

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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E-PRTR 2015

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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 tonnes¹ 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:

рН	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 guarter for 2015:

Quarter	рH	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	m³	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.

	Complaints Investigated	Complaints actually related to our activities
Detail	Total	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 10:41 11:12 11:44 22:00 15/09/2015	30 30 30 30 30	52.6 58.2 58.96 52.3	62.7 62.6 62.75 57.4	47.7 47.3 48.76 44.8	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.
	00:07 00:44	20 20	51.56 44.6	52.61 50.5	44.91 44.6	
AN1-2	14/09/2015 13:24 13:50 14:31 22:28 23:10 23:42	30 30 30 30 20 20	69.35 70.09 68.8 59.9 57.0 51.56	73.62 74.35 73.1 62.6 60.1 52.61	54.4 53.4 53.9 40.0 39.7 44.91	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.
AN1-3	14/09/2015 12:57 13:54 14:27 22:27 23:12 23:34	30 30 30 30 20 20	61.5 62.4 61.98 55.91 47.8 54.38	64.3 65.6 65.32 59.7 52.6 57.86	55.0 55.4 53.98 43.66 40.6 43.54	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.
AN1-4	14/09/2015 10:28 11:00 11:49 21:54 15/09/2015 00:06 00:38	30 30 30 30 30	52.78 52.89 53.3 47.52 27.8 47.02	54.33 54.77 56.2 48.74 48.6 48.08	49.02 49.68 49.7 45.94 45.5 45.72	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.



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	TOC(Ammonia (NH4) Ug/L	Conductivity uscm-
Frequency	TOC(mg/L)	as N	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		Ammonia (NH4) Ug/L	Conductivity uscm-
Frequency	TOC(mg/L)	as N	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
рН	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 TI (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.

-	ltem 🔻	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
			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.

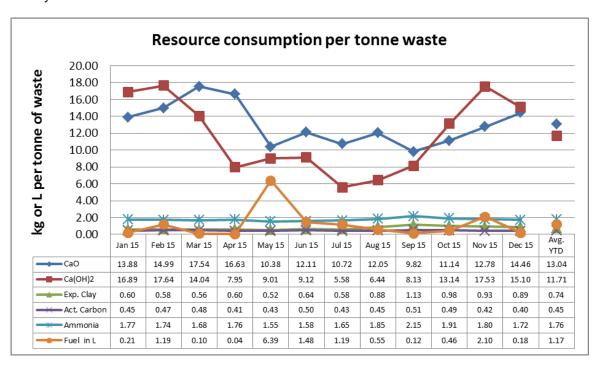
Actions arising out of this audit report have been included in our schedule of objectives and targets.

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.





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.



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, <u>www.indaver.ie</u>, 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 850°C 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/ADHE SIVE S/RE SINS	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 HAZORGANIC 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	
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
			Summarises the training procedure for Indaver including the requirement for training
P0328	Training and Staff Competence.docx	HR	plans
			Moving waste from IWS to the
P0462	Non Hazardous IWS Shipments to Meath.docx	Operations	Meath site
P0198	Loading Containers and Curtainsiders for Shipment.docx	Operations	How to load containers
			Tells you to ensure you received an SDS prior to ordering a
P0302	Safety Data Sheets.docx	Operations	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
			How to manage the bunker to
P0394	Bunker Management.docx	Plant Meath	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
D0472	Unand Identification and Diel Assessment descri	OFCII	How to identify hazards and how to complete a risk
P0172	Hazard Identification and Risk Assessment.docx	QESH	assessment
D0040		05011	How to use PPE for specified
P0040	Use of Personal Protective Equipment.docx	QESH	tasks
			How to analyse for parameters
			in the liquid waste prior to
P0357	Analysis of liquid samples for ME 1 Indaver Waste to Energy Facility.do	cx QESH	incineration
D0477	Identification and Evaluation of Facility and Associated	OFCII	How to identify the environmental aspects at W0167
P0177	Identification and Evaluation of Environmental Aspects.docx	QESH	03
			How to monitor and record
P0206	Monitoring and Recording of Environmental Information.docx	QESH	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
	Waste Planning and Creating MSW Sales Orders for Waste Deliveries to	<u> </u>	How waste loads are planned
P0337	Meath WTE.docx	Regional Sales	into W0167-03
			How waste is accepted at W0167- 03 and the waste acceptance
P0362	Waste Acceptance	Meath	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

Environmental Protection Agency 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 Production Volume Units**

Number of Installations Number of Operating Hours in Year Number of Employees

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

2. FRIR CEASS ACTIVITIES							
	Activity Number	Activity Name					
		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					
	5(b)	4 December 2000 on the incineration of waste					
		Installations for the disposal of non-hazardous waste					
		General					
	A COLVENTO DECLUATIONS (OL No. 540 - CO.						

3. SOLVENTS REGULATIONS (S.I. No. 543 of 20	002)
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 onsite treatment (either recovery or disposal activities) ? Yes

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

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SECTION A: SECTOR SPECIFIC PRTR POLLUTANTS

SECTI	ON A : SECTOR SPECIFIC PRTR POL	LUTANTS							
		RELEASES TO AIR				Please enter all quantities i	n this section in KGs		
		POLLUTANT		METI	IOD			QUANTITY	
				Me	ethod 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
					EN 14181 (Continuous				
02		Carbon monoxide (CO)	M	OTH	monitoring using FTIR)	9034.0	9034.0	0.0	0.0
					EN 14181 (Continuous				
03		Carbon dioxide (CO2)	M	OTH	monitoring using FTIR)	325367580.0	325367580.0	0.0	0.0
					EN 14181 (Continuous				
80		Chlorine and inorganic compounds (as HCI)	M	OTH	monitoring using FTIR)	1705.0	1705.0	0.0	0.0
					EN 14181 (Continuous				
84		Fluorine and inorganic compounds (as HF)	M	OTH	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
					EN 14181 (Continuous				
80		Nitrogen oxides (NOx/NO2)	M	OTH	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
					EN 14181 (Continuous				
11		Sulphur oxides (SOx/SO2)	M	OTH	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 N	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year

* 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)

SECTION	C: REMAINING POLLUTANT E	MISSIONS (As required in your Licence)							
		RELEASES TO AIR				Please enter all quantities	in this section in KGs		
		POLLUTANT		ME	THOD			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
					EN 14181 (Continuous				
210		Dust	M	OTH	monitoring using FTIR)	111.0) 111.(0.0	0.0
					EN 14181 (Continuous				
351		Total Organic Carbon (as C)	M	OTH	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 of	perators

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:

Link to previous years emissions data

Landfill:	Indaver Ireland Limited (Duleek)

Landfill:	Indaver Ireland Limited (Duleek)				=	
Please enter summary data on the quantities of methane flared and / or utilised			Meth	nod Used	Facility Total Consolity m2	1
				——————————————————————————————————————	Facility Total Capacity m3	
	T (Total) kg/Year	M/C/E	Method Code	Description	per hour	
Total estimated methane generation (as per						
site model)	0.0				N/A	
Methane flared	0.0				0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A						
above)	0.0				N/A	
						_

SECTION A: SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO WATERS
LUTANT
Name

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

SECTION B: REMAINING PRTR POLLUTANTS

	RELEASES TO WATERS
PO	LLUTANT
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
POI	LLUTANT
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 No

			Please enter all quantities	in this section in K	Gs
		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 k	(Gs	
		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 K	(Gs
		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	

SECTION A: PRTR POLLUTANTS

OLOTION ATTRICT OLLOT	OFFSITE TRANSFER OF POLLUTANTS DESTINED F	OR WASTE-WATER TRE	ATMENT OR SEV	WER	Please enter all quar	ntities in this section in KG	S		
POLLUTANT			M	ETHOD	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)

	Cicito (ac roquirou in your ziconoc)					_		
OFFSITE TRAN	SFER OF POLLUTANTS DESTINED FOR WASTE-W	Please enter all quantities in this section in KGs						
POLLUTANT			METHO)D	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

^{*} 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
Name

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

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

OLOTION B . IXLIII/ MINING I V	222017 at 1 2 mileotette (de required in Joan 21001100)						
	RELEASES TO LAND						
POLLUTANT							
Pollutant No.	Name						

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

			Please enter all quantities
	MET	HOD	
	ı		
M/C/E	Method Code	Designation or Description	Emission Point 1
			0.0

) then click the delete button

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

) then click the delete button

15 | 23/03/2016 15:41

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

5. ONSITE TREATM	ENT & OFFSITE TRAN	ISFERS OF W		PRTR# : W0167 Facility Name : Indaver Ireland	l Limited (Dulee	ek) Filena	ame : W0167_2015.xls	Return Year : 2015	T			23/03/2016 15:41 32
			Quantity						Haz Waste: Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and	<u>Haz Waste</u> : Address of Next Destination Facility	Name and License / Permit No. and Address of Final Recoverer /	Actual Address of Final Destination i.e. Final Recovery /
			(Tonnes per Year)		Waste		Method Used	_	Licence/Permit No of Recover/Disposer	Non Haz Waste: Address of Recover/Disposer	Disposer (HAZARDOUS WASTE ONLY)	Disposal Site (HAZARDOUS WASTE ONLY)
Transfer Destination	European Waste Code	Hazardous		Description of Waste	Treatment Operation	MC/E	Method Used	Location of Treatment			Abfall Verw ertungs	
To Other Countries	06 01 05	Yes	0.0	nitric acid and nitrous acid	D10	М	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road, Dublin Port, D1, D1, Ireland	Gesellschaft Gmb (AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany Abfall Verw ertungs Gesellschaft Gmb	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
To Other Countries	06 01 06	Yes	0.0	other acids	D10	М	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,D1,D1,Ireland	(AVG), IB2234/AVG-GENB- 2, Borsigstr. 2, D-22113 Hamburg, Hamburg, D-22113 Hamburg, Germany Abfall Verw ertungs Gesellschaft Gmb	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	(AVG), IB2234/AVG-GENB- 2, Borsigstr. 2, D-22113 Hamburg, Hamburg, D-22113 Hamburg, Germany Abfall Verw ertungs Gesellschaft Gmb	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	(AVG), IB2234/AVG-GENB- 2, Borsigstr. 2, D-22113 Hamburg, Hamburg, D-22113 Hamburg, Germany Abfall Verw ertungs Gesellschaft Gmb	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	(AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany Enva Ireland Ltd,196-	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	Industrial Estate John F Kennedy Road, Naas Road, Dublin 12, Ireland Abfall Verw ertungs Gesellschaft Gmb	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	(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	w astes not otherw ise specified	R9	M	Weighed	Offsite in Ireland	Rilta Environmental, W0192- 03	Block 402, Greenogue Business Park, Rathcoole, Dublin, Ireland	03,Block 402,Greenogue Business Park,Rathcoole,Dublin,Ireland Abfall Verw ertungs	Block 402, Greenogue Business Park, Rathcoole, Dublin, Ireland
To Other Countries	15 02 02	Yes		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	Gesellschaft Gmb (AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113	Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany
To Other Countries	16 05 04	Yes		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	(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		aqueous liquid w astes 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		aqueous liquid w astes 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,Low er point road,Co-Louth,Co-Louth,Ireland		
Within the Country	16 10 02	No		aqueous liquid w astes other than those mentioned in 16 10 01	D9	M	Weighed	Offsite in Ireland	Rilta Environmental,W0192- 03 Nurendale Limited trading as	Block 402, Greenogue Business Park, Rathcoole, Dublin, Ireland		
Within the Country	17 02 01	No	0.0	wood	R13	М	Weighed	Offsite in Ireland	Panda Waste Services Limited,W0140 - 03 Nurendale Limited trading as	Rathdrinagh,Beauparc,Navan,Co Meath,Ireland		
Within the Country		No		iron and steel soil and stones other than those mentioned	R13	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services	Rathdrinagh,Beauparc,Nava n,Co Meath,Ireland Rathdrinagh,Beauparc,Nava		
Within the Country Within the Country	17 05 04 17 06 04	No No		in 17 05 03 insulation materials other than those mentioned in 17 06 01 and 17 06 03	D15	M M	Weighed Weighed	Offsite in Ireland	Limited,W0140 - 03 Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	n ,Co Meath ,Ireland Rathdrinagh,Beauparc,Nava n ,Co Meath ,Ireland		
	17 09 04	No		mixed construction and demolition w astes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	R13	M	Weighed		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	М	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	М	Weighed	Offsite in Ireland	Clearcircle Metals (Limerick) Limited,WFP-LC+KC-11-001- 01 AES t/A Midland Waste	Ballysimon Road,Ballysimon Road,Limerick,Limerick,Irelan d		
Within the Country	19 01 02	No	0.0	ferrous materials removed from bottom ash	R12	М	Weighed	Offsite in Ireland	Disposal Company	Clonmagadden, Proudstown, Navan, Co-Meath, Ireland Conway Port Industrial		
Within the Country	19 01 02	No	0.0	ferrous materials removed from bottom ash	R4	М	Weighed	Offsite in Ireland	Multimetal Recycling,WFP- WW-10-0014-02	Estate,Bollarney,Murrough,Wicklow,Ireland	K&S Kali GmBH,LicenceM76D310/57,R	
To Other Countries	19 01 07	Yes	8468.0	solid w astes from gas treatment	R5	M	Weighed	Abroad	K&S Kali GmBH,LicenceM76D310/57	Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269,Germany	eutilisation Salt Mines (Phillippstaal), Nipper StraBe 33,36269 Philippsthal,36269 Philippsthal,Germany Indaver NV,MLAV1/9800000485/MV/	Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269 Philippsthal,Germany
To Other Countries	19 01 07	Yes	0.0	solid w astes from gas treatment	D9	M	Weighed	Abroad	Indaver NV,MLAV1/9800000485/MV/ bd	Industriele Afvalverw erking, Poldervliet w eg, B-2030 Antw erpen 3, B- 2030 Antw erpen 3, Belgium Werk Werra, Standort		2030 Antw erpen 3,Belgium
To Other Countries	19 01 07	Yes	224.7	solid w astes from gas treatment	R5	M	Weighed	Abroad	K&S,34/Hef-79 n 330-51/153	Wintershall Herfagrund,36266 Herfa	Afvalverw erking, Poldervliet	Afvalverw erking, Poldervliet w eg, B-2030 Antwerpen 3, B-
To Other Countries	19 01 07	Yes		solid w astes from gas treatment	R11	M	Weighed	Abroad	K&S Kali GmbH Werk Werra,AZ.1325/98 AZ6631/99 Whiteriver Landfill[Louth County Council]	ermany Whiteriver and Gunstow n Tow nland	Unterbreizbach, Untertagaev erw ertung Schaet 11, Unterbreihbach, D36414, G ermany	Unterbreizbach, Untertagaev erw ertung Schaet 11, Unterbreihbach, D36414, G ermany
Within the Country Within the Country		No No	0.0	bottom ash and slag other than those mentioned in 19 01 11 bottom ash and slag other than those mentioned in 19 01 11	D1 R10	M M	Weighed Weighed	Offsite in Ireland	Greenstar Knockharley,W0146-01	,Dunleer,Co-Louth,Co- Louth,Ireland Knockharley,Navan,Co- Meath,.,Ireland		
Within the Country	19 01 12	No		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, Castlebl ayney, Co-Monaghan, Ireland Ballynagran Residual		
Within the Country	19 01 12	No		bottom ash and slag other than those mentioned in 19 01 11	R10	М	Weighed	Offsite in Ireland	Greenstar Holdings Limited,W0165-02	Landfill,Ballynagran,Coolbeg and Kilcandra,Wicklow,Ireland Drehid Landfill(Bord Na Mona		
Within the Country	19 01 12	No		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	PLC),Killinagh Upper,Carbury,Co- Kildare,Ireland	Indaver	
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 Afvalverw erking,Poldervliet w eg,B-2030 Antw erpen 3,B- 2030 Antw erpen 3,Belgium	2030 Antw erpen 3,Belgium K&S Kali GmBH,LicenceM76D310/57,R	.,,,,,Belgium
To Other Countries	19 01 13	Yes	0.0	fly ash containing dangerous substances	R5	М	Weighed	Abroad	K&S Kali GmBH,LicenceM76D310/57	Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 Philippsthal,36269,Germany Werk Werra,Standort	eutilisation Salt Mines (Phillippstaal), Nipper StraBe 33,36269 Philippsthal,36269 Philippsthal, Germany K & S,34/Hef-79 n 330- 51/153, Werk Werra, Standort	Reutilisation Salt Mines(Phillippstaal), Nipper StraBe 33,36269 Phillippsthal,36269 Phillippsthal,Germany Werk Werra Standort
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	Wintershall Herfagrund,36266 Herfa	Wintershall Herfagrund,36266 Herfa ,36266 Herfa ,Germany K & S ,34/Hef-79n330- 51/153,Werra Plant Underground Waste Disposa	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 CRAENHALS METAL	Waste Disposal Plant, Herfa- Neurode, 36266 Heringen ,36266 Heringen ,Germany Van Patraestraat 90 ,2660 HOBOKEN (Antwerpen), Antwerp, 2660,	Plant, Herfa- Neurode, 36266 Heringen , 36266 Heringen , Germany	Waste Disposal Plant, Herfa- Neurode, 36266 Heringen ,36266 Heringen , Germany
	19 12 03	No		non-ferrous metal discarded electrical and electronic equipment other than those mentioned in 20	R4	M	Weighed	Abroad Officito in Iroland	TERMINAL,10088 Nurendale Limited trading as Panda Waste Services	Belgium Rathdrinagh,Beauparc,Nava		
·	20 01 36	No No		01 21, 20 01 23 and 20 01 35 plastics	R13	M	Weighed	Offsite in Ireland Offsite in Ireland	Nurendale Limited trading as Panda Waste Services Limited,W0140 - 03	n ,Co Meath ,Ireland Rathdrinagh,Beauparc,Nava n ,Co Meath ,Ireland		
	20 03 01	No		mixed municipal w aste	R13	M	Weighed	Offsite in Ireland	Nurendale Limited trading as Panda Waste Services	Rathdrinagh,Beauparc,Navan,Co Meath,Ireland		
Within the Country		No No		mixed municipal w aste	D15	M	Weighed		Panda Waste Services Limited,W0140 - 03 Indaver Ireland	Rathdrinagh,Beauparc,Nava n,Co Meath,Ireland Carranstown,Duleek,Co-		
·	20 03 01 20 03 03	No No		mixed municipal w aste street-cleaning residues	R1 R1	E M	Volume Calculation Weighed	_	tic Limited, W0167-02 Indaver Ireland tic Limited, W0167-02	Meath, N/A, Ireland Carranstow n, 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 Dublin City Council Ringsend Waste Water Treatment	Dundalk WWTW,Low er point road,Co-Louth,Co-Louth,Ireland Drainage Services Environmental and Engineering Dept,Civic		
Within the Country Within the Country	20 03 04	No No		septic tank sludge bulky w aste	D9	M	Weighed Weighed	Offsite in Ireland Offsite in Ireland	Whiteriver Landfill[Louth County Council]	Office,Wood Quay,Dublin 8,Ireland Whiteriver and Gunstown Townland ,Dunleer,Co-Louth,Co- Louth,Ireland		
Within the Country		No No		ferrous materials removed from bottom ash		M	Weighed	Offsite in Ireland	United Metals, WFP LK 2013	Eastway Business Park,Ballysimon,Ballysimon,Li merick,Ireland	i	
Within the Country	19 01 02	No	78.26	ferrous materials removed from bottom ash	R4	M	Weighed	Offsite in Ireland	,	Kiffagh,Crosserlough,Ballyja mesduff,Cavan,Ireland Industriele		
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	Afvalverw erking, Poldervliet w eg, B-2030 Antw erpen 3, B-2030 Antw erpen 3, Belgium		
To Other Countries	19 12 03	No	543.38	non-ferrous metal	R4	M	Weighed	Abroad	Galloo,IHM-AFVAL4024 Nurendale Limited trading as Panda Waste Services	Wervikstraat 320,8930 Menen,Menen,8930,Belgium Rathdrinagh,Beauparc,Nava		
Within the Country	20 01 38	No * Select a rov		wood other than that mentioned in 20 01 37 ing the Description of Waste then click the delete bu		M	Weighed	Offsite in Ireland	Panda Waste Services Limited,W0140 - 03	n ,Co Meath ,Ireland		

Link to previous
Link to previous
Link to Waste (

TREATMENT & OFFSITE TRAN	SFERS OF WASTE PRTR#: W0167 Facility Name: Indaver Ireland Lim Please enter all quantities on this sheet in Tonnes	ed (Duleek) Filename : W0167_2015.xls Return Year :		23/03/2016 15:4 3
European Waste	Quantity (Tonnes per Year)	Wethod Used Waste eatment Location	Non Haz Waste: Name and Destination Facility Licence/Permit No of Non Haz Waste: Address of Recover/Disposer On of	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)
Destination Code Countries 06.01.05	Yes On pitric soid and pitrous soid.	Deration WC/E Method Used Treatr	Indaver Ireland Tolka Quay Road,Dublin	Abfall Verw ertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany Hamburg,Germany Hamburg,Germany
Countries 06 01 05 Countries 06 01 06	Yes 0.0 nitric acid and nitrous acid D1 Yes 0.0 other acids D1	M Weighed Abroad M Weighed Abroad	Indaver Ireland Tolka Quay Road,Dublin Limited.W0036-02 Port.D1.Ireland	Hamburg,Germany Abfall Verw ertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany Hamburg,Germany Hamburg,Germany
Countries 06 02 03) M Weighed Abroad	Indaver Ireland Tolka Quay Road,Dublin Limited,W0036-02 Port,D1,D1,Ireland	Abfall Verw ertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany Hamburg,Germany Hamburg,Germany
Countries 06 02 04	Yes 0.0 sodium and potassium hydroxide D1) M Weighed Abroad	Indaver Ireland Tolka Quay Road, Dublin	Abfall Verw ertungs Gesellschaft Gmb (AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg Gormany Hamburg Gormany Hamburg Gormany
Countries 13 02 08	Yes 0.0 other engine, gear and lubricating oils D1) M Weighed Abroad	Indaver Ireland Tolka Quay Road,Dublin Limited,W0036-02 Port,D1,D1,Ireland	Abfall Verw ertungs Gesellschaft Gmb (AVG),lB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany Enva Ireland Ltd,196- 1,MacAnulty Clear Drains,John F Kennedy Industrial Estate John F MacAnulty Clear Drains,John F Kennedy Industrial Estate MacAnulty Clear Drains,John F Kennedy Industrial Estate
Country 13 05 07	Yes 0.0 oily water from oil/water separators D9	M Weighed Offsite in	Ireland Enva Ireland Ltd,196-1 Road,Dublin 12,Ireland	Road, Dublin 12, Ireland Road, Dublin 12, Ireland Road, Dublin 12, Ireland Road, Dublin 12, Ireland
Countries 13 07 01	Yes 0.0 fuel oil and diesel D1) M Weighed Abroad	Indaver Ireland Tolka Quay Road,Dublin Limited,W0036-02 Port,D1,D1,Ireland	Abfall Verw ertungs Gesellschaft Gmb (AVG),lB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany Hamburg,Germany Hamburg,Germany
Country 13 08 99		M Weighed Offsite in	Rilta Environmental,W0192- Business Park,Rathcoole,Dublin,Ireland	Rilta Environmental,W0192- 03,Block 402,Greenogue Business Business Park,Rathcoole,Dublin,Ireland Abfall Verw ertungs Gesellschaft Gmb
Countries 15 02 02	absorbents, filter materials (including oil filters not otherw ise specified), w iping cloths, protective clothing contaminated by Yes 0.0 dangerous substances D1) M Weighed Abroad	Indaver Ireland Tolka Quay Road,Dublin Limited,W0036-02 Port,D1,D1,Ireland	(AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113
Countries 16 05 04	gases in pressure containers (including Yes 0.0 halons) containing dangerous substances D1) M Weighed Abroad	Indaver Ireland Tolka Quay Road,Dublin Limited,W0036-02 Port,D1,D1,Ireland	Gesellschaft Gmb (AVG),IB2234/AVG-GENB- 2,Borsigstr. 2,D-22113 Hamburg,Hamburg,D-22113 Hamburg,Germany Rilta Environmental,W0192- 03,Block 402,Greenoque Block 402,Greenoque
Country 16 10 01 Country 16 10 02	aqueous liquid wastes other than those		Rilta Environmental, W0192- Business	03,Block 402,Greenogue Business Business Park,Rathcoole,Dublin,Ireland Park,Rathcoole,Dublin,Ireland
Country 16 10 02	aqueous liquid w astes other than those No 0.0 mentioned in 16 10 01 D9	M Weighed Offsite in	Block 402, Greenogue Rilta Environmental, W0192- Ireland 03 Rurendale Limited trading as Panda Waste Services Block 402, Greenogue Business Park, Rathcoole, Dublin, Ireland Rathdrinagh, Beauparc, Nava	
Country 17 02 01 Country 17 04 05	No 0.0 iron and steel R1 soil and stones other than those mentioned	M Weighed Offsite in M Weighed Offsite in	Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Nurendale Limited trading as Panda Waste Services Rathdrinagh,Beauparc,Nava Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Nurendale Limited trading as Panda Waste Services Rathdrinagh,Beauparc,Nava	
Country 17 05 04 Country 17 06 04	No 0.0 in 17 05 03 D1 insulation materials other than those No 0.24 mentioned in 17 06 01 and 17 06 03 D1 mixed construction and demolition w astes other than those mentioned in 17 09 01, 17	5 M Weighed Offsite in	Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Nurendale Limited trading as Panda Waste Services Rathdrinagh,Beauparc,Nava Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Nurendale Limited trading as Panda Waste Services Rathdrinagh,Beauparc,Nava	
Country 17 09 04 Country 19 01 02	No 2.44 09 02 and 17 09 03 R1 No 4400.22 ferrous materials removed from bottom ash R4		Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Hammond Lane Metal Pigeon House Company Limited,WFP-DC- Road,Ringsend,Dublin 4,Ringsend,Ireland Clearcircle Metals (Limerick) Ballysimon Road,Ballysimon Limited,WFP-LC+KC-11-001- Road,Limerick,Limerick,Irelan	
Country 19 01 02 Country 19 01 02	No 0.0 ferrous materials removed from bottom ash R1	2 M Weighed Offsite in	Ireland 01 d AES t/A Midland Waste Clonmagadden, Proudstow n, Ireland Limited, W0131-02 Navan, Co-Meath, Ireland Conw ay Port Industrial Conw ay Port Industrial Multimetal Recycling, WFP- Estate, Bollarney, Murrough, W	
Country 19 01 02	No 0.0 ferrous materials removed from bottom ash R4	M Weighed Offsite in	Reutilisation Salt Mines(Phillippstaal), Nipper	K&S Kali GmBH,LicenceM76D310/57,R eutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269 K&S Kali Reutilisation Salt Mines(Phillippstaal),Nipper StraBe 33,36269
Countries 19 01 07	Yes 8468.0 solid wastes from gas treatment R5	M Weighed Abroad	K&S Kali StraBe 33,36269 GmBH,LicenceM76D310/57 Philippsthal,36269,Germany Industriele Indaver Afvalverw erking,Poldervliet	Philippsthal,36269 Philippsthal,Germany Indaver NV,MLAV1/9800000485/MV/ bd,Industriele Afvalverw erking,Poldervliet Philippsthal,36269 Philippsthal,36269 Philippsthal,36269 Philippsthal,36269 Philippsthal,36269 Industrial,Germany Industrial,
Countries 19 01 07	Yes 0.0 solid wastes from gas treatment D9	M Weighed Abroad	NV,MLAV1/9800000485/MV/ w eg,B-2030 Antw erpen 3,B-1 bd 2030 Antw erpen 3,Belgium : Werk Werra,Standort	- w eg,B-2030 Antw erpen 3,B- 2030 Antw erpen 3,B- 2030 Antw erpen 3,Belgium 2030 Antw erpen 3,Belgium Indaver NV,MLAV1/9800000485/MV/ bd,Industriele Industriele Afvalverw erking,Poldervliet w eg,B-2030 Antw erpen 3,B- w eg,B-2030 Antw erpen 3,B-
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 ,36266 Herfa ,Germany Standort Unterbreizbach,Untertagaev	w eg,B-2030 Antw erpen 3,B- 2030 Antw erpen 3,Belgium K&S Kali GmbH Werk Werra,AZ.1325/98 AZ6631/99,Standort Unterbreizbach,Untertagaev erw ertung Schaet Standort Unterbreizbach,Untertagaev erw ertung Schaet Schaet W eg,B-2030 Antw erpen 3,Belgium Schaet Standort Unterbreizbach,Untertagaev erw ertung Schaet
Countries 19 01 07 Country 19 01 12	bottom ash and slag other than those		AZ6631/99 ermany Whiteriver Landfill[Louth Whiteriver and Gunstown County Council] Tow nland .Dunleer.Co-Louth.Co-	erw ertung Schaet erw ertung Schaet 11,Unterbreihbach,D36414,G ermany ermany
e Country 19 01 12 Country 19 01 12	bottom ash and slag other than those	M Weighed Offsite in M Weighed Offsite in	Scotchcorner Landfill Monaghan County Meatn,., reland Letterbane,Annyalla,Castlebl	
	bottom ash and slag other than those No 0.0 mentioned in 19 01 11 R1 bottom ash and slag other than those		Greenstar Holdings and	
Country 19 01 12 Countries 19 01 13	No 2304.1 mentioned in 19 01 11 R1		Industriele Industriele Indaver Afvalverw erking,Poldervliet NV,MLAV1/9800000485/MV/ w eg,B-2030 Antw erpen 3,B-	- w eg,B-2030 Antw erpen 3,B-
Countries 19 01 13	Yes 0.0 fly ash containing dangerous substances D9	ivi vveighed Abroad	Reutilisation Salt Mines(Phillippstaal),Nipper K&S Kali StraBe 33,36269	Philippsthal,36269 Philippsthal,36269
Countries 19 01 13 Countries 19 01 13	Yes 0.0 fly ash containing dangerous substances R5 Yes 1923.39 fly ash containing dangerous substances R5	M Weighed Abroad M Weighed Abroad	GmBH,LicenceM76D310/57 Philippsthal,36269,Germany Werk Werra,Standort Wintershall Herfagrund,36266 Herfa K&S,34/Hef-79 n 330-51/153 ,36266 Herfa ,Germany	Philippsthal, Germany K & S,34/Hef-79 n 330- 51/153, Werk Werra, Standort Wintershall Herfagrund, 36266 Herfa ,36266 Herfa, Germany ,36266 Herfa, Germany ,36266 Herfa, Germany
Countries 19 01 13	Yes 50.12 fly ash containing dangerous substances D1		Werra Plant Underground Waste Disposal Plant, Herfa- K & S ,34/Hef-79n330- Neurode, 36266 Heringen ,36266 Heringen ,Germany	K & S ,34/Hef-79n330- 51/153,Werra Plant Underground Waste Disposal Werra Plant Underground Plant,Herfa- Neurode,36266 Waste Disposal Plant,Herfa- Heringen ,36266 Heringen ,Germany ,36266 Heringen ,Germany
Countries 19 12 03	No 189.02 non-ferrous metal R4 discarded electrical and electronic equipment other than those mentioned in 20	M Weighed Abroad	Van Patraestraat 90 ,2660 HOBOKEN CRAENHALS METAL (Antw erpen),Antw erp,2660, TERMINAL,10088 Belgium Nurendale Limited trading as Panda Waste Services Rathdrinagh,Beauparc,Nava	,
Country 20 01 36 Country 20 01 39	No 0.7 01 21, 20 01 23 and 20 01 35 R1 No 0.0 plastics R1	B M Weighed Offsite in	Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Nurendale Limited trading as Panda Waste Services Rathdrinagh,Beauparc,Nava Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Nurendale Limited trading as Panda Waste Services Rathdrinagh,Beauparc,Nava	
Country 20 03 01 Country 20 03 01 Country 20 03 01	No 0.0 mixed municipal w aste D1		Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Nurendale Limited trading as Panda Waste Services Rathdrinagh,Beauparc,Nava Ireland Limited,W0140 - 03 n ,Co Meath ,Ireland Indaver Ireland Carranstow n,Duleek,Cogeneratic Limited,W0167-02 Meath,N/A,Ireland	
Country 20 03 03 Country 20 03 04	No 0.0 street-cleaning residues R1	M Weighed Onsite of	generatic Limited, W0167-02 Meath, N/A, Ireland EPS Dundalk and Drogheda Dundalk WWTW, Low er point WWTW, EPS Pumping & road, Co-Louth, Co-	
Country 20 03 04	No 135.32 septic tank sludge D9		Ireland Treatment Systems Louth,Ireland Drainage Services Environmental and Dublin City Council Ringsend Waste Water Treatment Ireland Plant,D0034-01 Whiteriver Landfill[Louth County Council] Louth,Ireland Environmental Engineering Dept,Civic Office,Wood Quay,Dublin 8,Ireland Whiteriver and Gunstown Tow nland	
Country 20 03 07 Country 19 01 02	No 0.0 bulky waste D1 No 592.88 ferrous materials removed from bottom ash R4		reland ,W0060-03 Louth,Ireland Eastw ay Business United Metals,WFP LK 2013 Park,Ballysimon,Ballysimon,Li merick,Ireland	
	No 78.26 ferrous materials removed from bottom ash R4 No 328.46 ferrous materials removed from bottom ash R4		Industriele Indaver Afvalverw erking,Poldervliet NV,MLAV1/9800000485/MV/ w eg,B-2030 Antw erpen 3,B-	-
Countries 19 12 03 Country 20 01 38	No 543.38 non-ferrous metal R4 No 5.76 w ood other than that mentioned in 20 01 37 R1	M Weighed Abroad 2 M Weighed Offsite in	Wervikstraat 320,8930 Galloo,IHM-AFVAL4024 Nurendale Limited trading as Panda Waste Services Wervikstraat 320,8930 Menen,Menen,8930,Belgium Rathdrinagh,Beauparc,Nava	
	* Select a row by double-clicking the Description of Waste then click the delete button			
<u>evious years w aste data</u> evious years w aste summary data	a & percentage change			
evious years waste summary data aste Guidance	a & percentage change			

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

All	ED PACKAGING WASTE	CHAPTER 15		QUANTITY	ACCEPTED SITE	cepted onsite in this top section		ACTIVITIES
	TYPE OF WASTE	List of Waste entry	WASTE DESCRIPTION Enter an accurate description of the waste.	Generated in Rol (tonnes)	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/p each waste stream listed below at your site. Please do not use generic descriptions such as recovery or re The description should be consistent with the ID numbers report Sheets B1, B2 and C.
1 pa ca Se 2 (eg pla Se 3 (eg	ackaging waste (eg corrugated ardboards, paper wrapping & bags) egregated plastic packaging waste eg PVC, PET & PE bottles & jars, astic bags, food wrappers) egregated wood packaging waste eg crates, cartons, cheese boxes,	15 01 01 15 01 02 15 01 03						
4 Se pa 5 Se ste	egregated w ood packaging w aste: allets or pallets & crates egregated metal packaging w aste - eel cans egregated metal packaging w aste-	15 01 03 15 01 04				0%		
7 Se w 8	egregated mixed metal packaging aste egregated waste tetrapacks	15 01 04 15 01 04 15 01 05	Empty mixed packaging-					
10 Se (e) Se 11 (e) ba	egregated mixed packaging waste egregated glass packaging waste eg bottles, jars) egregated textile packaging waste eg nets for fruits & vegetables, fabric egs)	15 01 06 15 01 07 15 01 09	this is shredded/stained/chop These come from the	2.2			This customer is an industrial customer	This waste is put into the bunker(pit), mixed with cranes, fed to a hopped before entering the furnace where it is incinerated at >850°C.
12 co co su Se 13 co ma	egregated packaging waste ontaining residues of or ontaminated by dangerous ubstances. egregated packaging waste ontaining a dangerous solid porous atrix (for example asbestos)	15 01 10* 15 01 11*	pharmaceutical industry-empty packages contaminated	0.567			The material itself is a packaging waste	This waste is put into the bunker(pit), mixed with cranes, fed to a hop before entering the furnace where it is incinerated at >850°C.
ple Ot	ther segregated packaging waste - ease specify ther segregated packaging waste - ease specify	15 15						
D number UNICIP	TYPE OF WASTE	List of Waste entry	WASTE DESCRIPTION Enter an accurate description of the waste.		ACCEPTED SITE 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/geach waste stream listed below at your site. Please do not use generic descriptions such as recovery or rethe description should be consistent with the ID numbers reposted Sheets B1, B2 and C.
Pa 17 so	ews and pams aper & cardboard from municipal burces (other than news and ams)	20 01 01						
18 Gia	lass from municipal sources <u>ousehold</u> food & garden w aste ypically brown bin)	20 01 02 20 01 08						
21 Ck so	ommercial food w aste eg from anteens, restaurants othing w aste from municipal ources extile w aste from municipal sources	20 01 08 20 01 10 20 01 11	Carpet tiles with old glue on the back of	1.9		0%	Esimated as they are carpet tiles	This waste is put into the bunker(pit), mixed with cranes, fed to a hop
23 Flu	uorescent tubes & other mercury- ontaining w aste	20 01 21* 20 01 25	them from the clean				tiles	before entering the furnace where it is incinerated at >850°C.
25 so W(co (e.	ixed batteries from municipal burces /ood w aste from municipal sources ontaining dangerous substances e.g. fence posts contaminated w ith reosote)	20 01 33* 20 01 37*						
(e.	dood w aste from municipal sources e. furniture) astic from municipal sources	20 01 38 20 01 39	These are foil tubes					
iro	etals from municipal sources eg light on odegradable garden & park w aste	20 01 40 20 02 01	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 hop before entering the furnace where it is incinerated at >850°C.
bir Mix	ixed residual w aste (typically black n) from household sources ixed residual w aste (typically black n) from non-household sources	20 03 01	Waste from bin collectors Waste from airports/industrial customers	162,707 3,103		25.2 25.2	Result comes from a study from Repack Result comes from a study from Repack	before entering the furnace where it is incinerated at >850°C.
33 Sti	reet-cleaning residues	20 03 01 20 03 03						
35 Wa	eptic tank sludge /aste from sew age cleaning ulky w aste from municipal sources	20 03 04 20 03 06 20 03 07	Broken furniture, broken air filters etc large items from	74		0	Estimated on the type of material that we receive-	This
36 (sl 37 Ot sp 38 Ot	ther municipal w aste - please pecify ther municipal w aste - please pecify	20 03 07 20 01 27* 20	large items from collection through skips generally paints collected at civic amenity sites	14		60	generally furniture, large broken items The majority of the deliveries	This waste is put into the bunker(pit), mixed with cranes, fed to a hop before entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a hop before entering the furnace where it is incinerated at >850°C.
39 Ott	•	20						
EEE: ease ote that ue to nanges								
the EEE ollection rgets, it very nportant								
at you port ny EEE ccepted.								
	ridges & freezers /hite goods	16 02 11* 20 01 23* 16 02 14 20 01 36						
Ot 44 eq	/s & PC monitors ther WEEE (e.g. phones, computer quipment, electronic toys, hairdryers, acuum cleaners)	16 02 13* 20 01 35* 16 02 14 20 01 36						
	uorescent tubes and other mercury- ontaining w aste	20 01 21*						
46 En	nd-of-life vehicles (not de-polluted)	16 01 04* 16 01 06						
ASTE ATTERI	ead acid batteries and accumulators ortable (w eigh <2 kg, not for utomotive or industrial use)							
49 no inc Ni- 50 po au	ead acid batteries and accumulators on-portable (automotive and dustrial) -Cd batteries and accumulators - ortable (w eigh <2 kg, not for utomotive or industrial use)	16 06 01* 16 06 02*						
51 no inc All 52 po au All	-Cd batteries and accumulators - on-portable (automotive and dustrial) Ikaline batteries and accumulators - ortable (w eigh <2 kg, not for utomotive or industrial use) Ikaline batteries and accumulators - on-portable (automotive and	16 06 02* 16 06 04 16 06 04						
&D /ASTE	dustrial) /aste concrete from C&D sources	17 01 01						
56 Wa	aste bricks from C&D sources aste tiles & ceramics from C&D burces	17 01 02 17 01 03						
57 tile co 58 Mix tile	ixture of w aste concrete, bricks, es ceramics from C&D sources ontaining dangerous substances ixture of w aste concrete, bricks, es ceramics from C&D sources	17 01 06* 17 01 07 17 02 01						
60 Wi w i	/aste glass from C&D sources (eg indow glass) /aste plastic from C&D sources /aste glass, plastic and wood from	17 02 02 17 02 03						
62 C8 su 63 C8 co Wa 64 eg		17 02 04* 17 04 01 17 04 02						
65 lea situ Wa so	faste lead from C&D sources eg ad pipes & flashing from building tes faste iron & steel scrap from C&D purces (eg building sites)	17 04 03 17 04 05 17 04 07						
67 so Wa 68 co da Wa 69 co (e.	faste cables from C&D sources faste cables from C&D sources containing oil, coal, tar & other cangerous substances from C&D sources not containing dangerous substances e.g. copper cables) contaminated soil & stone from C&D	17 04 10* 17 04 11 17 05 03*						
70 so so wa	vaste soil & stone from C&D sources vaste insulation material from C&D ources, containing asbestos		This is insulation material that comes					
73	aste insulation material from C&D ources	17 06 04	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	943		0	Its from a briquetting operation	This waste is put into the bunker(pit), mixed with cranes,fed to a hobefore entering the furnace where it is incinerated at >850°C.
74 co	/aste construction materials ontaining asbestos /aste gypsum-based construction aterial eg plasterboard	17 06 05* 17 08 02	of this report however					
76 Minda 77 Sk	ixed C&D w aste containing angerous substances kips containing mixed C&D w aste	17 09 03* 17 09 04 17 09 04						
	ther C&D w aste - please specify ther C&D w aste - please specify	17 17						
ROM THER DUSTR S (EWC HAPTE S 01-15,								
81 Waso Waso eg pro Wa	/aste plastic from agricultural purces /aste metal from agricultural sources, g farms, creameries & food rocessors /aste silver eg photographic film &	02 01 10						
83 pa co 84 Bo Fe sw 86 Fe	daste silver eg photographic film & aper containing silver or silver ompounds ottom ash, slag and boiler dust errous metal filings & turnings (eg w arf) from iron & steel industry errous metal dust & particles from	09 01 07 10 01 01 12 01 01						
87 (eg or 88 Pla pro	eel industry on-ferrous metal filings & turnings og aluminium or steel sw arf off-cuts of sw arf) astic from plastics industry eg roduction offcuts or shavings ther metal w astes from iron & steel	12 01 02 12 01 03 12 01 05 12 01 99						
90 Wa 91 Wa 92 Ot	dustry eg production off-cuts /aste engine, gear & lubricating oils /aste fuel oil and diesel ther w aste from industry - please	13 02 08* 13 07 01*	Food stuff not fit for				Estimate-these materials are	This waste is put into the bunker(pit), mixed with cranes,fed to a ho
92 sp 93 Ott sp Ott	ther w aste from industry - please pecify ther w aste from industry - please pecify ther w aste from industry - please pecify	02 02 03 02 03 04 02 05 01	consumption-e.g burgers etc Fruits not fit for consumption Food stuff not fit for consumption-milk powders etc	19 140		2 2	packaged for sale Estimate-these materials are packaged for sale	before entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a hebefore entering the furnace where it is incinerated at >850°C.
95 Ot sp	ther waste from industry - please pecify ther waste from industry - please pecify	07 05 12 07 05 13*	waste water treatment sludge Solids from the pharmaceutical industry	4,518 49		10	Delivered in skips generally Esimate on the fact the material is generally packaged coming to site and contains	This waste is put into the bunker(pit), mixed with cranes, fed to a he before entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a he before entering the furnace where it is incinerated at >850°C.
95b Ot sp	ther w aste from industry - please pecify ther w aste from industry - please	07 05 14 08 03 18	Solids from the pharmaceutical industry this is waste printing	36		10	Esimate on the fact the material is generally packaged coming to site Comes to site in large tonne	This waste is put into the bunker(pit), mixed with cranes, fed to a hebefore entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a he
95c sp 95d Ot sp 95e Ot sp 95f Ot	ther w aste from industry - please pecify ther w aste from industry - please pecify ther w aste from industry - please	08 03 18 11 01 10 15 02 02 * 15 02 03	Sludge cake Contaminated wipes/filters etc from a Contaminated wipes/filters etc from a	6 2 2 83		1 0 1 1	bags to contain the inks Delivered to site in skips Comes to site in FIBC's/fibre kegs so the 1% is an estimate of Comes to site in FIBC's/fibre	This waste is put into the bunker(pit), mixed with cranes, fed to a he before entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a he before entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a he before entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a he before entering the furnace where it is incinerated at >850°C.
95g Ot sp	ther w aste from industry - please pecify ther w aste from industry - please pecify	15 02 03 18 01 04 02 01 07	non infectious medical waste from a pharma company-they autoclave this on site, Ash trees-the customer was informed	7 1		20	kegs so the 1% is an estimate of Esimate from customer based on the contents Because these were trees so no	before entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a he before entering the furnace where it is incinerated at >850°C. This waste is put into the bunker(pit), mixed with cranes, fed to a he
95i Sp		07 05 01*	to destroy these by the dept of forestry Aqueous liquid waste from the pharma industry Sludge from the	15		0	packaging content applies Comes in tanks	before entering the furnace where it is incinerated at >850°C. This waste is injected directly into the furnace where it is incinerate >850°C.
sp sp	ther waste from industry - please pecify ther waste from industry - please pecify	07 05 12 08 03 08	Sludge from the pharma industry This is waste ink which is delivered for direct injection	308		0	Arrives in skips Comes in tanks	This waste is put into the bunker(pit), mixed with cranes,fed to a hebefore entering the furnace where it is incinerated at >850°C. This waste is injected directly into the furnace where it is incinerate >850°C.
ROCES ED ASTE ROM ASTE ANAGE ENT ACILITIE (EWC HAPTE								
96 Wa	aste paper & cardboard aste ferrous metal from mechanical eatment aste non-ferrous metal from	19 12 01 19 12 02						
99 Wa me	echanical treatment //aste plastics and rubber from echanical treatment //aste glass from mechanical eatment rocessed w aste w ood containing	19 12 03 19 12 04 19 12 05 19 12 06*						
101 da 102 Pro ch Wa 103 tree sto	rocessed w aste w ood containing rangerous substances rocessed w ood (e.g. nipped/shredded w ood) raste minerals from mechanical reatment (e.g. inorganic fines, sand, ones) combustible w aste (refuse derived ael)	19 12 06* 19 12 07 19 12 09 19 12 10						
105 fue of su 106 Or tre	ther wastes (including mixtures of aterials) from mechanical treatment waste, containing dangerous ubstances rganic fines from mechanical eatment of waste	19 12 11* 19 12 12	Mechnical treatment of				this is from a repack study that	This waste is not intend.
tre Ot	ixed residual waste from mechanical eatment of waste ther wastes from waste anagement facilities - please specify	19 12 12 19 02 03	municipal and municipal type waste Premixed wastes composed only of non hazardous waste- Autoclaved and Mechnically treated	45,136 2,841	289 5,434	23.4	this is from a repack study that was conducted on site in November 2015 this is from a repack study that was conducted on site in November 2015	before entering the furnace where it is incinerated at >850°C.
	ther w astes from w aste anagement facilities - please specify	19 08 05	Sludges from urban waste water treatment wastes from shredding of metal containing wastes-other fractions	38		0		This waste is put into the bunker(pit), mixed with cranes,fed to a hobefore entering the furnace where it is incinerated at >850°C.
			wastes-other fractions than those in 19 10 05 This customer recovers and recycle waste metals and waste containing metals, including recycling				The customer has not	
	ther w astes from w aste anagement facilities - please specify	19 10 06	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	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 hobefore entering the furnace where it is incinerated at >850°C.
Tir			currents to remove as much metal as possible. The resulting residues are categorised as ASR and recovered Indaver's WtE Facility.					
111 wi	/aste glass from ELVs eg indscreens /aste tyres	16 01 20 16 01 03						
114 Wa	/aste gas cylinders /aste gas cylinders containing angerous substances ther - please specify	16 05 05 16 05 04* 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 hobefore entering the furnace where it is incinerated at >850°C.
Ot	ther - please specify	16 03 05*	Finished products that were off spec-tablets Variety of off spec	0		10	Esimate on the fact the material is generally packaged coming to site and contains tablets in blister packs Comes to site in FIBC's/fibre	This waste is put into the bunker(pit), mixed with cranes, fed to a hobefore entering the furnace where it is incinerated at >850°C.
		-	Variety of off spec organic wastes e.g.			1	Comes to site in FIBC's/fibre kegs so the 1% is an estimate of the weight of the package holding the contaminated	This waste is put into the bunker(pit), mixed with cranes,fed to a hobefore entering the furnace where it is incinerated at >850°C.
116 Ot	ther - please specify	16 03 06 16 05 08*	waste oragnic solutions/waste parafilm Liquid vials from a pharmaceutical	0		10		This waste is put into the bunker(pit), mixed with cranes,fed to a hobefore entering the furnace where it is incinerated at >850°C.
116 Ot 116a Ot 116c Ot			waste oragnic solutions/waste parafilm Liquid vials from a			10 0 20	Esimate on the fact the liquid is in vials Comes in tanks Estimate based on the fact that	This waste is put into the bunker(pit), mixed with cranes,fed to a hobefore entering the furnace where it is incinerated at >850°C. This waste is injected directly into the furnace where it is incinerate >850°C. This waste is put into the bunker(pit), mixed with cranes,fed to a hobefore entering the furnace where it is incinerated at >850°C.

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)	, , ,	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 the next destination facility. Provide a brief, informative des Do not use generic terms surecovery or disposal. If the next owner is a BROKE 'brokered'
ottom 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		Knockharley Landfill Ltd W0146-02	Generally used for intermediate of the landfill or for use on roads with landfill
	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			Generally used for intermediate of the landfill or for use on roads wi
ttom 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		Monaghan Co Co Scotch Corner Landfill W0020-02	Generally used for intermediate the landfill or for use on roads with
ottom ash	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	Overall the site is probably taking in approx	Abroad	K & S,34/Hef-79 n 330-51/153,Werk Werra,Standort Wintershall Herfagrund,36266 Herfa	landfill or put into a cell
e gas residue	19 01 07*	8468.16	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d		Flue gas residue does not	municipal sources. This Overall the site is probably taking in approx		,36266 Herfa ,Germany K&S Kali GmBH,LicenceM76D310/57,Reutilisation Salt Mines(Phillippstaal),Nipper StraBe	Reutilisation in a salt mine, R5
e 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	This probably taking in approx 75% waste from		K&S Kali GmbH Werk Werra,AZ.1325/98 AZ6631/99,Standort	Reutilisation in a salt mine, R5
ue gas residue			9, 12, 22, 29, 31a, 31b, 36, 37,			is an esimate based on		Unterbreizbach,Untertagaeverwertung Schaet 11,Unterbreihbach,D36414,Germany K & S,34/Hef-79 n 330-51/153,Werk Werra,Standort Wintershall Herfagrund,36266 Herfa	Reutilisation in a salt mine, R11
iler ash	19 01 13*	1923.39	73, 92-95k, 107-110, 115-116d 9, 12, 22, 29, 31a, 31b, 36, 37,		Boiler ash does not contain packaging	75% waste from municipal sources This TOverall the site is		,36266 Herfa ,Germany	Reutilisation in a salt mine, R5
oiler ash	19 01 13*	50.12	73, 92-95k, 107-110, 115-116d 9, 12, 22, 29, 31a, 31b, 36, 37,	None in boiler ash	Boiler ash does not contain packaging	75% waste from municinal sources. This	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 mi
on Ferrous Metal	19 12 03	189.02	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.	75% waste from municipal sources. This is an esimate based on the incoming wastes		Craenhals Metal Terminal, 10088, Van Patraestraat 90 ,2660 HOBOKEN (Antwerpen),Antwerp,2660,Belgium	Using a flotation technique, Crac Metal Terminal recycles non-fer fractions. These are processed i raw materials, ready for use in t secondary non-ferrous industry
	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.	75% waste from municipal sources. This is an esimate based on the incoming wastes		België	Using a flotation technique and current seperation Galloo recyc ferrous fractions. These are pronew raw materials, ready for use
rrous Metal	19 01 02	164.12	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%		Overall the site is probably taking in approx 75% waste from municipal sources. This is an esimate based on the incoming wastes streams		ClearCircle Metals (Limerick) Ltd (Formerly Hegarty Metals) Ballysimon Road Limerick	secondary non-ferrous industry Bulking up for shipping abroad treatment
errous 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	probably taking in approx 75% waste from		United Metal Recycling (Ireland) Ltd. Eastway Business Park,	Bulking up for shipping abroad f
rrous Metal	19 01 02	78.26	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%	Repack for Percentage was given to us from Repack and this is what we get rebates from	probably taking in approx 75% waste from	Other	Wilton Waste Recycling	Bulking up for shipping abroad treatment
rrous Metal	19 01 02	4400.22	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%	Renack for Percentage was given to us from Repack and this is what we get rebates from Repack for	probably taking in approx	Other	Hammond Lane Metal Co. (Pigeon House) WFP-DC-09-0013-01	Bulking up for shipping abroad treatment
errous Metal	19 01 02	328.46	9, 12, 22, 29, 31a, 31b, 36, 37, 73, 92-95k, 107-110, 115-116d	56%		probably taking in approx	Abroad		Bulking up and cleaning prior to treatment

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(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 DA	FINAL TREATMENT (2015 DATA)										
non-exhaustive list of recovery of	nal 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 on-exhaustive list of recovery operations which includes material recovery (ie recycling), energy recovery (ie use as fuel (other than in direct cineration) 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 <u>all</u> 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	from municipal sources. This is an	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.	materials to the customer who	N/a			

227524

(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):

NATIONAL WASTE REPORT 201

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								
QUARTITI O	MATERIAL III 31	ONAGE ORGITE						
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						
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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

<u>Indaver Ireland</u> <u>Energy Audit</u>

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 the Process 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 = $[Ep-(Ef + Ei)]/0/97 \times (Ew + Ef]$ 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:

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

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

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

Ei means annual energy imported excluding Ev and Ef (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		
Trans of anomal	l lm:4	T	NCV	[
Type of energy	Unit	Tonne	(kJ/kg)	Energy (MWh)
Adjusted amount incinerated waste		224,632	9,460	590,283
Amount sewage sludge		-		
Amount used activated carbon		-	-	-
E _w Energy input of waste	MWh			590,283
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	MWh	16,202.00	-	151,405
incineration process				
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	-	-	-
Ер	MWh			393,652
R1				0.678
R1 with Climate Correction				0.77

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R1	l Adjusti	ments: C	urtailme	nt					
					ls plant as	energy mu	st be spilt	during these	e periods.
Data affected:	/IWh 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 t	o exclude d	ontraint pe	eriods			
	Ep Electrity produced in 5 reduced by electricity producted during contraint								
	·								
Frequency of proc	esssing d	ata:	monthly						
		0	:! a :: 1						
			ilment						
		MWh	t waste						
	la.: 45		404						
	Jan-15	6	164						
	Feb-15	0	0						
	Mar-15								
	Apr-15								
	May-15	0	0						
	Jun-15	0	0						
	Jul-15	6	171						
	Aug-15	6	159						
	Sep-15		26						
	Oct-15								
	Nov-15	16.3	457						
	- ·-								
	Dec-15 Total	53.8 101.6		å .					
	ıotaı	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 significant¹ 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

	Significant system	_			_
System	System	Poor	Fair	Good	Score
Office lighting	No			Χ	2.60
Shop floor lighting	Yes		Χ		2.20
Conveyors	Yes		Χ		2.00
Compressed air generation	Yes		Χ		1.80
Compressed air distribution	Yes		Χ		2.40
Steam production	Yes			Χ	3.00
Process cooling	Yes		Χ		2.00
Hybrid cranes	No		Χ		2.20
HVAC	Yes			Χ	2.60
Overall			Х		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)			х	3	High Frequency control
Sizing of system *			Х	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)			Х	3	No heat recovery practical
Score			Х	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)			х	3	High Frequency control
Sizing of system *			Х	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)			Х	3	No heat recovery practical
Score		Х		2.40	

<u>Indaver Ireland</u> <u>Energy Audit</u>

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			Х	3	Systems have been accurately sized based on load
Energy monitoring (e.g. is the energy consumption for this system known)		Х		2	Conveyors run when idle but this is minimal
Heat recovery (e.g. is any waste heat recovered)			Х	3	No heat recovery practical
Score		Χ		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) *			×	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		Х		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)		Х		2	No heat recovery, no local requirement for heat
Score		х		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					A VSD compressor runs on load when required and idles when there's no
demand or conditions) *			Х	3	demand
Losses (e.g. due to inefficiencies)			Х	3	System is well maintained with no leaks evident
Sizing of system		Х		2	No comment
Energy monitoring (e.g. is the energy consumption for this system known)			х	3	Sub metering and data logging

Heat recovery (e.g. is any waste				
heat recovered)		Χ	3	No heat recovery practical
Score	Х		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) *			Х	3	No comment
Losses (e.g. due to inefficiencies)			Х	3	No comment
Sizing of system			Х	3	No comment
Energy monitoring (e.g. is the energy consumption for this system known)			×	3	Steam output measured, waste input measured
· '			^		waste input measured
Heat recovery (e.g. is any waste heat recovered)			Х	3	No heat recovery practical
Score			Х	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) *			Х	3	VSD operated fans
Losses (e.g. due to inefficiencies)			х	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)		х		2	Quarterly metering at sub distribution board level now ongoing
					Exhaust steam to the ACC is at 45 °C limiting any further recovery.
Heat recovery (e.g. is any waste					Condensate is sent back
heat recovered)			Х	3	into the process
Score		х		2.80	

Performance hybrid cranes

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

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

Performance HVAC

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

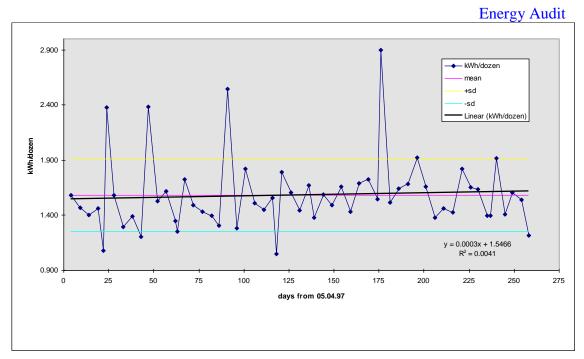


Figure -1 Normalised fuel consumption

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

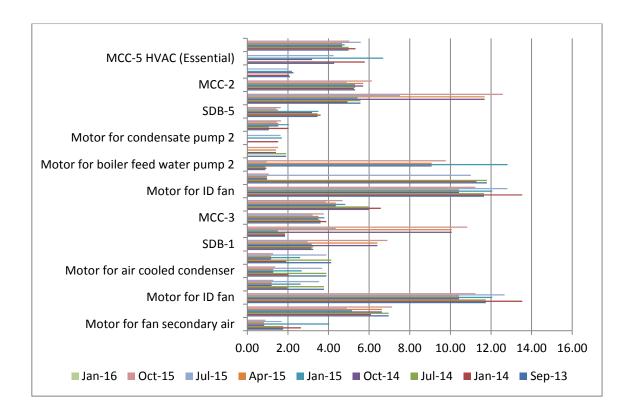
A power monitoring exercise is captured in a preventative maintenance plan. The Large consumers and sub distribution boards (without large consumers) all monitored.

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.

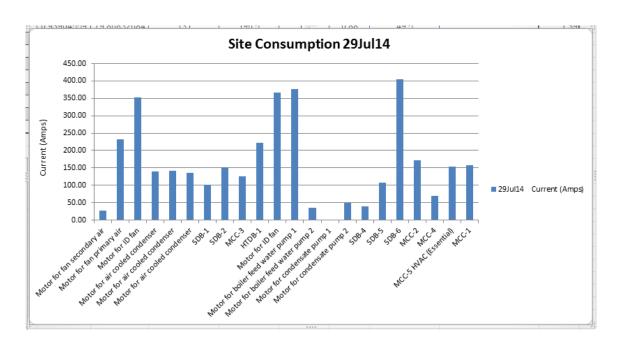
Maintenance have investigated turning off one of the standby compressors as it has never been called into service and this will lead to a reduction in electricity consumption. Once this has been done the monitoring can be completed which will determine the energy usage in a better fashion than the current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

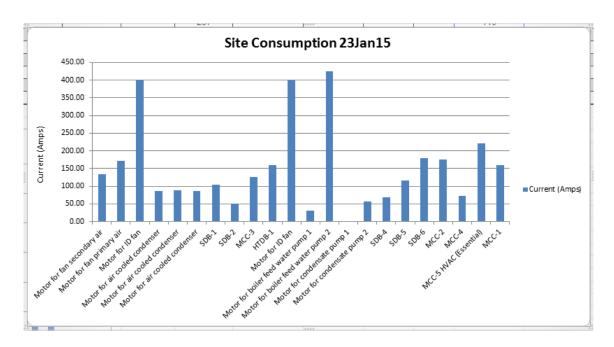
Areas Identified and Actions Completed

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:

Energy Audit

- 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.

Energy Audit

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.