Deephams Sewage Works Upgrade

Environmental Statement

Volume 1 of 3: Non-Technical Summary
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1. Introduction

1.1.1 This is the Non-Technical Summary of the Environmental Statement submitted as part of the planning application for the proposed Upgrade to Deephams Sewage Works in Edmonton, North London (referred to throughout as ‘the Upgrade’). The location of the site is shown in Figure 1.1.

1.1.2 The Environmental Statement has been produced by Cascade Consulting on behalf of Thames Water Utilities Ltd., which owns and operates Deephams Sewage Works.

1.1.3 The Non-Technical Summary forms part of the Environmental Statement but can also be read as a separate document. It is provided as Volume 1 of the Environmental Statement, with Volume 2 providing the detailed Environmental Impact Assessment and its conclusions, and Volume 3 the related Appendices.

1.1.4 The Non-Technical Summary describes in non-technical language the findings of the Environmental Impact Assessment, as reported in the Environmental Statement. This is an assessment of the likely significant effects that the Upgrade will have on the environment during the demolition of existing infrastructure and construction phases, and once the Upgraded sewage works is operational.

1.1.5 The Environmental Impact Assessment combines information from local organisations such as the London Borough of Enfield and the Environment Agency with specific surveys carried out on behalf of Thames Water, to provide a picture of the current environmental conditions within and around the sewage works site. The proposals for constructing and operating the Upgrade are then assessed to predict how these will affect the environment.

1.1.6 The conclusions describe the likely significant beneficial (positive) and adverse (negative) environmental effects that the Upgrade will have on people and the environment, and the measures (known as ‘mitigation measures’) that will be put in place to control any adverse environmental effects. The Environmental Impact Assessment also explains whether any significant environmental effects will remain after these measures have been put in place.

1.1.7 The Environmental Statement is a key part of the planning application for the Upgrade, and its content must be taken into account by the local planning authority, the London Borough of Enfield, when it is deciding whether to grant planning permission for the development.
Figure 1.1

Site boundary
Local authority boundary

Note: All locations are approximate

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Legend

London Borough of Enfield
London Borough of Waltham Forest
London Borough of Haringey
1.2 The Assessment and Consultation Process

1.2.1 The planning application for the Deephams Sewage Works Upgrade is accompanied by an Environmental Statement to comply with the requirements of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2011. These Regulations require certain types of projects to be the subject of an Environmental Impact Assessment, with the findings submitted in an Environmental Statement that must accompany its planning application.

1.2.2 The scope of this Environmental Statement was agreed with the London Borough of Enfield through a scoping process that defined the study area, the environmental topics to be included in the Environmental Impact Assessment, and how they should be assessed.

1.2.3 Thames Water obtained an Environmental Impact Assessment Scoping Opinion from the London Borough of Enfield in March 2014. The London Borough of Enfield received comments from the following organisations as part of this scoping process:

- London Borough of Enfield’s Biodiversity, Environmental Health and Traffic and Transportation departments
- Lee Valley Regional Park Authority
- Natural England
- English Heritage
- Environment Agency
- National Grid
- Canal and River Trust
- Transport for London
- London Fire and Emergency Planning

1.2.4 The scoping process confirmed that the following topics should be studied in detail within the Environmental Impact Assessment:

- Air Quality
- Contaminated Land
- Ecology
- Flood Risk
- Health
- Historic Environment
- Landscape and Visual
- Noise and Vibration
- Odour
- Transport
- Waste
- Water Resources

1.2.5 The findings of the assessments for each of these environmental topics is summarised in Sections 2.1 – 2.13 of this Non-Technical Summary.

1.2.6 Technical consultation has been carried out with organisations including those listed above in paragraph 1.2.3, since the project started in 2011. Thames Water has also had regular meetings with local councils, councillors and other organisations, and held two periods of formal public consultation in 2012 and 2014, including a series of drop in sessions for local residents. An open day was held in May 2014 so that local residents could tour the sewage works and ask questions about the Upgrade.

1.2.7 Feedback from of these meetings and consultation events has helped to inform the Upgrade proposals submitted in the planning application. Feedback from the two
public consultation events, with Thames Water’s response to the comments received, has been published on Thames Water’s Deephams Sewage Works Upgrade website (www.thameswater.co.uk/deephams).

1.2.8 The overwhelming majority of the responses received during the public consultations support the principle of the Upgrade proposals. The most important issue for local residents and many of the organisations consulted is to reduce odour from the sewage works.

1.2.9 Although many people supported Thames Water’s proposals for significant odour reduction, as set out in the second phase of consultation in 2014, both the London Borough of Enfield and a number of local residents wanted a greater level of odour reduction from the site. In response to the feedback received, Thames Water increased the amount of odour control that will be installed as part of the Upgrade. This will result in an 85 per cent reduction in the smell generated by the sewage works once the Upgrade is operational. This means that 99 per cent of residential and commercial properties will be removed from the areas most affected by odour from the sewage works.

1.3 Deephams Sewage Works and the Need for the Upgrade

1.3.1 Deephams Sewage Works is situated off Meridian Way and Picketts Lock Lane in Edmonton and serves a population equivalent of 891,000, as of 2011. Population equivalent is a way of expressing the amount of sewage that reaches the sewage works, in terms of the number of people it would take to produce the same amount of sewage. This includes sewage from all the residential, commercial and industrial properties in the area served by the works.

1.3.2 Figure 1.2 shows an aerial view of the existing sewage works which covers an area of 34 hectares and is Thames Water’s fourth largest sewage works. The sewage works collects and treats sewage from a large surrounding sewer network before passing it through a series of treatment stages and releasing treated sewage (effluent) to Salmons Brook via an outfall channel. The channel carries both treated effluent and, after very heavy or prolonged rainfall, partially treated storm water to Salmons Brook.

1.3.3 In 2010, the Environment Agency issued a new environmental permit that requires Thames Water to make significant improvements to the quality of the treated effluent from the sewage works by March 2017. These improvements, which are set out in the Government’s National Policy Statement for Waste Water, are necessary to help meet the requirements of European Directives on the quality of the water environment. The Upgrade will significantly improve the quality of treated effluent from the sewage works that flows into Salmons Brook, meeting the standards in the environmental permit.

1.3.4 In addition to delivering water quality improvements, the Upgrade will cater for population growth within the area already served by the works, and improve the infrastructure at the sewage works, much of which is now over 50 years old. It will provide sewage treatment for north London that is sustainable in the long term and is able to respond to the challenges of climate change, as well as delivering significant odour reductions from the sewage works.
Figure 1.2

Project Title: Deephams Sewage Works Upgrade

Note: All locations are approximate. Scale bars and north arrows are inappropriate for perspective figures and have therefore not been included.
1.4 Alternatives

1.4.1 Thames Water considered a range of potential alternative sites and alternative treatment technologies because originally it was proposed to provide the Upgrade on a new site, due to a lack of spare undeveloped land at Deephams. Following the Phase 1 consultation, it was decided that the option of developing the Upgrade on the existing Deephams Sewage Works site was the best solution. Public consultation in 2012 also confirmed support from local people for providing the Upgrade on the existing sewage works site. Potential alternative sites, technologies and layouts for the upgraded sewage works were also consulted on during the first phase of public consultation phase in 2012. Subsequently, Thames Water received alternative design solutions for the site from two contractors as part of a tender process to select a contractor to design and build the Upgrade. The scheme from the appointed contractor is the one that forms the basis for the proposed Upgrade, as described in the Environmental Statement and as submitted in the application for planning permission.

1.4.2 The alternative design, that was not selected, involved a single phase of new construction work with the demolition of three existing sets of wastewater treatment tanks and construction of one new set. The new set of tanks would have extended slightly further to the north, east and west than the existing tanks. In this alternative design, the upgraded treatment tanks would have taken up a smaller area of the site but they would have been closer to the residential properties on Picketts Lock Lane.

1.4.3 Thames Water considered that the alternative design would have had potentially greater impacts on the environment. These would have included a lot more digging, the possibility of disturbing contaminated land and archaeological areas, as well as more lorry movements. As the alternative would have been built closer to residential properties on Picketts Lock Lane, there would be a greater risk of construction impacts (such as noise, dust and reduced air quality) for local residents and the removal of more trees and scrub along the northern boundary of the site.

1.4.4 The design for the Upgrade provided by the successful contractor, which is described in Section 1.5 below, has several environmental benefits over the alternative, including:

- Less digging due to re-using the concrete bases of the existing tanks as the foundations for the new tanks;
- re-using demolition material from the walls of the old tanks as foundation material for the new tanks;
- fewer lorry movements needed because demolition material can be re-used on site, avoiding the need to bring new material to the site;
- reduced risk of disturbing contaminated land and archaeological remains; and
- keeping all the construction activities on the existing Deephams Sewage Works site.

1.4.5 This design was published as part of the second phase of public consultation in 2014 and was broadly supported by local residents and other consultees.

1.5 Description of the Development (‘the Upgrade’)

1.5.1 A diagram explaining the sewage treatment process at Deephams Sewage Works is given in Figure 1.3. The existing layout of the sewage works is shown in Figure 1.4 and the proposed layout of the Upgrade is shown in Figure 1.5.
1.5.2 The Upgrade will replace the three existing wastewater treatment 'streams' on the site (each stream is made up of primary settlement tanks, aeration lanes and final settlement tanks, as shown in Figure 1.4) with two new treatment streams. The aeration lanes in the two new streams will be fitted with a series of cages to provide a large surface area for the bacteria that treat the sewage to grow on, in films suspended in the cages (known as IFAS cages). This means that a higher level of treatment can be provided in smaller tanks.

1.5.3 The new streams will be built on the site of two of the existing streams (marked A and B in Figure 1.4), reusing some of the existing structures. The third stream (marked C in Figure 1.4) will be partially demolished and the primary settlement tanks converted for use as new storm tanks. The space created by the demolition of the remainder of Stream C will be retained so that it can be used by Thames Water for any future upgrades or improvements to the sewage works.

1.5.4 The Upgrade will not affect the sewage inlet works (where raw sewage comes into the works and is screened to remove grit and rag) or the sewage sludge treatment process (where sludge is sterilised so it can be recycled as a soil conditioner/fertiliser on farmland). However, both these parts of the works will have open tanks and channels covered and odour controlled to reduce smells.

1.5.5 The Upgrade will be built so that sewage flows through the works by gravity, with less need for pumping than at present. This means the Upgrade will use less energy and have reduced carbon emissions compared to the existing works. A new pumping station and blower house will be built to pump sewage from the inlet works to the primary settlement tanks, and to blow air into the aeration lanes to speed up the biological treatment process.

1.5.6 In addition to odour control on the inlet works, the new primary settlement tanks, part of the aeration lanes (called the anoxic zones), and the secondary sludge digester tanks will all be covered and odour controlled as part of the Upgrade.

1.5.7 Two new combined heat and power engines will be installed as part of the Upgrade. These will produce more renewable energy from the Upgrade than the current sewage works.

1.5.8 A new control room will be included to the west of the site and the Upgrade will continue to operate 24 hours a day, 7 days a week. The existing entrance to the sewage works, off Picketts Lock Lane, will continue to be the main entrance for the Upgraded sewage works. During operation, traffic levels are not expected to change in comparison to the current situation.

1.5.9 The Upgrade will also include a new education classroom for approximately 30 students in a former Thames Water training building near the entrance to the sewage works. A safe, guided walking route around the sewage works for accompanied educational tours will also be provided.

1.5.10 Once construction of the Upgrade is complete, the site will be landscaped. The landscaping plans are designed to provide an improved ecological habitat within the sewage works, and to provide a natural visual screen by replanting more trees than will be removed during construction of the Upgrade. Around the edges, parts of the site will also be sown with wildflower seeds.

**Construction**

1.5.11 Construction of the Upgrade is due to begin in July 2015 and will take approximately three years to complete. The construction programme has been designed to allow the sewage works to continue to operate while the new treatment streams are being built. Construction of the Upgrade will happen in five phases as
shown in Table 1.1.

**Table 1.1: Summary of construction phases**

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<thead>
<tr>
<th>Phase</th>
<th>Activities</th>
<th>Duration</th>
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<tr>
<td>1 – Advance Works</td>
<td>Establishment of site enabling, welfare and site compounds</td>
<td>3 months</td>
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<tr>
<td>2 – Stream A</td>
<td>Switch off stream, clean and demolish tanks and plant</td>
<td>14 months</td>
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<tr>
<td></td>
<td>Build new stream, pumping stations and final effluent culvert</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Install combined heat and power engines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Install odour covers on inlet works</td>
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<tr>
<td>3 – Stream B</td>
<td>Switch off stream, clean and demolish tanks and plant</td>
<td>12 months</td>
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<tr>
<td></td>
<td>Build new stream and pumping stations</td>
<td></td>
</tr>
<tr>
<td>4 – Stream C</td>
<td>Switch off stream, clean and demolish tanks and plant</td>
<td>6 months</td>
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<tr>
<td></td>
<td>Convert primary settlement tanks to storm tanks</td>
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<tr>
<td>5 - Completion</td>
<td>Commissioning, demobilisation, reinstatement of roads, landscaping</td>
<td>4 months</td>
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<tr>
<td></td>
<td>Provision of Education Centre and educational trail</td>
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<tr>
<td></td>
<td>Remove culvert from Enfield Ditch Tributary</td>
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1.5.12 By ensuring that Stream A is completed and working by 1 March 2017, the sewage works will be able to comply with the new environmental permit treated effluent quality requirements, while the remaining parts of the Upgrade are built. When completed in 2018, the Upgraded sewage works will have the capacity and resilience to accommodate future population growth and the effects of climate change over time.

1.5.13 In advance of the construction of the Upgrade, there will be a number of separate projects completed at the sewage works between 2014 and July 2015. These include demolition of the redundant sludge digesters in the north-western corner of the site; installation of a tertiary treatment plant near the eastern site boundary; and modifications to a ditch on the northern boundary of the site to improve flow, as well as other works around the site.
The sewage treatment process

**Screening**
The first stage of the process is to screen the sewage arriving at the sewage works to remove all the rags and larger objects, such as bricks, bottles, and nappies that cannot be broken down biologically in the treatment process and which could block or damage the treatment equipment. This is followed by a further filter stage to remove any grit.

**Primary treatment**
The sewage then passes into large settlement tanks. The solid waste settles to the bottom of the tanks and is removed for treatment later on (see ‘Sludge treatment’). Oils and grease present in the sewage float to the surface of the tanks and are skimmed from the surface. The wastewater then passes on to the next stage.

**Secondary treatment**
At this stage, any tiny harmful bacteria are removed from the wastewater. We do this by encouraging other bacteria to eat and break down the harmful bacteria.

**Final treatment**
The wastewater then passes into a final set of large settlement tanks where any bacteria or other tiny particles left over from the previous stages settle to the bottom of the tank and are either recycled to the secondary treatment stage or removed for treatment (see ‘Sludge treatment’ below).

At Deehams, a further treatment stage is needed where the treated wastewater is filtered to catch any solid particles before it is returned to the Salmons Brook. This is called tertiary treatment.

**Sludge treatment**
The solid waste that settled to the bottom of the tanks in the earlier stages is called ‘sludge’. The sludge is treated to make it safe and put it to good use.

Sludge is treated before being recycled as fertiliser on farm land. To treat the sludge we heat it, which kills bacteria and produces ‘biogas’. At Deehams we use biogas to generate electricity that is used to help power the site.

**Back to the river**
The final stage of the wastewater treatment process is to return the treated wastewater to Salmons Brook. The quality of the water is tested to make sure it meets the high water quality standards set by the Environment Agency.