WAINSTONES POWER

LANGAGE ENERGY CENTRE AND LANGAGE ENERGY PARK PLYMOUTH

ENVIRONMENTAL STATEMENT

JUNE 1998

WAINSTONES POWER

LANGAGE ENERGY CENTRE AND LANGAGE ENERGY PARK PLYMOUTH

ENVIRONMENTAL STATEMENT

JUNE 1998

M&M Document No. 35.00/PC03.0001
0488R000.DOC/S1/2/W

OUR REFERENCE :
YOUR REFERENCE :
DIRECT LINE :

October 2004

Address

Dear type Sirs, Sir etc

subject

Yours faithfully

Name and Title if required
For and on behalf of Merz and McLellan Limited

LIST OF REVISIONS

Current Rev.	Date	Page affected	Prepared by	Checked by (technical)	Checked by (quality assurance)	Approved by
Orig	24.04.98	All	K GRIFFIN	JW WEARMOUTH	GA HANLON	PT CLARK
			REVISION DETAILS			
Orig	24.04.98	All	First issue as 35.00/PC03.0001			

CONTENTS

LIST OF ABBREVIATIONS

BATNEEC	Best Available Techniques Not Entailing Excessive Cost
BPEO	Best Practicable Environmental Option
CAA	Civil Aviation Authority
CCGT	combined cycle gas turbine
CIMAH	Control of Industrial Major Accident Hazard Regulations
CWS	County Wildlife Site
dB(A)	unit of sound pressure level with frequency weighting to compensate for the varying sensitivity of the human ear to different frequencies
DCS	distributed control system
DO	Dissolved Oxygen
DRO	Design Record Office
EA	Environment Agency
EC	European Community
EEMUA	Engineering Equipment and Material Users
EPAQS	Expert Panel on Air Quality Standards
GIS	Gas insulated switchgear
GT	Gas turbine
ha	hectares
HGV	Heavy goods vehicle
HMIP	Her Majesty's Inspectorate of Pollution
IPC	Integrated pollution control
ISC-3	Industrial Source Complex -3
kV	kilovolt
L_{Aeq}	equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over a given period
L_{AN}	The A weighted sound level exceeded N per cent of the time
L_N	The sound level exceeded N per cent of the time
LNR	Local Nature Reserve
MW	Megawatt
NAQS	National Air Quality Standards
NETCEN	National Environmental Technology Centre
NGC	National Grid Company
NO	nitric oxide
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NR	Noise rating
OD	Ordnance Datum
OFFER	the Office of Electricity Regulation
OS	Ordnance Survey
PPE	personal protection equipment
PPG24	Planning Policy Guidance Note 24: Planning and noise
ppm	parts per million
RTS	Regional Transmission System
SAC	Special Area of Conservation
SF_6	sulphur hexafluoride
SHDC	South Hams District Council
SLINC	Sites of Local Importance for Nature Conservation
SMR	Sites and Monument Register
SO_2	sulphur dioxide
SPA	Special Protection Area

SSSI	Site of Special Scientific Interest
ST	Steam turbine
SYS	Seven Year Statement
TTWA	Travel to work area
UK	United Kingdom
UNECE	United National Economic Commission for Europe
WCSL	West Country Studies Library
WHO	World Health Organization

1. NON-TECHNICAL SUMMARY

Wainstones Power Ltd proposes to construct and operate a Combined Cycle Gas Turbine Energy Centre on land already allocated in South Hams District Council's Adopted Local Plan as an extension to the existing Langage Industrial Estate near Plymouth. In addition to this Energy Centre it is proposed to develop the remainder of the land allocated for industrial development as the Langage Industrial Estate extension as an Energy Park. The Energy Centre will make arrangements for the provision of steam, heat, the distribution of electrical power and high pressure gas throughout the Energy Park and the appropriate infrastructure will be installed.

The Energy Centre will provide of the order of 1010 MW of electrical power and will normally burn natural gas, however distillate fuel will be used at times of interruption to the gas supply. The proposed plant will help to displace power at present generated by less efficient and more polluting power stations elsewhere in the UK, making a major contribution to the security of supply and infrastructure of electrical distribution in the region and assisting with the stabilization of electricity prices.

The site

The proposed site of the Energy Centre is situated to the east of Plymouth, in an area already allocated by South Hams District Council as an extension to the existing Langage Industrial Estate. The extension comprises two sections, Phase 1 to the north, which includes the proposed Energy Centre site and Phase 2 to the south. Figure 1 shows the location. The established industrial area to the west of the site comprises some 54 ha of warehouses, offices and small factory units.

The site is roughly rectangular in shape and mainly comprises farmland. The site varies in elevation from about 90 m at the southern boundary to approximately 100 m at the northern boundary.

With the exception of the existing farm buildings on site the nearest housing lies some 700 m to the west south west. Plymouth city centre lies some 10 km to the west.

The proposed development

The proposed Energy Centre will comprise two main generating units each consisting of a gas turbine, a waste heat recovery boiler and a steam turbine. Fuel is burnt in the combustion chamber of the gas turbine from where the hot gases expand through the gas turbine to generate electricity. The hot exhaust gases are then used in the waste heat recovery boiler to generate steam which in turn is used to generate electricity via the steam turbine. The spent steam leaving each steam turbine passes to an air cooled condenser where the steam is condensed. The resultant condensate is returned to the waste heat recovery boiler for reuse. There will be no visible plumes or discharges of heated water to a local water course associated with the cooling water system. Each gas turbine and steam turbine will be associated with a single electrical generator. The power plant will be installed complete with a water treatment plant and cooling system. In addition to these two main generating units, each of approximately 480 MW capacity, the development will include a 50 MW open cycle gas turbine to provide a black start capability ie to provide electrical power to start-up the larger gas turbines in the event of power loss on the National Grid System. The Energy Centre will be connected on site to existing overhead lines which are part of the National Grid transmission system.

The plant will normally burn natural gas which is an inherently clean fuel. A new pipeline will be required to bring the natural gas to site via a new 3 km pipeline from the British Gas TransCo Regional Transmission System at Lyneham. Natural gas will not be stored on site. The stand-by fuel, distillate fuel-oil, to be used in the event of an interruption to the gas supply, will be stored on site in two 10 000 m^3 storage tanks. This fuel will be brought to site by road tanker and its use will be limited to 90 days per annum, ie to periods when the gas supply is interrupted.

The plant will operate continuously throughout the year and will be designed to have a minimum net operational life of 25 years.

Environmental controls at the plant will all be approved by the Environment Agency and all emissions must be within limits set in the licence to operate the plant.

Emissions of oxides of nitrogen will be controlled by the use of Dry Low NO_x Burners during gas firing and by the use of steam or water injection during distillate oil firing. The flue gases will be discharged via a single multi-flued 90 m tall stack.

Towns water will be treated in a water treatment plant for use as boiler make-up and for injection into the gas turbines when operating on distillate fuel-oil.

Construction of the new plant is expected to commence in October 1999. The construction workforce will average between about 350 and 400, with a maximum number of staff on site of the order of 600. The target date for full operation is October 2001. An operational staff of about 40 is expected.

The infrastructure for the Energy Park will be laid out at the same time as the Energy Centre and marketed in conjunction with the inward investment agencies in the region. It is anticipated that the advantages offered by the Energy Park concept will prove very attractive for both inward investment and companies already established in the region who are seeking to expand, as it will offer the opportunity for the beneficial use of the steam, heat, gas and electricity. The total development will provide over 50 000 m^2 (over half a million square feet) of industrial space providing between 1400 and 2200 jobs).

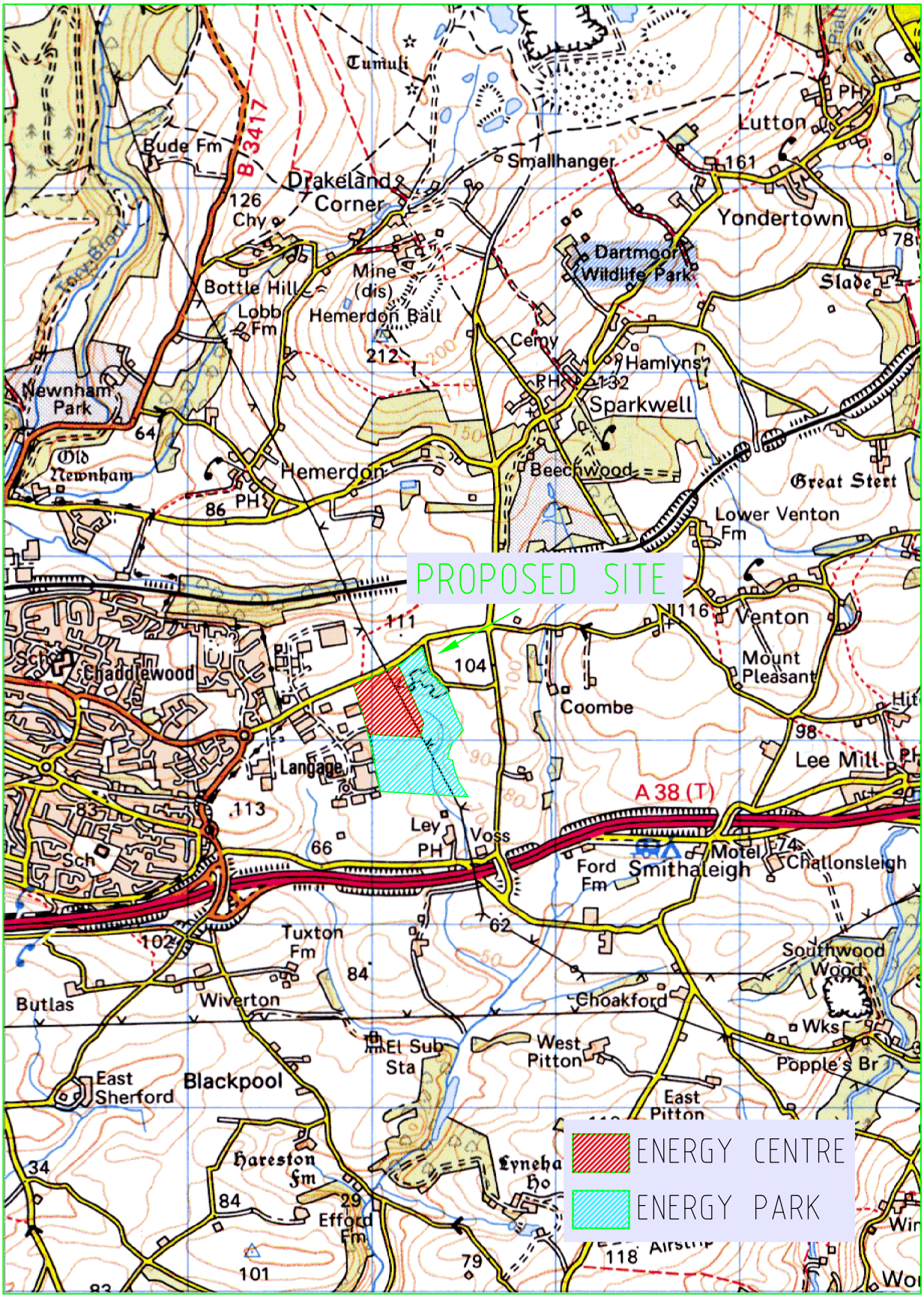
Air quality

Dust may be generated during several activities associated with the construction works, for example during excavations and earth moving operations. It is very unlikely during most weather conditions and using the proposed dust mitigation measures that dust generated by the site will cause nuisance at houses in the area.

During the operation of the Energy Centre the principal atmospheric emissions of concern will be the oxides of nitrogen (NO_x) during gas firing and the oxides of nitrogen and sulphur dioxide during distillate fuel-oil firing. Emission levels of NO_x will be maintained below 52 mg/m^3 during gas firing and below 86 mg/Nm^3 during distillate oil firing. The sulphur content of natural gas is negligible. Distillate fuel oil is also a low sulphur fuel, that used at the Energy Centre will contain less than 0.1 per cent sulphur.

South Hams District Council have used diffusion tubes to monitor NO_x levels in the Totnes area and in the vicinity of the proposed Energy Centre. Wainstones Power will instigate their own monitoring

S97-318



BASED UPON THE 1997 ORDANANCE SURVEY 1:50000 SCALE LANDRANGER MAP WITH THE PERMISSION OF HER MAJESTYS STATIONARY OFFICE © CROWN COPYRIGHT

REV		
B	19/3/98	SITE AREA MODIFIED
		PDO GDO KG
C	2/6/98	SITE AREA MODIFIED
		DW PDO KG

PB Power

LOCATION OF ENERGY PARK AND ENERGY CENTRE

Drawn: PDO
Checked: GDO
Approved: KG
Date: 5/12/97

Scale:

Drawing No: FIGURE 1.1

A B C

programme in conjunction with the local authorities before and during construction and through the first months of operation.

The atmospheric dispersion of the emissions of NO_x and SO_2 from the Energy Centre have been modelled and the maximum hourly and annual increments to ground level concentrations calculated.

The modelling excercise has shown that the emissions from the proposed plant will not impact significantly on local air quality and will not, in isolation, lead to exceedances of air quality guidelines or legislative limits.

Water quality

The proposed Energy Park site is drained by a small unnamed stream which discharges to the Silver Bridge Lake (a larger stream), which in turn discharges to the River Yealm, approximately 2 km west of Yealmpton. The small stream which drains the Energy Park will be retained.

The discharge of any effluents during construction, including site drainage, will be the responsibility of the Contractor who will reach agreement with the Environment Agency and the local sewerage undertakers with regard to the detailed methods of disposal. Standard good working practices should ensure that any impacts on the quality of water discharging from the site will be insignificant.

During operation all water required by the Energy Centre will be taken from a new Towns water supply to the site. During normal operation water will only be required, on a day to day basis, for make-up to the boiler water system. During interruptions to the gas supply, when it will be necessary to burn distillate fuel-oil, water will also be required for injection into the gas turbines in order to control NO_x emissions. This water will also be treated in the new water treatment plant.

On a day-to-day basis, the only effluent discharged from the Energy Centre will comprise the effluent from the water treatment plant. This effluent will be discharged to sewer. There will be no discharges of process water to any local water course. The effluent from the water treatment plant will contain salts removed from the Towns water with some additional sodium sulphate produced by neutralization of the spent regenerants.

Small quantities of boiler water (boiler blowdown) are discharged in order to avoid the build-up of impurities in the boiler water. This effluent is virtually pure water, containing very small quantities of various chemicals that are used to prevent corrosion and scaling in the boiler. Boiler blowdown will be re-used in the water treatment plant.

Any areas of the site that are likely to be contaminated with oil will drain to oil interceptor(s) to limit the oil in water content to below 10 ppm. This surface water, with surface waters from non-contaminated areas, will drain to the existing stream. Sewage will be discharged to the local sewerage system.

Other occupiers of the Energy Park will be required to make similar general arrangements through the usual planning processes.

Noise

Environmental noise levels have been predicted for the proposed Energy Centre based upon test data for similar units. An assumption has been made for this development that noise control treatment will be introduced due to the proximity of residential areas around the proposed site.

The likelihood that operating noise levels from the proposed CCGT Plant might give rise to complaints has been assessed in accordance with procedures outlined in BS 4142:1990 "Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas".

BS 4142 states that complaints might be expected where the predicted level (the rated level) actually exceeds the background by 10 dB or more. An excess of just 5 dB would be considered of *marginal significance* only, whilst levels of more than 10 dB below background would be regarded as a positive indication that complaints are unlikely.

The likelihood that operating noise levels from the CCGT plant might give rise to complaints from people working at adjacent trading units has been assessed by considering recommended noise levels in workshops/offices from BS 8233:1987 "Sound Insulation and Noise Reduction for Buildings" and also measurements recorded of typical Trading Estate noise levels during the daytime.

Recommended planning consent noise limits are given, based on guidelines from BS 4142 and BS 8233, and have been incorporated into suggested planning conditions typical of those issued for similar projects in the UK.

The level of noise control assumed on this project is extensive and has been based on achieving these limits, resulting in no significant noise impact due to the Energy Centre.

Individual occupiers of the Energy Park will be required to make applications for planning consent which will include noise limits where necessary.

Visual impact

The site is situated between the rolling farmland to the east of Plymouth and the industrial area of Langage. Although the industrial area is elevated, clear views are not widely available, due to the rolling nature of the terrain and the high hedge banks found in the area. Some views of the industrial area are, however, possible from the west. The whole area to be occupied by the Energy Park is however already designated for industrial development and changes to the visual aspect of the land are to be expected.

The proposed Energy Centre can be considered to be made up of two elements; the main Energy Centre buildings, at a maximum of 28 m high and the 90 m chimney. At this height the stack will rise above the surrounding plant and indeed all other buildings in the area. The Energy Centre will have a modern appearance with a clean outline and a simple bold structure.

An aerial view of the proposals can be seen on the front cover of this document.

Proposals for a landscaping scheme to the east and south of the Energy Park have been prepared.

Traffic and infrastructure

Vehicular access to the proposed site is good with access being via Holland Road and Sandy Road to the A38 (Deep Lane).

The large construction work force could result in approximately 200 vehicles travelling to the site during peak times.

In addition to staff transport movements, construction will include civil works traffic, mechanical works traffic and heavy and abnormal loads. Approximately 10 light vehicles per day and 20 heavy commercial vehicles per day on average would be expected to visit the site. Approximately 30 abnormal loads are expected over the 24 month construction period.

During the operational phase approximately 20 arrivals at the Energy Centre can be expected during the morning peak, resulting in no significant increase in traffic in the Langage area and no effect on local traffic patterns and infrastructure.

A new gas pipeline will be constructed to provide a main source of fuel for the Energy Centre. This will be the subject of a separate application under the Pipelines Act 1962 with its own Environmental Statement. When firing on distillate fuel oil of the order of six to seven 38 tonne tankers would be required per hour of operation. However, at times of interruption to the natural gas supply, fuel-oil would be taken from the on-site storage tanks whenever possible. The fuel oil storage tanks would then be refilled over a longer period, reducing the hourly flow of tankers to the site. Such periods of gas interruption are, in any case, likely to be rare.

Socio economics

A peak construction work force of 600 is expected, a substantial proportion of which it is hoped will be recruited from the local area.

The operational workforce of the Energy Centre will comprise approximately 40 skilled staff.

The proposed Energy Park would provide between 1400 and 2200 jobs depending on the type of companies attracted to the site. It is intended to promote industrial and employment uses that can capitalize on the availability of steam/heat/power/gas from the proposed Energy Centre. The provision of such cheap resources will encourage development of the Energy Park and will help to provide a stable employment base with new jobs and business opportunities.

Total investment in the Energy Centre will be of the order of £400 million. In addition, operational and maintenance costs will be of the order of £8 million per annum, a significant proportion of which will benefit the local economy. The Energy Park is expected to spend approximately £4 million per annum in the local community.

Ecology

Although the site is already allocated for industrial development, a habitat survey has been undertaken of Phase 1 of the extension to the industrial estate. Phase 2 will be surveyed at a later date. Phase 1 comprises four large fields, two smaller fields, and a number of smaller areas of derelict orchard and scrub. All the fields contain permanent improved pasture (rye grass). The field boundaries are mostly

traditional Devon banks approximately 1-1.5 m high and 2-3 m wide with a hedge on top. There are no plant species that are notable or rare.

Rabbits are present at very high densities around the margins of the fields. There is some evidence of badger activity, however, this appears to be very low and it is considered extremely unlikely that there are occupied badger setts on the site. As badgers can quickly excavate setts this situation may change before construction on site begins. An approved badger consultant will therefore investigate each hedge bank prior to clearance.

There are a total of 25 Sites of Special Scientific Interest (SSSIs) within 30 km of the site. Operation of the CCGT plant will lead to slight changes in air quality at these sites. The calculated increments to ground level concentrations of NO_x due to the plant are well within WHO and UNECE guidelines which have been specifically developed to protect flora and fauna.

A small area of the Energy Park, in the vicinity of the existing stream, will be developed as an Ecology Park, where the existing flora and fauna will be retained and enhanced.

Cultural heritage

The history of the site dates back to Saxon times, and from this time onwards, the majority of the site has probably always been used for agricultural purposes. There is no evidence of any prehistoric activity in the immediate area of the site. Evidence of any pre-medieval occupation, or of an extended early medieval settlement is only likely to be revealed during construction work, or as a result of geotechnical and geophysical investigations undertaken as part of the predevelopment works. Palaeoenvironmental material may be present in preserved deposits sealed beneath the medieval hedgebanks. It is therefore proposed that the Archaeology Group of Devon County Council be kept fully informed of the plans for the project and that an Archaeological Consultant be invited to the site to inspect any excavations made.