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219-1
office

ENVIRONMENTAL PROTECTION AGENCY
20 SEP 2005

Dr. Karen Creed
Waste Licensing
Environmental Protection Agency
P.O. Box 3000
Johnstown Castle Estate
County Wexford

19th September 2005

Our Ref.: MDE0202Lt0039Dun
File Ref.: 330

Re: Organic Gold Waste Licence Application Reg No. 219-1
Article 14 - Request for Additional Information

Dear Dr. Creed,

On behalf of Organic Gold (Marketing) Limited, please find enclosed 4 copies of the Article 14 response regarding the above waste licence application.

Please note that a digital copy of the report will follow shortly on CD. The odour report from Odour Monitoring Ireland will also follow shortly.

I trust this is satisfactory. If you have any queries, please do not hesitate to contact the undersigned.

Yours sincerely,

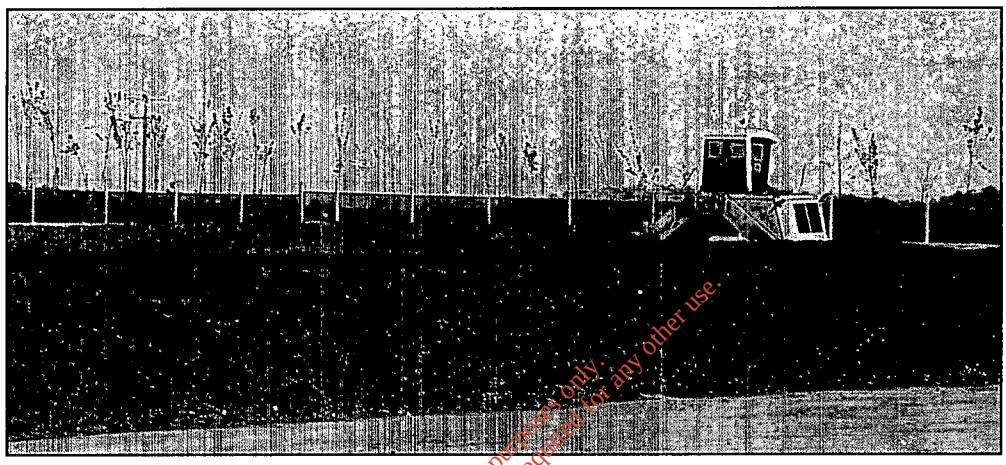
p.p. **Lorraine Herity**
For & on Behalf of RPS Consulting Engineers

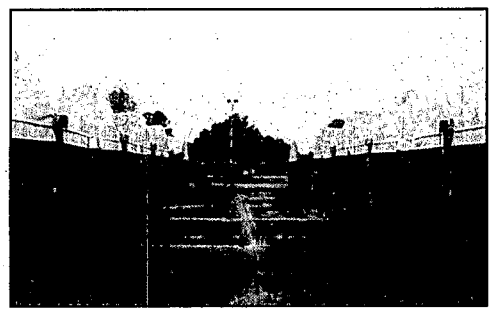
ÚF/úf

Enc.

ENVIRONMENTAL PROTECTION AGENCY WASTE LICENSING RECEIVED
20 SEP 2005
INITIALS.....

Organic Gold (Marketing) Ltd. Composting Plant





REPLY TO ARTICLE 14 REQUEST FOR ADDITIONAL INFORMATION

Reg. No. 219-1

Prepared by
RPS Consulting Engineers

September 2005

RPS

RPS

DOCUMENT CONTROL SHEET

Client	Organic Gold (Marketing) Ltd.					
Project Title	Organic Gold Compost Facility					
Document Title	Reply to EPA Article 14 Requests					
Document No.	MDE0202RP000Rp0005D01					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	11	3	0	9

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
D01	Draft	Lorraine Herity	Conall Boland	Larry O' Toole	Carnegie	August 2005

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APPENDICES

ARTICLE 12 COMPLIANCE REQUIREMENTS

BACKGROUND

Organic Gold were requested by the EPA to supply further information to complement an EPA waste Licence Application submitted to the EPA on the 30th of March 2004 in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations. This request was made in a letter of correspondence from the EPA dated the 16th of June 2005. This report responds to this request for further information from the EPA and provides detailed information in response to these requests.

1. Submit Floor Plan Drawing OG304 and Elevation Drawing OG303 referred to in the text but not attached.

RESPONSE TO QUESTION 1

The floor plan (OG304) and elevation drawing (OG303) can be found attached in **Appendix A** of this report.

2. Indicate the location of the activity on the OS Discovery Series Map.

RESPONSE TO QUESTION 2

An OS Discovery Series Map indicating the location of the site can be found attached in **Appendix B**.

3. Revise the non-technical summary to incorporate answers to (n) and (o) of Article 12 of S.I. 395 of 2004.

RESPONSE TO QUESTION 3

An answer to the above has been incorporated into the Non-Technical Summary under Section 5 Refer to **Appendix J**.

4. Submit a revised site layout map incorporating the location of the water tank on the concrete composting slab and indicate its purpose.

RESPONSE TO QUESTION 6

Correspondence from Roadstone Ireland is attached in **Appendix F** which gives details of the concrete mix and guarantees that the concrete mix used for laying the slab at Organic Gold facility is in accordance with the standard BS8007:1987, Section 6.2 to 6.4 of which relates to the design of concrete structures for retaining aqueous liquids. Visual inspections of the slab will be carried out by a qualified engineer every three years to detect any surface cracking or other deterioration. Any defects identified will be repaired to ensure effectiveness.

7. Provide an appropriately scaled site map showing leachate movement on-site including all storage tanks, channels, extraction points etc and include a description of the leachate transfer procedure and controls in place. Give details of the predicted leachate and soiled water volumes arising and the proposed treatment/disposal.

RESPONSE TO QUESTION 7

A site drainage map **DG008RevA01** for the site can be found in **Appendix G** which details the movement of onsite leachate and dirty water. On this drawing reference is made to: (1) ABP (Animal By Products) Dirty Water, (2) Dirty Water and (3) Storm Water.

1. ABP Dirty Water

This includes leachate from the in-vessel units, dirty water run-off from the working areas in between the in-vessel units, and dirty water run off (washings) from the waste reception shed.

The ABP dirty water will then be collected separately from other water on site and stored in Tank D. The ABP dirty water can then be pumped out of Tank D using the Ruscon Slurry Spreader and mixed with the incoming waste in the waste reception building to ensure that optimum moisture levels within the feedstock material has been met. The feedstock will then be treated in the in-vessel units. This is in accordance with the EU Animal BY-Products Regulations (1774/2002). Tank D has a capacity of 21m^3 and was designed for a 30 year return rainfall event.

The concrete floor in the in-vessel unit is designed to slope towards the entrance door. Any leachate produced during the treatment process in the in-vessel units will flow from the door of the units to a channel from where it will flow to a gully and into Tank D where it will be separately stored from other dirty water on site. Management at other composting plants in Cambridgeshire and West London, who use the Wasteology system and treat 40,000 and 50,000 tonnes of food and green waste respectively have reported that only a miniscule amount of leachate flows from the in vessel units.

Run-off from the green waste storage area will flow along the fall in the concrete and be collected in the dirty water channel along the side of the in-vessel units. The floor of the waste reception building will slope towards the west and all dirty water will be collected internally and discharged to the dirty water channel, where it will then flow to and be stored in Tank D.

2. Dirty Water

Treated product from the in-vessel units will be allowed to mature in the maturation area where the maturation period will last for up to 6-8 weeks. Any leachate produced in this area will be as a result of rainwater falling on the material. However based on facility operation to date, it is expected that the windrows will absorb the falling rainwater. During periods of heavy rainfall it may arise that not all rainwater is absorbed by the windrows. If so, this dirty water will the flow along the fall of the slab, into the gully and onwards in to the underground storage tanks (A and B). The windrows will be oriented so that the dirty water can flow along the slope of the concrete. Any dirty water collected in Tank A and B can be pumped to Tank C for storage or pumped directly out of Tank B using the slurry spreader. All of this dirty water will then be recirculated on the maturation area (Refer to picture in **Appendix D**).

RESPONSE TO QUESTION 4

The aboveground water storage tank referred to above is a dirty water storage tank. This is labelled Tank C on the Revised Site Layout Map **DG002RevA05**, which is attached in **Appendix C**. The capacity of this tank is 968m^3. The operation of the drainage is as follows:

Site drainage is collected in Tank A and then flows to Tank B under gravity. Dirty water will be pumped out of the underground storage tank (B) and transferred to Tank C. From Tank C, the dirty water will be pumped out of the tank using an umbilical cord on a Ruscon 6,820l slurry spreader and then spread using this machinery over the windrows. Refer to picture of slurry spreader engaged in watering the windrows in **Appendix D.**

5. Provide technical details and specifications (including cubic capacity) for the underground and overground leachate tanks. Submit proposals for the transfer of leachate to the overground tank during power failure or mechanical breakdown.

RESPONSE TO QUESTION 5

Technical specifications for the 2 underground storage Tanks (A and B) and the above ground storage Tank (C) are attached in **Appendix E** of this report. Refer to Table 1 below for exact capacities of all storage tanks on site. Tank D will be constructed according to the standards BS8110 1985 British standard for structural use of concrete and BS8007 1987 code of practice for concrete structures for aqueous liquids.

Table 1 Capacity of Storage Tanks at the Composting Yard

Tank	Position	Capacity
A	Underground	6.8m^3
B	Underground	16m^3
C	Aboveground	968m^3
D	Underground	21 m^3

During power failure or mechanical breakdown two options are available to transfer water from the underground storage tanks (A and B) to the above ground storage Tank (C).

(1) A Perkins Diesel generator is available on site during periods of power failure, which has an energy output of 80KVA. This can be used to power electrical pumps to pump out the water out of the storage tanks.

(2) The Ruscon slurry spreader used on site can be used to mechanically suck out the water which can then be spread on the windrows. This is powered by the diesel engine of the tractor.

6. Provide details on the impermeable nature of the concrete composting slab.

During the maturation period, the microbes give off a lot of heat which dries out the product and results in the process requiring additional moisture which is vital for the microbes to survive. This is why any excess surface water from the maturation stage is recirculated on the windrows. Dirty water will also arise from rain water falling on this part of the slab and from the wheel wash at the site entrance, and will flow along the fall of the concrete to a gully from where it will flow into the underground storage Tanks (A and B).

All dirty water that flows to the underground storage tanks will pass through an oil / petrol interceptor.

The underground storage tanks will be periodically emptied and the dirty water pumped to Tank C using a an umbilical cord on a Ruscon 6,820l slurry spreader and then spread using this machinery over the windrows in the maturation area to maintain optimum moisture conditions for microbes to survive

3. Storm Water (Clean Water)

This comprises clean run-off from the roof of the waste reception building and the in-vessel units and will be diverted to down pipes from where it will flow to a channel and be diverted to Tank B for storage. The clean water will thus be mixed with dirty water and recirculated onto the maturation pad because as stated above, the maturation stage is water hungry due to microbial activity. The underground storage tanks will be emptied as described above.

Linear (ACO) drains are used to ensure that the ABP dirty water and dirty storm water and clean water are separated on the site. An ACO drain runs along part of the eastern boundary of the maturation area which forms a sort of separation between the in-vessel composting area and the maturation area. An ACO drain will also be commissioned in the area south of and in-between the in-vessel units to collect any potential ABP dirty water run-off from the in-vessel working area from mixing with other site dirty water (from maturation area, storm water etc.) An ACO drain will also be installed at the site entrance to the site to contain any potential storm water run-off on the site.

The flow rate for predicted surface water arisings on site was calculated using appropriate storm return periods and are given in **Table 2** below:

Table 2 Predicted Dirty / Clean Water Arisings On-Site

Type of Water	Flow rate
ABP Dirty Water*	12 l/sec
Dirty Water**	23 l/sec
Storm Water (Clean Water)**	27 l/sec

Note: * Storage design is for a 30 year return period.
** Storage drainage design is for a 2 year return period.

8. Submit a revised site drainage plan. Indicate clean and dirty yard areas and indicate on the plan where the roof water of the fertiliser production building is directed (as a recent site visit found that this run-off was directed to a tank at the corner of this building). Submit proposals for the separation of clean and foul water drainage for the entire site.

RESPONSE TO QUESTION 8

Refer to response to Question 7 above and the Site Drainage Plan **MDEDG000RevA01**. It is proposed that surface water collected from the fertiliser production building and its surrounds will flows via a 220mm concrete pipe which runs from the corner of the main building via an underground pipe 4

inches below the concrete surface into an open ditch along the site boundary on the R162 road. (Refer to **DG007RevA01** for details).

The dirty and clean areas on the site are outlined below.

Dirty Area

The dirty areas on site include the following:

- In-vessel composting units
- Working area in-between the units
- Area surrounding the green waste storage area
- Waste reception building

Clean Area

The clean areas on site include the following:

- Maturation area
- Compost storage area
- Area below the in vessel units
- Fertiliser shed

9. For wastes other than that destined for recovery by composting, submit written agreements of acceptance and relevant permit/licence reference numbers.

RESPONSE TO QUESTION 9

Any waste generated at the site will be separately stored and sent to the Panda Waste Facility for recycling/ disposal which is located at Rathdrinagh, Beauparc, Nanan, Co. Meath, Waste licence register 104-2. The waste will also be delivered by panda waste to this facility who are a licensed carrier – Waste Collection Permit NO. WCP/MH/2001/01C.

10. Provide more detailed information on the proposed odour mitigation measures for all aspects of the activity.

A response to this query is being prepared by Odour Monitoring Ireland will be submitted separately.

11. Specify procedures for screening for non-compostable items.

RESPONSE TO QUESTION 11

Organic Gold intend on screening the compost product at the end of the maturation process, as necessary. The product will be screened typically using a 10-15ml screen. The amount of screening will depend on the quality of product required and regulatory requirements. Organic Gold are currently looking at screens which would best suit their screening needs on site. Once they have decided on a specific model they will submit technical specifications for the screen to the EPA.

12. Clarify the hours of operation of the site. Appendix 7, the Noise Monitoring Report states 08.00 to 18.00 and the application form states 07.00 to 20.00.

RESPONSE TO QUESTION 12

Organic Gold wish to operate between the hours of 07.00 to 20.00 Monday to Friday and from 07.00 to 14.00 on Saturdays.

With reference to the EPA's document "Guidance note for noise in relation to scheduled activities" the agency specifies daytime as 08:00 to 22:00 hours and nighttime as 22:00 to 08:00 hours.

In relation to the Organic Gold's proposed operating times, the hours between 07:00 to 08:00 would be categorised as night time operating hours and would therefore be limited to the night time noise criteria of 45dB LAeq.

From the measurements made during the noise survey, it is unlikely that the operation of the plant will breech these levels during this time period as the background LA90 parameter measured while the site was in operation were within this guidance level.

13. Specify the distances of the nearest sensitive receptors from the composting slab and the fertiliser shed.

RESPONSE TO QUESTION 13

The distances of nearest sensitive receptors from the composting slab and the fertiliser shed are given in **Table 3** below.

Table 3: Distances of Nearest Sensitive Receptors

Nearest Sensitive Receptor	Location	Distance from nearest point of composting slab*	Distance from nearest point of fertiliser shed*
SR1	To the North East of the Facility	235m	320m
SR2	To the North East of the Facility	265m	380m
SR3	To the South East of the Facility	390m	180m
SR4	To the West of the Facility	230m	510m

* Please note that these distances were measured from plan from Drawing **DG001RevA01**.

14. Propose control measures for vermin and birds.

RESPONSE TO QUESTION 14

Pets such as rodents and scavenging birds are attracted to fresh waste which has not undergone any treatment and which might be freely available to these pests which is the case at some landfill sites and other waste disposal areas. During the first stage of high rate composting the waste material is broken down and the organic matter content stabilised making it unattractive to pests. All waste acceptance and high rate composting will take place in-doors, which will prevent access to the decomposing material by rodents. Good operational procedures and effective housekeeping will also contribute to preventing any problems with pests on site.

The following procedures will be followed to prevent any problems with pests at the site.

Procedures to Prevent Nuisances with Pests:

- All fresh waste will be delivered to the enclosed waste reception building immediately upon delivery.
- Waste will undergo intensive composting which will make it unattractive to pests.
- Working areas will be kept clean and free of waste.
- A programme to prevent pest nuisance will be established by the operator involving poisons/traps. The efficiency of the programme will be monitored and measures revised as required.
- If any difficulties should arise due to birds or vermin actions will be taken to address this. A number of commercial solutions for pest and bird control including specialist contractors are available if required.

As the site is unlikely to be attractive to rodents due to the nature of the feedstock and given the mitigation and control measures mentioned above, there will be no significant impact from pests at the proposed site.

15. Clarify the inclusion of gypsum in Table H.1(d) Waste Types and Quantities when proceeding in the Waste Application Form it is stated that gypsum will not be accepted at this site.

RESPONSE TO QUESTION 15

Organic Gold does not propose accepting gypsum for composting at the proposed site. However, they do propose accepting gypsum at the site which will be stored in the fertiliser shed and used as an additive in the finished sludge compost. Organic Gold has found that gypsum when added to the compost products can enhance the pH and sulphur content of soil to which it is added. The acceptance of gypsum on site will be subject to regulatory approval.

16. Please provide a site-specific risk assessment, based on clear, independent scientific evidence which shows that bioaerosol levels which may arise from the receipt, shredding, composting and storage of green waste can be maintained at appropriate levels. In your assessment, please provide evidence that this proposed operation will not have any negative impacts on the nearest sensitive receptor site.

RESPONSE TO QUESTION 16

A bioaerosol risk assessment for the site is attached in **Appendix H**.

17. Identify on a suitably scaled map the location of the well and provide details and an assessment of the well water quality and extraction capacity. Provide details of mitigation measures to protect the well from contamination.

RESPONSE TO QUESTION 17

All water used on-site is currently taken from a shallow surface water well owned by Organic Gold. The well is fed by a natural spring close to the Yellow (Blackwater) River. The well is approximately 2 metres deep and is connected to a pump house which is a small structure approximately 1.5 square metres. A Holfeld pump pumps the water from the surface water well. Water not used by Organic Gold overflows into the Yellow (Blackwater) River.

Organic Gold expect to be connected up to the main water supply in October of this year, which will then supply required water to the proposed facility. 100mm Class II water mains will run from the site entrance and supply the facility. The shallow surface water supply well may act as an emergency supply of water to the facility in the future if ever a problem arose with obtaining water from the mains.

A water quality study of the shallow well was conducted on the 12th of August 2004. This was included in the **EIS, Volume 1 Chapter 8**, Refer to Tables 8.1 and 8.4 (Reference B).

The extraction capacity of the well is not known. However, the well was used in the past to supply drinking water to a herd of 700 cattle at the site. Therefore assuming that each head of cattle consumed approximately 91 litres per day, it is estimated that well has at the very least, the capacity to supply 23,250m^3/annum.

For the proposed facility it was estimated that maximum water usage on the site would be 66m^3/day or 24,090 m^3/annum, which is very similar to the amount of water that was consumed by the cattle in the past. However as stated in the EIS, water usage for the proposed facility is expected to be well below this figure in reality.

18. Submit proposals for site operations in the event of a power failure.

RESPONSE TO QUESTION 18

In the event of a power failure on site, it is expected that the facility would be without power for a maximum of one day. If this were to happen, no power would be available to maintain aeration within the composting units, or to pump water out of the storage tanks. The following operational procedures will thus be followed during power failures to limit any adverse environmental impacts.

1. The facility manger will advise the ESB of the power cut and put a response in place.
2. No waste will be accepted on site during power failures.
3. A Perkins Diesel generator is available on site which has an energy output of 80KVA. This can be used to power (1) the fans at the back of the composting units and maintain aeration with

the waste material, (2) the electrical pumps (if used in the future) to pump out the water out of the storage tanks and (3) the mist air system. The electrical connections of the in-vessel units and pump will be installed such that a switch to the back up generator can be made easily.

4. The Ruscon slurry spreader will be used to empty storage empty tanks if required.

19. Provide details of the predicted quality of final compost material to be produced on site and details of the proposed end use.

RESPONSE TO QUESTION 19

Organic Gold proposes to produce the highest quality compost possible on site. However the final compost product will depend on the type and quality of the incoming material. The quality of the compost will at least meet the quality requirements for stabilised biowaste and other classes of compost as outlined in the proposed 2nd draft of the EU Biowaste Directive or any other statutory requirements that may be applicable.

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

RESPONSE TO QUESTION 20

Following the maturation period the finished compost will be continuously moved off site in bulk quantities. If it arises that compost storage is required on site an area of 750m^2 has been designated on the concrete slab where compost storage can take place (Refer to drawing **DG0002RevA05 in Appendix C**). It is envisaged that no significant refinement, apart from screening of the compost will take place. Some of the sludge derived compost may be mixed with gypsum in the fertiliser shed as discussed in the reply to question 15 above but this is subject to regulatory approval.

21. 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.

RESPONSE TO QUESTION 21

Organic Gold is preparing to begin the application process to obtain permission from the Department of Food and Agriculture to treat animal by products (ABP's) on site. Only category 3 material which relates to catering waste will be treated on site. An Inspector from the Department has already visited the site and it is expected that the Inspector will work closely with Organic Gold in preparing the application and in ensuring that the proposed site layout will be ABP compliant. This has been the approach the Department has taken with other composting facilities in Ireland. The chosen Wasteology system has been determined as ABP compliant in the UK and is in operation at a number of facilities in the UK.

ABP Guidelines were issued by the Department in October 2004. It is important to note that these are only guidelines and may be subject to change with time and /or may be applied on a site-specific basis. The ABP Regulations (EC No. 1744/2002) requires that composting plants be equipped with:

A closed composting reactor, which cannot be by-passed, with

- Installations for monitoring temperature against time;
- Recording devices to continuously record measurements;
- An adequate safety system to prevent insufficient heating;
- Category 3 material (catering waste) used as raw material in a composting plant will be submitted to the following minimum requirements:
  - Minimum temperature in all material in the reactor: 70°C; and
  - Minimum time in the reactor at 70°C (all material): 60 minutes;
  - Maximum particles size of feedstock material is 12mm.

Catering waste will be treated according to the requirements of the Guidelines and the Department of Agriculture and Food.

Organic Gold will ensure that all catering waste accepted on-site is treated in accordance with the requirements of the ABP Guidelines and the Department.

Other operational procedures will be implemented on site to meet the requirements of the ABP guidelines and include the following:

- All incoming waste will be mixed, blended and pre-treated in the enclosed building.
- Working areas within the waste reception building, in-vessel units, and immediate surrounding areas will be washed down on a daily basis and these washings separately collected in an above ground storage tank (Tank D). This ABP dirty water will then be circulated only into the incoming feedstock. This mixed feedstock will then be treated in the in-vessel units.
- A fully documented pest control programme will be implemented throughout the whole facility.
- Finished compost will be stored away from the intake area and operators will ensure that a one-way system of materials flow is in operation at the site, in order to prevent recontamination of processed products.
- Clean and dirty water will be separated as outlined in response to Question 7 and 8.

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

RESPONSE TO QUESTION 22

The Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998-2001 aims to protect the environment, and in particular soil when sewage sludge is used in agriculture. To date the compost produced by Organic Gold has mainly been used in non-agricultural applications. However the facility may in the future supply compost to agriculture. Responsibilities in terms of the regulation will include:

- Testing compost product to determine compliance with quality requirements
- Organic Gold will be responsible for setting up a register of all sludge accepted on site. This will document the source and characterisation of sludge, date and quantity of sludge accepted. Organic Gold will also keep a register of where the sludge compost is sold to ensure full traceability of the product.

- Compost quality testing will be carried and results will be made available to all parties who purchase the sludge compost for use on agricultural land.

- Records of all sludge treated on site and the final destination of the sludge compost will be kept for a period of 10 years.

There are some limitations on the use of treated sludge when cultivating certain crops in agriculture. Treated sludge must not be applied to fruit and vegetable crops for ten months prior to harvesting, or for three weeks prior to grazing / harvesting of grassland or forage crops. Because Organic Gold will compost all sludge on site and a certain amount of the treated sludge will be used on agricultural land, the above limitations will apply to Organic Gold and will be strictly adhered to.

23. In accordance with the Section 84(4) provide information to show that Organic Gold (Marketing) Ltd. is likely to be in a position to meet any financial commitments or liabilities that may have been or will be entered into or incurred in carrying on the activity to which the application relates or in consequence of ceasing to carry out that activity.

RESPONSE TO QUESTION 23

Organic Gold is a financially viable company. A banker's reference was included in the Waste Licence Application in Attachment L2. Audited Directors' accounts for the year ended 31st of December 2003 are provided as requested by the EPA. Accounts for year 2004 have not been fully audited as of yet and are thus not available for inspection. Please note that this is commercially sensitive information and thus has been provided in a sealed envelope and attached in **Appendix I.**

APPENDIX A

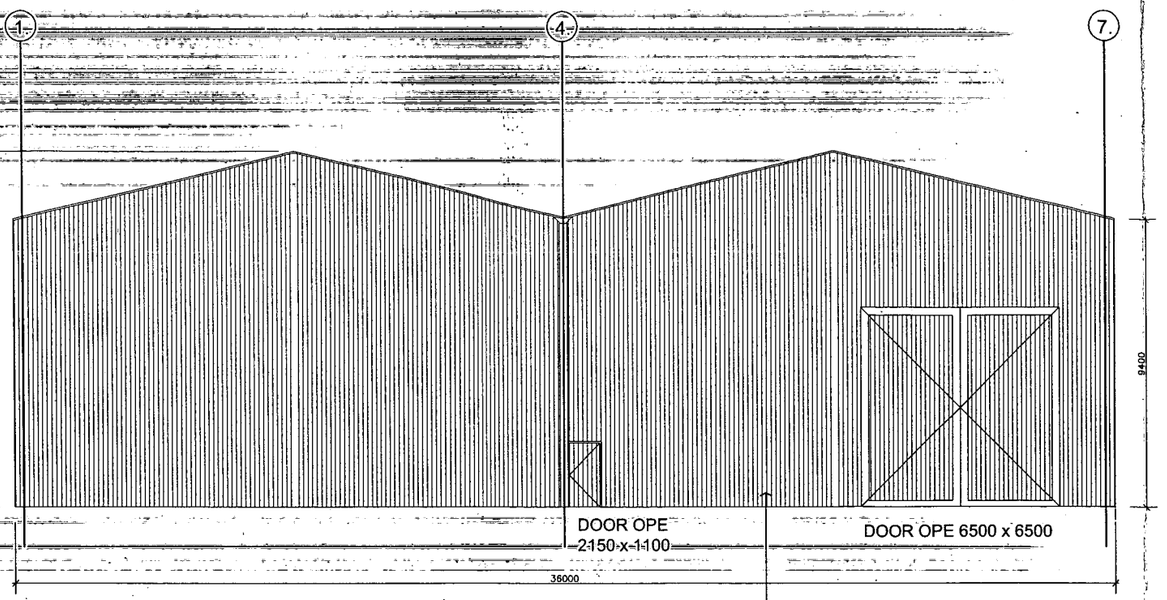
Waste Reception Building Drawings

OG304 and OG303

DRAWING STATUS
PLANNING

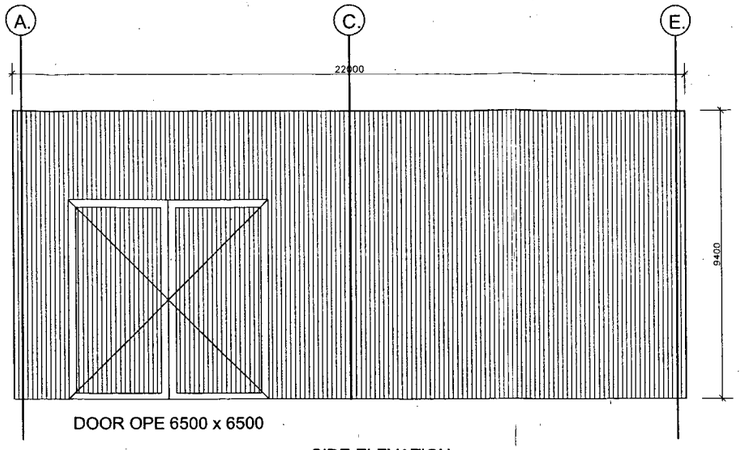
NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS.
2. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE. ENGINEER TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

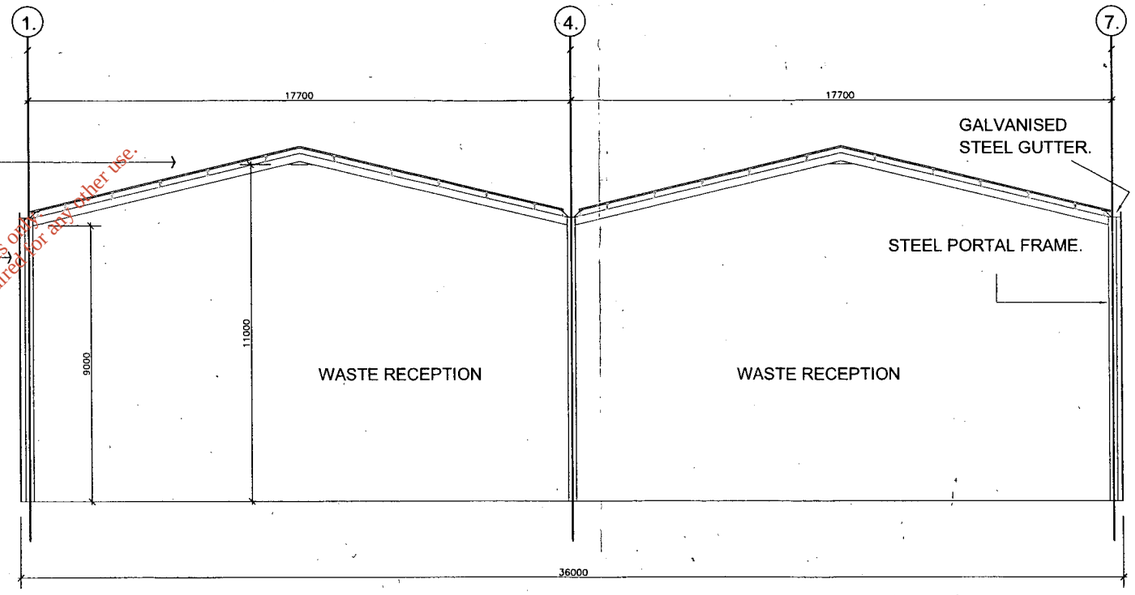


FRONT ELEVATION

KINGSPAN AGRICULTURAL CLADDING (or similar) GREEN/GREY



SIDE ELEVATION



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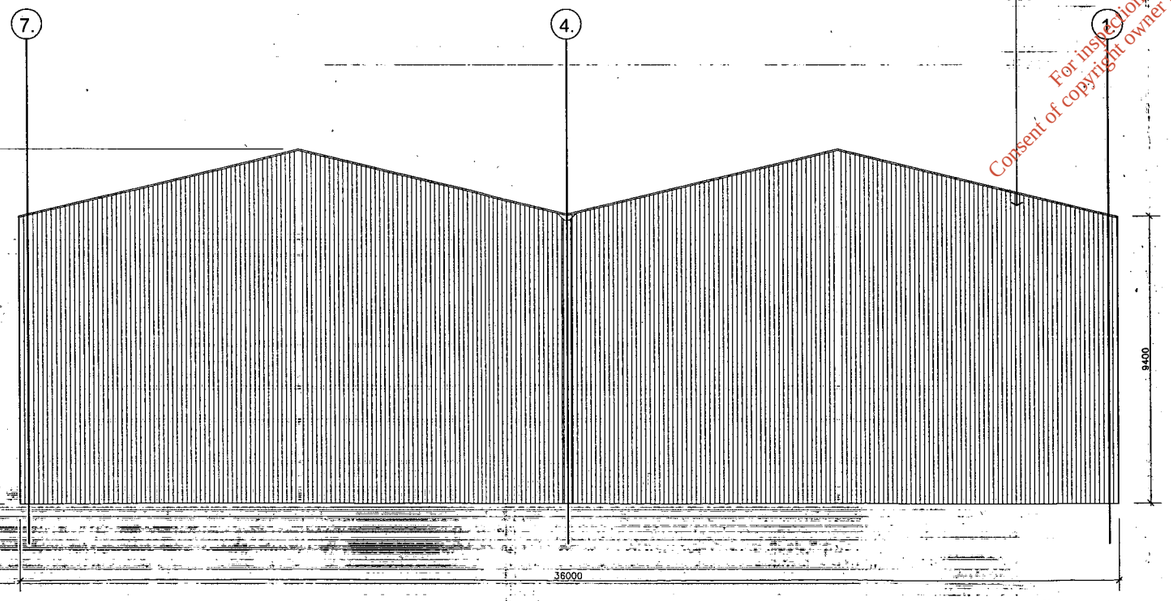
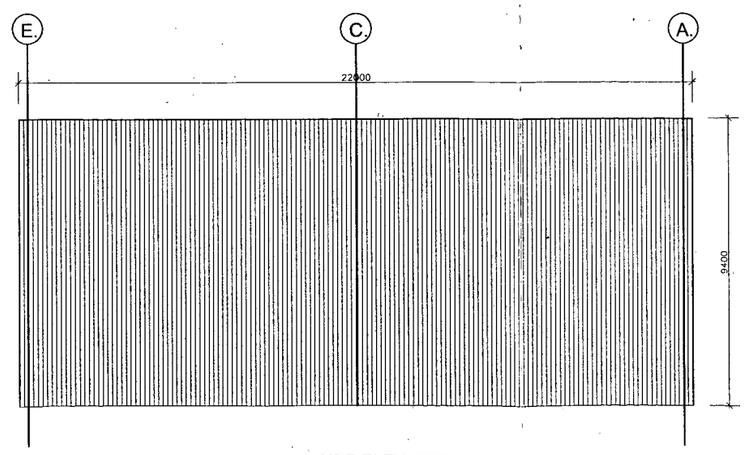


REAR ELEVATION



SIDE ELEVATION

Rev	Date	Amendments	by	chkd
A.	8.01	ISSUED FOR PLANNING	CT	CT.

AAC CONSULTING
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
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PROJECT
WILKINSTOWN
NAVAN

CLIENT
ORGANIC-GOLD

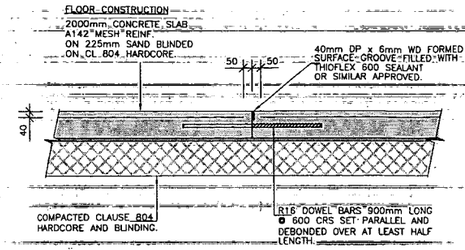
DRAWING TITLE
WASTE_RECEPTION_BUILDING
WILKINSTOWN
NAVAN

drawn by: CT	date: 01/05	scale: 1:100	chk: CT
job no OG3	drg.no. 03	rev. 0	

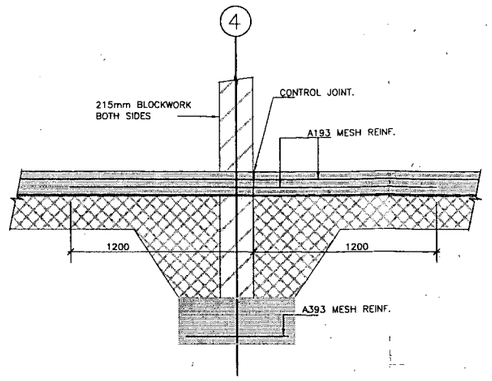
DRAWING STATUS
PLANNING

NOTES

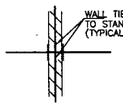
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS.
2. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING. ALL DIMENSIONS TO BE CHECKED ON SITE. ENGINEER TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
3. CONCRETE TO BE GRADE 35N20.
4. COVER TO REINFORCEMENT TO BE 50mm UNLESS NOTED OTHERWISE.
5. STRUCTURAL STEEL TO BE GRADE S275GP.
6. BOLTS TO BE GRADE 8.8 (U.N.O)
7. BLOCKWORK TO BE STRENGTH GRADE 5N.
8. ALL STANCHIONS ALONG GRIDLINES 1 & 7 TO BE COATED WITH INTUMESCENT PAINT TO ACHIEVE ONE HOUR FIRE RATING.



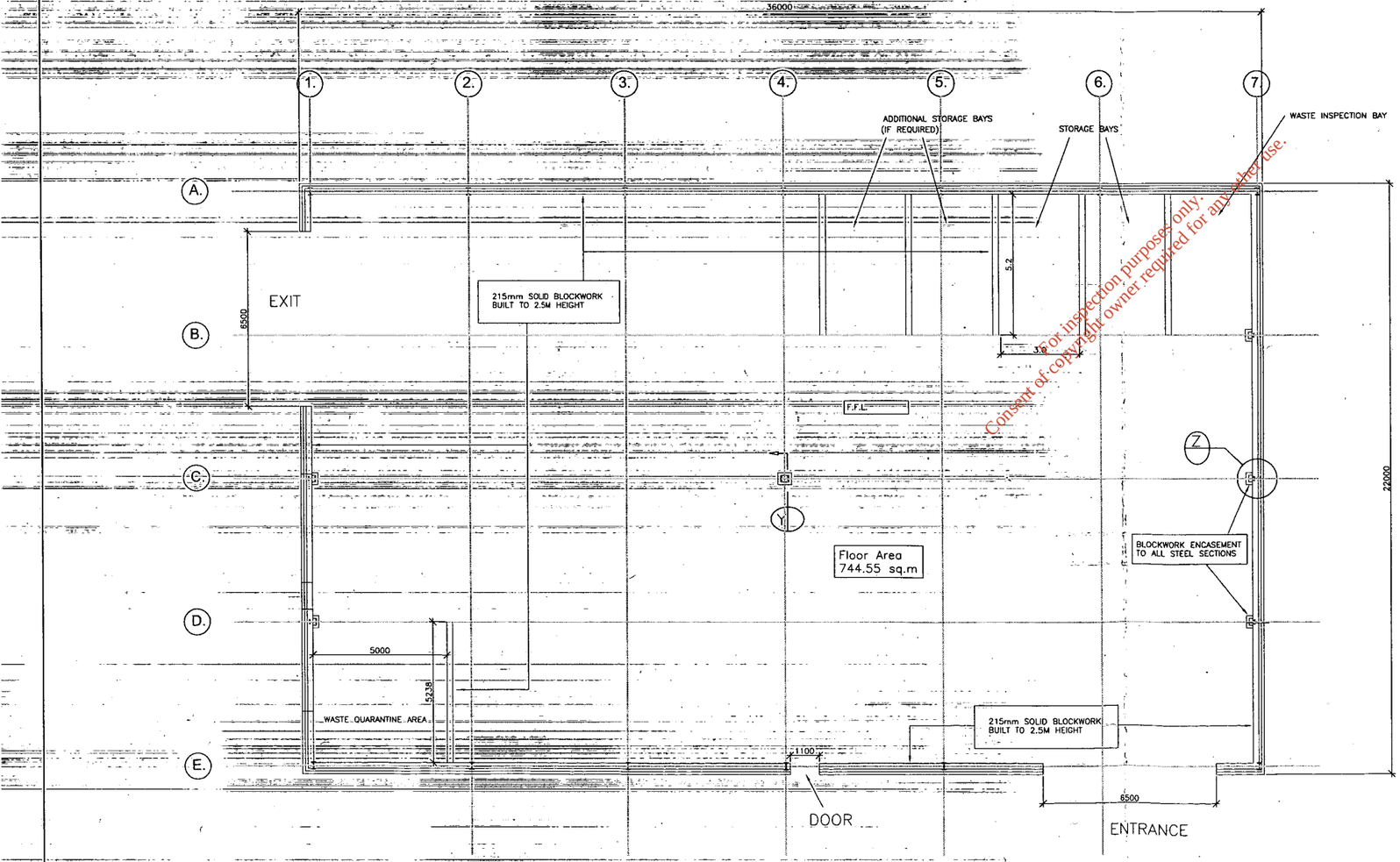
CJ CONSTRUCTION JOINT.



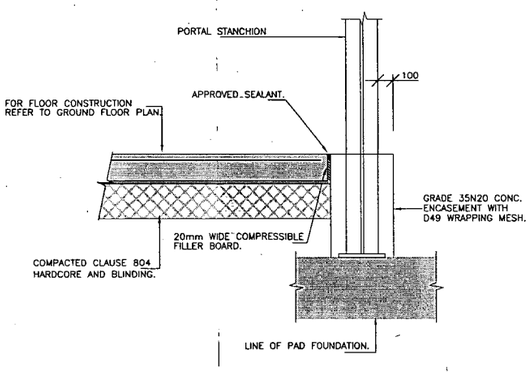
Y SECTION.



A DETAIL.
SCALE 1:50



GROUND FLOOR PLAN.



Z SECTION.

Rev	Date	Amendments	by	chkd
B.				
A.				

AAC CONSULTING
Hill of Rath,
Drogheda,
Co. Louth
TEL: 041 9838941
FAX: 041 9844359
conortf@eircom.net

PROJECT
ORGANIC GOLD

CLIENT
ORGANIC GOLD

DRAWING TITLE
FLOOR PLAN
SECTION DETAILS

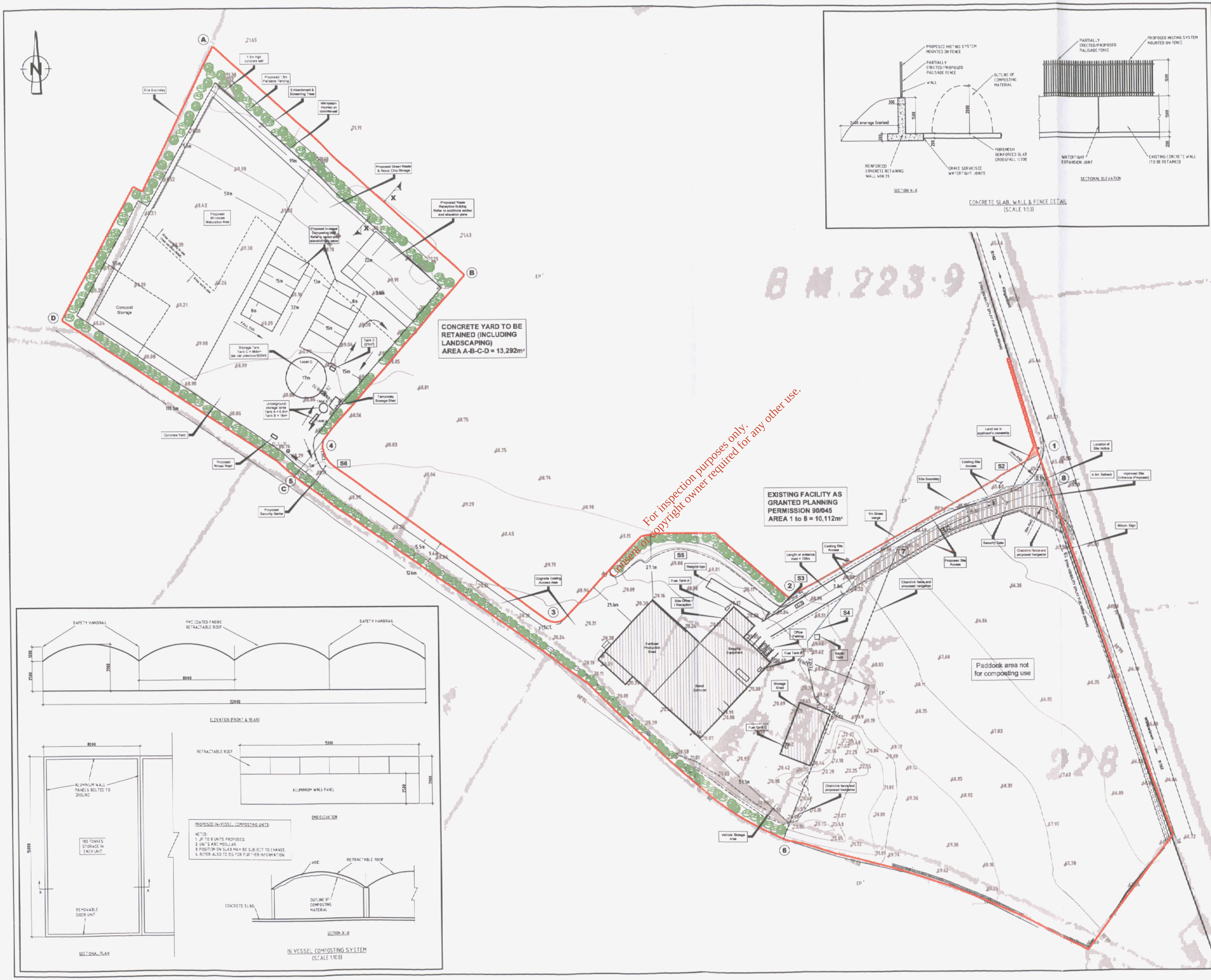
drawn by: CT	date: JAN'05	scale: 1:100	chk: CT
job no OG3	drg.no. 04	rev. 0	

APPENDIX B

OS Series Discovery Map

APPENDIX C

Revised Site Layout Map DG002RevA05



NOTES

1. This drawing is the property of RPS-MCOS Ltd., it is a confidential document and must not be copied, used, or its content divulged without prior written consent.
2. All Levels refer to Ordnance Survey Datum, Malin Head.
3. DO NOT SCALE, use figured dimensions only, if in doubt ask.

LEGEND:

- Additional land at existing site entrance to be included in proposed upgraded site entrance
- Land not in the ownership of Organic Gold (Refer to application form)
- Existing Site Access

SIGNAGE LEGEND

- S1 EPA Waste Licence Facility - Organic Gold (Marketing) Ltd.
- S2 Speed Limit 20 km/hr.
- S3 Report to Site Office
- S4 Fertiliser Production Shed
- S5 Proceed to Tipping Area and Composting Slab
- S6 Waste Inspection Ahead

No.	Date	Chk/Wr	Amendment / Issue	App.
A05	Sep'05	RH/LH	Issue to Client for Approval	CB
A04	Mar'05	HF/LH	Issue to Client for Approval	CB
A03	Jan'05	RH/WP	Issue to Client for Approval	CB
A02	Jan'05	RH/WP	Issue to Client for Approval	CB
A01	Jun'04	RH/WP	Issue to Client for Approval	CB

Client:

Organic Gold Ltd., Wilkinstown, Navan, Co. Meath

RPS MCOS

RPS-MCOS Ltd., Carnegie House, Library Road, Dun Laoghaire, Co. Dublin, Ireland.
P: +353 1 202 0870 - F: +353 1 202 0707
E: rpsmcos@rpsgroup.ie - W: www.rpsmcos.ie

Project:

ORGANIC GOLD COMPOSTING FACILITY

Title:

PROPOSED SITE LAYOUT PLAN

Drawn by: RH		Job No: MDE0202	
Checked by: WP		File No: MDE0202DG0002A05	
Approved by: CB		Drg. No: DG0002	Rev: A05
Scale: 1:500@A0			
Date: JUNE '04			

APPENDIX D

Ruscon Slurry Spreader for Recirculating Leachate

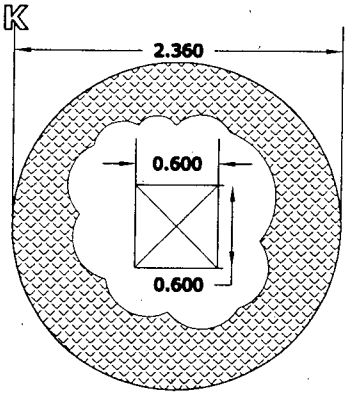
APPENDIX E

Technical Specifications for Storage Tanks

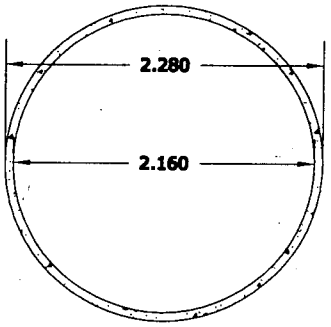
CARLOW PRECAST TANKS LTD.
Kilknock, Ballon, Co. Carlow, Tel: 059 915 9322, Fax 059 915 9202, e-mail: sales@carlowprecasttanks.com
Manufacturers of Septic and Effluent Tanks, Pump Chambers Reservoirs, Interceptors and Special Products

- TANA

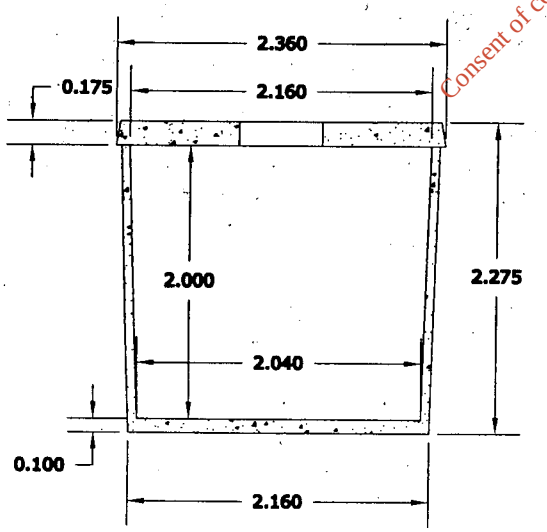
1500 GALLON (6.92 cubic metre) TANK



ROOF PLAN



FLOOR PLAN



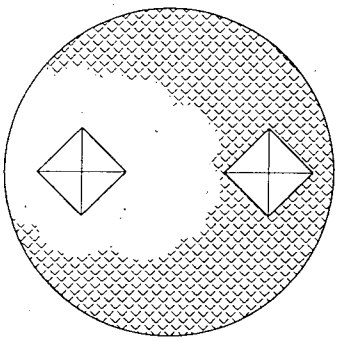
SECTION

0m 1m 2m

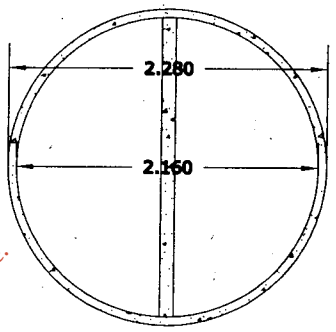
Standard tank weight 4.00 tonnes without lid, 5.40 tonnes including lid.

Septic tank weight 5.00 tonnes without lid, 6.40 tonnes including lid.

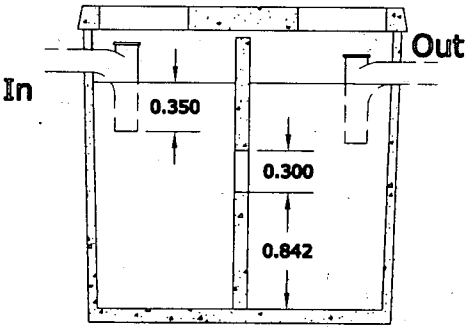
SEPTIC TANK



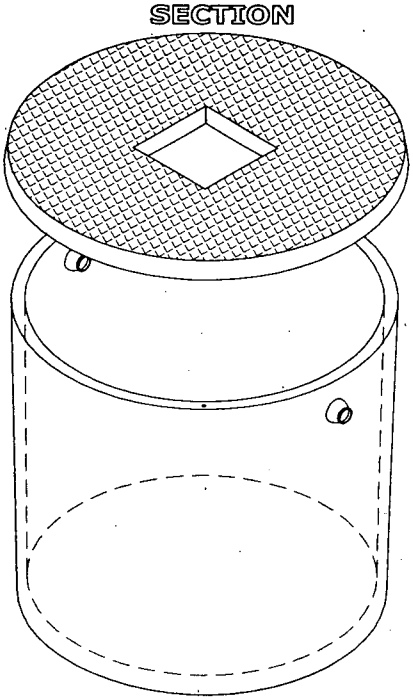
ROOF PLAN



FLOOR PLAN



SECTION



3D VIEW

field tensiometer, and they shall not fail in the seam. If a specimen fails, the entire operation shall be repeat Fusion Welding

Fusion-welding apparatus must be automated and vehicular-mounted. It shall be equipped with instrumentation indicating temperatures and pressures. It shall not damage the HDPE, which shall be protected from damage in heavily trafficked areas. A smooth insulating plate or fabric shall be placed beneath the hot apparatus after usage.

For cross seams the edge of the cross seams shall be abraded to a smooth incline (top and bottom) prior to welding.

The electric generator shall be placed on a smooth base such that no damage occurs to the HDPE.

Preparation

The seam area shall be clean and free of all moisture, dust, dirt, debris, and foreign material of any kind, immediately prior to seaming. If seam overlap grinding is required, the process shall be completed within one hour of the seaming operation and in a way that does not damage the HDPE. Seams shall be aligned to minimise the number of wrinkles and "fishmouths". Where fishmouths occur, the material shall be cut, overlapped, and an overlapping extrusion weld shall be applied.

Trial Seams

Trial seams to verify that seaming conditions are adequate, shall be made on fragment pieces of HDPE of the same type, thickness and general condition as that to be used in the installation. Such trial seams shall be made at the beginning of each seaming period, and at least once each five hours for each seaming apparatus used, and also if the welding apparatus is turned off for any reason. Each welder shall make at least one trial seam for each welding period for every apparatus in use. Trial seams shall be made under the same conditions as actual seams and will be performed with the HDPE in contact with the same subgrade type that the actual welding of the seam overlays. The trial seam sample shall be at least 1.5m long by 0.3m wide after seaming with the seam centred length wise. Seam overlap shall be to Specification.

Four specimens, each 25mm wide, and a minimum of 150mm apart, shall be cut from the trial seam sample by the Contractor. Two specimens will be tested in shear and two in peel using a field tensiometer, and they shall not fail in the seam. If a specimen fails, the entire operation shall be repeated. If the additional specimen fails, the seaming apparatus and welder shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful trial seams are achieved.

No geomembrane seaming shall take place until each seaming apparatus and welder meets these requirements. If the additional specimen fails, the seaming apparatus and welder shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful trial seams are achieved.

No geomembrane seaming shall take place until each seaming apparatus and welder meets these requirements.

Weather

No seaming of the geomembrane shall be undertaken at ambient temperatures below 5^0C or above 35^0C, measured approximately 50mm above the geomembrane surface. In all cases, the geomembranes shall be completely dry and protected from wind damage.

TANA

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Manufacturers and Suppliers of Septic and Effluent Tanks for Sewage Treatment Systems. Water Reservoirs. Pumping Chambers. Culverts and Special Products.

1500 Gallon Tank – Technical Data Sheet

1500 Gallon Tank

Materials

Concrete
Grade C50N15 concrete is used in manufacture from computerised mixing and batching facilities at Carlow Precast Tanks plant.

Formwork
Steel sectional inner and outer moulds are used to cast the tank in the upright position. Compaction is by poker vibrator.

Reinforcement
High yield Type 2 deformed bar reinforcement to BS 4449 in the lid. The walls and floor are reinforced using a 60mm long crimped end steel fibre of 1mm diameter dosed at 40kg per cubic metre of concrete.

Admixtures
A combined water reducing and plasticising admixture (Gelenium) is normally used to aid compaction and minimise the amount of free water in the product.

Spacers
Spacers to the lid reinforcement are of the clip-on plastic type.

Manufacture

Quality
Quality of manufacture and standards of workmanship comply with the requirements of BS8110 Part 1, Section 6.

Tolerances
Dimensional tolerances in manufacture exceed the requirements of BS 8110.

Curing
Tanks are cured in the mould for a minimum of sixteen hours and air cured for a minimum of 14 days.

Once this Certification has been given the Contractor shall have full responsibility for the surface. Any damage caused by installation or any other activities shall be repaired at the Contractors' expense.

No HDPE shall be placed onto an area which has become softened by precipitation or which has cracked due to desiccation. The surface shall be inspected daily to evaluate desiccation cracking and/or softening and any necessary repairs shall be undertaken at the Contractors expense.

Anchorage System

Care shall be taken when backfilling the anchor trenches to prevent any damage to the HDPE and the Contractor shall make good at his expense any such damage. No loose soil shall be allowed beneath the HDPE.

Placement

A field panel is the unit area of HDPE which is to be seamed in the field (i.e. a field panel is a roll or a portion of roll cut in the field.)

An indicative Panel Layout Plan showing location and type of all seams shall be submitted by the Contractor to the Engineer before commencement of installation. No installation is to be undertaken until the Engineer has given approval in writing to the Contractor that the panel layout submitted is satisfactory. All installation is to be in strict accordance with the Plan unless the Engineer gives advance approval to any site modifications.

Placement Method

Field panels shall be installed at the location and positions indicated on the Panel Layout drawings. They shall be placed one at a time, and each panel shall be seamed immediately after its placement in order to minimise the number of un-seamed panels exposed to wind.

The Contractor shall ensure that:

(i) equipment used shall not damage the HDPE by handling, trafficking, leakage of hydrocarbons, or other means.
(ii) Personnel working on the HDPE shall not smoke, wear damaging shoes, or engage in other activities which could damage the HDPE.
(iii) The method used to unroll the panels shall not cause scratches or crimps in the HDPE and shall not damage the supporting soil.
(iv) The prepared surface underlying the HDPE shall not deteriorate after acceptance, and shall remain acceptable up to the time of HDPE placement. Measures should be taken to avoid water entering the between the HDPE liner and clay liner.
(v) The method used to place the panels shall minimise wrinkles (especially differential wrinkles between adjacent panels).
(vi) Adequate temporary loading and/or anchoring (e.g. sand bags, tyres), not likely to damage the HDPE, shall be placed to prevent uplift by wind.
(vii) No vehicular traffic shall travel on the HDPE.

Panels

Field panels must be given a unique identification code consistent with the Layout plan. This identification code shall be agreed upon by the Engineer and Contractor. The identification code shall be related, through a table or chart, to the original resin and the constituent rolls.

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Manufacturers and Suppliers of Septic and Effluent Tanks for Sewage Treatment Systems, Water Reservoirs, Pumping Chambers, Culverts and Special Products.

1500 Gallon Tank – Technical Data Sheet

Casting
Tanks are cast in a single pour to avoid the formation of a cold joint. Poker vibrators are used rather than bolt on vibrators to ensure appropriate levels of compaction as the pour proceeds.

Defects
Minor defects (i.e. of neither structural or waterproofing significance) are repaired using a proprietary concrete repair mortar while the concrete is still green. Tanks failing to meet minimum quality criteria are discarded.

Temperature
Tanks are not produced at temperatures of less than four degrees on a falling thermometer. Indoor manufacturing and heating of the mould are used if necessary.

Concrete Grade
Grade C50 is used with a maximum free-water/cement ratio of 0.45 and a minimum cement content of 460kg per cubic metre.

Design

Design Philosophy

Being a standard product, tanks are designed for a theoretical set of onerous criteria as follows

1m Overburden
Groundwater to ground level
High horizontal pressure (K = 0.35) backfill material

On relatively difficult sites an individual analysis can be carried out using the exact site conditions. Alterations to the standard design are rarely necessary but additional reinforcement can be provided to meet requirements.

Two design situations are checked:

Overground / Full
Buried / Empty

The tanks have a design life of 50 years in the 'severe' environment as described in BS8110 and are guaranteed for 5 years from the date of delivery.

- *every fifth sample tested for density using nuclear or core cutter methods should also be tested using the sand replacement method to aid in identifying any systematic calibration errors.*

Materials sampled after placement and compaction in lifts which do not conform within the following allowable variations must be repaired:

Parameter	Testing Frequency
Moisture Content	3% (outliers not concentrated in one area or one lift)[1] and no moisture content less than 2% or more than 3% of the allowable value
Dry Density	3% and no dry density less than 0.8 kN/m^3 below the required value
Number of Passes	5 % (outliers not concentrated in one area or one lift)[1]

Note: *1.Samples that do not conform to design specification but are within maximum allowable variation must not be concentrated in one area or one lift.*

Repair of Sample/Test Holes

Sampling locations in the liner system must be backfilled and sealed by bentonite or similar sealing material.

Liner Acceptability

In the event of any of the above test results not being acceptable, the CQA Project Manager shall discuss these with the contractor. Should such events occur at unusually high frequency, the CQA Project Manager shall instruct the Contractor to cease clay placement whilst an investigation is undertaken.

Such an investigation will review some or all of the following, as well as other factors deemed appropriate by the CQA Project Manager:

- *source clay characteristics altered (e.g. variations in natural moisture content, P.I., etc.)*
- *inefficient Contractor's plant or working methodology*
- *inappropriate test methods or acceptance criteria*
- *defective test equipment or testing procedures*

The Project Manager shall ensure that the problem is rectified before authorising the recommencement of clay placement.

At completion of clay placement 100mm diameter undisturbed clay cores shall be taken from the clay, at locations to be specified by the CQA Project Manager. The EPA shall be consulted by the CQA Project Manager prior to finalising test locations.

The CQA Project Manager shall specify the number of sample locations required to be tested and two cores shall be taken from each location.

The CQA Project Manager shall ensure that these samples are delivered to an approved laboratory for permeability testing. One core from each sample location shall be tested, with the other core retained as a 'spare' until test results are available.

The CQA Project Manager shall deem the clay liner acceptable when all cores tested exhibit a co-efficient of permeability not greater than 1 x 10^{-9} m/s.

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Manufacturers and Suppliers of Septic and Effluent Tanks for Sewage Treatment Systems. Water Reservoirs. Pumping Chambers. Culverts and Special Products.

1500 Gallon Tank – Technical Data Sheet

Design Compliances

The following standards, codes and references are complied with in design.

BS8110	1985:	British Standard – Structural Use of Concrete.
BS8007	1987:	Code of Practice for Concrete Structures for Aqueous Liquids.

Dramix Design Guidelines for Fibre Reinforced Concrete.

Installation

Transport
Tanks are delivered on a platform bodied truck with hydraulic jib.

Access
Up to 6m reach is possible from the back of the truck to the centre of the tank. A minimum entrance width and clear height of 4m are required.

Weight
The empty tank with cover weighs 6000kg.

Excavation

General Practice
The excavation should exceed the base level by 100mm. The excavation should be brought to level using sand or fine aggregate, compacted and levelled.

Safety
The sides of the excavation should be suitably battered to avoid risk to personal safety or damage to the tank by partial collapse. The safety of the excavation and general works remains the responsibility of the purchaser.

Completion of the excavation should be coordinated to coincide with the arrival of the tank. This will minimise risk to safety and collapse of the excavation due to groundwater infiltration or other factors.

This plan has been prepared by RPS-MCOS and addresses the Construction Quality Assurance (CQA) of the sourcing, placement and compaction of the clay component of the composite liner for the three new cells of the Rampere Landfill Extension for Wicklow County Council. The CQA plan reflects the site specific requirements for the material selection and installation of the lining system at the Rampere Landfill Extension and outlines construction methods, testing and acceptance criteria.

Definitions Relating to CQA

CQA may be defined as;

> *A planned and systematic pattern of all means and actions designed to provide adequate confidence that items or services meet contractual and regulatory requirements, and will perform satisfactorily in service.*

In the context of this document CQA refers to the means and actions of the CQA consultant, to assure conformity of the lining system material selection, preparation and construction to this CQA plan, the drawings and specifications and to the sites operational Working Plan. CQA is provided by a party independent from the installation of the lining system and operation of the site.

In the event of ambiguity or conflict between the Specification and CQA plan, then the provisions of the Specifications will take precedence and then this CQA Plan.

The **CQA Consultant** may be defined as;

> *The party representing the Employer having responsibility for the direct technical supervision of the execution of the contract, including field testing, to ensure compliance with the Specification. The CQA Consultant is also responsible for observing and documenting construction activities under the terms of the contract and ensuring that the minimum requirements as set out in CQA Plan are met.*
>
> *Within this CQA Plan, the CQA Consultant will be appointed by the Employer to supervise the execution of the contract.*

The **Contractor** may be defined as;

> *The party responsible for the preparation and construction of the works to the Specifications as detailed, within the CQA Plan and the Contract Documents under the technical supervision of the CQA Consultant.*

Within this CQA Plan, the Contractor will be appointed by the Employer.

The **Employer** may be defined as;

> *The operator of the Landfill site and who has responsibilities for the facilities.*

Within the CQA Plan, the term Employer will refer specifically to Wicklow County Council.

The Licensing Authority (LA) is independent of the contract parties. The LA must be satisfied that the construction materials and methods meet the minimum requirements as set out within the Specification and CQA Plan. As such all CQA documentation and test results are to be forwarded to the LA. Within this CQA Plan, the Licensing Authority will refer specifically to the Environmental Protection Agency (EPA).

The personnel of the CQA Consultant team for this Project will include:

(i) *The CQA Project Manager, who operates from the office of the CQA Consultant and will be present or represented at site meetings.*

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1500 Gallon Tank – Technical Data Sheet

Placement

Procedure
The tank must only be lifted using the correct spreader bar and integral lifting lugs in the tank. Rough handling and impact are to be avoided.

Backfilling

The tank may be backfilled using excavated material provided that no topsoil is used below 150mm depth and that backfilling is free of large stones and cobbles.

Where excavated material is unsuitable for backfilling, 50mm (maximum) crushed rock may be used. Backfilling should be completed in horizontal layers not exceeding 500mm depth, lightly compacted on completion of each layer. The tank lid should be placed in position before backfilling begins to avoid unnecessary contamination of the tank.

Floatation

Care should be taken to avoid risk of floatation on sites where a high water table is possible. Local knowledge should be applied in selecting a suitable tank location. This selection is the responsibility of the purchaser.

Neglecting skin friction, the tank would be at the point of floatation when the water table is 900m below the top of the lid.

In exceptional circumstances floatation can be resisted by partial backfilling in lean mix concrete to form a hoop around the base of the tank engaging backfill material over.

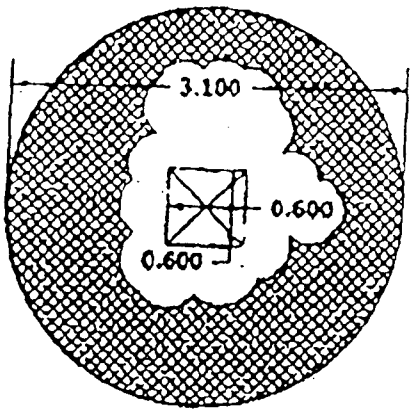
TANK B

[redacted] CARLOW PRECAST TANKS LTD.

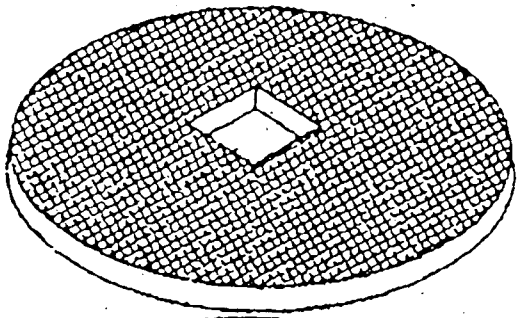
Killinock, Ballon, Co. Carlow. Tel: 0503 59222. Fax: 0503 59202. e-mail: sales@carlowprecasttanks.com

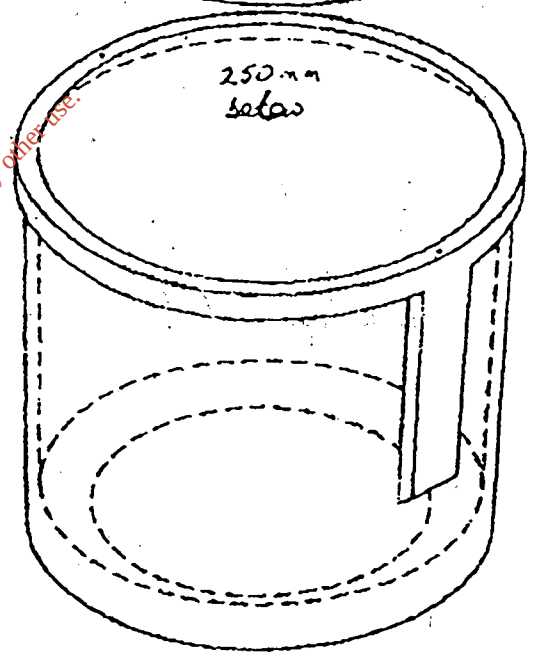
Septic and Effluent Tanks, Pump Chambers, Reservoirs, Interceptors and Special Products

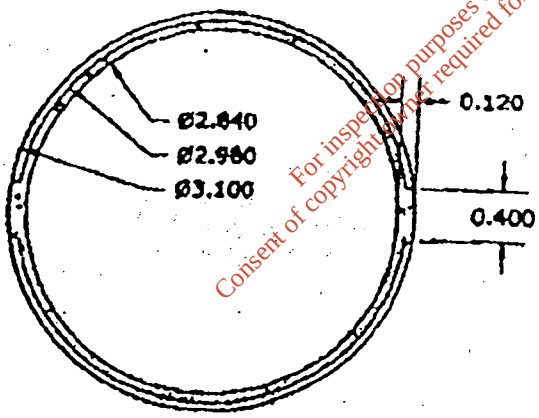
3500 GALLON (15.90 cubic metre) TANK



ROOF PLAN

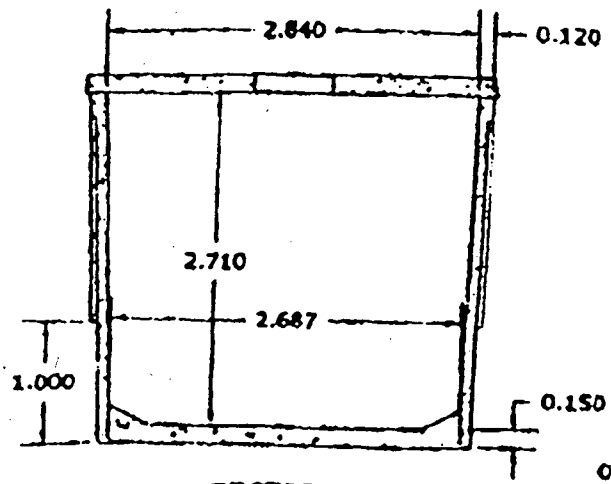






FLOOR PLAN

3D VIEW



SECTION

Roof design to particular loading requirements.

Collars, fittings etc. to customers requirements.

Standard tank weight 6.25 tonnes without lid, 9.10 tonnes including lid.

Tank can be subdivided to form septic tank, interceptor or other to customers requirements.

0m 1m 2m 3m 4m

SLURRY STORAGE SYSTEMS

PERMASTORE® TANKS & SILOS

Pollution Control - Slurry Management

“There is no doubting the business benefits to be won from proper slurry management and storage systems from Permastore. They make a quality product and also provide quality service to match.”

QUALITY ASSURED FIRM ISO 9002 SGS

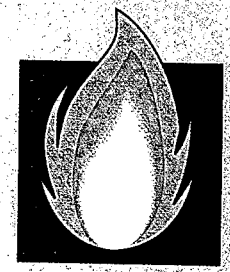
UKAS QUALITY MANAGEMENT 005

Total Control - Lasting Peace of Mind

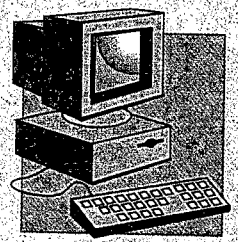
SLURRY STORAGE SYSTEMS

PERMASTORE® TANKS & SILOS

10 good reasons for choosing Permastore®

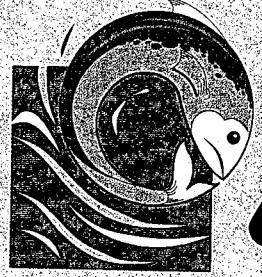


1 Tank quality
The tank is built with panels made of Glass-Fused-to-Steel. They have a proven long life with slurry tanks in use for over 30 years. The panels are resistant to the extremes of weather and to the corrosive effects of livestock effluent. Quality management systems certified to ISO 9001.



2 Tank design
Tailor-made systems are designed to match exactly your farm needs. Choose the size you need for your business plans. Select tall or wide tank sizes, or extendible options for future expansion.

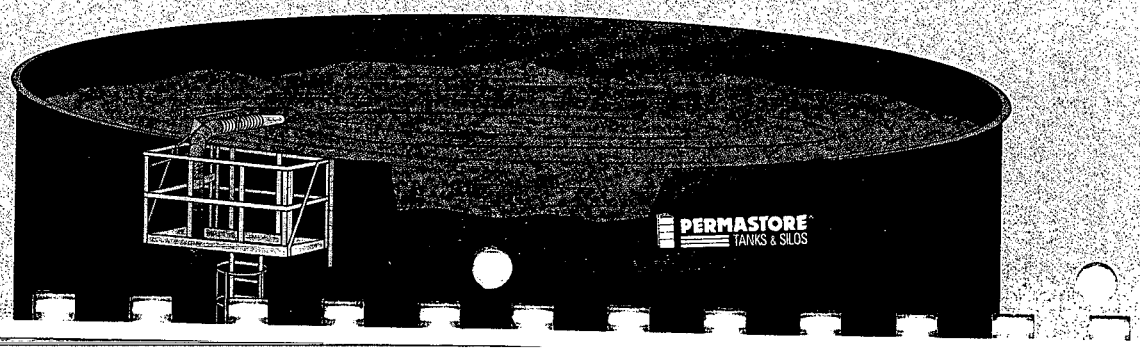
3 Pollution control
Contain farm waste safely and securely. Chosen by thousands of farmers world-wide for lasting peace of mind.



4 Environmental safety
Proven design and quality standards. Protects water sources throughout the world. Above ground installation of main store means there is no risk of hidden damage and leaks.

5 People safety
Safer for children and animals than a below ground store. Stores can be fitted with low cost tank covers to contain the spread of smells and airborne particles.

Jetter
Easy to operate directional jetter to reduce slurry crusts.

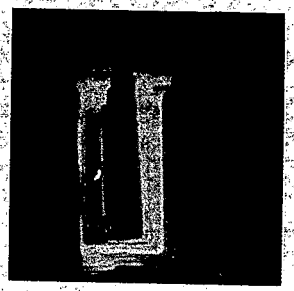


Platform and ladder
Handrails and trapdoor for safety. Removable ladder to prevent access by children.

Glass-Fused-to-Steel: the Permastore® process

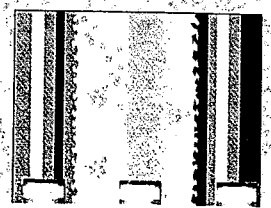
The structural strength of steel with the surface resistance of glass

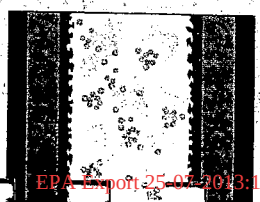
By combining the protective qualities of high silica glass - the most inert coating material available - with the structural strength of high grade steel, an extremely durable product is made. The two materials are permanently fused together by intense heat to produce an impervious, corrosion resistant panel which is immensely strong.



Permastore - the bonding of glass and steel

The special glass frit is finely ground and mixed with suspending agents and water to produce a slip. In a continuous process, the formed steel panels are intensively grit-blasted to clean and etch the surface, rolled to tank radius, chemically washed, given our special pre-coat spray and dried. The panels are then ready to be sprayed with the glass slip, but unlike paint, the glass is not just a surface layer - it becomes chemically and physically bonded to the steel as the panel passes through the furnace and is heated to over 840°C. The glass melts and fuses to the etched surface profile of the steel which in turn reacts with the glass. This intimate chemical and physical bond far exceeds the bonding strength achieved by other protective coating techniques.



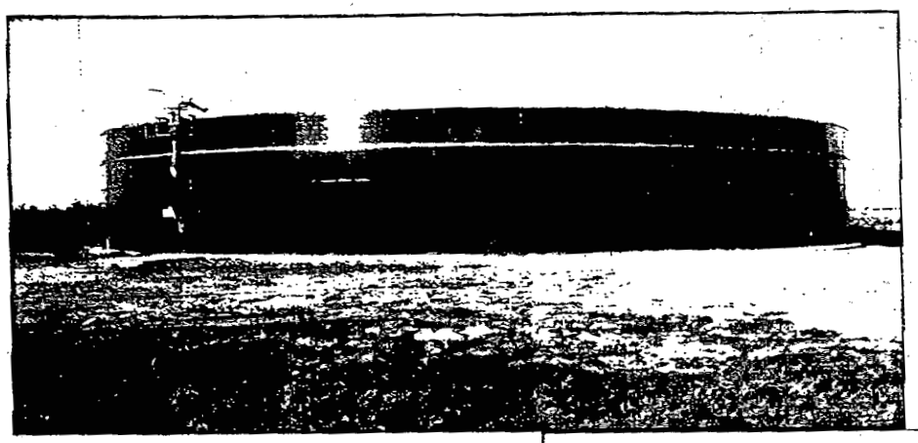


Slurry Management

PERMASTORE® TANKS & SILOS

Pollution Control

ECO FUSION®



Permastore are the market leaders in slurry store management and pollution control, serving farmers for over 35 years.

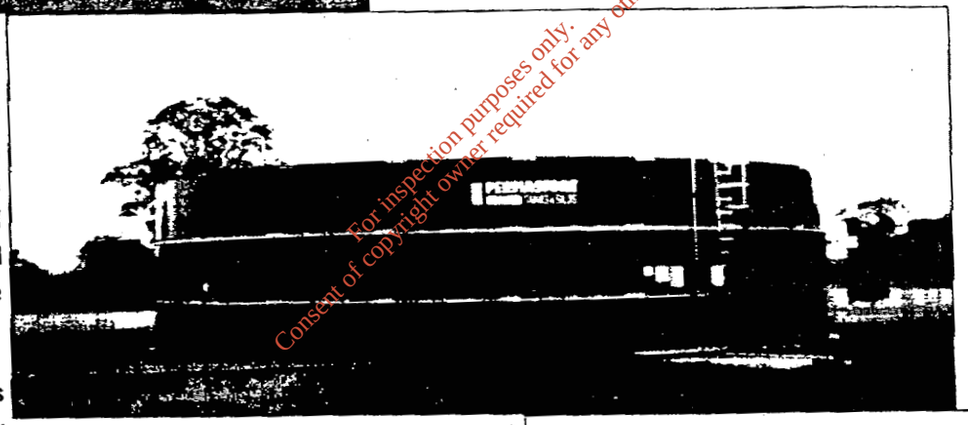
ECOFUSION® is used for:

- Livestock effluent tanks
- Moist grain silos

External Slurry Tank Colours

Years of Experience

First used over 40 years ago in the harsh conditions of forage and moist grain silos, Glass-Fused-to-Steel tanks and silos have proved to be the most reliable and economic solution to many environmental and conservation problems around the world.

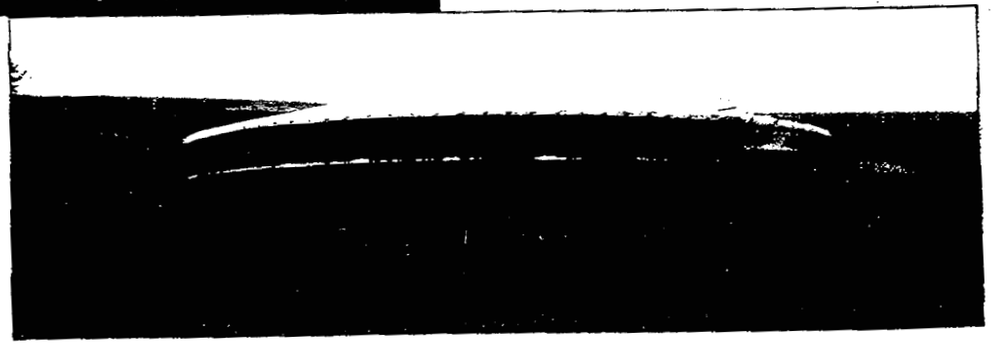


Permastore are the only UK Slurry Tank Supplier with a continuous trading history exceeding 35 years.

Permastore effectively supports its dealers to achieve and maintain the very highest standards.

30 Year Design Life

Permastore® Glass-Fused-to-Steel structures have been utilised extensively for the storage agricultural livestock effluent. The experience we have accrued over a period in excess of 35 years in association with independent assessment, continuous product development and improved quality provides a sound basis for a minimum 30 year Design Life compliant with ISO 15686 - 1 - 2 - 3.



The Slurry Storage Solution Experts

APPENDIX F

Information in Relation to Impermeability of Concrete Slab

roadstone

Roadstone Provinces Ltd.
Regional Office
Cherrymount
Drogheda
Co. Louth

Telephone
(041) 9837764
9837765
Fax 9835011

Sean Keane
Regional Director

North East Region

Mr John Finnegan
Organic Gold MKT Limited
Wilkinstown
Navan
Co Meath

Deerpark Quarry
Slane
Co Meath

19 August 2005

Dear Sir

Re: Data related to Concrete Mix supplied for construction of works

Site: Organic Gold Works Facility, Wilkinstown, Navan.

Further to our recent conversation relating to supply of data of concrete mix supplied for construction of above works facility in early 2003, please find details as follows:

- **Concrete Mix Details of Supply;**

28days characteristic cube strength	40N/mm²
Normal Portland Cement:	365kgs/m³
Total Water	185kgs
Water / Cement Ratio:	0.5

Aggregates and Sand used in compliance to requirements of IS.5 and BS 882.

- Your query relating to concrete sufficient for retention of aqueous liquids

I can confirm that based on the above concrete mix data and the requirements outlined in BS 8007 : 1987 Section 6.2 to 6.4 (attached) that concrete mix supplied is in compliance with this specification requirements for use in retaining aqueous liquids.

Yours sincerely

Patrick Smith
NE Quality Control Manager

Section 6. Concrete: specification and materials

6.1 General

This section gives methods of specifying, producing and assessing concrete for compliance that will in general ensure that the strength, durability and impermeability will be adequate for liquid-retaining structures. The recommendations in section 6 of BS 8110-1:1985 apply except where these are amended by this code.

6.2 Materials

6.2.1 Cements, ground granulated blastfurnace slags (g.g.b.s) and pulverized-fuel ashes (p.f.a.)

These are to be used as specified in **6.1.2** of BS 8110-1:1985 except that for normal use the target mean proportion of g.g.b.s. should not exceed 50 %. This applies to blended cements (**6.1.2.1** b)) and combinations made at the mixer (**6.1.2.1** d)). The target mean proportion of p.f.a. should not exceed 35 % as stated in BS 8110-1.

NOTE In this code the term "cement" means Portland cement or a combination of Portland cement and g.g.b.s. in accordance with BS 6699 or p.f.a. in accordance with BS 3892-1, unless otherwise stated.

6.2.2 Aggregates

Aggregates to be used should comply with either BS 882 or BS 1047 and have an absorption, as measured in accordance with BS 812-2:1975, generally not greater than 3 %.

NOTE Coarse aggregates with a low coefficient of thermal expansion are preferred (see BS 8110-2:1985).

6.3 Mix proportions

The minimum cement content should be 325 kg/m^3. A maximum water/cement ratio of 0.55 should be used except when Portland pulverized-fuel ash cement or a combination of ordinary Portland cement and p.f.a. is used, when the water/cement ratio should be 0.50. The 28-day characteristic cube strength should not be less than 35 N/mm^2, and the concrete should be classed as grade C35A.

It should be noted that this classification is not in accordance with BS 8110, as higher 28-day strengths may, with some types and proportions of constituent materials, lead to undesirably high cement contents. A reduction in the water/cement ratio may be achieved by the use of plasticizers.

For reinforced concrete the cement content should not exceed either 400 kg/m^3 of ordinary Portland cement or cements containing g.g.b.s. or 450 kg/m^3 where cements containing p.f.a. are used. For prestressed concrete the maximum cement content may be increased to 500 kg/m^3 or 550 kg/m^3 respectively.

6.4 Workability

The workability of the concrete should be specified in relation to the equipment and methods of handling and compaction, so that the concrete is placed without segregation, fully compacted, surrounds all reinforcement, tendons and ducts and completely fills the formwork. It is particularly important to ensure that full compaction is obtained in the vicinity of construction and movement joints, embedded water bars, tendon anchorages, pipes, etc.

6.5 Surface finish of concrete

The type of surface finish to be given to any member will depend on its position in the structure, its exposure, whether or not it is to receive an applied finish and the properties of the liquid to be stored. The recommendations in **6.10** of BS 8110-1:1985 apply.

It is not possible to ensure that a reinforced concrete member will remain uncracked. It is recommended, therefore, that any member that is to be permanently exposed to view is provided with a profile and type of finish that tend to minimize the effects of any surface marking.

6.6 Blinding layer

Where walls or floors are founded on the ground a screeded layer of plain concrete not less than 75 mm thick should be placed over the ground.

In normal circumstances this concrete should have proportions weaker than that used in the remainder of the structure, but not weaker than grade C20 as given in Table 6.2 of BS 8110-1:1985. Where aggressive soil or aggressive groundwater is expected, the concrete should not be weaker than grade C25, and if necessary, a sulphate-resisting or other special cement should be specified.

6.7 Pneumatically applied mortar

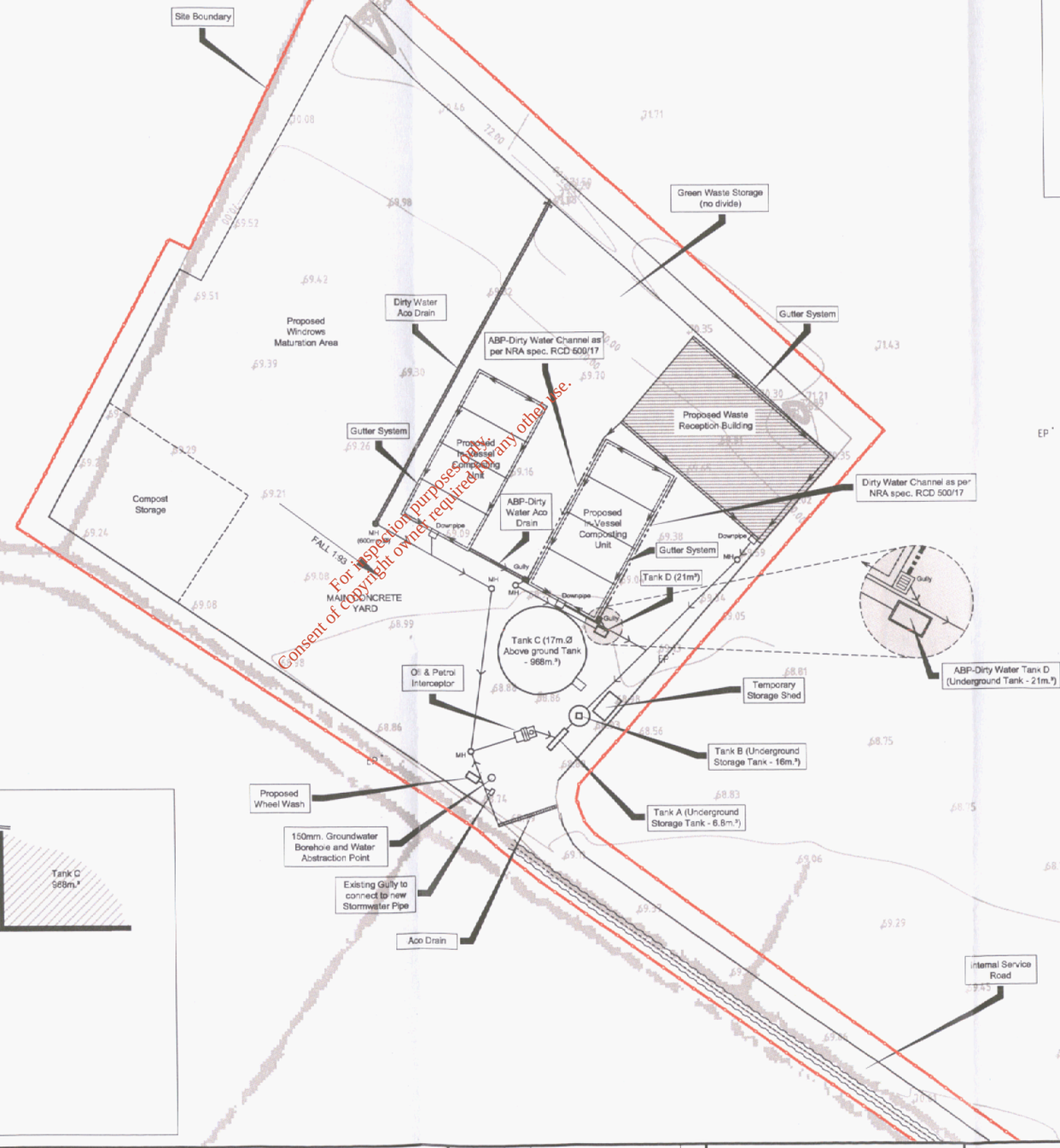
The pneumatic application of mortar is a specialist operation and should be carried out only by experienced operators. The designer should agree a full specification with the contractor for materials, mix proportions, mixing, placing, equipment and curing before any work commences.

APPENDIX G

Site Drainage Map DG0008RevA01

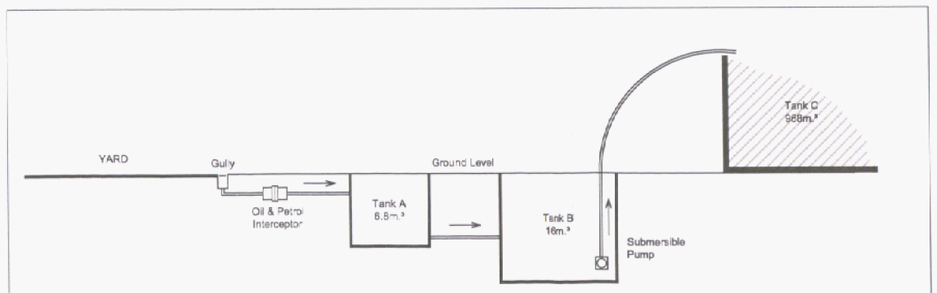
Surface Water Drainage DG007RevA01

A1 | File No: mce0202DG0003



NOTES:

1. Stormwater to Downpipes is run-off from roof areas.
2. ABP-Dirty Water will be separately collected & stored in Tank D as is required under Animal Byproducts Regulations (EC) No. 1774/2002.
3. All Storm Pipes to be a min. of 225mm.Ø to be laid at a minimum gradient 1:200.
4. For Surface Water Drainage for remainder of site refer to Drg. DG0007A01.



SCHEMATIC OF LEACHATE FLOW ON THE COMPOSTING SLAB
(not to scale)

Client: Organic Gold Ltd., Wilkinstown, Navan, Co. Meath

RPS MCOS
RPS-MCOS Ltd., Carnegie House, Library Road, Dun Laoghaire, Co. Dublin, Ireland.
T: +353 1 202 0870 - F: +353 1 202 0707
E: rpsmcos@rpsgroup.ie W: www.rpsmcos.ie

NOTES

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3. DO NOT SCALE, use figured dimensions only, if in doubt ask.

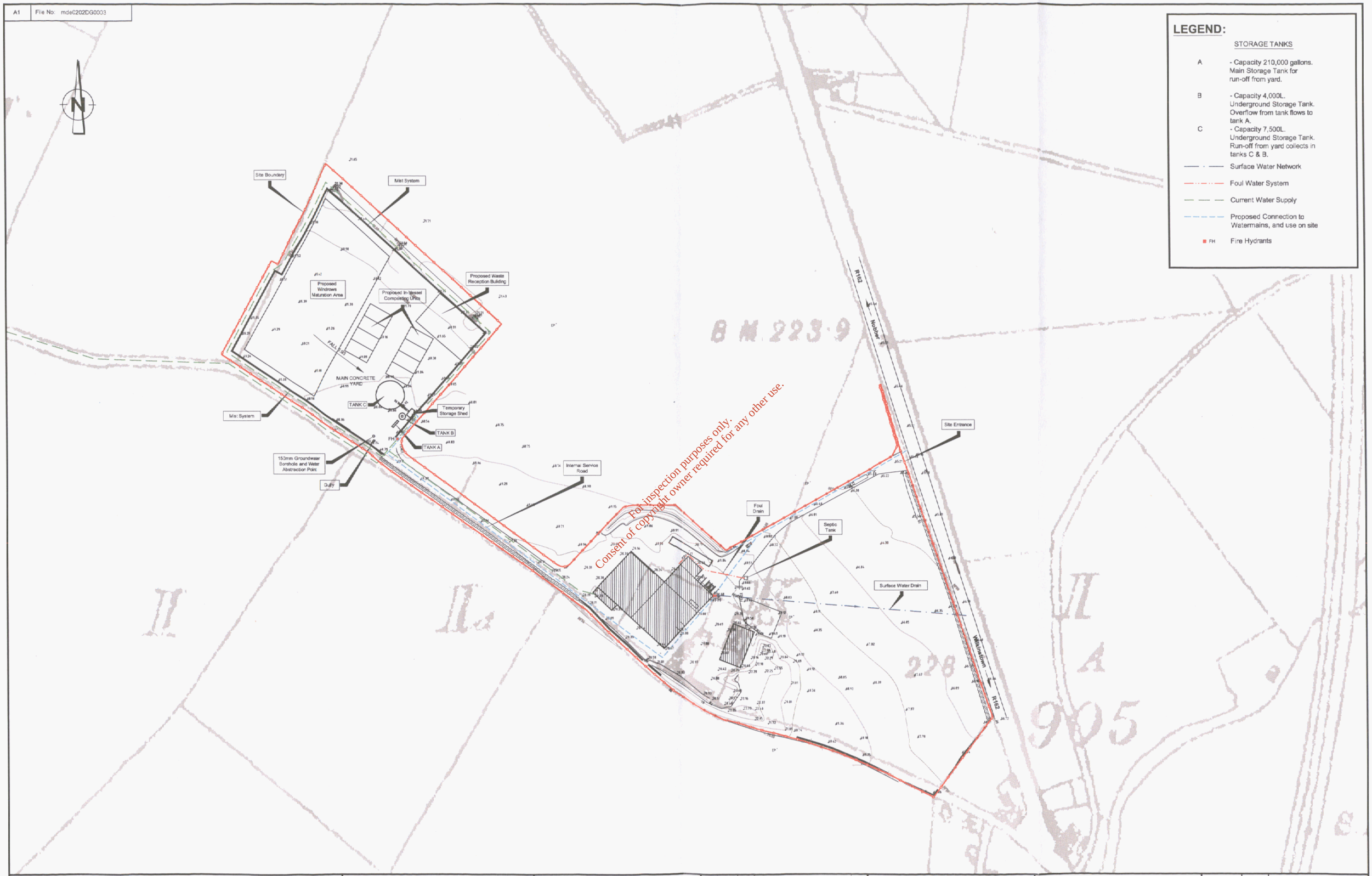
No.	Date	Amendment / Issue	App.
A01	Sep'05	Issue to Client for Approval	CB

Project: ORGANIC GOLD COMPOSTING FACILITY

Title: Plan showing Drainage layout

Drawn by:	RH	Job No:	mde0202
Checked by:	CP	File No:	mde0202dg0008A01
Approved by:	CB	Drg. No:	DG0008
Scale:	1:500	Rev:	A01
Date:	Sept. '05		

A1 | File No: mde0202DG0003



LEGEND:

STORAGE TANKS

- A - Capacity 210,000 gallons. Main Storage Tank for run-off from yard.
- B - Capacity 4,000L. Underground Storage Tank. Overflow from tank flows to tank A.
- C - Capacity 7,500L. Underground Storage Tank. Run-off from yard collects in tanks C & B.
- Surface Water Network
- Foul Water System
- Current Water Supply
- Proposed Connection to Watermains, and use on site
- FH Fire Hydrants

Client: Organic Gold Ltd., Wilkinstown, Navan, Co. Meath

RPS MCOS
RPS-MCOS Ltd., Carnegie House, Library Road, Dun Laoghaire, Co. Dublin, Ireland.
T: +353 1 202 0870 - F: +353 1 202 0707
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No.	Date		Amendment / Issue	App.
A01	Aug'06	RF / LH	Issue to Client for Approval	CB

Project: ORGANIC GOLD COMPOSTING FACILITY

Title: SURFACE WATER DRAINAGE

Drawn by:	RH	Job No: mde0202	
Checked by:	LH	File No: mde0202dg0007A01	
Approved by:	CB	Drg. No: DG0007	Rev: A01
Scale:	1:1000		
Date:	Aug. '05		

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1 INTRODUCTION

In order to evaluate the potential health implications of bioaerosols, RPS Group were commissioned by Organic Gold Ltd to carry out a risk assessment of their compositing facility in Co. Meath.

This report identifies the origins of bioaerosols, how they are associated with compositing and the health implications involved with working and living in the vicinity of a composting facility. A qualitative bioaerosol risk assessment will then review specific risks associated with the Organic Gold facility in operation at Wilkinstown, Co. Meath.

2 BIOAEROSOLS

2.2 DEFINITION AND ORIGINS OF BIOAEROSOLS

Bioaerosols are usually defined as aerosols or particulate matter of microbial, plant or animal origin that is often used synonymously with organic dust. Bioaerosols typically associated with composting processes are bacteria and fungi (including yeast and moulds) as these carryout the decomposition of organic waste to produce compost.

The controlled biological decomposition and stabilisation of organic waste, under predominantly aerobic conditions, allow the development of thermophilic temperatures as a result of biologically produced heat. The final product of decomposition of organic waste is high in humic content, is nutrient rich and is typically referred to as compost. Decomposition necessarily leads to multiplication of microorganisms within the composting substrate. During the composting process, these microorganisms can become airborne, and in some cases could have a potential impact on the health of residents living in the vicinity of composting plants.

Since bioaerosols are small particles (hence they have small settling velocities), they can be carried away from the site of composting. The pattern of dispersals around composting sites depends upon a number of factors:

- Type of composting machinery used.
- Moisture content of the compost.
- The microbial content of the material.
- Whether or not the facility is enclosed or open-air.
- Emission rate (the number of micro-organisms liberated per unit time).
- Prevailing atmospheric conditions (wind velocity and direction, temperature gradients, relative humidity).
- Local topography.

3 SITE DESCRIPTION

3.1 SITE LOCATION AND OPERATIONS

The Organic Gold Ltd site is located at the northern end of Wilkinstown, Co. Meath. The site entrance is located along the R162 Navan to Kingscourt road. All site traffic enters and exits the site via this entrance. Agricultural lands surround the remainder of the site. The two nearest sensitive locations are situated on the R162, one to the north of the entrance and one to the south of the entrance.

Current operations at the site primarily involve the composting of green waste, woodchip, sludge and other commercial organics to produce compost to be used for land restoration such as quarry reinstatement and road construction. Meath County Council currently permits composting activities at the site under waste permit (WMP 2002/26).

Other activities at the site involve the production of two specialised fertiliser products: Organic Gold Multi-Purpose Compost and a High Grade Fertiliser Product which have been ongoing at the site since 1986 and take place in the fertiliser production building.

The main on-site dust source is from the turning of the Windrows and the subsequent loading of product. Heavy Goods Vehicles entering and leaving may also create dust. The site only operates during daytime hours.

Organic Gold has eight employees on site, which includes company directors and site management.

3.2 EXISTING SITE LAYOUT

The site is located at an existing waste composting facility owned by Organic Gold (Marketing) Ltd. The existing facility is located on 4.5 hectares of land and the facility essentially consists of three parts:

1. Site Buildings and High Grade Fertiliser Shed (1.2 ha)
2. Paddock Area (1.5 ha)
3. The Composing Slab (1.8 ha)

3.2.1 Site Buildings and High Grade Fertiliser Shed

There is a fertiliser production shed on the site, which was erected in 1993 and is typical of agricultural buildings on a farmland. Processing within the shed involves (a) the production of the Organic Gold Multi-Purpose Compost and (b) the production of a High Grade Fertiliser. Retail multi-purpose compost known as 'Organic Gold' and a high-grade fertiliser product is produced and bagged in this shed.

Dewatered slurry is mixed with peat and allowed to mature before being bagged and sold as the Organic gold multi-purpose compost. The dewatered Slurry is 25% D.S and is dried using a Carrier Screen Press before being delivered to the Organic Gold site.

Industrial sludges delivered to the site from food processing companies will be used for the production of the high-grade fertiliser. These sludges are dried using a combi drum dryer and are 92% D.S. They are delivered to the site in purpose built sludge skip containers, which are fully enclosed.

Site accommodation comprises a designated site office located to the front of the fertiliser production shed, an entrance lobby to the office and staff toilet and washing facilities. Car parking spaces are also available outside the office area. A weighbridge is in place to record waste loads entering and leaving the site.

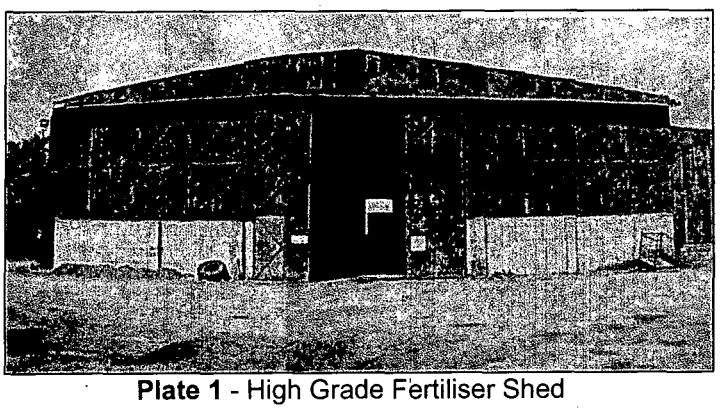

Plate 1 - High Grade Fertiliser Shed

The site consists of a large agricultural shed with an office attached. The Windrows are located on the concrete yard to the west of the office. A four-foot high wall surrounds the yard and earth and tree saplings are landscaped on top of the wall. There is agricultural land to the north and south of the site. The nearest receptors are located to the north of the site approximately 235 metres from the Windrows yard.

3.2.2 Paddock Area

The paddock is 1.5 ha in area and consists of typical agricultural grazing grass and is fenced off from the other areas of the site. No waste recovery operations take place in the paddock area.

Plate 2 - Paddock Area

3.2.3 The Composting Slab

The composting slab forms the main part of the facility where all composting operations take place. The slab is located on 1.8ha with a boundary wall of 1.5 metres high, built around it to enclose the slab area. There is also an additional 1.5 metre earthen embankment outside the wall where extensive landscaping has been undertaken and 2,100 tree saplings have been planted to enclose and screen the site. There is also a 1metre tall windbreak mesh has been erected on top of the perimeter wall, which reduces wind speed and increases the efficiency of the misting system installed to reduce odour impacts.

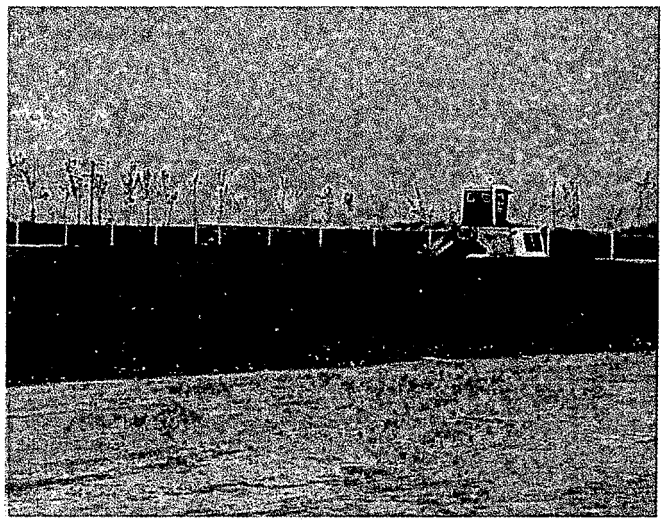

Plate 3 - Windrow Turner on the Composting Slab

3.3 PROPOSED SITE LAYOUT AND INFRASTRUCTURE

The site layout will not change significantly from the existing site.

Changes to the proposed site layout include:

- The construction of a waste reception building on the composting slab
- The use of modular in-vessel composting units for treating all waste arriving on site
- The construction of a new site entrance in the paddock area to allow for double lane traffic and improved safety for traffic entering and leaving the site
- Installation of security gates at the site entrance and the entrance to the composting slab
- Upgrading of the internal access roads

The major changes to the site include construction of the waste reception building, the in-vessel composting system, and the new site entrance, which will be described in the following sections.

3.3.1 Waste Reception Building

All waste handling such as waste inspection, storage and blending will take place in the newly constructed waste reception building. This building will act as a mitigation measure to reduce dust and bioaerosol emissions into the atmosphere.

The building will be 36m long, 22m wide and 11m high at the ridge and 9.6m at the eaves. It will be built using reinforced concrete walls and a steel portal frame system, with a Kingspan horizontal cladding material or similar. The building will contain a waste inspection area, storage bays for waste material and a waste quarantine area. All material in the waste reception area will be blended and mixed with recirculated leachate to ensure optimum moisture conditions within the feed stock material, thus preventing a particularly dry material from being composted in the in-vessel units.

3.3.2 In-Vessel Composting System

The Wasteology in-vessel composting system will be used on site for the rapid decomposition of the waste material over a two-week period. These enclosed in-vessel units are made out of pre-cast concrete and are modular in nature. Six in-vessel units will be required to treat 1,000 tonnes of waste over a two-week period. However, as part of a contingency plan it was purposed to purchase eight of these units so that there is some available capacity to allow for maintenance and repair of units.

The individual units which are 15m long, 8m wide and 2.5m high and are based on the Alfabloc instant walling system will be placed on the existing concrete slab. The units are unique in that they have a retractable roof manufactured out of a PVC coated material. The retractable roof can be either manually or mechanically retracted during loading and unloading of the units. The material in the roof has being designed to withstand severe weather conditions. Air handling units control air flow through

the composting material. The Wasteology system is designed as a modular and flexible system. (Refer to the company brochure attached in Appendix 2, Volume 2 of the EIS report).

3.3.3 New Site Entrance

A new site entrance will be constructed in the paddock to allow for double lane traffic and improved site safety. The new entrance will be located 25 metres to the south of the existing entrance and will be 7.3m wide with a 1m grass verge on either side of the carriageway.

Refer to Figure 5.1 Proposed Site Layout detailed in Section 5 of the EIS.

4 HEALTH IMPLICATIONS

4.1 LITERATURE REVIEW

Interest in bioaerosol exposure has greatly increased over the past few decades. This is largely due to biological agents being recognised in both the occupational and residential indoor environments as being the cause of a wide range of adverse health defects. New industrial activities have emerged in recent years which involve increased exposures to bioaerosols, e.g. the waste recycling and composting industry, biotechnological enzyme industries, detergent and food industries.

Some of the microorganisms associated with composting are recognised allergens. Repeated exposure to such allergens stimulate the immune system, causing a cascade of responses including the release of histamines, constricting airways, and reducing the lung capacity, resulting in chronic bronchitis, asthma and alveolitis. The occupational risks associated with bioaerosol exposures have been identified across numerous other industries including agriculture, sewage treatment, timber processes, fermentation, slaughterhouses etc.

However there is little research on bioaerosols to prove any potential risk outside the facility on dispersal patterns from composting sites to the surrounding environment. In the case of the State of New York Health Department, a prospective study of health symptoms and bioaerosol levels near a waste yard composting facility in the town of Islip in 1994, showed that residents within 500 metres of the site showed no clear evidence of health changes.

However a more recent study by the HSE in the UK in 1999, established a distance of 200 metres from a composting site by which concentrations of *Aspergillus fumigatus* (an allergen associated with occupational lung diseases such as Farmers Lung Disease and Mushroom Worker Lung Disease) reached background levels. This is used a basis for the recommendation that routine sampling at a composting facility should be carried out if a sensitive receptor, i.e. a private residence, lies within 200 metres of the site boundary.

4.2 ASSOCIATED RISKS OF COMPOSTING

Concerns have been expressed by residents in the vicinity of composting facilities citing potential adverse health effects resulting from inhalation of bioaerosols from the site. In order to understand the potential health hazards associated with exposure to compost bioaerosols, it is first important to examine in detail the microbial components of bioaerosols generated during composting process.

The bioaerosols typically associated with the composting process are bacteria and fungi (including yeasts and moulds) as these microbes carry out the degradation of organic waste to produce compost. Some of these microbes are recognised allergens such as thermophilic actinomycetes (bacteria) and *Aspergillus fumigatus* (fungi). Thermophillic actinomycetes are fundamental to composting as they break down celluloses and lignin. These bacteria flourish in the heat produced in the composting process. *Aspergillus fumigatus* is a fungus that can tolerate the high temperatures associated with the composting process.

Thermophilic actinonmycetes (*Saccharapolyspora faeni* and *Thermoactinomycetes vulgaris*) and *Aspergillus fumigatus* are associated with occupational allergic lung diseases such as farmer's lung disease and mushroom worker's lung disease (HSE "*Occupational and Environmental exposure to bioaerosols from composts and potential health effects – a critical review of published data*"). Repeated exposure to these microbes stimulates the immune system, causing a series of physical responses including the release of histamines, constricting airways and reduction in lung capacity. These long-term effects may result in chronic bronchitis, asthma or alveolitis. Also any human

pathogens present in the raw materials, such as coliform bacteria from faecal material could give rise to gastro-intestinal infection.

It is also important to note that some bioaerosols, even after the metabolic activity of decomposition, may enter into a 'resting' or Non Cultural But Viable (NCBV) stage. At this post-composting stage there is still potential for microbial cells to be toxic or allergenic.

5 EXPOSURE TO BIOAEROSOLS

5.1 EXPOSURE LIMITS OF BIOAEROSOLS

There are currently no Occupational Exposure Limits (OELs) applicable to exposure to biological parameters in the work place in Irish or international legislation. In Ireland, there are guidelines for minimising exposure to employees in the workplace in the Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994 (SI. 146 of 1994) and amendments (SI 248 of 1998).

The UK Health and Safety Executive has prepared a research report (ref 130) entitled *Occupational and Environmental exposure to bioaerosols from composts and potential health effects – a critical review of published data.* In this review there are several references to levels of fungi and bacteria as determined by a number research studies carried out at ambient sites, organic waste sites, municipal bio-waste sites and composting facilities. There reports have been compiled to generate a range of measurement data of various aspects of the domestic waste industry this information is presented in Table 1.1 below.

Work Activity	Fungi (cfu/m^3)	Bacteria (cfu/m^3)
Handling Domestic Waste	10^4-10^5	10^3-10^4
Domestic Waste Transfer Section	10^6	10^5
Domestic Waste Incineration	10^7	10^7
Domestic Waste Recycling	10^5	10^5
Domestic Waste Landfill Sites	10^5	10^6

CFU/M3 - is defined as a measurement of one or more cells/spores, which when inoculated onto suitable growth media form a single colony

Table 1.1 Published Data for Bioaerosol Concentrations at a Number of Waste Activities.

4.2 REDUCING THE LEVEL OF EXPOSURE TO BIOAEROSOLS

Several design and operational measures can be taken to reduce the exposure to bioaerosols at composting plants. These include:

- Waste acceptance, mixing and blending of incoming material in an enclosed building
- Composting of waste in enclosed conditions
- Moisture control of the raw material and compost.
- Dust control and collection systems in dry weather.
- Sweepers and water vehicles to control dust on access roadways.
- Air filters in cabins of mobile equipment.
- Adequate ventilation in the building.
- Ensuring good personal hygiene and that operators regularly change their work clothes.
- Carry out regular respiratory health screening and biological monitoring.

6 QUALITATIVE RISK ASSESSMENT

6.1 BACKGROUND

A risk assessment is used to determine the increased health risk that people are exposed to at different distances from the source of a hazardous pollutant. The purpose of a qualitative risk assessment investigation is to obtain information on Source, Pathway and Receptor present on or adjacent to the site.

- **Source (contaminant)** – a substance which is located in, on or under the land and has the potential to cause harm to human health, water resources or the wider environment.
- **Pathway** – the means or route by which a source of contamination can migrate; an identified receptor can be exposed to, or be affected by an identified source.
- **Receptor** – something, which could be harmed, including human health, water resources, ecology or the wider environment.

Each of these elements can exist independently. They create a potential risk where they are linked together. The linked combination of "Source – Pathway - Receptor" is known as a pollutant linkage. The presence of a pollutant linkage between these may then constitute a risk, the significance of which must be assessed and is dependent upon a number of factors.

Without a pollutant linkage, there is not a risk – even if a Source is present. Where there is a pollutant linkage, and therefore some measure of risk, it is important to identify whether that risk is significant.

6.2 SITE SPECIFIC POLLUTANT LINKAGE

A site-specific linkage for Organic Gold Ltd can be identified under each level.

6.2.1 *Source*

Current Site Operations

- **Composting Slab**

The composting slab forms the main part of the facility where all current composting activities take place in outdoor windrows. This is the main source of bioaerosols on the site, as it not an enclosed unit.

- **Fertiliser Shed**

Processing within the shed involves the production of the Organic Gold Multi-Purpose Compost and production of a High Grade Fertiliser. Within this area, the process of mixing peat with the slurry and sludge could lead to low quantities of bioaerosol emissions.

Proposed Site Operations

- **Enclosed Waste Reception Building**

Organic Gold propose to upgrade the current facility to minimise environmental nuisance at the site. All incoming material will be inspected, mixed and blended in the waste reception building. There could be a potential for bioaerosols to escape into the environment from the enclosed building during the opening and closing of doors when incoming waste is admitted into the building. This however is considered a minimal source of bioaerosols.

- **Green Waste Storage**

Green waste will be stored outdoors on the composting slab, prior to composting. This may lead to bioaerosols being liberated into the atmosphere.

- **Enclosed In-vessel Composting Units**

First phase of high rate decomposition takes place in enclosed in-vessel composting units for two weeks. Following this, the material will be removed from the units and allowed to mature in open windrows for approximately six to eight weeks. Once the material has matured it will be continuously moved off site in bulk quantities. During loading and unloading of these vessels, each unit will be opened for a maximum of one hour per day working at full treatment capacity. This offers another source of bioaerosols.

- **Maturation Area**

In the maturation area the product from the in-vessel units (which has undergone high rate decomposition) is allowed to mature in open windrows on the composting slab. However since the maturation area is not enclosed there will be a potential source of bioaerosols. Microbial activity is not as great during the maturation phase; therefore there is a potential for lower bioaerosol emissions, compared to the high rate decomposition phase (in-vessel units).

- **Compost Storage Area**

For the most part, mature compost will be moved off-site in bulk quantities, however if required compost will be stored in a dedicated compost storage area on the slab. This area can also be identified as a potential source of bioaerosol emissions.

- **Fertiliser Shed**

Similar activities as stated above will continue to take place in the enclosed fertiliser shed.

6.2.2 Pathway – the main pathway of dispersal of bioaerosols is dependant on prevailing atmospheric conditions (wind velocity and direction, temperature gradients, relative humidity).

Met Éireann 30-Year Average Climate Data, between 1961 – 1990, is outlined in Appendix A. In short, prevailing atmospheric conditions for the area are as follows.

- Average Temperature - 9.6 °C,
- Relative Humidity – 0900UTC 82% 1500UTC 72%
- Average Rainfall – 737.7mm
- Average Wind Velocity – 9.9knots
- Prevail Wind Direction - south-westerly

Also the topography of the site may contribute to dispersal. The site is located on an open and elevated site, which gradually slopes from the northeast, hence is not sheltered from the wind since it is an elevated site.

Access to the site is by private lane way, which leads to the R162 road. This route is commonly used by HGV's entering and exiting the site, which may also be a factor in creating a pathway of bioaerosol dispersal.

6.2.3 Receptor – The surrounding area is rural and is characterised by agricultural fields, mature hedgerows and trees, narrow winding roads and typical one off housing developments. The nearest sensitive receptors are private residential houses situated on the R162.

The nearest receptor (SR1) is a private dwelling, located to the northeast of the entrance. It is situated in a cul-de-sac 235m to the nearest point on the slab. There are also private dwellings to the west, northeast and southeastern boundary of the facility (Refer to Table 1.2 below).

In the village of Wilkinstown there is a school, post office, service garage, public house and a number of residential dwellings. (The school is located 680 metres from the existing site entrance).

Table 1.2 Distances of Nearest Sensitive Receptors

Nearest Sensitive Receptor	Location	Distance from nearest point of composting slab*	Distance from nearest point of fertiliser shed*
SR1	To the North East of the Facility	235m	320m
SR2	To the North East of the Facility	265m	380m
SR3	To the South East of the Facility	390m	180m
SR4	To the West of the Facility	230m	510m

* Please note that these distances were measured from plan from Drawing **DG001RevA01**.

6.3 BIOAEROSOL MONITORING AT ORGANIC GOLD LTD

Measurement of bioaerosols relies upon collection of a sample into or onto solid, liquid or agar media with subsequent microbiological and molecular biological analysis. Two approaches are used for evaluating microbial exposure.

Occupationally Related Exposure Sampling - where sampling apparatus is located in the worker's breathing space. Typically a low flow (2L/min) filtration sampler is used to sample the bioaerosols exposed to worker over the course of a single working shift.

Fixed-Point Sampling – where sampling is carried out at single locations judged to be representative of working activities on site. Sample periods are shorter than the previous method, ranging 1-30min, depending on how much a working environment is contaminated with microorganisms. This method has an advantage of direct inoculation of the agar plate at flow rates of 28.3 L/min.

6.3.1 Site Specific Monitoring

In September 2004, RPS staff carried out Fixed-Point Monitoring using an SKC Biostage Impactor. This procedure is outlined by the UK National Institute for Occupational Safety and Health (NAOSH) method for bioaerosol sampling (Method Reference 0800).

A survey was conducted at three separate off-site locations and four separate on-site locations (refer to Table 1.3), These results of each location (refer to Table 1.4) suggest showed that fungi were detected at a range of 10^1 - 10^2 cfu/m^3.

Table 1.3 Bioaerosol Monitoring Locations

Location	Description of Location
B1	At nearest sensitive receptor to the south west of the facility
B2	At nearest sensitive receptor to the south east of the facility
B3	At nearest sensitive receptor to the north east of the facility
B4	Indoors, in the fertiliser shed
B5	In the middle of the slab, directly down wind of windrow during turning (worst case scenario)
B6	Most Northern point on the boundary of the slab (Down wind)
B7	Most Southern point on the boundary of the slab (Up wind)

Table 1.4 Results of Bioaerosol Monitoring at the Organic Gold Facility

Location	Mesophilic bacteria* (cfu/m^3)	Aspergillus Spp (cfu/m^3)
B1	$2.36x10^2$	$2.36x10^3$
B2	$9.42x10^1$	No Growth
B3	$2.36x10^1$	No Growth
B4	No Growth	No Growth
B5	$3.5x10^3$	$7.07x10^3$
B6	$1.4x10^2$	$2.36x10^3$
B7	$1.9x10^2$	$2.36x10^3$

**Mesophillic Bacteria* - A group of bacteria that grow and thrive in a moderate temperature range between 20- 45 Deg C, potentially pathogenic.

These levels of bioaerosols determined at the Organic Gold facility are well below the ranges from other waste handling activities i.e. recycling, landfill, incineration, domestic waste handling etc. (See waste activities set out in the HSE Research Report (Ref 130), Refer to Table 1.1.)

As expected, the greatest measurement of *Aspergillus Spp* was detected in the centre of the composting slab (B5). The amount of *Aspergillus Spp* detected at points away from the slab decreased with distance i.e. B1, B6, B7. Even in the case of sampling downwind of a windrow during turning i.e. Location B3, results should indicate a worst-case scenario. However Aspergillus Spp was not detected using the approved NAOSH method. (*Aspergillus Spp* was also not detected at B2 and B4).

Bioaerosols concentrations are known to decline with distance from the source due to atmospheric dispersion and dilution. Furthermore, concentrations have been shown to decrease to background levels after site activities cease, suggesting that wind blown dispersion is insignificant (HSE Research Report – Ref 130).

6.4 SOURCE MITIGATION

Several design and operational measures have been undertaken by Organic Gold Ltd to reduce exposure of the nearest receptors to potentially harmful bioaerosols.

6.4.1 Current Mitigation Measures

Since the production of bioaerosols is greatly related to dust emissions, maintaining low concentrations of dust will in turn produce low concentrations of bioaerosols. The following control measures are currently in practice at the Organic Gold site to reduce the impact of bioaerosols on the surrounding environment.

- The composting slab is located on 1.8ha with a boundary wall of 1.5 metres high, built around it to enclose the slab area. There is also an additional 1.5 metre earthen embankment outside the wall where extensive landscaping has been undertaken and 2,100 tree saplings have been planted to further enclose and screen the site which will help to minimise bioaerosol and dust emissions from the site.

- There is also a 1m tall windbreak mesh has been erected on top of the perimeter wall, which reduces wind speed and again helps to maintain bioaerosol and dust emissions on site.

- Windrows in the maturation area are not be allowed to dry out thus preventing dusty conditions arising. If this does occur, the windrows will be "wetted down" to prevent dust emissions occurring. Also the windrows will not be operational during dry and blustery conditions

- All machinery and waste delivery trucks will be regularly serviced and kept in good working order to prevent further dust emissions thus preventing the spread of bioaerosols.

6.4.2 Proposed Mitigation Measures

The major developments proposed for the site includes the construction of a waste reception building and the use of in-vessel composting units. The new site entrance will also be upgraded to prevent dust emissions from arising. In addition to the previously stated mitigation measures the following mitigation measures will also be implemented at the site to prevent the future spread of bioaerosols.

- The high rate composting stage will take place in enclosed in-vessel composting units.
- All waste accepted on site will be mixed and blended with an enclosed waste reception building.
- Air filters will be installed in cabins of mobile equipment such as the windrow turner.
- Current plans for an improved site entrance will have a significant impact on reducing dust/bioaerosol emissions at the site. Site roads should be regularly cleaned and maintained as appropriate. Hard surface roads should be swept to remove mud and aggregate materials from their surface. Any un-surfaced roads should be restricted to essential site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust should be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road and on hard surfaced roads that site management will dictate that speed is to be restricted to 20 km per hour.
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary
- All employees will receive relevant health and safety training on the importance of good bioaerosol and dust operational practices. Regular health screening will be made available to all employees and each will be provided with Personnel Protective Equipment (PPE) for working on site.
- Regular monitoring for bioaerosols at the nearest receptors and at the site will be carried out.
- Dry incoming feed stock will be blended with recirculated leachate, maintaining optimum moisture conditions, thus preventing a dry feed stock from being composted.
- Organic Gold will continuously review mitigation measures to reduce bioaerosols at the site in conjunction with the proposed monitoring schedule and the EPA.

7 CONCLUSIONS

It has been established that potential health effects from composting site is highly dependant on a number a factors, including the raw material used in the process, mechanisms of composting, ventilation and dispersal patterns outside of the composting site. Maintaining low bioaerosols levels depends primarily on reducing the spread of organic dust within the composting facility; this would subsequently lead to a low bioaerosol dispersal rate to neighbouring sensitive receptors.

In the absence of a quantitative risk assessment it is recommended that there be a guideline setback distance of 200 metres from the nearest point of the composting slab to the nearest sensitive receptor. This is to facilitate abatement of bioaerosols from the composting facility. This buffer distance is arbitrary and outlines the minimum distance where bioaerosols reach background levels. A 200-metre distance would be particularly applicable to green waste composting. However where there are wind-breaking meshes, trees or bunds, this buffer distance could be slightly relaxed, which is the case with Organic Gold.

According to the Monitoring of the Health Impacts of Waste Composting Plants, UK Environment Agency Technical Report (p428, 2001) concentrations of bioaerosols fall off with distance from the composting facility, typically reaching background levels within 250 metres. The addition of 50 metres to the 200 metres recommended by the UK Environment Agency acts as an additional safety factor.

Despite one of the nearest receptors (a private dwelling northeast of the entrance) situated downwind of the prevailing southwesterly wind. This dwelling and other sensitive receptors are situated at a distance greater than 200 metres from the site of composting. In the absence of a quantitive risk assessment, having outlined a pollutant linkage from Source – Pathway – Receptor, the risk of the spread of bioaerosols from Organic Gold Ltd to the surrounding receptors can be considered low.

Also, continued good bioaerosol and dust management practices of the facility with advancing mitigation measures, will prevent further spread of the airborne microbes, thus reducing any potential human health risk by breaking the Source-Pathway-Receptor Linkage.

APPENDIX A

30-Year Met Data (1961-1990)

Appendix A1 – 30-Year Met Data for Dublin Airport													
Monthly, Annual Mean and Extreme Values													
1961-1990													
TEMPERATURE *(degrees Celsius)*	*jan*	*feb*	*mar*	*apr*	*may*	*jun*	*jul*	*aug*	*sep*	*oct*	*nov*	*dec*	*year*
mean daily max.	7.6	7.5	9.5	11.4	14.2	17.2	18.9	18.6	16.6	13.7	9.8	8.4	12.8
mean daily min.	2.5	2.5	3.1	4.4	6.8	9.6	11.4	11.1	9.6	7.6	4.2	3.4	6.4
mean	5.0	5.0	6.3	7.9	10.5	13.4	15.1	14.9	13.1	10.6	7.0	5.9	9.6
absolute max.	16.6	15.3	21.3	20.5	23.4	25.1	27.6	28.7	23.9	21.2	18.0	16.2	28.7
absolute min.	-9.4	-6.2	-6.7	-3.7	-1.0	1.5	4.8	4.1	1.7	-0.6	-3.4	-10.1	-10.1
mean no. of days with air frost	6.4	4.9	3.3	1.4	0.2	0.0	0.0	0.0	0.0	0.1	3.3	4.8	24.3
mean no. of days with ground frost	14.0	12.7	12.4	9.2	2.9	0.2	0.0	0.0	0.6	2.3	9.7	12.5	76.4
RELATIVE HUMIDITY *(%)*													
mean at 0900UTC	86	84	82	79	76	76	78	81	82	85	86	86	82
mean at 1500UTC	79	75	70	68	67	68	68	70	70	75	78	81	72
SUNSHINE *(hours)*	*jan*	*feb*	*mar*	*apr*	*may*	*jun*	*jul*	*aug*	*sep*	*oct*	*nov*	*dec*	*year*
mean daily duration	1.8	2.5	3.6	5.2	6.1	6.0	5.4	5.1	4.3	3.1	2.4	1.7	3.9
greatest daily duration	8.0	9.2	11.9	13.8	15.4	15.9	15.4	14.5	12.4	10.4	8.5	6.9	15.9
mean no. of days with no sun	11	8	5	3	2	2	1	2	3	6	8	11	61
RAINFALL *(mm)*													
mean monthly total	69.4	50.4	53.8	50.7	55.1	56.0	49.9	70.5	66.7	69.7	64.7	75.6	732.7
greatest daily total	30.3	31.3	35.7	26.2	30.0	46.6	34.8	60.2	40.9	47.5	55.1	41.7	60.2
mean no. of days with >= 0.2mm	18	14	16	14	16	14	13	15	15	16	16	18	185

mean no. of days with >= 1.0mm	13	10	11	10	11	10	9	11	10	11	11	12	128
mean no. of days with >= 5.0mm	5	3	3	3	4	4	3	4	4	4	4	5	48
WIND *(knots)*													
mean monthly speed	12.2	11.7	11.6	9.7	8.7	8.0	8.1	8.0	8.9	9.9	10.8	11.8	9.9
max. gust	75	73	61	60	58	55	54	56	64	73	64	71	75
max. mean 10-minute speed	48	49	42	41	39	36	34	41	35	45	43	47	49
mean no. of days with gales	2.1	1.1	1.2	0.3	0.3	0.1	0.0	0.3	0.2	0.5	0.7	1.4	8.2
WEATHER *(mean no. of days with...)*	*jan*	*feb*	*mar*	*apr*	*may*	*jun*	*jul*	*aug*	*sep*	*oct*	*nov*	*dec*	*year*
snow or sleet	6.0	5.5	4.3	1.7	0.3	0.0	0.0	0.0	0.0	0.1	0.9	2.9	21.6
snow lying at 0900UTC	2.1	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	4.5
hail	0.7	0.9	2.2	2.4	1.4	0.3	0.1	0.1	0.0	0.2	0.5	0.8	9.5
thunder	0.1	0.1	0.2	0.3	0.6	0.7	0.7	0.6	0.3	0.3	0.1	0.1	4.1
fog	4.8	4.3	3.9	4.5	3.6	3.1	3.6	5.3	4.9	4.7	4.0	3.9	50.5

APPENDIX I

Audited Directors Accounts

Organic Gold (Marketing) Limited

Accounts

Year Ended

31st December 2003.

Table of Contents

Organic Gold (Marketing) Limited.

Directors:	John Finegan James Finegan Thomas Finegan
Secretary:	James Finegan
Registered Office:	Balsaw House, Wilkinstown, Navan Co. Meath.
Bankers:	Bank of Ireland, Navan, Co. Meath.
Registered Auditors:	Cassells O'Brien & Co., 8 Ludlow Street, Navan, Co. Meath.
Companies Office Registration No:	123347

Organic Gold (Marketing) Limited

Report of the Directors.

The Directors have pleasure in submitting their Annual Report together with the Audited Accounts of the Company for the year ended 31st December 2003.

1. Review of the Development of Business:
The company's trade consists of the manufacture and sale of a soil conditioner derived from an unique formulation of cattle slurry, peat and seaweed. It is carried out from a premises at Wilkinstown, Navan, Co. Meath. Turnover shows a major increase over the previous year but overheads have also shown a major increase for the year resulting in a profit which is higher than the previous year.

2. Profit

	€
The Profit for the year amounted to	91,641
Deducting taxation in the amount of	11,309
The Profit after taxation was	80,332
The Revenue Reserves at the beginning of the year amounted to	(29,238)
The Revenue Reserves at the end of the year amounted to	51,094

3. Registered Auditor
Cassells O'Brien & Co., Registered Auditors, were appointed Auditors in accordance with Section 160 of the Companies Act 1963, they will continue in office.

4. Safety Health and Welfare Act 1989
The company is taking the necessary action to ensure compliance with the Act, including the adoption of a safety statement.

5. Responsibility Statement
The Directors are required by company law to prepare financial statements for each financial year which give a true and fair view of the state of affairs of the company as at the end of the financial year, and the results for that period. In preparing the financial statements suitable accounting policies have been used and applied consistently, and reasonable and prudent judgements have been made. Applicable accounting standards have been followed. The directors are also responsible for maintaining adequate accounting records and for safeguarding the assets of the company.

John Finegan Director.

James Finegan Director.

Balsaw House,
Wilkinstown,
Navan,
Co. Meath.

12th January 2005.

Auditors Report to the Members of Organic Gold (Marketing) Limited

We have audited the financial statements on pages 5 to 10 which have been prepared under the historical cos convention and the accounting policies set out on page 7.

This report is made solely to the company's members, as a body, in accordance with Section 193 of the Companies Act, 1990. Our audit work has been undertaken so that we might state to the company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fulles extent permitted by law we do not accept or assume responsibility to anyone other than the company and the company's members as a body, for our audit work, for this report, or for the opinions we have formed.

Respective responsibilities of directors and auditors

As described on page 3 the company's directors are responsible for the preparation of financial statements. It is our responsibility to form an independent opinion, based on our audit, on those statements and to report ou opinion to you.

Basis of opinion

We conducted our audit in accordance with Auditing Standards issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures in the financia statements. It also includes an assessment of the significant estimates and judgements made by the directors in the preparation of the financial statements, and of whether the accounting policies are appropriate to the company's circumstances, consistently applied and adequately disclosed.

We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion

In our opinion the financial statements give a true and fair view of the state of the company's affairs as at 31st December 2003 and of its profit for the year then ended and have been properly prepared in accordance with the Companies Acts 1963 to 2001.

We have obtained all the information and explanations we consider necessary for the purposes of our audit. In our opinion, proper books of account have been kept by the Company. The financial statements are in agreement with the books of account.

In our opinion the information given in the director's report on page 3 is consistent with the financial statements.

The net assets of the company, as stated in the balance sheet on page 6 are more than half of the amount of its called up share capital and, in our opinion, on that basis there did not exist at 31st December 2003 a financial situation which under section 40 (1) of the Companies (Amendment) Act 1983, would require the convening of an extraordinary general meeting of the company.

8 Ludlow Street,
Navan,
Co. Meath.

12th January 2005.

Cassells O'Brien & Co.,
Registered Auditors.

Organic Gold (Marketing) Limited.

Profit & Loss Account for the year ended 31st December 2003

	Appendix 1	2003 €	2002 €
Turnover		764,479	574,091
Net Profit for Year	1.	91,641	76,417
Taxation		11,309	-
Profit after Taxation		80,332	76,417
Revenue Reserves at beginning of year		(29,238)	(105,655)
Revenue Reserves at end of year		51,094	(29,238)

John Finegan Director.

James Finegan Director.

Organic Gold (Marketing) Limited

Balance Sheet as at 31st December 2003

Assets Employed	Notes		2003		2002
Fixed Assets			€		€
Patent			6,344		3,384
Tangible Assets	6.		721,960		514,894
			728,304		518,278
Current Assets					
Stock	5.	12,780		11,015	
Debtors & Prepayments	7.	267,798		87,746	
Cash at Bank		87		87	
		280,665		98,848	
Creditors (Amounts falling due Within one year)					
Trade Creditors & Expenses Accrued	8.	128,444		76,357	
Obligations under Finance Leases		92,582		48,871	
Taxation		11,309		-	
Bank Overdraft & Loans		144,086		33,704	
		376,421		158,932	
Net Current Assets (Liabilities)			(95,756)		(60,084)
Total Assets less Current Liabilities			632,548		458,194
Financed By					
Creditors (Amounts falling due After one year)					
Bank Loan			-		-
Loans			88,251		88,251
Obligations under Finance Leases			263,393		161,122
Directors Loan			123,831		132,080
			475,475		381,453
Capital & Reserves					
Share Capital	7.		123		123
Share Premium			105,856		105,856
Revenue Reserves			51,094		(29,238)
			157,073		76,741
			632,548		458,194

John Finegan Director.

James Finegan Director.

Organic Gold (Marketing) Limited
Notes on & Forming Part of the Accounts
For the year ended 31st December, 2003

1. Statement of Accounting Policies

(a) Historical Cost Convention

The Accounts are prepared under the Historical Cost Convention.

(b) Turnover

Turnover is the invoiced sale and cash received for goods sold and excludes value added tax.

(c) Depreciation

Fixed assets are stated at cost less accumulated depreciation to date. Depreciation is calculated to write off the assets over the period of their expected useful lives on a straight line basis for buildings and machinery and on a reducing balance basis for motor vehicles.

The rates are as follows:

Buildings	10%
Office Equipment	12 ½%
Plant & Machinery	12 ½%
Motor Vehicle	20%

(d) Stocks

Stock is valued at lower of cost and net realisable value.

(e) Leasing

Assets under a lease that transfers substantially all the risks of ownership to the company (finance lease) is capitalized as a tangible asset and depreciated over its estimated useful life. The corresponding obligations (net of finance charges) are shown separately as obligations under finance leases. Finance charges are allocated to accounting periods over the primary period of the lease. All other lease payments which are not material are written off to the Profit & Loss Account in the year in which they arise.

2. Employees & Remuneration

The average number of people employed by the company in the financial year was 1 (2002– 2) and it is analysed into various categories:

	2003	2002
Manufacture	1	2

The staff costs are comprised of:	2003 €	2002 €
Wages	15,458	26,696
Pension Costs	300	-
Social Welfare Costs	1,314	2,343
	17,072	29,039

3. Net Profit

The trading profit has been arrived at after charging:

	2003	2002
	€	€
Directors Remuneration	37,232	20,560
Auditors Remuneration	2,425	2,300
Depreciation: Owned Assets	51,262	39,448
Leased Assets	57,838	34,206
Finance Interest & Charges		
Bank Overdraft & Loans	6,252	2,760
Finance Lease Charges	12,017	9,277

4. Taxation

	2003	2002
Based on Profit for Year	€	€
Corporation Tax	11,309	NIL

The rate of corporation tax on manufacturing activities is 10%.

5. Stocks

	€	€
Finished Goods	11,330	9,215
Packaging	1,450	1,800
	12,780	11,015

6. Fixed Assets

Cost	Total	Buildings	Plant & Machinery	Office Equipment	Motor Vehicle
At 1st January 2003	909,306	420,674	459,680	-	28,952
Additions during year	315,966	76,691	233,490	5,785	-
At 31st December 2003	1,225,272	497,365	693,170	5,785	28,952
Depreciation					
At 1st January 2003	394,412	182,050	206,572	-	5,790
Charge for Year	108,900	37,105	66,440	723	4,632
At 31st December 2003	503,312	219,155	273,012	723	10,422
Net Book Value					
At 31st December 2003	721,960	278,210	420,158	5,062	18,530
At 1st January 2003	514,894	238,624	253,108	-	23,162

The net book value of plant & machinery of €420,158 includes an amount of €353,287 in respect of assets held under finance lease and the net book value of motor vehicle of €18,530 includes an amount of €18,530 in respect of assets held under a finance lease.

7. Debtors	2003	2002
	€	€
Trade Debtors and Prepayments	258,518	66,297
Amounts owed by related companies	9,280	21,449
	267,798	87,746

8. Creditors	2003	2002
	€	€
Creditors & Accrued Expenses	125,790	73,703
Amounts owed by related companies	2,654	2,654
	128,444	76,357

9. Share Capital	2003	2002
Authorised	€	€
Ordinary Shares of 1.27 Euro each	1,269,738	1269,738
Issued & Fully Paid		
Ordinary Shares of 1.27 Euro each	123	123

10. The accounts were approved by the directors on 12th January 2005.

Organic Gold (Marketing) Limited

Appendix 1

Manufacturing, Trading, Profit & Loss

Account for the year ended 31st December 2003.

		2003 Euro		2002 €
Sales		764,479		574,091
Less: Cost of Sales				
Opening Stock	9,215		16,615	
Purchases	120,831		161,462	
Composting Costs	95,899		17,000	
Wages & State Insurance	17,072		29,309	
Packaging	14,608		15,117	
	257,625		239,503	
Less: Closing Stock	11,330	246,295	9,215	230,288
		518,184		343,803
Trade Compensation		-		6,349
		518,184		350,152
Less: Expenses				
Insurances	23,785		12,850	
Light & Heat	7,657		2,838	
Telephone	6,831		6,017	
Rates	3,160		2,953	
Motor, Travel & Subsistence	25,770		21,026	
Directors Remuneration	37,232		20,560	
Hire of Equipment	7,970		3,877	
Transport	83,540		49,621	
Printing, Postage, Stationery & Advertising	7,539		4,241	
Machinery & General Repairs & Oil	45,188		22,760	
Professional Fees	42,994		26,641	
Audit & Accountancy Fee	2,425		2,300	
Finance Interest & Charges	18,269		12,037	
Sundry Expenses	5,283		4,402	
Loss on Disposal of Motor Vehicle	-		7,958	
Depreciation: Buildings	37,105		29,436	
Plant & Machinery	66,440		38,428	
Office Equipment	723		-	
Motor Vehicle	4,632	426,543	5,790	273,735
Net Profit for Year		91,641		76,417

APPENDIX J

Revised Non-Technical Summary

SECTION A NON-TECHNICAL SUMMARY

A Non-Technical Summary is to be submitted. The summary should include information on those aspects outlined in the Guidance Note and must comply with the requirements of Article 12 (1) (u) of the Waste Management (Licensing) Regulations, S.I. 395 of 2004.

The Non-Technical Summary should form **Attachment A.1**.

Attachment A.1 - Non-Technical Summary

1. Background

Organic Gold (Marketing) Ltd. is an established waste composting facility located in the townland of Wilkinstown, Navan, Co. Meath. Wilkinstown is a small village set in an agricultural area. The site is located 10 km's north of Navan along the R162 to Nobber and is located approximately 380 metres from the crossroads in Wilkinstown village. The site has been in the ownership of the Finnegan family for a number of decades where farming was the main enterprise for many years. Organic Gold have been involved in composting activities at this site since 1986 where they have been producing 'Organic Gold' a multi-purpose compost, which is widely sold in Ireland. A Site Location Map is provided in Appendix A of this Application and accompanying maps, drawings and photographs are in the EIS accompanying this application.

Summary Details

Applicant	Contact Details	Location	Local Authority
Organic Gold (Marketing) Ltd	Mr John Finnegan Tel (046) 905 4149 Fax (046) 905 4923	Wilkinstown, Navan Ordnance Survey Grid reference E284 687 N277 219	Meath County Council

The Organic Gold outdoor composting facility has operated under a Waste Permit from Meath County Council since 2002, in this period they successfully composted green waste, sludge and wood chips in outdoor windrows on part of the existing slab which was on an agricultural farmyard. In February 2004 the company decided to remove existing farm building and make more room for composting. At this time (and particularly due to space and operational constraints) nuisance odours were generated and Meath County Council responded with temporary restrictions on operations.

Organic Gold subsequently employed RPS-MCOS and also Odour Monitoring Ireland to respond to problems and prepare the Environmental Impact Statement (EIS) and an Environmental Protection Agency (EPA) Waste Licence application, as the company intend on increasing the amount of waste to be accepted on site from approximately 10,000 tonnes to 25,000 tonnes per annum.

At this stage, some new proposals are being put forward in the Waste Licence including the use of new technology in the form of in-vessel composting, a waste reception building and improved management and monitoring at the site. This is discussed in more detail in the Waste Licence Application, which will assess the environmental impacts of composting activities at the facility and will also point out necessary measures to be taken to minimise negative impacts resulting from all activities at the site.

2. Site Description/Current Waste Activities

The development is located on an open and elevated site with a slope gradually to the north and east. The site is bounded to the east by the R162 and to the south and west by a hedgerow bordered lane

way which leads to a private dwelling in a cul-de-sac approximately 260 metres from the northern boundary of the composting slab.

The existing facility is located on 4.5 hectares of land and the facility essentially consists of three parts:

1. Site Buildings and High Grade Fertiliser Shed (1.2 ha)
2. Paddock Area (1.5 ha)
3. The Composing Slab (1.8 ha)

Drawing MDE0202 DG004 A04 in Appendix A outlines the Site Layout for the facility indicating the existing and proposed infrastructure.

Site Buildings and High Grade Fertiliser Shed
There is a fertiliser production shed on the site, which was erected in 1993 and is typical of agricultural buildings on a farmland. Retail multi-purpose compost known as 'Organic Gold' and a high-grade fertiliser product is produced and bagged in this shed. This activity has not been the source of any local complaint and no changes to current operations are proposed.

Site accommodation comprises a designated site office located to the front of the fertiliser production shed, an entrance lobby to the office and staff toilet and washing facilities. Car parking spaces are also available outside the office area. A weighbridge is in place to record waste loads entering and leaving the site.

Paddock Area
The paddock is 1.5 ha in area and consists of typical agricultural grazing grass and is fenced off from the other areas of the site. No waste recovery operations take place in the paddock area.

The Composting Slab
The composting slab forms the main part of the facility where all composting operations take place. The slab is located on 1.8ha with a boundary wall of 1.5 metres high, built around it to enclose the slab area. There is also an additional 1.5 metre high earthen embankment outside the wall where extensive landscaping has been undertaken and 2,100 tree saplings have been planted to enclose and screen the site. There is also a 1m tall windbreak mesh erected on top of the perimeter wall, which reduces wind speed and increases the efficiency of the misting system installed to reduce odour impacts.

3. Proposed Expanded Waste Activities and Tonnages

Organic Gold proposes increasing the amount of waste accepted on site for composting from approximately 10,000 up to 25,000 tonnes. The material to be composted will be similar to current waste intake i.e. sludge, green waste, wood chip and other commercial organic materials. However, in the future greater emphasis will be placed on process control, odour nuisance prevention, waste acceptance and housekeeping procedures including health and safety for employees.

Hours of Operation
The facility will operate from 07.00 to 20.00 Monday to Friday and from 07.00 to 14.00 on Saturdays.

Hours of Waste Acceptance / Handling.
The facility will accept and handle waste from 08.00 to 19.00 Monday to Friday and from 08.00 to 13.00 on Saturdays.

Classes of Activity under the Waste Management Act

Waste Recovery Activities under the Fourth Schedule of the Act

Class 2: This is the **Principal Activity** on site and consists of the recovery of organic waste from municipal, industrial and commercial sources such as green waste, wood chip, sludge and a mixture of other organics such as brewers grain. The dried slurry will be recovered thorough mixing with peat to produce a commercial soil improver. Dried sludge will be recovered and mixed with other inorganics to produce a high-grade fertiliser. Other organic waste will be recovered through windrow composting producing a compost product.
Class 4: This activity would involve the acceptance of soil and subsoil's on site to be mixed with the compost producing an enhanced soil product.
Class 10: The use of finished compost as a soil improver with beneficial consequences for land to which it is added in land remediation projects.
Class 11: The use of waste obtained from licensed recovery activities.
Class 12: The exchange of wastes for reuse/recycling/recovery at the facility.
Class 13: The temporary storage of waste at the facility pending collection for further recycling and recovery.

Waste Disposal Activities under the Third Schedule of the Act
Class 11: The Blending or mixing of waste prior to disposal.
Class 12: Repackaging of wastes prior to disposal.
Class 13: The temporary storage of waste at the facility pending collection for disposal.

TABLE A.1 SUMMARY WASTE TYPES AND QUANTITIES

WASTE TYPE	(Current) TONNES PER ANNUM (2004)	(Proposed)* TONNES PER ANNUM Total 25,000 tonnes
Household	1,365	7,000
Commercial	6,001	8,000
Sewage Sludge	2,627	8,000
Industrial Non-Hazardous Sludges	248	2,000

* Note the exact mix of wastes accepted can not be predicted, since it depends on commercial forces – the maximum tonnage will remain at 25,000 tpa but the breakdown of the tonnages may vary from shown above. The 'European Waste Catalogue' codes for the specific waste types proposed are presented in Table H.1(D) of the application.

4. Proposed Site Infrastructure

A number of proposals for development of the site are made in this Waste Licence Application (and accompanying EIS) to minimise negative impacts resulting from all activities at the site and include the following:

- The construction of a waste reception building on the composting slab;
- The use of modular in-vessel composting units for treating all waste arriving on site;
- Improving the site entrance to allow for double lane traffic and improved sight lines safety for traffic entering and leaving the site;
- Improved signage at the site;
- Installation of security gates at the site entrance and the entrance to the composting slab;
- Upgrading of the internal access roads;
- Installation of fire hydrants at various points through the site;

Further details of the main elements are provided below.

Proposed Waste Reception Building

The waste reception building will be constructed as part of an odour mitigation measure where all waste handling such as waste inspection, storage and blending will take place. The building will contain a waste inspection area, storage bays for waste material and a waste quarantine area. All material in the waste reception area will be blended and placed in the in-vessel units within 24 hours, so to prevent potential odours being emitted from the reception area. Its design and finish will resemble a simple agricultural building with a view to integrating into the existing area.

In-Vessel Composting System

The Wasteology in-vessel composting system will be used on site for the rapid decomposition of the waste material over a two-week period. The in-vessel units are made out of pre-cast concrete and are modular in nature. Six in-vessel units will be required to treat 1,000 tonnes of waste over a two week period. However, as part of a contingency plan it is proposed to employ eight of these units so that there is some available capacity to allow for maintenance and repair of composting units.

The individual units which are 15m long, 8m wide and 2.5m high and are based on the Alfabloc instant walling system which will be placed on the existing concrete slab. The units are unique in that they have a retractable roof manufactured out of a PVC coated material. The retractable roof can be either manually or mechanically retracted during loading and unloading of the units. The material in the roof has being designed to withstand severe weather conditions. Air handling units control air flow through the composting material and maintain appropriate temperatures. Safety rails around the top of the wall of the units ensures operator safety during site operation. The Wasteology system is designed as a modular and flexible system.

Revised Site Entrance

The existing site entrance will be altered to allow for double lane traffic and improved site safety and sight lines onto the R162.

5. Proposed Processing of Waste Material

Reception of Material and Mixing

All the waste accepted on site will undergo inspection in the waste reception building before it is stored in the storage bays. Bulking materials such as wood chip and saw dust are required in the composting process as these materials provide a carbon source on which microbes can feed off. The organic waste material provides the nitrogen sources required by microbes for cell growth and functioning.

Organic Gold have found that the best mixture for matrix materials of wood chip, green waste and sludge is a 1:1:1 ratio. These materials will be blended together in that ratio in the waste reception building.

In-Vessel Compositing Units

All material will be moved to the enclosed composting vessels within 24 hours of arriving on the site, using front loaders. The roof will be retracted to allow for the vessel to be filled. Each vessel can hold approximately 180 tonnes of material depending on the materials bulk density.

The material will be allowed to decompose under forced aerated conditions at a temperature of approximately 60°C over the length of the entire process. The vessels are fitted with fans, which constantly force air up through the composting material via air ducts on the bottom of the units and will maintain aerated conditions in the composting material. The ventilation air is circulated within the system containing any odours from the composting process.

Thermometer probes are manually inserted throughout the material in the unit to allow for temperature to be recorded. Any leachate produced will be stored in a storage tank on the slab, before being recirculated back into the composting vessels or the maturing compost in the windrows, as required.

After 2 weeks of rapid decomposition the volume of waste material will have been reduced by 25% and the compost produced will be stabilised and pathogen free, according to the manufacturer of the Wasteology System. The roof will be retracted and the compost moved to a maturation area using a front loader.

Maturation Stage (Outdoor Windrow Composting)

To ensure a quality product is produced, the compost will be removed from the vessels and be allowed to mature in outdoor windrows on the maturation pad.

Windrows will be constructed in a similar fashion to current practice, using front loaders and formed into piles approximately 90-100m long, 3.5-4m wide and 1.5m high. Each windrow will be capable of holding approximately 200-300 tonnes of compost. A maximum of 12-15 windrows will be required to allow the compost to mature sufficiently. Windrows will be turned approximately 5 times during the maturation period or as temperature dictates to ensure that the windrows are kept aerated. Moisture levels of around 50 to 55% must be maintained to avoid drying out of the process. If the material is seen to be too dry stored leachate will be recirculated back into the process and moisture conditions maintained. Optimum moisture levels are required for optimum microbial growth.

The maturation period will take approximately 6 weeks at which time a fully stable, sanitised and mature compost product will be produced in compliance with EPA quality specifications within the future EPA Waste Licence.

Waste Prevention, Minimisation, Recovery and Disposal

Very little residue is produced at composting plants which results in small amounts of waste in need of recycling or disposal off site. The facility will be operated with a view to maximising the amount of material composted. Good operational and good housekeeping practices will be employed to prevent & minimise waste, and to recycle any material such as packaging. Any waste generated will be separately stored and sent to the Panda Waste Facility for recycling/ disposal which is located at Rathdrinagh, Beauparc, Nanan, Co. Meath, Waste licence register 104-2. The waste will also be delivered by panda waste to this facility who are a licensed carrier - Waste collection permit NO. WCP/MH/2001/01C. All leachate generated on site will be circulated in the composting process to maintain moisture within the matrix material.

6. Plant & Equipment

The main types of plant equipment used at the site are described below. A more complete inventory of equipment is in the main Waste Licence Application.

Composting of Organic Waste at The Compost Slab

- Wasteology In-Vessel Units (x8) holding 180 tonnes of organic waste. Each unit is 8 metres wide, 15 metres long and 2.5 metres high to the walls. Details in Appendix to this Licence Application.
- Backhus 15.5 Compost Turner - Purpose built self-propelled compost turning machine.
- Woiberforce Shredder – for shredding green waste and wood waste.
- Idrotech Odour Control Fogging System, erected along the compost slab perimeter with spray nozzles at 1.5 metre intervals. It is controlled by a wind directional change using a plc-controlled system.

Other equipment includes a mechanical loading shovel with air conditioned cab, two 14 tonne tipping trailer with roll over cover, a trailer which can hold 40 m^3 of material with a special mechanism to prevent spillages of material, a tractor and a 3000psi Three Phase Power Washer.

Processing of Organic Gold Retail Fertiliser

The equipment used in this process includes a mechanical loading shovel, an agricultural muck spreader (rear flails) converted for compost turning, a grader for screening compost, a compost blending hopper

and elevator to bagging plant, an air compressor for bag flushing, compost bag heat sealer, a pallet wrapping machine a tractor and a forklift.

High Grade Fertiliser Production

Additional equipment for use in this process includes an 8 tonne storage bin, an 8 tonne blending bottle (batch type purpose built aspiration unit with air extraction filter system and a 50 KVA Generator for back up purposes.

7. Potential Emissions and Environmental Impacts

Potential emissions and impacts which may arise as a result of waste composting activities at the proposed development are outlined below. Mitigation measures are also provided where applicable. The subjects of greater significance are discussed first.

Potential Odour Impacts

Odour dispersion modelling was conducted by Odour Monitoring Ireland to predict the potential odour impact the proposed facility would have on nearest receptors, working at a full capacity of 25,000 tonnes and during a worst case meteorological conditions i.e. stable, low wind conditions.

The model predicted that (following the implementation of in-vessel composting technology, the building of a waste reception building for waste delivery, mixing and blending, the use of a mist air system and improved odour management practices at the proposed site), minor odour impact may be perceived in the vicinity of the facility at less than 6 'odour units' for not more than 175 hours in a year. This is a similar level of impact as modelled for the existing facility and current waste intake using just a windrow system.

This however is based on a worst-case scenario and will only occur during meteorological conditions that do not favour odour dispersion (stable, low wind speed).

Odour Mitigation Measures Proposed

- A clear and precise odour management plan will be developed for the site so as to eliminate any significant odour emissions events. This will be integrated into the future environmental management system.
- The proposed use of in-vessel composting units, an enclosed waste reception shed and the mist air system will also help to reduce odour emissions at the site. The material will be greatly reduced in offensiveness after undergoing first stage in-vessel composting.
- That heavy-duty plastic curtains will be installed upon the inlet and outlet door of the waste reception building to reduce air circulation.
- The mist air system will continue to operate at the boundary of the site and will be regularly maintained to ensure odour reduction at the site.
- Odour management practices at the proposed site will need to be precise to eliminate odour impact and will include the following:
    - All raw material will be removed form the waste reception building within 24 hours and placed in the in-vessel composting units;
    - A closed-door strategy will be maintained upon the waste acceptance/mixing/blending building and only one door will be opened for a maximum of 15 minutes per hour;
    - Application of waste acceptance procedures will ensure that problematic odorous material will not be accepted at the site for treatment;
    - All mixing will be carried out indoors;

- Sufficient bulking material will be kept on-site to be mixed with the incoming raw material.
- Meteorological conditions will be taken into consideration when turning windrows and windrows will be turned regularly to maintain aerated conditions;
- The moisture content, temperature and Carbon:Nitrogen ratio within the windrows will be kept at optimum conditions to favour microbial activity with the piles;
- Leachate will be recycled back into the process in an appropriate manner. The recycled leachate should be applied evenly and in close proximity to the windrows

- Monitoring of odour emissions according to any requirements of future EPA Waste Licence.

- Organic Gold Marketing Ltd have agreed in principle that a biofilter will be installed at the proposed facility if negative odour impact occurs.

Potential Air Quality (Dust) Impacts

Baseline monitoring for dust was carried out, the main potential sources were identified as the composting slab and the site entrance. With proposed improvements to both these areas and the implementation of mitigation measures, no negative impacts are predicted for the surrounding environment. Future proposals for the site include the construction of a waste reception building and an improved site entrance. All waste will be delivered to the reception building where it will be mixed and blended before being introduced into the in-vessel units for composting. The enclosed building and the use of enclosed in-vessel units will reduce dust emissions arising at the proposed development during the blending and first stage of composting. After treatment in the in-vessel units the compost material will be allowed to mature outdoors. This material may become dry, especially in dry weather conditions and could potentially cause some dusty conditions to arise at the site.

The improved site entrance will be asphalted and speed restrictions on traffic entering and existing the site will be in place, which will reduce dust emissions at the site.

Dust Mitigation Measures Proposed

In order to ensure that no dust nuisance occurs, a series of mitigation measures will be implemented.

- The proposed in-vessel composting units will reduce odour impacts at the site due to greater containment of dust within the units.
- Waste delivery, mixing and blending should be carried out in the waste reception building which will also help to contain dust emissions.
- Windrows in the maturation area should not be allowed to dry out to prevent dusty conditions arising. If this does occur, the windrows will be "wetted down" to prevent dust emissions occurring.
- The improved site entrance will have a significant impact on reducing dust emissions at the site.
- Site roads should be regularly cleaned and maintained as appropriate. Hard surface roads should be swept to remove mud and aggregate materials from their surface.
- Vehicles using site roads should have their speed restricted, and this speed restriction must be enforced rigidly.
- Public roads outside the site should be regularly inspected for cleanliness, and cleaned as necessary.
- All machinery and waste delivery trucks will be regularly serviced and kept in good working order to prevent further dust emissions.

Potential Air Quality (Bioaerosols) Impacts

Bioaerosols are tiny air-borne microbes (such as bacteria, fungi) that occur in nature and are generated by processes such as composting, agriculture (harvesting crops), timber processing etc. Baseline sampling was carried out at the existing facility, which found the highest levels in the composting area during turning operations, which is typical of composting sites. Concentrations were found to be at normal background levels at all of the off-site sensitive receptors (households). There is no household within 260 metres of the site. With the implementation of mitigation measures – these are similar as for dust control – no impacts are predicted.

Future proposals involve the use of in-vessel composting units for the first stage of rapid enclosed decomposition of the waste material and the delivery and mixing/blending of waste in the enclosed waste reception building. The enclosed vessels and waste reception building should further decrease bioaerosol emissions at the proposed site. Therefore, it is considered that there will be no negative impact on sensitive receptors at the boundary of the site.

Bioaerosols Mitigation Measures Proposed

Several design and operational measures can be undertaken to reduce exposure to bioaerosols. These include:

- The production of bioaerosols at composting plants are well connected with dust emissions. Dust produced at a composting plant technically is not a bioaerosol. However, it can carry microbial constituents suspended in the air (bioaerosols). So by maintaining dust levels at low concentrations by applying dust mitigation measures outlined above, at the proposed facility, bioaerosol emissions will also be controlled.
- Enclosing the composting system especially during the first stages of waste decomposition.
- Waste delivery, mixing and blending should be carried out in the waste reception building. Maintain moisture content of the windrows in the maturation area.
- Air filters should be present in cabins of mobile equipment such as the windrows turner.
- Organic Gold will provide Personnel Protective Equipment (PPE) for employees to be used while working at the site.
- Regular health screening will be made available for employees.
- Regular monitoring for bioaerosols at the nearest residences and at the site should be carried out. This is especially the case for the enclosed waste reception area where there is greater potential for employee exposure to bioaerosols due to enclosed conditions.

Noise and Vibration (Potential Impacts and Mitigation)

A baseline noise survey was carried out with day and night time monitoring to characterise the current noise environment. The increased volumes of waste and the use of fans on the in-vessel compost units may increase noise slightly. However noise emissions at the facility are not expected to have a significant impact on the nearest household.

Potential Visual Impacts and Mitigation

Existing structures present on site have been in place for some time and are in keeping with the agricultural setting. The proposed new waste reception building will be 36m long by 22m wide, with a height of 11m at the ridge and 9.6m at the eaves. Its design and appearance will be simple.

Even after considering the careful design of the building, there will be a negative impact from the new building on visual receptors in the area due to its height and the impact will range from minor to moderate. The proposed scheme will have no significant impact upon landscape.

The objective of proposing mitigation measures is to attempt to reduce the level of visual impact at these locations from significant to not significant. This can most easily be achieved by creating screening using tree planting and the green colour of the proposed new structure will make them less visually intrusive.

In order to reduce the level of impact on the residence to the south east, the mound of spoil that partially blocks the view of the existing sheds will be extended and appropriately landscaped and planted with trees.

Human Beings (Potential Impacts and Mitigation)

The EIS considered possible impacts on community. This emphasized the need for successful odour control strategies at the facility. Other potential nuisance problems were considered including litter, pests & vermin, and fire. Appropriate mitigation measures are required – mainly operational procedures – to ensure that these do not create an impact on the local community.

Community (Potential Impacts and Mitigation)

There will a positive impact on the community due to the employment of 8 full-time staff members and other employment in support of the facilities (monitoring, technical studies etc..) However this is balanced against potential impacts discussed under odour above. At regional level there will a positive impact in that the facility will offer extra capacity for the recycling of sludge, green waste and other organic waste material, especially in light of the lack of sufficient composting infrastructure within Meath and the remainder of the North East Region. Recycling of this waste material will also help to reach national recycling target of 300,000 tonnes of biodegradable waste by 2013.

Traffic/Community/Natural Environment

There will be an overall positive impact from the construction of the new site entrance. The site entrance will be designed in accordance with design standards as set out in the 'Design Manual for Roads and Bridges' which will increase site safety. The improved site entrance will also create less dusty conditions at the site and therefore will reduce dust nuisance potential.

Ecology

Due to the creation of new habitat and screening (on spoil area) and the planting of native trees for screening purposes, there will be a positive impact on ecology at the site.

Aquatic Environment

(Surface Waters – rivers, streams) – A baseline assessment was carried out including sampling of the nearby Yellow (Blackwater) River. There are no direct discharges to surface water proposed form the composting area. Provided mitigation measures are implemented (including collecting and properly managing any composting leachate, spills etc.) in the facility design and operation, no impacts are predicted.

Geology and Hydrogeology

Given that operations will take place on impermeable surfaces, no impacts are expected. Mitigation measures (such as ensuring the integrity of the composting slab) are included, to ensure any leachate generated does not reach groundwater.

Archaeology and Cultural Heritage

A Licensed Archaeologist was employed to assess the proposed development. No impacts are predicted

Material Assets

No impact is predicted on agricultural land. Measures must be put in place to minimise odour impacts and other nuisances in order to prevent negative impacts on non-agricultural properties.

Natural Resources

Consumption of energy (electricity and fuel), water and other consumables will increase at the site due to the proposed development. However this is balanced with the environmental benefits of biological waste treatment. The facility will operate under a waste licence, which will require an environmental management system to be put in place. One aspect of this will be to minimise resource consumption.

Climate

No significant impacts predicted on local or global climate. Additional energy is used but by diverting organic waste from landfill, greenhouse gas emissions are also reduced.

8. Monitoring

The monitoring programme for dust, PM10 and bioaerosols at the proposed facility is outlined in Section F of the Application Form. It is proposed to monitor for dust three times annually and for PM10 and bioaerosols once annually.

The proposed monitoring programme for noise emissions at the facility is also outlined in Section F. It is proposed that this will be conducted annually.

9. Resources

The primary raw materials used in the facility include peat from Bord na Mona, silica sand, inorganic chemicals lignite and sea weed. Approximately 64,000 l/yr of water 60,000 units (KWh) electricity, and 11,200 litre /yr of diesel fuel will be used in facility operation. Other materials such as deodouriser for the misting system, degreaser and wetting agent will also be used. The quantities of resources used are outlined in more detail in Section G.I. of the Waste Licence Application.

10. Accident Prevention/Emergency Response

Emergency Procedures are outlined for the following situations:

- Fire Emergency
- Contamination Spill
- Site/Industrial Accident
- An Explosion or Discovery of a Suspicious Item etc.

Contact details for Emergency Services and site supervisors are also included. Further details are shown in Section J of the Application Form.

The European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2000 (S.I. No. 476 of 2000) **DO NOT apply** to this facility. The activity does not and could not give rise to an emission into aquifer of List I and List II substances therefore Council Directive 80/68/EEC is not relevant.

11. Decommissioning, Closure, Restoration and Aftercare

Decommissioning

Waste recovery activities will continue to be required to meet our national recycling and recovery targets in the foreseeable future, and as such there is no time limit for closure of the facility at present. In the unlikely event of unexpected closure, all waste material will be moved off-site to an appropriate authorised facility, and all compost product will be moved to authorised end markets. Any remaining raw materials would be returned to suppliers. Upon closure, the facility (including waste reception building) could easily be converted into agricultural farmyard use in keeping with the land use of the area. In this case, a significant amount of machinery from the facility could also be reused. The in-vessel composting units could be disassembled and either sent to another composting site or the constituent parts recycled or disposed of as required.

After Care Management

All emissions will continue to be monitored after decommissioning until such a time that Organic Gold Compost and the agency are content that the facility has been fully decommissioned and there is no potential for the release of further emissions into the environment.

12. Compliance with Section 40 (4) of the Waste Management Act

The applicant has confirmed compliance with the requirements of the Waste Management Act 1996-2003 in terms of the following: emissions shall not contravene standards or emission limit values, environmental pollution will not be caused, the proposed facility represents application of 'Best Available Technology' principles, the application complies with the North East Region Waste Management Plan, the applicant is a 'fit and proper person' under the Act to run the facility, there will be efficient use of energy, noise emissions will not breach any statutory limits, provision is made to prevent and respond to accidents/ emergencies, and provision are made for orderly closure and decommissioning (more details provided in Section L 1 of the Application.