

Southampton to London Pipeline Project

Volume 6

Environmental Statement (Volume B)
Chapter 3: Project Description

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3 Project Description

3.1 Introduction

- 3.1.1 This chapter provides a description of the development for the purposes of identifying and assessing the potential environmental impacts of the development in technical assessment Chapters 7 - 15 of Volume 2 of the Environmental Statement (ES).
- 3.1.2 The development is shown within the Works Plans and Land Plans that accompany the application for development consent.
- 3.1.3 In accordance with the EIA Regulations, the physical characteristics of the development are described within this chapter, together with its land use requirements; proposed access arrangements; landscaping strategy; utility arrangements; and estimated emissions, residues and (soil) arisings.
- 3.1.4 A description of the Order Limits is provided in Chapter 1 Introduction, with more detailed descriptions provided in each technical chapter within Volume 2 of the ES and is therefore not repeated here.
- 3.1.5 The project description provided within this chapter is the final form of the project taken to Development Consent Order (DCO) application (the application for development consent), and therefore it is possible that the appointed contractor(s) may diverge from the design and installation/construction methods described, within the limitations of the consenting process. However, in the event that such divergence occurs, it is anticipated that adherence to the terms of the consent would avoid the environmental effects being any worse than those associated with the final form of the project taken to DCO application.
- 3.1.6 Taking the existing pipeline out of service, known as decommissioning, is covered by the original pipeline consent and therefore does not form part of this project. The existing pipeline would be decommissioned once the replacement pipeline is operational. The nature of the pipeline network means that at no point can both pipelines be operational at the same time.
- 3.1.7 Appendix 3.1 Table of Trenchless Crossings describes the specialist trenchless crossing techniques that would be used, such as auger bore and horizontal directional drilling (HDD). Appendix 3.2 Proposed Construction Schedule provides an illustrative schedule for installation of the replacement pipeline.
- 3.1.8 This chapter contains a number of project commitments to reduce impacts on the environment. These are indicated by a reference number, for example (O1). All commitments are listed within the Register of Environmental Actions and Commitments (REAC). Further details can be found in Chapter 16 Environmental Management and Mitigation.
- 3.1.9 The following terms are used within this ES:
- *Order Limits*: The outer limits for the project, including the route and any temporary working areas that would be required to install the pipeline, such as access routes, and working compounds. This would also include the easement strip (extending 3m



either side of pipeline) that would be protected along the pipeline following installation.

- *Limits of Deviation (LoD)*: These limits show the maximum area within which the pipeline could be installed. This flexibility is required in order to deal with unforeseen circumstances, such as ground conditions and local features.
- *Working Width*: The width required within the Order Limits to install the pipeline. It does not include any working compounds, laydown areas, stringing out areas or off-site access roads.
- *Temporary construction compounds and laydown areas*: These are small satellite areas close to the route that are used for storing equipment, hosting staff facilities, and laying down pieces of the pipeline.
- *Temporary trenchless construction stringing out areas*: These areas are used to weld segments of the pipeline together above the ground.
- *Temporary construction site access roads*: These are temporary roads for machinery and vehicles. They are used to provide access to the highway from the work sites to reduce the impact on local roads.
- *Temporary logistics hubs*: These are areas which may be remote from the route of the replacement pipeline, that would be used for pipe storage and distribution as well as providing site offices, welfare and storage facilities.
- *Narrow Working*: This approach involves the contractor(s) using less space than standard working width due to localised constraints, such as working in roads or ecologically sensitive areas.

Design Resilience to Climate Change

- 3.1.10 The pipeline itself would be buried underground with a minimum depth from the top of the pipe to the ground surface of 1.2m, including under the bed of watercourses. This provides protection from climate change effects such flood events or other extreme weather events. The above ground components, such as the pigging station, pipeline markers and Cathodic Protection (CP) cabinets are, through design and materials considered resilient to climate change effects.
- 3.1.11 The flood resilience of the project is covered within the Flood Risk Assessment (**application document 7.3**) and Chapter 8 Water, where there is an assessment of the potential impacts and the proposed mitigation measures. Due to the short-term duration of installation, it has been agreed with the Environment Agency, that climate change impacts are scoped out of the assessment. There are no further impacts of climate change on the project anticipated during installation.
- 3.1.12 The pigging station is located in Flood Zone 1 and therefore consideration of climate change is not required.
- 3.1.13 It is concluded that the project overall is resilient to climate change over the 60 year design life.



- 3.1.14 The effects of the project on climate change are addressed in Appendix 13.1, Technical Note on Air Quality, which includes consideration of greenhouse gas emissions from construction traffic.

3.2 Description of the Replacement Pipeline

Below Ground Pipe

- 3.2.1 Esso Petroleum Company, Limited (Esso) intends to replace 90km (56 miles) of its 105km (65 miles) long aviation fuel pipeline that runs from its Fawley Refinery near Southampton to its West London Terminal storage facility in Hounslow. The replacement pipeline is 97km (60 miles) long, taking into account that it cannot follow the line of the existing pipeline along its whole length due to new developments and environmental constraints.
- 3.2.2 The replacement pipeline starts near Boorley Green at the end point of the previously replaced pipeline. The route runs generally in a northeast direction via the Pumping Station in Alton. It terminates at the West London Terminal storage facility. The layout of the project is presented in Figure 3.1.
- 3.2.3 The installed pipe would have a nominal internal diameter of 30cm and a nominal wall thickness of 11.9 mm. The wall thickness is greater than British Standard PD8010 (British Standards Institution, 2019) to provide additional long-term protection from deterioration or damage.
- 3.2.4 The replacement pipeline would be buried underground for its entire length. The minimum depth from the top of the pipe to the ground surface would be 1.2m in open cut sections, and deeper for trenchless crossings. This is reflected in the engineering designs. A slightly shallower depth may conceivably be necessary in exceptional circumstances, but all indications are that this would not be required. The pipeline would also be buried deeper, typically 1.5m from top of pipe to ground surface, in roads and streets to account for other existing infrastructure such as utility pipes, cables and sewers.
- 3.2.5 Where the replacement pipeline is routed adjacent to Esso's existing pipelines, the Order Limits are generally 36m wide to provide flexibility for detailed routeing and construction methodologies for pipeline installation adjacent to these existing pipelines. Where the replacement pipeline moves away from the existing pipelines the Order Limits are 30m wide. A wider working width may be required at some locations, for example, the Order Limits are wider where the geology requires more working area. Where specific width restrictions exist, for example for highway works or sensitive ecological areas, the working width would be narrowed. To reduce vegetation loss, the project includes an overarching commitment to only utilise a 10m width when crossing through boundaries between fields where these include hedgerows, trees or watercourses (O1).
- 3.2.6 Open cut trenching methods would be used for the majority of the route. For crossings of A roads and motorways (including the M25 and M3) and other heavily trafficked roads, railways (including main and branch lines) and some watercourses (including the River Thames), specialist trenchless techniques such as auger bore and horizontal directional drilling (HDD) would be used (Appendix 3.1 Table of Trenchless Crossings).



At these locations additional working space would be required and therefore the Order Limits have been widened.

Pigging Station near Boorley Green

- 3.2.7 Pigging stations allow the insertion and withdrawal of pipeline inspection gauges (PIGs) into and out of the pipeline. A new pigging station would be constructed, with the preferred location being southwest of Netherhill Lane between Boorley Green and Durley. The pigging station would contain valves, a PIG receiver and a PIG launcher.
- 3.2.8 The pigging station would be provided with power and telecoms. The pigging station would be located within a fenced compound approximately 23m x 30m in size (excluding its access track) with secure fencing up to 3m high incorporating a double access gate for vehicles. The compound would be provided with manually operated lighting for when the station is operated in low light conditions. It would not be permanently lit.
- 3.2.9 A very small amount of aviation fuel is removed from the pipe during pigging. The Pigging Station is designed to safely and securely capture such discharges during pigging operations and would be removed by tanker for disposal.

Valves

- 3.2.10 Fourteen remotely operated valves would be installed along the route of the replacement pipeline to allow isolation for maintenance or to limit the impact of a potential leak. The valves would be remotely operated from the pipeline control centre located at the West London Terminal storage facility. The valve locations can be found on Figure 3.1.
- 3.2.11 There is also a single Pressure Transducer (PT). The pressure transducer's primary purpose is to monitor pressure.
- 3.2.12 Twelve of the valves and the PT would be installed below ground level in chambers, with only limited above ground visible elements including secure chamber access covers with associated handrail and a control cabinet.
- 3.2.13 Each chamber would be located within an enclosure. Typically, the maximum dimensions of the enclosure would be approximately 7m x 5m in size, with secure fencing up to 2.4m high incorporating up to two pedestrian access gates. The enclosures would not be lit. Photograph 3.1 provides an illustration of a valve enclosure.

Photograph 3.1: An Existing Valve Enclosure and Flight Marker Post



Cathodic Protection (CP)

- 3.2.14 The Cathodic Protection (CP) system currently helps protect the existing pipeline against corrosion. Most elements of the CP system, including cabling and ground beds, are buried below ground and are not visible. The ground beds for the existing pipelines would be used as part of the CP system for the replacement pipeline.
- 3.2.15 Six above ground CP transformer rectifier cabinets would be needed close to the replacement pipeline to supply power to the CP system. The CP cabinet locations can be found on Figure 3.1. Where possible the cabinets for the existing pipeline would be refurbished and reused and internal components replaced.
- 3.2.16 The CP transformer rectifier cabinets would be powered by connections to existing electrical supplies associated with the CP system for the existing pipeline Photograph 3.2 shows a typical CP transformer rectifier cabinet.
- 3.2.17 The CP system includes small above ground industry standard CP test posts, which are installed approximately every 1km along the existing pipeline route, usually placed directly above the pipeline to a maximum height of 1.2m. The colour, appearance and size of a typical CP test post are very similar to that of a pipeline marker post (as described below).

Photograph 3.2: An Existing CP Transformer Rectifier Cabinet



Pipeline Markers

- 3.2.18 The replacement pipeline would be marked at intervals along the pipeline and at all watercourse, railway and road crossings and boundaries by installing new industry standard marker posts. In the absence of the above, the spacing of the marker posts would vary according to location. The maximum spacing would typically range from every 500m in rural areas to every 50m in high density residential areas, however, markers would need to be located such that ideally each adjacent marker is visible from any location along the pipeline. Photograph 3.3 shows a typical example of an industry standard marker post.
- 3.2.19 The route of the replacement pipeline would also be marked with new red and black colour-coded flight marker posts at a frequency of about 500m. These would be for use when the pipeline is inspected by helicopter and would be positioned at field boundaries where possible.

Photograph 3.3: Typical Industry Standard Marker Post



Installation of a Replacement Booster Pump at Alton Pumping Station

3.2.20 The replacement pipeline would be routed through the existing Alton Pumping Station, where it would connect to existing infrastructure and a proposed new booster pump to continue fuel supply to London Gatwick Airport. There are currently three existing external pumps at Alton Pumping Station. The project includes installing a single replacement external pump near to the existing pumps. A small amount of additional above ground pipework would be installed for the tie-ins to the replacement pump.

Modification of Existing Pigging Station at the West London Terminal Storage Facility

3.2.21 The existing pigging station at the West London Terminal storage facility would be modified, including installation of a new PIG receiver. The works would include minor changes to alignment of pipework within the pigging station, renewal of equipment and some positional change. However, the existing pipework and PIG receiver would become redundant and would be removed, with the result that there would be little change to the location, layout, size and appearance of the pigging station when viewed from outside the fence line.

3.3 Description of Each Section

3.3.1 To aid design development and environmental assessment, the route was divided into eight separate sections (Section A to Section H), as follows:

- Section A – Boorley Green to Bramdean
- Section B – Bramdean to South of Alton
- Section C – South of Alton to Crondall
- Section D – Crondall to Farnborough



- Section E – Farnborough to Bisley and Pirbright Ranges
- Section F – Bisley and Pirbright Ranges to M25
- Section G – M25 to M3
- Section H – M3 to West London Terminal storage facility

3.3.2 The eight sections are shown on Figure 3.1.

Section A – Boorley Green to Bramdean

Summary of Section A

3.3.3 Section A (Figure 3.1, Sheets 1 - 4) is largely rural and runs through agricultural land. Most of this section is within the South Downs National Park (SDNP). It spans Eastleigh Borough and Winchester City Council. As the replacement pipeline would have a larger diameter than the existing pipeline south of Boorley Green, a pigging station would be required southwest of Netherhill Lane between Boorley Green and Durley.

Route Description

3.3.4 Section A is approximately 20km (12 miles) long and starts just south of Maddoxford Lane to the east of Boorley Green. The Application route ('the route') heads east alongside Maddoxford Lane before crossing Maddoxford Lane and heading north across open land, then crosses Ford Lake Stream. The section then crosses the B2177 between Bishop's Waltham and Upham, where it enters the SDNP. The route diverts away from the existing pipeline to avoid the chalk grassland and established vegetation areas at Stephen's Castle Down. The route passes Joan's Acre Wood, then passes the village of Bramdean, before this section ends just after crossing the A272.

Sub-options in Section A

3.3.5 In this section, there is one part of the route in the area around Hinton Ampner that still include sub-options. There are two sub-options just east of Joan's Acre Wood, designed to take account of sites of environmental and cultural importance in the area:

- The **A2a** sub-option passes Joan's Acre Wood, avoiding Brockwood Copse and Roadside Strips Site of Importance for Nature Conservation (SINC) before heading northwest past Malthouse Plantation. This option is routed through the Hinton Ampner National Trust estate.
- The **A2b** sub-option passes underneath Brockwood Copse and Roadside Strips SINC before heading northwest past The Firs and Godwin's Plantation. The eastern option is routed around the Hinton Ampner National Trust estate. It then re-joins the western sub-option.

Use of Trenchless Installation Techniques

3.3.6 As detailed within Appendix 3.1 Table of Trenchless Crossings, trenchless installation techniques are proposed to be used for the following crossings:

- TC 001 – Ford Lake Stream;
- TC 002 – Stakes Lane;



- TC 003 – Riversdown Road (sub-option A2b only); and
- TC 004 – A272.

Section B – Bramdean to South of Alton

Summary of Section B

- 3.3.7 Section B (Figure 3.1, Sheets 4 - 6) is also largely rural, similar to Section A, and lies mainly within the SDNP – with a short section between Monkwood and near Four Marks outside the SDNP. It spans Eastleigh Borough and Winchester City Councils.

Route Description

- 3.3.8 Section B is around 15km (9 miles) long and starts just after the A272 crossing. It avoids Woodcote Copse and Bramdean Common before running north of West Tisted. It then runs through the Four Marks golf course followed by the crossing of the A32, before running outside the southern boundary of Chawton House Registered Park and Garden. The section ends at the boundary of the SDNP after the B3006 crossing.

Use of Trenchless Installation Techniques

- 3.3.9 As detailed within Appendix 3.1 Table of Trenchless Crossings, trenchless installation techniques are proposed to be used for the following crossings:
- TC 005 – Petersfield Road; and
 - TC 006 – A32.

Section C – South of Alton to Crowthorne

Summary of Section C

- 3.3.10 Section C (see Figure 3.1, Sheets 6 - 8) is largely rural with long stretches passing through agricultural land. It spans East Hampshire and Hart District Council.

Route Description

- 3.3.11 Section C is approximately 15km (9 miles) long and starts at the boundary of the SDNP after the B3006 crossing. It deviates slightly from the existing pipeline route to avoid local businesses. The route runs east of Alton, skirting around Worldham golf course before crossing Caker's Lane (B3004). This is followed by a crossing of the River Wey and the Alton to Waterloo railway line before it approaches Alton Pumping Station. From Alton Pumping Station the route passes under the A31 and then runs to the southeast of Upper and Lower Froyle. It avoids Locks Grove and Lee Wood SINC. The section ends at Dippenhall Street.



Use of Trenchless Installation Techniques

- 3.3.12 As detailed within Appendix 3.1 Table of Trenchless Crossings, trenchless installation techniques are proposed to be used for the following crossings:
- TC 007 – Caker Lane (may be trenchless or open cut - this is still to be determined); and
 - TC 008 & 009 – crossings of the River Wey and Alton to Waterloo railway line, and the A31 and minor access road respectively.

Section D – Crondall to Farnborough

Summary of Section D

- 3.3.13 Section D (Figure 3.1, Sheets 8 - 9) runs through both rural and urban areas. There are two Sites of Special Scientific Interest (SSSI) and a European designated wildlife site within this Section. This section spans Hart District Council and Rushmoor Borough Council.

Route Description

- 3.3.14 Section D is approximately 9km (6 miles) long and starts at Dippenhall Street shortly after which it crosses Oak Park Golf Course. The section continues, crossing the A287. It runs alongside Naishes Lane past Quetta Park where it deviates from the existing pipeline and passes through Wakefords Copse to avoid crossing Fleet Business Park. After running alongside the B3013 for approximately 300m it passes north of a development site, before crossing the northern part of Tweseldown Racecourse, Ewshot, and the Bourley and Long Valley SSSI. At Norris Hill the proposed haul road diverges from the pipe route in order to utilise an established track. This is followed by a crossing of the Basingstoke Canal and A323. The route passes along the northern boundary just outside Eelmoor Marsh SSSI. The section crosses Cody Technology Park and the western part of the former Southwood Golf Course and finishes just after the crossing of the A327.

Use of Trenchless Installation Techniques

- 3.3.15 As detailed within Appendix 3.1 Table of Trenchless Crossings, trenchless installation techniques are proposed to be used for the following crossings:
- TC 010 – A287 Ewshot Hill;
 - TC 011 & 012 – Bourley and Long Valley SSSI (two consecutive trenchless crossings);
 - TC 013 – Basingstoke Canal SSSI and A323; and
 - TC 014 – A327 Ively Road.

Section E – Farnborough to Bisley and Pirbright Ranges

Summary of Section E

- 3.3.16 Section E (see Figure 3.1, Sheets 9 - 10) runs through both rural and urban areas. It spans Rushmoor Borough Council and Surrey Heath Borough Council.



Route Description

- 3.3.17 Section E is approximately 9km (5 miles) long and starts just after the A327 crossing. It runs north through the western section of the former Southwood Golf Course and then through open land to the west of Cove Brook. It then runs along Cove Road (B3014) for a short distance and then along Nash Close before crossing the South Western main railway line. After the railway crossing the section runs east alongside the railway line to Stakes Lane and then along the southern boundary of the allotments located off Prospect Road.
- 3.3.18 Due to the restricted space alongside the railway line, trenchless techniques would be required for much of this length.
- 3.3.19 The section then continues east through Queen Elizabeth Park, followed by a crossing of the A325. The section then crosses the grounds of Farnborough Hill School, after which it would cross the North Downs railway line, A331, River Blackwater, Blackwater Valley and the Ascot to Guildford railway line. It then runs along the southeastern boundary of SC Johnson Ltd land before crossing Frimley Green Road (B3411) near the roundabout with Balmoral Drive. From the B3411 the route follows Balmoral Drive to Frith Hill, where it follows the existing pipeline across Pine Ridge Golf Course. This section finishes immediately after the B3015 at the junction of Old Bisley Road, The Maultway and Deepcut Bridge Road.

Use of Trenchless Installation Techniques

- 3.3.20 As detailed within Appendix 3.1 Table of Trenchless Crossings, trenchless installation techniques are proposed to be used for the following crossings:
- TC 015 – South Western Main railway line;
 - TC 016 – Cove Brook;
 - TC 017 & 018 – North side of railway embankment: Two consecutive trenchless crossings are proposed on the north side of the South Western Main railway line, parallel to West Heath Road and adjacent to the railway embankment;
 - TC 019 – A325 Farnborough Road; and
 - TC 020 – Blackwater Valley trenchless crossing of the North Downs railway line, the A331, River Blackwater, and Ascot to Guildford railway line (the crossing of the remaining elements of the Blackwater Valley may be trenchless or open cut – this is still to be determined).

Section F – Bisley and Pirbright Ranges to M25

Summary of Section F

- 3.3.21 Section F (Figure 3.1, Sheets 10 - 12) runs through both rural and urban areas, including two SSSIs. It spans Surrey Heath Borough Council and Runnymede Borough Council.

Route Description



- 3.3.22 Section F is approximately 17km (11 miles) long and starts immediately after the B3015, where it passes adjacent to the Bisley and Pirbright Ranges. It runs north adjacent to The Maultway (B3015) then turning east to follow Red Road (B311) and through an area of woodland. The section then crosses Guildford Road and the A322 Lightwater Bypass, continuing through the former Windlemere golf course. It then continues generally northeast, crossing the Hale Bourne and Windlesham Road, before passing through Chobham Common SSSI and Foxhills golf course to the B386. The section then crosses the B386 and continues north of St Peter's Hospital. It passes under the A320, through the grounds of Salesian School and under the M25.

Use of Trenchless Installation Techniques

- 3.3.23 As detailed within Appendix 3.1 Table of Trenchless Crossings, trenchless installation techniques are proposed to be used for the following crossings:
- TC 021 – A322 Lightwater Bypass;
 - TC 022 – Hale Bourne watercourse;
 - TC 023 – Windlesham Road (may be trenchless or open cut – this is still to be determined);
 - TC 024, 025 and 026 – Three trenchless crossings within Chobham Common SSSI;
 - TC 027 – Accommodation Road;
 - TC 028 – Holloway Hill woods;
 - TC 029 – Hardwick Lane; and
 - TC 030 – A320 Guildford Road, Salesian School grounds and the M25.

Section G – M25 to M3

Summary of Section G

- 3.3.24 Section G (Figure 3.1, Sheets 12 - 13) is largely urban, but also includes a SSSI. It spans Runnymede Borough Council and Spelthorne Borough Council.

Route Description

- 3.3.25 Section G is around 4km (3 miles) long and starts after the trenchless crossing of the A320/M25, before continuing through Abbey Moor golf course. There is then a crossing of the Chertsey Branch railway line between Chertsey and Addlestone Stations. It then follows Cranford Drive before crossing the A317 Chertsey Road and subsequently passing through the playing fields at Addlestone Moor. The section then crosses the Chertsey Bourne before heading towards the River Thames. The route diverts away from the existing pipeline crossing of the Thames to avoid Dumsey Meadow SSSI, which lies just north of the river. The trenchless crossing of the River Thames would continue under the B375 and Old Littleton Lane. The section ends at the M3 Motorway west of Littleton Lane.

Use of Trenchless Installation Techniques



- 3.3.26 As detailed within Appendix 3.1 Table of Trenchless Crossings, trenchless installation techniques are proposed to be used for the following crossings:
- TC 031 – Chertsey Branch railway line;
 - TC 032 – A317 Chertsey Road;
 - TC 033 – Chertsey Bourne;
 - TC 034 – River Thames and B375 Chertsey Bridge Road; and
 - TC 035 – M3.

Section H – M3 to the West London Terminal Storage Facility

Summary of Section H

- 3.3.27 Section H (Figure 3.1, Sheets 13 - 14) is largely urban. It spans Spelthorne Borough Council and ends just within the London Borough of Hounslow.

Route Description

- 3.3.28 Section H is around 8km (5 miles) long and starts after the crossing of the M3, proceeding north, before crossing the B376 Shepperton Road. The proposed River Thames flood alleviation scheme would also cross the route in this area.
- 3.3.29 The section then heads north to cross the Queen Mary Intake Canal before following Ashford Road (B377) west of the Queen Mary Reservoir. This is followed by a crossing of the Staines Reservoir Aqueduct and Ashford Road just south of the A308.
- 3.3.30 The section then passes through Fordbridge Park before crossing the Staines Bypass (A308).
- 3.3.31 After crossing the A308, it continues north adjacent to and along Woodthorpe Road, crossing the Waterloo to Reading railway line just east of Ashford Station. This would be accomplished by heading east to cross Church Road (B378) into the grounds of Clarendon Primary School and then crossing the railway line heading north.
- 3.3.32 The section passes on the east side of the grounds of St James Senior Boys' School and through the eastern part of the Thomas Knyvett College playing fields before crossing under the A30. The route finishes at the Esso West London Terminal storage facility in Hounslow.

Use of Trenchless Installation Techniques

- 3.3.33 As detailed within Appendix 3.1 Table of Trenchless Crossings, trenchless installation techniques are proposed to be used for the following crossings:
- TC 036 – B376 Shepperton Road;
 - TC 037 – Queen Mary Reservoir Intake Canal;
 - TC 038 – Staines Reservoir Aqueduct and B377 Ashford Road;
 - TC 039 – Staines Bypass A308, River Ash and Woodthorpe Road;
 - TC 040 – B378 Church Road;



- TC 041 – Waterloo to Reading Railway Line; and
- TC 042 – Staines Road A30.

3.4 Construction of the Replacement Pipeline

Construction Schedule

- 3.4.1 An illustrative Construction Schedule is provided in Appendix 3.2.
- 3.4.2 Works to install and commission the pipeline are expected to start from grant of DCO and be completed early 2023. Certain advance works may take place prior to development consent where consented under alternative regimes, for example, the Town and Country Planning Act 1990.
- 3.4.3 The construction schedule has yet to be developed in detail, as this would be undertaken during the detailed design stage. For the purposes of assessment, a short-term duration is assumed to be less than six months based on the criteria set out in Table 3.1 and includes mobilisation and reinstatement.
- 3.4.4 The construction of the new pigging station near to Boorley Green is anticipated to be undertaken through 2021 and would take up to four months to build.
- 3.4.5 Connections to the existing CP systems, valves and associated infrastructure would be installed whilst the pipeline is being laid as they are an integral part of the pipeline.
- 3.4.6 Marker posts would be erected after reinstatement.
- 3.4.7 Throughout the installation of the pipeline there would be a number of work fronts. A work front is a specific area or location where a crew, generally comprising up to 10 construction workers, are carrying out a particular aspect of the main pipeline construction activities, including topsoil stripping, trench excavation, pipe installation and backfilling of trenches. There may be several work fronts operating simultaneously. Each work front would typically continue in the same direction, south to north, but starting from a different point.
- 3.4.8 Trenchless techniques are proposed in a number of locations. The duration of such techniques varies according to the length of the pipe being installed and the technique used. For example, with horizontal directional drilling (HDD), the construction of a 100m long crossing would take around four to five weeks, with a further two weeks required per 100m increase in the length of the crossing. This also assumes that the works to install trenchless crossings would not be unduly restricted with regards to working hours and weather conditions. Certain activities would require continual 24 hour working, for example the pipe pulling phase for a HDD. If working hours for trenchless crossings are restricted, then the installation would take longer.
- 3.4.9 The construction schedule is based on a number of key assumptions for pipeline installation in differing terrain. These assumptions are presented in Table 3.1.



Table 3.1: Key Working Assumptions

Assumption	Open Areas	Urban Areas
Pipe length laid per week	450m	90m
Excavated spoil off-site	Limited	Yes
Standard construction working	Monday – Saturday 07:00 to 19:00	
Typical pipe lengths	12m	3-6m
Road closures for open cut pipeline crossings of carriageways	Up to three working days, Class B roads and lower.	
Traffic management	Traffic signals to be provided where pipe is laid along or adjacent to carriageways. Mostly two-way working.	

Construction Environmental Management Plan

- 3.4.10 A Construction Environmental Management Plan (CEMP) would be produced in line with the Outline CEMP. It would explain how the activities of sub-contractor(s) comply with its requirements and include subsidiary plans such as the management of waste and soils (G1). The Outline CEMP is found in Appendix 16.2 and would be expected to comply with the Code of Construction Practice (CoCP) (Appendix 16.1).
- 3.4.11 The contractor(s) would provide a series of reviewed methodologies. The number of construction activities subjected to this process would be decided on a risk-based approach and could include site preparation, pipe-laying, trenchless crossings and reinstatement. Each methodology would include the measures that need to be undertaken to meet the requirements outlined in the CEMP. Methodologies would be reviewed and accepted by the Employer’s Representative (G2).

Construction Phase Activities

- 3.4.12 Typical pre-installation activities are summarised in this section.

Route Survey, Setting Out and Record of Condition

- 3.4.13 Photographic records would be compiled during route surveys and setting out of the works. Detailed records of the condition of the roads in the vicinity of the route would be made. Photographic records would also be taken of features that are likely to be affected by the project.

Utility Diversions

- 3.4.14 Surveys to establish the full extent of underground services and public utilities would be undertaken prior to commencing works.



Working Area Preparation

- 3.4.15 All working areas would need to be prepared prior to installation of the pipeline. This would generally consist of:
- Erecting advance warning signs at road crossings;
 - Opening the entrance to the working area through field boundaries;
 - Making sure that services are well protected where the access/egress to compounds are created;
 - Erecting 'goal post' protection and location/warning notices where overhead cables are present. These govern the height at which plant can pass safely underneath;
 - Opening entrances to subsequent field boundaries;
 - Installing temporary watercourse crossings to maintain uninterrupted flows;
 - Pruning and protecting trees; and
 - The location of all known buried services would be identified, marked and surveyed, including digging of trial holes where appropriate. Location/warning notices would be erected for all known services.

Temporary Fencing

- 3.4.16 Working areas would be appropriately fenced. The choice of fencing would be decided following a risk assessment, relevant to the work location. Specific areas such as compounds may require additional security measures such as lighting, security guards or CCTV (G85).
- 3.4.17 Within all urban areas, and areas where an interface with the general public is anticipated, the use of either strong wall or block and mesh fencing e.g. HERAS fencing would be used. If the area is near a school, or on a pedestrian route to a school, double thickness fencing that has been multi-clipped may be used.
- 3.4.18 In some locations the fence used may also serve to provide acoustic and visual screening of the work sites and reduce the potential for disturbance of users in the surrounding areas (G85).
- 3.4.19 Provision of additional fencing on a site by site basis may be used to reduce the potential for impacts on wildlife and trees. Fencing would be regularly inspected and maintained and removed as part of the demobilisation unless otherwise specified (G85). When working within a field environment, fencing requirements would be discussed with the landowners. This would determine what kind of fencing would be required, on a field-by-field basis.

Pre-Construction Drainage

- 3.4.20 Runoff across the site would be controlled by the use of a variety of methods including header drains, buffer zones around watercourses, on site ditches, silt traps and bunding (G11). Reinstatement of any existing land drains once the pipeline construction has been completed forms part of land reinstatement as described below.



Temporary Access for Construction

- 3.4.21 Temporary access tracks would be provided to link the pipeline construction areas to the local road network. Where new or additional surfacing is required on any access tracks and compound areas, these would be permeable surfaces where ground conditions allow (G126). Where these temporary access tracks are across open ground, the topsoil would be stripped and the access track constructed by treating the subsoil with a soil binder or laying the track with stone on a geotextile membrane or timber bog mats.
- 3.4.22 The access tracks would be fenced and gated to aid control of vehicle access between the construction areas and the local road network.

Logistics Hubs

- 3.4.23 Six logistics hubs would be established in locations, close to the strategic road network before commencement of the main construction works. The logistic hubs would serve as points for accepting deliveries and storage of pipe. From the logistics hubs, pipe sections would be transported directly to the pipe storage areas within the various temporary construction compounds by lorry. Each of the hubs would provide a pipe laydown area, secure plant storage area, bunded fuel storage, single-storey offices, staff welfare facilities and a vehicle parking area.
- 3.4.24 Key information relating to the six logistics hubs is presented in Table 3.2 (running in south to north order from the first to the last row of the table):

Table 3.2: Logistics Hubs – Key Information and Assumptions

Logistic Hub Name	Approximate Area (Ha)	Current Land Use
A31 Ropley Dean	2.7	Currently in agricultural use as grazing.
A31/A32 Junction Northfield Lane, Alton	5.4	This site is in agricultural use as part of a sheep farm for winter grazing and silage production in the spring and summer.
Hartland Park Village, Farnborough	9.1	This is the site of an ex-military facility, the site has been demolished and cleared of all material. It has outline planning permission for 1500 homes. These are being built over the next 15 years.
Ministry of Defence (MoD) land: Deepcut Bridge Road, Frimley Green	1.9	Part of the MoD ranges – the site has a concrete surface with some overgrown and self-seeded tree cover.
M3 Junction 3: New Road, Windlesham	3.3	Currently being vacated and restored following use by Balfour Beatty as a compound for the M3 Smart Motorway works – therefore the land would be in agricultural use when Esso commence work.
Brett Aggregates, Littleton Lane, Shepperton	1.3	The site is currently a mineral extraction site (quarry) including some historical landfill, and is regulated under an Environmental Permit. The site is being restored to agriculture with some biodiversity areas including reed beds. The proposed logistics hub would be located on the proposed agricultural land.

- 3.4.25 Where applicable the topsoil would be stripped from the logistics area and stockpiled around the hub perimeter within the site fence. A stone road and apron would be laid



on a geotextile membrane to provide an all-weather surface access to the local highway.

- 3.4.26 Where viable, the logistics hubs would use temporary connections to existing utility networks (e.g. sewers, telecoms, power and water). Where these connections are not viable, self-contained welfare units and generators would be used.
- 3.4.27 The logistics hubs would require lighting. To provide safety and security low level lighting would be permanently on during periods of darkness. Lighting would be in accordance with relevant industry good practice standards and would be documented within the CoCP. Lighting would be of the lowest luminosity necessary for safe delivery of each task. It would be designed, positioned and directed to reduce the intrusion into adjacent properties and habitats (G45).
- 3.4.28 Over the proposed two-year construction period the estimated number of vehicle movements to and from the logistics hubs are provided in Table 3.3. Whilst average daily figures are given, there would be an increase in traffic movements during initial set up of the hubs.

Table 3.3: Estimated Two-Way Vehicle Movements – Average Number Per Working Day at Each Logistics Hub

Logistics Hub	HGV	LGV / Cars
A31 Ropley Dean	7	46
A32/A31 Junction Northfield Lane	13	74
Hartland Park Village, Farnborough	25	150
MoD land: Deepcut Bridge Road, Frimley Green	5	31
M3 Junction 3: New Road, Windlesham	29	159
Brett Aggregates, Littleton Lane, Shepperton	11	74

Construction Compounds

- 3.4.29 Approximately 52 temporary compounds would be established along the route of the new pipeline for the storage of pipe, materials, plant and equipment.
- 3.4.30 The fenced compounds would be accessed from the existing road network and would include single-storey staff welfare facilities, parking, waste storage, and wheel washing areas. The temporary compounds would also provide hardstanding areas, with apron and access areas comprising stone laid on a geotextile membrane.
- 3.4.31 Compound access points to the public highway would be constructed with temporary hard surfacing (G16).
- 3.4.32 Construction compound sizes would vary but would have a fenced area of approximately 40m x 60m for a typical rural construction compound. 2.4m high temporary fencing, incorporating both pedestrian and vehicle access gates, would be installed around the perimeter of each construction compound.
- 3.4.33 In general, the construction compounds would not be connected to existing utilities, using self-contained mobile welfare facilities, generators and mobile communications.



Lighting would be of the lowest luminosity necessary for safe delivery of each task. It would be designed, positioned and directed to reduce the intrusion into adjacent properties and habitats (G45).

- 3.4.34 The construction compounds would be modest in size, for example 40m by 60m. The exact size and shape would vary depending on site features and conditions.

Public Highways and Public Rights of Way

- 3.4.35 The works would require road, lane and footpath (pavement) closures and diversions for reasons of safety and the project would work to limit the impact of these works. Any work areas would be fenced off with appropriate safety signage and secure fencing.
- 3.4.36 All designated Public Rights of Way would be identified, and any potential temporary closures applied for/detailed in the draft DCO. All designated Public Rights of Way crossing the working area would be managed, including National Trails, with access only closed for short periods while construction activities occur (G114).

Topsoil Removal and Storage

- 3.4.37 Where topsoil stripping is required, the normal working practice (where not otherwise specified within a methodology document) would be to strip full depth of topsoil (where present) from construction compounds and logistics hubs; access roads; across the working width; and any other areas to be trafficked. The depth of topsoil strip would not be expected to exceed 0.3m. Topsoils and subsoils intended for reinstatement would be temporarily stockpiled as close to where they were stripped from as practicable (G155), unless the working width is reduced to such an extent that the topsoil would need to be stored at an alternative location close by. The topsoil would be reinstated above the subsoil (G154).

Haul Road Construction

- 3.4.38 Haul roads would be formed through most of the working area. Where soils are suitable, the haul roads would be formed from the exposed subsoil. Appropriate techniques would be used when necessary to provide protection for subsoils from compaction and smearing in areas subject to heavy trafficking. The specific protection measures and their required locations would be set out in the appointed contractors' methodology document and agreed between the contractor(s) and overseeing Suitably Experienced Person (SEP) prior to construction commencing (G157). Appropriate techniques could include treating the subsoil with a soil binder, laying the track with inert material on a geotextile membrane or installing timber bog mats.

Pipe Storage and Stringing

- 3.4.39 Six logistics hubs would be established in locations close to the strategic road network. The logistic hubs would serve as points for accepting deliveries and storage of pipe.
- 3.4.40 From the logistics hubs, pipe sections would be transported directly to the pipe storage areas within the various temporary construction compounds by lorry. From each pipe storage area, the pipe sections would then be transported along the working area and spaced appropriately in preparation for installation.



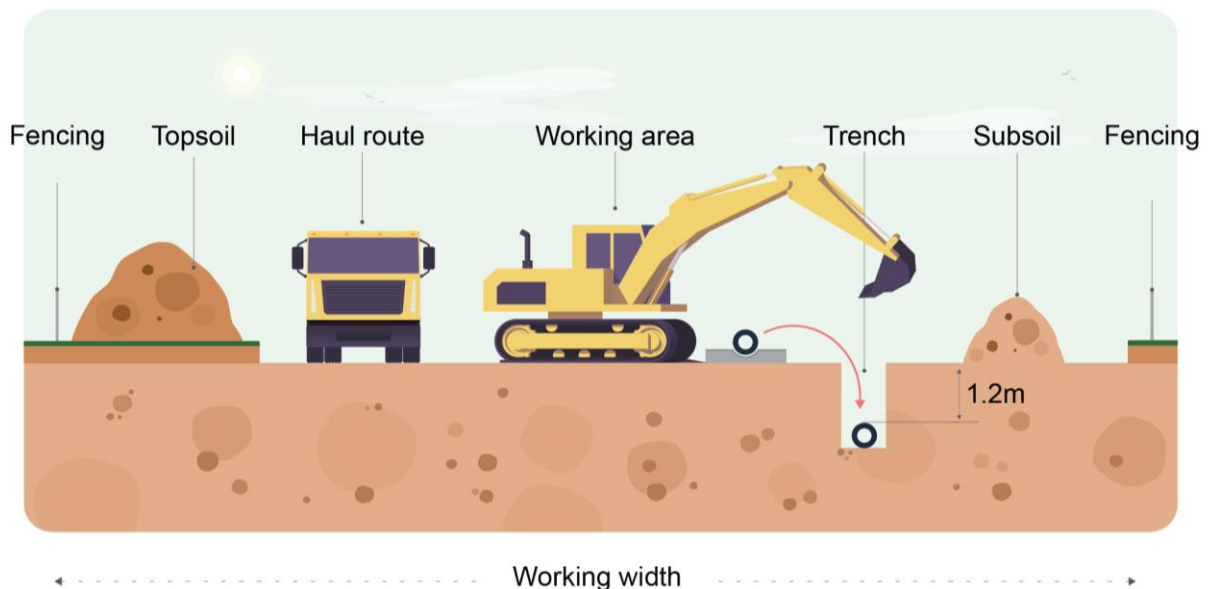
Welding and Joint Coating

- 3.4.41 Each length of pipe would be welded at the work front often at the surface before laying the pipe into the trench.
- 3.4.42 All welds would be subjected to a range of non-destructive testing techniques, including ultrasonic phased array or X-ray radiography tests. Any identified weld quality issues would be rectified at the work front and re-tested. All welders would be qualified and tested.
- 3.4.43 Prior to lowering into the trench, each joint is coated for additional protection and the whole pipeline section is checked for any holes in the coating. Areas with coating defects would be re-coated and checked again.

Trench Excavation and Pipe Installation

- 3.4.44 Open cut trenching would be used for the majority of the route. The trench would be excavated, with temporary storage of subsoil on the opposite side of the working width to previously removed topsoil. Either selected backfill or imported granular pipe bedding material would then be placed into the excavation and, following pipe installation, suitable surround materials would be placed as required. The trench would then be backfilled with the subsoil arisings and compacted. The soil backfilled over the pipe would have large stones or sharps removed to prevent damage of the pipe coating. Where the pipe trench is in a highway, imported backfill material would be used.
- 3.4.45 The amount of trench opened in any one day would match the progress of the welding crew, so that a trench is not opened for a prolonged period before pipe installation. This would be typically between 90 to 450m.
- 3.4.46 In some areas obstacles are present on both sides of the works creating a more constrained working width. At such locations, the pipeline may have to be constructed using a 'dead-end' working technique. This is where short lengths of trench are excavated, a section of pipeline installed, and the trench backfilled before the work moves forward to the next section.
- 3.4.47 A typical cross section showing open cut trenching for standard working widths are shown on Illustration 3.1, which is an artistic representation and not to scale.

Illustration 3.1: Example of Open Cut Working



Open Cut Trench Excavation in the Road

- 3.4.48 Where trench excavation is required in the road, this would commence with the breaking out of hard surfaces prior to excavation of the trench. Arisings generated by these activities would typically be tested and where suitable sent to a recycling facility.
- 3.4.49 The trench would be backfilled and reinstated as soon as practicable, allowing the fencing and all traffic management to be removed and the area returned to normal use.
- 3.4.50 Logistical movements of pipe into the urban areas, and the removal of arisings and placing of backfill material by grab lorries, would be undertaken outside of peak traveling hours where practicable.
- 3.4.51 Roads being crossed using open cut trenching would need to be partially or completely closed, with appropriate traffic management measures and temporary diversions being put in place for the duration of the works. Partial and complete road closures would be kept as short as practicable, typically a maximum of three working days for complete road closures, to reduce effects on local traffic and communities.

Open Cut Trench Excavation Through Watercourses

- 3.4.52 Watercourse crossings would be made using an open cut trench unless indicated as using a trenchless technique in Appendix 3.1 Table of Trenchless Crossings. The typical approach for open cut trench crossings of watercourses is described here.
- 3.4.53 A flume pipe (or pipes) would be installed into the bed of the watercourse, sized to allow the flow of the watercourse through it during the works. The watercourse would be dammed at each end of the flume to form a dry area in between. This would create a temporarily culverted section of the watercourse in the area of the crossing.
- 3.4.54 A vehicle haul road would be constructed over one half of the flume. A trench would then be excavated under the other half of the flume and the pipe installed at least 1m below the true cleaned bottom of the watercourse/ditch. Concrete protection slabs



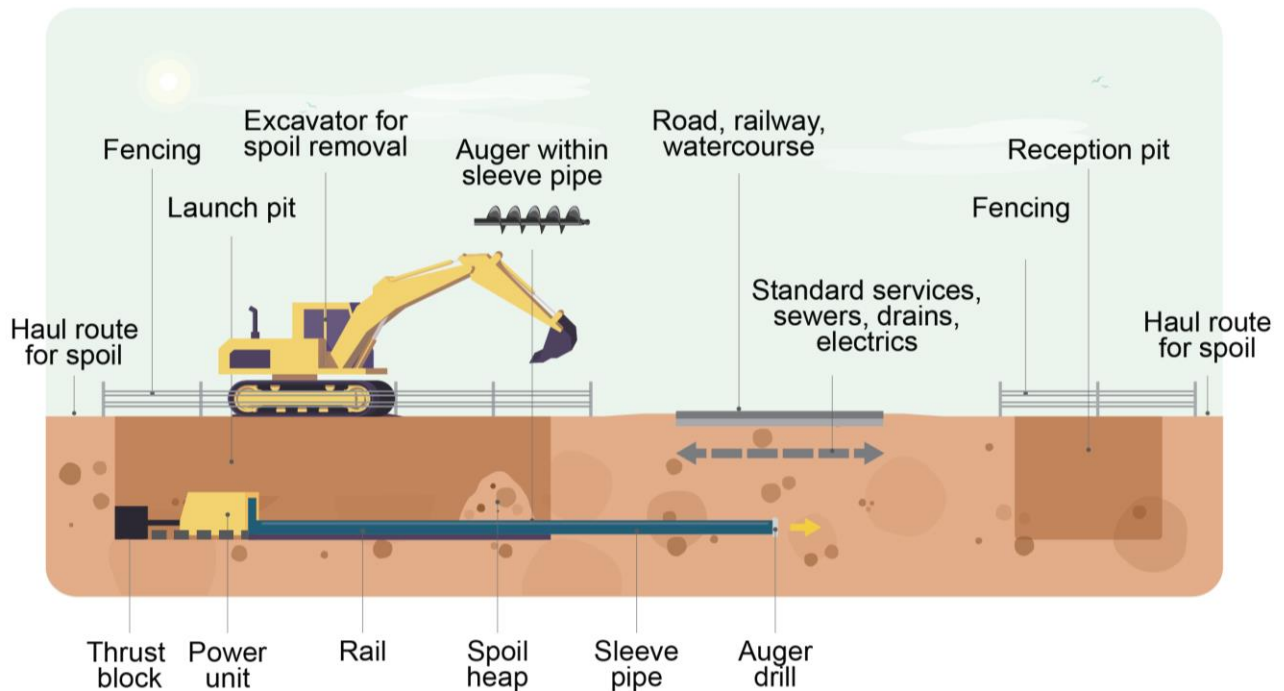
would be installed above the pipeline as additional protection from future watercourse dredging/cleaning works. Once the watercourse bed and banks are reinstated and all works complete, the flume would be removed allowing the watercourse to flow naturally.

- 3.4.55 If the over pumping methodology is adopted, then the watercourse is temporarily dammed upstream and downstream of the crossing point and pumps are set up to take the flow from upstream to downstream of the crossing point. Flume pipes are not installed in the riverbed in this case.

Trenchless Installation

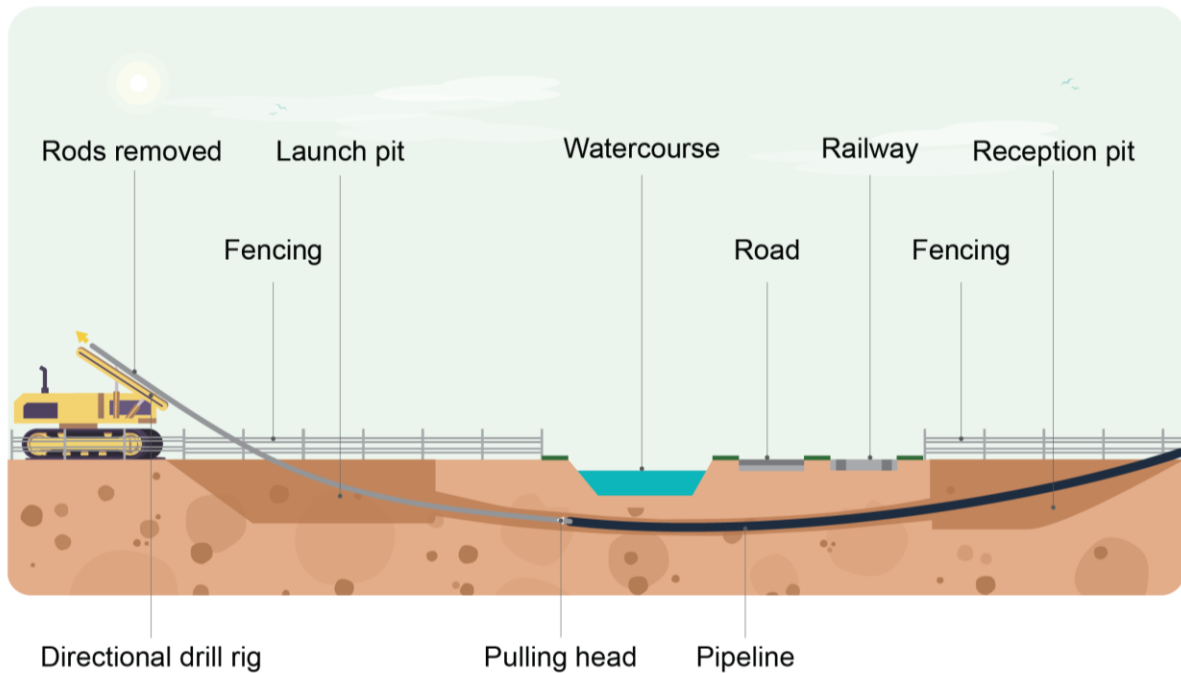
- 3.4.56 At a number of locations trenchless installation techniques would be used to avoid certain obstructions or to reduce impacts on sensitive areas. The choice of technique at any location is dependent on a number of site-specific factors including ground conditions, the space available for pipe stringing either side of the obstruction, and the sensitivity of the obstruction to potential settlement. Where a certain type of trenchless technique has been selected this is listed in Appendix 3.1 Table of Trenchless Crossings. For a number of crossings the particular technique has not been predetermined and the choice of technique would be determined by the installation contractor(s).
- 3.4.57 Auger bore is a trenchless method used over relatively short distances and usually at shallow depths. Shallow launch and reception shafts would be dug on either side of the obstacle. These may need supporting with concrete rings or sheet piles. An auger would bore horizontally to install a sleeve pipe beneath the obstacle and connect each pit.
- 3.4.58 Typical details of an auger bore are on Illustration 3.2, which is an artistic representation and not to scale.

Illustration 3.2: Example of Auger Bore Technique



- 3.4.59 Horizontal Directional Drilling (HDD) is a trenchless method of pipeline construction. A series of flexible rods would be driven through the earth from a 'launch pit' to form a small hole. A mud slurry would be used as a hydraulic fluid and coolant.
- 3.4.60 As the rods progress through the earth, extra rods would be added until the drill head emerges at the 'reception pit'. At the reception pit, the drill head would be removed and a larger one attached. This would continue to enlarge the hole until it is a size greater than the pipe.
- 3.4.61 A length of pipeline would be laid out and welded (pipe stringing) beyond the crossing. The welded pipe would then be pulled back through the hole completing the drilling operation. Typical details of a directional drill crossing are shown in Illustration 3.3, which is an artistic representation and not to scale.
- 3.4.62 Where possible, all muds would be captured in a lagoon close to the works where, once naturally dried, they can be re-used. Alternatively, they would be passed through separation/centrifuge equipment to separate out solids and the water from the slurry passed through settlement tanks/lagoons prior to discharge. When the works are within an urban environment and it is not possible to have on-site treatment facilities, the mud would be removed from site using a sealed tanker. The mud can then be dried and re-used at a later date.

Illustration 3.3: Example of Horizontal Directional Drilling (HDD) Technique



Dewatering

3.4.63 In some locations, groundwater levels may be high and dewatering would be required to aid pipeline construction. There would be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of emergency) (G12).

Demolition

3.4.64 The project would not require the demolition of any houses. However, a small number of single storey garages would need to be removed at Stakes Lane to the west of Farnborough Station to facilitate installation of the replacement pipeline. It is also possible that removal of garden sheds/greenhouses, temporary loss of land such as a garden and/or parking area, and the temporary loss of access and boundary features may be required.

Construction Activities Specific to Urban Areas

3.4.65 As a result of the increased number of constraints in urban areas the installation of the replacement pipeline would follow a similar sequence to that for other areas, although, the construction process would be more complex. The key differences are:

- Increased need for implementation of road closures, diversions and traffic management measures;
- More constrained working widths associated with increased obstructions and other constraints;
- A greater need for the breaking out of road and other hard surfaces when excavating the pipeline trench;



- Increased likelihood that material excavated from the pipeline trench would require off-site disposal; i.e. material excavated when laying pipelines in or across roads cannot be re-used, with suitable imported material having to be used for backfilling of the trench;
- Shorter pipe lengths resulting in more pipe welds; and
- Increased need for reinstatement of road surfaces, footpaths and landscaped areas.

3.4.66 Locations where roads require closure or where the working under traffic management is expected to be in place for more than four weeks, are identified within Table 3.4.

Table 3.4: Locations of Closure or Traffic Management in Place for More than Four Weeks

Requirement	Road	Length of works (m)	Length/ week	Weeks
Traffic Management	Ashford Road, Surrey	1450	90	18
Closure	St Catherine's Road, Surrey	110	18	6
Traffic management	Naishes Lane, Hampshire	656	90	7
Traffic management	B311 Red Road, Surrey	570	90	7
Traffic management	Woodthorpe Road, Surrey	725	90	9
Closure	Balmoral Drive, Surrey	375	90	5
Traffic Management	Balmoral Drive Surrey	436	55	8

Post Installation Phase Activities

Pipeline Hydrostatic Testing

- 3.4.67 Installed lengths of the pipeline would be subjected to a hydrostatic test procedure, where the pipeline length is filled with water, pressurised to a level greater than the maximum operating pressure of the installed pipe initially for four hours and then for a period of 24 hours. This test further measures the integrity of the pipeline as a whole, with any deficiency or loss of pressure during the test leading to investigation, replacement and retest until a satisfactory test condition is achieved. All tie-in welds which would not be subjected to a pressure test would be subjected to a rigorous regime of weld inspection and testing in line with industry standards.
- 3.4.68 Hydrostatic testing would be undertaken in sections. It is expected that water for hydrotesting would be sourced from a local water supply for each of the test sections. Should this not be available, water would be tankered in.
- 3.4.69 On completion of the hydrostatic tests, the water would be discharged at three locations: Boorley Green, Alton Pumping Station and the Esso West London Terminal storage facility. Appropriate discharge consents would be sought for the discharge of the water to suitable public sewers. If discharge consents cannot be obtained, the used test water would be tankered away and disposed of with a sewerage undertaker.

Land Reinstatement



- 3.4.70 Land drains would be reinstated to maintain the integrity of pre-existing land drainage patterns. The working width would then be cleared, any subsoil reinstated and loosened, and topsoil re-laid and seeded as required. Where possible, reinstatement of vegetation would generally be using the same or similar species to that removed (subject to restrictions for planting over and around the pipeline easements) (G88). Any affected hedgerow sections would be replanted, and any other affected boundaries reinstated as appropriate. Land would be returned to its original use with some exceptions such as change for ecological mitigation. Temporary fencing would remain in place until grazing land has sufficiently recovered to withstand grazing pressure.
- 3.4.71 In rural and other open areas, it is not anticipated that stripping or trenching would generate any large volume of excavated material that needs to be removed from site, with all excavated material expected to be replaced within the working area.

Construction of Above Ground Infrastructure

- 3.4.72 The construction of the new pigging station at Boorley Green and valves along the route of the replacement pipeline would generally follow a sequence of activities similar to that outlined below:
- Pre-construction activities (e.g. site access and the formation of compound and material stores);
 - Erection of secure fencing for construction works;
 - Construction of drainage measures (where required);
 - Earthworks to establish foundation levels;
 - Formation of plant foundation bases, chambers and above ground structures;
 - Construction of pipework and equipment and associated infrastructure; and
 - Perimeter reinstatement landscape works and removal of temporary infrastructure.

Equipment and Materials

- 3.4.73 A variety of different types of plant and equipment would need to be deployed, as briefly summarised below.
- 3.4.74 The installation of the pipeline would require use of plant and equipment including: welders; air compressors; excavators; excavator mounted breakers; tipper lorries; haulage lorries; automatic welding machines; angle grinders; vibratory piling rigs; auger units; HDD units and concrete pumps.
- 3.4.75 Mobile cranes and/or other lifting equipment such as telehandlers would also need to be deployed during construction, principally at the six logistics hubs and trenchless crossings.
- 3.4.76 The earthworks associated with the installation of the pipeline would require use of plant and equipment including: excavators; water pumps; bulldozers; dumper trucks; vibratory rollers; and tipper lorries.



- 3.4.77 Site lighting may be required for working areas in consideration of winter working hours and non-standard working arrangements. All lighting would be set up to avoid nuisance as far as is practicable, so would be low-level and directional to avoid glare into residential properties.
- 3.4.78 In consideration of the general public and other amenity users affected by the construction, low-level and directional site lighting may be required to illuminate footpaths adjacent to work area boundaries.
- 3.4.79 A Site Waste Management Plan (SWMP) would be developed prior to construction. The contractor(s) would maintain and monitor the SWMP throughout the construction period and oversee that any sub-contractors adhere to the SWMP (G77).

3.5 Operation of the Replacement Pipeline

- 3.5.1 Once the replacement pipeline is installed and operational, it would be protected by an easement strip that extends 3m either side of the pipeline. This is an area where no building, tree planting or other below-ground activity is permitted to take place without prior approval from Esso, to protect the pipeline from damage. Normal agricultural operations would still be allowed.
- 3.5.2 Once the pipeline is operational, Esso would carry out a programme of inspection and maintenance in accordance with good practice and regulatory requirements. This would typically include:
- Inspections of valves and pressure transducer, typically on a monthly basis;
 - Pipeline route walkover inspections, typically completed in the winter months every two years;
 - Pipeline route helicopter inspections, typically every other week;
 - Pipeline route patrols by vehicle/on foot in discrete areas, typically on a weekly basis;
 - CP transformer rectifier cabinet inspections, typically on a monthly basis; and
 - Testing of CP system (measurement of current at CP test points), typically on a biannual basis.
- 3.5.3 As summarised above, the pipeline route is walked and overflown regularly as additional security protection, assuring visual integrity of the route and assessing activity on the ground and surroundings which could compromise pipe security and integrity.

Remote Flow and Pressure Monitoring

- 3.5.4 Esso operates a 24/7 pipeline operation and monitoring regime with continuous flow monitoring capable of detecting pressure and flow differentials in the pipeline. Changes in flow can be detected and identified to a specific section of the pipeline.
- 3.5.5 Each cross-country valve on the pipeline would be powered and capable of remote and automated operation. Esso uses sophisticated tools to monitor all aspects of the



pipeline. If a change is detected, an automatic system sets off an alarm. If necessary, Esso can immediately shut down the pipeline.

- 3.5.6 Esso operates its assets to strict protocols and procedures, supported by emergency response plans developed to react immediately to potential incidents and to provide a co-ordinated and thorough response.

Cleaning and Inspection Using PIGs

- 3.5.7 Typically, Esso would clean the inside of the pipeline twice a year using a cleaning PIG.
- 3.5.8 With regards to inspection, Esso employs the use of in-line inspection tools providing intelligent monitoring of the pipeline from inside the pipe. This involves sending a PIG through the length of the pipe whilst the pipe remains operational. The PIGs are able to detect minute differentials in pipe wall thickness enabling ongoing monitoring of the pipe and facilitating further investigation or intervention at specific locations if required. These intelligent PIGs are run typically at five-year intervals.
- 3.5.9 A very small amount of aviation fuel is removed from the pipe during pigging. The Pigging Station is designed to safely and securely capture such discharges during pigging operations and would be removed by tanker for disposal.

3.6 Decommissioning of the Replacement Pipeline

- 3.6.1 When the operator of the replacement pipeline determines that it would permanently cease pipeline operations, it would consider and implement an appropriate decommissioning strategy taking account of good industry practice, its obligations to land owners under the relevant pipeline deeds and all relevant statutory requirements.
- 3.6.2 At the time that decommissioning would take place, the regulatory framework, good working practices and the future baseline could have altered. It is not possible to assess the probable future effects at the present time.
- 3.6.3 Decommissioning of the existing pipeline does not form part of this project.

3.7 References

British Standards Institution (2019). PD8010 – Pipeline Systems.



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