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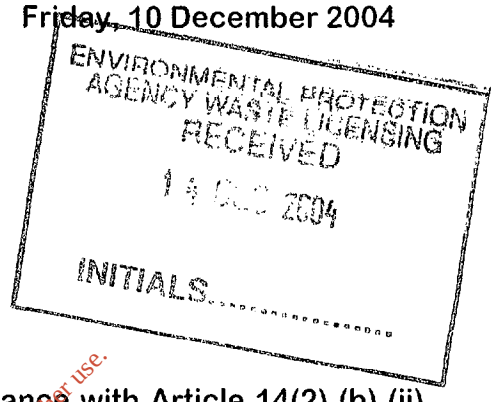
Our Ref:	Your Ref:	Date:
Rc/1208/12/04		Friday, 10 December 2004



Dr Thomas Mcloughlin,
Office of Licensing and Guidance
Environmental Protection Agency
P.O. Box 3000
Johnstown Castle Estate
Co. Wexford.

Re: Requested additional information in accordance with Article 14(2) (b) (ii) of the waste Management (Licensing) Regulations.

Dear Dr. Mcloughlin,

Further to your letter dated 14th October 2004 to our Client Mr Peter Ogg, (Shannon Vermicomposting Ltd) (Ref. 209-1) please find attached the requested additional information in relation to our Client's application for a waste licence for the relevant Vermicomposting facility at Coolross, Rathcabin, Co. Tipperary.

Yours sincerely,

Robert Cummins/ BSc. Arch. Sc. B. Arch. MRIAI.
For and on behalf of M. J. Farah and Associates

cc. Peter Ogg Shannon Vermicomposting Ltd.
Mike Boland, Minerex Environmental Ltd.
Brendan Slattery Arthur Cox

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Project Title: Proposed Development at Coolross, Rathcabbin, Co. Tipperary

Job No. 1208

Sheet No. 1

DRAWING REGISTER AND ISSUE SLIP

Issued By: Tom Shanahan Jnr.

Drawing no	Drawing title	Copies No of	size	Scale	Issue and revision (* = no revision)		
TY 009/02/-09	Ordnance Survey Rural Place Map	0	A3	1:2500			
1208/A/SV/101	Existing Site Layout & Site Notice Location	0	A1	1:500			
1208/A/PL/101	Proposed Site Layout and Landscape design	0	A1	1:500			
1[redacted]/PL/102	Proposed Elevations, Sections, Plan of Vermicompost mushroom tunnels	0	A2	1:100			
1208/A/PL/103	Proposed Elevations, Sections, Plan and Biodegradable Reception facility	0	A2	1:200			
1208/A/PL/104	Proposed Elevations, Sections and Plan of compost screening machine	0	A2	1:200			
1208/A/PL/105	Proposed Elevations, Sections, Plan of Timber Fence	0	A4	1:50			
1208/A/PL/106	Proposed Elevations, Sections, Plan of Staff Toilets and Canteen	0	A2	1:100			
1208/A/PL/107	Proposed Elevations, Sections, Plan of Plantshed	0	A2	1:200			
1208/A/EPA/101	**Macro Site Layout (Key Plan)**	**9**	**A1**	**1:500**	**A**		
1208/A/EPA/102	**Vermicomposting Tunnels**	**9**	**A1**	**1:100**			
1208/A/EPA/103	**Vermicomposting/Mushroom (Aeration Tunnel/Unit)**	**9**	**A1**	**1:100**			
1208/A/EPA/104	**Plant Shed & Canteen**	**9**	**A2**	**1:100**			
1208/A/EPA/105	**Waste Reception Facility**	**9**	**A1**	**1;100**			
1208/A/EPA/106	**Macro Leachate Collection System Layout**	**9**	**A1**	**1:500**			
1[redacted]/A/EPA/107	**Detail Facility Layout Sheet 1**	**9**	**A1**	**1:100**			
1[redacted]/A/EPA/108	**Detail Facility Layout Sheet 2**	**9**	**A1**	**1:100**			
1208/A/EPA/109	**Detail Facility Layout Sheet 3**	**9**	**A1**	**1:100**			
1208/A/EPA/110	**Detail Facility Layout Sheet 4**	**9**	**A1**	**1:100**			
1208/A/EPA/111	**Detail Facility Layout Sheet 5**	**9**	**A1**	**1:100**			

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Purpose of issue P = Preliminary Pg = Progress C = Comment I = Information Q = Quotation FC =Fire cert. PL =Planning T =Tender CN = Construction L = On loan - please return					I		
Medium P = paper D = Computer Disk M = Modem					P		
Bending schedule relevant bending schedule = S					S		
Issued to		Date of Issue	Day		10		
			Month		12		
			Year		04		
√	Client	**Peter Ogg /Shannon Vermicomposting Ltd.**			11		
	Quantity Surveyor						
	Structural Engineer						
	M & E						
	Main Contractor						
	Main Contractor (Site)						
	Authorities	**North Tipperary County Council**					
√	Office File				11		
√	Solicitor	**Brendan Slattery / Arthur Cox &Co.**			11		
√	Consultant	**Dr. Toni Gladding / REMS.**					
√	Other Authorities	**Environmental Protection Agency**			44		
√	Other Authorities	**Department Of Agriculture**			11		
√	Environmental Consultants	**Michael Boland / Minerex Environmental Ltd.**			11		

Shannon Vermicomposting Limited
Rathcabbin, Co. Tipperary

Waste License Application

Additional information submitted in response to a request from the EPA, dated 14th October 2004

Application Reference No. 209-1.

MEL Brief A5
MEL Doc. Ref.:1609-208.doc
6 December 2004

Application submitted by :
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Report To:
Dr. Thomas McLoughlin
Licensing and Control
Environmental Protection Agency
PO Box 3000
Johnstown Castle Estate
Wexford

Prepared by :

EurGeol **Michael Boland** M.Sc. PGeo

Reviewed by :

EurGeol **Cecil Shine** M.Sc. PGeo

Minerex
Environmental Limited

An application for a waste licence was submitted to the EPA on behalf of Shannon Vermicompposting Limited in early August 2004. On the 14th October 2004, the EPA wrote to Shannon Vercomposting Limited and requested additional information and copies of specific plans. This report and attachments provides the information that was requested and the issues are addressed in the same order as listed in the letter from the EPA.

1. ***Specify, by reference to the relevant European waste catalogue codes and provide clarification as to the codes of proposed wastes to be composted on site. Also, provide details of the residual municipal waste composted at the site, including details of the percentage contaminant material (including plastic, metal glass, etc.).***

The biodegradable organic wastes composted at the Shannon Vermicomposting Limited facility at Coolross, Co. Tipperary comprises:

(1) The organics fraction of domestic refuse that is obtained from waste transfer stations. The refuse is collected either by or on behalf of local authorities and it is segregated at the waste transfer stations. The organic fraction of the refuse consists of kitchen food waste (EWC Code 20 01 08) and garden green waste (EWC Code 20 02 01).
(2) Sewage sludges from local authority wastewater treatment plants (19 05 01).
(3) Commercial green wastes comprising grass, leaves and vegetation (EWC Code 20 02 01)
(4) Wood chippings to be used as an amendment material in the composting process (03 01 01, 03 01 03)

The summary of the organic waste to be composted is:

Material	EWC Code	Quantity
Household kitchen and garden green wastes collected by or on behalf of local authorities.	20 01 08 20 02 01	10,800 tonnes
Sewage Sludges	19 05 01	2,700 tonnes
Commercial green wastes	20 01 08	4,500 tonnes
Wood chippings	03 01 01 03 01 03	2,000 tonnes

2. ***Provide details of the proposed length of time which waste material will be composted during each stage of the vermicomposting process.***

The composting of the biodegradable wastes at Shannon Vermicomposting Limited is a three-stage process.

- The first phase is the waste reception and mixing. This is undertaken on the same the day that the waste arrives at the site and is completed in a concrete bay in the waste reception area. The solid biodegradable waste is mixed with wood chippings and mature compost to initiate the composting process. The mixed material is then moved to the aeration tunnels.
- The second phase of the composting process consists of the aeration of the material in one of the aeration tunnels. Air is blown through the piles of composting material from under-floor aeration pipes and the compost is also mechanically turned every four days. The aeration process last for 3-4 weeks. The system maintains a temperature ceiling of greater than 60°C by means of ventilation control and the turning of the piles. This encourages a high decomposition rate since significantly higher temperatures would inhibit and slow down decomposition by reducing microbial activity. At the end of the aeration process the

compost is screened. The oversize material is returned to the waste reception area and mixed with new waste and the fine compost is moved to the vermicomposting tunnels.

- The third phase of the composting process is the vermicomposting of the fine-grained, aerated compost. This is added to the worm beds in the vermicomposting tunnels in layers up to 150mm at a time. The rate at which the worms consume the waste is determined by the governed by the worm bed temperature, the size of the worm population and the moisture levels. All of these parameters are controlled by Shannon Vermicomposting. The temperature of the air bed is regulated by the flow of warm air through the worm bed from the aeration tunnels. The moisture level can be adjusted by the overhead sprinkler system and the worm density is controlled by the addition or removal of worms from the tanks containing the compost and worms. The vemicomposting phase of a batch of compost takes approximately 10 weeks to complete.

3. ***Amend Drawing No. 1208/A/PL/101, "Site Layout Map" to reflect your proposals regarding air abatement equipment and reflect the updated plan of the arrangement of aeration and vermicomposting tunnels, as discussed on site on the 21st September 2004.***

An amended site layout map, Drawing No. 1208/A/EPA/101 (scale 1:500) is attached in Appendix D. This map shows the relevant position of the aeration and vermicomposting tunnels on the site. Tunnels 1 to 4, the four southern tunnels, are aeration tunnels and tunnels 5 to 9, the five northern tunnels, are vermicomposting tunnels. A detailed drawing of the layout of an aeration tunnel, Drawing No. 1208/A/EPA/103 (scale 1;100) is included in Appendix F and a detailed drawing of the layout of each vermicomposting tunnel, Drawing No. 1208/A/EPA/102 (scale 1:100) is included in Appendix G.

In the aeration tunnels, the air abatement system comprises of four 100 mm wide aeration pipes set in the floor of the aeration tunnels. Air is supplied to these pipes by a 0.75 kw fan located at the rear of each tunnel. The air is extracted from the tunnel by two 100mm wide ventilation pipes located in the roof of each tunnel. The extracted air from the aeration tunnels is piped to the aeration pipes beneath the worm beds in the vermicomposting tunnels. The worm beds act as large biofilters to remediate odours produced by the composting of the organic wastes in the aeration tunnels. The air that passes through the worm beds is further treated for odours by the application of ozone. Each of the vermicomposting tunnels is fitted with 6 ozone units, each of which gives 1 gm/hour of ozone. The air is extracted from each of the tunnels by a 0.75 kw extractor fan located at the rear of each tunnel. This air is piped to the fans located in the plant where it is then blown by seven 0.75 kw fans to the large external biofilter located in the concrete surfaced area to the west of tunnels numbered 1 to 9.

4. ***Provide details of the proposed odorous air abatement equipment including materials of construction; operating regime; retention time; dimensions and proposed monitoring. In addition provide a summary of the sources and rate of odorous airflows to the abatement equipment.***

The system of odour abatement that is being installed at the composting facility comprises a three-phase process that will eliminate all odours that are generated as a result of the composting operation. The system comprises:

1. The source of the odours will be from the initial composting of the mixed material comprising the biodegradable wastes, amendment material and mature compost. This composting will be undertaken in the aeration tunnels and the materials will be composted for approximately 3-4 weeks. The aeration system in each tunnel consists of four (no.)

100mm plastic pipes that are set in the floor of the tunnel. Air is blown upwards and sucked downwards by 0.75kw fans with a capacity to produce 1960 m^3/hour of air. This process generates heat and produces a noticeable sweet odour. The extracted air from these tunnels is piped to aeration pipes at the base of the vermicomposting tanks in the vermicomposting tunnels. Each of these concrete tanks is 30m long by 1.9m wide by 1.2m high. Each contains three (no.) 100mm pipes that extends the full length of the tank and this is overlain by fine compost from the aeration tunnels and worms to process the compost. This mixture of compost, worm-cast compost, worms and micro-organisms act as a biofilter and is kept moist by sprinkling leachate that is collected from the tank, the pasteurized liquid fraction from the sewage sludge and /or water onto the worm bed to provide sufficient moisture (generally about 60% moisture) for the organisms to thrive.

2. The air that emerges from the surface of the vemicomposting tanks is further treated for odours by the application of ozone. Each of the vermicomposting tunnels is fitted with 6 ozone units, each of which gives 1 gm/hour of ozone. The units are ES660 with an output of 1 gm/hour, pump output of 10 litres/min, measures 450mm x 255mm x 132mm and weighs 6.8kg. The units are enclosed in a weather proof cabinet (IP66 rated) and are mounted to the side walls, 2.3m above the ground. Similar units are used in the Milne food factory in Birr to treat odours. Air from the vermicomposting tunnels is then extracted from the tunnels and piped to a large external biofilter.

3. The extracted air from the vermicomposting tunnels is piped to the external biofilter that comprises of a 60m long by 20m wide concrete surface with 16 channels containing 100mm aeration pipes. The pipes are overlain by a 1m thick biofilter comprising wood mulch, mature compost and micro-organisms. Eight (no.) 0.75 kw fans extract the air from the vermicomposting tunnels and blow it up through the biofilter.

5. Clarify the status of the facility in relation to Regulation (EC) No. 1774/2002, in particular what measures are to be undertaken on-site to comply with the requirements of the regulation for treatment of classified waste materials.

Regulation (EC) No. 1774/2002 relates to animal by-products not intended for human consumption. The Regulations list three distinct categories of waste materials; Category 1 – very high-risk material, Category 2 – high-risk material, and Category 3 – low risk material. Category 1 and Category 2 materials are not relevant to the composting activities at Shannon Vermicomposting Limited. However, Category 3 Material includes catering waste which is defined as "*all waste food including used coking oil originating in restaurants, catering facilities and kitchens, including central kitchens and household kitchens*". The organic fraction of domestic refuse contains kitchen food waste and thus is classified as a Category 3 waste material. However, this material can be used in composting without pre-treatment.

The Regulations require that certain procedures and facilities need to exist in order for a composting facility to comply with the requirements of the Regulation. These include;

Premises:

- The facility is located on the site of a former farm in an agricultural area but no animals are kept on the premises. The original hedgerows have been retained and the facility is boarded by stock-proof fencing to ensure that no animals can gain access to the facility.
- The composting operation takes place in a closed system where air circulated from the aeration process is passed through the vermicomposting tunnels and where any leachate produced by the process is contained in underground tanks and sprinkled back on the compost. Equipment is provided to monitor the temperature of the composting processes

in the aeration and vermicomposting tunnels in order to ensure that the compost is maintained at the required temperature for the correct period of time.

- Physical measurements of the compost comprising temperature, moisture content and pH are recorded by Shannon Vermicomposting Limited staff and the chemical properties of the compost is undertaken in an accredited laboratory. To date, analyses of the compost produced has been undertaken by Bord na Mona.
- Biodegradable wastes are mixed with amendment material as soon as they arrive at the facility to ensure that there is no untreated catering waste available at the site to attract vermin. The facility has been monitored regularly by Rentokil since 2003 to ensure that there is no vermin present at the facility.

Hygiene

- The waste reception area contains eight bays in which the different waste materials are unloaded and mixed with amendment material. The floor and bays of the reception area are constructed with concrete. The floors and sides of the bays are smooth and level to ensure that they can be properly cleaned. The floor of the reception area drains to underground storage and any leachate produced or soiled water resulting from the washing of the bays is collected and sprinkled on the worm beds in the vermicomposting tunnels.
- When the construction of the tunnels, drainage system and other ancillary facilities are completed a programme of daily and weekly inspections will be prepared as part of the environmental management system (EMS) for the facility. Currently, the facility is inspected on a daily basis by Mr Peter Ogg.

Processing standards

- Catering waste forms part of the biodegradable material that is composted at the Shannon Vermicomposting facility. The composting process that at the facility ensures that any pathogens present in the wastes are eliminated by the process.

  In the waste reception building, the organic sludges are passed through a fan separator to separate the liquid and solid fractions of the sludge. The liquid fraction is pasteurised at 70^0C for one hour and the liquid is later sprinkled on the worm beds as both a food for the worms and a moisture addition for the vermicomposting process.

  In the aeration tunnels, temperatures of 70^0C can be achieved for 1 hour to comply with the EU Animal By-products Regulations, if required. However, temperatures at this level can be detrimental to the micro-organisms that are present in the composting waste and which are also vital for the composting process. The temperature of the compost will be maintained between 55^0C and 65^0C during the aeration process and this phase of the composting process last for 3-4 weeks.

6. *Clarify the status of your facility in relation to the Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998 to 2001, in particular what measures are undertaken on-site to comply with the requirements of the regulations.*

S.I. No.148/1998 and S.I. No. 267/2001 relate to the use of sewage sludges in agriculture. The Regulations define "treated sludge" as sludge that has undergone biological, chemical or heat treatment, long-term storage, or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use. Sludges and treated sludges are classified as waste materials.

Composting is a natural process that converts biodegradable organic wastes into a stable product. Compost is not a waste product but it is classified as a soil amendment material that can be added to agriculture land. The grade of compost produced is defined by the chemical concentrations of the final product. S.I. No. 267/2001 defines limit values for the amounts of heavy metals which may be added annually to agriculture land, based on a 10-year average. These limits replace the maximum values for concentrations of heavy metals in sludge for use in agriculture which were defined in S.I. No.148/1998.

The compost produced by Shannon Vermicomposting Limited will be used for either growing mushrooms at the facility, used as a soil amendment material for golf courses or bagged for use in market gardening. It is thus not planned to use this compost in agriculture or to spread it on agriculture land.

7. ***Provide details on a suitable scaled map of the proposed leachate collection and management systems: include direction of flow; tank volumes; and explain the operational control system. Give details of the predicted leachate and soiled water volumes arising from the waste treatment/storage bays and any concrete areas. Provide details of the storage and the proposed treatment/disposal.***

An amended site layout map showing the leachate collection system, Drawing No. 1208/A/EPA/106 (scale 1:500) is attached in Appendix I. Further details of the leachate system are also presented on Drawing No. 1208/A/EPA/108 (scale 1:100) in Appendix K, Drawing No. 1208/A/EPA/110 (scale 1:100) in Appendix M and on Drawing No. 1208/A/EPA/111 (scale 1:100) in Appendix N. Detailed plans for the design of the Vermicomposting Tunnels are given in Drawing No. 1208/A/EPA/102 (scale 1:100) in Appendix E, for the Aeration Tunnels in Drawing No. 1208/A/EPA/103 (scale 1:100) in Appendix F and for the Waste Reception Facility in Drawing No. 1208/A/EPA/105 (scale 1:100) in Appendix H.

Each of the tunnels, both aeration tunnels or vermicomposting tunnels, contain a leachate collection system with a 500-gallon tank located underground at the back of each tunnel. The floors of the tunnel are designed with a very gentle slope from the front to the back in order to gather any leachate produced at a discharge point at the rear on the tunnels, from where it is piped to the external 500-gallon tanks. The leachate that is collected in the tanks is pumped back through two 44mm wide pipes located in the roof of each tunnel and sprinkled onto the compost or worm beds. To date, the amount of leachate generated in the vermicomposting tunnels is low, generally <10 gallons per day.

The waste reception facility is designed with the floor of the 8 bays and the adjoining working area sloping gently to the north. There are three 1000-gallon underground tanks located at the northern side of this facility. These tanks are connected by pipes to shores in the floor of the reception area. Very little leachate is generated in the waste reception facility because biodegradable organic waste is not stored in this facility. When the waste arrives at the site, it is mixed with amendment material and compost immediately and becomes part of the vermicomposting process. This material is then moved to the aeration tunnels. The greatest source of soiled water from the waste reception facility will come from the washing down of the bays. The soiled water produced by this operation will be collected in the underground storage tanks. This water is then sucked into a bowser and brought to the tunnels where it is pumped into the 1000-gallon underground tanks at the front of the tunnels. These tanks are connected by two 44mm pipes to the sprinkler pipes in the roofs of the tunnels and the water is used to moisten the compost and worm beds.

There are 1112m^2 of concrete surface in the area comprising the entrance gate, visitors car park, office building, weighbridge / portacabin and the entrance to the waste reception area. There is one underground 1000-gallon, located to the north of the office building where surface run-off

water drains to. This tank is connected by pipe to two of the 1000-gallon tanks at the front of the waste reception facility. This gives a total capacity for the collection of 3000-gallons of run-off. The 30-year mean rainfall in the Birr area is 0.804m per annum. This implies that the concrete surface would produce 894m^3 of run-off or 196,680 gallons per annum. This is equivalent to 539 gallons per day which is well below the available capacity. The water that is collected in these storage tanks will be transferred by bowser to the 1000-gallon tanks at the front of the tunnels to be used to moisten the compost or worm beds. If these tanks are full, the water could be stored in the five 2000 gallon underground storage tanks that are present on the site.

8. *Provide details of the source and predicted quantity of water to be used on site*

There are two sources of water available to supply the water requirements of the composting operation. The first is water from a well on site. The current well on-site is inadequate, both in its quality and yield to satisfy the requirements of the facility. Plans are in place to drill a new well that will be capable of providing 500 gallons per hour. The second source of water for the facility is provided from rain run-off from hard surfaces on the site and these are collected in the underground storage tanks. The provision of liquid for maintaining the composting process at the required moisture level is also supplied from leachate generated at the facility and from the pasteurized liquid from sewage sludges.

At the facility, there are five 2000-gallon underground tanks and twelve 1000-gallon underground tanks, giving a total capacity of 22,000 gallons. The collection of run-off rainfall from the hard surfaces gives the potential to collect up to 3076m^3 per annum. The breakdown is summarized below:

Category	Area m^2	30-year mean annual rainfall m	Total volume m^3	Mean daily m^3	Mean daily gallons
Roof of waste reception area	2187	0.804	1758	4.8	1060
Roof of plant shed	527	0.804	424	1.2	256
Concrete areas	1112	0.804	894	2.5	539

The considerable of volume of liquid will also be gathered from the liquid fraction of the sewage sludge that is composted at the facility. 2700 tonnes of sewage sludge contains approximately 1890m^3 of liquid. This is equivalent to 415,800 gallons or 1139 gallons per day. This liquid is rich in nutrients and it will be sprinkled on the worm beds as a source of food for the worms and as a moisture source. The liquid will be stored in the 1000-gallon tanks to the front of the vermicomposting tunnels and there is 5000 gallon capacity in these tanks.

9. *Provide details of the predicted quantity of final compost material to be produced on site and details of the proposed end use*

The vermicomposting process is a very efficient method for the conversion of an organic waste material to a useable product. The process converts one tonne of waste to 200kg of worm cast compost. Shannon Vermicomposting Limited plan to compost 20,000 tonnes of biodegradable organic waste each year. The vermicomposting process converts this to 4000 tonnes of worm cast compost. This is equal to 333 tonnes per month. 50% of this, i.e. 166.5 tonnes, is used as mature compost and mixed as an amendment material with the incoming organic waste. The other 166.5 tonnes per month will be divided between the growing of mushrooms and used as a quality amendment material to mix with sand to produce growth medium for use on parts of golf courses.

10. Describe the contingency arrangements for the provision of backup and spares in the case of breakdown of critical equipment required for compost screening.

The screener that is generally used on site is a Right 3-way trommel screener. This has a capacity to screen approximately 40-tonnes of compost per hour. In the event of a breakdown, Shannon Vermicomposting Limited also has a smaller Parker electric mobile 3-way screener which would replace the Right screener while it is being repaired. The Parker screener can process 20-tonnes per hour. Shannon Vermicomposting Limited also operates a programme of active maintenance to ensure that all electrical and mechanical equipment and machinery are properly maintained.

11. Provide details of the proposed blow separator / pasteurization system. Describe the controls to be used during the process, also provide details regarding the movement of pasteurized liquid around the site.

A fan separator and pasteurisation system is used to process the sewage sludge organic waste. The fan separator divides the liquid fraction of the sludge from the solid fraction. The liquid fraction is piped to one of two pasteurization tanks and heated to 70^0C for in excess of one hour to pasteurize the liquid. The solid fraction is mixed with other organic waste and composted in the aeration tunnels.

The fan separator is a FAN Press Screw Separator GmbH that is 2.7m, 2.3m long, 0.9m wide and 1.5m high. The FAN Press Screw Separator squeezes out the liquid from the incoming sludge producing solids that are drip-free and thus ideal for composting with other organic waste. The liquid fraction is piped to the pasteurisation tanks where it is heated in the first tank by an oil-fueled boiler. The tanks have a capacity of 40,000 gallons and each contain heating units with one being used primarily for pasteurising the liquid and the second being used for the storage of pasteurized liquid before it is transferred to a bowser and pumped to the 1000-gallon underground tanks at the front of the vermicomposting tunnels.

12. Provide details of the scale of the on-site diesel generators and predicted usage

A three-phase electricity supply has been applied for from the ESB. However, power at present is supplied by three diesel generators which are capable of providing 1000 kw of power. These generators will be retained at the facility after the three-phase power is connected to provide a back-up power supply in the event of a breakdown.

The predicted maximum power requirements for the facility is 80 kw and this is summarized below:

Electricity	**Loading**
Aeration fans 24 x 0.75 kw	20 kW
Lighting Indoor lights in tunnels, office and waste reception area. Outdoor yard lights	10 kW
Leachate pumps	25 kW
Ozone defusers, Fan separator, screeners	20 kW

13. ***Provide details of the aeration system to be installed within the composting bays of the waste reception building.***

Four of the bays in the waste reception area will be equipped with a sub-surface aeration pipes. Each of these bays will have four 100mm pipes extending along the length of the bay. The air for these pipes will be provided by 2 fans, each 0.75 kw which will blow air upwards through compost that may be stored temporarily there. This compost would be compost that has been through the aeration bays and awaiting to be screened or the oversize fraction from the screening process prior to it being re-mixed with new biodegradable waste.

14. ***Please provide a site specific risk assessment, based on clear, independent scientific evidence which shows the bioaerosol levels can be maintained at appropriate levels at the above proposed facility which may arise from the receipt and composting of green and other biodegradable waste. In your assessment, please provide evidence that this proposed operation will not have any negative impacts on the nearest sensitive receptor site, i.e. the residential property that is in the vicinity of the proposed facility or any proposed development adjacent to the site.***

An independent risk assessment to appraise potential dust and bioaerosol concentrations from the Shannon Vermicomposting Limited site was completed by Dr Toni Gladding of Roffco Environmental Monitoring Services Limited from the UK. The assessment compares the Shannon Vermicomposting site to results from air quality sampling that was undertaken during 2003 by Dr. Gladding at a similar size composting site. A copy of the report is included in Appendix A.

The report illustrates the risk to sensitive receptors in the locality based on results expected from such sites and from a literature review. It concludes that with good operating practices followed by enclosing screening operations, taking care regarding wind direction and regular dust suppression of roadways and at the exit of the screening conveyor belt will all minimize the generation of dust and bioaerosols and transport off site. It can be concluded that if effective management of the site and the compost is maintained that the risk to sensitive receptors remains very small.

15. ***Describe how the finished compost will be packaged/contained and removed off site.***

There are three uses that the worm cast compost that the facility will produce. These comprise:

- Compost will be used for mushroom growing on-site and thus does not leave the site
- Compost will be used for the improvement of the soil in golf courses. This will be moved as bulk loads in covered trucks.
- Small quantities of the worm cast compost will be bagged for sale in garden centers.

Attachment	Description
A	Risk Assessment Report by Dr. Toni Gladding
B	Ozone Defuser
C	FAN Screw separator
D	Drawing No. 1208/A/EPA/101 (Scale 1:500) Macro Site Layout (Key Plan)
E	Drawing No. 1208/A/EPA/102 (Scale 1:100) Vermicomposting Tunnels
F	Drawing No. 1208/A/EPA/103 (Scale 1:100) Aeration Tunnels
G	Drawing No. 1208/A/EPA/104 (Scale 1:100) Plant Shed and Canteen
H	Drawing No. 1208/A/EPA/105 (Scale 1:100) Waste reception Facility
I	Drawing No. 1208/A/EPA/106 (Scale 1:500) Macro Leachate Collection

	System Layout
J	Drawing No. 1208/A/EPA/107 (Scale 1:100) Detail Facility Layout Sheet 1
K	Drawing No. 1208/A/EPA/108 (Scale 1:100) Detail Facility Layout Sheet 2
L	Drawing No. 1208/A/EPA/109 (Scale 1:100) Detail Facility Layout Sheet 3
M	Drawing No. 1208/A/EPA/110 (Scale 1:100) Detail Facility Layout Sheet 4
N	Drawing No. 1208/A/EPA/111 (Scale 1:100) Detail Facility Layout Sheet 5