

Environmental Impact Statement

relating to

Proposed 900 Sow Integrated Pig Unit

at

Ballynameelagh, Cappagh, Co. Waterford

for

Mr. James McGrath,

***Ashleigh House, Ballynameelagh, Cappagh,
Co. Waterford.***

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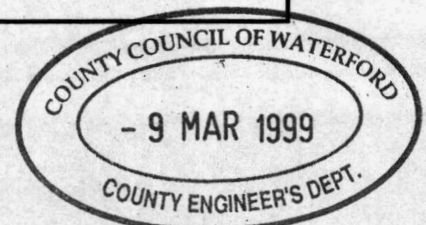


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1. NON-TECHNICAL SUMMARY

- 1.1 This proposal to expand the existing unit to a 900 sow integrated unit at Ballynameelagh, Cappagh, Co. Waterford is being put forward by Mr. James McGrath. The unit will conform to the highest standards. The proposal is fully in line with government policy aimed at increasing the competitiveness of the Irish Pig Meat Industry.
- 1.2 The development will occupy a landscaped site of approximately 4.37 hectares (10.8 acres). The proposed works involve including the forthcoming E.C. Regulations on Animal Welfare.
- 1.3 The buildings and their layout are state of the art for the industry. All clean water is separated from soiled water. Clean water is discharged independently to the adjoining stream and all soiled water is discharged to underfloor storage tanks.
- 1.4 Annual pig production is estimated at 21600 pigs (i.e. 415 pigs per week).
- 1.5 The pig unit will give direct employment to 5 staff and a trained manager. It will also give rise indirectly to another 21 jobs in the pig meat processing, milling and service sectors.
- 1.6 Annual slurry production is estimated at 16650 m³ and underfloor storage is 11987 m³ after allowing for accumulation of gases. This is enough for 37.4 weeks storage.
- 1.7 The pig slurry will be spread on 1110 hectares (2743 acres) after deductions of well drained productive farmland at an average rate of 15 m³/hectare (1330 gallons per acre). Cattle slurry produced on the spread farms (16985 m³) will be spread at an average rate of 15.3 m³/hectare (1360 gallons per acre).

A nutrient management plan has been prepared for every farm within the spreadlands. The nutrient management plan has taken into account the phosphorous level in the soil, the phosphorous produced on the farm, the phosphorous in pig manure and the limit to the amount of nitrogen that can be spread from organic manure (i.e. 250 kg/ha).

Spreading during the growing season only will further protect against nitrate-nitrogen contamination of groundwater.

- 1.8 Steps have been taken in the selection of the spreadgrounds and in designing the management of the spreading to ensure that no contamination of surface and ground water takes place.
- 1.9 Farmers in the area have pledged a total area of 2785 hectares, (1590 spreadable hectares) for slurry spreading. The spreadlands require 48062 kg of phosphorous. Using pig manure to help satisfy the phosphorous deficit the spreadlands could utilise 30373 kg of phosphorous. The proposed development will generate 19980 kg of phosphorous. This means that there is a land reserve of 52%.
- 1.10 Geotechnical and Environmental Services Limited were requested by M.S. Farm Services on behalf of Mr. Jim McGrath to carry out an independent assessment of the landbank where it is proposed to dispose of slurry generated from the existing piggery development. The spreadlands are mainly located in the area between Cappoquin and Dungarvan.

The study in general comprised the assessment of soil conditions, surface water and groundwater and their inter-relationships in the landspread areas, with an assessment of the potential impact of landspreading on the surface water and groundwater environment.

Both desk and site, works were undertaken, together with the preparation of a report. Areas deemed unsuitable as a result of the desk study were eliminated and the remaining areas were assessed in the field. 138 (No.) auger holes were excavated to determine the nature and thickness of subsoils (c.f. **Appendix 12**).

The topography of the area is characterised by undulating to rolling ground dissected by numerous small streams. These small streams feed the two main surface water features the River Blackwater and River Colligan. The lands in general appear well drained.

The most important criteria in the assessment of the required groundwater protection is the groundwater vulnerability, which in turn is dependent on the nature (permeability) and thickness of the subsoils overlying the bedrock. The subsoils in the study area are mainly glacial in origin, but the thickness, however can vary substantially.

Spreading restrictions including no spread areas and cordon sanitaires were imposed based on the available good practice guidelines and the hydrogeological (including the Waterford Aquifer Protection Scheme) topographical and land use data.

Samples were taken to establish the baseline surface and groundwater quality of the area. The surface water quality is in general typical of surface water quality in the Southeast region with some anomalies. The groundwater sampling points were considered to have variable degrees of well head protection.

In general the retained areas are considered suitable for landspreading at the low proposed spread rates. Provided good farm practice is applied the overall risk to the environment is considered low.

An Environmental Impact Assessment was carried out in support of this application. This entailed surveys of land quality in relation to soil drainage status, soil chemical fertility and farm husbandry practices. Surveys of water for quality analyses, geohydrological surveys and mapping of farmlands for spreadgrounds. Flora & Fauna, archaeological monuments and traffic levels were also noted. The following statements may be made:

(a) The lands selected as slurry spreadgrounds are well drained and are mostly deficient to low in phosphorus, one of the main plant nutrients supplied by pig slurry. No contamination of surface waters with run-off waters containing a high phosphorus content can be foreseen with the applied management. Neither will contamination of groundwater with nitrate-nitrogen take place. All lands with a soil P level in excess of 15 mg/l have been excluded from slurry spreading.

(b) The quality of the surface and groundwater leaving the area of the spreadground is good.

(c) The impacts from traffic, noise and odours at the pig unit are insignificant after all practical steps have been taken to mitigate them.

(d) Land spreading of slurry will be carried out using slurry tankers equipped with low trajectory splash plate or the band spreading method.

- 1.12 Proposals for monitoring surface and ground waters at the site and in the spreadgrounds and for monitoring soil fertility are set down in the Environmental Impact Statement. A register of slurry quantities, rates of spreading and location of spreadgrounds will be maintained for inspection and monitoring by Waterford County Council and the Environmental Protection Agency.
- 1.13 The flora, fauna and habitats of the site and spreadlands were studied. Flora and fauna should not be affected by the development or proposed spreading of slurry. Sensitive areas will be avoided in the spreadlands. Suitable margins along watercourses and hedgerows will remain as excluded zones to receive no slurry. There will be no loss of habitat.
- 1.14 There will be no damage to any site of archaeological or historic interest as a result of the development or slurry-spreading.
- 1.15 Disturbance of the landscape will be minimal during the construction period. The site will be suitably landscaped, with the planting of trees, etc., in a manner sensitive to the local environment.
- 1.16 There will be no negative effects on tourism in the area.
- 1.17 The applicant has applied to the Environmental Protection Agency for an Integrated Pollution Control Licence for this development.

2. INTRODUCTION

2.1 *Relevant Regulations for Environmental Impact Statements (EIS)*

This Environmental Impact Statement (EIS) is prepared in accordance with EC Council Directive 85/337/EEC, as effected in Ireland by the European Communities (Environmental Impact Assessment) Regulations 1989, S.I. No. 349 of 1989 and the Local Government (Planning and Development) regulations 1994 (S.I. 86 of 1994). Under these regulations it is required that an EIS be prepared for pig rearing installations where the capacity would exceed 3000 pig units on all soils other than gley soil. The proposed pig raising facility will carry 9000 pig units and accordingly requires the preparation of an EIS.

2.2 *National and E.C. Policy*

The proposed development is in line with national policy, (i) as expressed by the Minister for Agriculture on 10/7/1987 in a development plan for the Irish Pig Industry, (ii) as expressed in the Pig Production Group Report of 1988 and (iii) is in line with projected slaughterings of pigs at meat plants by the IDA, aimed at increasing the competitiveness of Irish pig meat in overseas markets. Irish meat plants have been updated in accordance with national and E.C. policy, entailing the expenditure of large sums of money by the promoters and substantial capital grant-aid by the Irish Government and the EC.

As recently as mid 1997 Teagasc launched a plan (Development of the National Pig Industry) to increase pig production in Ireland from 3.29 million pigs in 1996 to 4 million by the year 2000. Details of this plan are given in **Appendix 4**.

2.3 *Organisations and Bodies Consulted*

The scoping exercise of this EIS was carried out in line with previous submissions to Waterford County Council. Other organisations and bodies consulted include:

Geological Survey of Ireland.

Met Eireann.

Central Fisheries Board

Office of Public Works.

Department of Agriculture

Department of the Environment

National Parks and Wildlife Service

Teagasc, Johnstown Castle

Environmental Protection Agency

3. **DESCRIPTION**

3.1 *Overall Description*

The proposal envisages the expansion of the existing unit to a 900 sow integrated pig unit comprising the facilities necessary for a 900 sow integrated unit, a meal mixing room and associated meal and manure storage and distribution facilities. Drawings of the proposed new structures are presented in **Appendix 10**.

3.2 *Size and Scale of the Proposed Development*

The size and scale of the proposed development have been chosen after consideration of such matters as the site, land available for waste management, economic viability and labour efficiency.

In full production the pig population will comprise at any one time of the following: 701 dry sows, 199 suckling sows with bonhams, 3100 weaners pigs, 4500 fattening pigs, 65 maiden gilts and 20 boars. Pigs will be slaughtered at approximately 100 kg liveweight.

3.3 *Siting, Design, Construction and Structural Details*

The proposed development is situated on the site of an existing pig unit facility. Development involves the construction of new buildings and items of plant to accommodate the additional animal numbers. Details of siting and design are shown in Appendix 10.

3.3.1 *Construction Details*

A site location map and planning notice and a site plan are provided as part of Appendix 10.

3.3.2 *Design*

In arriving at an overall design to incorporate both new and existing buildings, consideration is given to colours of external facing materials to ensure maximum compatibility with the surrounding landscape. Also, features such as minimising ridge heights are an important element of the design process.

3.4 *Waste Production*

The main waste produced is pig slurry. Other wastes produced are animal carcasses, foul water and odour emissions.

3.4.1 *Types and Quantities of Waste*

The major waste product from the proposed pig unit is manure slurry. The yearly production of neat slurry amounts to 16,650 m³ and at 95% occupancy to 15,818 m³. All soiled water will be led to the underground slurry storage tanks.

Table 1	Slurry per week
701 Dry Sows x 53 Litres/Week =	37153
65 Maiden Gilts x 44 Litres/Week =	2860
20 Boars x 53 Litres/Week =	1060
199 Suckling Sows x 116.77 Litres/Week =	23237
3100 Weaners x 15 Litres/Week =	46500
4500 Fatteners x 34 Litres/Week =	153000
Total Weekly Production of Neat Excreta =	263810 litres/week 263.81 m ³ /week 13718 m ³ /year

a) Extraneous Water

In addition to this there will be 10% extraneous water for washing. This will add a further 26.38m³ to the above weekly figure or 1372m³ to the annual figure.

b) Surface Water from Dirty Yards.

The surface area of outside yards/passages which pigs will have access to is 1662m². This area, with a weekly average winter rainfall of 18mm, will add 30 m³ to the weekly figure above or 1560 m³ to the annual figure.

Table 2 Slurry Production

1	Neat Slurry	13718 m ³
2	Extraneous Water	1372 m ³
3	Surface Water from dirty yards	1560 m ³
	Grand total slurry production (m³)	16650 m³
	*Total slurry storage capacity (m³)	11986.64 m³
	Slurry storage capacity (weeks)	37.4 wks.

***For details see Appendix 18**

3.4.2 *Animal Carcasses*

The anticipated number of animal carcasses for disposal due to mortalities on an annual basis is estimated as follows:-

Sows	@	4%	=	36
Piglets	@	8%	=	1730
Weaners	@	1.5%	=	290
Fattening Pig	@	1%	=	207

Carcasses will be temporarily stored in a sealed metal skip for transport and disposal to a rendering plant at least once a week. A signed agreement to this effect is given in **Appendix 6**.

3.4.3 *Air Emissions*

Odours and emissions are minimal from modern pig units and are hardly detectable 100 metres from the unit on the downwind side. Removal of slurry from storage tanks is by tanker armoured suction hose inserted into the tank with minimal odour release. Odours can arise during land spreading of the slurry and measures to minimise these are dealt with under 'Slurry Disposal Proposals' section 3.6 and 'Air Quality', Art 5.3.4.

3.5 *Slurry Storage Proposals*

All slurry will be stored in underslat reinforced concrete tanks, specified to provide a watertight seal and constructed according to Department of Agriculture specifications. The total slurry storage capacity available is 11,986.7 m³ after allowing a 225mm freeboard for the accumulation of gases. This provides 37.4 weeks storage capacity. Details of the tank constructions are shown in **Appendix 10**.

3.6 *Slurry Disposal*

It is proposed to landspread all the slurry on 1590 hectares (3929 acres) gross and 1110 hectares (2743 acres) net of productive grassland and tillage land.

Farmers have pledged a total of 2785 hectares (6879 acres) of land for the unit, agreed in writing (**Appendix 3**). Farm No's 2,5,10,12,17,20,22,32,35,40,42, and 44 have been excluded for various reasons. Farm No's 13,14,21,24, 25,26,27,28,29,30,31,37,43, and 46 are kept as reserve land, (c.f. Table 4). The names locations and total areas of lands pledged are listed in Table 3 overleaf..

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Table 3 DETAILS OF OWNERSHIP OF SPREADLANDS

Farm No.	Name & Address	Townland	Total Area		Map
			Ac.	(Ha)	Sheet No.
1.	Matt Fogarty Farrenbullen Cappagh Co. Waterford	Farrenbullen Balllynameelagh Lower	150	(60.70)	W.30
2.	Margaret Barron Ballynahemery Cappagh, Co. Waterford.	Ballynahemery	80	(32.37)	W.30
3.	William Buckley Cappagh, Co. Waterford.	Ballynamindra Cappagh	215	(87.01)	W.30
4.	Brendan Buckley Cappagh Co. Waterford	Cappagh Kerren Upper Aglish	130	(52.61)	W.30
5.	John Cashman Rockfield Co. Waterford	Rockfield Balllygambon Upr. Shanbally	184	(74.46)	W.30 W.21

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Farm No.	Name & Address	Townland	Total Area		Map
			Ac.	(Ha)	Sheet No.
6.	James Quinn	Bawnavinogue	286	(115.74)	W.30
	Bawnavinnoge	Clonkerlin			W.22
	Cappagh	Boherawillin			
7.	John McGrath	Dromroe	92	(37.23)	W.30
	Dromroe East				
	Cappoquin				
	Co. Waterford				
8.	Michael Quinn	Ballygambon	300	(121.41)	W.30
	Ballyhane	Lower			
	Cappoquin	Knockyoolahan			W.21
	Co. Waterford.	Boherawillin			W.22
9.	James Meagher	Ballyhane	160	(64.75)	W.22
	Ballyhane	Glengoagh			W.34
	Cappoquin				W.30
	Co. Waterford				
10.	James Prendergast	Ballyhane	120	(48.56)	W.30
	Ballyhane	Knockanskagh Lwr.			W.22
	Cappoquin				W.21
	Co. Waterford				

Farm No.	Name & Address	Townland	Total Area		Map
			Ac.	(Ha)	Sheet No.
11.	Joe Riordan	Affane	290	(117.36)	W.30
	Affane	Cappagh			W.21
	Cappagh	Deerpark			W.34
	Co. Waterford	Kilmore			W.29.
		Dromore			
12.	Tom Browne	Kilclogher	86	(34.80)	W.30
	Kilclogher				
	Cappoquin				
	Co. Waterford				
13.	John O Donnell	Bridgequarter	158	(63.94)	W.30
	Bridgequarter				
	Cappoquin				
	Co. Waterford				
14.	Paddy Lynch	Whitechurch	35	(14.16)	W.30
	Whitechurch				
	Cappagh				
	Co. Waterford				
15.	Tom Ahearne	Scart	216	(87.41)	W.30
	Scart				
	Cappagh				
	Co. Waterford				

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Farm No.	Name & Address	Townland	Total Area Ac. (Ha.)	Map Sheet No.
16.	Pat Murphy Knockaun Cappagh Co. Waterford	Knockaun	167 (67.58)	W.30
17.	Maurice Murphy Knockaun Cappagh Co. Waterford	Knockaun Lisroe	120 (48.56)	W.30 W.22
18.	David Landers Knockmaun Cappagh Co. Waterford	Knockmaun	90 (36.42)	W.30
19.	John Browne Boherwillin Cappagh, Co. Waterford.	Boherwillin Kerren Aglish	90 (36.42)	W.30
20.	Jim Cliffe Clonkerdon Cappagh Co. Waterford	Clonkerdon	24 (9.71)	W.30
21.	Wm. O' Brien Kilmolash Cappagh Co. Waterford	Kilmolash Knocknaglogh	160 (64.75)	W.35 W.29

Farm No.	Name & Address	Townland	Total Area Ac. (Ha)	Map Sheet No.
22.	Noel Griffin Knocknaskagh Cappagh Co. Waterford	Knocknaskagh Lower Knocknaskagh Upr.	180 (72.84)	W.30
23.	Tom Barron Carrowgarraff Cappagh Co. Waterford	Carrowgarraff Lisroe	285 (115.33)	W.23
24.	Sean Osbourne Ballingown Cappagh Co. Waterford	Ballinparka Dromore	142 (57.46)	W.34 W.35
25.	David Osbourne Ballingown Cappagh Co. Waterford	Coolanest Dromore	100 (40.47)	W.29 W.34
26.	John Connery Ballingown Villerstown Cappagh Co. Waterford	Ballingown Ballycullane	230 (93.08)	W.29 W.34 W.35
27.	Seamus Meskill Dromore Cappagh Co. Waterford	Dromore Woodstock	250 (101.17)	W.29 W.34

Farm No.	Name & Address	Townland	Total Area Ac. (Ha)	Map Sheet No.
28.	Tom Joe Hannigan Aglish Cappagh Co. Waterford	Knockalara	95 (38.44)	W.29
29.	John Cotter Aglish, Cappagh Co. Waterford	Aglish Woodstock Scart	198 (80.13)	W.29 W.22 W.30
30	Tom Moore Aglish Cappagh Co. Waterford	Aglish Dromore	164 (66.37)	W.34 W.29
31.	Roger Hayes Ballynaparka Aglish Co. Waterford	Ballynaparka	40 (16.18)	W.29
32..	Anne Power Ballymacinogue Dungarvan Co. Waterford	Ballymacmague	155 (62.72)	W.30
33.	Jim Curran Ballynahemery Cappagh Co. Waterford	Ballynahemery	45 (18.21)	W.30

Farm No.	Name & Address	Townland	Total Area Ac. (Ha)	Map Sheet No.
34	Michael Phelan Cul Mhuire Cappagh Co. Waterford	Cappagh Newtown	72 (29.31)	W.30 W.22
35.	John Power Ballynamintra Cappagh Co. Waterford	Ballynamintra Upper	130 (52.61)	W30
36.	Pat McGrath Ballynacourty Cappagh Co. Waterford	Ballynacourty	115 (46.54)	W.30
37.	Pat Looby Ballymulalla Cappagh Co. Waterford	Ballymulalla West	40 (16.18)	W.30
38.	Lar. Looby Kilcreaney Cappagh Co. Waterford.	Kilcreaney	160 (64.75)	W.30
39.	Gerald O Donovan Ballygambon Cappagh Co. Waterford	Ballygambon Scart	110 (44.51)	W.30 W.22

Farm No.	Name & Address	Townland	Total Area Ac. (Ha)	Map Sheet No.
40.	Michael O Keeffe Killeeshal Dungarvan Co. Waterford	Killeeshal	56 (22.66)	W.30
41.	Diarmuid Horgan Garryduff Dungarvan Co. Waterford	Garryduff	305 (123.43)	W.22
42.	Denis Looby Knockballiniry Ardfinnan Co. Tipperary	Knockballiniry	50 (20.23)	T.88
43.	James O Brien Parkmore Cappagh Co. Waterford	Parkmore Graigue More Garraun Upper	148 (59.89)	W.22
44.	Maurice Tobin Garraun Modelligo Co. Waterford	Garraun Vicarstown Sth.	65 (26.30)	W.22
45.	Cappoquin Estate Cappoquin Co. Waterford	Glen Upper Knockalahar	271 (109.67)	W.30 W.22

Farm No.	Name & Address	Townland	Total Area Ac. (Ha)	Map Sheet No.
46.	Edmond Scanlan Carraghroche Cappagh Co. Waterford	Dromore Curraghroche	136 (55.03)	W.34 W.29
47.	Paddy O Keeffe Ballynameelagh Cappagh Co. Waterford	Ballynameelagh	130 (52.61)	W.30
48.	Seamus Buckley Colligan Cappagh Co. Waterford	Carrowgarrieff Cappagh	140 (56.65)	W.22 W.30
49.	Anthony Broderick Mountstuart Aglish Co. Waterford	Lackenagreany Mountstuart	286 (115.74)	W.35
50.	Colm Broderick Mountstuart Aglish Co. Waterford	Lackenagreany Monalummery	176 (71.22)	W.35
51.	Joe Broderick Woodstock Keereen Co. Waterford	Woodstock	43 (17.40)	W.30

Farm No.	Name & Address	Townland	Total Area Ac.	(Ha)	Map Sheet No.
52.	Brian Doyle Rathdaniel Rathvilly Co. Carlow.	Clonkerdon	49	(19.83)	W.30
53.	Denis Lyndham/ Thomas Stamp Clonkerdon Cappagh Co. Waterford	Clonkerdon	40	(16.18)	W.30
54.	James Twomey Clonkerdon Cappagh Co. Waterford	Clonkerdon	18	(7.28)	W.30
55.	David Connors Balllygambon Lower Cappagh Co Waterford	Balllygambon Lower	60	(24.28)	W.30
56.	James McGrath Ballynameelagh Cappagh Co. Waterford	Ballynameelagh	78	(31.56)	W.30

3.6.1 *Existing Nutrient Levels & Claimed Loading Capacity of Soils*

Soil samples were taken from all of the lands signed up for slurry spreading. The results are shown in **Appendix 11**. On the basis of these results and the May 1995 recommendations from Johnstown Castle, the P requirement for each plot of land in each farm has been calculated (**Appendix 5**). No supplemental P is allocated to areas with P readings in excess of 10 mg/kg for grazing ground and in excess of 15 mg/kg for silage ground.

For the purpose of slurry spreading values of 0.6 kg P/m³ for cattle slurry and 1.2 kg P/m³ for pig slurry were used. The volumes of cattle and pig slurry to be applied on each plot is also calculated in **Appendix 5**. The average rates of slurry to be spread over the entire spreadlands are 15 m³/ha for pig slurry and 15.3 m³/ha for cattle slurry.

The names, locations and total area of lands pledged are given in Table 3

In relation to heavy metal, i.e., copper zinc it is shown in section 3.11 that these metals do not give rise to cause for concern. No mitigation measures are required.

It is proposed to spread the slurry using vacuum tankers equipped with low trajectory splash plates or band spreaders. Slurry will be spread strictly in accordance with the Teagasc Code of Good Practice for Slurry Spreading (**Appendix 13**) and the BATNEEC notes for the Pig Production Sector (EPA 1996).

3.7 *Slurry Tankers Owned and Available*

The developer will provide one vacuum tanker for the purpose of spreading the pig slurry, spreading contractors and farmers will transport the remainder.

3.8 Agreements for Slurry Spreading

Neighbouring farmers have pledged 2785 ha of land for slurry spreading. Copies of agreements signed by the farmers are included in **Appendix 3** along with maps identifying the farm spreadgrounds (**Appendix 1**).

Farms in the spreadgrounds over-winter their cattle indoors. The slurry produced over this period (normally 18 weeks) is collected and returned to the land during the growing season. Table 5 shows the total volume of cattle slurry produced on each farm and the volume of pig slurry required to meet the crop P requirements as calculated in **Appendix 5**.

3.9 Details of services required.

The estimated daily water requirement of the unit in full production is 50400 litres. Water is provided by a borehole on the site and this has sufficient capacity for the new development. The well details are shown in **Appendix 21**.

Electricity supply is provided by a 100 KVA transformer. A report from the Electricity Supply Board is provided in **Appendix 16**.

3.10 Details of Feedstuffs

About 100 tonnes per week of a balanced meal mixture will be consumed on the unit by all categories of pigs. This feed will be manufactured on site in the mixing room. Feeds will be blended on a least cost basis using the following raw materials (barley, wheat, soyabean meal, sugar beet pulp, pollard, soya oil, molasses, minerals and vitamins). Feed will be mixed with water prior to feeding to pigs using a computerised wet feeding system. All pigs will also have access to drip free nipple drinkers.

Copper is added to the meal mixture at the rate of approx. 0.5 kg of copper sulphate($\text{Cu SO}^4 5\text{H}^2\text{O}$) per tonne of meal for growing and finishing pigs. This gives rise to slurry with a copper content of 30mg/l copper. It is not proposed to supplement the meals with zinc.

3.11 Maximum Soil Contaminant Concentration

The pig slurry spread will not add any contaminant to the lands used for land-spreading. The elements in the pig manure comprise chiefly carbon, oxygen, hydrogen and nitrogen with lesser amounts of phosphorus, sulphur and copper. At an application rate of 15.0 m^3 /hectare, the application rate of 0.45 kg/hectare Cu is less than 3% of that permitted in EC Directive 86/278 on the application of sewage sludge to agricultural land.

4. DESCRIPTION OF ALTERNATIVES CONSIDERED

4.1 Alternative Sites Considered

As sizeable pig houses already exist at the proposed site no alternative site was considered.

4.2 Alternative Site Layout and Designs

Alternative site layouts and designs were considered. The optimum depth of tank was decided upon on the basis of air draughts, capacity and costs etc. Generally the most economical and efficient layout for pig production and pig movement was designed for.

4.3 *Alternative processes considered*

There is no other satisfactory alternative process for pig production. Land-spreading is the one practical economic means of utilising the nutrients in pig slurry and is in line with the current thinking on resource recovery. The method of landspreading proposed (i.e. low trajectory splashplate/band spreading) is very practicable and should minimise odours emitted from slurry.

5. **DESCRIPTION OF EXISTING ENVIRONMENT**

5.1 *Location of Structures*

The site location map (Ordinance survey, map sheet no. 30, County Waterford) and site plans are included in **Appendix 10**. The proposed unit is located in the townland of Ballynameelagh, approx 400m from the public roadway, and at an elevation of 20m. The pig unit is about 7.5 km from Cappoquin and 10km from Dungarvan. It is located in a wholly agricultural area.

5.2 *Land Spreading Area*

5.2.1 *Ordinance Survey Maps*

Ordinance Survey Maps (1/10560) are enclosed with the EIS (**Appendix 1**).

5.2.1.1 *Spreading areas*

Spreading areas are outlined in Red. The adjusted area of the spreadgrounds is 1109.8 hectares, and the adjusted area of the reserve spreadgrounds is 480.4 hectares.

5.2.1.2 *Watercourses*

All relevant watercourses and wells are shown in Blue on maps in **Appendix 1**.

5.2.1.3 *Dwelling Houses*

All property (dwellings, factories etc.) in the vicinity of the unit and landspread areas is shown in Green (**Appendix 1**).

5.2.1.4 *Sites of archaeological and historic interest*

Sites of archaeological and historical interest in the area of the spreadlands have all been identified in **Appendix 1** on the spreadland maps and an Archaeological Report is supplied in **Appendix 9**.

5.2.1.5 *Unsuitable Land*

Areas considered for slurry spreading but deemed unsuitable are excluded and indicated on the maps in **Appendix 1** (shaded Orange).

5.3 *Assessment of Land-Spread Areas*

5.3.1 *Introduction*

Geotechnical and Environmental Services Limited were requested by M.S. Farm Services, on behalf of Mr. James McGrath, Ballynameelagh, Cappagh, to carry out an independent assessment of an area of land where it is proposed to dispose of slurry generated from an existing piggery development. The proposed landspread areas are situated in the broad environs of the Cappoquin-Dungarvan area. This assessment is submitted in full as **Appendix 12**.

The assessment is required as part of an application to the Environmental Protection Agency for an IPC (Integrated Pollution Control) Licence, and a planning application to Waterford Co. Council.

The study comprises an assessment of the soil conditions, surface water and groundwater and their inter-relationship in the area in which it is proposed to dispose of the slurry, together with an assessment of the potential impact of land application of slurry.

The study was undertaken in May 1998 and comprised the following approach.

- ◆ A desk study of the available information on the Geology, Hydrogeology and Subsoils (nature and thickness) for the region.
- ◆ Walk-over survey to visually inspect and assess each proposed landspread plot. This involved walking approximately 30 km through the lands making observations on the geology, subsoils and hydrogeology features of the area.
- ◆ Site investigations involving the excavation of 138 No. auger holes.
- ◆ Elimination of areas deemed unsuitable for landspreading.
- ◆ Preparation of the report.

This report provides information on the following items:

Description of Existing Environment

Physical Features

- ⇒ Location of the proposed landsread plots
- ⇒ Natural and artificial surface water features
- ⇒ Existing land-use
- ⇒ Topography, slopes and surface water run-off susceptibility

Geology and Hydrogeology

- ⇒ Geological description of solid bedrock and subsoils
- ⇒ Permeability assessment of the subsoils
- ⇒ Depth to bedrock information
- ⇒ Aquifer classification
- ⇒ Groundwater vulnerability
- ⇒ Aquifer resource assessment and application of the code of practice (EPA/GSI matrix) for resource assessment
- ⇒ Local Hydrogeology
 - Borehole locations
 - Localised groundwater flow

Assessment of the likely impact of landspreading

The proposed landspread farms are grouped into larger, geographically similar plots, which are independently assessed based on Risk Management Principles.

Taking into account: The existing environment and the available guidelines on good farm practice,
Assessment guidelines for landspreading areas,
Guidelines on aquifer vulnerability and protection.

This report is a component of an overall integrated landbank assessment coordinated by M.S. Farm Services.

Sources of Information

The sources of information used in this study are as follows;

The 1:100,000 scale Geology map of East Cork-Waterford (Sheet 22), (GSI, 1995).

The Co. Tipperary (South) and the Co. Waterford Groundwater Protection Schemes prepared for Tipperary Co. Council (South Riding) and Waterford Co. Council by the Geological Survey of Ireland.

Information collected as part of the licence application on behalf of the client.

5.3.2 GENERALISED DESCRIPTION OF THE EXISTING ENVIRONMENT

5.3.2.1 Topography, Surface water features and climate

The majority of the proposed spreadlands are situated in the Cappoquin-Dungarvan area, north and south of the N72 road. The remaining spreadlands are located to the south of Lismore and west of the River Blackwater. One proposed spreadland is located west of Newcastle, Co. Tipperary (see Figure 1(A), 1(B) & 1(C) for proposed landspread locations, **Appendix 12**).

The regional topography comprises undulating to rolling hills, which generally slopes towards the surface water features. The topography reflects the underlying geological deformation of the bedrock, which results in broad, approximate east-west trending valleys and hills.

The dominant surface water features are the River Blackwater, to the west, which is tidally affected, and the Colligan River to the east. The Goish River, the Finisk River and the Magaha River discharge into the dominant surface water features along their course. These large surface water features are fed by a number of smaller streams and drainage ditches. Natural shallow groundwater flow contributes baseflow to the total surface flow.

Annual precipitation is recorded as approximately 1,200mm/yr, with the wettest period occurring from September to January. Groundwater recharge takes place almost exclusively in the winter months due to low vegetation moisture demand and high moisture content. Some summer recharge is possible during prolonged heavy showers, when the precipitation exceeds the vegetation moisture demand.

5.3.2.2 Geology

Bedrock Geology

Reference to the 1:100,000 Geological Survey of Ireland geology sheet 22 indicates that the proposed landspread region is underlain by sedimentary rocks of Devonian and Carboniferous age (see Figure 2(A) & 2(B), Appendix 12).

The Devonian rocks mainly occupy the high ground, shown in Figure 2(B) by the brown and green colours. The Carboniferous rocks mainly occupy the valley floors and low-lying regions, (shown in Figure 2(B), Appendix 12, by the blue and purple colours).

Devonian

The oldest bedrock to occur in this region is the Ballytrasna Formation, which comprises approximately 90% dusky-red mudstone, while the remainder comprises pale-red, fine-medium grained sandstone.

The Knockmealdown Formation is sandstone dominant. It is broadly upward fining, with conglomerates and conglomeratic sandstones being quite common near its base, but dying out upward into sandstones.

The Kiltorcan Formation comprises sequences dominated by thick-bedded, green, yellow and white coloured sandstones arranged in fining upwards cycles with interbedded purple and green mudstone.

The Gyleen Formation is thought to be partly time equivalent to the Kiltorcan Formation, which occurs mainly to the north, whereas the Gyleen Formation occurs mainly to the south. It is characterised by alternating mudstones and sandstones.

Carboniferous

The Lower Limestone Shales consist of a number of formations, which are grouped together because they are too thin to show separately. The Crow's Point Formation comprises approximately 92% sandstone and 8% mudstones and shales. The Mellon House Formation consists of a sequence of thin-bedded skeletal limestones and alternating calcareous and non-calcareous silty mudstones. The Ringmoylan Formation consists of fossiliferous, calcareous mudstones and subsidiary limestone. The Ballyvergin Formation is characterised by greenish grey, non-calcareous mudstone and a distinctive assemblage of reworked material.

The Ballymartin Formation is a thinly bedded succession of interbedded dark grey coloured nodular muddy limestones and calcareous shales.

The Ballysteen Formation appears to comprise dark grey bioclastic limestone, which become increasingly muddy upwards. The formation is thought to be in the order of 300m thick.

The Waulsortian Limestone Formation occurs extensively in this area. The limestone is predominantly a massive calcareous mudstone, containing original cavities filled with internal sediments and calcareous cements. The Waulsortian Limestones are typified by zones of intense fracture cleavage, which affects the permeability of the rock mass dramatically. The Waulsortian occurrence is restricted to the low lying areas.

The Silverspring Formation overlies the Waulsortain Limestone and comprises pale coloured, bedded cherts and dark biomicrites. Large volumes of chert characterise the formation, decreasing upwards until dark grey siliceous limestone dominates.

The Kileshin Formation overlies the Silverspring Formation with a gradational contact between the two. It consists of clean to slightly argillaceous limestone with occasional nodules of chert.

Structure

The bedrock in this area of Co. Waterford and Co. Tipperary was deformed during the Variscan Orogeny at the end of the Carboniferous Period. The structural deformation of the rocks in the Cappoquin-Dungravan area is generally more intense than further north into Co. Tipperary.

In outline, approximately east-west trending anticlines and synclines dominate the structure of this part of Waterford. The major synclines are large, upward facing open structures. Second and third order folds are developed on the flanks of the major folds.

Cleavage is well developed in the Cappoquin-Dungarvan area. Within the Waulsortian Limestones zones of intense cleavage, accompanied by extensive recrystallisation and calcite veining, occur in places.

Most of the major fold limbs are cut by strike-parallel faults. North-south cross faults are very common throughout the area. These structures generally trend between 10° and 30° west of north. Across these faults there appears to be a noticeable change in strike of second order fold axes. These faults give rise to a series of dislocated blocks or compartments, which also tends to result in compartmentalised hydrogeological units.

Subsoils Geology

The origin of the subsoils, within the proposed landbank is associated with the movement of ice sheets during the last glaciation of the Quaternary Period. The deposits from the ice sheets infilled, or partially infilled hollows and valleys in the preglacial topography. The ice sheets retreated in a series of steps or halt stages. There are thick deposits associated with these halt stages, which are frequently represented by morainic complexes.

The fine-grained materials (SILTS, CLAYS and TILLS) associated with these ice sheets are widely distributed throughout the area. Coarse grained deposits (SANDS and GRAVELS) are mainly of glaciofluvial origin, which take the form of various types of outwash deposits, including moraines, kames and eskers.

Reference to the relevant Quaternary information for Co. Tipperary and Co. Waterford indicates that a TILL overlies the bedrock. In Co. Waterford the TILL is derived from Sandstone provenance, while in Co. Tipperary it is of Limestone provenance. Small pockets of SAND and GRAVEL are recorded throughout the region. This is considered to have a higher permeability than the Sandstone and Limestone TILL. Along river sections Alluvium is recorded.

The existing information on the thickness of subsoil indicates that the depth to bedrock is very variable in this region. Records of rock at the surface are numerous throughout the area, however findings from the site investigation indicates that within 10 metres of outcrop subsoils can thicken appreciably. This illustrates the variation in thickness which was encountered throughout the area. The suitability assessment of the proposed spreadlands takes into account the augering information and visual assessment.

5.3.2.3 Site Investigation

138 No. auger holes were excavated using a tractor mounted, hydraulically operated auger. The auger forms a hole approximately 150mm in diameter and it is possible to examine the soil type as the auger is rotated into the ground. It is possible to auger to a depth of at least 1.0m using this system unless bedrock or large boulders are encountered.

The procedure results in minimal disruption to the ground and the holes are backfilled and compacted on completion of the drilling.

Detailed logs of the site investigation are appended to Appendix 12 and locations are shown in Figures A1(A), A1(B) & A1(C). The results are discussed in Section 6 of Appendix 12.

Based on the information gathered from the augering, the soil profile was found to comprise between 0.2m and 1.0m of TOPSOIL overlying subsoil which generally comprised brown coloured, SOFT to FIRM (occasionally STIFF) CLAY. In some areas a brown to grey, LOOSE to MEDIUM DENSE, clayey SAND and GRAVEL was found underlying the CLAY.

5.3.2.4 Hydrogeology

The consolidated material (bedrock geology) of this area is old and indurated, hence most of the original depositional features, such as original permeability and porosity, are no longer present. In these type of strata secondary permeability is dominant. The principal geological processes that develop secondary permeability (fissures/fractures/joints) in rocks are structural movement, solution due to groundwater movement and general weathering.

These are all somewhat irregular processes, as is the permeability created in the rocks. The permeability developed by these processes will be greatest in the clean, competent, coarser grained and uniform strata, such as limestones and sandstones.

The thick geological succession with numerous different lithologies, complex structure and wide variation in permeability leads to a complicated hydrogeological regime and closely spaced groundwater boundaries.

On the basis of results of well surveys, pumping tests, geophysical well logging, resource calculations and surface water flow investigations the geological strata are divided into an aquifer classification. The aquifer classification is listed below (see also Figure 2(A) & 2(B), Appendix 12).

When considering groundwater flow regimes three factors should be kept in mind:

1. The complexity of the geology.
2. The large volumes of available recharge.
3. The Quaternary drift deposits.

The Ballytrasna Formation and the Knockmealdown Formation are both classified as **Locally Important Aquifers** which are moderately productive only in localised zones. The Kiltorcan Formation is classified as a **Regionally Important Aquifer**, where the groundwater flow is predominantly through fractures and fissures. The Gyleen Formation, the Crows Point formation, the Lower Limestone Shales, the Ballymartin Formation and the Ballysteen Formation are all classified as **Locally Important Aquifers**, which is moderately productive only in localised zones. The Waulsortian Limestone Formation, the Silverspring Formation and the Kilsheelan Formation area all classified as **Regionally Important Aquifers**, where groundwater flow is through karst conduits.

Based on the available hydrogeological information approximately 60% of the proposed landbank is underlain by the Waulsortian Limestone Formation and the Kiltorcan Formation, **Regionally Important Aquifers**, where the groundwater flow is predominantly through either karst conduits or fissures and fractures within the rock mass.

The groundwater vulnerability is also very varied over the proposed spreadlands. The available information indicates that approximately 30-35% of the proposed landbank is located over aquifers that are classified as **Actually or Probably Extreme Vulnerability** land. The vulnerability of the remainder of the lands is assessed as **Probably High**. Within this area there are no ratings lower than high due to the subsoil thickness variation, which can change an order of magnitude within 100m.

When the aquifer classification is considered in association with the vulnerability rating a groundwater resource assessment is made. This land zoning provides a general framework for groundwater protection.

The location and management of potentially polluting activities in each groundwater protection zone is by means of **Groundwater Protection Responses**. By consulting a **Response Matrix**, it can be seen (a) whether such an activity is likely to be acceptable on that site, (b) what kind of further investigations may be necessary to reach a final decision, and (c) what planning or licensing conditions may be necessary for that activity. The groundwater protection responses are a means of ensuring that good environmental practices are followed.

The expected regional groundwater flow is expected to be towards in a general east or west direction, along the valley floor, with groundwater discharging into the major surface water features, i.e., the River Blackwater to the west and the Colligan River and the coast to the east.

The Waulsortian Limestone and the Kiltorcan Formations are very productive aquifers and are utilised for many of the public supplies in this region, which includes the Cappoquin supply (Kiltorcan Formation) and the Dungarvan supply (Waulsortian Limestone).

No obvious karst features were observed during the visual assessment or the site investigation of the proposed landspread areas. Further south, in Ardmore, Co. Waterford and Cloyne, Co. Cork, the Waulsortian Limestone displays abundant karstic features, which include well established cave systems, springs, sink holes and collapse features. Due to the subsoil cover in the Cappoquin-Dungarvan region karst features may not be well-defined or are obscured from view.

Obtaining good well yields from the limestone aquifers, which would be suitable for industrial and intensive agricultural requirements, is highly dependent on intercepting water filled conduits, fractures and fissures and also on the interconnectivity of these flow channels.

In areas of low permeability subsoils and moderate slopes a high proportion of the available recharge will become surface run-off.

5.3.2.5 Land use and Cropping History

The spreadgrounds consist of both grassland (for grazing and silage production) and tillage land (roots and cereals). Farm management standards on all farms included for land spreading is good.

5.3.2.6 Existing nutrient levels and chemical loading capacity of soils

The soil type on one farm is Grey Brown Podzolic (Soil association number 34. An Foras Taluntais, 1980). Grey Brown Podzolic soils are deep well-drained soils of loam texture and of high base status. These soils have a wide use range. Owing to their depth, free drainage, medium texture and good moisture holding capacity, they are first class grassland soils. They are also good tillage soils and are suitable for cereals and crops.

The soil types on the other farms are Acid Brown Earths (Soil Association No. 13) and Brown Podzolics (Soil Association No. 15). Acid Brown Earth soils have a wide use range and are very suitable for both tillage and grass production. Because of their sandy loam texture, free drainage and good structure, they are easy to cultivate and can produce a wide range of crops.

The Brown podzolic soils have similar land use ranges to the Acid Brown Earths. They have desirable structure, texture, drainage and depth features, and as a result, they have a wide range of potential uses and are well suited to arable cropping and grassland.

The nutrient status of the soil was determined by soil analysis. Soil samples were taken from lands representing 2785 ha (6879 ac). Full details of the analyses are shown in Appendix 11, and average P values for each farm are shown in Table 4.

Results of the chemical analyses (Morgan's Test) carried out at Teagasc Laboratories, Johnstown Castle, Wexford, showed that soil phosphorus (P) levels in the selected spreadgrounds are generally below that required for optimum production and could benefit from the application of slurry. Table 6 shows the quantities of pig slurry that can be used to help meet soil P requirements.

High phosphorus areas have been excluded (where the P values were greater than 15 mg/kg). These excluded areas are marked on the maps. These lands will be monitored in the future and when the P index has dropped they will be included in the spreadlands and receive pig slurry at the recommended rates. This leaves a total suitable land area of 1590 ha (3929 acres).

Table 7 gives details on Nitrogen Loading for the spreadlands based on both cattle N production and pig slurry application rate.

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Table 4 Average Soil P Levels & Requirements of Spreadlands

[illegible]

***Reserve Farms**

**Table 6 Pig Slurry Requirement per Farm based on crop requirements
(Calculated from soil test results)**

[illegible]

*** Reserve Farms**

Table 7 Nitrogen Loading by Farm (At proposed slurry spreading rates)

<i>Farm No</i>	<i>Name</i>	<i>Spread Area (HA)</i>	<i>Cattle Slurry (M³)</i>	<i>N From CS (KG)</i>	<i>Pig Slurry (M³)</i>	<i>N From PS (KG)</i>	<i>Total Org. N Applied (KG)</i>	<i>Avg. Org N Application (KG/HA)</i>
1	Matt Fogarty	43.7	1087.2	10000	220.6	902	10902	250
3	William Buckley	57.4	1238.04	12108	545	2234.5	14342.5	250
4	Brendan Buckely	32.4	720	6500	390	1599.0	8099.0	250
6	James Quinn	90.3	1582.2	14500	1531	6277.1	20777.1	230
7	John McGrath	33.1	563.4	5445	680	2788	8233	249
8	Michael Quinn	77.1	1148.2	10820	1511	6195.1	17015.1	220.95
9	James Meagher	55.5	1123.20	9960	797	3267.7	13227.7	238
11	Joe Riordan	83.6	-	-	2713	11123.3	11123.3	133
15	Tom Ahearne	60.9	1204.20	11090	740	3034.0	14124.0	232
16	Pat Murphy	59.8	1127.7	9870	1218	4985.6	14855.6	248
18	David Landers	26.3	572.04	5809	180	738	6547	249
19	John Browne	32.6	-	-	822.5	3372.25	3372.2	103.44
23	Tom Barron	85.2	1897.2	16690	574	2361.6	19051.6	224
33	Jim Curran	16.1	270.54	2976	255	1045.5	4021.5	249.8
34	Michael Phelan	18.9	-	-	517	2119.7	2119.7	112.15
36	Pat McGrath	35.2	660.6	6300	600	2460	8760	249
38	Lar Looby	43.1	888.3	9430	320	1312	10742	249.23

Table 7 Nitrogen Loading by Farm (At proposed slurry spreading rates)

Farm No	Name	Spread Area (HA)	Cattle Slurry (M³)	N From CS (KG)	Pig Slurry (M³)	N From PS (KG)	Total Org. N Applied (KG)	Avg. Org N Application (KG/HA)
39	Gerard O Donovan	38.6	772.2	8015	400	1640	9655	250
41	Diarmuid Horgan	93.9	1320.3	13620	1589	6510.8	20130.8	214.38
45	Cappoquin Estates	52.5	-	-	1346	5518.6	5518.6	105
47	Paddy O Keeffe	23.7	378	848.7	206	4250	5098.7	215
48	Seamus Buckley	49.9	432	3900	832	3411.2	7311.2	146.52
*13	John O Donnell	28.6	748.80	6850	70	287	7137	249.5
*14	Paddy Lynch	13	196.02	1836	93	379.25	2215.2	170
*21	William O Brien	52.8	385.2	3880	461	3817.1	7697.1	146
*24	Sean Osbourne	44.8	754.2	6920	635	2607.6	9527.6	212.67
*25	David Osbourne	35.3	42.96	3661	900	3685.9	7346.9	208
*26	John Connery	48.3	633.60	5320	1009	4132.8	9452.8	195.7
*27	Seamus Meskill	41.3	1091.7	9450	213	873.3	10323.3	250
*28	Tom Joe Hannigan	35.3	-	-	810	3321	3321	94
*29	John Cotter	29.4	-	-	824	3378.4	3378.4	114.9
*30	Tom Moore	41.2	828	8420	460	1886	10306	250
*31	Roger Hayes	15	-	-	312	1281.25	1281.2	85.42
*37	Pat Looby	7.4	117	1090	95	393.6	1483.6	200.5

Table 7 Nitrogen Loading by Farm (At proposed slurry spreading rates)

Farm No	Name	Spread Area (HA)	Cattle Slurry (M³)	N From CS (KG)	Pig Slurry (M³)	N From PS (KG)	Total Org. N Applied (KG)	Avg. Org N Application (KG/HA)
*43	James O Brien	52.7	858.6	6560	1109	4546.9	11106.9	210.75
*46	Edmond Scanlan	35.3	748.8	6640	333	1365.3	8005.3	226.78

- Reserve Farms

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5.3.3 Water Quality Analysis

For information on water quality analyses, see **Appendix 19**.

5.3.4 Air Quality

The proposed development will take place in an entirely agricultural hinterland where typical farm odours are to be found and expected. These odours arise from farmyards and lands during the day to day operations such as silage feeding, slurry agitation and landspreading. The existing unit, using best available practices, is already operating without a significant effect on the environment and will continue to strive to minimise all environmental impacts. This is in full conformity with its status as a high health herd.

5.3.5 Noise Levels

A simple definition of noise is “unwanted sound”. The major noises associated with a pig unit are animals at feeding time, ventilation fans, feed unloading and tractors loading pig effluent.

Noise levels are measured in decibels and a weighting factor (A) is applied to approximate the frequency response to the human ear. This weighted decibel scale, dB(A), correlates well with human sensations of loudness, disturbance and annoyance.

Background noise levels in rural areas of Ireland are 45-50 dB(A). Typical noise levels at pig units of similar size to the proposed unit are higher at 54 dB(A) when pigs are resting. The sound level from the dry sows and boars in anticipation of their feed is increased for c.10 to 15 minutes per day. Noise levels at the unit may reach 85 dB(A) at this time. Typical noise levels of feed delivery vehicles and tractors may range from 70 dB(A) to 85 dB(A). However at a distance of 100 m from the unit these noises attenuate and are not greatly above background noise level. They are unlikely to be a nuisance. Noise from delivery trucks blowing feed raw material into the bins will arise for about 4 hours every week.

5.3.6 Traffic Levels

A traffic survey detailed in **Appendix 14** yielded an AADT of 265 vehicles per day +/- 17%.

6. DESCRIPTION OF IMPACTS AND MITIGATION MEASURES

6.0 EMPLOYMENT AND HUMAN WELL-BEING

In full production the pig unit will employ 5 full time staff and a manager. These staff will reside locally with a significant positive economic impact on the area.

The unit will also indirectly lead to another 21 jobs in pig meat processing, feed compounding, and the service sectors.

The pig unit is designed to operate with best available technology under the supervision of a highly trained and experienced manager. The working conditions will meet the standards of the British Control of Substances Hazardous to Health Regulations (COSHH) which implement EC Directive 80/07/EEC

6.1 STRUCTURES

6.1.1 LANDSCAPE AND VISUAL ASPECTS

The proposed unit is located in a remote area. The structures comprise long low A-roofed houses. The tallest structure is the mill house which will be 15m above ground level at its highest point. The proposed buildings primarily consist of single storey, steel framed structures with PVC coated metal cladding externally to walls and sloping roof. Chimneys will be of black PVC pipe.

Mitigation Measures

a) External Finishes

All new buildings and recladding to be in selected colour/colours to blend with the surrounding landscape as much as possible. It is proposed to discuss and agree with Waterford Co. Council a scheme prior to commencement.

b) Building Heights

All new buildings to be designed to keep ridge heights to the lowest possible level. This is achieved by minimising roof slopes and ground floor to eave levels.

c) Landscaping

It is proposed to provide selected landscaping in the form of specimen trees, shrubs and flower beds, particularly at the site entrance.

6.1.2 SLURRY STORAGE, SURFACE AND GROUND WATER

Slurry will be stored in underfloor reinforced concrete tanks constructed according to Dept. of Agriculture specifications. There will be no impact from these on surface or ground waters.

6.1.3 NOISE LEVELS

Apart from the noise level at feeding time (10-15 minutes) and from delivery vehicles referred to in Section 5.2.5, the noise levels from the pigs at other times are insignificant.

Other noises arise from the operation of feed preparation plant and ventilating fans. The noise generated by these is inaudible outside the immediate vicinity of the buildings and adjoining yards.

Insulation levels in modern pig units is high, normally 60 mm extruded polystyrene in walls and 60 mm extruded polystyrene in ceilings. This will greatly muffle noise levels from the interiors of the pig buildings.

6.1.4 ODOURS AND EMISSIONS

Odours and emissions from modern well managed pig units are insignificant outside the confines of buildings and adjoining yards. Significant odours and emissions at the unit only arise during the removal of slurry from the storage tanks. The release of these odours is minimised by inserting the tanker's armoured suction hose in a fixed pipe in the walls of the tanks.

6.1.5 ESTIMATED INCREASE IN TRAFFIC

On completion of the development the estimated increase in traffic is estimated at 20-25 wheeled vehicles per week.

6.1.6 MORTALITY, TRANSPORT AND DISPOSAL OF CARCASSES

Management practices on the unit will be actively focused on minimising pig mortality. Nevertheless, some will occur and the mortality under good management has been estimated in section 3.4.2.

Carcasses will be temporarily stored in a sealed trailer skip for transport to a licensed rendering plant at regular intervals in the manner normal on such farms (see section 3.4.2.)

6.1.7 ACCIDENTAL SPILLAGES

Slurry is the only material of concern. Since slurry tankers must be pressurised for delivery of the slurry the risk of any sizeable leakage or spillage is minimal. In the case of an accidental spillage occurring the developer will notify Waterford Co. Council and will take the necessary measures to clean up such a spillage. Slurry tankers will be kept clean.

6.1.8 CONTROL OF RODENTS

The control of rodents has been successfully carried out in the past by a pest control company (PEST PREVENTION SERVICES LTD.) Mr. James McGrath proposes to maintain this contract for the proposed development (see **Appendix 20**).

6.2. LANDSPREADING

6.2.1 LANDSPREADING RATES AND NUTRIENT BALANCE

The land area suitable for land spread of slurry is 1590 ha including a reserve of 480 ha. The farming enterprises in the area are mainly cattle, sheep and tillage. Slurry will be spread to match crop requirements for P. Calculations of P spread in the form of cattle slurry. P levels required for crop growth and levels of pig slurry P available for each farm are shown in **Appendix 5**. Pig slurry will be spread at an average rate of 15 m³/ha. Pig and cattle slurry will be used to help meet crop P requirements in the spreadlands except where there is a danger of over applying organic Nitrogen. In this case the balance of P will be spread in the form of chemical fertiliser.

Appendix 5 shows the rates of P application required to meet crop growth for different soil P indexes. The Teagasc Code of Good Practice will be used for land-spreading of slurry at all times (**Appendix 13**)

In relation to chemical loading, the application of the pig slurry entails the substitution of nutrients from chemical fertilisers by those from organic manures. There is no net increase in the application of plant nutrients leading to accumulation, particularly of phosphorus and nitrogen.

The nutrient status of the soil was determined by chemical analysis. The rate of slurry application will be based on the nutrient status of the soil. A schedule of the average soil phosphorus levels and phosphorus requirement of the spread grounds on each farm is represented in Table 4 above.

The total phosphorus requirement of the spreadland is 33768 kg. The total quantity of phosphorus supplied in the cattle slurry is 10191 kg and the deficit needs to be made up by 19648 m³ of pig slurry (23577 kg P). Only 16650 m³ of pig slurry is available in supplying 19980 kg of phosphorus, leaving a soil deficit of 3597 kg of phosphorus. The above figures are based on all the 1110 ha of available suitable land being used. This does not include the reserve land.

Spreading rates are based on the soil phosphorus (P) index of the lands involved. This soil P index shown in Table 4 is taken from the Teagasc "Soil Analysis and Fertiliser, Lime, Animal Manures and Trace Element Recommendations" (Johnstown Castle, Wexford, 1994). Recommendations are based on the revised figures (1995). These are outlined in Table 8 below.

Table 8. Phosphorus (P) for Grazing, Silage and Tillage Land (Kg/Ha)

Soil P	Status	Grazing	Silage		Tillage		
			1 st Cut	2 nd Cut	(Beet)	(Cereals)	Cereals (Straw Removed)
1.	(Deficiency)	40	50	20	70	35	45
2.	(Low)	30	40	15	55	30	35
3.	(Medium)	10	25	10	40	10	20
4.	(High)	0	15	5	20	0	0

Full details of the phosphate calculations for each farm are given in **Appendix 5**.

6.2.2. SLURRY DISPOSAL AND THE QUALITY OF SURFACE AND GROUND WATERS

Pig slurry can cause serious water pollution if discharged directly to groundwater or surface waters. Whether or not landspreading creates a risk to the aquatic environment is largely dependent on a number of natural physical characteristics. These include such factors as geology, soils, climate, hydrology and hydrogeology, and on more anthropogenic factors such as operational procedures and the proximity of other potentially polluting features such as farmyards, silage pits, slurry pits and septic tanks.

The assessment of the likely impacts from the landspreading needs to consider all of the above factors in a holistic way.

6.2.2.1 Relevant Guidelines

Over the past few years a number of working parties have produced guidelines on the environmental management of intensive agricultural developments. These include:

- The Geological Survey of Ireland guidelines for the assessment of the vulnerability of groundwater to various potentially polluting activities and proposed approaches to the risk assessment of groundwater pollution. (Daly, 1994).
- The BATNEEC guidance note for the Pig Production Sector, published by the EPA.
- Guidance notes prepared as the result of the work of a Technical Sub-committee under the aegis of the Management committee of the Regional Water Laboratory, which looked at the landspreading of animal wastes and the scoping of Environmental Impact Statements related to piggery developments (Moore, 1995).
- Guidelines for good farm practice detailed in the Rural Environment Protection Scheme documentation (1992) also include a section on landspreading.
- Guidance notes and oral communications with EPA representatives relating to the Integrated Pollution Control Licensing Application procedures (1997).

Reference was made to all these sets of guidelines in the preparation of this report.

6.2.2.2 Discussion of Likely Significant Impacts

Groundwater

Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The travel time, attenuation capacity of the soils and the nature of the contaminants are important elements in determining the vulnerability of groundwater. The Geological Survey of Ireland have prepared guidelines which help in categorising the vulnerability.

Applying these guidelines and using the properties of the subsoils and bedrock, vulnerability ratings can be determined for the proposed landspread areas. The vulnerability classifications determined by the GSI for the aquifer protection scheme are shown in Figure 3(A) 3(B) & 3(C) Appendix 12.

When the aquifer classification is considered, in addition to the vulnerability, a groundwater resource assessment can be made, to determine the potential risk from a potentially polluting activity.

Surface Water

Where subsoils are of low permeability there is an increased risk to surface water, resulting from reduced infiltration to the ground and increased risk of surface run-off. For this reason, it is important that good farm practices are adhered to in relation to surface water protection. Of particular importance are areas sloping towards watercourses that may be prone to surface run-off. With a few exceptions slopes within the area are not excessive, and provided the proposed mitigation measures are adhered to the risk is expected to be low.

Slurry will be uniformly spread on dry land and in the growing season. February through September. Adherence to the Teagasc Code of Good Practice for Slurry Spreading (Appendix 13) will forestall surface run-off, which is the most likely route for phosphorus enrichment of surface waters. Moreover, under the proposed spreading schedules, accumulation of phosphorus in the soil will not take place. Applying the slurry during the growing season will ensure that nitrate-nitrogen (which is leachable) will be fully taken up by the grass roots and that leaching potential is minimal because of low recharge.

6.2.3 AIR QUALITY AND SLURRY DISPOSAL

The proposed spreadgrounds are entirely in a farming area where the air quality is determined by odours emitted from manure, animals and feedstuffs (e.g. silage). Nevertheless, every effort will be made to reduce offensive odours to insignificant levels. All manures will be spread from tankers fitted with a low trajectory splash plate or band spreader to minimise aerosol formation and dispersion. No slurry will be spread nearer than 100 metres of any dwelling house save with the express approval of the inhabitants in writing. No spreading of slurry will be permitted in windy weather close by dwelling houses or main roads.

6.2.4 WASTE MANAGEMENT

The area available for spreading is much greater than that required. Slurry will be spread at the rates specified in section 6.2.1. A slurry spreading register will be maintained showing the date, amount of slurry spread, the area and owner of farmland and the rate of spread per acre. This register will be available for inspection by Waterford Co. Council and the EPA. A copy of this register is shown in **Appendix 15**. The Teagasc Code of Good Practice for Slurry Spreading will be adhered to at all times (See **Appendix 13**).

6.2.5 MITIGATION MEASURES

6.2.5.1 REDUCTION OF ODOUR EMISSIONS

This issue is addressed in sections 3.4.3 and 6.2.3. In addition the following measures will be taken to reduce odour from the development.

- a) Fans and chimneys in houses will be so that foul air is dissipated high into the atmosphere where it will be mixed with fresher air thus reducing odours in the locality.
- b) Strict hygiene and cleanliness will be observed at and around the unit.
- c) The skip for collecting dead animals will be covered at all times. It will be removed for disposal of carcasses at least once weekly.

6.2.5.2. PERIODS AND RATES OF SPREADING OF SLURRY

This issue is addressed in sections 5.3.2.6, 6.2.1 and 6.2.2.

6.2.5.3. REDUCTION OF RISK OF DISEASE SPREAD

The economic viability of a pig production unit at going rates depends primarily on feed conversion ratio and low mortality. High standards of hygiene will ensure that disease is controlled and contained. Access to the unit is strictly restricted to control the spread of disease to the pig herd. The procedures for dealing with dead animals, as set down in section 6.1.6, are standard for the industry.

6.2.5.4 DE-COMMISSIONING/LIFE SPAN OF DEVELOPMENT

All pig units require a major capital investment every 10-15 years to keep them efficient and pleasant places to work. So long as this investment is made there is no reason that a unit of this type could not operate for up to 40 years. However, if for economic reasons or technical reasons this does not occur decommissioning will take place. All Slurry and organic matter will be thoroughly removed from the site. All equipment and materials of value will be salvaged. It is then proposed that the unit be left standing after making it safe and secure. It is highly unlikely that this scenario would ever develop due to the high initial capital investment in the unit.

6.2.5.5. DEPOPULATION

Depopulation of a unit occurs when a disease such as atrophic rhinitis or haemophilus pneumonia becomes so rampant on a unit that pig production becomes uneconomic. In this event, services cease and pigs are sold so that within 6 months the unit is empty of stock. The unit is left idle for 6 weeks, thoroughly washed and disinfected. After this 6 week period repopulation commences.

Destocking of a unit or complete slaughter of stock on a unit because of a notifiable disease has not happened in Ireland for more than 40 years. In the unlikely event of such a disease outbreak, the Department of Agriculture takes total control. In this event a site for burial has been identified on Mr. James McGrath's land (See Appendix 8).

6.2.5.6 Reductions of risk of pollution to surface and ground water

Guidelines for the land application of animal wastes (1993) suggest that animal slurries in general should not be applied:

- On wet or water logged lands.
- On steep slopes, particularly sloping towards watercourses.
- On frozen or snow covered lands.
- On exposed bedrock.
- Fields that have been pipe or mole drained and the soil is cracked down to the drains or backfill.
- Fields that have been pipe or mole drained in the previous 12 months.
- Fields that have been subsoiled over a pipe or mole drainage system in the previous twelve months.
- Within 15m of exposed karstified limestone or karst features such as swallow holes and collapse features.
- Where permeable bedrock is overlain by shallow (less than 1m from the surface) free draining subsoils, such as sands, gravels and sandy tills. Where the bedrock is limestone or dolomite a greater depth of subsoil is desirable (2m).
- Where the watertable is within 1m of the surface in free draining areas.

The guidelines suggest a storage capacity of 24-26 weeks in case of extreme wet conditions. The proposed storage capacity for this development is 37.4 weeks.

Guidelines on the optimum times for spreading are also available. Although precise calendar dates are not listed, the advice suggests that the application of nutrients should coincide with the periods of plant growth, so that the nutrients within the slurry will be utilised by the growing crop.

Application of natural fertilisers (slurries) should be avoided when the soil conditions prevent infiltration, such as wet or waterlogged soil, frozen or snow covered soils and on land sloping steeply towards watercourses. Unsuitable climatic conditions include when heavy rain is forecast within 48 hours.

In this landspreading proposed:.

- Spreading will not be undertaken within 10m of any watercourse and the cordon sanitaire is increased in some instances where the slope towards the watercourse was deemed excessive.
- Spreading will not be undertaken within 50m of a domestic supply well.
- Spreading will be done in a safe manner in strict accordance with the best available weather forecasts.
- The proposed spreading rates are considered low and this also helps to mitigate any potential impacts.

6.3. GENERAL

6.3.1 Flora and Fauna of the piggery site.

6.3.1.1 Description of the present conditions of the Flora and Fauna at the Piggery Site

The area in Ballynameelagh surrounding the present pig unit and the expansion site is mainly of an improved cultivated grassland nature (fertilised and reseeded), therefore the vegetation is typically species poor and of very little scientific interest. There are however, interspersed throughout the area weeds such as nettles and docks. This is also an indication of previous spreading of slurry. There is some outcropping of rock south of the unit.

Hedgerows have for the most part been removed internally, with the exception of riparian shading on the northern bank of a stream running through pasture and silage grassland below the piggery. This significant stream, a tributary of the River Brickey, is the outfall point for clean water runoff from the unit.

Biological and chemical sampling has been undertaken at this location to ascertain water quality (c.f. Appendix 7). Shading is afforded by dense vegetation including: alder *Alnus glutinosa*, blackthorn *Prunus spinosa*, holly *Ilex aquifolium*, hawthorn *Crataegus monogyna*, gorse *Ulex europaeus*, soft rush *Juncus effusus*, nettles *Urtica dioica*, goosegrass *Galium aparine* and meadowsweet *Filipendula ulmaria*. Macrophytic growth is relatively abundant where riparian shading is reduced.

At the extreme southern boundary of this farm a slow moving stream flows, fed by a wet ditch on the western boundary. Here vegetation is dominated by willow *Salix sp.* with cover also from elder *Sambucus nigra*, ash *Fraxinus excelsior*, holly *Ilex aquifolium*, hawthorn *Crataegus monogyna*, honeysuckle *Lonicera periclymenum*, dog rose *Rosa canina*, ferns *Dryopteris spp.*, *Asplenium scolopendrium* and lord-and-ladies *Arum maculatum*.

Boundary hedgerows are relatively good with mature ash, scots pine *Pinus sylvestris* and hedge cover is provided by hawthorn and elder. These hedges, together with riparian vegetation, afford important wildlife habitats for birds and small mammals.

Nesting places are also supplied by the many farm buildings in the yard adjacent to the piggery and indeed at the unit itself. Bird species seen at time of visit include: jackdaws *Corvus monedula*, rooks *C. frugilegus*, chaffinch *Fringilla coelebs*, magpie *Pica pica*, blackbird *Turdus merula*, starlings *Sturnus vulgaris* and swallows *Hirundo rustica*.

In general, the fauna of the area while being healthily diverse is of no particular scientific value, and is surrounded by land with similar habitat which will facilitate speedy recolonisation in the event of any temporary disturbance.

6.3.1.2 Description of the likely impact on the Flora and Fauna

There is nothing of any scientific value in the area where expansion of the piggery is proposed. Caution will be required, however, when the construction commences as it is possible that without due care, drains may become clogged up during earth shifting. This would result in destruction of prevailing habitats.

The developed unit would have much improved drainage and water collection facilities. This will ultimately improve the control of waste nutrients from the plant resulting in reduced danger of contaminating the environment. Prevention of effluent run-off to the stream lying south of the unit, (at a gentle slope), must be ensured.

Over the years a stable floral and faunal community has become established in the environs of the piggery. Positive development of the unit should not have a deleterious effect.

6.3.1.3. Means to minimise the impact

Care must be taken during construction to avoid physically damaging ditches and streams.

Building may damage nesting areas and noise may disturb fauna in the short term, however there is so much similar habitat available that displacement would be temporary. It would also be envisaged that the construction would take place at the time of year when it would not affect nesting.

All necessary precautions against adversely affecting watercourses should be taken including fencing off the clean water outlet drain which leads to the main stream on the farm.

All possibility of leakages during distribution of slurry from storage tanks to spreaders should be avoided.

6.3.1.4. Conclusions

- 1) The area designated for expansion is an area where there is already much mechanical and human activity so developments would be unlikely to disturb wildlife habitats in the vicinity of the unit.
- 2) The surrounding fields lack internal hedgerows and comprise improved grassland so development is unlikely to affect flora and fauna.
- 3) Fauna will remain undisturbed so long as habitats remain intact; the available niches in the environs of the piggery are limited in diversity but abundant in quantity. Thus any displacement will be temporary and recolonisation will be spontaneous.
- 4) Continuous and efficient monitoring of water outlets and effluent storage tanks is essential to minimise the risk of nutrient enrichment of nearby watercourses.
- 5) The most significant impact of expansion of this pig unit will be landspreading of an increased volume of slurry.

6.3.2. FLORA AND FAUNA OF THE SPREADLANDS

6.3.2.1. Description of the present conditions of the Flora and Fauna in the proposed spreadlands

The spreadlands were surveyed between 20th and 24th April 1998 and cover a total area of 7373 acres. The landbank is relatively continuous, surrounding the piggery at Ballynameelagh, and located about the main Lismore-Dungarvan N72 road. Thus, with few exceptions, the proposed spreadlands lie within a seven kilometre radius of the piggery.

The landscape is dominated by a gently rolling topography with occasional marshy and hilly areas. The underlying geology comprises Devonian sandstones with veins of Carboniferous limestone trending in an east-west direction.

Soil types represented include acid brown earths and brown podzolics. Land use capability is generally wide except where shallow depth and somewhat high altitude is a limiting factor. In the main, these regions are afforested throughout the spreadlands.

With regard to habitat types, the area consists predominantly of well managed, long established dairy stock and tillage land on which slurry has been spread for many years. The majority of grasslands have been improved through reseeded, reclamation, artificial and organic fertilisation. The vegetation is typically species poor, mainly comprising high quality, *Lolium Cynosuretum* pastures of rye and clover.

While there are no proposed Natural Heritage Areas within the proposed spreadlands, Farm Codes 8,11,25,26,27 and 30 lie in close proximity to the River Blackwater, a proposed NHA (Site No. 72). A site synopsis for the Blackwater River and Estuary, provided by the National Parks and Wildlife Service, is supplied in Appendix 7.

The primary vegetation in the improved fields is typical of fertile agricultural land with preferred fast growing grasses, mainly rye *Lolium sp.*

The variation seen is as a result of regular fertilisation, i.e. nettle *Urtica dioica*, dock *Rumex sp.*, chickweed *Stellaria media* and thistles *Cirsium spp.*

Uncultivated marginal grasslands exhibit higher species diversity. In wetter areas vegetation is predominantly rushes. *Juncus sp.*, and yellow iris *Iris pseudacorus*. Cuckooflower *Cardamine pratensis*, ragged robin *Lychnis flos cuculi*, meadowsweet *Filipendula ulmaria*, red clover *Trifolium pratense* and creeping buttercup *Ranunculus repens* are commonly found in unimproved headlands. Waste areas are dominated by nettles, thistles, ragwort *Senecio jacobaea*, dandelion *Taraxacum officinale*, pineappleweed *Matricaria discoidea* and hogweed *Heracleum sylvestris*. On higher slopes such as Knocknagoppal gorse species are found.

Hedgerows provide a very important flora and fauna habitat. They provide essential cover and foraging area for smaller mammals, birds and invertebrates.

The quality of hedgerows varies throughout the spreadlands from poor, cropped hedges, to good, hedgerows with standards, affording valuable wildlife cover. Often, particularly in tillage areas, internal hedges have been completely removed, surviving fragments provide vital cover to passerines and small mammals and the tillage crop itself gives seasonal cover.

Hedgerows are typically composed of hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, holly *Ilex aquifolium* and bramble *Rubus fruticosus*. Standards found include horsechestnut *Aesculus hippocastanum*, beech *Fagus sylvatica*, ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus*, hazel *Corylus avellana* and birch *Betula spp.*

Groundflora in hedgerows include bracken *Pteridium aquilinum*, gorse *Ulex europaeus*, foxglove *Digitalis purpurea*, lesser celandine *Ranunculus ficaria*, vetch *Vicia sepium*, lords-and-ladies *Arum maculatum* and dog violet *Viola sp.* Epiphytes - honeysuckle *Lonicera periclymenum* and ivy *Hedera helix* - are abundant.

There are occasional copses of coniferous trees within the proposed spreadlands. These are composed of sitka spruce *Picea sitchensis* mainly but larch *Larix decidua* and scots pine *Pinus sylvestris* groves were also noted. These copses, small deciduous woodlands, wooded glens and individual trees give essential shelter for passerine bird species. Likewise, afforested regions adjacent or within spread farms give valuable wildlife cover.

Riparian vegetation provides good cover in places, comprising alder *Alnus glutinosa*, willow *Salix spp.*, ferns *Dryopteris spp.*, *Asplenium scolopendrium*, hemlock water-dropwort *Oenanthe crocata*, soft rush *Juncus effusus* and birds foot trefoil *Lotus corniculatus*. Wetlands, ponds and lakes within or adjacent to spreadlands are important habitats requiring utmost protection when spreading slurry.

Regions of limestone rock outcrop sustain a diverse floral assemblage including gorse, herb-robert *Geranium robertianum*, ferns and mosses.

This is also the niche of the rare Green Winged Orchid. This species and its habitat are protected by the Flora Protection Order, S.I. No. 274 of 1987. Though no specimens were observed during farm surveys it is imperative that such habitats remain undisturbed.

The dominant watercourse in this region is the Munster Blackwater and its tributaries; Glenshelane, Finisk, Goish, Ballynaparka, Farnane, Magaha Rivers and Glenassy and Glenkeereen Streams. The Colligan and Brickey Rivers which outfall to Dungarvan Harbour and the River Tar are also adjacent to proposed spreadlands. Baseline biological water sampling was undertaken at two locations in the course of this survey. Water quality was found to be relatively good. A fuller analysis of these investigations is detailed in **Appendix 7**.

Man-made habitats such as stone walls, lime kilns, derelict farmhouses, churches, disused farm lanes, quarries and old stone bridges throughout the spreadlands, provide possible habitats for declining species such as bats and barn owls as well as common rodents. Archaeological features such as ringforts are often covered in dense thorn, gorse, secondary canopy trees or natural hedges and serve as sanctuaries.

With regard to fauna, a variety of passerines were observed throughout the proposed landspreading areas. Also observed were swans *Cygnus olor*, herons *Ardea cinerea*, mallard *Anas platyrhynchos*, pheasant *Phasianus colchicus* and kestrel *Falco tinnunculus*. The most common mammal observed by far was the rabbit *Oryctolagus cuniculus*. Also seen were pine marten *Martes martes* and stoat *Mustela erminea*. Although not directly observed it is evident that badgers *Meles meles* and foxes *Vulpes vulpes* are present. Deer and mink are reportedly present too. The overall fauna of the area is of no scientific importance but it is plentiful and appears stable. A frequency chart of fauna observed is given in **Appendix 7**.

6.3.2.2. Description of the likely impact on the Flora and Fauna

Indiscriminate slurry spreading would have degradative consequences for local flora and fauna despite their adaptations and present stability.

Spreading on hedgerows will cause a layer of dried slurry to clog and suffocate the vegetation. High levels of nutrients will result in increased productivity and selection for more nutrient tolerant species will occur, leading inevitably to reduced floral diversity and a consequent reduction in faunal diversity. Careless spreading against or in the environs of other preferred habitats such as old buildings, stone walls and woodlands will disturb nesting birds and resident mammals.

The spreading of slurry on soft ground will cause physical damage to plants and terrain. Spreading on land adjacent to waterways can be damaging to the eutrophic status of field drains, streams and rivers. Eutrophication removes the sensitive and favours the tolerant species thus decreasing biodiversity and water quality.

Spreading on marshy areas, shallow standing pools and poorly drained soil can lead to leaching of the nutrients into the water table with far reaching consequences for local surface and groundwater supplies. The same deleterious process adjacent to ponds and lakes would reduce water quality, decrease invertebrate diversity and thus undermine the food chain for fish and higher vertebrates.

6.3.2.3. Means to minimise the impacts

Care must be exercised during slurry spreading. BATNEEC guidelines as set by the EPA and the Teagasc Code of Practice should be adhered to in order to safeguard marshy lands, watercourses and groundwater resources. Spreading on wet, poorly drained or rushy fields should be strictly avoided.

In environmentally sensitive areas it is proposed to utilise bandspreaders whereby slurry is spread at groundlevel rather than sprayed. This technique reduces the risk of slurry "crusts" forming on hedges and minimises drift.

Hedgerows, old buildings, stone walls, rock outcrops and archaeological features should be regarded appropriately as important wildlife habitats and avoided as far as possible.

All possible precautions must be taken to avoid adversely affecting any watercourses. It is recommended to maintain a spread free belt of at least 10 metres from small watercourses, ponds and ditches and at least 20 metres from larger rivers.

6.3.2.4. Conclusions

- 1) The proposed spreadlands have been subjected to organic and/or artificial fertilisation for many years.
- 2) The habitats here have in the main, been formed by agricultural activities. The lands encompass a relatively homogenous and species poor environment to which the extant flora and fauna are adapted and should remain stable as long as care is observed during slurry spreading to avoid habitat destruction.
- 3) Land adjacent to watercourses should be treated with great care. Accidental spillage or eutrophication via run-off or leaching would devastate invertebrate communities with deleterious consequences for all trophic levels.
- 4) BATNEEC guidelines should be observed when spreading slurry, especially with regard to cordon sanitaires about watercourses, wells and rock outcrops.
- 5) Provided that conscientious practices are observed, slurry spreading should not adversely affect the present stability and diversity of flora and fauna in spreadlands deemed suitable.

6.3.3 Archaeology and Cultural Heritage

This issue is addressed in **Appendix 9**.

6.3.4 Traffic

Traffic increase due to the development will be small (See section 6.1.5). The road surface and foundation is sound and is unlikely to deteriorate due to increased traffic.

6.3.5 Climatology

The existing and proposed development has not had and will not have any effect on the climate in the area.

6.3.6 Interactions

When interactions between humans, flora, fauna, soil, water, air, climate and landscape are examined no significant negative impacts are envisaged.

6.3.7 Material Assets

There is no reason to suggest that material assets will be affected or devalued in the locality due to the proposed development. The proposed development will operate in as sensitive a manner as possible and as such no negative impacts on material assets are envisaged.

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7. MONITORING

7.1 DRAINAGE FROM THE SOIL

Uncontaminated roof water from the pig unit will be piped to the nearest outfall ditch. This drain will be provided with a sampling point where it outfalls to the receiving ditch. Water samples will be taken in winter and in summer from this point and analysed for physical and chemical properties at an independent laboratory.

7.2 GROUNDWATER AND SURFACE WATER

The one well and the three stream sampling points will be analysed and results will be maintained for inspection by Waterford County Council and the EPA.

7.3 SOILS

Soils of the spreadgrounds will be sampled every 3 years and analysed chemically at an independent laboratory. These analyses will be maintained in a register for inspection by Waterford County Council and the EPA. Whenever necessary, adjustments will be made to the rate of spreading and to the spreading landpool to take into account the results of the soil analyses. Before any adjustments are made, notification in writing to Waterford Co. Council and the EPA shall be made for approval.

7.4 SLURRY DISPOSAL

A register of all slurry disposed from the pig unit will be kept on the unit. This will record the date, quantity, destination and weather conditions at time of spreading. This will be available for inspection by Waterford County Council and the EPA at all times.

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Appendix 3

Slurry Spreading Agreements

For inspection purposes only.
Consent of copyright owner required for any other use.

058/ 68126

FC 1



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Matt Fogarty of Larranbullen Cappash (Waterford)

give permission to Jim McGrath

to dispose of pig slurry by spreading on 150 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Matthew Fogarty

Date: 21/1/98

058/ 68062

F.C.2.?



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Margaret Barron of BALLYNAHEWERY CAPPAHL
give permission to Jim McGEATH
to dispose of pig slurry by spreading on FO of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Margaret Barron

Date: 25/2/98



SLURRY SPREADING AGREEMENT

To whom it may concern.

I, William Buckley of Papash (Waterford)
give permission to Jim McGRATH
to dispose of pig slurry by spreading on 215 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: William Buckley
Date: 18-1-98

086-8128154



F.C.4

SLURRY SPREADING AGREEMENT

To whom it may concern.

I Brendan Buckley of Cappagh (C. McTeague)
Keelon Upper Aglisha
give permission to Jim McGRATH

to dispose of pig slurry by spreading on 130 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Brendan Buckley

Date: 8/1/98

088/ 68155

f.c 5



SLURRY SPREADING AGREEMENT

To whom it may concern.

I John CASHMAN of Rockfield Appash (Wales)
give permission to Jim McGRATH

to dispose of pig slurry by spreading on 784 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: [Signature]

Date: 16.1.98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I James Quinn of Bawn Avinger Cappa
give permission to Jim McGRATH Donkordan Cappa
Boherawing Cappa
to dispose of pig slurry by spreading on 286 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: James Quinn

Date: 16-1-98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I John McGrath of Dromore East (approx 1600 yds)

give permission to Jim McGrath

to dispose of pig slurry by spreading on 92 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: John McGrath

Date: 15-1-98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I Mr Quinn of Ballyhen Cappagh
give permission to Jim McGRATH Ballyhen Cappagh
to dispose of pig slurry by spreading on 300 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Mr Quinn Cappagh
Mr Quinn Cappagh

Signed: Michael Quinn

Date: 14/1/98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I James McGeary of BALLYHANE CAPPAGLIH
give permission to Jim M'GEATH Stranally Knocknoro Cappaglin
to dispose of pig slurry by spreading on 160 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: James McGeary

Date: 28/2/98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I James Pendergast of BALLYHANE APPQUIN
give permission to Jim M'GRATH KNOCKSKRIGH APPQUIN
to dispose of pig slurry by spreading on 40 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: James Pendergast.

Date: 2/2/98

86 546610

FC 11



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Joe Riordan of Affane Rappanin

give permission to Jim McGRATH

to dispose of pig slurry by spreading on 290 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: _____

A handwritten signature in black ink, appearing to read "Joe Riordan", written over a horizontal line.

Date: _____

5/1/98

PTD



SLURRY SPREADING AGREEMENT

To whom it may concern.

I John O'Donnell of BRIDGE QUARTER
give permission to Jim McGeath
to dispose of pig slurry by spreading on 158 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: John O'Donnell

Date: 15/1/98

055-65124

F C 14



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Paddy Lynch of Whitechurch Cappagh
give permission to Jim Mc Grath
to dispose of pig slurry by spreading on 35 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: _____

Paddy Lynch

Date: _____

19/2/98

058 65059

FC 15



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Tom Ahern of SEALT CAPPAGL
give permission to Jim McGeary
to dispose of pig slurry by spreading on 216 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed:

Thomas Ahern

Date:

14-1-98

OS8 68032

F.C 11



SLURRY SPREADING AGREEMENT

To whom it may concern.

I PAT MURPHY of Knockain.
give permission to Jim McGeary
to dispose of pig slurry by spreading on 1.67 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Patrick Murphy

Date: 26/2/98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I MAURICE MURPHY of KNOCKAUN
give permission to SIM McGRATH
to dispose of pig slurry by spreading on 120 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Maurice Anthony Murphy

Date: 20/1/98

058/ 68070

F.C 18



SLURRY SPREADING AGREEMENT

To whom it may concern.

I DAVID LINDERS of KNOCKAUN GAPPAH

give permission to SIM McGEATH

to dispose of pig slurry by spreading on 90 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the Planning Authority.

Signed: David Linder

Date: 19/1/98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I John Browne. of Kearon Aguish Cappocuin
give permission to Jim McGeath.
to dispose of pig slurry by spreading on 90 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: John Browne

Date: 13/2/98

024. 96138

F.C 20



SLURRY SPREADING AGREEMENT

To whom it may concern.

3

I Jim Cliffe of Ponikvar (appreh)
give permission to Jim McGeary

to dispose of pig slurry by spreading on 24 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Jim Cliffe

Date: 15.1.88

086 8204498

024-96193

F.C 21



SLURRY SPREADING AGREEMENT

To whom it may concern.

I WILLIAM O'BRIEN of KILKNOXASH GAPPOQUIN CHALERTON

give permission to Jim McGeary

to dispose of pig slurry by spreading on 160 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: William O'Brien

Date: 16.1.98

PTO

F.C 22



SLURRY SPREADING AGREEMENT

To whom it may concern.

I ETHAN
Griffin of KNOCKNSKOISH COPPOLEIGH
give permission to Jim McGRATH
to dispose of pig slurry by spreading on 100 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Ethan Griffin

Date: 18-1-98

Q8/68025

F.C 22



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Noel Griffin of Knocilagskeigh Cappoquin
give permission to Jim M'Grath
to dispose of pig slurry by spreading on 20 Acres of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Noel Griffin

Date: 18.1.98

058/68078

F. C 23



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Tom Barron of CARROWGARLIFF CAPPAHOLLOUGH
LISACE CAPPAH
give permission to Jim McGRATH
to dispose of pig slurry by spreading on 285 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Thomas Barron

Date: 28/1/98

024 - 96525
088 - 2781488

FC 24



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Sean Osborne of Dromore Aghish
give permission to Jim McGeehan BALLINPARKA Aghish
to dispose of pig slurry by spreading on 142 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Sean Osborne

Date: 18/1/98

024-96217
085 2701873

F.C 25



SLURRY SPREADING AGREEMENT

To whom it may concern.

I DAVID OSBORNE of DRONOGH AGLEN
CO. DUBLIN
give permission to SIM M'GRATH
to dispose of pig slurry by spreading on 100 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: David Osborne

Date: 18/1/98

024 - 96418
088 541465

F.C 26



SLURRY SPREADING AGREEMENT

To whom it may concern.

I John Conneely of Ballingown Vihiersstown
BALLYCULANE CASH
give permission to _____

to dispose of pig slurry by spreading on 230 _____ of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: John Conneely

Date: 18.1.98

024 96170

F.C 27



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Seamus Meskill of Dromore Agribusiness Co. Ltd.
give permission to Jim McGeath Woodstock Agribusiness Co. Ltd.
to dispose of pig slurry by spreading on 250 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Seamus Meskill

Date: 18.1.98

026 - 96284

FC 28



SLURRY SPREADING AGREEMENT

To whom it may concern.

ILLUSTRATION AGAIN

I Tom Joe Hannigan of Knockalara Cappoquin

give permission to Jim McGee

to dispose of pig slurry by spreading on 95 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the Planning Authority.

Signed: Tom Joe Hannigan

Date: 20/1/98

024-96106
086-5247481

F.C. 28 29



SLURRY SPREADING AGREEMENT

To whom it may concern.

I JOHN COTTER of AGLISH Cappoquin
give permission to Jim McGinn
to dispose of pig slurry by spreading on 198 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: John Cotter

Date: 18-1-98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I Tom Moore of AGASH CAPPORIN
DROMORE AGASH
give permission to Jim McGRATH
to dispose of pig slurry by spreading on 16a of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Mr Moore

Date: 14/2/98

024 - 96265
088 - 520898

F.C 31



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Roger Hayes of BARKIN PARK AGLISH
give permission to Jim McCreath
to dispose of pig slurry by spreading on 50 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Roger Hayes

Date: 11/1/98

OS 41785
CBS 2781490

f.c 32



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Anne Power of Ballymacinague
Dungarvan.
give permission to Jim McGrath
to dispose of pig slurry by spreading on 155 acres of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Anne Power.

Date: 10/1/98

058/43066

F.C 33



SLURRY SPREADING AGREEMENT

To whom it may concern.

I J. Curran of BALLY HIRRE APPASH

give permission to Jim McGRATH

to dispose of pig slurry by spreading on 45 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the Planning Authority.

Signed: J. Curran

Date: 4/1/98

FC 34



SLURRY SPREADING AGREEMENT

To whom it may concern,

I Mickael Phelan of Cult Mhuire Cappagh Co. Waterford
give permission to Jim McGrath Newtown Woodlisa Cappagh
to dispose of pig slurry by spreading on 72 acres of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Mickael Phelan

Date: 15/1/98

055-68008

FC 35



SLURRY SPREADING AGREEMENT

To whom it may concern.

I John Power of BALLINAMINTRA (Cappagh) Co. Wick
give permission to Jim McGRATH
to dispose of pig slurry by spreading on 130 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: John Power

Date: 18-1-98

058 68006 024
058 43329 17547

F.C 36



SLURRY SPREADING AGREEMENT

To whom it may concern.

I PAT M'GRATH of BALLINACOURTY CAPPASH
give permission to SIM M'GRATH
to dispose of pig slurry by spreading on 1.5 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

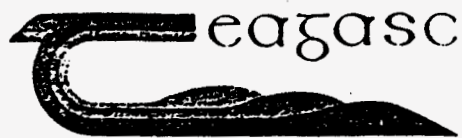
Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: PAT M'GRATH

Date: 6/2/98

058/ 68074

F. C 37



SLURRY SPREADING AGREEMENT

To whom it may concern.

I PAT LOOBY of BALLYMOLLA
give permission to JIM M'GEATH
to dispose of pig slurry by spreading on 40 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: P. Looay

Date: 13/2/98

62049

F.C 38



SLURRY SPREADING AGREEMENT

To whom it may concern.

I LAR LOOBY of KILCREANY
give permission to Jim McGEATH
to dispose of pig slurry by spreading on 160 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: LAR LOOBY

Date: 13/1/98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I GERALD O'DONOVAN of BALLYGAMMON CAPPASH CO. WEXFORD
give permission to Jim McGRATH SCART. Macoligo

to dispose of pig slurry by spreading on 110 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Gerald O'Donovan

Date: 10/2/98

058-68028
088-2781485

F.C 40



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Mr O'Keefe of KILLISHAL GAPPASH (CHUTEJUR)
give permission to Jim McGEATH Knockgallon Gappash

to dispose of pig slurry by spreading on 56 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Michael O'Keefe

Date: 18.1.98

058 / 68102
058 / 2787940

f.c 41



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Diarmuid Horgan of Garryduff College Dungarvan
give permission to Jim McGeath Waterford

to dispose of pig slurry by spreading on 305 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Diarmuid Horgan

Date: 6/1/98

CS8/54103 (Noel)

CS8/2796791

F.C 42



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Denis Looby of Knock Ballynira Ardara/Tipp
give permission to Jim McGrath
to dispose of pig slurry by spreading on 50 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Denis Looby

Date: 14.1.98

024 96261
088 2787946

F.C. 43



SLURRY SPREADING AGREEMENT

To whom it may concern.

I James O'Brien of Parkmore Modeligo Lippash
give permission to Jim McGeath Craigmore 1.1
Seam Upper 1.1
to dispose of pig slurry by spreading on 118 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: James O'Brien

Date: 18.1.98

SLURRY SPREADING AGREEMENT

To whom it may concern.

I Maurice Tobin of Gawn, Modeligo

give permission to Jim McGarr

to dispose of pig slurry by spreading on 65a of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Maurice Tobin

Date: 7/1/98



SLURRY SPREADING AGREEMENT

To whom it may concern.

I DAVID KEANE of CAPPOQUIN ESTATE, CAPPOQUIN
give permission to Mr Jim McGRATH CAPPAUGH

to dispose of pig slurry by spreading on 271 acres of land in my ownership +
that of Cappoquin Estate Farms Ltd
as outlined in Section Ref 45 of the 6" O.S. map supplied. This
permission shall be for 10 years or as otherwise agreed.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: David Keane

Date: 9/2/98



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Ned Scanlon of Curraghroche Cappoguin
give permission to JAMES McGRATH (ASHISH CAPPAGUIN)
to dispose of pig slurry by spreading on 136 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Ned Scanlon.

Date: 13/2/98

058/ 68-205

F. C. 42



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Paddy O'Keeffe of BALLINAMERLA CAPPALE GHALEA
give permission to Jim McCreath
to dispose of pig slurry by spreading on 130 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: _____

P.O. O'Keeffe

Date: _____

13/1/98

F.C 48



SLURRY SPREADING AGREEMENT

To whom it may concern.

I SEAMUS BUCKLEY of Collier Appeal

give permission to SIM McGRATH

to dispose of pig slurry by spreading on 140 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the Planning Authority.

Signed: Seamus Buckley

Date: 11/2/98

024)98176
F.C. 49



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Anthony Broderick of MT STUART ASKISH
give permission to Jim McGRATH
to dispose of pig slurry by spreading on 2.56 of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Anthony Broderick

Date: 26/2/98

F.C. 50



SLURRY SPREADING AGREEMENT

To whom it may concern.

I, Colm Broderick of Mt Stuart Aglish

give permission to Jim McGRATH

to dispose of pig slurry by spreading on 176 ac of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Colm Broderick

Date: 16/2/98

F.C 51



SLURRY SPREADING AGREEMENT

To whom it may concern.

I, Joseph Broderick of Wardstock Kerean
give permission to Jim McGEARY

to dispose of pig slurry by spreading on 4.3 Acres of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Joe Broderick

Date: 26/2/98



F.L 52

SLURRY SPREADING AGREEMENT

To whom it may concern.

I BRIAN DOYLE of RATH DANIEL, RATHVILLAGE CO. CARLOW
give permission to ASHLEIGH FARMS, BALLINAMEELA, CAPPAGH CO. WATERFORD
to dispose of pig slurry by spreading on 49 ACRES of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Brian Doyle

Date: 16/2/98

EC 53



SLURRY SPREADING AGREEMENT

To whom it may concern.

I Dennis LYNDDHAM of CLONKARDON
give permission to Jim McGRATH

to dispose of pig slurry by spreading on 40 Acres of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Dennis Lynndon

Date: 18 - 2 - 98

F. C. 53



SLURRY SPREADING AGREEMENT

To whom it may concern.

I THOMAS STAMP of CLONKORDON

give permission to Jim Mc Geath

to dispose of pig slurry by spreading on 410 Acres of land in my ownership
as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: Thomas Stamp

Date: 18 - 2 - 98

F. C 54



SLURRY SPREADING AGREEMENT

To whom it may concern.

I JAMES TWOMEY of CLONKORDON

give permission to Jim McGRATH

to dispose of pig slurry by spreading on 18 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the Planning Authority.

Signed: JAMES TWOMEY

Date: 28/2/98



SLURRY SPREADING AGREEMENT

To whom it may concern.

I DAVID CONNORS of BALLYGARBON

give permission to JANE McGRATH

to dispose of pig slurry by spreading on 60 of land in my ownership

as outlined in Section _____ of the 6" O.S. map supplied.

Spreading shall be carried out subject to the terms of conditions specified by the
Planning Authority.

Signed: _____

A handwritten signature in black ink, appearing to read "David Connors", written over a horizontal line.

Date: _____

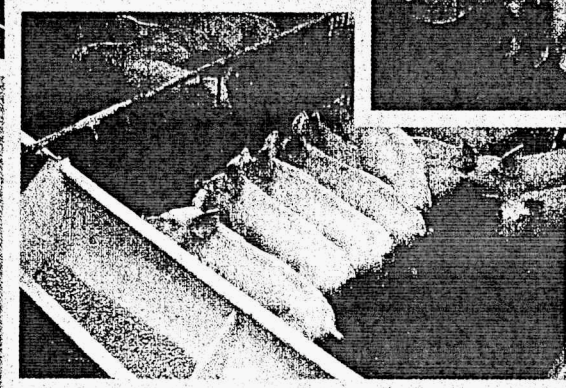
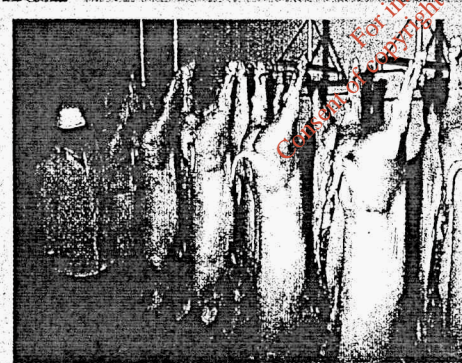
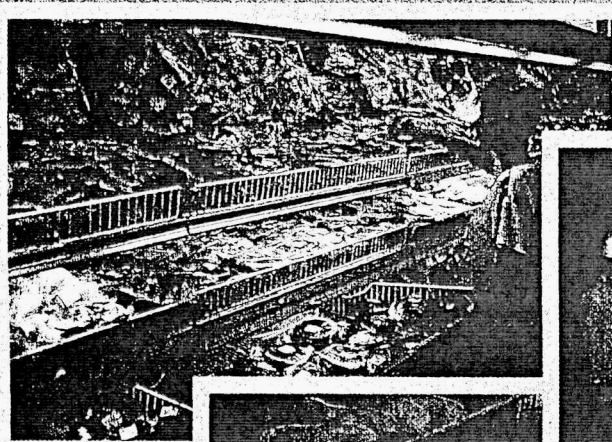
6/2/98

APPENDIX 4

**DEVELOPMENT OF THE NATIONAL
PIG INDUSTRY (1997-2000)**

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Development of the National Pig Industry (1997-2000)



Teagasc Pig Advisers

ADVISER	COUNTIES	ADDRESS	TELEPHONE
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Michael Martin Chief Pig Adviser	Clare Galway Mayo Roscommon Sligo Leitrim Longford	Teagasc Rural Development Division, Athenry, County Galway	091-844473
Gerard McCutcheon Pig Adviser	Wexford Wicklow Kilkenny Carlow	Teagasc, Barrett St., Bagenalstown, County Carlow	0503-21267/21305
Sean O'Dowd Pig Adviser	Laois Offaly Tipperary NR	Teagasc, Barrett St., Bagenalstown, County Carlow	0503-21267/21305
Claran Carroll Pig Adviser	Tipperary SR Waterford	Teagasc, Moorepark, Fermoy, County Cork	025-33344
Jim Finn Pig Adviser	Cork East Limerick	Teagasc, Moorepark, Fermoy, County Cork	025-33344

Teagasc Pig Researchers

NAME	ADDRESS	TELEPHONE NUMBER
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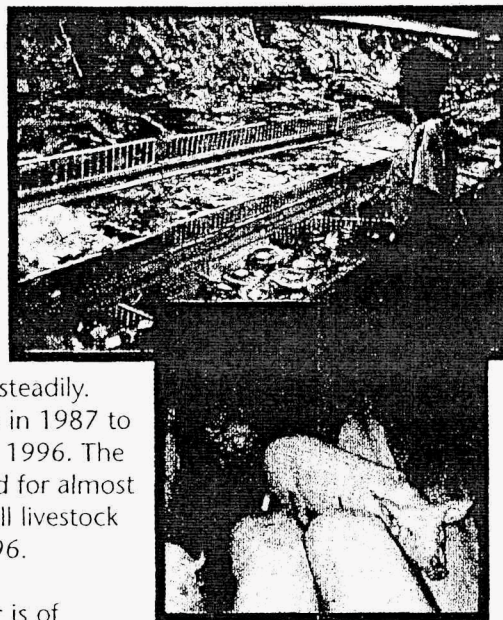
Development of the National Pig Industry 1997-2000

Irish pig output is increasing steadily. Output grew from 2.1m pigs in 1987 to approximately 3.25m pigs in 1996. The farmgate pig value accounted for almost 10% of the output value of all livestock and livestock products in 1996.

Increasing pig output further is of national importance for a number of reasons:

- One million extra pigs produced would create over 2,000 extra jobs. This would provide well paid, permanent employment in rural areas
- All increased pig output would be exported, earning an estimated extra £150m per year
- Significant market opportunities are likely to arise for Irish pigmeat in the EU market over the next few years as a reduction in pigmeat production in some other EU countries is likely to occur

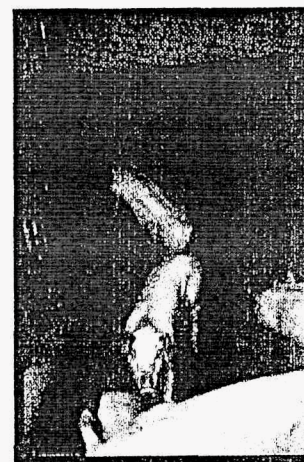
The Teagasc document "Development of the National Pig Industry (1997-2000)" identifies the critical issues in the sectors of relevance to the Irish pig industry. The following commitments are needed by each of the key sectors to ensure that continued development of the industry is obtained.



The Producer

- The average breeding herd size in Ireland is the largest in the EU providing a good base for expansion
- Expansion of sow numbers is possible because it is profitable and because there are no quota restrictions on pig numbers. However it is unwise to develop sow units with more than approx. 500 sows
- To ensure that top class operatives continue to enter the industry working conditions and pay rates must be attractive
- Maintain a high pig herd health status and use the Teagasc Pig Evaluation Programme when selecting sires. This will ensure maximum feed conversion efficiency and carcass quality
- Pig manure must be managed carefully to protect the environment. Look to tillage areas to expand pig production
- Comply with welfare regulations on dry sow housing and stocking rates for growing pigs

Feed Compounders

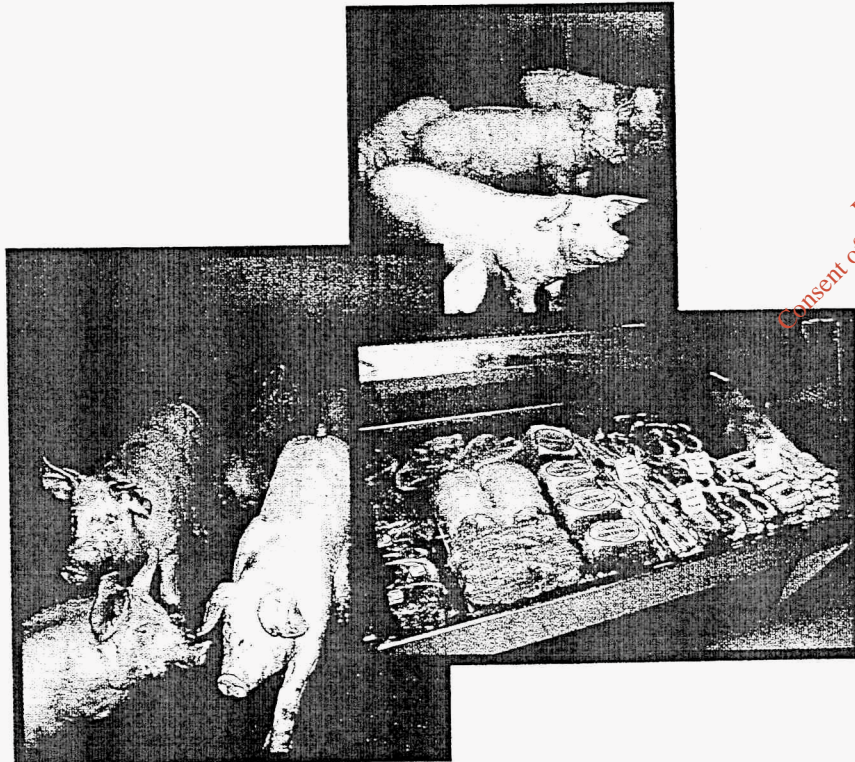


- Issue digestibility values for essential amino acids and phosphorus in feeds to more closely match nutrient requirement at different growth stages. This would reduce nitrogen and phosphorus in pig manure
- List the feed ingredients used in pig diets in descending order
- Check imported raw materials carefully before inclusion in pig diets

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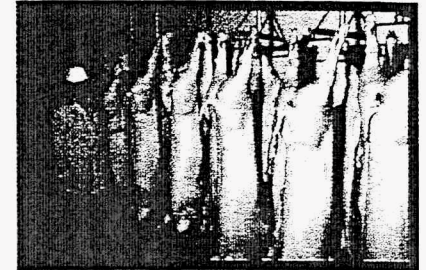
Teagasc

- Teagasc have appointed an additional full-time researcher to meet the research needs in production areas unique to Ireland
- Teagasc are committed to providing two additional pig advisers to service existing clients and provide the necessary support for new and expanding units
- Training of new entrants to the pig industry starts primarily at agricultural colleges. Each agricultural student will be encouraged to take a 25 hour module in pig production
- Training courses in personnel management which are needed by many of the managing staff working in large pig units will be developed



The Processor and the Slaughterhouse

- Slaughterhouses must implement an Integrated Quality Control Scheme to guarantee product safety and traceability
- Food safety is of paramount importance. Slaughterhouses and processors must liaise closely with producers and wholesalers on all aspects of food safety
- Orderly slaughtering of pigs is essential. Planned expansion in pig output requires additional capital investment to cater for the increased throughput, particularly in the North Eastern part of the country
- Constant liaison of pig processors with pig producers is essential. Producers should receive regular summaries of pigs delivered showing average weight, lean meat percentage and weight range. Processors should discuss with producers future changes in carcase weight, quality and type of pig required by the market



The Department of Agriculture, Food and Forestry

- Ireland is free of many serious diseases which are now endemic in Europe. A computerised system of recording health problems on the slaughter line by veterinary inspectors should be introduced to record less serious pig ailments and reports returned to each producer
- A scheme to eradicate Aujeszky's disease over a three year period should be introduced
- A number of EU member states employ a Net Energy System to evaluate feed ingredients. This system should be introduced to Ireland allowing compounders to declare the energy level in pig feeds

Appendix 5

Phosphorus Calculations

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TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner MATT FOGARTY

National Grid Reference (8 digit, 4E

Map Reference F.C. 1

1, 2	X163 959
3-7	X171 956

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.7	7.6	11.5	1CS	15	25	15	--	--	
2	8.8	7.7	6.0	1CS	25	41.67	25	--	--	
3	8.9	7.8	11.7	2CS	20	33.33	20	--	--	
4	7.9	5.1	4.0	2CS	55	14.5	8.7	17.1	20.50	25.8
5	8.9	7.8	1.6	PP	40	14.5	8.7	17.1	20.5	10.8
6	8.8	7.7	7.1	PP	10	16.7	10	--	--	
7	8.7	--	25.3	PP	--	--	--	--	--	
	60.70	43.7							220.60	

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner WILLIAM BUCKLEY

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 3

1-7	X179 958
8, 9	X179 969
10	X191 965

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.7	7.6	9.9	1CS	25	22.3	13.4	9.7	11.6	16.6
2	8.7	7.8	6.5	1CS	25	22.3	13.4	9.7	11.6	
3	7.71	5.4	8.7	1CS	25	22.3	13.4	9.7	11.6	
4	8.8	6.2	5.5	1CS	40	22.3	13.4	22.2	26.6	
5	8.6	--	14.9	PP	--	--	--	--	--	
6	9.1	7.8	3.1	PP	30	22.3	13.38	--	--	
7	8.9	7.5	7.9	PP	10	16.7	10	--	--	
8	8.6	--	11.0	PP	--	--	--	--	--	
9	8.7	7.2	3.7	PP	30	22.3	13.38	13.3	15.96	
10	9.2	7.9	3.6	PP	30	22.3	13.38	13.3	15.96	
	87.01	57.4						545		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner BRENDAN BUCKLEY

National Grid Reference (8 digit, 4E, 4N) 1-4 - X175 961

Map Reference F.C.4

5,6 - X145 925

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	9.0	8.1	8.3	1CS	25	22.2	13.33	9.73	11.67	
2	9.1	8.0	2.7	PP	40	22.2	13.33	12.80	15.4	
3	8.91	8.1	1.8	PP	40	22.2	13.33	12.80	15.4	11.27
4	9.1	8.2	3.3	PP	30	22.2	13.33	12.80	15.4	11.27
5	8.5	--	2.0	PP	40	--	--	--	--	40
6	8.0	--	5.3	PP	30	--	--	--	--	40
	52.61	32.4						390		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner JAMES QUINN

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C.6

1, 4-12	X160 973
2, 3, 13-15	X152 942

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.8	7.1	13.0	Beet	20	33.33	20	--	--	
2	7.6	6.9	7.5	1CS	35	25	15	16.7	20	
3	7.7	6.8	5.8	1CS	55	25	15	33.3	40	
4	7.81	5.9	5.6	1CS	55	25	15	33.3	40	
5	7.6	--	21.0	1CS	--	--	--	--	--	
6	7.7	7.2	2.7	PP	40	20	12	23.3	28	
7	7.6	7.1	2.0	PP	40	20	12	23.3	28	
8	7.4	6.9	1.9	PP	40	20	12	23.3	28	
9	7.92	7.1	4.4	PP	30	--	--	16.6	20	10
10	7.8	7.0	9.0	PP	10	16.7	10	--	--	
11	7.5	--	10.9	PP	--	--	--	--	--	
12	7.7	7.3	3.7	PP	30	--	--	16.6	20	10
13	7.51	6.5	7.3	PP	10	16.7	10	--	--	
14	7.9	7.1	4.9	PP	30	14.2	8.5	17.9	21.5	
15	8.2	7.4	3.8	PP	30	14.2	8.5	17.9	21.5	
	115.74	90.3						1531		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner JOHN MCGRATH

National Grid Reference (8 digit, 4E, 4N) 1-5 - X145 970

Map Reference F.C. 7

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On- Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.4	6.7	2.1	1CS	50	17	10.2	28.0	33.6	6.2
2	7.23	6.5	4.0	PP	30	17	10.2	16.5	19.8	
3	7.8	6.8	4.5	1CS	40	17	10.2	24.3	29.8	
4	7.6	6.6	5.3	PP	30	17	10.2	16.5	19.8	
5	7.2	6.5	4.7	PP	30	17	10.2	16.5	19.8	
	37.23	33.1						680		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner MICHAEL QUINN

National Grid Reference (8 digit, 4E, 4N) 1,6-8 X151 953

Map Reference F.C.8

1,6-8	X151 953
2-5	X139 995
9	X150 958
10,11	X111 978
12-14	X167 977

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.7	7.8	12.2	Maize	20	33.3	20	--	--	35 20 30
2	8.6	--	6.6	2CS	35	--	--	--	--	
3	8.6	--	10.4	2CS	20	--	--	--	--	
4	8.5	--	4.5	PP	30	--	--	--	--	
5	8.6	--	18.7	PP	--	--	--	--	--	
6	8.7	7.8	7.6	2CS	35	33.3	20	12.5	15	
7	8.6	7.7	8.7	1CS	25	--	--	20.8	25	
8	8.7	7.7	1.3	2CS	55	33.3	20	29.2	35	
9	8.7	7.6	2.0	PP	40	33.3	20	16.7	20	
10	8.81	7.8	3.3	PP	30	--	--	25	30	
11	8.7	7.7	1.9	PP	40	--	--	33.3	40	
12	8.8	7.6	6.8	PP	10	15.7	9.4	--	--	
13	8.7	7.5	4.3	PP	30	--	--	25	30	
14	8.7	7.9	2.8	PP	40	--	--	33.3	40	

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner JOE RIORDAN

National Grid Reference (8 digit, 4E, 4N)

1-7	X122 978
8	X109 981
9, 10	X181 962
11	X062 976

Map Reference F.C. 11

12 X121 855

13, 14 X099 900

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.42	3.2	7.1	Wheat	25	--	--	20.8	25	
2	8.3	7.5	6.4	Wheat	25	--	--	20.8	25	
3	8.4	7.3	7.1	Barley	25	--	--	20.8	25	
4	8.2	--	2.4	Barley	--	--	--	--	--	
5	8.31	7.7	2.4	Barley	45	--	--	37.5	45	
6	8.4	7.3	2.3	Barley	45	--	--	37.5	45	
7	8.3	7.5	3.0	Barley	45	--	--	37.5	45	
8	8.2	7.2	3.1	Beet	55	--	--	45.8	55	
9	8.41	7.6	5.2	Oats	35	--	--	29.2	35	
10	8.3	7.3	4.5	Oats	35	--	--	29.2	35	
11	8.2	--	5.4	SA	--	--	--	--	--	
12	8.42	7.0	8.4	Barley	25	--	--	20.8	25	
13	8.7	7.1	5.0	Beet	55	--	--	45.8	55	
14	8.8	6.9	2.1	Oats	45	--	--	37.5	45	
	117.36	83.6								

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

1, 3-8
2X163 955
X155 947Land Owner JOHN O'DONNELL

National Grid Reference (8 digit, 4E, 4N) _____

Map Reference F.C. 13

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On- Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.6	8.2	3.0	1CS	40	28.6	17.2	--	--	22.8
2	7.94	--	10.2	PP	--	--	--	--	--	--
3	8.2	6.9	10.7	2CS	20	28.6	17.2	--	--	2.8
4	8.3	--	18.2	PP	--	--	--	--	--	--
5	7.9	5.1	11.1	Hay	15	25	15	--	--	--
6	8.7	8.4	5.1	PP	30	28.6	17.2	8.3	10	2.8
7	7.6	--	10.1	PP	--	--	--	--	--	--
8	6.7	--	10.5	PP	--	--	--	--	--	--
	63.94	28.6								

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner PADDY LYNCH

National Grid Reference (8 digit, 4E, 4N) 1, 2 X166 954

Map Reference F.C. 14

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On- Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in- Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	6.96	6.4	8.0	PP	10	16.7	10	--	--	
2	7.2	6.6	8.7	Hay	25	13.5	8.1	14.1	16.9	
	14.16	13.0						93.0		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner TOM AHEARNE

National Grid Reference (8 digit, 4E, 4N)

1	X141 930
2, 3	X163 935
4-10	X170 944

Map Reference F.C. 15

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.0	--	9.7	Maize	40	--	--	--	--	40
2	7.9	5.0	7.3	PP	10	16.7	10	--	--	
3	7.6	5.6	8.1	Oats	25	41.7	25	--	--	
4	6.8	6.1	4.5	PP	30	--	--	25	30	
5	6.5	5.9	5.7	2CS	55	11.3	6.8	40.2	48.2	
6	9.49	8.6	10.4	1CS	15	25	15	--	--	
7	8.25	7.7	8.7	Maize	40	25	15	20.8	25	
8	8.9	7.6	3.6	PP	30	--	--	25	30	
9	7.98	7.5	6.9	PP	10	16.7	10	--	--	
10	7.6	--	11.0	Wheat	--	--	--	--	--	
11	7.5	6.9	8.0	Wheat	25	41.7	25	--	--	
	87.42	60.9						740		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner PAT MURPHYNational Grid Reference (8 digit, 4E, 4N) 1-8 X193 943Map Reference F.C. 16

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.6	7.8	2.1	2CS	70	--	--	58.3	70	
2	8.74	7.9	6.9	1CS	25	22.5	13.5	9.6	11.5	
3	8.4	7.3	2.2	1CS	50	22.5	13.5	30.4	36.5	
4	8.62	7.6	5.9	1CS	40	22.5	13.5	22.1	26.5	
5	8.0	6.4	5.8	PP	30	22.5	13.5	13.8	16.5	
6	8.4	7.5	4.6	PP	30	22.5	13.5	13.8	16.5	
7	8.32	7.6	7.1	PP	10	16.7	10	--	--	
8	8.5	7.7	4.8	PP	30	22.5	13.5	13.8	16.5	
	67.58	59.8						1218		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner DAVID LANDERS

National Grid Reference (8 digit, 4E, 4N) 1 X200 932
2 X189 931
3-5 X192 934

Map Reference F.C. 18

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	5.2	4.4	3.1	1CS	40	34.1	20.5	10.4	12.5	7
2	4.6	3.0	8.6	3CS	35	34.1	20.5	12.1	14.5	
3	9.9	9.4	5.7	2CS	55	34.1	20.5	10.4	12.5	22
4	6.62	--	4.8	PP	--	--	--	--	--	
5	10.1	9.5	5.0	PP	30	--	--	--	--	
	36.42	26.3						180		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

1-4 X133 945
5 X126 945
6-9 X166 898

Land Owner WILLIAM O'BRIEN

National Grid Reference (8 digit, 4E, 4N) _____

Map Reference F.C. 21

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On- Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.3	--	10.6	2CS	20	--	--	--	--	
2	6.9	--	7.3	PP	10	--	--	--	--	
3	5.9	--	5.0	2CS	55	--	--	--	--	
4	6.6	--	7.6	PP	10	--	--	--	--	
5	10.15	9.2	14.6	2CS	20	13.2	7.9	10.1	12.1	
6	6.8	4.2	6.0	PP	30	13.2	7.9	18.4	22.1	
7	6.5	3.2	3.2	PP	30	13.2	7.9	18.4	22.1	
8	7.0	5.9	5.4	PP	30	13.2	7.9	18.4	22.1	
9	7.6	6.7	5.7	PP	30	13.2	7.9	18.4	22.1	
	64.75	29.2								

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner TOM BARRONNational Grid Reference (8 digit, 4E, 4N) 1, 2, 9-12 X198 990
3-8 X189 990Map Reference F.C. 23

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	9.2	8.0	11.6	1CS	15	25	15	--	--	
2	8.9	7.9	9.3	1CS	25	41.7	25	--	--	
3	9.53	8.4	3.9	1CS	40	22.8	13.7	21.9	26.3	
4	9.8	8.0	8.1	PP	10	16.7	10	--	--	
5	9.2	8.2	8.9	2CS	35	22.8	13.7	17.75	21.3	
6	9.8	8.9	5.3	PP	30	22.8	13.7	13.60	16.3	
7	9.8	9.1	8.8	PP	10	16.7	10	--	--	
8	8.7	--	12.3	PP	--	--	--	--	--	
9	8.9	--	13.7	PP	--	--	--	--	--	
10	9.9	8.4	8.5	PP	10	16.7	10	--	--	
11	10.8	9.1	8.1	PP	10	16.7	10	--	--	
12	10.8	9.2	5.8	PP	30	22.8	13.7	13.60	16.3	
	115.33	85.2								

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner SEAN OSBOURNE

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 24

1	X115 897
2-4	X109 896
5	X139 907
6	X122 917
7	X111 909
8	X133 884

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.2	6.4	7.5	2CS	35	15.3	9.2	21.5	25.8	
2	7.42	6.5	8.9	PP	10	16.7	10	--	--	
3	7.14	6.3	5.5	PP	30	15.3	9.2	17.3	20.8	
4	7.0	6.2	12.0	1CS	15	25	15	--	--	
5	6.9	--	15.5	Hay	--	--	--	--	--	
6	7.1	6.5	5.3	PP	30	15.3	9.2	17.3	20.8	
7	7.0	6.3	1.8	PP	40	15.3	9.2	25.7	30.8	
8	7.7	6.6	3.5	PP	30	15.3	9.2	17.3	20.8	
	57.46	44.8						635		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner DAVID OSBOURNENational Grid Reference (8 digit, 4E, 4N) 1-3 X105 918
4, 5 X102 908Map Reference F.C. 25

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.67	6.8	5.3	Maize	55	20.4	12.2	35.7	42.8	
2	8.1	6.9	9.2	Barley	35	20.4	12.2	19	22.8	
3	8.0	7.1	3.7	PP	30	--	--	25	30	
4	8.4	7.3	4.5	PP	30	--	--	25	30	
5	8.3	7.2	4.3	1CS	40	20.4	12.2	23.2	27.8	
	40.47	35.3						900		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner JOHN CONNERY

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 26

1-4	X 109 927
5,6	X111 935
7,8	X125 900
9	X139 907

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	10.4	9.3	6.0	Barley	35	27.4	16.4	15.5	18.6	
2	10.3	--	19.6	Beet	--	--	--	--	--	
3	10.9	--	23.1	Beet	--	--	--	--	--	
4	10.2	8.8	7.5	2CS	35	27.4	16.4	15.5	18.6	
5	10.3	7.9	4.0	PP	30	--	--	25	30	
6	10.44	8.2	5.0	PP	30	--	--	25	30	
7	10.3	--	20.8	Beet	--	--	--	--	--	
8	10.0	9.1	4.1	PP	30	--	--	25	30	
9	10.24	5.0	5.3	1CS	40	27.4	16.4	19.7	23.6	
	93.08	48.3						1009		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner SEAMUS MESKILL

National Grid Reference (8 digit, 4E, 4N)

Map Reference _____

1	X109 894
2	X115 890
3, 5	X104 891
4, 6, 7	X115 900
8-11	X131 938

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.9	8.3	9.2	2CS	35	32	19.2	12.0	14.4	
2	10.4	9.4	9.0	2CS	35	32	19.2	12.0	14.4	
3	9.9	--	29.7	2CS	--	--	--	--	--	
4	8.8	7.9	11.7	2CS	20	33.3	20	--	--	
5	8.9	--	9.1	PP	10	--	--	--	--	
6	8.85	7.8	8.6	PP	10	16.7	10	--	--	
7	8.9	7.9	8.1	PP	10	16.7	10	--	--	
8	9.17	--	13.7	PP	--	--	--	--	--	
9	8.9	--	4.0	PP	30	--	--	--	--	
10	8.9	--	6.6	PP	10	--	--	--	--	
11	9.6	--	2.9	PP	40	--	--	--	--	
	101.17	41.3						213		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner JOHN COTTER

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 29

1, 2	X101 899
3-5	X135 938
6, 7	S173 005

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	11.52	10.2	7.6	Beet	40	---	---	33.3	40	35 55 55
2	11.4	9.1	7.8	Barley	25	---	---	20.8	25	
3	11.1	--	5.0	Barley	35	---	---	--	--	
4	11.7	--	4.1	Beet	55	---	---	--	--	
5	11.0	--	5.2	Beet	55	---	---	--	--	
6	11.21	10.1	5.2	Barley	35	---	---	29.2	35	
7	12.2	--	--	Wheat	--	---	---	--	--	
	80.13	29.4						824		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner TOM MOORE

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 30

1, 4-6	X118 914
2, 7	X095 904
3, 8	X121 910

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.1	6.9	4.2	Maize	55	20	12	35.8	43	
2	8.0	3.6	4.7	Maize	55	20	12	35.8	43	
3	8.4	7.4	7.7	1CS	25	20	12	--	--	13
4	8.6	6.8	5.7	PP	30	20	12	12.4	15	3
5	8.4	7.5	1.8	1CS	50	20	12	--	--	38
6	8.37	--	28.2	1CS	--	--	--	--	--	
7	8.5	7.0	5.5	PP	30	20	12	--	--	18
8	8.0	2.0	4.2	1CS	40	20	12	--	--	28
	66.37	41.2						460		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner RODGER HAYES

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 31

1, 2	X126 918

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.18	7.6	6.8	Barley	25	--	--	20.8	25	
2	8.0	7.4	9.5	Barley	25	--	--	20.8	25	
	16.18	15.0						312		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner JIM CURRAN

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 33

1, 2	X168 964

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	9.11	8.0	3.3	2CS	55	16.8	10.1	15.84	19.0	25.9
2	9.1	8.1	1.5	PP	40	16.8	10.1	15.84	19.0	10.9
	18.21	16.10						255		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner MICHAEL PHELAN

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 34

1, 2	X176 965
3, 4	S154 016

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.3	6.6	10.5	2CS	20	--	--	16.7	20	
2	7.5	6.5	5.8	Barley	35	--	--	29.2	35	
3	6.91	4.2	10.6	PP	--	--	--	--	--	
4	7.42	5.8	2.4	Barley	45	--	--	37.5	45	
	29.13	18.9						517		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner PAT. MCGRATH

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 36

1-3, 5, 6	X198 950
4	X194 953

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.9	6.9	6.1	2CS	35	20	12	19.2	23	
2	7.64	7.1	2.7	2CS	70	20	12	30.0	36	22
3	7.8	7.3	10.8	2CS	20	33	20	--	--	
4	7.5	--	3.7	PP	30	2	--	--	--	30
5	7.8	6.9	4.1	PP	30	10	6	18.3	22	2
6	7.9	7.0	5.4	PP	30	10	6	18.3	22	2
	46.54	35.2						600		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner PAT LOOBY

Map Reference F.C. 37

National Grid Reference (8 digit, 4E, 4N)

1	X165 937
2	X168 935

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.18	7.4	9.6	1CS	25	25.8	9.5	12.9	15.5	
2	8.0	--	17.7	1CS	--	--	--	--	--	
	16.18	7.4						95.0		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner LAR LOOBY

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 38

1-8	X175 945

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.2	7.3	9.3	PP	10	16.7	10	--	--	6.6
2	8.0	7.0	4.2	PP	30	24.6	14.8	12.7	15.2	
3	8.3	--	2.4	PP	--	--	--	--	--	
4	8.1	--	13.8	PP	--	--	--	--	--	
5	8.2	7.3	6.8	PP	10	16.7	10	--	--	
6	8.1	7.4	3.4	Barley	35	24.6	14.8	11.4	13.6	
7	8.0	7.1	6.0	PP	10	16.7	10	--	--	
8	7.85	7.0	7.1	Beet	40	24.6	14.8	21	25.2	
	64.75	43.1						320		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner GERALD O'DONOVAN

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 39

1, 4, 5	X154 949
3	X170 995
2	X151 958

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On- Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.7	7.9	3.1	2CS	55	19.6	11.8	20.0	24	19.2
2	8.21	5.8	1.6	2CS	70	19.6	11.8	20.0	24	34.2
3	9.8	8.8	6.2	PP	10	16.7	10	--	--	--
4	8.6	7.8	11.4	1CS	15	25	15	--	--	--
5	9.2	8.3	5.5	PP	30	19.6	11.8	15.2	18.2	--
	44.51	38.6						400		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner DIARMUID HOGAN

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 41

1-10, 13	X206 994
11, 12	S206 008
14, 15	X088 986

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.3	7.3	3.8	PP	30	20	12	15	18	
2	8.1	7.6	5.8	PP	30	20	12	15	18	
3	8.0	--	19.3	2CS	--	--	--	--	--	
4	8.2	7.4	10.6	2CS	20	33.3	20	--	--	
5	8.3	7.7	8.7	2CS	35	20	12	19.2	23	
6	8.4	7.4	4.8	PP	30	20	12	15	18	
7	8.2	7.6	3.8	PP	30	20	12	15	18	
8	8.0	7.7	4.3	PP	30	20	12	15	18	
9	8.2	7.8	3.6	PP	30	21.5	12.9	14.3	17.1	
10	8.33	7.6	5.4	1CS	40	--	--	33.3	40	
11	8.0	--	12.2	PP	--	--	--	--	--	
12	7.5	4.7	7.6	Hay	25	--	--	20.8	25	
13	8.1	7.5	3.9	PP	30	--	--	25	30	
14	8.9	6.9	13.0	Maize	20	--	--	16.7	20	
15	8.9	6.7	11.3	Maize	20	--	--	16.7	20	
	123.43	93.9						1589		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner JAMES O'BRIEN

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 43

1-7	X165 995

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.4	7.5	2.6	PP	40	22.7	13.6	22.0	26.4	
2	8.61	7.7	3.1	PP	30	22.7	13.6	13.7	16.4	
3	8.63	6.9	1.9	PP	40	--	--	33.3	40	
4	8.5	7.5	9.1	PP	10	16.7	10	--	--	
5	8.3	7.8	4.5	1CS	40	30	18	18.3	22	
6	8.7	7.7	4.7	2CS	55	20	12	35.8	43	
7	8.75	7.6	5.3	PP	30	--	--	25.0	30	
	59.89	52.7						1109		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner CAPPAQUIN ESTATE

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 45

1-6	X144 958
7-14	X172 972
15	X182 989

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.4	--	10.7	WW	--	--	--	--	--	
2	7.3	6.4	9.1	WW	25	--	--	20.8	25	
3	7.2	6.6	7.6	WW	25	--	--	20.8	25	
4	7.4	--	13.0	WW	--	--	--	--	--	
5	7.11	--	10.8	WW	--	--	--	--	--	
6	7.53	--	10.9	WW	--	--	--	--	--	
7	7.4	6.4	6.4	WW	25	--	--	20.8	25	
8	7.3	--	17.2	Oats	--	--	--	--	--	
9	7.5	6.6	7.3	Oats	25	--	--	20.8	25	
10	7.64	6.5	8.9	Barley	25	--	--	20.8	25	
11	7.1	6.7	5.4	Beet	55	--	--	45.8	55	
12	7.3	6.8	6.2	Beet	40	--	--	33.3	40	
13	7.4	--	2.4	S Aside	--	--	--	--	--	
14	7.6	--	2.7	S Aside	--	--	--	--	--	
15	7.7	6.5	7.3	Oats	25	--	--	20.8	25	
	110.88	52.5						1346		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner EDMUND SCANLAN

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 46

1-3	X119 907
4-7	X114 946

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	7.8	6.5	11.3	PP	--	--	--	--	--	
2	7.9	7.0	3.5	1CS	40	24.2	14.5	21.2	25.5	
3	7.7	7.2	7.7	1CS	25	24.2	14.5	8.8	10.5	
4	7.84	7.1	7.0	2CS	35	24.2	14.5	17.1	20.5	
5	7.9	6.8	8.6	PP	10	16.7	10	--	--	
6	7.7	5.9	10.4	PP	--	--	--	--	--	
7	8.2	7.2	8.6	PP	10	16.7	10	--	--	
	55.04	35.3								

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner PADDY O'KEEFFE

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 47

1-6	X167 945

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.7	--	46.2	2CS	--	--	--	--	--	
2	8.9	8.0	11.9	2CS	20	15.6	9.4	8.8	10.6	
3	8.8	7.9	5.3	PP	30	15.6	9.4	17.2	20.6	
4	8.7	7.8	8.1	PP	10	16.7	10	--	--	
5	8.6	--	26.1	PP	--	--	--	--	--	
6	8.91	--	13.8	PP	--	--	--	--	--	
	52.61	23.7						206		

TABLE 11B (ii): WASTE DISPOSAL BY LANDSPREADING

Land Owner SEAMUS BUCKLEY

National Grid Reference (8 digit, 4E, 4N)

Map Reference F.C. 48

1-4	X172 962
5-7	X191 984

Field ID	Total Area (ha)	Usable Area (ha)	Soil P Test (mg P/l)	Crop	P Requirement (kg P/ha)	Volume of On-Farm Slurry Returned (m ³ /ha)	Estimated P in On-Farm Slurry (kg P/ha)	Volume of Pig/Poultry Manure to be Applied (m ³ /ha)	P Applied in Pig/Poultry Manure (kg P/ha)	Annual Artificial P Fertiliser to be used (kg P/ha)
1	8.0	7.3	4.7	PP	30	--	--	25	30	
2	8.15	7.1	6.5	1CS	25	13.8	8.3	13.9	16.7	
3	8.1	7.1	8.8	PP	10	16.7	10	--	--	
4	8.0	6.8	7.2	PP	10	16.7	10	--	--	
5	8.2	7.4	3.4	1CS	40	13.8	8.3	26.4	31.7	
6	8.0	7.0	5.5	PP	30	--	--	25	30	
7	8.2	7.2	5.5	PP	30	--	--	25	30	
	56.65	49.9						832		

Appendix 6

Carcass Disposal Agreement

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Clonmel
Co Tipperary

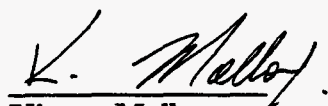
23 February 1998

To whom it may concern

I wish to state that we will collect all dead animals from the pig unit at Ballinameela, Cappagh, Co Waterford, owned by James McGrath.

These animals will be collected weekly and delivered to Ronan's Factory, Castleblake, Rosegreen, Cashel.

Signed:


Kieran Molloy.

Clonmel Fats Ltd.,
23 Mitchel St,
Clonmel
Tel. 052-24509
Vat No. 47598111

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