



Appendix 3-PD-1: Assessment Assumptions

Table of Contents

Appendix 3-PD-1: Assessment Assumptions	1
1. Introduction.....	1
2. Construction Phase Description.....	1
3. Construction Phase Plant Equipment and Noise Levels.....	18

Tables

Table 1: Part 1a and Part1b – Indicative Construction Phase Plant List.....	19
Table 2: Part 2 – Indicative Construction Phase Plant List	28
Table 3: Part 3 – Indicative Construction Phase Plant List	30
Table 4: Part 4a – Indicative Construction Phase Plant List	32
Table 5: Part 4b – Indicative Construction Phase Plant List	33

Appendix 3-PD-1: Assessment Assumptions

1. Introduction

- 1.1.1 This appendix to **Chapter 3: The Proposed Development** (PEI Report **Volume 2**) provides supplementary indicative construction information, including assumptions where necessary, to support certain topic-specific preliminary assessments. This includes the noise and vibration and traffic and transport assessments.
- 1.1.2 The information presented in this appendix will be updated following further design development and will be assessed and reported in the Environmental Statement (ES).

2. Construction Phase Description

- 2.1.1 This section presents additional indicative information regarding the construction phase of the Proposed Development for the purposes of the preliminary traffic and transport assessment (as provided in **Chapter 21: Traffic and Transport** in PEI Report **Volume 2**).

2.2 Part 1a: Minworth Advanced Water Treatment Works Construction Phase

Overview

- 2.2.1 The construction of Part 1a will be comprised of multiple stages of construction including for enabling works (e.g. site clearance, setting up of compounds, accesses and haul routes) followed by site works (e.g. groundworks, pipe laying [open-cut or trenchless], earthworks, piling works, precast works, structural steel / cladding).

Construction Compounds

- 2.2.2 It is proposed that up to two construction compounds are to be established to enable the construction of Part 1a (illustrated on **Figure 3-P1A-1** in PEI Report **Volume 3**).

Access / Egress

- 2.2.3 Access / egress points and roads / tracks will be constructed to provide access from the public highways to haul routes, working areas and site compounds. This will involve utilising upgraded existing access / egress points for the purposes of the Proposed Development. To upgrade and/or construct the access / egress points, temporary traffic management will be used, where required, to manage the flow of traffic. This may include

measures such as cones, barriers, signage, 'stop' and 'go' boards and traffic lights.

2.2.4 Access / egress points for the construction of Part 1a are from (illustrated on **Figure 3-P1A-1** in PEI Report **Volume 3**):

- a. A4079 Kingsbury Road – this would be used for construction traffic but will remain as a permanent access point to the fully constructed and operational Minworth AWTP. This access is located approximately 530m east of the existing Minworth WwRC site access. The access route would utilise an existing track, which would need to be upgraded. Currently, there is a facility for left and right turns onto Kingsbury Road, which is dual carriageway at this location, with the eastbound lane diverging to one lane immediately east of the access track.
- b. Water Orton Lane – this would be used during construction only. An existing track to the Minworth WwRC would be utilised, which would need to be cleared of vegetation as it is currently not in active use. There is an existing bellmouth associated with this access / egress point.

Construction Programme and Working Hours

2.2.5 It is anticipated that the construction programme to complete the Part 1a construction works will be up to 20-25 months.

2.2.6 The details of the proposed construction working days and hours are provided in section 3.11 of **Chapter 3: The Proposed Development** in PEI Report **Volume 2**.

Construction Vehicle Traffic Movements

2.2.7 Initial HGV estimates provided by the design team identified that throughout the duration of the proposed construction of Part 1a, a total of up to 9,366 HGVs (including a 20% uplift for contingency) will be generated. This equates to an average of 468 HGVs per month or 20 HGVs per day. Over a typical working day, this equates to 2 HGVs per hour. This is based on a worst-case 20 month construction programme, 24 working days (assumed as 20 weekdays and four Saturdays) per month or 220 hours per month (based on 10 working hours on weekdays and five hours on Saturdays). Therefore, on average this generates up to four two-way HGV trips (i.e. two arrivals and two departures) per hour.

2.2.8 The peak construction period for Part 1a will likely occur when there is likely to be the most overlap of works for Part 1a, including earth / ground works. For this peak month, it has been estimated that up to 609 HGVs will be generated. Using the same approach as previously set out, this equates to approximately 25 HGVs per day or three HGVs per hour. This indicates that during the peak month of construction of Part 1a there will be approximately six two-way HGV

trips (three arrivals and three departures) per hour, which is considered to be negligible. Outside of this peak month, HGV trips will be lower and therefore also considered to be negligible.

Construction Workforce / Staff Vehicle Traffic Movements

- 2.2.9 It has been identified that up to 60 staff will be employed for the construction of Part 1a (Minworth AWTP). These staff are then split into five working groups including groundworks / pipe laying (six staff), earthworks (12 staff), piling works (six staff), precast works (24 staff) and structural steel / cladding works (12 staff). These groups are then further divided into eight groups of six workers, with up to two work fronts working at various stages of the build.
- 2.2.10 Most works will be completed linearly rather than simultaneously – e.g. either groundwork or earthworks first, followed by piling works.
- 2.2.11 As a ‘worst-case’ scenario, this would result in 60 vehicle (arrival) trips in the AM (likely to be between 07:00 – 08:00) and 60 vehicle (departure) trips in the PM (likely to be between 18:00 – 19:00). This is due to the assumption of staff arriving on the hour prior to the start and departing post of working hours of 08:00 – 18:00 on weekdays. However, construction staff will be split into different groups of five workers working at various stages of the construction and different locations rather than all at the same time.
- 2.2.12 On average, it has been assumed that 50% of the total construction staff will be on-site at any one time due to the sequencing of works. This assumption is based on the different roles of staff assigned at different stages of works, e.g. some staff are assigned to do groundworks, others on pipelaying, etc. The various stages of works will not all occur at the same time, logically they typically follow on from each other. Noting that there is a potential for certain stages to overlap, however typically this sees one stage of works ramping down whilst the other work stage begins to develop. In addition, a further 20% reduction in vehicle trips can be accounted for through staff using sustainable modes of travel such as car sharing, and / or use of cycles, shuttle bus / public transport. It is anticipated that single occupancy vehicle trips will be accompanied by a reasonable level of car sharing trips, as well as the potential for shuttle bus and other sustainable modes of travel. Based on the above assumptions, the construction staff vehicle trips equates to approximately 18 vehicle (arrival) trips in the AM and 18 vehicle (departure) trips in the PM.

Temporary Road Closures and Diversions

- 2.2.13 At this stage, there are no proposed temporary road closures and/or diversions proposed to enable the construction of Part 1a.

Temporary PRow Closures and Diversions

- 2.2.14 At this stage, PRow affected by the proposed construction will either be kept open during the construction works, through the use of temporary railed walkways; or a short diversion will be provided.

Operational Phase

Overview

- 2.2.15 Part 1a includes the operation (including maintenance) of the proposed Minworth AWTP and associated infrastructure.

Permanent Accesses

- 2.2.16 The Minworth AWTP will be utilising the existing access off the A4097 Kingsbury Road which will be upgraded as part of the construction works.

Operational Staff and Traffic Movements

- 2.2.17 At this stage, it is expected that the Minworth AWTP will be staffed 24/7 spread across three eight-hour shifts per day and approximately 11 Full-Time Equivalent (FTE) employees will be required. As a 'worst-case' scenario – assuming single vehicle occupancy trips – this equates to approximately 11 vehicle (arrival) trips and 11 vehicle (departure) trips at any given start / end shift hours.

Permanent Road Closures and Diversions

- 2.2.18 At this stage, there are no proposed permanent road closures and/or diversions as part of the operation of the Minworth AWTP.

Permanent PRow Closures and Diversions

- 2.2.19 At this stage, all PRow affected during construction will be reinstated following the completion of construction phase.

2.3 Part 1b: Minworth to Atherstone Pipeline

Construction Phase

Overview

- 2.3.1 The construction of Part 1b will be comprised of multiple stages of construction such as enabling works (site clearance, setting up of compounds / accesses and haul routes), pipe laying (earthworks and groundworks / pipelaying using open cut method), trenchless crossing (piling works, groundworks, trenchless crossing works) and construction of a Break Pressure Tank (BPT).
- 2.3.2 Temporary access to the BPT area will likely be gained from Twenty One Oaks Road and Coleshill Road. A working area will be required for the

construction of the BPT, to allow for material and soils storage, storage of pre-cast elements and working space.

Construction Compounds

2.3.3 It is proposed that up to 15 construction compounds are to be set up as part of the construction of Part 1b, illustrated in **Figure 3-P1B-1** in PEI Report **Volume 3**.

2.3.4 A working area is required to support construction and would include temporary construction compounds, with associated temporary access roads, launch and reception sites for trenchless crossings, and a working width in which to construct the pipeline.

Access / Egress

2.3.5 It is proposed that up to 28 construction access / egress points are to be required for the construction of Part 1b, illustrated in **Figure 3-P1B-1** in PEI Report **Volume 3**

2.3.6 Temporary access / egress roads would be required to access / egress compound areas, along the pipeline route. These would make use of existing tracks where possible; in most cases this would require hedgerow and tree removal to facilitate an access / egress route that is wide enough for construction vehicles. Where there are no existing tracks, existing field accesses would be used and may need to be widened. Access roads would be routed to use existing gaps in hedgerows and trees that form the boundary of fields, where possible, to reduce vegetation loss.

Construction Programme and Working Hours

2.3.7 It is anticipated that the construction programme to complete the Part 1b construction works will be up to approximately 29 months.

2.3.8 The details of the proposed construction working days and hours are provided in section 3.11 of **Chapter 3: The Proposed Development** (PEI Report **Volume 2**).

Construction Vehicle Traffic Movements

2.3.9 Several construction access / egress points and compounds are proposed along the Part 1b Preliminary Order Limits route. It is anticipated that majority of the proposed pipeline will be laid in a 'rolling' basis rather than simultaneously; however, it is acknowledged that there will be some occasional overlap between the proposed works.

2.3.10 Initial estimates of the design team identified a total of up to 19,061 HGVs (including a 20% uplift for contingency) will be generated throughout the duration of the proposed construction of Part 1b. This equates to an average of 657 HGVs per month or 27 HGVs per day or three HGVs per hour, based

on a 29 month construction programme, 24 working days (assumed as 20 weekdays and four Saturdays) per month or 220 hours per month (ten working hours on weekdays and five hours on Saturdays). Therefore, on average this generates up to six two-way HGV trips (three arrivals and three departures) per hour spread across multiple locations of Part 1b.

- 2.3.11 The peak construction for Part 1b will likely occur when there is likely to be the most overlap of works for Part 1b. For this peak month, it has been estimated that up to 1,650 HGVs will be generated. This equates to approximately 69 HGVs per day or eight HGVs per hour. This, therefore, indicates that at peak month of construction of Part 1b, is likely to generate up to 16 two-way HGV trips (eight arrivals and eight departures) per hour.

Construction Workforce / Staff Vehicle Traffic Movements

- 2.3.12 It has been identified that up to 108 staff will be employed for the construction of Part 1b. These staff are then split into three working groups including pipe laying / open cut method (48 staff), trenchless crossings (24 staff), and construction of BPT (36 staff). These working groups are then further divided into 12 groups of five workers, with up to two work fronts working at various stages of the build.

- 2.3.13 In addition, the works involved at any one site will only be either pipe laying works or trenchless crossing as these are two different types of pipeline installation.

- 2.3.14 As a 'worst-case' scenario, this would result in 84 staff (arrival) trips in the AM (likely to be between 07:00 – 08:00) and 84 staff (departure) trips in the PM (likely to be between 18:00 – 19:00) which is a combination of pipe laying / open cut and construction of the BPT. However, this is deemed unrealistic as the construction staff is likely to be split into different groups of six workers working at various stages of the construction and different locations rather than all at the same time. Given that each activity is likely to typically follow previous activity, a robust assessment assumes that approximately 50% of the total staff will be on one site at the same time, in reality. For example, once earthworks are largely completed on-site, staff associated with this task will not be present on-site. Therefore, the assumption is considered robust given how the nature of the site is likely to be developed with key tasks following on from one another.

- 2.3.15 Furthermore, it should be noted that it is very unlikely that construction staff will arrive on-site on single occupancy vehicles. It is anticipated that some other modes of travel will be evident such as car sharing and use of other modes of travel. A further 40% reduction on vehicle trips has been assumed which can be accounted for staff using sustainable modes of travel such as car sharing. Gangs typically travel to site with two or more staff members, to

reduce costs, and therefore the above assumption is considered robust. This, therefore, equates to a 'worst-case' of 25 vehicle (arrival) trips in the AM and 25 vehicle (departure) trips in the PM per specific worksite.

Temporary Road Closures and Diversions

2.3.16 At this stage, where obstacles such as A-roads, Main Rivers and railways prevent the use of open cut methods, the design proposes to utilise trenchless techniques to install the new pipeline.

2.3.17 As part of the construction works for Part 1b, a temporary road closure is proposed along Coleshill Road located south of Atherstone. The road closure will be implemented in a rolling phase, with each diversion route provided for both general and HGV traffic. The extent of the proposed phased temporary road closure and its corresponding diversion routes are still under further investigation and will be confirmed at ES stage. Details regarding the duration and timings of this road closure (or diversion) are currently unknown and will be reconfirmed at the ES stage with the final Proposed Development design.

Temporary PRow Closures and Diversions

2.3.18 At this stage, it is proposed that PRow affected by the proposed construction will either be kept open during the construction works through the use of (e.g.) temporary railed walkways; or a short diversion will be provided.

2.3.19 However, this will be reconfirmed at the ES stage with the final Proposed Development design.

Operational Phase

Overview

2.3.20 Part 1b comprises the operation (including maintenance) of transfer of water through the new underground pipeline from the Minworth AWTP to an outfall at Atherstone, to the Coventry Canal. During the operational phase for Part 1b the following infrastructure will be left in place:

- a. Pipeline to transfer water;
- b. Trenchless crossing shafts;
- c. A BPT, with below and above ground elements; and
- d. Cathodic protection, air valves and washouts.

2.3.21 Currently two cathodic protection units are proposed, one near to the Marsh Lane crossing and one at the BPT (as illustrated in **Figure 3-P1B-1** in PEI Report **Volume 3**).

Break Pressure Tank

2.3.22 The BPT would likely be located in an agricultural field, which is bounded by Twenty One Oaks Road to the west, and Coleshill Road to the south.

2.3.23 The BPT would be unmanned except for planned and reactive maintenance (mainly inspection and possible repairs) by Severn Trent (ST); which ultimately will not generate a significant number of vehicular trips.

Permanent Access / Egress

2.3.24 Access / egress to the BPT would be provided via the construction of a new bellmouth junction from Coleshill Road.

2.3.25 Furthermore, access / egress to the proposed Atherstone outfall would be provided via the construction of a new access road from the existing Atherstone Golf Club access road.

Operational Staff and Traffic Movements

2.3.26 It has been assumed that the permanent infrastructure will generate minimal vehicular trips which will be associated with general checks and maintenance.

Permanent Road Closures and Diversions

2.3.27 At this stage, there are no proposed permanent road closures and/or diversions as part of the operation of Part 1b. However, this will be reconfirmed at the ES stage with the final Proposed Development design.

Permanent PRow Closures and Diversions

2.3.28 At this stage, all PRow affected during the construction of Part 1b will be reinstated following the completion of construction phase. However, this will be reconfirmed at the ES stage with the final Proposed Development design.

2.4 Part 2: Works to Coventry, Oxford and Grand Union Canals

Construction Phase

Overview

2.4.1 The construction of Part 2 will be comprised of multiple stages of construction such as enabling works (site clearance, setting up of compounds / accesses and haul routes), construction of an outfall structure at Atherstone, construction of pumped and gravity bypasses, pumping stations, bank raising, construction of up to four transfer locks, and modification to one canal bridge, and existing control and waste weirs.

Construction Compounds

- 2.4.2 It is proposed that up to 38 construction compounds are to be established to enable the construction of Part 2.

Access/Egress

- 2.4.3 Temporary access/egress points and access roads/tracks would be constructed to provide access from the public highways to haul routes, working areas and site compounds. This will involve utilising and upgrading existing access/egress points and creating new accesses. To construct the access points temporary traffic management will be used, where required, to manage the flow of traffic. This may include measures such as cones, barriers, signage, 'stop' and 'go' boards and traffic lights.
- 2.4.4 Access/egress points for the construction of Part 2 include, but are not limited to:
- a. One access/egress point for the Atherstone outfall structure temporary and maintenance works:
 - i. Atherstone Golf Course.
 - b. Four access/egress points for the pumped bypasses temporary works:
 - i. B4109 Parrots Grove;
 - ii. Brindley Road;
 - iii. A45; and
 - iv. Simpson Road.
 - c. Four access/egress points for the gravity bypasses temporary works:
 - i. A5 Watling Street;
 - ii. Three Bridges Road;
 - iii. Roman Road; and
 - iv. Bridge Road.
 - d. Access/egress points used for other works will be utilised for canal bank raising temporary works; and
 - e. Four access/egress points for the transfer locks temporary works:
 - i. B4111 Nuneaton Road;
 - ii. Smeaton Lane;
 - iii. Weedon Lane; and

iv. Either: Newport Road or Parklands Road.

2.4.5 The exact form and details of these accesses will be confirmed at the ES stage.

Construction Programme and Working Hours

2.4.6 The list below provides approximate durations within the construction programme, this will be reconfirmed at the ES stage.

2.4.7 At this stage, it is anticipated that the construction programme to complete each aspect of the Part 2 works will be as follows:

- a. Atherstone outfall structure: 15 weeks;
- b. Pumped bypasses: 7-9 months each (with Braunstone Pumped Bypass likely to be 12 months);
- c. Gravity bypasses: 4-6 months each (with Stoke Bruerne Gravity Bypass likely to be eight months);
- d. Canal bank raising: typically 1-2 months but dependent upon single length of raising works;
- e. Transfer locks: two blocks of approximately six months, in the off-season;
- f. Bridge 88 modifications: 5-8 months; and
- g. Modification of control and waste weirs: seven weeks.

2.4.8 The details of the proposed construction working days and hours are provided in section 3.11 of **Chapter 3: The Proposed Development** in PEI Report **Volume 2**.

Construction Vehicle Traffic Movements

2.4.9 Initial HGV estimates associated with each aspect of the Part 2 works are as follows:

- a. Atherstone outfall structure: peak of three HGV trips per day (six movements);
- b. Pumped bypasses: peak of five HGV trips per day (ten movements) per Indicative Working Area site;
- c. Gravity bypasses: peak of three HGV trips per day (six movements) per Indicative Working Area site;
- d. Canal bank raising: peak of three HGV trips per day (six movements) per landside access;
- e. Transfer locks: peak of five HGV trips per day (ten movements) per Indicative Working Area site;

- f. Bridge 88 modifications: peak of five HGV trips per day (ten movements); and
- g. Modification of control and waste weirs: peak of three HGV trips per day (six movements).

Construction Workforce / Staff Vehicle Traffic Movements

2.4.10 At this stage, the list below provides approximate numbers of staff, which will be reconfirmed at the ES stage. It is estimated that the construction workforce and staff vehicle traffic movements for each aspect of the Part 2 works is as follows:

- a. Atherstone outfall structure: peak number of ten FTE construction staff;
- b. Pumped bypasses: peak number of ten FTE construction staff per Indicative Working Area site;
- c. Gravity bypasses: peak number of five FTE construction staff per site;
- d. Canal bank raising: peak number of 20 FTE construction staff across the works (four teams of five workers);
- e. Transfer locks: peak number of ten FTE construction staff per Indicative Working Area site;
- f. Bridge 88 modifications: peak number of five FTE construction staff; and
- g. Modification of control and waste weirs: peak number of five FTE construction staff per Indicative Working Area site.

2.4.11 Based on the above, the construction phase for Part 2 will not generate a significant number of HGV or workforce/staff vehicular trips in any given location as trip generation for individual works is limited and works are spread over a wider area.

Temporary Road Closures and Diversions

2.4.12 At this stage, there are no proposed temporary road closures and/or diversions as part of the construction of Part 2.

Temporary PRow Closures and Diversions

2.4.13 At this stage, it is proposed that PRow and canal towpaths affected by the Part 2 construction works will either be kept open during works through the use of (e.g.) temporary railed walkways; or a short diversion will be provided.

Operational Phase

Overview

2.4.14 Part 2 includes the operation (including maintenance) of several new structures (e.g. outfall, pumped and gravity bypasses, transfer locks) and associated infrastructure.

Operational Staff and Traffic Movements

- 2.4.15 For the outfall at Atherstone, bypass structures, pumping stations and transfer locks, all elements have been designed so that there are no deliveries required and minimal maintenance, with no permanent on-site staff.
- 2.4.16 Access/egress has been included to allow day to day, maintenance, for example maintenance of mechanical and electrical equipment and clearance of debris from screens, plus repairs and replacement works. This would be very intermittent, and regular access would be less than once per month, or as a result of operational incidents or exceptional weather events.
- 2.4.17 No other maintenance activities are likely required specifically for Part 2 beyond the Trust's day-to-day maintenance regime for the canal network.

Permanent Road Closures and Diversions

- 2.4.18 At this stage, there are no proposed permanent road closures and/or diversions as part of the operation of Part 2.

Permanent PRow Closures and Diversions

- 2.4.19 At this stage, all PRow and canal towpaths affected during construction will be reinstated following the completion of construction phase.

2.5 Part 3: Works to Daventry and Drayton Reservoirs

Construction Phase

Overview

- 2.5.1 The construction of Part 3 will be comprised of multiple stages of construction such as the construction of the pipeline into Drayton Reservoir (which will be similar to the process described in Part 1b), works to inlet and outlet structures at both reservoirs, bank raising along the existing channel at Daventry Reservoir only and the replacement of an existing culvert over the Grand Union Canal. The works for this will be similar to those described for the construction of weirs under pumped bypasses in Part 2.

Construction Compounds

- 2.5.2 It is proposed that up to three construction compounds are to be established to enable the construction of Part 3.

Access/Egress

- 2.5.3 It is proposed that up to four construction access/egresses are to be established as part of the construction of Part 3.
- 2.5.4 Temporary access/egress points and access roads would be constructed to provide access from the public highways to haul routes, working areas and site compounds. This will involve utilising and upgrading existing access

points and creating new access/egresses. To construct the access points temporary traffic management will be used, where required, to manage the flow of traffic. This may include measures such as; cones, barriers, signage, 'stop' and 'go' boards and traffic lights.

2.5.5 Access/egress points for the construction of Part 3 include, but are not limited to:

- a. The Newham Drive access will serve the construction area and construction compound to the west of Drayton Reservoir;
- b. Osprey Drive access will serve the construction area and construction compound to the west of Daventry Reservoir;
- c. The B4036 access will serve the construction area and construction compound located north east of Daventry Reservoir; and
- d. The A361 Ashby Road access will serve the construction area and construction compound located to the east of Drayton Reservoir.

Construction Programme and Working Days

2.5.6 It is anticipated that the construction programme to complete the Part 3 works will be up to approximately 12 months.

Construction Vehicle Traffic Movements

2.5.7 The exact numbers of construction vehicle traffic (HGVs) associated with the construction of Part 3 are still to be confirmed. However, given the relatively small working area when compared to other Parts of the Proposed Development, these are likely to be very low (i.e. less than 60 two-way trips per hour). This will be reconfirmed at the ES stage with the final Proposed Development design.

Construction Workforce / Staff Vehicle Traffic Movements

2.5.8 Similarly to the above, the exact numbers of construction staff associated with the construction of Part 3 are still to be determined. However, given the relatively small-scale when compared to other Parts of the Proposed Development, these are likely to be very low. This will be reconfirmed at the ES stage with the final Proposed Development design.

Temporary Road Closures and Diversions

2.5.9 At this stage, there are no proposed temporary road closures and/or diversions as part of the construction of Part 3.

Temporary PRow Closures and Diversions

2.5.10 At this stage, it is proposed that PRow affected by the proposed construction will either be kept open during works through the use of (e.g.) temporary railed walkways; or a short diversion will be provided.

Operational Phase

Overview

2.5.11 Part 3 includes the operation (including maintenance) of the new pipeline to Daventry and Drayton Reservoirs, and the operation of the two reservoirs for the purposes of maintaining required canal water levels.

2.5.12 It is understood that the maintenance and operation of Part 3 will not generate a significant number of vehicular trips.

Permanent Accesses

2.5.13 The location of the permanent accesses for Part 3 are still to be confirmed and will be finalised at ES stage.

Operational Staff and Traffic Movements

2.5.14 The exact numbers of operational staff and traffic movements associated with the operation of Part 3 are still to be confirmed. However, given the relatively small-scale when compared to other Parts of the Proposed Development, these are likely to be very low. This will be reconfirmed at the ES stage with the final Proposed Development design.

Permanent Road Closures and Diversions

2.5.15 At this stage, there are no proposed permanent road closures and/or diversions as part of the operation of Part 3.

Permanent PRow Closures and Diversions

2.5.16 At this stage, all PRow affected during construction will be reinstated following the completion of construction phase.

2.6 Part 4a: Abstraction, Storage and Treatment

Construction Phase

Overview

2.6.1 The construction of Part 4a will comprise of the construction, operation, and maintenance of infrastructure such as abstraction infrastructure, new pumping station, weirs, water storage, water treatment works (WTW), access roads and car parking, and temporary construction working areas.

Construction Compounds

2.6.2 It is proposed that up to three main construction working areas are to be set up as part of the construction of Part 4a.

Access/Egress

- 2.6.3 Temporary access/egress points and access roads would be constructed to provide access from the public highways to haul routes, working areas and site compounds. This will involve utilising and upgrading the existing access/egress point off A4146 Stoke Road for the abstraction point and creating a new access/egress on A4146 Stoke Road further north-east for the water treatment works. To construct the access points, temporary traffic management will be used, where required, to manage the flow of traffic. This may include measures such as; cones, barriers, signage, 'stop' and 'go' boards and traffic lights.
- 2.6.4 The abstraction point near Great Brickhill, south-east of Milton Keynes, works will be accessed via the existing access track off A4146 Stoke Road. The Galley WTW site will be accessed from a new access track off A4146 Stoke Road. The access will be prior to the roundabout with a slip road on and of A4146 Stoke Road, enabling safe entry and exit to and from the A-road.

Construction Programme and Working Days

- 2.6.5 At this stage, the list below is an approximate duration. It is anticipated that the construction programme to complete the works associated with Part 4a for each aspect of the works will be as follows:
- a. Abstraction to storage and treatment: 12 months;
 - b. Raw water storage: 34 months; and
 - c. WTW: 38 months.

Construction Vehicle Traffic Movements (HGV)

- 2.6.6 It is anticipated that the construction vehicle traffic movements (HGVs) associated with Part 4a will equate to approximately 5,100 movements over the course of the construction period. This equates to less than six HGV movements per day and less than one movement per hour.

Construction Workforce / Staff Vehicle Traffic Movements

- 2.6.7 It is anticipated that the estimated peak number of construction staff is 50 FTE, with associated small amount of vehicle movements associated with Part 4a.

Temporary Road Closures and Diversions

- 2.6.8 At this stage, there are no proposed temporary road closures and/or diversions as part of the construction of Part 4a.

Temporary PRow Closures and Diversions

- 2.6.9 It is proposed that PRow affected by the Part 4a construction will either be kept open during works through the use of temporary railed walkways; or a short diversion will be provided.

Operational Phase

Overview

- 2.6.10 Part 4a comprises the operation (including maintenance) of the abstraction point, water storage, WTW and associated infrastructure.

Operational Staff and Traffic Movements

- 2.6.11 Although the WTW site will be manned, staff numbers will be low and there will be less than five staff movements to/from site per day.
- 2.6.12 Operational HGV movements will primarily relate to sludge disposal and chemical deliveries. For the maximum rate of operation, aggregate indicative maximum vehicle movements will be up to three HGVs per day; however, typically the rate will be lower than this, at up to two HGV movements per day.

Operational Staff and Traffic Movements

- 2.6.13 The exact numbers of operational staff and traffic movements associated with the operation of Part 4a are still to be confirmed. However, given the relatively small-scale of the operational works, these are likely to be very low. This will be reconfirmed at the ES stage with the final Proposed Development design.

Permanent Road Closures and Diversions

- 2.6.14 At this stage, there are no proposed permanent road closures and/or diversions as part of the operation of Part 4a.

Permanent PRow Closures and Diversions

- 2.6.15 At this stage, all PRow affected during construction will be reverted back to its original state following the completion of the construction phase.

2.7 Part 4b: Pipeline to an Existing Underground Reservoir near Luton

Construction Phase

Construction Overview

- 2.7.1 The construction phase of Part 4b will comprise of the construction of a new underground pipeline (using both open cut and trenchless techniques), works to facilitate temporary and permanent access, temporary construction working areas and compounds, and below ground works where required. Additionally,

there are proposed works within AfW owned land to connect the new pipe to the existing water distribution infrastructure near Luton.

Construction Compounds

- 2.7.2 It is proposed that up to two main construction compounds at either end of the route are to be set up as part of the construction of Part 4b, with mobile compounds moving along the pipeline route where required.

Access/Egress

- 2.7.3 Temporary access points and access roads would be constructed or established to provide access/egress from the public highways to haul routes, working areas and site compounds. This will involve utilising and/or upgrading existing access/egress points and creating new ones. To construct the access/egress points temporary traffic management will be used, where required, to manage the flow of traffic. This may include measures such as; cones, barriers, signage, 'stop' and 'go' boards and traffic lights. Existing roads will be used to gain access to a temporary track that will be laid within the pipeline working area from the nearest access/egress road. The relevant temporary storage/lay down areas would seek to be located as near as practicable to the intended access/egress roads.
- 2.7.4 The exact locations of construction access/egress for Part 4b are still to be confirmed and will be defined at ES stage.

Construction Programme and Working Days

- 2.7.5 It is anticipated that the construction programme to complete the works associated with Part 4b will be approximately 25 months.

Construction Vehicle Traffic Movements

- 2.7.6 It is anticipated that the construction vehicle traffic movements (HGVs) associated with Part 4b will be one HGV trip per day (two movements).

Construction Workforce / Staff Vehicle Traffic Movements

- 2.7.7 It is anticipated that the construction vehicle traffic movements (workforce and staff) associated with Part 4b for each site will reflect one group of five workers per site. However, multiple groups may work concurrently on separate pipe sections. The number of groups of five working simultaneously will be assessed at ES stage.

Temporary Road Closures and Diversions

- 2.7.8 At this stage, there are no proposed temporary road closures and/or diversions as part of the construction of Part 4b.

Temporary PRow Closures and Diversions

- 2.7.9 At this stage, it is proposed that PRow affected by the proposed construction will either be kept open during works through the use of (e.g.) temporary railed walkways; or a short diversion will be provided.

Operational Phase

Overview

- 2.7.10 Part 4b includes the operation (including maintenance) of the pipeline and associated infrastructure.

Operational Staff and Traffic Movements

- 2.7.11 Operational trips are not yet known for Part 4b; however, in line with other Parts of the Proposed Development, operational trips are likely to be very low as the proposals are primarily underground pipeline. The number of operational trips for Part 4b will be confirmed at ES stage.

Permanent Road Closures and Diversions

- 2.7.12 At this stage, there are no proposed permanent road closures and/or diversions as part of the operation of Part 4b.

Permanent PRow Closures and Diversions

- 2.7.13 At this stage, all PRow affected during construction will be reverted back to its original state following the completion of construction phase.

3. Construction Phase Plant Equipment and Noise Levels

- 3.1.1 **Table 1** to **Table 5** present an indicative list of construction phase plant equipment (with associated sound levels) for the purposes of the preliminary noise and vibration assessment (as provided in **Chapter 19: Noise and Vibration** in PEI Report **Volume 2**).

Table 1: Part 1a and Part1b – Indicative Construction Phase Plant List

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k		
Enabling Works	Site Establishment (Main Compound)	Veg Clearance	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			Chipper	1	100	112	112	110	113	116	115	111	105	121	From HSE research report RR618 for Chipper C Trimmed hardwood
			Chainsaw	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
			Strimmer	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
		Groundworks	20-30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Welfare Subby	7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Mobile Crane	1	100	106	97	95	92	90	85	77	68	95	BS 5228: Tab C.4 #46
			MEWP/Cherry Picker	1	100	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
			80kVa Generator (containerised)	1	100	107	102	95	92	83	79	73	68	93	BS 5228: Tab C.6 #39
	Advanced Archaeological Works	Groundworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			5t Dumper	1	100	118	114	100	99	99	99	94	87	106	BS 5228: Tab C.4 #7
		Specialist Survey	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Environmental Mitigation	Planting Sub-Consultant	13t Excavator	1	100	112	102	99	99	96	94	89	83	102	BS 5228: Tab C.6 #12
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			7m Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Ardent Handler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Fencing	Fencing Subby	5t Excavator	1	100	99	99	94	87	87	86	82	76	93	BS 5228: Tab C.4 #68
			Concrete Mixer	1	100	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
AWTP	Establish Site Compound	Veg Clearance	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			Chipper	1	100	112	112	110	113	116	115	111	105	121	From HSE research report RR618 for Chipper C Trimmed hardwood

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k		
			Chainsaw	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
			Strimmer	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
		Groundworks	20-30t Excavtor	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Welfare Subby	7m Telehanfler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Mobile Crane	1	100	106	97	95	92	90	85	77	68	95	BS 5228: Tab C.4 #46
			MEWP/Cherry Picker	1	100	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
			80kVa Generator (containerised)	1	100	107	102	95	92	83	79	73	68	93	BS 5228: Tab C.6 #39
	General Civil Works	Groundworks / Pipe Laying	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			20t Excavator breaker attachment	1	100	114	114	111	106	108	106	104	99	113	BS 5228: Tab C.9 #12
			5t dumper	1	100	118	114	100	99	99	99	94	87	106	BS 5228: Tab C.4 #7
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Gas torch/burning gear	1	100	102	102	100	89	88	86	84	84	96	BS 5228: Tab C.3 #34
			Welding set & Generator	1	100	103	100	95	96	98	94	90	88	101	BS 5228: Tab C.3 #32
			Angle Grinder	1	100	85	79	80	88	98	105	101	101	108	BS 5228: Tab C.4 #93
		Earthworks	30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			Moxy Mt 31 articulated dumper	1	100	112	112	109	107	104	101	97	92	109	BS 5228: Tab C.8 #16
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Piling Works	30t Excavator with MOVAX	1	100	108	115	116	112	111	106	102	93	115	BS 5228: Tab C.3 #2

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k		
			impact hammer attachment												
			30t Excavator with MOVAX vibro hammer attachment	1	100	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8
		Formwork Reinforced Concrete (FRC) / Precast Works	Concrete Wagon (7m3)	1	100	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
			Static Concrete Pump	1	100	110	110	100	99	97	96	90	82	103	BS 5228: Tab C.3 #26
			Vibrating Concrete Poker	1	100	90	98	98	92	90	89	87	84	97	BS 5228: Tab C.4 #34
			30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Static grout mixer/pump	1	100	115	115	105	104	102	101	95	87	108	Overall sound power level from BS 5228: Tab D.5 #49. Spectrum from BS 5228: Tab C.3 #26
		Structural Steel / Roofing / Cladding Subby	7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Crawler Crane	1	100	109	105	97	95	90	88	89	79	98	BS 5228: Tab C.3 #29
			MEWP/Cherry Picker	1	100	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
		Planting Subby	13t Excavator	1	100	112	102	99	99	96	94	89	83	102	BS 5228: Tab C.6 #12
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			7m Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Ardent Handler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	MEICA Fit Out	MEICA Teams	100t Mobile Crane	1	100	101	99	96	98	94	91	82	77	99	BS 5228: Tab C.4 #41
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k		
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Concrete Corer	1	100	103	102	103	100	102	103	108	108	113	BS 5228: Tab C.4 #69
			SDS Drill	1	100	90	89	90	87	89	90	95	95	100	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.4 #69
		MEICA Teams	Static Water Pump	1	100	101	96	90	90	89	84	81	69	93	BS 5228: Tab C.2 #45
			10,000l water tanker (HGV)	1	100	109	110	95	100	99	102	101	94	107	BS 5228: Tab C.4 #89
	Dry & Wet Testing														
GUC Pipeline	Establish Site Compound, Access Routes & Working Corridor	Veg Clearance	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			Chipper	1	100	112	112	110	113	116	115	111	105	121	From HSE research report RR618 for Chipper C Trimmed hardwood
			Chainsaw	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
			Strimmer	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
		Groundworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			5t Dumper	1	100	118	114	100	99	99	99	94	87	106	BS 5228: Tab C.4 #7
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Welfare Subby	7m Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Mobile Crane	1	100	106	97	95	92	90	85	77	68	95	BS 5228: Tab C.4 #46
			20kVA Generator (containerised)	1	100	107	102	95	92	83	79	73	68	93	BS 5228: Tab C.6 #39
	Pipeline	Earthworks	30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Groundworks / Pipe Laying	30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k		
			Welding set & Generator	1	100	103	100	95	96	98	94	90	88	101	BS 5228: Tab C.3 #32
Break Pressure Tank	Site Establishment	Veg Clearance	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			Chipper	1	100	112	112	110	113	116	115	111	105	121	From HSE research report RR618 for Chipper C Trimmed hardwood
			Chainsaw	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
			Strimmer	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
		Groundworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			9t Dumper	1	100	118	114	100	99	99	99	94	87	106	BS 5228: Tab C.4 #7
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Welfare Subby	7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Mobile Crane	1	100	106	97	95	92	90	85	77	68	95	BS 5228: Tab C.4 #46
			MEWP/Cherry Picker	1	100	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
			80kVa Generator (containerised)	1	100	107	102	95	92	83	79	73	68	93	BS 5228: Tab C.6 #39
	General Civil Works	Groundworks / Pipe Laying	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Welding set & Generator	1	100	103	100	95	96	98	94	90	88	101	BS 5228: Tab C.3 #32
		Earthworks	30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			Moxy Mt 31 articulated dumper	1	100	112	112	109	107	104	101	97	92	109	BS 5228: Tab C.8 #16
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Piling Works	30t Excavator with MOVAX	1	100	108	115	116	112	111	106	102	93	115	BS 5228: Tab C.3 #2

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k		
		Formwork Reinforced Concrete (FRC) / Precast Works	impact hammer attachment												
			30t Excavator with MOVAX vibro hammer attachment	1	100	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8
			Concrete Wagon (7m ³)	1	100	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
			Static Concrete Pump	1	100	110	110	100	99	97	96	90	82	103	BS 5228: Tab C.3 #26
			Vibrating Concrete Poker	1	100	90	98	98	92	90	89	87	84	97	BS 5228: Tab C.4 #34
			30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Crawler Crane	1	100	109	105	97	95	90	88	89	79	98	BS 5228: Tab C.3 #29
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Static grout mixer/pump	1	100	115	115	105	104	102	101	95	87	108	Overall sound power level from BS 5228: Tab D.5 #49. Spectrum from BS 5228: Tab C.3 #26
	MEICA Fit Out	MEICA Teams	100t Mobile Crane	1	100	101	99	96	98	94	91	82	77	99	BS 5228: Tab C.4 #41
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Concrete Corer	1	100	103	102	103	100	102	103	108	108	113	BS 5228: Tab C.4 #69
			SDS Drill	1	100	90	89	90	87	89	90	95	95	100	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.4 #69
	Reinstatement	Earthworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			5t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
			13t Excavator	1	100	112	102	99	99	96	94	89	83	102	BS 5228: Tab C.6 #12

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference	
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k			
		Planting Subby	Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26	
			7m Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54	
			Ardent Handler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54	
	Dry & Wet Testing	MEICA Teams	Static Water Pump	1	100	101	96	90	90	89	84	81	69	93	BS 5228: Tab C.2 #45	
			10,000l Water Tanker (HGV)	1	100	109	110	95	100	99	102	101	94	107	BS 5228: Tab C.4 #89	
Trenchless Crossings	Drive & Reception Pits	Piling Works	30t excavator with MOVAX impact hammer attachment	1	100	108	115	116	112	111	106	102	93	115	BS 5228: Tab C.3 #2	
			30t excavator with MOVAX vibro hammer attachment	1	100	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8	
		Groundworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10	
			5t Dumper	1	100	118	114	100	99	99	99	94	87	106	BS 5228: Tab C.4 #7	
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21	
		Pipe Jack	Trenchless Crossing Subby	Hydraulic powerpack	1	100	105	100	101	97	96	94	92	88	102	BS 5228: Tab C.1 #8
	Hydraulic Ram			1	100	111	111	109	102	101	104	106	105	111	BS 5228: Tab C.1 #6	
	7m telehandler			1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54	
	50t Crawler Crane			1	100	109	105	97	95	90	88	89	79	98	BS 5228: Tab C.3 #29	
	Outfall	Site Establishment	Veg Clearance	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
				Chipper	1	100	112	112	110	113	116	115	111	105	121	From HSE research report RR618 for Chipper C Trimmed hardwood
				Chainsaw	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
Strimmer				1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73	
Groundworks			20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10	

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k		
		Welfare Subby	9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Mobile Crane	1	100	106	97	95	92	90	85	77	68	95	BS 5228: Tab C.4 #46
			MEWP/Cherry Picker	1	100	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
			80kVa Generator (containerised)	1	100	107	102	95	92	83	79	73	68	93	BS 5228: Tab C.6 #39
	General Civil Works	Groundworks / Pipe Laying	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Welding set & Generator	1	100	103	100	95	96	98	94	90	88	101	BS 5228: Tab C.3 #32
		Earthworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Piling Works	30t excavator with MOVAX impact hammer attachment	1	100	108	115	116	112	111	106	102	93	115	BS 5228: Tab C.3 #2
			30t excavator with MOVAX vibro hammer attachment	1	100	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8
		Formwork Reinforced Concrete (FRC)	Concrete Wagon (7m3)	1	100	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
			Static Concrete Pump	1	100	110	110	100	99	97	96	90	82	103	BS 5228: Tab C.3 #26
			Vibrating Concrete Poker	1	100	90	98	98	92	90	89	87	84	97	BS 5228: Tab C.4 #34
			20t excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Crawler Crane	1	100	109	105	97	95	90	88	89	79	98	BS 5228: Tab C.3 #29
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26

Work Package Breakdown Structure			Typical Plant / Equipment	No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams				63	125	250	500	1k	2k	4k	8k		
			Static grout mixer/pump	1	100	115	115	105	104	102	101	95	87	108	Overall sound power level from BS 5228: Tab D.5 #49. Spectrum from BS 5228: Tab C.3 #26
	MEICA Fit Out	MEICA Teams	100t Mobile Crane	1	100	101	99	96	98	94	91	82	77	99	BS 5228: Tab C.4 #41
			7m Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Concrete Corer	1	100	103	102	103	100	102	103	108	108	113	BS 5228: Tab C.4 #69
			SDS Drill	1	100	90	89	90	87	89	90	95	95	100	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.4 #69
	Reinstatement	Earthworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Planting Subby	13t Excavator	1	100	112	102	99	99	96	94	89	83	102	BS 5228: Tab C.6 #12
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Ardent Handler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Commissioning	MEICA Teams	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Notes and Assumptions:

- WBS based on indicative construction programme ('Construction Schedule-Minworth 115MLD V3') – Note: Developed construction programme required for full EIA assessments and DCO application;
- Content of above table based on construction of GUC elements of pipeline and treatment plant only (115mld);
- Typical plant, equipment and activities are based on previous experience; and
- Information contained in the above table is based on ongoing design work ahead of Gate 3 submission.

Table 2: Part 2 – Indicative Construction Phase Plant List

Work Package Breakdown Structure			No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
Pipelines and Weirs	Construction of Pipelines, Intake and Discharge Weirs, construction and excavation of intake and discharge structures	Pile driving rig (crane or leader rig)	1	30	96	88	87	85	79	78	73	72	87	BS 5228: Tab C.3 #11
		Vibratory hammer	1	30	101	93	93	92	98	100	100	96	105	BS 5228: Tab C.3 #4
		Impact hammer	1	30	107	93	88	87	94	91	81	74	97	BS 5228: Tab C.3 #5
		Hydraulic press-in machine	1	30	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8
		Excavators	2	60	123	112	107	101	98	96	92	85	105	BS 5228: Tab C.2 #19
		Mobile Crane	1	60	109	105	94	90	87	85	79	74	95	BS 5228: Tab C.3 #28
		Pump sets (submersible)	2	100	109	101	85	84	80	77	77	70	90	BS 5228: Tab C.8 #23
		Pump sets (centrifugal)	2	100	103	103	90	86	83	82	76	68	91	BS 5228: Tab C.3 #13
		Generators	2	100	97	97	95	88	87	88	84	81	94	BS 5228: Tab C.4 #85
		Barges or Pontoon platforms	2	60	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
		Survey equipment	1	100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
		Welding and cutting equipment	1	30	95	96	97	96	97	94	89	84	101	BS 5228: Tab C.3 #31
		Compactors and rollers	2	60	109	104	100	101	100	100	96	91	106	BS 5228: Tab C.2 #42
		Settlement tanks	2	100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
		Filtration units	2	100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
		Working platforms	2	60	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
		Lighting towers	2	60	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
Pumping Station	Construction of pumping station wet well Construction of pumping station wet well	Crane	1	60	109	105	94	90	87	85	79	74	95	BS 5228: Tab C.3 #28
		Excavator 20-25t with Clamshell/Grab bucket attachment	1	60	123	112	107	101	98	96	92	85	105	BS 5228: Tab C.2 #19
		Concrete mixer	1	60	89	93	86	86	85	81	79	77	89	BS 5228: Tab C.4 #23
		Concrete pump	1	60	112	104	98	99	101	101	94	86	106	BS 5228: Tab C.3 #25
		Dewatering pump	3	60	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
		Power generator	1	60	98	90	90	85	81	80	76	69	88	BS 5228: Tab C.4 #77
		Winch/hoist	1	60	92	92	93	93	91	89	87	80	96	BS 5228: Tab C.4 #61
		Site lighting and ventilation	3	60	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87

Work Package Breakdown Structure			No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
Pumping Station		Dump truck	2	60	103	101	103	100	96	93	89	84	102	Measured overall sound power level. Spectrum from C.6 #17
		Water pumps	2	60	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
		Hand tools	2	60	94	94	96	96	91	85	83	79	97	BS 5228: Tab C.1 #19
		Safety equipment	1	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
	Construction of pumping station wet well - Access Road	Excavator	1	60	123	112	107	101	98	96	92	85	105	BS 5228: Tab C.2 #19
		Compactor/roller	1	60	109	104	100	101	100	100	96	91	106	BS 5228: Tab C.2 #42
		Dump truck	2	60	103	101	103	100	96	93	89	84	102	Measured overall sound power level. Spectrum from C.6 #17
		Grader	1	60	111	100	102	99	98	104	88	82	107	Overall A-weighted sound power level from manufacturers. Spectrum from BS 5228: Tab C.2 #12
	Construction of pumping station control building	Excavator	1	60	123	112	107	101	98	96	92	85	105	BS 5228: Tab C.2 #19
		Tipper truck	1	60	103	101	103	100	96	93	89	84	102	Measured overall sound power level. Spectrum from C.6 #17
		Plate compactor	1	60	98	102	99	106	102	103	91	86	108	BS 5228: Tab C.2 #41
		Concrete mixer	1	60	89	93	86	86	85	81	79	77	89	BS 5228: Tab C.4 #23
		Concrete vibrator	1	60	110	108	108	101	97	100	98	93	106	BS 5228: Tab C.4 #33
		Water pump	1	60	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
		Manual equipment (roof and superstructure)	1	30	94	94	96	96	91	85	83	79	97	BS 5228: Tab C.1 #19
		Portable generator	1	100	98	90	90	85	81	80	76	69	88	BS 5228: Tab C.4 #77
		Lighting equipment	3	60	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
Bridge 88	Earthworks and Site preparation	Excavator	1	100	104	101	90	94	90	87	82	77	96	BS 5228: Tab C.3 #20
		dump truck 5t	1	100	112	109	102	101	100	96	89	81	104	BS 5228: Tab C.4 #3
		plate compactor	1	100	98	102	99	106	102	103	91	86	108	BS 5228: Tab C.2 #41
		chain saw	1	10	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
	Concrete and Foundation Works	concrete mixer	1	50	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
		vibrator	1	100	110	108	108	101	97	100	98	93	106	BS 5228: Tab C.4 #33
		water pump	1	100	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46

Work Package Breakdown Structure			No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
Notes and Assumptions: a. Typical plant, equipment and activities are based on previous experience; and b. Information contained in the above table is based on ongoing design work ahead of Gate 3 submission.														

Table 3: Part 3 – Indicative Construction Phase Plant List

Work Package Breakdown Structure		No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
Refill Pipeline and Structures for Filling the Drayton Reservoir	13t Excavator	1	100	105	93	95	95	91	89	85	75	97	BS 5228: Tab C.2 #25
	1.5-58t Mini Excavator	1	100	115	107	104	98	96	92	85	76	102	BS 5228: Tab C.4 #67
	Dump Truck	1	100	110	108	108	101	97	100	98	93	106	BS 5228: Tab C.4 #33
	Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Compactor	1	100	109	104	100	101	100	100	96	91	106	BS 5228: Tab C.2 #42
	Concrete Mixer	1	100	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
	Diesel Water Pump	1	100	109	99	95	90	93	93	91	87	99	BS 5228: Tab C.11 #2
	Hydraulic Trench Boxes	1	100	103	112	106	102	98	96	92	89	105	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.2 #2
Refill Pipeline and Structures for Filling the Daventry Reservoir	13t Excavator	1	100	105	93	95	95	91	89	85	75	97	BS 5228: Tab C.2 #25
	1.5-58t Mini Excavator	1	100	115	107	104	98	96	92	85	76	102	BS 5228: Tab C.4 #67
	Dump Truck	1	100	110	108	108	101	97	100	98	93	106	BS 5228: Tab C.4 #33
	Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Compactor	1	100	109	104	100	101	100	100	96	91	106	BS 5228: Tab C.2 #42
	Concrete Mixer	1	100	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
	Diesel Water Pump	1	100	109	99	95	90	93	93	91	87	99	BS 5228: Tab C.11 #2
	Hydraulic Trench Boxes	1	100	103	112	106	102	98	96	92	89	105	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.2 #2
Drayton Discharge (Siphon) Modifications	Excavator	1	100	105	93	95	95	91	89	85	75	97	BS 5228: Tab C.2 #25
	Trench Shoring Equipment	1	100	103	112	106	102	98	96	92	89	105	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.2 #2
	Dump Trucks	1	100	110	108	108	101	97	100	98	93	106	BS 5228: Tab C.4 #33
	Mobile Crane	1	100	108	100	99	95	93	90	85	77	98	BS 5228: Tab C.3 #30

Work Package Breakdown Structure		No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
	HDPE Pipe Fusion Welding Machine	1	100	110	106	110	109	109	106	100	92	113	113 dB LwA measured. Spectrum from BS 5228: Tab C.1 #10
	Concrete Mixer	1	100	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
	Plate/Roller Compactor	1	100	109	104	100	101	100	100	96	91	106	BS 5228: Tab C.2 #42
	Dewatering Pumps	1	100	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
Daventry Outlet and Discharge Channel	30t Excavator	2	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
	Long Reach Excavator	1	100	102	111	104	103	98	99	91	85	106	BS 5228: Tab C.7 #1
	50t Mobile Crane	1	100	108	100	99	95	93	90	85	77	98	BS 5228: Tab C.3 #30
	Sheet Piling Rigs	2	100	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8
	Dewatering Pumps	2	100	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
	Dump Trucks	6	100	110	108	108	101	97	100	98	93	106	BS 5228: Tab C.4 #33
	Tekehandler	2	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Plate/Roller Compactor	2	100	109	104	100	101	100	100	96	91	106	BS 5228: Tab C.2 #42
	Concrete Pumps and Truck Mixers	1	100	111	109	106	107	105	102	99	94	110	BS 5228: Tab C.4 #25
	Site Generators	2	100	98	90	90	85	81	80	76	69	88	BS 5228: Tab C.4 #77
	Lighting Towers	4	100	105	100	92	88	87	85	82	70	93	BS 5228: Tab C.4 #87
GUC Pipeline Pipeline Earthworks	30t excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
	9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
	20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
GUC Pipeline Pipeline Groundworks / Pipe Laying	30t excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
	7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
	Welding set & Generator	1	100	103	100	95	96	98	94	90	88	101	BS 5228: Tab C.3 #32
Notes and Assumptions:													
a. Typical plant, equipment and activities are based on previous experience; and b. Information contained in the above table is based on ongoing design work ahead of Gate 3 submission.													

Table 4: Part 4a – Indicative Construction Phase Plant List

Work Package Breakdown Structure			No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
Treatment Work	Earthworks and Site Preparation	Excavators	6	60	106	98	100	96	95	94	101	93	104	BS 5228: Tab C.2 #5
		Bulldozer	2	60	107	105	104	102	96	95	88	87	103	BS 5228: Tab C.2 #1
		Dump Trucks	10	60	108	104	101	98	97	94	91	86	102	BS 5228: Tab C.2 #32
		Rollers	3	60	108	103	105	100	95	90	82	74	101	BS 5228: Tab C.2 #38
	Concrete and Foundation Works	Concrete Mixers	3	60	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
		Concrete Pumps	2	60	107	108	101	100	97	96	87	81	103	BS 5228: Tab C.4 #28
		Formwork and Scaffolding Systems	0	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
		Electric Drill	6	60	90	89	90	87	89	90	95	95	100	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.4 #69
	Mechanical Electrical and Process Installation	Welding Machines	10	60	95	96	97	96	97	94	89	84	101	BS 5228: Tab C.3 #31
		Dewatering Pumps	3	60	103	102	88	82	82	81	76	74	90	BS 5228: Tab C.2 #46
		Generators	4	100	98	90	90	85	81	80	76	69	88	BS 5228: Tab C.4 #77
		Pipelaying and Alignment Tools	6	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
	Material Handling and Site Logistics	Telehandlers	4	60	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
		Forklifts	3	60	113	107	97	95	92	90	84	75	99	Overall A-weighted sound power level from manufacturer. Spectrum from C.2 #35
		Pallet Jacks	10	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
	Survey and Finishing	Laser Levels	3	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
		Hand Tools	12	60	94	94	96	96	91	85	83	79	97	BS 5228: Tab C.1 #19
		Power Tools	12	60	83	82	83	80	82	83	88	88	93	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.4 #69
	Structural Steel and Superstructure Assembly	Mobile Cranes	4	60	108	104	99	91	92	91	84	78	98	BS 5228: Tab C.4 #43
		Tower Cranes	2	60	110	105	108	104	94	94	84	78	104	BS 5228: Tab C.4 #48
		MEWP	12	60	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
Storage Pond	Site setup / Excavation and spoil storage / Spoil management /	Excavators	6	60	106	98	100	96	95	94	101	93	104	BS 5228: Tab C.2 #5

Work Package Breakdown Structure			No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
	Embankment construction													
	Site setup / Excavation and spoil storage / Spoil management / Embankment construction	Articulated Dump Trucks	12	60	108	104	101	98	97	94	91	86	102	BS 5228: Tab C.2 #32
		Bulldozer	3	60	107	105	104	102	96	95	88	87	103	BS 5228: Tab C.2 #1
		Padfoot Rollers	3	60	108	106	102	99	96	96	89	85	103	Overall A-weighted sound power level from manufacturer. Spectrum from BS 5228: Tab C.5 #28
		Motor Graders	2	60	116	115	111	107	112	106	102	93	114	BS 5228: Tab C.6 #31
		Water Bowsers	2	60	106	114	112	106	106	105	98	97	111	BS 5228: Tab C.6 #38
		Front-End Loaders	3	60	110	110	99	101	97	95	94	86	104	BS 5228: Tab C.6 #34
		Low Loaders	2	60	101	106	106	106	102	101	96	94	108	BS 5228: Tab C.2 #34
		Survey Equipment	1	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
		Site Support Vehicles	4	60	101	106	106	106	102	101	96	94	108	BS 5228: Tab C.2 #34
Notes and Assumptions: a. Typical plant, equipment and activities are based on previous experience; and b. Information contained in the above table is based on ongoing design work ahead of Gate 3 submission.														

Table 5: Part 4b – Indicative Construction Phase Plant List

Work Package Breakdown Structure				No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
Enabling Works	Site Establishment (Main Compound)	Veg Clearance	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			Chipper	1	100	112	112	110	113	116	115	111	105	121	From HSE research report RR618 for Chipper C Trimmed hardwood
			Chainsaw	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
			Strimmer	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
		Groundworks	20-30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18

Work Package Breakdown Structure				No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
		Welfare Subby	9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Mobile Crane	1	100	106	97	95	92	90	85	77	68	95	BS 5228: Tab C.4 #46
			MEWP/Cherry Picker	1	100	106	104	90	91	88	87	86	77	95	BS 5228: Tab C.4 #57
			80kVa Generator (containerised)	1	100	107	102	95	92	83	79	73	68	93	BS 5228: Tab C.6 #39
	Advanced Archaeological Works	Groundworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			5t Dumper	1	100	118	114	100	99	99	99	94	87	106	BS 5228: Tab C.4 #7
		Specialist Survey	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Environmental Mitigation	Planting Subby	13t Excavator	1	100	112	102	99	99	96	94	89	83	102	BS 5228: Tab C.6 #12
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			7m Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Ardent Handler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
	Fencing	Fencing Subby	5t Excavator	1	100	99	99	94	87	87	86	82	76	93	BS 5228: Tab C.4 #68
			Concrete Mixer	1	100	111	102	94	97	98	106	88	83	108	BS 5228: Tab C.4 #20
GUC Pipeline	Establish Site Compound, Access Routes & Working Corridor	Veg Clearance	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			Chipper	1	100	112	112	110	113	116	115	111	105	121	From HSE research report RR618 for Chipper C Trimmed hardwood
			Chainsaw	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
			Strimmer	1	100	95	112	104	103	103	105	109	108	114	Overall sound power level from BS 5228: Tab D.2 #14. Spectrum from BS 5228: Tab C.4 #73
		Groundworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			5t Dumper	1	100	118	114	100	99	99	99	94	87	106	BS 5228: Tab C.4 #7
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21

Work Package Breakdown Structure				No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
GUC Pipeline	Establish Site Compound, Access Routes & Working Corridor	Welfare Subby	7m Telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Mobile Crane	1	100	106	97	95	92	90	85	77	68	95	BS 5228: Tab C.4 #46
			20kVA Generator (containerised)	1	100	107	102	95	92	83	79	73	68	93	BS 5228: Tab C.6 #39
	Pipeline	Earthworks	30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			9t Dumper	1	100	110	104	103	102	96	96	92	83	104	BS 5228: Tab C.4 #4
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
		Groundworks / Pipe Laying	30t Excavator	1	100	104	107	103	103	104	101	98	93	108	BS 5228: Tab C.5 #18
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			Articulated flatbed lorry (HGV)	1	100	116	112	103	101	103	100	96	88	107	BS 5228: Tab C.6 #26
			Welding set & Generator	1	100	103	100	95	96	98	94	90	88	101	BS 5228: Tab C.3 #32
Trenchless Crossings	Drive & Reception Pits	Piling Works	30t excavator with MOVAX impact hammer attachment	1	100	108	115	116	112	111	106	102	93	115	BS 5228: Tab C.3 #2
			30t excavator with MOVAX vibro hammer attachment	1	100	111	110	107	110	112	110	105	95	116	BS 5228: Tab C.3 #8
		Groundworks	20t Excavator	1	100	111	107	106	104	102	99	93	88	107	BS 5228: Tab C.6 #10
			5t Dumper	1	100	118	114	100	99	99	99	94	87	106	BS 5228: Tab C.4 #7
			20t Wagon (HGV)	1	100	110	112	106	103	99	98	93	87	106	BS 5228: Tab C.8 #21
	Pipe Jack	Trenchless Crossing Subby	Hydraulic powerpack	1	100	105	100	101	97	96	94	92	88	102	BS 5228: Tab C.1 #8
			Hydraulic Ram	1	100	111	111	109	102	101	104	106	105	111	BS 5228: Tab C.1 #6
			7m telehandler	1	100	107	101	94	93	106	94	82	75	107	BS 5228: Tab C.4 #54
			50t Crawler Crane	1	100	109	105	97	95	90	88	89	79	98	BS 5228: Tab C.3 #29

Work Package Breakdown Structure				No.	% on-time	Unweighted Octave Band Sound Power Level [Lw dB]								Overall Sound Power Level [LwA dB]	Reference
Element	Task	Construction Teams	Typical Plant / Equipment			63	125	250	500	1k	2k	4k	8k		
Notes and Assumptions: a. WBS based on indicative construction programme ('Construction Schedule-Minworth 115MLD V3') – Note: Developed construction; b. programme required for full EIA assessments and DCO application; c. Content of above table based on construction of GUC elements of pipeline and treatment plant only (115mld); d. Typical plant, equipment and activities are based on previous experience; and e. Information contained in the above table is based on ongoing design work ahead of Gate 3 submission.															