to ensure no leaks or spills occurring.
- Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present).
- Conduct a re-test in three years time.

Signed: Niall Nally	**Qualification:** Environmental Consultant	**Date:** 04/03/13

Photo 4 outside view of unit

Photo 5 close-up view of bund opening

Photo 6 internal view of bund walls, design and condition

Photo 7 internal view of bund

DATA SHEET: BUNDING STRUCTURES – Bund 04

Company: KMK **Site**: Cappincur Ind Estate, Tullamore **Bund Ref No**: Bund 03 A, B inside areas and sump at B area **Sump & drainage channel location**: Inside B building (see figure 1)	**Photo / sketch** Photos 8 & 9
Sump Dimensions: L = 2m, W = 0.95m, H = 0.24m **Drainage channel dimensions:** L = 18m, W = 0.3m, H = 0.16m	**Vessel(s) – Materials of Construction:** None stored at this location
Sump & Channel Construction Material: Pre-cast concrete	**Vessel(s) – Total Storage Volume:** Only wet filter cakes are stored here (on a spill pallet). In addition batteries are stored in dedicated battery boxes also.
Sump & Channel Lining Material: All pre-cast concrete	**Vessel(s) – 110% of Volume of Largest Vessel:** not applicable
Sump Retention Volume: 0.456m^3 or 456 litres **Channel retention volume:** 0.864m^3 or 864 litres **Total retention capacity (sump & channel):** 1.32m^3 or 1,320litres	**Vessel(s) – 25% of Total Storage Volume**: not applicable
Sump and trench Capacity test pass/fail? Pass (minimal liquids stored at this location)	
Deemed practicable / safe to conduct hydrostatic test? No	
If no, give reasons: a flooding of this trench and sump is not required due to the internal status of it and the absence of vessels being stored at this location. It is also impractical to flood this area.	
Description and Results of Hydrostatic Test:	**Date of Hydrostatic test:**
None	N/A

HYDROSTATIC TEST DETAILS:

BS 8007:1987 (Yes/No)?	No
~~**Fill Rate**~~	
~~**Stabilisation Period**~~	
~~**Duration of the Test**~~	
~~**Acceptance Criteria (Total permissible drop in water level)**~~	
~~**Water Level Change in Reference Vessel**~~	

Result (Pass/Fail)	**N/A**

Description and Results of Visual Inspection:	**Date of Visual Inspection:** 22-02-13	
• All sump and drainage channel areas were in good condition. • Two IBC bags of wet filter material was positioned on top of a yellow dedicated spill pallet over the drainage channel for extra spill protection. The spill pallet looked new and of very good condition (photo 9).		
Bund Contents: Medium Risk from the storage of filter materials, lead acid batteries, residual oils etc	**Bund Condition**: Good	**Action**: Carry out recommendations
Recommendations: • Ensure daily visual inspections of the spill pallet and floor area to ensure no leaks or spills occurring on the ground. Check the sump and drainage channel also at weekly intervals. • Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present). • Conduct a re-test in three years time.		
Signed: Niall Nally	**Qualification:** Environmental Consultant	**Date:** 04/07/13

Figure 1 – internal B sump and drainage channel.

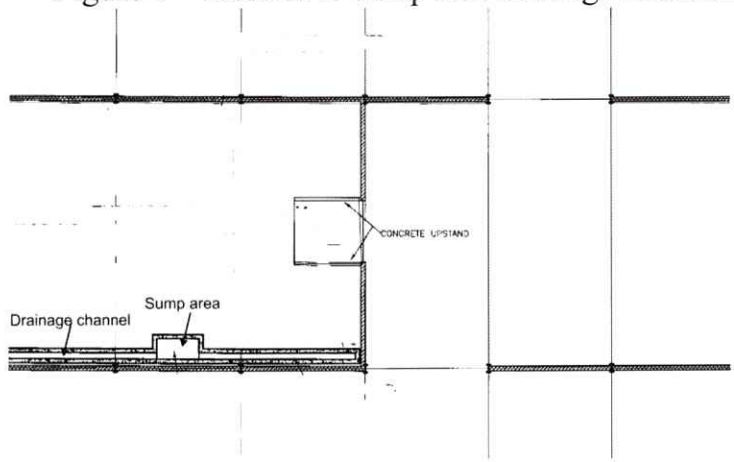

Photo 8 view of internal trench & sump

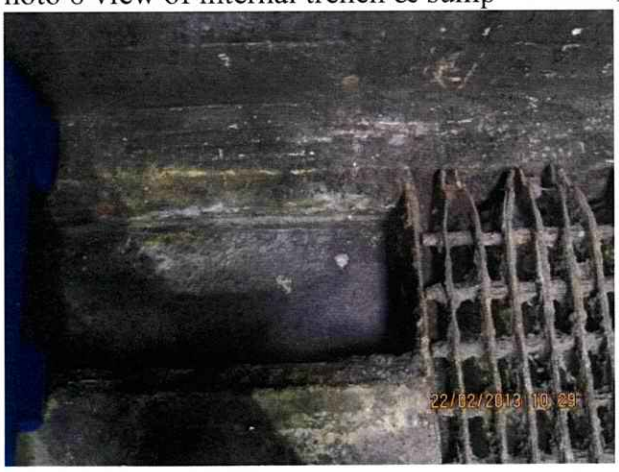

Photo 9 view heavy plastic spill pallet

3.0 CONCLUSIONS

Table 3.1 below summarises the conclusions of the bund assessments.

Table 3.1 Bund Assessment Recommendations

Bund Ref	Capacity result	Hydrostatic result	Recommendations
Bund 01	Fail	Pass	• Ensure daily visual inspections of the bund and tank inside the bund to ensure no leaks or spills occurring. • Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present). • Conduct a re-test in three years time.
Bund 02	Pass	Pass	• Ensure daily visual inspections of the bund and tank inside the bund to ensure no leaks or spills occurring. • Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present). • Conduct a re-test in three years time.
Bund 03	Pass	Not applicable	• Ensure daily visual inspections of the spill pallet and floor area to ensure no leaks or spills occurring on the ground. Check the sump and drainage channel also at weekly intervals. • Ensure a plentiful supply of oil adsorbent materials remains readily available at the bund (as is the case at present). • Conduct a re-test in three years time.