

Agenda Item No:

NORTH LONDON WASTE AUTHORITY

REPORT TITLE:

REVIEW OF THE IN-VESSEL COMPOSTING SERVICE

REPORT OF:

HEAD OF WASTE STRATEGY AND CONTRACTS

FOR SUBMISSION TO:

AUTHORITY MEETING

DATE:

11 April 2007

SUMMARY OF REPORT:

This report updates members on the first year of operations at the in-vessel composting facility at Edmonton operated by LondonWaste Ltd, the Authority's main waste disposal contractor. The operations of the facility, the outputs from the process and the costs to the Authority are reviewed.

RECOMMENDATION

The Authority is recommended to note the contents of this report.

**Signed by Head of Waste Strategy
and Contracts**

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Date:

1.0 INTRODUCTION

- 1.1 Deliveries of compostable waste to the in-vessel composting facility operated by LondonWaste Ltd at Edmonton commenced on 21st September 2006. The facility was officially opened by Ben Bradshaw MP Minister for Local Environment, Marine and Animal Welfare on 9th March 2006 in celebration of the first finished compost product being released to Boroughs for local use.
- 1.2 The facility was designed to receive 30,000 tonnes per annum of biodegradable organic waste collected from residents' kitchens and gardens within the NLWA area. The cost of construction was assisted by a grant of £1.7 million from the London Recycling Fund, a part of the overall sum of £4 million received by the Authority and the constituent Boroughs for the North London Integrated Compost Project. This is reflected in the gate fee to the Authority at the facility.
- 1.3 The facility is licensed by both the State Veterinary Service (SVS) and the Environment Agency (EA) and is suitable for treating many types of compostable wastes including those containing animal by-products. This allows the facility to receive wastes containing meat and waste from catering establishments. This freedom allows the Boroughs to collect a much wider range of wastes from local residents for composting at the site.
- 1.4 The technology used was supplied by Agrivert Ltd and is licensed from Biodegma GmbH. It is in proven use in Europe, particularly in Germany but this is the first installation in the United Kingdom.
- 1.5 Initially waste is deposited inside an enclosed reception building where waste is inspected and then shredded to a uniform particle size. Air is drawn from inside the Tipping Hall through a biofilter that removes odours before discharging cleaned air to the atmosphere.
- 1.6 After shredding, the waste is loaded into two sets of eight enclosed tunnels. Inside these tunnels the first stages of composting occur. The waste self-heats due to the biological activity of the naturally occurring bacteria and fungi and the temperature of the waste rises above 60 degrees Celsius. This temperature is maintained for at least two consecutive days to destroy pathogens and weed species. This temperature must be achieved to comply with the animal by-products regulations and prevent the spread of animal or plant diseases. After about five days the waste is transferred to a second identical set of tunnels and the process is repeated. This ensures that the waste is properly treated and that any part of the waste that did not reach the required temperature in the first tunnel is subjected to a second treatment.

- 1.7 The waste within the tunnels generates leachate which is collected for biological treatment off site. Air is blown through the waste to encourage the composting process, reduce odour formation and to control the temperature of the waste. The tunnel roofs are made of a patented membrane that reduces the escape of odours but allows the compost to “breathe” and allows the release of excessive moisture generated during the composting process. The membrane acts as a molecular sieve allowing relatively tiny metabolic products (water and carbon dioxide molecules) to pass through the holes in the membrane but preventing larger odour molecules from escaping from the tunnels.
- 1.8 When the waste is removed from the tunnels it is transferred to the maturation pad for the final stage of production. This is a further period of up to three months before screening and removal from site to customers. “Maturation” is a separate stage where further biochemical processes occur and can continue for many months. It is an important and distinct process from that occurring in the tunnels and is necessary to produce a “quality compost” product. The process of maturation is highly aerobic and it is as important to manage the maturing compost as it is to manage the waste in the tunnels at the start of the process. Compost can continue to mature for many months and the longer it is left the better the product. The net result of the process is a typical mass reduction of between 50 and 60% and the creation of a genuinely marketable product.
- 1.9 The mature compost is screened to remove oversize material and contaminants such as plastics and stones and is then sent to end-users. The majority of the compost produced at Edmonton is sent to agricultural uses.
- 1.10 A schematic showing the plant layout and site description is attached at Appendix 1.

2.0 REVIEW OF OPERATIONS

- 2.1 This report reviews the operation between the period 21 September 2005 when operations commenced and 28 February 2007, the most recent complete month at the time of writing the report.

2.2 At the design stage it was predicted that in the first year of operation the total amount of waste directly delivered to the facility by the Boroughs would be 26,518 tonnes. This figure was used in the application to the London Recycling Fund for grant funding but in actuality the amount delivered was only 21,437 tonnes, a shortfall of just over 5,000 tonnes. The shortfall in tonnage directly delivered to the facility was made up to a total tonnage treated in the facility of 29,388 tonnes by the addition of 5,450 tonnes of green waste deposited by LondonWaste Ltd and 2,501 tonnes of kitchen and garden waste delivered by West London Waste Authority. This total was very close indeed to the designed throughput of 30,000 tonnes per annum.

2.3 The pattern of deliveries to the facility showed a slower than expected start as Borough collection services were introduced and residents got used to the new system. Deliveries reached a peak during the summer in May and June 2006. The pattern of deliveries was as expected but each month's tonnage delivered was slightly less than predicted. In the graph below the predicted pattern of deliveries is shown by the black line. If this pattern was followed, the facility would treat exactly the 30,000 tonnes design capacity. The columns show the amount of NLWA Borough waste that was composted and the total amount of waste from all sources that was composted. This includes all the waste deposited by the NLWA Boroughs as well as "top up" green waste supplied by LondonWaste Ltd from their contracts with NLWA Boroughs for green waste and waste received from the West London Waste Authority.

Figure 1: Tonnes of material composted at the Edmonton In-vessel facility since September 2005.

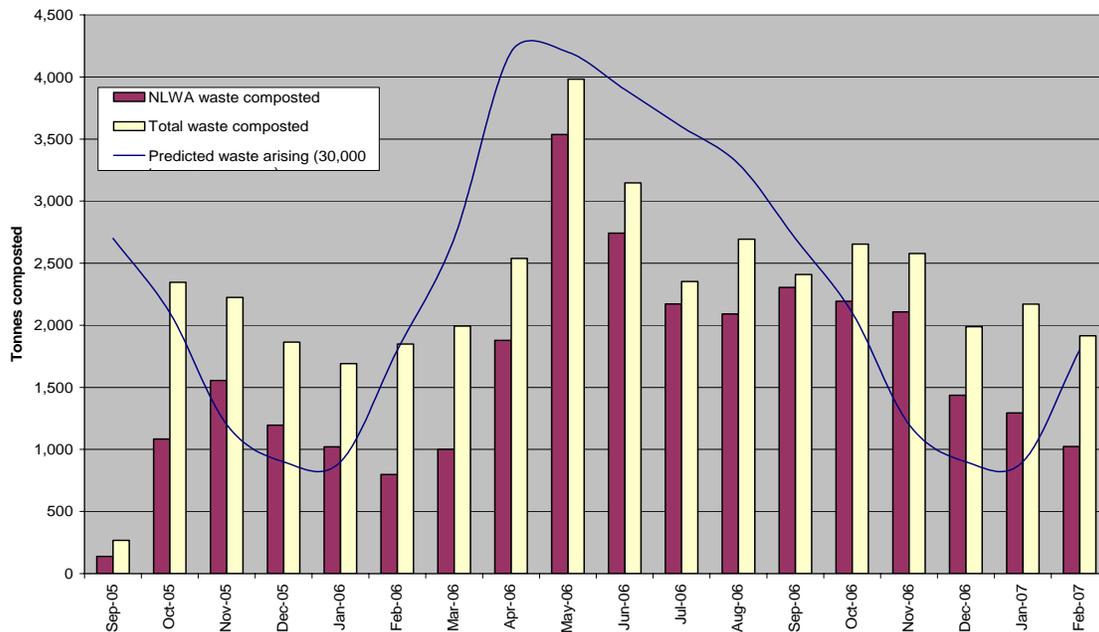
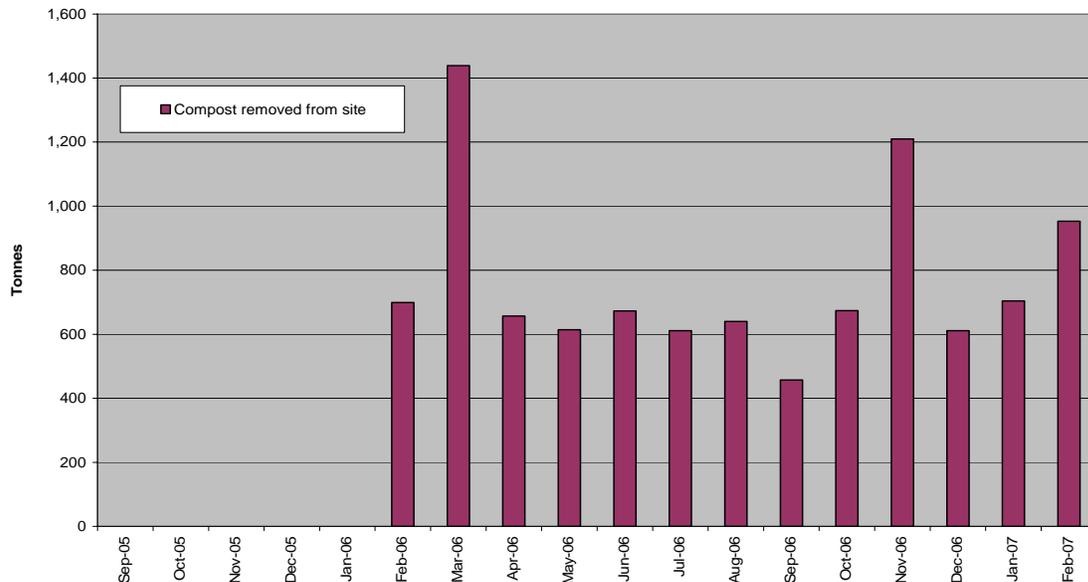


Figure 2: Compost production at the Edmonton In-vessel facility since September 2005.



2.4 To the end of February 2007, 11,197 tonnes of compost had been produced by the Edmonton facility. The majority of this (9,909 tonnes) was applied to agriculture and 1,287 tonnes was returned to the Boroughs for use in parks and public gardens as a mulch and soil improver.

Quality of Input Material

2.5 Since the commencement of the operation the quality of loads delivered by the Boroughs has been remarkably good with only a few loads being considered unprocessable. A number of loads containing lower levels of contamination that was subsequently removed at the plant were also deposited. These loads were routinely reported to Boroughs as soon as the information was provided by LondonWaste Ltd to help improve the quality of incoming loads for the future.

Product Quality

2.6 On 26 February 2007 the compost produced by LondonWaste Ltd was certified to comply with the BSI PAS 100 standard. This standard is promoted by WRAP and the Compost Association and is becoming increasingly recognised in the market place. Achieving this certification allows the product to be marketed with a recognised quality mark and will give customers confidence in the quality of the product. The certification is important as it will assist with placing the material in a competitive market where the supply of compost is increasing rapidly.

- 2.7 In order to maintain the PAS 100 certification, the quality of waste delivered to the facility must be maintained with as few contaminants as possible and the process must continue to produce compost to the required specification by operating the process to the required standard.

Environmental Controls

- 2.8 During the peak flow period between May and September 2006 the facility was found to be unable to manage the amounts of waste that were delivered and there were problems with odour generation as a consequence. There were a substantial number of complaints from local businesses and members of the public resulting in enforcement action by the Environment Agency and the London Borough of Enfield to abate the nuisance.
- 2.9 In order to alleviate the problem the company removed the stored material on the maturation pad that was causing the odour as well as finding alternative landfill diversion routes for 1,604 tonnes delivered above the processing capacity at that time. The company also introduced a biological control method involving spraying a proprietary suspension of bacteria and fungi which forms a microbial blanket over the maturation pad which absorbs odour molecules before they can escape to the atmosphere.
- 2.10 During the peak period of complaints, LondonWaste Ltd logged and investigated all complaints received. The company found that the compost plant was only one of several significant sources of odour in the area and there were a number of complaints from local residents that they considered should not be attributed to their operation. Since the summer of 2006 the number of complaints about odour from the plant has reduced substantially.
- 2.11 LondonWaste Ltd has made a commitment to enclose the maturation pad at the facility in the coming year subject to planning permission. No details of the plans for the enclosure have yet been made available to the Authority but Officers are advised that the company has prepared a design and submitted an application to the planning authority for permission to erect the structure. The enclosure is intended to further reduce the levels of odour escaping from the facility. The Authority will not face any additional costs as a consequence of the company's decision to construct the roof.

Costs

- 2.12 The Authority has a “take or pay arrangement with LondonWaste Ltd, negotiated as a deed of variation to the Main Waste Disposal Contract. If insufficient waste is collected by boroughs and delivered by the Authority to LondonWaste, the company seeks to fill the capacity with suitable wastes from other sources. This is predominantly green waste from reuse and recycling centres in our area for which a partial rebate is received by the Authority from the company. The Authority received a full rebate for the wastes accepted by LondonWaste Ltd from the West London Waste Authority.
- 2.13 The final basic gate fee has been agreed at a level saving the Authority over £5,000 per year against the original budget position and the supplementary placement cost arising from including meat in the input specification at a level saving the Authority some £150,000 per year against the original budget position too. Both these savings were anticipated and have therefore already been reflected in the budget approved at the last meeting of the Authority.
- 2.14 A separate, “Part 2” report entitled “Review of the In-Vessel Composting Service - Confidential Gate Fee” contains additional information relating to the Authorities agreed costs for this service and should be read in conjunction with this report.

3.0 THE FUTURE

- 3.1 For the current year (2006/07) Officers previously advised LondonWaste Ltd to expect to receive the full 30,000 tonnes of compostable waste from the Boroughs that the Authority has committed to pay for. It now appears that this figure will not be met as although the amount of waste being collected within the Boroughs and delivered by the Authority has increased dramatically in comparison to last year the total delivered is expected to be closer to 25,500 tonnes. In future years it is anticipated that the amounts of waste delivered to the facility will grow as participation in borough collection schemes increases. Officers have advised LondonWaste Ltd not to expect spare capacity to be available to sell to third parties during 2007/08.

- 3.2 LondonWaste Ltd has produced a “Production Plan” for the compost plant in December 2007. This production plan anticipated that there will be surplus capacity during the months between November 2006 and March 2007 but a shortfall in treatment capacity between April and August 2007. In December 2006 the anticipated shortfall in capacity was 3,000 tonnes i.e. the available treatment capacity is predicted to fall short of the requirement by 3,000 tonnes between April and August 2007. LondonWaste Ltd is currently in dialogue with other companies providing composting facilities and hopes to be able to offer the Authority alternative arrangements to ensure that all suitable wastes delivered by the Authority are composted.

Compostable Packaging

- 3.3 Boroughs have requested that the company accepts compostable packaging as part of the waste stream. The company has been reluctant to do so due to the risk of increased contamination of the final product with materials that are not truly compostable or are hidden inside packaging. However, the company has conducted trials of several brands of compostable packaging and has agreed to accept packaging that conforms to British Standard BS EN 13432 as long as the Authority fully researches and approves the collection methodology employed by the Borough. It should be noted that suitable packaging can be made from a number of different materials including cornstarch and paper.

4.0 CONCLUSIONS

- 4.1 The in-vessel composting plant at Edmonton has made a significant contribution to diverting waste from landfill in the Authority’s area. A substantial tonnage of waste has been treated at the facility and the compost produced has been returned for beneficial use in parks and gardens in the North London area and to agriculture elsewhere.
- 4.2 The Authority has negotiated a realistic gate for the operation considering the costs of constructing and operating the process and the relatively short contract period.
- 4.3 The standard of waste delivered to the facility to date has been very good with few loads containing excessive levels of contamination.
- 4.4 Compost produced at the facility is now certified to British Standard PAS 100. This certification will assist with product marketing and give confidence to end users that the material is a quality product.

- 4.5 There were early problems with odour generation at the plant but it appears that these are now resolved. The maturation pad at the facility is to be enclosed to reduce odour but this is not expected before the summer of 2007. The cost of this is to be borne by LondonWaste Ltd and the Authority does not expect to face additional charges as a consequence of this development.
- 4.6 The facility is not expected to be able to accommodate the peak flow of compostable waste delivered during the summer months and at this time no alternative outlets have been identified. This is clearly a concern and suitable alternative treatment facilities need to be secured. Officers will continue to work with LondonWaste Ltd to ensure that all suitable waste collected for composting is treated appropriately.
- 4.7 LondonWaste Ltd has agreed that compostable packaging that conforms to British Standard BS EN 13432 can be accepted at the facility in future as long as the Authority fully researches and approves the collection methodology employed by the Borough. It is anticipated that this will assist the Borough collection schemes in the future.
- 4.8 Boroughs now have the opportunity to request compost to be delivered at no cost for their use. The minimum delivery is a volume of 40 cubic metres. Smaller loads can be collected at no cost from the site at Edmonton in a vehicle that is suitable for loading using a loading shovel.

5.0 LEGAL ADVISER'S COMMENTS

- 5.1 The Legal Adviser has reviewed this report and has no further comments to add.

6.0 FINANCIAL ADVISER'S COMMENTS

- 6.1 The Financial Adviser has reviewed this report and has no further comments to add.

Local Government Act 1972 – Access to information

Documents used: None.

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Appendix 1. Plant layout and site description.



In the diagram above, the flow of material is from right to left. The process lasts about twelve to fifteen weeks from the point of reception to producing fully matured compost. On receipt, the waste is inspected to identify gross contaminants such as plastics, metals, glass and other undesirable items such as large logs and fence posts. The waste is then shredded and blended to reduce the particle size and produce a more consistent material that will compost more effectively.

The shredded waste is loaded into the Stage 1 tunnels and is allowed to self-heat by the action of the naturally occurring microorganisms in the waste. The process is controlled by blowing air through the waste and is monitored to ensure that the waste reaches a temperature in excess of 60 Celsius for at least 48 hours. This ensures that human, plant and animal pathogens and weed species are destroyed and accelerates the natural composting process. After about seven days the material is transferred to a second, identical set of tunnels and the same cycle is repeated. This ensures that any waste not effectively sanitised the first time around is successfully treated the second time. Other advantages of the tunnels are that the process can be optimised with moisture, oxygen levels and temperature being effectively controlled. These process parameters must be effectively controlled to prevent odour formation and to ensure that the process operates efficiently. The fabric in the roofs of the tunnels acts as a molecular sieve and works in a similar way to a tea strainer in that it allows water molecules to pass through and prevents larger odour generating molecules from escaping to the environment. The most active stages of the composting process occur in the tunnels.

The waste is then removed from the Stage 2 tunnels and matured in the open air. The maturation process is highly aerobic and so the material requires regular turning to prevent odour generation which can occur if the oxygen levels are allowed to fall. The material is matured at the facility for a further eight weeks during which time the chemical composition of the material changes and the nutrient balance of the compost improves. Typical compost will continue to improve in nutrient value for up to a year but is usually suitable for most applications after eight weeks. After maturation the compost is screened to remove oversize material and contaminants such as plastic bags and stones that have survived the process. The compost product is then removed from site for use in agriculture or landscaping.