



## **Birmingham Resilience Project**

Severn Trent Water Ltd

### **Utilities Statement**

January 2016



## Birmingham Resilience Project (BRP)

Project no: B1958935  
Document title: Utilities Statement  
Document No.: A5W11215 – PW31780  
Revision: Revision 0  
Date: 15<sup>th</sup> January 2016  
Client name: Severn Trent Water Ltd  
Client no: A5W-11251  
Project manager: Gearoid Cox  
Manager: Jeremy Osborne  
Author: Jeremy Osborne  
File name:

### Laing O'Rourke

BRP | 2800 The Crescent Birmingham Business Park | B37 7YL

Laing O'Rourke | Bridge Place 1 | Anchor Boulevard | Crossways | Dartford | Kent | DA2 6SN  
[www.laingorourke.com](http://www.laingorourke.com)

Limitation: This report has been prepared on behalf of, and for the exclusive use of Severn Trent Water, and is subject to, and issued in accordance with, the provisions of the contract between LORI and the STW. LORI or its partner companies accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

## Contents

### Contents

<b>1.</b>	<b>Introduction.....</b>	<b>1</b>
<b>2.</b>	<b>Utility Requirements: Permanent Operation .....</b>	<b>2</b>
2.1	Intake Structure .....	2
2.2	Intake Pumping Station .....	2
2.3	Break Pressure Tank .....	3
2.4	Raw Water Pipeline .....	4
2.5	Frankley Water Treatment Works .....	4
<b>3.</b>	<b>Utility Requirements: Construction Phase .....</b>	<b>6</b>
3.1	Intake Structure & Pumping Station .....	6
3.2	Break Pressure Tank .....	6
3.3	Raw Water Pipeline .....	7
3.4	Frankley Water Treatment Works .....	7
<b>4.</b>	<b>Interfaces with Utility Companies .....</b>	<b>9</b>
4.1	Introduction .....	9
4.2	Tables .....	9
	Appendices .....	10
A.	Record of interfaces with Utility Companies .....	11
B.	Agreed method of crossing and mitigation measures .....	19

## 1. Introduction

The Utility Statement is intended to provide information relating to the interfaces between the Birmingham Resilience Project (BRP) and the utility providers affected by the project as well as the impact of the project on provision of the utilities to the wider community. It is submitted by Severn Trent Water (STW) to support planning applications for the BRP.

The document is divided into three sections:

a) Utility requirements for the permanent works

This section aims to set out the needs of the permanent works for utilities and explain how these would be obtained. The section will explain what we have discussed and agreed with the utility providers and what plans they may have put into place to reinforce their system to accommodate the project needs.

b) Utility requirements for the construction phase

This section aims to explain what the utility requirements will be by the contractors undertaking the works and how these will be managed. The section will explain what we have discussed and agreed with the utility providers and what plans we will require the contractor to put in place to minimise disruption during construction.

c) Interfaces with utilities

This section aims to identify all the utilities that will be impacted during the construction of the project works. It will show what we have discussed and agreed with the utility provider to ensure protection of the utility, minimise the risk to damage of the utility and, where appropriate, what measures the utility provider plans to put in place to minimise the risk to disruption to the wider community.

Through this document we demonstrate that the project has ensured that all utility requirements have been identified, examined and provision made to minimise disruption to the community, risk of damage to the utility and that, where necessary, plans are in place to reinforce the utility network.

The potential environmental impact of the provision of utilities (e.g. excavations in the vicinity of trees or archaeological remains) is addressed in the Environmental Statement where relevant.

## 2. Utility Requirements: Permanent Operation

### 2.1 Intake Structure

The river intake structure is located adjacent to the River Severn near to the Severn Bank Park and relatively remote from public highways. It is connected to the pumping station with a short section of pipeline allowing River Severn water to flow to the wet well of the pumps. Between the two structures there will be a sampling point to allow water quality to be sampled and assessed prior to pumping to Frankley Water Treatment Works (WTW) being commenced.

All facilities required for the intake structure and the kiosk will be provided directly from the pumping station with no external connections necessary.

### 2.2 Intake Pumping Station

The intake pumping station, known as the river intake pumping station (RIPS) is the major consumer of utilities on the raw water side of the project requiring both a new power supply and a new potable water supply.

#### 2.2.1 Power

The RIPS requires 7.5MVA dual, redundant supply (that is two separate power supplies which can provide all the power necessary as independent sources). Discussions with Western Power Distribution (WPD) have been concluded and a plan to provide this power to the RIPS has been agreed. The power supply will be provided under a separate consenting process so will not form part of the planning applications for the BRP.

WPD have agreed to provide new buried cables to the RIPS together with localised network reinforcement at the Stourport primary substation. This scheme will require WPD to cross the River Stour with the new cables using an additional crossing location to the one they currently use.

#### 2.2.2 Telecoms

Communications between the RIPS (and the associated intake structure and sampling kiosk) and the Frankley WTW control centre will be managed via the STW dedicated fibre optic cables being installed within the pipeline easement. As an emergency back up a Public Switched Data Network (PSDN) connection will be required and no issues are foreseen with this provision.

#### 2.2.3 Water

The RIPS will require an initial input of potable water to provide cooling to the large pumps during operation. This will be to charge a closed loop cooling system which will have no further input or drainage requirement under normal circumstances. The system will require a facility for re-charging to maintain pressure and for drainage at time of shut down for maintenance.

In addition the RIPS proposals include a mess facility and toilet block which will also require a potable water feed.

To satisfy this water requirement a new dedicated main will be required to be laid along the raw water pipeline easement from Bewdley Road North.

A completed potable water application has been submitted to STW New Connections.

#### 2.2.4 Drainage

Drainage is considered as foul drainage and surface water management. Below is a summary of our approach with further details to be found in the Flood Risk Assessment (FRA) documents accompanying the planning application.

#### a) Foul Drainage

Our design allows for foul drainage from the mess and toilet facility as well as drain down from the raw water pumps cooling system at times of shut down for maintenance.

Foul drainage will be managed via an onsite cess pit which will be periodically emptied by a STW tanker for disposal at a STW wastewater treatment plant. Cooling water drained will be discharged to the cess pit with the foul drainage.

#### b) Surface Water Management

The scheme will capture all surface water by way of trapped gullies feeding into an attenuation tank, the overall size of which has been calculated to accommodate the storm water from a 1 in 100 year storm event including an allowance for climate change. The outlet from the tank will be restricted to a discharge rate, to be agreed with the Environment Agency, to simulate an equivalent green field run off rate which will discharge to an existing ditch on the site. This ditch, which ultimately drains to the River Severn, offers a degree of further attenuation and sediment capture. The trapped gullies are designed to retain small amount of silt and oils which will be recovered via a gulley sucker at periodic intervals.

The re-use of rainwater as “grey water” for toilet flushing and site wash down use will be considered during the detailed design stage.

## 2.3 Break Pressure Tank

The break pressure tank (BPT) is located roughly two thirds along the length of the pipeline near Romsley in an elevated position and in a rural location where utilities are sparsely located. The facility has a low level of power demand and will be occasionally manned leading to minimum requirements for other utilities.

### 2.3.1 Power

The power demand of the BPT is estimated to be 125KVA and will be provided as a single source supply. The requirement is mainly to support the powdered activated carbon (PAC) dosing unit and as such, should a power outage be experienced, mobile temporary power generation can be quickly and easily provided from STW locations with minimal impact on its operation. The power supply will be provided from a nearby pole mounted transformer and WPD have confirmed the availability of this power requirement. This power requirement also includes provision for the site lighting.

### 2.3.2 Telecoms

Communications between the BPT and the Frankley WTW control centre will be managed via the STW dedicated fibre optic cables being installed within the pipeline easement. As an emergency back up a PSDN connection will be required and no issues are foreseen with this provision.

### 2.3.3 Water

There will be a requirement to provide potable water to the BPT to service the PAC unit as well as the site emergency shower and the mess facility made available for occasional use.

To satisfy this water requirement a new dedicated main will be required to be laid along the raw water pipeline easement from Bromsgrove Road. A completed potable water application has been submitted to STW New Connections.

### 2.3.4 Drainage

Drainage is considered as foul drainage and surface water management. Below is a summary of our approach with further details to be found in the FRA documents accompanying the planning application.

#### a) Foul Drainage

From the mess and toilet facility, the emergency shower and the bunded area around the PAC dosing unit will be drained to an onsite cess pit which will be periodically emptied by a STW tanker for disposal at an appropriate STW wastewater treatment plant.

#### b) Surface Water Management

This includes rainfall from the roofs, hardstandings and access roads of the development. These flows will drain into a purpose built attenuation tank, the overall size of the has been calculated to accommodate the storm water from a 1 in 100 year storm event including an allowance for climate change. Further site investigation during detailed design may enable the holding tank to be converted to a site soak-away should ground conditions prove to be favourable for this. The outlet from the tank will be restricted to a discharge rate, to be agreed with the Environment Agency, to simulate an equivalent green field run off rate. The drainage from the site is connected to the pipeline washout valve drain pipe on the west site of Bromsgrove road.

## 2.4 Raw Water Pipeline

The raw water pipeline has very little requirement for utility provision. The pipeline is composed of a pipe, isolation valves, washouts and air valves. It is not expected that any of these will require any power or telecoms input.

Washout valves will be installed at low areas along the pipeline to allow for final draining of residual water at times of access for maintenance. A few of these locations will require drainage to a local watercourse.

Any telecoms will be to provide open or closed signals to the Frankley WTW control room and would be provided via the STW fibre optic line installed alongside the pipeline itself.

## 2.5 Frankley Water Treatment Works

### 2.5.1 Power

Frankley Water Treatment Works (WTW) is an existing WTW in the STW system which has an agreed Authorised Supply Capacity (ASC) with WPD. Current operations of the plant do not reach this ASC either in average load or maximum load; however the spare capacity in the ASC is not sufficient to provide for the proposed works which will increase the required ASC to 5MVA.

WPD have agreed to provide this required ASC through a combination of cable upgrading and switching at the transformer stations to their network.

### 2.5.2 Telecoms

There are no requirements for additional telecoms provision to the new works at Frankley WTW.

### 2.5.3 Water

All water requirements will be met from within the WTW site from the water treatment process with no impact on water supply.

### 2.5.4 Drainage

Drainage is considered as foul drainage and surface water management. Below is a summary of our approach with further details to be found in the FRA documents accompanying the planning application.

#### a) Foul Drainage

Foul drainage will be collected from:

- Centrate flow from the centrifuges when Frankley WTW is fed by River Severn water (4% of the time).
- Partially thickened sludge from the thickeners when Frankley WTW is fed from the Elan Valley Aqueduct (96% of the time).
- Drainage within the confines of the covered cake export apron (sludge leachate).
- 'Sleeping policeman' bund area adjacent to the sludge treatment area<sup>1</sup>.
- Centrifuge area wash down.
- Water quality monitoring points where the instruments use added chemicals to indicate quality and which cannot be recycled back into the process.
- Welfare facilities.

The foul flows will be discharged into the existing public sewer system for transfer to and treatment at Minworth Wastewater Treatment Works (WwTW).

When Frankley WTW is operating on River Severn source water only, the volume of foul flow to be discharged from the new process areas will be lower than the equivalent flow volumes from the existing Dissolved Air Flootation (DAF) process streams. With the DAF process suspended during the river mode, there will therefore be sufficient capacity within the existing consent for the foul discharge from the new process without any further work.

When Frankley WTW is operating on Elan Valley Aqueduct source water, the new process will include plant to partially thicken the sludge to reduce the total overall foul volumes to be discharged to sewer compared to the current discharge volumes which will improve the current position.

#### b) Surface Water Management

Surface water from the southwest side of the site is currently discharged into a culverted stream crossing the site to an outfall into Merritts Brook.

The new site arrangement will include a surface water pipe network to collect rainfall from the roofs, hardstandings and access roads of the development. These flows will discharge into a purpose built attenuation tank. The overall size of the attenuation tank has been calculated to accommodate the storm water from a 1 in 100 year storm event including an allowance for climate change. The outlet from the tank will be restricted to a discharge rate, to be agreed with the Environment Agency, to simulate an equivalent green field run off rate. The returned storm flows will discharge via an oil/water/solids interceptor tank system through the existing culvert to outfall into Merritts Brook.

<sup>1</sup> Sleeping policeman delivery bund areas are for locating vehicles (e.g. tanker delivery or sludge wagon removal) and isolating sections of the road drainage system. There is an interlocked 3-way valve system which is normally open to the surface water system. When a vehicle is parked for offloading / loading, the 3-way valve is turned to divert any spillages within the sleeping policeman bund to either a buried blind tank (for tanker disposal) or the foul sewer.

## 3. Utility Requirements: Construction Phase

### 3.1 Intake Structure & Pumping Station

The site establishment at Lickhill will serve the intake structure and the pumping station construction as well as the pipeline installation activities in the local area. The construction establishment will consist of a site office and welfare facility as well as parking and space for some stores and equipment. Temporary connections to the utility systems will be arranged by the contractor at an appropriate time unless noted below.

#### 3.1.1 Power

The site cabins and welfare facilities will be provided by Select Plant Hire who will make all the necessary provisions with WPD to connect the site establishment to the available power system.

#### 3.1.2 Telecoms

In addition to the use of mobile phones for all staff, the fixed offices will be connected to the telephone network for both voice and data (broadband) facilities. These will be provided by connection to the existing infrastructure.

#### 3.1.3 Water

Potable water will be required to service the welfare aspects of the site establishment and will be provided by direct connection to the STW local water main.

#### 3.1.4 Drainage

Waste water will be captured in a suitably sized tank installed for this purpose. Site operating procedures require that the tank is monitored and regularly emptied. The tank will be removed from the site when the project is complete.

Surface water will be captured and managed on the surface through soak-away within the project boundary.

### 3.2 Break Pressure Tank

The site establishment at the BPT at Romsley will serve the construction of the BPT as well as local pipeline installation activities. The construction establishment will consist of a site office and welfare facility as well as parking and space for some stores, pipes and equipment.

#### 3.2.1 Power

WPD have been contracted to provide a new power connection from the existing pole mounted transformer to the site for the permanent works and it is intend to utilise this supply for the temporary works also.

#### 3.2.2 Telecoms

Telecoms will be provided by connection to the existing infrastructure.

#### 3.2.3 Water

Potable water will be required to service the welfare aspects of the site establishment and will be provided by direct connection to the local STW local water main.

#### 3.2.4 Drainage

Waste water will be captured in a suitably sized tank installed for this purpose. Site operating procedures require that the tank is monitored and regularly emptied. The tank will be removed from the site when the project is complete.

Surface water will be captured and managed on the surface through soak-aways within the project boundary.

### 3.3 Raw Water Pipeline

Installation of the pipeline will be managed from a central site office and yard to be located in Stourport-on-Severn on a vacant industrial site, with satellite support from mobile units. Each tunnel location will also have a temporary facility to provide administration and welfare facilities.

Tunnel location facilities will be entirely self-contained with no connections to fixed utility services. The exception to this is for water arising from dewatering activities necessary to facilitate excavation of tunnel shafts. This is dealt with in 3.3.4 Drainage below.

A self contained, mobile canteen will be provided at discreet locations along the route selected to best serve the needs of the pipeline team at any given time. Mobile welfare (toilets etc) will be provided at the work location along the route.

#### 3.3.1 Power

Power to the offices and yard at Stourport-on-Severn will be provided by the existing power connection.

#### 3.3.2 Telecoms

In addition to the use of mobile phones for all staff, the fixed offices will be connected to the telephone network for both voice and data (broadband) facilities.

#### 3.3.3 Water

Potable water will be required to service the welfare aspects of the site establishment and will be provided by direct connection to the STW local water main.

#### 3.3.4 Drainage

Wastewater will be collected and discharged through the existing wastewater connection at the site.

### 3.4 Frankley Water Treatment Works

At the WTW the construction establishment will include a car park at the north entrance to the site with a shuttle bus to the main site establishment located within the boundary of the works itself. This location will include the site offices including a canteen and welfare facilities for the site management and design team which we expect to range from 50 to 80 individuals. During the peak of the construction activities we expect to reach about 300 workforce team members who will be catered for with separate welfare facilities.

#### 3.4.1 Power

The current plan for the establishment will require 200 Amps for the offices and 200 Amps for the workforce welfare and canteen.

Initially the site establishment will require 500KVA increasing to 700KVA at peak demand. This is to service the needs of three tower cranes and 300 operatives on site. We expect the demand to decrease back to 500KVA for the final stage of the construction work.

Our current proposal is to utilise the ASC (available supply capacity) required for the permanent works to provide the necessary power demand during construction. This depends on the ability of WPD to provide local primary feed reinforcement in the required timescales. Further power requirements will be met through the use of diesel generators if/as required.

### 3.4.2 Telecoms

The telephony and broadband requirements of the site establishment will be managed and provided through the supplier of the accommodation. We will provide telephone / broadband for 80 staff at the offices with a further 20 points at the welfare facility.

### 3.4.3 Water

Water provision to service the welfare and canteen facilities is estimated at 4.5m<sup>3</sup> per day which will be provided directly from the STW local water supply.

### 3.4.4 Drainage

The location of the site establishment has been used for a previous site base and is serviced by a 150mm outlet pipe running into a 225mm Combined Sewer Overflow. Our modelling indicates that this will not service our needs.

The site offices will utilise capacity in the foul drainage system made available following decommissioning of an existing large contractors accommodation site with no detriment to the existing system.

The welfare facilities for the 300 (at peak) workforce will be drained to a dedicated holding tank which will be emptied by tanker periodically and disposed of at a licenced facility. Our estimate used for construction planning is based on a figure of 100l/day per worker.

Surface water will be captured and managed on the surface through either soakaways within the site boundary or pumped, via treatment processes directly into Merritts Brook. There will be a requirement for a number of temporary discharge consents to Merritts brook during the construction process which will be managed by the construction contractor.

We are investigating the opportunity to incorporate a grey water system within the office and welfare establishments to capture rain water as well as water from showers hand wash basins and similar for use in toilet flushing and washdown facilities. This is aimed specifically at reducing the volume of water sent to waste across the site

## 4. Interfaces with Utility Companies

### 4.1 Introduction

The entire length of the pipeline route has been investigated, surveyed and plotted on our geographic information system “PMF”. This tool identifies every utility and other asset which is impacted during the installation of the pipeline system – which includes the pipeline, the intake structure, the pumping station, the break pressure tank as well as washout valves and drainage valves installed along the route.

The team has had extensive discussions with the affected utility companies and has agreed methods and mitigations to ensure that the impact on the utility asset and the continuance of performance of that asset is understood and minimised.

The tables in the Appendix A and B presents the pertinent information relating to each utility affected by the pipeline system together with the agreed method of crossing the utility and any specific requirements of the owner of the asset.

### 4.2 Tables

Refer to Appendices

Appendix A: Record of interfaces with Utility Companies

Appendix B: Agreed method of crossing and mitigation measures.

## Appendices

## A. Record of interfaces with Utility Companies

Utility / 3rd Party	Initial contact/ Last Contact	Current status	No.	Mitigation requirements and other provisions
National Grid - Electric transmission lines	27/11/2014 13/11/2015	Requirement to maintain 5.3m clearance only (email from Martin Sankey 13/11/15)	1	Plan and section drawings received from National Grid which include cross section of cable arrangement and anticipated swing.
			2	Goal posts', warning signs etc required. Safety procedures required where within 5.3m of outer cables (measures required to be agreed with National Grid)
			3	Only suitable plant e.g. those fitted with limiters to be used within arc range.
			4	Plant and vehicle movements along working width to be minimised / restricted
National Grid - Gas	27/11/2014 09/09/2015	Meeting held to review the proposed crossings of natural gas pipelines along the BRP pipeline scheme and agree requirements for permitting the crossings.	1	NG updated with latest crossing schedule for finalised route (low, medium & high pressure).
			2	Contractor planning trenchless crossings for all High Pressure (subject to agreement by National Grid) to minimise disruption and maximise programme - open cut involves hand dig within 3m of HP mains.
			3	Protective work over gas mains required where vehicles and plant will cross.
			4	The overflow/washout discharge point to the rear of Manchester Inn will require input from National Grid, in particular if a headwall

Utility / 3rd Party	Initial contact/ Last Contact	Current status	No.	Mitigation requirements and other provisions
		Awaiting confirmation that proposed crossings of High Pressure mains is acceptable and no welded joint X-Rays are required. Need to undertake trial holes to determine locations and submit settlement calcs.		is found to be required during detail design.
				HIGH PRESSURE GAS PIPE CROSSINGS
			HP1	All High Pressure gas lines affected by the scheme are welded steel pipes classed as P18. This means they were laid before 1972 and there is no information on the condition of the welds which are expected to be every 12meters. There is a crossing of the 36" pipeline which is not defined as P18.
			HP2	There is no information relating to the buried depth of the gas main. NG request that the Contractor undertake trial holes as soon as possible to determine the buried depth. This information will be required to carry out settlement calculations
			HP3	Trial holes on HP mains must be undertaken under NG supervision. Agreed that if excavations are carefully managed and expose just the top of the pipe then no pressure reduction will be required.
		HP4	Ordinarily National Grid require less than 10mm of settlement at the crossing as measured on the top of the pipe. Calculations to be submitted post trial holes (required to determine depth) & third party to check prior to approval.	

Utility / 3rd Party	Initial contact/ Last Contact	Current status	No.	Mitigation requirements and other provisions
			HP5	Alternatively the welds around the crossing point can be exposed and X-Rayed to determine the actual condition and a specific settlement limit determined for that crossing. Due to the need to reduce pressure in the pipe when it is exposed National Grid would only undertake X-Ray between April and September (winter period is high demand when pressures need to be kept high to maintain supply)
			HP6	NG ordinarily require the High pressure main is crossed at 90 degrees or as close to 90 degrees as possible. All crossings have been amended to be within NG tolerances for this.
			HP7	Note that access to UG1XA may be difficult due to the surrounding tenants. Review crossing location and consider access in method statement.
			HP8	Agreed that during the crossing the contractor would excavate a slip trench 3m away and parallel to the existing gas main at a depth of 600mm below the gas main invert (on the positive side of the crossing).
			HP9	National Grid will mark out the line of the assets affected.
			HP10	Any vehicle crossing of the pipeline will require approval from NG before it occurs. Most likely will require surface level reinforcement of some sort.
			<b>MEDIUM &amp; LOW PRESSURE PIPE CROSSINGS</b>	
			ML1	Medium and low pressure pipes are considered together by NG

Utility / 3rd Party	Initial contact/ Last Contact	Current status	No.	Mitigation requirements and other provisions
			ML2	There is no information relating to the buried depth of the gas main. NG request that the Contractor undertake trial holes as soon as possible to determine the buried depth (NG supervision not required). This information will be required to carry out settlement calculations.
			ML3	Allowable settlement on low and medium pressure mains is up to 30/ 40mm
			ML4	Contractor is required to provide method statement for trial holes to NG for approval prior to commencing
			ML5	Contractor to provide settlement calculations to one of the two approved firms for verification as before. Settlement calculations are not normally required for low and medium pressure mains
Western Power Distribution - Electricity	20/11/2014 27/10/15 (Bham SW) 24/11/15 (Bham SE) 07/01/16 (Tipton)	Pipeline covered by 3 offices – meetings held and agreements made for cable re-routing and isolation during construction. Final confirmation to follow once contract in place..	1	Plan and section drawings received from WPD which include cross section of cable arrangement and anticipated swing.
			2	Goal posts', warning signs etc required near overhead cables (distance dependent on voltage, height etc
			3	Only suitable plant e.g. those fitted with limitors to be used within arc range.
			4	Plant and vehicle movements along working width to be minimised / restricted
			5	Contractor to provide civil support for WPD where trenching required

Utility / 3rd Party	Initial contact/ Last Contact	Current status	No.	Mitigation requirements and other provisions
			6	WPD raise concerns over obtaining wayleaves where required. Include STW Land agents in these negotiations.
ES Pipelines (Gas) Supply to Severn Bank Park only)	17/11/2014 19/8/2015	Contact again once contract made, undertake trials holes and share method statements. See email 19/8/15	1	Trial hole required well in advance of works to confirm depth and precis location of gas main. The gas main should be located at around 750mm – 1000mm cover.
			2	Long sections, risk assessments and method statements to be submitted to ES for approval - recommendation is a minimum 500mm clearance between pipes (subject to trial hole results).
			3	During the crossing monitoring the process beneath the medium pressure PE gas main is paramount and the gas main be suitably exposed circumferentially at the crossing point to absolutely ensure that any vertical soil displacement is in 'free space' and that it exerts no stress on the gas main as it passes beneath.
			4	Reinstatement with compacted fine fill below, around and 200mm above, a layer of gas main warning tape applied, allowing for original surfaces to be finally reinstated will be adequate.
BT	19/08/2014	Record drawings obtained	1	Some diversions of OH cables have been identified where lines are too low or poles need to be moved to facilitate works
Virgin Media	19/08/2014	Updated record drawings requested to check finalised route.	1	All Virgin Media infrastructure along the route is underground and should not be affected by the works.
			2	VM is in or along highways where crossings are proposed as trenchless.
Severn Trent Water –	Throughout	Ongoing		No specific requirements.

Utility / 3rd Party	Initial contact/ Last Contact	Current status	No.	Mitigation requirements and other provisions
Wastewater				
Severn Trent Water - Water	Throughout	Ongoing Will cross strategic mains (including EVA and SVA) so specific concerns do need to be raised.		Some of the mains crossings will require Risk & Contingency documents to be produced. The R&C is then incorporated into a RAMS. The documents will need approval from Severn Trent Water Network Controllers before the work starts.
South Staffordshire Water - Water	May-15	Updated record drawings requested to check finalised route.		No specific requirements.
ESSO pipeline (via agent - Fisher German)	13/11/2014 07/10/15	Consent Permission form awaiting completion once trial holes to locate pipeline completed. Continuing dialogue through FG.	1	Fisher German updated with confirmed crossing point and information on proposal to use trenchless technology. Trial holes for condition survey a likely requirement prior to approval.
			2	Contractor planning trenchless crossings (subject to agreement by Fisher German) to minimise disruption and maximise programme - open cut involves hand dig near ESSO pipeline.
			3	Two slit trenches to depth 600mm below ESSO pipeline required to prove the trenchless crossing technique from shot side is in the right location.
			4	Protective work over ESSO pipeline required where vehicles and plant will cross.
			5	Additional specific crossing requirements (e.g. monitoring during works) to be confirmed.
			6	Investigate interaction of cathodic protection between Esso pipe and ours.

Utility / 3rd Party	Initial contact/ Last Contact	Current status	No.	Mitigation requirements and other provisions
GPSS pipeline (via agent )	14/11/2014 24/09/15	Ongoing - information sent with finalised route details/ confirmed crossing location & proposed trenchless technique. Note that there are two pipelines to cross, one a live pipe the other abandoned but both must be treated the same.	1	OPA (Oil Pipeline Associates) updated with confirmed crossing point and information on proposal to use trenchless technology. Trial holes for condition survey a likely requirement prior to approval.
			2	Contractor planning trenchless crossings (subject to agreement by OPA) to minimise disruption and maximise programme - open cut involves hand dig near pipeline.
			3	Protective work over pipeline required where vehicles and plant will cross.
			4	Meeting on site confirms need to trial hole to locate pipeline depth as well as depth of abandoned main. Requirements for crossing agreed.
North Worcestershire Water Management	25/11/2014 18/11/2015	Temporary Works Consent submission approximately 3 months prior to crossing commencement	1	Temporary Works Consent, Risk Assessment and Method Statement will be required for each crossing where temporary works are required (details of how flows, silt, etc will be managed must be demonstrated in the documentation). The Authority has two months in which to grant or refuse consent.
			2	Environment Agency form PPG5 lists typical risks that will need addressing (e.g. silt and watercourse flows).
			3	Where no temporary works are required e.g. trenchless crossing a drawing showing the plan & cross section will be sent for record purposes

Utility / 3rd Party	Initial contact/ Last Contact	Current status	No.	Mitigation requirements and other provisions
South Worcestershire Land Drainage Partnership	04/12/2014 23/11/2015	Temporary Works Consent submission approximately 3 months prior to crossing commencement	1	Temporary Works Consent, Risk Assessment and Method Statement will be required for each crossing where temporary works are required (details of how flows, silt, etc will be managed must be demonstrated in the documentation). The Authority has two months in which to grant or refuse consent.
			2	Environment Agency form PPG5 lists typical risks that will need addressing (e.g. silt and watercourse flows).
			3	Where no temporary works are required e.g. trenchless crossing a drawing showing the plan & cross section will be sent for record purposes

## B. Agreed method of crossing and mitigation measures

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
National Grid - Electric transmission lines	<b>3 nr crossings</b>			
	-275kV	Between A449 Worcester Rd & Railway	Trenchless	FOR ALL No specific requirements anticipated - safety procedures required where within 5.3m of outer cables Trenchless crossing shafts to be located correct distance from overhead lines to use plant and equipment safely 'Goal posts' required either side of overheads along working width as warning to vehicles (vehicle movements will be limited/minimised)
	-275kV	Between Woodrow Ln & Drayton Rd	Open Cut	
	-275kV	Parallel to M5 (on eastern side)	Trenchless	
National Grid - Gas	<b>1 nr Low Pressure</b>			
	-90mm PE / 6" CI	Wilden Lane	Trenchless	Trial hole req'd to prove depths during design stage.
	<b>5 nr Medium Pressure</b>			
	-140mm PE in 6" DD (Bewdley Road)	Bewdley Road	Trenchless	FOR ALL Trial holes req'd to prove depths during design stage.
	-315mm PE (A451 Minster Road)	A451 Minster Road	Trenchless	
-125mm PE (A 448 Bromsgrove Road)	A448 Bromsgrove Road	Trenchless		

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction	
	-63mm PE (A450 Worcester Road)	A450 Worcester Road	Trenchless	<p>FOR ALL</p> <p>Site supervision by National Grid required for all works. Trial hole req'd to prove depth during design stage (&amp; to allow settlement calculations to be submitted for approval to ensure less than 10mm).</p> <p>Protective works over pipes for vehicular/plant crossing locations.</p> <p>Specific crossing requirements (e.g. likely to require trial hole for condition survey, monitoring during works) to be confirmed.</p> <p>A slip trench is required 3m away, parallel to the gas main at a depth of 600mm below the gas main invert (on the positive side of the crossing) for monitoring purposes.</p> <p><i>The excavation for the overflow / washout pipe should be kept more than 3m from gas main to allow the use of mechanical equipment (less than 3m is hand dig only) - any headwall design for the discharge into the watercourse will be discussed with National Grid to ensure the gas main is not affected</i></p>	
	-63mm PE (Woodrow Lane)	Woodrow Lane	Trenchless		
	<b>7 nr High Pressure</b>				
	-324mm ST	East of Wilden Top Road	Trenchless		
	-324mm ST	East of Railway Line (Torton)	Trenchless		
	-610mm ST	West of Drayton Lane	Trenchless		
	-324mm ST	East of Mearse Lane	Trenchless		
	-914mm ST	North of Newtown Lane	Trenchless		
	-457mm ST	East of Pound Lane	Trenchless		
	-914mm ST	West of Frankley Beeches	Trenchless		
<i>Work will also be required alongside 914mm ST</i>	<i>Overflow / washout to brook at rear of Manchester Inn, B4551 Bromsgrove Rd</i>	<i>Open cut (adjacent)</i>			
Western Power	<b>High Voltage -</b>				

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
Distribution - Electricity	-11kV UG	Bewdley Road North	Trenchless	Diversion for access & safe working (pipeline & cables parallel)
	-11kV UG	Alongside dismantled railway	Trenchless	
	-11kV UG	Across Kingsway (Burlish Top)	Open Cut	
	-33kV OH - PERMANENT DIVERSION	Across Kingsway to Minster Road	DIVERT / UG	
	-33kV UG	A451 Minster Road	Trenchless	
	-11kV UG	A451 Minster Road	Trenchless	
	-11kV UG	Towpath of Staffs & Worcs Canal	Trenchless	
	-2 x 11kV OH (parallel)	Between canal & River Stour	Open Cut	
	-132kV OH (pylons)	Between canal & River Stour	Open Cut	
	-11kV UG (cross twice)	Wilden Industrial Estate	Trenchless	
	-11kV OH	Field east of Wilden Top Road		
	-11kV OH	Field west of A449 Worcester Road		
	-11kV OH - PERMANENT DIVERSION	East of Railway crossing	DIVERT UG / RELOCATE POLE	Diversion for access & safe working around shaft for trenchless crossing (pole located in construction path)
	-11kV OH	Field north-east of Heath Lane	Open Cut	

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
	-11kV OH	Between A448 Bromsgrove Rd & A449 Worcester Rd	Open Cut	<p>Diversion for access &amp; safe working around shaft for trenchless crossing (pole located in construction path) - temporary diversion</p> <p>Temporary diversion for safe access to BPT site &amp; proposed compound area</p> <p>Temporary diversion as OH bisects proposed compound area &amp; two mains to be laid underneath</p>
	-11kV UG	A449 Worcester Road	Open Cut	
	-11kV OH	Field east of Woodrow Lane	Open Cut	
	-11kV OH	Field west of Barrowhill Lane	Open Cut	
	-11kV OH & 11kV OH spur off	Field west of Waystone Lane	Open Cut	
	-11kV OH	Field west of A491 Stourbridge Road	Open Cut	
	-11kV OH - PERMANENT DIVERSION	East of The Bell PH, Bell End	DIVERT TO HEDGELINE (UG)	
	-11kV OH	East of The Bell PH, Bell End	Trenchless	
	-11kV OH	Field north of Heath End Road	Open cut	
	-11kV OH	East of Gorse Green Lane	Open cut	
	-11kV OH	West of Little Farley Wood	Open cut	
	-11kV OH - TEMPORARY DIVERSION	By junction of B4551 Bromsgrove Rd & Putney Lane	DIVERT FOR SITE ACCESS	
	-11kV OH - TEMPORARY	Field bounded by B4551 & Putney Lane	DIVERT / UG	

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
	DIVERSION			Permanent diversion for safe construction & future access to BPT site
	-11kV OH - PERMANENT DIVERSION	Across BPT site	DIVERT / UG	
	-2 x 11kV OH	Field north of Newtown Lane	Open cut	
	-11kV OH	Field south of Yew Tree Lane	Open cut	
	-3 x 11kV OH	Field south of Frankley Green Lane	Open Cut	
	-2 x 132kV OH (pylons)	West of Frankley WTW	Open Cut	
<b>Low Voltage -</b>				
	-3 x LV UG	Wilden Industrial Estate	Trenchless	Request LV OH is raised to allow safe working underneath
	-Service UG	Wilden Lane	Trenchless	
	- LV OH	Field west of Wilden Top Road	Open cut	
	- LV OH	East of A449 Worcester Road	Trenchless	
	- LV OH - RAISE LINES	Woodrow Lane	Open cut	
	- LV OH	Nr The Bell PH, Bell End	Trenchless	
	- LV UG	Gorse Green Lane, to Bay Tree Cottage	Open cut	

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
	- LV OH	Field east of Gorse Green Lane	Open cut	Request LV OH is raised to allow safe working underneath
	- LV UG, LV UG & Service OH	Field east of Woodfield Lane	Open cut	
	- LV OH - RAISE LINES	Field south of Yew Tree Lane	Open cut	
ES Pipelines (Gas)	<b>1 nr Medium Pressure</b>			
	-90mm PE	Alongside access to Lickhill site	Trenchless	Trial hole required in advance of works. Gas main to be circumferentially exposed during crossing for monitoring purposes. ESP will supervise works when crossing being carried out
BT	<b>23 nr crossings</b>			
	- 2nr BT UG	Alongside access to Lickhill site	Trenchless	OH may need raising for access along working width & car park access
	- BT OH - RAISE LINES	Crossing Kingsway (branch also runs alongside Kingsway)	Open cut	
	- BT UG	Line to Wilden Industrial Estate (Carpets of Kidderminster)	Trenchless	
	- BT UG	Wilden Lane	Trenchless	
	- BT UG	A449 Worcester Road	Trenchless	
	- BT UG	A448 Bromsgrove Road	Trenchless	

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
	- BT UG	A450 Worcester Road	Trenchless	OH may need raising to facilitate work
	- BT OH - RAISE LINES	Harvington Hall Lane	Trenchless	
	- BT UG	Woodrow Lane	Trenchless	
	- BT UG	Drayton Road	Trenchless	OH may need raising & pole relocated to facilitate work
	- BT OH	Barrowhill Lane	Open cut	
	- BT OH - RAISE LINES & RELOCATE	Dordale Road (Bradford Road)	Trenchless	
	- BT UG	A491 Stourbridge Road	Trenchless	
	- BT OH	Heath End Road	Trenchless	
	- BT OH	Gorse Green Lane	Open cut	
	- BT UG	Newtown Lane	Trenchless	
	- BT UG	Woodfield Lane	Trenchless	
	- BT UG	Farley Lane	Trenchless	
	- BT UG	B4551 Bromsgrove Road	Trenchless	
	- BT OH	Field west of Newtown Road	Open cut	
	- BT OH	Yew Tree Lane	Trenchless	
	- BT UG	Frankley Hill Lane	Trenchless	

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
Virgin Media	<b>3 nr crossings</b>			
	-Duct/trench	A448 Bromsgrove Road	Trenchless	FOR ALL All Virgin Media infrastructure along the route is underground and should not be affected by the works. All crossings are trenchless road crossings. Cables should be marked up on site prior to work commencing.
	-Duct/trench	A450 Worcester Road	Trenchless	
	-Duct/trench	B4551 Bromsgrove Road	Trenchless	
<b>7 nr crossings</b>				
Severn Trent Water - Wastewater	-sewage pumping station	Adjacent to 192 Wilden Lane		No specific requirements.
	-80mm PVC Pressurised	Wilden Lane	Trenchless	
	-150mm VC	Wilden Lane	Trenchless	
	-450mm	Wilden Lane	Trenchless	
	-150mm VC	Field east of railway	Trenchless	
	-150mm VC	Butts Lane	Open cut	
	-150mm VC	A450 Worcester Road	Trenchless	
	-100mm PVC Pressurised	A450 Worcester Road	Trenchless	
Severn Trent Water - Water	<b>28 nr crossings</b>			
	-800mm DI South	Field east of Bewdley Rd North	Trenchless	FOR ALL

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
	Strategic Main			<p>The mains crossings require Risk &amp; Contingency documents to be produced and will need approval from Severn Trent Water Network Controllers before the work starts.</p> <p>Trial holes required for larger water mains where depths not known.</p>
	-7" CI	Field east of Bewdley Rd North	Open cut	
	-7" CI	Field east of Bewdley Rd North	Open cut	
	-350mm DI	West side of dismantled railway	Trenchless	
	-250mm DI	East side of dismantled railway	Open cut	
	-6" CI	East side of dismantled railway	Open cut	
	-5" CI	A451 Minster Road	Trenchless	
	-90mm PE	Wilden Lane	Trenchless	
	-3" CI	Wilden Top Road	Trenchless	
	-125mm PE	A449 Worcester Road	Trenchless	
	-4" AC	Field east of Barrs Lane	Open cut	
	-3" AC	A448 Bromsgrove Road	Trenchless	
	-3" CI	A450 Worcester Road	Trenchless	
	-4" AC	Harbash Lane	Trenchless	
	-12" SI	Harvington Hall Lane	Trenchless	
	-180mm PE	Harvington Hall Lane	Trenchless	
	-4" AC - abandoned	Harvington Hall Lane	Trenchless	

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
	-250mm PE	The Holloway	Open cut	
	-4" CI	Woodrow Lane	Trenchless	
	-3" AC	Woodrow Lane	Trenchless	
	-15" SI	Field west of Drayton Road	Trenchless	
	-50mm PE	Drayton Road	Trenchless	
	-125mm PE	Dordale Road	Trenchless	
	-3" PVC	A491 Stourbridge Road	Trenchless	
	-3" CI	Gorse Green Lane	Open cut	
	-3" CI	Farley Lane	Trenchless	
	-2" AC	Field east of Pound Lane	Trenchless	
	-600mm DI	Field west of Frankley Hill Lane	Trenchless	
	-Severn Aqueduct	Approach to Frankley WTW	Open cut	
South Staffordshire Water	<b>1 nr crossing</b>			
	-4" CI	Putney Lane	Open cut	No specific requirements. Watermain should be marked up prior to work commencing & hand dig round pipe to expose.
ESSO pipeline	<b>1 nr crossing</b>			

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
(via agent - Fisher German)	-14" ST	To East of Drayton Road	Trenchless	Site supervision required. Protective works required over pipeline for vehicular / plant crossing locations. <b>Specific crossing requirements (e.g. likely to require trial hole for condition survey, monitoring during works) to be confirmed.</b>
GPSS pipeline (now CLH) (via agent - OPA)	<b>1 nr crossing</b>			
		Kingsway	Trenchless	Site supervision required. Protective works required over pipeline for vehicular / plant crossing locations. <b>Specific crossing requirements (trial hole to locate main and also redundant main as well as slip trench during crossing).</b>
South Worcestershire Land Drainage Partnership	<b>1 nr crossing</b>			
	-Watercourse	In field to south of Summerfield west of A449 Worcester Road	Open cut	Temporary Works Consent, Risk Assessment & Method Statement to be submitted for approval (covers flow & silt control)
North Worcestershire Water Management	<b>15 nr crossings (including drainage ditches)</b>			
				Temporary Works Consent, Risk Assessment & Method Statement to be submitted for approval (covers flow & silt control) requirements below as advised by NWWM:
	-Watercourse / ditch	In field to east of Staffs & Worcs Canal	Trenchless	No, as no in channel activities foreseen that could obstruct flow

Utility / 3rd Party	Crossing	Location	Technique proposed (subject to change)	Requirements for construction
	-Watercourse / ditch	In field to west of River Stour	Trenchless	No, as no in channel activities foreseen that could obstruct flow
	-Roadside ditch / drain	Woodrow Lane	Trenchless	No, not classed as significant fluvial drainage path
	-Roadside ditch / drain	In fields south of Bradford House	Open cut	Yes
	-Fenn Brook	Adjacent to A491 Stourbridge Road	Trenchless	No, as no in channel activities foreseen that could obstruct flow
	-Roadside ditch / drain	Woodfield Lane	Trenchless	No, not classed as significant fluvial drainage path
	-Roadside ditch / drain	Field adjacent to Bromsgrove Road	Trenchless	No, not classed as significant fluvial drainage path
	-Watercourse / springs	To east of Break Pressure Tank site	Open cut	Yes
	-Watercourse / ditch	To east of watercourse / springs above	Open cut	No, not classed as significant fluvial drainage path
	-Roadside ditch / drain	Newtown Lane	Trenchless	No, not classed as significant fluvial drainage path
	-Watercourse / ditch	In field on Frankley Hill	Open cut	No, not classed as significant fluvial drainage path
	-Roadside ditch / drain	Pound Lane	Open cut	No, not classed as significant fluvial drainage path
	-Roadside ditch / drain	Pound Lane	Open cut	No, not classed as significant fluvial drainage path
	-Roadside ditch / drain	Yew Tree Lane	Trenchless	No, not classed as significant fluvial drainage path
	-Watercourse	North-west of Frankley Beeches	Open cut	Yes