ANNUAL ENVIRONMENTAL REPORT

Waste Licence Registration No.:	W0167-03
Licensee:	Indaver Ireland Limited
Location of Activity:	Carranstown, Duleek, Co-Meath
Attention:	Environmental Protection Agency Office of Environmental Enforcement McCumiskey House, Richview Clonskeagh Road Dublin 14

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1. Waste Recovery Report

As a recovery option, the waste-to-energy facility can contribute to packaging recovery targets set out under the Packaging Directive (currently 60% recovery). It is estimated that up to 48,000t residual packaging waste in the MSW accepted will be recovered at the facility.

The facility contributed to the national target of diverting 50% household waste from landfill. Approximately 165,903 tonnes of municipal type waste (EWC code Chapter 20) was treated at the facility in 2015, compared with 589,693 tonnes[1] household waste disposed of to landfill in the country.

The End of Life Vehicles Directive sets a minimum reuse and recovery target of 85% from 2006 increasing to 95% reuse and recovery by 2015. Up to 10% of this target may be met through energy recovery. The Meath waste-to-energy facility is positioned to accept End of Life Vehicle residue in the form of car shred and contribute to this recovery target from 2011 onwards.
In the reporting year 2015, a figure of 776 Ton of automotive shredder waste was accepted and recovered.

Flue Gas Residue and Boiler ash are removed from site and where possible sent to an underground salt mine in Germany. This is considered a recovery operation, R5/R11, as the mine is being back-filled with this material in order to stabilise the ground above.

Ferrous metals are recovered from the bottom ash on site using a magnet and sent to metal brokers within Ireland and this year some metal was sent to our facility in Belgium also. Indaver are now recovering non ferrous metal from the bottom ash on site using an eddy current system. This began in June 2014 and has been a successful project with over 700T recovered in.

Residue	Tonnage	Recovery Option
Ferrous Metal	5,564	R4
Non Ferrous Metal	732	R4
Flue Gas Residue	10,407	R5/R11
Boiler Ash	1,923	R5
Bottom Ash	21,600	R10

Bottom ash is currently being landfilled. The bottom ash is generally being used for cover or road making within the landfill which allows the recovery code R10 to be assigned.

[1] *Figures from 2012, From the National Waste Report 2012, EPA*

2. Emissions from the installation

The E-PRTR attached as appendix 1 gives an account of the emissions from the installation.

Surface Water Emissions

Surface Water/Pond
The system is monitored continuously at the DCS by the operators. The discharge is checked daily in accordance with the licence. There have been no unusual discharges in 2015. Also, no water can be discharged when the readings are over the trigger levels.

Surface Water Agreed Trigger Levels:

pH	TOC	Conductivity
6-9	Warning Level 25 mg/L Action Level 30mg/L	Warning Level 1000 µScm^{-1} Action Level 1200 µScm^{-1}

Average Results per quarter for 2015:

Quarter	pH	TOC mg/L	Conductivity µScm^{-1}	Discharge Volume m^3
Quarter 1	7.3	6.92	599	1,936
Quarter 2	7.54	15.95	360	927
Quarter 3	7.56	12.89	256	2,720
Quarter 4	7.5	9.62	300.22	5987

3. Waste Management Record, including summary of rejected waste loads

All waste that arrives at the site is planned in advance. It is tracked through our SAP system. It is weighed prior to entry on the weighbridge and this weight is updated within the sales order on SAP. There were no rejected loads in 2015.

For waste in and out of the site please refer to appendix 2, the waste treatment survey.

4. Resource consumption summary

Resource		Consumption in 2015
IN		
Waste	ton	227,524
Energy		
Fuel (diesel)	m3	221
Steam to use in the process	GJ	730,055
Electricity	MWh	17,755
Additives		
Quicklime	Ton	3,000
Hydrated lime	Ton	2,675
Activated carbon	Ton	103
Expanded Clay	Ton	170
ammonia	Ton	402
Water		
well water	m^3	67,191

5. Complaints Summary

All Environmental Complaints are dealt with as per the Environmental Complaints Procedure.

There were 2 environmental complaints registered in 2015. This is shown in the table below. All 2015 complaints have been closed out.

Detail	Complaints Investigated Total	Complaints actually related to our activities Total
Litter/Traffic	1	1
Odour	1	1

6. Schedule of Environmental Objectives and Targets

A schedule of environmental objectives and targets were set for 2015 as per section 7. A new schedule has been set up for 2016 as outlined under section 8.

7. Environmental Management Programme-report for 2015

2015 Schedule of Environmental Objectives and Targets

Item	Status	Responsible	Completion Status %
Investigate cooler air inlet for air compressor	More flow meters are required to be installed to further investigate. This is going to go forward into 2016 for investigation and completion	Rory Murphy	25
Obtain permission for the installation of a pretreatment plant for hazardous residues	Planning permission was submitted to An Bord Plenala. The licence already has permission within the conditions to allow for this pretreatment plant.	Grace McCormack	60
Continued Document Management System upgrade	The document management system was upgraded to a new Microsoft Office Sharepoint Server. This allows for all staff to have access to procedure, licences, goals, register of environmental aspects etc	Mary Miller	100
Indaver Community Liaison Committee	Indaver continue to be a part of the community liaison committee	Conor Jones	100
Test programme for hazardous waste acceptance to be approved by the Agency	The Test programme was approved by the Agency and completed in October 2015	Grace McCormack	100
New notice board and plan of the facility to be installed as review of licence to licence reg W0167-03	Installed	Rory Murphy	100

8. Environmental Management Programme-proposal for 2016

2016 Schedule of Environmental Objectives and Targets

Item	Status	Responsible	Time frame
Radiation Detector to be installed at the entrance to the facility	Proposal issued to the Agency for approval	Joe Crawley	Once approved by the Agency
Install the pre-treatment plant for the treatment of hazardous residues	Awaiting planning permission. To be complete by end of 2016	Oliver Kelly	Q4 2016
Audit of external outlet which is used by the facility	Included in audit schedule for 2016	Grace McCormack	Q2 2016
Complete energy audit of the facility	Proposals received and are being reviewed. Report to be reviewed and any findings followed up by including in the schedule of objectives and targets. These will include any of the actions raised during the 2015 energy audit report also.	Grace McCormack	Q4 2016
Develop and implement an action plan for transition to ISO 14001:2015	Action plan for ISO 2015. Assess the requirements, complete gap analysis and action plan.	Mary Miller	Q4 2016

9. PRTR-report for previous year

As per the PRTR regulations, S.I. No 123 of 2007 requires that Indaver report to the Agency on an annual basis. Indaver submitted their E-PRTR on 23rd March 2015 and this is attached in Appendix 1.

10. PRTR-proposal for current year

It is anticipated that Indaver will continue to monitor the ur air emissions as in 2015. These are TOC, HCl, HF, SO_2, NO_x, CO, dust and dioxins.

11. Noise Monitoring Report Summary

Noise level results

Monitoring Point	Date/ Start Time	Monitoring Interval (minutes)	L(A)eq	$L(A)_{10}$	$L(A)_{90}$	Audible Noise Sources
AN1-1	14/09/2015					Low level audible noise from site activities during daytime hours. Road traffic noise from R152 main audible noise source. Some site traffic noise entering and exiting main gate approx. 120m away. Low level noise from incinerator just audible during evening and night time hours.
	10:41	30	52.6	62.7	47.7	
	11:12	30	**58.2**	62.6	47.3	
	11:44	30	**58.96**	62.75	48.76	
	22:00	30	**52.3**	57.4	44.8	
	15/09/2015					
	00:07	20	**51.56**	52.61	44.91	
	00:44	20	**44.6**	50.5	44.6	
AN1-2	14/09/2015					Little if any noise from site activities. Road traffic noise from R152 main audible noise source. Some site traffic noise entering and exiting main gate approx. 40m away. Low level noise from incinerator just audible during evening and night time hours.
	13:24	30	**69.35**	73.62	54.4	
	13:50	30	**70.09**	74.35	53.4	
	14:31	30	**68.8**	73.1	53.9	
	22:28	30	**59.9**	62.6	40.0	
	23:10	20	**57.0**	60.1	39.7	
	23:42	20	**51.56**	52.61	44.91	
AN1-3	14/09/2015					Little if any noise audible from site activities. Some site traffic noise entering and exiting main gate approx. 60m away. Road traffic noise from R152 main audible noise source. Low level noise from incinerator emissions just audible during evening and night time hours.
	12:57	30	**61.5**	64.3	55.0	
	13:54	30	**62.4**	65.6	55.4	
	14:27	30	**61.98**	65.32	53.98	
	22:27	30	**55.91**	59.7	43.66	
	23:12	20	**47.8**	52.6	40.6	
	23:34	20	**54.38**	57.86	43.54	
AN1-4	14/09/2015					Forklift operating approx. 90m away and waste truck unloading approx. 80m away main source of site noise during daytime hours. Noise audible from off site road traffic, overhead planes and cattle in adjacent field. Some low level audible noise from bottom ash hall during evening and night time hours. Cattle calling caused breach of night time noise limit.
	10:28	30	52.78	54.33	49.02	
	11:00	30	52.89	54.77	49.68	
	11:49	30	53.3	56.2	49.7	
	21:54	30	47.52	48.74	45.94	
	15/09/2015					
	00:06	20	27.8	48.6	45.5	
	00:38	20	**47.02**	48.08	45.72	

Tonal or Impulsive Noise

Monitoring Point	Time	Tonal or Impulsive Noise from Site Activity	Comments
AN1-1	Day, Evening & Night	No	No significant tonal and impulsive noise from site activities.
AN1-2	Day, Evening & Night	No	No significant tonal and impulsive noise from site activities.
AN1-3	Day, Evening & Night	No	No significant tonal and impulsive noise from site activities.
AN1-4	Day, Evening & Night	No	No significant tonal and impulsive noise from site activities.

Noise levels recorded at AN1-1, AN1-2 and AN1-3 are primarily due to interference noise from road traffic on the R152 which runs adjacent to the front of the facility and not as a result of Indaver site operations.

Noise readings at location AN1-4 did not exceed day, evening or night time noise limits except for one reading during night time hours. Cattle calling in the field immediately adjacent to the AN1-4 caused an elevation in recorded noise levels during this reading.

LA90 readings are the noise levels recorded over 90% of the monitoring duration. These readings remove intermittent noise from the recorded noise level such as noise from passing road traffic. The LA90 readings are a truer reflection of noise from Indaver site operations however when traffic is particularly heavy LA90 readings will also be increased. The LA90 readings were within noise limits at locations AN1-1, AN1-2 and AN1-3 for all but one reading at AN1-3.

The noise levels detected at AN1-1, AN1-2 and AN1-3 were not due to Indaver activities.

No tonal or impulsive noise from site activities was recorded during day or night time monitoring.

In conclusion, noise emissions from the site have a minimal impact on the local environment.

12. Ambient Monitoring Summary

It is a requirement of Schedule C.6.1 of W0167-03 that monthly groundwater monitoring and biannual monitoring of the groundwater monitoring boreholes takes place. Please see below a summary of the results for the same.

AGW1-1 Upgradient Monitoring Point

Monitoring Frequency	TOC(mg/L)	Ammonia (NH4) Ug/L as N	Conductivity uscm-1@25C
Jan-15	1.68	10	640
Feb-15	2.23	24	635
Mar-15	7.04	10	630
Apr-15	13.69	10	618
May-15	1.8	16	618
Jun-15	0.61	55	608
Jul-15	1.563	25	614
Aug-15	1.46	10	614
Sep-15	1.69	27	602
Oct-15	1.52	10	607
Nov-15	1.48	10	630
Dec-15	1.47	14	627

AGW1-2 Downgradient Monitoring Point

Monitoring Frequency	TOC(mg/L)	Ammonia (NH4) Ug/L as N	Conductivity uscm-1@25C
Jan-15	1.09	15	653
Feb-15	0.85	11	682
Mar-15	6.01	10	696
Apr-15	9.94	10	684
May-15	0.58	14	685
Jun-15	0.64	92	682
Jul-15	0.527	19	701
Aug-15	0.59	44	699
Sep-15	0.66	61	697
Oct-15	0.5	52	690
Nov-15	0.51	12	687
Dec-15	0.62	20	686

AGW1-3 Downgradient Monitoring Point

Monitoring Frequency	TOC(mg/L)	Ammonia (NH4) Ug/L as N	Conductivity uscm-1@25C
Jan-15	0.93	38	625
Feb-15	0.76	10	625
Mar-15	9.73	10	623
Apr-15	16.78	10	611
May-15	0.7	15	608
Jun-15	3.81	62	601
Jul-15	0.618	20	610
Aug-15	0.56	10	615
Sep-15	0.63	167	621
Oct-15	0.47	31	618
Nov-15	0.55	10	632
Dec-15	0.56	16	632

Biannual Results

	AGW1-1	AGW1-2	AGW1-3	AGW1-1	AGW1-2	AGW1-3
Date	13/04/15	13/04/15	13/04/15	11/09/15	11/09/15	11/09/15
pH	7.5	7.4	7.3	7.4	7.4	7.3
Nitrate(mg/L as N)	2.86	7.55	8.01	1.79	6.75	7.9
Nitrite(mg/L as N)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chloride (mg/L)	25.34	72.37	20.54	26.68	70.86	34.59
Fluoride (mg/L)	0.12	0.1	0.11	0.13	0.12	0.16
Metals-Cd (ug/L)	<0.09	<0.09	0.107	0.241	0.121	0.22
Metals Tl (ug/L)	<0.06	<0.06	<0.06	0.138	<0.06	<0.06
Metals Hg (ug/L)	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Metals Pb (ug/L)	1.174	0.164	0.191	10.43	1.251	1.57
Metals Cr (ug/L)	<2.14	2.688	<2.14	8.394	6.351	4.464
Metals Cu (ug/L)	1.568	0.789	0.863	12.99	7.393	7.181
Metals Mn (ug/L)	30.41	4.317	3.888	318.8	62.45	59.35
Metals Ni (ug/L)	1.044	0.237	0.729	5.635	1.7	2.773
Metals As (ug/L)	0.344	0.135	<0.1	1.717	0.787	1.171
Metals CO (ug/L)	0.155	0.147	0.174	1.299	0.389	1.12
Metals V (ug/L)	0.463	0.433	0.919	2.455	0.827	2.146
Metals Sn (ug/L)	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8
Organohalogens	26.988	<5	<5	35.065	<5	<5
Total coliforms(no/100ml)	150	20	<10	0	0	0
Faecal Coliforms(no/100ml)	10	<10	<10	0	0	0

Overall it can be stated the activities on the site at W0167-03 has no significant impact on the groundwater quality as can be shown by the above results.

13. Tank and pipeline testing and inspection report

Please see below for summary of bunds tested in 2015.
This testing is followed up on the maintenance programme in SAP.

	Item	SAP Description	Bund Tag	Serial Number	Last Test	Next Test
18	New Chemstore-2nd Unit for Maintenance	Chemstore MH002 - Maintenance	UYA99-BB018	12509	Aug-15	Aug-18
22	Nitric Atomiser Disk Cleaning bath	Nitric Atomiser Disk Cleaning bath	UYA99-BB022	HTS10 BB001	Oct-15	Oct-18
23	Nitric Atomiser Disk Rincing bath	Nitric Atomiser Disk Rincing bath	UYA99-BB023	HTS10 BB002	Oct-15	Oct-18

14. Reported incidents summary

All Environmental Incidents are dealt with as per the Environmental Incident Investigation and Reporting Procedure.

There were 9 minor incidents reported in 2015. These relate to CO, low temperature and TOC.

15. Energy Efficiency audit report summary

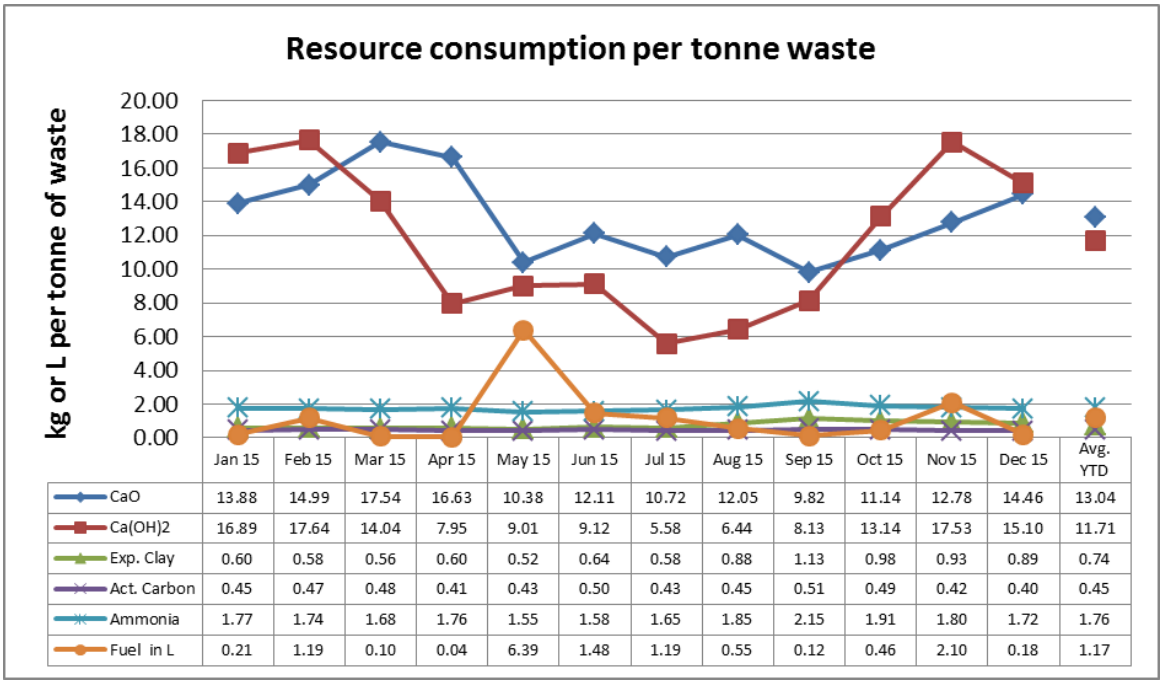
An energy audit was completed at the facility in 2015 as required by Condition 7.1.3 of W0167-03. Indaver has surpassed the requirement for 0.65 for energy efficiency and so the plant is deemed a recovery facility. The full report is attached in appendix 3.

Actions arising out of this audit report have been included in our schedule of objectives and targets.

For the reporting year 2015 Indaver exported its greatest ever amount, 134,445 MWh of electricity to the national grid and imported just 592 MWh. This is a slight increase in the amount of electricity exported and a slight reduction in the amount of energy imported. Indaver produce electricity to run the facility and only import electricity when in shutdown.

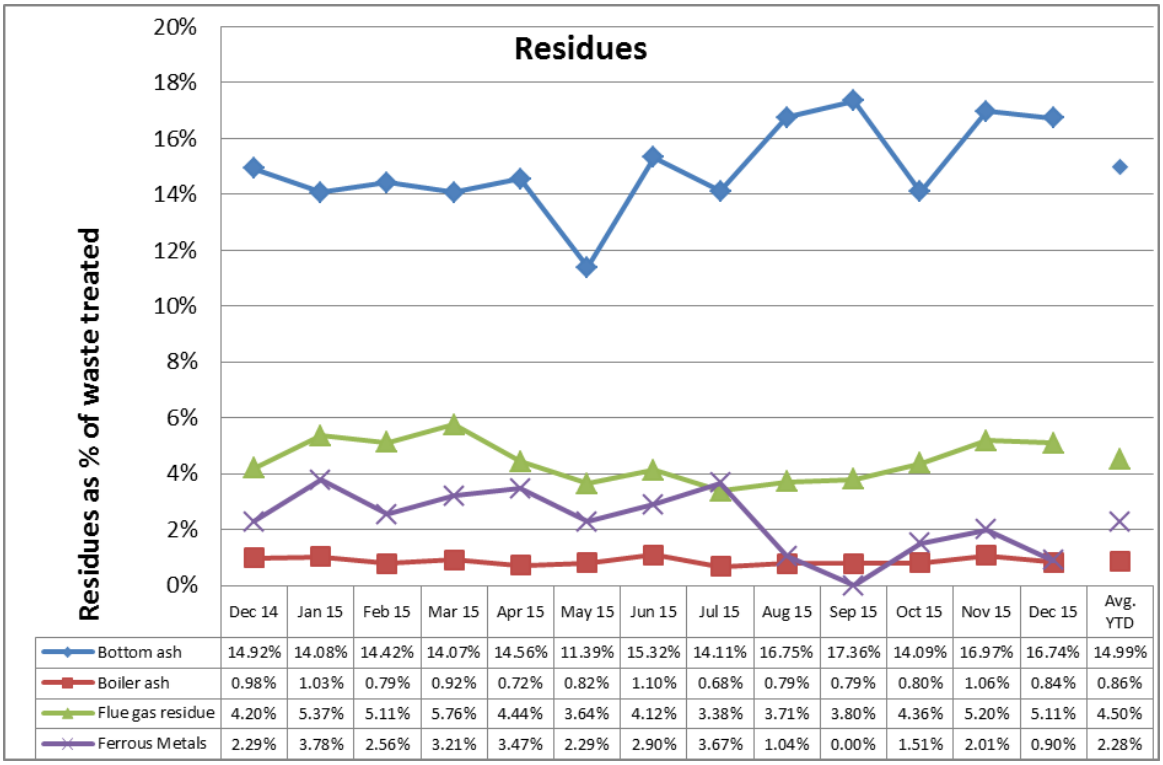
16. Report on the assessment of the efficiency of use of raw materials in processes and the reduction of waste generated

Indaver strive to ensure that raw consumables are used to their full effect and this is monitored continuously by the management and staff at the facility. The process engineer is tasked with reviewing this data to ensure that raw materials are used as efficiently as possible. Below is a graph showing the weight of consumable used per tonne of waste processed. In 2015 the upstream SO_2 results were higher than ever and this is shown by the increase in use of lime milk and hydrated lime.



	Jan 15	Feb 15	Mar 15	Apr 15	May 15	Jun 15	Jul 15	Aug 15	Sep 15	Oct 15	Nov 15	Dec 15	Avg. YTD
CaO	13.88	14.99	17.54	16.63	10.38	12.11	10.72	12.05	9.82	11.14	12.78	14.46	13.04
Ca(OH)2	16.89	17.64	14.04	7.95	9.01	9.12	5.58	6.44	8.13	13.14	17.53	15.10	11.71
Exp. Clay	0.60	0.58	0.56	0.60	0.52	0.64	0.58	0.88	1.13	0.98	0.93	0.89	0.74
Act. Carbon	0.45	0.47	0.48	0.41	0.43	0.50	0.43	0.45	0.51	0.49	0.42	0.40	0.45
Ammonia	1.77	1.74	1.68	1.76	1.55	1.58	1.65	1.85	2.15	1.91	1.80	1.72	1.76
Fuel in L	0.21	1.19	0.10	0.04	6.39	1.48	1.19	0.55	0.12	0.46	2.10	0.18	1.17

Indaver also strive to ensure that residues are monitored to ensure that the production of residues is kept to a minimum. This is again tracked by the process engineer at the site. The graph below shows the percentage of residues produced per tonne of waste treated. Some residues are of benefit for example the ferrous metal and non ferrous metal. These residues are sent on to recovery outlets for further treatment. The majority of the other residues, bottom ash, boiler ash and flue gas residue, are used as a recovery material.



	Dec 14	Jan 15	Feb 15	Mar 15	Apr 15	May 15	Jun 15	Jul 15	Aug 15	Sep 15	Oct 15	Nov 15	Dec 15	Avg. YTD
Bottom ash	14.92%	14.08%	14.42%	14.07%	14.56%	11.39%	15.32%	14.11%	16.75%	17.36%	14.09%	16.97%	16.74%	14.99%
Boiler ash	0.98%	1.03%	0.79%	0.92%	0.72%	0.82%	1.10%	0.68%	0.79%	0.79%	0.80%	1.06%	0.84%	0.86%
Flue gas residue	4.20%	5.37%	5.11%	5.76%	4.44%	3.64%	4.12%	3.38%	3.71%	3.80%	4.36%	5.20%	5.11%	4.50%
Ferrous Metals	2.29%	3.78%	2.56%	3.21%	3.47%	2.29%	2.90%	3.67%	1.04%	0.00%	1.51%	2.01%	0.90%	2.28%

17. Report on progress made and proposals being developed to minimise water demand and the volume of trade effluent discharges

Indaver do not have any effluent discharges from the site. Any water that is generated in the process is re-used within the process. The water demand from the site is not large and water that is used for cleaning purposes on the site is re-used.

18. Development/Infrastructural works summary (completed in previous year or prepared for current year)

The area for the unloading of aqueous tankers on site was re-structured in 2015. This now allows two tankers to offload into the storage tank on site. These tankers can also unload directly into the aqueous injection point. The ground was demarcated to show that any spillage in this area goes towards the underground pits which are re-used in the process.
In 2016 it is planned to develop an ash pre-treatment facility, subject to planning amendment permission. Indaver will seek agreement from the Agency prior to infrastructural works taking place.

19. Reports on financial provision made under this licence, management and staffing structure of the installation and a programme for public information

A bond is in place for the CRAMP costs at W0167-03. An insurance policy is in place for the ELRA costings. They were approved by the Agency on the 2nd October 2015.

Management structure at the site has not changed since the Agency was last informed. The plant is run by a plant manager with a production manager (deputy plant manager), process engineer, maintenance manager and the site is supported by the quality & environmental manager, the health & safety manager and the regional project engineer. The site has production staff of 20 people on a 5-shift pattern which allows the site to run 24/7. There is also a maintenance department of 9 people and these employees comprise the Emergency Response Team.

All communications with interested parties are dealt with as per P0184 Internal & External Communications Procedure. Indaver has several visits per year from interested parties e.g. schools, universities etc. Customers and interested parties also audit the site to assess Indaver's systems and treatment of their waste streams.

Environmental information is made available to interested parties upon request.

Indaver's website, www.indaver.ie, is a valuable source of information for customers and interested parties.

20. Review of decommissioning plan

The decommissioning plan or CRAMP was updated in September 2015 to incorporate hazardous waste being accepted at the facility under the new revision licence W0167-03. This was approved by the Agency prior to the acceptance of hazardous waste at the site.

21. Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental liabilities)

The output of the risk treatment process is the development of a statement of measures to be taken to minimise the environmental risk of the activity. Since its development, the facility has been designed constructed and operated to minimise risk in every aspect of its operations.
Though additional suitable hazardous waste streams will be accepted at the facility, the same mitigation measures are in place to ensure the risk of an accident or environmental incident at the site is minimised.
On the basis of the risks identified above, a statement of measures is not presently considered necessary but Indaver will continue to review operations to identify additional environmental mitigation as the need arises.

22. Environmental Liabilities Risk assessment review

The ELRA was reviewed and updated to take account of hazardous waste at the facility. This was approved by the Agency in September 2015. There is an insurance policy in place to cover the financial risks and this was agreed by the Agency in October 2015.

23. Summary record of the use of the emergency generator

The emergency generator was used a total of 67 hours in 2015. It is tested weekly and these records are stored at the facility.

24. Summary of audits of waste disposal, treatment and recovery sites for the incinerator residues from the installation

During 2011, Indaver Group audited K&S, the facility for the recovery of our flue gas residues and boiler ash. The facility was approved for use and continued use.

Hammond Lane, the facility which accepts the ferrous metal from the site was audited in March 2014. The facility was approved for continued use.

Another outlet audit is planned for May 2016.

25. Report on particulates monitoring

Please refer to Appendix 1-E-PRTR

26. Waste activities carried out at the facility

The primary operation on the Meath Waste-to-Energy Facility is the incineration of non hazardous wastes with associated energy recovery in the form of steam which is used to generate electricity. In 2015 the licence was reviewed and this now allows the acceptance and treatment of 10,000 tonnes of some suitable hazardous waste annually.

In general terms, the Meath WtE Facility is designed to incinerate and recover energy from the residual fraction of non-hazardous household, commercial and industrial waste, non-hazardous wastewater sludge and some suitable hazardous waste also. It consists of an incineration plant with energy recovery and ancillary services, and the throughput of the facility for incineration is 235,000tpa.

The facility comprises of the following main elements:

- The main process building (comprising of tipping hall, waste bunker, furnace, boiler, steam turbine, flue gas treatment and ash storage) including the control room and administration offices
- A building housing the air cooled condenser
- A contractors' compound and office accommodation
- A warehouse building with a workshop
- A transformer compound and ESB substation with emergency generator
- A security building with weighbridge at facility entrance
- A process/firewater water storage tank and fire pump house.

The main process building is approximately 160 m long, 40 m wide at the widest point and 40 m above ground at the highest point. The stack is 65 m tall and vents the treated combustion gases to atmosphere. The plant is based on conventional grate furnace technology with a horizontal steam boiler and an advanced flue gas treatment system designed to meet the current emissions regulations. The plant will produce up to 21 MW electricity of which approximately 18MW is exported to the national grid.

Waste is transported to the site by waste contractors in accordance with the site's licensed opening hours. On entering the site, waste contractors follow a well marked two-way route to the tipping hall where inspections on the waste are conducted by Indaver on a routine basis. There is a large turning area outside the tipping hall to allow the waste delivery vehicles turn safely before entering the hall and a maximum speed limit of 15 km/h. In the tipping hall, waste is deposited into the waste bunker where it is mixed by the crane before being placed in the hopper for the furnace. Liquids are incinerated by way of the direct injection point at the aqueous unloading station or from the storage tank.

In the furnace, the waste is incinerated at temperatures exceeding 850ºC T2S. The ash collected from the bottom of the furnace passes through a wet bath before being stored for collection and removal from the site. The combustion gases from the process pass through a number of treatment stages. This includes two stages of dosing (lime milk and lime) for acid removal and two stages of dosing (expanded clay and activated carbon) for dioxin removal, before passing through filter bags and being discharged to atmosphere via the emissions stack. The emissions to air are continuously monitored and fed back to the control room for the facility where the levels of dosing can be adjusted if required.

27. Quantity and composition of waste received, recovered and disposed of during the reporting period and each previous year (relevant ewc codes to be used)

The waste treatment survey is attached as appendix 2. This details incoming waste and outgoing waste. The figures below are for incoming waste to the site. All these wastes were received and recovered at W0167-03

Waste accepted in 2015

EWC	Description of waste	Weight (Kg)
020203	020203 FOOD ANIMAL ORIG UNFIT FOR CONSUM	8460
020304	020304 WASTE UNFIT FOR CONSUMPTION	18560
020501	020501 FOOD UNSUITABLE FOR CONSUMPTION	139560
070512	070512 WWTP SLUDGE	4518020
070513	070513* PHARMA WASTE SOLID	49033
070514	070514 NON HAZ SOLID WASTE	35800
070514	070514 PHARMA WASTE SOLID	510007
080318	080318 WASTE PRINTING TONER	5800
110110	110110 SLUDGES AND FILTERCAKES	2320
150106	150106 EMPTY MIXED PACKAGING	2200
150110	150110* EMPTY PACKAGING WASTE	567
150202	150202* FILTERS/ABSORBENTS/WIPES ORG	1967
150203	150203 FILTERS/ABSORBENTS/WIPES	83000
160304	160304 OFF SPEC LIQUID	19499
160304	160304 OFF SPEC SOLID	820
160305	160305* OFF SPEC SOLID	220
160306	160306 OFF SPEC LIQUID	2720
160306	160306 OFF SPEC SOLID	236083
160508	160508* DISCARDED CHEMICALS LIQUID	47
170604	170604 INSULATION	942880
180104	180104 NON-INFECTIOUS MEDICAL WASTE	7240
190203	190203 PREMIXED NON HAZ WASTE	8274620
190805	190805 SLUDGES FROM URBAN WASTE WATER	37780
191006	191006 SHREDDINGS FROM METAL CTG WASTE	776040
191212	191212 RESIDU FROM MECH. TREATM.	45425120
200111	200111 TEXTILE	1900
200127	200127* PAINT/INK/ADHESIVES/RESINS	13840
200140	200140 METALS	2840
200301	200301 MUNICIPAL WASTE	165810150
200307	200307 BULKY WASTE	74039
02 01 07	ASH TREES	760
16 10 02	HIGH WATER WITH GLYCOL	236540
07 05 12	NON HAZ ORGANIC SLUDGE	103460
16 01 07*	OIL FILTERS	100
07 05 01*	PRODUCTION PROCESS LIQUID WASTE	15140
08 03 08	WASTE INK SOLUTION	308280
16 10 02	WATER FROM FIREPOND	44620

Waste accepted in 2014

Material Accepted	Quantity/Tonnes
020203 MATERIALS UNFIT FOR CONSUMPTION	14.12
020501 FOOD UNSUITABLE FOR CONSUMPTION	194.04
040222 WASTE FROM PROCESSED TEXTILE	44.68
070512 WWTP SLUDGE	5737.26
070514 NON HAZ SOLID WASTE	32.78
070514 PHARMA WASTE SOLID	230.06
080318 WASTE PRINTING TONER	136.76
110110 SLUDGES AND FILTERCAKES	4.2
150102 EMPTY PLASTIC PACKAGING	0.6
150103 TIMBER PALLETS	0.18
150203 FILTERS/ABSORBENTS/WIPES	39.46
160304 OFF SPEC LIQUID	0.22
160306 OFF SPEC SOLID	333.28
170604 INSULATION	741.38
190203 PREMIXED NON HAZ WASTE	7283.3
190805 SLUDGES FROM URBAN WASTE WATER	56.4
191006 SHREDDINGS FROM METAL CTG WASTE	498.22
191212 RESIDU FROM MECH. TREATM.	59789.52
200111 TEXTILE	19.46
200139 PLASTICS	37.78
200140 METALS	8.54
200301 MUNICIPAL WASTE	155808.42
200307 BULKY WASTE	772.18
080308 WASTE INK SOLUTION	301.41

28. Full title and a written summary of any procedures developed by the licensee in the year which relates to the facility operation

As hazardous waste was accepted in 2015 an update to the following procedures occurred.

Reference	Name	Department II	Summary
P0328	Training and Staff Competence.docx	HR	Summarises the training procedure for Indaver including the requirement for training plans
P0462	Non Hazardous IWS Shipments to Meath.docx	Operations	Moving waste from IWS to the Meath site
P0198	Loading Containers and Curtainsiders for Shipment.docx	Operations	How to load containers
P0302	Safety Data Sheets.docx	Operations	Tells you to ensure you received an SDS prior to ordering a chemical
P0057	Classification and Identification of Waste.docx	Operations	How to classify waste
P0363	Waste Handling.docx	Plant Meath	How to handle waste on site at W0167-03
P0394	Bunker Management.docx	Plant Meath	How to manage the bunker to ensure a steady waste feed
P0401	Cooling Water Systems.docx	Plant Meath	Production procedure
P0410	Grate Siftings.docx	Plant Meath	Production procedure
P0416	Lime Milk Preparation and Injection.docx	Plant Meath	Production procedure
P0425	Rapping Device.docx	Plant Meath	Production procedure
P0531	EDIL Operating Procedure.docx	Plant Meath	Production procedure
P0488	LEAN SIX SIGMA (LSS) FOR CONTINUOUS IMPROVEMENT.docx	QESH	System for continuous improvement
P0172	Hazard Identification and Risk Assessment.docx	QESH	How to identify hazards and how to complete a risk assessment
P0040	Use of Personal Protective Equipment.docx	QESH	How to use PPE for specified tasks
P0357	Analysis of liquid samples for ME 1 Indaver Waste to Energy Facility.docx	QESH	How to analyse for parameters in the liquid waste prior to incineration
P0177	Identification and Evaluation of Environmental Aspects.docx	QESH	How to identify the environmental aspects at W0167-03
P0206	Monitoring and Recording of Environmental Information.docx	QESH	How to monitor and record environmental information
P0499	Management of TFSs for Wrapping CAS and Indaver Meath.docx	Regional Sales	Ensuring an adequate supply of TFS are in place for outgoing wastes from W0167-03
P0337	Waste Planning and Creating MSW Sales Orders for Waste Deliveries to Meath WTE.docx	Regional Sales	How waste loads are planned into W0167-03
P0362	Waste Acceptance	Meath	How waste is accepted at W0167-03 and the waste acceptance criteria

29. Review of nuisance controls

Indaver ensures that the following do not cause nuisance at the site. Vermin, birds, flies, mud, dust, litter and odour. Vermin is controlled by an external contractor who comes to site monthly and reviews the status of the site. There is no issue with vermin at the site. Birds are monitored to ensure they are not causing nuisance. Flies are not an issue at the site. Mud, dust, litter and odour are taken care of through good operational practices at the site. Negative pressure in the tipping hall and bunker area ensures that no odours escape. It also ensures that dust and windswept litter are minimised. A road sweeper comes to site on a monthly basis as a minimum which ensures no mud and dust is present to cause a nuisance. Litter picks are completed as and when necessary. Routine odour assessments are also undertaken at the site.

Appendix 1: E-PRTR plus acceptance verification

Guidance to completing the PRTR workbook

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2015

1. FACILITY IDENTIFICATION

Parent Company Name	Indaver Ireland Limited
Facility Name	Indaver Ireland Limited (Duleek)
PRTR Identification Number	W0167
Licence Number	W0167-03

Classes of Activity

No.	**class_name**
-	Refer to PRTR class activities below

Address 1	Carranstown
Address 2	Duleek
Address 3	Meath
Address 4	
	Meath
Country	Ireland
Coordinates of Location	-6.39215 53.6765
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Grace McCormack
AER Returns Contact Email Address	grace.mccormack@indaver.ie
AER Returns Contact Position	Quality and Environmental Manager
AER Returns Contact Telephone Number	041 213 4005
AER Returns Contact Mobile Phone Number	086 046 4224
AER Returns Contact Fax Number	N/a
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	37
User Feedback/Comments	We also now have a licence for incinerating certain hazardous EWC codes, not sure if the PRTR class then needs to be changed. There has been some changes of over 50% in the emissions to air, some are higher and some are reduced, it is based on the acid load that is present in the waste that the SO2 is higher, lower for others but essentially the waste controls a lot of the results for the emissions.
Web Address	www.indaver.ie

2. PRTR CLASS ACTIVITIES

Activity Number	**Activity Name**
5(b)	Installations for the incineration of non-hazardous waste in the scope of Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste
5(c) 50.1	Installations for the disposal of non-hazardous waste General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
Have you been granted an exemption ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

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) ?	Yes

This question is only applicable if you are an IPPC or Quarry site

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
02	Carbon monoxide (CO)	M	OTH	EN 14181 (Continuous monitoring using FTIR)	9034.0	9034.0	0.0	0.0
03	Carbon dioxide (CO2)	M	OTH	EN 14181 (Continuous monitoring using FTIR)	325367580.0	325367580.0	0.0	0.0
80	Chlorine and inorganic compounds (as HCl)	M	OTH	EN 14181 (Continuous monitoring using FTIR)	1705.0	1705.0	0.0	0.0
84	Fluorine and inorganic compounds (as HF)	M	OTH	EN 14181 (Continuous monitoring using FTIR)	374.0	374.0	0.0	0.0
21	Mercury and compounds (as Hg)	M	EN 13211:2001		4.6	4.6	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	M	OTH	EN 14181 (Continuous monitoring using FTIR)	227401.0	227401.0	0.0	0.0
86	Particulate matter (PM10)	M	OTH	US EPA M01A	289.43	289.43	0.0	0.0
47	PCDD + PCDF (dioxins + furans)(as Teq)	M	EN 1948-1 to3:2003		0.0000046	0.0000046	0.0	0.0
11	Sulphur oxides (SOx/SO2)	M	OTH	EN 14181 (Continuous monitoring using FTIR)	44819.0	44819.0	0.0	0.0
05	**Nitrous oxide (N2O)**	M	OTH	TGN M22	3284.0	3284.0	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					
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
210	Dust	M	OTH	EN 14181 (Continuous monitoring using FTIR)	111.0	111.0	0.0	0.0
351	Total Organic Carbon (as C)	M	OTH	EN 14181 (Continuous monitoring using FID)	709.0	709.0	0.0	0.0
347	Total heavy metals	M	EN 14385:2004		30.0	30.0	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: Indaver Ireland Limited (Duleek)

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used**		**Facility Total Capacity m3 per hour**	
			Method Code	**Designation or Description**		
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	

4.2 RELEASES TO WATERS

Link to previous years emissions data

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO WATERS	
POLLUTANT	
No. Annex II	Name

* Select a row by double-clicking on the Pollutant Name (Column B)

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS	
POLLUTANT	
No. Annex II	Name

* Select a row by double-clicking on the Pollutant Name (Column B)

SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO WATERS	
POLLUTANT	
Pollutant No.	Name

* Select a row by double-clicking on the Pollutant Name (Column B)

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should N(

			Please enter all quantities in this section in KGs	
	Method Used			
M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year
			0.0	0.0

) then click the delete button

			Please enter all quantities in this section in KGs	
	Method Used			
M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year
			0.0	0.0

) then click the delete button

			Please enter all quantities in this section in KGs	
	Method Used			
M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year
			0.0	0.0

) then click the delete button

OT be submitted under AER / PRTR Reporting as this only concerns Releases from your facility

QUANTITY	
A (Accidental) KG/Year	F (Fugitive) KG/Year
0.0	0.0

QUANTITY	
A (Accidental) KG/Year	F (Fugitive) KG/Year
0.0	0.0

QUANTITY	
A (Accidental) KG/Year	F (Fugitive) KG/Year
0.0	0.0

4.3 RELEASES TO WASTEWATER OR SEWER

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					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 POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
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
					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

4.4 RELEASES TO LAND

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND	
POLLUTANT	
No. Annex II	Name

* Select a row by double-clicking on the Pollutant Name (Column B)

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND	
POLLUTANT	
Pollutant No.	Name

* Select a row by double-clicking on the Pollutant Name (Column B)

			Please enter all quantities
METHOD			
	Method Used		
M/C/E	Method Code	Designation or Description	Emission Point 1
			0.0

) then click the delete button

			Please enter all quantities
METHOD			
	Method Used		
M/C/E	Method Code	Designation or Description	Emission Point 1
			0.0

) then click the delete button

in this section in KGs	
QUANTITY	
T (Total) KG/Year	A (Accidental) KG/Year
0.0	0.0

in this section in KGs	
QUANTITY	
T (Total) KG/Year	A (Accidental) KG/Year
0.0	0.0

Please enter all quantities on this sheet in Tonnes

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used: M/C/E	Method Used: 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)
To Other Countries	06 01 05	Yes	0.0	nitric acid and nitrous acid	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	Abfall Verwertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB-2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
To Other Countries	06 01 06	Yes	0.0	other acids	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	Abfall Verwertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB-2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
To Other Countries	06 02 03	Yes	0.0	ammonium hydroxide	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	Abfall Verwertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB-2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
To Other Countries	06 02 04	Yes	0.0	sodium and potassium hydroxide	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	Abfall Verwertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB-2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
To Other Countries	13 02 08	Yes	0.0	other engine, gear and lubricating oils	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	Abfall Verwertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB-2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
Within the Country	13 05 07	Yes	0.0	oily water from oil/water separators	D9	M	Weighed	Offsite in Ireland	Enva Ireland Ltd,196-1	MacAnulty Clear Drains,John F Kennedy Industrial Estate John F Kennedy Road,Naas Road,Dublin 12,Ireland	Enva Ireland Ltd,196-1,MacAnulty Clear Drains,John F Kennedy Industrial Estate John F Kennedy Road,Naas Road,Dublin 12,Ireland	MacAnulty Clear Drains,John F Kennedy Industrial Estate John F Kennedy Road,Naas Road,Dublin 12,Ireland
To Other Countries	13 07 01	Yes	0.0	fuel oil and diesel	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	Abfall Verwertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB-2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
Within the Country	13 08 99	Yes	0.0	wastes not otherwise specified	R9	M	Weighed	Offsite in Ireland	Rilta Environmental,W0192-03	Block 402,Greenogue Business Park,Rathcoole,Dublin,Ireland	Rilta Environmental,W0192-03,Block 402,Greenogue Business Park,Rathcoole,Dublin,Ireland	Block 402,Greenogue Business Park,Rathcoole,Dublin,Ireland
To Other Countries	15 02 02	Yes	0.0	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	Abfall Verwertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB-2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
To Other Countries	16 05 04	Yes	0.0	gases in pressure containers (including halons) containing dangerous substances	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	Abfall Verwertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB-2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
Within the Country	16 10 01	Yes	0.0	aqueous liquid wastes containing dangerous substances	D9	M	Weighed	Offsite in Ireland	Rilta Environmental,W0192-03	Block 402,Greenogue Business Park,Rathcoole,Dublin,Ireland	Rilta Environmental,W0192-03,Block 402,Greenogue Business Park,Rathcoole,Dublin,Ireland	Block 402,Greenogue Business Park,Rathcoole,Dublin,Ireland
Within the Country	16 10 02	No	0.0	aqueous liquid wastes other than those mentioned in 16 10 01	D9	M	Weighed	Offsite in Ireland	EPS Dundalk and Drogheda WWTW,EPS Pumping & Treatment Systems	Dundalk WWTW,Lower point road,Co-Louth,Co-Louth,Ireland		
Within the Country	16 10 02	No	0.0	aqueous liquid wastes other than those mentioned in 16 10 01	D9	M	Weighed	Offsite in Ireland	Rilta Environmental,W0192-03	Block 402,Greenogue Business Park,Rathcoole,Dublin,Ireland		
Within the Country	17 02 01	No	0.0	wood	R13	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	17 04 05	No	0.0	iron and steel	R13	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	17 05 04	No	0.0	soil and stones other than those mentioned in 17 05 03	D15	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	17 06 04	No	0.24	insulation materials other than those mentioned in 17 06 01 and 17 06 03	D15	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	17 09 04	No	2.44	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	R13	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	19 01 02	No	4400.22	ferrous materials removed from bottom ash	R4	M	Weighed	Offsite in Ireland	Hammond Lane Metal Company Limited,WFP-DC-0013-01	Pigeon House Road,Ringsend,Dublin 4,Ringsend,Ireland		
Within the Country	19 01 02	No	164.12	ferrous materials removed from bottom ash	R4	M	Weighed	Offsite in Ireland	Clearcircle Metals (Limerick) Limited,WFP-LC+KC-11-001-01	Ballysimon Road,Ballysimon Road,Limerick,Limerick,Ireland		
Within the Country	19 01 02	No	0.0	ferrous materials removed from bottom ash	R12	M	Weighed	Offsite in Ireland	AES t/A Midland Waste Disposal Company Limited,W0131-02	Clonmagadden,Proudstown,Navan,Co-Meath,Ireland		
Within the Country	19 01 02	No	0.0	ferrous materials removed from bottom ash	R4	M	Weighed	Offsite in Ireland	Multimetal Recycling,WFP-WW-10-0014-02	Conway Port Industrial Estate,Bollarney,Murrough,Wicklow ,Ireland		
To Other Countries	19 01 07	Yes	8468.0	solid wastes from gas treatment	R5	M	Weighed	Abroad	K&S Kali GmBH,LicenceM76D310/57	Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269,Germany	K&S Kali GmBH,LicenceM76D310/57,Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269 Philippsthal,Germany	Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269 Philippsthal,Germany
To Other Countries	19 01 07	Yes	0.0	solid wastes from gas treatment	D9	M	Weighed	Abroad	Indaver NV,MLAV1/9800000485/MV/bd	Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium	Indaver NV,MLAV1/9800000485/MV/bd,Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium	Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium
To Other Countries	19 01 07	Yes	224.7	solid wastes from gas treatment	R5	M	Weighed	Abroad	K&S,34/Hef-79 n 330-51/153	Werk Werra,Standort Wintershall Herfagrund,36266 Herfa ,36266 Herfa ,Germany	Indaver NV,MLAV1/9800000485/MV/bd,Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium	Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium
To Other Countries	19 01 07	Yes	1714.43	solid wastes from gas treatment	R11	M	Weighed	Abroad	K&S Kali GmbH Werk Werra,AZ.1325/98 AZ6631/99	Standort Unterbreizbach,Untertagaeverwertung Schaet 11,Unterbreizbach,D36414,Germany	K&S Kali GmbH Werk Werra,AZ.1325/98 AZ6631/99,Standort Unterbreizbach,Untertagaeverwertung Schaet 11,Unterbreihbach,D36414,Germany	Standort Unterbreizbach,Untertagaeverwertung Schaet 11,Unterbreihbach,D36414,Germany
Within the Country	19 01 12	No	0.0	bottom ash and slag other than those mentioned in 19 01 11	D1	M	Weighed	Offsite in Ireland	Whiteriver Landfill[Louth County Council] ,W0060-03	Whiteriver and Gunstown Townland ,Dunleer,Co-Louth,Co-Louth,Ireland		
Within the Country	**19 01 12**	**No**	19295.556	bottom ash and slag other than those mentioned in 19 01 11	R10	M	Weighed	Offsite in Ireland	Greenstar Knockharley,W0146-01	Knockharley,Navan,Co-Meath,.,Ireland		
Within the Country	19 01 12	No	12322.08	bottom ash and slag other than those mentioned in 19 01 11	D1	M	Weighed	Offsite in Ireland	Scotchcorner Landfill Monaghan County Council,W0020-02	Letterbane,Annyalla,Castleblayney,Co-Monaghan,Ireland		
Within the Country	19 01 12	No	0.0	bottom ash and slag other than those mentioned in 19 01 11	R10	M	Weighed	Offsite in Ireland	Greenstar Holdings Limited,W0165-02	Ballynagran Residual Landfill,Ballynagran,Coolbeg and Kilcandra,Wicklow ,Ireland		
Within the Country	19 01 12	No	2304.1	bottom ash and slag other than those mentioned in 19 01 11	R10	M	Weighed	Offsite in Ireland	Drehid Landfill(Bord Na Mona PLC),W201-03	Drehid Landfill(Bord Na Mona PLC),Killinagh Upper,Carbury,Co-Kildare,Ireland		
To Other Countries	19 01 13	Yes	0.0	fly ash containing dangerous substances	D9	M	Weighed	Abroad	Indaver NV,MLAV1/9800000485/MV/bd	Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium	Indaver NV,MLAV1/9800000485/MV/bd,Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium	.,.,.,.,Belgium
To Other Countries	19 01 13	Yes	0.0	fly ash containing dangerous substances	R5	M	Weighed	Abroad	K&S Kali GmBH,LicenceM76D310/57	Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269,Germany	K&S Kali GmBH,LicenceM76D310/57,Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269 Philippsthal,Germany	Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269 Philippsthal,Germany
To Other Countries	19 01 13	Yes	1923.39	fly ash containing dangerous substances	R5	M	Weighed	Abroad	K&S,34/Hef-79 n 330-51/153	Werk Werra,Standort Wintershall Herfagrund,36266 Herfa ,36266 Herfa ,Germany	K & S,34/Hef-79 n 330-51/153,Werk Werra,Standort Wintershall Herfagrund,36266 Herfa ,36266 Herfa ,Germany	Werk Werra,Standort Wintershall Herfagrund,36266 Herfa ,36266 Herfa ,Germany
To Other Countries	19 01 13	Yes	50.12	fly ash containing dangerous substances	D12	M	Weighed	Abroad	K & S ,34/Hef-79n330-51/153	Werra Plant Underground Waste Disposal Plant,Herfa-Neurode,36266 Heringen ,36266 Heringen ,Germany	K & S ,34/Hef-79n330-51/153,Werra Plant Underground Waste Disposal Plant,Herfa- Neurode,36266 Heringen ,36266 Heringen ,Germany	Werra Plant Underground Waste Disposal Plant,Herfa-Neurode,36266 Heringen ,36266 Heringen ,Germany
To Other Countries	19 12 03	No	189.02	non-ferrous metal	R4	M	Weighed	Abroad	CRAENHALS METAL TERMINAL,10088	Van Patraestraat 90 ,2660 HOBOKEN (Antwerpen),Antwerp,2660,Belgium		
Within the Country	20 01 36	No	0.7	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	R13	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	20 01 39	No	0.0	plastics	R13	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	20 03 01	No	0.0	mixed municipal waste	R13	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	20 03 01	No	0.0	mixed municipal waste	D15	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		
Within the Country	20 03 01	No	0.0	mixed municipal waste	R1	E	Volume Calculation	Onsite of generati	Indaver Ireland Limited,W0167-02	Carranstown,Duleek,Co-Meath,N/A,Ireland		
Within the Country	20 03 03	No	0.0	street-cleaning residues	R1	M	Weighed	Onsite of generati	Indaver Ireland Limited,W0167-02	Carranstown,Duleek,Co-Meath,N/A,Ireland		
Within the Country	20 03 04	No	0.0	septic tank sludge	D9	M	Weighed	Offsite in Ireland	EPS Dundalk and Drogheda WWTW,EPS Pumping & Treatment Systems	Dundalk WWTW,Lower point road,Co-Louth,Co-Louth,Ireland		
Within the Country	20 03 04	No	135.32	septic tank sludge	D9	M	Weighed	Offsite in Ireland	Dublin City Council Ringsend Waste Water Treatment Plant,D0034-01	Drainage Services Environmental and Engineering Dept,Civic Office,Wood Quay,Dublin 8,Ireland		
Within the Country	20 03 07	No	0.0	bulky waste	D1	M	Weighed	Offsite in Ireland	Whiteriver Landfill[Louth County Council] ,W0060-03	Whiteriver and Gunstown Townland ,Dunleer,Co-Louth,Co-Louth,Ireland		
Within the Country	19 01 02	No	592.88	ferrous materials removed from bottom ash	R4	M	Weighed	Offsite in Ireland	United Metals,WFP LK 2013 147A R1	Eastway Business Park,Ballysimon,Ballysimon,Limerick,Ireland		
Within the Country	19 01 02	No	78.26	ferrous materials removed from bottom ash	R4	M	Weighed	Offsite in Ireland	Wilton Waste Recycling Limited ,WFP CN 15-003-01	Kiffagh,Crosserlough,Ballyjamesduff,Cavan,Ireland		
To Other Countries	19 01 02	No	328.46	ferrous materials removed from bottom ash	R4	M	Weighed	Abroad	Indaver NV,MLAV1/9800000485/MV/bd	Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium		
To Other Countries	19 12 03	No	543.38	non-ferrous metal	R4	M	Weighed	Abroad	Galloo,IHM-AFVAL4024	Wervikstraat 320,8930 Menen,Menen,8930,Belgium		
Within the Country	20 01 38	No	5.76	wood other than that mentioned in 20 01 37	R12	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	Rathdrinagh,Beauparc,Navan ,Co Meath ,Ireland		

* Select a row by double-clicking the Description of Waste then click the delete button

Link to previous years waste data
Link to previous years waste summary data & percentage change
Link to Waste Guidance

Thank you,

Your AER / PRTR Emissions Data submission has been accepted by our data system.

You may now proceed to save your submitted emissions and waste transfers information in a format suitable for insertion into your Full AER report. The Full AER Report must be submitted in electronic (PDF) form only, the AER is NOT required in hardcopy (paper) form.

Please retain the receipt / tracking number below in case of future queries about this submission and in case a request is made by an authorised person in this regard.

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Appendix 2: Treatment survey

NATIONAL WASTE REPORT 2015 SURVEY

WASTE ACCEPTED ONSITE (2015 Data)

NB - please be aware that the column headings for the segregated packaging waste section (row 4-21) are different to the column headings for all other waste materials (starting row 24). See important info worksheet for guidance.

SEGREGATED PACKAGING WASTE (CHAPTER 15 CODES): Please report on segregated packaging waste accepted onsite in this top section.

ID number	TYPE OF WASTE	List of Waste entry	WASTE DESCRIPTION Enter an accurate description of the waste.	QUANTITY ACCEPTED ONSITE: Generated in RoI (tonnes)	QUANTITY ACCEPTED ONSITE: Generated abroad (tonnes)	Percentage from municipal sources (%) See municipal waste graphic worksheet if you need guidance on what is and isn't municipal waste.	How did you estimate the percentage in column H?	ACTIVITIES CARRIED OUT AT YOUR SITE Provide a brief, informative description of how you handle/process each waste stream listed below at your site. Please do not use generic descriptions such as recovery or recycling. The description should be consistent with the ID numbers reported on Sheets B1, B2 and C.
1	Segregated cardboard & paper packaging waste (eg corrugated cardboards, paper wrapping & bags)	15 01 01						
2	Segregated plastic packaging waste (eg PVC, PET & PE bottles & jars, plastic bags, food wrappers)	15 01 02						
3	Segregated wood packaging waste (eg crates, cartons, cheese boxes, fruit trays)	15 01 03						
4	Segregated wood packaging waste pallets or pallets & crates	15 01 03				0%		
5	Segregated metal packaging waste - steel cans	15 01 04						
6	Segregated metal packaging waste- aluminium cans	15 01 04						
7	Segregated mixed metal packaging waste	15 01 04						
8	Segregated waste tetrapacks	15 01 05						
9	Segregated mixed packaging waste	15 01 06	Empty mixed packaging-this is shredded/stained/chop	2.2		0	This customer is an industrial customer	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
10	Segregated glass packaging waste (eg bottles, jars)	15 01 07						
11	Segregated textile packaging waste (eg nets for fruits & vegetables, fabric bags)	15 01 09						
12	Segregated packaging waste containing residues of or contaminated by dangerous substances.	15 01 10*	These come from the pharmaceutical industry-empty packages contaminated	0.567		100	The material itself is a packaging waste	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
13	Segregated packaging waste containing a dangerous solid porous matrix (for example asbestos)	15 01 11*						
14	Other segregated packaging waste - please specify	15 - -						
15	Other segregated packaging waste - please specify	15 - -						

Please note that

ID number	TYPE OF WASTE	List of Waste entry	WASTE DESCRIPTION Enter an accurate description of the waste.	QUANTITY ACCEPTED ONSITE: Generated in RoI (tonnes)	QUANTITY ACCEPTED ONSITE: Generated abroad (tonnes)	Packaging percentage (%) As this is a mixed material stream, containing packaging and non-packaging, we need you to estimate the % waste packaging.	How did you estimate the percentage in column H?	ACTIVITIES CARRIED OUT AT YOUR SITE Provide a brief, informative description of how you handle/process each waste stream listed below at your site. Please do not use generic descriptions such as recovery or recycling. The description should be consistent with the ID numbers reported on Sheets B1, B2 and C.
MUNICIPAL WASTE								
16	News and pams	20 01 01						
17	Paper & cardboard from municipal sources (other than news and pams)	20 01 01						
18	Glass from municipal sources	20 01 02						
19	Household food & garden waste (typically brown bin)	20 01 08						
20	Commercial food waste eg from canteens, restaurants	20 01 08						
21	Clothing waste from municipal sources	20 01 10						
22	Textile waste from municipal sources (e.g. curtains)	20 01 11	Carpet tiles with old glue on the back of them from the clean	1.9		0%	Esimated as they are carpet tiles	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
23	Fluorescent tubes & other mercury-containing waste	20 01 21*						
24	Edible oil & fat	20 01 25						
25	Mixed batteries from municipal sources	20 01 33*						
26	Wood waste from municipal sources containing dangerous substances (e.g. fence posts contaminated with creosote)	20 01 37*						
27	Wood waste from municipal sources (e. furniture)	20 01 38						
28	Plastic from municipal sources	20 01 39						
29	Metals from municipal sources eg light iron	20 01 40	These are foil tubes from a manufacturing company, they are the tubes that things like toothpaste/dental glue etc goes into	3		100	These are used in packaging things like toothpast/dental glue etc	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
30	Biodegradable garden & park waste	20 02 01						
31a	Mixed residual waste (typically black bin) from household sources	20 03 01	Waste from bin collectors	162,707		25.2	Result comes from a study from Repack	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
31b	Mixed residual waste (typically black bin) from non-household sources	20 03 01	Waste from airports/industrial customers	3,103		25.2	Result comes from a study from Repack	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
32	Mixed dry recyclables (typically green bin)	20 03 01						
33	Street-cleaning residues	20 03 03						
34	Septic tank sludge	20 03 04						
35	Waste from sewage cleaning	20 03 06						
36	Bulky waste from municipal sources (skips or otherwise)	20 03 07	Broken furniture, broken air filters etc large items from collection through skips generally	74		0	Estimated on the type of material that we receive-generally furniture, large broken items	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
37	Other municipal waste - please specify	20 01 27*	paints collected at civic amenity sites	14		60	The majority of the deliveries are empty contaminated paint tins	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
38	Other municipal waste - please specify	20 --						
39	Other municipal waste - please specify	20 - -						
40	Other municipal waste - please specify	20 - -						
WEEE: Please note that due to changes of the WEEE collection targets, it is very important that you report any WEEE accepted.								
41	Fridges & freezers	16 02 11* 20 01 23*						
42	White goods	16 02 14 20 01 36						
43	TVs & PC monitors	16 02 13* 20 01 35*						
44	Other WEEE (e.g. phones, computer equipment, electronic toys, hairdryers, vacuum cleaners)	16 02 14 20 01 36						
45	Fluorescent tubes and other mercury-containing waste	20 01 21*						
End of Life Vehicles (ELVs)								
46	End-of-life vehicles (not de-polluted)	16 01 04*						
47	End-of-life vehicles (de-polluted)	16 01 06						
WASTE BATTERI								
48	Lead acid batteries and accumulators - portable (weigh <2 kg, not for automotive or industrial use)	16 06 01*						
49	Lead acid batteries and accumulators - non-portable (automotive and industrial)	16 06 01*						
50	Ni-Cd batteries and accumulators - portable (weigh <2 kg, not for automotive or industrial use)	16 06 02*						
51	Ni-Cd batteries and accumulators - non-portable (automotive and industrial)	16 06 02*						
52	Alkaline batteries and accumulators - portable (weigh <2 kg, not for automotive or industrial use)	16 06 04						
53	Alkaline batteries and accumulators - non-portable (automotive and industrial)	16 06 04						
C&D WASTE								
54	Waste concrete from C&D sources	17 01 01						
55	Waste bricks from C&D sources	17 01 02						
56	Waste tiles & ceramics from C&D sources	17 01 03						
57	Mixture of waste concrete, bricks, tiles ceramics from C&D sources containing dangerous substances	17 01 06*						
58	Mixture of waste concrete, bricks, tiles ceramics from C&D sources	17 01 07						
59	Waste wood from C&D sources	17 02 01						
60	Waste glass from C&D sources (eg window glass)	17 02 02						
61	Waste plastic from C&D sources	17 02 03						
62	Waste glass, plastic and wood from C&D sources, containing dangerous substances	17 02 04*						
63	Waste copper, brass, bronze from C&D sources eg copper piping, copper cylinders, brass taps	17 04 01						
64	Waste aluminium from C&D sources eg window frames, fascia, soffits, gutters, downpipes etc.	17 04 02						
65	Waste lead from C&D sources eg lead pipes & flashing from building sites	17 04 03						
66	Waste iron & steel scrap from C&D sources (eg building sites)	17 04 05						
67	Waste mixed metals from C&D sources	17 04 07						
68	Waste cables from C&D sources containing oil, coal, tar & other dangerous substances	17 04 10*						
69	Waste cables from C&D sources not containing dangerous substances (e.g. copper cables)	17 04 11						
70	Contaminated soil & stone from C&D sources	17 05 03*						
71	Waste soil & stone from C&D sources	17 05 04						
72	Waste insulation material from C&D sources, containing asbestos	17 06 03*						
73	Waste insulation material from C&D sources	17 06 04	This is insulation material that comes from a briquetting operation, the waste used to go to landfill but does have a calorific value. Last year the code was reported after as 10 12 99 from the validation of this report however the customer maybe	943		0	Its from a briquetting operation	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
74	Waste construction materials containing asbestos	17 06 05*						
75	Waste gypsum-based construction material eg plasterboard	17 08 02						
76	Mixed C&D waste containing dangerous substances	17 09 03*						
77	Skips containing mixed C&D waste	17 09 04						
78	Mixed C&D waste	17 09 04						
79	Other C&D waste - please specify	17 - -						
80	Other C&D waste - please specify	17 - -						
WASTE FROM OTHER INDUSTRIES (EWC CHAPTERS 01-15, 18)								
81	Waste plastic from agricultural sources	02 01 04						
82	Waste metal from agricultural sources, eg farms, creameries & food processors	02 01 10						
83	Waste silver eg photographic film & paper containing silver or silver compounds	09 01 07						
84	Bottom ash, slag and boiler dust	10 01 01						
85	Ferrous metal filings & turnings (eg swarf) from iron & steel industry	12 01 01						
86	Ferrous metal dust & particles from steel industry	12 01 02						
87	Non-ferrous metal filings & turnings (eg aluminium or steel swarf off-cuts or swarf)	12 01 03						
88	Plastic from plastics industry eg production offcuts or shavings	12 01 05						
89	Other metal wastes from iron & steel industry eg production off-cuts	12 01 99						
90	Waste engine, gear & lubricating oils	13 02 08*						
91	Waste fuel oil and diesel	13 07 01*						
92	Other waste from industry - please specify	02 02 03	Food stuff not fit for consumption-e.g burgers etc	8		2	Estimate-these materials are packaged for sale	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
93	Other waste from industry - please specify	02 03 04	Fruits not fit for consumption	19		2	Estimate-these materials are packaged for sale	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
94	Other waste from industry - please specify	02 05 01	Food stuff not fit for consumption-milk powders etc	140		2	Estimate-these materials are packaged for sale	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95	Other waste from industry - please specify	07 05 12	waste water treatment sludge	4,518		0	Delivered in skips generally	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95a	Other waste from industry - please specify	07 05 13*	Solids from the pharmaceutical industry	49		10	Esimate on the fact the material is generally packaged coming to site and contains tablets in blister packs	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95b	Other waste from industry - please specify	07 05 14	Solids from the pharmaceutical industry	36		10	Esimate on the fact the material is generally packaged coming to site	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95c	Other waste from industry - please specify	08 03 18	this is waste printing toner	6		1	Comes to site in large tonne bags to contain the inks	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95d	Other waste from industry - please specify	11 01 10	Sludge cake	2		0	Delivered to site in skips	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95e	Other waste from industry - please specify	15 02 02 *	Contaminated wipes/filters etc from a	2		1	Comes to site in FIBC's/fibre kegs so the 1% is an estimate of	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95f	Other waste from industry - please specify	15 02 03	Contaminated wipes/filters etc from a	83		1	Comes to site in FIBC's/fibre kegs so the 1% is an estimate of	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95g	Other waste from industry - please specify	18 01 04	non infectious medical waste from a pharma company-they autoclave this on site,	7		20	Esimate from customer based on the contents	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95h	Other waste from industry - please specify	02 01 07	Ash trees-the customer was informed to destroy these by the dept of forestry	1		0	Because these were trees so no packaging content applies	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95i	Other waste from industry - please specify	07 05 01*	Aqueous liquid waste from the pharma industry	15		0	Comes in tanks	This waste is injected directly into the furnace where it is incinerated at >850°C.
95j	Other waste from industry - please specify	07 05 12	Sludge from the pharma industry	103		0	Arrives in skips	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
95k	Other waste from industry - please specify	08 03 08	This is waste ink which is delivered for direct injection	308		0	Comes in tanks	This waste is injected directly into the furnace where it is incinerated at >850°C.
PROCESSED WASTE FROM WASTE MANAGEMENT FACILITIES (EWC CHAPTER 19)								
96	Waste paper & cardboard	19 12 01						
97	Waste ferrous metal from mechanical treatment	19 12 02						
98	Waste non-ferrous metal from mechanical treatment	19 12 03						
99	Waste plastics and rubber from mechanical treatment	19 12 04						
100	Waste glass from mechanical treatment	19 12 05						
101	Processed waste wood containing dangerous substances	19 12 06*						
102	Processed wood (e.g. chipped/shredded wood)	19 12 07						
103	Waste minerals from mechanical treatment (e.g. inorganic fines, sand, stones)	19 12 09						
104	Combustible waste (refuse derived fuel)	19 12 10						
105	Other wastes (including mixtures of materials) from mechanical treatment of waste, containing dangerous substances	19 12 11*						
106	Organic fines from mechanical treatment of waste	19 12 12						
107	Mixed residual waste from mechanical treatment of waste	19 12 12	Mechnical treatment of municipal and municipal type waste	45,136	289	23.4	this is from a repack study that was conducted on site in November 2015	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
108	Other wastes from waste management facilities - please specify	19 02 03	Premixed wastes composed only of non hazardous waste-Autoclaved and Mechnically treated medical waste	2,841	5,434	23.4	this is from a repack study that was conducted on site in November 2015	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
109	Other wastes from waste management facilities - please specify	19 08 05	Sludges from urban waste water treatment	38		0	Comes in skips so no packaging content	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
110	Other wastes from waste management facilities - please specify	19 10 06	wastes from shredding of metal containing wastes-other fractions than those in 19 10 05 This customer recovers and recycle waste metals and waste containing metals, including recycling ELV's. They collect waste and process at their facility, where waste is shredded and put through a system of magnets and eddie currents to remove as much metal as possible. The resulting residues are categorised as ASR and recovered Indaver's WtE Facility.	776		0	The customer has not estimated the % packaging in this waste but it is likely to be zero as the majority is from car shredding	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
OTHER WASTE								
111	Waste glass from ELVs eg windscreens	16 01 20						
112	Waste tyres	16 01 03						
113	Waste gas cylinders	16 05 05						
114	Waste gas cylinders containing dangerous substances	16 05 04*						
115	Other - please specify	16 03 04	Off spec liquid/solids, majority of these items were ice packs	20		10	esimate based on the fact that the ice packs are in their own packets	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
116	Other - please specify	16 03 05*	Finished products that were off spec-tablets	0		10	Esimate on the fact the material is generally packaged coming to site and contains tablets in blister packs	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
116a	Other - please specify	16 03 06	Variety of off spec organic wastes e.g. waste oragnic solutions/waste parafilm	239		1	Comes to site in FIBC's/fibre kegs so the 1% is an estimate of the weight of the package holding the contaminated wipes/filters etc	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
116b	Other - please specify	16 05 08*	Liquid vials from a pharmaceutical company	0		10	Esimate on the fact the liquid is in vials	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
116c	Other - please specify	16 10 02	liquid waste streams-water with glycol and contaminated fire water from a pond	282		0	Comes in tanks	This waste is injected directly into the furnace where it is incinerated at >850°C.
116d	Other - please specify	16 01 07	oil filters from a civic amenity site	0		20	Estimate based on the fact that the filter is probably the most	This waste is put into the bunker(pit), mixed with cranes,fed to a hopper before entering the furnace where it is incinerated at >850°C.
116e	Other - please specify							
116f	Other - please specify							

Total waste accepted in 2015 (tonnes):	226,066.95

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WASTE TRANSFERRED OFFSITE (2015 DATA)

When reporting transfers of WEEE off-site, for compliance scheme WEEE, please provide the actual destination of the WEEE, and not just the name of the compliance scheme.

Description Enter an accurate description of the waste sent offsite	List of Waste entry (EWC Code)	Quantity transferred offsite (Tonnes)	ID Number Enter the ID number(s) of all the waste streams ACCEPTED from which this material was derived (Sheet A, column B)	Packaging Content (%) For wood, plastics, metals, glass, paper/cardboard, RDF/SRF etc	How did you estimate the percentage in column F?	Content (%) of material from municipal sources.	Select next destination facility type	Enter details of next destination (company name, address. and authorisation number). If the operator has multiple sites, please ensure you select the correct authorisation number. If the next owner of the waste is a broker, please give the broker name and authorisation details. If you selected private sales/farmer in column I, please provide further details here. If you selected WWTP in column I please provide the WWTP location. If you selected Other in column I, please enter name, address and authorisation number where applicable.	Description of activities carried out at the next destination facility Provide a brief, informative description. Do not use generic terms such as recovery or disposal. If the next owner is a BROKER, add 'brokered'
Bottom ash	19 01 12	19295.556	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	None in bottom ash	Bottom ash does not contain packaging	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Landfill	Knockharley Landfill Ltd W0146-02	Generally used for intermediate cover at the landfill or for use on roads within the landfill
Bottom ash	19 01 12	2304	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	None in bottom ash	Bottom ash does not contain packaging	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Landfill	Bord na Mona PLC Drehid Waste Management Facility W0201-03	Generally used for intermediate cover at the landfill or for use on roads within the landfill
Bottom ash	19 01 12	12322.08	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	None in bottom ash	Bottom ash does not contain packaging	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Landfill	Monaghan Co Co Scotch Corner Landfill W0020-02	Generally used for intermediate cover at the landfill or for use on roads within the landfill or put into a cell
Flue gas residue	19 01 07*	224.7	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	None in flue gas residue	Flue gas residue does not contain packaging	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Abroad	K & S,34/Hef-79 n 330-51/153,Werk Werra,Standort Wintershall Herfagrund,36266 Herfa ,36266 Herfa ,Germany	Reutilisation in a salt mine, R5
Flue gas residue	19 01 07*	8468.16	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	None in flue gas residue	Flue gas residue does not contain packaging	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Abroad	K&S Kali GmBH,LicenceM76D310/57,Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269 Philippsthal,Germany	Reutilisation in a salt mine, R5
Flue gas residue	19 01 07*	1714.43	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	None in flue gas residue	Flue gas residue does not contain packaging	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Abroad	K&S Kali GmbH Werk Werra,AZ.1325/98 AZ6631/99,Standort Unterbreizbach,Untertagaeverwertung Schaet 11,Unterbreihbach,D36414,Germany	Reutilisation in a salt mine, R11
Boiler ash	19 01 13*	1923.39	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	None in boiler ash	Boiler ash does not contain packaging	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Abroad	K & S,34/Hef-79 n 330-51/153,Werk Werra,Standort Wintershall Herfagrund,36266 Herfa ,36266 Herfa ,Germany	Reutilisation in a salt mine, R5
Boiler ash	19 01 13*	50.12	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	None in boiler ash	Boiler ash does not contain packaging	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Abroad	K & S ,34/Hef-79n330-51/153,Werra Plant Underground Waste Disposal Plant,Herfa-Neurode,36266 Heringen ,36266 Heringen ,Germany	Disposal in underground salt mine, D12
Non Ferrous Metal	19 12 03	189.02	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	60%	This is the figure that was estimated from the outlet that we sent the metal to for further recovery. This figure has not been agreed by Repack yet, they have our reports and have yet to confirm if they agree with the figure.	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Abroad	Craenhals Metal Terminal, 10088, Van Patraestraat 90 ,2660 HOBOKEN (Antwerpen),Antwerp,2660,Belgium	Using a flotation technique, Craenhals Metal Terminal recycles non-ferrous fractions. These are processed into new raw materials, ready for use in the secondary non-ferrous industry.
Non Ferrous Metal	19 12 03	543.38	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	60%	This is the figure that was estimated from the outlet that we sent the metal to for further recovery. This figure has not been agreed by Repack yet, they have our reports and have yet to confirm if they agree with the figure.	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Abroad	GALLOO Wervikstraat 320, 8930 MENEN België	Using a flotation technique and eddy current seperation Galloo recycles non-ferrous fractions. These are processed into new raw materials, ready for use in the secondary non-ferrous industry.
Ferrous Metal	19 01 02	164.12	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%	Percentage was given to us from Repack and this is what we get rebates from Repack for.	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Other	ClearCircle Metals (Limerick) Ltd (Formerly Hegarty Metals) Ballysimon Road Limerick	Bulking up for shipping abroad for treatment
Ferrous Metal	19 01 02	592.88	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%	Percentage was given to us from Repack and this is what we get rebates from Repack for.	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Other	United Metal Recycling (Ireland) Ltd. Eastway Business Park,	Bulking up for shipping abroad for treatment
Ferrous Metal	19 01 02	78.26	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%	Percentage was given to us from Repack and this is what we get rebates from Repack for.	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Other	Wilton Waste Recycling	Bulking up for shipping abroad for treatment
Ferrous Metal	19 01 02	4400.22	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%	Percentage was given to us from Repack and this is what we get rebates from Repack for.	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Other	Hammond Lane Metal Co. (Pigeon House) WFP-DC-09-0013-01	Bulking up for shipping abroad for treatment
Ferrous Metal	19 01 02	328.46	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%	Percentage was given to us from Repack and this is what we get rebates from Repack for.	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Abroad	Indaver NV,MLAV1/9800000485/MV/bd,Industriele Afvalverwerking,Poldervlietweg,B-2030 Antwerpen 3,B-2030 Antwerpen 3,Belgium	Bulking up and cleaning prior to final treatment

(If you need to add more rows (or delete), you will be prevented from doing so; please call the helpline on 01-4721072).									

Total waste transferred in 2015 (tonnes):	**52599**

NATIONAL WASTE REPORT 2015 SURVEY

FINAL TREATMENT (2015 DATA)

Final treatment of a material means treatment to the point that it is no longer waste. Annex II of Waste Framework Directive (2008/98/EC) sets out a non-exhaustive list of recovery operations which includes material recovery (ie recycling), energy recovery (ie use as fuel (other than in direct incineration) or other means to generate energy) and biological recovery (eg composting).

Description Enter an accurate description of the material	Quantity of material recovered at your premises: material used onsite and material sent offsite. (Tonnes)	ID Number Enter the ID number(s) of all the WASTE streams accepted from which this material was derived (Sheet A, column B)	Packaging Content (%) For wood, plastics, metals, glass, paper/cardboard, RDF/SRF etc	How did you estimate the percentage in column E?	Content (%) of material from municipal sources.	RECOVERY OPERATION Describe the recovery process carried out on your premises.	What end-of-waste criteria did you use to determine end-of-waste?	Enter details of the next material owner (destination facility or broker) if there is an offsite transfer (name, address, authorisation number) or give your own site name if recovered material is used onsite.
All waste that is accepted on site goes into the bunker with the exception of the aqueousliquids which are directly injected into the furnace.	227524	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	For 19 12 12 the result of a repack study is that 23.4% is packaging. For 20 03 01 the result is 25.2%	Repack study was conducted on site in November 2015	Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams	Waste is incinerated at high temperatures in order to produce steam. The steam drives the turbine which in turn generates electricity which we export to the national grid.	We are the end waste treatment centre for these materials and we issue certs of treatment for these materials to the customer who provides us with the waste	N/a
(If you need to add more rows (or delete), you will be prevented from doing so; please call the helpline on 01-4721072).								

Total final treatment in 2015 (tonnes):	227524

MATERIAL IN STORAGE ON YOUR PREMISES

COMPLETE THIS SHEET ONLY IF YOUR COMPANY HAD MATERIAL IN STOCK AT EITH

DESCRIPTION Enter an accurate description of the waste	List of Waste entry (EWC)	ID code from Sheet A, where applicable. *Where waste is in storage from previous year and not related to waste accepted in calendar year being reported on, please mark N/A*
A mixture of all the waste from the incoming spreadsheet. The waste is mixed in the bunker and therefore it loses its identity. The only stream that doesn't enter the bunker is the aqueous liquids and that is injected directly into the furnace and wouldn't form part of the storage figures.	All the items EWC that are listed in tab A	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d

(If you need to add more rows (or delete), you will be prevented from doing so; please call the helpline on 01-4721072).		
Totals		

5 SURVEY

ER THE START OR END OF YEAR

QUANTITY OF MATERIAL IN STORAGE ONSITE		
AT START OF YEAR (TONNES)	AT END OF YEAR (TONNES)	NET STORAGE (TONNES) (Auto-calculates)
4,280.00	4,431.70	151.70
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
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		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
4,280.00	4,431.70	151.70

Net storage (tonnes):	**151.70**

Appendix 3: Energy Efficiency Report

Indaver Ireland

Energy Audit

Waste Licence W0167-03

2015 Energy Audit

Document Title	Energy Audit
Document No.	2015 Energy Audit
Client	Indaver
Address	Carranstown, Duleek, County Meath

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Introduction

Indaver Ireland has a Waste Licence W0167-03 issued by the EPA. This licence requires that Indaver Ireland complete an energy audit and that the report of this audit be available on site for inspection by the EPA and a summary accompanies the AER. The scope of the required energy audit is defined by the 'Guidance Note on Energy Efficiency Auditing', published by the EPA, Johnstown Castle, Co. Wexford, Ireland. This document is intended to satisfy the specified scope.

It is noted that whilst the EPA require an energy audit, the plant is relatively new having been built and commissioned in 2011 and has been designed and built with energy efficiency taken into consideration from the start.

Site description

The site includes the following areas

- Offices
- Waste reception hall
- Furnace area
- Turbine Hall
- Maintenance workshops
- Flue Gas Treatment area
- Security and associated weighbridges

The site carries out the following activities that are significant in terms of energy consumption

- Waste incineration

Utilities necessary to support the above activities that are significant in terms of energy consumption are

- Compressed air
- Steam generation
- Conveyor systems
- Steam cooling

Audit

Audit timing

The audit of the site is continuously reviewed by the E & I Lead and a paper based audit afterward.
The weather conditions were normal for the time of year, but weather does not significantly effect energy consumption.

Audit period

December 2014 to December 2015

Audit personnel

The persons involved in the audit where theProcess Engineer Joe Crawley, , the Maintenance Manager, Rory Murphy, , Electrical and Instrumentation Supervisor Eoin Wright and the Quality and Environmental Manager, Grace McCormack.

Scope of audit

The scope of the required energy audit is as defined by the 'Guidance Note on Energy Efficiency Auditing', published by the EPA, Johnstown Castle, Co. Wexford, Ireland.

Additional requirements re the energy audit are contained in Condition 7.1.2 and Condition 7.1.3 of the Waste Licence. The scope of the audit includes these conditions which read as follows

7.1.2 The licensee shall build and operate the facility to achieve an energy efficiency of, as a minimum, 0.65 using the formulae below to calculate Energy Efficiency:

Energy Efficiency = [Ep– (Ef + Ei)]/0/97 x (Ew + Ef] where

Emission point = annual energy produced as heat or electricity (GJ/year) (heat produced for commercial use is multiplied by 1.1 and electricity is multiplied by 2.6)

Ef = annual energy input to the system from fuels contributing to the production of steam (GJ/year)

Ew = annual energy contained in the waste input using the net calorific value of the waste (GJ/year)

Only those systems whose energy consumption is significant were examined in detail.

Audit process

The audit process carried out to arrive at the recommendations was as follows:

Review of energy data

It is noted that the plant is a 'waste to energy' plant and therefore bought in electricity is insignificant. The energy data analysed included data for treated waste, steam produced and electricity generated.

Energy Efficiency

Condition 7.1.2 of the Waste Licence sets minimum energy efficiency. The achievement of this parameter is reviewed.

Review of best practice

A literature review was undertaken in 2012 by the external consultant who produced the 2012 report to determine best practice. This included review of the UK Action Energy publications (Good Practice Case Studies, Good Practice Guides and Energy Consumption Guides), BATNEEC Guidance Documents and BREF publications. This review allows identification of any lack of best practice during the audit.

Site audit

During the site audit all areas, processes and systems of energy significance were reviewed under the following six headings

- Whether the systems could effectively modulate energy consumption to production levels, occupancy levels, outside temperature or light levels.
- The extent of any losses from the system (e.g. heat loss, air leaks, friction or drive losses)

- The size of the system in relation to load (e.g. whether , for example, motors are under loaded)
- Whether there is good monitoring system in place (e.g. is energy input metered and production throughput measured, then analysed)
- Whether there is an opportunity for heat recovery and a use for the recovered heat
- Review of the 2014 audit report and the 2015 objectives and targets

Energy Management System

Energy management is an all-encompassing process that should include every aspect of an organisation from finance, human resources and public relations to maintenance, purchasing and planning.

Energy Performance

Site energy performance

It is noted that the plant is a 'waste to energy' facility. The prime objective of the plant is to achieve a volume reduction of the waste material by incinerating the combustible proportion. The waste material is burned in a furnace and steam is produced. The steam is then used in a steam turbine to generate electricity. The electricity, less the house load of approximately 1.8 MW, is exported.

Fork lift trucks are gas (LPG) powered but as this is negligible, it is ignored.

Condition 7.1.3 requires a calculation to be determined for the net usable energy produced per tonne of waste. This calculation was performed and the result is as shown:

Net Usable Energy Per Tonne of Waste Processed	0.67 M Wh/Tonne

Condition 7.1.3 also requires a full breakdown of the calculation of each parameter in the equation and the results for this is shown below:

$$\text{Energy efficiency} = \frac{E_p - (E_f + E_i)}{0.97 * (E_w + E_f)}$$

In which:

E_p *means annual energy produced as heat or electricity. It is calculated with energy in the form of electricity being multiplied by 2.6 and heat produced for commercial use multiplied by 1.1 (GJ/year)*

E_f *means annual energy input to the system from fuels contributing to the production of steam (GJ/year)*

E_w *means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year)*

E_i *means annual energy imported excluding* E_w *and* E_f *(GJ/year)*

0.97 *is a factor accounting for energy losses due to bottom ash and radiation*

In addition, Annex II of the WFD highlights that this formula shall be applied in accordance with the Reference Document on Best Available Techniques for Waste Incineration (BREF WI).

Data used: 1st January 2015 to 31st December 2015.

Total waste treated 01/01/15 to 31/12/15	227524	**Tonnes**		
Total electricity produced 01/01/15 to 31/12/15	151608	**MWh**		

Type of energy	**Unit**	**Tonne**	**NCV (kJ/kg)**	**Energy (MWh)**
Adjusted amount incinerated waste		224,632	9,100	567,820
Amount sewage sludge		-		
Amount used activated carbon		-	-	-
E_w Energy input of waste	**MWh**			**567,820**
Ef: Light fuel oil used for startup / keeping temperature	tonne	179.6	42,000	2,095
Ef: Natural gas used		-	-	-
Ef: Energy input by imported energy with steam	**MWh**			**2,095**
Ei: Light fuel oil used for startup / shutdown	tonne	179.6	42,000	2,095
Ei: Natural gas used	-	-	-	-
Ei: imported electricity (multiplied with equivalence factor 2.6)	-	-	-	
Ei: imported heat	-	-	-	-
Ei: Energy input by imported energy without steam	**MWh**			**2,095**
Ep: Adjusted electricity produced and internally used for incineration process	MWh	16,202.00	-	151,405
Ep: electricity delivered to a third party	MWh	135,406.00	-	
Ep: Electricity produced	**MWh**	**151,506.40**		**151,404.80**
Ep: Heat exported	MWh	-	-	-
Ep: Heat exported	**MWh**	**-**	**-**	**-**
Ep: heat used internally for steam driven pumps, backflow, heating flue gas, liquid APC residues		-	-	-
Ep: for soot blowing without backflow		-	-	
Ep: for heating buildings, deaeration, NH4OH injection		-	-	-
Ep: Heat used internally	**MWh**	**-**	**-**	**-**
Ep	**MWh**			**393,652**
R1				**0.705**
R1 with Climate Correction				**0.80**

R1 Adjustments: Curtailment

Objective:	Omit periods where NCC constrains / curtails plant as energy must be spilt during these periods.
Data affected:	MWh produced, waste tonnes processed
Obtaining data:	MWh produced and waste treated during constraints from NCC
affect of data	Tonnes of waste in 1.1 reduced to exclude contraint periods
	Ep Electrity produced in 5 reduced by electricity producted during contraint

Frequency of processsing data: monthly

Curtailment

	MWh	t waste
Jan-15	6	164
Feb-15	0	0
Mar-15	3.5	76
Apr-15	0	
May-15	0	0
Jun-15	0	0
Jul-15	6	171
Aug-15	6	159
Sep-15	1	26
Oct-15	9	240
Nov-15	16.3	457
Dec-15	53.8	1,598
Total	**101.6**	**2892**

Energy Performance Assessment

The overall energy performance of the site can be determined by considering the energy performance of the different systems (i.e. building lighting, space heating etc). The aim of this approach is to provide an easy to interpret overview of the energy performance of the site and each sub-system in a table format. The method is also repeatable and different auditors should arrive at the same rating. This is of particular value where there is a lack of sub metering.

The performance of each significant[1] sub system is determined by reviewing the separate aspects within it. Each aspect is rated 1 to 3 where

- 1 = Needs improvement
- 2 = Fair
- 3 = Good

All systems have the same generic aspects (for each system, the most significant aspect is marked by *)

- Ability of controls to modulate output to meet demand.
- The extent of losses (air, heat etc)
- Correct sizing of system
- Monitoring
- Options for heat recovery (where applicable)

The performance of each system is therefore determined from the average of the rating of the generic aspects. Thus the rating of each system will range from 1 to 3. The overall score for the site is the average of the ratings for the individual systems. This is shown in Table 1 below.

[1] A significant sub system is defined as a large group of items with similar energy characteristics determined qualitatively that can be treated as an homogenous group for the purposes of investigating energy efficiency measures.

Table 1 Performance of site and systems

System	Significant system	Poor	Fair	Good	Score
Office lighting	No			X	2.60
Shop floor lighting	Yes		X		2.20
Conveyors	Yes		X		2.00
Compressed air generation	Yes		X		1.80
Compressed air distribution	Yes		X		2.40
Steam production	Yes			X	3.00
Process cooling	Yes		X		2.00
Hybrid cranes	No		X		2.20
HVAC	Yes			X	2.60
Overall			X		2.29

Performance Office lighting

	Poor	Fair	Good	Score	Comments
Modulation of output (e.g. ability to adjust output in line with demand or conditions)			x	3	Occupancy sensors have been put in the office block
Losses (e.g. due to inefficiencies)			x	3	High Frequency control
Sizing of system *			x	3	Light levels correct task
Energy monitoring (e.g. is the energy consumption for this system known)		x		2	Occupancy sensors present and exit signage in place
Heat recovery (e.g. is any waste heat recovered)			x	3	No heat recovery practical
Score			x	2.80	

Performance Shop Floor Process Building lighting

	Poor	Fair	Good	Score	Select a comment
Modulation of output (e.g. ability to adjust output in line with demand or conditions)		x		2	Light switches have been and continue to be installed where routes permit
Losses (e.g. due to inefficiencies)			x	3	High Frequency control
Sizing of system *			x	3	Lux level is correct for task
Energy monitoring (e.g. is the energy consumption for this system known)	x			1	No sub metering at fine enough level
Heat recovery (e.g. is any waste heat recovered)			x	3	No heat recovery practical
Score		x		2.40	

Performance Production equipment (conveyers)

	Poor	Fair	Good	Score	Comments
Modulation of output (e.g. ability to adjust output in line with demand or conditions) *			x	3	Conveyors run when idle but this is minimal
Losses (e.g. due to inefficiencies)			x	3	Conveyors are regularly checked for alignment and corrective and preventative work orders are generated when required
Sizing of system			x	3	Systems have been accurately sized based on load
Energy monitoring (e.g. is the energy consumption for this system known)		x		2	Conveyors run when idle but this is minimal
Heat recovery (e.g. is any waste heat recovered)			x	3	No heat recovery practical
Score		x		2.80	

Performance Compressed air generation

Compressed air generation refers to air compressors, but excludes driers, filters and the distribution system.

	Poor	Fair	Good	Score	Comments
Modulation of output (e.g. ability to adjust output in line with demand or conditions) *			x	3	Just one compressor has VSD, this is the lead compressor.
Losses (e.g. due to inefficiencies)			x	3	A VSD compressor runs on load when required and idles when there's no demand
Sizing of system		x		2	No comment
Energy monitoring (e.g. is the energy consumption for this system known)	x			1	No sub metering at fine enough level
Heat recovery (e.g. is any waste heat recovered)		x		2	No heat recovery, no local requirement for heat
Score		x		2.20	

Performance Compressed air distribution

The compressed air distribution system consists of the piping from the compressor to point of use including air receivers, driers and filters.

	Poor	Fair	Good	Score	Comments
Modulation of output (e.g. ability to adjust output in line with demand or conditions) *			x	3	A VSD compressor runs on load when required and idles when there's no demand
Losses (e.g. due to inefficiencies)			X	3	System is well maintained with no leaks evident
Sizing of system		x		2	No comment
Energy monitoring (e.g. is the energy consumption for this system known)			x	3	Sub metering and data logging

Heat recovery (e.g. is any waste heat recovered)			x	3	No heat recovery practical
Score		x		2.80	

Performance steam production

	Poor	Fair	Good	Score	Comments
Modulation of output (e.g. ability to adjust output in line with demand or conditions) *			x	3	No comment
Losses (e.g. due to inefficiencies)			x	3	No comment
Sizing of system			x	3	No comment
Energy monitoring (e.g. is the energy consumption for this system known)			x	3	Steam output measured, waste input measured
Heat recovery (e.g. is any waste heat recovered)			x	3	No heat recovery practical
Score			x	3.00	

Performance Process cooling (air cooled condensers)

	Poor	Fair	Good	Score	Comments
Modulation of output (e.g. ability to adjust output in line with demand or conditions) *			x	3	VSD operated fans
Losses (e.g. due to inefficiencies)			x	3	Fouling of heat exchange surface is monitored
Sizing of system			X	3	System has been sized to run at 100% resulting in high efficiency from the motors and drives
Energy monitoring (e.g. is the energy consumption for this system known)		x		2	Quarterly metering at sub distribution board level now ongoing
Heat recovery (e.g. is any waste heat recovered)			X	3	Exhaust steam to the ACC is at 45 °C limiting any further recovery. Condensate is sent back into the process
Score		x		2.80	

Performance hybrid cranes

	Poor	Fair	Good	Score	Comments
Modulation of output (e.g. ability to adjust output in line with demand or conditions)			x	3	Crane program is set to only utilize cranes when required. Otherwise, cranes will idle with no consumption
Losses (e.g. due to inefficiencies)			x	3	No Comment
Sizing of system			X	3	Cranes specified against load. Material or process hasn't changed since design
Energy monitoring (e.g. is the energy consumption for this system known)	x			1	No sub metering at fine level.

Heat recovery (e.g. is any waste heat recovered)			x	3	No heat recovery practical
Score		x		2.60	

Performance HVAC

	Poor	Fair	Good	Score	Comments
Modulation of output (e.g. ability to adjust output in line with demand or conditions)			x	3	Variable volume system
Losses (e.g. due to inefficiencies)			x	3	Intake air taken from hot area above boilers
Sizing of system		x		2	No comment
Energy monitoring (e.g. is the energy consumption for this system known)		x		2	Measured and controlled on the BMS system
Heat recovery (e.g. is any waste heat recovered)			x	3	No heat recovery practical as many sources of low grade heat in plant.
Score		x		2.60	

Recommendations

The audit recommendations from the 2015 audit are shown in the table below. These items(items 1, 3 and 4) were put into the objectives and targets for 2015 and the update on these are below.

Table -2 Recommendations

Ref.	Measure	Inter - dependency	Predicted annual savings, kWh	Predicted annual GHG savings, t CO_2	Predicted annual cost saving, €	Capital cost measure, €	Simple payback period, yrs	Capital cost per tonne annual CO_2 savings, €/t
1	Ambient light/occupancy controllers for office lights	None	2,409	0.7	170	1,000	5.9	1361
2	Investigate suitability of ambient light controllers for shop floor	None	22,886	7.0	1,600	1,500	0.9	215
3	Cooler air inlet for air compressor	6	39,814	12.1	2,787	1,000	0.4	82
4	Monitor energy use at finer level	5	823,221	251.1	57,625	10,000	0.2	40
5	Define Energy Policy	4	823,221	251.1	57,625	-	-	0
6	Review air pressure and consider separating instrument air from plant air	3	88,476	27.0	6,195	-	-	0
7	Investigate uses for exhaust steam	None	2,599,092	792.7	181,935		-	0
	Totals		**4,399,119**	**1,342**	**307,937**	**22,500**	**0.07**	**16.8**

Notes

1. GHG savings based on electricity generated being classed as 50% green and displacing electricity with an emission factor of 0.61 g/kWh. Predicted GHG emission savings are therefore 0.305 g/kWh. (Source SEAI).

Ambient light/occupancy controllers office areas

Ambient light/occupancy controllers operate by automatically switching off the lights when the natural light level is sufficient. The occupancy feature of the unit switches off the lights when left in the 'on' position lights if there is no one in the room.

It was noted during the audit that many office areas had good natural daylight yet the light were on, or there was no one in the room and the lights were on.

Rooms with large numbers of lights should be prioritised over rooms with a few lights as the cost of the energy saving measure is more closely related to the number of rooms than installed load.

2015 Objective and Target:

Awareness Campaign

A Poster & Awareness campaign was implemented by the Environmental Officer. Stickers and Posters are now visible by all light switches.

Occupancy Controllers

The following light/occupancy controllers are now purchased and installed in the following office areas with blank plates put over existing switches to prevent being left on.

Areas Identified and Actions Completed

Level 5: Engineer's Office

Level 4: All offices & corridors

Level 3: All toilets and small corridor

Level 2: E&I Team Leader & Maintenance Manager Offices

Level 0: All toilets and small corridor

Security Building: Toilets and small corridor

Removal of surplus lighting

The following areas have been identified as a possible reduction in the amount of lighting required.

Areas Identified

Level 5: Engineer's Office

Level 4: process engineers office and corridor

Level 2: open plan workshop area

Security Building: Toilets and small corridor

Excess Lighting in Process Hall

Process Areas

To continue the review of Plant Lighting Levels - Measure lighting with Lux meter and review requirement. Remove non-required excess lighting where possible or install switches on circuits that will not compromise on safe access and egress routes. This is listed under individual goals under cost savings.

Areas Identified and Actions Completed during 2015

Production Cage: 6 Lights now switched locally.

MCC 1: 2hr timer switch installed switching off lights that have been left on unnecessarily.

MCC 2: 2hr timer switch installed switching off lights that have been left on unnecessarily

MCC 3: 2hr timer switch installed switching off lights that have been left on unnecessarily.

Technical Gallery 1: 2hr timer switch installed switching off lights that have been left on unnecessarily.

Technical Gallery 2: 2hr timer switch installed switching off lights that have been left on unnecessarily.

VSD room: 2hr timer switch installed switching off lights that have been left on unnecessarily.

Lime milk prep room: switch moved to outside room to encourage lights being turned off as it wasn't safe to do so when switch inside room

Lime milk pump room: switch moved to outside room to encourage lights being turned off as it wasn't safe to do so when switch inside room

Monitor energy use at finer level

UK Good Practice Guide 316 "Undertaking an Industrial Energy Survey," explains the purpose of a monitoring and targeting system:

"*An energy survey can only ever be a snapshot. It is therefore best at detecting opportunities for permanent modifications to plant, equipment, buildings and operating procedures. However, your organisation may be incurring hidden costs through avoidable waste occurring at random and remaining undetected. Examples could include:*

- *Time switches and other self-acting controls failing in the 'on' position.*
- *Maintenance errors, such as fitting an oversized replacement motor.*
- *Operating errors, such as running an air compressor against a closed isolation valve*
- *Lax discipline, for example leaving auxiliaries to run when not required.*
- *Leaks.*

A management technique called Monitoring and Targeting (M&T) is the most effective defence against these kinds of loss, which a one-off survey would miss. The next best option – a regular programme of routine energy inspections – would be a more costly exercise, and would anyway miss many kinds of energy-wasting faults because they are frequently of an unforeseen nature.

M&T works by combining regular consumption data (usually weekly or monthly) with corresponding data on production throughput, weather, or other driving factors (called 'variables' in the older literature). An M&T scheme is primed with targets for each stream of consumption, these targets being related to the relevant driving factor, so that given the level of activity in the facility, a 'correct' ration of energy can be estimated at each point of use. The deviation between actual and expected consumptions indicates the extent of any unexpected loss, which can then be converted to its implied cost in order to establish its significance. When the fault detected in this way proves persistent, the pattern of deviation can be analysed as an aid to diagnosis.

An effective M&T scheme provides, in effect, a continuous review of the site's performance, and as well as revealing random unexpected losses, it can be used to monitor and verify the effectiveness of other energy conservation measures. Verification is doubly significant if your company is engaged in emissions trading."

According to Sustainable Energy Ireland, sites using M&T have achieved savings representing 5 and 25% of the annual fuel bill. A UK Department of Energy Survey found that the average annual savings identified by companies implementing M&T was 13% and in some cases savings in excess of 25% were obtained. A conservative figure of 5% has been assumed for this report.

At present, the electricity consumption of each significant item of equipment is not monitored. However, by fitting sub metering, the energy consumption can be monitored. Examples of possible items or systems to monitor are

- Office lighting on a per floor level
- Production area lighting
- Outside lighting
- Each conveyors or groups of related conveyors
- Air cooled condenser fans
- Each air compressors

The consumption figures, normalised where appropriate, can be plotted on a daily basis and a technique such as Statistical Process Control (SPC) used to analyse the variations. A typical plot of normalised fuel consumption, using this technique but with data from another client is shown below.

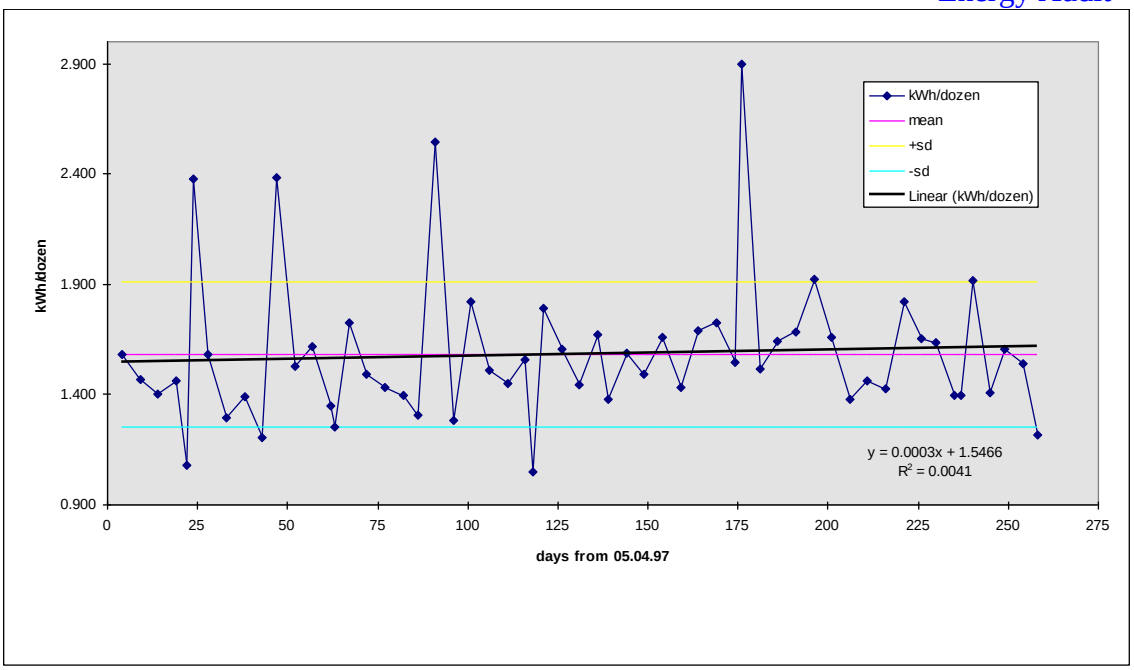


Figure -1 Normalised fuel consumption

If the production process were completely under control, then the actual consumption per unit of output would be a straight horizontal line similar to the line labelled 'mean' in the figure above. Because of variations due to a multiplicity of factors, e.g. changing calorific values of waste, deterioration of equipment over time, different operator practices, weather conditions and so on there will be variations in the consumption of electricity per unit of output. These variations are shown by the line labelled kWh/dozen.

The key to reducing energy consumption lies in determining which variations are due to causes which can be controlled (termed 'assignable causes') and those for which no known explanation exists or is possible - 'un-assignable causes'. In general variations due to 'assignable causes' will lie outside the upper and lower control lines (which are each one standard deviation apart from the mean line). In addition, those variations which can not be controlled will lie inside the control lines.

The UK Carbon Trust web site states that a structured and formal energy management policy can allow you to achieve savings of 10 - 20%; for more information follow the link http://www.carbontrust.co.uk/energy/startsaving/tech_energy_management_introduction.htm

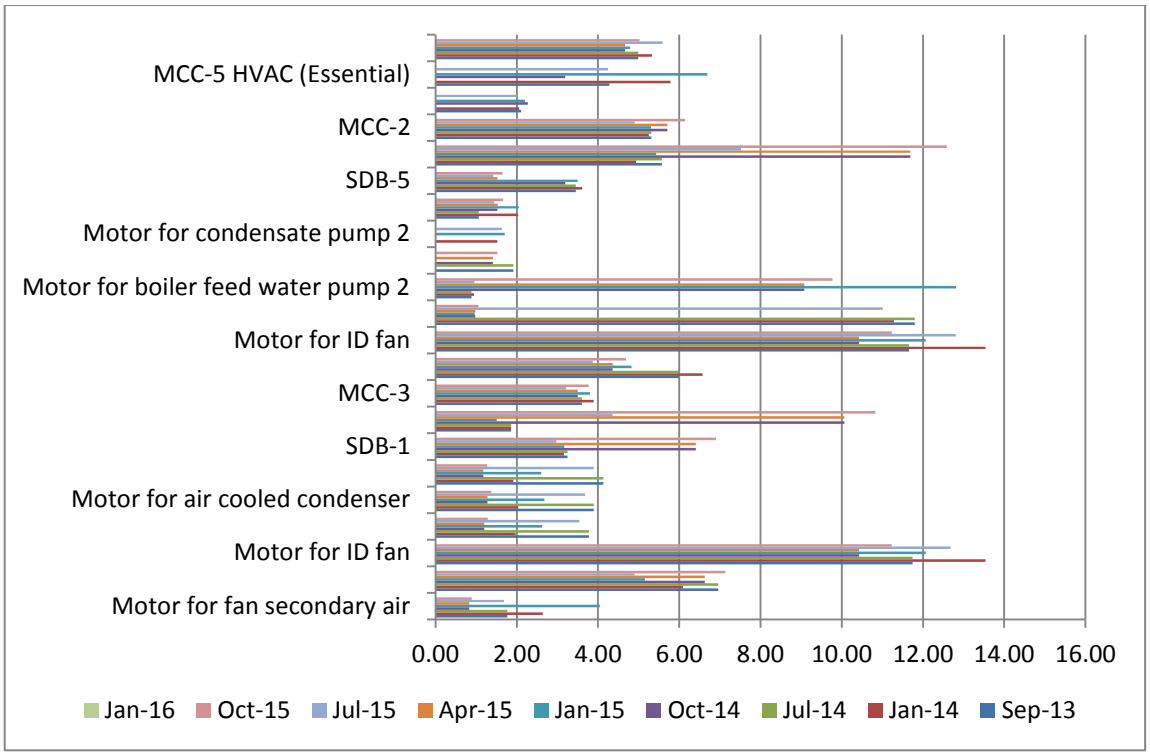
Actions for 2016

Monitoring at a finer Level

A power monitoring exercise is captured in a preventative maintenance plan. The Large consumers and sub distribution boards (without large consumers) all monitored.

The current was monitored during a period of 2 hours. The results are now provided in a report shown below in graphical format against previous findings. This will be repeated in 2016 and reviewed.

S:\Project Meath\93 Operations\934 Maintenance\9342 Preventative Maintenance\93426 Electrical Checks & Inspections\001 - E&I Execution Lists\Power Consumption\Power Monitoring Energy Usage.xlsx



Actions for 2016

The site power consumption monitoring will be scheduled for 4 times a year and the results will be compared to the baseline report. Decision will be made after the evaluation of these results whether to further monitor at the sub-distribution board level. The decision will be E&I lead.

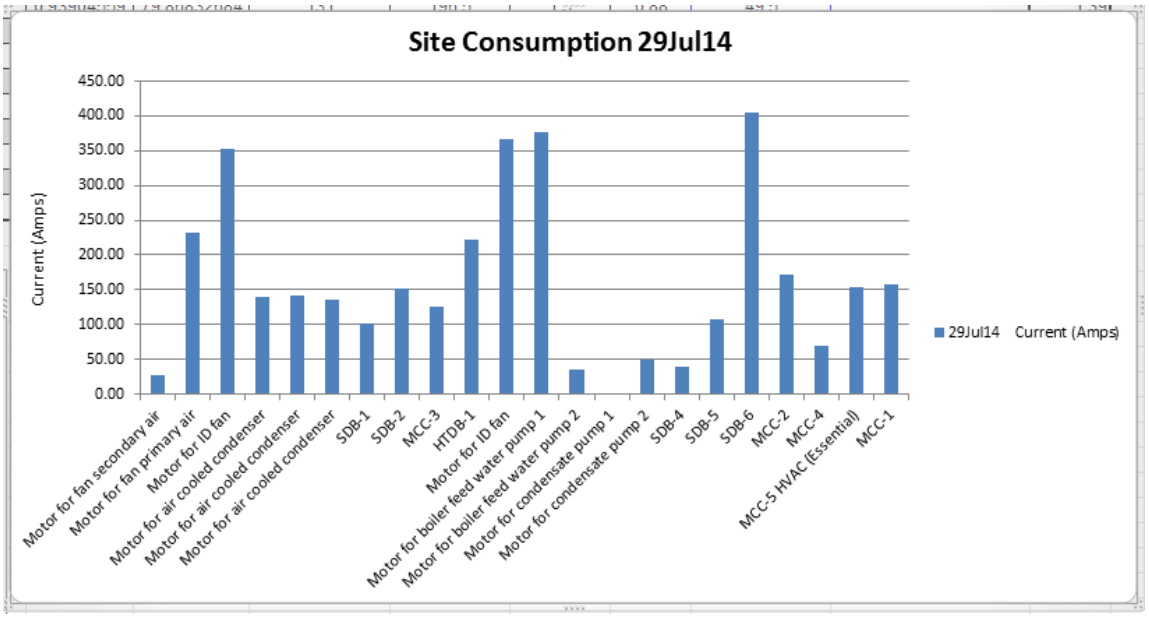
Monitoring and investigation of the set points used in the HVAC Control System.

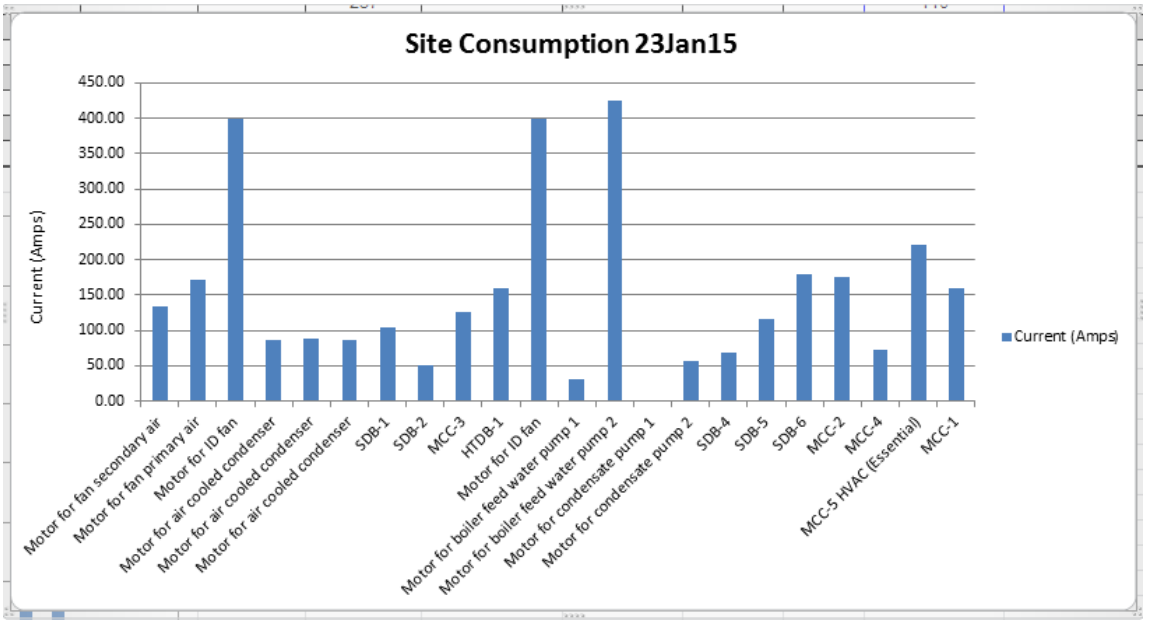
Maintenance have investigated turning off one of the standby compressors as it has never been called into service and this will lead to a reduction in electricity consumption. Once this has been done the monitoring can be completed which will determine the energy usage in a better fashion than the current method.

Areas Identified and Actions Completed

A database of results has been compiled from the monitoring carried out. The energy consumed on site can be directly correlated to plant performance due to uncontrollable variables such as Waste CV / steam production. Ambient weather temperature also has a large influence on main consumers such as:

- ACC: 3 large VSD driven motor & fans. Cooler ambient temperatures means the ACC doesn't have to work as hard but a higher steam load will have an adverse effect on the ACC regardless of the ambient temperature.
- Primary/Secondary Air Fans: These will be varied considerably by the Production Team depending on the waste's calorific value to ensure a good burn-out. Wet waste means a lower CV resulting in lower volumes of Primary Air and higher volumes of Secondary Air.
- HTDB 1: The heat tracing on the conveyors is not required to be running as much in the warm weather as it does in the cold weather.
- SDBs: The heat exchangers on the roof. Cooler ambient temperatures means the heat exchangers don't have to work as hard.
- MCC-5 HVAC: Warm weather means that the heaters on the HVAC aren't required but the Air Conditioning may be in more demand within the offices.





Conclusions

Our site's consumption is dynamic with many input variables having an effect on our internal energy consumption as outlined above. Our site has been designed to adapt automatically to the specific requirements on any day such as VSD driven fans slowing or speeding dependant on load requirements and ambient temperatures. Heat Tracing on Conveyors automatically switching itself off when ambient & product temperature are sufficient to maintain required setpoints.

Review air pressure and consider separating instrument air from plant air

Normal industrial compressed air systems tend to have operating at 7-bar pressure. During the survey it was noted that the on-load pressure of the compressor was of about 10 bar and this has been confirmed as correct.

Compressed air is provided by up to three air compressors. There is one VSD controlled air compressor operating and is the lead compressor, the others operate in assist/backup mode once the VSD controlled compressor is running at 100%.

There are three compressed air systems,

- Compressed Air, untreated at 10 bar
- Plant Air , dew point 2 C at 9 bar
- Instrument Air, dew point -40 C at 7 bar

UK Carbon Action Good Practice Guide 126 “Compressing Air Costs” states “it takes up to 5% more electricity to generate the air at a 10% greater pressure”. It is therefore suggested that the actual minimum air pressure for satisfactory operation be established with a consideration to reducing air pressures.

2016 Objective and Target

Options going forward to be investigated:

Review of process area lightings.

New installation or new purchase of equipment-the energy efficiency of the equipment is taken into account prior to purchase.

Investigate the possibility of replacing the maintenance jeep to a hybrid/electrical vehicle.

Investigate the possibility of solar panels on the site

Brought over from 2015:

A study has started to measure and calculate the cost of Instrument Air versus Plant Air with a view to justifying the migration of the Flue Gas Area and the Christ Demineralized Water Skid onto the Plant Air System.

This study and rationalization will carry into 2016’s targets and may result in some or all of the following objectives:

- Plant Air feeding the Flue Gas Area instead of Instrument Air
- Plant Air feeding the Christ Demineralized Water Skid instead of Instrument Air
- Plant Air feeding the Furnace Cameras instead of Instrument Air
- Turning off one of our Desiccant Dryers.
- Turning off one of our Refrigerant Dryers.