Southern Water

Cross Solent Water Main
REPLACEMENT SCHEME

Non-Technical Summary

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4D

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Introduction

Southern Water is applying for the consents required to enable it to replace the Cross Solent Mains, the pipelines that supply water to the Isle of Wight from the mainland.

It proposes to install a new twin pipeline between Lepe, in Hampshire, and Gurnard, on the Isle of Wight, as a replacement for the two existing pipes which were laid on the sea bed in 1980 and have reached the end of their intended operational life. The physical condition of the existing pipes has deteriorated, giving concern about their continuing ability to withstand the normal pumping pressures associated with water transfer.

The Cross Solent Main is a vital component of the water supply infrastructure of the Isle of Wight. Over the course of a year it carries over a quarter of the Isle of Wight's water needs, and a higher percentage at times of peak demand.

Without the ability to transfer water from the mainland through the Cross Solent mains Southern Water would be unable to meet peak demands on the island, whose indigenous water resources are limited. The company's water resources plan for the period 2002/03 to 2029/30, which has passed the scrutiny of the Environment Agency and the Director General of Water Services, concludes that an increase in supply from the mainland through the Cross Solent mains is the only feasible option to meet forecast future demand on the Isle of Wight, whilst also addressing the immediate need to replace the existing deteriorating pipelines.

A scheme to replace the existing pipes with a new main with a greater capacity is therefore included in Southern Water's capital programme for the period 2005-2010, which has been approved by the Director General of Water Services.

4Delivery Limited, a joint venture between United Utilities, Costain and Montgomery Watson Harza will implement the scheme on behalf of Southern Water.

Southern Water has now submitted applications under the Town and Country Planning Act 1990 and the Planning and Compulsory Purchase Act 2004 for the works required on and under the land (i.e., above mean low water mark) to New Forest District Council and the Isle of Wight Council.

Applications will also be made to the Department of Food and Rural Affairs, under the Food and Environment Protection Act 1985 for consent to lay the pipelines on the sea bed and, under the Coast Protection Act for a licence for those elements of the proposals lying below mean high water springs.

Environmental Impact Assessment and this Document

As required by the UK regulations that implement European directives on environmental impact assessment (EIA), an assessment has been made of the potential impacts of the proposal on the environment. The results of the EIA are described in the Environmental Statement (ES) which has been submitted with the consent applications. The ES has been prepared by the Halcrow Group Limited with the assistance of a team of specialist consultants.

This document is the summary of the ES in non-technical language.

Description of the Proposed Scheme

In summary, the scheme includes the following works.

In New Forest District

- A temporary drill rig site north of Lepe Country Park with temporary access from Lepe Road.
- Approximately 1100m of underground twin water supply pipeline, installed by drilling south from the rig site to emerge in the Solent below low water mark.

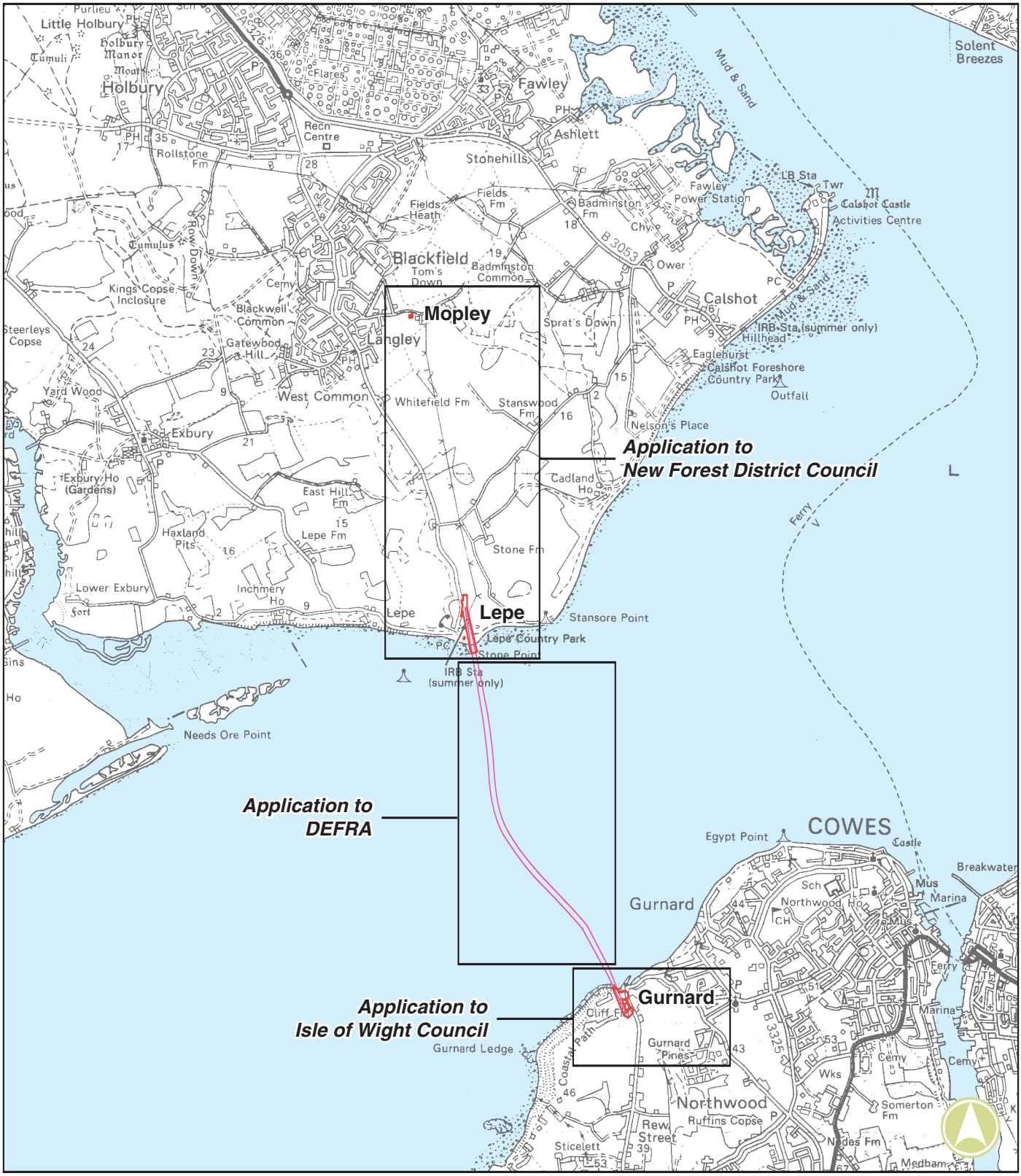

Figure 1 **Planning Applications and Applications to Defra (Diagrammatic)**

CROSS SOLENT WATER MAIN REPLACEMENT SCHEME

PLANNING APPLICATIONS

Drawing Number: SWS/410/PA/01

Drawn by: NM | Date: 050729

Scale. 1:50 000

Proposed rig site at Lepe

Proposed rig site at Gurnard

- A flowmeter chamber under the roadside verge east of Lepe Road with an adjacent, above-ground control kiosk housing telecommunications and electrical equipment.
- Connection into the existing main adjacent the drill site.
- Replacement pumps and other minor works at Mopley Booster Pumping Station.
- Reinstatement of the existing connection chamber in the lower car park at Lepe Country Park.

On the Isle of Wight

- A temporary drill rig site south of Hornhill Copse with temporary access off Rew Street.
- Approximately 900m of underground twin water supply pipeline, laid within sleeving of approximately 500mm internal diameter, installed by drilling north from the rig site to emerge in the Solent below low water mark.
- An underground flowmeter chamber south of Hornhill Copse, with an adjacent control kiosk housing telecommunications and electrical equipment.
- Approximately 130m of single underground water pipeline, installed by drilling north from the rig site to emerge in the field to the north of Cliff Farm, together with a short section of pipeline installed by open trench excavation, to connect the new mains to the existing water distribution network.
- Reinstatement of the existing connection chamber in the field north of Cliff Farm.
- Minor pipework modification works within an existing building at Broadfields Reservoir.

Below low water

- Approximately 2200m of twin water supply pipes, linking the underground sections drilled beneath both foreshores, laid on the sea bed and embedded to a depth of approximately 1.2m.

The new pipelines will have an internal diameter of approximately 300mm and provide an overall capacity of 20megalitres (20,000,000 litres) of treated water per day, pumped from Testwood Water Supply Works. For comparison, the existing pipes are 200mm diameter and capable of supplying 12megalitres per day.

Need and Alternatives

Water from the mainland is a vital resource for the Isle of Wight; without it Southern Water could not meet the Island's needs. Doing-nothing, allowing the existing mains to fail, is thus not an option.

As noted in the introduction, replacement of the present, life-expired pipelines that cross the Western Solent is therefore a key feature of Southern Water's Water Resource Plan for the period to 2030.

The Water Resource Plan has been prepared in accordance with guidelines published by the Environment Agency. It considers all viable options for meeting forecast water demand on the Isle of Wight.

Demand forecasts take account of likely population growth and the proposals of the statutory development plan. Factors that might reduce the rate of demand increase have been assessed. The Plan concludes that the only viable option to meet current and future water needs is to augment indigenous sources by transferring water from the mainland through the Cross Solent mains. This option has been agreed by the Environment Agency, which has included it in its advice to government ministers, and specifically recognised by the Director General of Water Services in the Company's business plan.

The additional environmental impact of increasing the diameter of the twin pipelines across the Solent to provide additional capacity is insignificant and the extra cost of so doing is between 5-10% of the capital cost of the scheme.

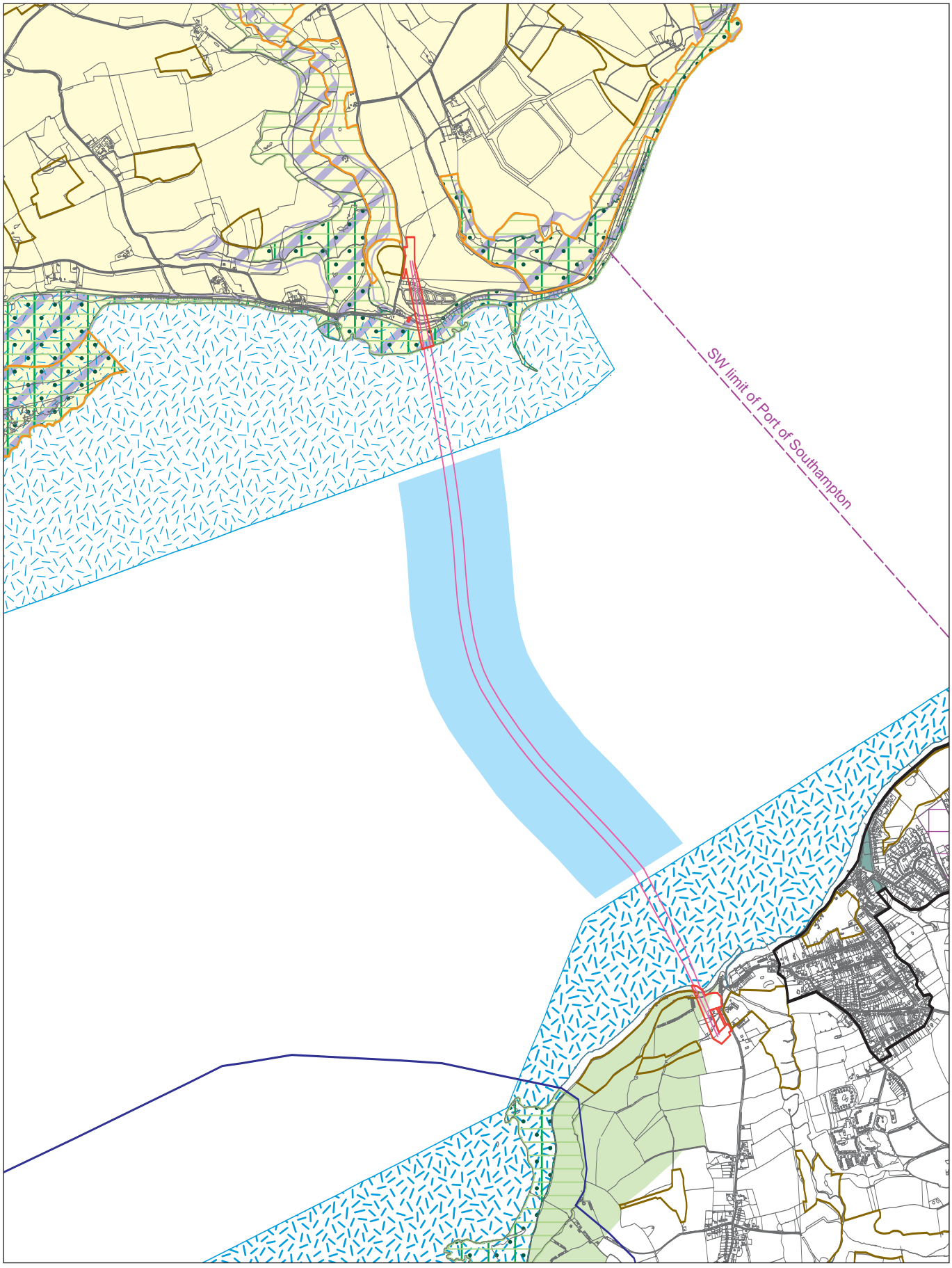

Figure 2 : Planning and Environmental Constraints

Source. *New Forest District Local Plan Adopted 1999*
New Forest District Local Plan First Alteration (Proposed Modifications) 2005
Isle of Wight Unitary Development Plan 1996-2011
Environment Agency
Southern Water

Scale. 1:25 000

Sufficient resources are available within the abstraction licence at the Testwood Water Supply Works, which is the largest treatment works in Southern Water's area, to meet the Isle of Wight's needs. No alterations to the Works are likely to be required to pump the additional volume to the Isle of Wight.

Alternative pipeline configurations and routes

Feasible alternatives, including a single larger pipe, twin pipelines or multiple smaller pipelines, were assessed against environmental, operational and engineering criteria. The assessment supported the principle of constructing twin pipelines of 300mm diameter.

Four installation options were considered:

- Laying the pipes directly on the sea bed from shore to shore, with invasive trenching across the foreshore. This option was rejected because of its impact on the internationally designated nature conservation sites.
- Directionally drilling an underground pipeline from land on both shores, meeting in the middle of the Solent. This option would be at the limits of current technology and would involve significant construction risks. It would also require very large construction areas (between 500m and 2000m long) on land, for which acceptable sites could not be found. This option was therefore rejected for technical and environmental reasons.

- A 4km long tunnel, with a bore diameter of 4.2m. This would be a very large and very expensive civil engineering project, generating over 7,200 lorry movements to remove spoil alone. It was rejected on grounds of cost and the environmental impact during construction.

- A combination of underground pipes installed by directional drilling under both foreshores with the central section laid on the sea bed, and embedded into it by pressure jetting. The EIA, backed up by the results of consultation with key stakeholders, showed this to be the solution which would have least overall impact on the environment. It would avoid direct impact on the international designated foreshores and construction would have least impact on the New Forest National Park. This option was therefore adopted as the preferred solution.

Since the start and finish points of the Cross Solent pipelines are fixed by existing water infrastructure, the assessment of alternative routes was limited to the detailed route of the pipeline and the locations and design of the associated above-ground structures along its route.

Particular care was taken, in respect of the terrestrial proposals, to site construction and working areas away from residential and leisure uses, avoid areas of value for nature conservation, and

include proposals to remove redundant infrastructure and reinstate the ground to its original condition.

In respect of the marine section, the main concern was to minimise the impact on the environmental, commercial and leisure resources of the Western Solent, and on navigation, whilst also securing a reasonable degree of protection for the pipes from accidental damage.

The findings of the EIA process played a significant role in the iteration of the design of the scheme. A number of amendments were made to the pipeline route and to its design in order to minimise potential adverse environmental effects.

Consultation and the Scope of the Environmental Impact Assessment

A comprehensive consultation exercise, which involved key stakeholders, provided a further important source of information, concerns and views which, as far as possible, have been responded to and reflected in the proposals. Particular account was taken of the advice of English Nature in respect of the potential impact on nature conservation, especially in view of the requirements of the Habitats Regulations and the Wildlife & Countryside Act.

Discussions were held with landowners and tenants to ensure that, where it was possible to do so, their needs were accommodated, especially during construction when there will inevitably be some disruption. At Lepe, the proposals were amended to ensure that they had minimal impact on the popular country park run by Hampshire County Council and the farming operations of the Cadland Estate. The proposals at Gurnard have been designed to keep to a minimum the visual intrusion of the works, the disturbance to local residents and disruptions to local roads.

Consultation with key consultees began in October 2004. In summary, the principal environmental issues to emerge (reflected in the Scoping Opinions from the local authorities) were as follows:

- The importance of securing water supplies to the Isle of Wight.
- The need to avoid or minimise impacts on international, national and local nature conservation sites and impacts on protected species/habitats and terrestrial ecological features.
- The possibility of impacts on areas of terrestrial and maritime archaeological interest (including Palaeolithic peat beds).
- The possibility of impacts on migratory fish species, fisheries and fishing activities.
- The risk of release of drilling lubricants such as bentonite, turbidity and the impacts on water quality.
- Possible impacts on the coastline and for coastal erosion.
- The need to avoid or minimise impacts on recreation and tourism, particularly within Lepe Country Park.
- The need to minimise the impact of construction traffic, especially on roads in the National Park.
- The risk of localised temporary increases in dust, noise and vibration.
- The importance of avoiding significant new structures in the National Park and the Area of Outstanding natural Beauty.
- The need to deal properly with waste material arising from the works.
- The potential effects of temporary disruption to access to local residential properties.
- The need to minimise disruption to navigation and to commercial and recreational craft.

The Existing Environment

Relevant aspects of the existing environment of the Western Solent, from Lepe in Hampshire to Gurnard on the Isle of Wight, were studied. This area includes parts of several national and international environmental designations, which underlines the value of its ecology, landscape and cultural heritage. The most notable designations are in respect of nature and landscape conservation - the Solent Maritime Special Area of Conservation and the Solent and Southampton Water Special Protection Area and Ramsar site, the New Forest National Park and the Isle of Wight Area of Outstanding Natural Beauty.

The Western Solent is also an important commercial waterway and internationally noted sailing water. It is a mixed sea fishery, important for both commercial and non-commercial fish species including oysters and clams.

Tourism and recreation, ashore and on the water, are significant features of the environment and economies of the New Forest and Isle of Wight. Lepe Country Park, the location of the landfall of the existing Cross Solent mains, is a very popular location for informal recreation.

This picture of a sensitive yet well-used environment is reflected in statutory planning policies and government planning advice. These restrict development to that needed to meet the essential needs of the area and require that, when development is justified, great care should be taken to minimise environmental impacts. There are particularly demanding statutory requirements for developments that may have a significant effect on nature conservation sites designated under European Directives.

Environmental Impacts

As noted earlier, the scheme has been designed to avoid significant effects on the environment. Those that remain, during construction and when the mains are operational, and the

Figure 3 Existing Water Main
Testwood WSW - Broadfields Reservoir

- Existing Water Main
- New Forest National Park
- Area of Outstanding Natural Beauty

CROSS SOLENT WATER MAIN REPLACEMENT SCHEME

EXISTING WATER MAIN

Drawing Number: SWS/410/PA/03

Drawn by: MS | Date: 050803

Not to Scale

measures that will be taken to reduce and offset them, are identified in the ES and summarised below.

Impacts during Construction

Water Quality

There is a potential for temporary adverse impacts on bathing water quality resulting from sedimentation and accidental spillages of fuels, oil, or other construction materials into the water column of the Solent during the directional drilling of the pipeline. However, pollution control measures and good construction management practices will be put in place to ensure that risks are minimised.

There will be minor temporary increased levels of suspended and deposited sediment during the embedding of the pipeline including the release of drilling lubricant from drill-breakouts. Sediment transport modelling has shown that the depth averaged concentrations of both drilling lubricant and sand concentrations are very small in comparison to both mean values and the natural variability in suspended sediment levels

Small quantities of drilling lubricant and benthic sediment will be released into the water column and will settle in the subtidal and intertidal zones. Predicted cumulative deposition depths are: sand sediment not exceeding 0.1mm a few days after jetting has ceased; drilling lubricant not exceeding 0.1mm after one week of its release. These impacts are considered to be of minor significance.

Flora and Fauna

The proposed pipeline pass beneath the two foreshores and construction activities will therefore not have a direct impact on the internationally designated nature conservation areas.

Hampshire shoreline

To avoid the possibility that construction work at Lepe and Gurnard, which has to include limited hedgerow removal, will have an impact on breeding birds, this work will undertaken outside the bird breeding season.

Isle of Wight shoreline

Drilling works at Gurnard will be undertaken as late in May 2006 as possible, to avoid disturbance to red squirrels which are present within a wood adjacent to the site. By then, the majority of the young will be weaned and mobile.

The drilled sections of the pipelines will emerge on the sea bed at least 50m seaward of the boundary of the Special Area of Conservation. Drilling lubricant may be released into the water column when the drill breaks through the sea bed, with a consequent minor temporary adverse impact on marine ecology. The risks will be minimised by selecting a contractor who has proven competence in this type of work. The maximum predicted concentration of drilling lubricant is well within the recorded range of natural variability.

There will also be a minor temporary adverse impact on marine ecology from suspended sediment during the jetting activities, although maximum concentrations should again be well within the recorded range of natural variability.

Fisheries

The jetting operations required to embed the pipelines in the sea bed may result in the loss of or damage to shellfish (abrasion of shells) along the route of the pipeline. This is considered to be a moderate adverse impact. Jetting may also temporarily displace fish and invertebrates and result in a potentially minor adverse impact on some species. Similarly, changes in sediment characteristics associated with the jetting may result in temporary minor adverse changes to the sea bed community.

To minimise avoidable effects on commercial fishing activities, the contractor will maintain liaison with local fishermen. Construction activities that require temporary limitations on access to fishing grounds will be notified in advance. An appropriate local notice to mariners will be provided.

Landscape Character

Construction activities will have some, unavoidable temporary adverse impact on the landscape of the surrounding area. However, the drill rig sites have been selected, within engineering and operational constraints, to minimise the impact

on the landscape of the National Park and the Isle of Wight Area of Outstanding Natural Beauty. The contractor will employ a 'tidy site' policy. Construction activities will have no significant impact on the character of the Solent itself.

Visual Amenity

The visual effects of the plant and works will also be temporary. At Gurnard, some residential properties on Rew Street opposite the entrance into the site will have a direct view of the working area. Vehicle users will also have a glimpsed view of the drill rig site on Lepe Road on their way to and from Lepe Country Park. During construction, visual impacts will be experienced by residents and recreational users on the coastal frontage and sea-farers, as a result of the presence of marine vessels associated with the marine connections and jetting of the twin pipeline.

The 'tidy site' policy to be employed by the contractor will also mitigate against avoidable local adverse visual impacts.

Land Use

Apart from the small areas retained in operational use, construction activities will not leave a permanent impact. Land used for construction will be reinstated following completion of the scheme. Pre- and post-construction site inspections (including photographic surveys) will be undertaken to guide reinstatement has been carried out. The contractors will liaise with the local community before and during construction. Measures, such as newsletters and informative notices, (for example on the Lepe Country Park notice board), will be taken to keep the community informed about the construction programme and to let the general public and recreation users in the area know what is happening.

Air quality and climate

Some construction activities, such as earth-moving and stockpiling of soil, produce dust which could be deposited in the surrounding area. It is proposed to sweep any debris from construction traffic from local roads in order to minimise the risk of affecting areas around works sites.

Noise and Vibration

Noise from construction activities will be temporary and its effects localised (generally within 100m of the construction site boundary). Predictions have been made of the noise levels likely to be generated by the construction at the closest noise-sensitive properties.

With the measures described below in place, there will be no significant impacts at the properties closest to the Lepe construction site Stone Farm and the Helmsmann). The four houses on Rew Street closest to the West Gurnard construction site are, however, likely to suffer temporary severe adverse impacts at times during the drilling programme.

Measures will be taken to minimise unavoidable construction noise. EC Directives and UK Statutory Instruments limit noise emissions from a variety of construction plant. Screening will be used to shield particularly noisy activities, and working practices will be discussed with the local authorities. Plant will be properly maintained and operated to minimise noise disturbance. The local community will be fully informed about the nature and timing of activities.

Archaeology

The proposed marine works could disturb an area of reported obstructions (which might be debris from the dispersal of the shipwreck 'Algerian') identified on the sea bed. The significance of the impact on this and other currently undiscovered archaeological evidence is clearly impossible to predict. Where possible, assisted by an archaeological interpretation of the geophysical survey, known maritime archaeological features will be avoided.

Cores obtained from the marine ground investigation works will be analysed by a qualified archaeologist to provide an indication of the presence or absence of Palaeolithic peat deposits. An archaeological watching brief will be provided during site preparation works at Lepe and Gurnard.

Traffic

Construction traffic associated with both the Lepe and Gurnard drill rig sites will peak at around 40 vehicles a week. The greatest volumes of traffic will be experienced during the delivery and removal of drilling plant. This level of additional traffic will have minor adverse impacts on Lepe Road and Rew Street. Local traffic control will be necessary at times.

All vehicle access routes will be inspected following construction and any attributable damage to the works will be re-instated by the contractors. For this purpose, pre- and post-construction condition surveys will be undertaken. To prevent the spread of construction debris, any debris on the roads arising from the works or vehicles entering or leaving the works will be swept or cleaned.

Access routes for construction traffic will be agreed with the Highways Authorities, who will also be consulted on the timings of movements of major construction items. For the purposes of the ES, it has been assumed that the route for construction traffic to and from the Lepe rig site will be via Lepe Road and the A326. Traffic generated by the Gurnard rig site will use Rew Road to the south of the site and Pallance Road.

Operational Impact

An Environmental Action Plan has been prepared to ensure that the findings of the EIA will be addressed during the implementation phase of the project. Operation of the new

Cross Solent mains will have no significant adverse impacts on the environment. Few of the structures associated with the mains will be visible.

The principal positive effect of the scheme, which is an extremely important benefit, will be to provide the Isle of Wight with a secure source of water from the mainland. As explained in the Introduction, achievement of this objective will enable Southern Water to meet current and future forecast demands for water up to 2030. The scheme implements the principal proposal of Southern Water's Water Resource Plan. It will also provide increased flexibility to meet water demand and manage local resources in times of drought, or other circumstances that might lead to a reduction in local resources.