ENVIRONMENTAL IMPACT ASSESSMENT

A study on costs and benefits

Volume 2 — Detailed case studies

EUROPEAN
COMMISSION

A great deal of additional information on the European Union is available on the Internet.
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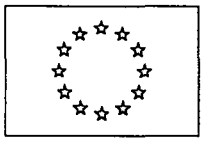

EUROPEAN COMMISSION
Directorate-General
Environment, Nuclear Safety and Civil Protection

ENVIRONMENTAL IMPACT ASSESSMENT

A study on Costs and Benefits

FINAL REPORT

Volume 2: Detailed case studies

December 1996

ENVIRONMENTAL IMPACT ASSESSMENT IN EUROPE

a study on
COSTS AND BENEFITS
VOLUME 2

DETAILED REPORTS ON PROJECT EIA CASE STUDIES

Prepared for

THE EUROPEAN COMMISSION
DG XI

by
Land Use Consultants

in association with
Eureco, Luxembourg, and
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October 1996

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VOLUME 2 - CASE STUDIES

INTRODUCTION

CONTENTS

1. This document is the second volume of a report prepared on behalf of DG XI of the European Commission which examines the costs and benefits associated with the implementation of environmental impact assessment, in accordance with Directive 85/337/EEC.

2. This volume contains the detailed findings of Eighteen Case Studies of Project EIA's in four Member States. The research methodology is described in Volume I of the report and the case studies were examined between January and August 1996.

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3. The Project Team gratefully acknowledges the help of the individual developers and the many organisations who provided the basic information, or who commented, on the individual case studies.

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ANNEX I

GREECE

CASE STUDY 1. EGNATIA HIGHWAY

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process relating to the Egnatia Highway in Greece. It forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by George Tsekouras and Rena Klabatsea of Enviplan, during February - March 1996. It included interviews with the following:

- the Project Manager for the EIA (Mr. Spyros Papagrigoriou, Head of ENVECO Consultants);
- the Head of the Environmental Planning Directorate at the Ministry of the Environment, Planning and Public Works (Mr. Nondas Toleris);
- the Project Supervisor at the Directorate for Road Construction Studies, Ministry of the Environment, Planning and Public Works (Mr. Zisimos Karvounis);
- the Head of the WWF's Bear Programme (Mr. Triandafyllos Adamakopoulos).

2.2 Data was also collected through a telephone interview with Mrs. Kaimaki in the Environment Department of the MEPPW's Public Works Directorate.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 This case study relates to a 42 km section of the proposed 720 km new Egnatia Highway across northern Greece, linking Igoumenitsa with the Turkish border at the River Evros, and passing through Thessaloniki and Alexandroupolis. The whole route has been subject to the initial phase of EIA, but this case study looks, in particular, at the detailed EIA for an area providing an important habitat for the Brown Bear. This section of the route, between Panagia and Aliakmonas, is located in the Trikala and Grevena Prefectures.

3.2 Proposals for building this highway were first put forward by the Greek Government in the 1960s. The route broadly follows the line of the ancient road built by the Romans

between 146 and 120 BC linking countries, including Italy, on the Adriatic with the Aegean Sea. It has always been a strategic route, linking East with West, and has assumed considerable national and international importance in recent years. The whole project is financed by the European Union Cohesion Fund.

3.3 The area is mountainous, and parts are afforested. It is a wild and beautiful part of the country, and is popular for outdoor recreation including climbing, walking and picnicking. Construction is now under way along the whole length of the route.

3.4 The principal participants in the EIA process are:

• Developer:	Ministry of the Environment, Planning, & Public Works, Directorate for Road Construction Studies.
• Competent authority:	Ministry of the Environment, Planning, & Public Works, Environmental Planning Directorate.
• EIA consultants:	ENVECO S.A., Consultants in Environmental Protection, Management and Economics.
• Statutory consultees:	Ministry of Agriculture, Forestry Directorate. Archaeology Department. Public Power Corporation. Town Planning Department, Prefecture of Grevena.
• Non-Government Organisations:	World Wide Fund for Nature (WWF). Greek Society for the Protection of Nature. Bear Programme (Arktos). Arktouros Programme.
• Public groups :	Grevena Climbing Club. Chairmen of the Communities in the region.

4.0 DETAILS OF THE EIA PROCESS

4.1 Preliminary studies on the routing of the entire road (720 km) began in January 1992, and covered construction methods, technical works, geological aspects, hydrology and to some extent, environmental impact. These feasibility studies produced 4-5 alternative alignments for the development of particular sections of the route, following which the best options were chosen by the design team. This stage of the work was followed by the procedures for obtaining preliminary siting approval from MEPPW in August 1993.

4.2 Having confirmed the preliminary siting approvals, MEPPW commissioned a consortia of four collaborating consultancies to carry out the full road construction study, and they in turn appointed ENVECO S.A to prepare the EIA. The EIA studies were undertaken over a period of 5 months between March and September 1994 when the EIA was submitted for approval.

4.3 **Screening:** The decision to apply EIA procedures to the Egnatia Highway had been taken early in the design process.

4.4 **Scoping:** The scope of the EIA studies was decided by the study team. It is significant that the existence of the brown bear habitat, and its importance for international nature conservation had not been identified in the studies leading to the preliminary siting approval for this section of road.

4.5 **Baseline studies:** In addition to the usual range of environmental topics, additional geotechnical, topographical and road construction studies were undertaken under the framework of the EIA.

4.6 **Consultation:** Joint site visits were made on a number of occasions by the consultants, accompanied by representatives of the Ministry, competent authority, local officers and social organisations. Representatives of the World Wide Fund for Nature were also present.

4.7 **Key environmental issues:** Primary concerns related to possible adverse impacts on the brown bear, and disturbance to the scenery and recreational assets of the region.

4.8 **Mitigation proposals:** The main areas of mitigation related to protection of the brown bear habitat, which included some fundamental changes in road design and construction, including the use of tunnelling rather than cuttings to leave access routes for bears across the road corridor.

4.9 **Form of the EIS:** The EIS was published in an A4 portrait size document of 195 pages, containing numerous maps, plans, diagrams and photographs:

• A: Introduction	13 pages
• B: Project Characteristics	17
• C: Description and Register of Existing Environmental State	77
• D: Impact Assessment and Mitigation Proposals	68
• Bibliography	3
• Appendices	17

4.10 **The decision-making process:** The decision to approve the project was taken in April 1995, seven months after the submission of the EIS.

4.11 The quality of the study was deemed by all the agencies involved to be very high and considerably better than average for such studies. Even non-government organisations, despite their objections to the scheme, did not dispute the quality and completeness of the study.

4.12 **Post EIA:** The EIA resulted in the need to make a number of modifications to the original design plans, and gave rise to a delay of between 6 and 9 months on the initial programme estimate.

4.13 Although approval of the EIS was given by MEPPW in April 1995, objections to the EIA were raised, and a challenge was made through the Council of State by a conservation group, calling for additional environmental protection work to be carried out. This group, Arktos, comprises members of WWF representing the Bear Programme, and it draws

part of its support and funding from the EU LIFE Programme, and the Greek Ministry of Agriculture.

4.14 A subsequent counter-challenge has been made by the competent authority, denying that the EIA is inadequate. The case has not yet been heard by the Council of State.

5.0 REVIEW OF COSTS

Introduction

5.1 Costs have been identified in both financial and time terms wherever possible, and related to the different components of the EIA process. The capital cost of the entire route is 2.5 billion ECU (1992 prices). The section of road included within this case study has a budget of 175 million ECU, of which the construction costs amount to 173 million ECU.

Preliminary stage

5.2 The cost of the feasibility study leading to initial site approval was approximately 333 300 ECU which represents 0.19% of the total project cost, only a negligible proportion of the total expenditure.

EIA stage

5.3 The cost of the EIA studies was 133 333 ECU, which represents 28 % of the technical study budget and 0.076% of the total project cost. This figure includes additional geotechnical, topographical and road construction studies. The EIS involved 13 person months of work, as detailed below:

• engineer	4 months
• road construction expert	1 month
• architect / planner	1 month
• forest scientist	1 month
• ecologist	2 months
• air and pollution expert	1.5 months
• civil engineer / hydraulic scientist	1 month
• project manager	1.5 months

5.4 The two members of the competent authority who were involved with the proposal spent 15 days each on the project, mainly in attending site meetings, reviewing the EIS and in discussion with the various government and non-government agencies. The statutory consultees were kept informed at all stages of the study, and as a result they were not required to spend any more time than usual in vetting the final document. The WWF representatives carried out five visits, together with the consultants, to collect information relating to the biotope of the brown bear.

Post EIA stage

5.5 The project was modified as a result of the EIA process, and mitigation measures introduced in order to protect the brown bear habitat and minimise further environmental impacts. It is estimated that these mitigation works have increased the

costs of construction by 50 million ECU, which constitutes 32% of the total capital cost of the project. For example, the construction of tunnels is likely to cost four times as much as the embankments which were originally proposed. The mitigation works have delayed construction by approximately 6-9 months, whilst the legal challenge by the Bear Programme has introduced a further element of delay.

6.0 REVIEW OF BENEFITS

6.1 Generally, the quality and completeness of the EIS is seen to be of great benefit, as it highlighted both the key environmental issues and the needs of the local residents, whilst at the same time endeavouring to minimise the necessary increase in the initial cost of the project.

Benefits to the environment

6.2 One of the key benefits of the EIA process was that it identified, for the first time, the considerable importance of the brown bear biotope. It also introduced measures to minimise visual impact, with a reduction of the stretches of embankment and trenches from 75m to 30-35m, and a corresponding change in the camber of the road.

Benefits to the developer

6.3 The EIA process led to the establishment of good working relationships with both the competent authority and the consultees. The developer also recognises the value of the EIA in improving the project design.

Benefits to the competent authority

6.4 The competent authority supports the need for EIA and its strict implementation. It believes that the EIS reflected a very good example of the EIA process, and was noted for its objectivity. In addition to providing valuable baseline information, the EIS highlighted the key environmental effects and proposed solutions which involved a radical rethink of aspects of the project design.

Benefits to the statutory consultees

6.5 The statutory consultees found the EIS to be objective, well-documented and complete as regards examination of all the possible repercussions for the natural and manmade environment, during both the construction and operational stages. The excellent spirit of co-operation between the developer and the local agencies meant that their comments on the methodology and the assessment of impacts were considered from the outset.

Benefits to the public

6.6 Local residents, including members of the Grevena Climbing Club, were satisfied that the EIA provided a solution for the protection of the long tradition of recreation in the area, given that the original route for the highway altered an area of natural beauty, including wetlands, which is of regional importance for recreation.

7.0 SUMMARY OF FINDINGS

7.1 **The environment:** the creation of a new road is clearly going to impact on the environment. However it is felt that the significance of this project for the development of a large area of Greece, combined with its importance for the European Union, offsets the negative environmental impact. It is generally felt that the way in which the EIA systematically dealt with the major environmental issues should be included amongst the positive aspects of the project.

7.2 **The developer** acknowledges the value of the EIA despite the delay it caused in constructing the project and the increase in cost. It is recognised that the modifications resulting from the EIA process have considerably improved the original proposal.

7.3 **The EIA project manager** believes that the environmental benefits outweigh the increase in cost. He is aware of the difficulties and special nature of the study and considers the delays, apart from the recourse to the Council of State, to be reasonable and expected.

7.4 **The competent authority** states that the EIS deals with the issues in the best possible way, and that any additional modifications to the revised routing, as proposed by Arktos, would have much greater cost implications.

7.5 **The statutory consultees** were well-informed from the outset, had no major objections, and considered the study to be of a high standard.

7.6 **The public:** concern over the impacts of the road is not great, as the project forms part of an overall plan for northern Greece and will make a considerable contribution to regional development by improving links between the central and the more remote regions. Local interests are satisfied that their recreational interests have been protected.

CASE STUDY 2. ROAD CONSTRUCTION, KATAFYKI GORGE

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process relating to the construction of a road in Katafyki Gorge, Greece. It forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by George Tsekouras and Rena Klabatsea of Enviplan, during May - June 1996. It included the following:

- interview with the spokesman for the Fourni Conservation Society 'Vigla' and for the Residents Committee for the Preservation of the Katafyki Gorge (Mr. Iannis Varkarolis);
- telephone interview with the lawyer for the Fourni Conservation Society (Mr. V. Dorovinis).

2.2 As the EIA was undertaken by Enviplan, it has also been possible to draw upon information held internally. Unfortunately, it has not been possible to interview the competent authority, the Prefecture of Argolida's Forestry Directorate.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 This is a particularly interesting case study as it relates to a project which was approved and part-constructed, without an EIA. The residents of the region were considerably concerned about the development, and commissioned an EIA study themselves, to draw attention to the environmental impacts of the proposal.

3.2 The project concerns the construction of a 5.5 metre wide road covering a distance of 7km in the Katafyki Gorge, Ermionida. The gorge lies south-east of the settlement of Fourni and 6km north-east of Ermioni.

3.3 The gorge is an area of outstanding natural beauty (AONB) and lies within a well known game reserve, which is also popular for recreation and with ecologists. Parts are forested, with some areas state owned. Four boreholes supply water from underground aquifers to the communities of Ermioni (population 2879) and Fourni (population 369).

3.4 The decision to construct the road was taken by the Argolida Forestry Directorate in June 1991, on the grounds that it would serve both the region's farmland and the need to establish fire prevention measures in the gorge. The Ermioni Community's Technical Department then carried out a feasibility study and put the work out to tender, with financing from the Ermioni Community.

3.5 Work on the construction of the road began in Fourni and prompted an immediate reaction from the residents of the community, who, led by the Conservation Society, took legal action to stop the work and protect the region from development which they believed would have a serious effect on the environment, and by extension, on living conditions.

3.6 The case was referred to the courts, beginning with the local courts in the summer of 1991, after 300 metres of the road had already been constructed in the community of Fourni. It then went before the highest judicial authority in the country, the Council of State, with a petition that was submitted in October of the same year, when work on the project had been temporarily interrupted.

3.7 The Conservation Society's petition to the Council of State recommended the revoking of the decision to construct the road through the Katafyki Gorge. The case was heard in January 1992, and the court ruled in favour of stopping work on the project.

3.8 Given the special features of this case study, the principal participants are as follows:

• Developer:	Prefecture of Argolida's Forestry Directorate and Ermioni Community's Technical Dept.
• Public Groups	Fourni Conservation Society 'Vigla'. Residents Committee for the Preservation of the Katafyki Gorge.

4.0 DETAILS OF THE EIA PROCESS

4.1 In order to provide fully substantiated support for the residents petition, the preparation of a preliminary EIA was assigned by the Conservation Society to ENVIPLAN consultants. The work took two months to complete, and the EIA study, which was ready in December 1991, played a key role in the court's final decision.

4.2 **Form of the EIS:** The EIS was published in an A4 portrait size document of 20 A4 pages:

• Introduction	1 page
• Description of project	1
• Description of existing situation	7
• Impact of proposals	6
• Alternative proposal	2
• Conclusions	3
• Bibliography and sources	

5.0 REVIEW OF COSTS

5.1 The project was initiated on the basis of the feasibility study carried out by the Technical Department of the Prefecture of Argolida. This study was undertaken by two people over a period of one week. The time estimated for this study is therefore 0.5 man months.

5.2 The estimated cost of the project is Dr. 30 million (100,000 ECU).

5.3 The costs (in time and money) to the Fourni Community's Residents Association of their coordinated action to halt construction of the road and protect the gorge were as follows:

-	Legal fees (for local courts and Council of State)	Dr.600,000	(2,000 ECU)
-	Fee for EIA Study report	Dr. 500,000	(1,666 ECU)
-	Sundry, consumables, etc.	Dr. 50,000	(166 ECU)
	Total Estimated Cost	**Dr. 1,150,000**	**(3,832 ECU)**

5.4 It is estimated that 2 members of the Residents Association worked on the project for 4 months, 20 people for 15 days, and the 7-member Community Council for 10 days.

5.5 The EIA Study commissioned to support the residents' appeal was undertaken over a two month period. Five qualified professionals were involved in the preparation of the EIA Study report, as follows :

- 1 town and regional planner-environmentalist
- 1 architect-regional planner
- 1 architect-planner, specialising in environmental protection issues
- 1 biologist-ornithologist
- 1 naturalist-environmentalist

6.0 REVIEW OF BENEFITS

6.1 The EIA study considered the environmental costs which had resulted from the construction of 300 metres of road and compared them to the environmental benefits which would result if the road project was stopped.

6.2 The Katafyki gorge is an area of outstanding natural beauty (AONB) and a declared game reserve, and is used as an informal recreation area and visiting place for people with special ecological interests. Along the bottom of the gorge is a seasonal river and one of the area's smallest and most important aquifers. This feeds 4 boreholes drilled in the riverbed which supply water to the communities of Fourni and Ermioni.

6.3 As a result of the blasting and quarrying undertaken in connection with the road construction, one of the boreholes had become unusable and a second was threatened.

6.4 The EIA report drew attention to the adverse effects the road project would have on the natural environment of the gorge, and on the natural and manmade environment of the broader area.

7.0 SUMMARY OF FINDINGS

7.1 As a result of the community's legal action, the Council of State decided in favour of the local community, and construction of the road was halted.

CASE STUDY 3. HARBOUR PROJECT, PATMOS

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process relating to the harbour project on the Greek island of Patmos. It forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by George Tsekouras and Rena Klabatsea of Enviplan, during February - March 1996. It included interviews with the following:

- the Project Manager for the EIA(Mr. Spyros Papagrigoriou, Head of ENVECO Consultants);
- the Head of the Environmental Planning Directorate at the Ministry of the Environment, Planning & Public Works, MEPPW (Mr Nondas Toleris);
- the Head of the Planning & Studies Department of the MEPPW's Directorate of Harbour Works (Mr E. Tsavdaris).

2.2 The interviewers were able to look at the EIS prior to holding the interviews, so that they were in a position to follow the issues which were critical to the costs and benefits arising at each stage of the study.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The project concerns the extension and improvement of the infrastructure of the only harbour on the island of Patmos, in the Aegean Sea, and was proposed because the existing harbour was too small to accommodate the number and size of vessels visiting the island. It represented one of 10 similar harbour projects being promoted by MEPPW at that time.

3.2 The harbour at Patmos is of outstanding scenic value. Many historic properties are grouped around the harbour, and its walls and defences are constructed in natural island stone. The island constitutes an important cultural and religious monument for the Christian world and the project in question is thought to be of particular value to tourism

and the local economy. Its completion is not unconnected with recent celebrations on the island marking the 1900th anniversary of the writing of the Book of Revelations by St. John.

3.3 In September 1991, the Dodecanese Prefecture Harbour Fund approved detailed proposals for Patmos Harbour. However, an EIA was required in order to obtain financing for the project. This was commissioned by the MEPPW's Directorate of Harbour Works, and undertaken in parallel with a feasibility study for the proposal.

3.4 The principal participants in the EIA were:

• Developer:	Ministry of the Environment, Planning & Public Works, General Secretariat for Public Works, Directorate of Harbour Works.
• Competent authority:	Ministry of the Environment, Planning & Public Works, Environmental Planning Directorate.
• EIA consultants:	ENVECO S.A., Consultants in Environmental Protection, Management and Economics.
• Statutory consultees:	Dodecanese Prefectural Council. Dodecanese Harbour Fund. Harbour Authority. Town Planning Department of the Dodecanese Prefecture.
• Non-Government Organisations:	Monastery of St. John the Theologian. Municipality of the town of Patmos. Old Boat Builders Association.
• Public groups:	Chairmen of the Communities in the region.

4.0 DETAILS OF THE EIA PROCESS

4.1 The EIA was undertaken by ENVECO S.A. who were appointed by D.T. Constantinidis & Co Ltd., the consultancy commissioned by MEPPW to carry out both the feasibility study and the EIA. The EIA was undertaken over a period of three months between July and September 1993, in conjunction with the application for preliminary siting approval. The EIS was submitted in September 1993 and approval for the development was granted in June 1994. The quality of the EIS has been described as well above average by both the competent authority and the consultees.

4.2 The key environmental issues related to the potential damage to the marine environment through construction works, and disturbance to the historic, architectural, and visual setting of the harbour and its surroundings. Discussion on the need for mitigating measures began during the preparation of the EIS and continued throughout its review. This led to the competent authority placing the following environmental restrictions on the developer:

- Traditional materials were to be used for construction to ensure that the project complemented its surroundings. The use of building materials from Patmos and neighbouring uninhabited islands was banned;

- Construction work was to be halted during the summer months at the height of the tourist season;

- The development of land-based facilities in the harbour such as shops and restaurants would not be permitted.

4.3 The EIS is A4 portrait size and extends to 188 pages, including maps and photographs. An additional folder contains 17 AO size plans. The format of the report is as follows:

• Introduction	4 pages
• General information about the study	14
• Need for the project	4
• Description of the project	35
• Description of existing environmental conditions	40
• Description of manmade environment	29
• Evaluation and assessment of environmental impact	32
• Methods of dealing with environmental impacts	8
• Environmental statement and recommendations	7
• Monitoring of environmental impacts	1
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• Appendices	13

5.0 REVIEW OF COSTS

Introduction

5.1 The full cost of implementing the harbour extension and improvements amounted to 4 Million ECU. These costs were raised significantly, for both the construction and operational stages, above the levels which would normally be expected for equivalent harbour works in less sensitive locations.

5.2 During construction, the main increase in costs arose from restrictions on winning local materials, which meant that all building materials had to be imported. The principal costs in the operational phase are represented by economic opportunities which have been foregone in the interests of protecting the environmental integrity of the harbour area. This refers principally to the decision not to allow commercial development such as shops and cafes.

5.3 An indirect consequence of the harbour improvements is that the island is experiencing higher levels of tourism and increased traffic congestion, which was already a serious environmental problem. Whilst the EIA controlled and contained traffic impacts within the immediate vicinity of the harbour, the wider issues were beyond its remit. However, the EIS did draw attention to the need for an integrated traffic and transport study.

Preliminary stage

5.4 The cost of the original studies commissioned by the Dodecanese Prefecture Harbour Fund are not known. The feasibility study undertaken in parallel with the EIA cost 40 000 ECU (1994 prices) and represented 1% of the total project cost.

EIA stage

5.5 The EIA cost 27 000 ECU and represented 0.675% of the total capital cost. The consultants were able to use some of the information contained in the original studies for the Harbour Fund, and spent approximately 10 person months preparing the EIS:

• environmental engineer / sanitation expert	2.5 months
• civil engineer / hydraulic scientist	3 months
• ecologist	1 month
• harbour engineers	2.5 months
• project manager	1 month

5.6 The commissioning authority (and developer of the project) estimates that for a period of 5-6 months, it was closely involved in monitoring the feasibility and EIA studies for all 10 harbour projects referred to earlier.

5.7 During the review stage, two members of the competent authority each spent 15-20 days in visits and discussions with both the developer and various government and non-government agencies. Four months elapsed between submission of the EIS and its approval by the competent authority.

Post EIA stage

5.8 When compared with similar projects in less sensitive areas, the environmental restrictions imposed as a result of the EIA process clearly increased the cost of the project during both its construction and operation. No figures are available regarding the extent of the increased costs, since it would be extremely difficult to estimate the income foregone as a result of the restriction on land uses in the harbour area. However, had the development of land-based facilities been permitted, the environmental costs to the island's most central point would have been extremely high, and would change the whole character and cultural value of Patmos. This would then have financial implications for the tourist industry and the local economy.

6.0 REVIEW OF BENEFITS

Benefits to the environment

6.1 The EIA has helped to prevent the significant deterioration which might otherwise have occurred in the absence of sensitive design and construction. The project blends harmoniously with its surroundings by using traditional materials which have been imported to avoid disturbance to the island and its surroundings. The restriction of land-based facilities will, to some extent, alleviate existing problems of traffic congestion around the harbour.

Benefits to the developer

6.2 Due to the thoroughness of the EIA, and its attention to the need for mitigation, the decision-making process proceeded very rapidly, avoiding any delay. The consultants fostered an excellent spirit of co-operation between all participants, which eased the process of reaching agreement on mitigation works.

Benefits to the competent authority

6.3 The competent authority found the EIS particularly helpful as it was regarded to be of a particularly high standard, due to its objectivity and the way in which interactions between the various complex issues were handled.

Benefits to the statutory consultees

6.4 The EIS was again accepted as objective, well-documented, and comprehensive. As a result no problems were raised during the review process, although the Prefectural Council was late in submitting its views to the competent authority.

Benefits to the public

6.5 Local people regarded the harbour improvements and extension as a routine set of operations designed to improve the island's economic and social welfare by boosting tourism without destroying the special qualities of the island. In consequence, there was little public interest in, or comment about, the EIA.

6.6 As far as the remaining non-government organisations and public groups are concerned, the main role was played by the Monastery of St. John the Theologian, which agreed with the proposals put forward by the EIA study team.

7.0 SUMMARY OF FINDINGS

7.1 **The environment:** the EIA has helped to ensure both sensitive design and construction, and the restriction of land-based development which could pose a serious threat to the historic, architectural, and visual setting of the harbour. Although the EIA did not address the traffic congestion in the vicinity of Patmos harbour in detail, it did draw attention to the need for an integrated traffic study.

7.2 **The developer:** the Directorate of Harbour Works carried out regular monitoring of the EIA process, and together with the competent authority, had no hesitation in adopting the environmental restrictions imposed by the EIA.

7.3 **The EIA project manager** believes the environmental benefits to be significant, long-term, and directly linked to the island's character and special value.

7.4 **The competent authority** considered the EIS to be of a high standard, and as a result, it was of considerable value during the decision-making process.

7.5 **The statutory consultees** were also satisfied with the quality of the EIS, and found the information helpful.

7.6 **The public:** public interest was not very great in this instance, as the project was seen as routine harbour extension work, which would benefit the local economy. Both the Monastery and the Old Boatbuilders Association played a significant role in the process and were satisfied with the outcome (the latter had to be relocated during construction).

CASE STUDY 4. WASTE TREATMENT PLANT, PATRAS

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process relating to the waste treatment plant in Patras, Greece. It forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by George Tsekouras and Rena Klabatsea of Enviplan, during February - March 1996. It included interviews with the following:

- the Project Manager for the EIA (Mr. Spyros Papagrigoriou, Head of ENVECO Consultants);
- a chemical engineer in the Environmental Planning Directorate at the Ministry of the Environment, Planning & Public Works, MEPPW (Mr. Stavros Polychronakis).

2.2 Information was also obtained through a telephone interview with Mr. Markos Sklivaniotis, a chemical engineer with the Patras Municipal Water & Sewage Corporation, who is responsible for monitoring the project.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The proposal involves the construction of a waste treatment facility to serve the city of Patras, which has a population of 150 000. The developer is the City Municipal Water & Sewage Corporation, which has appointed contractors to undertake the work on its behalf.

3.2 Although the 10.5 hectare site at Kokkinos Milos is located close to the coast, it lies within the urban limits of Patras. The site was selected to permit the discharge of effluent by an underwater outfall. The initial proposals for a new sewage treatment works at Patras were developed in the 1980s, with preliminary siting approval granted by 1989.

3.3 The second stage detailed assessment began in 1993, when an EIS was produced by a study team on behalf of the City Corporation, and submitted to the MEPPW in October of that year. The Ministry forwarded the study to Achaia Prefectural Council in February

1994 when it was published. Two months later, the EIS was returned to the Ministry with the Prefecture's comments. The environmental regulations for the project were approved in June 1994 by a joint decision of the Interior Ministry and MEPPW.

3.4 Between August and September 1994, an implementation EIA was undertaken by consultants retained by contractors who were tendering for the construction of the works. This implementation EIA was considered by the competent authority over 3 months (October-December 1994) and then sent to the Prefectural Council for publication. A further 2 months elapsed before it was approved. **In order to cover all the stages of EIA in Greece, it is the implementation EIA and associated procedures which has been investigated in detail in this case study report.**

3.5 Each of the six companies tendering for the contract had to prepare an implementation EIA. Ultimately, the contractors who had commissioned the implementation EIA discussed here, failed to win the construction contract. It was therefore necessary for the successful firm to submit its own EIA implementation study to the competent authority, for the same approval process as its predecessor. Construction work has now commenced, and the treatment plant should be operational by 1999.

3.6 The principal participants in this project were as follows:

•	Developer:	Patras Municipality, Patras Municipal Water & Sewage Corporation.
•	Competent	Ministry of the Environment, Planning & Public authority: Works, Environmental Planning Directorate.
•	Statutory consultees:	Achaia Prefectural Council. MEPPW Departments in Achaia Prefecture.
•	Non-Government Organisations:	None.
•	Public Groups:	Residents of the region who formed a social control committee to monitor the project's construction.

4.0 DETAILS OF THE EIA PROCESS

4.1 **Preliminary Siting EIA:** The preliminary EIA stage involved the preliminary siting approval which occurred in two stages. First, the site of the plant was identified and confirmed in the General Development Plan for the City of Patras, in November 1986. Secondly, a Prefectural Decision to designate the area of sea off Kokkinos Milos as a receptor for treated waste, was agreed on 30th March 1989.

4.2 The work of preparing the report, including the EIS for the preliminary siting approval, was carried out internally by the City Authorities. It examined demographic, tourism and industrial growth patterns in order to forecast future loadings on the treatment works; locational and site conditions; the sewerage network; potential methods of treatment; marine conditions; measures for controlling and minimising environmental impact; and

proposals for monitoring. The city was assisted by the University of Patras (Geology Department, and Marine Geology & Physical Oceanography Laboratory) in carrying out oceanographic research.

4.3 The preliminary EIS comprised 70 pages of text supported by four appendices covering:

- the Prefectural Decision (30/03/89) relating to sea disposal of treated waste;
- a draft Health and Safety Regulation for Waste Treatment Plants (Technical Chamber of Commerce);
- an oceanographic study of the Patraikos Gulf (1981-82);
- oceanographic research on siting an underwater waste pipe (University of Patras).

4.4 **EIA Implementation Study:** This work was undertaken by ENVECO S.A., appointed by a joint venture group of contractors who were amongst those tendering for the construction works. The second stage EIA implementation study was actually undertaken while the tendering process was proceeding.

4.5 **Scoping:** The scope of the implementation study was determined by the previous investigations.

4.6 **Baseline Studies:** Although most of the background data had been collected for the earlier siting studies, it was necessary for the team to reassess a number of key areas, including issues relating to odour, noise and use of aerosols.

4.7 **Consultation:** Public participation in the process was restricted to the stage at which the Prefecture published the completed document. At this time, local residents formed a 'Social Control Committee' with the aim of monitoring the development and ensuring that environmental regulations were complied with.

4.8 **Key Environmental Issues:** The key issues examined in the implementation EIA relate to the control of noise, traffic, odours, air-borne pollution, effects of aerosols, insects, chemicals, aesthetic considerations, and possible effects on the marine environment. A monitoring programme is also provided.

4.9 **Mitigation proposals:** These were designed to address each of the topics listed above, under key environmental issues. Special measures were recommended for dealing with odour, involving the use of biofilters, which are expensive to purchase and maintain. A very low noise limit of 45dB was also proposed, although this may be difficult to achieve in practice.

4.10 **Form of the EIS:** The second EIS consists of one A4 document comprising 23 pages of text, with an appendix containing maps, diagrams and photographs, covering a further 9 pages. This document reviews the choice of recommended treatment system; describes the site conditions; examines previously identified areas of environmental impact; and then discusses ways of mitigating these. It is divided into the following chapter headings:

•	A:	Documents supporting choice of system recommended	2 pages
•	B:	Description of areas affected by the waste treatment plant	5
•	C:	Potential environmental impacts of the plant and ways of dealing with them	12
•	D:	Environmental monitoring programme	2
•	E:	Conclusions	2

5.0 REVIEW OF COSTS

Capital costs

5.1 The original budget for development of the waste treatment plant was estimated at 5 million ECU (1993 prices). However, in the intervening period, costs have been revised to 8 million ECU (1996 prices).

Costs for the original EIA

5.2 Costs are not available for the original EIA undertaken by the City of Patras, as the work was undertaken internally. However, it has been estimated that the fee for a similar study today would be approximately 67 000 - 83 000 ECU.

Costs for the implementation EIA

5.3 The ENVECO study cost 16 500 ECU (1994 prices) which represents 0.2 % of the total project cost. It took three months to complete, with 4 specialists collectively putting in the equivalent of 8 person-months of effort:

• sanitation engineer	3 months
• regional planner	2 months
• environmentalist	2 months
• project manager	1 month

5.4 Prior to approving the EIA, the competent authority visited the site and spent 2-3 days reviewing the EIS. A longer period of time was required for the collection of supplementary data. Altogether, it took 3 months for the EIS to be forwarded to the Prefectural Council for publication, and a further 2 months for its approval.

Post EIA stage

5.5 As a result of the implementation EIA, additional protection works were identified which increased the scale of environmental protection costs (including maintenance) by 0.33-0.5 million ECU (1994 prices). This represents an increase of 10% over the original investment cost, and can be largely attributed to the proposed use of biofilters (active carbon filters) for reducing odour. These are very expensive systems both to purchase and to maintain.

6.0 REVIEW OF BENEFITS

Benefits to the environment

6.1 The disposal of treated effluent through an underwater discharge has the potential to adversely affect the ecology of the marine environment, and operation of the plant could also have adverse effects on-shore. However, the EIA process has identified and anticipated these effects, and sought to minimise them as far as possible. The recommended biofilters will also reduce odour problems over a considerable distance.

Benefits to the developer

6.2 Projects of this nature frequently meet with opposition from local residents and the procedure for obtaining permission is often time-consuming and costly. However, in this case there was complete acceptance by the local population as they received assurances from the local authorities that the environmental regulations finally approved would be implemented to the letter. The contractors, on whose behalf the EIA implementation study was undertaken, considered that the process had been of real value, even though it had raised the development cost, because it had proposed solutions which improved the original plan, and provided greater safeguards for local residents.

Benefits to the competent authority

6.3 The EIA implementation study was deemed by the competent authority to be of a high standard, and the authority received the full co-operation of the developer and the EIA specialists. This was of considerable benefit during the decision-making process.

Benefits to the statutory consultees

6.4 Close collaboration took place between the EIS study team, and the statutory consultees, throughout the EIA process. This reduced the length of time needed to review and comment upon the completed document.

Benefits to the public

6.5 The residents are satisfied that there will be no adverse impacts on either their health or their property, and as a result, public opposition has been considerably less than might have been expected. The local people have been convinced that the measures set out in the implementation EIA will minimise nuisance from noise and odour, and as the local authorities intend to implement the environmental regulations to the letter, concerns that the treatment plant will cause a considerable drop in the value of land and property in the surrounding area have largely been removed.

7.0 SUMMARY OF FINDINGS

7.1 **The environment:** although the siting and operation of such a plant will inevitably have impacts on the environment, the EIA process has dealt seriously and systematically with the major environmental impacts of odour, emissions, and noise, and has identified ways in which these impacts can be successfully mitigated.

7.2 **The developer:** the firm on whose behalf the EIA implementation study was undertaken was not finally selected. However, the company recognises the value of the study, despite the resultant increase in capital cost, as it believes the study proposals improve the original plan.

7.3 **The EIA project manager** believes that the environmental benefits outweigh the increase in investment costs.

7.4 **The competent authority:** Co-operation between the developer and the competent authority has been excellent throughout the EIA process.

7.5 **The statutory consultees** are satisfied with the way in which they have been consulted.

7.6 **The public:** public concern over the implications of locating the treatment plant in a residential area was initially high. However, by the end of the EIA process, local residents were satisfied that the plant would have no significant impacts on either their health or the value of their property.

CASE STUDY 5. ENERGY CENTRE AT VENIZELEIO HOSPITAL, CRETE

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process relating to the energy centre at Venizeleio Hospital, Crete. It forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by George Tsekouras and Rena Klabatsea of Enviplan, during February - March 1996. It included interviews with the following:

- the Project Manager for the EIA (Mr. Spyros Papagrigoriou, Head of ENVECO Consultants);
- the Environmental Planning Directorate at the Ministry of the Environment, Planning & Public Works (Mrs. Anastasia Pantazopoulou).

2.2 The interviewers were able to examine the study before and after the interviews, so that they were in a position to follow the issues which were critical to the costs and benefits arising at each stage of the study.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 This project involves the construction and operation of an energy centre within the grounds of Venizeleio hospital, on the island of Crete. The development comprises: a compressed air production unit; storage of medical gases; an incinerator; water supply engine room; hot water boiler and steam boiler.

3.2 At the present time, potentially hazardous and toxic hospital waste is transported from the teaching hospital at Venizeleio to the regional general hospital in Heraklion, for disposal. Treatment of this material in-situ would remove the risks of accidents occurring in transit, which are not insignificant given that the transport of waste in Greece, particularly in the provinces, is not always carried out with sufficient care.

3.3 Venizeleio Hospital is located 5km from the centre of Heraklion, the largest town on Crete, and close to the world famous archaeological site of Knossos Palace, which is the home of the Minotaur in Greek mythology.

3.4 Proposals for the energy centre were developed in 1993. In June 1994, the hospital authorities appointed ENVECO S.A. to prepare a first stage EIA. This was carried out between July and October 1994, in parallel with procedures for preliminary siting approval. Preliminary siting approval has been granted, which means that, in principle, the development will be permitted.

3.5 Alterations to the General Development Plan for Heraklion were not believed to be necessary, as it is generally believed that the distance between the hospital and the town is great enough to prevent any significant environmental impacts on Heraklion. However, the EIA has still to be approved, as there is concern over the impacts of the proposals on the archaeological site of Knossos.

3.6 In Greece, development with the potential to affect ancient monuments is always subjected to time-consuming review procedures. If the State Archaeological Council is persuaded that Knossos will not be adversely affected by the proposals, the Ministry of Culture will agree to co-sign the EIS. If this does not happen, the decision-making process will reach a deadlock, as all the relevant ministers must approve the EIS.

3.7 The principal participants in the project are as follows:

• Developer:	Venizeleio Hospital, Heraklion, Crete.
• Competent	Ministry of the Environment, Planning & Public authority: Works, Environmental Planning Directorate.
• EIA consultants:	ENVECO S.A., Consultants in Environmental Protection, Management and Economics.
• Statutory consultees:	State Archaeological Council. Ministry of Health. Town Planning Dept. of the Heraklion Region, Crete.. Heraklion Regional Council. Municipality of Heraklion.
• Non-Government Organisations:	None.
• Public Groups:	None.

4.0 DETAILS OF THE EIA PROCESS

Preliminary Studies

4.1 In addition to obtaining preliminary siting approval, the initial work included detailed discussions with the planning department of the prefecture of Heraklion, regarding whether or not a review of the General Development Plan for the area was necessary. The timescale for this stage was greatly extended by the special procedures relating to projects affecting archaeological sites.

EIA stage

4.2 The initial EIA studies were conducted by ENVECO S.A. over a period of 3 months, and resulted in the production of the first stage EIA report which is described below.

4.3 **Screening:** The EIA was a mandatory requirement as the project falls under Annex 1.

4.4 **Scoping:** The scope of the investigations was determined by the consultants in discussion with the competent authority.

4.5 **Consultation:** Very extensive and time-consuming meetings have been held between the developer, the consultants, and other interested parties.

4.6 **Preparation of EIS:** Due to the sensitivity of the development site which lies within the grounds of a major hospital, and the cultural and heritage value of neighbouring sites, the EIA had to address a wide range of subjects.

4.7 **Key Environmental Issues:** The main concerns relate to the need to maintain the health and well-being of patients at the hospital, and to protect the landscape and surroundings of Knossos Palace from unsightly development.

4.8 **Mitigation Proposals:** A primary concern of the State Archaeological Council is that neither chimney nor smoke should be visible from any part of the archaeological site, while health concerns dictated that there should be no risk of smoke entering rooms in the hospital. This led to a redesign of the chimney structures, involving the use of a greater number of smaller chimneys.

4.9 **Form of the EIS:** The EIS is a single report, A4 portrait size, which is 73 pages long, excluding 21 pages of appendices:

• 1: General information about the study	3 pages
• 2: Feasibility of the project	4
• 3: Description of the project	9
• 4: Existing environmental conditions	18
• 5: Evaluation and assessment of environmental impact	23
• 6: Methods of dealing with environmental impact	4
• 7: Environmental statement and monitoring of environmental impact	4
• 8: Preliminary siting approval	8
• Bibliography	
• Appendices	

Post EIA stage

4.10 Until a decision is reached on the first stage application, no further progress will be made in examining the environmental effects of the project.

5.0 REVIEW OF COSTS

Capital Costs

5.1 The budget for the project has been set at 1.3 million ECU (1994 prices). Most of the expenditure is associated with the incinerator equipment rather than the general building work.

EIA stage

5.2 The work undertaken to date on the EIA has cost 33 350 ECU which represents 2.56% of the total capital cost. It has involved 8.5 person months of effort:

• chemical engineer	3 months
• air pollution expert	1 month
• engineer	0.5 months
• architect-planner	0.5 months
• environmental expert	1 month
• civil engineer	1.5 months
• project manager	1 month

5.3 Members of the competent authority's staff have estimated that they would each have spent one month on the proposal had there not been delays with the archaeology department. It is not known how much more time will be required, given that the procedure for approval of the EIS has not yet been completed.

5.4 The State Archaeological Council has been extremely conscientious in pursuing the details of the development proposal, and has incurred very substantial time inputs on the part of its key staff.

Post EIA stage

5.5 The EIA work identified the need for modified pyrolytic incineration equipment and this has increased the capital cost of the project by an estimated 7%. However, as the need for the modifications was identified towards the beginning of the EIA process, this did not result in any time delays.

6.0 REVIEW OF BENEFITS

Introduction

6.1 The EIA has ensured that issues of national importance have been identified and addressed at an early stage in the siting process, while it is still possible to introduce modifications to the basic design.

Benefits to the Environment

6.2 The main consequences for the environment arising from the EIA are a lessening in the level of potential damage to archaeological and cultural assets, and a reduction in potential health hazards for patients at the existing hospital. If the equipment is installed, it will have to satisfy the environmental regulations proposed in the EIS.

6.3 The EIA process should ensure that technological improvements in the disposal of waste are achieved, without causing any change in the historical and cultural environment of Knossos.

Benefits to the Developer

6.4 The developer has incurred significant additional costs and delays as a result of the EIA process, which limit the scale of benefits. However, the developer has recognised that there is a need for EIA in cases such as this.

Benefits to the Competent Authority

6.5 The authority acknowledges that the EIA has been prepared to a high standard, and has dealt with all the issues comprehensively and objectively.

7.0 SUMMARY OF FINDINGS

7.1 **The environment:** although the EIA process has not led to any direct environmental improvements, it has resulted in a modified project design which does not adversely impact upon the historical and cultural environment of Knossos.

7.2 **The developer** acknowledges the need for the EIA, despite the resultant increase in capital costs, as it ensures the hospital operates on a sounder basis.

7.3 **The EIA project manager** has commented that the social, economic and environmental benefits to be derived through implementation of the EIA recommendations will greatly exceed the increased costs associated with mitigation.

7.4 **The competent authority** considers this EIA to be of a high standard and of value to the decision-making process. However, the time inputs required from the statutory consultees, and the corresponding difficulties for the developer are also recognised.

7.5 **The statutory consultees:** the State Archaeological Council was extremely conscientious in its task, and this resulted in the project suffering considerable delay, since

the procedure for taking decisions and proposing modifications is generally a very time-consuming one.

7.6 **The public:** No public groups were involved in this particular case study, probably because the site is not located in a highly populated area. In addition, any concerns over the historical and cultural environment are being actively pursued by the statutory consultees who are imposing significant restrictions on the plans for the project.

7.7 By ensuring the protection of a major tourist attraction, the EIA will, indirectly, be of benefit to the local economy.

ANNEX 2

THE NETHERLANDS

CASE STUDY 1. STORAGE RESERVOIR, BRABANTSE BIESBOSCH

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process as it applied to the development of the 4th storage reservoir, Brabantse Biesbosch. The report forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom, and follows a standard format[1] which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings
8. Bibliographic References

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by EurEco during the period March - May 1996. The report has been prepared on the basis of the following sources :

- interviews with a representative of the Province of Noord-Brabant (in the role of competent authority and 'formal' developer), and with a representative of the Water Storage Corporation Brabantse Biesbosch WBB (being the 'real' developer), on the site of the WBB in the Brabantse Biesbosch;
- key documents related to the EIA process that were kindly forwarded by the competent authority and the developer (see bibliography);
- specific documents and data on the relative costs and benefits of the EIA process of the project (see bibliography).

2.2 The interviews were carried out following a standard questionnaire developed in agreement with the commissioner of the study, and adapted to the Dutch situation by EurEco. A draft case study report was sent for comment to the interviewed persons.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The development proposals involve the preparation of an implementation plan for a 4th water storage reservoir near the part of the estuary of the rivers Meuse and Rhine known as the Brabantse Biesbosch.

3.2 The Biesbosch is situated in the south-western part of the Netherlands. In the late sixties, it was given a storage function for drinking water; three storage reservoirs have been built

[1] The format has been agreed with the commissioner of the study, DG XI of the European Commission, and laid down in <LUC 1996>.

in the Biesbosch between 1969 and 1979. A location for a fourth reservoir (Zuiderklip) has been reserved in the Biesbosch. This site has been classified in national, regional and local plans[2] in force under the Dutch environmental planning legislation.

3.3 As a result of the growing concern for nature and the environment, the nature conservation value of the Biesbosch was increasingly recognised. The Biesbosch was consequently classified as a 'wetland of international importance' under the Ramsar-Convention in the early eighties and was selected to become a National Park under the Dutch Nature Protection Act in 1985[3].

3.4 Whilst the Zuiderklip location in the Biesbosch remained the legal location for the 4th reservoir, it became more and more clear that the development of a reservoir at this location would significantly harm the nature value of the Biesbosch. Preliminary research for alternative locations outside the Biesbosch started in 1992. Two possible alternative locations ('Jannezand' and 'Koekoek') have been identified in this research.

3.5 The Province of Noord-Brabant decided subsequently to make use of the provision of the Dutch spatial planning legislation that allows a regional plan to be further detailed in a so-called implementation plan ('uitwerkingsplan'). This would permit the Province to designate a different location for the 4th reservoir. The initial location would be maintained if a suitable alternative could not be found.

3.6 EIA was compulsory for both the development of a storage reservoir and of a mineral extraction activity of this size (> 100 hectares). The objective of EIA was to assist decision making on the implementation plan.

3.7 The EIA was a so-called 'location-EIA' ('locatie-m.e.r.') as different locations were compared but also an 'installation-EIA' ('inrichtingen-m.e.r.') as different reservoir designs were compared at each location.

3.8 The principal participants in the EIA process were as follows :

The 'formal' developer and competent authority	The Provincial Government ('Gedeputeerde Staten') of the Province of Noord-Brabant, as competent authority for preparing and deciding upon an implementation plan.
The 'real' developer	The Water Storage Corporation Brabantse Biesbosch WBB, being the actual developer of the 4th storage reservoir.
Statutory Consultees	The independent EIA Commission. The provincial spatial planning Committee. The provincial water and environment Committee. The regional environmental Inspectorate.

2 Tweede Structuurschema Drink- en Industriewatervoorziening, 1984; Streekplan Noord-Brabant, 1992; Bestemmingsplan Made en Drimmelen, 1972.

3 The final decision on the creation of a National Park was taken in 1994.

Other principal participants	Water board 'Alm and Biesbosch.' Several farmer associations. Concerned municipalities (Dussen, Hooge en Lage Zwaluw, Made en Drimmelen). Director Agriculture, Nature and Outdoor Recreation of the Province of Noord-Brabant. Vereniging Behoud Biesbosch (Association for the Protection of the Biesbosch). Nature Park Brabantse Biesbosch i.o.

4.0 DETAILS OF THE EIA PROCESS

4.1 The EIA for the implementation plan 4th storage reservoir Brabantse Biesbosch was prepared in the period of March 1994 (publication of the guidelines for the EIS) to November 1994 (publication of the EIS). **Table 1** gives details on the steps of the EIA process. WBB employed Witteveen+Bos, consulting engineers, and Werkplaats voor Milieubouw ir. Wil Thijsen to carry out the EIA and to provide support within the EIA procedure.

Table 1 : Steps in the EIA process of the implementation plan 4th storage reservoir Brabantse Biesbosch

Step	Activity	Date
1. Preliminary	1.1 Notification of intent ('startnotitie')	18.11.93
	1.2 Publication of the notification of intent	01.12.93
2. Scoping	2.1 Reactions of the public on the notification of intent	03.12.93 - 03.01.94
	2.2 Advice of the independent EIA Commission for the Guidelines for the EIS ('Richtlijnen')	02.94
	2.3 Advice of other Statutory Consultees	-
	2.4 Guidelines of the competent authorities for the EIS	08.03.94
3. EIA studies	3.1 Formal submission of EIS	09.11.94
4. EIS judgement	4.1 Judgement by the competent authorities on the correctness and completeness of the EIS	09.11.94
	4.2 Publication of the EIS and the draft implementation plan	15.11.94
5. Consultation on EIS	5.1 Public consultation on the EIS and the draft implementation plan	17.11.94 - 15.01.95
	5.2 Public meeting	15.12.94
	5.3 Advice of statutory consultees - Provincial spatial planning committee - Provincial water and environment committee	 12.12.94 20.12.94
	5.4 Review advice of the independent EIA Commission ('toetsingsadvies')	12.02.95
6. Decision	6.1 Decision on the implementation plan for the 4th storage reservoir	26.09.95
	6.2 Decision on the reactions of the public on the implementation plan	06.02.96
7. Post EIA	7.1 Evaluation and monitoring	1998 and onwards

EurEco 1996

4.2 The following points are worth noting :

- a *steering group* was formed to discuss the preparation of the implementation plan and the results of the EIA studies. This steering group met 6 times; 5 times during the EIA process. The following organisations were represented on the steering group :
  - the concerned municipalities;
  - the Nature Park Brabantse Biesbosch i.o.;
  - the Water board 'Alm and Biesbosch';
  - the national Ministry for Housing, Spatial Planning and Environment;
  - the national Ministry for Agriculture, Nature and Fisheries;
  - the Water Storage Corporation Brabantse Biesbosch;
  - the Provincial Government of the Province of Noord-Brabant.

  There was much discussion in the steering group on the results of the EIA studies as a result of the conflicting interests of the development proposal : nature, agriculture and storage of drinking water.

- parallel to this *steering group*, an EIA project group was formed in order to guide the EIA studies. Public officers of different departments of the Province of Noord-Brabant together with representatives of WBB were members of this group.

- the *guidelines* for EIS prepared by the competent authorities were practically identical to the advice of the independent EIA Commission apart from an extra alternative, which had been introduced by the EIA Commission. The guidelines made it possible to examine this alternative on its practicality and to drop it if it proved to be a non-feasible alternative;

- the location of Zuiderklip has been taken as the *'zero'-alternative* of this EIA; the 4th storage reservoir would have been built on this location if no decision on the implementation plan had been taken. The option of not building any 4th reservoir at all has not been taken in consideration as quality and quantity requirements necessitated a 4th reservoir.

- the EIS has been set up as an *environmental analysis*, not as an integrated analysis (following the Dutch EIA legislation). This means that costs were excluded from the comparative analysis.

- in accordance with the Dutch EIA legislation, *final results* of the EIA studies have been communicated to the public. Draft results have not been communicated for reason of the controversial interests appearing during the EIA;

- the *final decision* was to develop the 4th reservoir on the Jannezand location, with embankments of 4.5 - 5 m high. This alternative was close to the optimal environmental alternative of the EIS and is situated out of the Biesbosch National Park. It had similar technical and financial implications to the 'zero'-alternative.

4.3 The EIS comprises a non technical summary of 12 pages, a full report of 163 pages, a general appendix and three review documents, on nature and landscape, on geo-hydrological aspects and on drinking and process water facilities. The full report follows a conventional format covering the subjects listed in **Table 2**.

Table 2 : Subjects covered in the EIS

Chapter		Pages
1.	Introduction	3
2.	Necessity for and objective of the proposed activity	11
3.	Decisions already taken and decisions for which the EIS has been prepared	10
4.	Description of the proposed activities and the alternatives	29
5.	Description of the existing state of the environment and the predicted changes without the activity	38
6.	Predicted environmental effects of the proposed activity	51
7.	Comparison of the alternatives	12
8.	Survey of gaps in knowledge and information. Possibilities for monitoring and evaluation	2

4.4 It is not the purpose of this case study report to carry out any independent analysis or review of the detailed findings of the EIS. That would require a full study in its own right. However, it is relevant to record that the Province, the WBB[4] and the independent EIA Commission[5] broadly agreed that the EIS was of good quality and provided the necessary information for decision making. The EIS will be included as an example in the practical guide of the independent EIA Commission ('Praktijkboek MER').

[4] As expressed in the interviews with the representatives of the developer and co-ordinating competent authorities.

[5] As expressed in its review advice, quoted in the consultation notes of the Province of Noord-Brabant <Province of Noord-Brabant, 1995a>.

5.0 REVIEW OF COSTS

5.1 Costs have been identified in both time and financial terms and related to the different components of the EIA process. **Table 3** presents the overall findings.

Table 3: Review of costs in the EIA process of the implementation plan 4th storage reservoir Brabantse Biesbosch

([6]),([7]),([8])	WBB ('real' developer)		Province of Noord-Brabant (competent authority and 'formal' developer)		Others	Total
Step	Time (days)	Financial (ECU)	Time (days)	Financial (ECU)	Time (days)	Financial (ECU)
1. Preliminary	20		40	1000		
2. Scoping	20		30			
3. EIA studies	100	200 000	100	3000		
4. EIS judgement	-		10			
5. Consultation on the EIS	25		10	1000		
6. Decision	-		-			
7. Post EIA	-		-			
Totals	145	200 000	190	5000		
Totals in ECU ([9])	72 500	200 000	95 000	5000	([10])	372 500 ========

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5.2 In the *Preliminary* stage (stage 1), the complete time input (20 days) of the *developer WBB* was used for assisting the Province in writing the notification of intent ('startnotitie'). The time input of the *Province* in this stage (40 days) was also completely used for the notification of intent, both for the actual writing of this document and for the preliminary consultations on draft versions. Much time was spent defining responsibilities and

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6 In assessing the costs of the EIA process, we have taken full account of time and financial costs that occurred in the EIA processes of phases 2 - 5 (scoping, EIA studies, judgement of EIS and consultation on the EIS). In phases 1 (preliminary), 6 and 7 (decision and post EIA) we only have taken account of extra costs that occurred because the EIA-process was run. Time and financial costs for normal decision making, e.g. related to the normal procedure for the delivery of a licence, have not been included.

7 The table presents estimates provided by the 'real' developer, WBB, and by the competent authority and 'formal' developer, the Province of Noord-Brabant. The time estimates comprise the time dedicated to the EIA process by different persons within the organisation of WBB and the Province, thus including e.g. secretarial support, juridical support, technical specialists etc.. The financial estimates only include major costs.

8 Applied rate : 1 ECU = 2 NLG.

9 An average daily rate of 500 ECU has been applied to convert costs expressed in time into financial terms.

10 We have had a rough estimate of the EIA Commission of personnel and expert costs for the production of the scoping and review advice (ECU 14,000.-).

structuring the consultation process (setting up of the project group, etc.). Advertising costs of the *Province* amounted in this stage to approximately 1000 ECU.

5.3 In the *scoping* stage (stage 2), the *developer WBB* reported 5 days for consultation with the Province and the independent EIA Commission on the draft guidelines for the EIS. He indicated that a supplementary 15 days were necessary for providing the independent EIA Commission with information on the 'Steenen muur' location, which had not been included in the notification of intent[11]. The *Province* had to allocate about 30 days for the guidelines and consultation with the independent EIA Commission.

5.4 Most of the time input of both the developer WBB and the Province was used in the *EIA studies* stage (stage 3). The *developer WBB* used in total 100 days over a period of 8 months. He commissioned the work carried out by the external consultant. He participated in the meetings of the EIA project group and of the steering group. He also had important financial costs in this stage : 200 000 ECU covering the costs for external consultancy for EIA. The *Province* also reported to have used about 100 days in this stage. Most of this time was allocated for the consultation of involved parties, particularly through the meetings with the steering group and the EIA project group. These time inputs include the preliminary review advice given exceptionally by the independent EIA Commission. The *developer WBB* indicated that 20 days out of 100 were spent taking account of this preliminary advice.

5.5 The *Province* used 10 days in stage 4. This time was principally used for the preparation of the implementation plan on the basis of the EIS, and for the preliminary consultations on this plan. The authorities also had advertising costs, estimated at 1000 ECU.

5.6 The time input of the *developer WBB* in stage 5 (*consultation on the EIS*) was significant (20 - 25 days) and included the consultation with interested parties and particularly with the municipality of Dussen, having the alternative of Jannezand on its territory. The Province reports to have used 10 days in this stage, also on consultation with the principal interested parties. The review advice of the independent EIA commission was positive, although it contained some specific remarks. The Province of Noord-Brabant has taken account of these remarks in the decision making on the implementation plan.

5.7 Both the *developer WBB* and the *Province* reported that they used no (extra) time in the *decision* stage (stage 6) for taking account of comments generated during the EIA process.

5.8 Construction is programmed for between 1998 and 2010. This means that neither time nor costs have been incurred yet for *post EIA* activities (stage 7).

5.9 The total estimated costs are 300 000 ECU for the developer WBB and 100 000 ECU for the Province. Total costs related to the EIA process amount thus to about 400 000 ECU, corresponding to 0.3% of the capital investment (150 million ECU).

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[11] This location had initially not been included in the notification of intent for technical, social and political reasons (the Provincial Government's policy was to maintain the land use at this location <Gedeputeerde Staten, 1994>). It has finally been included in the guidelines (upon advice of the independent EIA Commission) but was not included as a full alternative in the EIS because it was technically very difficult to build a reservoir of the desired volume, 45 million m3, on this small location.

6.0 REVIEW OF BENEFITS

6.1 This section reviews the benefits of EIA within the decision making process of the implementation plan 4th storage reservoir Brabantse Biesbosch, benefits that have been identified in the interviews with developer and competent authority.

6.2 According to the *developer WBB* and the *Province*, EIA was particularly helpful in this case for :

- *including environmental concerns at the earliest opportunity.* EIA ensured that environmental aspects were discussed extensively, along with other key aspects of the project design. The final decision to take a embankment height of 4.5 - 5 m is a good example of a successful change in the project design; the standard height of 8.5 m would surely have been maintained if a process like EIA had not been undertaken[12].

- *streamlining of decision making.* The EIA process was particularly important in the process of acceptance of and commitment to the decision to develop the reservoir at a location out of the Biesbosch. This principally applied to the decision makers of the steering group. The EIS assisted these decision-makers in explaining and getting acceptance for the decision with the key interested parties (the farmers living at the location and the municipality of Dussen having the location on its territory).

6.3 The following specific benefits have in addition been identified in this EIA process:

- the notification of intent was extremely important for structuring the EIA process and the decision making procedure. The clearness of the notification of intent was very beneficial for the rest of the procedure;

- the meetings with the independent EIA commission were reported to be very beneficial too, particularly for the quality of the EIA studies and the EIS;

- the EIA process helped in gaining public acceptance of the development proposals (it is relevant to mention that far less people attended the second public hearing, 45 instead of 170, and that the responses were far more constructive than at the first public hearing). The process further helped WBB to strengthen its position as a legally correct and environmentally responsible company;

- the EIS includes an outline for an evaluation programme (as required by the Dutch EIA legislation). The EIS was considered to be a good reference point for future monitoring;

- although running the EIA procedure took a period of one year, the developer and competent authority consider that there were significant time savings; without a process like EIA it would have taken years to reach a consensus.

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[12] The fact that an alternative with 4 m dyke height had been taken into account was the direct effect of the combination of a 'location'-EIA and an 'installation'-EIA that was undertaken upon advice of the independent EIA Commission.

7.0 SUMMARY OF FINDINGS

7.1 Both the *developer WBB* and the *Province* were positive towards the EIA process in this case. They laid emphasis on the streamlining of the decision making procedure of such a complex project with important environmental effects. They reported that they would have never been able to reach consensus in a year without a process like EIA.

7.2 The estimated costs for EIA were approximately 0.3% of the capital investment. The benefits of EIA for the streamlining of decision making were in this case considered to be more important than the costs and time used for EIA.

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8.3 Interviews / Contacts

Province of Noord-Brabant, ing. H. van der Flier, environmental policy officer in the department 'spatial planning rural areas', secretary and principal of the EIA project group.

Water Storage Corporation Brabantse Biesbosch ltd., ir. J. Waals, project manager.

CASE STUDY 2. NATIONAL ROAD, VENLO - St JOOST

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process as it applied to the development of national road 73 south Venlo - St. Joost in the Netherlands. The report forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom, and follows a standard format[1] which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings
8. Bibliographic References

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by EurEco during the period March - May 1996. The report has been prepared on the basis of the following sources :

- an interview with a representative of the regional Directorate of Limburg, Directorate for Public Works and Water Management, Ministry of Transport, Public Works and Water Management. The regional Directorate of Limburg played the role of developer within the Ministry;
- an interview with two representatives of the General-Directorate for Public Works and Water Management, Ministry of Transport, Public Works and Water Management. The General-Directorate played the role of competent authority within the Ministry;
- key documents related to the EIA process that were kindly forwarded by the competent authority and the developer (see bibliography);
- specific documents and data on the relative costs and benefits of the EIA process for the project (see bibliography).

2.2 The interviews were carried out following a standard questionnaire developed in agreement with the commissioner of the study, and adapted to the Dutch situation by EurEco. A draft case study report was sent to the interviewed persons for comment.

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[1] The format has been agreed with the commissioner of the study, DG XI of the European Commission, and laid down in <LUC 1996>.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The development proposals involve the construction of national road 73 south Venlo - St Joost.

3.2 This road will be of regional importance, in particular for connecting the towns of the area south of Venlo and around Roermond to the motorways A67 and A2. This connection is at present ensured by the N271, on the east bank of the Meuse, and the N273, on the west bank of the Meuse. Both the N271 and the N273 are normal roads with 80 km/h and 50 km/h speed limits.

3.3 Plans to construct national road 73 have existed since the 1970s and aim to respond to the growing intensity of traffic and particularly as this traffic traverses the centres of the towns on the east and west bank of the Meuse.

3.4 The trajectory (route) for the southern part was fixed in 1985, following normal trajectory fixing procedures without EIA, which was not compulsory at that time. The Minister of Transport, Public Works and Water Management then chose for a motorway on the east bank of the Meuse.

3.5 However, in 1990, the European Commission criticised the Dutch implementation of Directive 85/337/EEC on the subject of the submission of road projects to EIA. The Dutch government decided to bring the Dutch legislation in line with Community law as soon as possible and determined that any decision on road projects that had already been taken, but that had not yet been laid down in local spatial plans, should be submitted to EIA.

3.6 This lead in March 1992 to the abolishment of the Minister's decision of 1985. Renewed decision-making had to take place; an EIA process was started.

3.7 The EIA was a so-called 'trajectory-EIA' ('tracé-m.e.r. studie'). The EIA procedure was combined with the non-compulsory 'trajectory fixing procedure'. The 'Trajectory-law' (tracé-wet) was not yet applicable to this project.

3.8 The principal participants in the EIA process were as follows :

The developer:	The Minister of Transport, Public Works and Water Management. Within the Ministry of Transport, Public Works and Water Management, the regional Directorate of Limburg of 'Rijkswaterstaat' played the role of developer.
The competent authority:	The Minister of Transport, Public Works and Water Management. Within the Ministry of Transport, Public Works and Water Management, the General-Directorate of 'Rijkswaterstaat' played the role of competent authority.

The statutory consultees:	The independent EIA Commission. The Director of the department Agriculture, Nature and Outdoor Recreation of the Province of Limburg. The regional Environmental Inspectorate .
Report of findings:	Overlegorgaan verkeersinfrastructuur OVI.
Other participants:	Other national ministries (such as environment, nature, economic affairs, finance), province of Limburg, municipalities in the study area, environmental organisations, interest groups of agriculture and industry, public.

4.0 DETAILS OF THE EIA PROCESS

4.1 The EIA process for the development of national road 73 south took place in two phases. The 'mother EIA process' started in October 1992 with the publication of the notification of intent and ended in March 1995 when a decision on the trajectory was taken. A second EIA process (a so-called 'implementation EIA' or 'uitwerkings-m.e.r.') was necessary because there were slight differences between the chosen trajectory and the alternatives described in the EIS. The second EIA process started in March 1995 and ended in December 1995 when the final decision was taken.

4.2 This report focuses on the first EIA process, the 'mother EIA process', because this process was decisive for the fixing of the overall trajectory. The costs and benefits of this procedure are detailed in this report.

4.3 The developer employed SME environmental consultants, for management assistance during the EIA process. It further employed the consultants, Heidemij Advies, for the EIA studies as well as for the traffic and transport analyses.

Table 1 : Steps in the EIA process of National Road 73 South - Venlo St Joost		
Step	**Activity**	**Date**
1. Preliminary	1.1 Notification of intent ('startnotitie')	15.10.92
	1.2 Publication of the notification of intent	19.10.92
2. Scoping	2.1 Reactions of the public on the notification of intent	19.10.92 - 18.11.92 04.01.93 - 29.01.93
	2.2 Advice of the independent EIA Commission on the Guidelines for the EIS ('Richtlijnen')	22.12.92
	2.3 Advice of the Statutory Consultees - Director of the department Agriculture, Nature and Outdoor recreation of the Province of Limburg;	11.92
	2.4 Guidelines of the competent authorities for the EIS	27.02.93
3. EIA studies	3.1 Formal submission of EIS	22.12.93
4. EIS judgement	4.1 Judgement by the competent authorities on the correctness and completeness of the EIS	01.94
	4.2 Publication of the EIS	05.01.94
5. Consultation on EIS	5.1 Public consultation on the EIS	03.01.94 - 12.02.94
	5.2 Public hearings (four hearings in this stage)	11.01.94 - 19.01.94
	5.3 Review advice of the independent EIA Commission ('toetsingsadvies')	29.03.94
6. Decisions	6.1 Initial trajectory decision of the Minister in power	28.04.94
	6.2 Postponing of the decision to the next Government	08.07.94
	6.2 Initial trajectory decision of the Government Kok	01.03.95
	6.3 Discussion in the Chamber of Deputies	02.03.95
	6.4 Final trajectory decision of the Government Kok	03.03.95
7. Post EIA	7.1 Evaluation and monitoring	1995 and onwards

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4.4 The following points are worth noting:

- as in every national road project, the EIA was combined with the traffic and transport analyses as well as with the financial analysis of the development of the road project. The EIS is hence an integrated document that includes environmental, financial and traffic-economic criteria;

- the guidelines for the EIS from the competent authority were almost identical to the advice for guidelines from the independent EIA Commission;

- 13 alternatives were analysed in the EIA studies. The authorities made a completely new start and included both west and east bank alternatives. The following alternatives were selected :

- alternative A : 'zero'-alternative (without the development of the national road)
- alternative B : 'zero-plus'-alternative (minor changes to the present situation)
- alternatives C1-C3 : development of a new highway (C1 on the east bank and C2/3 on the west bank)
- alternatives C4-C6 : upgrading of the existing highways N 271 and N 273
- alternatives D1-D3 : development of a new motorway (D1 on the east bank and D2/3 on the west bank)
- alternatives E1-E2 : most optimal human and environmental alternatives

- the developer decided to adopt a pro-active attitude towards the public, interested parties and decision makers. This attitude can be illustrated by :
  - the creation of two regional project guidance groups with the purpose of disseminating information on the EIA process, a first one with regional and local decision-makers, a second one with regional and local public administrations. During the EIA process, these groups met about once a month.
  - a total of 16 public hearings held at 4 different locations at 4 stages during the EIA process. The hearings concerned the notification of intent, the start of EIA studies, the draft results and the final EIS.
  - the information brochures that have been published.

- the *timetable for EIA studies* was very strict : the EIS had to be produced before 1.1.94 in order to remain under the non-compulsory 'trajectory fixing procedure'; otherwise the EIA procedure would be cancelled and restarted under the Trajectory law. Such loss of time was politically unacceptable. This meant that both the environmental analysis and the traffic / transport analysis had to be undertaken in the period from March 1993 to December 1993. Significant efforts were needed from the EIA project team.

- *final decision making* took place at the national level, between spring 1994 and spring 1995. After departmental consultation, the government made an outline decision for a motorway on the east bank, in April 1994. However it soon became apparent that national road 73 south was a sensitive political issue for the government then in power. In March 1995, the next government, the government Kok, made an initial decision for a motorway on the west bank. This decision could not convince the Chamber of Deputies which voted, with one vote making the difference, for a motorway on the east bank. The government subsequently decided to accept the vote and to carry out a slightly adapted form of the east bank alternative D1 of the EIS. Special measures were taken in order to limit nature and landscape loss in the area between Roermond and St.Joost.

4.5 The EIS comprises a non technical summary of 44 pages (in the form of a professional brochure), a summary of 20 pages and a full report of 268 pages. The EIS also includes a separate report for the east bank and one for the west bank, an appendix report as well as a survey of produced maps. The full report follows a conventional format covering the subjects listed in **Table 2**.

Table 2 : Subjects covered in the EIS		
Chapter		**Pages**
1.	Introduction	2
2.	Decisions already taken and decisions for which the EIS has been prepared	18
3.	Necessity for and objective of the proposed activity	28
4.	Possible solutions	10
5.	Description of the proposed activities and the alternatives	30
6.	Description of the existing state of the environment and the predicted changes without the activity	48
7.	Predicted effects on the traffic and transport situation	16
8.	Predicted environmental effects	56
9.	Predicted effects on other policy fields	16
10.	Comparison of the alternatives	24
11.	Most optimal human and environmental alternatives	8
12.	Survey of gaps in knowledge and information.	6
13.	Possibilities for monitoring and evaluation	6

4.6 It is not the purpose of this case study report to carry out any independent analysis or review of the detailed findings of the EIS. That would require a full study in its own right. However, it is relevant to record that the developer, the competent authority, most of the public in general, including environmentalists[2] and the independent EIA Commission[3] broadly agreed that the EIS was of good quality and provided the necessary information for decision making. In the opinion of the competent authority, less information would have been adequate.

[2] As expressed in the interviews with the representatives of the developer and competent authority.
[3] As expressed in its review advice.

5.0 REVIEW OF COSTS

5.1 Costs have been identified in both time and financial terms and related to the different components of the EIA process. **Table 3** presents the overall findings.

Table 3: Review of costs in the EIA process of the development of national road 73 south

([4]),([5]),([6]),([7])	Developer (Limburg directorate)		Competent authority (General Directorate)		Others	Total
Step	Time (days)	Financial (ECU)	Time (days)	Financial (ECU)	Time (days)	Financial (ECU)
1. Preliminary	110	31500	3	-		
2. Scoping	65	6500	5	-		
3. EIA studies	640	1 230 000	5	-		
4. EIS judgement	5	-	2	-		
5. Consultation on the EIS	20	10 000	2	-		
6. Decision	20	-	180 ([8])	-		
7. Post EIA	1	-	-	-		
Totals	861	1 278 000	197	-		
Totals in ECU ([9])	430 500	1 278 000	98 500	-	([10])	1 807 000 =====

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4 In assessing the costs of the EIA process, we have taken full account of time and financial costs that occurred in the EIA process in phases 2 - 5 (scoping, EIA studies, judgement of EIS and consultation on the EIS). We included in addition the full time input of the competent authority during phase 6 (decision) because it was in this case not possible to separate environmental aspects from other aspects (this is in contrast to other case-studies). In phase 1 (preliminary) we have only taken account of extra costs that occurred because the EIA-process was run; project preparation costs occuring before March 1992 have not been included.

5 Because of the integrated approach of the EIA studies, it was in this case not possible to separate costs due to environmental analyses and costs due to traffic / transport analyses. The 861 days used by the developer and the sum of ECU 1 278 000 should thus be related to the complete environmental and traffic / transport studies for the development of national road 73 south.

6 The table presents estimates provided by the EIA projects office of the regional Directorate of Limburg (in the role of developer), and by the General-Directorate of Rijkswaterstaat (in the role of competent authority). The time estimates comprise the time dedicated to the EIA process by different persons within these organisations, thus including e.g. secretarial support, juridical support, technical specialists etc. The financial estimates only include major costs.

7 Applied rate : 1 ECU = 2 NLG.

8 The competent authority reported a time input of 180 days for decision making on national road 73 south, because of its political sensitivity. Normal decision making takes around 10 days for road projects.

9 An average daily rate of 500 ECU has been applied to convert costs expressed in time into financial terms.

10 It has not been possible within the scope of the study to detail the costs of the EIA process of other involved parties. As these parties were far less intensively involved in the EIA process than the developer and the competent authority, we have assumed that we could ignore these costs with regard to the total costs of developer and competent authority.

5.2 In the *Preliminary* stage (stage 1), about half of the time input of the *developer* was used for the realisation of the notification of intent (50 days). Discussion with the competent authorities and the independent EIA Commission took another 30 days. The developer had in this stage only little experience with EIA. It is for this reason that the developer employed SME for assistance on the management of the EIA process. An operational programme ('plan van aanpak') has been developed in co-operation with SME. The *competent authority* used only 3 days in this stage. This must be seen in the context of the large experience of the competent authority with EIA processes: the Ministry is in charge of all EIA processes run for infrastructure projects.

5.3 In the *scoping* stage (stage 2), the *developer* reported that 25 days were necessary for the consultation on the guidelines for the EIS. He further indicated that 40 days were used for informing the public, interested parties and decision makers. The *competent authority* used 5 days in this stage, for the publication of the notification of intent (0.5 days), the guidelines (3 days), consultation with the developer (0.5 days) and consultation with the independent EIA Commission (1 day).

5.4 Most of the time input of the *developer* was used in the *EIA studies* stage (stage 3) running from March 1993 to December 1993. The EIA project team used 640 days in the preparation of the EIS. The developer also had important financial costs in this stage : 1 000 000 ECU for the EIS including traffic / transport analysis and 225 000 ECU for management assistance during the EIA process. The *competent authority* reported to have used about 5 days in this stage, allocated to the liaison with the developer.

5.5 The *developer* reported to have used 5 days in stage 4 (*EIS judgement*). The *competent authority* used 2 days in this stage, allocated to the judgement and to the publication of the EIS.

5.6 The time input of the *developer* in stage 5 (*consultation on the EIS*) was about 20 days and included the consultation with interested parties. Financial costs of about 10 000 ECU occurred. The *competent authority* reported to have used 2 days for the public hearings.

5.7 The *developer* used 20 days in the *decision* stage (stage 6) in order to assist the decision making process. The *competent authority* reported that they had to allocate 180 days to the decision making process due to the political sensitivity of the project. Normal decision-making would have taken about 10 days.

5.8 The developer is presently mapping out the road and has until now allocated 1 day to *post EIA* activities (stage 7), such as the evaluation and implementation of measures described in the EIA process.

5.9 The total estimated costs are about 1 700 000 ECU for the developer and about 100 000 ECU for the competent authority. Total costs related to the EIA process amount thus to about 2 000 000 ECU, corresponding to 0.4% of the capital investment (capital investment of the project as decided upon in March 1995 is about 500 million ECU).

6.0 REVIEW OF BENEFITS

6.1 This section reviews the benefits of the EIA process within the decision making process of the development of the national road 73 south. These benefits have been identified in the interviews with developer and competent authority.

6.2 According to the *developer* and *competent authority*, the main benefit of EIA was that it was helpful for :

- *making clear the environmental effects of decision making.* The EIA studies did take full account of the environmental aspects and provided extensive information on the local effects on protected nature and landscapes. The EIA studies ensured that environmental aspects were taken into account at an early stage of the project design. Furthermore, the iterative process that the EIA process installs to integrate environmental aspects into the project design was seen as very positive.

6.3 The EIA process was in addition helpful for :

- *gathering information in a systematic way.* The EIA process ensured a systematic way of taking environmental considerations into account. The integrated procedure combining EIA and traffic / transport analyses ensured that all key aspects were taken into account;

- *creating an objective information basis.* Objective information gathering is a principal objective of the EIA process. The review advice of an outsider, the independent EIA Commission, guarantees a certain objectivity;

- *taking account of the opinions of public and interest parties.* The EIA process has two formal stages of consultation with the public and interested parties. The results of these consultation form an integral part of the EIA process. According to the developer and competent authority, this is good practice in open processes of public decision making. Other techniques could however have the same or even better results. Experiments with the process 'Infralab' that aims to have local interest groups actively involved in both problem definition and solution building[11] are currently underway;

- *making project objectives explicit.* The EIA process helped to define the exact purposes of the project.

6.4 Both the developer and the competent authority emphasised that the EIA process did streamline information gathering but *did not streamline decision-making.* EIA did nevertheless help to make clear the contradictions of the road project, according to the developer. The competent authority goes further and states that EIA might play a diverging role in such controversial projects.

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[11] The current form of the notification of intent of the EIA process was in this context criticised by the competent authority. The notification of intent should, in the opinion of the competent authority, already take explicit account of the interests of different groups involved in the decision making process. This is often not the case.

7.0 SUMMARY OF FINDINGS

7.1 According to both the *developer* and the *competent authority*, the main benefits of the EIA process are that the environmental effects were made clear for decision making. The combined trajectory (route) fixing and EIA procedure did help in structuring the information gathering for decision making as well as in having the road project locally accepted. It provided a comprehensive information basis for decision making but did not in this case streamline decision making, that took place at the national level under sensitive political circumstances.

7.2 The estimated costs for this process were approximately 0.4% of the capital investment of the road project. The developer and the competent authority both consider that these costs are worth it to ensure good practice within decision making. However, according to the competent authority, the information basis could have been less extensive (and thus less costly) with the same effects on decision making.

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8.3 Interviews / Contacts

Ir. M. Bos, Section Development & National Roads, General-Directorate, Directorate-General for Public works and Water Management, Ministry of Transport, Public Works and Water Management.

Ing. G. van Heusden, head of the EIA projects office of the Limburg Directorate, Directorate-General for Public works and Water Management, Ministry of Transport, Public Works and Water Management.

Mr. H. Portasse, Section Infrastructure and General Administration, General-Directorate, Directorate-General for Public works and Water Management, Ministry of Transport, Public Works and Water Management.

CASE STUDY 3. WASTE INCINERATION FACILITY, TWENTE

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process as it applied to the development of the Waste Incineration Facility Twente. The report forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom, and follows a standard format[1] which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings
8. Bibliographic References

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by EurEco during the period March - May 1996. The report has been prepared up on the basis of the following sources :

- interview with a representative of the co-ordinating competent authority, the Province of Overijssel;
- interview with a representative of the developer, AVI Twente bv (on the site of the waste incineration facility);
- key documents related to the EIA process that were kindly forwarded by the developer and the competent authority (see bibliography);
- specific documents and data on the relative costs and benefits of the EIA process of the project (see bibliography).

2.2 The interviews were carried out following a standard questionnaire developed in agreement with the commissioner of the study, and adapted to the Dutch situation by EurEco. A draft case study report was sent for comment to the interviewed persons.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The development proposals involve the creation of a waste incineration facility in the industry park known as Boeldershoek in the municipality of Enschede. Enschede forms part of the Twente region, which is situated in the Province of Overijssel in the east of the Netherlands, near to the Dutch-German border.

[1] The format has been agreed with the commissioner of the study, DG XI of the European Commission, and laid down in <LUC 1996>.

3.2 As regards the site of AVI Twente, the industry park of Boeldershoek had already been allocated for heavy waste treatment facilities through spatial planning policy adopted in 1990[2]. A project of integrated waste treatment facilities had initially been planned in Boeldershoek but appeared to be difficult to realise due to the technical and organisational complexity of the project. In 1992, the project was divided into independent parts, including the waste incineration facility Twente.

3.3 As the location had already been determined, decision-making focused on the delivery of the environmental and waste water licences. A detailed project EIA ('inrichtings-m.e.r.') was needed for these licences.

3.4 The principal participants in the EIA process are as follows :

The developer:	AVI Twente bv, being a joint venture between the co-operating municipalities of Twente ('regio Twente') and the regional electricity company ('EDON').
The competent authority:	The Provincial Government of Overijssel ('Gedeputeerde Staten'), which was in charge of the delivery of the environmental authorisation and co-ordinating the EIA process. the Executive Board of the water board 'Regge en Dinkel', which was in charge of the water discharge licence and was co-responsible for the EIA process.
Consultees and statutory consultees:	The independent EIA Commission. The Director of Agriculture, Nature and Outdoor Recreation of the province of Overijssel. The Regional Environmental Inspectorate. The Director of the Waste Management Unit of the Ministry of the Environment. The municipalities of Enschede and Hengelo. The National Water Management Institute 'RIZA'. The neighbouring authorities (Regierungspräsidenten) of Munster and Weser Ems in Germany.
NGOs:	Natuur en Milieu Overijssel.

4.0 DETAILS OF THE EIA PROCESS

4.1 The EIA for the waste incineration facility Twente has been processed in the minimum time-path fixed in the Dutch Environmental Protection Act. **Table 1** gives details on these steps. AVI Twente employed Haskoning, consulting engineers, to carry out the EIA and to provide support within the EIA procedure.

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2 E.g. in the regional plan 'Streekplan Twente' of 12 December 1990.

Table 1 : Steps in the EIA process for the waste incineration facility Twente			
Step	**Activity**		**Date**
1. Preliminary Stage	1.1	Informal consultation between developer and competent authorities	18.03.93
	1.2	Submission of the notification of intent ('startnotitie')	01.04.93
	1.3	Publication of the notification of intent	21.04.93
2. Scoping	2.1	Reactions of the public on the notification of intent	22.04.93 - 21.05.93
	2.2	Advice of the independent EIA Commission for the Guidelines for the EIS ('Richtlijnen')	18.06.93
	2.3	Advice of other Statutory Consultees	-
	2.4	Guidelines of the competent authorities for the EIS	20.07.93
3. EIA studies	3.1	Formal submission of EIS	03.08.93
4. EIS judgement	4.1	Judgement by the competent authorities on the correctness and completeness of the EIS	Between 03.08.93 and 14.09.93
	4.2	Publication of the EIS	29.09.93
5 Consultation on the EIS	5.1	Public consultation on the EIS	30.09.93 - 29.10.93
	5.2	Public meeting	14.10.93
	5.3	Advice of statutory consultees	-
	5.4	Review advice of the independent EIA Commission ('toetsingsadvies')	29.11.93
6. Decision	6.1	Decision on the environmental licence and the water discharge licence[3]	15.03.94
7. Post EIA	7.1	Evaluation and monitoring	1997 and upwards

4.2 The following points are worth noting :

- there was initially discussion over whether EIA was necessary because an EIS had already been produced for the integrated project of waste treatment facilities. The decision to draw up a new EIA was taken because of a slight shift in location of the waste incineration facility (300 m), a change in the applied process (the current concept is based on separation of waste streams at source, making a separation step before incineration unnecessary) and a change in the capacity (230.000 instead of 180.000 t/a);

- the developer asked the involved authorities to participate in the EIA process by taking part in a EIA guidance committee. Representatives of the province of Overijssel, of the water board 'Regge en Dinkel', of the municipalities of Hengelo and Enschede and the regional Environmental Inspectorate took part in this committee. The committee had four meetings in the period of May-June 93. It discussed draft texts of the EIS;

[3] The delivery of these licences was in this case the ultimate result of the procedure in which the EIA was involved. The decision documents provide the authority for the granting of the licences.

- the developer adopted a very open and proactive approach in its liaison with the authorities and public. The regular edition of a newspaper on the development of the waste incineration facility Twente was one of the instruments used in this approach;

- the EIS guidelines of the competent authorities were almost identical to the advice for guidelines of the independent EIA Commission;

- the principal work for the EIA studies was carried out before formal release of the guidelines for EIS by the competent authorities. The developer based the EIA studies on the (draft) guidelines of the independent EIA Commission. The EIS could therefore be submitted very soon after this formal release (after about two weeks). The developer was able to win much time through this approach.

4.3 The EIS comprises a non technical summary of 43 pages, a full report of 288 pages and appendices of about 70 pages. The report follows a conventional format covering the subjects listed in **Table 2.**

Table 2 : Subjects covered in the EIS

Chapter		Pages
1.	Introduction	4
2.	Objective of the proposed activity	21
3.	Decisions for which the EIS has been prepared	13
4.	Description of the proposed activities and the alternatives	133
5.	Description of the existing state of the environment and the predicted changes without the activity	47
6.	Predicted environmental effects of the proposed activity	56
7.	Comparison of the alternatives	19
8.	Survey of gaps in knowledge and information. Possibilities for monitoring and evaluation	4

4.4 It is not the purpose of this case study report to carry out any independent analysis or review of the detailed findings of the EIS. That would require a full study in its own right. However, it is relevant to record that the developer, the competent authorities[4] and the independent EIA Commission[5] broadly agreed that the EIS was of good quality and provided the necessary information for decision making.

5.0 REVIEW OF COSTS

5.1 Costs have been identified in both time and financial terms and related to the different components of the EIA process. **Table 3** presents the overall findings.

[4] As expressed in the interviews with the representatives of the developer and co-ordinating competent authorities.

[5] As expressed in its review advice of 29.11.1993.

Table 3: Review of costs in the EIA process of the Waste incineration facility Twente

([6]),([7]),([8])	Developer		Co-ordinating competent authority		Others	Total
Step	Time (days)	Financial (ECU)	Time (days)	Financial (ECU)	Time (days)	Financial (ECU)
1. Preliminary work	5 - 10		10 - 15	375		
2. Scoping	1		10			
3. EIA studies	40		45 - 50			
4. EIS judgement	-		3 - 5			
5. Consultation on the EIS	1		2	375		
6. Decision	1		5			
7. Post EIA	-		-			
Totals	± 50	118 250	± 80	750		
Totals in ECU ([9])	25 000	118 250([10])	40 000	750	([11])	184 000 =====

5.2 In the *Preliminary* stage (stage 1), almost the complete time input (5 - 10 days) of the *developer* was spent in informal consultation with the competent authorities and in the writing of the notification of intent ('startnotitie'). The *co-ordinating competent authority* had to allocate significant time (5 days) to screening because there was doubt over whether or not an additional EIA was needed. The rest of the time input in this stage (5 - 10 days) has been allocated to analysing the draft notification of intent and to the publication of the notification of intent. Advertising costs of the *co-ordinating competent authority* amounted in this stage to 375 ECU[12].

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6 In assessing the costs of the EIA process, we have taken full account of time and financial costs that occurred in the EIA processes of phases 2 - 5 (scoping, EIA studies, judgement of EIS and consultation on the EIS). In phases 1 (preliminary), 6 and 7 (decision and post EIA) we only have taken account of extra costs that occurred because the EIA-process was run. Time and financial costs for normal decision making, e.g. related to the normal procedure for the delivery of a licence, have not been included.

7 The table presents estimates provided by the developer, AVI Twente bv, and the co-ordinating competent authority, the province of Overijssel. The time estimate comprises the time dedicated to the EIA process by different persons within the organisation of the developer and the competent authority, thus including e.g. secretarial support, juridical support, technical specialists etc.. The financial estimates only include major costs.

8 Applied rate : 1 ECU = 2 NLG.

9 An average daily rate of 500 ECU has been applied to convert costs expressed in time into financial terms.

10 Not taking into account the 150,000 ECU that the developer had to pay for the delivery of the environmental licence (see below).

11 We have had a rough estimate of the EIA Commission of personnel and expert costs for the production of the scoping and review advice (ECU 7,500.-)

12 This figure has been deducted from the 1500 ECU of advertising costs that the developer had to pay to the co-ordinating competent authority for the environmental licence, including the EIA. Two advertising stages occur in the EIA procedure, another two in the licence procedure. This would mean 375 ECU per advertising stage.

5.3 In the *scoping* stage (stage 2), the *developer* reported only 1 day for consultation of the co-ordinating competent authority and the independent EIA commission on the draft guidelines for the EIS. The *co-ordinating competent authority* had to allocate much more time in this stage : about 10 days in total for consultation and preparation of the guidelines for the EIS.

5.4 Most of the time input of both the developer and the competent authority was used in the *EIA studies* stage (stage 3). The *developer* used in total 40 days over a period of 4 months. He commissioned the work carried out by the external consultant and organised the meetings with the EIA guidance committee. He also had important financial costs in this stage : 118 250 ECU covering the costs for external consultancy for EIA as well as costs for the printing and publishing of documents. These costs cover all external costs paid by the developer for the EIA process, also those for consultancy support in stage 1 (notification of intent).

5.5 The *co-ordinating competent authority* reported to have used 45 - 50 days in this stage. Most of this time was allocated for reviewing draft versions of the EIS, by the co-ordinating officers and other specialists that provided comments on the draft texts. The liaison with the NAO (Noordelijk Afvaloverleg Orgaan), an inter provincial body that co-ordinates waste management policy for the northern provinces took 5 days during the EIA studies. The main concern was that the applied process (incineration with sorting at source, not mechanical sorting), was not in harmony with NAO policy laid down in strategy documents. The competent authority (and the developer) were in the end successful in convincing the NAO of the advantages of the applied process, both in terms of financial and environmental benefits. A further point of discussion was whether AVI Twente should process 30 000 tonnes of wastes of other provinces. A formal agreement with NAO was also reached on this point.

5.6 The *co-ordinating competent authorities* used 3 to 5 days in stage 4, for the formal judgement of the correctness and completeness of the EIS as well as for the publication of the EIS. The authorities also had advertising costs, estimated at 375 ECU (see above).

5.7 The time input in stage 5 (*consultation on the EIS*) was very limited for both the developer and the co-ordinating competent authority. The *developer* allocated 1 day to this stage, the *co-ordinating competent authorities* 2 days. Response was low during the public hearing on the EIA. Only one representative of local NGOs attended this hearing. The review advice of the independent EIA commission was positive, although it contained some remarks, e.g. on the importance of a contract between proponents and suppliers and on the implementation of a system that monitors the stability of the soil (there is a risk of soil instability due to former salt mining near to and around the site of the incineration facility).

5.8 Both the developer and the co-ordinating competent authority reported that they used some (extra) time in the *decision* stage (stage 6) for taking account of comments generated during the EIA process. The *developer* used 1 day, the *co-ordinating competent authority* 5 days.

5.9 Construction started in May 1994. The facility should be operational by 1997. This means that neither time nor costs have yet been incurred for *post EIA* activities (stage 7). The *developer* will have post EIA costs because the environmental licence requires that a

detailed evaluation of the EIA will be carried out three years after the start of the activities.

5.10 The total estimated costs are approximately 140 000 ECU for the developer[13] and 40 000 ECU for the co-ordinating competent authority. Total costs related to the EIA process amount thus to about 200 000 ECU, corresponding to less than 0.1% of the capital investment (300 million ECU). The competent authority charged a legal fee of 150 000 ECU for the delivery of the environmental licence, calculated as 50 000 ECU for the delivery of the licence for this class of installations, plus 200% (100 000 ECU) because EIA was required. The competent authority benefited in addition from a subsidy[14] of 12 500 ECU from the national Environment Ministry, destined at covering initial costs of the administration of an EIA process.

6.0 REVIEW OF BENEFITS

6.1 This section reviews the benefits of EIA within the decision making process for the waste incineration facility Twente, benefits that have been identified in the interviews with the developer and co-ordinating competent authority.

6.2 According to the *co-ordinating competent authority*, EIA was particularly helpful in the Twente case for :

- *including environmental concerns at the earliest opportunity.* EIA ensured that key aspects of the project design have been discussed extensively. Examples include the capacity of the incinerator and the applied process (with or without mechanical sorting). The authorities felt that they had much influence[15] on these aspects due to their close involvement in the project.

- *negotiating on the interface of economy and environment.* The EIA studies identified numerous practical environmental measures in relation to the project. The identification of these measures took place in a co-operative process that facilitated the exchange of ideas and know-how between all participating authorities and the project developers. Several of these measures were directly included in the project design (e.g. noise measures), others were selected for further investigation (e.g. using surface water as process water).

- *reaching consensus.* EIA had an important role in the consensus that the different parties have reached, principally between the municipalities (in AVI Twente bv), the province and the NAO.

6.3 Other benefits have been identified but were less important, such as the provision of a *valuable reference point for monitoring* of environmental effects and the *improvement of working relations* between participating parties.

6.4 EIA did not in this case have a major impact on the *acceptance* of the project proposal by the local community. According to the co-ordinating competent authority, this acceptance

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13 Not taking into account the 150 000 ECU that the developer had to pay for the delivery of the environmental licence (see below).

14 This subsidy scheme has in the meantime been abolished.

15 Much more than if they were only to draw up the environmental licence.

was already widespread, which was illustrated by the low number of public comments on the EIS and the fact that no use was made of the right to appeal.

6.5 The *developer* underlined that the inclusion of *environmental concerns at the earliest opportunity* and the *reaching of consensus* were two principal benefits of EIA in the Twente case. He added that the accepted information basis, in the form of an EIS, was decisive in the reaching of consensus. The developer further emphasised that the instrument of EIA fitted particularly well with the *open and pro-active approach* that was chosen for the development of the waste incineration facility.

7.0 SUMMARY OF FINDINGS

7.1 Both the *developer* and the *co-ordinating competent authorities* were positive towards the EIA process in the Twente case. They laid emphasis on the streamlining of the decision making procedure for such a complex project with important environmental effects. The estimated costs for EIA were smaller than 0.1% of the capital investment. The benefits of EIA for the streamlining of decision making were in the Twente case considered as more important than the costs and time used for EIA.

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8.3 Interviews / Contacts

Provincie van Overijssel, ing. E.A. Broens, Waste Policy Officer.

AVI Twente bv, ir. R. Viveen, Project Manager.

CASE STUDY 4. WESTERSCHELDE SHORE CONNECTION

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process as it applied to the development of the Westerschelde shore connection in the Netherlands. The report forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom, and follows a standard format[1] which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings
8. Bibliographic References

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by EurEco during the period March - May 1996. The report has been prepared on the basis of the following sources :

- an interview with a representative of the Province of Zeeland, who was involved in the EIA process as competent authority;
- an interview with two representatives of the project office for the Westerschelde shore connection of the Province of Zeeland, who were involved in the EIA process as developer;
- key documents related to the EIA process that were kindly forwarded by the competent authority and the developer (see bibliography);
- specific documents and data on the relative costs and benefits of the EIA process of the project (see bibliography).

2.2 The interviews were carried out following a standard questionnaire developed in agreement with the commissioner of the study, and adapted to the Dutch situation by EurEco. A draft case study report was sent to the interviewed persons for comment.

[1] The format has been agreed with the commissioner of the study, DG XI of the European Commission, and laid down in <LUC 1996>.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The development proposals involve the construction of the Westerschelde shore connection. The Westerschelde forms part of the estuary of the river Scheldt and is located in the Province of Zeeland, in the extreme Southwest of the Netherlands.

3.2 The Westerschelde shore connection will link the isolated southern part of the Province of Zeeland (Zeeuwsch-Vlaanderen) to central parts (Walcheren and Zuid-Beveland). The areas are currently linked by two ferries, one in the west between Vlissingen and Breskens and one in the east between Kruiningen and Perkpolder.

3.3 The Westerschelde shore connection has two principal objectives :

- to improve the connection between economic and urban centres in the central and southern part of Zeeland (regional function);
- to improve the access of Zeeland to the north and the south (inter-regional function).

An international transport function (e.g. between Rotterdam and the north of France) is not explicitly envisaged.

3.4 The development of the Westerschelde shore connection had a long preparation period. As long ago as 1977, the Minister of Transport, Public Works and Water Management fixed the trajectory[2] at the location of trajectory 5 of the EIS. In 1983, however, the Minister decided not to continue the project because of the high level of national funding that the project would necessitate.

3.5 In 1986, the provincial government of Zeeland presented a position paper that introduced several new elements to the discussion, such as the possibility of private funding and the positive financial effects of another, more central location (this would make it possible to dismantle the existing ferries). The province and the national authorities agreed to re-open the discussion and to study the feasibility of different options for the Westerschelde shore connection in detail.

3.6 A trajectory fixing procedure was started in 1987, in combination with an EIA process. In the Dutch vocabulary, the EIA was a so-called 'trajectory-EIA' ('tracé-m.e.r. studie'). The province of Zeeland was the developer and competent authority of the EIA procedure because the shore connection was a road of regional, not national importance[3].

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2 The term 'trajectory' refers to both the horizontal and vertical alignments of the connection.

3 The national authorities continued nevertheless to play a very important role in the decision making. The trajectory fixing procedure has been stopped several times for discussion with the national authorities on the funding of the project.

3.7 The principal participants in the EIA process were as follows :

The developer and competent authority:	The Province of Zeeland.
Advice on the trajectory:	The national Council for Water Management and Public Works ('Raad voor de Waterstaat').
The statutory consultees:	The independent EIA Commission. The Director of the department Agriculture, Nature and Outdoor Recreation of the Province of Zeeland. The regional Environmental Inspectorate.
Other advisers:	The provincial Spatial Planning Committee. The provincial Environmental Council.
Other participants:	Municipalities, local and regional interest groups, environmental organisations, public.

4.0 DETAILS OF THE EIA PROCESS

4.1 The EIA process for the development of the Westerschelde shore connection took place between November 1987 (notification of intent) and March 1991 (decision on the trajectory). The EIA studies were divided into a general analysis of five trajectories (March 1988 - November 1988) and a detailed analysis of three trajectories (February 1989 - August 1989).

4.2 Several additional environmental analyses were undertaken after the formal trajectory decision. The main reason for this was that the detailed analysis contained bridge-bridge and bridge-tunnel constructions, but no bored tunnel variant. This variant appeared nevertheless as the most advantageous solution and it was thus necessary to undertake additional research on the environmental effects of this type of tunnel. A first study was completed in December 1993 and detailed studies on the land connections of a bored tunnel were produced in 1995. These studies did not form part of the formal EIA process which ended after the trajectory decision in 1991.

4.3 This case study report focuses on the period between November 1988 and March 1991, because this was the period in which the EIA process was run and because it was decisive for the fixing of the overall trajectory. The costs and benefits of this procedure are detailed in this report.

Table 1 : Steps in the EIA process of the development of the Westerschelde shore connection			
Step	**Activity**		**Date**
1. Preliminary	1.1	Notification of intent ('startnotitie')	11.87
	1.2	Publication of the notification of intent	02.12.87
2. Scoping	2.1	Reactions of the public on the notification of intent	03.12.87 - 08.01.88
	2.2	Advice of the independent EIA Commission for the Guidelines for the EIS ('Richtlijnen')	10.02.88
	2.3	Advice of the Statutory Consultees	
		- Director of the department Agriculture, Nature and Outdoor Recreation of the Province of Zeeland;	06.01.88
		- Regional Environmental Inspectorate;	06.01.88
	2.4	Guidelines of the competent authorities for the EIS	03.88
3. EIA studies	3.1	EIS first stage (analysis of all trajectories)	11.88
	3.2	Decision on the alternatives to be detailed	10.02.89
	3.3	EIS second stage (detailed analysis of three trajectories)	08.89
4. EIS judgement	4.1	Judgement by the competent authorities on the correctness and completeness of the EIS	15.08.89
	4.2	Publication of the EIS	26.02.90
5. Consultation on EIS	5.1	Public consultation on the EIS	02.03.90 - 14.04.90
	5.2	Public meetings (in total eight meetings)	12.03.90 - 09.05.90
	5.3	Advice of statutory consultees	
		- Director of the department Agriculture, Nature and Outdoor Recreation of the Province of Zeeland;	11.04.90
		- Regional Environmental Inspectorate;	12.04.90
	5.4	Review advice of the independent EIA Commission ('toetsingsadvies')	11.06.90
	5.5	Other advices	
		- Council for Water Management & Public Works	06.12.90
		- Provincial spatial planning committee	16.01.91
		- Provincial environmental council	16.01.91
6. Decisions	6.1	Trajectory decision of the Provincial Council	01.03.91
7. Post EIA	7.1	Evaluation and monitoring	1991 and onwards

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4.4 The following points are worth noting:

- EIA has been combined with the traffic and transport analyses as well as with the financial analysis of the development of the project. The EIS thus provided the decision makers with an *integrated information basis*. The consultant, DHV, has been employed for the whole of the studies.

- the Province of Zeeland established a *specific project organisation* for the development of the Westerschelde shore connection because of the complexity of the project. This organisation included a *project steering group*, with (political) representatives of province, state and municipalities, and a *project guidance group*, with civil officers of the same parties. *Working groups* were created for different aspects of the development of the shore connection; one of these working groups was in charge of the trajectory-EIA process.

- the Province designated a *specific working group for the role of competent authority*. This group directly reported to the concerned deputy and was placed outside the project organisation for the Westerschelde shore connection.

- the *guidelines for EIS* prepared by the competent authority were almost identical to the advice for guidelines from the independent EIA Commission. The Province did not deviate from this advice in order to avoid criticism of the combined role of competent authority and developer[4].

- *six trajectory alternatives* were analysed in the EIA studies :

  - '0'-alternative : maintaining the two ferries at the very east and the very west of the studied area;

  - alternative 1 : a bored tunnel-tunnel connection at the location of the west ferry;

  - alternatives 2W and 2E : a bridge-bridge or bridge-tunnel connection between Borssele and Hoofdplaat;

  - alternative 3 : a bridge-bridge or tunnel-tunnel connection between Ellewoutsdijk and Terneuzen;

  - alternatives 4W and 4E : a bridge-bridge or bridge-tunnel connection between Oudelande and Terneuzen;

  - alternative 5 : a bridge-bridge or bridge-tunnel connection at the location of the east ferry.

- several areas with specific *nature conservation value* are located in the study area, in particular the southern part of Zuid-Beveland ('zak van Zuid-Beveland') and wetlands in and near to the Westerschelde;

- *Belgian authorities* have been consulted within the development procedures. Their position was that a bridge over the shipping channel of the Westerschelde would hinder ships going to Antwerp and that they could thus only accept a tunnel under the shipping channel. The EIS examined both solutions and held open both bridge-bridge and bridge-tunnel constructions;

- the *independent EIA Commission* considered that the EIS was a well written document but also that some major omissions appeared. The Commission stated for instance that the effects on nature and on the ecological balance of the Westerschelde were more significant than described in the EIS. The Commission laid further emphasis on a bored tunnel construction, as not having any impact at all on the nature conservation value of the Westerschelde.

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[4] There were some criticisms of the level of detail of the guidelines. According to the developer, the guidelines and the information basis could have been less extensive (and thus less costly) with the same effects on decision making.

- after the general analysis of the EIA studies, the Provincial Council decided in *February 1989* not to retain alternatives 1 and 2, on the basis that the investment would not in these cases be outweighed by the benefits for the regional development of the Province of Zeeland;

- after the detailed analysis of alternatives 3, 4 and 5, the final decision was made in *March 1991*. Trajectory 3 was chosen because it scored best on the criterion of the regional development of Zeeland and scored better on environmental and landscape issues than alternative 4. The higher costs were no reason to abandon this alternative.

- the *choice for a bored tunnel* instead of a sunken tunnel was made afterwards. After the suggestion of the independent EIA Commission for this type of tunnel, the Province left the choice of the layout open to the companies that were invited to tender for the construction of the shore connection. All tenderers came surprisingly with bored tunnel constructions, not with sunken tunnel constructions. This was unexpected because bored tunnel constructions in a sandy substrate were previously considered as not sufficiently proven and were associated with high costs.

4.5 The EIS comprises a professionally edited and printed full report of 245 pages and technical appendices of 60 pages. The EIS has been summarised in a separate non technical brochure. The full report follows a conventional format covering the subjects listed in **Table 2**.

Table 2 : Subjects covered in the EIS

Chapter		Pages
1.	Introduction	4
2.	Formulation of the problem	4
3.	Possible solutions	4
4.	Decision making and procedures	6
5.	Description of the existing state of the environment and the predicted changes without the activity	74
6.	First selection of the alternatives	6
7.	Detailed description of the alternatives	64
8.	Predicted effects (environmental effects and other effects)	68
9.	Comparison of the alternatives	8
10.	Gaps in knowledge and information, details for an evaluation programme	2

4.6 It is not the purpose of this case study report to carry out any independent analysis or review of the detailed findings of the EIS. That would require a full study in its own right. However, it is relevant to record that the developer and the competent authority[5] broadly agreed that the EIS, supplemented with the additional information requested by the independent EIA Commission, was of good quality and provided the necessary information for integrated decision making.

[5] As expressed in the interviews with the representatives of the developer and competent authority.

5.0 REVIEW OF COSTS

5.1 Costs have been identified in financial terms and related to the different components of the EIA process. **Table 3** presents the overall findings.

Table 3: Review of costs of developer and competent authority in the trajectory fixing and EIA process of the development of the Westerschelde shore connection

[6],[7],[8] Period			Ext. EIA (ECU)	Ext. res. (ECU)	Proj. man. (ECU)	Print. (ECU)	Inform. (ECU)	Personnel (ECU)	Miscell. (ECU)	Total (ECU)
1988	1.	Preliminary	53 401	309 177	42 576			128 802	68332	602 288
	2.	Scoping								
	3.	EIA studies								
1989	3.	EIA studies	52 771	188 846	48 655			214 099	223 399	727 770
	4	Judgement								
1990	5.	Consultation		48 069		36 804	12 286	150 777	57 980	305 916
	6.	Decision								
Totals			106 172	546 091	91 231	36 804	12 286	493 677	349 711	1 635 97 ====

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Ext. EIA = External costs for EIA studies; Ext. rest = External costs for traffic and trajectory studies; Proj. man. = External costs for project management assistance; Print. = Printing costs; Inform. = Costs for public hearings; Personnel = Personnel costs of the Province; Miscell. = Miscellaneous

5.2 The table illustrates that the share purely allocated to external expertise for EIA studies was only a minor part (6%) of the overall costs. In practice however these costs can not be separated from the other costs for studies (traffic and trajectory analyses) or from general costs.

5.3 The table further illustrates that the costs for the studies (EIA, trajectory and traffic) amounted to 39% of the total costs over 1988-1990. The internal personnel costs of the Province were the second most significant costs (30% of all costs).

5.4 The total estimated costs of the Province of Zeeland for the development of the Westerschelde shore connection in the period where the EIA process was run, were about 1 600 000 ECU. These costs correspond to about 0.2% of the capital investment (capital investment of the bored tunnel is about 800 million ECU).

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6 It has not been possible within the scope of the study to detail the costs of the EIA process for the other involved parties. Because these parties were far less intensively involved in the EIA and trajectory fixing process than the developer and the competent authority, we have assumed that we could ignore these costs with regard to the total costs of the developer and competent authority.

7 The interviewed persons provided figures on the yearly costs that the Province of Zeeland held for the development of the Westerschelde shore connection, from 1988 to 1996. Because of the complexity of the project and the application of an integrated approach, it has been difficult to distinguish between costs for EIA, costs for the transport and traffic analyses and costs for normal decision making, without EIA. We therefore present here total costs of the Province of Zeeland for the development of the shore connection over the period of 1988 to 1990, the period in which the major part of the EIA process was run.

8 Applied rate : 1 ECU = 2 NLG.

5.5 The Ministry of the Environment granted a subsidy of 25 000 ECU to the Province of Zeeland for the EIA procedure.

6.0 REVIEW OF BENEFITS

6.1 This section reviews the benefits of the EIA process within the decision making process of the development of the Westerschelde shore connection. These benefits have been identified in the interviews with the developer and competent authority.

6.2 According to the *developer* and the *competent authority*, the main benefit of EIA was in :

- *making clear the environmental effects of decision making*. Environmental effects were already taken into account before EIA was compulsory, but an added benefit of EIA is that it provides a systematic approach for analysing these aspects, and the results are written down in a basic document. The EIA process ensured that environmental aspects were taken into account in an early stage of the project design and that these considerations effectively influenced key aspects of the project design (location and lay-out).

6.3 The EIA process was in addition helpful for :

- *gathering information in a systematic way*. The EIA process ensured a systematic way of taking environmental aspects into account. The integrated procedure combining EIA and traffic / transport analyses ensured that all key aspects were taken into account.

- *creating an objective information basis*. Objective information gathering is a principal objective of the EIA process. The review advice of outsiders, the independent EIA Commission and the Council for Water management and Public Works, guarantees a certain objectivity. The strict separation of tasks between developer and competent authority also helped to ensure objectivity.

- *taking account of the opinions of public and interest parties*. The EIA process has two formal stages of consultation with the public and interested parties. The results of these consultations form an integral part of the EIA process. According to the developer and competent authority, this results in good practice and open processes in public decision making. Similar techniques could however have the same results.

- *making project objectives explicit*. The EIA process helped to define the exact purposes of the project.

6.4 The integrated process of trajectory fixing and EIA structured and streamlined decision making in this complex project. At the outset, the project was controversial, not only with the public but also with municipalities and economic partners. The information gathering process helped parties to agree the project objectives. The consultation helped the developer in forming links with the interested parties and the public. There was only one party, the municipality of Borssele, that appealed against the decision.

7.0 SUMMARY OF FINDINGS

7.1 According to both the *developer* and the *competent authority*, the main benefits of the EIA process are that the environmental effects were clearly identified for decision making purposes. Environmental aspects were important in the choice of a bored tunnel variant. The combined trajectory fixing and EIA procedure did help in structuring decision making as well as in having the project locally accepted.

7.2 The estimated costs for this process were approximately 0.2% of the capital investment of the project. The developer and the competent authority consider that these costs are justified to ensure good practice within decision making and that the EIA improved the quality of decision making.

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Provincie Zeeland (1996): Extracts of financial administration of the Westerschelde shore connection project, Middelburg (unpublished).

8.2 General Case Study Documents

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LUC (1996): "Costs and benefits associated with the implementation of the EIA process", Interim Report, January 1996.

Ministerie VROM, Ministerie L&V (1994): "Milieu-effectrapportage 48, Gebruik en effectiviteit van M.E.R. in Besluitvorming", 25 May 1994.

8.3 Interviews / Contacts

Mr S. Rockx, Province of Zeeland, Directorate Environment, Public Works and Water Management (Mr Rockx was project engineer for the Westerschelde shore connection project and was involved in the EIA process in the role of developer).

Mr. J. Van Houte, Province of Zeeland, Directorate Environment, Public Works and Water Management (Mr Van Houte was project co-ordinator for the Westerschelde shore connection project and was involved in the EIA process in the role of developer).

Mr. Th. Van Riet, Province of Zeeland, Directorate Environment, Public Works and Water Management (Mr Van Riet was environmental policy officer for the Province and was involved in the EIA process in the role of competent authority).

CASE STUDY 5. HOUSING LOCATIONS, ZAANSTAD

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process as it applied to the development of a new housing location in Zaanstad in the Netherlands. The report forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom, and follows a standard format[1] which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings
8. Bibliographic References

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by EurEco during the period March - May 1996. The report has been prepared on the basis of the following sources :

- an interview with a representative of the Province of Noord-Holland, who was involved in the EIA process as developer[2];
- key documents related to the EIA process that were kindly forwarded by the competent authority and the developer (see bibliography);
- specific documents and data on the relative costs and benefits of the EIA process of the project (see bibliography).

2.2 The interviews were carried out following a standard questionnaire developed in agreement with the commissioner of the study, and adapted to the Dutch situation by EurEco. A draft case study report was sent to the interviewed person for comment.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The project involves the development of a large new housing area in Zaanstad, a municipality of 130 000 inhabitants that borders Amsterdam. It comprises, on the one hand, a series of urban centres along the road and rail connections with Amsterdam and, on the other, open areas and polders designated for agriculture and nature.

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1 The format has been agreed with the commissioner of the study, DG XI of the European Commission, and laid down in <LUC 1996>.

2 The representative from the competent authority was not available in the period of March - May 1996. The developer, who worked closely with the competent authority throughout the EIA process, provided some information in the place of the competent authority. The opinions expressed here are however those of the developer, unless otherwise mentioned.

3.2 The initial housing strategy of the municipality of Zaanstad was to extend its housing capacity by using vacant land within the urban centres. It appeared however that a significant delay would occur after 1995, principally because of the difficulty in finding funds for the clean-up of polluted areas. Zaanstad would therefore not be able to reach the objective of developing 5000 houses between 1995 and 2005, an objective that had been agreed with the Amsterdam region.

3.3 This led to the initiative to develop a new housing location in Zaanstad. Conditions for such a location were that it had to border existing urban centres and be connected to existing transport facilities.

3.4 For such a new location, the Province of Noord-Holland had to undertake a partial revision of the regional plan in force. EIA was compulsory for a development of more than 4000 houses. The EIA process was run within the framework of the partial revision procedure of the regional plan.

3.5 The principal participants in the EIA process were as follows :

Developer and competent authority:	The Province of Noord-Holland.
The statutory consultees:	The independent EIA Commission. The Director of the department Agriculture, Nature and Outdoor Recreation of the Province of Noord-Holland. the regional Environmental Inspectorate.
Other advisers:	The provincial Spatial Planning Committee.
Other participants:	The municipality of Zaanstad, inhabitants of local communities, environmental organisations, farming organisations, public.

4.0 DETAILS OF THE EIA PROCESS

4.1 The EIA process for the development of the housing location, Zaanstad, took place between March 1992 (notification of intent) and August 1993 (review advice from the independent EIA Commission).

4.2 The Province decided to undertake the EIA studies with its own personnel covering all aspects of the EIA studies. This was anticipated to lead to :

- a full integration of the revision of the regional plan and the EIA studies;
- a gain of time (duplication of work was avoided for some of the plan revision);
- a better understanding of local effects;
- an extension of the know-how of the involved public officers of the Province;
- reduced costs (the members of the EIA team were already on the Province's payroll).

Table 1 : Steps in the EIA process of the development of the housing location Zaanstad		
Step	**Activity**	**Date**
1. Preliminary	1.1 Notification of intent ('startnotitie')	03.92
	1.2 Publication of the notification of intent	03.92
2. Scoping	2.1 Reactions of the public on the notification of intent	20.03.92-19.05.92
	2.2 Advice of the independent EIA Commission for the Guidelines for the EIS ('Richtlijnen')	05.92
	2.3 Advice of the Statutory Consultees - Director of the department Agriculture, Nature and Outdoor Recreation of the Province of Zeeland; - Regional Environmental Inspectorate;	05.92 05.92
	2.4 Advice of the Provincial Spatial Planning Committee	06.92
	2.5 Guidelines of the competent authorities for the EIS	02.07.92
3. EIA studies	3.1 EIS; draft decision for the revision of the regional plan	01.93
4. EIS judgement	4.1 Judgement by the competent authorities on the correctness and completeness of the EIS	01.93
	4.2 Publication of the EIS and the draft decision for the revision of the regional plan	02.93
5. Consultation on EIS	5.1 Public consultation on the EIS and the draft decision for the revision of the regional plan	24.05.93-24.07.93
	5.2 Review advice of the independent EIA Commission ('toetsingsadvies')	08.93
	5.3 Public hearings	14.12.93
	5.4 Advice of the Provincial spatial planning committee	01.94
6. Decision	6.1 Final decision on the partial revision of the regional plan	21.03.94
7. Post EIA	7.1 Evaluation and monitoring	-

4.3 The following points are worth noting :

- EIA has been closely integrated in the procedure for the revision of the regional plan. The background information for the revision comprised environmental, housing, spatial planning, transport and cost analyses. The EIS provided the decision makers with an *integrated information basis;*
- a specific *project group 'revision regional plan'* was established and equipped with civil officers of the Province. The following provincial services were represented in the project group :
  - 'Ruimte en Groen' Department: plan development office, local spatial planning office, rural areas sector, research and information sector. A *project manager for the 'revision regional plan'* was designated from the plan development office. This office had the *developer* role within the EIA process;
  - Environment and Water Department.
  - Roads, Traffic and Transport Department.

- the *EIA studies* were undertaken by the research and information sector. A *project manager for 'EIA studies'* was designated from this sector;
- the role of *competent authority* was played by the EIA co-ordinator of the Province, who is attached to the provincial Environment and Water Department. This EIA co-ordinator was the president of a *EIA guidance committee* containing the same members as the project group 'revision regional plan', except the developer. The EIA co-ordinator did not initially participate in the project group. The project group and the EIA guidance committee were combined in one group from August 1992;
- the EIA studies were undertaken for *two scenarios*, the first one involved the construction of 3000 houses, the second one of 5000 houses. Four *alternative locations* were studied: Assendelft-Noord, Guisveld, Westzijdeveld and Oostzanerveld. Combinations of these locations were also studied;
- *conclusions of the EIA studies* were that two locations should be left out of consideration from an environmental point of view: Guisveld and Oostzanerveld. Construction should take place on the Assendelft-Noord or the Westzijdeveld location, or on a combination of these locations. There was no significant difference between these two locations;
- the EIA took account of two important *uncertainties*. The first uncertainty concerned the noise nuisance of the envisaged expansion of the Schiphol airport. The second concerns the programmed construction of a new rapid rail connection between Zaandam, Oostzanerveld and Amsterdam. The ranking of locations in the EIA studies appeared however not to be influenced by decisions on these two proposals;
- the *final decision* was to develop a housing project of 5000 houses on the location of Assendelft-Noord. This decision was in accordance with the outcomes of the EIA studies.

4.5 The EIS comprises a full report of 169 pages. The report follows a conventional format covering the subjects listed in **Table 2**.

Table 2 : Subjects covered in the EIS

Chapter		Pages
1.	Introduction	4
2.	Formulation of the problem and of objectives	6
3.	Decisions already made and decisions still to make	6
4.	Description of the existing state of the environment and the predicted changes without the activity	44
5.	Description of the location alternatives	8
6.	Predicted environmental effects	62
7.	Comparison of the alternatives	8
8.	Environmentally most optimal alternative	8
9.	Miscellaneous	4
10.	Implementation aspects	4
11.	Gaps in knowledge	2

4.6 It is not the purpose of this case study report to carry out any independent analysis or review of the detailed findings of the EIS. That would require a full study in its own right. However, it is relevant to record that the developer[3] and the independent EIA Commission[4] broadly agreed that the EIS was of good quality and provided the necessary information for decision making.

5.0 REVIEW OF COSTS

5.1 Costs have been identified in financial terms and related to the different components of the EIA process. **Table 3** presents the overall findings.

Table 3: Review of costs of the Province of Noord-Holland in the plan revision and EIA process for the development of the housing project in Zaanstad

([5]),([6]),([7])	*EIA process*			*Plan revision process*		
Period	Personnel costs (ECU)	Other costs (ECU)	Total EIA (ECU)	Personnel costs (ECU)	Other costs (ECU)	Total plan rev. (ECU)
1991 1.Preliminary				6418		6418
1992 1.Preliminary 2.Scoping 3.EIA studies	222 233		222 233	95 880		95 880
1993 3.EIA studies 4 Judgement 5.Consultation	53 125	15 500	68 625	72 208	25 000	77 208
1994 6.Decision				19 933		19 933
Totals	275 358	15 500	290 858 ====	194 439	25 000	219 439 ====

5.2 The table illustrates that the share allocated to the EIA studies was a major part (57%) of the overall costs for the EIA and plan revision procedure. The most important part of these costs were increased during the stage of EIA studies.

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3 As expressed in the interview.

4 As expressed in the review advice, quoted in <SME 1993>.

5 It has not been possible within the scope of the study to detail the costs of the EIA process of the other involved parties. Because these parties were far less intensively involved in the EIA and plan revision process than the developer and the competent authority, we have assumed that we could ignore these costs with regard to the total costs of the developer and competent authority.

6 The interviewed persons provided figures on the yearly costs that the Province of Noord-Holland had for the plan revision and EIA process, from 1991 to 1994. Personnel costs have been calculated on the basis of a review of used hours <'Ruimte en Groen' Department 1994>, multiplied by an average fee of 42.50 ECU / hour (average of fees applied within the province). Hours incurred in the Road, Traffic and Transport Department and in the Environment and Water Department have been added on the basis of <Bosma 1993>.
Other costs are applied in the above mentioned document <'Ruimte en Groen' Department 1994>.

7 Applied rate : 1 ECU = 2 NLG.

5.3 Total estimated costs of the Province of Noord-Holland for the EIA process for the development of the housing locations, Zaanstad were about 300 000 ECU. These costs correspond to less than 0.1% of the capital investment (the capital investment of the housing project is about 500 million ECU).

6.0 REVIEW OF BENEFITS

6.1 This section reviews the benefits of the EIA process within the plan revision procedure for the development of the housing locations, Zaanstad. These benefits have been identified in the interview with the developer.

6.2 According to the developer, the main benefit of EIA was in this case that it was helpful for:

- *structuring the analysis of environmental (and other) aspects.* Environmental effects were already taken into account before EIA was compulsory, but an added benefit of EIA is that it provides a systematic approach for analysing these aspects and recording them in a structured document. The EIA process ensured that environmental aspects were taken into account at an early stage of the project design and that these aspects effectively influenced the location choice.

6.3 The EIA process was in addition helpful for :

- *creating an objective information basis.* Objective information gathering is a principal objective of the EIA process. The review advice of an outsider, the independent EIA Commission, guarantees a certain objectivity;

- *explaining the needs and backgrounds of the project.* The EIA process has two formal stages of consultation with the public and interested parties. The results of these consultations form an integral part of the EIA process. According to the developer, the EIA process helps politicians and civil officers in explaining policy options. Differences in opinions and political priorities can continue to occur but the EIA process helps in clarifying the different options for the process of political weighting.

6.4 The integrated process of plan revision and EIA structured and streamlined decision making in this project. The information gathering process helped parties to agree project objectives. The consultation helped the developer establish links with the interested parties and the public.

7.0 SUMMARY OF FINDINGS

7.1 According to the developer, the main benefit of the EIA process is that it provides a systematic approach for the analysis of environmental (and other) aspects. The EIA process further helped in explaining the needs for, and backgrounds of, the housing project. The EIA process caused some delay in the plan revision procedure, but this is not significant compared with the success of the combined procedure in contributing to the decision making process (previous similar decision making, without EIA in 1979 and in 1987, was not successful in Zaanstad).

7.2 The estimated costs for this process were less than 0.1% of the capital investment of the project. The developer considers that these costs are justified to ensure good practice within decision making.

8.0 BIBLIOGRAPHIC REFERENCES

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Province of Noord-Holland (1992-1994): several internal documents on the plan revision procedure and the EIA process, e.g. <Bosma 1993: 'Urenbesteding MER Zaanstad'> and <'Ruimte en Groen' Department 1994: 'Nacalculatie partiële streekplanherziening woningbouwlocatie Zaanstad'>.

Province of Noord-Holland (1993): "Streekplan Amsterdam Noordzeekanaalgebied - partiële herziening woningbouw Zaanstad - ontwerp", Haarlem, April 1993.

SME (1993): "Evaluatie intern MER Provincie Noord-Holland", Nijmegen, September 1993.

8.2 General Case Study Documents

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LUC (1996): "Costs and benefits associated with the implementation of the EIA process", Interim Report, January 1996.

Ministerie VROM, Ministerie L&V (1994): "Milieu-effectrapportage 48, Gebruik en effectiviteit van M.E.R. in Besluitvorming", 25 May 1994.

8.3 Interviews / Contacts

Mr G. Ravesteijn, Province of Noord-Holland, Department 'Ruimte en Groen', Plan development office (Mr Ravesteijn was project manager for the revision of the regional plan for the housing project in Zaanstad and was involved in the EIA process in the role of developer).

ANNEX 3

UNITED KINGDOM

CASE STUDY 1. BATHEASTON / SWAINSWICK BYPASS AND A36 LINK

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process relating to the proposed construction of the Batheaston / Swainswick Bypass and A36 Link, near Bath, in the UK. It forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by Jeremy Owen of Land Use Consultants, during May 1996. It included:

- familiarisation with the Environmental Statement (EIS);
- a site visit accompanied by the developer (Mr Ken Petch of the Highways Agency) and representatives of the consultant engineers commissioned to undertake the EIA (Mr David Carmichael and Mr Tom Swope);
- written correspondence with:
  - the Countryside Commission;
  - Bath and North East Somerset Council.
- telephone interviews with:
  - Mr. Roger Eaton, Planning and Highways, Wiltshire County Council
  - Ms. Ann Skinner, Conservation Officer, Environment Agency
  - Mr. Brian Parker, Transport Consultant (representing Bathampton Parish Council, Bathampton Environmental & Traffic Action Group, and the Bath Preservation Trust, under the umbrella group Bath Region and Avon Valley Environmental Group ('BRAVE')).

2.2 Because more than six years have passed since the EIA was completed, detailed information has been difficult to obtain (e.g. there is no legal obligation in the UK for accounting records to be kept for more than six years). In particular, several of the key people representing statutory consultees at the time of the EIA have either retired or

have changed jobs. In addition, local government re-organisation has meant that the relevant local authorities in the area (i.e. Avon County Council, Bath City Council and Wansdyke District Council) ceased to exist as from 1 April 1996. These have been replaced by a single unitary authority of Bath and North East Somerset District Council.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The proposed road development is located approximately 3 km east of the centre of Bath, south west England. The aim of the scheme is to relieve local communities of noise, pollution, increasing accident risks and overall reductions in the quality of life of local residents associated with mounting traffic congestion in the area.

3.2 Two communities are particularly affected by the congestion: Batheaston and Swainswick. The congestion in Batheaston is caused by traffic travelling along the A4 into and out of Bath. The A46, which intersects with the main east-west motorway traversing the south of England (the M4) at junction 18, descends steeply through Swainswick before joining the A4 south of the village.

3.3 In addition, there is no direct trunk road link between the A46 north of Swainswick and the A36 south of Bathampton. This route is a busy trans-regional link between the south coast towns and ports of Poole/Bournemouth, Southampton and Portsmouth and the south west regional centre of Bristol. At present most through traffic has to make a detour into the city of Bath, crossing the River Avon and adding to the congestion.

3.4 Proposals for major road schemes to relieve the area of congestion have been discussed for over 50 years, but until the present scheme was announced, progress on solutions had always been limited. Earlier studies included:

- First scheme to relieve the A4 (1936)
- Batheaston Bypass Stage 1 Proposal (1966)
- Batheaston Stage 2 feasibility study (1971)
- Internal traffic study for Bath by Jamieson McKay & Partners (1973)
- Scott Wilson Kirkpatrick & Partners report on a trunk road strategy between Bristol and Southampton (1976)
- Mander Raikes Marshall report on improvements to the A36 between Warminster and Bath (1980)

3.5 In the late 1960s/early 1970s plans for a Batheaston Bypass were dropped primarily due to opposition to a road tunnel which was to connect it to Bath. The present scheme therefore represents the culmination of many years' work and innumerable discussions with interested parties. It comprises three main elements:

- the Swainswick bypass;
- the Batheaston bypass
- A36 link road

3.6 Bath has been designated a World Heritage Site by UNESCO, and the location of the development proposals is environmentally sensitive for a number of other reasons. The road scheme would either directly impact upon, or be in the close vicinity of the following features of environmental interest:

- River Avon floodplain
- Hampton Rock Cutting proposed Site of Special Scientific Interest (SSSI)
- Cotswold AONB
- Bath Conservation Area
- Bathampton Conservation Area
- Little Solsbury Hill Scheduled Ancient Monument
- Statutory Green Belt

3.7 In view of the environmental sensitivity of the area, the Department of Transport decided that the undertaking of a voluntary EIA would help inform the decision-making process. It was the first formal EIA undertaken by the Department of Transport and it represented one of a number of feasibility studies carried out for the proposals at the time.

3.8 The process of planning, assessment and coming to a final decision on the scheme was protracted. It lasted from 1982 until the land orders were passed in March 1993. It included a Public Inquiry which lasted 75 days between 5 June 1990 and 6 December 1990. The final decision of the Secretaries of State for the Environment and Transport (i.e. the competent authorities) was to grant permission for the construction of the first two elements of the scheme (i.e. the Swainswick and Batheaston bypasses) but to delete from the land orders the construction of the third element (i.e. the A36 link).

3.9 The award for the Contract to construct the two bypasses was made in March 1994 with a 30 month Contract period. The bypasses are due to open to traffic in July 1996. At the time of the Public Inquiry, the full capital cost of the scheme was estimated as being:

	Capital cost	**Length**	**Capital cost per kilometre**
Swainswick Bypass	50.98 m ECU	2.18 km	23.34 m ECU
Batheaston Bypass	21.09 m ECU	2.14 km	9.86 m ECU
A36 Link	7.27 m ECU	1.28 km	5.69 m ECU
Total	**79.35 m ECU**	**5.60 km**	**14.16 m ECU**

3.10 The estimated capital cost of the two approved elements of the scheme were therefore 68.42 million ECU. It is likely that the final costs of construction, including land, supervision and VAT will have increased to approximately 91.5 million ECU.

3.11 The key features of the scheme which were highlighted in a Public Information Leaflet issued by the Highways Agency in June 1995 are:

Length:	4.3 km
Standards:	Urban Dual Two Lane Carriageway
Design Speed:	85 kph
Bridges:	2 crossings of River Avon involving 5 separate structures 4 Overbridges 1 Underpass
Deep Diaphragm Retaining Walls:	1700 m
Cantilever Retaining Walls:	192 m
Environmental:	Extensive landshaping and planting including ecological wetland area and badger tunnels

4.0 DETAILS OF THE EIA PROCESS

4.1 The preferred route for the scheme was announced in 1986. The EC Directive was put into highway law by the Highways (Assessment of Environmental Effects) Regulations 1988 which relates to the Highways Act 1980. As a result, the Highways Agency maintain that an EIA was not legally required. Nonetheless, the Agency decided to carry out an EIA on a voluntary basis. The EIS was published to accompany the draft Line, Side Roads and Detrunking Orders in June 1989. A Supplementary Environmental Statement was subsequently published in April 1990 to address the results of additional survey work and changes in the road design.

4.2 Voluntary EIAs have the same status, and are subject to the same procedures, as EIAs required under legislation, and the first decision letter issued on 30 June 1992 jointly on behalf of the Secretaries of State for the Environment and Transport noted that:

> *"The Secretaries of State have considered the Environmental Statement and Supplement (Inquiry Documents D17 and D25). They are satisfied that they comply fully with the relevant statutory requirements including Council Directive No. 85/337/EC."* (para. 5 of the Decision Letter dated 30 June 1992)

4.3 The EIS was prepared by Sir Alexander Gibb & Partners ('Gibb'), Consulting Engineers, on behalf of the Highways Agency. Gibbs were appointed design agents for the complete scheme in 1982. They employed Derek Lovejoy and Partners to address landscape issues. The first EIS was A4 in size and was bound as one document. It was structured as follows:

(i)	Introduction	(1 page)
(ii)	The General Area	(3)
(iii)	The Published Scheme	
	- Swainswick Bypass	(1)
	- Batheaston Bypass	(1)
	- A36 Link	(1)
(iv)	Effect on Traffic	(1)
(v)	Mitigation Measures	(9)
(vi)	Environmental Data	(1 para.)
(vii)	Alternative Routes	(5)

Annex 1	Non Technical Summary	(5)
Annex 2	Plan of Published Scheme	(A3 plan)
Annex 3	Changes in Traffic Flow	(A3 plan)
Annex 4	Principal Landscape Proposals	(A3 plan)
Annex 5	Environmental Data	(24 pages of matrices)

4.4 The Environmental Data examined the direct and indirect effects of the proposals under five headings:

Group 1: Travellers
Group 2: Occupiers
Group 3: Users (of areas and features/facilities such as parks, shops, etc.)
Group 4: Policies for Conserving and Enhancing the Area
Group 5: Transport, Development and Economic Policies
Group 6: Financial Effects (Net Present Values)

4.5 A comparative analysis was carried out between the preferred route against the 'do-nothing' option for effects on Groups 1 to 3. For Group 1, the Present Value of Benefits in was also presented. For Groups 4 and 5 the comparative analysis was with respect to the achievement of policy objectives.

4.6 In April 1990, a Supplementary Statement was published to take into account alterations to the proposed scheme, and additional surveys on features of archaeological, geological and ecological interest. The Supplementary Statement was structured as follows:

(i)	Introduction	(1 page)
(ii)	Supplement to 'The Published Scheme'	(5)
(iii)	Effect on Traffic	(1)
(iv)	Supplement to Mitigation Measures	(5)
(v)	Effects on the Environment	(5)

Annex S.2 Plan of Published Scheme	(A3 plan)
Annex S.3 Changes in Traffic Flow	(A3 plan)
Annex S.4 Principal Landscape Proposals	(A3 plan)
Annex S.5 Scheme Framework	(28)
Annex A.7 Geological Survey Report	(17)
Annex A.6 Archaeological Survey Report	(2)

4.7 Annex S.5 presented an updated analysis of the matrices included in Annex 5 to the first EIS. The Geological Survey Report was prepared by Dr. C.O. Hunt of the University of London. The Archaeological Report was an interim statement issued by the Archaeological Officer, Avon County Council.

4.8 The Highways Agency wish to stress that the EIA was one of the first for a road scheme in the UK. They recognise that it had some weaknesses, and that subsequent EIAs have been of a higher standard. The Highways Agency state that, once the decision had been made to put forward proposals to build the road scheme, environmental considerations affected all aspects of its design. Since the publication of the EIS, the Department of Transport has issued detailed guidance on the undertaking of EIA for road schemes ('Design Manual for Roads and Bridges, Volume 11, Environmental Assessment').

4.9 It does not appear from the Inspector's Report of the Public Inquiry that consultees and interested parties questioned the adequacy of the EIS *per se*. Indeed, the Inspector's Report, which runs to 334 pages plus Annexes, only specifically mentions the EIS once and this simply referred to the fact that an EIS and Supplementary EIS had been submitted with the application. However, there was much debate about the nature of the environmental effects of the proposed scheme, and the proposed mitigation. Much of this information was presented in other technical reports submitted to the Inquiry.

4.10 The National Rivers Authority (Environment Agency from 1st April 1996) did not express concern over the accuracy of the EIS. However, one representative did feel that problems of traffic congestion in the region as a whole were being addressed on a piecemeal basis, with individual ESs prepared for small sections of a much longer route. She was concerned that the cumulative impact of road development on the river valley and the region's wildlife resources was not being properly assessed.

5.0 REVIEW OF COSTS

PRELIMINARY STAGE

5.1 **Route Selection:** As described above, the eventual choice of preferred route represented the culmination of many years studies and proposals. During the public consultation stage in 1985, several routes were presented for debate. These were known as the 'Orange', 'Yellow', 'Red', and 'Purple' routes between Upper Swainswick and the Main Line Railway in the Avon Valley. A 'Blue' Route was put forward as an alternative to either the Red or Purple routes between Upper Swainswick and Bailbrook Lane. For the link southwards to the A36, the choice was between the 'Green' and 'Brown' routes. Where no alternatives were put forward, the route was indicated 'Black'.

5.2 Prior to the EIS a preferred route was established and this formed the basis of the EIA. The choice of preferred route was on the basis of least environmental damage without entailing unreasonable economic cost (e.g. lengthy tunnels were ruled out an early stage).

5.3 **Feasibility Studies:** Several feasibility studies were undertaken as already described. There were ongoing discussions between the consultant engineers, the Highways Agency and statutory consultees, particularly the local authorities throughout this period. For example, the Countryside Commission estimate that about 5 days of their time were spent in such consultations, whilst the neighbouring local authority, Wansdyke District Council, spent approximately 10 days on this stage.

5.4 The National Rivers Authority (NRA) was also involved in extensive consultation at this stage, and they have estimated that this included more than 15 days input from a development control engineer, and a further 10 days of Conservation Officer time. Although this was prior to the formal EIA studies, most of the time was spent in identifying mitigation measures for impacts on the water environment, and in arranging NRA maintenance access following construction.

5.5 The NRA also provided the Highways Agency with a considerable amount of information, including an assessment of flood risk, analyses of existing conditions, and requirements for the design brief. As no charge was made, the cost of providing this information was borne by the NRA.

5.6 **Summary of Costs:** The developer was unable to provide an estimate of the amount of time spent or the financial cost of the preliminary stage. However, it is estimated that 1.83 million ECU was spent on the all the studies (including the EIA) which took place leading up to the choice of a preferred route. The Highways Agency estimates that the equivalent of 1 person year was spent by them on this stage of the process. The remainder of the time was incurred by consultants.

PROJECT SCREENING

5.7 The Highways Agency decided at an early stage that they would undertake an EIA. At the time there was no guidance available as to how to conduct the EIA. The only people consulted on the need for an EIA would have been officers responsible for environmental

issues within the Department of Transport. The decision to go ahead was made for political reasons - to prevent there being any criticism for not undertaking one.

EIA STUDIES

5.8 **Scoping to Determine Areas of Study:** Although no formal scoping exercise was undertaken, the Highways Agency and their consultants believe that the range of consultations which took place prior to the EIA effectively had the same end result. This view is also supported by the Environment Agency.

5.9 The key issues to emerge from consultation throughout the 1980s included:

- intrusion into private property
- land severance
- land take
- visual intrusion
- effect on SSSIs
- effect on protected buildings and Scheduled Ancient Monuments

5.10 Further issues were highlighted by the NRA, namely:

- loss of 80,000 m^3 of flood storage
- ecological impacts due to loss of light under the bridge
- landscape impact of the bridge on the river valley
- impact on the nationally rare Loddon pond weed in the River Avon

5.11 **Baseline Studies:** A number of baseline studies were undertaken during the course of the EIA. These included surveys on:

- built environment
- flora and fauna
- geotechnical aspects
- land use
- landscape
- traffic (flows and origination/destination)

5.12 In response to requests from the NRA, the Highways Agency commissioned hydraulics research and a study of Loddon Pond Weed (its status, distribution, and the feasibility of transplantation). The baseline studies also identified that more survey work would be required on badgers, bats, archaeology and the effects on the proposed Hampton Rock Geological SSSI. Information on these surveys was referred to in the Supplementary Statement. In addition, the geotechnical surveys and land use surveys led to minor alterations in the alignment of the preferred route. Neither the Highways Agency nor its consultant engineer were able to provide estimates of the costs of the baseline studies.

5.13 **Provision of Background Information / Consultation with Statutory Bodies:** Existing information was provided by a number of bodies, including the National Rivers Authority and the County Archaeologist (listed buildings and Scheduled Ancient Monuments). The consultant does not recall charges being made for this information

although he stated that more recently charges have been introduced. There was generally no problem obtaining the information.

5.14 **Liaison with the Public:** Although public consultation was not a formal element in the undertaking of the EIA, there had been a major public consultation exercise on the alternative routes in 1985. A leaflet was produced which included the background to the scheme, set out the choice of routes in text and on a plan. For each route, a short summary of the key points was provided:

- length
- cost
- buildings likely to be demolished
- land taken
- effect on farms
- landscape impact
- effect on traffic
- summary

5.15 A public exhibition was held from 9 - 20 July 1985 in Batheaston in a local church hall and members of the public were invited to complete a questionnaire. In addition, there was a Public Exhibition when the draft orders were first published in March 1989 in both Bathampton and Batheaston on 9-12 June and 14-17 June 1989. As a result of the comments received during this consultation, a revised set of orders were published in December 1990, and these were the orders which were taken at the Public Inquiry.

PROCESSING THE ORDER

5.16 The processing of the Order was a lengthy process, given that it involved a major public inquiry. The date of publication of the draft orders for the scheme was March 1990. The final decision was made in June 1992. During this period a large amount of resources were used by all interested parties, especially at the time of the Inquiry. Gibbs claim that they had a team of up to 30 consultants working full-time on the case during the Inquiry, and the Highways Agency stated that their involvement amounted to 6 people working full-time.

5.17 Both the Countryside Commission and Wansdyke District Council have estimated that they spent approximately 15 days reviewing the EIS as part of their preparation for the Public Inquiry. Although the NRA Conservation Officer only saw the ecological surveys, she felt that it would have been useful to have seen the EIS in its entirety.

5.18 The Inspector recommended that the A36 link should be deleted from the scheme, but that the Swainswick and Batheaston Bypasses should be constructed along the Department of Transport's proposed line. The Secretaries of State agreed with his recommendations.

POST EIA COSTS

5.19 **Project Redesign:** Taken as a whole, the planning (including the EIA) and decision-making process led to a large number of detailed design changes to the road scheme. Several of these led to the need to prepare a Supplementary Statement. For example, at

Bailbrook a 70 m cut and cover tunnel was included to reduce visual and noise intrusion to neighbouring properties, and the material to be used for retaining walls was changed to the more expensive reconstituted Bath stone.

5.20 **Mitigation:** The first EIS and supplementary EIS included a range of environmental mitigating features. The EIS states that:

> *"The proposals have been designed to minimise environmental impacts such as visual intrusion, land severance and the effects of noise. The measures adopted are as follows:*
>
> - *the alignment and levels of the proposed road have been designed to ensure the best possible fit with the surrounding landscape and existing features;*
> - *some embankments have been extended and shaped in order to blend them into the natural shape of the land. It is proposed to restore some of these areas back to agricultural use;*
> - *tree and shrub planting proposals have been introduced to link with existing areas of woodlands, tree groups and hedgerows and in places screening;*
> - *the Royal Fine Art Commission has been consulted on the appearance of most of the bridge and specialist advice is to be sought on the appearance Bailbrook retaining walls."*

5.21 The mitigating features were further refined and added to during the course of the Public Inquiry. Examples include the planting of 7,000 new trees and 70,000 shrubs to replace the 230 trees uprooted; one-third of the scheme was to receive visual protection from 2m high false cutting; and the road surface was to be a less intrusive 'black top' rather than concrete. At the request of the NRA, gaps were to be introduced into the Avon viaduct to allow for improved light penetration under the bridge, and a flood water storage scheme and wetland area were to be created by the Highways Agency. Although an estimate of the expenditure is not available, the cost of these measures was borne solely by the Highways Agency.

5.22 **Preparation of Conditions:** The road scheme had to be built in accordance with provisions of the decision letters. The Highways Agency estimates that the financial effect of accommodating all the environmental provisions, when compared to building a road at minimum-cost, would have increased the total scheme cost by approximately one-third (i.e. c.23.18 million ECU). For example, the cost of providing a flood storage area in the floodplain of the River Avon (which also acts as a nature reserve), and the relocation of badger setts was in the order of 1.95 million ECU. The Agency also estimates that 5% of the total time spent on the scheme specifically related to environmental issues. Were such issues as bridge design, design of retaining wall, etc., included, this would rise to c. 50% of total scheme cost.

5.23 **Arrangements for Monitoring:** Although monitoring provisions were not included in the EIS, there will be ongoing monitoring of the effects of the scheme, for example, on traffic numbers, and on flood levels and water storage.

6.0 REVIEW OF BENEFITS

PRELIMINARY STAGE

6.1 The main benefits to the Highways Agency of consultations on environmental issues in the early stages was to identify all the likely key issues, and not to be surprised at a later stage. It also helped inform the design of the scheme, and helped developer and its consultants familiarise themselves with the area.

EIA STUDIES

6.2 **Scoping to Determine Areas of Study:** Although no formal scoping exercise was undertaken, the above-mentioned consultations helped highlight issues of concern, and therefore focused the attention of the consultants preparing the EIS.

6.3 **Baseline Studies:** Undertaking baseline studies helped identify where there were deficiencies of knowledge, particularly in relation to a rare aquatic plant in the River Avon (Loddon Pondweed), and badgers and bats. Baselines studies on geology and archaeology were also useful in clarifying the nature of the features which might be affected.

6.4 **Consultation with Statutory Bodies:** This was a vital element of the whole planning process, and helped influence the final design of the scheme.

6.5 **Assessment of Effects:** The EIS helped to focus attention on some of the key environmental effects of the scheme. However, it was clear that the level of detail provided by the EIS was insufficient for the Public Inquiry and many supporting technical documents were referred to. There were some criticisms of the EIS. For example, the Countryside Commission considered that it failed to take account of the much wider strategic issues. Wiltshire County Council (a neighbouring local authority) claimed that it is unlikely that the EIS featured prominently in their evidence given at Inquiry, although nowadays it would be an important factor.

6.6 **Outputs from the Environmental Assessment:** The overall impression that emerges from undertaking research into the case study is that the EIS represented a useful tool but that its impact on the planning process was not as great as it could have been. However, once the Highways Agency came forward with its proposals for a road scheme to the east of Bath, the debate was dominated by environmental issues. These were discussed at the planning stage, at the route selection stage, in public consultation and discussions with consultees, as well as the Public Inquiry itself. It is virtually impossible to distinguish where the consideration of environmental effects due to the EIA process ended. What is clear, however, is that the production of an EIS formed only one part of the whole process of considering environmental issues.

6.7 **Liaison with the Public**: The Highways Agency found the publication consultation exercise extremely useful in clarifying people's concerns, and their preference over which route to select. This was a crucial part of the planning process. However, the public played no role in the formal EIA. Public exhibitions and photo-montages (not included in the EIS) were probably of more help in informing the public. It is noticeable that the EIS itself was hardly referred to in the Inspector's Report.

6.8 The Highways Agency also felt that the preparation of an EIS would help counter any criticism that it had not considered the environmental effects of its proposals in an area which it knew would be extremely sensitive.

PROCESSING THE APPLICATION

6.9 The undertaking of an EIA did not materially hold up an already lengthy planning process.

POST EIA STATEMENT

6.10 **Project Modifications/Redesign:** The EIA and the subsequent Public Inquiry together led to a number of significant changes in the design of the road which were aimed at reducing the environmental impacts of the road. One of the key mitigation measures currently being implemented is the creation of a large wetland/flood storage area, and the NRA Conservation Officer is very pleased with the way in which this is progressing. However, it is likely that this mitigation would still have been requested by the NRA in the absence of an EIS.

7.0 SUMMARY OF FINDINGS

7.1 The Highways Agency claims that it was very much feeling its way with the undertaking of an EIA. It was the first it prepared and it had no guidance available to help it with the process. The EIS should be seen in this light, and it should be remembered that the quality of the work now produced is of a very much higher standard.

7.2 It should also be noted that it has been extremely difficult to obtain any detailed information on time and financial costs. This is in part a reflection of the amount of time which has passed since the EIA was undertaken but also because it is very difficult for interested parties to separate out the EIA from the wider planning process.

7.3 **The Developer:** The Highways Agency found the EIA process helped it to build environmental factors into the design of the road from an early stage and it helped to pre-empt any surprises late on in the decision-making process. It also wished to appear more open and accountable, and saw the EIS as a way of achieving this.

7.4 **The Competent Authority:** The competent authority is the Department of Transport, the Department to which the Highways Agency is accountable. The EIA helped feed into the decision-making process in the Public Inquiry.

7.5 **The Statutory Consultees:** It is probably fair to say that the statutory consultees largely looked to the Inquiry to satisfy them of any concerns they might have, rather than the EIS itself. For example, some of the key mitigation measures including the creation of the wetland area ,were not identified until the Inquiry stage, whilst the Inspector's Report makes no mention of statutory consultees referring specifically to the EIS during the Inquiry. However, in general terms it appears likely that the EIS helped in their preparation of evidence/statements for Inquiry, albeit that differences emerged as to the interpretation of the effects on the environment.

7.6 **The Public Interest:** The production of an EIS represented only one mechanism for bringing the implications of the road scheme to the attention of the public. It is likely that the exhibitions probably played a more important role in informing public opinion.

7.7 **Costs and Benefits to the Environment:** There is little doubt that environmental considerations played an important part on the planning process for this particular road scheme. Indeed, with respect to the A36 Link, the Secretaries of State for the Environment and Transport concluded that:

> *"the Link's impact on the environment and recreational amenity taken with its prejudicial effects outweigh its advantages which are principally economic"* (para. 20 of the Decision Letter dated 30 June 1992).

7.8 The cost of the scheme was increased considerably in order to take into account environmental considerations. Although there is likely to be considerable relief from traffic for local communities affected by existing congestion, many interested parties argued unsuccessfully at the Inquiry that the road schemes in their entirety should not be built, and that a more strategic solution to traffic problems was required. The effects of the road scheme on the environment in general and the landscape in particular will undoubtedly be significant. Some of these effects will be ameliorated by mitigation measures proposed as a result of the findings of the EIA and the Inquiry. The end result, therefore, is that the building of the road scheme is likely to have both costs and benefits to the environment, and the nature of these depends very much on who you ask.

CASE STUDY 2. POULTRY DEVELOPMENT, BISHOPS TACHBROOK

1.0 INTRODUCTION

1.1 This case study report reviews the costs and benefits of the EIA process relating to the proposed poultry development at Bishops Tachbrook in the UK. It forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by Joanna Wright of Land Use Consultants, during April 1996. It included:

- familiarisation with the Environmental Statement (EIS);
- a site visit accompanied by the farmer (Mr K Evans of T.I Evans & Son) and his agent (Peter Bromwich from Peter Bromwich & Co.);
- a meeting with the farmer's agent;
- a telephone interview with the organisation responsible for preparing the EIS (David Howatson from the Agricultural Development and Advisory Service - ADAS);
- a meeting with the local planning authority case officer (Nick Hood from Warwick District Council);
- a review of the application file held by Warwick District Council;
- discussions with statutory consultees:
  - the Environmental Health Officer, Warwick District Council;
  - the Environment Agency (formerly the National Rivers Authority).

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The site of the proposed poultry unit is located approximately two miles to the south of Leamington Spa, outside the village of Bishops Tachbrook, in Warwickshire. The

surrounding area is predominantly open countryside with a small number of individual properties located nearby.

3.2 The site covers approximately 2.5 hectares, is privately owned, and like much of the neighbouring land, is under arable cultivation. The proposed development would consist of eight poultry rearing units houses which would contain a total of 240,000 birds at any one time, together with two domestic dwellings for the workers required to run the unit on a day-to-day basis. Depending on maintenance, the sheds should last 30 years, and providing that the enterprise is successful, the sheds will be gradually replaced.

3.3 The development was proposed for a number of reasons:

- Government policy has sought to reduce subsidies for agricultural production whilst encouraging alternative uses for current agricultural assets. As the future of enterprises such as dairying and arable become increasingly uncertain, the poultry unit would represent a step towards diversification and provide an alternative source of future income, particularly as the UK demand for poultry meat is currently increasing.

- In the late 1980s, a levy was introduced on corn produced and sold from an agricultural holding, and on a large acreage of land this can result in a substantial sum being deducted from the overall income from corn sales. This, coupled with a straw burning ban which was introduced in 1992, prompted the decision to investigate a farming enterprise which would consume both home produced corn and straw.

- The resulting litter from the poultry houses would provide a valuable source of nutrients which can be used on arable crops to reduce the amount of artificial fertilisers applied to the growing crop.

3.4 The total capital cost of the project is estimated at 1.46-1.53 million ECU[1] (excluding land acquisition costs as the land was already owned). Construction began in 1995 with the laying out of the access road, and the unit should be operational by early 1997.

4.0 DETAILS OF THE EIA PROCESS

4.1 This case study is a particularly interesting example as the planning application was initially submitted without an accompanying Environmental Statement. As a result of this, it is possible to compare the adequacy of the information provided for the purpose of determining a planning application in the absence of an EIS, against that which was provided as a result of the EIA process.

4.2 The planning application was originally submitted in outline form at the beginning of January 1991. Approximately ten weeks later, and following discussions with the applicant, the planning authority confirmed that under the Town and Country Planning (Assessment of Environmental Effects) Regulations 1988, an EIS would be necessary. This was because Schedule 2 of the Regulations requires an EIA for poultry units designed to

[1] All costs are given as 1991 prices.

house more than 100,000 birds which are deemed likely to have significant effects on the environment.

4.3 The planning application was then 'frozen' until the EIS was submitted in October 1991. Final planning permission for the poultry unit was granted in May 1994.

4.4 The EIS was prepared by ADAS during the period March - October 1991. It comprises two parts:

(i) a Non-Technical Summary (NTS);
(ii) a series of technical reports covering nine specialised areas.

The technical reports are bound together, along with the NTS (although the latter is also available as a separate publication).

4.5 The report is A4 'portrait' size, and follows a conventional format covering the following subjects:

• Non-Technical Summary		(37)
• Technical Reports:	A - Land Use	(17)
	B - Landscape	(15)
	C - Ecology	(14)
	D - Noise	(20)
	E - Odour	(10)
	F - Dusts	(8)
	G - Vermin	(6)
	H - Waste Materials	(29)
	J - Transport / Traffic	(14)

Figures in brackets indicate the number of individual sides of paper covered by text in each chapter; the total length of the document being 170 pages of text. Both the technical reports and the NTS include a number of A3 fold-out plans, whilst the NTS also includes several photographs.

4.6 It is broadly acknowledged that the EIA process was a learning experience for both those involved in preparing and submitting the EIS, and those responsible for evaluating the information it provided. The farmer's agent and the ADAS team had little previous involvement with EIA, whilst the local planning authority had never dealt with an application which was accompanied by an EIS.

4.7 It is not the purpose of this report to carry out an independent review of the Environmental Statement. However, it is worth noting some of the views of those who studied the EIS. For example, the local planning authority found the EIS to be comprehensive, and 'adequate for the purposes of determining the planning application'. Whilst it was felt that the report could have been more concise, this was a criticism levelled at Environmental Statements in general. The Environmental Health Officer, whose comments on the findings of the EIS were requested by the local planning authority, agreed with both the predictions relating to dust and vermin, and the measures suggested to minimise these impacts. Whilst he explained that it was difficult to comment

on the conclusions relating to odour, as this is a subjective matter, the wind charts did help in assessing the proposals.

4.8 Some omissions in the report were cited by the consultees. For example, Whitnash Town Council argued that whilst the incineration of bird mortalities on site was mentioned in the EIS, no reference was made to a proposed incinerator. Whilst acknowledging that the EIS recognised that the proposal would affect users of the public path, the Ramblers Association felt that insufficient information was provided on the impact of odours on users of the bridleway, and on measures to control the spread of disease.

5.0 REVIEW OF COSTS

PRELIMINARY STAGE

5.1 Strictly speaking, costs during this period refer to expenditure prior to the lodging of the planning application as the EIS was submitted at a later stage. However, similar procedures would have been followed, and expenses incurred, had the EIS been submitted at the same time.

5.2 **Site Selection:** The examination of alternative sites was somewhat restricted, as the aim was to find a alternative use for existing land. However, a number of selection criteria had to be satisfied, as the unit should be self contained and easily accessible in order to:

- ensure efficient transport of birds and materials;
- minimise disease risks from other units or general visitors to the farm;
- ensure site security and welfare of birds.

5.3 In identifying the precise location of the unit, within the land owned by the farmer, environmental criteria were taken into consideration. The site was chosen because it was relatively low lying, screened to a certain extent by land form, and existing hedgerows and trees, and away from major settlements.

5.4 **Feasibility Studies:** Although there was no formal feasibility study as such, discussions between the farmer and farmer's agent began approximately 12 months prior to the submission of the planning application. Technical advice was also provided by Sun Valley Poultry Ltd and Jacques Hall & Co. Ltd, whilst one meeting was held with the local authority, in order to explain the proposals.

5.5 **Summary of Costs:** The technical advice, involving one meeting and follow-up correspondence, was provided free of charge. The fees for the farmer's agent during this period were approx. 2440 ECU, which equates to 17% of the total cost to get permission, and 0.16% of the total capital costs.

PROJECT SCREENING

5.6 As previously mentioned, the EIS was requested under Schedule 2 of the UK Regulations as there was concern over the possible environmental impacts of the poultry units which were designed to house more than 100,000 birds.

5.7 Although the local planning authority is unable to give a precise estimate of the time taken to determine the need for an EIS, discussions took place over a period of two months. During this time, a number of bodies were consulted, including the County Highways Department, the Environmental Health Officer, neighbouring district councils, and the National Rivers Authority (the Environment Agency from 1.4.96). Two officers from Warwick District Council also visited existing poultry units in Herefordshire to familiarise themselves with the nature of such developments.

5.8 Whilst the screening process was quite lengthy, this was partly because the local planning authority had not previously dealt with an EIS. For example, planning officers from the County Council were consulted as they had more experience with EIA procedures.

5.9 The farmer does not feel that he incurred any additional costs due to the delay in requesting an EIS, as he was not ready to begin construction at that stage.

EIA STUDIES

5.10 **Scoping to Determine Areas of Study:** No formal scoping exercise was undertaken, partly because as an agricultural advisory service, ADAS were already familiar with the possible impacts of such developments. However, the local planning authority thought that it was unfair to request an EIS without explaining the key concerns, so met with ADAS to clarify the range of issues to be assessed. ADAS then provided the farmer with a 'schedule of impacts which should be considered'.

5.11 The local planning authority estimated that two days were spent in determining the scope of the study (excluding the time spent in building up the background information necessary for making these decisions). The key concerns of the public were also identified at this stage, as part of the consultation on the submitted planning application.

5.12 **Baseline Studies:** A number of in-house baseline surveys were carried out by ADAS, including:

- the recording of existing background noise levels;
- general observations on odour and air quality;
- a review of the agricultural land quality.

Whilst an internal charge was levied on these surveys, the overall expense was included within the cost for the EIS.

5.13 **Provision of Background Information / Consultation with Statutory Bodies:** Existing information was provided by a number of bodies, including the National Rivers Authority and the County Archaeologist. Whilst no fee was payable for this information, charges have since been introduced.

5.14 The local planning authority also provided a number of Ordnance Survey maps for a negligible cost of 16 ECU, although these maps would have been needed for the purpose of lodging a planning application in any case.

5.15 It is difficult to break down the costs of this stage, as the collection of information was rolled together with the consultation, in order to save time. However, this combined work accounted for a considerable amount of the total time spent preparing the EIS. No extra costs were incurred as a result of delays in the provision of information.

5.16 **Liaison with the Public:** A formal consultation exercise was not undertaken during preparation of the EIS, as the key issues had been identified following submission of the planning application.

EIA STATEMENT

5.17 **Writing the Statement:** Once the necessary information had been collected, the report took approx. 15 person days to write up. Although there was little consultation at this stage, ADAS did contact the local planning authority when they were at the point of compiling the draft EIS, to identify any further concerns that needed to be addressed in the report. The draft EIS was not made publicly available prior to publication.

5.18 **Printing and Publishing the Documents:** The printing of three full copies (including technical reports) and approx. five summary reports was included within the overall price for the EIA. The Non-Technical Summary was available to the public free of charge, whilst the full EIS cost 61 ECU. The latter simply reflected the cost of printing and assembling the report and no attempt was made to recoup any of the costs associated with undertaking the EIA.

5.19 **Summary of Costs:** Although the farmer paid 8660 ECU for the EIS, this is a considerable underestimation of the real cost of preparing the report. This was largely because ADAS put in a low bid as they were keen to secure the project in order to increase their EIA experience. This lack of experience also meant that the work took more time than originally anticipated, and ADAS estimate that the EIS actually cost 18 300 ECU in terms of their time, with the additional costs being absorbed by themselves.

5.20 The price paid for the EIS represents 61% of the total cost of obtaining permission, and approx. 0.6% of the total capital costs.

PROCESSING THE APPLICATION

5.21 The planning application was submitted to Warwick District Council in January 1991, together with an application fee of 2800 ECU. No supporting information was provided, apart from the EIS, and the local planning authority did not request any supplementary information.

5.22 The planning officer estimated that he spent 1-2 days examining the EIS. A formal review of the report was not undertaken, instead the planning authority relied heavily on the comments of the statutory consultees. This included the officers responsible for environmental health and amenities, whose time is subject to internal charging mechanisms. For example, the Environmental Health Officer estimates that he spent approximately 1 day reviewing the EIS, and 2 days examining the mitigation proposals.

5.23 Although there was no formal public consultation, the EIS was forwarded to adjoining occupiers, the relevant parish and town councils, and a number of other organisations

which had previously expressed concern. Further time was then spent by the local planning authority in considering their comments

5.24 The processing of the application was delayed for a number of reasons, particularly because the EIS was requested subsequent to the lodging of the planning application. However, this had no real financial implications for the farmer, as he was not in a position to begin construction.

POST EIA COSTS

5.25 **Project Redesign:** The EIA process did not result in any significant changes to the project design. Whilst minor changes were made to the landscaping proposals following comments from Warwick D.C's Amenities Officer, this is not expected to have serious cost implications.

5.26 **Mitigation:** Whilst a number of mitigation measures were included in the EIS, it was argued that most of these would still have been proposed in the absence of an EIA. The farmer's agent did not feel that the implementation of the mitigation proposals would prove to be too costly. For example, to minimise the visual impact of the development, it was agreed that the feed bins should not rise above the roof line. However, lower and wider bins are now sold as a standard design.

5.27 Further landscaping measures, such as the construction of an earth bund and tree planting, should not be too costly as the farmer already has most of the materials and equipment needed. In addition, the work will be fitted in around the other work on the farm, when it is quiet. The trees for landscaping will be planted in 1.2m widths and should cost around 1220 ECU.

5.28 **Preparation of Conditions:** Twenty-four conditions were attached to the planning permission, covering both the construction and operational stages. These were wide-ranging and included measures to protect landscape quality, retain control over future development, and protect public access. The cost of drawing up the formal authorisation and preparing conditions was borne by the local planning authority and not passed onto the farmer.

5.29 **Legal Agreements:** The farmer entered into a Section 106 Agreement, confirming that a range of additional environmental works would be undertaken as part of the development. The drawing up of this agreement was a lengthy process.

5.30 **Arrangements for Monitoring:** Monitoring provisions were not included in the EIS, although in hindsight, the planning officer felt that this may have been helpful. Warwick District Council will monitor dust and odour at their own expense, although any infringements of conditions or agreements will result in an immediate request for the defects to be remedied.

6.0 REVIEW OF BENEFITS

PRELIMINARY STAGE

6.1 The identification of alternative sites was somewhat restricted, as the aim was to find a new use for existing land. However, environmental factors were taken into consideration, and the final location was chosen because it was relatively low lying, away from major settlements, and screened to a certain extent by existing landscape features.

EIA STATEMENT

6.2 **Scoping to Determine Areas of Study:** The local planning authority thought that although the key issues would probably have been identified anyway, it was useful to start with a broader analysis of possible concerns.

6.3 **Baseline Studies:** Although the baseline studies did not really identify any environmental issues that had not been highlighted through the scoping study, they did provide some useful information. For example, the ecological data for that area is now more detailed then that which was previously held.

6.4 **Consultation with Statutory Bodies:** Both ADAS and the local planning authority found that the detailed discussions were very useful, both in the amount of information that was provided and in identifying where conflicts were likely.

6.5 **Assessment of Effects:** The local planning authority found that the EIA process had been particularly useful because it had 'stretched the boundaries' beyond more traditional land use considerations, and had examined issues such as dust, odour, vermin and waste. Whilst these concerns are intrinsically linked to the planning application, it was felt that without the EIS, planning officers would have had to rely more on the expertise of the Environmental Health Department.

6.6 In addition, the planning officer considered that concerns relating to more familiar issues had been clarified through evaluation in an EIS.

6.7 When the initial round of consultations on the planning application began in February 1991, officers from the adjoining local authority, Stratford District Council, explained that they were unable to provide a formal response as the application did not provide adequate information on the disposal of waste, and the impacts associated with dust, noise, and odour. However, once they had examined the EIS which followed, they were able to state that the Authority did not wish to sustain an objection to the proposals.

6.8 In a similar way, the County Highways Department originally lodged a holding objection requiring the applicant to provide detailed traffic generation figures for the proposed development. However, on the basis of the information provided in the EIS, they were able to remove their objection.

6.9 **Outputs from the Environmental Assessment:** The local planning authority believed that the EIS was comprehensive and adequately covered the key issues. However, it was felt that the report could have been more concise, and presented in a way that enabled the key sections to be directly transposed into the report for the planning committee. In

this case, the planning officer had to spend a number of hours rewriting and summarising parts of the report for presentation to the planning committee. Given the pressure to determine applications within the statutory period (16 weeks for applications with an EIA), the planning officer felt that it would be helpful if the authors of an EIS could keep in mind that the purpose of the report is to assist in determining a planning application.

6.10 The local planning authority also expressed a more general concern regarding the objectivity of any EIS, given that the authors are ultimately answerable to the developer. It was suggested that the local authority should have some influence on selecting the organisation which is to undertake the Environment Assessment.

6.11 **Liaison with the Public**: The local planning authority felt quite strongly that the EIS had helped in liaison with public, as a lot of questions had been asked following the submission of the original application. The fact that a comprehensive Non-Technical Summary was available free of charge was seen to be particularly helpful.

6.12 By providing far more detail than the planning application alone, the EIS had given the public something firm to respond to. For example, the response from Bishops Tachbrook Parish Council clearly relied heavily on the information contained in the EIS, and referred to the number of tonnes of excess waste which would be produced, and the frequency of lorry movements. The planning officer felt that the public were confident that all the important issues were being taken into consideration.

6.13 In support of the belief that the EIS did lessen public concern, an article that appeared in the local paper following submission of the application, but prior to the preparation of the EIS, claimed that 'fears over hen factory' were causing 'shock waves throughout the community'. Although a number of local organisations remained concerned about the proposals having read the EIS, the 'shock waves' were not clearly evident and there were no objections from adjoining landowners.

PROCESSING THE APPLICATION

6.14 Whilst the local planning authority felt that the EIS had added to the length of time taken to determine the application, the farmer's agent felt quite strongly that the whole process of obtaining planning permission would have taken longer had the EIS not been prepared.

POST EIA STATEMENT

6.15 **Project Modifications/Redesign:** Whilst the EIA process did not result in any significant changes to the project design, minor changes were made to improve the landscaping proposals.

6.16 **Preparation of Conditions / Legal Agreements:** When conditions are attached to a planning permission, they have to meet a number of criteria, including that they must be 'relevant to planning'. The planning officer experienced some difficulty in relating some of the more broader environmental concerns such as the impact of dust, directly to land use planning. As a result of this, measures to protect the environment were covered by a Section 106 legal agreement. However, the officer did feel that as his experience with EIA increased, it would become easier to phrase the conditions so that their link with land use planning was more apparent.

6.17 A complicated legal agreement can take the local planning authority two to three months to finalise. In this case however, they found that the EIS significantly reduced the time taken to draft the agreement, as much of the information could be taken directly from the report. Had the EIS not been prepared, the local authority would have had to have done much more of the preparation work themselves.

7.0 SUMMARY OF FINDINGS

7.1 When considering the costs and benefits relating to the EIA process for this development proposal, it is important to remember that it was a learning experience for both those involved in preparing and submitting the EIS, and those responsible for evaluating the information it provided. It would not be unreasonable to expect that in future cases, the costs could be reduced and the benefits increased. For example, the local planning authority may well find that in future, it takes less time to determine the need for an EIS, to identify the key impacts and to review the final report. At the same time, increased familiarity with the nature of the issues addressed in EIA may make it easier to tie the mitigation measures stated in the EIS in with planning conditions.

7.2 It has been argued that the information contained in an EIS would be provided with a planning application as a matter of course, and that the EIS is just a co-ordinated (and sometimes unnecessary) means of presenting this information. However, this was clearly not the case with this example, as it was not possible for the competent authority, the statutory consultees or other concerned bodies to form an opinion on the basis of the information provided.

7.3 The views of each of the principal participants, in terms of their experience of the costs and benefits arising from the EIA process, are summarised below:

7.4 **The Developer:** Although the EIS represented over 60% of the total cost to the farmer of obtaining planning permission, his agent believes that the EIS sped up the process of obtaining permission considerably. He also feels that the open and professional way in which the information was provided, has improved the reputation of the farmer with the local planning authority.

7.5 **The Competent Authority:** As a result of the EIS screening and scoping phases, the earlier stages of determining the application did take longer, although this was partly because the EIA was not requested at the outset. Later on in the process however, the EIS did help to clarify the key environmental issues, and significantly reduced the time spent preparing the legal agreement

7.6 Whilst the local planning authority believe the EIA process to be potentially very beneficial, concerns were expressed about the objectivity of Environmental Statements, and the length of time needed to interpret the results and present this to the planning committee.

7.7 **The Statutory Consultees:** The original application did not provide the statutory consultees with the information they needed in order to come to an informed judgement on the proposals. Whilst the EIS did not remove all their concerns, it enabled them to make an educated response, thereby fulfilling their statutory duties.

7.8 **The Public Interest:** Again, the original planning application did not address local concerns, and prompted many requests for further information. The EIS did not alleviate all these concerns, but did highlight those areas where in reality, their interests were likely to be most affected.

7.9 Whilst the 'shockwaves throughout local community' prior to the EIS, may well have been exaggerated in the desire for a more newsworthy story, it is probably fair to say that the EIA process did lessen public concern.

7.10 **Costs and Benefits to the Environment:** The project design remained largely unaltered as a result of the EIS, although the landscaping proposals were amended to further reduce the visual impact of the development. Although it is argued that the mitigation measures would have been proposed in any case, the methodical way in which the EIS was prepared would have highlighted any areas where mitigation measures were lacking. It also provided a sound platform for the drawing up of the legal agreement relating to environmental protection.

7.11 As the development is still under construction, it is not yet possible to determine whether the EIS has accurately predicted the impacts on the environment, or the degree to which the mitigation measures have been successful.

CASE STUDY 3. BRYN TITLI WINDFARM, POWYS

1.0 INTRODUCTION

1.1 This report reviews the costs and benefits associated with the EIA process as they applied to the development of Bryn Titli Windfarm, in Wales. The report forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom, and follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by Liz Wood-Griffiths of Land Use Consultants, and involved face to face meetings with the developer and competent authority, and telephone interviews with the statutory consultees.

2.2 The environmental statement entitled 'Bryn Titli Windfarm Environmental Statement' was provided by National Wind Power Ltd and read by Ms Wood-Griffiths prior to any meetings.

2.3 On Friday 22nd March 1996, Ms Wood-Griffiths met with Mr Peter Hinson, Development Manager, National Wind Power Ltd. This was followed by a meeting with Mr Jeremy Wright, of Radnorshire District Council on Wednesday 27th March 1996.

2.4 Telephone interviews were then conducted with the relevant statutory consultees, and interest groups. The following people were contacted as part of the study:

- Ira Hughes — Countryside Council for Wales
- Dave Drewitt — Countryside Council for Wales
- Tony Prater — Royal Society for the Protection of Birds (RSPB)

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The proposed development involves the construction of a 22 turbine windfarm known as the Bryn Titli Windfarm. The site is located in mid Wales, 8 km to the north west of Rhayader, towards the eastern margin of the Cambrian Mountains.

3.2 The Bryn Titli site is located on a large upland plateau area at an elevation of between 400 - 500m above ordnance datum (AOD), rising to 491m AOD.

3.3 The turbines planned for the site are of "medium" size with 35-37m diameter rotors and will have a combined maximum output of 9-10 Megawatts. The turbines will be arranged

in a semi-circular pattern following the high ground of the plateau to benefit from the prevailing south westerly winds, and the windfarm will have an annual energy capture of approximately 25 million Kilowatt hours.

3.4 The windfarm was developed by National Wind Power, and the total project cost was 13.42 million ECU. The competent authority was Radnorshire District Council.

4.0 DETAILS OF THE EIA PROCESS

4.1 The Bryn Titli windfarm evolved from a previous application, submitted in July 1991 to develop a 33 turbine windfarm, known as the Marcheini windfarm. This proposal covered a larger land area and extended across the designated SSSI, to include Drysgol hill to the east and Yr Wylorn to the south.

4.2 Following submission of the planning application, National Wind Power were advised by the competent authority, that a formal environmental statement was required to accompany the planning application. An environmental statement for the Marcheini Windfarm was undertaken and submitted to the competent authority in June 1992. In undertaking the assessment, the technical design of the windfarm was modified, and as a result, the number of turbines proposed was reduced from 33 to 26. This reduction was possible because of the development and availability of new wind turbines which were capable of an increased output from 300kW to 400kW.

4.3 Following the submission of the environmental statement, the planning application was called in by the Welsh Office in August 1992, before a final decision had been made by the competent authority. In view of the delay that the inquiry process would entail, and the fact that turbine design was changing, National Wind Power decided to withdraw the application in order to re-assess the project.

4.4 This case study reviews the EIA process as it applied to the second application for the Bryn Titli windfarm. The environmental assessment was undertaken between October 1992 and March 1993 by National Wind Power with specialist input provided on landscape, ecology, hydrology and planning by external consultants.

4.5 The environmental statement comprises two documents. The main environmental statement is in A4 format and consists of 197 pages. It is set out in 13 chapters as follows:

Preface		(2 pages)
1	Introduction	(6 pages)
2	Project Description	(10 pages)
3	Project Construction	(11 pages)
4	Planning Policy	(24 pages)
5	Landscape and Visual Impact Assessment	(46 pages)
6	Ecological Assessment	(23 pages)
7	Ornithological Assessment	(49 pages)
8	Archaeological Assessment	(12 pages)
9	Electro-Magnetic Interference	(1 page)
10	Hydrological Assessment	(4 pages)
11	Noise Assessment	(5 pages)
12	Safety	(2 pages)
13	Economic Implications	(2 pages)

4.6 A separate A3 document is also provided which contains 32 illustrative figures.

4.7 The planning application for the Bryn Titli windfarm was submitted to Radnorshire District Council on 15th March 1993, and permission for the development was granted in June 1993.

4.8 The Windfarm was constructed between September 1993 and May 1994, and the total project cost was 13.42 million ECU.

5.0 REVIEW OF COSTS

COSTS TO THE DEVELOPER

PRELIMINARY COSTS

5.1 **Site Selection** Four potential sites, all within the Rhayader area of Wales were originally considered for development. The sites were considered against a number of basic criteria, and the Bryn Titli site was identified as being the most suitable. There is no cost information available for this stage of the process, although the environmental statement indicates that site selection is "a long, complicated and costly process which requires the balancing of many issues over a period of several months." The principal costs associated with this stage of the process therefore are likely to be internal staff time costs.

5.2 **Costs Associated with Marcheini Application** The application for the Marcheini development was submitted in July 1991, and following the submission of the application, the developer was notified that a formal environmental statement was required to accompany the planning application. The developer therefore carried out a full environmental assessment of the Marcheini proposal which was submitted to the competent authority in June 1992.

5.3 A number of discussions were held between the developer, the competent authority and the Countryside Council for Wales on the scope and content of the environmental statement. It is estimated that 10 person days were spent by the developer in discussion with the statutory bodies during the preparation of the environmental assessment.

5.4 As part of the environmental assessment of the Marcheini proposal, the developer commissioned studies on landscape, fauna (birds), flora, access, archaeology, soil assessments, and ground surveys. The cost of each survey is set out below:

• landscape	9150 ECU
• fauna (birds)	305 ECU
• flora	1464 ECU
• access	7320 ECU
• archaeology	1708 ECU
• soil assessments	7320 ECU
• ground surveys	2440 ECU

5.5 The total cost of the baseline surveys commissioned for the Marcheini application therefore amount to 29 707 ECU.

5.6 When the planning application was called in, and it became apparent that the application would be subject to a planning inquiry, National Wind Power decided to withdraw their application. The environmental assessment undertaken for the Marcheini proposal was one of the earliest environmental assessments for a windfarm to be undertaken, and whilst the Marcheini proposal was initially considered to be an appropriate development, consultation with the Countryside Council for Wales highlighted concerns relating to the environmental sensitivities of the area. Of particular concern was the potential impact of the development on the designated SSSI. National Wind Power accepted that the planning application, and supporting documentation did not fully address the specific environmental issues relating to the site, and therefore decided to withdraw the application in October 1992, and reassess the design and layout of the site as part of a new planning application.

5.7 **Summary of Costs** A total of 15 months elapsed between the developer submitting the planning application for the Marcheini site and then deciding to withdraw the application. During this time an environmental assessment of the proposal was undertaken, and the project design was modified. Approximately 30 500 ECU was spent on baseline environmental studies, which represents 0.22% of the total project cost.

PROJECT SCREENING

5.8 The developer determined the need for an EIA for the Bryn Titli Windfarm application in consultation with the local planing authority. An environmental assessment had been required for the previous Marcheini Windfarm application, and having undertaken the scoping exercise for the Bryn Titli development, the developer realised that an environmental statement would need to be submitted with any planning application. This was confirmed by the local planning authority.

EIA STUDIES

5.9 **Scoping** The scoping exercise was put out to tender, and consultants were appointed to review the previous environmental assessment, and prepare a scoping report identifying areas for further study. This study was undertaken over a 3 month period, and the consultancy fees paid were 2440 ECU. In addition, one person employed by National Wind Power was also involved in the scoping exercise, and spent approximately 30% of their time over the 3 month period working on the scoping studies. This represents an internal cost of approximately 9760 ECU, making the total cost of the scoping exercise 12 200 ECU.

5.10 National Wind Power however commented that they believed the consultants had kept their own costs down in the hope that they would secure the contract for the environmental assessment.

5.11 **Baseline Studies** Additional baseline studies were commissioned to supplement the information already collated during the previous application. The baseline studies were undertaken over a four month period, and the topic areas covered and costs of each study are set out below:

- Landscape 18 300 ECU
- Surveys 1830 ECU
- Ground ecology 12 200 ECU
- Birds 4880 ECU
- Planning 9150 ECU
- Hydrology 976 ECU

5.12 **Provision of Background Information** Apart from the baseline studies undertaken by National Wind Power as part of the Marcheini application, there was very little information available relating to the site. The local planning authority were helpful and provided the information on planning which the developer requested. The statutory consultees were less inclined to provide the full information.

5.13 **Consultation with Statutory Bodies** During the course of the EIA studies, consultations were carried out with the local planning authority and statutory consultees. It is estimated that approximately 25 person days were spent in consultation and meetings by National Wind Power personnel, and approximately the same amount of time was probably spent by external consultants.

5.14 **Public Consultation** Consultation with the public and was carried out through local contacts. The area is sparsely populated, and no public meetings were held. However, the policy of National Wind Power now is to hold public meetings for every project they are involved with, although this policy was not in place when the environmental assessment for Bryn Titli was being undertaken.

5.15 **Assessment of Environmental Effects and Mitigation** The main areas of potential adverse effect, identified during the assessment were concerned with the effects on the landscape, ecology, and birds, and in a broad sense, amenity issues (i.e. the potential for the development to cause noise, visual intrusion, and traffic disruption).

5.16 Mitigation measures were introduced to minimise these impacts, and the design of the project was modified. The number of turbines was reduced, and some of the turbine positions were altered. The whole construction method was revised, and further work on the reinstatement of the site was undertaken. These modifications may have increased costs to a minor degree, but not significantly.

EIA STATEMENT

5.17 The environmental statement was written throughout the timescale of the project. It is estimated that it probably took about two months of combined effort to produce the document, with input from both in house personnel and external consultants.

5.18 Thirty copies of the document were printed and this cost 5490 ECU.

PROCESSING THE EIA

5.19 The time taken to prepare the documentation to support the planning application is estimated at having taken approximately 10 man days, which would have been spread over a 6 month period. Most of the information required as part of the planning

application was contained within the environmental statement, and there was very little additional information required.

5.20 The planning application fee was approximately 3050 ECU. At the time of the application, the planning fee was based on the land area covered by the development. This has subsequently been altered, and planning fees are now based on the number of turbines to be erected.

5.21 Following submission of the planning application, the developer estimates that approximately 10% of one persons time was spent liaising with the competent authority whilst the application was being processed. Most of this time was spent on phone calls and correspondence over the three month period. There were a number of objections to the scheme, and the developer estimates that approximately 5 person days were spent dealing with issues arising from these objections.

5.22 The Marcheini and Bryn Titli windfarm proposals were the first planning applications for windfarm development that Radnorshire District Council had received. National Wind Power therefore took members of the planning committee to operating windfarms in the neighbouring district of Montgomeryshire, and to Cornwall, to enable them to see the generating turbines in operation.

5.23 The planning application was submitted on 12th March 1993, and permission was granted on the 11th June 1993 subject to 24 planning conditions. The decision was made within the statutory 16 week time period, and there was no delay.

5.24 The developer also entered into a section 106 agreement with the local planning authority. This covered the land management and bird monitoring schemes, and also included a commitment by the developer to restore television picture quality should the turbines affect the television and radio signals. The legal fees associated with the section 106 agreement were 3050 ECU.

SUMMARY OF EIA COSTS

5.25 The total fees paid by National Wind Power during the development of the Bryn Titli site are summarised below:

Preliminary Stage	
Baseline Studies	29 707 ECU
EIA studies	
Scoping	2440 ECU
Baseline Studies	47 336 ECU
Printing costs	5490 ECU
Legal Fees	3050 ECU
Total Fees	**88 023 ECU**

5.26 The fees paid to consultants represent 0.65% of the total project cost. In addition to the fees paid to external consultants it is estimated that the internal costs to National Wind Power of undertaking the assessment would amount to approximately 48 800 ECU. This gives a total cost of 136 823 ECU which represents 1.02% of the total project cost.

POST EIA COSTS

5.27 **Project Construction** The Bryn Titli windfarm was constructed between September 1993 and May 1994.

5.28 **Monitoring Costs** The bird monitoring programme agreed as part of the section 106 agreement, has been undertaken by the local office of the RSPB, and has cost 36 600 ECU to date.

5.29 As part of the environmental enhancement measures identified during the EIA process, National Wind Power agreed to a land management scheme, and the company contributes 6100 ECU per annum to this scheme.

5.30 **Reinstatement Costs** After 25 years, the estimated life of the windfarm, the turbines will be dismantled and the land reinstated. It is estimated that the cost of reinstating the land will be 61 000 ECU.

COSTS TO THE COMPETENT AUTHORITY

5.31 The competent authority were not able to provide precise details on the time and costs to the authority of processing the application. The authority does not require officers to record the time spent on particular applications, and the case officer who originally dealt with the application had subsequently left the authority. Nevertheless, the Director of Planning was able to provide some information about the process that had been followed, and the possible cost implications to the authority of dealing with the application.

PRELIMINARY STAGE

5.32 Radnorshire District Council first became involved in the development in June 1991, prior to the submission of the planning application for the Marcheini windfarm. There was a preliminary meeting in which the competent authority set out the issues which would need to be covered in the planning application.

5.33 Following the submission of the planning application, the authority decided that the application needed an environmental assessment under Regulation 9 of the Town and Country Planning (Assessment of Environment Effects) Regulations 1988, and notified the developer in July 1991. A meeting was held between the developer and the competent authority during which the issues which would need to be covered by the environmental assessment were discussed.

5.34 During the preparation of the environmental statement, the competent authority was involved in discussion with the developer. The time spent in these meetings and discussions was similar to the time inputs that would be required in pre-application discussion with most major developments, and the competent authority do not believe that their time inputs were increased as a result of the requirement to prepare and environmental statement.

5.35 Following submission of the environmental statement in June 1992, the competent authority requested some additional information from the developer which was received

in July 1992. The competent authority reported that they had a good working relationship with the developer, and that additional information was supplied promptly when requested.

5.36 The application for the Marcheini proposal went before the planning committee on 25th August 1992. However, on 21st August 1992, the Welsh Office decided that the Secretary of State should determine the application, and therefore the committee were not able to determine the application when it came before them. The Director of Planning recommended that the application should be refused, but the committee resolved at their meeting that they would have approved the application if it had been their decision.

PROCESSING THE APPLICATION

5.37 The Bryn Titli application would have been subject to the standard administrative procedures followed by the department. Approximately one day would normally be spent by administrative staff informing statutory consultees of the application and sending out relevant documents. The case officer for the development would then usually spend 1.5 - 2 days in meetings with the applicant, and site visits.

5.38 The remaining workload and time inputs are then fixed by correspondence and the amount of interest that the application generates, as the time taken to process an application is strongly influenced by the public response to the development proposal. Time inputs also vary as the planning procedure progresses, with much activity at reporting times, when a case officer may be working full time on an application whilst at other times there is little or no involvement. In general, the time spent by the case officer on an application would amount to approximately 2-3 person weeks for each application.

5.39 However, applications which are accompanied by environmental statements are usually for large and more complex developments, and are usually dealt with by senior planning officers. There may be indirect cost to the department which are not quantifiable, which result from the removal of a senior officer from other aspects of the departments work.

5.40 The planning fee for the Bryn Titli application was approximately 3050 ECU, but this figure would not have covered the cost to the local authority of processing the application. The statutory time period for processing an application submitted with an environmental statement is 16 weeks, and the authority determined the application within the statutory period.

5.41 The Director of Planning recommended that the application should be refused on the grounds of visual impact and ecological effects on the adjacent SSSI. However, the planning committee voted in favour of the development, believing that the development would bring new investment to a farming based community, and local jobs.

5.42 Although it was not possible to provide a detailed breakdown of the time and costs incurred processing the application, the competent authority did not believe that the environmental statement had increased the time or costs of processing the application. The costs of advertising the application, and arranging public consultations were no more than they would have been for an application submitted without an environmental statement. In fact, the authority believed that the cost of processing the application may

have been higher if an environmental statement had not been submitted. The environmental statement provided information which allowed the authority to dispose of those issues which were not significant, and concentrate on the critical issues related to the development. The absence of an environmental statement would have raised more questions, and led to more correspondence between the developer the competent authority and the statutory consultees.

POST EIA COSTS

5.43 The development did not bring the economic benefits to the community that had been hoped, and resulted in bitter disputes between those who were in favour of the development and those who were opposed.

5.44 The contract to supply the turbines was won by a Danish company, and Danish labour was used to construct the windfarm. The decision to approve the development was weighed between the impact of the development on the landscape and the creation of local jobs. The economic benefits were considered to outweigh the landscape impact, but these benefits have not occurred.

COSTS TO THE STATUTORY CONSULTEES

PRELIMINARY STAGE

5.45 **Countryside Council for Wales:** The local officer for the Countryside Council for Wales was involved in pre-application discussions with the developer relating to the Marcheini application, and when the developer agreed to carry out an environmental assessment, CCW set out the issues which they would wish to see covered by the study. The total time spent by the local officer during the preparation of the Marcheini application amounted to approximately 3 days.

5.46 Following the submission of the environmental statement, CCW became more heavily involved. Several people were involved in survey work, and correspondence. It is estimated that the equivalent of 1 person month was spent in total.

5.47 **RSPB:** The RSPB indicated that they are rarely consulted as part of any pre-application discussions.

EIA STUDIES

5.48 **Countryside Council for Wales:** CCW had very little involvement with the developer during the preparation of the environmental statement for the Bryn Titli development. However, the comments made by CCW in relation to the Marcheini application had been noted and taken into account in the preparation of the environmental statement.

5.49 The review of the Bryn Titli statement took less time than the previous application, and it is estimated that approximately 1 week was spent reviewing the assessment. Most of the agency's concerns had been addressed, but they did suggest that the developer should enter into a land management agreement to improve the ecological value of the site.

5.50 In addition to the time spent by the local office of the CCW, there was also some input from the agency headquarters. This was in relation to the planning policy issues which the development raised. It is estimated that for the Bryn Titli application, between 2-3 person weeks in total was spent on the application. This estimate includes the time spent in site meetings, internal discussions, and administration.

5.51 **RSPB:** The RSPB were notified of the planning application. The time taken to respond to the application was approximately four person days, and would have involved a site visit, review of the statement and drafting the response.

POST EIA COSTS

5.52 **Countryside Council for Wales:** Following the grant of planning permission, CCW have been involved in work relating to the establishment of the land management scheme. Approximately 2 person weeks have been spent to date, but this work is ongoing.

6.0 REVIEW OF BENEFITS

BENEFITS TO THE ENVIRONMENT

6.1 In supporting the proposal to develop the windfarm, the environmental statement refers to the benefits that result from the use of renewable forms of energy, and the need to cut down on global carbon dioxide emissions. The environmental statement states that the amount of electricity generated by the windfarm each year would result in the emission of 26,000 tonnes of carbon dioxide and other pollutants were it to be generated from a conventional power station.

6.2 The major issues of concern relating to the Marcheini application related to the landscape impact, bird strike, and the effect on the SSSI. In the original planning application, it was proposed to locate some turbines within the area designated as a SSSI. The environmental assessment carried out for the Marcheini proposal resulted in a reduction in the number of turbines, and the turbines proposed within the SSSI were removed.

6.3 The Bryn Titli assessment resulted in a number of modifications to the project design which minimised the environmental effects of the development. The method of working for the construction of the windfarm was revised to reduce the impact of the temporary and permanent construction works, and the layout of the windfarm was modified in the following ways:

- wind turbines were removed from areas of heather and mire;
- the tracks were realigned to avoid all significant areas of mire and flora;
- turbines were removed from the southern half of the development area to eliminate the visual impact of the development from certain view points;
- the locations of the wind turbines, and the temporary construction facilities were concentrated in non-sensitive areas;

- wind turbines were repositioned to minimise the visual impact from the Wye Valley;

- a land management scheme was agreed in principle aimed at improving the ecology of the development area through the management of grazing, so allowing heather and other flora to recover.

6.4 With both the Marcheini and Bryn Titli proposals, a major issue of concern was the potential effects of the development on birds, particularly in relation to bird strikes. National Wind Power agreed to undertake a bird monitoring programme and commissioned the RSPB to undertake this work. The surveys involved identifying breeding birds on the site, examining bird usage of the site, before, during and after construction, and bird strikes.

6.5 The survey results indicate no evidence of bird strike, but do show a slight reduction in use of the site by two of the main bird species - red kite and raven. This may be due to the development of the windfarm but it is possible that bird usage of this area has been affected by the establishment of a feeding station approximately 5 miles away which coincided with the development of the windfarm.

6.6 The area officer for the Countryside Council for Wales however, did state that he believed that the windfarm development will have resulted in unknown harm.

BENEFITS TO THE DEVELOPER

6.7 As a result of the Marcheini application, the developer reviewed the whole project and redesigned the layout of the windfarm to minimise environmental effects. As a result, the windfarm was compressed to a quarter of the original site area, which will have reduced construction costs, and wind turbines were removed from the area designated as a SSSI.

6.8 Although the Marcheini application did not progress, the work undertaken on the environmental assessment fed into the environmental assessment for the Bryn Titli windfarm and assisted with the redesign of the windfarm. The early consultation with the statutory bodies helped in determining which areas of the site were unsuitable for the location of wind turbines, and also helped to identify the critical parameters of the project and clarify which factors would be important in determining the planning application.

6.9 National Wind Power have stated that they are totally committed to the EIA process. The Bryn Titli EIA was one of the earliest assessments that the company undertook, and company policy with respect to EIA has subsequently been modified. In particular, it is now company policy to hold public meetings for every project which is proposed for development.

6.10 The EIA process improved working relationships with statutory agencies and allowed discussions to focus on the key issues of concern, reaching consensus where possible. These discussions also helped to clarify key areas of disagreement.

6.11 The company reported that the specifications set out in contracts have improved in line with the EIA process, and that EIA has driven these internal improvements. It costs no more to implement projects to the specification set out in the environmental assessment,

and may also help to reduce costs. The EIA seeks to reduce to an absolute minimum the area of land affected by the development, and this is specified in the method of working. Therefore the construction costs should be reduced because a smaller area will require reinstatement.

6.12 The company reported that in Scotland, the environmental statement in total is often adopted as a planning condition, and therefore any breach of the environmental statement is a breach of planning. National Wind Power would welcome this approach to be adopted more widely, as it would help the company to enforce conditions on contractors.

BENEFITS TO THE COMPETENT AUTHORITY

6.13 The EIA Regulations apply to large, controversial and complex projects which require a substantial amount of information to be able to reach a decision. Any application for such development should be supported by full information, and in a form that is recognised as being valid. The EIA process is a useful mechanism for bringing this about.

6.14 The EIA process places the onus on the developer to provide the necessary information. It allows the competent authority to identify the type of information required, and assists the authority in requests for additional information.

6.15 The EIA process does not increase the time taken to process an application - this tends to be fixed by public concern and response to the development - and may reduce costs, as it allows issues which will have minimal impact to be dismissed early in the process, allowing the time to be spent on the key aspects of the development. An environmental statement provides the public with more information, and allays public concern.

6.16 The competent authority had a good relationship with the developer, and stated that the EIA process did improve working relationships between the key parities. Areas of common ground could be identified and agreed upon, and meetings could therefore be focused on those issues that needed to be resolved. The EIA process helped to clarify the key issues for decision makers.

BENEFITS TO THE STATUTORY CONSULTEES

6.17 **Countryside Council for Wales:** CCW believe that the EIA process is very valuable. It forces developers to think through and explain the implications of their development proposals, in a transparent way which is available to the public and statutory bodies. Whilst it does take time to produce the documents, if done properly, it can speed up the process. If insufficient information is provided, and additional information is required, then this can increase the time taken to process the applications.

6.18 Scoping discussions with the statutory consultees are considered to be very beneficial. With major developments, and where experienced consultants are employed, the scoping studies are useful at teasing out the concerns of the development. They provide an opportunity for the statutory authorities to understand from the outset what the developer wants to do, and allows them to highlight issues of concern which may require mitigation.

6.19 The EIA process has improved the quality of applications which are received for major developments and has resulted in better decision making. The Council tries to ensure that planning conditions and obligations are put in place to cover the commitments made by developers in environmental statements, and wherever possible, monitoring is undertaken.

6.20 **RSPB:** The RSPB believes that EIA does result in environmental improvements. However, they are a non government agency with limited funds and do not have the time or resources to become involved in detailed discussions on all applications.

7.0 SUMMARY OF FINDINGS

7.1 In this particular case, the EIA process resulted in modifications to the project design which minimised environmental effects. The EIA process highlighted the environmental sensitivities of the area, and prevented damage to a site of national ecological importance. In addition, the method of working was totally revised to minimise the land area affected by the development, bringing environmental benefits, and benefits to the developer through reduced construction costs.

7.2 The developer is totally committed to the use of EIA and believes in the value of the process. The EIA process has driven internal improvements to project specifications and increased the developer's awareness of the need to involve the public during the planning process.

CASE STUDY 4. CAMBERLEY SEWAGE TREATMENT WORKS

1.0 INTRODUCTION

1.1 This report reviews the costs and benefits associated with the EIA process as it applies to the proposal to develop a liquids waste treatment centre at Camberley Sewage Treatment Works. The report forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom, and follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by Liz Wood-Griffiths of Land Use Consultants, and involved face to face meetings with the developer and competent authority, and telephone interviews with the statutory consultees.

2.2 The environmental statement entitled 'Environmental Assessment of a Proposed Liquids Treatment Centre at Camberley STW, August 1992' was provided by Thames Waste Management Ltd (TWML) and read by Ms Wood-Griffiths prior to any meetings.

2.3 On Friday 22nd March 1996, Ms Wood-Griffiths met with Mr Chris Hatton, Technical Director of Thames Waste Management Ltd. This was followed by a meeting with Mr Alan Stones of Surrey County Council on Monday 1st April 1996.

2.4 Telephone interviews were then conducted with the relevant statutory consultees, and interest groups. The following people were contacted as part of the study:

- John Dawson — Surrey Heath Borough Council
- Anne-Marie Crane — Environmental Protection Agency (formerly the National Rivers Authority)

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The proposed development involves the construction of a liquid wastes treatment plant on an undeveloped part of the existing Camberley Sewage Treatment Works (Camberley STW). The development is intended to augment the capability of the existing sewage works by providing a facility for the treatment of a wide range of aqueous industrial wastes.

3.2 The development is required to meet a growing demand for liquid waste treatment facilities in the south east region. Historically, the vast majority of liquid industrial waste

has been disposed of by landfilling in the UK reflecting the abundance of landfill space and relative cheapness of landfill. Whilst contained landfill which incorporates natural or artificial liners is considered acceptable for liquid and/or special wastes in some circumstances, increasing concerns about the generation of leachate and the potential for liners to fail and contaminate groundwater have led to stricter site licensing, and greater restrictions on the disposal of liquid wastes to landfills.

3.3 Stricter licensing of landfill sites, and restrictions on the use of landfill for liquid wastes has meant that some landfill sites have been obliged to reduce or eliminate these inputs. In addition, landfill capacity in the region is under increasing pressure, and research indicates that landfill disposal for liquid wastes in the south-east will reduce by at least 200,000 tonnes in the near future.

3.4 Information available on the quantities of liquid wastes generated in the south/south-east region of England indicated that approximately 600,000 tonnes of liquid industrial wastes are tankered in the region each year. The majority of these wastes are neutral sludges, oil/water mixtures and food wastes. Most of the landfill and treatment plants in the south-east are located in Essex and Hertfordshire, and therefore waste originating in the south or west of London has to be transported across London for treatment and disposal, which can result in some wastes being tankered considerable distances.

3.5 The proposed development is intended to meet the increasing demand for liquid waste treatment. The development will consist of a liquid waste treatment plant with a capacity to treat 140,000 tonnes of waste per annum, and a drummed and packaged waste bulking and transfer station capable of handling up to 11,000 tonnes of waste per year. Liquid waste will be treated to produce a solid suitable for landfill and a liquid effluent which can then be treated at the existing sewage treatment works. The drum transfer station will sort drums and packages and, if the waste is suitable, remove the contents for bulking or treatment within the liquid waste treatment plant. Sorted drums and bulked wastes will be exported off site to licensed waste management facilities for recovery or disposal.

3.6 The proposed development will consist of a new plant constructed on approximately 1.4 hectares of a currently vacant area of the Camberley STW site. In addition, a currently unused filter bed and a settlement tank previously used for sewage treatment will be used as part of the treatment of liquids arising from the waste treatment process. The internal road structure of the treatment works will be improved, and it is estimated that the plant would take approximately 36 weeks to construct. The capital cost of constructing the treatment plant is estimated to be 6.71 million ECU.

3.7 The precise nature and quantity of waste accepted will vary depending on the different industrial producers sending waste to the plant, and will be governed by the Surrey Waste Regulation Authority. However it is anticipated that 20-25% of the incoming waste is likely to be categorised as "special."

3.8 The proposed site is immediately surrounded on three sides by the existing sewage treatment works. Beyond the site boundary, the site is surrounded on two sides by the York Town Industrial Estate, the nearest property being approximately 75 metres to the north, and on one side by Watchmoor Business Park, the nearest property being approximately 125 metres to the south. The remaining side is bounded by the A321 dual

carriageway which is approximately 50 metres to the west of the proposed site. The nearest residential properties are over 400 metres away.

4.0 DETAILS OF THE EIA PROCESS

4.1 The proposed development falls within the definition of an Annex I project being "a waste disposal installation for the incineration or chemical treatment of special waste." An environmental assessment is therefore mandatory.

4.2 The environmental assessment was undertaken by environmental consultants ERL. The environmental consultants worked closely with a specialist design consultancy both consultancies being commissioned at the same time, and this enabled environmental mitigation measures to be built into the overall project design.

4.3 The environmental assessment was undertaken between July 1991 and August 1992. The Environmental Statement consists of one document which includes the non-technical summary (18 pages), the environmental statement (58 pages), and 11 technical appendices. The total length of the statement is 260 pages.

4.4 The environmental statement is set out in 10 chapters as follows:

• 1	Introduction	(5 pages)
• 2	Need for the Proposed Development	(6 pages)
• 3	Alternative sites for the proposed plant	(5 pages)
• 4	Description of the proposed development	(6 pages)
• 5	Development timetable	(1 page)
• 6	Description of the Proposed Site	(6 pages)
• 7	Proposed mitigation measures - Construction	(4 pages)
• 8	Proposed Mitigation Measures - Operation	(20 pages)
• 9	Potential Residual Impacts	(4 pages)
• 10	Conclusions	(1 page)

4.5 The environmental statement is supported by 11 technical appendices which describe in detail existing baseline conditions, potential environmental effects, mitigation measures proposed and the significance of the remaining environmental effects. The following subject areas are covered:

• Annex A	Atmospheric Environment
• Annex B	Geology, Hydrogeology and Surface Water
• Annex C	Terrestrial Ecology
• Annex D	Land Use, Cultural Heritage and Planning Context
• Annex E	Noise and Vibration
• Annex F	Traffic and Transport
• Annex G	Landscape and Visual Impact
• Annex H	Management of Construction Waste and Treatment Residues
• Annex I	Off-Site Safety
• Annex J	Socio-economic Impact
• Annex K	Environmental Monitoring

4.6 A planning application, accompanied by the environmental statement was submitted to Surrey County Council in September 1992. Permission for the development was granted in April 1993. In addition to planning consent, the development also needs to be licensed by the Waste Regulation Authority and a Waste Management Licence was granted in July 1994.

4.7 Construction of the treatment plant has not yet started, and the developer has subsequently applied for permission to develop the proposed development in two phases. Changes in the waste disposal market brought about by the recession of the early 1990s, has resulted in over capacity in the market at the present time. The developer therefore proposes to develop approximately 10% of the total project initially with the remainder of the plant being constructed within the following four to five years.

5.0 REVIEW OF COSTS

COSTS TO THE DEVELOPER

PRELIMINARY STAGE

5.1 **Local Plan Representations:** The proposed development site falls within the administrative area of Surrey Heath Borough Council, and TWML had previously made representations on the draft Local Plan. The draft Plan for the district had included part of the sewage treatment works in the area designated as countryside, and TWML argued that the proposed boundary should be altered to include the treatment works within the designated settlement area. As a result of these representations the authority subsequently modified the Local Plan.

5.2 The company's representations on the Local Plan had minimal cost implications, and were undertaken as a matter of course before the Camberley site had been selected for development. However, following the selection of the Camberley site, further written representations were made to the Borough Council, and it is estimated that in total this would have represented approximately one man day.

5.3 **Site Selection:** This was undertaken in house over a six month period. Initially the treatment works at Slough was the favoured site for development, but this site was rejected following technical studies of the site. A detailed review of alternative sites was then undertaken over a three month period, and the Camberley site was selected.

5.4 Six members of staff were involved in the site selection process, although the majority of the work (approximately 95%) was undertaken by the Technical Director. This did not represent a full time commitment, and it is estimated that the total time spent on site selection was equivalent to one man month. It is estimated that the technical studies carried out for the Slough site which represent abortive work, cost approximately 9760 ECU.

5.5 **Marketing Study:** The information available to the company on the quantities of liquid wastes generated in the region was minimal, and therefore the developer commissioned a marketing survey to supplement this information. The marketing study was undertaken by external consultants over a 3 month period and cost 6100 ECU.

5.6 **Commissioning Consultants:** Once the Camberley site had been selected, TWML appointed an environmental consultancy to undertake the environmental assessment, and a specialist engineering consultancy to carry out the detailed plant design. The company invited four environmental consultancies to bid for the contract and interviewed two. The engineering consultancy was selected because of its specialist knowledge having previously designed a similar treatment plant elsewhere. The costs associated with this stage of the process are the time costs associated with selecting the consultants and are unlikely to amount to more than one or two man days.

PROJECT SCREENING

5.7 The project is an Annex I project and therefore an EIA was mandatory.

EIA STUDIES

5.8 **Scoping:** Scoping was undertaken as part of the tendering process. The environmental consultancies invited to bid for the work, were each asked to prepare a scoping report setting out the key issues that they felt would need to be addressed by the environmental statement. On the basis of these submissions, TWML selected two for interview and then appointed ERL. Most of the time costs associated with the scoping exercise are therefore incorporated in the costs associated with commissioning consultants.

5.9 Once ERL had been appointed, TWML and the consultancy team held some preliminary discussions with the statutory bodies. These focused on the broad planning issues associated with the development, and the key issues and main environmental topic areas which would need to be addressed by the environmental assessment. These consultations are estimated to have taken approximately five man days.

5.10 **Baseline Studies:** The baseline studies were undertaken over a four month period. These included a traffic survey, a ground survey, a noise survey, an ecological survey within the site boundary, and a visual assessment from three viewpoints. The baseline studies informed both the environmental assessment and plant design and were undertaken by the environmental consultants. The cost of the studies is included in the overall fee of 45 140 ECU which TWML paid to the consultants. However it is estimated that the baseline studies cost approximately 12 200 ECU the most expensive aspect being the costs associated with soil, water and vegetation analysis which were approximately 4270 ECU.

5.11 **Provision of Background Information:** Some baseline information relating to the local water course was provided by the NRA (the water regulator), but no charge was made for this.

5.12 **Consultation with Statutory Bodies:** Consultations with the statutory bodies were undertaken by the consultants and the developer with most time spent in consultation with the county and district planning authorities. It is estimated that a total of 12 man days was spent in consultation with the competent authority and statutory consultees.

5.13 **Assessment of Environmental Effects and Mitigation:** The assessment of the effects of the development on the environment identified a number of potential adverse effects, and these were mitigated against in the design of the treatment plant.

5.14 The most significant effect was the potential for the development to exacerbate an existing odour problem and introduce hazardous vapours. As a result of the assessment, the plant was designed to ensure that all material was passed through appropriate odour scrubbers to minimise any adverse environmental effects. It is estimated that these modifications have added approximately 10% to the overall project cost (671 000 ECU.). Whilst some of the ventilation modifications would be required under Health and Safety legislation, it is estimated that the modifications to the plant that can be attributed to environmental mitigation represent approximately 6-7% of the total project cost (402 600 - 464 210 ECU).

5.15 A landscaping and planting scheme was also proposed to minimise the visual effect of the development. The landscaping scheme proposed will cost approximately 61 000 ECU to implement.

5.16 **Project Design Costs:** The design of the treatment plant was undertaken in parallel with the environmental assessment. The two consultancy firms worked closely together, allowing each study to inform the parallel study, and, as described above, potential adverse effects could be minimised or eliminated through in the design of the treatment plant.

5.17 The engineering consultancy fees cost TWML approximately 366 000 ECU. The detailed design confirmed that the project was economically feasible and was needed to secure Board approval for the development. It also provided information required for the planning application, and it is estimated that approximately 50% of the design fee (183 000 ECU) can be attributed to providing the information required for the planning application.

5.18 **Public Consultation:** Prior to submitting the planning application, the developer carried out a form of consultation with the public. The exercise was intended to inform local residents and businesses of the development proposals, but did not seek their views. An A5 coloured brochure, 8 pages in length was printed, and posted with a covering letter to local residents and businesses. Approximately 150 copies of the brochure were printed. TWML also made presentations to the Blackwater Valley Conservation Group and to the businesses on the adjacent Business Park.

5.19 The brochure generated two or three phone calls from local residents, who were satisfied following discussion that their concerns had been fully addressed. Likewise, the Blackwater Valley Conservation Group were also satisfied that the development would not result in any adverse effects. However, the businesses located adjacent to the site were not reassured by these actions. They were particularly concerned about the routing of HGVs through the Business Park, and the effect this would have on peoples' perceptions of the quality of their businesses.

EIA STATEMENT

5.20 **Writing the Statement:** The environmental statement was written over a period of four to five months. Drafting the statement was an ongoing process and continued in parallel with the EIA studies. Drafts of the document were circulated within the study

team, but were not circulated to any outside bodies. Three drafts of the document were prepared before the document was finalised.

5.21 The Technical Director of TWML wrote sections of the environmental statement dealing with site selection and policy background and estimates that his input into the preparation of the environmental statement took approximately 10 days. The cost to the external consultants of writing the environmental statement are included within the overall consultancy fees.

5.22 **Printing Costs:** Forty copies of the document were printed and this cost 1952 ECU.

PROCESSING THE EIA

5.23 The planning application was submitted to the competent authority (Surrey County Council) in September 1992, accompanied by the environmental statement. Sixteen copies of the documentation were submitted, and the application fee was 5502 ECU.

5.24 Following submission of the application the developer was asked to provide additional information. The information requested included further details of the proposed landscape planting scheme, an archaeological assessment, and further information relating to atmospheric modelling and off site safety. The planting scheme was undertaken by ERL and the cost of the work is included in the overall fee paid by TWML. The archaeological assessment cost a further 915 ECU and the assessment of odour cost approximately 610 ECU.

5.25 Following submission of the planning application, the developer estimates that approximately 7 days were spent liaising with the competent authority. An additional 4 days was spent dealing with issues raised by objectors.

5.26 Planning permission was granted for the development in April 1993 and seventeen conditions were attached.

POST EIA COSTS

5.27 In addition to planning consent, the development also needs to be licensed by the Waste Regulation Authority. Having secured planning permission for the development, the developer then applied to the Waste Regulation authority for a Waste Management Licence. The supporting documentation included plans of the proposed development together with a description of how the plant would be operated. It is estimated that the documentation for this application cost the company approximately 24 400 ECU to prepare, and the licence application fee was an additional 2440 - 3660 ECU.

5.28 Construction work on the treatment plant has not yet started, and TWML have recently requested permission to construct the development in two phases. In phase 1, approximately 10% of the total project value will be constructed. TWML have indicated that the reasons for constructing the plant in two phases result from changes in the market conditions. In the late 1980s when the need for the development was identified, the waste market in the UK was buoyant. However securing the necessary planning and licensing consents took approximately three years to complete, and during this time, the waste market had been affected by the recession and there was over capacity in the

market. By developing the treatment plant in two phases, TWML hope to establish their position in the market, and the second phase will follow within four to five years when it is hoped that the market conditions will have changed and demand for treatment facilities will have increased.

SUMMARY OF DEVELOPER COSTS

5.29 A total of 29 months (November 1990 - April 1993) elapsed between the identification of the need for the development to securing planning permission.

5.30 The preliminary stage involved site selection and market research and took six months to complete. It is estimated that the work on site selection represented one man month of staff time - 16.6% of one persons work over the six month period - and the marketing and technical studies cost a total of 15 860 ECU of the total project cost.

5.31 The EIA studies were carried out by external consultants over a 13 month period. The fees paid to the environmental consultancy were 45 140 ECU and represent 0.67% of the total project cost. Consultancy fees of 366 000 ECU were also paid to a specialist design consultancy which represent 5.45% of the total project cost. Information on the plant design was required for the planning application, and it is estimated that 50% of these fees, (183 000 ECU) can be attributed to information required for planning purposes. The plant design was undertaken in parallel with the environmental assessment, and therefore a proportion of these costs could be attributed to the environmental assessment.

5.32 It is unlikely that all of these costs could be attributed to the EIA. If it is assumed that the design team costs doubled the cost of the EIA, increasing the EIA costs to 91 500 ECU, this would represent 1.36% of the total project cost. However, much of the information contained within the environmental statement relating to the detailed design of the plant would be required by the planning authority as part of normal planning procedures.

5.33 In addition to consultancy fees there are additional costs relating to the time spent by TWML staff in discussions with the statutory authorities, public consultation and preparation of the EIA. However these time costs would be incurred with most planning applications regardless of whether or not an EIA was required. It is estimated that approximately 30 man days were spent by TWML staff during the EIA studies. Of these, the ten days spent writing the environmental assessment can be considered to be additional.

COSTS TO THE COMPETENT AUTHORITY

PRELIMINARY COSTS

5.34 There were no costs to the competent authority associated with the preliminary stage.

SCREENING

5.35 The development fell within the definition of an Annex I project, and therefore an EIA was mandatory.

EIA STUDIES

5.36 **Scoping:** Surrey County Council were consulted on the scope of the studies. They wrote to the developer setting out in general terms the types of issues that would need to be addressed by the environmental assessment, although the time spent by the case officer was considered to be minimal, amounting to no more than two to three hours.

5.37 **Baseline Studies:** The competent authority did not participate directly in any baseline studies, although they were involved in discussions with the developer about the form and content of the studies. These discussions were straightforward and it is estimated that a total of five hours of officer time was spent in face to face meetings with a further ten hours spent in background research.

PROCESSING THE EIA

5.38 The statutory time period allowed for processing the environmental assessment and reaching a decision is 16 weeks. However the application was not decided in this time as more time was needed to carry out the necessary consultations. The planning application was submitted in September 1992, and went to the planning committee on the 14th April 1993. This delay was the result of general work pressures and was not affected by the EIA process.

5.39 The competent authority advertised the proposal in the local press and on the site, and notified 37 adjoining occupiers and residents by post. This cost the authority approximately 610 ECU.

5.40 There was very little public interest in the proposal. The authority received 18 representations in total objecting to the development. Sixteen letters were received from the occupiers of the adjacent Watchmoor Business Park expressing concern about: traffic generation; the use of the Business Park service road for access to the site; possible nuisance including odour and noise; impact on the setting of the Business Park; damage to structures and risk of accidents. One local resident objected on the grounds of potential health risk and nuisance, and Hawley Parish Council expressed concern about the danger of spillage to the river Blackwater.

5.41 Having received the environmental statement the competent authority estimated that approximately 15 hours was spent reviewing the document. The environmental statement however did not increase the time taken to process the application and the competent authority believes that the document helped to streamline the process.

SUMMARY OF COSTS

5.42 The time spent by officers in discussion with the developer and in processing the application were not considered to have been increased at all by the EIA process. The discussions held with the developer during the course of the EIA studies were equivalent to the type of pre-application discussions which the authority would hold with any developer. Advertising the development in the press and notifying neighbours is a requirement under the Town and Country Planning Act and did not therefore represent an additional cost. The delay in processing the application was the result of general work

pressures and was not affected by the fact that an environmental statement had been submitted with the planning application.

COSTS TO THE STATUTORY CONSULTEES

PRELIMINARY COSTS

5.43 **Surrey Heath Borough Council** incurred minimal costs in connection with the Local Plan modifications however the procedure was very straight forward and amounted to a few hours of officer time only.

EIA STUDIES

5.44 **Surrey Heath Borough Council** Surrey Heath Borough Council were involved in a number of discussions with the developer during the course of the EIA studies, but their involvement was minimal, and is estimated at approximately 2-3 hours. The planning officer reported that the discussions focused on the issues that the authority would wish to see covered by the environmental assessment, and were of a general nature focusing on planning issues such as noise, odour, traffic generation and visual impact.

PROCESSING THE EIA

5.45 **Surrey Heath Borough Council** The application was reviewed by the Highways, Environmental Health and Planning Departments. The environmental statement addressed all the authorities concerns, and the authority did not object to the proposal. In total, across all departments, approximately 20 hours of officer time was spent reviewing the application and environmental statement.

5.46 **NRA** The planning liaison department of the NRA estimated that the presence of the EIA increased the standard time taken to process the application by about two hours. This was because it was necessary to review the document and copy relevant sections to other departments.

5.47 The authority objected to the planning application when it was first submitted because there was insufficient information regarding the discharges from the site. However these issues were resolved in a meeting with TWML and the authority subsequently withdrew their objection.

SUMMARY OF COSTS

5.48 Officer time spent by the statutory authorities during the course of the EIA studies was not significantly increased as a result of the requirement for an EIA. The discussions held with the developer during the course of the EIA studies are comparable with the pre-application discussions which would occur between a developer and the statutory authorities with any application for development, as were the procedures followed during the processing of the application.

6.0 REVIEW OF BENEFITS

ENVIRONMENTAL BENEFITS

6.1 The site selection process ensured that the most suitable site was selected for development. Environmental factors were considered during the site selection process as the development site needed to meet certain basic criteria.

6.2 The Camberley site was the most appropriate because it had the capacity to treat the additional waste so minimising any potential impacts on surface water. The nearest residential properties were over 400 metres away, and there was sufficient land available within the existing sewage treatment works for the development. In addition, two unused filter beds on the site, could be utilised for first stage treatment before full treatment occurs.

6.3 The environmental assessment ensured that all potential environmental effects were identified. The key environmental issues identified at the scoping stage related to traffic generation, odour plant safety and potential effects on river quality.

6.4 The baseline studies improved the developers understanding of the interactions occurring on the site, and also highlighted the need to place more emphasis on the visual effects of the development. As a result of the environmental assessment it was possible to minimise any adverse environmental effects in the overall plant design. The treatment works have been designed to ensure that emissions of dust, odour and volatile compounds are unlikely, and odour control and ventilation systems are in place to ensure that there will be no significant impacts should fugitive emissions occur. Without these measures the treatment plant could exacerbate an existing odour problem affecting the occupiers of the adjacent business park, and local residents.

6.5 The environmental assessment also highlighted the need to place greater emphasis on the visual effects of the development, and a landscaping scheme is proposed to minimise the visual impact. The landscaping scheme was developed in consultation with English Nature and the Blackwater Conservation Society and has been designed so as to increase the ecological value of the area, and involves the creation of a wetland habitat within the site.

6.6 The EIA has identified the environmental areas which will need to be monitored once the development has been constructed. These include air and water emissions, surface water quality and soil and vegetation monitoring. The establishment of monitoring programmes will ensure that the development is operating within the terms of its planning permission, and will also ensure that any adverse or unexpected environmental effects are identified as early as possible allowing remedial works to be put in place if appropriate.

BENEFITS TO THE DEVELOPER

6.7 **Local Plan Representations** The time taken on local plan representations, whilst not directly related to the environmental assessment did help the developer in the long run by ensuring that the development proposals did not conflict with local plan policies for the area.

6.8 **Site Selection** The site selection process ensured that resources were focused on the most appropriate sites, and that feasibility and technical evaluations were only carried out on sites which satisfied the basic selection criteria

6.9 **Scoping** The scoping study identified the key issues that needed to be addressed by the environmental assessment, and helped to focus on these issues at an early stage in the process. It also assisted in the identification of relevant information and enabled the necessary information to be gathered at an early stage.

6.10 The developer considers the scoping exercise to be a vital part of the EIA process, and considers that the competent authority and statutory consultees should be involved in the process making clear the main areas that the environmental assessment should address, and setting out the criteria which will be used to evaluate the environmental statement. This would prevent the developer spending time and resources on topic areas which will not be considered seriously, and also places an onus on the statutory authorities to set out the key areas of concern, so minimising the need for the developer to supply additional information once the environmental assessment has been completed.

6.11 **Consultations** The developer knew from the outset that the nature of the development was likely to raise public concern, and therefore wanted to ensure that consultation with the statutory authorities took place to ensure that the key issues of concern were fully addressed by the environmental assessment. The consultation process improved the working relationships between the developer and the statutory consultees and gave the developer a greater understanding of the responsibilities of the statutory agencies and the reasons for their concern.

6.12 Consultations with the NRA were particularly helpful. The NRA originally objected to the planning application but, following consultation, the developer was able to address their specific concerns and the objection was withdrawn.

6.13 The developer was aware from the outset that the development proposed could meet with strong local opposition, and that there could be problems securing permission for the development. The developer considered it important to be open and honest about the development from the outset and recognised the value of carrying out a comprehensive environmental assessment to minimise public concern about the project. The environmental assessment undertaken was very comprehensive, and the environmental statement provided the information the statutory agencies needed in order to make a decision. As a result, the planning application was extremely straightforward, and there was very little public concern generated by the proposals.

6.14 The approach towards good environmental practice adopted by the developer is likely to result in long term benefits to the company. Many of their potential clients are blue chip companies which have established their own environmental standards, and therefore require the companies they deal with to adopt similar standards. Many companies carry out environmental audits on the waste disposal companies that they use. The fact that TWML have undertaken a full environmental assessment of the development, and have implemented mitigation measures to minimise environmental impacts where possible, is likely to help the company to secure new clients. Failure on the part of TWML to have undertaken such an assessment could, potentially, have had major financial implications for the company in the future.

6.15 In addition to the planning permission, the development also requires licensing by the Waste Regulation Authority. The environmental assessment and statement assisted the developer in preparing the necessary documentation to support the application for a waste management licence.

BENEFITS TO THE COMPETENT AUTHORITY

6.16 The competent authority felt that the EIS helped to clarify the key environmental issues, and streamlined the decision-making process considerably. Although the application was delayed, this was the result of general work pressures and not the EIA process.

BENEFITS TO THE STATUTORY CONSULTEES

6.17 As all the information was provided in one well structured document, the statutory consultees were able to provide well-informed responses. As a result, it was felt that the EIS could have reduced the time taken to review the application.

BENEFITS TO THE PUBLIC

6.18 The majority of adverse environmental effects have been mitigated in the overall project design and site layout, although it is not possible to prevent any adverse effects that may result from the routing of HGVs through the adjacent Watchmoor Business Park. For safety reasons, vehicular access through the Industrial Estate will not be permitted, and vehicular access to the site will be through the Business Park. To minimise the effects from HGV traffic, access to the site will be restricted to standard working hours, and TWML will seek to ensure that wherever possible deliveries will not be scheduled to correspond with peak hour times. However, the main concern from the occupiers of the Business Park were related to the effects of passing HGV traffic on their clients perceptions of their businesses rather on issues of noise and nuisance.

7.0 SUMMARY OF FINDINGS

7.1 The procedures followed for Camberley Sewage Works represent a 'text book example' of the EIA process, in that it involved close liaison between the developer and the consultant from the outset, and was conducted on a fixed programme with a clear study methodology. All the participants acknowledge the benefits of preparing the EIS, particularly as the environmental consultants worked closely with the design consultants, enabling environmental mitigation measures to be built into the overall project design.

7.2 As a result of the comprehensive and open EIA process which involved extensive consultation, the processing of an application for a potentially contentious development ran smoothly. The EIA did not increase the time taken to process the application, and may have actually reduced time costs.

7.3 Failure on the part of the developer to have undertaken a good EIA could, potentially, have had major financial implications for the company in the future, as many of their potential clients expect certain environmental standards from the waste disposal companies that they use.

CASE STUDY 5. SEABANK POWER STATION

1.0 INTRODUCTION

1.1 This report reviews the costs and benefits associated with the EIA process as they applied to the development of Seabank Power Station near Avonmouth in the UK. The report forms part of a series of 18 case studies on project EIAs in Greece, the Netherlands, Spain and the United Kingdom, and follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by Liz Wood-Griffiths and Joanna Wright of Land Use Consultants.

2..2 On Monday 4th March 1996, Ms Wood-Griffiths and Ms Wright met with Ivor Phelsinger, Glen Smith and Ted East from Seabank Power, together with Rupert Higgins and Tony Holmes, the environmental consultants who carried out the ecological and landscape aspects of the environmental assessment. This meeting was held at the Seabank Power site where construction of the site was underway.

2.3 Following this meeting, Joanna Wright met with Mr Mohammed from the Department of Trade and Industry, (the competent authority), and Liz Wood-Griffiths met with Kate Hoare, the Planning Officer for Bristol City Council who dealt with the application. A subsequent meeting was also arranged with Mr Arnold Miller, Environmental Health Officer for Bristol City Council. These meetings were supplemented by telephone interviews with the following statutory bodies:

- Tony Doyle, Planning Officer, Northavon District Council;
- Mr Bradford, English Nature;
- John Hesscott, HM Inspectorate of Pollution (the Environment Agency from 1/4/96);
- Nigel Crane and Roger Saxon, NRA (the Environment Agency from 1/4/96);
- Wendy Pettigrew, Countryside Commission;
- The Health and Safety Executive.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The proposed project involves the construction of a new electricity generating station at the site of the former Seabank Gas Works near Bristol. The proposal is that Seabank Power Ltd, an independent power producer owned jointly by British Gas and Midlands

Electricity plc, will construct and operate the generating station, which is needed to meet predicted future demand.

3.2 The type of generating station proposed is a Combined Cycle Gas Turbine (CCGT) station. The principal fuel source for the power station will be sulphur free natural gas, which will be mixed with air, and used to generate electricity. The hot exhaust gases from this process will then be delivered to waste heat recovery boilers and used to generate high pressure steam. This will then be used to power a condensing steam turbine, which will be directly connected to a second electricity generator. The exhaust gases from the waste heat recovery boiler will then be dispersed into the atmosphere via tall stacks.

3.3 The system proposed and described in the Environmental Statement consists of two gas turbines, two waste heat recovery boilers and one steam turbine, generally known as a 2+2+1 configuration. Each of the modules will therefore be independent providing considerable flexibility in operation and capable of providing a total of not more than 1212 megawatts installed capacity. The power station is expected to have a generating life of 25 years.

3.4 Each power module will be housed in identical turbine halls with a local control room dedicated to each module. The waste heat recovery boilers and associated stacks will be located outside the halls. The proposed system will have up to six individual stacks each up to 80 metres in height to allow for the dispersion of the gaseous emissions into the atmosphere.

3.5 A new cross country gas pipeline will be required to deliver the fuel to the site. To cater for periods of interruption to the gas supply, distillate fuel oil will be used as a standby fuel. This fuel will also be supplied by pipeline and stored on the site in the existing storage tanks.

3.6 Steam used in the steam turbine generating sets will be condensed so that the high purity water can be recovered and reused. Cooling will be achieved in cooling towers where heat is lost by evaporation of the recirculating water. The cooling water required for the process will be taken from the Avonmouth sewage treatment works and will be continuously recycled and reused in the towers. A main and return pipe will need to be laid from the Avonmouth Works to the Seabank site. Tertiary treatment will take place at Seabank to remove excess nutrients, and produce a virtually sterile supply of water for the station. The majority of waste waters generated by the site will be recycled and reused, and any surplus waters will be returned to the Avonmouth sewage works.

3.7 A 400kV substation will be constructed within the site to receive the power station output and connect it to an over head transmission line which will connect the site to the National Grid. A new 400kV overhead line approximately 7.5 km in length will be required.

3.8 Construction of the station will take place in two phases. The first phase will be the site preparation works and will involve: demolition of redundant buildings; excavations in selected areas where the power station equipment and buildings will be located; removal of redundant underground services; relocation of some of the surface drainage rhines; and relocation of existing services which run on or through the site.

3.9 The second phase will involve constructing the turbine halls, stacks, cooling towers and water treatment plant, landscaping works, and construction of the pipelines required to supply fuel oil, water and gas to the site. It is expected that the construction works will require a work force of between 600-700 and that the majority of the work force will be recruited or contracted locally.

3.10 The following aspects of the development also require planning permission and environmental assessment and are subject to separate consents:

- the construction of a new 400Kv transmission line.
- the reinforcement of the natural gas supply pipeline.
- the oil supply pipeline.
- the supply and return mains from the Avonmouth Sewage Treatment plant.

3.11 The costs associated with these permissions have not been considered in this case study.

3.12 At the time of the planning application, (1991), the Secretary of State for Energy's consent was required for the construction or extension of any power station with a capacity of 50 megawatts or more. The planning application for the development was therefore lodged with the Department of Energy. This Government Department has subsequently been incorporated within the Department of Trade and Industry.

3.13 The application submitted in April 1991 was granted planning consent in September 1993. In 1995, the developer applied for consent to alter the site layout. This was due to improvements in plant design which have meant that the same amount of electrical power can be produced with fewer turbines, so reducing the overall size of the generating plant. Permission for the amendments was granted, and construction works began in late 1995.

4.0 DETAILS OF THE EIA PROCESS

4.1 The environmental assessment was prepared by a joint team led by Seabank Power Ltd, and including external consultants Stone and Webster Engineering Ltd., (Engineering Consultants), the Hubbard Ford Partnership (Architects and Planning Consultants) and Travers Morgan (Transport Consultants).

4.2 An application for development was lodged with the Department of Energy in April 1991, accompanied by an environmental statement. The environmental statement was considered to be deficient in a number of areas, and on the advice of the Department of Energy, the developer withdrew the planning application in May 1991, and re-submitted it in October 1991 with a revised document.

4.3 Further information was requested by the competent authority in December 1991, and this was supplied by the developer in March 1992. Approval for the development was finally granted in September 1993.

4.4 The Environmental Statement submitted in October 1991 comprises three documents: the non-technical summary, the main Environmental Statement, and illustrations for the visual impact study. The non-technical summary and Environmental Statement are in A4 format. The illustrations are provided in a separate A3 document.

4.5 The main Statement is divided into thirteen sections as indicated below. A summary is provided at the start of each section.

•	1.	Introduction	(5)
•	2.	Project Description	(13)
•	3.	Mitigating Techniques	(20)
•	4.	The Site	(8)
•	5.	Air	(20)
•	6.	Water	(14)
•	7.	Noise	(6)
•	8.	Ecological Assessment	(16)
•	9.	Landscape and Visual Assessment	(28)
•	10.	Architecture	(4)
•	11.	Hazard Identification and Risk Ranking	(4)
•	12.	Socio Economic Analysis	(5)
•	13.	Traffic Analysis	(10)
•	14.	Pre and Post Development Monitoring	(1)

4.6 Figures in brackets indicate the number of individual sides of paper covered by text in each chapter; the total length of the document being 154 pages of text. There are an additional 15 pages of tables and 34 pages of figures, in addition to 9 A3 pages of illustrations which are provided in a separate document.

4.7 There are seven appendices to the document providing background data on air quality measurements, typical exhaust gas analysis for oil and gas fired stations, the location of receptor sites for air quality monitoring, wind speed and directional information, and background noise levels.

5.0 REVIEW OF COSTS

COSTS TO THE DEVELOPER

PRELIMINARY STAGE

5.1 **Site Selection:** Initially a number of sites throughout the UK were considered. The search was narrowed down to the south west area, because predicted demand figures indicated that demand in this area would exceed supply. Six sites which met the basic selection criteria were then examined in more detail.

5.2 **Feasibility Studies:** Having selected the Seabank site, a 'cost time resource analysis' was carried out between October 1990 and December 1990. This study examined the commercial, technical and environmental feasibility of the development and was required to secure Board approval for the development for the release of funds for further investigation. The feasibility study involved approximately 250 person days, and cost 122 000 ECU.

PROJECT SCREENING

5.3 Power stations with a heat output in excess of 300 megawatts were included in the Annex I list of projects, and an Environmental Statement is therefore mandatory.

EIA STUDIES

5.4 **Scoping:** No formal scoping study was undertaken, although the company did consult with the statutory consultees about the form and content of the environmental statement. However, the consultations were very general, and basically confirmed the requirements of the EC Directive and the need to consider the environmental effects on the topic areas specified in the Directive.

5.5 To some extent the key impacts were 'scoped' during the feasibility studies as it was known that emissions to air and water would need to be considered in detail as part of the environmental assessment, as this is a familiar concern with any power station proposal.

5.6 It is estimated that the costs during this stage of the process were 18 300 ECU.

5.7 **Baseline Studies:** For the first environmental statement prepared in April 1991, some baseline surveys were undertaken. These were supplemented with further survey work between April 1991 and October 1991.

5.8 Baseline surveys were undertaken to cover the following environmental topic areas :

- Ecology
- Landscape and Visual Impact
- Atmospheric Emissions
- Noise
- Traffic and Transport
- Water Resources

5.9 The total cost of the baseline surveys was 122 000 ECU. They ran in parallel with other aspects of the environmental assessment and were carried out between February and October 1991.

5.10 **Provision of Background Information:** Some background information was available from existing sources. The Environmental Health Departments of Bristol City Council and Northavon District Council supplied some air quality data, but this had to be supplemented by additional baseline surveys. The Met Office also supplied some data.

5.11 Some officer time would have been spent in providing this data, and a nominal charge was made for the information, but this is considered to be negligible.

5.12 **Consultation with Statutory Bodies:** The developer, was involved in general preliminary discussions with the statutory agencies prior to their first application in April 1991. During the preparation of the second environmental statement between April 1991 and October 1991, more detailed discussions were carried out, and a significant amount of time was spent by the developer and the statutory consultees on the

development proposal. The time spent in consultation during the EIA studies is estimated to have cost 42 700 ECU.

5.13 **Consultation with the Public:** The developer conducted an ongoing process of public consultation and attended a number of parish meetings. However, the main activity occurred in September 1991, prior to the submission of the second application. A series of one day exhibitions were held at parish halls within a 6-8 mile radius of the proposed site, and a public meeting was held. The consultation was a joint exercise between Seabank Power and the National Grid Company which were supplying the power lines for the development. The total cost of the public consultation exercise was 61 000 ECU. This figure included leaflet printing, advertising and staffing the exhibitions, and the use of a public relations firm

EIA STATEMENT

5.14 **Writing the Statement:** The environmental statement was prepared over a 10 month period. The document prepared in April 1991 was modified to include information on landscaping, alterations to the building design, and presentational changes which included the use of less technical language and the provision of additional explanatory text. The costs attributable to the preparation of the environmental statement is 140 300 ECU.

5.15 **Printing and Publishing the Documents:** A total of 250 copies of the environmental statements were published, together with 1000 copies of the non-technical summary. Printing costs were 30 500 ECU.

PROCESSING THE APPLICATION

5.16 The planning application was submitted to the competent authority (the Department of Energy) in October 1991 together with an application fee of 24 400 ECU.

5.17 Following submission of the application, the developer was asked to provide additional information, on atmospheric emissions, land contamination, landscaping, decommissioning, noise, and safety and emergency procedures. This information was prepared between December 1991 and March 1992, and cost approximately 42 700 ECU.

5.18 The costs associated with other applications required to support the development are estimated to have cost 140 300 ECU.

5.19 Permission for the development was granted in September 1993. No reasons for the delay were given, but the developer believes that the application was delayed mainly for political reasons. The application coincided with the coal review, and the developer believes that the final decision was delayed until the results of the coal review were known

5.20 The planning consent effectively gave permission in principle to the development of a power station at the site. Sixty two planning conditions were attached to the planning consent, many of which required the developer to submit further details of the scheme to the local planning authority for approval before development commenced.

5.21 The delay in securing consent had significant cost implications for the developer. The delay meant that the project had to be restructured, because the original partner pulled

out and a new partner had to be found to invest in the development and purchase the electricity. Seabank Power estimate that this delay cost the company approximately 915 000 ECU.

SUMMARY OF EIA COSTS

5.22 The full costs of the environmental assessment amounted to approximately 512 400 ECU. This included the costs of the baseline studies, time spent in consultation, and printing and publication costs. The capital cost of the total project is 384 million ECU, whilst the capital cost of the power station is 268 million ECU. The EIA costs therefore represent 0.13% of the total project cost, and 0.19% of the total cost of the power station.

POST EIA COSTS

5.23 In early January 1995, Seabank Power applied to the DTI for permission to vary the original site layout following advances in technology over the intervening period which allowed the same amount of electricity to be generated from fewer turbines. Approval for the amendments was granted in November 1995. The company estimates that a minimum of 6 person months has been spent in discussion with the statutory authorities, with most time being spent in negotiations relating to the planning conditions.

5.24 As a result of these discussions, the design of the power station has been modified quite considerably. The company estimates that the architectural modifications which have been required in order to minimise the visual impact of the development will increase construction costs by approximately 1.22 million ECU. In addition, the building design will result in higher maintenance costs, and a greater chance of building failure.

5.25 In addition to planning permission, the development requires the permission of HMIP to emit discharges to air and water. In April 1995, Seabank Power submitted their application for authorisation under the Environmental Protection Act 1990. This was approved in September 1995, but does not become effective until April 1997. The application fee for authorisation was 12 200 ECU and the company is also required to pay an annual subsistence fee once the power station becomes operational. The authorisation allows the power station to emit certain gases, the limits set either by mass or as concentrations.

5.26 Additional expenditure will also have been incurred in securing the planning consents for other aspects of the development, (e.g. the oil and gas pipelines and overhead transmission lines), and in obtaining the necessary operating consents.

COSTS TO THE COMPETENT AUTHORITY

5.27 The costs to the competent authority, (the Department of Energy) were mainly those concerned with processing the application, and the Department had no involvement in the project until the first planning application was submitted in April 1991.

PROCESSING THE APPLICATION

5.28 **Review of EIA Statement:** The review of the environmental statement took about four days to complete. A further day was spent reviewing the supplementary information.

5.29 The Department reviews the statement to determine the extent to which further information is required. This information is then requested in the form of a 'Reg.10 notice.' At least one Reg. 10 notice is issued for every environmental statement reviewed even if the Department has been involved during the environmental assessment process, because the statutory consultees and the general public, will always identify concerns that had not been previously recognised. This can have considerable time implications.

5.30 **Consultations with the Developer:** Three day trips to Bristol (including one when the first application was withdrawn and resubmitted, and one after the revised proposal was submitted), plus a meeting in London and correspondence by phone and letter.

5.31 **Consultations with Statutory Consultees:** A minimal amount of time was involved. The Department forwards the application and environmental statement to the statutory consultees for comment, who then respond to the Department. If any site specific meetings are held, the Department will ensure that both the developer and the statutory consultees are involved.

5.32 Under Section 36 of the Electricity Act 1989, an application must be determined within four months unless, as in most cases, there is a request for further information. The Seabank application took almost two years to determine which is the longest time for a proposal not subject to a public Inquiry. Most applications for power stations are decided within 9-12 months, including 1 month to come to a recommendation 1 month to agree conditions, and 1 month to get ministerial approval.

COSTS TO THE STATUTORY CONSULTEES

5.33 **Bristol City Council:** Prior to the first application being submitted in April 1991, Bristol City Council had very little involvement in the EIA process. There were a few cursory inquires from the developer, and the authority set out in broad terms the issues they would wish to see considered in the environmental statement. There were also some preliminary discussions relating to air quality and monitoring locations.

5.34 Following the submission of the first application in April 1991, the authority became much more heavily involved. Between April 1991 and August 1992, the case officer for Bristol City Council estimates that between 4 - 8 person months were spent processing the application.

5.35 A significant amount of officer time was spent processing the application. Whilst it is recognised that major development proposals do require more time to process, in this particular case the presence of the environmental statement is considered to have added to the time taken to process the application. The lack of a scoping study, and failure to enter into detailed discussions with the statutory bodies at an earlier stage are identified as key reasons for the delay. In addition, the application was for an outline permission, with much of the detailed design still to be finalised. This created difficulties, because the council required a certain level of detail in order to be able to make an informed decision, yet the developer was not always able to supply this because it was too early in the process.

5.36 **Northavon District Council:** Northavon District Council were involved in pre-application discussions with the developer prior to submission of the planning application but these involved very little time.

5.37 Once the application had been received, the Council, set up a project team to deal with the planning application consisting of individuals with expertise in particular areas. In the case of Seabank a team of 6 or 8 was established, and it was estimated that from the submission of the application to the decision (October 1991 to September 1993), approximately 5% of each officers' time was spent on the application. This equates to approximately 7 person months.

5.38 The project officer's view was that in general, the environmental assessment process increases the time spent by local authorities deciding planning applications. The environmental statement provides more information about the proposed development, but often tends to raise more questions and leads to a disproportionate increase in work. It does however result in better planning decisions.

5.39 The officer also referred to the problems association with the outline planning consent. The development described in the environmental statement is much larger that that which is now proposed. In reality, the environmental statement presents a worst case scenario, but has not actually tested or assessed the development which will eventually be built.

5.40 **The National Rivers Authority:** The NRA were involved in early discussions with the developer. These were of a general nature, and were concerned with the regulations which applied to various aspects of the development, and the consents and procedures that would need to be obtained and followed by the developer.

5.41 Following submission of the first environmental statement, the NRA became involved in discussions with the developer concerning the supply of cooling water, and suggested the Avonmouth Sewage Treatment Works as a potential source. These discussions did not take up a vast amount of time.

5.42 Following the grant of planning permission, the authority has been involved in further discussion relating to discharge consents and more recently in connection with contaminated land which is being dealt with now that construction works have started.

5.43 **English Nature:** English Nature were involved in preliminary discussions with Seabank Power during October 1990, but at this time but they were commercial and confidential. The agency provided advice on the ecological interest of the area, and prepared a brief document setting out the scope of the issues that would need to be considered as the development proceeded if cooling water was taken from the Severn Estuary. These discussions took approximately 2 person days.

5.44 In February 1991, English Nature prepared a draft scoping report highlighting the international, national and local importance of nearby sites, and indicating where information could be gathered. This four page document was primarily concerned with the Severn Estuary, but it also considered geological aspects, fisheries, water and air quality, mitigation and precautionary measures, contingency plans and monitoring. This input took approximately two person days.

5.45 The agency spent one day reviewing and preparing comments on the first environmental statement in June 1991, and indicated where further information was needed. They spent a further two days reviewing the final document which was submitted in October 1991.

5.46 **HM Inspectorate of Pollution (HMIP):** HMIP were involved in the preliminary stages. A number of meetings were held with the developer, HMIP and EHOs from Bristol City Council and Northavon District Council to address air quality issues. These discussions were of a general nature, and were concerned with ensuring that there were no obvious air quality issues which would prevent development of a power station on the site.

5.47 The discussions considered the locations of the air monitoring stations and also considered in general terms the possible effects of the Second Severn Crossing (a new road over the estuary), with respect to increasing car emissions, and the cumulative effects on air quality.

5.48 During the EIA studies, discussions about the number and height of emission stacks were held. HMIP advised that fewer stacks would reduce atmospheric emissions, but this was not incorporated into the plant design, and the development described in the environmental statement presents the worst case scenario.

5.49 As a statutory consultee, HMIP were consulted on the application during 1992 and were involved in a number of meetings, specifically about air quality concerns and stack heights.

5.50 It is estimated that the agency spent approximately 5-6 days in preliminary discussion, and approximately the same amount of time in discussions following submission of the planning application. The review of the environmental statement focused on those sections of the document which were relevant to their concerns, and the document contained sufficient information for the agency to reach a decision. However, HMIP do not believe that the EIA process increased officer time. The agency would have been involved in similar if not identical discussions with any developer regardless of whether or not an EIA was being undertaken.

5.51 **The Countryside Commission:** The Countryside Commission reported that they spent very little time on the application. The proposal did not affect any designated sites and therefore their involvement was minimal.

5.52 **The Health and Safety Executive:** The Health and Safety Executive were not involved at all during the planning stages. The Executive becomes involved in the months preceding construction to ensure that the design and construction methods incorporate health and safety issues.

SUMMARY OF COSTS

5.53 The cost to the developer of undertaking the environmental assessment was 512 400 ECU, which represents 0.13% of the total project cost of 384 million ECU, and 0.19% of the total cost of the power station. The developer stated that a similar amount of money (610 000 ECU at 1995 prices) would have to be spent in advance on an EIA and the associated consultation regardless of the size of the project.

5.54 It took two years to decide this application. Most major developments of this kind normally take between 9-12 months to decide, so this application was delayed by approximately 12 months, which had implications for the developer. The original partner pulled out, and it cost approximately 915 000 ECU to restart the project. The delay also had implications for the overall design of the power station because technological advances in the intervening period, meant that the footprint of the power station could be reduced.

5.55 Both Bristol City Council and Northavon District Council believe that the environmental statement increased the time taken to process the application, because it tended to raise more questions. However, it is also acknowledged that this was one of the first applications to be accompanied by an environmental statement that either authority had received, and their lack of familiarity with the procedures may have increased the time taken to process the application although not significantly.

5.56 More significant however was the lack of a scoping study and delay in entering detailed negotiations with the statutory authorities. Whilst the developer did consult with the statutory agencies about the form and content of the EIA, only a very broad outline of the topics to be covered was provided. No formal scoping study was undertaken, and as a result, many issues of major concern were omitted in the original EIS submitted in April 1991. Had a more detailed scoping exercise been undertaken, some of these issues, particularly with respect to the policy issues of the area may have been identified at an earlier stage.

6.0 REVIEW OF BENEFITS

BENEFITS TO THE ENVIRONMENT

PRELIMINARY STAGE

6.1 The site selection process ensured that the most suitable site was selected for development. Environmental factors were considered during the site selection process as the development site needed to meet certain basic criteria.

6.2 Five site areas were considered on land adjacent to the Severn Estuary, and a further six sites were considered in the immediate vicinity of Seabank. A broad overview of the potential environmental effects was considered as part of the site selection process, and the Seabank site was finally selected for the following reasons: the core area of the site had been used for energy purposes for many years and re-development of the site would avoid the need to develop a green field site; the power station development would be compatible with neighbouring land uses; access to the main road network was good; the site was located away from residential areas. Specific environmental benefits that resulted from the selection of the Seabank site were the rehabilitation of a derelict and contaminated site, and the prevention of development on a green field area.

EIA STUDIES

6.3 The project was modified during the course of the EIA studies, the most significant modification in environmental terms being the proposal to use water from the

Avonmouth sewage treatment works for cooling rather than water from the Severn Estuary.

6.4 The main environmental benefits to result from the environmental assessment are:

- the use of the water from the Avonmouth Sewage Treatment Works as a source of cooling water. This is preferable to using water from the Severn Estuary, (a site of international nature conservation importance), and preferable to the use of water from the Bristol Water Company's bulk supply which is potential drinking water. Use of water from the treatment works will also reduce the discharge load to the estuary;

- the landscaping requirements which have been agreed are aimed at improving the landscape of the industrial area, and creating a habitat for birds which use the saltmarsh nearby. The landscape proposals seek to recreate the historic landscape of the area, which was originally wetland, and to enhance the archaeological features of the area;

- the restoration of a contaminated site. The site was previously an old gas works site, and the land and groundwater is contaminated with heavy metals. Remedial works are being undertaken to the site to remove the contamination, as a result of the development;

- the development of a gas fired power station to replace an existing coal fired power station will help to reduce global carbon dioxide emissions, although local levels may increase. In order to help mitigate against this effect, the developer has contributed 122 000 ECU for planting of the community forest and this could be considered a direct environmental benefit.

POST EIA

6.5 The mitigation measures set out in the environmental statement have been incorporated into planning conditions. These are concerned with air emissions, water resources and the prevention of water and soil pollution, waste disposal, noise emissions and the visual impact of the development.

6.6 Technological advances in the period between submitting the planning application and granting planning permission of the development, have meant that the same amount of electricity can be generated with fewer generators. An application to vary the form of the development was submitted in March 1995, indicating a smaller land area for the development. However, the mitigation measures relating to the source of cooling water and the landscape and habitat creation proposals still apply.

6.7 The development which will ultimately be built on the site will have less impact than the development described in the environmental statement.

6.8 In addition, the company is also reviewing the potential for the development to provide hot water from the cooling system to other industries should a suitable user be identified nearby.

BENEFITS TO THE DEVELOPER

6.9 The proposed development falls within the definition of an annex I project and therefore an EIA is a legal requirement. Without an EIA the competent authority would not have considered the planning application.

6.10 Much of the information provided in the EIA is also required by HMIP when they are considering applications for authorisation under the Environmental Protection Act 1990. As such, the preparation of the environmental statement assisted the developer in securing other consents necessary for the operation of the plant.

BENEFITS TO THE COMPETENT AUTHORITY

6.11 The presence of the environmental statement did help the planning authority in setting out planning conditions. The Department of Trade and Industry has approximately 30 standard conditions to which site specific conditions are added. Any mitigating measures or benefits stated in the environmental statement are pinned down by planning conditions. If developers subsequently object to any condition, then the environmental statement has to be revised, and the revised document subjected to further consultation.

BENEFITS TO THE STATUTORY CONSULTEES

6.12 **Bristol City Council:** Bristol City Council believe that the EIA process did improve working relationships between the developer and the statutory agencies, during the time that the application was being processed. However, the personalities at Seabank Power have subsequently changed, and new working relationships have been developed.

6.13 The EIA ensured that the decision making process was better informed, and although it may have added time, the decision that was made was probably better as a result. Much of the information that was supplied in the environmental statement would have been required anyway for a planning application of this type, but the environmental statement provides a structured way of ensuring that all issues of concern are considered.

6.14 **Northavon District Council:** The case officer's view was that applications accompanied with an environmental statement do take longer to deal with, but the environmental statement provides a structure within which to consider the application and assists with the decision making process.

6.15 **National Rivers Authority:** Officers from the NRA stated that they felt that the EIA was of benefit to the overall planning process, as it requires the developer to focus on key issues from the outset, and to justify their reasons for the development.

6.16 **English Nature:** With respect to processing the environmental statement, English Nature did not consider their time inputs on this particular project to have been significantly increased by the presence of the environmental statement, and the Agency was generally impressed with most aspects of the power station EIA as a single application.

6.17 **HMIP:** HMIP felt that the EIA process did influence the design of the power station. HMIP are concerned with emissions from the plant. Whilst there were other measures

that could have been put in place to minimise emissions from the plant (e.g. fewer chimney stacks, selective combustion reduction), HMIP employs the BATNEC approach ("Best Available Techniques Not Exceeding Excessive Cost"), and the air quality in the immediate vicinity of the power station did not justify the imposition of these measures on the power station.

7.0 SUMMARY OF FINDINGS

7.1 The lack of early consultation, and the failure to prepare a scoping report are identified by all parties as major omissions which ultimately delayed the decision making process, because key environmental and policy issues were not considered from the outset. In this particular case, the environmental statement extended the decision making process by 12 months although, in general, an environmental statement does help to speed up the process.

7.2 The environmental assessment was undertaken to accompany an application for outline planning consent. As such, some of the detail relating to the design of the plant had not been finalised at the time of the application, and the development which will ultimately be constructed on the site will bear little resemblance to the development which was assessed in the environmental statement. To ensure that the development meets the environmental conditions set out in the environmental statement, planning conditions have been attached to the planning consent which require the developer to submit detailed proposals to the local planning authority for approval before construction works begin.

7.3 The environmental statement has only considered the development of the power station. The infrastructure required to support it was subject to separate environmental assessments.

7.4 All the parties involved acknowledge that there were procedural difficulties with the environmental assessment which was undertaken for the power station. However, to a large extent, these resulted from the fact the both the local planning authority and the developer were unfamiliar with the EIA Regulations. Despite this, and the subsequent delay which resulted, the developer found the EIA process useful for pulling together and presenting the information required for the planning application, and believed that the process has resulted in environmental benefits.

CASE STUDY 6. WYTCH FARM OILFIELD, DORSET

1.0 INTRODUCTION

1.1 This report reviews the costs and benefits of the EIA process as it applied to the development of Well Site 'M', which forms one of 11 wells within the Wytch Farm Oilfield. The report forms part of a series of 18 case studies on Project EIAs in the Netherlands, the United Kingdom, Spain and Greece and follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project and Participants
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

2.0 CONDUCT OF THE CASE STUDY

2.1 The research for this case study was undertaken by P.J.Nelson of Land Use Consultants during the period of February 22nd and March 1st, 1996. A copy of the EIA, entitled Environmental Statement Well Site 'M' was forwarded in advance by BP Exploration. The EIS was read by Peter Nelson prior to his site visit which took place on Monday 26th February. The visit included a tour of the area of Poole Harbour, a brief inspection of the Goathorn Peninsula and Well Site 'M', and a visit to the main oil-gathering ground, where the meeting with BP Exploration took place

2.2 A meeting was held at Dorset County Council Planning Department on 4th April 1996 with Mr Tony Jefferies, the case work officer responsible for dealing with the EIA and general planning issues relating to the Wytch Farm oilfield. This meeting lasted for 2.5 hours and was followed by a further discussion with the Deputy County Planning Officer.

2.3 Peter Nelson subsequently telephoned the statutory consultees to ask questions about their views on the relative costs and benefits of the EIA process as applied to this project. This report was written in two parts commencing on 27th February.

3.0 OUTLINE DESCRIPTION OF THE PROJECT AND PARTICIPANTS

3.1 The development proposals involved the construction of a new oil drilling platform and wellsite on the Goathorn Peninsula which projects into the shallow waters of Poole Harbour on the south coast of England. The new Well Site is designed to extract oil and gas from a marine reservoir lying under the approaches to Poole Harbour, and extending 8 kilometres out to sea. This reservoir overlaps with other land-based oil reservoirs which have been exploited since the 1930's

3.2 Development of the oil field began on-shore in the early 1930's at a site at Wytch Farm and, in the early years, oil was extracted with mechanical pumps known as 'nodding donkeys'. With more advanced drilling technology the full potential of the inland oilfield

was discovered and exploited during the period 1960-80. The existence of a new oil reservoir extending out to sea was identified through surveys in the 1970's. The British Government invited applications for exploratory drilling through the Department of Trade and Industry and the oil field reserves were initially identified by the Gas Council (later British Gas). Between 1984 -86 a major research and development programme was undertaken to determine the scope for exploiting the oilfield, by BP Exploration, which had taken over the licence

3.3 The entire oilfield underlies some of the most sensitive heathland, intertidal, and marine habitats in Southern England. Consequently the early development proposals were subject to close consultation between the prospective developer, and the respective government agencies. Although it predated statutory requirements for EIA, a series of environmental appraisals were prepared for different elements of the whole development.

3.4 The early plans for developing the seaward part of the oilfield involved the concept of building an artificial island (Hook Island) off the coast which would provide the base for combined drilling and production oil wells. These ideas raised considerable concern in terms of the potential impacts both for navigation and the environment, although they were pursued as the only practical way of developing the oilfield at that time. The project was promoted as a Private Bill through Parliament in 1991, and proceeded as far as the second reading (i.e. close to final decision) before the decision was taken to adopt a different approach.

3.5 Different views have been expressed about the reasons for the change of plan. The increasing levels of concern over environmental impact and safety hazards are cited as one reason, but another major factor was the significant advance in drilling technology which had been achieved over a 5 year period, making it possible to drill remote sites by 'extended reach drilling' involving both curved and horizontal boring.

3.6 From both the developers' and the regulator's standpoint it was important that whatever approach was adopted the technology should be capable of extracting the maximum amount of oil from the reservoir to realise the full economic benefit and avoid wasting finite natural resources. Much of the discussion about alternative wellsite locations therefore involved balancing the environmental effects against the technological constraints. In the proposals which were eventually adopted it was calculated that around 80% of the available oil could be extracted, and subsequent tests suggest that in excess of 90% recovery will be achieved in practise.

3.7 In 1991 BP took over an existing exploration Well Site 'F' operated by British Gas, which was conveniently located within reach of most parts of the oilfield, using the new technology. The company discussed the possible requirement for a formal EIA but because its plans for test drilling, using extended reach techniques, only required extension of an existing site rather than entirely new construction a full EIA was not required. Nevertheless, the company following its standard in-house procedures, did undertake a full range of environmental studies which were published in September 1992. (Extended Reach Drilling, Well Site 'F' - Environmental Studies)

3.8 Well Site 'F' did not have sufficient capacity to serve as the main location for exploiting all the oil reserves, so in April 1992 investigations began to locate a new production Well

Site. Four potential sites were considered for the new well, including the company's preferred location on the foreshore at Studland, although this was subsequently dropped because of its exposure to view from a wide area. The other alternatives included sites D and X and the site eventually chosen known as Well Site 'M' which is the subject of this EIA case study. The EIA was the first to be produced by BP for its developments in Dorset under the EC Directive

3.9 The principal participants in this project are as follows :

•	Developer:	BP Exploration Operating Company Ltd.
	(Supported by its	ARCO British Ltd
	partners):	Premier Consolidated Oilfields plc
		Clyde Petroleum (Dorset) Ltd
		Purbeck Exploration Ltd
		Goal Petroleum plc
•	Competent authority:	Dorset County Council
•	Statutory consultees:	English Nature (flora and fauna) English Heritage (culture/archaeology) Countryside Commission (landscape)
•	Non Government Organisations:	Royal Society for the Protection of Birds
•	Public Groups:	British Herpetological Society

4.0 DETAILS OF THE EIA PROCESS

CONDUCT OF THE EIA STUDIES

4.1 The following description is concerned only with the preparation of the Environmental Impact Studies and Environmental Statement for Well Site 'M.'

4.2 The EIA studies were undertaken between April and September in 1992. Findings from earlier studies for Well Site 'F' were incorporated in the EIA and reduced the amount of new field-work required.

4.3 The company managed the EIA process and wrote the Environmental Statement using the resources of its permanent environmental unit, which services the entire Wytch Farm oil field. Staff members of the unit have altered over the years but at the time of the assessment the team included M.J.Mason, S. Stevenson, and D.C.Rogers.

4.4 Other specialists were contracted to undertake specific parts of the EIA, as required. These specialists included:

- The Institute of Terrestrial Ecology (Fauna and Flora)
- Nicholas Pearson Associates Ltd (Landscape and Visual Impact)
- DNV Technica Ltd (Noise)
- AC Archaeology (Cultural Heritage)

PREPARATION OF THE EIS

4.5 Sections of the EIS were written while the surveys were in progress but the main text was prepared between September 1992 and January 1993.

4.6 Consultation drafts were issued to the main parties, and the final EIS was submitted with the planning application in July 1993.

4.7 The decision to approve the project was given in December 1993, and work commenced immediately on site.

4.8 The environmental statement comprises of one document, which is A4 portrait size and runs to 101 pages.

4.9 The report follows a conventional format in 19 sections covering the following subjects :

Note: Figures in brackets indicate the number of individual sides of paper covered by text in each chapter.

4.10 The report contains 14 sides of black and white illustrations, 7 sides of colour maps and diagrams, and 9 sides of colour photographs illustrating the site and typical processing operations. Written text covers approximately 68 sides.

4.11 It is not the purpose of this report to carry out any independent analysis or review of the detailed findings of the Environmental Statement. That would require a full study in its own right. However, it is relevant to record the views of the competent authority, statutory consultees, and public bodies on the value of the EIA.

4.12 **Preliminary consultations:** In the stages leading up to the decision to promote Well Site 'M', BP Exploration was involved in very detailed discussions with the Wytch Farm Liaison Committee and with Dorset County Council as the competent authority. These discussions continued over a period of two years. Up to 16 organisations, and a number of smaller interest groups were involved in the consultation process.

4.13 **Feasibility Studies:** In the preliminary stage for Well Site 'M', much of the earlier research for Well Site 'F' was used to inform the design process. Additional studies were also carried out specifically for the new site. These included;

- engineering studies on the need to strengthen the foundations for the drilling rig;
- the design of the flare pit;
- contingency planning.

4.14 The preliminary studies took in the region of six months to complete, and had already begun to address the environmental issues which were subsequently dealt with in more detail in the EIA.

4.15 **Project Screening:** The decision to prepare an EIA for the site was taken by BP Exploration following discussion with the County Planning Department. The company has undertaken its own internal environmental appraisals of its development proposals for many years, but this was the first time it had produced a full EIA in accordance with the EC Directive. Production of an EIA is now standard practice within the company for all projects of this size and sensitivity.

4.16 No formal guidance was used to determine the need for an EIA. It was felt, in the light of the recent history of the oilfield development, that an EIA was unavoidable. The decision was reached by the local management and was taken instantaneously.

4.17 In response to the question - would it assist your organisation if more specific criteria were laid down defining when EIA is required? - the answer was given that this would not affect the company's position, or that of Dorset County Council, both of whom have developed their own internal methodology - but clearer standards would help to set bench-marks for work in other parts of the country, where there is no tradition of hydrocarbon extraction.

4.18 It is the company's experience that the environmental controls exercised in the United Kingdom are as strict as in any other country. Norway was cited as one country which has particularly stringent environmental safeguards. In general regulations and controls are less strict in Eastern European countries.

4.19 **Scoping:** No formal scoping report was prepared for the project. However, the relevant issues were discussed in a meeting convened for the purpose. The main areas of concern were identified as:

- visual intrusion
- noise
- impacts on flora and fauna within the SSSI
- land-use and restoration

4.20 The scoping process took the equivalent of 3 days time for members of the development company.

4.21 All members of the oilfield liaison committee were involved in the scoping meeting including the competent authority, statutory consultees, NGOs and representatives of the local council. The main issues arising from these discussions included the amount of land which would be required for the Well Site, given that the whole area is located within a Site of Special Scientific Interest (SSSI).

4.22 It was also agreed that since the site was zoned as a potential Special Protection Area (SPA) it should be treated as if this designation already applied. There was some difference of opinion about the most appropriate form of protection, and about long term restoration proposals for the site, once it was decommissioned (in 20-25 year's time). The County Council had maintained a consistent policy of seeking to provide total screening for all oilfield installations in the interests of protecting the landscape and tourism industry of the surrounding area. It was supported in this view by the Countryside Commission. However, English Nature had become increasingly concerned about the loss of heathland within Dorset, which is a rare habitat throughout Britain. Parts of the site possessed remnant heathland, although much of the area had been planted with pine. The County Council wished to see increased planting to hide and screen the industrial plant, while English Nature wished to see existing trees felled and the heathland vegetation being actively managed.

4.23 The developer did not consider that it would be particularly beneficial for requirements for scoping studies to be formalised, since the company has its own methods and approaches to such issues and would not wish to follow prescribed guidelines in all cases.

4.24 **Baseline Studies:** Baseline Studies were conducted to cover all the main environmental topic areas including :

• ecology	(2-3 months)
• landscape	(1 month)
• soils and geology	(1 month)
• water quality	(1 month)
• climatic conditions	(3 weeks)
• archaeology	(1 month)
• traffic	(1 week)
• land use and agriculture	(2 weeks)

These surveys were conducted over a period of 6 months. The time taken for each survey is recorded above in brackets.

4.25 Much of the ecological survey work had been carried out in earlier studies for Well Site 'F'. However, it was necessary to carry out an additional survey of Badgers, to confirm that a set found on the site was no longer occupied. A survey of Nightjars was also commissioned in August 1992.

5.0 REVIEW OF COSTS

COSTS TO DEVELOPER

OVERALL PROJECT COSTS

5.1 In order to put the environmental studies for Well Site 'M' in context, a brief summary of overall development costs for the entire project is appropriate. The development of the oil field has occurred in 3 phases, over more than fifty years:

- *phase 1* - took place during the period 1930 - 1960 by the Gas Council (land-based wells using mechanical pumps with very low output rates) for which the costs have not been ascertained in this study.

- *phase 2* - between 1960 -1990 - involved development of the main Wytch Farm oilfield including construction of all the main well sites, a central gathering ground, and the first stage of off-shore extraction with the establishment of a drilling and production well on Furzey Island, and both land-based and submarine pipelines. This phase has involved costs of around 610 million ECU.

- *phase 3* - Development of the offshore oilfield - involved the construction of 11 wells, including Well site 'M', and the undertaking of three major seismic surveys, involving expenditure of 103.7 million ECU to date.

5.2 Construction of the surface installations for Well Site 'M', (i.e. all elements above the 'Christmas tree' valve) has cost 12.2 million ECU. This is the figure which is directly relevant to the surface works covered by the EIA. In addition, below ground costs for drilling the extended reach boreholes are typically in the region of 1.22 million ECU for every kilometre of borehole. Well Site 'M' is designed to allow 10 boreholes to be drilled for distances of up to 8 kilometres, giving additional below ground development costs of 73.2 - 97.6 million ECU.

PRELIMINARY STAGE

5.3 BP Exploration monitors all project development costs very carefully, but there are many practical difficulties in extracting cost information retrospectively for purposes other than those for which the accounting systems were designed. These constraints, which occur with all the case studies to a greater or lesser extent include the facts that:

- Records are kept by central cost control for all major areas of expenditure, but responsibility for budgets below fixed levels (e.g. 61 000 ECU) is delegated to managers of specific parts of the project. These records may be kept for only 1-2 years.

- Funds may be allocated from different budget heads (for example the exploration group, or external affairs group).

- Key staff may have moved to other positions in the company.

5.4 The most significant constraint in isolating preliminary costs for this project, was the constantly evolving nature of the development proposals for the off-shore oilfield, as discussed in paragraph 3.5. Surveys of land-based options for the main drilling and production platform began in late 1991, following the decision to abandon plans for an artificial island. Interest was focused initially on expanding Well Site F which incurred costs in the region of 488 000 ECU for both engineering and environmental studies over the period up to September 1992.

5.5 Alternative sites were examined over the same timespan and by April 1992 four other Well Sites were under investigation including Well Site 'M'. Information collected during all of these studies, and indeed data accumulated throughout the entire life of the oilfield has been drawn on where appropriate in preparing the EIA. While there is no accurate figure for preliminary costs it may be assumed that in the region of 732 000 ECU was spent on environmentally related studies and surveys in the preliminary stage up to April 1992. In addition, BP Exploration had the equivalent of two staff members working on a permanent basis on the project (an Environmental Scientist and Project Manager). This staff time cost in the region of 234 240 ECU for the year.(234 days x 5002 = 500 ECU)

EIA STAGE

5.6 **Screening:** There were only the most nominal costs (2 person days - say 800) associated with screening the project to decide whether or not an EIA would be required, since the company had adopted a general policy of applying EIA to such development. Dorset County Council was also clear that an EIA would be required.

5.7 **Scoping:** The review of scoping issues was undertaken by the liaison team of key participants at one of its routine meetings. Costs therefore amounted to the equivalent of 8 person-days of effort (say 3904 ECU)

5.8 **EIA Studies:** Most of the cost of environmental surveys was borne during the preliminary stage. A budget of 85 400 ECU was allocated to cover the planning application and EIA Stage, of which the application itself cost 10 980 ECU. This budget also covered consultancy time in helping to draft parts of the EIA Statement.

5.9 **Provision of Background Information:** All data necessary to complete the EIA studies was held by BP Exploration so no additional costs were incurred under this heading.

5.10 **Consultation with Statutory Bodies:** Close contact is maintained between BP and a range of Statutory bodies through various liaison committees relating to the whole of the Wytch Farm oilfield. It is therefore difficult to distinguish time spent specifically on a single project, let alone a discrete part of that project.

5.11 **Liaison with the Public:** A leaflet was prepared to describe the studies on the Goathorn Peninsula, and circulated through libraries and other public outlets. In addition the company held regular briefing meetings with the District and Parish Councils. Public

interest in the project was restricted to groups with specific concerns, like the Herpetological Society, and very few individual members of the public responded to press releases.

5.12 **Project Management:** Project management is an essential element of a multi-faceted development like the Wytch Farm oilfield, and it is likely that up to 50% of total staff time is committed to aspects of management. This work would be required, however, for all types of study (technical, economic, social or environmental), and would take place whether or not a formal EIA is required.

5.13 **Assessment of Effects:** The task of assessing and evaluating impacts of the development was carried out continuously as part of the overall appraisal and these costs are incorporated under the heading of baseline studies

5.14 **Modifications to Project Design:** Significant changes occurred in the outline design of the drilling site, and also in some specific details as a result of the EIA process. Such modifications occur as a matter of course with most if not all Well Sites, as the engineers' ideal site requirements have to be modified to accommodate particular constraints and characteristics of the site.

5.15 **Mitigation:** Additional safeguards were incorporated in the project design, but these works have not been costed separately, and cannot be distinguished from other features of the site construction works.

5.16 **Drafting the EIA Statement:** It is estimated that the EIA took 30 person weeks to write, (one person full time over 6 months with 20% additional input from others). This translates to a cost of 75 030 ECU based on 150 days @ 500 ECU.

5.17 **Formal Consultation and Review:** Costs of liaison with other interests have been discussed above.

5.18 **Public Consultation Prior to Publication:** The developer had very little involvement in formal consultation with the public.

5.19 **Printing and Publishing the Documents:** The EIA Statement cost 9760 ECU to produce and 150 copies were printed.

5.20 **Decision making process:** No significant delay was incurred, but the consequences of any such delay would have been very severe, as the rig had been ordered from Germany and the cost of stand by time is 18 300 ECU per day.

POST EIA STAGE

5.21 Following submission of the planning application and EIA the developer incurred further costs in the negotiating stage. No significant redesign of any of the project elements was required but the company did agree to take on the management of a small area of remnant heathland, 500m away from the Well Site. This represented a very significant increased cost of 305 000 ECU over the 4 years it will take to establish.

5.22 **Annual Monitoring Costs:** The company has its own well structured monitoring programmes for oilfield development which are required both for good housekeeping,

and also for safety and contingency planning. It is estimated that in the region of 30 500 ECU is spent per annum on environmental protection of Well Site 'M'.

COSTS TO COMPETENT AUTHORITY

PRELIMINARY COSTS

5.23 Like the developer, Dorset County Council Planning Department had been actively engaged in the strategic planning of the oilfield for a number of years prior to the decision to promote Well Site 'M'. Officers were therefore aware of the general development plans in advance of the EIA. Actual costs in terms of staff time are hard to quantify but it is estimated that perhaps 2 person weeks was required in the preliminary stage. (Equivalent to 5002 ECU).

5.24 **Screening:** Only a few hours were required to confirm the need for an EIA.

5.25 **Scoping:** The scoping process was undertaken during a routine liaison meeting and incurred an estimated 8 hours of staff time.

5.26 **EIA Studies:** The only demands placed on the authority arose from the need to attend routine liaison meetings. This time input amounted to a total of 28 days of which an estimated 8 days related to Well Site 'M'. No additional costs were incurred.

5.27 **Review of EIS:** Between July and December 1993 the case work officer spent an average of 2 hours a day working on the review. (120 days x 2 hours = 240 hours = 34 days = 13940) Of this time 60% was spent in discussion with the developer, 30% was committed to discussions with the statutory consultees and the balance of 10% was related to public consultation.

5.28 The authority considered several drafts of the EIA Statement, and 4 people read the final document. The total time input was in the region of 8-10 person- days. (i.e. 5002 ECU).

5.29 The time spent in drafting the planning consent and preparing conditions was handled as routine work by the development control team and involved no additional work because an EIA had been involved. If anything the existence of the EIA had simplified this area of work.

6.0 REVIEW OF BENEFITS

PRELIMINARY STAGE

6.1 **The Developer** BP Exploration has adopted a very positive and pro-active response to its environmental responsibilities, both for ethical, but also commercial reasons. If major controversy and delays are to be avoided, it is vital that proper attention is given to environmental issues relating to major developments in sensitive areas. The company was therefore carrying out extensive environmental studies long before it became a formal requirement.

6.2 **The Competent Authority** Dorset County Council has always maintained a close interest and strict control over development of the Wytch Farm Oilfield. The Authority

was therefore fully appraised about the main environmental issues affecting the site before the development proposals were introduced.

Other Parties

6.3 Given the high level of environmental awareness on the part of all the main participants, it is clear that careful analysis of potential environmental effects would have occurred with this development application even if there had been no requirement for a formal EIA. The attitude of all the parties can therefore be seen as supportive from the outset

EIA STAGE

6.4 **Screening and Scoping** Screening of the project to decide whether or not EIA was required was not necessary in this case, due to the prior commitment of the developer. However all the parties agreed that screening procedures were important in less obvious cases in order to clarify the situation at an early stage in the project design process.

6.5 Scoping had been conducted, more or less as a matter of course, during routine meetings of the liaison committee. The view of the developer and competent authority was that scoping is essential within the EIA process. However, the developer's representative commented that the company preferred to define its own requirements, and would not be enthusiastic about a more formalised process which was defined in regulations.

6.6 **The developer** saw one of the main benefits in undertaking systematic reviews of baseline information as being the provision of hard information with which to debate issues relating to project design and mitigation with the competent authority and statutory consultees.

6.7 **The competent authority** considered that most of the key issues affecting the eventual planning decision were resolved during the work, and related discussions, on the baseline studies. This was the most active part of the EIA process.

6.8 Preparation of the EIS was an essential part of the process, but the completed document largely confirmed what was already known by this stage. The competent authority was able to draw directly on the EIS in drafting conditions.

6.9 Once the application and EIS had been submitted the decision stage progressed very smoothly. One member of the developer's project team had been convinced at the outset of the EIA process that it would lead to a demand for a full public inquiry. This proved not to be the case. There was very little public opposition or concern in spite of the site's sensitivity, and the decision was taken with the minimum of delay.

POST EIA

6.10 **The developer** recognised that some mitigation works would be necessary to protect the environmental qualities of the site, but formed the opinion that Dorset County Council, influenced strongly by English Nature, had required additional measures which could not be justified in terms of the development's direct impact. This view is acknowledged in the County Planning Officer's report to committee where he notes that "the development site itself has little immediate conservation value...however it forms

part of an important SSSI ... and has been identified as a potential Special Protection Area. Those circumstances need to be reflected in provision for conservation gain, as part of any development in such a sensitive location."

6.11 **English Nature** itself stated that "the land management plan for the Peninsula should be seen in part as mitigation for the Dorset oilfield development as a whole rather than solely 'M' site"

7.0 SUMMARY OF FINDINGS

7.1 Any insensitively sited, poorly designed or badly managed development in this location would cause serious damage to one of the most important landscape and nature conservation areas in southern England. The environmental qualities of the area are of international importance, and contribute to the economic prosperity of the region through recreation and tourism. The success of BP Exploration and its partners, and the regulatory authorities, in achieving the development of a major oilfield with the minimum of disturbance to this fragile environment has been recognised through a number of major awards.

7.2 Although the development of Well Site 'M' has inevitably caused a temporary loss of habitat, environmental considerations have been considered from the outset, and wider enhancement measures should lead to a net gain in environmental quality, once the site has been cleared and reinstated as heath or woodland.

7.3 Although the costs of the EIA were considerable, the developer found that the EIS provided hard information with which to debate issues relating to project design and mitigation with the competent authority and statutory consultees. There was little public opposition despite the site's sensitivity, and the decision making process progressed very smoothly.

7.4 The competent authority felt that most of the key issues affecting the final planning decision were resolved during the EIA process, whilst the EIS gave the statutory consultees confidence that the key issues were being thoroughly considered.

ANNEX 4

SPAIN

Case Study 1. Madrid-Valencia Highway 1

Case Study 2. Madrid Airport Extension 7

CASE STUDY 1. MADRID - VALENCIA HIGHWAY

1.0 INTRODUCTION

1.1 This case study reviews the costs and benefits of the EIA process relating to the routing and construction of 34 kilometres of new dual carriageway to replace part of the existing Madrid-Valencia N III Highway. It forms part of a series of 18 case studies on project EIAs in Greece the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

1.3 Although the format of the report is standard, it should be noted that the level of detail obtained on the Spanish case studies is less extensive than that for the other countries, since only three days was committed to the investigation in total. This reflects the fact that examples from Spain were not included in the research contract and the information has been sought on a voluntary basis.

2.0 CONDUCT OF THE CASE STUDY

2.1 Research for this case study was undertaken by Peter Nelson of Land Use Consultants, during a visit to Madrid between 3rd-6th March 1996. Information was supplied by Mr Diego Sebastian de Erice, of Eurostudios; Mr Jose Ramon Gonzalez Lastra, Director General of Environmental Information and Assessment, at the Ministry of Public Works, Transportation and the Environment; Mr Juan Pedro de Uralde, Greenpeace, and Mr. M.A. Valladares, Adena.

3.0 OUTLINE DESCRIPTION OF THE PROJECT

3.1 In recent years Spain has embarked on an ambitious programme of road building, including the upgrading of its national arterial routes. This case study relates to the Madrid-Valencia N III Highway and construction of 34 kilometres of new road between Minglanilla and Caudete de las Fuentes in the province of Cuenca-Valencia.

3.2 The existing sub-standard road ran immediately to the south of the Dam of Contreras, crossing the Rio Cabriel on an extension to the dam embankment. Design standards for the improved road required two 7 metre wide carriageways, each with 2.5 metre wide outer shoulders, a minimum radius of 900 metres and maximum gradient of 6% to maintain driving speeds of 120 Km./hour.

3.3 It was concluded by the Ministry of Transport and Public Works that it would be technically very difficult to widen this road due to constraints on both vertical and

horizontal alignments. Studies were therefore undertaken to identify alternative routes, and three options were selected for detailed examination. These were:

alternative 1 - running immediately to the south of the existing road,
alternative 2 - lying further south and screened from the existing road corridor by a dominant mountain ridge, and
alternative 3 - being the most southerly, and crossing the entrance to the gorge.

3.4 **Alternative 1** emerged from the studies as the most expensive to construct due to the presence of unstable ground conditions, and uncertainties about the load-bearing capacity of the underlying rock. In one section a tunnel would have been required. The full capital cost prior to introducing corrective environmental measures was **25,000 million pesetas**. While this route was problematic in engineering terms it was clearly the least damaging to the environment. This scheme was chosen as the preferred option by the consultancy team.

3.5 **Alternative 2** involved a greater distance and was environmentally less acceptable than Alternative 1. It was not favoured on either engineering or environmental grounds.

3.6 **Alternative 3** was chosen by the Ministry as the preferred route. Its initial capital cost before addition of corrective measures was **17,000 million pesetas**, and even after mitigation costs were added it remained the cheapest option. However, while this was the preferred route in economic and technical terms, it was also the most damaging environmentally, since the road cuts across the dramatic landscape feature formed by the head of the gorge, on a high viaduct, and the route also interferes with the movement of small mammals which form the principal food source for nationally rare birds of prey which inhabit the area of the gorge.

3.7 The decision to promote the most southerly route prompted strong criticism from the regional government and from amenity and conservation bodies, and resulted in significant mitigation work being required

4.0 DETAILS OF THE EIA PROCESS

4.1 The EIA was undertaken in three stages, as is standard for major road schemes in Spain:

Stage One considered the routing of alternative road corridors between the starting and finishing points. Work at this strategic level involves mapping and assessment at 1:50,000 or 1:25,000 scale.

Stage Two involved assessing the corrective measures which need to be put in place to reduce environmental impacts. This work is undertaken at 1:10,000 or !:5,000 scale.

Stage Three consisted of an assessment of the chosen route at detailed design stage and involved plotting and costing all environmental works at a scale of 1:1,000.

4.2 Under the Spanish system, the main difference between stages 2 and 3 lies in the level of detail, and degree of definition of construction details. For example in stage two it is normal to describe the need for erecting fencing over certain lengths of the route to avoid animals straying onto the road, but in stage three the report will describe the precise height, materials and dimensions of the fence, and show its exact alignment on the ground.

Stage One took 8 months to complete, of which 7 months were taken up by the technical and environmental studies and one month in generating the report.

Stage Two lasted for 12 months with a similar breakdown of time.

Stage Three also required 12 months - between May 1993 and the declaration on 26th April 1994.

4.3 The detailed project appraisal consists of 35 ' books'. The first 23 books describe all aspects of the project including geology and land ownership.

Book 24 set out individual route sections with maps, plans and design details,
Books 25 -26 cover drainage, structures, and traffic signage,
Book 27 Describes the environmental corrective measures,
Book 28 sets out technical conditions for the work
Books 29-33 provide the project budget, broken down for each section of the route, and including, in section 32, the cost of environmental corrective measures,
Book 34 describes safety and health measures, and finally,
Book 35 reviews the environmental impacts. This final book is, itself, 135 pages in length and is divided as shown below:

Length (Pages)	Subject Matter
10	Impact Summary
4	Introduction
2	Description of the project
70	Description of the setting
6	Description of possible effects on the environment
43	Identification and characterisation of Impacts
9	Corrective Works subdivided into 1 page Fauna 1 page river systems 1 page cultural heritage 6 pages landscape and countryside reinstatement
10	Programme for environmental monitoring
6	photographs

4.4 Finally it should be noted that the Environmental Impact Statement is supported by appendices and annexes which are of similar length to the EIA itself.

5.0 REVIEW OF COSTS

5.1 Preparation of the EIA for stage one cost between 10 and 12 million pesetas (63,290 ECU) with a similar level of expenditure in stage two giving a combined cost of 20 - 24 million ECU which represented 0.03 % of the total capital cost of the project including mitigation. Mitigation costs identified in stage three of the studies for the 34 kilometres of road amounted to 350 million pesetas (2,215,000 ECU) or around 10 million pesetas per kilometre, including study costs. Based on the total project capital cost of 17,350 million pesetas, the mitigation costs amounted to 2% of gross costs.

5.2 The amount of time taken by the competent authority in preparing a report on the scope of the EIA, reviewing the documentation, publicising its findings co-ordinating responses, and preparing the final declaration for this particular study is not known. However, an estimate on the part of the developer's consultant, and comments from the Environment section of the Ministry suggested that the time inputs would have been in the region of six person weeks for the scoping stage (3 persons working an average of two weeks) and up to four person months of effort in covering the other stages. On this basis, and allowing a standard 500 ECU per staff day, the cost of the Competent Authorities time could be placed at around 55,000 ECU.

5.3 In terms of the response of NGOs, both Greenpeace and Adena / WWF made representations concerning the potential environmental damage of the project. The two organisations have difficulty finding time to comment on individual EIAs and consider that the returns on the effort made are seldom very productive in terms of influencing the outcome of major political decisions. In the case of the Madrid - Valencia Highway it has been a long term strategic aim to link the two cities with an improved road, but the route passes through some of Spain's most sensitive habitats, and many different ecosystems. Both organisations maintain that the practice in Spain, (and in many other countries) of assessing route improvements in short lengths fails to identify this broader picture. It was for this reason that Adena/WWF employed two members of staff working full time for 3 months in the summer of 1995 to highlight concerns relating to the Valencia-Madrid highway through studies, press releases and lobbying.

5.4 By comparison with the time spent by the promoter and competent authority the input of Adena/WWF's time does not have a great impact on the overall costs of the EIA process, but when considered in relation to that organisation's internal budgets it represented a significant proportion of its staff time and resources. Five staff work in the areas of Environmental Education and EIA, and the time spent on the Madrid-Valencia highway therefore represented 10% of their collective time availability in 1995.

5.5 The time inputs by other participants to the process, including the Regional Government, and local communities, is not known.

6.0 REVIEW OF BENEFITS

6.1 In this case study the opportunity did not arise to discuss the costs and benefits with the promoting highway agency which was the Ministry of Public Works and Transport. The review of benefits is therefore based entirely on the opinions of a very limited cross section of participants, including the EIA Consultants, and bodies which were critical of the chosen route alignment. This is likely to have presented a somewhat one-sided view of the EIA process.

Benefits to the Environment

6.2 While criticisms have been made about the selection of alternatives and the extent to which the routes represented realistic options, the fact that alternatives were considered, is a significant contribution and improvement on the situation which previously existed in Spain. In this particular case, economic and technical factors were considered to outweight the environmental concerns at the decision-making stage, which lead to the selection of a sub-optimal environmental solution. The case study highlights the fact that EIA is only one part of the decision-making process, but the fact that the results are published should help to encourage more debate about the weight which should be attached to environmental issues in future road-building projects.

Benefits to the project

6.3 The 'three tier' approach to environmental assessment of road projects provided the opportunity to incorporate mitigation measures into the final design, and to reduce the scale of environmental impact which might otherwise occur. However, the extent to which such benefits can be realised is dependant to a large extent on the budget provisions which are made when the scheme is first approved. Some of the restrictions which can be introduced on capital cost, and hence the scope for implementing environmental protection measures are discussed in **Appendix 2**.

7.0 SUMMARY OF FINDINGS

7.1 In this case study it was apparent that the detailed assessment of the approved route of a new road, and the level of attention given to mitigation, were carried out to very high standards. However, the decision to select the chosen route did not endorse the advice contained in the consultants' reports and the EIA findings. This is not a criticism of the EIA process as such, but does emphasis the importance of the political process in determining the ultimate effects of new development on the environment.

CASE STUDY 2. THE ENLARGEMENT OF MADRID AIRPORT

AMPLIACION DEL AEROPUERTO DE BARAJAS

1.0 INTRODUCTION

1.1 This case study reviews the costs and benefits of the EIA process relating to the proposed expansion of Madrid international airport including the building of a new terminal and a third runway. It forms part of a series of 18 case studies on project EIAs in Greece the Netherlands, Spain and the United Kingdom.

1.2 The report follows a standard format which comprises:

2. Conduct of the Case Study
3. Outline Description of the Project
4. Details of the EIA Process
5. Review of Costs
6. Review of Benefits
7. Summary of Findings

1.3 Although the format of the report is standard, it should be noted that the level of detail obtained on the Spanish case studies is less extensive than that for the other countries, since only three days was committed to the investigation in total. This reflects the fact that examples from Spain were not included in the research contract and the information has been sought on a voluntary basis.

2.0 CONDUCT OF THE CASE STUDY

2.1 Research for this case study was undertaken by Peter Nelson of Land Use Consultants, during a visit to Madrid in March 1996.

2.2 Information was provided by Mr Jose Miguel Pena Perez and Mr Francisco Salazar de la Cruz of AENA, the State Civil Aviation Authority; Mr Jose Ramon Gonzalez Lastra, Director General of Environmental Information and Assessment, at the Ministry of Public Works, Transportation and the Environment: and Mr. A. Trujillano, Head of Environmental Impact assessment for the Autonomous communidad of Madrid

3.0 OUTLINE DESCRIPTION OF THE PROJECT

3.1 Development Master Planning is the responsibility of the civil aviation authority which forms part of the Ministry of Public Works. In the mid 1980's designs for the improvement of Barajas Airport were prepared by the civil aviation authorities' internal design teams, allowing for maximum capacity of 60 million passengers, with a total investment of 60,000 million pesetas.

3.2 Shortly after completion of the civil aviation authorities' studies, the Ministry of Public Works decided to commission a series of studies on 30 Spanish airports, including Madrid.

Civil aviation in Spain had originally been controlled by the Military Aviation Authority, and in the 1970s and 80s the military interest remained significant. The new studies were therefore conducted with the assistance of the military authorities and the USAF. The involvement of the United States Air Force stemmed from its strong presence in Spain at the time and its access to technical expertise, and financial aid.

3.3 In the light of the second round of studies, the Ministry of Public Works recommended that Madrid Barajas airport should be expanded with the addition of 3 new runways to give a total of 5 runways and an ultimate capacity of 80 million passengers, at a cost of 600,000 million pesetas. At the time the airport was accommodating in the region of 40 million passengers.

3.4 The Government accepted the recommendations for this more ambitious plan in 1988 and gave public presentations about its development programme, although no further action was taken over the next 2 years.

3.5 Official attitudes to major development proposals are susceptible to the political process, and it has been suggested that in recent years opponents of the airport (on environmental and quality of life grounds) have secured greater influence within the Ministry. It is therefore perhaps no coincidence that in 1990 Aena was asked to redesign the Masterplan proposals which took on their present shape with one new runway and terminal. The current projected cost of the development is 150,000 million pesetas, less than half the cost of the 1988 proposals, but significantly above the mid-1980 estimate. Analysis of air travel forecasts suggests that the airport will reach its intended design capacity of 60 million passengers in the period 2010-15, but world forecasts for air travel are constantly being revised, and these dates are only indicative.

The Developer

3.6 **Aena** is a newly established management company which has responsibility for 40 airports throughout Spain. It undertakes both strategic and environmental planning for the airports under its control. At the present time three studies are in progress at Alicante, Vitoria and Madrid Airports.

3.7 Major economic impact studies have recently been completed for Valencia, Las Palmas, and Malaga airports. A characteristic of the work now being undertaken by the authority is a strong focus on economic as well as environmental impact. The authority is committed to protecting the value of past and current investment in infrastructure and employment. Aena recognises that there is an increasingly vociferous criticism of new airport projects, primarily on environmental grounds, and believes that the true importance of airports to the national regional, and local economies of the areas in which they are situated is often overlooked as a result. This approach by Aena is highlighted in a recent study of Barcelona Airport, which examined employment salaries, rents and production. The study showed that the airport provides direct employment for 5000 people, and indirect employment for a total of 45,000 people.

Current Proposals for Madrid Airport

3.8 As the main airport of Spain, and gateway to the capital, Madrid airport has been under severe pressure for a number of years and is operating at capacity. Some short-term

measures are being taken to alleviate existing congestion, but the authority maintains that suppressed and potential demand can only be met by building a new runway, and creating a new terminal hub at the junction of the existing and proposed runways. It should be noted that some critics of the expansion programme have argued that the short term measures are actually designed to facilitate the eventual development and ought to have been subject to EIA in their own right.

3.9 The total area lying within the curtilage of the proposed development site is 850 hectares, of which 150 hectares, lying within the Jarama river valley, is needed for the disposal of spoil from the proposed runway. This runway will be 2000 metres in length, and 40 million cubic metres of earth and rock will need to be excavated.

3.10 Plans for developing the airport have met increasingly well organised and articulated opposition from people living close to the airport, including families of pilots and aircrew who are based at the airport and inhabit the outer suburbs.

3.11 Aena completed a full EIA on the Airport in late 1995, and a decision is expected in mid-summer 1996 from the Competent authority. The Authority is now embarking on an ambitious socio-economic study. This work will be undertaken by the University de Alcala de Henares, working on a strict brief from the authority. The study will correlate the noise footprints defined in the EIA with an equivalent socio-economic footprint, based on the rental value of properties. Contingent valuation techniques will be used to establish levels of public demand in terms of jobs, and environmental conditions.

3.12 The Socio-economic study has a budget of 1 million US $. Equivalent to 740,000 ECU. 40% of this budget will be spent on establishing a reliable data base on economic and social conditions around the airport. The larger sum of $600,000 will be used to carry out environmental evaluation relating to potential environmental effects. The programme allows for 6,000 home interviews, and an approach has been made to the EU for financial support for this research.

4.0 PREPARATION OF THE EIA

4.1 The first studies on the present airport extension proposals began in 1990, within the Ministry of Public Works. The Ministry has split functions, in being both the client for major public development projects, but also acting as the assessor and competent authority for such projects. The Ministry's own studies were focused on demand projections for air travel.

4.2 Aena became involved in the project in December 1991, and produced its first unpublished EIA study findings, with the assistance of its consultants, in December 1992. The EIA is an annex 1 project. This assessment was summarised in a 100 page document which was published in January 1993, and circulated to the Mayors of local communities, and other public bodies. Comments were received back from these organisations and a further amended document, known as the 'green report' was published in the summer 1994.

4.3 The Ministry of Public Works, in its capacity as Competent Authority, considered that this report was incomplete, and requested new studies and very extensive additions or amendments to the existing text. In making its criticisms the ministry drew on German

data and noise standards which suggested that up to 150,000 people would be adversely affected by the expansion and extended noise foot-prints. Aena maintained that no airport in the world, including those in Germany, are required to operate within these indicative guidelines, and produced its own evidence to suggest that the numbers of people potentially affected was closer to 10-15,000. This data was produced by Aena, using a new consultancy team, and the new material was published in the summer 1995. Aena considers that its EIA constitutes the full range of information submitted in 1994 and 1995, whereas the Ministry of Public Works considers that only the second (1995) report is the official EIA .

4.4 The 1995 Aena document, like its predecessor, was circulated amongst local authorities and public bodies, as a basis for comment. A challenge has subsequently been mounted by one community, on both fiscal and legal grounds, alleging that the EIA does not cover all the ecological impacts.

4.5 Due to the continuing delay in approving an expansion programme, the airport is now stretched to its limits in meeting the demands of 55 -60 operators per hour. Aena estimates that without constraints, the airport would be handling 70 operators per hour to meet current demand. In the short term there are improvements which the authorities can make including widening taxi-ways and temporary parking areas for aircraft which ease handling arrangements. Opponents of the expansion say that these 'minor' works are facilitating the longer term development rather than meeting only short-term requirements, and represent a form of cumulative impact.

4.6 While the airport expansion programme has been under review, population growth has continued in the areas surrounding the airport, and there has been ineffective control over new residential and industrial development. As a result there are now more people who are likely to be adversely affected by noise than was the case eight years ago when the expansion plans were announced. One group who argue that a military airfield (the former USA base at Torrejon 5 kilometres away) should be developed instead of Barajas, are the pilots who would find it easier to reach, and also less disturbing to their own home environment

Content of the EIA

4.7 The EIA constitutes a large collection of files and reports. Its principal findings are contained in 5 volumes with supporting appendices. Book 1 deals with the general range of environmental impacts, whereas Book 2 concentrates entirely on the Survey and analysis of Noise. Proposals for combating noise, including remedial works like the erection of barriers, and proposals for future monitoring are contained in Book 4. The structure of the main report is similar to that produced for other types of development, although there are clearly different specialisms involved, particularly in relation to noise. This subject has been examined in great detail and an elaborate noise monitoring system has been set up round the airport, at a cost of 200 million pesetas. This system has contributed to the EIA research but would have been required in any event to assist with airport management. The EIA studies and reports are estimated to have cost in the region of 1 million ECU.

4.8 The process of defining the scope of the EIA forms part of Spanish procedure, with the developer being required to submit an initial synopsis of the study to the competent

authority under Decree 11/31/88 which translates the basic provisions of the EC Directive into Spanish law. The Decree suggests a synopsis of around 25 pages, but in this case the document was 51 pages in length.

4.9 The scoping process identified the usual range of topics for investigation including noise and the risk of bird strikes. Official guidelines have been published on the use of EIA in connection with airport development. These are contained in 'Guidas metodologicas para la elaboracion de estudios de impacto ambiental 4 aeropuertos ; Ministerio de Obras Publicas y Transportes'. Aena's representative's felt that this guidance treats some of the issues in a simplistic way. In consequence they have extended and developed their own guidelines.

4.10 The second stage work has been assisted by external consultants; INTECSA.

4.11 Having submitted their first EIA documentation 2 years ago Aena feels that a decision is two years overdue. When published this is likely to set many conditions governing future development of the airport, The EIA declaration will not impose detailed controls, but rather a broad commitment towards environmental protection. For example, the document may specify where noise barrier have to be erected, but it will not describe the type of construction or required height.

4.12 Public concerns and criticism of the 1994 study were instrumental in leading to the Ministry's call for additional information.

4.13 The second stage EIA work began in February 1995 and continued until August 1995. Aena maintains that much of the information was not required under the decree but was volunteered including:

- an analysis of alternative locations
- detailed descriptions of airport operations
- local demographic statistics
- synthesis of hydrological calculations
- dimensions of extension works
- disposal of spoil
- proposals for control of airspace.
- footprint of noise in the absence of any new development (the do-nothing scenario)
- social study (prepared by the public transport ministry
- Emergency plans
- models of atmospheric pollution
- noise assessment.

4.14 The major additional piece of work related to a study of requirements for noise insulation in local houses. As noted earlier, the views expressed by the Ministry's own environmental advisors were not accepted on the grounds of the impracticality and excessive cost to implement. Instead, Aena commissioned DHV of Holland to carry out a sectoral noise study, using an American model which places less emphasis on external noise measurements than the German model.

4.15 Aena has declined to publish its estimates of the cost of achieving the required levels of noise insulation in individual homes, regarding this as commercially sensitive, and arguing

that the true costs can only be established on a house by house basis once the airport development is operational and measures are taken to deal with each property individually.

4.16 Aena also considered that a number of the demands for additional information from the Ministry were not strictly necessary to meet the requirements of the EIA. As an example they cite detailed studies on climate and carbon monoxide from aircraft exhausts which were undertaken, but only confirmed what was already known, which was that the adjacent roads to the airport produce ten times the pollution load , with no equivalent controls.

5.0 REVIEW OF COSTS

5.1 Information on the costs of undertaking the EIA has been obtained largely from the promoter, AENA, and it has not been feasible to get equivalent information from the competent authority. The cost of preparing the EIA studies exceeded 1 million ECU. This figure did not include some of the detailed environmental surveys, and monitoring which is required as part of the normal functioning of the airport. For example, noise monitoring equipment which has been installed for continuous surveillance cost 200 million pesetas, Notwithstanding the substantial cost of the EIA , in relative terms it represented only 0.10 % of the estimated capital cost of the full project at 150,000 million pesetas.

5.2 The cost of the EIA work related to external consultancy services and did not include staff time on the part of AENA. This was not as extensive as that required by the consultants but no direct figures are available. It may be assumed that taking all costs into account the total expenditure on the EIA work would not have exceeded 0.2 % of scheme costs for the developer.

5.3 No figures are available for work undertaken within the two arms of the Ministry of Public Works, but it is clear that both the sponsoring division, and the environmental assessment unit were heavily involved in preliminary studies, and reviews of the EIA findings.

6.0 REVIEW OF BENEFITS

Benefits to the Environment

6.1 Development of any major international airport is certain to have some adverse effects upon the environment, although the scale and magnitude of such impacts may be reduced by careful siting of the facilities and their detailed design. Consideration of alternative sites was undertaken in earlier strategic studies but the EIA considered in this case study has focused entirely on the extension to the existing airport.

6.2 In the absence of a review of alternative sites, the main benefits stemming from the EIA process are considered to lie in the very detailed discussions and negotiations which have taken place between the Developer and Competent Authority concerning the precise methods for reducing impacts and mitigating unavoidable effects.

Benefits to the Developer

6.3 A frank assessment of the developers' view would be that considerable frustration has been experienced, resulting from the time required to meet, and costs of complying with, requests for additional information from the Competent Authority. EIA is seen as a necessary, and unavoidable process which forms part of increasingly complex regulations affecting all aspects of civil aviation administration. However, there was no suggestion that these processes would have been any simpler or shorter in the absence of formal EIA requirements. The Developer had concluded that public opposition to major developments, like airports will continue to grow, and that environmental concerns should be balanced by equal weight being given to socio-economic effects. It was for this reason that the company had embarked on its new socio-economic survey.

Response of the Competent Authority

6.4 Although the EIA process had taken longer than the prescribed period to complete, it was important to recognise that this was one of the largest and most complex development proposals in Spain, and had direct implications for the national economy. Considered in these terms the EIA had been very effective, and efficient in identifying the critical environmental issues affecting the local population, including levels of air and noise pollution, and ensuring that mitigating measures were properly assessed and implemented, in the event that the project goes ahead..

Attitudes of the Local Authority

6.4 It was not practical in the time allocated for this review to make contact with all the individual communities surrounding the airport. However, the issues relating to the airport were discussed with Snr. A. Trujillano the head of the environmental impact unit for the Autonomous communidad of Madrid. Snr. Trujillano confirmed the substance of earlier discussions but could not comment in detail on his authorities' attitude because the case was effectively sub-judice due to the imminent announcement of the EIA Declaration. Snr. Trujillano explained that the region was not involved as competent authority in determining the Airport application but for some aspects of the Airport development Madrid has concurrent competence with national government. This is mainly in relation to land use planning since approval of the project would require modification of previous zonings for industrial development. The region is also heavily involved in negotiations over noise reduction and insulation for domestic and industrial premises as a representative of local communities. (A fuller note on the work of the EIA unit for Madrid Autonomous Communidad is contained in Appendix 1.)

7.0 SUMMARY OF FINDINGS

7.1 The extension of Madrid Airport represented the largest single development considered in the course of this research, and it was apparent that the EIA had been a long and involved process. However, it was equally clear that the EIA had provided a clear framework for discussion and debate between the various parties, and had successfully identified all the key issues which were relevant to the eventual decision.

APPENDIX 1

INTERVIEW WITH Mr. A. TRUJILLANO
Head of Environmental Impact Assessment
for the Autonomous Communidad of Madrid

Meeting held between 14.00 - 16.00 hours on 6th March 1996

EIA within Madrid Autonomous Community

1.1 Madrid Autonomous Communidad employs a total of 10 people working in the field of EIA, principally in producing EIA Declarations and in commenting on the scoping requirement of individual projects. Their time is committed largely to projects which are subject to EIA legislation at regional level for which Madrid is the competent authority, with roughly 10 % of the time being devoted to national projects (like Barajas airport).

1.2 The autonomous region of Madrid has its own EIA legislation which amplifies and is more prescriptive than the national legislation. For example whereas the National Decree lays down 12 topics which must be covered in an impact study, the Madrid regulations define 52 categories.

1.3 Since EIA was introduced, 30% of the projects submitted have been promoted by public agencies and 70% have originated in the private sector; but the amount of work involved in processing these two categories is very different with the public projects requiring significantly more time. As an indication of workload, 145 EIA studies were initiated within the Madrid region during 1995. Experience has shown that it takes around 12-14 months to process each EIA.

The Quality of EIAs

1.4 EIA started to be taken seriously in the Madrid region in 1984 when officers started to attend training courses. Later, following implementation of the Directive many reports were received in the first 2-3 years which purported to be EIA' s but were this in name only. They did not follow any systematic methodology, and were simply justifications of the scheme. Now the standards are much better, but officers continue to regret the absence of effective standards and controls which would ensure the quality of EISs.

1.5 EIA studies still tend to be undertaken as a process for the sake of producing an attractive document, but with no guarantee of the quality of the research or the accuracy of the contents. The exercise is undertaken for the benefit of securing a development permission not to protect the environment.

1.6 In some autonomous regions a simplified form of EIA has been introduced for some less complicated or controversial projects. This twin track approach is not used in Madrid Region. However, for some types of project the EIAs do tend to be less complicated. An example was presented of an EIA for the extension of Los Gallegos Sand and Gravel Quarry near San Fernando de Henares, containing a 23 page summary and main report of under 100 pages. Although described as a less complicated study the documentation appeared to be comprehensive, at least in terms of the subject matter covered.

1.7 Snr. Trujillano commented that in his view the length of the document did not correlate with the quality of the assessment. It was quite common for documents to contain completely irrelevant information. For example, in one recent study, lists of marriages over the previous 5 years had been included in a section describing the population structure of the area.

1.8 The possibility of introducing a requirement for method statements to be prepared as part of the EIA was discussed. These would require a developer to describe who had produced the EIA, over what timescale and with what resources. It was felt that even with this commitment some developers could not be relied on to give accurate answers. In some autonomous regions for example, Castille and Leon, the regulations require that EIAs are prepared by authors selected from an approved list of qualified individuals, but again experience had shown that the best results were not necessarily obtained from the most qualified people

1.9 **The role of officers:** Officers are assigned to individual projects, and meet at monthly intervals to review progress on major EIAs. The officers play the dominant role in preparing initial scoping reports, in reviewing the subsequent documentation, and in writing the EIA Declaration.

1.10 **The role of the Public:** The meeting discussed the importance of public involvement as a democratic means of testing quality. It was agreed that, while this is important, in Spain consultation tends to take place with organised groups and official representatives of the public.

1.11 **The role of Elected Politicians:** Snr. Trujillano commented that local politicians usually became involved in EIA studies at one of two levels. The first is where the elected representatives are unfamiliar with the issues and rely largely on the officers' technical report. Even in these cases, if important issues are raised at the declaration stage then elected members will start to become more actively involved and have something very direct to say about the situation.

1.12 The second level of involvement arises where major local issues are raised from the outset, and politicians have their own strong opinions. In these cases the political agenda may dominate considerations of the case and have little or no relationship to the technical findings of the EIA study.

1.13 **Appeals** Where a developer is unwilling to accept the EIA Declaration it is possible for a legal challenge to be mounted through reference to the National Advisory Board. However, in Madrid Region there has only been one case of an appeal. This was in relation to a major urban development programme

Case Studies

1.14 Three specific projects were discussed as examples of EIA. These included:
Barajas Airport Extension,
A new incinerator in Ville de Mine Gomez, and
The Madrid orbital road at El Monte de Pardo

1.15 In the case of Barajas Airport extension it was not possible for Snr. Trujillano to say much since the EIA Declaration was imminent. The region was not involved as competent authority in determining the Airport application but Madrid did have concurrent competence with national government for some aspects of the airport development. This related mainly to land use planning since approval of the project would require modification of previous zonings for industrial development. The region was also heavily involved in negotiations over noise reduction and insulation for domestic and industrial premises as a representative of local communities.

1.16 The new incinerator was a particularly controversial project, which had been initiated before Madrid Region had adopted its own EIA legislation in 1991. Under national law there had been no requirement at the time for an EIA to be carried out in relation to the disposal of urban waste. Madrid now requires all proposals for the disposal of toxic and dangerous substances to be accompanied by an EIA. The decision to develop the incinerator had not been subject to public debate and so it was not until construction began that the public started to protest. The Authority was now conducting studies, including an EIA, in order to provide a landfill site for the disposal of the incinerator ash residue. This component of the development had already prompted over 400 letters of objection from the public.

1.17 In the case of the new orbital road, there had been a considerable amount of public consultation concerning the alternative alignments for a section of the new outer orbital road. The choice of alignments included three routes lying within a narrow corridor round the edge of the city. The inner route passes close to residential property, while the outer route cuts into the natural park of El Monte de Pardo, which is of high nature conservation value and also contains the Royal summer residence. The third route involved a composite alignment utilising sections of the other two routes. Snr. Trujillano commented that public reaction had been strongest to the proposals which directly affected individual properties, and to the issues of noise and air pollution. Less concern had been registered about damage to nature conservation and landscape.

APPENDIX 2

INTERVIEW WITH Mr. DIEGO SEBASTIAN DE ERICE EUROSTUDIOS s.a. MADRID

Background

2.1 This company is a major Civil Engineering Contractor in Spain. It specialises in road construction, dams large commercial buildings. It has developed its own environmental planning and assessment division which is lead by Snr. Sebastian DeErice .

EIA's for Road Projects

Environmental Costs

2.2 The discussion focused on the Company's recent experience in managing EIAs particularly related to roads. There is no established percentage for the amount of money which is spent on environmental protection and enhancement for major road schemes. As a rule of thumb, the company reckons that between 5 - 10 % of the technical design and study costs is spent on environmental issues. Design costs and technical studies typically cost in the region of 10% of the capital construction costs. It can therefore be deduced that the environmental costs of a major project are in the region of 0.5 - 1.0 % of gross scheme costs. These ratios do not remain the same for other types of project; for example, study costs and remedial works for dam construction projects usually represent a lower ratio.

Role of the Competent Authority

2.3 In discussing road projects it is important to remember that the initiating agency is the Ministry of Transport and Public Works. This body also has an internal division which acts as the competent authority. The existence of both specialisms in the same department confers a natural advantage on those external consultants who also have both services in house. It is much easier for the Design Engineers to talk to the environmental planners if they are in the same organisation.

Role of Consultants

2..4 This view prompted an interesting discussion about relationships between the client, principal contractors for EIA work, and specialist consultancies. In general, where work on environmental issues is sub-contracted out to smaller specialist companies Diego feels that this makes it much harder to co-ordinate the work and secure a common standard. On the other hand there are a range of specialisms which even the larger firms do not carry in house. These often include 'acoustics and archaeology.

Stages of Road EIA's

2.5 The three stage approach to EIAs for road schemes was discussed. Stage One considers the routing of alternatives between two points. For this work mapping and assessment is usually undertaken at 1:50,000 or 1:25,000 scale. Stage Two involves assessing the corrective measures which need to be put in place to reduce environmental impacts. This work is undertaken at 1:10,000 or !:5,000 scale. The final review is made of the

chosen route at detailed design stage and involves plotting and costing all environmental works at a scale of 1:1,000. The main difference between stages 2 and 3 lies in the level of detail, and degree of definition of construction details.

2..6 Before EIA legislation was introduced, environmental assessment was only conducted during the last stage of the design process. Now the competent authority is primarily concerned with the first two stages.

Influence of the EIA on Decision -making

2.7 It is usually open to the successful design team to suggest which routes are considered as alternatives to the client's initial route, but the client will also give strong direction on possible alternatives. In the final analysis it will be the promoting authority which determines the preferred route on a balance of cost, technical feasibility and environmental impact. In many cases the developer will place strong emphasis on technical feasibility and cost, and it is common for the environmental team' views on environmental concerns to be overridden.

Timescale

2.8 Route planning, design and construction is an extended process which can take from 3 to 10 years in the case of road schemes, but these timescales are short by comparison with Dams which make take 15-20 years to complete. The Minister of Public Works has gone on record in complaining that all public construction projects are delayed by EIA. These delays also have a knock-on effect for private companies who tender for the work since payment is often delayed. For example there is a current case where an EIA was started in January 1993, but this study has still not reached the stage of being published for public information. The consequence for the company which tendered to produce the EIA is very serious, since its own staff costs are rising, and yet it is unable to complete the work.

Links between Project and EIA Costs

2.9 Once the competent authority and the promoting authority have decided on a chosen route for a road, the details including the target cost for its construction will be published. The second round of tendering then takes place amongst companies wishing to be considered for its design and construction.

2.10 The amount of money which is made available for EIAs is usually fixed by competitive tender but, more often than not, the tender will include all other engineering design services for the project. Decisions to award design and EIA tenders take account of the companies' technical and design competence, but greatest emphasis is placed on their financial bids. There is a natural desire on the part of all tendering companies to reduce their tender prices as far as possible and, in consequence, sums available for environmental studies are often squeezed. It is also common for different sections of the route to be awarded to different contractors, creating potential difficulties in terms of continuity of assessment.

2.11 A concern for private companies tendering for design and EIA work is that the timescale for completing each stage is very variable. This has been acknowledged by Government There are circumstances in which companies may be asked to tender for the first two

stages of work simultaneously, but delays of one or two years can occur between route selection and detailed design, resulting in significant losses to the company due to increasing staff costs in the intervening period or changes in design standards and specifications.

2.12 For companies preparing EIAs the issue of cost is important, but the competent authority is seldom aware of how much it costs to undertake such work, and does not take this factor into account in reviewing the product. It is quite common for competent authorities in Spain to reject an EIA because the work has not achieved an appropriate standard.

APPENDIX 3

INTERVIEW WITH MR. JOSE RAMON GONZALEZ LASTRA

Director General of Environmental Information and Assessment
Environment Division
Ministry of Public Works, Transportation and the Environment
(MOPTMA)
The meeting was held between 12.00 - 13.00 hours on 6th March 1996.

3.1 The Director very kindly answered a series of questions about EIA procedures in Spain, and the following notes record the main substance of the interview, although the sequence in which the material is discussed has been changed.

3.2 The Ministry has prepared a data base in order to monitor progress on all EIAs under state control, a copy of which was provided on computer disc. Studies included in the data-base are largely those promoted by public agencies, although records of the following private projects are also kept:

- Mining
- Energy Generation (including Dams)
- Chemical Industry
- Motorways
- Dual Carriageways

3.3 Central government deals with mining projects for those provincial governments who do not have staff with the full range of expertise, and in cases where the project affects two provinces simultaneously.

3.4 The Ministry of Public Building and Works shares responsibility with the Nuclear Authority for nuclear installations.

3.5 As a general observation the Director pointed out that the case studies being examined by Land Use Consultants in Spain were not really typical examples since each has its own particular characteristics. The Barajas Airport extension is the first of its kind in involving socio-economic as well as environmental assessment. The Valencia - Madrid crossing of the Cabriel Gorge raised more political issues than it did environmental ones. The Itois Dam is unusual in affecting a wide shallow valley with existing habitation, rather than a remote, unpopulated, and deep-sided valley which is more characteristic of Spanish reservoirs.

Discussion on the performance of EIA procedures in Spain.

3.6 **Public Participation Stage** 30 days are officially allowed for responses to the consultation period. More time is usually allowed - typically three months from the time the summary document is sent for consultation.

3.7 The main focus of public consultation is on sectors in the community who have something to say, including local and regional authorities, universities, and NGOs. These bodies are also asked to identify any other groups who might have useful comments.

3.8 The aim of public consultation is to get an idea of the way in which the study should be undertaken. This guidance is then written into a report which is delivered to the prospective developer in accordance with article 14. Until a few years ago advice was issued in the form of a letter, but a much fuller report of 20-30 pages is now produced which typically requires a month to prepare.

3.9 **Article 14** specifies that a report should be sent to the developer containing the responses from public consultation. The authority is allowed 1 month to write this report. Until a year ago the report was really just a letter accompanying the responses. Now it involves a much more detailed analysis of 20 pages or more which spells out what the ministry thinks is relevant and gives an orientation as to how the study should be conducted.

3.10 **Staffing** The ministry did have a severe staff shortage, but it has now recruited 25 individuals who work on the 50 -60 major projects each year from the Ministry of Public Works. These projects have a combined value in the region of 500,000 - 700,000 million pesetas a year.

3.11 **Articles 16 - 18** Once the promoter has received the advice of the Competent Authority, it is the promoter's responsibility to produce a report containing a definition of the project which is forwarded to the Competent Authority. The promoter then prepares the EIS.

3.12 The EIS is submitted to the Competent Authority which then consults official bodies and the public. The Competent authority subsequently prepares a report on the comments it has received.

Timetable and Performance

3.13 An internal review of the progress of individual EIAs indicated that three basic situations arise. In the case of projects giving rise to very minor impacts the quality of the accompanying EIS is not a particularly relevant factor and the declaration is usually dealt with without delay. More complex cases involving significant impacts can also be dealt with rapidly if a thorough and competent EIS has been produced. Significant delays tend to occur largely in cases where significant adverse impacts are anticipated and the EIS has been poorly researched or documented. The first two categories can usually be processed within the 30 days allowed by legislation, but the last category can take up to three years.

3.14 **Article 19** This article provides powers for the competent authority to require the submission of additional information when the EIA study is judged to be incomplete. In some cases, the authority may demand an entirely new study. Circumstances do arise in which the Competent Authority may reject the EIS. This had happened a few weeks earlier in relation to a dam construction project for which the EIS had been submitted three years previously.

3.15 Although delays did occur it was possible for contentious proposals to be dealt with swiftly. In 1995 proposals for another reservoir project had been rejected because the promoter had failed to identify corrective measures for dealing with the loss of habitats

for eight species of bird listed under the EC Habitats Directive. A new study had been submitted in January 1996 and the EIA Declaration had been issued in under three months at the end of February 1996.

3.16 Another factor influencing the timescale for processing EISs was the amount of material submitted. It was not uncommon for the files relating to a single EIA (as in the case of Barajas Airport) to take up a metre of shelf space. Under these circumstances it was simply not practical to review the data in less than a month, let alone respond to all the points of detail. For complex projects of this nature the ministry would sometimes have four or five people working full time for a month to complete the task.

3.17 In discussing the workload associated with processing EIAs it was important to remember that the Ministry dealt only with State initiated projects, and a limited category of regional projects. Taking Spain as whole however, there had been many more than 3,500 EISs produced since the Directive came into effect.

3.18 Over the last three years there have been significant improvements in the quality of EIAs. It was noticeable that EISs for railway projects were usually submitted in a very complete form and required little revision and amendment. Most mining EISs were also competently produced, although the issues were often controversial. Road projects included a significant number of below standard EISs while proposals for reservoirs and dams usually needed the most attention and modification.

3.19 Although quality has improved the Government is still concerned about the level of achievement since almost 50% of EISs require some form of supplementary or relevant information before a declaration can be issued.

3.20 The main factors affecting quality were discussed and the following issues were highlighted. Because the promoting agency is often part of the same ministry or administrative body which is encouraging the development in question, there is an underlying tendency for contractors to be appointed who specialise in design and development of major infrastructure projects. These firms are not necessarily the best providers of EIA services, which often leads to the need to sub-contract the work. Companies who actually prepare the EIA do not necessarily receive much of the money which is allocated for EIA, and the transfer of information and responsibilities between the design consultants and EIA specialists can add to delay, and internal cost.

3.21 During its presidency of the European Union, the government had devoted considerable attention to EIA and the EA division of the ministry had been working on a new parliamentary bill, which would have contained measures for dealing with some of these issues. Preliminary consultation with NGOs and the Autonomous Communities had been very positive, but with the impending change of government, it was not possible to predict whether or not new legislation would be forthcoming.

3.22 The ministry was, however, concerned that 75% of its workload on EIA came about through the need to respond to inadequate studies and poorly prepared EISs. There is still a strong presumption on the part of most promoters of major projects, that EIA is just an administrative procedure, setting a number of hurdles which have to be jumped in order to get permission for development, rather than a positive tool for better project design and environmental protection and enhancement.

3.23 In discussing the use of EIA in Spain it was important to note that some autonomous regions had introduced simplified EIA procedures, which are run in parallel with the formal requirements of the directive for more major projects. These simplified procedures allow for the production of a report on potential environmental effects without requiring detailed study. By way of example Extramadura Community had examined over 2000 such studies in 1995 alone.

APPENDIX 4

EIA CENTRE - MADRID

Interview with:
Mrs Paz Arumburu

These notes provide a record of the discussion which took place at the EIA Centre on 4th March 1996 at 17.00 hrs..

4.1 The EIA Centre provides an information reference point for organisations, academics, and practitioners with an interest in EIA in Spain. The centre has its own collection of EISs for research purposes but does not maintain a formal collection The research interests of the Centre are wide-ranging, but have concentrated on the quality of EISs produced in Spain. Increasing interest is being shown in the use of EIA techniques in strategic studies.

4.3 In considering EIA practice in Spain it is important to note that EISs are produced at National, Regional and Local level, and sometimes at an intermediate level between national and regional, for example in the Basque Autonomous Community.

4.4 The Centre has undertaken some research into the issue of costs and benefits, but has found it a difficult area in which to get detailed information. Most EIA work is contracted out by promoters to consultancies who naturally regard much of the information as commercially confidential, while competent authorities do not usually record their time, or disclose the expenses associated with reviewing EISs or consulting on their findings. It is also a fact that costs can range from 500,000 to 50 million pesetas, depending on the nature and scale of the project. It is therefore difficult to generalise about cost.

4.5 Spanish legislation recommends that the public should be consulted about the scope and content of EISs during the preliminary stages. Although this is not compulsory, some degree of consultation usually does occur in practice. From studies undertaken by the Centre it is clear that most consultation occurs with official bodies and the public is not directly involved.

4.7 The main challenge in Spain in terms of securing objective and comprehensive EIA stems from the fact that the Promoter and Competent Authority are often different divisions of the same administrative body.

4.8 The outgoing government administration has proposed revisions to the state legislation to bring Spanish EIA closer in line with the Directive. The suggested measures have included the requirement that developers should publish the cost of the EIA in the final EIS.

4.9 The Spanish system is time-consuming and it is not uncommon for a period of 2-3 years to elapse between the start and completion of the work. Reasons for delay may lie with either the promoter or the Competent authority, depending on the circumstances. Developers often taken many months to complete technical studies, and even then the quality of the resulting EIS is sometimes lacking. The Ministry of Public Works EIA division has now produced a database which is being used to track the performance of the various State EISs.

APPENDIX 5

Interview with Ing. Esteban Martin Zsogon,
Environmental Consultant, Madrid.

5.1 One of the practical difficulties for an environmental consultant working in Spain, is the need to maintain familiarity not only with the National legislation but also the distinct laws and regulations which are promulgated by each of the Autonomous Communities.

5.2 A number of the Communities have produced their own simplified EIA procedures, for example the Balearic Islands and Canary Islands. Others have produced very comprehensive and integrated forms of assessment. Castillon and Leon, for example have a combined system for Environmental assessment and eco-auditing. This region also maintains a register of approved individual consultants, and only firms employing such individuals may undertake EIA work. Entry into the register is dependent upon having completed an approved training course, and being able to demonstrate an appropriate level of experience.

5.3 In Castillon & Leon thresholds for simplified EIA can be quite low. For example a proposal for a pig farm housing 1000 pigs will require EIA and the cost of the study is likely to be comparable to that of the work necessary to plan and design the complex. A typical study could cost in the range of 450,000 pesetas, while the equivalent design costs could amount to 600,000 pesetas. These costs in combination would amount to around 6.5% of the total development cost of 16 million pesetas with the EIA representing 2.8%.

APPENDIX 6

INTERVIEW WITH GREENPEACE (SPAIN)

Mr. Juan Pedro de Uralde

Meeting held between 12.00 - 14.30 hours on 5th March 1996

6.1 A meeting was held with Greenpeace to discuss its experience in dealing with requests for comments on individual EIAs as a non-governmental organisation, and its wider views on the effectiveness of EIA procedures in Spain.

6.2 Greenpeace has around 70,000 members in Spain. It employs 40 staff including volunteers. The environmental issues which are uppermost in its national campaigns are toxic waste disposal, poor planning in coastal regions, uncontrolled road transport development, and water resource exploitation.

6.3 Greenpeace is regularly invited to comment on individual EIA projects at the formative stage, and after the EISs have been prepared. However, with its limited staff resources and the need to make the most effective contribution possible towards environmental conservation, the staff only devote about 5% of their time to EIA. This reflects their experience that comments, from NGO's have very little influence on the conduct of the studies or the ultimate decision. It was argued that although many hundreds of projects have been subjected to EIA in Spain because of their potentially significant adverse impacts, very few have been rejected because of unacceptable levels of damage, and probably no more than ten have been substantially altered to safeguard environmental interests.

6.4 Greenpeace views the development of water resources as one of the biggest threats to the environment of Spain, and the discussion focused on this area of concern. In the last decade Spain has experienced increasing water shortages, due to nation-wide droughts and unseasonally low rainfall in the south. Rainfall during the winter of 1995/96 was very substantial, but the underlying trend has been downwards. The distribution of natural resources is heavily skewed to the North while most of the demand arises in the south through both agriculture and industrial needs.

6.5 In order to overcome these deficiencies a draft National Hydrological Plan has been prepared which proposes the mass transfer of water by canal, pumping and river regulation from north to south. According to Greenpeace, this draft plan has not been subjected to any form of environmental appraisal, and has never been approved by Parliament. Instead parliament has proposed that a National Irrigation Plan and River Basin Management Plans for all the major catchments should be drawn up first.

6.6 In the absence of a National Water Plan, a number of the autonomous regions are starting to put elements of the draft proposals into practice by building individual dams, even though the environmental consequences have been inadequately assessed.

6.7 Greenpeace maintains that there is a need for a national review of water demand, and that one of the first actions of government should be to curb its growth, and encourage

Box 1 - Summary of the EIA process relating to the Itois Dam Project

Prior to 1985	Technical studies began on the Itois dam project in the 1970s
December 1985	An EIA was prepared for the project. The EIA was reportedly based on the scheme details prepared in 1975, which were no longer current.
February 1989	The EIA was revised - although Greenpeace alleges that this involved little more than a change in the date - and did not take account of the scheme modifications.
June 1989	The Autonomous Community publicised the EIS and invited comments, although it was not the Competent Authority, and this step should have been taken by the National Government.
April 1990	The National Government published the technical studies, without the EIA.
June 1990	The Autonomous Community approved the content of the EIA.
June 1990	Consultations with ECONA (Instituto National para la Conservacion de la Naturalejo) following approval of the EIS.
September 1990	The Ministry of Public Works issued its Environmental Impact Declaration, without first arranging for public consultation.
November 1990	Technical proposals for the Dam were approved and published.
1992	Conservation Groups complained to the European Community on the grounds that the appropriate EIA procedures had not been followed
1993	Works commenced on site
1993	Independent reports were published by Environmental Groups, questioning the accuracy of the EIS and official reports.
September/October 1993	The Ministry of Public Works requested a second opinion from ECONA on the quality of the EIS. The chief officer of ECONA confirmed the inadequacy of the EIS. However, this letter was subsequently disowned. The chief officer left his post and took up other duties shortly afterwards.
June 1994	The Council for Environmental Assessment within the Ministry of Public Buildings and Works criticised the scale of environmental damage and recommended that the project should be abandoned
1994	The General Assembly of the International Union for Nature Conservation (IUCN) passed a resolution opposing the dam at the Buenos Aires Conference
December 1994	The EC concluded that appropriate EIA procedures had not been followed, and recommended that a new evaluation should be undertaken.
1994	A legal appeal was lodged against the EIA Declaration which has not been determined

water conservation. It cites the continuing development of intensive agriculture irrigation schemes and golf courses in the south as examples of inappropriate use.

6.8 As an example of the pressures on Spain's natural and man-made environment, Greenpeace referred to the Itoiz Dam project which is located in the Navarra Region, and is designed to regulate the upper reaches of the Rio Ebro. Within the immediate catchment of the Dam are three Natural Reserves, and two Special Protection Areas. The area surrounding the proposed reservoir contains 150 species of bird, including the Golden Eagle and Vulture, which are under threat of extinction. The valley floor within which the dam and reservoir would be developed is farmed, and a number of farmsteads would be displaced.

6.9 It should be noted that the Itois Dam has become something of a 'cause celebre' and a focus for objection in Spain, and due to its size and scale, and the long timescale over which it has been developed, it is not necessarily typical of smaller or more recent EIA projects. Nevertheless, aspects of the case are relevant to wider considerations about the way EIA operates in practice.

6.10 The history of the project's development is briefly summarised in **Box 1.**

6.11 Greenpeace is highly critical of the EIA procedures which have been followed throughout the development of this project. It highlights the conflicts of interest which exist between the role of the promoter and the Competent authority when these are combined within one organisation, and the confusion which can be caused when responsibilities between state and regional government departments are not clear-cut. In the case of the Itois Dam, no overall assessment has taken place concerning the aims of the project which involves extensive canalisation of natural rivers, and the development of a major irrigation scheme, in addition to the construction of the dam and reservoir.

6.12 In terms of the EIA procedures themselves, the Spanish requirements relating to dams required that ECONA, (the environmental authority formerly located within the ministry of Agriculture and since disbanded,) should have been asked to prepare an independent report prior to a decision being taken to develop the project. ECONA was not asked to report until after work had commenced on site. The quality of the EIS was poor and much important information was omitted. No alternatives were considered and the EIS was little more than an inventory of environmental features with no critical appraisal of the potential impacts. The public consultation procedures did not take place according to the regulations. As a result few people knew about the scale of the project, or had the opportunity to comment before critical decisions were taken.

6.13 Legal challenges were made against the project at national, regional and local level, and the Agencia Nacional ruled that the dam construction was illegal. However the Government subsequently appealed to the highest court which has not issued a final judgement. In the meantime dam construction continues. It is alleged by Greenpeace that the work will not be stopped, regardless of the scale of environmental damage because the cost of compensation to the contractors, estimated at 24,000 million pesetas, would be crippling.

6.14 The European Union advised the Spanish Government in 1994 that a new evaluation of the environmental effects of the project should be undertaken, considering all the relevant

components which include not only the dam, but a new Canal, the irrigation system, a new road to replace one flooded by the reservoir and the quarry from which material for dam construction is being won.

6.15 In summing up its reaction to the use of EIA in Spain, Greenpeace maintained that EIA is seen largely as a procedural and administrative exercise, with little attempt to use the process creatively to improve project design. The failure to consider realistic alternatives to specific projects was one of the main failings. This had been the case with the Itois Dam, but also with parts of the Madrid -Valencia highway. One of the three 'alternatives' considered in this case study had been stated by the developer to be unbuildable - so how could it realistically be treated as a viable alternative to the other two routes, both of which ran through environmentally sensitive areas?

6.16 There was also, in Greenpeace's opinion, a strong emphasis on assessing, and mitigating those elements of a project which could be tackled with relative ease while ignoring the more fundamental issues. The example was cited of a highway tunnelling project in which the EIS had concentrated on the potential impact of air ventilation shafts on the nesting sites for rare and endangered Eagles, but had not discussed the overall effects of the new route on the feeding areas and wider habitat of the same species.

6.17 Another area of concern for Greenpeace, was the tendency for all EIA work associated with large scale projects to be awarded to the environmental divisions of major civil engineering consultancies, whose principal fees were derived from construction of the projects they were assessing. Greenpeace did not consider that an objective and unbiased report could be produced in these circumstances.

APPENDIX 7

Interview with ADENA/WWF (Association Nature Defense/ World-Wide Fund for Nature)

This meeting took place with Mr M.A.Valladares at 17.00 hours on 5th March 1996.

7.1 ADRENA is the title of the Spanish branch of the World-Wide Fund for Nature. It has a total of 25,000 members in the country. Nature Conservation and concern for the environment has not been a significant preoccupation of the Spanish people due to the past history of social and economic pressures.

7.2 ADENA concentrates its attention on core areas to avoid dissipating the energy of its small staff. Over the last ten years it has campaigned specifically on:

environmental damage caused by infrastructure projects,
the adverse impacts often associated with European Structural Fund projects,
implications for the environment of European Policies in areas like transport,
use of EIA.

7.3 The organisation can no longer rely on the income which comes in the form of donations from members, but is becoming quite successful in winning contracts from Government and local authorities, to undertake environmental research.

7.4 ADENA receives one or two EISs every week from Government or Autonomous Communities, inviting comments, but it does not have sufficient staff to be able to respond, and considers its time is better spent in researching a limited number of highly sensitive projects of national significance. In considering the Madrid/Valencia highway for example, two members of staff had worked full time for 3 months during the summer of 1995 undertaking field studies, preparing press releases and lobbying Government officials and politicians. This was far more effective in expressing the wider concerns about environmental damage, than commenting on a 200 page document, with over 20 appendices of equivalent length, relating to only 30 kilometres of road.

7.5 For ADENA the national road building programme was one of the main concerns since most of the routes pass through highly sensitive habitats. Proposals for developing the countries' water resources represented the other primary concern. No progress had been made in developing the National Hydrological Plan for many months, and with the impending change in government further delay was likely.

7.6 The biggest task which needed to be tackled through EIA procedures was not the effect of individual projects, significant though these are, but the appraisal of the regional and even national implications of major development programmes. For example, little data was available at regional level about the environmental conditions within individual river catchments. Nevertheless, water departments at national and regional government level were developing schemes for storage reservoirs, river regulation schemes ,and agricultural intensification through irrigation with inadequate environmental data, and insufficient time to carry out proper research. An example of the scale of the problem was given relating to the future development proposals for the region of Desarrollo. The

Plan de Desarrollo Regional de Espana , produced in 1993 by the Ministry of Economic Development and Housing had contained only two lines of text referring to the natural environment.

7.7 ADENA had therefore undertaken a series of demonstration projects and published independent reports in order to stress the benefits of fully integrated regional assessments. Examples included a study of the Tajo River Basin, and a full scale environmental assessment of the road building plan for Castille -La Mancha (Effectos Ambientales Plan de Desarrollo Regional De castilla - La Mancha, December 1991). Some of this work had been part-funded by the European Community.

APPENDIX I

QUESTIONNAIRES FOR INTERVIEWS

with

1. The Developer
2. The Competent Authority
3. Statutory Consultees

INTERVIEW No. 1 - WITH DEVELOPER

COSTS AND BENEFITS ASSOCIATED WITH PROJECT EIAS

QUESTIONNAIRE

FOR STRUCTURED INTERVIEW THROUGH A DIRECT MEETING WITH THE DEVELOPER

PROJECT DETAILS

Name of Project :

Address :

Type of Development (Annex I / Annex II) :

Size of Development :

Total Project Cost :

Year in which development commenced :

Name of Interviewee :

Interviewed by :

INTERVIEW No. 1 - WITH DEVELOPER

PURPOSE OF QUESTION		OUTPUTS
	PRE-EIA STAGE	
	CONSIDERATION OF ALTERNATIVES :	
BACKGROUND	How many potential development sites did you consider before selecting the existing location?	NUMBER
BACKGROUND	Did environmental factors influence selection of the preferred site?	YES/NO
	Was this information included in the eventual EIA?	YES/NO

INTERVIEW No. 1 - WITH DEVELOPER

PURPOSE OF QUESTION		OUTPUTS
	PRE-EIA STAGE (CONTINUED)	
	PRELIMINARY CONSULTATIONS :	
BACKGROUND	Did you consult with the local planning authority / government departments in relation to the development proposal?	YES/NO + DETAILS
BACKGROUND	How many organisations did you consult with? *(record details)*	NUMBER + DETAILS
COSTS	Over what timescale were these discussions carried out? *(in weeks/months)*	TIME
COST	Please indicate the amount of time spent in these discussions *(in days)*	TIME
COST/ BENEFIT	Did these consultations influence the final development proposal?	DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	PRE-EIA STAGE (CONTINUED)	
	FEASIBILITY STUDIES :	
BACKGROUND	Please describe the nature of any feasibility studies undertaken to inform project design?	DESCRIPTION
COST	What was the cost of carrying out these studies?	FINANCIAL SUM
COST	How long did it take to complete these studies? *(in weeks/months and staff time)*	TIME
BACKGROUND	Did these studies include a review of environmental issues? *(if so, record details)*	DESCRIPTION + DETAILS
COST/ BENEFIT	Were these taken into account in the detailed project design? If so, what was the cost and what benefits followed?	FINANCIAL SUM + DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	PRE-EIA STAGE (CONTINUED)	
	SUMMARY OF PRE-EIA STAGE COSTS AND BENEFITS :	
COST	Can you estimate the cost of the pre-EIA stage?	FINANCIAL SUM
COST	How does this compare with the capital cost of the overall project?	PERCENTAGE
COST/ BENEFIT	Were there any specific costs or benefits to the project which arose as a result of conducting pre-EIA studies?	DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	PROJECT SCREENING	
BACKGROUND	Did you determine the need for an EIA on your own initiative?	YES/NO
BACKGROUND	Did you have access to firm guidelines/criteria/thresholds indicating that an EIA was required *(if so, please describe these)*	YES/NO + DETAILS
COST/ BENEFIT	Would it assist your organisation if more specific criteria were laid down defining when EIA is required?	YES/NO + COMMENT
BACKGROUND	Did you consult the competent authority on the need for an environmental assessment?	YES/NO
COST	How long did it take them to reach a decision?	TIME
BACKGROUND	Is it normal practice for your organisation to undertake EA for projects of this size?	YES/NO
BACKGROUND	From your experience elsewhere, have you found any significant variations between competent local authorities on the need for project EA?	YES/NO

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES	
	SCOPING STAGE :	
BACKGROUND	Did you undertake a scoping exercise as part of the EA?	YES/NO
COST	How long did this take? *(in weeks/months)*	TIME
COST/ BENEFIT	Did you consult with the local authority/statutory consultees, NGOs or the general public as part of this process? *(if so, please describe the nature of the exercise, any time and /or costs involved and any benefits derived from the process)*	YES/NO FINANCIAL SUM DESCRIPTION
BACKGROUND	Did the consultation process identify additional issues of specific concern? If so what were they?	YES/NO + DETAILS
BACKGROUND	What were the key issues to emerge from the scoping exercise?	DETAILS
BENEFITS	Do you think that the scoping study was beneficial to the overall EIA process? *(if so, please describe these benefits)* *(Prompt: focused attention on key issues, identified existing sources of information, highlighted the need for additional surveys, maximised use of available resources).*	YES/NO + DETAILS
COST	Can you provide a breakdown of the time and cost of carrying out the scoping report?	FINANCIAL SUM + TIME
BENEFIT	Do you think it would be helpful to have the scope of the study clearly defined by the local planning authority at the start of the EIA process? - *(if so, please give reasons)*	DESCRIPTION + DETAILS

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES (CONTINUED)	
	BASELINE STUDIES :	
BACKGROUND	Please describe the nature of the baseline studies undertaken?	DESCRIPTION
TIME	How long did the baseline surveys take to complete? *(in weeks/months for each area of study)*	TIME + DETAILS
BACKGROUND	How much information was available from existing sources?	DESCRIPTION
COST/ BENEFIT	Did the local authority / statutory consultees provide relevant background data on request? - *(if so, please provide details of the information)* Was a charge made for this?	DESCRIPTION + FINANCIAL SUM
BACKGROUND	Was the information provided promptly?	YES/NO

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES (CONTINUED)	
	BASELINE STUDIES (CONTINUED)	
COST	Did you have to commission new research? - *(if so please give details)*	TIME + FINANCIAL SUM
COST	What was the approximate cost of the baseline studies? - *(itemised for each area of study if possible)*	FINANCIAL SUM
BENEFIT	Did the baseline survey identify any environmental issues that had not been anticipated at the scoping stage?	YES/NO
POTENTIAL BENEFIT	Did the baseline survey lead to any review of the key issues identified in the scoping exercise?	YES/NO
BENEFIT	To what extent did these studies increase your knowledge and understanding of local environmental interactions?	DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES (CONTINUED)	
	CONSULTATION :	
BACKGROUND	Did you carry out formal consultations with the local planning authority and statutory consultees?	DESCRIPTION
COST	How much time was involved in undertaking these consultations? - *(record as person/days of effort)*	TIME
BENEFITS	Did these consultations assist in the EIA process? In what way? *(Prompt - improved working relationships, greater understanding of potential conflicts, ensured specific concerns were taken into account).*	YES/NO + DETAILS
BACKGROUND	Did you consult with the public at this stage in the procedure?	YES/NO
BACKGROUND	How was this consultation carried out? *(prompt - public meeting, public exhibition, questionnaire survey)*	DESCRIPTION
BENEFITS	Did the public consultation exercise assist the EIA process? In what way? *(Prompt - allowed us to explain our proposal, allowed people to set out issues of concern)*	YES/NO + DETAILS
COST	How much time did the consultation exercise take? - *(record as person/days of effort)*	TIME
COST	What was the approximate cost of carrying out this consultation?	FINANCIAL SUM

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES (CONTINUED)	
	ASSESSMENT OF EFFECTS :	
BACKGROUND	Did the environmental assessment identify any adverse environmental effects?	DESCRIPTION
BACKGROUND	What was the nature of these effects?	DESCRIPTION
BENEFITS	Were mitigation measures identified to minimise these effects? - *(if so, please summarise)*	YES/NO + DETAILS
BENEFITS	Did the assessment identify scope for environmental enhancement? - *(if so, please provide an outline description)*	YES/NO + DETAILS
BENEFITS/ COSTS	Did the assessment bring about modifications to the project design? If so, did this increase or reduce the overall project cost?	DESCRIPTION + FINANCIAL SUM
COSTS/	Did the EIA specify costs for undertaking mitigating works?	FINANCIAL SUM
BENEFITS	Did the EIA set out proposals for monitoring/auditing mitigation works once the development was in operation?	YES/NO + DETAILS

PURPOSE OF QUESTION		OUTPUTS
	EIA STATEMENT	
BACKGROUND	How long did it take to write the environmental statement?	TIME
COST	How much did it cost in staff time/consultancy fees to prepare the EIS?	TIME + FINANCIAL SUM
BACKGROUND	Was a draft statement subject to consultation or review?	DESCRIPTION
COST	How long did this take? *(person/days of effort)*	TIME
BACKGROUND	Was the environmental statement modified as a result of this consultation? If so, what changes were made?	YES/NO + DETAILS
BACKGROUND	Was any additional survey work required to address any issues of concern? - *(if so, please provide details)*	DESCRIPTION
BACKGROUND	How many copies of the document were printed?	NUMBER
COST	How much did it cost to print these documents?	FINANCIAL SUM
BACKGROUND	Was any supporting information provided with the environmental statement? What did it consist of?	DESCRIPTION
COST	How much did it cost to produce this documentation?	FINANCIAL SUM

PURPOSE OF QUESTION		OUTPUTS
	PROCESSING THE EIA AND SUPPORTING PROCEDURES TO OBTAIN AUTHORISATION FOR THE PROJECT	
BACKGROUND + COSTS	How long did it take to complete supporting procedures (ie to submit applications for planning permission or development permits)? - *(please give overall timescale and person/days of effort)* *(note : interviewer to obtain details of standard procedures)*	DESCRIPTION + TIME
COST	How much was the application fee?	FINANCIAL SUM
BACKGROUND	Did the local planning authority subsequently ask for additional information to support the planning application?	DETAILS
COST	How long did the competent authority take to reach a decision? - *(overall timescale)*	TIME
COST	Did they give any reasons for the delay? *(if applicable)*	DESCRIPTION
COST	Did the delay have financial implications for your company? - *(if so, please give reasons and estimated cost)*	FINANCIAL SUM

PURPOSE OF QUESTION		OUTPUTS
	PROCESSING THE EIA AND SUPPORTING PROCEDURES TO OBTAIN AUTHORISATION FOR THE PROJECT (continued)	
COST	How much time was spent by your organisation in liaising with the competent authority **after** the EIA was submitted?	TIME
BACKGROUND	Were there any objections to the development proposals? If so, who objected and on what grounds?	YES/NO + DETAILS
BACKGROUND	Had these bodies been consulted during the environmental assessment process?	YES/NO
BACKGROUND	Were these objections raised at this time?	YES/NO
COST	How much time and money was spent in dealing with objections?	TIME + FINANCIAL SUM
BACKGROUND	Were conditions attached to the grant of planning permission or the development permit authorising the works to proceed?	DETAILS

PURPOSE OF QUESTION		OUTPUTS
	SUMMARY OF EIA STUDY AND EIA PROCESSING COSTS AND BENEFITS	
COST + BENEFITS	What has been the total cost of undertaking the EIA (excluding the pre-EIA stage) based on the summary analysis below? Scoping Consultations Scoping Report Baseline Information Baseline Studies Cost EIA Statutory Consultations Public Consultations Modifications to Project Design Writing ES Additional Surveys (if any) Printing EIA Document Printing Appendices Making Applications (non-EIA) Paying Fees (Non-EIA) EIA Fees (if applicable) Financial Implications of Delay (if any) TOTAL	FINANCIAL SUM
COST	What proportion of the overall capital cost of development does the EIA study and EIA process represent?	%

PURPOSE OF QUESTION		OUTPUTS
	POST EIA COSTS AND BENEFITS	
BENEFITS	As a result of the EIA process, has your company's standing with the regulatory authorities and the general public been improved, and has the EIA process affected the nature of the operations in any way?	YES/NO + DESCRIPTION
BENEFITS	Have the mitigation measures set out in the EIA been implemented in full?	YES/NO + DETAILS
COST	What has been the cost of implementing these measures?	FINANCIAL SUM
BENEFITS	Have any proposals for environmental enhancement set out within the EIA been implemented? What was the nature of these proposals?	DESCRIPTION + DETAILS

PURPOSE OF QUESTION		OUTPUTS
	POST EIA COSTS AND BENEFITS (CONTINUED)	
COST	What has been the cost of implementing environmental enhancement measures?	FINANCIAL SUM
COST	What has been the capital cost of constructing the development?	FINANCIAL SUM
COST	What proportion of the overall development cost does the EIA process represent?	PERCENTAGE
BENEFITS	Has the EIA process assisted with monitoring subsequent effects of the project?	DESCRIPTION

INTERVIEW No.2 - WITH COMPETENT AUTHORITY

COSTS AND BENEFITS ASSOCIATED WITH PROJECT EIAs

QUESTIONNAIRE

FOR STRUCTURED INTERVIEW THROUGH A DIRECT MEETING WITH THE COMPETENT AUTHORITY

PROJECT DETAILS

Name of Project :

Address :

Type of Development (Annex I / Annex II) :

INTERVIEW No.2 - WITH COMPETENT AUTHORITY

PURPOSE OF QUESTION		OUTPUTS
	PRE-EIA STUDY	
BACKGROUND	Was your authority made aware of the development proposals during the initial feasibility studies stages and before proposals for an EA were advanced? *(if so please provide details)*	DESCRIPTION
	PROJECT SCREENING	
BACKGROUND	Did the developer or the authority determine the need for an EIA?	YES/NO
BACKGROUND	Does the authority rely on national thresholds and criteria for determining whether or not an EA is required or does it have its own guidelines/criteria/thresholds? *(if so, please describe these)*	YES/NO + DETAILS
COST/ BENEFIT	Would it assist your authority if more specific criteria were laid down defining when EIA is required?	YES/NO + COMMENT
COST	How much time was spent in determining whether or not an EIA would be required in this case?	TIME
BACKGROUND	Was the amount of time spent on determining the need for an EIA in this particular case typical for your authority?	YES/NO

INTERVIEW No.2 - WITH COMPETENT AUTHORITY

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES	
	SCOPING STAGE :	
BACKGROUND	Was the authority consulted by the developer about the content of the EIA studies in advance of the work being carried out?	YES/NO
BACKGROUND	Did the EA Studies involve: A Scoping Exercise? Full Baseline Surveys - covering what subject areas?	YES/NO
BACKGROUND	Did the authority participate in the scoping exercise? If so, was this at the prompting of the developer or through direct involvement of the authority?	YES/NO + DETAILS
BACKGROUND	What do you consider were the key issues to emerge from the scoping exercise?	DESCRIPTION
COST	How much time was spent on the scoping stage of the study by your authority?	TIME
BENEFITS	Do you think that the scoping study was beneficial to the overall EIA process? *(if so, please describe these benefits)*	YES/NO + DETAILS
COST/ BENEFIT	Do you think it is desirable that the EC Directive should be amended so that the competent authority is automatically involved in determining the scope of an EIA?	YES/NO + DETAILS

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES (CONTINUED)	
	BASELINE INFORMATION :	
COST/ BENEFIT	Did the developer request information held by the authority in order to undertake baseline studies? *(if so, please provide details of the information)* Was a charge made for this?	DESCRIPTION + FINANCIAL SUM
COST	How much time was spent in researching and providing background information? Were any additional costs incurred which were not passed on to the developer?	DESCRIPTION + FINANCIAL SUM
BENEFIT	Did the developer's baseline surveys identify any environmental issues that had not been anticipated at the scoping stage?	YES/NO
	CONSULTATION :	
BENEFITS	Did the developer consult with the statutory consultees during the course of the EIA studies?	YES/NO + DETAILS
BENEFITS	Did the developer consult with the general public during the course of the EIA studies?	YES/NO + DETAILS
COSTS	How much time did your authority spend in liaising with the developer and other parties during the EIA study stage? *(person/days)*	TIME

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES (CONTINUED)	
	ASSESSMENT OF EFFECTS :	
BACKGROUND	Did the environmental assessment identify any adverse environmental effects?	DESCRIPTION
BACKGROUND	What was the nature of these effects?	DESCRIPTION
BENEFITS	Were mitigation measures identified to minimise these effects? - *(if so, please summarise)*	YES/NO + DETAILS
BENEFITS	Did the assessment identify scope for environmental enhancement? - *(if so, please provide an outline description)*	YES/NO + DETAILS
BENEFITS/ COSTS	Did the assessment bring about modifications to the project design? If so, did this reduce the overall environmental impact?	DESCRIPTION + FINANCIAL SUM
COSTS/	Did the EIA specify costs for undertaking mitigating works?	FINANCIAL SUM
BENEFITS	Did the EIA set out proposals for monitoring/auditing mitigation works once the development was in operation?	YES/NO + DETAILS
BENEFITS	Did preparation of the EIA studies assist all the parties in focusing on significant environmental effects?	YES/NO + DETAILS

PURPOSE OF QUESTION		OUTPUTS
	REVIEW OF EIA STATEMENT	
COST	How much time did the authority spend in reviewing the Environmental Statement? *(please break this down by subject area)*	TIME
COST	How much time was spent *(in person/days)* by the authority in : - discussion with the developer? - discussion with statutory consultees? - consultation with the public?	TIME

PURPOSE OF QUESTION		OUTPUTS
	OUTPUTS FROM THE EIA STATEMENT	
BACKGROUND	What is your opinion of the quality of the completed EIA statement in terms of: Coverage of key environmental issues? - Adequate prediction of all significant impacts? - Attention to mitigation? - Clarity of presentation? - Objectivity and lack of bias?	DESCRIPTION
BENEFITS	Did the EIA result in any improvements to the project design, or processes which were capable of reducing the scale of adverse environmental impact?	DESCRIPTION
BENEFITS	Did the EIS Statement provide specific information on the costs of reducing, avoiding or compensating for adverse environmental impacts?	DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	ORGANISATION AND MANAGEMENT	
BACKGROUND	What was the statutory period allowed for processing the EIA and reaching a decision? Was the work completed in this time or not? *(please provide details of the actual time required)*	DETAILS
COSTS	Did the authority conduct all stages of the review with its own staff or did it require expert advice from external sources? If experts were used what was the cost of this service?	DESCRIPTION + FINANCIAL SUM
COSTS	What costs were incurred by the authority in advertising the EIA, arranging public consultations, or otherwise processing the EIA?	FINANCIAL SUM
BENEFITS	Did the EIA process improve working relationships between the key parties? - *(if so, please provide further details)*	DESCRIPTION
BENEFITS	Did the EIA help to clarify key issues for the decision-makers?	DESCRIPTION
COSTS/ BENEFITS	How did the EIA process affect the decision-making process (ie did it reduce or add to the time required to process the application) - Please estimate the time involved in each stage of the process?	DESCRIPTION + TIME
BENEFITS	Did the EIA assist the competent authority in liaising with the public?	YES/NO
COSTS/ BENEFITS	Did the EIA lessen or increase the levels of public concern relating to the project	YES/NO DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	THE DECISION	
COSTS/ BENEFITS	In your opinion, was the final decision to approve, refuse, and/or modify the proposal materially affected by the preparation of an EIA. If so how was the decision affected?	DESCRIPTION
BENEFITS	Did the existence of the EIA assist in preparing conditions or other legal agreements governing the construction and operation of the project?	DESCRIPTION
COST/ BENEFIT	What are your overall impressions about the way in which the developer has conducted the EIA?	DESCRIPTION
	POST-EIA COSTS AND BENEFITS	
BENEFITS	Have the mitigation measures set out in the EIA been implemented in full?	YES/NO + DESCRIPTION
BENEFITS	Has the EIA process assisted with monitoring the subsequent environmental effects of the project?	YES/NO + DESCRIPTION
COSTS	Were the costs involved in reviewing the EIA and subsequent monitoring of the development higher or lower than they would otherwise have been (in the absence of an EIA)?	DESCRIPTION

INTERVIEW No. 3 - WITH STATUTORY CONSULTEE

COSTS AND BENEFITS ASSOCIATED WITH PROJECT EIAS

QUESTIONNAIRE

FOR STRUCTURED INTERVIEW BY TELEPHONE WITH
STATUTORY CONSULTEES / NON GOVERNMENTAL ORGANISATIONS

PROJECT DETAILS

Name of Project :

Address :

Type of Development (Annex I / Annex II) :

INTERVIEW No. 3 - WITH STATUTORY CONSULTEE

PURPOSE OF QUESTION		OUTPUTS
	PRE EIA COSTS	
BACKGROUND	Were you involved in any discussions with the developer during the project design stage? What was the nature of these discussions?	DESCRIPTION + DETAILS
COST	How much time did you spend on these consultations? *(person/days)*	TIME
BACKGROUND	Did you provide any information to the developer? *(if so please provide details)*	DETAILS
COST	Did you make a charge for this?	YES/NO
COST	How much?	FINANCIAL SUM
POTENTIAL BENEFITS	If you were not consulted during the project design stage, do you think it would have been helpful if you had been? For what reasons? *(Prompt - allowed specific concerns to be addressed from the outset, allow mitigation measures to be incorporated into project design?)*	DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	PROJECT SCREENING	
BACKGROUND	Were you consulted on the need for an EIA?	YES/NO
COST	How much time did this take? *(person/days)*	TIME
BACKGROUND	Did you identify any specific environmental issues that should be addressed by the ES?	DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	EIA STUDIES	
BACKGROUND	Were you consulted as part of the scoping exercise? What was the nature of this consultation? *(Face to face interview, telephone conversation, written communication)*	YES/NO + DESCRIPTION
COST	How long did the consultation process take? *(person/days)*	TIME
BACKGROUND	Did you provide any information to the developer during this stage?	YES/NO + DESCRIPTION
COST	Was a charge made for this?	FINANCIAL SUM
BACKGROUND	What were your key concerns relating to the development? Were these addressed in the scoping study?	DETAIL
BENEFITS	Do you think the scoping exercise was beneficial to the overall EIA process?	DESCRIPTION

PURPOSE OF QUESTION		OUTPUTS
	BASELINE SURVEYS	
BACKGROUND	Were you involved in formal consultations with the developer over the form and content of the Baseline Surveys? What was the nature of these consultations?	YES/NO + DETAILS
COST	How long did they take? *(person/days)*	TIME
BENEFITS	Did you find these consultations helpful? In what way?	YES/NO + DESCRIPTION
	REVIEW OF EIA	
COST	How long did it take you to review the ES? *(person/days)*	TIME
BENEFITS	Did the Environmental Statement address your particular concerns? - *(please highlight any particular areas)*	YES/NO
COSTS/ BENEFITS	Did the EIA provide full mitigating measures to deal with avoidable areas of adverse impact?	YES/NO + DETAILS
COST	How much time did this take? *(person/days)*	TIME

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