



Oxfordshire County Council

Assessment of Production & Management of Agricultural
Waste In Oxfordshire

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1 Introduction

The previous draft of the Oxfordshire Minerals and Waste Core Strategy did not address agricultural waste explicitly as an issue although the supporting Waste Needs Assessment did present an estimate of total production of 900,000 tonnes in 1998¹. Whether agricultural waste needs separate consideration depends on how much of this waste stream may require management through facilities provided for in the Plan and if the quantity of such waste would warrant additional capacity provision.

The need to consider this waste stream more closely arises from the introduction of the Waste Management (England and Wales) Regulations 2006. This brought agricultural waste under legislative control for the first time. Prior to this much waste was managed on farm through the use of burning or farm tips but now is more likely to be managed in the same way as commercial and industrial waste streams.² As such there is the possibility that waste arising from this sector will be introduced into the formal waste management process and therefore require additional capacity to be provided (and planned for).

In order to identify whether waste from agricultural sources needs separate consideration in the Plan, the following two areas have been considered:

1. The likely level of baseline arisings.
2. The way in which arisings are managed.

¹ Source *Strategic Waste Management Assessment 2000: South East: Environment Agency*. The bulk of this - 98% - comprised 'animal matter' such as natural manure and slurry which are not classed as waste when used directly as a fertiliser. This includes when they are used on a different farm to where they came from.

² See Environment Agency (2003) *Agricultural Waste Survey 2003*. Environment Agency, Bristol for description of practices

2 Estimating Baseline Arisings

2.1 Non Natural Agricultural Waste Arisings

The recognised source of national estimates for arisings of non-natural agricultural waste available is the Environment Agency Report entitled *Towards Sustainable Agricultural Waste Management* published in 2001³. This presents estimates down to regional level for 1998. For the South East it estimated that just under 46,500 tonnes of non-natural agricultural waste was produced on an annual basis. 'Non-natural agricultural waste' is waste other than that organic waste (such as manures and slurries) which arises from farming activities. This includes discarded pesticide containers, plastics, tyres, batteries, clinical waste, old machinery, waste oil and packaging waste⁴. This distinction is the reason for the major difference between the previously cited production figure for Oxfordshire of 900,000 tpa and the above value.

The Farm Business Survey⁵ presents a profile for farming activity by region and county.

Table 1 shows the % of total number of farms in the South East and Oxfordshire in 2011/12.

Table 1: Number of Farms by Category in the South East & Oxfordshire

Source: FBS data builder. v52[2.4.a]: Table 7073

	SE counties	Oxon	Oxon as % of SE
Arable	2,690	517	19.20
Livestock	2,204	601	27.25
Mixed/other	996	298	29.92
Total number of farms	5,890	1,415	24.02

Using the data in [Table 1](#), if one simply applies the % of total number of farms in Oxfordshire (24%) to the regional waste arising estimate, it gives a value of **11,170 tonnes per annum**. Clearly this is a broad-brush approach that ignores the fact that different types of agricultural unit will produce different types and quantities of waste.

³ Environment Agency (2001). *Towards Sustainable Agricultural Waste Management*. Environment Agency R&D Technical Report P1-339. Environment Agency, Bristol.

⁴ An element of these arisings will fall within the classification of hazardous waste but a review of the Environment Agency Hazardous Waste Data Interrogator for 2011 indicates very little material from this source was consigned. This is borne out by the data in Table 3 which shows only 10 tonnes of waste regarded as hazardous were dealt with at permitted facilities.

⁵ <http://www.farmbusinesssurvey.co.uk/DataBuilder/Default.aspx?Menu=Menu&Module=Counties>

Taking a more refined approach we have applied data from the Environment Agency Agricultural Waste Survey 2003 that reviewed waste arisings on different types of farms and practices applied. It did not however generate new data for actual quantities. Applying the arising data to the three farm categories identified in [Table 1](#). This gives a total value of **10,374 tonnes per annum** in Table 2 below.

Table 2: Waste Arisings Apportioned by Farm Type in the South East & Oxfordshire

Source: EA 1998 Survey (SE arisings) plus EA 2003 survey (incidence by farm type) plus Farm Business survey
 (farm type numbers) Table 1

	Arable	Livestock	Mixed/ Other	Total (tpa)
SE Total	15,242	14,478	11,708	41,428
Oxon	2,927	3,945	3,503	10,374

We believe this value is stronger than the previous because it reflects the different profile of farms within Oxfordshire. One shortcoming of this method is that the EA 2003 survey did not apportion every waste stream identified in the 1998 survey data. Therefore there is a shortfall between the regional total generated through this method and the value given in the 1998 survey of around 5,000 tpa. This represents 11% of the total (i.e. 5,000 as % of 46,500). To correct for the under-reporting the total taken has had a further 11% added i.e. $10,374 \times 11\%$ giving an arisings total of just over **11,500 tonnes per annum**.

2.2 Organic Agricultural Waste Arisings

As organic arisings may require specialist management in certain circumstances and also may provide feedstock for certain types of capacity e.g. AD, an attempt has been made to estimate quantities using production factors of organic waste from different types of farming unit operating at a standard size:⁶ The data used to derive the values presented in [Table 1](#) has been applied to these per unit production factors to generate a 'ballpark figure' for organic waste arisings in Oxfordshire. It is necessarily ballpark because:

⁶ Biffaward (2003). *Agricultural Waste Mass Balance: Opportunities for Recycling and Producing Energy from Waste Technologies*.

- the actual size of each unit in Oxfordshire is unknown; and
- a proportion (25%) of units are 'mixed' for which no production factor is given.

The outcome of this exercise is summarised in Table 3 below:

Table 3: Organic Waste Arisings Estimates by Farm Type in Oxfordshire (tonnes per annum)
 Source: Farm Business survey (farm type numbers) Table 1 plus Agricultural Waste Mass Balance

Type	Dairy	Pigs	Beef	Arable	
Oxon units (n)	51	26	550	395	1,022
Slurry	68,731	78,697	0	0	150,428
Farmyard manure	11,666	44,595	353,713	0	412,337
Silage effluent	1,768	0	8,802	0	10,585
Milk waste	36	0	0	0	36
Animal carcasses	44	136	825	0	1,014
Animal tissue	24	0	550	0	576
Baled straw	0	0	0	107,824	108,097
Vegetable/cereal residue	0	0	0	13,034	13,067
Ploughed in straw	0		0	28,042	28,113
Organic Total	82,320	123,455	364,440	149,294	719,509

Taking the total value - 719,509 tonnes - and adding it to the 11,500 tonnes of non-organic waste estimated and accounting for the fact that 25% of the farm population is not counted in the Table (being mixed) suggests that the 900,000 tonne per annum value cited in the OWINA for all agricultural waste is within the right ballpark. It also confirms that organic waste represents 98% of production. Of most interest in terms of feedstock potential is the circa 200,000 tonnes of slurry, manure and silage effluent produced by the intensive farming units - dairy and pig production.

Table 4: Agricultural Waste Arisings Estimates in Oxfordshire (tonnes per annum)
 Rounded

	Tpa	Running total tpa
Organic Farm Waste Arisings Estimate	719,500	719,500
25% correction for mixed NB: same profile assumed as across Table 3.	179,900	899,400
Non Organic Farm Waste Arisings	11,500	910,900

3 Management Options

The DEFRA

three options for managing agricultural waste as follows:

1. Take the waste off-farm to an appropriately permitted facility or engage a waste management contractor to do so.

2. Apply to the Environment Agency for a permit to manage certain waste on-farm.⁸

The Environment Agency considers manure and slurry used as feedstock materials for anaerobic digestion (AD) to be wastes. It has introduced standard rules permit for the digestion or composting of manures and slurries on farms. Where the only waste feedstock to an AD plant is agricultural manure and slurry the digestate output is not classed as waste if it is spread as a fertiliser on agricultural land. Hence the input waste ceases to be a waste and will no longer be counted.

3. Register an appropriate exemption with the Environment Agency to recover or dispose of some waste on-farm. Most activities involving the storage, recycling and disposal of farm wastes can be registered as exempt from the need to have an environmental permit.

Exemptions relevant to farmers include:

- the anaerobic digestion of manures and slurry
- composting vegetation waste
- using rubble from a demolished farm building in the foundations of a road
- treatment of sheep dip or pesticide washings for disposal

In the case of options 1 to 2 the waste managed would be recorded via the Waste Data Interrogator (WDI). A summary of this data for 2011 is presented in the following section.

⁷ DEFRA 2006 Product code PB 11674

⁸ Intensive farming units such as pig or poultry farms are subject to environmental permitting. In some cases a waste processing facility such as an anaerobic digestion plant may be operated as part of the existing permitted installation.

4 Quantities managed through Permitted Capacity

A search of the Environment Agency Waste Data Interrogator identified that in 2012, a total of 1,480 tonnes of waste from agricultural sources (EWC⁹ chapter 02 01) in Oxfordshire was managed at permitted sites. Table 4 presents a breakdown of this in terms of nature and type.

Table 5: Waste Arising from Oxfordshire Classed as Agricultural Waste Managed at Permitted Facilities

(Source: EA WDI 2011)

EWC Waste Description	Tonnage
Animal-tissue waste	1,083
Plant-tissue waste	305
Waste plastics (except packaging)	51
Animal manure (including spoiled straw) treated off-site	38
Agrochemical waste containing dangerous substances	2
Agrochemical waste not containing dangerous substances	1
Grand Total	1,480

As the majority of waste managed appears to be of an organic nature taking the baseline estimate of 11,500 tpa of non-natural waste, this suggests that a very small amount of this type of waste (54 tonnes) was managed at permitted sites likely to be managing waste from other commercial and industrial sources.

However this table doesn't include the following waste types which are known to be produced on farms but are counted in the WDI under other waste codes. The main types are listed below with total tonnages handled from Oxfordshire at permitted facilities in 2012. The actual proportion that can be attributed to farms (as their source) is unknown.

- Agricultural packaging such as plastic film which is explicitly excluded from the Chapter 2 count (<700 tonnes),
- End of Life vehicles such as tractors (4,000 tonnes);
- tyres (5,500 tonnes) ; and
- asbestos construction waste (2,000 tonnes)

On this basis the amount of agricultural waste managed at permitted sites is likely to be higher than the circa 1,480 tonnes per annum indicated although not by a substantial amount.

⁹ EWC = European Waste Classification

5 Exemptions

To reduce the regulatory burden on agricultural waste producers, a specific range of activities exempt from permitting were introduced. Formal exemption from permitting is gained by simple registration of the activity on the Environment Agency website. The activities range from the deposit of toilet waste from portaloos through to burning of certain wastes and deposit of certain specified waste to confer agricultural benefit and a register is maintained of all registered activities. As there is no cost associated with registration, farms may have registered for all possible exemptions that may apply to their waste related activities to ensure that the risk of exposure to enforcement action is minimised. As such, the exemption register can be expected to over report the actual number of activities taking place. This over reporting may be offset by the fact that some activities may not have been registered as exempt at all - registration being voluntary - the actual numbers are unknown.

Examination of the exemption register for Oxfordshire indicates that just over 2,500 (2,547) exemptions for agricultural waste and just under 1,000 (968) exemptions that involve agricultural and non agricultural waste are registered in Oxfordshire. Those classes of exempt activity for which more than 20 registrations are listed are presented in rank order in Table 5 below.

Table 6: Registered Exemptions in Oxfordshire involving Agricultural Waste in Rank Order
 (Source: Environment Agency)

Code	Activity	Agric only	Agric plus
D7	Burning plant material waste in the open	362	121
D1	Deposit of waste from dredging of inland waters	272	85
U10	Spreading various waste on agricultural land to confer benefit	238	104
T6	Treatment of plant tissue from agriculture by chipping, shredding, cutting or pulverising	208	82
U1	Use of waste in construction inc soil from cleaning and washing fruit & vegetables	192	133
U8	Use of waste for a specified purpose inc End-of-life tyres as a weight on cover sheeting on agricultural premises	191	84
U13	Spreading of plant matter to confer benefit	124	37
D4	Deposit of agricultural waste consisting of plant tissue under a Plant Health Notice	119	0
U14	Incorporation of ash from from burning cereal straw or stubble or from burning wastes under exemption D7 into soil	96	27
T23	Aerobic composting of plant tissue waste and associated prior treatment	91	34
U4	Burning of plant tissue waste as a fuel in a small appliance	88	46
T1	Cleaning, washing, spraying or coating relevant waste inc plastic packaging from agriculture eg wash waste plastic drums so that they can be reused or sold for reuse	83	16
D6	Disposal of plant material and wood by incineration	79	12
S2	Storage of waste in a secure place inc Farm plastics (non packaging) and poultry litter ash	73	34
U12	Spread mulch from untreated wood and plant matter as a protective covering onto land.	65	30
S1	Storage of waste in a secure place pending recovery inc plastics and plastic packaging	53	18
T32	Treatment of non-hazardous pesticide washings in a biobed or biofilter	27	6
U15	To allow pig and poultry carcass ash to be mixed with slurry and/or manure and spread on farmland.	26	
T4	Preparatory treatments (baling, sorting, shredding etc) inc plastics	22	14

Care must be taken when considering these exemptions as they can involve the receipt of waste from non-agricultural sources onto agricultural land which is beyond the scope of this exercise. An example would be receipt of hardcore to build farm tracks.

As the purpose of this exercise is to identify the agricultural waste that may require taking to facilities intended specifically to manage waste, those exempt activities identified in Table 6 which involve on farm treatment, use or disposal have been excluded from further consideration and Table 6 below shows the four remaining significant exemptions in rank order.

Table 7: Registered Exemptions Requiring Off-site Treatment
 (Source: Environment Agency 2013)

Code	Activity	unit	Agric only	Agric plus
T1	Cleaning, washing, spraying or coating relevant waste inc plastic packaging from agriculture eg wash waste plastic drums so that they can be reused or sold for reuse	Store up to 300 tonnes at any one time for up to 3 months; treat up to 300 tonnes of waste over any seven-day period; no more than 1 tonne stored over any seven-day period	83	16
S2	Storage of waste in a secure place inc Farm plastics (non packaging) and poultry litter ash	500 tpa plastic; 3,000tpa poultry litter ash	73	34
S1	Storage of waste in a secure place pending recovery	store up to: 400 m3 plastics and plastic packaging at any one time; 3 m3 waste oil or absorbents at any one time	53	18
T4	Preparatory treatments (baling, sorting, shredding etc) inc plastics	treat up to 100 tonnes outside in any seven-day period; treat up to 3,000 tonnes indoors in any seven-day period; store up to 500 tonnes at any one time.	22	14

This indicates that up to 313 exempt activities that may subsequently result in agricultural waste being managed offsite are currently registered in Oxfordshire.

Due to the imprecise and non-specific nature of the exemptions it is not possible to attribute tonnages managed through these routes. However it may be reasonable to assume that some of the waste managed through these activities ends up at permitted facilities and the tonnages of waste are therefore recorded at that point. (i.e. captured in [Table 4](#) above).

6 Collection Capacity

In order to verify the conclusion around exemptions a rapid review of agricultural waste collectors that serve Oxfordshire was undertaken via an internet search. The sample identified is listed in the Table below

Table 8: Sample of Agricultural Waste Collectors

Name	Base	Materials Collected	Comment
R C Baker	Banbury	Cardboard & Plastics	in association with Agri.Cycle based in Lincs
Shorts Agricultural Services	Berkshire	Cardboard & Plastics	Collected and baled in Berks
Solway Recycling Ltd	Dumfries	Cardboard & Plastics inc Bale Wrap & Silo Covers	Operate national collection network inc free collection from farms. Waste is then baled for onward recycling.
Grassroots Recycling	Wiltshire	Cardboard & Plastics	

This illustrates that there are collection networks in place that will either feed or be fed by exempt activities. These facilities may require express planning consent. For example a farm in West Sussex is known to have obtained consent for baling plastic and cardboard from agricultural sources for a tonnage not exceeding 100 tonnes pa. Such activities may also lead to the need for aggregation or even processing facilities but these are likely to be located in areas that serve a wide regional market. e.g. Lincolnshire.

7 Processing Capacity

Some of the consented capacity at the organic waste processing facilities in Oxfordshire will receive farm waste as part of the feedstock. In particular an Anaerobic Digestion facility at Upper Farm Warborough with a total capacity of 33,000 tpa of which 9,000 is for pig manure in liquid form. In light of this, consideration should be given to how the Plan provides for the development of on farm AD and composting facilities and how available consented capacity might be affected by provision for organic wastes from agricultural sources.

8 Conclusion

The arising estimates indicate that non natural agricultural waste represents a relatively small proportion of the total quantity of waste produced in Oxfordshire. Of that an unknown amount is already managed through the formal management system without currently posing apparent capacity challenges. Tonnages are also dealt with through activities exempt from the need for a permit and providing the exemptions remain in place this suggests that any additional demand for separate management of this stream will not be significant. There is an established collection network for certain materials feeding or fed by exempt sites. The potential introduction of organic waste from intensive farming units in particular is something that the Plan could seek to take account of if taking a feedstock focussed approach.