

**TOWN & COUNTRY PLANNING ACT 1990**

**A PLANNING APPLICATION FOR THE EXTENSION AND DEVELOPMENT OF THE EXISTING CAYTHORPE POWER GENERATION FACILITY AS AN UNDERGROUND GAS STORAGE FACILITY, THE CONSTRUCTION OF A WELLSITE AND THE DRILLING OF 6 BOREHOLES TO ACCESS AN IDENTIFIED UNDERGROUND GAS BEARING GEOLOGICAL STRUCTURE, THE CONSTRUCTION OF A CONNECTION FACILITY INTO THE TRANSCO NATIONAL TRANSMISSION SYSTEM TOGETHER WITH ASSOCIATED INTER-CONNECTING PIPELINES**

**AT CAYTHORPE, BRIDLINGTON, EAST YORKSHIRE**

**NON-TECHNICAL SUMMARY**

**SUBMITTED ON BEHALF OF  
CAYTHORPE GAS STORAGE LIMITED**

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November 2005

## **NON-TECHNICAL SUMMARY**

### **1 INTRODUCTION**

1.1 Caythorpe Gas Storage Limited is applying to the East Riding of Yorkshire Council for planning permission to extend and develop the existing Caythorpe Power Generation Facility as an underground gas storage facility, construct a wellsite and drill 6 boreholes to access an identified underground gas bearing geological structure, construct a connection facility into the Transco National Transmission System together with associated inter-connecting pipelines at Caythorpe near Bridlington.

1.2 The Planning Application is accompanied by an Environmental Statement of and this Non-Technical Summary forms part. The summary has also been published separately so that it can be made widely available. As required by the 1999 Regulations, an Environmental Statement is the report of a systematic analysis whereby information on the likely environmental effects of a proposed development is collected, assessed and taken into account by the planning authority in making its judgement on whether the proposed development should go ahead.

1.3 The Non-Technical Summary is an integral part of the Environmental Statement. Its role is to provide a synopsis of the information contained within the Environmental Statement but written in such a way that it can be understood by the non-technical reader.

1.4 A copy of the Planning Application and the Environmental Statement is available for public inspection during normal working hours at the following addresses:-

East Riding of Yorkshire Council	East Riding of Yorkshire Council
Strategic Development Services	Bridlington Customer Service Centre
County Hall	Town Hall
Beverley,	Quay Road
HU17 9BA	Bridlington, YO16 4LP

- 1.5 As required by Section 17 of the 1999 Regulations, copies of the Environmental Statement are available on CD-Rom at a cost of £10 or, alternatively, as a hard copy at a cost of £100. (The Non-Technical Summary can be found on the following web site ([www.warwickenergy.com](http://www.warwickenergy.com))).

Please contact:-

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## **2 SITE DESCRIPTION**

- 2.1 The development area is located at the south-eastern edge of the Yorkshire Wolds as shown on drawing C7266/1 and is characterized by intensive farmland. It lies some 4-7 km inland from the coastal resort of Bridlington. The village of Rudston lies at the north-western sector of the area whilst the former medieval village of Caythorpe and the neighbouring Caythorpe power generation facility mark the north-eastern extremity. Woldgate, a single track public road aligned on the highest ground to the south and along the route of a former Roman Road, marks the southern boundary. Thorpe Hall and Low Caythorpe Farm are situated within the area, the main geographical feature of which consists of the valley of the Gypsy Race – a typical Wolds chalkland stream which flows west to east from beyond Rudston to the North Sea at Bridlington. The valley is 1-2 km wide and extends into the Wolds for a distance of about 10 km. It is typical of valleys with a glacial origin. All of these features are shown on Drawing C7266/2 together with the location of each element of the proposed development.

## **3 PROJECT DESCRIPTION**

- 3.1 The proposed development comprises:-
- The extension and development of the existing Caythorpe power generation facility as an underground natural gas storage facility

- The construction of a wellsite and the drilling of 6 boreholes to access an identified underground gas-bearing geological structure
- The construction of a connection facility into the Transco National Transmission System (NTS) together with associated inter-connecting pipelines.

3.2 The purposes of the 4 elements of the project are to:-

- Drill 6 additional wells into the reservoir to realize optimum storage potential
- Provide above ground processing and compression equipment to handle gas re-injection and production, water extraction from the produced gas and metering of the imported and exported gas
- Provide a high pressure gas pipeline connection to the Transco NTS to import and export retrieved and stored gas
- Provide a connection facility at the point of exit/re-entry from/into the NTS
- There is an recognised need for the proposed development

#### **4 PLANNING POLICY FRAMEWORK**

4.1 The proposed development must be judged in the context of national, regional and local planning policies relating to mineral development and environmental issues notably those concerning development in open countryside of high landscape value, archaeology and nature conservation. As the site lies within the unitary authority of the East Riding of Yorkshire Council then the policies of this authority are relevant.

4.2 At the national and regional level the proposed development is in line with policies relating to sustainable development. At the local level the proposal meets the requirements in the Joint Hull and East Riding Structure Plan, the East Yorkshire District Plan and the Joint Hull and East Riding Minerals Plan due to the mitigating measures embodied in the proposals that reduce the environmental impact of the proposals to an acceptable level.

## **5 KEY ISSUES**

5.1 The key issues addressed in the Environmental Statement were identified during consultations with the local authority and other organizations. The views of local residents were also sought.

5.2 Consultations throughout the design and planning of the project between November 2004 and October 2005 have been undertaken with:-

- ERYC Environmental Health Department
- ERYC Highways Department
- ERYC Public Rights of Way Department
- ERYC Planning Department
- The Environment Agency
- English Nature
- Yorkshire Wildlife Trust
- English Heritage
- Humber Archaeology Partnership (archaeological advisers to ERYC)
- Boynton Parish Council
- Rudston Parish Council
- Burton Agnes Parish Council
- Health & Safety Executive

5.3 Public consultation has been undertaken by way of a Public Meeting held at the Rudston Village Hall on 13 June and under the auspices of the Caythorpe Liaison Committee whose inaugural meeting took place at the Caythorpe site office on 11 October.

5.4 The key issues identified as requiring assessment were:-

- Health & Safety & Risk Assessments
- Need
- Effect on the Open Countryside (Landscape and Visual)
- Ecology and Nature Conservation
- Archaeology (Cultural Heritage)
- Emissions to Air
- Noise
- Traffic

5.5 Safety is not a matter for the consideration of the planning authority, but in recognition of the extent of public concern, a safety report has been prepared for the proposed development and is provided with the planning application.

5.6 Additional topics addressed by the environmental impact assessment carried out and reported in this Environmental Statement are Hydrology and Hydrogeology, Agriculture, Lighting and Socio-Economic impacts.

## **6 LANDSCAPE & VISUAL AMENITY**

6.1.1 The assessment considers all aspects of the proposed Caythorpe gas storage project on the landscape and on local views. The assessment of impacts is made in relation to existing landscape character and to existing views that are available from within the local area.

6.1.2 The assessment draws on a range of sources. These include descriptions for joint character area 27, the Yorkshire Wolds contained in 'Countryside Character Volume 3: 'Yorkshire and The Humber'', the draft 'East Riding of Yorkshire Landscape Character Assessment', Ordnance Survey mapped information and aerial photographs and fieldwork within the local area.

### **6.2 Site Location and Character**

6.2.1 The proposed gas storage facility (GSF) site is located at the south-eastern edge of the Yorkshire Wolds within the valley of Gypsey Race, approximately 2.3 km west of Rudston village, 1.2 km east of Boynton village, and some 4 km inland of the coastal resort of Bridlington. It would be an extension of the existing Caythorpe gas production and electricity generation site (PGF). The site is not located within a landscape designated at either national or regional level. The adopted East Yorkshire Borough Local Plan identifies a Wolds Area of Landscape Protection that applies to the site and much of the surrounding area.

6.2.2 Landscape in the vicinity of the GSF site is chiefly characterised by the distinctive valley of the Gypsey Race which is cut into the elevated rolling plateau of the Yorkshire Wolds. Outside of the valley, the landscape is rolling arable farmland, elevated, open and large in scale, with only occasional plantation woodlands or shelterbelts, sparse trees and gappy or

remnant hedges. There is a general lack of development, apart from transmission masts on high points, scattered farmsteads and the crematorium at the Octon Crossroads.

6.2.3 The Gypsy Race valley includes a generally flat and relatively narrow valley floor and the sloping valley sides which rise approx 50m to the rolling chalk plateaux and ridges above. Although arable farmland predominates, there is also considerable tree and woodland cover that tends to limit views within the valley. The area is sparsely populated, with scattered farms and individual properties, the villages of Boynton and Rudston and the grounds and wider estates of Thorpe Hall and Boynton Hall nearby. The existing Caythorpe PGF is an established feature of the landscape.

### **6.3 The Gas Storage Facility Proposal**

6.3.1 The gas storage facility proposal incorporates measures designed to help to reduce or avoid impacts on the local landscape and on visual character. It has four main parts:

- the main above-ground facilities to be located within and as an extension to the existing Caythorpe PGF;
- a new wellsite at Carr Plantation;
- the underground pipeline corridor and access track approximately 1.3km long constructed within the corridor to link the wellsite to the extended PGF site; and
- the Woldgate Above Ground Installation (AGI), a small scale connection facility located on the south side of Woldgate, close to the Rudston AGI.

### **6.4 Predicted Landscape Impacts**

#### **Construction, Drilling and Testing Phases**

6.4.1 The temporary presence of the contractor's site offices and materials compound, site vehicles and machinery, and on the wellsite, the drilling rig (47.4m high) storage tanks (12.8m high), testing equipment and a ground flare (10m high) would lead to impacts during site construction / drilling and testing works. Impacts on the landscape would vary; at the wellsite these are

likely to be of medium-high or high magnitude, with medium-low magnitude impacts elsewhere. Due to their temporary and reversible nature, none would represent a significant impact in terms of the Environmental Impact Regulations 1999.

### **Operational Phase**

- 6.4.2 There would be changes in the fabric of the landscape, including the loss of approximately 5.55 ha. of arable farmland which is not considered to be significant. Losses of hedgerow would be more than compensated for by proposals for new tree shrub and hedgerow planting. Although eventual decommissioning and site restoration would inevitably result in the removal of much of the new planting, sufficient would remain for medium-long term changes to be of slight significance and beneficial.
- 6.4.3 The principal effect on landscape character would involve the extension of the existing Caythorpe PGF site. The scale of the site would increase by approximately 40% in terms of above-ground infrastructure and there would be an incremental increase in engineered and built features in the local landscape. New site features would include two compressor houses each 17.5 x 11 x 11m high and associated processing facilities, an exhaust stack 15m high, and a switchgear building with associated transformer compound. Extensive soft landscape proposals would help to physically and visually enclose the site. Impacts on existing landscape character are predicted to be of medium magnitude and moderate significance. These would not represent a 'significant impact' as referred to in the Environmental Impact Regulations 1999.
- 6.4.4 There would also be changes in the existing character of land at the Carr Plantation Wellsite where six underground wellheads, a small control building and minor processing equipment would be located on a stepped drilling platform that would be cut into the natural slope. Low planted mounds would wrap around the wellsite platform. Changes would occur due to the introduction of a stepped engineered platform with utilitarian buildings and equipment into an undeveloped landscape ie an open agricultural field

where no similar features currently exist. Impacts on local landscape character would be of medium magnitude and moderate significance. These would not represent a ‘significant impact’ as referred to in the Environmental Impact Regulations 1999.

6.4.5 Works within the underground pipeline corridor would also give rise to landscape impacts during the operation of the GSF, notably the creation of a new access track and associated bridge over Gypsy Race between the proposed Wellsite and the extended Caythorpe PGF site. The track has been designed to appear as a farm track, and would not therefore seem to be out of place in the local landscape. Impacts on landscape character would not be significant.

6.4.6 Impacts would also occur due to the creation of the proposed Woldgate AGI within an undeveloped open agricultural field located adjacent to Woldgate. The buildings and equipment would be relatively small in both scale and number and have a utilitarian character. Planting works, including a new hedgerow along Woldgate, would help to integrate the AGI within its wider setting. Impacts on landscape character are predicted to be of low-medium magnitude and moderate-slight significance. These would not represent a ‘significant impact’ as referred to in the Environmental Impact Regulations 1999.

## **6.5 Predicted Visual Impacts**

### **Construction, Drilling and Testing Phases**

6.5.1 The main source of temporary visual impacts would be the appearance by day and night (lit) of the 47.4m high drilling rig in position on the proposed Carr Plantation Wellsite. Secondary sources of impact include the contractors’ compounds that would be located on the extension site, at the Woldgate AGI site, and within the working area on the proposed well-site, with associated cabins, parking and materials storage.

6.5.2 Generally, Carr Plantation would obstruct many potential views of the lower parts of the drilling rig and of contractor’s working area on the proposed Wellsite. On the extended PGF site, existing buildings and structures, on-site

and roadside vegetation would similarly interrupt many potential views of the contractor's compound. In these cases potential impacts would be of low-medium or low magnitude. However medium-high or medium magnitude visual effects are likely at relatively short-range from the Rudston – Woldgate bridleway, from Thorpe Hall and properties within its grounds, from Woldgate in the vicinity of the AGI site, and from the B1253 road where the temporary site entrance would provide close range opportunities for views of the contractor's compound. Given their temporary (up to 1 year) and reversible nature these are not considered to represent significant visual impacts.

### **Operational Phase**

- 6.5.3 Proposed changes in the layout of buildings and gas processing equipment on the existing Caythorpe PGF would have only limited effect on existing views. The main site buildings and exhaust chimney would be unaffected, and the position of the ground incinerator would be moved very slightly. Proposed replacement tanks would be lower in height and less obtrusive in external views than existing tanks. Most of the existing vegetation within and adjacent to the site would be retained and supplemented by new planting. The main sources of potential visual impacts would be the two large compressor buildings and the proposed exhaust stack. The proposed access track would be a secondary source of potential visual impact.
- 6.5.4 Even in the short term, before proposed planting has become fully effective in mitigating views, impacts in existing views from many individual residential properties, settlements, roads and public rights of way, including from the Rudston – Woldgate bridlepath would be of either nil, negligible or low magnitude ie they would not occur, or would represent very slight or minor changes in the view. No 'significant impact' as referred to in the Environmental Impact Regulations 1999 would occur. However impacts of medium or medium-high magnitude are predicted in views of the extended PGF at relatively close range from the western end of the public footpath from the B1253 (West Lawn Wood) to B1253 at Easton (via Boynton), and from the northern part of Church Lane. For walkers and other high or high-

medium sensitivity viewers, visual effects of moderate-substantial or substantial significance may occur, representing a significant effect in terms of the Environmental Impact Regulations 1999.

6.5.5 In the medium term ie between 5-15 years following commencement of gas storage operations, predicted magnitudes of impact would decrease in views as new planting becomes established and effective in interrupting or filtering views towards the site. Generally, impacts would not exceed low-medium magnitude, and would not therefore give rise to significant effects in terms of the Environmental Impact Regulations 1999, even for high sensitivity visual receptors. The exception to this would be impacts in views from the footpath referred to above and from parts of Church Lane, in which impacts would be reduced but may remain significant in terms of the Environmental Impact Regulations 1999. No significant impacts would occur in the longer term i.e. 15 years +.

## 6.6 **Decommissioning**

6.6.1 Following expiry of planning consent, the GSF would be decommissioned. All visible engineered or built features would be dismantled and removed, and constructed or consolidated surfaces would be broken up, including the bridge across Gypsy Race and the site access track. Highway access points would be removed, allowing roadside verges and hedgerows to be re-established. Planting on temporary soil mounds would be removed and soils re-spread to achieve naturalistic profiles that marry in with the surrounding landform. Restored land would be returned to agriculture. There would be some long term improvements in character due to proposed hedgerow and hedgerow tree replanting and restoration works that would make a positive contribution to the pattern of the landscape.

## 6.7 **Conclusions**

6.7.1 The proposed GSF would not be a permanent feature of the landscape. Following expiry of planning consent the GSF would be decommissioned and all visible features, including soil mounds and associated planting, would be removed and the land returned to agricultural use.

- 6.7.2 There would be no significant impacts on the fabric of the landscape. Arable farmland is a common resource locally, the area lost to the GSF development is not large, and much if not all of the loss would be reversible when the land is returned to agriculture following decommissioning. Proposed tree and shrub planting would add new features to the landscape, and although most would be removed following decommissioning, hedgerow replanting and restoration works would remain, making long term improvements in landscape character.
- 6.7.3 The GSF would achieve an acceptable 'environmental fit' with existing landscape character and value. Careful design and siting within compact and relatively well-screened sites together with extensive landscape proposals would reduce the potential effects of the new site features. As a result impacts on landscape character would not be 'significant' as referred to in the Environmental Impact Regulations 1999. During the site construction / drilling and testing phase, impacts would be due mainly to the presence of the tall drilling rig and of various contractors' construction compounds. Given the temporary nature of these features in the landscape, impacts on character and value would not be 'significant' in terms of the Environmental Impact Regulations 1999.
- 6.7.4 The GSF would not be widely visible from within the local landscape and when operational would have only limited effect on existing views. There would be no significant impacts in views from individual residential properties (high sensitivity), due largely to the screening effect of woodland and built structures within the existing Caythorpe PGF site and by intervening trees. Significant visual impacts may occur in the short term in views from one public footpath and from the northern part of a minor road to the east of the extended PGF site, but from other public rights of way and roads impacts would be low or negligible. Although visual impacts would arise during the site construction / drilling and testing phase of the GSF due mainly to the widespread visibility of the drilling rig, these would not be 'significant' due to the temporary nature of the effect.

6.7.5 Nationally designated landscapes would not be affected by the GSF proposal. In terms of local designations there would be no significant impacts on the character and value of the Wolds Area of Landscape Protection as currently defined by the East Yorkshire Borough Local Plan. Although impacts on landscape character and existing views would occur locally, they would generally be limited in extent and magnitude and the GSF would not be prominent in or harm the quality of the Wolds Area of Landscape Protection.

## **7 ARCHAEOLOGY & CULTURAL HERITAGE**

### **7.1 Introduction**

7.1.1 Cultural heritage covers all aspects of the historic environment including Conservation Areas, Listed Buildings, Scheduled Monuments, Registered Parks and Gardens, other local historic landscape designations, all other recorded archaeological sites or areas, and hedgerows of historic importance.

7.1.2 The study assesses all aspects of the proposed Caythorpe Gas Storage Project upon such sites, and principally the extension to the existing Caythorpe Power Generation Facility (PGF), the new Carr Plantation wellsite, the new flowline linking the Carr Plantation Wellsite to the Caythorpe PGF, the Transco National Transmission System (NTS) connection at a new Woldgate AGI and Yorkshire Electricity (YE) underground supply cable. The aim of the study is to identify any significant cultural heritage constraints within the area of the proposed development, identify any predicted impacts and propose appropriate measures to mitigate any impacts.

7.1.3 The assessment represents a comprehensive review of published, documentary, map and aerial photographic information relating to archaeological sites and the built heritage within the study area, including the results of previous archaeological surveys and excavations undertaken at Low Caythorpe and along the route of the existing pipeline. The information obtained was supplemented by an inspection of the areas of the proposed development as well as sites and buildings whose settings or character could also potentially be affected by the proposals. Geophysical surveys have also been undertaken on the site of the proposed Caythorpe PGF extension and the new Carr Plantation Wellsite to assist with both site selection and design,

and the results included within the study. Consultations were held with both the Humber Archaeology Partnership (archaeological advisors to the East Riding of Yorkshire Council) and English Heritage during the course of the study and associated surveys.

## **7.2 Background**

### **Conservation Areas and Listed Buildings**

7.2.1 No Conservation areas are designated within the local area. There are however two clusters of Listed Buildings nearby. The Thorpe Hall cluster of Listed Buildings lies closest to the gas storage site. The Listed Buildings, which include Thorpe Hall (Grade II\*) and the Grade I listed dairy are approximately 425-675m from the gas storage site, separated from it by the landscaped park and grounds of Thorpe Hall, and by Carr Plantation, a mature mixed woodland.

7.2.2 The Boynton Hall cluster of Listed Buildings, which includes the Grade I listed Boynton Hall and the Grade II\* listed Church of St Andrew, is located at a minimum distance of 1.2 km east of the proposed extension to the Caythorpe PGF, and is separated from it by the landscaped park and grounds to Boynton Hall, and by valley woodland and farmland.

### **Registered Parks and Gardens of Special Historic Interest**

7.2.3 There are no Registered Parks and Gardens of Special Historic Interest within the local area. Although both Boynton Hall and Thorpe Hall are included on the UK Database of Historic Parks and Gardens, neither is considered to be of sufficient 'special historic interest' to merit inclusion in English Heritage's Register of Parks and Gardens of Special Historic Interest in England.

### **Archaeological Remains**

7.2.4 The area of the proposed development is located within the Great Wold Valley, an area of the Yorkshire Wolds landscape particularly rich in archaeological sites of both national and regional importance, included a number of Scheduled Monuments. Lying within an area of intensive arable cultivation, the majority of these sites are recorded as 'cropmarks' from

aerial photographs (where subsurface archaeological features such as ditches and pits are visible as a result of differential ripening of crops) and represent most periods of the prehistoric, Roman and later occupation within the area.

- 7.2.5 The earliest recorded sites within the study area are of Neolithic date (3,500–2,000 BC). These include probable areas of settlement identified from scatters of artefacts such as flint tools and fragments of pottery. Most of the excavated evidence for Neolithic occupation is recorded on the wold summit to the south and is largely restricted to deeper features such as pits, with shallower structural evidence such as slots and postholes apparently having already been removed as a result of more recent ploughing.
- 7.2.6 Recorded sites of Bronze Age date (2,000–700 BC) primarily consist of boundaries in the form of ditches or rows of pits, and round barrows (burial mounds). A complex of such boundaries has been recorded as cropmarks extending for several kilometres in length along the valley to the south of the development proposals. Evidence of possible Bronze Age settlement has been identified both from surface scatters of flint tools and a group of pits adjacent to the Gypsy Race. An isolated Bronze Age round barrows is recorded in The Belt to the south of Thorpe Hall, while numerous barrows are located on the wold summit to the south. The barrows at South Site Mount and in Sands Wood are Scheduled Monuments.
- 7.2.7 No settlement sites of Iron Age date (700 BC–AD 71) are recorded within the area. Sites of this period instead predominantly consist of cemeteries containing graves in barrows surrounded by square ditches, a type of burial distinctive of eastern Yorkshire. These cemeteries are mostly located in the valley to the south of the Gypsy Race, including the area to the south of both Caythorpe and Carr Plantation. Isolated finds of Iron Age date have also been made in the vicinity of Carr Plantation and Thorpe Hall.
- 7.2.8 An extensive area of settlement of probable Roman date (AD 71–410) is recorded to the east and south of the existing Caythorpe PGF from cropmarks and by geophysical survey. The eastern part of this settlement is a Scheduled Monument. The site consists of a complex network of enclosures and trackways to the north of the Gypsy Race associated with a number of

probable huts and pits. A Roman date for the settlement was established during excavation in advance of the construction of the existing pipeline.

- 7.2.9 These excavations also indicated that occupation within this area of Roman settlement continued into the Anglo-Saxon period. A second area of Anglo-Saxon settlement, including the remains of a timber hall, was also recorded some distance to the south of Carr Plantation. A burial of Anglo-Saxon date has been found to the south of Carr Plantation near Thorpe Hall, while other finds suggest the possibility of further burials in this area.
- 7.2.10 The deserted settlements of both Caythorpe and Thorpe pre-date the Norman Conquest of 1066. The surviving evidence of settlement at Low Caythorpe is however of later medieval date and includes the remains of the village and associated manor. The site of the deserted medieval village is located to the west of the existing farmstead and the manorial to the east (to the west of the existing Caythorpe PGF). Both sites are Scheduled Monuments. The manor consists of the visible earthwork remains of banked enclosures which contain the manor itself as well as a group of buildings which probably represent an associated farm. Evidence from documentary sources and excavations suggest that the site had been deserted by the early 16th century. A series of ponds and possible gardens are probably landscape features associated with the house built by the Constable family in the 17th century, which may have destroyed the site of the medieval mill. The site of a chapel was located to the south-east. The area to the south of the existing PGF was probably part of a complex of field systems associated with the village and manor.
- 7.2.11 Visible remains for parts of the former field systems still survive, and include a probable field boundary to the south of the Gypsy Race defining an area of ridge and furrow cultivation to the north. A trackway to the west is probably also medieval in origin.
- 7.2.12 Sites of post-medieval and modern date centre upon the only two recorded settlements within the area at Thorpe and Low Caythorpe, together with associated changes to the landscape. These included the creation of the park to the south of Thorpe Hall in the 18th and early 19th century, including the establishment of Carr Plantation. A farmstead continued on the existing site

of Low Caythorpe after the village had been depopulated and the manor abandoned, although the existing farmhouse and buildings date to the 19th century. Most of the existing field boundaries to the south of the farm were in existence by 1762, with only relatively minor later alterations or subdivisions. These fields contain a number of trackways of 18th or 19th century date, as well as areas of small-scale quarrying for both chalk and sand to the south of Carr Plantation and the Gypsy Race.

### **7.3 Impact of the Development**

#### **Impacts on Listed Buildings**

##### *Construction impacts*

- 7.3.1 The Caythorpe gas storage proposal would have no direct impacts on any Listed Building. There is some potential for temporary effects during construction on the settings of Listed Buildings arising from the presence of the drilling rig on the proposed Carr Plantation Wellsite. Impacts would be due to the height of the drilling rig (47.36m), its engineered character and the effect of lighting on the rig at night.
- 7.3.2 The settings to the Boynton Hall cluster of Listed Buildings would not be affected by the presence of the drilling rig due to intervening distance (minimum 2.35 km). Potential effects on the Thorpe Hall cluster of Listed Buildings would be limited by physical separation (minimum 425m) and by the screening effect of Carr Plantation, and the drilling rig would not interrupt the principal southern vista available from Thorpe Hall. Predicted effects would be temporary (6-9 months duration) and reversible, and of negligible significance overall i.e. there would be no appreciable impact upon the Thorpe Hall Listed Buildings and their settings, and the integrity or understanding of these Listed Buildings would not be affected.

##### *Operational impacts*

- 7.3.3 The Caythorpe gas storage proposal would have no operational impacts on Listed Buildings and their settings.

## **Impacts on Archaeological Remains**

### *Construction impacts*

- 7.3.4 The potential impacts of the construction of the proposed Caythorpe Gas Storage Project upon archaeological remains would principally relate to the removal of topsoil and subsoil, ground reduction, deeper excavations for foundations and services, trench excavations for the flowline and underground cable, and landscaping (including mounding and tree planting). With the exception of the underground cable all components of the development have been located to avoid any impacts upon Scheduled Monuments.
- 7.3.5 The location of the proposed Caythorpe PGF extension has been specifically designed to minimise the impact upon significant known archaeological remains. Relocation of the extension to the east of existing facility should avoid any significant impacts upon the main area of settlement enclosures of Roman and Anglo-Saxon date, and further evaluation will be undertaken to confirm this. The mounding proposals would extend to the south of the PGF extension into the area of possible settlement but the subsurface remains would be preserved beneath these. Given the mitigation measures which will be undertaken the proposed PGF extension will have no significant impacts upon archaeological remains.
- 7.3.6 In order to minimise the predicted impacts upon archaeological remains, the footprint of the proposed Carr Plantation Well site has been deliberately limited in extent by means of terracing the site into the hillslope to the south with retaining walls. On the basis of known evidence and the results of the geophysical survey, some archaeological remains of ditches and pits, and part of a possible enclosure, are likely to exist within the well site area. There is also the potential for Anglo-Saxon burials to extend into the area. A small proportion of the area has previously been disturbed by modern quarrying. The mounding proposals would extend over areas containing part of a prehistoric boundary complex as well as most of the modern quarries. However, the overall scale of the impacts is limited and would be upon less significant linear features. Given the mitigation measures that will be undertaken during construction and the fact that subsurface remains will be

preserved within the area of proposed mounding, there will be no significant impacts upon archaeological remains.

- 7.3.7 The corridor for the flowline linking the proposed Wellsite to the Caythorpe PGF will extend for a total distance of some 1.2km, approximately half of which will be within a new corridor some 11m wide. Various archaeological sites recorded along this section of the flowline including a trackway, a possible boundary feature and pits recorded as cropmarks. A possible square barrow cemetery and an area of Roman settlement are recorded to the south of the flowline. The flowline will also cross part of a trackway, boundary and an area of former ridge and furrow cultivation of probable medieval date. In each case the impact is upon only a small proportion of a more extensive monument, and given an appropriate level of mitigation there would be no significant impacts upon these remains. To the east of the intersection with the existing pipeline previous archaeological investigations indicate potential impacts upon a group of Bronze Age pits and any additional Iron Age square barrows to the south of the Gypsy Race, as well as the Roman and Anglo-Saxon settlement to the south of the Caythorpe PGF. These additional impacts would be small in scale and can be mitigated by excavation during construction, and are not therefore considered significant.
- 7.3.8 The proposed connection to the Transco NTS at the Woldgate AGI would be located at the intersection of two existing pipelines in an area already previously disturbed. Given the limited scale of the proposals and the ability to mitigate any impacts upon any archaeological remains within this area through excavation and recording, the proposed NTS connection will have no significant impacts.
- 7.3.9 The underground electric cable to Woldgate will be routed along existing roads and laid within a narrow trench along the roadside verge or within the existing highway. At the north end the route of the cable will run along the course of a Roman road and then cross the eastern extent of the probable Roman and Anglo-Saxon settlement site. Further south it will cross the multiple boundary of probable Bronze Age date and is located to the east of an area of Iron Age square barrows. Given the limited width and depth of the

cable trench the potential impacts upon these sites are unlikely to be significant.

*Operational impacts*

- 7.3.10 No significant impacts upon the setting of the six Scheduled Monuments within the vicinity of the proposed development are predicted.

**7.4 Mitigation**

**Listed Buildings**

- 7.4.1 The potential effects of the drilling rig during site construction works on the settings of the Thorpe Hall Listed Buildings would be partially mitigated through the use of downward projected luminaries to control light spillage and off-site glare, and through the short-term presence of the rig at the wellsite.

**Archaeological Remains**

- 7.4.2 The potential impacts of the Caythorpe Gas Storage Project upon archaeological remains have already been partially mitigated by locating the wellsite facilities to the south of Carr Plantation and as a consequence being able to reduce the size and alter the location of the extension to the existing Caythorpe PGF.
- 7.4.3 Impacts upon archaeological remains can be effectively mitigated through further evaluation in advance of construction, followed by excavation and recording of any sites affected during construction. The evaluation would include further geophysical survey, a measured earthwork survey and trial trenching. The trial trenching would be undertaken within the area of both the Caythorpe PGF extension and the Carr Plantation Wellsite to determine the nature and survival of any archaeological remains and establish the predicted impact of the development proposals. A report on the evaluation would be prepared in advance of the determination of the planning application, and a final scheme of mitigation agreed with the Humber Archaeology Partnership and English Heritage. It is anticipated that this would consist of excavation in advance of construction within the area of the Caythorpe PGF extension and Carr Plantation Wellsite. Targeted excavation

would also be undertaken on known sites within the existing pipeline corridor and on any sites identified along the new flowline. In the remaining areas an archaeological ‘watching brief’ would be undertaken. Both academic and more general reports on the results of the excavations would be prepared.

- 7.4.4 The proposed mounding around both the Caythorpe PGF extension and the Carr Plantation Wellsite will have no significant impacts upon subsurface archaeological remains subject to appropriate mitigation measures. These would include the retention of the existing topsoil, construction of the mounding to a height of less than 3.5m and an agreed construction method using protective membranes and low pressure ground vehicles.

## 7.5 **Conclusions**

- 7.5.1 No Conservation Areas or Registered Parks and Gardens of Special Historic Interest are located within the local area and no designation of this type would be affected by the GSF proposal.
- 7.5.2 There would be no significant impacts on the settings of Listed Buildings, nor would there be impacts on the fabric of Listed Buildings. The presence of the tall drilling rig on the proposed Carr Plantation Wellsite may result in temporary impacts over a six to nine month period to the wider setting to Thorpe Hall and its associated Listed Buildings, but such impacts would not be significant. No other element of the GSF proposal has any potential to affect Listed Buildings.
- 7.5.3 The proposed gas storage facilities have been specifically located and designed in order to minimise their impact upon significant known archaeological remains. As a consequence the proposed extension to the Caythorpe PGF was reduced in size and located to the east of the existing facility in order to avoid any direct impacts upon adjacent Scheduled Monuments and minimise the impacts upon a Roman and Anglo-Saxon settlement to the south. The landscape mounding in this area is not predicted to have any significant impact upon the settlement, which will be preserved beneath the mounding, and no significant impacts upon the setting of the adjacent Scheduled Monuments are predicted.

- 7.5.4 The proposed Wellsite has been located to the south of the Carr Plantation and will be terraced into the hillslope so as to reduce its size. An Anglo-Saxon burial has been recorded to the west, while geophysical survey suggests a number of linear features and parts of possible enclosures within the area. Two modern sand quarries are also recorded within the area of the Wellsite and associated mounding.
- 7.5.5 The pipeline from the Caythorpe PGF site to the NTS connection near Rudston Beacon would be located within the existing pipeline corridor and no impacts upon archaeological remains are therefore predicted. The proposed flowline between the Wellsite and the Caythorpe PGF has been routed to avoid any significant impacts upon surviving earthwork remains of a medieval boundary and associated ridge and furrow, although enclosures and burials of possible prehistoric date, as well as the area of Roman and Anglo-Saxon settlement to the south of the Caythorpe PGF, may survive elsewhere along the route.
- 7.5.6 The proposed compound for the NTS connection to the south of Woldgate will have no predicted impacts upon archaeological remains while the underground electric cable from the Caythorpe PGF to Woldgate will have only a minor impact upon part of the Roman and Anglo-Saxon settlement to the east of Caythorpe.
- 7.5.7 All of the predicted and potential impacts of the proposed gas storage facilities upon archaeological remains can be effectively mitigated by means of a staged programme of further evaluation, followed by investigation, recording and publication of any remains affected by the proposals. On the basis of the implementation of this agreed mitigation strategy no significant impacts upon archaeological remains as a result of the development proposals are predicted.

## **8 ECOLOGY**

- 8.1 The ecological assessment for the proposed Caythorpe Gas Storage Project has included desk study and field surveys to describe the ecological baseline, an evaluation of nature conservation interests, assessment of potential effects,

description of mitigation measures and assessment of residual effects on flora and fauna.

- 8.2 No designated statutory or non-statutory sites of nature conservation value would be significantly affected by the proposed development. Potential minor, temporary and indirect effects would be avoided and minimised through control of construction methods and standard measures to prevent pollution and other environmental incidents.
- 8.3 No statutory protected species would be significantly affected by the proposed development. Potential minor, temporary and indirect effects would be avoided and minimised through control of construction methods and standard measures to prevent pollution and other environmental incidents. The site would be regularly inspected and monitored to detect protected and/or notable species (particularly badger, water vole and nesting birds) in close proximity to working areas and appropriate mitigation measures implemented if required.
- 8.4 Habitat losses are restricted to areas of low nature conservation value, including arable land and species-poor hedgerows. Most of this would be reinstated on completion of the pipeline installation. New planting would offset minor losses to hedgerow habitats.
- 8.5 The mitigation proposals include regular inspection and auditing of environmental protection measures to ensure standards are met and to implement remedial actions should any significant environmental incidents occur.
- 8.6 It is concluded that there are no significant ecological effects arising from the proposed Gas Storage Project and that the proposals do not conflict with Local plan policies for nature conservation.

## **9 TRAFFIC & HIGHWAYS**

- 9.1 The operation of the proposed Caythorpe Gas Storage Project would involve similar levels of staff car and lorry movements to the current site. As such the generated traffic would not have a material impact on capacity, accidents or amenity.

- 9.2 The construction of the site and installation of the pipeline would take 15 months and would entail 44 lorry movements per day for the first 2 months rising to a peak of 66 lorry movements per day. After this there would be on average, between 8 and 12 lorry loads per day.
- 9.3 The only suitable route to the site for construction traffic is the B1253 from its junction with the A166. All lorry movements to the site for the construction of the well site and pipeline – and for the long-term operation of the project – would be directed to use this route. The B1253 has a relatively low daily flow and its increased usage would have no material effect on capacity or amenity.
- 9.4 Boynton School takes access directly from the B1253 and there have been three accidents in the vicinity of the school. Increased lorry movements at school start/finish times could increase the accident potential and so construction traffic should be timed to avoid these times.
- 9.5 The existing access to the PGF and the proposed temporary construction access are somewhat substandard. Temporary traffic signals would be installed for the duration of the construction work to provide a safe access.
- 9.6 All material and personnel involved in the construction of the pipeline would use the existing access on B1253. Construction traffic crossing Woldgate and the Burton Agnes to Rudston road would be controlled by temporary traffic signals.
- 9.7 The construction of the new Woldgate AGI would involve construction traffic using the Burton Agnes to Rudston road and Woldgate. Woldgate is unsuitable for 2-way traffic. A 1-way route would be introduced using the single track road leading south from the existing Rudston AGI towards Burton Agnes. Woldgate is not an important through road. To minimise damage to the verges of Woldgate, the road would be closed to through traffic for the duration of the construction of the new Woldgate AGI and diversion routes signed.
- 9.8 In conclusion, the operation of the proposed Caythorpe Gas Storage Project would not have any adverse impact of traffic matters, and the impact of

construction traffic during the construction phase of the proposed Caythorpe Gas Storage Project would be kept within acceptable limits.

## **10 NOISE**

- 10.1 Background noise levels have been monitored in the vicinity of the nearest houses and the important noise sources have been identified.
- 10.2 Noise levels from operation of the site have been estimated to be  $29 L_{Aeq,1hr}$  or less, considerably less than current ambient levels. The risk of annoyance is low. The risk is not significant and no further action is required in relation to noise.
- 10.3 Noise arising from drilling operations as perceived at any dwelling would be  $40 L_{Aeq}$  or less. In unfavourable wind conditions noise levels may increase to  $42 L_{Aeq}$ , which is within the night time criterion derived from MPS2 and below the level at which sleep disturbance might occur.
- 10.4 It is concluded that neither operational noise or noise from drilling activities would be loud enough to cause annoyance to persons in the vicinity.

## **11 HYDROLOGY & HYROGEOLOGY**

### **11.1 Hydrology**

- 11.1.1 Potential hydrological impacts associated with the need to manage surface water during the construction and operational phases of the proposed development can be fully mitigated by using water management techniques that are standard practice in relation to construction projects. With adequate drainage management provision prior to construction and appropriate levels of drainage management during the operational phase of the project it is concluded that the development could be constructed and operated without adverse impact on surface water quality.
- 11.1.2 The proposed gas pipeline and roadway crossing of the Gypsey Race can be designed to ensure that there is no adverse impact on flow or flood risk in the Gypsey Race upstream or downstream of the site. However, the presence of an elevated roadway across the floodplain introduces a potential obstruction on both the left bank and right bank flood plains with the potential to increase the area of flood plain inundation upstream of the roadway during

periods of significant flooding in the Gypsy Race. As this area consists entirely of uncultivated grassland a slight increase in the extent of flooding in this area would have no significant impact in the flooded area and there would be no noticeable impact upstream or downstream of the site.

## **11.2 Hydrogeology**

11.2.1 Potential impacts on the groundwater system can be fully mitigated by carefully designed and implemented site drainage management facilities and the adoption of standard wellfield technologies for well construction. It is therefore concluded that the proposed development will have no residual impact on groundwater in the vicinity of the site.

## **12 EMISSIONS TO AIR**

12.1 The impact of mitigation measures during construction will ensure that emissions to air arising from construction and drilling activities create minimal impact. Emissions to air during normal operations will also be reduced to an absolute minimum by the use of industry standard emission control measures.

12.2 The impact of greenhouse gas emissions will be mitigated by combusting process gas where possible to convert from methane to the much less harmful carbon dioxide.

12.3 Total on-site emissions to air in terms of carbon dioxide equivalent would be very significantly reduced compared with the existing operational levels.

## **13 LIGHTING**

13.1 Potential adverse impact from light pollution at the proposed extension to the existing Caythorpe PGF, the new Carr Plantation Wellsite and the new Woldgate NTS connection will be mitigated by the adoption of the same lighting procedures currently in place at the Caythorpe PGF.

13.2 Lighting columns would be of minimal height commensurate with providing safe illuminated operating areas. Lighting will be task orientated and only switched on when required. Purposely designed downward projected luminaries would be adopted to control light spillage and off-site glare.

- 13.3 As a consequence of the above procedures, adverse impact due to night-time glow would be mitigated to an acceptable level and be no more noticeable than the distinct and significant lighting from the Carnaby Industrial Estate.
- 13.4 For safety reasons the drilling rig is required to be illuminated at night. This includes the need for a red danger light being provided at the top of the rig. However mitigation of significant adverse impact is provided by the short-term presence of the rig at the wellsite. All other ground level lighting provided during drilling operations would be a minimum level sufficient to permit safety of operations. Following drilling activities the wellsite would be left in darkness except when an operator required access at which time minimal task orientated illumination would be used.
- 13.5 When the lighting has been installed, including rig lighting, an impact assessment will be carried out at night time from light sensitive locations such as dwellings, roads and other public access points. The results of the assessment will be used to adjust site lighting to minimise impact.

## **14 AGRICULTURE & SOILS**

- 14.1 The Caythorpe proposals would result in the permanent, irreversible loss of only 0.4ha of agricultural land within Subgrade 3a, the temporary loss (medium term) of 4.9ha of Subgrade 3a land, the temporary loss (short term) of 0.9ha of Grade 2 and 4.47ha of Subgrade 3a land and the temporary loss (short and medium term) of 3.85ha of poorer quality Subgrade 3b land.
- 14.2 None of the individual parcels of land taken out of agricultural use is of sufficient significance to have any serious financial implication upon any of the farm units involved. Any long term losses would be offset under the terms of agreed compensation.
- 14.3 Much of the agricultural land affected by the proposals is well drained and the effects upon land drainage are not an issue which would affect the sustainability of the farm businesses on the chalky soils of the Yorkshire Wolds. Within the alluvium of the Gypsy Race a comprehensive remedial drainage scheme to intercept all disrupted drains within this area would be planned and implemented to the satisfaction of the Planning Authority,

English Heritage and the landowners concerned. As a result, the long term sustainability of the affected farm businesses would not be compromised.

## **15 SOCIO-ECONOMIC FACTORS**

- 15.1 The gas storage facility would provide national, regional and local socio-economic benefits by way of providing strategic long term benefits to industrial, commercial and domestic gas consumers through security of supply and potential reduction in gas prices together with local benefits from employment opportunities and expenditure in the local economy.

## **16 OTHER ISSUES**

- 16.1 During the scoping and public consultation exercise other issues were identified.

### **Safety**

- 16.1 The matter of public safety has been identified as a result of the public consultation exercise. In view of the perceived importance of safety a supplementary Safety Evaluation Report is submitted to the local planning authority along with the Environmental Statement for public information. It does not form part of the planning application.

### **Temporary Status of the Development**

- 16.2 The existing Caythorpe power generation facility is based on the extraction of a finite mineral resource. Similarly the re-injection of gas into the gasfield is a replenishment of the resource to enable further extraction at times of national need. It is recognized that the proposal is inextricably linked to mineral development. Hence planning permission is being sought for a limited period of 25 years.

## **17 SUMMARY**

- 17.1 Caythorpe Gas Storage Limited is applying for planning permission to deploy the existing Caythorpe natural gasfield as an underground gas storage facility.

- 17.2 The proposal does not conflict with national and local planning policies and helps substantiate the Government's declared need for an increase in the nation's facility for gas storage.
- 17.3 Through a combination of careful site selection, design and operational practices, impacts that could arise from the proposed development can be mitigated so as to pose no threat to the environment or the local community.



<b>PROJECT:</b>	CAYTHORPE GAS STORAGE PROJECT	David Langham Dip.T.P.(Dist)F.R.T.P.I Consultant Chartered Town Planner
<b>DRAWING TITLE:</b>	LOCATION PLAN	
<b>CLIENT:</b>	CAYTHORPE GAS STORAGE LIMITED	
<b>DRAWING NO:</b>	C7266/1	
<b>DATE:</b>	NOVEMBER 2005	
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