



NORTHSTOWE PHASE 2 PLANNING APPLICATION

Utilities Report

August 2014

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Homes & Communities Agency

Northstowe Phase 2

Utilities Report

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Report No 5003-UA006156-UP3R-03

Date 15th August 2014

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1 INTRODUCTION

1.1 Background

This report has been prepared by Hyder Consulting (UK) Limited (Hyder) for the Homes & Communities Agency (HCA) in connection with Phase 2 of the proposed development at Northstowe, Cambridgeshire. It sets out the information associated with the provision of utility services to the development based upon anticipated service offerings from the respective incumbent utility companies and utility service providers.

The following elements are key to the economic and logistical success of the Northstowe development;

- The water, energy and telecommunication requirements for the site.
- The capacity of each respective utility system and the probable network reinforcement that will need to be undertaken.
- The strategy for bringing the services to the development in conjunction with construction of the on-site infrastructure.

Enquiries have been issued to utility companies known to operate networks in this area of Cambridgeshire to identify the extent of their existing networks in the vicinity of the development. This information has been reviewed and details provided within Section 2 of this report.

This report should also be read in conjunction with the Energy Strategy submitted in support of the outline planning application for Phase 2.

1.2 Site Location

The proposed development at Northstowe is located near the town of Longstanton which lies approximately 10km to the north west of Cambridge, to the east of Longstanton and to the north of Oakington and is bounded by the Cambridgeshire Guided Busway to the east. The location of the Phase 2 site is shown on Figure 1.1.

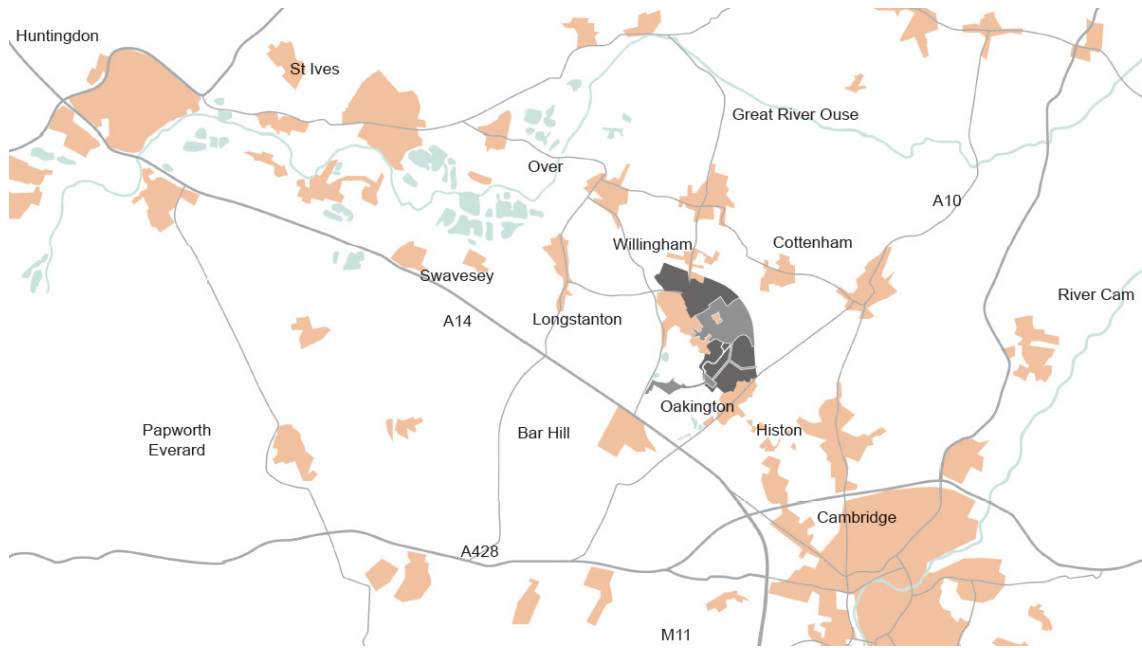


Figure 1-1 Northstowe Location Plan

1.3 Site Description

A planning application for development of Phase 2 of Northstowe with details of appearance, landscaping, layout, scale and access reserved (save for the matters submitted in respect of the Southern Access Road (West)) comprising:

- 1) development of the main Phase 2 development area for up to 3,500 dwellings, two primary schools, the secondary school, the town centre including employment uses, formal and informal recreational space and landscaped areas, the eastern sports hub, the remainder of the western sports hub (to complete the provision delivered at Phase 1), the busway, a primary road to link to the southern access, construction haul route, engineering and infrastructure works; and
- 2) construction of a highway link (Southern Access Road (West)) between the proposed new town of Northstowe and the B1050, improvements to the B1050, and associated landscaping and drainage.

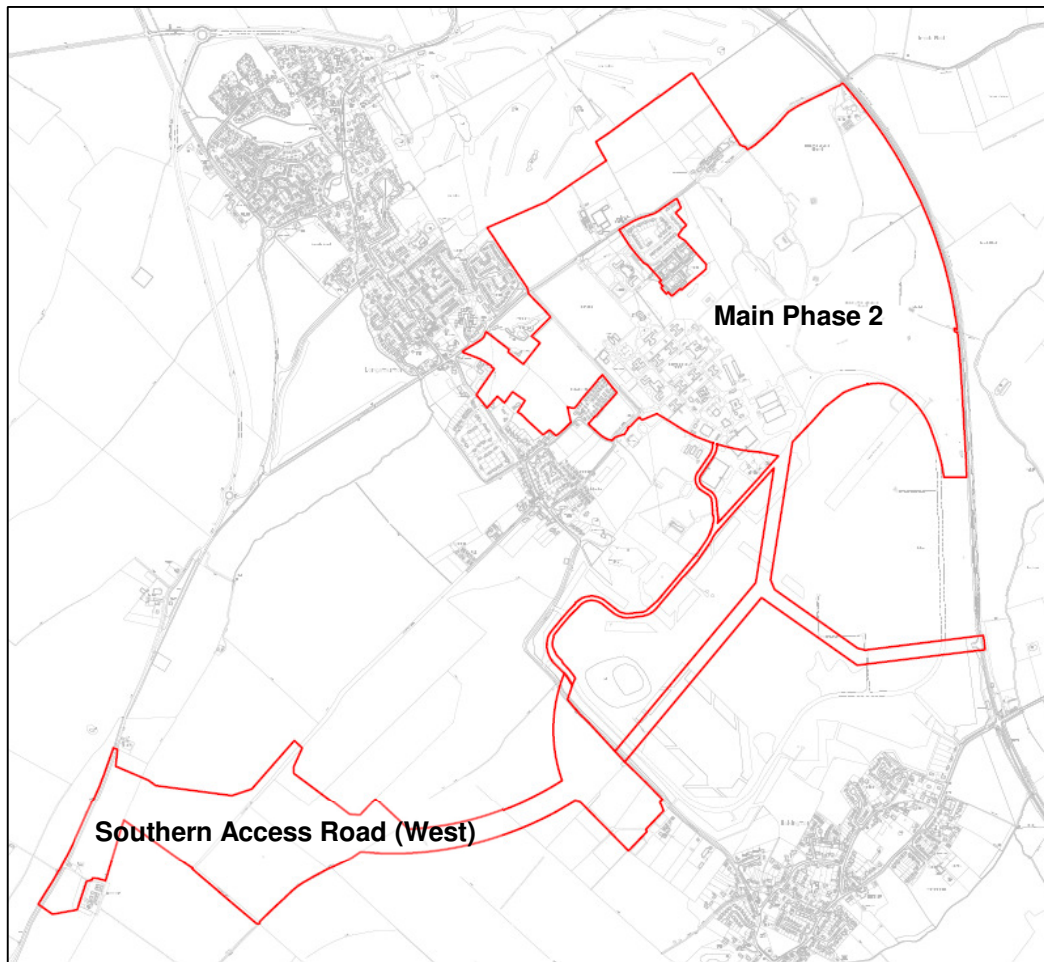


Figure 1-2 Proposed Northstowe Development

2 EXISTING UTILITY NETWORK

2.1 General

The available utility information for existing utilities has been compiled in Appendix A along with copies of correspondence.

2.2 Foul Drainage

The existing foul drainage network at Longstanton and Oakington comprise gravity sub-networks which terminate at local pumping stations which pump flows to Uttons Drove Wastewater Treatment Works (WwTW). Rampton Drift has a separate pumped main connecting to Longstanton Pumping Station. There is also an abandoned sewage treatment works on site which used to serve the Barracks and Immigration centre.

2.3 Water

An existing trunk water main is located to the west of Longstanton and Oakington which runs in an approximately north-westerly direction crossing the A14 south of Dry Drayton before crossing Dry Drayton Road and the B1050 Hattons Road. The main connects to Madingley and Coton Reservoirs. Local supply water mains are located within the existing highway through Longstanton, Oakington and in Rampton Road.

2.4 Electricity

An existing 33 KV supply forming part of the Burwell Primary substation network runs to the west of the development crossing Hattons Road and connects to Hattons Road sub-station.

11 Kv supplies are located in Hattons Road and High Street (Longstanton) with local sub stations to serve the LV network. (eg 11 Kv Prentice Close sub-station)

2.5 Gas

The main gas infrastructure comprises 200mm IP (Intermediate Pressure) gas main which runs along the A14 to the west of the development together with 2 no. 100mm IP mains which run to the south of Oakington and connect to a gas governor supplying the local medium pressure system. Medium pressure gas mains are located in Hattons Road and High Street (Longstanton) with local gas governors for the LV gas supply. (eg Prentice Close governor)

2.6 Telecoms

Existing BT Openreach telecoms infrastructure is located within the A14 corridor and the highway network serving immediate residential areas of Longstanton, Oakington and Rampton Drift. There is also Virgin Media infrastructure in Hattons Road and Longstanton.

2.7 Available Capacity

There is only very limited spare capacity within the existing utility network for all services. Reinforcement of supplies will be necessary to serve the Phase 2 scheme and these reinforcement works would be phased as part of the overall Northstowe development.

3 PROPOSED UTILITIES

3.1 Introduction

Strategies for providing adequate supplies of Foul Drainage, Water, Electricity, Gas and Telecoms to serve the proposed redevelopment of Northstowe have been established through consultation with the relevant statutory undertakers. These have been developed and agreed following consultation with the incumbent service providers for this area, namely: UK Power Networks (formally EDF Energy), National Grid, Anglian Water and Cambridge Water.

The incumbent service companies have been contacted to ascertain whether the responses previously given are still valid. At the time of writing, Cambridge Water, National Grid and UK Power Networks have confirmed that the previous responses are still valid whilst Anglian Water have commented on the potential connections to Uttons Drove WwTW. A copy of this correspondence is available in Appendix A.

An assessment of utility demand for each service has been prepared based on the current sustainability objectives for the development which is summarised in Appendix B.

The proposed utility distribution in the Phase 2 site would follow the proposed road network with services located in footways or verge areas and connect to the wider reinforced existing network and new networks in Phase 1 area.

3.2 Foul Drainage

Anglian Water is the Sewage Undertaker for the area. They are responsible for the existing and proposed surface and foul water sewage systems as well as the sewage treatment facilities in the area.

The Anglian Water strategy for the Northstowe development comprises the connection of foul flows to Uttons Drove WwTW which will be upgraded to accommodate increased volume. This is a long term strategy that has previously been agreed with the Environment Agency, the IDB and SCDC as part of the Northstowe Development Framework.

Anglian Water's network in the villages of Longstanton and Oakington is at capacity. The existing foul flow from Longstanton is pumped to Uttons Drove WwTW. No foul flows from the development will be discharged to the existing foul sewer network in Longstanton.

It is proposed that the foul flows from the proposed development will be discharged via a series of connected pumping stations (5 to 6 in number) culminating with a terminal pumping station situated in Phase 2 which will connect to Uttons Drove WwTW via a rising main. Anglian Water have commented that due to the time overlap predicted between Phase 1 and Phase 2, it would be possible to allow some flows from the early stages of Phase 2 to be served by the Phase 1 Pumping Station. This would be a temporary arrangement and, once the Phase 2 pumping station and rising main is constructed, all Phase 2 flows will be directed through them.

The pump stations could be constructed through either the Water Industry Act (WIA) Section 104 (Adoption) or Sewer Requisition routes.

The total peak discharge of foul water for Phase 2 has been assessed as 446l/s as shown in Appendix B. However, the peak foul water loading has been assessed in the Drainage Strategy as being 70/s connecting into the terminal pumping station within the Phase 2 area. This peak flow takes into account the rate of outflow for each of the pumping stations and includes an

allowance for flows from Phase 3 passing through Phase 2. Please refer to Drainage Strategy for further information.

3.3 Water Supply

Cambridge Water supplies the area around Northstowe from the Cherry Hinton reservoir to the south east of Cambridge and has confirmed that they have adequate water resources to serve the proposed Northstowe development but the local infrastructure has little spare capacity and can only support a very limited number of additional dwellings.

Phase 1 of the development (up to 1500 dwellings) can be supplied without the need for any infrastructure reinforcement. However, as the adjacent mains infrastructure has little or no spare capacity, a local off-site main will be required to bring water from the bulk transfer system to the west of the development.

Demands beyond circa 1500 dwellings would require a second branch connection from the trunk mains and it is planned that this would be made at the Oakington end of the site to form a ring main via a spine utility corridor through the centre of the site.

Beyond circa 3000 dwellings, reinforcements will be needed to the trunk main system. This is currently estimated to consist of upgrade to the Coton Booster station and approximately 5.5km of 450mm diameter main laid parallel with the existing trunk mains from Madingley Service Reservoir. 18 months should be allowed for the planning, design and construction of all reinforcement works.

Phases beyond Phase 1 could be served by extending the Phase 1 spine main network into Phase 2 and beyond. Phase 1 is being served by Anglian Water who is seeking an INSET agreement to work within Cambridge Water's region. Cambridge Water are co-operating with this INSET. This allows one undertaker to complete both potable water and drainage. It is recommended that a similar arrangement be sought with Phase 2.

Water demand for Phase 2 has been assessed as 74l/s. Please refer to Appendix B for further information.

3.4 Electricity Supply

UK Power Networks, formally EDF, is the electricity supplier for the Northstowe area.

The existing site and the surrounding villages are currently supplied from a strategic 132kV substation at Histon which is connected to a primary 33kV/11kV substation located adjacent to Hattons Road south of Longstanton. A small number of 11kV substations are also situated throughout the development area. Previously, the long term strategy to service the future demand from the Northstowe development was to upgrade the Histon sub-station. UKPN has now confirmed that the Histon substation will not require any upgrade with significant load transfer to the new Arbury Grid.

To serve the initial capacity requirements of the Phase 1 development of 1500 dwellings, 11kV cable infrastructure will be needed from the Longstanton sub-station to the site, delivering an initial 1.5MVA capacity. A further 33Kv cable infrastructure between Histon and Longstanton will be required to extend capacity up to 7MVA. This supplementary capacity would be utilised to complete Phase 1 site and the initial sub-phases on Phase 2.

The remainder of Phase 2 will take the total number of units beyond 3000 (7MVA) units (total of Phase 1 and Phase 2). At this stage, a new 33kV supply will need to be connected from the Histon sub-station to a new on-site primary sub-station (33kV/11kV). This new sub-station would be located within the proposed site infrastructure and would connect to new 11kV substations located to serve each section of the development.

The proposed new primary substation would require a space of approximately 30x40m. This excludes any landscaping requirements. The location of the substation will need to be determined at detailed design stage.

There is potential for electricity to be exported from the development which could result in further reinforcement requirements. Please refer to the Energy Strategy for further information.

Electricity demand for Phase 2 has been assessed as 33,665 kVa. Please refer to Appendix B for further information.

3.5 Gas Supply

National Grid, is the gas supplier for the Northstowe area and the principal supply main is an 8 inch (approx. 200mm) intermediate pressure (IP) gas main that runs along the western verge of the A14. This main in turn supplies a 4 inch (approx. 100mm) IP main leading to a pressure reduction station in Oakington, which supplies Oakington and Longstanton with Medium Pressure (MP) gas.

To supply the whole of the site beyond an initial 750 units in Phase 1 will require significant reinforcement of the off-site gas network. This would include works to the upstream High Pressure (HP) gas main as well as reinforcement to the IP main adjacent to the A14.

The site will connect to the IP main via two branches:

- Along Hattons Road / Longstanton Bypass into the northern end of the development
- Along Southern Access Road (West) into the southern end of the development.

The programme for the HP network reinforcement delivery is reported to be 3 years.

Gas demand for Phase 2 has been assessed as 88,276,514 kWh. Please refer to Appendix B for further information.

3.6 Telecommunications

British telecom (BT) and Virgin Media operate in the Northstowe area. BT has strategic infrastructure in the area running along the A14, Hattons Road and Dry Drayton Road with limited Virgin infrastructure Longstanton.

There is currently only limited spare capacity in the existing networks and upgrading works are necessary to serve the development. The upgrading works would provide new high speed telecoms connections that would comprise below ground infrastructure together with a limited number of small cabinets/pillars that would be located on the line of the existing network. This new high speed telecoms would need to be determined at detailed design stage and would follow on from any works carried out as part of Phase 1.

4 DRAINAGE AND WATER MANAGEMENT

4.1 Introduction

Both the foul and surface water drainage strategies have been formed after extensive consideration. The resulting strategies represent a major opportunity to demonstrate best practice in the supply, use, reuse, collection, treatment and disposal of foul and surface water. Detailed information can be found in the Flood Risk Assessment and Drainage Strategy as well as the Sustainability Statement which details water usage.

4.2 Water Management

It is anticipated that water usage by the development will be minimised through a series of measures as set out:

- Provision of visible metering that creates an awareness of a higher level of accountability at the dwelling.
- Low water use appliances, such as low water use taps and showers, low flush toilets, dishwashers and washing machines.
- Rainwater harvesting facilities, such as Water Butts, and Sustainable Drainage Systems (SuDs) attenuation facilities that provide additional ecological and landscape features.
- Potential for green roofs on some residential, community buildings, commercial premises and/or schools.

These measures will reduce the demand for clean water supplies and reduce the volume of water entering the drainage systems and will be targeted to meet Code for Sustainable Homes Level 4 and BREEAM Very Good standards for potable water.

4.3 Foul Drainage

This area is served by Uttons Drove WwTW and has been identified as a growth area in the Local Development Framework and has seen new development in recent years such as at Cambourne, with more development expected in the medium to long term, including Northstowe. The Uttons Drove WwTW, which discharges into the Uttons Drove drain, was identified by Anglian Water as the treatment facility best suited for improvement in order to receive the increased effluent associated with new development in the area.

Within the Phase 1 of the development, a single terminal pump station will discharge to the Uttons Drove WwTW and as part of the development strategy, Phase 2 will also have a terminal pumping station that will connect directly to Uttons Drove WwTW. It has been confirmed by Anglian Water that the WwTW will need to be updated as part of their investment plan which can then provide capacity for the development through implementation of their upgrade plans.

Anglian Water have commented that due to the time overlap predicted between the two phases, it would be possible to allow some flows from the early stages of Phase 2 to be served by the Phase 1 Pumping Station. This would be a temporary arrangement and, once the Phase 2 pumping station and rising main is constructed, all Phase 2 flows will be directed through them.

4.4 Surface Water

It is proposed to provide a surface water drainage system for the development incorporating Sustainable Drainage systems (SuDs) which combined with landscaping features provide an enhanced environment without increasing the rate of surface water run-off from the developed site. These SuDs facilities will be provided to serve all of Phase 2; incorporating local plot and 'regional' development wide approaches.

"Site wide" facilities will be constructed as part of the infrastructure works for the development and will serve the whole of the development area. These facilities incorporate attenuation ponds designed to accommodate a 1:200 year rainfall event (twice the normal design capacity). Additional local facilities will be provided within each development parcel. The type and nature of these facilities, such as permeable paving, will be determined as the design process proceeds.

Details for the proposed drainage strategy are contained in the Flood Risk Assessment and Drainage Strategy.

5 CONCLUSIONS

The proposed utility requirements covering foul drainage, water, gas, electricity and telecoms for the proposed Phase 2 site have been reviewed by assessing the future demand taking into consideration sustainability objectives for the Northstowe development.

Enquiries have been made with the statutory undertakers and utility companies known to operate within the South Cambridgeshire area and the responses have been reviewed with details of services within or in the vicinity of the site set out in Section 2. In general there is limited spare capacity and reinforcement of the relevant networks will be required for the wider Northstowe development as well as the Phase 2 site.

The anticipated utility requirements have been assessed and the relevant statutory undertakers contacted compared to confirm their proposals for reinforcement of the supply network. The reinforcement works would generally be on the line of existing. The new distribution network within the Phase 2 site would be located within the highway access infrastructure, footways and verges. Spaces would also need to be allocated within the phase 2 site for sub stations, pumping stations and gas governors and these would form part of the overall development infrastructure.

Appendix A – Correspondence

Network Enquiry No : 180001691
Your Reference : 2005-UA006156-01

nationalgrid

Brick Kiln Street
Hinckley
LE10 0NA.

National Gas Emergency Service - 0800 111 999* (24hrs)
*calls will be recorded and may be monitored

Mr David Hughes
Hyder Consulting (UK) Limited
HCL HOUSE
ST MELLONS BUSINESS PARK
ST MELLONS
CARDIFF
CF3 0EY

Date : 29th April 2014
Contact : Bethany Dunster
Direct Tel : 0845 3666758
Direct Fax : 0845 0700868
Email : networkdesign@nationalgrid.com

www.nationalgrid.com

Dear David,

Re: Land Enquiry for Proposed Development Site at NEW SUPPLY, NORTHSTOWE PHASE 2, LONGSTANTON, CB24 1ZZ.

Thank you for your enquiry which we received on 22nd April 2014. I enclose details of National Grid Gas plant in the vicinity of your proposed supply.

The nearest main is 8 metres from the site boundary and it is a Medium Pressure main. However this main has insufficient capacity for the requested demand and will require reinforcement.

The Connection Charging Point indicated on the drawing creates the financial distinction between Connection Costs, that are fully chargeable and upstream reinforcement costs.

Following the submission of a quotation request from your preferred connection provider the reinforcement costs will be subject to the economic test to determine the amount of National Grid and / or Customer contribution in line with National Grid's Connections Charging Statement.

Please be aware of existing mains or services within the site boundary that may require diversionary or abandonment works, this will be costed upon receipt of a firm request.

A copy of the National Grid Connections Charging Statement referenced in this letter can be found on National Grid's website:

<http://www.nationalgrid.com/uk/Gas/Charges/statements/connection/publications/>

If you require a printed version please contact us on the details provided above.

I trust this meets with your requirements at this stage. If you have any queries please do not hesitate to contact Bethany Dunster on the above number.

Yours sincerely,

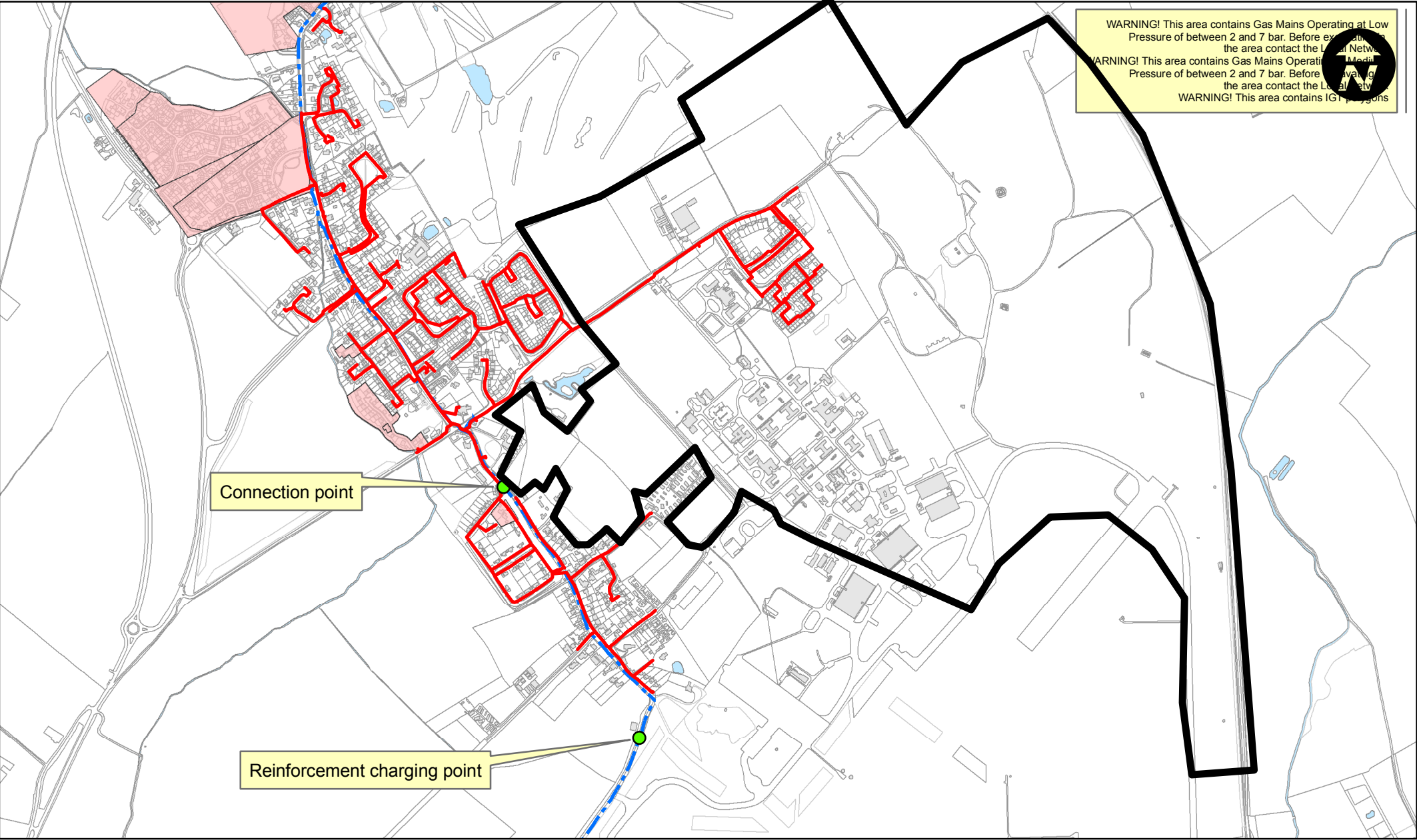


Adam Leeson
Design Specialist



National Grid Gas plc
Registered No.2006000
Registered Address 1-3 Strand, London, WC2N 5EH

Letter Id: CRM013
Page 1 of 1



SCALE: 1:1,250 @ A4	L/P GAS MAIN M/P GAS MAIN I/P GAS MAIN H/P GAS MAIN N/H/P GAS MAIN PROPOSED PIPE - LP PROPOSED PIPE - MP PROPOSED PIPE - IP ABANDON - LP ABANDON - MP		SCHEME: <NG GDFO Scheme Name> DESIGN: <NG GDFO Design Number> REVISION: <NG GDFO Revision>	This plan shows those pipes owned by National Grid in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc., are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by National Grid plc or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and any other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.	180001691	
USER ID: bethany.dunster DATE: 29-Apr-2014 11:08:39 INTERNAL USE ONLY MAP REF: 540482, 266391 CENTRE:	Some examples of Plant Items: Valve Syphon Depth of Cover Change of Dia Change of Material					

This plan is reproduced from or based on the OS map by National Grid Gas plc, with the sanction of the controller of HM Stationery Office. Crown Copyright Reserved.

MRS/Johnson/F1.01

19 February 2014

Mr P Johnson
Hyder Consulting (UK) Ltd
HCL House
Fortran Road
St Mellons Business Park
St Mellons
Cardiff
CF3 0EY

Cambridge Water

90 Fulbourn Road
Cambridge
CB1 9JN

www.cambridge-water.co.uk

Email: info@cambridge-water.co.uk

Telephone: 01223 706050

Fax: 01223 214052

Dear Paul,

Re: Northstowe, Cambridgeshire

Thank you for your letter dated 9 January 2014.

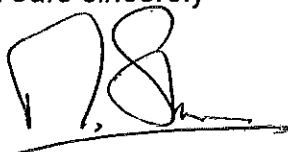
The position remains pretty much as detailed in the previous utilities report you enclosed with your letter. That is the local infrastructure has little spare capacity and can only support a very limited number of additional dwellings and then only in certain locations.

There is however spare capacity in the trunk mains to the West of the development for up to 3,000 dwellings, there after reinforcement works will be required. The reinforcement works will consist of laying approximately 5.5km of 450mm diameter main in parallel to the existing, from Madingley reservoir towards the development. In addition it is likely that the pumps and controls at Coton booster will require upgrading. For avoidance of doubt the reinforcement works or a sizeable proportion of it will need to be in place before the 3001 dwelling is connected.

I enclose as requested a plan to show the existing local infrastructure together with the major trunk mains to the West of Northstowe.

I trust the above and the enclosed answer your query however if you require more information or would like to meet to discuss matters further please do not hesitate to come back to me.

Yours sincerely



Mike Sloan
Network Development Manager
Encl.

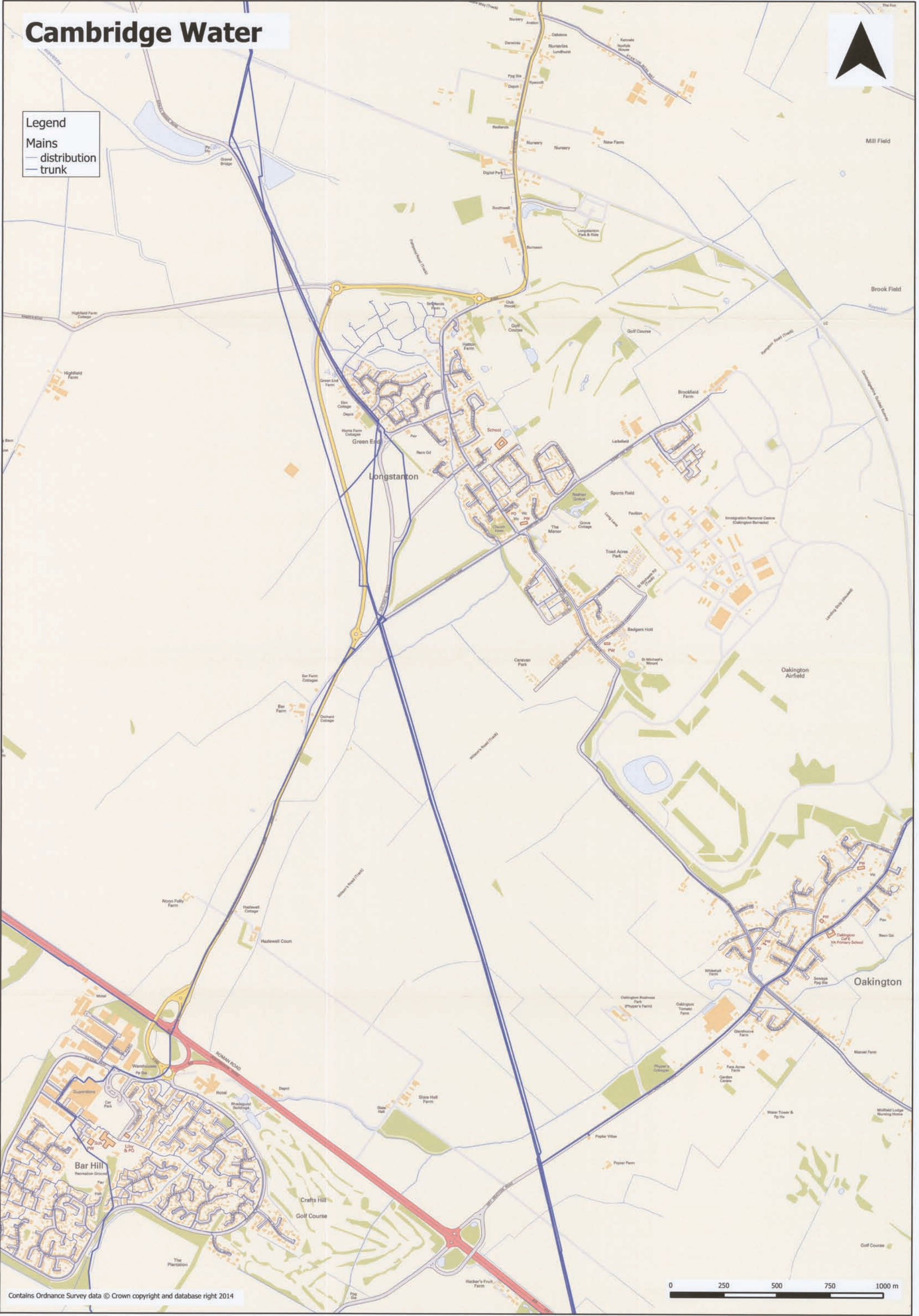
Cambridge Water

Legend

Mains

distribution

trunk



MRS/Hughes/DJP/F1.01

22 May 2014

Mr D Hughes
Hyder Consulting (UK) Ltd
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CB1 9JN

www.cambridge-water.co.uk

Email: info@cambridge-water.co.uk

Telephone: 01223 706050

Fax: 01223 214052

Dear David,

**Re: Northstowe Phase 2
Proposed Development at Longstanton, Cambridgeshire**

Thank you for your letter of 16 April 2014.

The position remains pretty much as detailed in the previous utilities report you mentioned. It remains the case that the local infrastructure has little spare capacity and can only support a very limited number of additional dwellings and then only in certain locations.

The trunk mains transfer system to the West of the development has spare capacity for up to 3,000 dwellings; thereafter this system will require reinforcement. The reinforcement works will involve laying approximately 5.5km of 450mm diameter main parallel to the existing, from Madingley reservoir towards the development. In addition it is likely that the pumps and controls at Coton booster will require upgrading. For avoidance of doubt, the reinforcement works or a sizeable proportion of it will need to be in place before the 3,001 dwellings can be connected.

As stated in previous correspondence, it remains the case that Phase 1 of the development (1500 dwellings) can be supplied without the need for any infrastructure reinforcement. As the adjacent mains infrastructure has little or no spare capacity, a local off-site main will be required to bring water from the bulk transfer system to the west of the development, see enclosed drawing no. F1-E-1253 B.

The assumption to date has been that future phases could initially be served by extending the Phase 1 spine main network south into Phase 2 and beyond. Eventually as the development grows, a second connection will be required, the location for this is not fixed however, it would need to come off the same system and to the south of that for Phase 1. Again due to capacity limitations in the existing infrastructure adjacent to the development areas, a length of local off-site main will be required.

Cambridge Water

90 Fulbourn Road

Cambridge

CB1 9JN

www.cambridge-water.co.uk

Email: info@cambridge-water.co.uk

Telephone: 01223 706050

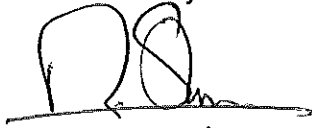
Fax: 01223 214052

You should also be aware that a key part of the supply strategy for the development is to ensure that eventually there is a link through the development South to North.

As stated earlier, the existing strategic infrastructure has sufficient spare capacity to service in the region of 3000 dwellings. However the reinforcement work mentioned earlier should be complete and in service before the 3,001st dwelling is connected. Due to the nature of the reinforcement works, you should allow 18 months for planning, design and construction.

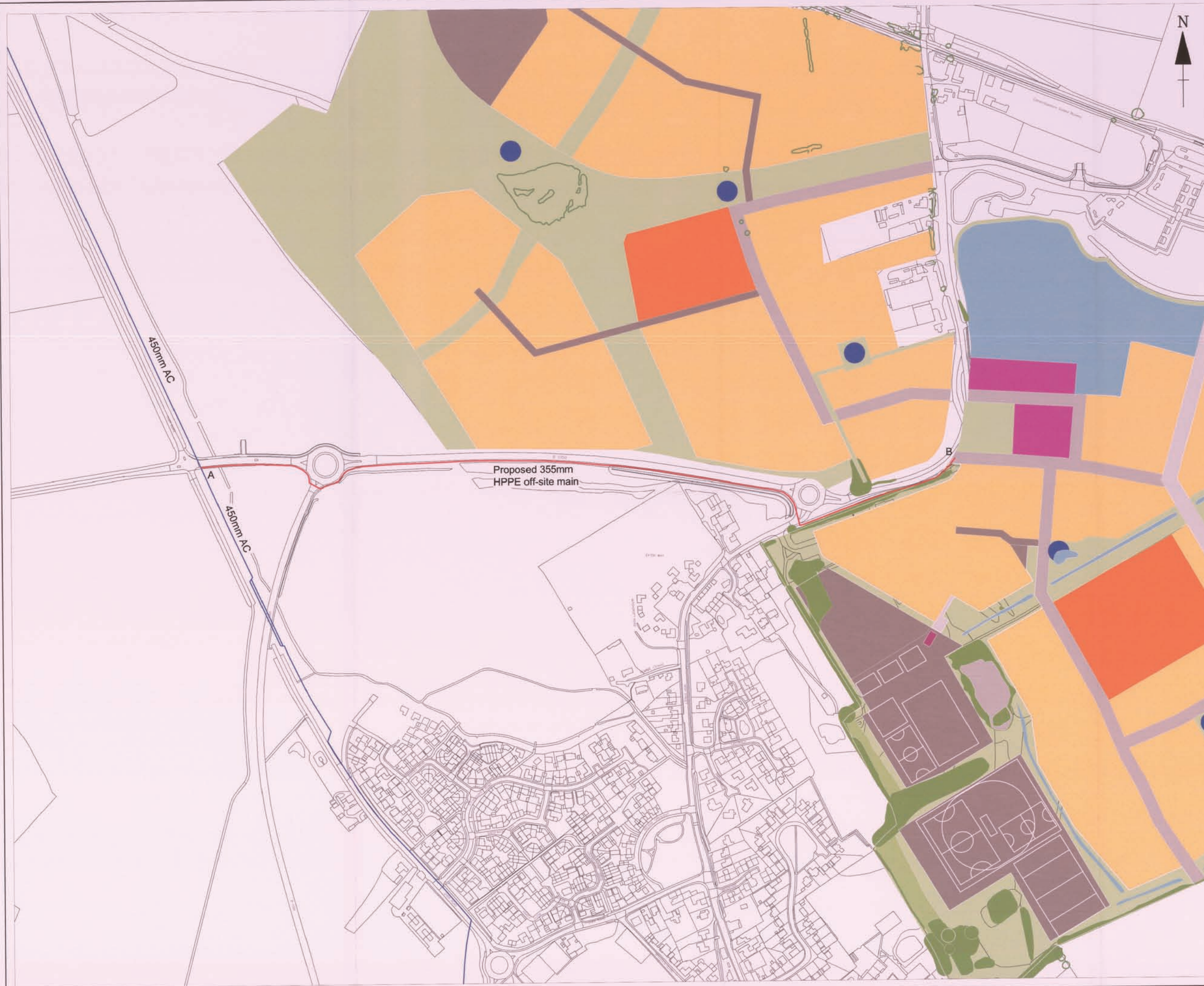
I trust the above and the enclosed answer your query however, if you require more information or would like to meet to discuss matters further please do not hesitate to come back to me.

Yours sincerely



Mike Sloan
Network Development Manager

Encl.



NOTES:-



This information is provided for general guidance only. The position of water mains shown on this plan should not be relied upon as being precise. The actual position of the mains must be established by taking trial holes in all cases. The company must be given two working days notification of the intention to excavate trial holes. No service pipes are shown on this plan



PROPOSED EXTENSION OF WATER MAINS

EXISTING WATER MAINS

PROPOSED WATER MAINS

PROPOSED COMMUNICATION PIPES

DATE
03/02/12

DRAWING No.
F1-E-1253

KS	MRS	10/01/13	POINT OF CONNECTION POSITION A & B ADDED	B
DRAWN	CHECKED	DATE	DESCRIPTION	REV
PROJECT				
NORTHSTOWE PHASE 1				
TITLE				
PROPOSED 355mm OFF-SITE WATER MAIN NORTHERN PLAN				
STATUS				
PRELIMINARY				
DRAWN	CHECKED	DATE	SCALE	DRAWING No.
KS	MRS	03/02/12	1:2500 @ A1	F1-E-1253
				REV
				B



90 Fulbourn Road
Cambridge
CB1 9JN
01223 706050

David Hughes

From: Farrer Michael <mFarrer@anglianwater.co.uk>
Sent: 07 July 2014 17:06
To: Philip Harker
Cc: 'Paul.Kitson@hca.gsi.gov.uk'
Subject: Northstowe Phase 2 - Foul Water

Dear Philip,

I am responding to the letter sent to Jamie Worthington regarding Northstowe Phase 2 – Foul Water. Jamie has now moved on to another appointment within Anglian Water, so please regard me as the main point of contact.

Your questions were submitted to our Growth Planning and Equivalence Team and I have now received their response.

It is their view that the final solution for serving Phase 2 will be a separate pumping station and rising main to Uttons Drove WRC, however, due to the time overlap predicted between the two phases, it would be possible to allow some flows from the early stages of Phase 2 to be served by the Phase 1 Pumping Station. This would be a temporary arrangement and, once the Phase 2 pumping station and rising main is constructed, all Phase 2 flows will be directed through them.

In summary: Phase 1 will be served by a TPS for 1500 dwellings and the 3500 dwellings from Phase 2 will be served by a separate TPS. As a temporary arrangement, some early flows from Phase 2 could be directed through the Phase 1 TPS, due to the time overlap of the phases.

The next step for Phase 2 would be to commission a detail design for the foul drainage. I have requested a cost and timescale for this and will forward it to you as soon as it is available. The normal process is for you to underwrite the cost of the detailed design (no money required at this stage) and we will then incorporate the final design costs into the overall scheme costs. The only time the design costs are invoiced are if the development is cancelled or mothballed, at which time we would invoice for costs incurred to that date.

The detailed design process investigates all options and you will be invited to take part in Risk and Value sessions to determine the final solution. A requisition is usually required when the final solution has been identified with a budget cost.

Please let me know if you have any questions or if you would like to meet to discuss this further.

Regards

Mike

Mike Farrer
Developer Account Manager
Tel: 07771 773154
Mobex: 813410
E-mail: mfarrer@anglianwater.co.uk
Website: www.anglianwater.co.uk/developers/

Please Note: I will be on leave from 26th July to 3rd August inclusive

From: Philip Harker [<mailto:Philip.Harker@hyderconsulting.com>]
Sent: 04 June 2014 16:53
To: jWorthington@anglianwater.co.uk

Cc: Paul Kitson (Paul.Kitson@hca.gsi.gov.uk); Andy Hawkes; Renuka Gunasekara
Subject: Northstowe Phase 2 - Foul Water

Dear Jamie

Further to your meeting with Paul Kitson recently, we kindly request your consideration of the below.

In brief, the Northstowe Phase 2 development will consist of:

- Circa 3500 homes
- Town centre with approximately 80,000m² of floor space (including retail, food and drink, leisure and light industrial/office)
- Two primary schools
- A secondary school

An outline planning application for the Phase 2 site will be submitted at the end of July 2014 and we expect to receive consent by early next year. Construction will commence in 2018, effectively overlapping with the Gallagher Phase 1 site, and continue to build out at a rate of circa 250 units per year (through to circa 2030).

As per the original 2007 Northstowe planning application – the strategy for disposal of foul water is to requisition connection to the AW Uttons Drove Wastewater Treatment Works, via a terminal pumping station (TPS) located adjacent to the park and ride within Phase 1 site boundary. The Phase 1 planning application documents confirm this approach, stating that the TPS will be sized to enable flows from the whole Northstowe development to be pumped to Uttons Drove.

Our Phase 2 foul sewerage design is predicated on this approach, with gravity sewers and lifting stations that direct foul water toward connection with the Phase 1 sewerage network (and/or direct to the TPS).

Obviously it makes much more sense to construct one TPS and undertake one dig for the rising main to Uttons Drove (especially given the overlap in build out of the two phases). We appreciate that pump set arrangement with the TPS may be altered during build out and that potentially two rising main pipes (in the same trench) may be required to prevent septicity. These arrangements would enable the original strategy to be followed and still provide cost savings.

As such we would like to ensure that the Phase 2 Northstowe foul drainage flows are being appropriately incorporated into the on-going designs of the TPS and rising main. Our understanding is that you are also still at the relatively early stages of the ongoing designs for the TPS and rising main and therefore Phase 2 site requirements can be easily included.

Are you able to advise us if we should apply Anglian Water to “underwrite the detailed design for the scheme” or “requisition the sewers” to take the matters forward? Also, will this have to be done independent to Phase 1 or still can be incorporated within your existing agreement for Phase 1 site with Gallagher Estates by making the necessary alterations?

Please can you advise what further information you may require and what next steps should be to ensure that forward thinking and inclusive design can be undertaken.

Best regards

Philip Harker
Technical Director - *Land Development,*
Buildings & Environment
Hyder Consulting
Manning House
22 Carlisle Place
London
SW1P 1JA

Mr David Hughes
Hyder Consulting Ltd
HCL House
Fortran Road
St Mellons
Cardiff
CF3 0EY

14th July 2014

Our Ref: 401598584/QID215031

Dear Mr Hughes

Site Address: Northstowe Phase 2, Longstanton, Cambridgeshire, CB24 1ZZ

Thank you for your recent enquiry regarding the above site. I am writing to you on behalf Eastern Power Networks PLC the licensed distributor of electricity for the above address trading as UK Power Networks.

I am pleased to be able to provide you with a budget estimate for the non contestable work. It is important to note that this budget estimate is intended as a guide only. It may have been prepared without carrying out a site visit or system studies. No enquiry has been made as to the availability of consents or the existence of any ground conditions that may affect the works. It is not an offer to provide the connection and nor does it reserve any capacity on UK Power Networks' electricity distribution system.

1. Budget estimate

The budget estimate for this work is:

£13,500,000.00 (exclusive of VAT) if the Point Of Connection (POC) is at our Histon Grid Substation.

- The above price allows for the following:
 - C. £6.5m being allowed for the installation of 2 x cables from Histon Grid to the site and the installation of a new 33kV/11kV Primary Substation
 - C. £5.2m being allowed for installation of 11kV substations, cabling and services for 3500 plots
 - C. £1.8m being allowed for 11kV substations, cabling and services for 21MW of Commercial Services.

2. Budget estimate assumptions

This budget estimate is based on the following assumptions:

- The most appropriate Point of Connection (POC) is as described above.
- A viable cable or overhead line route exists along the route we have assumed between the Point of Connection (POC) and your site.
- In cases where the Point of Connection (POC) is to be at High Voltage, that a substation can be located on your premises at or close to the position we have assumed.
- Where electric lines are to be installed in private land UK Power Networks will require an easement in perpetuity for its electric lines and in the case of electrical plant the freehold interest in the substation site, on UK Power Networks terms, without charge and before any work commences.
- You will carry out, at no charge to UK Power Networks, all the civil works within the site boundary, including substation bases, substation buildings where applicable and the excavation/reinstatement of cable trenches.
- Unless stated in your application, all loads are assumed to be of a resistive nature. Should you intend to install equipment that may cause disturbances on UK Power Networks' electricity distribution system (e.g. motors; welders; etc.) this may affect the estimate considerably.
- All UK Power Networks' work is to be carried out as a continuous programme of work that can be completed substantially within 12 months from the acceptance of the formal offer.
- You will carry out all the contestable work

Please note that if any of the assumptions prove to be incorrect, this may have a significant impact on the price in any subsequent quotation. You should note also that UK Power Networks' formal connection offer may vary considerably from the budget estimate. If you place reliance upon the budget estimate for budgeting or other planning purposes, you do so at your own risk.

If you would like to proceed to a formal offer of connection then you should apply for a quotation, Please refer to our website <http://www.ukpowernetworks.co.uk/internet/en/help-and-advice/help-sheets/> for '**The connection process**' which details our application process. To help us progress any future enquiry as quickly as possible please quote the UK Power Networks Reference Number from this letter on all correspondence.

If you have any questions about your budget estimate or need more information, the best time to call is between the hours of 9:00 am and 4:30 pm, Monday to Friday. If I am unavailable or engaged on another call when you ring, you may like to leave a message or call back later.

Yours sincerely



Keir Spiller
Commercial Project Manager
Tel: 07875113659
Email: keir.spiller@ukpowernetworks.co.uk

David Hughes

From: Hunt, Peter <peter.hunt@ukpowernetworks.co.uk>
Sent: 15 May 2014 12:18
To: David Hughes
Subject: RE: Northstowe Phase 2

David

We have had a look at the documents received and would like to make the following comments.

1. Utilities report Dec 2007

- 2.2 Electricity P6 – Reference should be UKPN and not EDF.
- There is no T point at Horningsea. Circuits to Fulbourn and Arbury/Milton now diverge at this point
- Primary should read NG Super grid.
- 2.2.3 P7 – St Ives should read St Neots
- 3.2 Electricity P11 – EDF should read UKPN Any reinforcement is not necessarily funded totally by UKPN
- Arbury substation work is now complete.
- P12 – The Histon substation will not require upgrade however load will be transferred to Arbury
- 3.2.3 will feed 11kV circuit^s

2. Phase 1 Planning application

- 4 Electricity supply P6 – 4.1.3 Expected load for Northstowe is included at highest level of UKPN funded reinforcement i.e. 132kV network but driven by P2/6 compliance rather than speculative load. Spare capacity has been generated at 132kV level as a result of needing to meet P2/6 compliance. Network design to meet P2/6 compliance has taken into account load growth and locations of major developments. There are no plans to upgrade Histon Grid for Northstowe, although there has been significant load transfer to the new Arbury Grid.
- 4.2.2 3.5MVA is not available however we have recently issued a 2.5MVA offer for this site. As of today it has not been accepted.
- 4.3.2 Beyond 2.5MVA, 33kV circuits from Histon to Longstanton will need to be reinforced. The cable route may not be relevant to supplying a new Primary at Northstowe.
- 4.3.3 30x40 metres excludes any landscaping requirements.
- Note: - The capacity previously allocated for Northstowe has already been taken by other developments.

I trust that this will be of use to you.

Kind Regards

Peter.

Peter S Hunt
Connections Project Manager
Major Projects
Tel: 07875119714

UK Power Networks
Barton Road
Bury St Edmunds
Suffolk
IP32 7BG
e-mail: peter.hunt@ukpowernetworks.co.uk

From: David Hughes [mailto:David.Hughes@hyderconsulting.com]
Sent: 07 May 2014 09:36
To: Hunt, Peter
Cc: info
Subject: RE: Northstowe Phase 2

Appendix B - Demand Calculation Summary

1. Water Demand Summary (Approximately)

Land Use	Area (m2)	Number of Properties	Total Population	Conventional Development Water Consumption (l/person[m2]/day)	Conventional Development Water Consumption (l/day)	Conventional Development Water Consumption (l/s)
Residential		3,500	10532	120	1,263,780.00	43.88
Social / Community	9,000	N/A	2045	33.0	67,500.00	2.34
Commercial	21,200	N/A	4818	33.0	159,000.00	5.52
Restaurant	3,500	N/A	795	270	214,772.73	7.46
Retail / Leisure	45,000	N/A	N/A	4.0	180,000.00	6.25
Education	25,700	N/A	3213	80	257,000.00	8.92
					2,142,052.73	74.38

Sustainable Development Water Consumption (l/person[m2]/day)	Sustainable Development Water Consumption (l/day)	Sustainable Development Water Consumption (l/s)
105	1,105,807.50	38.40
6.5	13,339.92	0.46
6.5	31,422.92	1.09
162	128,863.64	4.47
2.4	108,000.00	3.75
48	154,200.00	5.35
	1,541,633.98	53.53

Development Total

2,142,053 74

1,541,634 54

Resources

- Conventional development rates obtained from: Rules of Thumb 5th Edition – Water Demand
Thames Water Guidelines for Undertaking Sewerage Modelling (November 2005)
- Sustainable development rates obtained from: Code for Sustainable Homes Technical Guide (November 2010)
BREEAM Offices – Assessment Prediction Checklist

2. Sewage Generation Summary (Approximately)

Land Use	Area (m2)	Number of Properties	Total Population	Conventional Development Water Consumption (l/person[m2]/day)	Conventional Development Average Discharge (l/day)	Conventional Development Average Discharge (l/s)	Conventional Development Peak Discharge (l/s)
Residential		3,500	10532	120	1,263,780.00	43.88	263.29
Social / Community	9,000	N/A	2045	33.0	67,500.00	2.34	14.06
Commercial	21,200	N/A	4818	33.0	159,000.00	5.52	33.13
Restaurant	3,500	N/A	795	270	214,772.73	7.46	44.74
Retail / Leisure	45,000	N/A	N/A	4.0	180,000.00	6.25	37.50
Education	25,700	N/A	3213	80	257,000.00	8.92	53.54
					2,142,052.73	74.38	446.26

Sustainable Development Water Consumption (l/person[m2]/day)	Sustainable Development Average Discharge (l/day)	Sustainable Development Average Discharge (l/s)	Sustainable Development Peak Discharge (l/s)
105	1,105,807.50	38.40	230.38
6.5	13,339.92	0.46	2.78
6.5	31,422.92	1.09	6.55
162	128,863.64	4.47	26.85
2.4	108,000.00	3.75	22.50
48	154,200.00	5.35	32.13
	1,541,633.98	53.53	321.17

Development Total

2,142,053 74 446

1,541,634 54 321

Resources

- Conventional development rates obtained from: Rules of Thumb 5th Edition – Water Demand
Thames Water Guidelines for Undertaking Sewerage Modelling (November 2005)
- Sustainable development rates obtained from: Code for Sustainable Homes Technical Guide (November 2010)
BREEAM Offices – Assessment Prediction Checklist

3. Electrical Demand Summary (Approximately)

Land Use	Area (m2)	Number of Properties	Total Population	Conventional Development Electrical Demand Rate (kW/m2[property])	Conventional Development Electrical Demand (kW)	Conventional Development Electrical Demand (kVA)
Residential		3,500	10532	5	10,500.00	12,352.94
Social / Community	9,000	N/A	N/A	0.120	648.00	762.35
Commercial	21,200	N/A	4818	0.120	2,289.60	2,693.65
Restaurant	3,500			0.120	252.00	296.47
Retail / Leisure	45,000	N/A	N/A	0.300	12,150.00	14,294.12
Education	25,700	N/A	5625	0.120	2,775.60	3,265.41
					28,615.20	33,664.94

Development Total	28,615	33,665
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***As stated in Section 3.2 there is potential for electricity to be exported from the development. Please refer to the Energy Strategy for further information (Ref: UA006156-ESD-R.01).**

Assumptions

Design Factors:

Power Factor 0.85 [Conversion from kW to kVA]

Residential:

Conventional Development 15 kW/property (15W/m2 assuming 100m2 property)
300 kwh/m2/year

Residential split
Affordable 35%
Private 65%

Residents per property
Affordable 4.40
Private 2.26

Load Factor 0.6

Commercial (Offices / Hairdressers) and Social / Community:

Conventional Development 0.12 kW/m2 12 kwh/m2
Staff density 4.4 m2/person

[The Workplace (Health, Safety & Welfare) Regulations 1992:
Minimum working space = 11m3 (assume 2.5m high)]

Load Factor 0.9

Retail / Leisure:

Conventional Development 0.3 kW/m2 130 kwh/m2

Load Factor 0.9

Education:

Conventional Development 0.12 kW/m2
Pupil density 8 m2/pupil [Assumed]

Load Factor 0.9

4. Gas Demand Summary (Approximately)

Land Use	Area (ha)	Area (m2)	Assumed Gas Demand (kW/m ²)	Assumed Gas Load (kW)	Heating Season (Weeks)	Days Used Per Week	Hours of Heating Per Day (24 Hrs)	Boiler Efficiency %	Load factor %	Estimated Annual Load (kJ)	Conventional Development Estimated Annual Load (kWh)	Sustainable Development (30% Reduction) Estimated Annual Load (kWh)
(Total Plot Area)	42.3											
Residential	31.9	319,000	0.125	39875.000	45	7	10	90%	70%	284,874,975,000.00	79,131,937.50	55392356.25
Social / Community	0.9	9,000	0.080	720.000	40	5	8	90%	70%	2,612,736,000.00	725,760.00	508032
Commercial	2.5	24,700	0.080	1976.000	40	5	8	90%	70%	7,170,508,800.00	1,991,808.00	1394265.6
Retail / Leisure	4.5	45,000	0.080	3600.000	40	6	8	90%	70%	15,676,416,000.00	4,354,560.00	3048192
Education	2.6	25,700	0.080	2056.000	40	5	8	90%	70%	7,460,812,800.00	2,072,448.00	1450713.6
											88,276,513.50	61,793,559.45
Development Total											88,276,514	61,793,559

Assumptions

Residential:		
Conventional Development	0.125	kW/m2
Employment (Office):		
Conventional Development	0.08	kW/m2
Local Centre (Shopping Centre):		
Conventional Development	0.08	kW/m2
Education:		
Conventional Development	0.08	kW/m2