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1.0 PREFACE TO THE WASTE MANAGEMENT PLAN

1. (a) Description of the County

Location and Principal Towns

County Kildare is an inland county in the east of Ireland between 275 494 E and 268 653 N and 215 390 E and 222 058 N. It is bounded on the south by County Carlow, to the west by counties Laois and Offaly and to the east by counties Dublin and Wicklow. Meath bounds Kildare to the north (Fig 1.1).

The county is 1,688km² in area. The principal towns within County Kildare are Naas, Leixlip, Newbridge, Kildare, Maynooth and Athy. Co. Kildare has a population of 134,992 (Census of Population, 1996) which accounts for 3.7% of the total population of the State.

Topographic Features

The county may be divided into three main physiographic regions as follows:

- (i) The Plainlands – County Kildare is dominated by a lowlying and flat topography. Approximately two thirds of the county is less than 100m ordnance datum (OD). The Plainlands of County Kildare can be subdivided into three regions. These are the central and southern plains, the west central lowlands and the northwest boglands. The plain of central and southern Kildare varies from very flat to strongly undulating. The west central lowlands are characterised by raised bogland which formed after the last glaciation. This region is drained by the River Barrow and its tributaries. In northwest Kildare relief is low and elevations in this area are between 60m and 120m OD.
- (ii) The East Kildare Uplands – These uplands occupy a narrow strip which runs along the Kildare/Wicklow county boundary to the southeast of Kill. The highest elevation in County Kildare occurs in this region at 349m OD. These hills can be considered as the foothills of the Wicklow Mountains. The hills of the East Kildare Uplands follow a northeast-southwest trend. Elevations range from approximately 140 to 350 m OD. The strongest relief occurring in Kildare is seen in this region. To the east lie the Wicklow Mountains and to the west are the plains of Kildare.

- (iii) The Chair of Kildare and the Newtown Hills comprise a ridge of low hills trending northeast-southwest between Kildare and Rathangan. Redhills, the most southerly of the hills, rises to a height in excess of 138m OD. Dunmurray Hill immediately to the north of Redhills, reaches 234m OD and Grange Hill (also known as the Chair of Kildare) reaches 226m OD. These three hills are separated from the Hill of Allen (202m OD) by almost 3km of lower ground (92m OD).

Geology

The bedrock geology of County Kildare can be divided into four associations based on lithological variation. Refer to Figure 1.2.

- (i) Lower Palaeozoic slates, volcanic rocks and old red sandstone formations.
- (ii) Silurian calcereous greywackes, silstones and shales.
- (iii) Tullow Granite Pluton.
- (iv) Carboniferous Limestone.

The main quarternary sediments identified in County Kildare are gravel deposits, glaciolacustrine deposits, peat, till and alluvial deposits.

Soil Associations

The main soil associations in County Kildare belong to three physiographic divisions. These are the flat to undulating lowlands with mainly dry mineral soils; and the flat to undulating lowlands with mainly wet mineral soils and organic soils. Relatively small areas covered by the hill physiographic division. Figure 1.3 shows the generalised distribution of the soil associations in County Kildare.

Hydrogeology

County Kildare is fortunate to have extensive and valuable groundwater resources. The most important aquifer units are the sand and gravel deposits which overlie limestone bedrock in the central area of the county. The accumulations of stored groundwater in County Kildare are very large compared with annual recharge and therefore they can act as a balance for fluctuations in recharge rates. Figure 1.4 is a generalised Aquifer Classification Map of County Kildare. Aquifer categories are designated based on the aquifer classification system of the Geological Survey of Ireland (GSI). The GSI categorises aquifers as regionally important, locally important or poor. Each category is subdivided based on the value of the resource and hydrogeological characteristics.

Hydrology

The major rivers draining County Kildare are the Liffey, the Boyne and the Barrow. The Liffey rises in the Wicklow Mountains; and flows west before swinging to the north at Kilcullen. It meanders through Kildare before turning east towards Dublin. The Liffey drains a catchment of 1,122 km² above Islandbridge Weir, Dublin. The catchment of the Liffey is 872 km², 631 km² of which is in County Kildare.

The Barrow flows through part of the western side of County Kildare. It rises in the Slieve Bloom Mountains in County Laois and flows in a southerly direction. This river has a total catchment of 3,068 km² of which 818 km² lies upstream of Carlow. This includes a part of County Laois.

The upper catchment area of the River Boyne, which rises near Newburyhall, Carbury in Kildare, and its tributaries, including the River Blackwater, drain the northern area of County Kildare. Approximately 8% of the Boyne catchment lies within County Kildare. This amounts to 216 km² of the total catchment of the Boyne (2,700 km²).

Annual rainfall averages for County Kildare vary between 746 mm and 932 mm. The higher rainfall averages generally correspond to elevated areas. For example, at Pollaphouca (elevation 174 mm OD) the annual average rainfall is 932 mm, the highest recorded annual average. The highest monthly averages occur between August and January.

There is no synoptic weather station in Kildare. However, those at Casement Aerodrome, Co. Dublin and at Kilkenny provide useful data. Potential evapotranspiration ranges between 5 mm in winter months and 90 mm in summer months. Yearly totals for Casement Aerodrome and Kilkenny were 530 mm and 459 mm, respectively. Using these values, available precipitation for recharge (to groundwater and surface water) is estimated at 180 mm and 363.8 mm for Casement Aerodrome and Kilkenny, respectively.

1. (b) Population Size and Distribution

Population Size

The population of County Kildare according to the 1996 Census is 134,992. Numbers increased by 12,336 persons or 10.1% during the intercensal period 1991-1996. This large growth is due in part to the proximity of Kildare to Dublin. The records for comparison with earlier years are illustrated below.

Figure 1.5: Historical Population of Co. Kildare 1956-1996

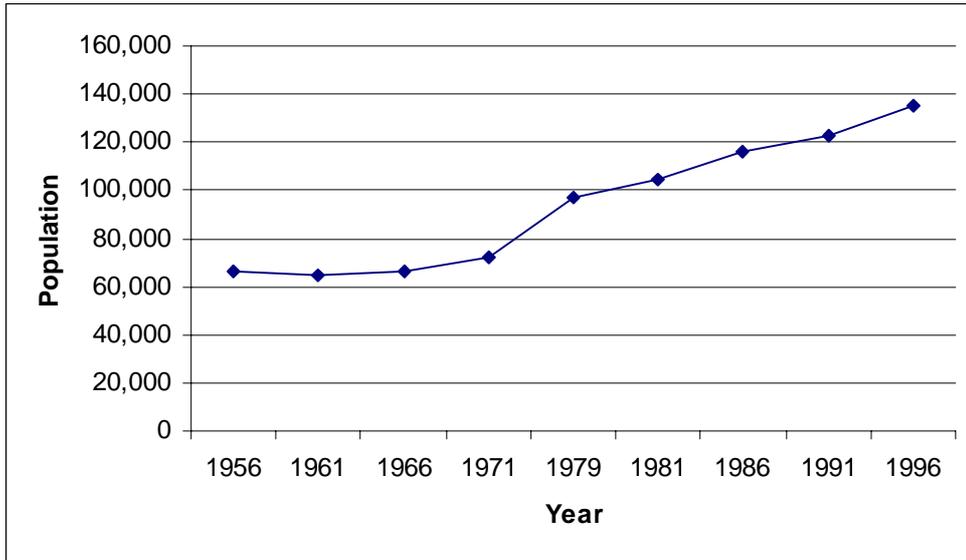


Figure 1.5 illustrates the population trends for the county over the last forty years. The overall population can be seen to have remained quite stable from 1956-1971. It was from this point that the population began to rise steadily. Unlike most other counties and the State, Co. Kildare did not experience a slight fall in population between 1986-1991. The current population settlement is focused in urban areas, the urban/rural split favoring urban 60.6% to 39.4%. This compares with the State population distribution of urban 58% to rural 42%.

With respect to future population numbers in the County, reference was made to the projections in the County Development Plan 1999. The County Development Plan used two different projections, Projection A which is based on a natural increase throughout the County and Projection B which is based on migration patterns area by area.

Population and Household Distribution

Kildare may be divided into six main districts, namely Athy and Naas urban districts and Athy No. 1, Celbridge No. 1, Eddenderry No.1 and Naas No.1 rural districts.

Athy No.1 rural district has a population of 14,748 which is 11% of the county population. Athy urban district has a population of 5306, 4% of the county total.

Naas No.1 rural district has a population of 50,208 which is 37% of the county population. Naas urban district has a population of 14,074, 10% of the county total. The latter shows a 26.3% rise in population in the Naas Urban Area since 1991. The town of Clane shows an increase of 44% in 1991-1996.

Celbridge No. 1 rural district has a population of 43,237 which is 32% of the county total. This figure represents an increase in population of 15.3% since 1991 with the Celbridge urban area showing an increase of 27.2% rising from 8,763 to 11,143. The population of Maynooth increased by 36.4% between 1991 and 1996.

Edenderry No.2 rural district has a population of 7,419 which is 5% of the total population of the county.

The number of households in aggregate town areas (i.e. population clusters of 1,500 or more inhabitants) is 23,920 and that in aggregate rural areas is 13,507. The average number of persons per household in the county is 3.39, i.e. 3.35 in the aggregate town areas and 3.47 in the aggregate rural areas. Table 1.2 gives the number of households in each town in Kildare with a population greater than 10,000.

Table 1.2: Number of Households in Towns of Population > 10,000

TOWN	NO. OF HOUSEHOLDS
Naas	4,380
Leixlip	3,543
Droichead Nua	4,015
Celbridge	3,465

1. (c) Industrial, Commercial, Agricultural and Tourist Activity in the County

Industrial

Industrial activity in Co. Kildare is represented by a number of sectors including *high technology* (e.g. Intel, Hewlett Packard), *food processing* (Green Isle), *engineering* (Master Plant, Moovmor), *pharmaceutical* (Wyeth and Oral-B) and *services* (e.g. Bord na Mona HQ, Council Offices).

Apart from the major names referred to above the majority of industrial concerns may be classified as small to medium enterprises. (Source: Industrial Development Authority, and Forbairt)

Commercial

Commercial businesses are also significant in both number and distribution within the county. Each of the main towns, i.e. Athy, Newbridge, Naas has in the region of 100 – 150 commercial businesses. Of these, grocery (18%) and public houses (18%) are in the highest proportion. Other important commercial businesses include clothing, footwear and newsagents. (Source: Central Statistics Office).

Agricultural

Kildare has 123,000 ha of farmed land. Of this 33,000 ha consists of crops, fruit and horticulture, 85,000 ha of silage, hay and pasture (of which 16,000 ha is silage) and 5,000 ha of rough grazing (in use).

Total number of cattle in the county is 140,000, while sheep number 281,000 and pigs total 26,200. Poultry, deer and goats are also farmed and these number 95,000, 100 and 300 respectively. (Source: Central Statistics Office).

Tourism

A number of festivals and events take place around the county each year. Major events include the race meetings at the Curragh, Naas and Punchestown race courses. Kildare has a worldwide reputation for its equine industry arising from the county's concentration of stud farms, equestrian centres and race courses. Other activities which attract tourists include the excellent angling and facilities. Kildare offers an interesting and contrasting countryside made up of agricultural land, peatlands, forests, rivers and canals, the low-lying Curragh Plain and the Hill of Allen.

Composite Map

Figure 1.6 is a composite map indicating the general distribution of activities under appropriate headings.

1. (d) Transport Infrastructure

Road Network

County Kildare is serviced by a network of national, regional and county roads as shown on Figure 1.7. These routes may be described as follows:

- (i) The Motorways primarily serve long and medium distance traffic. They are characterised by legal definition, by having no access except at interchanges and having no at-grade junctions. Special care is required with regard to building lines, signs and external lighting when considering development near this type of road.
- (ii) National Primary routes in the county are the N4 (Dublin – Galway), N7 (Dublin – Cork/Limerick) and N9 (Naas – Waterford). These roads primarily serve long and medium distance traffic passing through the county. Certain sections of these roads are reaching the limits of their traffic bearing capacity.
- (iii) There are two National Secondary Roads passing through the county, the N78 (Kilcullen - Athy) and the N81 (Dublin – Baltinglass). They serve long and medium distance traffic and also cater for local traffic.

- (iv) Regional roads link the principal towns in the county and also serve local traffic. They are generally of a high standard and in some cases carry very considerable volumes of traffic.
- (v) County Roads serve local traffic.

Kildare County Council has a number of plans underway with regard to road improvement, extensions etc. Proposals for the by-pass of Kildare Town have received ministerial approval and construction has started. Plans have been approved for the extension of the Kilcock – Kinnegad Motorway (M4).

It is proposed to locate an interchange at Kilcock west of where the Courtown Road crosses the M4. It is also proposed to locate an interchange between Maynooth and Leixlip, to serve, inter alia, Celbridge. A plan is currently being prepared in respect of all regional and county roads in the county. Improvements will be required at specific locations where local traffic conditions and other considerations dictate.

Rail Network

The railway network makes a significant contribution to the economic activity of the county. The main lines (see Fig. 1.7) are:

- (i) Dublin – Limerick/Cork;
- (ii) Dublin – Mullingar – Sligo; and
- (iii) Dublin – Carlow – Kilkenny – Waterford.

There are stations at Newbridge, Kildare, Athy and at Maynooth. In addition there are commuter services utilising the main lines. In the case of North Kildare that serves Leixlip and Maynooth, and in the case of Central Kildare Celbridge, Sallins and Naas, Newbridge and Kildare.

It is likely that demand for these services, and particularly the commuter services, will increase due to increased population in the towns served, and due to changing patterns of commuting and economic activity. Usage of the line serving Maynooth, for example, increased by 14% in 1996.

A minimal amount of abandoned broad-gauge line (double/single track) also exists which previously linked Naas with Tullow in County Carlow.

There are no rail freight depots in County Kildare. Opportunities for the transport of waste by rail would require considerable development of existing stations and the creation of new depots.

Ports and Navigable Waterways

Kildare is an inland county and therefore has no ports. The River Barrow is the main river flowing through the County. It is navigable throughout its course in Kildare. The Royal Canal and the Grand Canal are also significant navigable waterways in the county giving passage to both Dublin and the Shannon.

1. (e) Groundwater

The major groundwater abstraction points for County Kildare are shown on Figure 1.4. As of April 1995 it was estimated that 25,000 persons in the county depended on groundwater for their water supply. Private wells supplied water to approximately 11,000 persons and the mains supply from 21 local authority groundwater abstraction points served a population of approximately 10,000. It is estimated that 4.0Mm³ of groundwater is abstracted annually.

Groundwater quality from the highly permeable aquifers of County Kildare is generally excellent. Groundwater from these aquifers tends to be very hard, a characteristic which, although beneficial to health, can cause problems to pipes, hot water systems and some industrial processes. Groundwater from the less permeable aquifers is poor and is often characterised by low pH values and high concentrations of iron, manganese and sulphates.

Many aquifers in County Kildare are vulnerable to pollution. Water-bearing glacial deposits (sand and gravels), particularly where the water table is shallow, can be at risk from landspreading of fertilisers or septic tank effluents. Aquifer vulnerability may be increased by activities such as quarrying and mining or excavation works, where some of the natural protection provided by overlying soil is removed. Human activities affect the natural purity of groundwater so that groundwater quality varies throughout County Kildare. As of June 1992 all of the County's public groundwater sources provided water which satisfied the European Community Regulations of 1988. Several abstraction points have nitrate levels close to EC maximum allowable concentrations (MAC). This high level is probably due to fertilisers or sewage entering the groundwater.

The nature of the soil and the underlying subsoil play an important role in determining the vulnerability of groundwater. Groundwater is most at risk where subsoils are absent or thin and in areas of karstic limestone. For a contained waste disposal site, the best rock types are the finer grained variety such as slates, shales, mudstones, siltstones and clayey glacial till or clays. In County Kildare these rock types are not widespread. A more common scenario in County Kildare is limestone bedrock covered by a thick sand and gravel aquifer. Much of the land is low-lying and the water table tends to be relatively shallow. In some cases, a thin sand and gravel covering lies on karstified limestone or fractured sandstone. In this scenario the bedrock often exhibits secondary permeability and this will encourage rapid

contaminant movement particularly when the overlying sand and gravel is clean and well sorted. These sites constitute the major aquifers in County Kildare and are the most vulnerable to pollution.

1. (f) Land Use Considerations and Designated Environmental Protection Areas

Particular regard is given by Kildare County Council to the siting, design and visual impact of proposed developments when assessing proposals for areas of special amenity value or special interest. Consideration is given to the high amenity value, scenic quality, recreational attractiveness, historic or scientific value of each area, the protection of groundwater resources and traffic safety.

Areas of special control and environmental protection include:

- Areas of landscape importance;
- Natural Heritage Areas;
- Exposed mountain slopes;
- Heath lands;
- Buildings and other structures of artistic, architectural or historic interest (including national monuments) and their environs;
- Areas of woodlands;
- The environs of important tourist facilities;
- The banks and escarpments of adjoining rivers; and
- Estuarine wetlands.

Appendix III shows ecological sites, mountains and grasslands which are proposed Natural Heritage Areas on the grounds of importance for wildlife conservation.

1. (g) List of Waste Management Legislation

Waste Management Act 1996

The enactment of the Waste Management Act 1996 has put in place one of the most powerful pieces of legislation since the inauguration of the Planning Acts in 1963. For the first time, waste has been comprehensively defined and the requirements for management of waste strictly laid down. The Act and subsequent Regulations set out a comprehensive regulatory framework for waste management in Ireland. Roles are defined for the Minister (of the Environment and Local Government), the Environmental Protection Agency (EPA), local authorities and other public authorities.

These roles may be summarised as follows:-

(i) The Minister for the Environment and Local Government

- Policy direction;
- Assist and support waste prevention and recovery initiatives;
- Make regulations.

(ii) The EPA

- Licensing of all significant waste disposal and recovery activities;
- Planning management and control in relation to hazardous waste;
- IPC licensing of certain waste-related activities, e.g. incineration.

(iii) Local Authorities (Counties and County Boroughs)

- Make waste management plans;
- Operate a permit system for waste collectors;
- Collect, or arrange for the collection of, household waste;
- Provide and operate, or arrange for the provision and operation of, such facilities as appear necessary for the disposal and recovery of household waste.

Section 38 of the Act, to which the last item above refers, provides a mechanism whereby local authorities may enter into agreements with other local authorities or “other persons” for the recovery or disposal of waste. The Act permits what it terms “joint provision and operation” for any relevant facility.

Local Agenda 21

In June 1995 the Minister for the Environment published a document entitled ‘Local Authorities and Sustainable Development, Guidelines on Local Agenda 21’. The document recommends that all developments should be sustainable with due regard to balancing the capacity of the environment to sustain human activity against the requirement to meet social, economic and cultural aspirations.

Sustainable development was defined as “development which meets the needs of the present without comprising the ability of future generations to meet their own needs”. One of the aims of Agenda 21 is to reduce the amount of energy and raw materials society consumes, as well as the pollution and waste it produces. It was stated that sustainable development can only be brought about by co-operation and partnership between all social and economic groups and interests.

The following guidance to the elements involved in Local Agenda 21 was given:

- Relevant policies, plans or programmes should be reviewed or developed to address environment and development concerns fully and reflect the overall vision of the community regarding sustainable development;
- The main issues of concern in the local authority area, and objectives and specific targets for achieving sustainable development, should be identified;
- The action to be taken, and by whom, to work towards these objectives and targets should be specified;
- Details of how progress will be assessed, and a review process, should be defined;
- Finished products encapsulating the above (such as an environmental charter, a policy document, a review of the Local Agenda 21 process and future outlook) should be clear, simple and acceptable to the wider community, and should be published and made widely available.

The importance of the role of local government was stressed in that local authorities play a vital role in educating and mobilising the public around sustainable development. It is suggested that the balance be a broad collaborative approach guided and facilitated by local authorities, key words being:-

- Information;
- Awareness;
- Consultation;
- Feedback;
- Partnership;
- Monitoring;
- Progress.

It is suggested that the local authority should lead by example by:

- Adopting an environment charter or mission statement;
- Adopting a voluntary environment management system;
- Pursuing green housekeeping measures;
- Staff training and information; and
- Budgeting.

Local authorities are to consider the aims of Local Agenda 21 in formulating policies on:-

- Land use/development;
- Urban development;
- Provision of services;
- Transport policy and traffic management;
- Housing;
- Tourism;
- Health;
- Action for equality; and
- Environmental activities.

Much of the (recent) environmental legislation is founded on the principles embodied in Local Agenda 21. Relevant waste management legislation is listed below.

National Policy and Legislation

- Environmental Protection Agency Act 1992;
- Health, Safety & Welfare at Work Act 1989 & Regulations;
- The Local Government (Planning & Development) Acts and Regulations 1963-1993;
- Litter Pollution Act 1997;
- The Water Pollution Act 1977 (amended 1990);
- Waste Management Act 1996;
- Waste Management Regulations (Farm Plastic) 1997;
- Waste Management Regulations (Packaging) 1997;
- Waste Management (Licensing) Regulations 1997;
- Waste Management (Planning) Regulations 1997;
- European Communities (Amendment of Waste Management Act, 1996) Regulations, 1998;
- Waste Management (Amendment of Waste Management Act, 1996) Regulations, 1998;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998;
- Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998;
- Waste Management (Transfrontier Shipment of Waste) Regulations, 1998;
- Waste Management (Permit) Regulations, 1998;
- Waste Management (Miscellaneous Provisions) Regulations, 1998;
- A Policy Statement:- Management Changing Our Ways, DoELG 1998.
- Recycling for Ireland, DoE 1994
- Proposed National Hazardous Waste Management Plan, EPA 1999

EU Waste Strategy and Policy

General: -

- The Framework Directive on Waste. Council Directive 75/442/EEC as amended by 91/156/EEC;
- The Framework Directive on Hazardous Waste i.e., Council Directive 91/689/EEC;
- The Fifth Action Programme on the Environment “Towards Sustainability” (5EAP) 1992;
- Council Regulations (EEC) No. 259/93 on the supervision and control of shipments of waste within, into and out of the European Community;
- European Waste Catalogue (1993), the Hazardous Waste List (1994).

Specific: -

- 87/101/EEC The Disposal of Waste Oils;
- 86/278/EEC The Protection of the Environment, and in particular of the soil, when sewage sludge is used in agriculture;
- 91/157/EEC On batteries and accumulators containing certain dangerous substances;
- 76/403/EEC (to be replaced in March 1998 by 96/59/EC) The disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT);
- 94/62/EC Packaging and Packaging Waste;
- 81/972/EEC The re-use of waste paper and the use of recycled paper; and
- 1999/31/EC EU Directive on the Landfilling of Waste.

Other Legislation

- 81/369/EEC The Prevention of Air Pollution from New Waste Incineration Plants;
- 89/429/EEC The Prevention of Air Pollution from Existing Waste Incineration Plants;
- 94/67/EC Incineration of Hazardous Waste (under review)
- 91/271/EEC Urban Wastewater Treatment;
- 90/667/EEC Animal waste;
- 96/61/EC Integrated Pollution Prevention and Control Directive (IPPC); and
- 97/11/EC Environmental Impact Assessment (EIA).