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M25 WIDENING JUNCTION 30/31
ENVIRONMENT REPORT 1
VOLUME I

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M25 WIDENING JUNCTION 30/31
ENVIRONMENT REPORT 1

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1.0 INTRODUCTION

1.1 Background

A Study Commission undertaken by Parkman Consulting Engineers between 1990 and 1991, led to recommendations being made for increasing the capacity of the M25 between Junctions 24 and 31. Included in that study was a preliminary environmental appraisal of all issues relating to the environmental constraints of the M25 widening.

1.2 Brief

Mott MacDonald was commissioned by the DOT to review the data collected during the 1990/1991 Study Commission and expand and update this as necessary. The objective of the study was the identification and mapping of those environmental features likely to present a significant environmental constraint to possible scheme layouts and the production of a Stage 1 Report that will form part of the basis of a future Environmental Statement, in accordance with the requirements of EC Directive 85/337. The area of interest is located around Junction 30/31 of the M25 and is shown on Map 1.

1.3 Standards and Codes of Practice

The study was carried out in accordance with Volume 11 Design Manual for Roads and Bridges, and covered the following areas:

Planning
Archaeology and cultural heritage
Ecology
Landscape
Land use and agriculture
Impacts on vehicle drivers
Water quality and drainage
Geology, soils and contaminated land

1.4 Methodology

The Study Commission carried out by Parkman Consulting Engineers was reviewed and the information updated by consultations with officers from Essex County Council and Thurrock Borough Council. A list of these consultations and contact names is included in Appendix 1. The sources of information are detailed in Appendix 2. The desk studies were supplemented by a site visit. Contact was also made with the National Rivers Authority (NRA) and English Nature.

1.5 Limitations of the Study

The study undertaken for this Part 1 Report is based on a review of readily available information. Analysis of impacts and the effects of the various route options will be undertaken for the Part 2 Report which will follow later. Since detailed traffic data will not be available until the route options are defined, the conditions regarding air quality and noise are only covered briefly in this report and will be covered in depth for the Part 2 study.

2.0 PLANNING

2.1 Baseline Condition

The objective of the Part 1 study was to identify the national, regional and county planning policies whose stated policies could be affected by an improvement scheme.

2.1.1 National and Regional Policies

Guidance on national policy is provided in the form of the Planning Policy Guidance Notes (PPGs) and in the DOE circulars. The relevant PPGs are PPG2, Green Belts, PPG12, Regional Guidance for the South East and PPG7, the Countryside and the Rural Economy published in 1989, 1988 and 1992 respectively.

The statutory function of the Green Belt is as a strategic planning tool designed primarily to control the spread of urban sprawl, development and coalescence of towns. PPG7 recognises that around some conurbations there are areas of 'urban fringe' where land use conflicts and environmental problems arise. The study area is an example of 'urban fringe' and contains areas of derelict land and damaged landscape and under-used land whose viability for agricultural use has been affected by urban pressures. The guidance note states that areas such as these require 'a positive approach to planning and environmental improvement and beneficial use of land, and increased public access, to provide an amenity for the residents of urban areas.'

Although there is a general presumption against development in the Green Belt, which PPG12 states is not affected by the M25, the Guidance also states that the Government is pressing ahead with proposals to improve road links from east London including improved access to the M25.

Guidance on national policy is also given in Circular 27/87: Nature Conservation. The circular states that 'one of the essential tasks for Government, local authorities, and all public agencies concerned with the use of land and natural resources is to ensure the effective conservation of the landscape, its wildlife and natural resources while making adequate provision for the necessary development and economic growth.'

The local planning authorities in the south-east region have formed a collective planning body, the South-east Regional Planning Conference (SERPLAN). This organisation has no statutory powers or status, but its role is recognised by the Secretary of State. A strategy has been produced for the south-east setting out the strategic proposals for development in the region for the 1990s. These include proposals for the East Thames Corridor, in which Thurrock and the study area is situated. These policies are aimed at regenerating the eastern side of London.

2.1.2 County Policies

The Essex Structure Plan: Approved First Alteration, Written Statement 1991 sets out the County's policies and proposals and has been approved by the Secretary of State. This Structure Plan supersedes the Essex Structure Plan approved by the Government in 1982.

Relevant policies have been extracted from the plan and are set out in Appendix 3. In particular Policy T2 states that the County Council is in support of the M25 widening scheme and will encourage the Department of Transport to implement it as quickly as possible. The remaining policies are concerned with ensuring that natural resources and environmental concerns are addressed in all new developments.

2.1.3 Local Policies

The local planning authority is Thurrock Borough Council. The recently produced Thurrock Borough Local Plan Deposit Draft has been examined and a schedule of local planning policies has been produced in Appendix 4. The detailed examination of the local planning policies will be carried out for the Stage 2 assessment.

2.2 Assessment of Environmental Effects

The widening of the M25 is in accordance with the stated national and regional planning policies and the desire to regenerate the eastern side of London. Nevertheless, it will be necessary to ensure that the scheme is carried out with due regard for the need to protect the natural resources and environment of this area, which has already been seriously degraded.

2.3 Mitigation

As the scheme itself is not in conflict with the planning policies mitigation measures should concentrate on the need to protect those significant environmental features and natural resources identified in this report. Where possible the scheme and should aim to enhance the opportunities for landscape and nature conservation improvements in the study area, particularly in view of guidance issued by PPG7 regarding 'urban fringe' and the Green Belt.

3.0 ARCHAEOLOGY AND HERITAGE

3.1 Baseline Conditions

Sites of archaeological interest, ancient monuments, historic landscapes and listed buildings have been identified through consultation with Essex County Council Planning Department and an examination of Thurrock Borough Local Plan Deposit Draft. A description of each site and the findings of previous excavations and surveys is included in Appendix 5 and their locations are indicated on Maps 2.1 and 2.2

The area is considered to be rich in archaeological resources which include Prehistoric, Roman and Medieval remains. Of particular importance are the Church of St Michael and Aveley Manor Moat. In addition, there is potential for future finds in areas not yet investigated. Three areas of particularly high potential with regard to possible future archaeological finds have been identified:

Greenlands and Bluelands Quarry, Site 5040-5045 during the planning process for the nearby sports ground, important environmental and artefact evidence was found in the pleistocene deposits that run through these quarries and it is considered likely that there could be further surviving remnants in the unexcavated areas. This area is currently being investigated and evaluated for archaeological remains as part of the Channel Tunnel rail link project. Should these investigations uncover any remains it is likely that, due to the rarity of the potential pleistocene finds, this is one area that could require *in-situ* preservation.

Belhus Park, Sites 5102-5105 - during construction of the M25, Iron Age remains were found. The area of study was, however, confined to that affected by the scheme and it is likely that the remains extend further.

Mar Dyke, Sites 5113-5115 - work in similar areas of alluvial deposit and on other sections of Mar Dyke have shown that such deposits can provide good historic environmental evidence eg water logged organic deposits, flora and fauna.

There are several listed buildings in Aveley, including one Grade I site, the Church of St Michael on the High Street as well as the Scheduled Ancient Monument (SAM), Aveley Manor Moat. These are listed in Appendix 6 and their locations are indicated on Maps 2.1 and 2.2. The Belhus Park was designed by Capability Brown and is listed in the Register of Parks and Gardens of Special Historic Interest in England

It is unlikely that the SAM or village of Aveley will be affected, being some distance from the existing M25. The bluelands quarry site is also remote from the motorway. However, there is the potential for the sites in Belhus Park and the Mar Dyke to be disturbed, especially as finds have already been made in these areas during excavations for the existing M25.

3.2 Assessment of Environmental Effects

3.2.1 Construction

During construction, impacts on historic resources can arise from:

- temporary land take or disturbance, resulting in permanent damage or loss to archaeological or historic features. This could be a consequence of construction operations such as earthworks or the movement of plant or vehicles on the construction areas, haul roads and access routes;
- impacts on visual setting of archaeological or historic sites due to construction activities.

The detailed evaluation of construction impacts will depend on the construction activities, processes and plant and the exact location of these activities with respect to the potential receivers.

3.2.2 Operation

During operation of the proposed scheme, impacts on historic resources can arise from:

- permanent loss of, or damage to, resources due to land take or disturbance (eg vibration, air pollution);
- permanent coverage or loss of access for future excavation to areas that currently contain or have potential to contain archaeological resources;
- impacts on visual setting of archaeological or historic sites due to the presence and operation of the proposed scheme.

3.3 Environmental Constraints and Mitigation

The constraints will be a function of the location of the proposed land take and construction activities and the sensitivity of the sites. Of the areas that have been fully evaluated, the Church of St Michael (SMR sites 9957-99) and Aveley Manor Moat (site 5079) will require full *in-situ* preservation. The level of site investigation and criteria for evaluation will need to be determined for each site through consultation with the local authority and will be considered in detail for the Part 2 assessment.

Prior to their evaluation it is not possible to state categorically the level or nature of mitigation required at each site. However, at this stage it is anticipated that apart from sites 9957-99 and 5079, sites 5040-45 are the ones most likely to require *in-situ* preservation. However, should any of the site investigations at other locations uncover particularly valuable archaeological resources, their status of significance and hence the required mitigation measures could alter.

Where preservation *in-situ* is not specified as a requirement, it will still nearly always be the preferable option and this preference is clearly stated in the Thurrock Borough Local Plan, Local Policy BE35. This may be possible through sympathetic design, eg foundations which avoid or minimise disturbance to remains, raising of foundation levels, careful siting of landscaped or open areas, works sites and haul roads. Techniques are also available for sealing archaeological remains underneath buildings or landscaping, so ensuring their preservation for the future even though they remain inaccessible for the time being.

4.0 ECOLOGY

4.1 Baseline Condition

The objective of the Part 1 study was to identify the constraints with respect to nature conservation that may be affected by the development.

The ecological assessment identified the following designated sites; Sites of Special Scientific Interest (SSSI) which are of national importance, Sites of Importance for Nature Conservation (SINCS) which have been identified by the Essex Wildlife Trust, and Areas of Local Nature Conservation Significance (ALNCS) which have been identified by Thurrock Borough Council. The study also identified the known breeding sites of protected species.

The designated sites are illustrated on Maps 3.1 and 3.2.

4.1.1 Terrestrial

Sites of Special Scientific Interest

There is one Site of Special Scientific Interest (TQ 574 796). This area is known as the Purfleet Chalk Pits and has been designated as an SSSI for its geological importance. However, it is also understood that there is an interesting flora present on the site including the establishment of sea buckthorn and mallow. This site is discussed in more detail in Section 9.0, Geology, Soils and Land Contamination.

Sites of Importance for Nature Conservation

There are currently six Sites of Importance for Nature Conservation (SINCS) within the study area. Essentially these SINCS comprise woodlands and grasslands and follow the course of Mar Dyke. SINCS are subject to Thurrock Borough Local Plan, policy LN15. Details of each site are included in Appendix 7 and are summarised as follows.

Watt's Wood: This is an ancient woodland, bisected by the Purfleet arterial road, and forms two woods of very different character. The northern part is dominated by Pedunculate Oak with poor flora and the southern part is dominated by English Elm.

Hangman's Wood: This wood is on the north east side of Junction 30. It was once a Pedunculate Oak, Ash and Hazel stand with sweet chestnut being planted long ago, but has been invaded by sycamore. Since it has suffered severe storm damage it is now the subject of a restoration project.

Brannett's Wood: This wood is on the eastern border of the study area. It is bordered to the east by the main line railway, to the south by a surface water drainage ditch and Mar Dyke and to the north by a residential development. It was originally dominated by Pedunculate Oak and Hazel but today is dominated by Sweet Chestnut and Sycamore. The ground flora, although smothered by bramble, contains many ancient woodland species and there are slightly wetter areas which are noted for Ragged Robin and Bog-Stitchwort.

Brickbarn Wood: This woodland is situated on the southern section of the Mar Dyke Valley. It is bordered to the east by the railway line, to the south by the A13, and to the north by Mar Dyke. Although it is an ancient woodland little information exists. It is currently used extensively for recreational purposes, in particular for commercial war games and has sustained significant damage to the undergrowth.

Mar Dyke Grasslands: The stretch of the Mar Dyke which is contained within the study area is bordered by an extensive grassland area forming an important wildlife corridor. The grassland has been improved which has reduced its botanical interest, but it is reported that barn owls frequent the area.

Pond in Belhus Woods Country Park: This pond is on the northern most border of the study area and is bordered directly to the east by the existing M25. Within this pond is a small wooded island which provides a valuable safe breeding site for birds.

Areas of Local Nature Conservation Significance

There are two sites in the study area that have been designated as Areas of Local Nature Conservation Significance (ALNCS) by Thurrock Borough Council and are subject to Thurrock Borough Local Plan, local policy LN16.

Belhus Park is situated in the north western section of the study area and is bordered to the east by the existing M25. It is a mosaic of woodland, grassland, open water and wetland. The woodland within the park is traditionally managed for hazel coppice with oak. It is reported by Parkman Consulting Engineers that an interesting ground flora is present consisting of bluebells, wood stitch wort and ragged robin particularly in the damper areas such as ditches and ponds. On the edge of the M25 are several hay meadows which are reported to be traditionally managed.

Ash Plantation has also been designated as an ALNCS and is situated to the north east of the study area on the eastern side of the M25. Further information on this site is unavailable.

Mardyke Valley

This has been designated an ecological corridor in the Thurrock Borough Local Plan, local policy LN16. Ecological corridors are routes which enable flora and fauna to move from one site to another and to therefore colonise nearby sites

Protected species

At this stage of the Assessment there are three known protected species inhabiting the study area. The Barn Owl is known to frequent the Mar Dyke Grasslands and is protected under Schedule 1 of the Wildlife and Countryside Act 1981. The Kingfisher, which, is known to be breeding successfully in Belhus Park, is also protected under Schedule 1 of the Wildlife and Countryside Act 1981. There is also a badger sett in Belhus Park; badgers are protected at all times by the Protection of Badgers Act 1992.

4.1.2 Aquatic

The only water course running through the study area is Mar Dyke. Mar Dyke itself has little floating vegetation but the banks support a marginal flora of Purple Lossestrife, Bur-Reed, Reed, Reed Sweet-grass, Greater Pond-sedge and Reedmace. The faunal interest of the Dyke is low for vertebrates but several invertebrates have been reported. Three relatively scarce species of leech, *Dina lineata, Erpodella testacea* and *Alboglossiphonia heteroclita* and a relatively scarce Beetle species (*Hygrobia hermanni*) and snail species (*Valvata macrostoma*) have been reported.

The presence of leeches is generally symptomatic of poor water quality but despite this they do present a conservation interest.

There is no information available regarding the ecological status of the quarries or chalk pits. It is recommended that detailed ecological surveys of these water bodies are undertaken to form part of the Part 2 study, if it is likely that they will be affected by the proposals.

4.2 Assessment of Environmental Effects

4.2.1 Construction

Areas that will possibly be affected during construction are Belhus Park, Mar Dyke Grasslands, Mar Dyke, Ash Plantation and the pond in Belhus Park. If land take is involved for the development there will be a direct impact on these sites. If the A13 is widened Brannett's Wood will be directly affected through the probability of land take. The habitats of the above mentioned protected species will be affected together with adverse implications

on habitats of other flora and fauna. There is the possibility that without adequate protection measures the ecological potential of Mar Dyke could be further reduced if a spillage of construction materials, occurs.

4.2.2 Operation

Severance and fragmentation of sites may disrupt flora and fauna, in particular breeding habitats. Increased traffic on both the A13 and the M25 will have a detrimental effect on terrestrial and aquatic habitats because of the potential increase in animal mortalities and through potential pollution incidents resulting from road accidents.

4.3 Environmental Constraints and Mitigation

Additional, detailed surveys of the above areas should be undertaken in further stages of the Environmental Assessment before an accurate assessment of the environmental impacts of the development and detailed mitigation measures can be made.

The principal environmental constraint is the presence of badgers within the study area. The specific location of the badger sett will be identified in order to assess whether it will be directly affected. If this is the case remedial measures will need to be taken. These could include relocating the badgers and constructing a new sett if necessary.

5.0 LANDSCAPE

5.1 Baseline Condition

A site visit was made to assess the current landscape quality and the major landscape features are shown on Maps 4.1 and 4.2. Land use is shown on Maps 5.1 and 5.2. The landscape was assessed in terms of its general topography, vegetation, features of cultural and historical importance, areas of designated landscape significance or value and visual detractors. Directions of uninterrupted views have also been considered in relation to the visual impact of a possible improvement scheme on communities and residential properties.

The south east section of the study area is generally flat and despoiled by pylons, mineral workings and industry, including a large cement works. The only wooded area of any significance is Watts Wood which is subject to a tree preservation order. The disused minerals workings along Purfleet Road provide water areas of some landscape importance in an otherwise uninteresting setting, as does this part of the Mar Dyke Valley. The major settlement in this area is opposite Watt's Wood and consists of a 1930s development to the west of the recreation ground and a new development to the east and opposite the Purfleet chalk pits. The existing M25 is visible from this area, and any improvement scheme may therefore affect the outlook from these properties.

North of the Mar Dyke Valley and west of the existing M25, is an agricultural area. This is the only part of the study area under agricultural production, consequently it has a more open aspect in contrast to the generally industrial nature of much of the area and the more wooded area to the east of the M25. The landscape is flat, generally of poor quality and despoiled by rubbish dumping, and is used mainly for horse related activities. The major settlement in this area is the village of Aveley which has a Grade I listed church and a number of other Grade II listed buildings. The majority of the new development was constructed in the 1930s. The existing motorway is largely in cutting through this area, although the A13 embankments on Junction 30 are visible.

Belhus Park is located in the northern part of the study area, east of the M25, and comprises a golf course and sports ground. The landscape is characteristic of a country park and has local and historical importance having been designed by Capability Brown It is mainly grassland with individual and isolated groups of trees. The existing motorway is in cutting and its impact is therefore reduced on the landscape of this area.

To the east of the motorway and north of the Mar Dyke valley is a mainly flat area comprising some woodland in the north and playing fields and agricultural land to the south. The main settlement area of South Ockendon comprises mainly 1930s housing. The existing motorway is in cutting in this area.

The area south of Stifford Road comprises the Mar Dyke valley and is the main area of landscape significance and comprises a relatively steeply sided wooded river valley with

floodplain meadows. This area has an attractive appearance; the mature deciduous woodland on the upper valley slopes grading through grassland pasture to the Mar Dyke flowing at the base of the valley. The major wooded areas are Hangman's Wood, which is protected by a tree preservation order, Brannett's Wood on the north side of the river and Brickbarn Wood to the south. The disused sand pit adjacent to Hangman's Wood is flooded and provides an interesting water feature. It is currently used for fishing.

This area of the Mar Dyke valley together with the Belhus Park, has been designated by Thurrock Borough Council as Landscape of Local Importance, local policy LN3. Although these areas are not strategically significant in County terms, they are considered extremely valuable in the context of the local environment and provide visual relief from the more developed areas, especially where there has been waste disposal and minerals extraction. The Mar Dyke valley is also the site of a proposed country park, local policy LR15. Proposals for a community forest, the Thames Chase Community Forest, local policy LN7, include areas of the Belhus Park and the wooded areas to the east of the existing M25 (see Maps 6.1 and 6.2).

The area south of the A13 is of little landscape value, the whole area having been extensively worked for minerals extraction. The area immediately adjacent to the A13 was a former minerals extraction site and is now used as a motor sports complex. The Lakeside Regional Shopping Centre is located on the boundary of the study area. Immediately adjacent to the motorway is the Thurrock service station.

5.2 Assessment of Environmental Effects

The main potential for adverse impacts arises from the possible effects on the areas of Local Landscape Importance in the Mar Dyke Valley and Belhus Park and possible increases in visual intrusion on surrounding properties. On the western side of the motorway in the Mar Dyke Valley there may be a loss of wooded areas. The settlements near Watt's Wood have an uninterrupted view of the M25 are therefore the most likely to be adversely affected by the visual impact of the scheme.

5.3 Environmental Constraints and Mitigation

Details of the route alignment and design are not available at this stage, therefore it is only possible to discuss mitigation in very general terms. It should be possible to enhance areas of poor landscape quality and reduce the impacts to those properties whose outlook may be affected, by incorporating specific measures including on and off site planting, mounding and earth shaping and retaining existing vegetation wherever possible.

6.0 LAND USE

6.1 Baseline Condition

The existing land use has been described in detail in the Landscape Section of this report and is summarised on Maps 5.1 and 5.2. The major land use in the area has been for minerals extraction or works associated with the minerals extraction industry, such as cement works, and the Marley tile works. Many of the minerals extraction sites have later been used as landfill sites. The remainder of the area comprises areas of public and private open space, agricultural land and the three main settlements at Aveley village, South Ockendon and south of the Arterial Road Purfleet near Watt's Wood.

6.2 Assessment of Environmental Effects

6.2.1 Demolition of private property and associated land-take

Demolition or land-take of private property is not known at this stage as preliminary layouts have not been identified, although demolition of private property is unlikely.

6.2.2 Loss of land used by the community

The Land Use Maps 5.1 and 5.2 and Planning Designation Maps 6.1 and 6.2, show the public open space to be retained, and other recreational space. The public rights of way and the proposed new path along the Mar Dyke Valley are also shown. Wooded areas including Watts Wood, Hangman's Wood, Brannett's Wood, Ash Plantation and Brickbarn Wood are also accessible to the public. If it is assumed that land-take will most likely be near the existing M25, then the recreational open space at Belhus Park and along the Mar Dyke valley, including the existing right of way, is most at risk.

6.2.3 Effects on Development Land

Thurrock Borough Council's planning designations for the study area are shown on Map 6.1 and 6.2, Planning Designations and the areas identified for future development are shown in Table 6.1. The local planning designations for Ecology and Landscape LN16 and LN3 respectively, are discussed in those sections and shown on Maps 3.1 and 3.2 and 4.1 and 4.2. Tree preservation orders are shown on the Maps 4.1 and 4.2.

TABLE 6.1

Local Planning Designations in the Study Area

Site Description	Planning Designation	Local Policy
Belhus Park	Public Open space to be retained	LR6
Ship Lane/ Stifford Road	Cycleway	T11
Chadwell Link Road	Land safeguarded for new road building	T2
A13(T) Wennington-Mardyke (M25)	Land safeguarded for new road building	T2
Dolphin Development Area	Employment generating development	E16
	Land for new and industrial and commercial development in primary areas.	E2
Land north of the Arterial Road Purfleet and the Arterial Road Stifford	Green Belt	GB1, GB2
St Cedds Roman Catholic school site	Housing Land - Outstanding planning permissions	H2
Watt's Wood Site (partially developed)	Housing Land - Outstanding planning permissions	H2

The area to the north of the Purfleet and Stifford Arterial Road is designated as Green Belt. However, the Essex Structure Plan supports the proposed widening of the M25 and therefore this policy takes priority over Green Belt policies which would normally resist new development.

6.2.4 Effects on Agricultural Land

The agricultural land quality is classified in the Agricultural Land Classification Maps and is shown on Maps 7.1 and 7.2. Most of the Grade 1 agricultural land is located south of Aveley village to the east and west of Ship Lane and is currently used for horse related activities. The Mar Dyke valley is primarily Grade 3, with some Grade 2 near Brannett's Wood but is not used for agricultural production.

6.3 Environmental Constraints and Mitigation

Since preliminary layouts have not yet been identified, discussion of impacts and mitigation will be carried out in the Part 2 report.

7.0 IMPACTS ON VEHICLE DRIVERS

The assessment of 'driver stress' suggests that driver stress usually relates to traffic flows. Whilst this overall approach is understood, it is felt that within the area under consideration it is more likely to relate to the overall shortcomings of the motorway and its junctions; these relate in particular to delays, congestion and poor signage.

Three basic factors have been considered:

(a) **Frustration**: This is stated to be caused by a driver's inability to drive at his/her desired speed. For the M25 this should ease with subsequent improvement schemes. The proposed A13 Wennington to Mar Dyke will, when complete, ease journeys for A13 users that at present need to negotiate the Junction 30/31 complex. The study aims to improve these junctions and should, therefore, also reduce frustration on these links. In the short-term, driver frustration will of course rise as an unavoidable consequence of the necessary construction work during the improvements.

(b) **Fear**: Fear arises from the presence of other vehicles, inadequate sight distances, pedestrians, poor lighting, road width, roadworks, maintenance, high and fast vehicle flows and the percentage of heavy goods vehicles. With the obvious exception of the construction period it would be expected that these sources of fear would diminish with appropriate changes to the junctions and links in this section of the Motorway. If dedicated links can be justified, they would help to remove ~~non-segregated, dedicated left turns found at Junction 30 to A13 where at present~~ the uncertainty of driver intention, against normal roundabout rules, must be a cause of fear.

(c) **Route uncertainty**: this should ease with any proposed improvements; indeed as mentioned in (a), the removing of the A13 traffic from the Junction 30/31 complex must remove some uncertainty for non-regular users. It is expected that an overall improvement to routing will be achieved as part of the area improvements.

Details on how driver stress will be relieved will be included in the Part 2 Environmental Assessment when additional details of the design of the modifications of the road will be available.

8.0 WATER QUALITY AND DRAINAGE

8.1 Baseline Conditions

Water quality is regularly monitored by the National Rivers Authority (NRA) and other Water Regulation Authorities and the results are recorded on public registers. It is an offence, under the Water Resources Act 1991 to cause or knowingly permit the entry of polluting matter into a water course unless it is done within the terms of a discharge consent issued by the NRA. Included in the above condition are: point source discharges and diffuse sources of pollution, for example run off from roads, as both these forms of ingress to the water body have the potential to impact upon the water quality.

Consultation has been undertaken with the National Rivers Authority in order to establish and confirm the status of the water quality of water courses and bodies within the area of influence. The only natural water course in the area is the Mar Dyke, which provides an ecological corridor along its river banks. The M25 crosses the Mar Dyke at TQ 586 898 where it is flowing towards the River Thames. The NRA were consulted regarding water chemistry, biological monitoring, groundwater protection zones, flood plains, and fisheries.

8.1.1 Water Chemistry

Data on the water chemistry of Mar Dyke was not available for this study. However, a map supplied by the NRA Anglian Region, of the 1992 River Chemical Quality Survey for the whole region, illustrates that the quality of the Mar Dyke is Class 3, ie Poor Quality.

8.1.2 Biological Monitoring

Biological monitoring is regularly undertaken at two sites on Mar Dyke. However, recent biological data was not available for this study. The 1992 Biological River Quality Survey of the Anglian Region classifies the biological quality of the Mar Dyke as Class B - Fair.

The data supplied for the study undertaken in 1991 showed that several interesting invertebrate species were present. These have been discussed in Chapter 3 Ecology. This conservation interest is unexpected due to the low quality of the water. However, invertebrate species such as leeches, snails and beetle are generally indicative of poor water quality.

Further data on the biological monitoring will be sought for Part 2 of the Environmental Assessment.

8.1.3 Fisheries

Data for 1992 onwards was not available from the NRA therefore the data from the Study Commission, Parkmans 1991 has been used. The data used in the latter report indicated that the fishery was in a serious state of decline, the number of species having reduced to a tenth between 1986 and 1989. It is reported that the estimates of density and biomass in 1989 were the poorest ever recorded in Essex. According to the NRA, the poverty of the fish is a result of the consistently poor water quality, of which the major causes are considered to be sewage effluent, major road drainage, farm effluent and substantial water abstraction. There are also two recorded pollution incidents. In 1986 a discharge of sewage effluent resulted in low oxygen and in 1988 the nitrification plant at the Upminster Sewage Treatment Works failed and resulted in high levels of ammonia in the river.

8.1.4 Groundwater Protection Zones

In 1992 the NRA produced a set of policies in relation to groundwater protection and this has been published in the 'Policy and Practice for the Protection of Groundwater'. These have been developed following a considerable amount of work with the aim of establishing a system for classifying the vulnerability of groundwater supplies. Information is generally available from the NRA but data on specific areas is incomplete. Data has been requested for the Mar Dyke area under investigation but to date is unavailable. However, in broad terms, following the study of the 'Groundwater Vulnerability for England and Wales' map (NRA 1992) the study area borders the zones classified as minor aquifer, and low class major aquifer. The higher status of groundwater is likely to be in the chalk areas, for example in the Purfleet chalk pits.

8.1.5 Floodplains and Drainage

The improvement of the M25 and the A13 is expected to accommodate a higher volume of traffic compared to the existing volumes. It is understood that the Mar Dyke is prone to flooding although information regarding the current status of discharges and storm flows is not readily available. The significance of these discharges is dependent on the existing flow and channel volumes.

8.2 Assessment of Environmental Effects

The significance of contaminants entering water courses is dependent on:

a) the quantity and type of contaminant in the run-off; and
b) the volume and flow of the channel.

The proportions entering the water course are dependent on systems for removing the contaminants. The nature of run-off during the construction and operation of a road is variable but generally includes the following in differing quantities:

- suspended solids: mainly from mud, grit associated with de-icing salts, corrosion, metal particles, tyre organics and road surface wear.
- lead: this is predominantly from petrol but with decreasing amounts due to developing exhaust technology and unleaded petrol.
- zinc and cadmium: from corrosion of exhaust pipes and brake wear; the galvanised portions of the vehicle.
- organics such as rubber, bitumen and oils; which may in turn release polyaromatic hydrocarbons.
- de-icing agents.
- grounds maintenance debris - mowings, leaves, herbicides and pesticides.
- iron - from corrosion.
- anti-caking agents from road salt and nickel, chromium, copper and bromine from salt impurities.

8.2.1 Construction

Pollutants entering water courses associated with the construction or improvement of roads are predominantly dust, generated by construction activities and chemicals such as lubricating oils and heavy petrochemicals used in the construction. Accidental spillages are of particular concern.

Contaminated sites may also lead to water pollution during the construction. There are areas along the M25 and the A13 where the existing roads border landfill sites. The effect of construction on or near landfill sites is that there is the potential for construction activity to disturb the sites. Such disturbance may release toxic chemicals together with creating pathways through which the contaminants can leach to the groundwater or water course. An assessment of the contents of the landfill sites and behaviour of such material would assist in the development of mitigatory measures. The issue of contaminated sites is discussed in more detail in the section 9.0. Geology, Soils and Contaminated Land

Dust and suspended solids are likely to be released or generated by disturbance of the river banks or bed during the potential construction of new bridge work, channelisation of the river bed or the extension of existing culverts.

Habitat loss may occur and the significant effect in terms of water quality will be in relation to the Pond at the north end of Belhus Park. This is exacerbated by the reports of deposits, (Study Commission, Parkmans 1991) of chemicals in this area and disturbance of these could lead to pollution of the pond.

8.2.2 Operation

The predominant impact during operation of the improved road will be that of increased road drainage into the Mar Dyke, both from the A13 and the M25. In addition there is the increased risk of spillages from the increased volume of traffic, thus an improved mitigation plan for dealing with such incidence should be integrated into the design of the improvements.

8.3 Environmental Constraints and Mitigation Measures

It is necessary to identify the ecological status of the Mar Dyke and the mineral workings pits in more detail in order to determine the most appropriate forms of mitigation.

Information from the NRA will be sought for the Part 2 study for chemical and biological water quality, groundwater protection zones, flood plains and future water quality objectives. Initial consultation with the NRA regarding mitigation will be held.

Thurrock Borough Local Plan policy BE28 requires that appropriate measures are taken to prevent pollution of water courses.

The most effective form of mitigation is to prevent pollutants from being discharged. Storage ponds, dry ditches and interceptors can all be utilised for controlling and minimising discharge and also for removing pollutants.

To ensure the most effective and appropriate measures are installed for reducing and minimising the risk of pollution further work may need to be undertaken to assess:

- the character and constituents of land fill sites in the vicinity of water bodies;
- the ecological status of the water bodies, particularly the disused mineral working pits;
- the pollution risk from an accidental spillage;
- the least disturbing method for extending the roads across the water courses.

9.0 GEOLOGY, SOILS AND CONTAMINATED LAND

9.1 Baseline Conditions

9.1.1 Geology

The study area lies on the southern limb of the Thames Valley syncline with the upper chalk gently dipping to the north. From the chalk outcrops in the south, progressing northwards, the formation is generally of more recent origin and the depth to chalk increases significantly. Minor flexuring within the broad synclinal fold may have occurred but no faulting is recorded on the Geological Survey Maps. The main geological formations occurring in the study area are shown on Maps 8.1 and 8.2 and are as follows:-

Formation	Age
Alluvium	Recent
Brickearth Terrace Deposits	Pleistocene
London Clay Woolwich and Reading Beds Thanet Beds	Eocene
Upper Chalk	Cretaceous

Chalk

The upper zones of the chalk are weathered, assuming the form of hard lumps or nodules embedded in a soft matrix. At deeper levels the chalk becomes hard and blocky.

Thanet Beds

The Beds consist of a dense to very dense light brown to olive green silty, slightly clayey fine sand.

Woolwich and Reading Beds

The beds are of a variable nature with the upper layers generally consisting of soft to firm grey-brown sandy silty clays, and the lower layers consisting of dense to very dense brown and olive green clayey and silty sands of fine to medium grading.

London Clay

The upper levels of London Clay consist of a firm to stiff brown fissured silty clay. The strength increases with depth and it becomes very stiff and changes to a blue/grey colour at approximately 9 - 10 m depth.

Terrace Deposits

The Terrace Deposits are generally well graded, medium to dense, fine and medium gravels very often with fine, medium and coarse sand and are slightly clayey. The terrace deposits at Purfleet Chalk Pits at NGR TQ 560794, 566795 and 569796 have been designated as a Site of Special Scientific Interest due to their variation and potential for demonstrating their relationship to those in the Thames terrace sequence. The notification for the site is reproduced in Appendix 8 and its location is shown on Map 3.2.

Brickearth

Occur as soft to firm brown or grey sandy silty clay, occasionally thinly laminated, or as a dark grey or brown clayey fine and medium sand with occasional small gravels. In isolated areas the soil may be organic.

Alluvium

Occurs as soft dark grey to black clayey peat and clayey sandy silt with occasional bands of soft, dark grey laminated silty clay are present along with decayed wood and plant remains.

9.1.2 Contaminated Land

Several potentially contaminated sites have been identified through discussions with Essex County Council Waste Regulation Authority and from the review of the Study Commission by Parkman, 1991. A list of these sites is included in Appendix 9 and their locations indicated on Maps 9.1 and 9.2. However, the records held by the local authorities are incomplete. In addition, licensing requirements for landfill sites were not introduced until 1976 and it is therefore possible that landfilling activities prior to that date have not been recorded. The data presented in Appendix 9 and Maps 9.1 and 9.2 should therefore be treated with caution. From the acquired data, however, it can be concluded that much of the land in the study area has been used for landfill purposes, several of them for domestic waste.

9.2 Assessment of Environmental Effects

9.2.1 Construction

During the construction phase, impacts arising from landfill and industrial sites can include:

- risks to health and safety of the workforce arising from exposure to contaminated material or toxic gases during excavation and relocation;
- risk of combustion or explosion of landfill gas;
- pollution to surface and groundwater (see also Chapter 8);
- phytotoxic effects;

- impacts associated with the transport and disposal of contaminated material (eg availability of suitable alternative disposal sites).

9.2.2 Operation

During the operation period impacts arising from landfill sites can include:

- differential settlement arising from biodegration of waste;
- impacts on integrity of construction material and thus on the construction itself, for example sulphates reduce the strength of concrete and phenols degrade plastics; and
- migration of landfill gases.

9.3 Environmental Constraints and Mitigation

The potentially contaminated nature of the land in the vicinity of the improvements could place significant constraints on any scheme. Where the presence of contaminated land is suspected, and this probably applies to much of the study area, further adequate site investigations will be necessary to determine the nature, extent and significance of any contamination so that the potential impacts can be assessed and mitigation measures proposed. If the potential impacts of the contaminated land are considered to be significant, a comprehensive and appropriate mitigation strategy must be formulated and implemented before the proposed widening can commence.

Possible mitigation measures could include:

- protective clothing for the workforce;
- sealed containment of contaminated material during transport;
- removal of contaminated material to another site;
- controlled venting of landfill gas.

The presence of the SSSI at the Purfleet Chalk Pits will place considerable constraints on the availability of that area for the proposed scheme or associated construction activities.

10.0 AIR QUALITY

Air quality can be affected in two different ways by a road scheme. First, there might be localised changes, either improvements or reductions in air quality, along all or part of a scheme. Second, there might be significant changes in the overall quantity of emissions from the traffic on the road network. In order to forecast the magnitude of possible impacts, it is necessary to make a three way comparison: between current air quality levels, those anticipated in the design year if the scheme is not built, and those anticipated if the scheme is built. As it is only possible to measure the first of these situations, it is necessary to compare modelled levels for all three cases to ensure that comparison is made on a consistent basis. Exceptionally, monitoring of existing air quality would be useful where it is affected by significant amounts of pollution from non-road traffic sources. This may be the case around Junction 31 where there is a significant amount of industry adjacent to the existing M25. This will be considered in the Part 2 study to confirm whether or not this is the case.

DMRB Vol 11 contains a guide to calculating the likely changes in pollution levels at both local and overall scales and these methods will be used as part of the Part 2 study to determine whether pollution problems would be created, worsened or improved. It is based on a series of graphs which can be used to calculate concentrations of carbon monoxide (CO), oxides of nitrogen (NOX), hydrocarbons (HC), and carbon dioxide (CO_2). The estimation techniques require the derivation of effective traffic flows calculated from knowledge of vehicle type and flow and associated emission rates, which are then combined to determine ground level pollution concentrations. Details of traffic flow have not yet been determined, but will be available for the Part 2 study. In general however the dispersion rate of these pollutants is such that ambient levels are reached at distances greater than 200 m from the road. There is currently one rank of houses on the edge of South Ockendon which is within this distance band of the existing M25, with some properties on the edge of Aveley just outside this band.

The contribution made by traffic to regional scale air pollution problems depends on the total amount of pollution emitted, and not on the concentration at any particular location. If a new road relieves congestion it can cause vehicles to operate in ways which produce less emissions. This occurs because vehicles operate most efficiently and produce least pollution when driven in freely flowing traffic at moderate speeds.

In recognition of the contribution of vehicle emissions to air pollution in general, measures have been taken to reduce the quantities emitted. Since the early 1970s statutory units have been applied to permissible levels of CO, HC and NOX in vehicle exhausts. The limits have been reduced several times since they were introduced, and are due to be made more severe during the 1990s. As a result of these and other measures the amount of pollution from each vehicle has reduced and is expected to continue to reduce as new vehicles replace older, more polluting types. The prediction method given in DMRB Vol 11 takes these changes into account, however it should be noted that the prediction rates for CO_2 would not be reduced by the above measures. Analyses of these aspects will be carried out as part of the Part 2 study.

11.0 TRAFFIC NOISE

People are particularly sensitive to the effects of noise, especially high intensities and sudden changes in noise level. Therefore, noise is potentially a key impact on the community when considering a road scheme. Noise is often defined as unwanted sound and may come from a variety of sources. Traffic noise is a particular concern in sensitive areas such as housing estates and other highly populated local places. The aim of the noise assessment is to forecast the change in noise level caused by a road scheme at any given location. To calculate the change, it is necessary to know the site's ambient noise level and predicted noise level after the scheme has opened.

Noise levels resulting from traffic can be predicted using the methods described in the Department of Transport's publication 'Calculation of Road Traffic Noise' (CRTN) and as required by the Department of Transport's Design Manual For Roads and Bridges (DMRB Volume 11). This method calculates noise levels at a distance from the highway, taking into account such factors as traffic flow, speed and composition, road configuration, intervening ground cover between source and receiver, screening (barriers, buildings and land form), angle of view of the traffic and reflections from opposing facades. Since traffic figures have not yet been determined, a detailed noise analysis will be carried out for the Part 2 study. Housing most likely to be affected is on the edge of South Ockendon (approximately 150 m from the edge of the existing motorway) and the edge of Aveley (approximately 250 m from the existing motorway). Mitigation measures could be provided in the form of screen mounding or barriers.

12.0 SUMMARY OF KEY ENVIRONMENTAL CONSTRAINTS

The Part 1 study has identified the main environmental constraints associated with the road widening scheme. The major features of environmental interest are as follows:

The Mar Dyke Valley

This area contains most of the sites of nature conservation interest and the largest areas of woodland. It has also been designated an Area of Local Landscape Importance and there are proposals for a country park. The Thames Chase Community Forest also includes much of this area. The local authority is improving public access to the area by designating a new riverside right of way. The river water quality of the Mar Dyke is poor, although it does support some interesting species of leeches.

Belhus Park

This area is generally of archaeological interest and there have been a number of finds. The park itself was designed by Capability Brown and is registered as a park of special historic interest. It is now used as a golf course and is an important area of public open space with a right of way passing through the golf course. This area is also included in the area of Local Landscape Importance and in the Thames Chase Community Forest and contains the Belhus Pond which has been designated a SINC. The presence of protected species such as badgers is also a significant environmental constraint.

Aveley Village

The village has a Grade I listed building and a number of Grade II listed buildings and is also the site of the Scheduled Ancient Monument, Aveley Manor moated site. There are a number of other sites of archaeological importance.

Disused Minerals Workings Pits

These disused pits have become important water areas and further surveys will need to be carried out to assess their ecological significance should they be likely to be affected. They also provide recreational fishing in the area near Hangman's Wood and provide areas of landscape interest in an otherwise despoiled environment. The Purfleet Chalk pits, the only SSSI in the study area, have been designated for their geological importance.

If any of these areas are affected by the scheme, then measures should be taken to ensure that there is mitigation of the environmental effects.

Contaminated Land

The main constraints to the proposed development are the landfill sites, many of which are located adjacent to the existing M25. Several of these have been used for domestic refuse and will therefore need careful investigation prior to any route development.

13.0 RECOMMENDATIONS FOR FURTHER WORK

The Part 1 study has identified the key environmental constraints for use in the development of possible route options. Once route options are defined, the Part 2 study will assess the environmental impact in more detail. There are several areas of survey work that have been identified in order to facilitate the Part 2 study. These are as follows:

Archeology

Whilst trial trenching or similar detailed site work is not considered appropriate at this stage, a more detailed overview is required in the light of the relatively high number of sites that have been identified, in order to determine the likelihood of any hitherto unknown sites of significance being affected.

Ecology

A detailed field survey of those areas affected by the route options will need to be undertaken, including aquatic surveys where necessary.

Landscape

A site visit will be necessary to determine the likelihood of any increase in visual intrusion.

Water Quality

Further data on chemical and biological quality of the watercourses will need to be sought from the NRA, as will more detail of the groundwater resources in order to ascertain any potential impact.

Landfill Investigation

This has been highlighted as an area requiring further work. However, this will not be possible without undertaking detailed site investigation which is outside the scope of this commission.

Air Quality and Noise

Analysis of these elements will be carried out once detailed traffic flow data are available.

APPENDIX 1

Consultees

Archaeology		Alison Bennet, Essex County Council Planning Department
		Louise Austin, Essex County Council Planning Department
		Caroline Ingle, Essex County Council Planning Department
Ecology	(Conservation)	Robin Carpenter, Essex County Council Planning Department
	(Footpaths)	Gary White, Essex County Council Planning Department
	(Countryside)	Wendy Wright, Essex County Council Planning Department
Water Quality		A D Barnden, NRA Anglian Region
Geology	(SSSI)	Myles Houlden, English Nature, Colchester
	(Contamination)	Tim Shepherd, Essex County Council Waste Regulation Section
	(Minerals)	Roy Levett, Essex County Council Planning Department
Planning - Local Planning Policies		Annette Reeves, Thurrock Borough Council

APPENDIX 2

Sources of Information

General	"M25 Improvement, Junctions 24 to 31, Environmental Studies": Volumes 1,2,3 and 4 and Environmental Site Register. Prepared by Environmental Advisory Unit, Liverpool University Ltd March-April 1991
	"M25 Improvements between Junctions 24 to 31, Technical Appraisal Report": Volumes 1,2 and 3. Prepared by Parkman Consulting Engineers for the Department of Transport, December 1991.
	The Design Manual for Roads and Bridges, Volume 11 Environmental Assessment, Highways Agency
Planning	Essex Structure Plan Approved First Alteration, 1991
	Thurrock Borough Council Local Plan, Deposit Draft, 1994
	PPG 2, Green Belts
	PPG 7, The Countryside and the Rural Economy
	PPG 12, Regional Guidance for the South East
Archaeology	Sites and Monuments Record, Essex County Council Planning Department
Ecology	Sites of Importance for Nature Conservation, Essex Wildlife Trust
Water Quality	Policy and Practice for the Protection of Groundwater, National Rivers Authority 1992
Geology	SSSI Notification, English Nature British Geological Survey Maps
Agriculture	Agricultural Land Classification of England and Wales

APPENDIX 3

Essex County Council Planning Policies

METROPOLITAN GREEN BELT

Policy S5

A green belt will be maintained in the south and west of the county, the main purposes of the green belt are to prevent the outward spread of London, to preserve around London a stretch of open country and to prevent the coalescence of towns and villages within it. The precise boundaries of this green belt will be defined in local plans, but, as a general indication, the outer boundary should start at the county boundary with Hertfordshire to the north west of Bishop's Stortford, to run eastwards to meet the approximate line of the M11 motorway which it should follow southwards as far as the crossing with the A1060 road to the western edge of Chelmsford, gird the west and south sides of that town to reach the approximate line of the A130 road, along which it should run to Rettendon Place before turning eastwards towards south Woodham Ferrers. From the western boundary of the town it should run south to the River Crouch which it follows to the confluence with the River Roach. The boundary should then run west of Foulness Island to meet the Thames Estuary and thence westwards, excluding existing built-up areas, as far as the county boundary with greater London.

Policy S7

The green belt is defined tightly against London's continuously built-up area. The boundaries around towns and villages will be defined by reference to the foreseen long-term expansion of their built-up areas acceptable in the context of the stated purposes of the green belt and to the provisions specified in this plan.

Policy S9

Within the green belt permission will not be given, except in very special circumstances, for the construction of new buildings or for the change of use or extension of existing buildings (other than reasonable extensions to existing dwellings), for purposes other than agriculture, mineral extraction or forestry, small-scale facilities for outdoor participatory sport and recreation, institutions requiring large grounds, cemeteries or similar uses which are open in character. Dwelling for agricultural workers may be permitted in conjunction with farms if it can be shown that the worker must be resident on the agricultural holding. Any development which is permitted shall be of a scale, design and siting such that the appearance of the countryside is not impaired.

TRANSPORT

County Road Network

Policy T2

The Road system in the county will be improved in order to achieve a functional hierarchy of roads based on the following categories:

Strategic motorway
Strategic primary road
Regional primary road
Principal country/urban road

The County Council will support the trunk road schemes and studies listed in Table 1 and will encourage the department of transport to implement them as quickly as possible.

[The M25 Widening of Dual 3-lane sections is included in Table 1]

Cyclist and Pedestrians

Policy T9

Safe and convenient conditions for cyclists and pedestrians will be encouraged, in particular by the improvement and extension of cycleways and footpaths, the provision of facilities when new traffic management measures are introduced and by encouraging the provision of links between homes, workplaces and other facilities when new developments are planned.

Open Land and Townscape Features

Policy BE12

Proposals for development intensifying or extending a built-up area should make satisfactory provision for the location and amount of open land.

Policy BE13

The townscape value of major natural features and important areas of open space in towns and villages shall be safeguarded.

CONSERVATION

Conservation areas and Protected Buildings

Policy C2

Buildings of architectural, historic and townscape importance will be protected from demolition and unsympathetic change and their settings safeguarded as far as possible.

Policy C3

In areas where development will not otherwise be allowed the conversion of buildings of architectural or historic interest may be permitted in appropriate circumstances where this would preserve a building.

Archaeology

Policy C4

Development which would substantially and adversely affect an area or site of outstanding archaeological interest will not normally be permitted.

Policy C5

Important archaeological areas and sites in the county will be protected and conserved wherever possible.

Policy C6

Application for planning permission for development affecting scheduled ancient monuments and other important archaeological sites will normally be refused if there is an overriding case for preservation. Where there is no overriding case for preservation planning permission will normally be granted provided adequate opportunity is given for the recording and, where desirable, the excavation of such sites, in some circumstances, development may be permitted subject to conditions affording reasonable access to the site to carry out and observe excavations, and record finds, both before and during development.

NATURAL RESOURCES

Agriculture

Policy NR1

There will be a general presumption against development causing the sterilisation or disruption of commercial farmland and, where possible, land unsuitable for productive agricultural use should be developed instead.

Policy NR2

Development which would result in the permanent loss of land included in Grades 1, 2 and 3A of the Ministry of Agriculture, Fisheries and Food Land Classification will normally be refused unless it can be shown that no suitable alternative site of lesser agricultural value is possible and there is an overriding need for the development.

Nature Conservation

Policy NR6

There will be a presumption against any development which would adversely and materially affect designated national nature reserves and sites of special scientific interest.

Policy NR8

Development prejudicial to the retention and management of important wildlife habitat and their inter-relationships will normally be refused.

Policy NR10

The natural beauty, amenity and traditional quality of the Essex landscape will be protected, conserved and enhanced. There will be a presumption against development which would case permanent loss to, or damage to, this landscape.

Policy NR15

In proposals for development, existing woods, trees and hedgerows should be retained wherever possible and new planting of appropriate species will normally be required to replace any losses resulting from development.

Policy NR16

Existing woodlands should be retained wherever possible with management appropriate to age, use, location and scientific interest.

LEISURE RECREATION AND TOURISM

Informal Countryside Recreation

Policy L3

Subject to other policies in the plan, and in particular to policy NR8, facilities for informal countryside recreation including, where appropriate, further provision and extension of country parks, will be encouraged in the following locations:

[Mardyke Valley is included in the list of locations]

Within these areas encouragement will be given to the establishment of agreements, and the management of land, for public access. Development which would prejudice the recreational value of these areas will not normally be permitted.

Policy L7

Major countryside recreational facilities will be safeguarded and measures will be employed to control capacity and to accommodate a range of activities appropriate to the sites.

Policy L7A

The network of definitive public rights of way will be safeguarded and improved and publicised. Where appropriate new rights of way will be created.

APPENDIX 4

Thurrock Borough Local Plan Policies

Archaeology

BE25 SITES OF ARCHAEOLOGICAL IMPORTANCE

Where important Archaeological sites and monuments, whether scheduled or not, and their settings are affected by a proposed development there will be presumption in favour of their preservation in situ.

If there is evidence that archaeological remains may exist in the local plan area whose extent and importance are unknown, the Council may require developers to arrange for an archaeological field assessment to be carried out before the planning application can be determined thus enabling an informed and reasonable planning decision to be made.

Where preservation is not possible or feasible then the Council will not allow development to take place until satisfactory provision has been made for a programme of archaeological investigation and recording prior to the commencement of the development.

Built Environment

BE26 DEVELOPMENT OF CONTAMINATED LTD

When considering applications for the development of residential or other environmentally sensitive land uses, on land suspected of being contaminated by hazardous substances arising out of previous land uses, the Council must be satisfied that all appropriate measures to deal with the contamination of the site are undertaken prior to development beginning. Environmental surveys will be required to ensure that remedial measures are possible to reclaim the land for the proposed use, to the satisfaction of the Council.

BE27 DEVELOPMENT NEAR LANDFILL SITES

Applications for development proposals within 250 metres of a landfill or former landfill site will require a specialist report on the safety of the proposed development.

BE28 THE PREVENTION OF POLLUTION TO WATERCOURSES

The Council will require that appropriate measures are taken in association with new development proposals, to prevent the pollution of underground strata, water supplies and water courses, of all kinds.

Developments which the Council consider would be likely to lead to undesirable and unnecessary pollution will not be permitted.

In this regard the Council may seek the advice of the National Rivers Authority and other appropriate bodies about potential off-site risks to the public.

BE29 ENVIRONMENTAL ASSESSMENT

The Council has adopted as supplementary planning guidance, the document, 'The Essex Guide to Environmental Assessment', prepared by The Essex Planning Officers Association.

The document gives examples of good practice in the preparation of Environmental Statements. The Council commend this document to applicants who must prepare an Environmental Statement to accompany a major planning application.

The Green Belt

GB1 THE GREEN BELT IN THURROCK

In areas subject to Green Belt policies, as shown on the proposals map, there will be a strong presumption against permitting new development.

Proposals for certain limited forms of development relating to residential properties, agricultural concerns, equestrian activities, sport and recreation, which may in special circumstances be regarded as appropriate in the green belt, will be considered under policies GB3 to GB13.

GB2 DESIGN CONSIDERATIONS IN THE GREEN BELT

(i) PHYSICAL FORM

Where proposals are acceptable in principle under policies GB1 and GB3 to GB13 and buildings are proposed, the Council will expect such structures to be properly designed and constructed of sound materials appropriate to the countryside. Careful regard will be paid to the siting, scale, layout and location of buildings and, where appropriate, the provision of landscaping will be required, particularly in areas designated as in need of landscape improvement, under Policy LN2.

(ii) ENVIRONMENTAL IMPACT

The development should not have a detrimental effect on the amenities of local residents, rural activities and countryside users nor on highway safety.

(iii) LANDSCAPE IMPACT

Any development should take full account of its impact on the existing landscape and should safeguard, maintain and enhance existing landscape features, watercourses, trees, hedges and plants through approved landscaping schemes.

GB9 AGRICULTURAL LAND

The Council will have regard to structure plan policies NR1 to NR4 and will support proposals for the agricultural use of land in the Green Belt and will seek to ensure that existing good quality agricultural land, particularly of grades 1 and 2, is not lost to irreversible development.

Landscape and Nature Conservation

LN3 LANDSCAPES OF LOCAL IMPORTANCE

In areas designated as Landscapes of Local Importance development will only be permitted if it would not cause permanent loss of, or damage to the character of the landscape. The designated areas are listed below and shown on the Proposals Map.

Belhus Woods
Aveley Lakes/Pits
Lower Mardyke Valley
Belhus Park

LN6 TREE PRESERVATION ORDERS

The Council will serve Tree Preservation Orders where appropriate to preserve important trees, groups of trees, hedgerow trees and woodlands.

LN7 THAMES CHASE (THE EAST LONDON COMMUNITY FOREST)

Within Thames Chase the Council will expect development proposals to contribute positively towards the implementation of the objectives of the Community Forest project. These relate particularly to habitat creation, environmental enhancement, and, where appropriate, recreational use of the forest.

LN12 DEVELOPMENT PROPOSALS AND NATURE CONSERVATION

New developments will only be permitted if proper protection is given to the nature conservation value of the development site.

Development prejudicial to the retention and management of important wildlife habitats and their inter-relationships will not normally be permitted.

In appropriate cases the Council will require that landscaping schemes submitted under Policy BE4 for new wild life habitat creation and management.

LN13 DEVELOPMENT AFFECTING SITES OF SPECIAL SCIENTIFIC INTEREST

Development will only be permitted within or around sites of special scientific interest, where it can be shown that there would be no damage to nature conservation or other interests.

LN15 SITES OF IMPORTANCE FOR NATURE CONSERVATION

In areas identified on the proposals map as sites of importance for nature conservation development will only be permitted which would not materially harm their nature conservation value.

LN16 AREAS OF LOCAL NATURE CONSERVATION SIGNIFICANCE AND ECOLOGICAL CORRIDORS

Areas of local nature conservation significance, and ecological corridors, for the enjoyment and protection of nature within the Borough are indicated on the proposals map. Developments in these areas will only be permitted where the nature conservation interest of the area is retained.

Housing and Population

H2 HOUSING LAND-OUTSTANDING PLANNING PERMISSIONS

On sites which had outstanding planning permission for housing on 31st March 1993, the permission will normally be renewed, subject to compliance with other policies in the plan. The sites with consent for twelve or more dwellings to which this policy applies are set out in the schedule at Appendix 10.

Employment

E2 LAND FOR NEW INDUSTRIAL AND COMMERCIAL DEVELOPMENT IN PRIMARY AREAS

Land will be set aside within primary industrial and commercial areas for new industrial and commercial development as shown on the proposals map.

E15 DOLPHIN DEVELOPMENT AREA

The Council will promote a "Flagship" high quality employment generating development on the Dolphin site. Development should ideally incorporate a mix of uses in a well landscaped environment. Environmentally intrusive development will not normally be permitted. To help to achieve this the Council will produce a promotional development brief for the area in conjunction with landowners.

Leisure and Recreation

LR4 PROVISION OF ADDITIONAL OPEN SPACE

The Council will seek to ensure that provision of outdoor playing space and/or amenity open space is made as shown on the Proposals Map.

LR15 PROPOSED MARDYKE COUNTRY PARK

Thurrock Borough Council will consult with the countryside commission, Essex County Council, landowners and other bodies with the intention of establishing a country park in the Mardyke Valley area.

Transport

T2 NEW ROAD BUILDING

Land will be safeguarded for the construction of the following new roads, as indicated on the proposals map, in connection with the development of land or to cater for traffic growth. No development will be permitted which would affect these road lines:-

a. A13(T) Wennington - Mardyke (M25)
b. Chadwell Link Road

T3 ROAD IMPROVEMENT SCHEMES

The following roads and junctions will be the subject of improvement works, as indicated on the proposals map, to be carried out in connection with the development of land or construction of new roads in the Borough, or to meet local highway standards.

a. A126 West Thurrock Way Dualling
b. Ship Lane, Aveley
k. Stonehouse Corner, Purfleet

T8 EXISTING AND NEW PUBLIC FOOTPATHS

The Council will promote greater use of public footpaths as a means of communication and, to this end, will:

- Seek to secure the retention and maintenance of public pedestrian rights of way over all existing footpaths except those identified in Policy T9.

- Provide Route signposting where necessary;

- Require the provision by developers of new segregated public footpaths wherever appropriate within new development;

- Seek to secure the provision of the following new footpath routes in particular, as indicated on the proposals map:-

  a. Mardyke Way extension to River Thames.

T11 CYCLEWAYS

The Council will promote greater use of the bicycle as a means of transport and, to this end, will:

- Take account of the needs of the cyclist in the design of all new highway and traffic management schemes;

- Seek the provision of segregated cycleways within all forms of major new development where appropriate to link areas of residence, workplace, education, recreation, shopping and other amenity;

- Seek the provision of secure facilities for the parking of bicycles at all locations where such need is identified;

- Introduce advisory signposted cycle routes throughout the Borough.

Cycleway spine routes will be established as indicated on the proposals map.

APPENDIX 5

Location and Description of Previous Archaeological Finds

County District THU Site No. 5017

Parish civil Thurrock

NGR TQ 589794 Old Map No. TQ57-005

Period-general prehistoric Site type-general complex

Site Name Tunnel Cement Pits

Description

South of A13. Early iron age pit with sherds. {1}
In Thurrock Museum. {2}
Next to the A13 overlooking the Mardyke Valley, noted in 1970, a flat-based pit at the edge of a gravel quarry, later evidenced by a cropmark. Surface measurements-6' 6" at the quarry edge, running back for 3' 4". Some sand-martin damage to the section. Part of a large, flint-gritted pot was found. It contained 2 burnt flint lumps and a sandstone rubber (?).Part of a red clay loom weight was found in the basic fill. All finds were suggestive of the early iron age. The face was cleared for drawing but the pit was not excavated. {3}

Site and Artefact Types

Site type pit Form recorded
Period-specific early iron age Material -

Site type pottery Form find
Period-specific early iron age Material -

Site type pot boiler Form find
Period-specific early iron age Material flint

Site type loom weight Form find
Period-specific early iron age Material fired clay

Site type rubbing stone Form find
Period-specific early iron age Material stone

Land classification:

Site Assessment

Archaeological History:
Event salv record Name Bingley, R Date 1970

Visits:Name Date

Sources:

1 Desc text Location ECC
Collection SMR

2 Artefact Location Thurrock LH Mus
Acc No 1221

3 Desc text Location ECC
Collection Panorama
Author Bingley, R Date 1974-19+
Prehistoric and Other Features at WestThurrock
Vol 18, p66

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5023

Parish civil Thurrock

NGR TQ 569798 Old Map No. TQ57-008

Period-general Roman Site type-general complex

Description

Roman pottery from ditch-pit section. Excavated by Thurrock Museum in 1972 . {1} {2}
In Thurrock Museum. {3}
According to the sheet, a phone call from T-Carney-RB cremation, a 2nd century flask, "quite old find". {3} {4}
Noted by Miss C E Allin, cremation burial, during quarrying at Ship Lane, Aveley. A flask from the burial is in Thurrock Local History Museum, Acc No 1493, so presumably refers to the same find as above. According to source 6 a report is in Thurrock Museum. {5} {6} {7}

Site and Artefact Types

Site type pottery Form find
Period-specific C2 Material -

Site type cremation Form find
Period-specific C2 Material -

Land classification:

Site Assessment
Date of ditch-pit section?

Archaeological History:

Visits:Name Date

Sources:

1 Desc text Location ECC
Collection SMR

2 Desc text Location -
Collection OScard
Author - Date 1978
TQ57NE25

3 Artefact Location Thurrock Mus
Acc No 1493

4 Pers Comm Location -
Author Carney, TJ Date 1976

5 Desc text Location ECC
Collection OScard

Author -
TQ57NE29

Date 1978

6 Desc text Location ECC
Collection Essex Archaeol News
Author Babbidge, AVin Huggins, PJ(ed) Date 1974
Archaeology in Essex, 1972-73
No 48, Autumn, p14

7 Desc text Location Thurrock Mus

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5030

Parish civil Thurrock

NGR TQ 56527952 Old Map No. TQ57-011

Period-general undetermined **Site type-general**

Description

40 dencholes. (Col Mus map probably inaccurate). Reference to Essex Naturalist, Vol 15, p7 does not mention this site, but refers to Grays Chalk Pit, with section of denehole at c598792. Reference to Trans Essex Archaeol Soc, Vol 15, p157, Church Wall's chalk pit-more than 8 dene holes-same pit as above? A phone conservation with Mark Davies indicated there was "probably inaccurate cross on Colchester Museum Map". {1} {2} {3} {4} {5} Possibly some confusion with TQ57-015, 5035 as 40 dene holes are also mentioned there.

Site and Artefact Types

Site type dene hole Form reported
Period-specific undetermined Material -

Land classification:

Site Assessment

Archaeological History:

Visits:Name Date

Sources:

1 Desc text Location ECC
Collection SMR
Author Toller, H Date -

2 Map Location Col Mus
OS 6"?

3 Desc text Location -
Collection VCHTS?
Essex
p483?

4 Desc text Location -
Collection Essex Natur
Vol 15, p7

5 Desc text Location -
Collection Trans Essex Archaeol Soc
Vol 15, p157

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU - Site No. 5035

Parish civil Thurrock

NGR TQ 586798 Old Map No. TQ57-015

Cross Reference 5030

Period-general undetermined Site type-general complex

Description

Mardyke deneholes. 4 revealed in 1956 after workings by East London Gravel Co. They conformed to the standard pattern. All were trefoil in shape and quite large (each chamber was over 20ft long, one over 40ft). All had traces of smoke stains and rope marks at the entrance, and down both sides of the shafts were footholds. Several chambers had niches cut in them. There was a space of over 8ft between the existing floor level and the ceiling but the original floor level beneath the silt was not found, despite probing. Inspection indicated that c40 deneholes exist. Also found-a shaft lined with chalk blocks and filled with human refuse, probably formerly a well. {1} {2} Possibly TQ57-011 or part of it has been confused with this site as 40 deneholes are also mentioned there (see 5030)

Site and Artefact Types

Site type dene hole Form reported
Period-specific undetermined Material -

Site type well Form reported
Period-specific undetermined Material -

Site type pit Form reported
Period-specific undetermined Material -

Land classification

Site Assessment

Archaeolgical History:

*Visits:*Name Date

Sources:

1 Desc text Location ECC
Collection SMR

2 Desc text Location -
Collection Panorama
Vol 2, p14

Date of compilation or update: Gilman, PJ Date 3-1985

Site type pottery Form find
Period-specific C12-C13 Material -

Site type cobbled surface Form find
Period-specific medieval? Material -

Site type shell Form find
Period-specific medieval? Material -

Site type bone Form find
Period-specific medieval? Material -

Site type worked stone Form find
Period-specific medieval? Material -

Site type tile Form find
Period-specific medieval? Material -

Site type garden Form documentary
Period-specific C13 Material -

Site type deer park Form documentary
Period-specific C14 Material -

Land classification:

On site scrub - Date 1983

By site grassland - Date 1983
churchyard - Date 1983
recreational use - Date 1983
thoroughfare cul de sac Date 1983
grassland - Date 1983

Site Status SAM SAM No. 179 Date 1976 -

Site Assessment
Site in a bad state in 1980. Dumping of garden waste in January 1980. Damage from badger setts. {11}
Interior now dense scrubby woodland. {9}

Archaeological History:

Visits:Name Date
Drewett, PL, IAM 1973:6
Paterson, H, FMW 1980:1
Chant, K, FMW 1983:11
Buckley, DG, Couchman, CR, Petchey, MR 1974?

Sources:

1 Desc text Location ECC
Collection RCHM
Author - Date 1923
An Inventory of the Historical Monuments in Essex
Vol 4, p6

2 Desc text Location ECC
Collection SMR
Aveley Manor moated site

3 Desc text Location ECC
Collection Essex Archaeol Hist
Author Couchman, CR, Buckley, DG, Petchey, MR in Couchman, CR + Date 1976
Work Undertaken by Essex County Council Archaeology Section, 1974-76
Vol 8, p167

4 Artefact Location Thurrock LH Mus

5 Plan-sketch Location ECC
Collection SMR
Aveley Manor moated site

6 Desc text Location ECC
Collection SMR
Author Morant, P Date 1768
Vol 1, p77

7 Map Location ERO
Author Saxton, P Date 1593, 1+
D-D7h 18, copy in SMR

8 Desc text Location -
Collection VCH
Author - Date 1903
Essex
Vol 1, p54, 56

9 Desc text Location ECC
Collection HBMC
Author - Date 1985
Scheduled Ancient Monuments

10 List Location ECC
Collection MSRG
Author Sellers, E Date -
TQ58-024

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5086

Parish civil Thurrock

NGR TQ 57338156 Old Map No. TQ58-034

Period-general undetermined Site type-general

Description

3 tumuli said to exist here. {1}-{3}

Site and Artefact Types

Site type barrow Form reported
Period-specific undetermined Material -

Land classification:

Site Assessment

Archaeological History:

Visits:Name Date

Sources:

1 Desc text Location ECC
Collection SMR

2 Desc text Location -
Collection VCHTS
Essex
p237a

3 Map Location Col Mus
Collection OS
OS 6"

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5087

Parish civil Thurrock

NGR TQ 575815 Old Map No. TQ58-034

Period-general post medieval Site type-general complex

Site Name Belhus Park

Description

Mid 18th century ice house confirmed in the grounds of Belhus Park. {1}
The nature of the brickwork and historical documents suggest its incorporation into a mid 18th century improvement scheme. {2}
Excavated in June and July 1979 in advance of works for the M25, which it was feared might damage the structure. The work aimed to remove material from the well and record the walls. The foundations of the entrance passage and of the buttresses to support the roof were located. The floor level was indicated by a few remaining bricks. A piece of clay roof tile from this area (with a hole pierced before firing) was the only evidence for the covering of the passage roof that projected beyond the mound. The well contained leaf mould over collapsed wall and roof material. Wooden posts may have been part of the door frame. A large wooden padlock, probably late 19th century, may be associated. A platform around the side of the well was found. Ice was presumably stored above this level. The platform was sloped to allow water run off. A drain, small, was found leading from the well. The floor of the well was of large bricks. The icehouse itself was of red bricks without frogs. Repairs had been carried out to the platform, possibly indicating use until the late 19th century, but not necessarily as an icehouse. A local tradition suggests use as a game store and this may have been so at the turn of the century. Late Victorian pottery found in the well was not useful for dating the roof's collapse. No indication of steps was found nor for any ornamentation. No precise dating evidence but the icehouse may be associated with mid 18th century improvememts carried out by Lord Dacre (Thomas Barrett-Lennard, 1717-1786), a pond and ornamental mounds. A 1760's date is suggested. {3}
A mound shown on the C&A map of 1777 may be the icehouse. {4}

Site and Artefact Types

Site type ice-house	Form recorded
Period-specific C18	Material brick
Site type padlock	Form find
Period-specific C19	Material iron
Site type doorway	Form find
Period-specific post medieval	Material wood
Site type drain	Form recorded
Period-specific C18?	Material brick
Site type roofing tile	Form find
Period-specific post medieval	Material -

Site type brick Form find
Period-specific post medieval Material -

Site type pottery Form find
Period-specific C19-C20 Material -

Land classification:

Site Assessment
Wall was backfilled after excavation. Detailed plans and photographs in Thurrock Museum. {5} {6}

Archaeological History:
Event salv excav Name Carney, TJ Date 1979

Visits:Name Date

Sources:

1 Desc text Location ECC
Collection SMR

2 Desc text Location ECC
Collection Essex J
Author Carney, TJ in Eddy, MR(ed) Date 1980
Excavations in Essex 1979
Vol 16, No 1, p3

3 Excav report Location ECC
Collection Panorama
Author Carney, TJ Date 1980
Belhus Park Ice House, Aveley
No 23, pp96-106

4 Map Location ECC
Author C&A Date 1777
XXII

5 Plan-measured Location Thurrock Mus

6 Photo Location Thurrock Mus

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5102

Parish civil Thurrock

NGR TQ 575812 Old Map No. TQ58-065

Cross Reference 5103 5104 5105

Period-general undetermined Site type-general complex

Site Name Aveley-Belhus Park

Description

Cropmarks-2 adjoined rectilinear enclosures, to the north a possible ring ditch, rather faint and irregular but with a central 'pit'. Possibly 3 more ring ditches further to the north but too faint to interpret. {1} {2}
See 5104 for rectilinear enclosures.

Site and Artefact Types

Site type ring ditch Form cropmark
Period-specific undetermined Material -

Site type pit Form cropmark
Period-specific undetermined Material -

Land classification:

On site cultivated land - Date 1976

Site Assessment

Archaeological History:

Visits:Name Date

Sources:

1 Desc text Location ECC
Collection SMR
Author Priddy, DA Date 1979

2 AP Location ECC
Collection NMR
Author -
TQ5781-1-8, 9 Date 1976:6

3 AP Location ECC
Collection SMR
TQ58-065

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5103

Parish civil Thurrock

NGR TQ 575812 Old Map No. TQ58-065

Cross Reference 5102 5104 5105

Period-general prehistoric Site type-general

Site Name Aveley-Belhus Park

Description

Cropmark site. Excavated due to the construction of Grays Northern and Eastern by-passes and the M25. Residual bronze age pottery was found (see 5102 for ring ditch cropmarks). {1} {2}

Site and Artefact Types

Site type pottery Form find
Period-specific bronze age Material -

Land classification:

Site Assessment

Archaeological History:
Event salv excav Name Carney, TJ and Wilkinson, T+ Date 1979

Visits: Name Date

Sources:

1 Desc text Location ECC
Collection SMR
Author Priddy, D A Date 1979

2 Desc text Location ECC
Collection Essex J
Author Wilkinson, TJ with Carney, TJ in Eddy, MR(ed) Date 1981
Excavations in Essex, 1979
Vol 16, No 1, p8

Date of compilation or update: Gilman, PJ Date 3:1985

APPENDIX 6

Conservation Areas, Listed Buildings and Scheduled Ancient Monuments within the Study Area

Listed Buildings		Site Reference
Grade I:	Church of St Michael, High Street, Aveley	1
Grade II:	Park Corner House, High Street, Aveley	2
	54 and 56, High Street, Aveley	3
	Aveley Hall, Ship Lane, Aveley	4

Scheduled Ancient Monuments

	Aveley Manor Moat, Aveley	5079

County District THU Site No. 5104

Parish civil Thurrock

NGR TQ 575812 Old Map No. TQ58-065

Cross Reference 5102 5103 5105

Period-general prehistoric Site type-general complex

Site Name Avelcy-Belhus Park

Description

Cropmarks. 2 adjoining rectilinear enclosures, to the north a possible ring ditch (see 5102 for ring ditch). {1} {2} {3}
Iron age subrectangular enclosure adjacent to large pre-Roman iron age enclosure, examined initially by T J Carney, later by T J Wilkinson.
Revealed due to the construction of Grays Northern and Eastern by-passes and the M25. {4}
Only one enclosure, the western, was threatened by the motorway. In earlier phases of the ditched enclosure early-middle iron age pottery was found. The enclosure seems to have had an external bank. The final phase, with a deep ditch or pit exposed just within the road trace, showed there had been considerable occupation in the late iron age and Belgic periods, shown by large quantities of pottery with fragments of Belgic brick. {5}

Site and Artefact Types

Site type subrectangular enclosure Form recorded
Period-specific iron age Material -

Site type enclosure Form cropmark
Period-specific late iron age? Material -

Site type pottery Form find
Period-specific early-middle iron age Material -

Site type pottery Form find
Period-specific late iron age Material -

Site type pottery:belgic Form find
Period-specific late iron age Material -

Site type ditch Form recorded
Period-specific late iron age Material -

Site type pit Form recorded
Period-specific late iron age Material -

Site type artefact Form find
Period-specific late iron age Material fired clay

Land classification:

Site Assessment

No evidence of buildings but enough occupation material to suggest a significant multi-period iron age (and possibly Romano-British) settlement was within the enclosure and awaits further excavation within the remaining eastern enclosure. {5}

Archaeological History:
Event salv excav Name Carney, TJ and Wilkinson, T+ Date 1979

Visits:Name Date

Sources:

1 Desc text Location ECC
Collection SMR
Author Priddy, DA Date 1979

2 AP Location ECC
Collection NMR
Author - Date 1976:6
TQ5781-1-8, 9

3 AP Location ECC
Collection SMR
TQ58-065

4 Desc text Location ECC
Collection Essex J
Author Wilkinson, TJ with Carney, TJin Eddy, MR(ed) Date 1981
Excavations in Essex 1979
Vol 16, No 1, p8

Excav report Location ECC
Collection Wilkinson, TJ
Author 1980 Date Rescue +
p14
5

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5105

Parish civil Thurrock

NGR TQ 575812 Old Map No. TQ58-065

Cross Reference 5102 5103 5104

Period-general Roman Site type-general complex
Site Name Aveley-Belhus Park

Description
Cropmarks site. Excavated due to the construction of Grays Northern and Eastern by-passes and the M25. Several phases of RB ditches may form part of a rectilinear field system. {1} {2}
Following the utilising of a rectangular iron age enclosure, a series of ditches and pits containing Romano-British pottery was superimposed on the area. {3}

Site and Artefact Types
Site type ditch Form recorded
Period-specific Roman Material -

Site type field system Form circumstantial evidence
Period-specific Roman Material -

Site type pit Form recorded
Period-specific Roman Material -

Site type pottery Form find
Period-specific Roman Material -

Site Assessment
See 5104

Archaeological History:
Event salv excav Name Carney, TJ and Wilkinson, T+ Date 1979

Sources:
1 Desc text Location ECC
Collection SMR
Author Priddy, DA Date 1979

2 Desc text Location ECC
Collection Essex J
Author Wilkinson, TJ with Carney, TJ in Eddy, MR(ed) Date 1981
Excavations in Essex 1979
Vol 16, No 1, p8

Excav report Location ECC
Collection Wilkinson, TJ
Author 1980 Date Rescue +
p14
3

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5113

Parish civil Thurrock

NGR TQ 580800 Old Map No. TQ58-076

Cross Reference 5114 5115

Period-general prehistoric Site type-general

Site Name Mar Dyke

Description

Foundations for the Mar Dyke viaduct were dug through over 5m of peaty deposits in the floor of the Mar Dyke, south east of Aveley. 3 sections were studied and sampled for the environmental background to the A13 sites. The lowest sediments showed an apparent intr sion of estuarine conditions into the valley followed by accumulation of wood peats and reed swamps in rapid succession. Later deposits suggest further incursions until, c1.5m from the surface, marshland gives way for the first time, to a small stream. It is suggested this was in the late iron age or Roman periods (levels here were above middle iron age finds-see 5115). {1}

Site and Artefact Types

Site type cereal remains Form find
Period-specific undetermined Material -

Site type pollen Form find
Period-specific undetermined Material -

Land classification:

Site Assessment

Archaeological History:
Event salv excav Name Wilkinson, TJ Date 1979-1980

Visits:Name Date

Sources:

Excav report Location ECC
Collection Wilkinson, TJ
Author 1980 Date Rescue +
p16
1

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5114

Parish civil Thurrock

NGR TQ 580800 Old Map No. TQ58-076

Cross Reference 5113 5115

Period-general prehistoric Site type-general

Site Name Mar Dyke

Description

"A neolithic flint knife was found within the lower woody and marsh peats". Found in sections dug to obtain information on the environmental background to the A13 sites, when foundations were dug for the Mar Dyke viaduct. {1}

Site and Artefact Types

Site type knife Form find
Period-specific neolithic Material flint

Land classification:

Site Assessment

Archaeological History:
Event salv excav Name Wilkinson, TJ Date 1979-1980

Visits: Name Date

Sources:

Excav report Location ECC
Collection Wilkinson, TJ
Author 1980 Date Rescue +
p16
1

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5115

Parish civil Thurrock

NGR TQ 580800 Old Map No. TQ58-076

Cross Reference 5113 5114

Period-general prehistoric Site type-general complex

Site Name Mar Dyke

Description

Finds in sections dug to obtain information on the environmental background to the A13 sites, when foundations were dug for the Mar Dyke viaduct. "Where humic muds prevailed", charcoal and calcined flint 'pot boilers' were found. also a small number of middle iron age sand tempered pottery sherds. {1}

Site and Artefact Types

Site type pottery Form find
Period-specific middle iron age Material -

Site type pot boiler Form find
Period-specific middle iron age? Material flint

Land classification:

Site Assessment

Archaeological History:
Event salv excav Name Wilkinson, TJ Date 1979-1980

Visits: Name Date

Sources:

Excav report Location ECC
Collection Wilkinson, TJ
Author 1980 Date Rescue +
p16
1

Date of compilation or update: Gilman, PJ Date 3:1985

County Essex District THU Site No. 7377

Parish civil Thurrock

NGR TQ 573812C Old Map No. TQ58-079

Period-general post medieval Site type-general

Height O.D. (m) Area (ha) 60

Site Name Aveley - Belhus Park

Description

Remnant of mid C18 landscape park, now golf course. Formal garden existed to south of house in C17, destroyed by Capability Brown's work (1753-4) and supplemented by Richard Woods (1770-1). {1}

Site and Artefact Types

Site type garden Form documentary
Period-specific C17 Material -

Site type park Form standing monument
Period-specific C18 Material -

Land classification:

On site garden public? Date -
recreational use golf course Date -
thoroughfare road Date -

By site cultivated land - Date -
building - Date -

Site Status LG-II SAM No. Date 1987

Site Assessment

Archaeological History:

Visits: Name Date

Sources:

1 Desc text Location ECC
Collection HBMC
Author Thacker, C Date 1987
Register of Parks and Gardens of Special Historic Interest in England

Date of compilation or update: Priddy, DA Date 2:1988

County District THU Site No. 9957

Parish civil Thurrock

NGR TQ 56758009 Old Map No. TQ58-24

Cross reference 9958 9959

Period-general Roman Site type-general complex

Site Name Church of St Michael, Aveley

Description

Parish church of St Michael. Roman brick incorporated into the walls. {1}

Site and Artefact Types

Site type brick Form reused material
Period-specific Roman Material -

Land classification:

Site Status SAM No. Date -

Site Assessment

Archaeological History:
Event salv record Name Andrews, D Date 1992

Sources:

1 Desc text Location ECC
Collection RCHM
Author - Date 1923
An Inventory of the Historical Monuments in Essex
Vol 4, p4

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5040

Parish civil Thurrock

NGR TQ 565785C **Old Map No.** TQ57-017

Cross Reference 5008 5042 5053 5044 5045

Period-general prehistoric **Site type-general** complex

Site Name Purfleet-Greenlands and Bluelands Quarries

Description

A palaeolithic site at North Rd, Purfleet, Essex. Flint flakes. {1}
Flakes of palaeolithic aspect found in these quarries in 1965 by Susann Palmer. In the same year excavations began in Greenlands quarry but very few palaeolithic finds were made and in 1966 efforts were moved to Bluelands quarry (an extension of Greenlands). Work continued until 1968 when torrential rain caused a road collapse into trench 3
A complete succession of Pleistocene deposits was located in the south face of Blueland quarry. "The evidence in both quarries suggests that the deposits are contained within a channel along an approximate north-east to south-west line".In Greenlands quarry the palaeolithic finds were almost all Clactonian (retouched flakes, scrapers, waste flakes, 1 nodule). In Bluelands quarry trench 3 were Clactonian scrapers, unretouched flakes, a waste flake, 1 proto-Levallois core and other palaeolithic finds (scrapers, retouched flakes, cores, waste flakes, miscellaneous items) were found. In trenches 1 and 2, scrapers included Clactonian and others, there were Clactonian, proto-Levallois and diverse retouched flakes, a small hand-axe, awls, a graver, Clactonian waste flakes and others, and 8 nondescript cores. Trench 4 produced:1 scraper of proto-Levallois type, a Clactonian scraper, cores, waste flakes, 1 scraper, 1 possible awl, tiny chips etc. Molluscs, with 1 exception, were freshwater animals and indicated temperate conditions. Environmental evidence did not give a clear indication of the date of the deposits containing the artefacts (they could have been older than these deposits. It seems that an interglacial phase for the lower brickearths (from which the pollen samples came) is suggested and Dr J T Hollin felt the results suggested an Ipswichian rather than an Hoxnian date for the brickearths (further research may modify this). Gravel may be the result of flooding in an arm or meander of the old Mardyke. The flint industry is described as middle Acheulian with a strong Clactonian element (possibly derived). Some Levallois indicated (not as strong as Botany pit-see 5008). The original knapping site was probably close by, the artefacts couldn't have moved in the gravels for a great distance or time as the assemblage (apart from many Clactonian flakes which were rolled), was unabraded. No dating conclusions reached, further research may clarify the problems. {2}

Site and Artefact Types

Site type worked flint Form find
Period-specific palaeolithic Material -

Site type levallois Form find
Period-specific palaeolithic Material flint

County District THU Site No. 5042

Parish civil Thurrock

NGR TQ 565785C Old Map No. TQ57-017

Cross Reference 5040 5043 5044 5045

Period-general prehistoric Site type-general complex

Site Name Purfleet-Greenlands and Bluelands Quarries

Description

Mesolithic finds in Greenlands quarry. Trench 1-blade cores, scrapers, a hammerstone, waste flakes, 1 core-trimming flake of mesolithic type. Trench 2- cores, micro-burin miss-hits, waste flakes, calcined flints, a core trimming flake. {1}

Site and Artefact Types

Site type worked flint Form find
Period-specific mesolithic Material -

Site type hammer stone Form find
Period-specific mesolithic Material -

Land classification:

Site Assessment

Archaeological History:
Event part excav Name Palmer, S Date 1965-68

*Visits:*Name Date

Sources:

1 Excav report Location ECC
Collection Essex Archaeol Hist
Author Palmer, S Date 1975
A Palaeolithic Site at North Rd, Purfleet, Essex
Vol 7, pp4-5

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5043

Parish civil Thurrock

NGR TQ 565785C Old Map No. TQ57-017

Cross Reference 5040 5042 5044 5045

Period-general prehistoric Site type-general complex

Site Name Purfleet-Greenlands and Bluelands Quarries

Description

Greenlands quarry, neolithic finds in topsoil in trenches 1 and 2: pottery, scrapers, calcined flints, waste flakes, 1 core (from the context these seem to be neolithic). {1}

Site and Artefact Types

Site type pottery Form find
Period specific neolithic Material -

Site type worked flint Form find
Period-specific neolithic? Material -

Land classification:

Site Assessment

Archaeological History:
Event part excav Name Palmer, S Date 1965-68

Visits: Name Date

Sources:

1 Excav report Location ECC
Collection Essex Archaeol Hist
Author Palmer, S Date 1975
A Palaeolithic Site at North Rd, Purfleet, Essex
Vol 7, pp4-5

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5044

Parish civil Thurrock

NGR TQ 565785C Old Map No. TQ57-017

Cross Reference 5040 5042 5043 5045

Period-general prehistoric Site type-general

Site Name Purfleet-Greenlands and Bluelands Quarries

Description

1 iron age sherd found in Trench 2 in Greenlands quarry, in the topsoil. {1}

Site and Artefact Types

Site type pottery Form find
Period-specific iron age Material -

Land classification:

Site Assessment

Archaeological History:
Event part excav Name Palmer, S Date 1965-68

*Visits:*Name Date

Sources:

1 Excav report Location ECC
Collection Essex Archaeol Hist
Author Palmer, S Date 1975
A Palaeolithic Site at North Rd, Purfleet, Essex
Vol 7, pp4-5

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5045

Parish civil Thurrock

NGR TQ 565785C Old Map No. TQ57-017

Cross Reference 5040 5042 5043 5044

Period-general medieval Site type-general

Site Name Purfleet-Greenlands and Bluelands Quarries

Description

1 small piece of medieval green glaze found in the topsoil in trench 2 in Greenlands quarry. {1}

Site and Artefact Types

Site type pottery Form find
Period-specific medieval Material -

Land classification:

Site Assessment

Archaeological History:
Event part excav Name Palmer, S Date 1965-1968

*Visits:*Name Date

Sources:

1 Excav report Location ECC
Collection Essex Archaeol Hist
Author Palmer, S Date 1975
A Palaeolithic Site at North Rd, Purfleet, Essex
Vol 7, pp4-5

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5052

Parish civil Thurrock

NGR TQ 575796 Old Map No. TQ57-025

Period-general undetermined Site type-general

Description

Denehole found along the M25 to the south of Mar Dyke. It had a trefoil chamber cut in the chalk, situated at the east end of a horizontal passage. The passage led to the west towards the hillslope overlooking the Mar Dyke- "it appears that this was a horizontal adit variety of denehole". From study of sediments in 12m of tunnel it seems it was backfilled after abandonment. No datable artefacts found though, from tool markings in the chalk, it seems that metal picks or chisels were used in excavating it. {1} {2}

Site and Artefact Types

Site type dene hole Form recorded
Period-specific undetermined Material -

Land classification:

Site Assessment

Archaeological History:
Event salv excav Name Wilkinson, TJ Date 1979-1980

Visits:Name Date

Sources:

1 Excav report Location ECC
Collection ECC
Author Wilkinson, TJ Date 1980
Rescue Archaeology along the A13 in South Essex:a preliminary report p17

2 Desc text Location ECC
Collection SMR
Author Wilkinson, TJ Date -

Date of compilation or update: Gilman, PJ Date 3:1985

County District THU Site No. 5079

Parish civil Thurrock

NGR TQ 56898007 Old Map No. TQ58-024

Period-general medieval Site type-general complex

Height O.D. (m) 20 Area (ha)

Site Name Aveley Manor

Description

Homestead moat immediately east of the church. {1}
Moated manor south east of the churchyard. Part of the moat is water-filled, the west side is indicated by surface irregularities. Other, possibly associated surface features link up with up with an outlying pond and existing watercourses. Badger workings have thrown up pottery, dug through an area of cobbling and exposed a block of masonry. Before the conquest the manor was held by a local baron. In the reigns of Henry II and John Gilbert de Tani held it of the king. In the 13th century Aveley Manor came into the Brianzon family. In the 14th century it passed to Thomas de Bradeston (d1360) who held the manor and the advowson of a chapel (demolished but originally north of the moat and possibly 14th century). The manor changed hands several times in the 15th-16th centuries, eventually coming to the crown. By 1593 the house had disappeared, however. A 1782 copy of Saxton's map of 1593 marks the site where it was said to have been. {2}
Routine site inspection by ECC Archaeology Section. The moat surrounded a sub-triangular area, the south east and part of the north sides still surviving as a ditch. The west side was represented by a clear depression in pasture. Finds from the badger setts included stone, cobbling, pottery, bone and oyster shells. The medieval pottery included 4 sherds in a sub-St Neots shell-gritted fabric. Of the other 3, 2 had evidence of glaze. The date range of the group is probably 1150-1250. Finds in Thurrock Museum . {3} {4}
Plan in SMR. {5} According to Morant the house was entirely demolished but it stood in a little field near the south east corner of the churchyard. The site was still surrounded by a moat, part overgrown, in some parts "still of a considerable width and full of water." Relevant part is in SMR. {6}
Tracing of 1782 copy of the 1593 map is in SMR, also information from the VCH relating to the site. {7} {8}
In 1287 manor is described as a messuage, garden and artilage, in 1399 as a capital messuage, in 1374 as a capital messuage with the park 'badly enclosed with a ditch and feeble palings', in 1506 as a messuage and in 1578 the manor is Marshfods House on a different site. {9}
Other ref: {10}

Site and Artefact Types

Site type moat	Form earthwork
Period-specific medieval	Material -
Site type house	Form documentary
Period-specific medieval	Material -

APPENDIX 7

Sites of Importance for Nature Conservation as designated by Essex Wildlife Trust

W3 Watt's Wood (11.4 ha) TQ 565788

This ancient wood is bisected by the Purfleet arterial road, forming two woods of very different character. The northern section (much the larger) has a high canopy of Pedunculate Oak (*Quercus robur*) and Ash (*Fraxinus excelsior*) over old Hazel (*Corylus avellana*) coppice. The flora is poor, being dominated by Ivy (*Hedera helix*) and with Bluebell (*Hyacinthoides non-scripta*), Wood Spurge (*Euphorbia amygdaloides*), Spindle (*Euonymus europaeus*) and Greater Stitchwort (*Stellaria holostea*).

The southern section is largely dominated by English Elm (*Ulmus procera*), with some Pedunculate Oak (*Quercus robur*) and Hazel (*Corylus avellana*) to the east. The Ivy (*Hedera helix*) - dominated flora also includes Spindle (*Euonymus europaeus*), Three-veined Sandwort (*Moehringia trinervia*) and Bluebell (*Hyacinthoides non-scripta*).

W5 Hangman's Wood, South Ockendon (4.0 ha) TQ 578805

Although originally a Pedunculate Oak (*Quercus robur*), Ash (*Fraxinus excelsior*), Hazel (*Corylus avellana*) stand, Hangman's wood was long ago planted with Sweet Chestnut (*Castanea sativa*) and is now badly invaded by Sycamore (*Acer pseudoplatanus*) and Elm (*Ulmus sp.*). The whole wood is badly storm damaged but is the subject of a restoration project. Spindle (*Euonymus europaeus*), Bluebell (*Hyacinthoides non-scripta*) and Three-veined Sandwort (*Moehringia trinervia*) occur amongst the flora.

W9 Brannett's Wood/Low Well Wood (17.9 ha) TQ 585803

This valley-side woodland, originally composed of Pedunculate Oak (*Quercus robur*), Ash (*Fraxinus excelsior*) and Hazel (*Corylus avellana*) now has much old Sweet Chestnut (*Castanea sativa*) and Sycamore (*Acer pseudoplatanus*). Low Well Wood has few standards but does have vigorous and dense understorey growth. The generally dense undergrowth throughout tends to restrict public access to the several paths through the woods. The ground flora, though smothered by Bramble (*Rubus fruticosus*), does contain many ancient woodland species such as Remote Sedge (*Carex remota*), Wood Spurge (*Euphorbia amygdaloides*) and Bluebell (*Hyacinthoides non-scripta*). Damper areas are notable for Ragged Robin (*Lychnis flos-cuculi*) and Bog Stichwort (*Stellaria alsine*).

W10 Brickbarn Wood (5.0 ha) TQ 587800

Little information exists regarding this ancient wood. It is surrounded by a large area of recent woodland and scrub, with the whole site being extensively used for commercial wargaming resulting in a somewhat disturbed ground layer and damage to the understorey. The canopy is mainly Pedunculate Oak (*Quercus robur*) with a little Ash (*Fraxinus excelsior*) and with Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and Elder (*Sambucus nigra*) forming the understorey. In undisturbed areas Bramble (*Rubus fruticosus*) covers much of the ground layer. The conservation value of this site would be enhanced by moderating its current recreational use.

G2 Mar Dyke Grasslands (67.1 ha) TQ 555791 to TQ 591802

These pastures bordering the Mar Dyke form, in the borough context, a particularly extensive grassland area and an important wildlife corridor. They have a sward typified by Cock's-foot (*Dactylis glomerata*), Ryegrass (*Lolium perenne*), Yorkshire Fog (*Holcus lanatus*) and various clovers (*Trifolium sp.*). The Mar Dyke itself has little floating aquatic vegetation but the banks support a marginal flora of Purple Loosestrife (*Lythrum salicaria*), Bur-reed (*Sparganium sp.*), Reed (*Phragmites australis*), Reed Sweet-grass (*Glyceria maxima*), Greater Pond-sedge (*Carex riparia*) and Reedmace (*Typha latifolia*). Barn Owls are known to frequent the Mar Dyke/Watts's Wood area.

FW2 Pond in Belhus Woods Country Park (0.5 ha) TQ 575819

This pond represents the extreme western end of Long Pond now cut off by the M25. There is a well developed marginal vegetation and a small wooded island providing a valuable, safe breeding site for birds.

APPENDIX 8

SSSI Notification

COUNTY: ESSEX

SITE NAME: PURFLEET CHALK PITS

DISTRICT: THURROCK

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.

Local Planning Authority: Thurrock Borough Council

National Grid Reference: TQ 560784
TQ 566785
TQ 569786

Area 9.9 (ha.) 24.4 (ac.)

Ordnance Survey Sheet 1:50,000 177

1:10,000: TQ 57 NE

Date Notified (under 1949 Act):

Date of last revision:

Date Notified (under 1981 Act): 1986

Date of last revision:

Other Information

A new site

DESCRIPTION AND REASONS FOR NOTIFICATIONS

At Purfleet Chalk Pits, terrace deposits are seen banked against Chalk on the north side of the Purfleet Anticline, which therefore separates them from the present-day Thames Valley and places them in the valley of the Mar Dyke. These deposits are extremely variable and include chalky, shelly facies and possible estuarine (laminated) beds. In the western part of the area a very rich proto-Levallois industry has been discovered. Amino-acid dating of the shells has suggested a pre-Ipswichian interglacial age for the terrace, although it is clearly lower than the Boyn Hill Terrace, which is usually associated with the earlier interglacial period, the Hoxnian. Great potential therefore exists for demonstrating the relationship of the complex and problematic Purfleet deposits to those of the Thames terrace sequence.

APPENDIX 9

Data for Identified Contaminated Sites

Site	Grid Ref	Site Ref	Tipping Permission	Date of Tipping	Tip Material	Quality of Restoration	Previous Use	Present Use	Area (ha)
Dolphin Motorway Estate 2	569 782	17	Thu/1262/73	1955-65 1979-	Quarry Overburden Concrete Block, Rubble	Dumped	Chalk Pit	Active Tip	21.0
Dolphin Motorway Estate 1	574 786	16b	1725a/9/7	1955-65	Quarry Overburden	Dumped	Chalk Pit	None	4.0
Tunnel Quarry No. 4	574 783	14a	Thu/869/61	1980-	Factory Waste	Dumped	Chalk Pit	Active Tip	2.2
Tunnel Quarry No. 4	577 7885	14a		1981-	Treated Chemical Waste	Dumped	Chalk Pit	Active Tip	1.4
Olley A13 Tip	578 795	10,11	Thu/30/76 Thu/30a/76 Thu/545/78	1970-	Inert Industrial Waste	Good	Chalk Pit	Active Tip	
Tunnel Quarry No. 2	582 795	12	ES/Thu/440/59	1978	Chalk	Unsatisfactory	Chalk Pit	None	
Aveley By-Pass	571 807	5	Thu/22/71	1973-77	Builders & Factory		Sand & Gravel		6.0
Stifford Road	573 805	5a	T/Thu/670/65	1966-69	Household Refuse		Sand & Gravel	Depot	3.0
Marley	574 803	8a	T/Thu/364/68	1968-70	Soils, Scrap, Concrete Paper & Builders Waste	Fair	Ballast	Depot	3.0
Hangmans Wood	5765 804	8c		1979	Soils	Good	Sand & Gravel	None	1.4
Stifford Road	577 806	5b	T/Thu/670/65	1966/69	Household Refuse	Poor	Sand & Gravel		4.2

Additional known landfill sites for which there is no data are located at site reference 16,16a,16c,9a,9b,74 74a and 74b.