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**Birmingham Resilience Project**

Severn Trent Water

**Planning Statement**

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## Birmingham Resilience Project

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## 1. Introduction

### 1.1 Purpose of this Statement

This Planning Statement has been prepared by Jacobs UK Ltd in support of five planning applications described in Table 1.1 below which form the Birmingham Resilience Project on behalf of Severn Trent Water Ltd (STWL). This document summarises the key elements of the proposed development and using our professional judgement assesses the material considerations relevant to the determination of the accompanying planning applications in relation to national and local planning policy relevant to the application sites. The five planning applications are:

<b>Local Planning Authority (LPA)</b>	<b>Planning application descriptions</b>
Wyre Forest District Council	<p>Two planning applications for:</p> <ul style="list-style-type: none"> <li>• Construction of a river intake, pumping station, underground water pipeline (approximately 12.5km in length) and associated infrastructure forming part of the Birmingham Resilience Project.</li> <li>• Construction of powdered activated carbon (PAC) dosing unit and alterations to pump house at Trimley Water Treatment Works in support of the Birmingham Resilience Project.</li> </ul>
Wychavon District Council	<p>One planning application for:</p> <ul style="list-style-type: none"> <li>• Construction of underground water pipeline (approximately 2.2km in length) and associated infrastructure forming part of the Birmingham Resilience Project.</li> </ul>
Bromsgrove District Council	<p>One planning application for:</p> <ul style="list-style-type: none"> <li>• Construction of underground water pipeline (approximately 10.8km in length), break pressure tank, extension to Frankley Water Treatment Works (including centrate tanks and pumping station, sludge tanks, storage buildings, washwater lamellas and landscape bund) and associated infrastructure forming part of the Birmingham Resilience Project.</li> </ul>
Birmingham City Council	<p>One planning application for:</p> <ul style="list-style-type: none"> <li>• Construction of underground water pipeline (approximately 0.5km in length) and upgrade of Frankley Water Treatment Works to include backwash tanks, sand ballasted lamella, overflow tank, emergency return pumping station, rapid gravity filters, storage tanks and buildings, minor alterations to the existing reservoir and associated infrastructure as part of the Birmingham Resilience Project.</li> </ul>

**Table 1.1 : Planning application descriptions**

In appraising the development against the relevant planning policies, this Statement draws on the information obtained from a range of surveys and assessments, the full details of which are presented in the Environmental Statement. Information on the proposed lighting scheme is not provided in the Environmental Statement and has therefore been included in Appendix A of this Statement.

## 1.2 Supporting Information

The following documents are also provided as part of the planning application packages:

<b>Supporting Document</b>	<b>Description</b>	<b>Relevant aspects of the scheme/LPAs</b>
Drawing pack	Provides location plans, site plans, elevations and other technical details. The red line boundary has been drawn so as to include all areas required for the construction of the scheme, including all temporary and permanent accesses to the highway, as well as land required for mitigation.	1x pack for each LPA
Design and Access Statement	Explains the design principles and concepts that have been applied to the development and describes how issues relating to access to the development have been dealt with.	All
Consultation Statement	Details how the community has been involved in discussions concerning the proposed development and the results of consultation exercises.	All
Environmental Statement (Volumes 1-4)	Including the following topics: <ul style="list-style-type: none"> <li>• Ecology (aquatic and terrestrial)</li> <li>• Landscape &amp; Visual</li> <li>• Arboriculture</li> <li>• Cultural Heritage</li> <li>• Geology and Contamination</li> <li>• Hydrogeology</li> <li>• Water Quality, Hydrology and Geomorphology</li> <li>• Flood Risk (Including Flood Risk Assessment and Drainage Strategy)</li> <li>• Traffic and Access (Including Transport Assessment)</li> <li>• Noise and Vibration</li> <li>• Air Quality and Odour</li> <li>• Agriculture and Soils</li> <li>• Community and Socio-economics</li> <li>• Materials and Waste</li> <li>• Sustainability</li> </ul>	All
Utilities Statement	Demonstrates that the availability of utilities has been examined and that the proposals would not result in undue stress on the delivery of those services to the wider community.	All

Table 1.2 : Supporting Documents

## 2. Proposed Development

### 2.1 Project Overview

STWL is proposing the development of a scheme (the Birmingham Resilience Project, BRP) to provide an alternative source of potable water for Birmingham. Around 1.2 million STWL customers in the Birmingham area are currently reliant on Elan Valley water from the reservoir in mid-Wales. The water is transported 119km via the Elan Valley Aqueduct (EVA) to Frankley Water Treatment Works (WTW), near Birmingham. The EVA is a strategically important asset, providing almost 20% of STWL's total water supplies.

The EVA was constructed over 100 years ago in 1904 and is now in need of refurbishment. The proposal is to provide an alternative source of water from the River Severn to enable the EVA to be taken out of service for short periods to allow essential refurbishment work to be carried out. The intention is for the BRP scheme to be operated for periods of around 50 days at a time, during the autumn or winter months when river levels are sufficiently high to enable abstraction without any significant environmental or social impacts. It is anticipated that one 50 day EVA outage would be planned every one to two years, subject to water availability in the river.

The proposed new abstraction point is at Lickhill, located between Bewdley and Stourport on Severn, Worcestershire. During operation, the new abstraction would be supplemented by increased abstraction from STWL's existing operational site at Trimbley WTW (up to the existing licensed limit). Trimbley is also located on the River Severn, approximately 7.5km north of Lickhill. The combined flow to Frankley from these two sites will be a nominal 245MI/d (i.e. 245 million litres per day).

The scheme comprises the following principal components:

- New river intake (abstraction point) on the River Severn at Lickhill.
- New pumping station approximately 400m to the east of the river intake at Lickhill with a capacity for 130MI/d average abstraction and 140MI/d peak abstraction.
- Raw water transfer pipeline of approximately 25km in length from Lickhill to Frankley WTW.
- A break pressure tank (BPT) (formerly referred to as a 'balancing tank' in the Scoping Report) located near the village of Romsley, at the high point along the pipeline route.
- Upgrades and extension to Frankley WTW to allow treatment of River Severn water, which has higher treatment requirements compared to the Elan Valley water which it currently receives.
- Chemical treatment for pesticide removal at both the Romsley BPT site and at Trimbley WTW.

In addition to planned maintenance of the EVA, the BRP scheme would provide resilience for Birmingham's water supply in the event of an emergency scenario, for example an emergency shutdown of the EVA (note that the abstraction licence from the Environment Agency would not permit emergency use and utilising this infrastructure in an emergency situation would only be permitted to take place under a ministerial direction from Defra under Section 207 of the Water Resources Act). The BRP is not intended to address future growth in Birmingham.

### 2.2 Project Need

STWL has a statutory duty to provide a secure supply of water to its customers (over 8 million people). A clear strategic direction for resilience was set out in the Pitt Report (2008) which made it clear that utility companies were expected to maintain essential services under worst-case scenarios. Resilience was a central theme in the government's water strategy, Water for Life (2013), while the Government's National Climate Change Risk Assessment (2012) included the vulnerability of the public water supply to climate change as a priority risk for the UK. The Water Bill – introduced in the House of Commons in June 2013 – contains changes to Ofwat's duties concerning resilience. It features a new primary duty for Ofwat "*to secure the long-term resilience of water supply and sewerage systems against environmental pressures, population growth and changes in consumer behaviour*". This reflects the high priority that government places on resilience.

The EVA transfers water from STWL's largest single source of raw water to their largest water treatment works at Frankley. The water flows entirely by gravity and takes of the order of a day to complete its journey to Frankley. Coming from a rural upland source, the water is soft and of high quality with very few contaminants, meaning that little treatment is required. This coupled with the fact that the water flows along the EVA entirely by gravity (no pumping is necessary), means that the supply from the reservoirs has a low carbon footprint and is an environmentally sustainable source of water. It is therefore a key strategic resource which must be maintained.

Over the last five years STWL has invested in a programme of works to further understand the condition of the EVA and the risks it presents to the resilience of the water supply and to local communities in the event of a failure. An assessment of the direct consequences of a catastrophic failure of the EVA on people and properties in the vicinity of the asset has been undertaken. Over time community risk gradually increases as the asset age increases, hence the importance of providing a means to allow an enhanced programme of EVA maintenance and refurbishment.

At present STWL's ability to make significant engineering interventions or to carry out detailed internal inspections of the EVA is limited as it is dependent on the storage capacity of the Frankley and Bartley reservoirs at Frankley WTW. The current storage capacity restricts the shutdowns to five days at a time. Maintenance and surveys can only be carried out during three of the five days due to the time it takes to drain-down and subsequently recharge the EVA. This significantly restricts what work can be done and is an inefficient way of working. Water availability and peak demands further constrain the window in which they can be done. Being able to shut the EVA down for 50 days at a time would enable STWL to carry out a programme of maintenance in a sustainable way, including detailed internal inspections which would help identify and prioritise future maintenance. The 50 day shutdown would allow a period of around 30 days dry working on the EVA plus time for drain-down and re-commissioning of the WTW process units back onto EVA water once the works are completed.

Much of STWL's water supply system is a network of large diameter pipes known as the strategic grid. This allows water to be moved around to where it is needed most; thus water can be moved from Birmingham into the strategic grid and vice-versa. However, the other sources connected to the strategic grid cannot currently replace the supply from Frankley WTW for prolonged periods of time. For a planned EVA shut down the normal EVA flow would be replaced by the following:

- Additional 80MI/d from other sources comprising 55MI/d from the strategic grid, 20MI/d from South Staffordshire Water and 5MI/d from the Edgbaston boreholes;
- Reduction of non-essential water exports from Frankley; and
- Utilisation of 120MI/d River Severn water from the existing abstraction at Trimbley.

It has been estimated that the combination of the above would leave a shortfall in Frankley's demand of the order of 130MI/d. Accordingly this is the proposed capacity for the new river abstraction at Lickhill.

## **2.3 Development Description and Location**

The following sections provide a description of each element of the scheme. This includes security features such as fencing, lighting and CCTV cameras where relevant which are a requirement due to the development being a key strategic resource.

### **2.3.1 River Intake (Wyre Forest)**

The proposed intake is located at Lickhill within the administrative area of Wyre Forest District Council. The intake would comprise a concrete structure set into the river bank with the following features:

- Intake apron and coarse screen to protect the fine screens from large river debris.
- Fine screens.
- Penstocks to allow flow to be shut off for maintenance purposes.

- Grit traps.
- Bio-bullet dosing chamber.

The length of the intake structure would be approximately 46m. The main intake structure at the top of the embankment would be flush with ground level and include access covers to chambers beneath. The screen motors would be elevated just above ground level but would still be below the 1 in 100 year flood level and would therefore be designed to withstand being submerged, with instrumentation and electrical cabling telemetry being provided from the pumping station set back from the river outside of the floodplain. The screen would extend 8.5m into the river channel from the top of the bank and 3.6m into the channel measured from the river low water level to the outer face of the coarse screen. The river channel is approximately 40m wide at this point.

For security purposes a protective cage would be installed over the screens and motors on the riverside of a handrail. No additional security fence around the intake is proposed, although the proposals include for a gated reinforced grass compound to allow STWL service delivery personnel to park alongside the intake structure during maintenance work. The Severn Way public right of way which runs along the riverbank would be subject to a small permanent diversion around this compound and landscape planting would be provided to screen the facility on the landward side. Lighting would be provided on two 6.0m poles, with lights directionally mounted with diffusers to limit light spill. A security camera would be installed on one of the poles. The facility would be unmanned and unlit in normal operation. Any activity requiring personnel to be present at the intake would take place in daylight hours and manual operation of the intake lighting would be an infrequent occurrence.

The intake is only intended to be used for one 50-day period every one to two years during a planned EVA refurbishment exercise. However the screens would also require daily operation for short periods throughout the year to keep them wetted and to prevent any build-up of debris. It is likely that this would comprise two short periods (approximately five minutes each), which would be confined to the daytime.

BioBullet dosing would be provided for control of zebra mussels, an invasive species present in high numbers in the River Severn, with potential for causing biofouling of the transfer pipeline and receiving WTW facilities.

Access to the intake site would be provided by a new access track, comprising a reinforced grass surface, starting from the existing road which serves the Severn Bank Park residential area (approximately 275m in length). A small turning area would be required at the intake. Operational traffic movements would be low comprising monthly visits by a van for routine maintenance work and less frequent visits for inspections of security, screen maintenance following flood events, and emptying of grit traps as required. During a 50 day operational period this would increase to a daily visit to check on screen operation, grit accumulation and to undertake BioBullet dosing.

On-line water quality sampling would be provided continuously (in case the facility is required in the event of an emergency) in order to detect pollution events in the river. Small diameter sampling pipes would link the sampling points to automatic water quality monitors located in the pumping station. Should elevated levels of volatile organic carbon (VOC) or ammonia be detected, the penstocks and pumps would, if operating at the time, automatically shut down.

The river intake would only be operated during the autumn/winter months when sufficient flow is present in the river, as determined by Environment Agency Hands-off-Flow (HoF) constraints. The abstraction licence application submitted in parallel with the Planning Applications is for a 50 day period of abstraction during the period October- March. However the intake structure has been designed to ensure that abstraction could be carried out at flows below the HoF in case of an emergency situation.

### **2.3.2 Pumping Station (Wyre Forest)**

The pumping station site is located outside of the flood plain, approximately 400m behind the river intake. The site was formerly quarried and subsequently used for landfilling of waste, but has since been restored to grazing land. The site area is approximately 1.5ha. The intake would be connected to the pumping station via a below ground gravity steel pipe installed in an 1800mm diameter tunnel.

The pumping station development would comprise the following principal components:

- Four fixed speed pumps (3x duty plus 1x standby) with a combined duty capacity of 140ML/d.
- High voltage electrical incomer (to be provided by Western Power Distribution Ltd) and switch gear (NB: no standby power (i.e. diesel generators) would be provided).
- Three surge vessels.
- Mess room including control room, store, office and welfare facilities.
- Improvements to the road serving the Severn Bank Park residential area.
- Flow control valve for discharge of ‘sweetening flow’ into the River Severn.

The above ground structure would comprise a courtyard arrangement with a footprint measuring approximately 42m x 45.6m. The pumping station building and the power/switchgear building would form the main body of the development, with the surge vessel building and the mess room/office providing the wings of the courtyard. Suitably sized secure roller shutter type doors would be provided to enable pump components to be moved into and out of the building.

The building would be designed to resemble an agricultural building, similar to existing barns found in the surrounding farmland. This would include grey blockwork with dark green steel cladding above, topped by a goose-grey steel pitched roof. The doors would be dark grey to provide an appropriate degree of contrast.

The site has a significant slope towards the river. Excavation would be undertaken to set the pumping station building into the hillside to minimise apparent building heights and keep them below the sky line from all public view points. The maximum height of the pumping station building would be 8.6m but actual elevation above the existing ground profile would only be 6.4m at the rear of the building. Suitable excavated material would be used to provide a landscape bund on the west side of the building to provide screening for views from Severn Bank Park. Landscape planting would be provided on this bund and around the building.

Access to the site would be via a security gate off the tarmac road leading down to Severn Bank Park. Improvements would be provided to the tarmac road at the completion of the construction phase. Car parking together with an access and turning area would be provided at the front of the building. A 3.0m high security fence would be provided around the inner perimeter of the site, comprising the buildings and parking/access areas. A timber post and rail fence would be provided for the outer perimeter including the landscape bund.

External lighting for the site would be provided by a series of 6.0m floodlights providing tightly focussed illumination for the access road within the security fence, while 4.0m high floodlights would provide illumination within the courtyard area. All lighting has been designed to minimise impacts on adjacent receptors and would only be in operation when personnel are at the pumping station. The facility would be unmanned and unlit in normal operation. All activity requiring personnel to be present would take place in daylight hours. Operation of the lighting would therefore be an infrequent event.

The proposed pumping station design comprises the removal of approximately 10,000m<sup>3</sup> of material from beneath the proposed footprint of the pumping station building and compound, and piled foundations would be socketed into underlying sandstone strata with a reinforced concrete raft foundation forming the pumping station building floor. Below ground the pumping station would comprise a 15.0m diameter shaft leading down to the pump well at approximately 21.0m depth below the floor level where the pumps would be housed. Above the pump well would be a reinforced concrete pipework gallery with pipework from each pump connected to the pumping main to Frankley WTW. The building sits above the pipework gallery and houses the electric motors for the pumps, the control panel and overhead lifting gear as well as other ancillary equipment.

The pump motors would be housed within acoustic enclosures at ground floor level. The building would be windowless but air conditioning would be provided through louvres located at the rear of the building. There would be no significant emissions of air from the building during operation.

Site drainage would be directed to an underground attenuation area for discharge of uncontaminated surface water drainage at rates equivalent to greenfield runoff rates.

Operational traffic serving the pumping station would be low frequency, comprising small vans or cars as follows:

- Weekly inspection of sampling equipment.
- Monthly routine maintenance of all areas and grounds maintenance.
- Monthly inspection of landfill gas monitoring.
- Annual inspections of power incomer, surge vessels, security and fire systems.
- During a 50 day operational period, vehicle movements would increase to daily visits by various operational staff to check on pump runs and calibration of instruments.

### **2.3.3 Transfer Pipeline (All Local Planning Authorities)**

The transfer pipeline would be approximately 25km in length, comprising 21.5km of rising main up to a high point where a break pressure tank would be provided, and 4.5km of gravity main from the break pressure tank down to Frankley WTW. The pipeline would be routed between the River Severn in Wyre Forest District and Frankley WTW in the city of Birmingham, passing through Wychavon District and Bromsgrove District. This breaks down as 12.5km of pipeline within Wyre Forest, 2.2km in Wychavon, 10.8km in Bromsgrove and 0.5km in Birmingham. Table 2.1 describes the location and identifies the relevant Local Planning Authority of each section of the pipeline.

Section Number	Start of Section (road crossing )	End of Section (road crossing)	Local Planning Authority
1	River Severn	Kingsway	Wyre Forest District Council
2	Burlish Top	A451 Minster Road	Wyre Forest District Council
3	A451 Minster Road	Wilden Top Road	Wyre Forest District Council
4	Wilden Top Road	A449 Worcester Road	Wyre Forest District Council and Wychavon District Council
5	A449 Worcester Road	A450 Worcester Road	Wyre Forest District Council and Wychavon District Council
6	A450 Worcester Road	Drayton Road	Wyre Forest District Council
7	Drayton Road	Bradford Lane	Wyre Forest District Council and Bromsgrove District Council
8	Bradford Lane	A491 Stourbridge Road	Bromsgrove District Council
9	A491 Stourbridge Road	Madeley Road	Bromsgrove District Council
10	Madeley Road	Putney Lane BPT site	Bromsgrove District Council
11	Putney Lane BPT site	M5	Bromsgrove District Council
12	M5	Frankley Water Treatment Works	Bromsgrove District Council and Birmingham City Council

**Table 2.1 : Pipeline sections**

The pipeline design includes the following key design features:

- 1050mm diameter welded steel pipe with an epoxy liner.
- A total of approximately 1.6km of tunnels in a dozen or more sections along the route (locations shown on the relevant Location Plans (Drawing number A5W11215-PW31772)).
- Approximately 46 air valves and 42 washout chambers (indicative locations shown on the relevant Plan and Longitudinal Sections (Drawing numbers A5W11215-CW12175 to A5W11215-CW12194 inclusive)).
- Two roadside cathodic protection kiosks of 1.2m height (locations shown on Figure 4.2 (Proposed Development) of the Environmental Statement).

- A fibre optic cable that runs the length of the pipeline.

With the exception of the air valves, washout chambers and cathodic protection kiosks, the entire pipeline would be located underground. Air valves are required at high points along the pipeline route to allow release of air during initial filling of the main and subsequently during operation. Air valves would be located in below ground chambers with only manholes visible. A typical air valve chamber arrangement is shown on Drawing A5W11215-MW38001.

Washout chambers are required at low points along the pipeline route to enable certain sections of pipe to be drained down for maintenance purposes. These would be located in below ground chambers with only manholes visible when not in use. A typical washout chamber arrangement is shown on Drawing A5W11215-MW38003.

Cathodic protection is required to prevent corrosion of the pipeline. At each of the two required locations a small above ground kiosk would be sited on the roadside or on an existing access track with cabling to connect to the pipe. A typical cathodic protection kiosk is shown on Drawing 96739-DWG-008.

The pipeline would discharge to the existing Frankley Reservoir via a new reception chamber (shown on Drawing A5W11215-PW31730).

Outside of the normal 50 day operational periods, it would be necessary to maintain good water quality within the pipeline. River Severn water is relatively high in organics and nutrients and would soon turn septic if left to stand in the pipe. It is proposed that a 'sweetening flow' be provided by pumping EVA water back down the pipeline from Frankley WTW to discharge back through the intake screens at Lickhill. Laboratory tests have indicated that, because of the very low concentrations of pollutants in EVA water, it would only require a sweetening flow of 3-4l/s to maintain good water quality following an initial flush to purge River Severn water with EVA water.

The new sweetening flow pumping station would comprise two submersible pumps located at the end of the EVA, on entry into Frankley Reservoir. A control kiosk would be located alongside. It is proposed that a pump rate of 40l/s be provided to implement the initial purge of River Severn water. This pumping station would then be operated intermittently (18 hours per week) with control of the discharge flow to 3-4l/s being provided by a flow control valve at the pumping station, combined with storage in the break pressure tank.

The levels of operational traffic along the pipeline route would be minimal with only very occasional traffic movements required for maintenance. Access would be mostly over farmland, in agreement with the landowner concerned, using existing access points. No new accesses or surfacing are proposed for this purpose.

#### **2.3.4 Break Pressure Tank (Bromsgrove)**

A concrete break pressure tank would be provided at the high point along the pipeline route, approximately 1km south of the village of Romsley in the Clent Hills within the administrative boundary of Bromsgrove District Council. The site is currently agricultural used for pasture and measures approximately 0.6ha in area. The break pressure tank would have a capacity of approximately 1600m<sup>3</sup>. The structure would have a footprint of 25.0m by 20.0m with a depth of 4.0m (2.4m above ground at the highest point).

Facilities would be provided on site for the dosing of powdered activated carbon (PAC) for the removal of potential pesticides in the river water. This site provides an optimum location for PAC dosing as the travel time to Frankley WTW (approximately 40 minutes) would provide the required contact time for efficient pesticide removal. The PAC dosing facilities comprise two hoppers for PAC storage and a kiosk where the powder would be mixed with water for dosing into the gravity pipe below the outlet from the break pressure tank. Each hopper would be approximately 15.0m long, 4.4m wide and at the highest point would be 6.3m above ground level. A concrete access road into the site would allow tankers to pull up between the break pressure tank and hoppers.

A 3.0m high security fence would be provided around the entire site and a twin security gate provided at a new access point onto Putney Lane. External lighting for the BPT would be provided by a series of 4.0m and 6.0m floodlights providing tightly focussed illumination for the access road and equipment areas within the security

fence. All lighting has been designed to minimise impact on adjacent receptors and would only be in operation when personnel are at the BPT. The facility would be unmanned and unlit in normal operation. All activity requiring personnel to be present would take place in daylight hours. Operation of the lighting would therefore be an infrequent event.

The break pressure tank would be provided with an emergency overflow pipe which is required in the event that the gravity pipe to Frankley should be shut down and the various water level trips in the break pressure tank (linked to the pumping station) all fail to operate. A flow switch in the overflow would pick up the first signs of an overflow event and trip the pumps. It is envisaged that the likelihood of this happening is very remote and the risk of the overflow being used extremely low. Nevertheless a route has been selected which would direct the water into a field which then drains into Fenn Brook. Surface drainage would be directed to an on-site below ground attenuation tank which would be provided with a separate overflow pipe of around 500m in length leading to Fenn Brook in the event that the attenuation tank should overflow.

Limited improvements to Putney Lane would be required to comply with the necessary highways design requirements for a new access. As part of the Environmental Impact Assessment (EIA), speed surveys have been undertaken for Putney Lane indicating that the average speed is less than 30mph, which would be commensurate with the existing nature of the road. The access has been designed accordingly and this would require the removal of 10.0m of hedgerow on the northern side of the access and 35.0m along the southern side.

Operational traffic to serve the break pressure tank site would comprise monthly inspections of security, instrumentation and telemetry (small van required). During a 50 day operational period this would increase to an initial PAC delivery to fill the hoppers of 6 x 25m<sup>3</sup> heavy goods vehicles (HGVs) over a 2-day period, followed by daily visits by one HGV to keep the PAC hoppers topped up. At the end of the 50 day period, there would be a requirement for a small number of HGV visits to empty the PAC hoppers of any surplus PAC.

### **2.3.5 Frankley Water Treatment Works Upgrade (Bromsgrove and Birmingham)**

The existing water treatment works at Frankley is located wholly within the administrative boundary of Birmingham City Council and comprises a series of water treatment stages:

- Clarification using the process of ‘dissolved air flotation’ (DAF) which provides coagulation and flocculation of suspended material. Lime and ferric sulphate are added to promote coagulation, followed by air injection to form surface flocs which are then removed from the tanks.
- Filtration using rapid gravity filters (RGFs) to reduce the turbidity of the water to an acceptable level and to remove micro-organisms, including *Cryptosporidium*.
- Disinfection using chlorination in ‘contact tanks’ followed by final pH adjustment and addition of phosphoric acid which is used to prevent leaching of lead within the water distribution system.

There are two parallel process streams each with a hydraulic capacity of the order of 260Ml/d. Typical treated water output from Frankley is 310-340Ml/d, with 40Ml/d of this being provided from the River Severn via the abstraction at Trimley, and the remainder via the Elan Valley Aqueduct from mid-Wales.

The existing water treatment works is designed to treat predominantly Elan Valley water which has low levels of colour, turbidity and organic matter. The existing DAFs would not be able to effectively treat water from the River Severn which has higher levels of suspended solids and organic material. Accordingly a new process treatment called ‘sand ballasted lamellas’ (SBL) is being proposed for the BRP project, together with a new set of RGFs and other associated process requirements. There is also the requirement for a new sludge treatment process to treat the additional sludge that would be produced in the clarification and filtration processes with the switch to River Severn water.

The new process treatment works would become part of the overall Frankley works operating 24 hours a day for 365 days a year. The DAF units would be retained to provide operational flexibility and additional resilience to treat the two different sources of water across three process streams.

The proposed development would be enclosed within a security fence comprising two lines of fencing 2.0m apart with intruder detection devices mounted on 4.0m high masts and CCTV cameras mounted on 6.0m masts, located between the two fence lines. The outer fence would be 1.8m high and the inner high security fence 3.0m high.

Given the security fencing, there would be no requirement for any background lighting when the plant is unmanned. The new security cameras would operate using infra-red so normal task and background lighting options would only be required when an operator has to enter the zone. The operators would activate lighting either at the security gate on entry / exit or remotely from the control room. Lighting would be provided in the form of 20Lux general lighting along roadways, areas between tanks, perimeter lighting around open tanks, pumping stations and washwater tank platforms. Additional lighting would be provided to ensure 50Lux illumination at specific areas of the new process units including RGFs, sand ballasted lamellas, weighbridge and wheel wash areas. Higher illumination lighting would be provided by floodlights mounted on 6.0m high poles for the road, delivery laybys and the hardstanding areas. The lighting design includes directional mounting of the luminaires with diffusers arranged to limit the spill lighting outside the treatment areas.

Operational traffic movements currently comprise around 40 cars and small vans per day plus approximately 30 tanker deliveries per month. Additional operational traffic associated with the proposed upgraded works would comprise approximately 15 tanker deliveries per month, plus three sludge collection wagons per day during the 50 day periods when treating River Severn water alone.

### **Proposed development within Birmingham**

The proposed new water treatment works development would be located within the administrative boundary of Birmingham and would comprise the following (further details are provided in the Design and Access Statement):

- Sand ballasted lamella treatment tanks and sludge transfer pumping station (measuring approximately 45.2m x 52.6m. The structure itself would be 6.2m. On top of this structure would be eight kiosks, the top of which would be 8.8m above ground, and two sand silos connected by a platform, the top of which would be 14.4m above the ground).
- RGFs (measuring approximately 84.5m x 58.1m. The structure itself would be 4.8m. On top of this structure would be 12 kiosks, the top of which would be 8.9m above ground).
- Clean water backwash tanks (measuring approximately 45.5m x 40.0m. The structure would be largely below ground level with a kiosk, pipework and ten pumps located above ground with a maximum height of 4.0m).
- Dirty backwash tanks pumping station (measuring approximately 25.0m x 7.0m with a height of 2.6m).
- Coagulation building (measuring approximately 32.4m x 17.3m with a height of 8.2m) and associated chemical storage tanks.
- Disinfection building (measuring approximately 25.4m x 16.3m with a height of 8.3m) and associated chemical storage tanks.
- Emergency return pumping station, including a 17.0m deep by 27.0m diameter shaft, to temporarily divert treated water back into Frankley Reservoir in the event that it should fail drinking water standards.
- Emergency return pumping station switchroom (measuring approximately 20.4m x 12.7m with a height of 7.0m).
- CO<sub>2</sub> plant consisting of two 14.7m high cylindrical tanks with a diameter of approximately 3.0m and associated equipment enclosed within a 3.0m high security fence covering an area of approximately 11.0m x 11.0m.
- Surface water drainage attenuation tank (converted from existing disused tank on site) prior to discharge via existing outfall to Merritt's Brook.
- MCC and blower building (measuring approximately 35.4m x 10.4m with a height of 7.5m).
- HV switchroom (measuring approximately 35.5m x 10.8m with a height of 7.4m).

- Replacement bisulphate (measuring approximately 19.5m x 15.6m with a height of 7.9m).
- Associated small scale infrastructure including electrical switchrooms, generator building, kiosks, vessels, pipes and ducts.

The water treatment works development is proposed for brownfield land within the existing developed area of the WTW. This area comprises a number of old structures, abandoned below ground tanks and a stockpile of spoil from earlier construction projects along the southern boundary. It is proposed that this spoil material would be utilised to create landscape bunds if suitable, with the surplus material being exported from the site for reuse in other development projects such as road building. Subject to the results of ongoing contaminated land testing, it is possible that a small proportion of this would require disposal to landfill.

Most of the structures on the site would be open tanks but there would be a requirement for three main buildings (coagulation, disinfection and HV switchroom). The tallest new structures on site would be the sand silo on top of the sand ballasted lamella and the CO<sub>2</sub> plant which would be 14.4m and 14.75m respectively. To put these heights into context, the tallest structure on the existing site is a lime plant with a height of 22.5m above ground.

### **Proposed development within Bromsgrove**

The proposed new sludge treatment works development would be located within the administrative boundary of Bromsgrove and would comprise the following, including approximate dimensions:

- Washwater lamella tanks to settle sludge from the water treatment works backwash streams (measuring approximately 31.0m x 32.0m with a height of 7.0m) and associated kiosks.
- MCC building (measuring approximately 20.4m x 10.3m with a height of 7.5m).
- Sludge thickener tanks (three 17.0m diameter cylindrical tanks with a height of 7.0m) and associated kiosks.
- Thickened sludge storage tanks (two 11.0m diameter cylindrical tanks with a height of 6.0m) and associated kiosks.
- Sludge thickener feed tanks (two 17.4m diameter cylindrical tanks with a height of 6.0m) and associated kiosks.
- Centrate tanks and centrifuges (three 11.0m diameter cylindrical tanks with a height of 6.7m and centrifuges raised on a platform with a height of 8.7m).
- Sludge cake storage area (a covered area measuring 31.0m x 18.0m with a height of 8.5m).
- Polymer storage kiosk (measuring approximately 16.5m x 8.2m with a height of 6.2m).

The proposed sludge treatment plant is located on greenfield land beyond the southern boundary of the site. The total greenfield land take for the new structures is approximately 1.72ha. Landscape bunding would be provided along the western and southern boundaries to protect views from elevated ground beyond. The total permanent agricultural land take including the sludge plant development, landscape bunds and land in between the two would be 5.21ha. As a public right of way currently runs along the boundary of the WTW site, a footpath diversion would be routed along the outside of these bunds (refer to drawing A5W-11215-PW26093 Permanent Footpath Diversion Plan). It is proposed that the bunds would be approximately 30.0m wide and 5.0m tall and planted with trees and shrubs. Further detail on the landscaping proposals is provided on Figures 9.4 to 9.11 (Landscape and Ecology Mitigation Plans) of the Environmental Statement illustrating cross-sections through the bunds, footpath diversion and new development.

Most of the structures on the site would be open tanks and the tallest new structures on the site would be the sludge centrifuge tanks and thickened sludge storage tanks at approximately 8.0m tall.

#### **2.3.6 Trimpley PAC Plant (Wyre Forest)**

The PAC plant to be provided at the existing Trimpley WTW essentially comprises the same treatment units to be provided at the BPT site, namely two hoppers for storage of PAC and a small dosing system (within a kiosk)

to inject the PAC into the supply pipeline before onward pumping to Frankley. Each hopper would be approximately 12.0m long, 4.4m wide and at the highest point would be 6.3m above ground level, and the kiosk would be approximately 20.0m long by 3.5m wide by 3.6m high located between the hoppers. An existing steel sheet PAC building would be demolished.

The PAC dosing would only be operated during the 50 day periods when the EVA has been shut down for refurbishment and Frankley is being fed with River Severn water alone. Additional operational traffic to that already visiting the works would comprise three PAC tankers per week during these 50 day periods.

It is also proposed that the low lift pumping station, which delivers abstracted water into the on-site storage reservoir, would be refurbished with new pumps. These would be housed within the existing pumping station building, with the only additional footprint requirement being a kiosk outside the pumping station building.

## **2.4 Consideration of Alternatives**

The BRP is the outcome of a STWL study to identify options that provide an alternative source of raw water supplies to the main water treatment works in Birmingham (Frankley WTW). The study was carried out by STWL, MWH, Aecom-Hyder and others during 2013 and was known as the Birmingham Resilience Study (BRS).

The BRS involved developing a large number of possible high level solutions for meeting the demand in Birmingham whilst the EVA is out of service. These solutions were considered at a regional level, and the preferred solution, which was endorsed by the Severn Trent Board and submitted to Ofwat, comprised a river abstraction pumping station located on the River Severn which would abstract river water and pump it through a new dedicated pipeline(s) to Frankley WTW. The preferred solution included the necessary modifications at Frankley WTW to enable treatment of the abstracted river water for supply to the Birmingham demand zone.

During the BRS, three notional locations for a possible river abstraction pumping station on the River Severn were investigated at a strategic level. These were at Trimley, Stourport and Ombersley. STWL then undertook investigation of further sites along the River Severn between Trimley and Ombersley to confirm the most appropriate location for the abstraction intake and pumping station, taking into account a wide range of engineering and environmental considerations.

Optioneering work was undertaken throughout 2014 to identify and develop technically feasible and environmentally sensitive options for the river intake, pumping station, transfer pipeline and WTW upgrade. This involved an iterative, systematic evaluation of alternatives to identify the proposed development. Further details of the alternative sites considered for the pipeline alignment, river intake, pumping station, BPT and the proposed works at Frankley WTW are provided in Chapter 3 (Design Evolution and Alternatives Considered) of the ES.

The optioneering work included desk studies, site walkovers, targeted site investigations, consultations with statutory consultees and a series of public consultation events. A series of multi-disciplinary specialist workshops were held, where professional judgement was applied to an agreed set of evaluation criteria, with the aim of reaching consensus on the preferred options. The objective has been to develop and promote a scheme which would ensure the minimum disturbance to people and the environment.

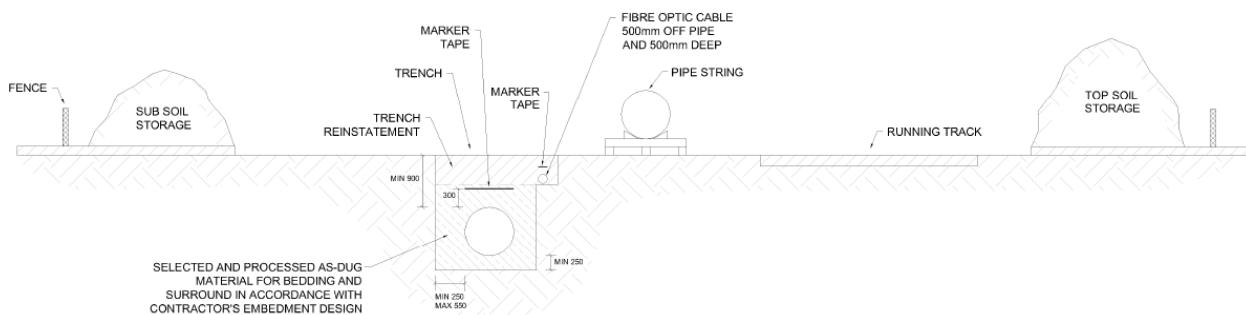
## **2.5 Construction**

STWL have committed to Ofwat that the Birmingham Resilience Project will be operational by March 2020. Based on the required completion date and the expected construction timescales, it is anticipated that construction of all components would begin in July 2016 (subject to planning approval and discharge of any pre-commencement conditions), with the river intake, pumping station and pipeline being completed ahead of the WTW upgrade. This would enable river water to be supplied for testing and commissioning of the proposed WTW extension. An indicative construction programme for each element of the scheme is provided below in Table 4.3, assuming a July 2016 start. Further detail is provided in Chapter 4 of the Environmental Statement.

Scheme Element	Enabling Works	Main Construction	Testing & Commissioning	Final Reinstatement
Lickhill Intake & PS	July 2016	July 2016 – January 2018	Winter 2017-8	January 2018
Pipeline	July 2016	Minimal winter working, construction would take place mainly in the summer months of 2016 and 2017	Late 2017	November 2017
Tunnels	July 2016			March 2017
Break Pressure Tank		9 months duration, start date tbc	Late 2017	
Frankley WTW Upgrade	January 2016	July 2016 – June 2019	Winter 2018-9	April – June 2019
Trimbley PAC		3 months duration, start date tbc		

**Table 2.2 : Indicative construction programme**

The planning application red line boundaries include all areas that would be needed for construction of the scheme. This includes a working area along the pipeline of approximately 45.0m width but varying as required. Figure 2.1 shows a typical cross section of the working width during the construction period. Along the route of the pipeline, traffic (including workers, mechanical equipment and material deliveries) would access the working width at one of seven access points located at intervals along the length of the water pipeline, from which point it would travel along the pipeline route in order to minimise the number of access points from the highway and the volume of construction traffic on local roads.

**Figure 2.1 : Typical working width**

The main site compound would be located in Stourport (the former Parsons Chain site) within Wyre Forest. This site was formerly used for warehousing and office facilities but was cleared in 2008 and is currently vacant with only a concrete platform remaining on site. This site would comprise the site offices for the pipeline construction, car parking for up to 300 personnel and storage areas for plant, materials and equipment. This compound would be the logistical hub for the pipeline construction, and act as a focal point for the operations. It forms part of the planning application to Wyre Forest District Council but is defined by a separate red line boundary as it is not

contiguous with the main pipeline route. In addition, smaller temporary site office and welfare facilities would be provided at the following locations:

- River intake and pumping station site – located to the north east of both working areas providing temporary site office, welfare facilities and approximately 70 car parking spaces.
- Break pressure tank - located in the field to the west of the BPT, on the opposite side of Putney Lane, providing storage areas for plant, materials and equipment, and accommodation and car parking for up to 30 personnel.
- Frankley WTW - located to the north of the working areas within the Frankley WTW site boundary. An additional area for welfare facilities would be provided closer to the main construction site. A temporary car park for approximately 300 personnel would be located to the north of the site within the red line boundary, and a shuttle bus service would be set up for workers to travel safely within the WTW operational area between the temporary car park and the main construction area.
- Trimley WTW - A small site office, consisting of a container-style welfare unit and secured storage area for plant and materials would be placed on existing hard-standing within the WTW operational area.

Whilst the main site compound would form the focal point for pipeline construction logistics, at a number of locations along the pipeline route the working width would be widened to allow local storage of plant and materials for whichever task is due to commence for that section.

With the exception of tunnel boring activities, construction activities for the river intake, pumping station, transfer pipeline, BPT and works at Trimley WTW would be restricted to between 07:00 to 19:00 from Monday to Friday and 07:00 to 13:00 on Saturdays. Tunnel boring activities would need to be undertaken 24-hours per day, 6 days per week (Monday to Saturday) in order for the process to operate efficiently. At Frankley WTW, construction activities would be restricted to between 08:00 to 18:00 from Monday to Friday and 08:00 to 13:00 on Saturday in line with standard guidance provided by the Environmental Protection Unit of Birmingham City Council.

### 3. Pre-Application Consultation

Throughout the project, STWL has undertaken regular consultation with the local planning authorities, statutory consultees, local communities and affected landowners.

STWL has entered into a Planning Performance Agreement (PPA) with Wyre Forest District Council, Bromsgrove District Council and Birmingham City Council. The PPA establishes project management arrangements between STWL and the councils to provide a framework for communications and resources for a timely determination of the planning application. Meetings with the Planning Officers of the local authorities have been held at regular intervals throughout 2014 and 2015 to provide up to date information about the project and obtain feedback on the proposals. Formal pre-application meetings with individual authorities were held from September to November 2015. A summary of the meeting dates with Planning Officers is provided below.

- 24<sup>th</sup> July 2014 – Site visit/planning meeting with Emma Anning and Heather Stone, Wyre Forest District Council Planning Officers at Trimley WTW
- 9<sup>th</sup> Sept 2014 – Planning meeting with John Stallisland, Bromsgrove District Council Planning Officer
- 26<sup>th</sup> Sept 2014 – Planning meeting with John Richardson and Andy Conroy, Planning Officers at Birmingham City
- 3<sup>rd</sup> December 2014 – Planning and EIA meeting with LPA Planning Officers, Stone Manor Hotel, Chaddesley Corbett
- 19<sup>th</sup> March 2015 – Project update with LPA Planning Officers, The Granary, Shenstone
- 17<sup>th</sup> April 2015 – Meeting with Andy Conroy, Planning Officer at Birmingham City Council to agree validation requirements
- 14<sup>th</sup> May 2015 - Meeting with Emma Anning, Planning Officer at Wyre Forest DC to agree validation requirements for Wyre Forest and Bromsgrove
- 23<sup>rd</sup> July 2015 - Meeting with Eversheds and LPA Planning Officers, Colmore Row, Birmingham
- 15<sup>th</sup> September 2015 – Wyre Forest and Bromsgrove pre-planning applications meeting with Team of Officers
- 3<sup>rd</sup> November 2015 – Wychavon pre-planning application meeting with David Addison, Planning Officer
- 4<sup>th</sup> November 2015 – Bromsgrove landscape meeting with Andrew Bucklitch, Landscape Officer and Emma Anning, Planning Officer
- 1<sup>st</sup> December 2015 – Wyre Forest and Bromsgrove update meeting with Emma Anning, Planning Officer
- 19<sup>th</sup> January 2016 – Wyre Forest and Bromsgrove update meeting with Emma Anning, Planning Officer to discuss final pumping station design

In addition to the above meetings attended by Planning Officers, meetings have also taken place with other council officers, as appropriate, and on-going liaison has been carried out with a range of statutory and non-statutory consultees including the Environment Agency, Natural England, Natural Resources Wales and English Heritage (now Historic England). Further details are provided in Section 6.3 (Consultation) of the Environmental Statement, with a summary of specific stakeholder engagement relevant to each specialist topic presented in the relevant topic chapters within the Environmental Statement.

Between November 2014 and December 2015 two series of public exhibitions were held at community facilities along the proposed pipeline route. The aim was to inform the communities near the project of the drivers for the project, provide information about the likely impacts during construction and operation, and to gather local feedback on the proposals. Full details of the public engagement strategy, including how feedback received has been used to help shape the design of the scheme, is provided in the Consultation Statement.

## 4. Planning History

### 4.1 River Intake and Pumping Station

A search of the Wyre Forest District Council and Worcestershire County Council planning application records revealed that there are no historic planning applications directly associated with the site of the river intake or the pumping station.

### 4.2 Transfer Pipeline

Between the river intake and the pumping station sites the pipeline crosses a former quarry and landfill (Lickhill Quarry). The planning history search identified a small number of planning applications associated with the former use of the site, however the site has since been restored to greenfield conditions and no applications for new development from within the last 10 years were identified.

North of the proposed pumping station site the pipeline route runs through another former quarry and landfill (Blackstone Quarry). The most recent planning application associated with this site (07/0418/COUN) relates to the non-compliance with condition of a previous planning application for the extraction of sand and gravel. Condition 5 of this planning permission requires the site to be restored to a condition fit for agricultural use by August 2015. The land should therefore be in agricultural use ahead of construction of the BRP project and would be returned to this use once construction is completed.

At Burlish Golf Course planning permission has been granted for its remodelling (12/0739/FULL). Discussions have been held with representatives of the Golf Club to ensure that impacts to the remodelled golf course are minimised.

A search of the Wychavon District Council, Bromsgrove District Council and Worcestershire County Council planning application records revealed that there are a number of historic planning applications along the route of the pipeline. Pending and extant planning permissions were considered during the route alignment process in order to minimise adverse impacts on proposed development. Within Wychavon, the route alignment crosses an area of land contained within the red line boundary of planning application W/15/02587/PN (proposed erection of extension to existing production area in connection with established fencing business). The pipeline would however be tunnelled beneath the access road to the site and would not restrict future development of the site itself. It is not considered likely that any planning consents would be adversely affected by the scheme.

### 4.3 Break Pressure Tank

A search of the Bromsgrove District Council and Worcestershire County Council planning application records revealed that there are no historic planning applications directly associated with the site of the break pressure tank.

### 4.4 Frankley Water Treatment Upgrade Works

A search of the Bromsgrove District Council and Worcestershire County Council planning application records revealed that there are no historic planning applications directly associated with the site of the Frankley water treatment works extension. A search of the Birmingham City Council planning application records revealed the following applications that have been submitted and approved within the last five years:

- 2011/05427/PA - Erection of 4no. single storey buildings for water treatment
- 2013/02813/PA - Variation of Condition No. 3 attached to planning approval 2011/05427/PA to allow for amended noise levels
- 2013/08976/PA - Relocation of the Hollymoor Pump Kiosk (approved under 2011/05427/PA)
- 2014/06464/PA - Erection of lime dosing plant and kiosks

#### **4.5 Trimpley Water Treatment Works**

A search of the Wyre Forest District Council planning application records revealed that there are no historic planning applications directly associated with the site of the PAC plant. In 2008, planning permission was granted for modifications to the pumping station building (07/1163/FULL).

## 5. Planning Policy

### 5.1 National Planning Policy

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England. The core principles of the NPPF state that planning should be plan-led, providing a practical framework within which decisions on planning applications can be made with a high degree of predictability and efficiency. At the heart of the NPPF is a presumption in favour of sustainable development. It seeks to support sustainable development while taking account of the different roles and character of different areas, protecting the Green Belt and supporting thriving communities.

### 5.2 Local Planning Policy

Applications for planning permission must be determined in accordance with the relevant local development plan unless material considerations indicate otherwise. Policies contained within the development plan should not be considered out of date if they were adopted prior to the publication of the NPPF; however where a plan is not up to date and inconsistent with the NPPF, less weight will be given to its policies.

Weight may also be given to emerging development plans and greater weight may be given to emerging plans that are more advanced in their preparation, have less significant unresolved objections, and are consistent with the NPPF.

The scheme crosses four separate local planning authority boundaries. Table 5-A below identifies the relevant adopted and emerging development plans for each authority, as well as which aspects of the scheme they are applicable to.

Local Planning Authority	Adopted Development Plan	Emerging Development Plan	Relevant aspects of the scheme
Wyre Forest District Council	<ul style="list-style-type: none"> <li>• Wyre Forest Adopted Core Strategy 2010</li> <li>• Wyre Forest Site Allocations and Policies Local Plan 2013</li> <li>• Worcestershire Waste Core Strategy 2012</li> <li>• Hereford and Worcester Minerals Local Plan (saved policies) 1997</li> <li>• Chaddesley Corbett Neighbourhood Plan (adopted 2014)</li> </ul>	<ul style="list-style-type: none"> <li>• Worcestershire Minerals Local Plan (expected to be submitted for examination in 2017)</li> </ul>	River intake, pumping station, pipeline and Trimbley works.
Wychavon District Council	<ul style="list-style-type: none"> <li>• Wychavon Local Plan (saved policies) 2006</li> <li>• Worcestershire Waste Core Strategy 2012</li> <li>• Hereford and Worcester Minerals Local Plan (saved policies) 1997</li> </ul>	<ul style="list-style-type: none"> <li>• South Worcestershire Development Plan (currently undergoing examination)</li> <li>• Worcestershire Minerals Local Plan (expected to be submitted for examination in 2017)</li> </ul>	Pipeline.
Bromsgrove District Council	<ul style="list-style-type: none"> <li>• Bromsgrove District Local Plan 2004</li> <li>• Worcestershire Waste Core Strategy 2012</li> <li>• Hereford and Worcester Minerals Local Plan (saved policies) 1997</li> </ul>	<ul style="list-style-type: none"> <li>• Bromsgrove District Plan (currently undergoing examination)</li> <li>• Worcestershire Minerals Local Plan (expected to be submitted for examination in 2017)</li> </ul>	Pipeline, break pressure tank and part of the Frankley water treatment upgrade works.

<b>Local Planning Authority</b>	<b>Adopted Development Plan</b>	<b>Emerging Development Plan</b>	<b>Relevant aspects of the scheme</b>
Birmingham City Council	<ul style="list-style-type: none"><li>• Birmingham Unitary Development Plan (saved policies) 2005</li></ul>	<ul style="list-style-type: none"><li>• Birmingham Development Plan (currently undergoing examination)</li></ul>	Frankley water treatment upgrade works.

**Table 5-A Relevant Adopted and Emerging Development Plans**

## 6. Policy Review

### 6.1 Green Belt

The entire scheme is located within the Green Belt. The NPPF states that the purpose of the Green Belt is to:

- Check the unrestricted sprawl of large built-up areas;
- Prevent neighbouring towns merging into one another;
- Assist in safeguarding the countryside from encroachment;
- Preserve the setting and special character of historic towns; and
- Assist in urban regeneration, by encouraging and recycling of derelict and other urban land.

A number of local planning policies reflect the provisions of the NPPF and these are listed in Table 6-A below.

Development Plan	Policy
Wyre Forest Site Allocations and Policies Local Plan 2013	SAL.UP1 Green Belt
Wychavon Local Plan (saved policies) 2006	SR7 Development in the Green Belt
South Worcestershire Development Plan (under examination)	SWDP 2 Development Strategy and Settlement Hierarchy
Bromsgrove District Local Plan 2004	DS2 Green Belt Development Criteria and DS13 Sustainable Development
Bromsgrove District Plan (emerging)	BDP4 Green Belt
Birmingham Unitary Development Plan (saved policies) 2005	3.45 Green Belt
Birmingham Development Plan (emerging)	TP10 Green Belt

**Table 6-A Local Planning Policies – Green Belt**

Development that could be harmful to the Green Belt is considered to be inappropriate development and should not be permitted except in very special circumstances. Paragraph 90 of the NPPF outlines certain forms of development which are not considered to be inappropriate in the Green Belt, provided they preserve the openness of the Green Belt and do not conflict with the purposes of including the land in the Green Belt. Included in this list are engineering operations. As the proposed pipeline would constitute engineering operations and would not impact on the openness of Green Belt (as it would be located underground), having consulted with the LPAs it is not considered to be inappropriate development.

The construction of new buildings<sup>1</sup> should be regarded as inappropriate development however there are a small number of exceptions to this including:

*“Limited infilling or the partial or complete redevelopment of previously developed sites (brownfield land), whether redundant or in continuing use (excluding temporary buildings), which would not have a greater impact on the openness of the Green Belt and the purpose of including land within it than the existing development.”*

The proposed structures within the administrative area of Birmingham City Council would be located within the existing Frankley WTW site which Birmingham City Council has considered as a Major Development Site in the Green Belt on previous planning applications for development at the site. As discussed with the relevant Planning Officers at the pre-application stage, no structures would be constructed higher than the existing structures within the site and the development is not likely to have a greater impact on the openness of the

<sup>1</sup> The definition of a building, as provided in s336 of the Town and Country Planning Act 1990, includes “any structure or erection, and any part of a building so defined, but does not include plant or machinery comprised in a building”.

Green Belt, or the purpose of including the land within it. The proposed works within Birmingham is therefore not considered to be inappropriate development.

The following buildings and structures however are considered to be inappropriate development and very special circumstances must be demonstrated for the project to proceed:

- River intake (Wyre Forest).
- Pumping station (Wyre Forest).
- Break pressure tank (Bromsgrove).
- Two roadside cathodic protection kiosks of 1.2m height (Wyre Forest and Bromsgrove).
- The WTW extension within the administrative area of Bromsgrove District Council.
- The proposed works at Trimley WTW (Wyre Forest).

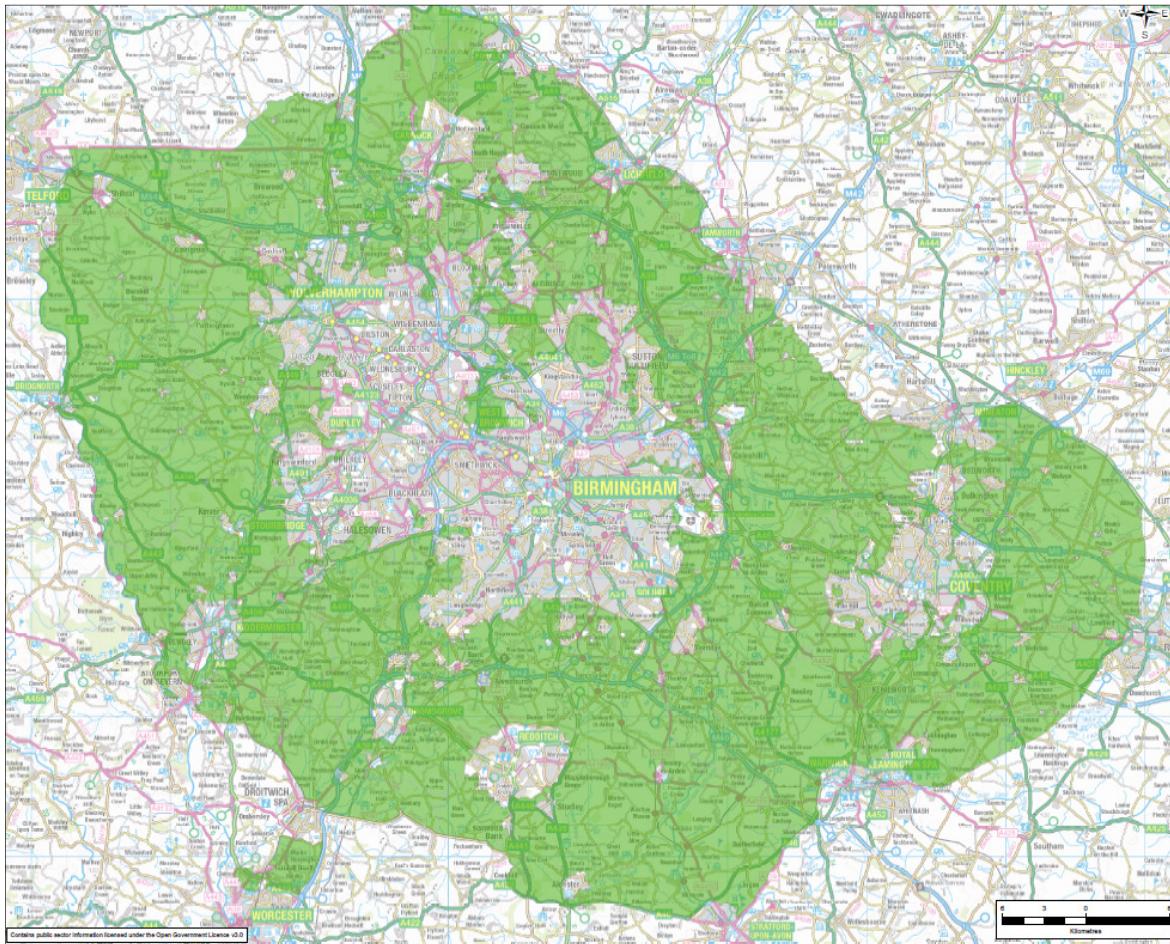
The following sections describe why the development is required within the Green Belt, how harm to the Green Belt has been minimised through careful siting and design of these structures, and details the very special circumstances that exist for the proposed development.

#### **6.1.1 Location within the Green Belt**

Given that Birmingham is surrounded by land designated as Green Belt, including the existing Frankley WTW itself (refer to Figure 6.1), it would not be possible to provide an alternative water supply from outside the city without crossing the Green Belt. A detailed optioneering assessment concluded that the most favourable option for this alternative supply would be a new intake from the River Severn. An area of search was then identified along the River Severn for the most appropriate location for the new river intake. This was based on the suitability for new abstraction sites and the cost associated with the length of new transfer pipeline required to reach the existing water treatment works at Frankley. The chosen area of search extended from Trimley to Ombersley.

A total of 22 potential intake sites were identified, 11 of which were located within the Green Belt. Each of these sites were evaluated against a comprehensive range of technical and environmental criteria including the availability of water for abstraction. Taking these factors into account, the site at Lickhill was identified as the preferred option. Although the Lickhill site is located within the Green Belt, the selection of any of the sites outside of the Green Belt would have resulted in the requirement for a much longer transfer pipeline which would not only have cost implications but also the potential for significantly increased environmental impacts (further details are provided in Section 3.3 of the Environmental Statement).

The location of the pipeline and the existing WTW at Frankley and Trimley within the Green Belt means that there is also a requirement for the above ground structures associated with the BRP (i.e. the pumping station, break pressure tank and new structures at Frankley and Trimley WTW) to be in the Green Belt.



**Figure 6.1 : Green Belt area surrounding Birmingham.**

#### **6.1.2 Potential for harm to the Green Belt**

The main characteristics of the Green Belt are its openness and permanence. As such, Green Belt policy aims to prevent urban sprawl by keeping the land permanently open. The scheme is assessed against the main principles of the Green Belt and its openness below.

##### **Assist in safeguarding the countryside from encroachment and check unrestricted sprawl of large built-up areas**

Due to the nature of the scheme and technical requirements, the river intake, pumping station and break pressure tank are located within the countryside and not adjacent to any built up areas. At Frankley WTW as much of the proposed infrastructure as possible would be located within the existing site. Although there is a requirement to extend the site into Bromsgrove District, this extension would be contained by a landscaped bund and is unlikely to encourage further sprawl of the built up area as no precedent would be set for future residential or economic development in the area. It is therefore considered that although the development would extend into the countryside, the proposals would not conflict with the principle of checking unrestricted sprawl of large built-up areas.

### **Prevent neighbouring towns from merging**

The proposed development would not lead to development that would close the gap between any settlements and it is not considered that the proposals would conflict with the principle of preventing neighbouring towns from merging.

### **Preserve the setting and special character of historic towns**

Within the area that the structures detailed above would be located, the Green Belt is characterised as agricultural land and not as the setting of any historic towns. It is not considered that the proposals would conflict with the principle of preserving the setting and special character of any historic towns.

### **Assist in urban regeneration, by encouraging the recycling of derelict and other urban land.**

The characteristics of the scheme mean that the river intake must be located at a location that satisfies its technical requirements while the pumping station and break pressure tank must be located on the proposed pipeline route. As such it has not been possible to locate these structures elsewhere such as on urban land. At Frankley WTW, as much of the development as practicable has been located within the existing WTW boundary making the most efficient use of the land available.

### **Openness**

The location, siting, materials and design of all structures have been carefully considered to minimise impact on the openness and visual amenity of the Green Belt. Some of the design features and mitigation for each structure are outlined below, and further assessment on the impacts of the scheme on openness is provided in Chapter 9 (Landscape and Visual) of the Environmental Statement.

#### River Intake

- The intake has been designed to minimise its engineered character, including careful choice of materials and colours to suit its riverside context and in keeping with frontage details at Bewdley. This would include stone cladding and period handrails.
- Management of riverside vegetation removal to prevent excessive loss.
- The provision of planting alongside and at the rear of the intake is designed to mimic the river corridor native mix, and would help screen the facility.
- Suitable marginal aquatic planting and terrestrial planting is proposed within the rock revetment, underneath the intake facility wingwalls.
- The access track would be constructed from a reinforced grass system.

#### Pumping Station

- Excavation would be undertaken to set the pumping station building into the hillside to minimise apparent building heights and keep them below the sky line from all public view points.
- The building would resemble an agricultural building, similar to existing barns found in the surrounding farmland.
- Suitable excavated material would be used to provide a landscape bund on the west side of the building to provide screening for views from Severn Bank Park.
- Slopes of permanent bunds at the pumping station would be optimised to provide visual screening whilst blending in with surrounding ground levels. Tree, hedgerow and shrub planting would mature to further visually screen the changes in topography.
- Positioning of the pumping facility with woodland planting to the north would tie in with the existing planting to the north at New Barns Cottage and reduce effects on landscape pattern.

### Break Pressure Tank

- The BPT and other plant would be largely excavated into the hillside which would significantly reduce potential landscape and visual impacts.
- The BPT would be provided with a ‘green roof’.
- Native hedgerow planting is proposed along the site’s southern, eastern and northern boundaries in order to assimilate the development into the surrounding field pattern.
- Native shrub mix planting areas are proposed at the entrance and access road to provide further screening.

### Frankley Water Treatment Works

- The proposed architectural treatment for the new development would follow that of the existing works, and use a consistent architectural material throughout, namely industrial profiled metal cladding. Following consultation with the local authority it was agreed that the colour choice for the cladding materials and above ground structures should generally be dark green, rather than the light green colour predominant in the existing works. This is because the darker colour would be less reflective, blend in better with the tree canopies of the adjacent copse, and therefore have less visual impact.
- The profiling of the sludge treatment area would consist of a shallower slope facing away from the site to reduce its prominence.
- Landscape bunding would be provided along the western and southern boundaries to protect views from elevated ground beyond.
- Landscape bunds would be seeded and planted with woodland and shrubs of native species to reduce their prominence and provide visual screening to the WTW.
- The construction stage elements such as the car park to the north of the site have been planned to retain and protect existing mature trees.
- The retaining wall south of the proposed extension has been designed to incorporate a vegetated earth bank.

### Trimbley Water Treatment Works

- The siting of the plant has been carefully considered to minimise tree removal.
- Replacement planting of native woodland and shrub species is proposed to restore the boundary screening.

#### **6.1.3 Very Special Circumstances**

As the scheme includes buildings which are regarded as inappropriate development in terms of Green Belt policy, very special circumstances must be demonstrated to show how any harm to the Green Belt is clearly outweighed by other considerations.

STWL has a statutory duty to provide a secure supply of water to its customers. A clear strategic direction for resilience was set out in the Pitt Report (2008) which made it clear that utility companies were expected to maintain essential services under worst-case scenarios. Resilience was a central theme in the government’s water strategy, Water for Life (2013), while the Government’s National Climate Change Risk Assessment (2012) included the vulnerability of the public water supply to climate change as a priority risk for the UK. The Water Bill – introduced in the House of Commons in June 2013 – contains changes to Ofwat’s duties concerning resilience. It features a new primary duty for Ofwat “*to secure the long-term resilience of water supply and sewerage systems against environmental pressures, population growth and changes in consumer behaviour*”. This reflects the high priority that government places on resilience.

As discussed in Section 2 of this report, the main objective of the project is to provide resilience to the water supply to Birmingham, which is currently highly dependent on the EVA carrying water from the Elan Valley in mid Wales. Around 1.2 million STWL customers in the Birmingham area are currently reliant on Elan Valley

water from the reservoir in mid-Wales. The water is transported 119km via the EVA to Frankley WTW. To facilitate future maintenance of the EVA it is necessary to provide an alternative source of water for the duration of the works.

Because of the nature of the development, there is no suitable alternative to development in the Green Belt. Available space within the existing Frankley WTW has been utilised as far possible, and where new buildings are proposed in the Green Belt, their location, siting, design and materials have been carefully chosen so as to minimise impacts on the openness of the area. Overall, the proposed scheme would provide resilience to the water supply of Birmingham, thereby supporting the social and economic objectives of the city for sustainable development. Although it is accepted that the proposed river intake, pumping station, break pressure tank, the works at Trimley WTW and the extension to Frankley WTW are by definition inappropriate development within the Green Belt, the benefits of the proposed scheme as discussed here are significant and clearly outweigh any harm to the Green Belt by reason of inappropriateness. Very special circumstances therefore exist to justify this development in the Green Belt.

## **6.2 Land Use**

### **6.2.1 Development Allocations**

#### **Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)**

The proposed pipeline route alignment passes beneath land allocated for employment use at Wilden Lane Industrial Estate. The pipeline would be tunnelled at this location and would therefore not result in the loss of any land from the allocation.

The site proposed for the construction compound forms part of the former Parsons Chain site south of Hartlebury Road (B4193) in Stourport on Severn. The site was cleared in 2008 and is currently vacant with only a concrete platform remaining on site. Policy SAL.EA3 (Parsons Chain) of the Wyre Forest Site Allocations and Policies Local Plan allocates the land for a mix of uses including residential, business and community uses throughout the site. The construction compound would be used for a temporary period during the construction of the pipeline only and this use has been agreed with the landowner. The use of the site as a construction compound would not restrict the future development of the site for the allocated uses or any other use.

#### **Wychavon (Pipeline)**

No sites allocated for development would be affected by the proposed scheme within Wychavon.

#### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

No sites allocated for development would be affected by the proposed scheme within Bromsgrove.

#### **Birmingham (Frankley WTW)**

No sites allocated for development would be affected by the proposed scheme within Birmingham.

### **6.2.2 Agricultural Land**

#### **6.2.2.1 Relevant Policies**

##### **NPPF (whole scheme)**

Paragraph 112 of the NPPF encourages local planning authorities to take into account the benefits (economic and other) of the best and most versatile agricultural land. Areas of poorer quality land should be used in preference to that of a higher quality land where significant development of agricultural land is demonstrated to be necessary. The quality and versatility of agricultural land is classified from Agricultural Land Classification (ALC) Grade 1, excellent, to Grade 5, very poor, based in part on soil type. Grade 3 is further subdivided into

Grades 3a and 3b. Land in Grades 1, 2 or 3a is defined in the Planning Practice Guidance as the best and most versatile agricultural land.

#### **Wyre Forest (Trimbley PAC Dosing, RIPS, Pipeline)**

While the adopted Wyre Forest Core Strategy states that development would not be permitted if it was likely to have an adverse impact on the best and most versatile land (Policy DS04: Rural Regeneration of the Wyre Forest Core Strategy), the adopted Site Allocations and Policies Local Plan aligns more closely with the NPPF by stating that development of the best and most versatile agricultural land will not be permitted “*unless the development cannot be located on previously developed land, within the boundaries of existing settlements or on poorer quality agricultural land*” (Policy SAL.UP14: Agricultural Land Quality of the Wyre Forest Site Allocations and Policies Local Plan). In addition, Policy SAL.UP14 seeks to ensure that farming operations on any agricultural land are not prejudiced by development.

#### **Wychavon (Pipeline)**

Policy SWD13: Effective Use of Land of the emerging South Worcestershire Development Plan reflects the policies of the NPPF. Where any development is required on the best and most versatile agricultural land, the lowest grade of land should be used except where the sustainable development objectives of the South Worcestershire Development Plan would be better met by using land of a higher grade. The effects of development on farm economics and management will also be considered in the determination of planning applications and mitigation will be required to ensure that no severance of buildings from land or farm fragmentation takes place.

#### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Policy DS13: Sustainable Development of the Bromsgrove District Local Plan seeks to protect the District's character and environmental assets including the best and most versatile agricultural land.

#### **Birmingham (Frankley WTW)**

No relevant policies have been identified.

##### **6.2.2.2 Review**

The land use within the pipeline corridor is primarily agricultural with arable (including some specialist cropping) and livestock farming predominating. The land generally comprises Grade 2 agricultural land in the western half of the pipeline route, Grade 3 in the eastern half and Grade 4 on the River Stour floodplain and in the Clent Hills area. Following the installation of the pipeline, the agricultural land would be reinstated to its former use and physical characteristics. There would therefore be no change of use associated with the pipeline apart from very minor intrusions associated with valve chambers and similar pipeline management features. At Frankley WTW there would also be some temporary loss of agricultural land for construction working areas including a temporary car park to the north of the WTW (within Birmingham) and soil storage areas to the south of the WTW (within Bromsgrove). In order to reduce the effects of the temporary disturbance of agricultural land, standard soil handling practices would be employed in accordance with current guidance and legislation. Further details of these methods are set out in Chapter 19 (Agriculture and Soils) of the ES. Detailed measures will also be set out in a Soil Management Plan which would form part of the Construction Environmental Management Plan (CEMP) (a draft of which is available in Appendix 4.2 of the Environmental Statement).

The only permanent loss of agricultural land would be at the intake, pumping station, BPT and Frankley WTW extension sites (a total of approximately 8.06ha). The river intake and pumping station sites (within Wyre Forest) and the BPT site (within Bromsgrove) comprise approximately 35% of the total loss of agricultural land and are classified as Grade 4 agricultural land. The proposed Frankley WTW extension site (within Bromsgrove) comprises approximately 65% of the total loss of agricultural land and is considered to be Grade 3b agricultural land.

Thirty two farms and landholdings would be subject to temporary land take for the construction of the proposed pipeline. During this period arrangements would be made for continued access to fields potentially severed by

the pipe laying works. Three farm businesses would be affected by permanent land take associated with the intake and pumping station, the BPT, and the Frankley WTW extension. This would result in a loss of between 0.99% and 3.25% of the total land area of each farm and discussions with the landowners and tenants of these holdings have been held to ensure farming operations would not be prejudiced by the development.

As the proposed scheme would not result in the permanent loss of any land considered to be best and most versatile agricultural land (i.e. 3a or higher), and mitigation measures would be employed to ensure farming operations are not prejudiced by the development, no conflict with planning policies are expected with regard to agricultural land.

### **6.2.3 Recreational Land**

#### **6.2.3.1 Relevant Policies**

##### **NPPF (whole scheme)**

At the core of the NPPF is a presumption in favour of sustainable development. This means that as well as protecting and enhancing the environment, the planning system must contribute to building a strong and responsive economy while also supporting strong, vibrant and healthy communities.

In order to achieve this, development should seek to protect and enhance the social, recreational and cultural facilities and services that the community needs. The NPPF also highlights the importance of access to high quality open spaces and opportunities for sport and recreation which can make an important contribution to the health and wellbeing of communities. Paragraph 74 states:

*“Existing open space, sports and recreational buildings and land, including playing fields, should not be built on unless:*

- *an assessment has been undertaken which has clearly shown the open space, buildings or land to be surplus to requirements; or*
- *the loss resulting from the proposed development would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location; or*
- *the development is for alternative sports and recreational provision, the needs for which clearly outweigh the loss.”*

##### **Wyre Forest (Trimbley PAC Dosing, RIPS, Pipeline)**

In line with the NPPF, development within Wyre Forest should contribute to the social wellbeing of the area (Policy SAL.PFSD1: Presumption in Favour of Sustainable Development of the Wyre Forest Site Allocations and Policies Local Plan). Community facilities and services should be sustained and existing sport and recreation facilities should be safeguarded and enhanced in accordance with the standards set out in the District's Open Space, Sport and Recreation Assessment (Policies CP01: Delivering Sustainable Development Standards and CP07: Delivering Community Wellbeing of the Wyre Forest Core Strategy). The proposed pipeline would run through an area of outdoor sports use identified as Minster Road on the Wyre Forest Policies Map. Policy SAL.UP4: Open Space and Play Provision of the Wyre Forest Site Allocations and Policies Local Plan states that this site, as well as other areas identified in the Open Space, Sports and Recreation Assessment should only be built on if the criteria listed in paragraph 74 of the NPPF are met.

##### **Wychavon (Pipeline)**

Proposals which result in the loss of, or adversely affect the operation of, a community facility will only be permitted where an acceptable and feasible alternative facility exists or a replacement can be provided (Policy COM11: Protection of Community Facilities of the Wychavon Local Plan). The local green network, which includes existing open space, sports and recreational buildings and land, including playing fields should also be protected in line with the policies of the NPPF (COM13: Protection of Open Space and Sport and Recreational Buildings and Land in Towns and Villages of the Wychavon Local Plan and Policy SWDP38: Local Green Network of the emerging South Worcestershire Development Plan)

**Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Within Bromsgrove there is a requirement for development to safeguard and improve the quality of life of residents in a number of ways including by protecting land of recreation and amenity value (Policy DS13: Sustainable Development of the Bromsgrove District Plan and Policies BDP1: Sustainable Development Principles and BDP25: Health and Well Being of the emerging Bromsgrove District Plan). Any development that results in the loss of playing fields or outdoor sports facilities must satisfy the criteria detailed in the NPPF (Policy S32: Loss of Private Playing Fields of the Bromsgrove District Local Plan) and development of open space will only be considered where it can be clearly demonstrated that there is unlikely to be any long-term need to retain it for either recreational or amenity purposes (Policy RAT4: Retention of Open Space of the Bromsgrove District Local Plan).

**Birmingham (Frankley WTW)**

In line with the requirements of the NPPF, any proposals which would have an adverse effect on the open space network (including all open land of recreational or public value) will not be permitted unless exceptional circumstances exist taking into account the availability of open space nearby, its quality, and how well it meets local needs (Policies 3.47 – 3.60: Open Spaces and Playing Fields of the Birmingham Unitary Development Plan and Policies TP9: Open Space, Playing Fields and Allotments and TP11: Sports Facilities of the emerging Birmingham Development Plan). The existing green infrastructure network throughout the city should also be maintained and expanded where possible (Policy TP7: Green Infrastructure Network of the emerging Birmingham Development Plan).

**6.2.3.2 Review**

Following the installation of the pipeline, the land would be reinstated to its former use and physical characteristics. There would therefore be no permanent loss of land used by the community or for recreation. It is likely that the following areas would be impacted for a temporary period during construction works, however following discussions with landowners and other key stakeholders it is considered that impacts can be minimised and effectively mitigated as follows:

- Burlish Top Local Nature Reserve (Wyre Forest) – the pipeline route would run along Kingsway which would be closed during the construction of that section of pipeline (up to three months), thereby affecting access to the car park. A temporary car park for the public would be created south of the pipeline, in lieu of the lost public car park at Burlish Top. A suitable crossing point would be created which would enable the public to continue to access the Burlish Top nature reserve.
- Burlish Park Golf Club (Wyre Forest) – The pipeline would be aligned along Kingsway in order to avoid any impacts to the golf course which is currently undergoing remodelling. Where it would be necessary to cross the golf course between Kingsway and the Kidderminster Harriers training ground, trenchless methods would be used to ensure access between all sections of the golf course remains open.
- Kidderminster Harriers training ground (Wyre Forest) – The pipeline would cross land which is currently used as seven football training pitches used by Kidderminster Harriers and other clubs. Land at this location would also be required as a working area associated with the proposed tunnel to the east. Two pitches would be lost for a period of approximately 15 months for the construction of a tunnel shaft. Disruption to the other five pitches would be minimised by confining the pipeline construction to a 12 week period. On completion, all pitches would be [re-instated to the same, if not better condition than they were in at the commencement of works](#). Discussions are taking place with the landowner of the pitches to determine whether it would be possible to convert a disused driving range (owned by the same landowner) located to the north to sports pitches. This would ensure that there would be no overall loss in the number of pitches available during construction, and they could be retained following construction resulting in an overall increase in the number of sports pitches.
- Wilden Motocross Track (Wyre Forest) – The pipeline would be tunneled beneath the racing circuit to ensure no impacts to the motocross track.

None of the permanent above ground structures would impact on any recreational land (public rights of way are considered separately in Section 6.4 of this Statement).

No conflict with planning policies relating to community land and recreation is therefore expected as a result of the scheme.

## 6.3 Traffic

### 6.3.1 Relevant Policies

#### NPPF (whole scheme)

Section 4 of the NPPF promotes sustainable transport and encourages transport solutions to reduce greenhouse gas emissions and reduce congestion. For all development sites, access should be safe and suitable. With regards to levels of parking facilities required for development, local planning authorities are required to take into account the accessibility of the development, the type and use of development, and the availability of opportunities for public transport.

#### Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)

Development proposals should have full regard to the traffic impact on the local highway network and any proposals that would result in the deterioration of highway safety would not be allowed. In line with the NPPF, proposals should also ensure that adequate visibility is available for vehicles turning into and out of the site (Policy CP03: Promoting Transport Choice and Accessibility of the Wyre Forest Core Strategy and Policy SAL.CC1: Sustainable Transport Infrastructure of the Wyre Forest Site Allocations and Policies Local Plan). Where a development is likely to generate significant goods vehicle traffic, it should be located in close proximity to the Lorry Route Network (as indicated on the Policies Map), and will not be permitted if it will have an adverse impact on residential areas (Policy SAL.CC4: Freight of the Wyre Forest Site Allocations and Policies Local Plan).

The level of parking provided for development should be consistent with the standards set out in the Worcestershire County Highways Design and car parking should be designed to fully integrate with development proposals (Policy SAL.CC2: Parking of the Wyre Forest Site Allocations and Policies Local Plan).

In addition, within Chaddesley Corbett Parish, Policy CC12: Highways and Traffic Principles of the Chaddesley Corbett Neighbourhood Plan seeks to ensure that development meets road safety standards and maintains a peaceful and safe rural parish.

#### Wychavon (Pipeline)

In accordance with the NPPF, development will only be permitted if it does not have an adverse effect on the operation of the transport network (Policy GD2: General Development Control of the Wychavon Local Plan). For developments that generate significant heavy goods vehicle traffic, proposals will only be approved if the site is easily accessible via the Lorry Route Network and there is no adverse environmental impact on residential amenity. It should also be demonstrated that goods cannot be moved by rail (Policy ECON11: Freight of the Wychavon Local Plan).

#### Bromsgrove (Pipeline, BPT, Frankley WTW Extension)

Any development proposals that involve significant reforming of land and/or the importation of material will be considered against a number of factors including the number of vehicle movements, the impact on the amenities of local residents, and regard for general safety (Policy ES16: Reforming Land of the Bromsgrove District Local Plan).

#### Birmingham (Frankley WTW)

Within Birmingham, a Strategic Highway Network (SHN) has been developed as part of the transport strategy. The SHN consists of major routes where high capacity and a free flow of traffic should be maintained and includes the A38 and the B4121 (Policy 6.38: The Strategic Highway Network of the Birmingham Unitary Development Plan). The City aims to achieve a sustainable transport network and the local planning authority

will therefore have regard for the ability of the local road network to accommodate additional traffic (Policy BDP1: Sustainable Development Principles Plan, Policy TP37: A Sustainable Transport Network and Policy TP43: Traffic and Congestion Management of the emerging Birmingham Development).

### 6.3.2 Review

Only very low levels of traffic would be generated by the development once operational (refer to Section 2.3 of this report for details of operational traffic at each component of the scheme). Details of the levels of traffic expected to be generated during the construction of the scheme are provided in the Transport Assessment and summarised in Chapter 16 of the Environmental Statement. An assessment of the predicted impact of construction traffic on the operation of key road junctions on the proposed construction traffic routes is also provided. The potential for use of freight barge operators on the River Severn was investigated for the bulk movement of spoil. However it was established that the River Severn at Lickhill is too shallow and would require dredging which would not be a viable option. Options for movement of material by rail were also investigated however there are no existing rail freight terminals within or close to the development area.

Construction traffic routes have therefore been determined through discussions between Jacobs, STWL's contractor and local Highway Authorities and are shown in the construction stage Traffic Management Plan (Appendix M of the Transport Assessment). The construction traffic routes correspond with designated heavy goods vehicle (HGV) routes on the Worcestershire Advisory Lorry Route Map as far as practicable and to avoid roads which have been assessed as not suitable for HGV traffic due to carriageway width, visibility or weight prohibitions (including within the villages of Chaddesley Corbett, Bluntington, Drayton and Belbroughton). Following consultation with residents it was agreed that certain roads serving the village of Wilden would not be used for HGV traffic, for example the southern section of Wilden Lane which passes through the centre of the village and the primary school.

Along the route of the pipeline, traffic (including workers, mechanical equipment and material deliveries) would access the working width at one of seven access points located at intervals along the length of the water pipeline, from which point it would travel along the pipeline route. Access to the pipeline from the highway would be taken from existing accesses wherever practicable. However, new accesses to the highway would be formed at both sides of the majority of road crossings - to allow a continuous right of way for pipeline construction traffic in both directions along the working area. During construction of the pipeline, in order to minimise impacts of construction workers vehicles on local roads along the route, construction workers would travel first to the site office at Stourport from where they would share minibuses, cars and vans to travel to locations along the length of the pipeline.

During the construction phase of the project, a number of minor roads could potentially require temporary closure if crossed by the water transfer pipeline by means of an 'open cut' crossing method. Major roads (A roads, B roads and motorways) would be crossed by a 'trenchless' method i.e. a form of tunnelling during pipeline construction and so would not require closure. A list of road crossings crossed by the pipeline is included as Appendix Y of the Transport Assessment. Where the method of crossing is indicated as 'open cut', traffic management would be employed with short term temporary road closures being used if required.

One minor road with a local access function, Kingsway in Stourport-on-Severn (Wyre Forest), would form part of the water transfer pipeline alignment and would require a closure for between 6 and 12 weeks. Further details of how this closure would be managed are included in the construction Traffic Management Plan.

Access to both the river intake and pumping station construction areas would be taken from the old Blackstone Landfill access off Bewdley Road North. This would be cleared and widened into a new temporary access with a tarmac roadway from Bewdley Road to the compound and site office location. A stone haul road would be constructed to take plant, machinery and other vehicles from the offices and welfare area, through the temporary working area for the pumping station and along a 250m temporary haul road to the river bank. A temporary footpath would be constructed for construction workers. Construction traffic would have to cross the concrete road which provides access to Severn Bank Park under managed conditions, however no construction traffic would use the concrete road and it would remain open at all times.

Access to the BPT construction site would be taken via an existing access off Putney Lane. The existing access would require some modification to ensure safe sight lines for construction vehicles, and for operational traffic once the site is in operation.

At Frankley WTW, all deliveries and HGV traffic would be routed through the existing main access to Frankley WTW on Waterworks Drive and light goods vehicle (LGV) traffic (e.g. personal cars of workforce) would be routed to the temporary car park via an existing access on Frankley Lane. Traffic within the site would be managed for safety using a one-way system and shuttle bus for personnel. For access to Trimbley WTW the existing HGV access route would be used which is controlled at the front gate.

Once operational, all new structures would be unmanned in normal operation and it is likely that only two additional personnel would be employed as a result of the scheme (one at Trimbley and one at Frankley). Sufficient parking has been provided at the river intake, the pumping station and the break pressure tank sites to serve the operational traffic required (see Section 2.3 of this report for a description of the likely levels of operational traffic).

Environmental impacts as a result of the traffic generated are considered in the noise and air quality sections.

Overall it is acknowledged that the scheme would be a major construction project, however with the mitigation outlined above and detailed in the Transport Assessment and construction Traffic Management Plan, disturbance to local residents and businesses should be minimised during the construction period, and no significant adverse impacts on the highway capacity or safety are predicted. Once constructed, only very low levels of traffic would be generated as a result of the development. No conflict with planning policies relating to traffic is expected.

## **6.4 Public Rights of Way**

### **6.4.1 Relevant Policies**

#### **NPPF (whole scheme)**

Development should seek to protect and enhance the social, recreational and cultural facilities and services that the community needs, including public rights of way.

#### **Wyre Forest (Trimbley PAC Dosing, RIPS, Pipeline)**

Developments which affect public rights of way will need to make provision for their continuation or diversion (Policy SAL.UP3: Providing a Green Infrastructure Network of the Wyre Forest Site Allocations and Policies Local Plan).

#### **Wychavon (Pipeline)**

Development proposals will only be permitted if they would not have an adverse effect on public rights of way (Policy GD2: General Development Control of the Wychavon Local Plan).

#### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Where a right of way is likely to be affected by a development, alternative routes will need to be provided (Policy RAT13: Retention of Open Space of the Bromsgrove District Local Plan).

#### **Birmingham (Frankley WTW)**

In line with the requirements of the NPPF, any proposals which would have an adverse effect on the open space network will not be permitted unless exceptional circumstances exist (Policy 3.47: Open Spaces and Playing Fields of the Birmingham Unitary Development Plan).

#### 6.4.2 Review

Construction of the scheme has the potential for temporary effects on 33 public rights of way (shown on Figure 16.3 of the Environmental Statement). It is not anticipated that any temporary PRoW closures would be required, other than for very short-term (less than one day) periods for pipeline installation. Public access across the working width laid out for the pipeline would be maintained and would generally follow the original alignment of the footpath or bridleway, except in circumstances where a more direct route across the working width would provide a better solution in terms of safety. Access and egress of the working width would be made by appropriate crossing of the working fence line i.e. gates or stiles. There would be breaks in the topsoil storage areas on the alignment of the public right of way that would give adequate visibility of construction traffic, and signage would be erected warning construction traffic that it is approaching a public right of way. At times when operations are working in the area of the right of way, measures to assist the general public in an appropriate and safe way across the working width will be put in place. Signage located at either ends of the affected section of public right of way would have warning notices giving information on the existence of construction work in the area, and the effect on the route; this would also give notice of any temporary closure with a date, time and duration. The planned phasing of the construction programme for the pipeline would limit the number of footpaths impacted at any given time.

Two footpaths would require temporary diversion during construction and permanent diversion once the development is operational. These are:

- The Severn Way waymarked long distance footpath (ref: 560B) which follows the course of the River Severn. A local permanent diversion would be required around the proposed intake structure for approximately 50m taking the footpath away from the river bank by approximately 15m. (Refer to drawing A5W11215-PD26770 Proposed Lickhill River Intake General Layout Plan).
- Public Right of Way 537C which runs along the western boundary of the existing Frankley WTW. A local permanent diversion would be required around the proposed extension to the water treatment works for approximately 400m. (Refer to drawing A5W11215-PA26093 Permanent Diversion Footpath Plan).

Applications for the temporary and permanent diversion of the footpaths would be submitted to Worcestershire County Council following the submission of these planning applications.

By ensuring that public rights of way would be kept open for all but a short period of time during construction and with the provision of local diversions to two public rights of way, no conflict with planning policies relating to public rights of way is expected.

### 6.5 Ecology

#### 6.5.1 Relevant Policies

##### NPPF (whole scheme)

Paragraph 109 of the NPPF states that the planning system should recognise the wider benefits of ecosystem services, minimise impacts on biodiversity, provide net gains in biodiversity where possible and contribute to the government's commitment to halt the overall decline in biodiversity (including by establishing coherent ecological networks that are more resilient to current and future pressures). Planning for biodiversity at a landscape scale is encouraged and the preservation, restoration and re-creation of priority habitats, ecological networks and priority species populations is promoted (paragraph 117).

In addition to the legislation protecting internationally and nationally designated sites, the following principles should be applied in order to conserve and enhance biodiversity:

- *"if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
- *proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other*

*(developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;*

- *development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
- *opportunities to incorporate biodiversity in and around developments should be encouraged;*
- *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and*
- *the following wildlife sites should be given the same protection as European sites:*
  - *potential Special Protection Areas and possible Special Areas of Conservation;*
  - *listed or proposed Ramsar sites; and*
  - *sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.*" (Paragraph 118).

#### **Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)**

Development that has a detrimental impact on habitats of biodiversity sites (including locally designated sites and habitats recognised within the Worcestershire BAP) or provisions for protected species would not be permitted. All new development is also required to enhance opportunities within the site or make contributions to off-site biodiversity projects (Policy CP14: Providing Opportunities for Local Biodiversity and Geodiversity of the Wyre Forest Core Strategy and Policy SAL.UP5: Providing Opportunities for Safeguarding Local Biodiversity and Geodiversity of the Wyre Forest Site Allocations and Policies Local Plan).

The existing green infrastructure network within the District should also be safeguarded and new development is required to contribute positively towards the District's green infrastructure network. A number of features have been identified as key green infrastructure assets including the Rivers Severn and Stour (and associated wetlands), the Staffordshire and Worcestershire Canal, and the District's heathland and acid grasslands. New development alongside these watercourses should maintain and enhance their biodiversity value (Policy CP13: Providing a Green Infrastructure Network of the Wyre Forest Core Strategy and Policy SAL.UP3: Providing a Green Infrastructure Network of the Wyre Forest Site Allocations and Policies Local Plan).

#### **Wychavon (Pipeline)**

In addition to the protection afforded to internationally and nationally protected habitats and species (Policies ENV3 Sites of International Importance for Nature Conservation and ENV4 Sites of Special Scientific Interest of the Wychavon Local Plan and Policy SWDP 22: Biodiversity and Geodiversity of the emerging South Worcestershire Development Plan), protection is also afforded to sites and species of regional and local importance including Grassland Inventory Sites (GIS), Local Wildlife Sites (LWS), plantation or ancient woodland sites, important individual trees, and species or habitats of principle importance recognised in the Biodiversity Action Plan or listed under section 41 of the Natural Environment and Rural Communities Act 2006. Development which has an adverse impact on these sites will only be permitted if:

- The need for development outweighs the importance of the biodiversity interest; and
- There are no reasonable alternative sites available; and
- Full compensatory provision is secured.

All new development must also seek to enhance biodiversity, safeguard ecological corridors, and contribute towards securing coherent, robust ecological networks at both a local and wider landscape scale. Off-site mitigation will only be acceptable where on-site mitigation is clearly not possible (Policies ENV5: Sites of

Regional or Local Wildlife Importance, ENV6: Protected Species, ENV7: Protection of Wider Biodiversity of the Wychavon Local Plan and Policy SWDP 22: Biodiversity and Geodiversity of the emerging South Worcestershire Development Plan). In addition, any features considered to be important for their ecological value including trees, hedgerows and woodland should be protected (Policy ENV8: Protection of Hedgerows, Trees and Woodland of the Wychavon Local Plan Plan).

### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

In line with the NPPF, a number of policies in both the adopted Bromsgrove District Plan and the emerging Bromsgrove District Plan aim to protect and enhance sites and areas of high nature conservation value including nationally and locally protected sites, and irreplaceable natural resources such as ancient woodlands, habitat of principles importance, waterbodies, marshlands, wetlands, unimproved grassland, wildlife corridors, stepping zones and buffer zones. These policies include:

- DS9: Protection of Designated Environmental Areas of the Bromsgrove District Local Plan.
- DS13: Sustainable Development of the Bromsgrove District Local Plan.
- C9: Development Affecting SSSIs and NNRs of the Bromsgrove District Local Plan.
- C10: Development Affecting SWSs and LNRs of the Bromsgrove District Local Plan.
- C10A: Development Affecting other Wildlife Sites of the Bromsgrove District Local Plan.
- C12: Wildlife Corridors of the Bromsgrove District Local Plan.
- C16: Effect of Infrastructure Development on the Landscape of the Bromsgrove District Local Plan.
- C17: Retention of Existing Trees of the Bromsgrove District Local Plan.
- C18: Retention of Existing Woodland of the Bromsgrove District Local Plan.
- C19: Tree Preservation Orders of the Bromsgrove District Local Plan.
- BDP19: High Quality Design of the emerging Bromsgrove District Plan.
- BDP21: Natural Environment of the emerging Bromsgrove District Plan.

### **Birmingham (Frankley WTW)**

All development should contribute to enhancing Birmingham's natural environment and biodiversity enhancement measures appropriate to the nature and scale of the development are encouraged. Development that is likely to adversely affect local sites of biodiversity importance, priority habitats and species, and landscape features of major importance to wildlife will only be permitted if the need for the development outweighs the need to safeguard the conservation value of the site or feature and mitigation can be put in place. Where mitigation is not possible appropriate compensation should be secured (Policies 3.37 - 3.39 Nature Conservation of the Birmingham Unitary Development Plan and Policy TP8: Biodiversity and Geodiversity of the emerging Birmingham Development Plan).

#### **6.5.2 Review**

In identifying route and site options for the scheme, extensive constraints mapping was used to ensure that the development would avoid statutory designated nature conservation sites as far as possible. The River Severn flows into the Severn Estuary which is designated as Ramsar, SAC, SPA and Sites of Special Scientific Interest (SSSI) protected areas. Effects of the abstraction from the River Severn would be avoided by timing of the abstraction during autumn and winter months when sufficient water is present in the river as determined by the Environment Agency Hands off Flow limit. The reduction in downstream flows would have no significant effects on downstream designations including those listed above. In addition, the predicted changes in flow and downstream river levels at weirs are considered to be minimal, and would be unlikely to affect the existing levels

of migration of species such as Atlantic salmon. Potential fish entrainment<sup>2</sup> at the new intake would be mitigated by applying good practice in the design of the intake screens.

Hydrological links were also identified between the scheme and Wilden Marshes and Meadows SSSI, however modelling and assessment of the potential impacts on the SSSI have shown that there would be no direct impact on the interest features of the site.

Non-statutory designated sites for nature conservation, woodland habitats and ponds have also been avoided as far as possible in the design of the scheme and incursion into habitats of principal importance has been minimised. Chapters 7 (Terrestrial Ecology) and 8 (Aquatic Ecology) of the Environmental Statement detail the potential ecological impacts which include loss of habitat of local value, removal of approximately 5 trees from the edge of Little Farley Wood which is designated as Ancient Replanted Woodland, the loss of approximately 0.5ha of broadleaved woodland along the length of the pipeline route and at the intake location, and the temporary loss of approximately 2.2km of hedgerow (permanent loss of approximately 49m). The construction phase also has the potential to have an adverse impact on barn owls, breeding and wintering birds, bats, reptiles and badgers.

With regard to the key green infrastructure assets identified by Wyre Forest Development Plan, the pipeline would be tunnelled beneath the River Stour and the Staffordshire and Worcestershire Canal and avoids areas of heathland and acid grassland of value. As such no adverse impacts to the biodiversity value are expected on these features. There would be a permanent loss of a small section of river bank habitat on the east bank of the River Severn to facilitate the river intake infrastructure. Overall this would result in a localised impact which would be managed to prevent excessive loss. In order to mitigate this loss the provision of planting alongside and at the rear of the intake and the realigned Severn Way footpath is designed to mimic the river corridor native mix. Biodiversity enhancements are also proposed at the intake site with the provision of a kingfisher nest tunnel, the introduction of species rich grassland and hibernacula.

A holistic approach has been used to develop an overall package of mitigation as a number of features are likely to have the same requirements in terms of habitat creation and connectivity and juxtaposition of different habitats. The mitigation measures have been designed to avoid potentially negative ecological impacts as far as practicable and reduce potential impacts that could not be avoided. These are fully detailed in Chapters 7 and 8 of the Environmental Statement and include:

- Reinstatement of habitats and watercourses along the pipeline route post construction.
- Provision of replacement habitat (in particular artificial tree roosts for bats and an artificial badger sett).
- Translocation of hedgerows during construction.
- Implementation of emergency protocol in case of accidental spillage of pollutants into watercourses.
- Timing and management of construction works to minimise impacts and disturbance to terrestrial and aquatic protected species. This includes the use of silent piling techniques to minimise noise and vibration impacts on fish during the construction of the intake, and no night-time working at the intake to allow unhindered fish migration during the hours of darkness.
- Habitat modification such as hedgerow coppicing and vegetation clearance, as well as use of netting and artificial fillers during the non-breeding season to limit impacts to breeding birds.
- Pre-works checks for protected species by an Ecological Clerk of Works.

In addition, the Environmental Statement details a range of proposed enhancement measures including:

- Provision of a 'living wall' at Frankley WTW.
- Provision of a 'green roof' at the BPT.
- New planting including the replacement of three trees for every tree lost.

<sup>2</sup> Entrainment could occur when fish and/or larvae travel into the intake by virtue of water pressure, choice and/or approach velocities in excess of the fish swimming speed. Depending on the intake set up, once through the screen there is the potential for the fish or larvae to be drawn into the raw water system.

- Supplementary planting of translocated and retained hedgerows with a diverse range of broad leaved species of local provenance, and planting of additional whips to reconnect retained hedgerows and infill defunct hedgerows.
- The provision of reptile refugia, nest boxes and hibernacula on STWL owned land using materials from vegetation clearance and structures built into the slopes at the pumping station.
- Proposal to agree Heads of Terms with Worcestershire Wildlife Trust, Barn Owl Trust, Mammal Society, Worcestershire Bat Group to support additional habitat creation.
- Introduction of species rich grassland rather than improved grassland at the river intake, pumping station, BPT and areas of grassland at the WTWs which would be managed under site specific management plans.

Once operational no adverse impacts on terrestrial ecology are expected. The river intake, pumping station and BPT facilities would be unmanned outside of the 50 day planned operational periods, with routine maintenance limited to periodic visits during day light hours. Minimal disturbance to species can be assumed from these visits. Night time working and the need for artificial lighting would only be required in times of emergency.

Frankly and Trimley WTW are existing operational sites and as such sources of noise and lighting disturbance already occur. Operation of the additional buildings is therefore likely to have minimal impact upon species present locally. Additional fixed lighting proposed at the new structures and the inlet site have been designed to limit light spill. Lighting modelling predicts new light sources would emit 0.5Lux at a maximum of 20m from the new inlet and 0.5Lux in isolated areas outside of the new boundary of the new structures. 0.5Lux is equivalent to moonlight and as such should have no impact upon nocturnal species.

Overall, the scheme has been designed to avoid adverse impacts to any designated sites for nature conservation and minimise impacts on biodiversity as far as possible, and a package of mitigation and enhancement measures has been designed that takes account of the affected habitats and their connectivity. While there is a policy conflict relating to a minimal loss of trees (including ancient woodland) and hedgerows as a result of the development, the benefits it would result in in terms of providing a resilient water supply to the city of Birmingham, outweigh this impact.

## **6.6 Landscape and Visual**

### **6.6.1 Relevant Policies**

#### **NPPF (whole scheme)**

Paragraph 109 of the NPPF requires development to contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes. Great weight should be afforded to the conservation of landscapes designations with the highest protection including National Parks and Areas of Outstanding Natural Beauty (paragraph 115) however no landscapes designated as such would be affected by the BRP scheme.

#### **Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)**

In line with the NPPF, the Wyre Forest Core Strategy also seeks to protect and enhance the landscape character of the district (Policy CP12: Landscape Character). In addition, the existing green infrastructure network, including assets essential to the District's local distinctiveness such as the Rivers Severn and Stour, associated wetlands and the Staffordshire and Worcestershire Canal, should be safeguarded and enhanced (Policy CP13: Providing a Green Infrastructure Network of the Wyre Forest Core Strategy and Policy SAL.UP3 Providing a Green Infrastructure Network of the Wyre Forest Site Allocations and Policies Local Plan).

Any new buildings are required to be well designed and complement the layout through the appropriate use of scale, mass, proportions and materials (Policy CP11: Quality Design and Local Distinctiveness of the Wyre Forest Core Strategy) and landscaping schemes are required to protect existing trees and distinctive landscape features where possible (Policies SAL.UP9: Landscaping and Boundary Treatments and SAL.UP7: Quality design and local distinctiveness of the Wyre Forest Site Allocations and Policies Plan).

Policy CC8: Landscape Design Principles of the Chaddesley Corbett Neighbourhood Plan specifically seeks to retain open spaces surrounding settlements within Chaddesley Corbett Parish, protect specific views as detailed in the Neighbourhood Plan Proposals Map, and protect mature and established trees.

### **Wychavon (Pipeline)**

Like the NPPF, the adopted and emerging Wychavon Plans seek to protect and enhance valued landscapes (ENV1: Landscape Character of the Wychavon Local Plan and Policy SWDP25: Landscape Character of the emerging South Worcestershire Development Plan). In particular, Policy SWDP25 of the emerging South Worcestershire Development Plan states that development should be appropriate to, and integrate with, the landscape setting (Policy SWDP25: Landscape Character of the emerging South Worcestershire Development Plan). Where appropriate a landscaping scheme should form an integral part of the development (Policy SUR2: Landscape Design of the adopted Local Plan). Development must also be designed to avoid significant adverse impacts in the form of light pollution (Policy SWDP31: Pollution of the emerging South Worcestershire Development Plan).

### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

The proposed pipeline and the break pressure tank runs through an area that the Bromsgrove District Proposals Maps designates locally as a Landscape Protection Area (LPA). While the adopted Bromsgrove District Local Plan states that development will only be approved within LPAs if the impact on the landscape would be negligible (Policy DS9: Protection of Designated Environmental Areas), the emerging Bromsgrove District Plan does not provide protection for Landscape Protection Areas. The emerging Bromsgrove District Plan has been submitted for examination and is more consistent with the NPPF than the adopted Local Plan in this regard and can therefore be awarded greater weight. Policy BDP21: Natural Environment of the emerging District Plan does however seek to protect and enhance the distinctive character of Bromsgrove as identified in the Worcestershire Landscape Character Assessment.

In determining planning applications, Bromsgrove District Council will also have regard to any potential impact on visual amenity and links to green infrastructure including woodland and hedgerows (Policies BDP1: Sustainable Development Principles,) and BDP24: Green Infrastructure of the emerging Bromsgrove District Plan).

### **Birmingham (Frankley WTW)**

Given the urban nature of Birmingham, new development should respond to site conditions and the local area context (Policy PG3: Place Making of the emerging Birmingham Development Plan) and should have regard for the local character including topography, views, skyline, scale and massing (Policy 3.14D: Good Urban Design Principles of the Birmingham Unitary Development Plan). Any proposed landscaping should complement the surrounding area with existing mature trees, hedgerows, and landscaping retained where possible (Policy 3.14D and 3.16A – 3.16B of the Birmingham Unitary Development Plan).

#### **6.6.2 Review**

In identifying route and site options for the scheme, extensive constraints mapping was used to ensure that the development would avoid designated landscapes as far as practicable. As a result, no designated landscapes would be adversely impacted by the scheme.

Once constructed the land affected by the pipeline would be restored to its former use, there would be no changes to topography along the route, and the extensive proposals for native planting including replacement hedgerows along the pipeline route would help to restore the landscape pattern and character along the route.

In terms of the proposed above ground structures, their location, siting, materials and design have all been carefully considered during the design process in order to minimise impacts on the landscape and visual amenity. Some of the design features for each structure are outlined in Section 6.1.2 (Openness) above, and further detail is provided in Chapter 9 (Landscape and Visual) of the Environmental Statement. In addition, a range of mitigation measures are proposed in order to avoid, reduce or offset adverse effects from the scheme.

These include landscape mounding at the pumping station and Frankley WTW sites where mounds have been carefully designed to balance the need to respect local landscape character and reduce visual impacts while. Their engineered appearance has also been minimised (e.g. the mounds at the pumping station have shallower outward facing slopes and are blended as far as possible with the surrounding landform). Wherever practicable, the retention and protection of woodland and trees has been sought, including those along the pipeline route. There are extensive proposals for native woodland and shrub planting as illustrated on the Environmental Masterplan (Figure 9.3 in the Environmental Statement) and the planting scheme has been designed so as to restore landscape pattern and character, screen views of the proposed structures, as well as to provide wildlife habitat to connect with and enhance local biodiversity.

Overall, it is considered that the above ground structures would result in localised landscape and visual impacts, however provided the mitigation detailed here and in the Environmental Statement is implemented and effectively managed, no conflict with planning policy is expected.

## 6.7 Lighting

### 6.7.1 Relevant Policies

#### NPPF (whole scheme)

Paragraph 125 of the NPPF states that the impact of light pollution from artificial light on local amenity and intrinsically dark landscapes should be limited by encouraging good design.

#### Wyre Forest (Trimbley PAC Dosing, RIPS, Pipeline)

No relevant policies have been identified.

#### Wychavon (Pipeline)

Development must also be designed to avoid significant adverse impacts in the form of light pollution (Policy SWDP31: Pollution of the emerging South Worcestershire Development Plan).

#### Bromsgrove (Pipeline, BPT, Frankley WTW Extension)

Appropriate measures should be designed to reduce light pollution (Policy BDP19: High Quality Design of the emerging District Plan).

#### Birmingham (Frankley WTW)

No relevant policies have been identified.

### 6.7.2 Review

The above ground infrastructure associated with the BRP would require external lighting for safe operation and maintenance. Appendix A: Lighting Requirements describes the statutory, STWL and project requirements that have been considered in the lighting design at the river intake, pumping station, break pressure tank, Trimbley WTW and Frankley WTW.

Once operational, at the river intake, pumping station and BPT, lighting would be provided to ensure an average illumination level of 20Lux to ensure safe movement of people, machines and vehicles. Additional lighting is proposed to ensure an average illumination of 200Lux adjacent to the PAC dosing units at the break pressure tank site where a greater perception of detail would be required. The lighting design includes directional mounting of the luminaires with diffusers arranged to limit light spill. The lighting would be manually switched by STWL personnel on arrival at the sites. The lighting would only be in operation when STWL personnel are present at the facilities outside daylight hours. Activities requiring site attendance such as maintenance are anticipated to be undertaken at monthly visits during day light hours. Typically the facilities would only be illuminated as a result of:

- Security alert by the CCTV systems requiring a site visit to inspect or secure the facility.

- An unplanned plant failure requiring urgent intervention to prevent an unsafe condition or further equipment damage.

At Frankley WTW and Trimley WTW the lighting has been designed in line with the existing site lighting to ensure an average illumination of 20Lux adjacent to roadways, areas between tanks, perimeter lighting around open tanks, pumping stations and washwater tank platforms. This general lighting would be maintained throughout the year and automatically switched on with the existing works lighting. At Frankley WTW, further lighting would be provided to ensure an average illumination of 50Lux at specific areas of the new process units where there would be movement of people, machines and vehicles in hazardous areas. These areas include chemical delivery bunds, delivery laybys, rapid gravity filter gallery, sand ballasted lamellas, and weighbridge and wheel wash areas. Low level lighting would be provided for the handrails surrounding the surface water attenuation tank and dirty backwash tank to ensure personnel safety and safe movement. Any unplanned activities outside daylight hours and during the EVA shutdown requiring lighting above the general lighting levels would be undertaken using additional task lighting. At Trimley WTW, further lighting is provided to ensure an average illumination level of 200Lux at specific areas of process plant work requiring perception of detail at the PAC system. At both Frankley and Trimley WTW the lighting would act in conjunction with and complement the existing lighting at the works and would coincide with the activation of the existing lighting.

Once operational no adverse ecological or landscape and visual (including local amenity and/or dark night sky) impacts are expected as a result of lighting. The river intake, pumping station and BPT facilities would be unmanned outside of the 50 day planned operational periods, with routine maintenance limited to periodic visits during day light hours. Night time working and the need for artificial lighting would only be required in times of emergency. Frankly and Trimley WTW are existing operational sites and operation of the additional buildings is likely to have minimal additional impact. Additional fixed lighting proposed at the new structures and the inlet site have been designed to limit light spill. A level of lighting appropriate to safe working practices would be provided. Lighting modelling predicts new light sources would emit 0.5Lux at a maximum of 20m from the new inlet and 0.5Lux in isolated areas outside of the new boundary of the new structures. 0.5Lux is equivalent to moonlight on a clear night.

Given the limited occasions that the lighting would be used, as well as the measures taken to ensure light spill is limited, no conflict with policies relating to lighting is expected.

## **6.8 Arboriculture**

### **6.8.1 Relevant Policies**

#### **NPPF (whole scheme)**

Paragraph 118 of the NPPF states that:

*"Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss."*

#### **Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)**

Existing trees should be protected and incorporated into development where possible. Where it has been demonstrated through a tree survey that retention is not possible, replacements should be provided (Policies SAL.UP7: Quality Design and Local Distinctiveness and SAL.UP9: Landscaping and Boundary Treatment of the Wyre Forest Site Allocations and Policies Local Plan). In addition, existing trees and woodlands which have Tree Preservation Orders (TPOs) are required to be conserved and enhanced and, on appropriate development sites, new trees and woodlands should be planted in keeping with the landscape character of the area (Policy CP14: Providing Opportunities for Local Biodiversity and Geodiversity of the Wyre Forest Core Strategy)

Policy CC8: Landscape Design Principles of the Chaddesley Corbett Neighbourhood Plan 2014 states:

*"Mature and established trees of amenity value should be protected and incorporated into landscaping schemes wherever possible. The planting of local species will be encouraged. Species should be appropriate to the location and setting in terms of type, height, density and the need for ongoing management. When constructing boundaries native tree species should be used in preference to building walls or the planting of "Leylandii / conifer". Existing hedgerows should be retained and the establishment of new native hedges is encouraged."*

### **Wychavon (Pipeline)**

Any development that affects trees, hedgerows or woodland should be accompanied by a statement that justifies the design approach taken. Removal of hedgerows, trees or woodland will only be permitted where it can be demonstrated that the proposal will benefit the visual, historic or ecological value of the area (Policy ENV8: Protection of Hedgerows, Trees and Woodland of the Wychavon Local Plan).

### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Policies C17: Retention of Existing Trees and C18: Retention of Existing Woodland of the Bromsgrove District Local Plan and Policy BDP19: High Quality Design of the emerging Bromsgrove District Plan seek to ensure that all trees and woodland (particularly ancient semi-natural woodland) are retained wherever possible and integrated with new development.

### **Birmingham (Frankley WTW)**

The Birmingham Unitary Development Plan highlights the importance of trees for their visual amenity, benefits to health, historical significance and nature conservation value. Developers are expected to retain trees and hedgerows where possible, and failing this provide replacement trees and hedgerows (Policy 3.16A: Trees and Landscapes in the Urban Environment of the Birmingham Unitary Development Plan). Policy TP7: Green Infrastructure of the emerging Birmingham Development Plan also seeks to conserve woodland and encourages all new development to allow for new tree planting.

#### **6.8.2 Review**

Chapter 10 (Arboriculture) of the Environmental Statement presents an assessment of the impact of the proposed development on trees and hedgerows and includes detailed tree plans and root protection areas to ensure the survival of retained trees.

The design process has sought to retain existing trees wherever practicable subject to the engineering constraints associated with delivering a scheme of this scale. This has included adjusting the working area along the pipeline length to avoid existing trees. Tree losses associated with the construction corridor would be mitigated with new planting and it is proposed that there would be, on average, a replacement of three trees for every tree lost. The location of the new planting is based on mitigation for the loss of landscape and visual impacts along the route, the requirements for operational clearance for the pipeline and agreement from third party landowners. All new planting is proposed within the red line boundary.

The pipeline route does pass adjacent to the very edge of Little Farley Wood which is registered as Ancient Replanted Woodland. This is an example of a substantially felled and replanted (with coniferous species) ancient woodland site which generally has less value than untouched ancient woodland sites, although this does depend upon the amount of soil compaction that has occurred as a result of felling activities. Evidence for Little Farley Wood indicates that the seed bed has been compacted in the past and does not support a typical ancient woodland flora of high biodiversity. Therefore, although there is potential for the requirement of the removal of approximately 5 conifer trees from the edge of this woodland, it is not considered that this would result in the loss or deterioration of an irreplaceable habitat.

In addition, three veteran trees have been identified within the pipeline route corridor. Veteran trees are trees which, because of their age, size or condition are of cultural, historical, landscape and nature conservation value. Of the three veteran trees identified, one would be lost as part of the scheme proposals and opportunities

to retain timber as a local ecological resource would be explored. In addition cuttings or seeds, if available, would be propagated with a view to providing new planting of the same provenance in the locality.

No trees covered by a Tree Protection Order (TPO) would be impacted by the proposed scheme.

It has also been estimated that the construction of the scheme would require the temporary removal of approximately 2.2km of hedgerow. In order to minimise this impact the following measures are proposed:

- Working widths would be minimised from an average of 45m to between 8m and 23m at each hedgerow.
- The retention and translocation of hedgerows as far as practicable.
- Supplementary planting to reconnect retained hedgerows and infill or reconnect defunct hedges.

Overall, while there is a policy conflict relating to a minimal loss of trees and hedgerows as a result of the development, the benefits it would result in in terms of providing a resilient water supply to the city of Birmingham, outweigh this impact.

## **6.9 Cultural Heritage**

### **6.9.1 Relevant Policies**

#### **NPPF (whole scheme)**

Section 12: Conserving and Enhancing the Historic Environment of the NPPF states that when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be. Where a proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset (including its setting) it should be demonstrated that this is necessary in order to achieve substantial public benefits that outweigh that harm or loss, or where all of the following apply:

- *"the nature of the heritage asset prevents all reasonable uses of the site; and*
- *no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and*
- *conservation by grant-funding or some form of charitable public ownership is demonstrably not possible; and*
- *the harm or loss is outweighed by the benefit of bringing the site back into use."* (Paragraph 133).

Where a development is likely to have a direct or indirect effect on non-designated heritage assets, a balanced judgement should be made by the local planning authority having regard for the scale of any harm or loss and the significance of the heritage asset.

#### **Wyre Forest (Trimbley PAC Dosing, RIPS, Pipeline)**

When designing new development the presence of heritage assets should be taken into account (Policy CP11: Quality Design and Local Distinctiveness of the Wyre Forest Core Strategy). In line with the NPPF, any development that affects the District's heritage assets, including their setting, are required to demonstrate how these will be protected, conserved and where appropriate, enhanced. If a development is likely to result in an adverse impact on an asset or its setting, or it will result in a reduction or loss of significance, it must be clearly demonstrated that there are no alternative means of meeting the need of the development and the reasons for the development outweigh the significance of the heritage asset (Policy SAL.UP6: Safeguarding the Historic Environment of the Wyre Forest Site Allocations and Policies Local Plan).

Within the Parish of Chaddesley Corbett development should seek to preserve or enhance the character of the hamlets within and outside the Conservation Areas, especially those buildings dating from the nineteenth and early twentieth century (Policy CC8: Landscape Design Principles of the Chaddesley Corbett Neighbourhood

Plan). The loss of non-designated heritage assets (locally listed buildings) should also be resisted (Policy CC11: Local Heritage List of the Chaddesley Corbett Neighbourhood Plan).

### **Wychavon (Pipeline)**

The following policies reflect the requirements of the NPPF discussed above:

- Policy GD2: General Development Control of the Wychavon Local Plan.
- Policy ENV10: Sites of Archaeological Significance of the Wychavon Local Plan.
- Policy ENV11: Historic Parks and Gardens of the Wychavon Local Plan.
- Policy ENV12: Conservation Areas of the Wychavon Local Plan.
- Policy ENV14: Settings of Listed Buildings of the Wychavon Local Plan.
- Policy SWDP 6: Historic Environment of the emerging South Worcestershire Development Plan.
- Policy SWDP 24: Management of the Historic Environment emerging South Worcestershire Development Plan.

Emerging Policy SWDP6: Historic Environment also specifically outlines a range of non-designated heritage assets which are considered to be of local importance including the wider historic landscape (including locally distinctive settlement patterns, field systems, woodlands and commons and historic farmsteads and smallholdings); and historic transportation networks and infrastructure including roads and trackways, canals, river navigations, railways and their associated industries. In addition, development will not be permitted where it would have an adverse impact on hedgerows, trees or woodland, their setting or wider habitat, where such features are considered to be important for their historic value (Policy ENV8 Protection of Hedgerows, Trees and Woodland).

### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

The following policies reflect the requirements of the NPPF discussed above:

- Policy DS9: Protection of Designated Environmental Areas of the Bromsgrove District Local Plan.
- Policy DS13: Sustainable Development of the Bromsgrove District Local Plan.
- Policy S35A: Development in Conservation Areas of the Bromsgrove District Local Plan.
- Policy S48: Historic Parks and Gardens of the Bromsgrove District Local Plan.
- Policy C36: Preservation of Archaeological Resources of the Bromsgrove District Local Plan.
- Policy C37: Excavation Around Archaeological Remains of the Bromsgrove District Local Plan.
- Policy C38: Development Criteria for Archaeological Sites of the Bromsgrove District Local Plan.
- Policy BDP1: Sustainable Development Principles of the emerging Bromsgrove District Plan.
- Policy BDP20: Managing the Historic Environment of the emerging Bromsgrove District Plan.

Specific non-designated heritage assets of local importance include the historic landscape of the District, including locally distinctive settlement patterns, field systems, woodlands and historic farmsteads; designed landscapes; archaeological remains of all periods; and historic transportation networks and infrastructure including roads, trackways, canals and railways.

### **Birmingham (Frankley WTW)**

Policies 3.20 – 3.33 and Policy 8.36 of the Birmingham Unitary Development Plan and Policy TP12: Historic Environment of the emerging Birmingham Development Plan) seek to protect and enhance the historic environment within Birmingham, including assets listed on the ‘Local List’, in line with the NPPF.

### 6.9.2 Review

In identifying route and site options for the scheme, extensive constraints mapping was used to ensure that the development would avoid designated historic assets (including Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, and Registered Battlefields). As a result, no features of cultural heritage value would be directly impacted as a result of the proposed scheme.

During construction, adverse impacts on the setting of four designated assets in Bromsgrove District and Wyre Forest District are predicted as a result of noise and visual intrusion:

- Harvington Hall Grade I Listed Building located east of Harvington, Wyre Forest.
- Bradford House Grade II\* Listed Building located south of Belbroughton, Bromsgrove.
- Churchyard Cross Scheduled Monument and Grade II\* Listed Building located in Frankley churchyard, Bromsgrove.
- St Leonard's Church Grade II\* Listed Building located in Frankley, Bromsgrove.

Where practicable, planting is proposed to mitigate these impacts, and no impacts are predicted once the scheme is operational.

In order to ensure that the construction works have a minimal impact on any previously unknown archaeological remains, a mitigation strategy of earthwork surveys, targeted archaeological excavations and a watching brief is proposed. Works covered under the watching brief would include construction activities affecting the River Severn (this would enable the recording of any early evidence of navigation and any archaeological remains preserved within the river bed and banks which may be revealed during the construction of the intake structure), and any locally important historic transport networks and infrastructure that would be crossed using trenchless construction methods (including the existing and dismantled railway lines and the Staffordshire and Worcestershire Canal).

During construction, adverse impacts resulting from the temporary removal of landscape elements, such as historically important hedgerows are also predicted; however working widths would be reduced where hedgerows would need to be crossed and impacted hedgerows would be reinstated once the construction phase has been completed.

Overall, while the scheme is likely to result in adverse impacts to the settings of four designated heritage assets during construction, once operational, no conflict with planning policies relating to cultural heritage assets is expected.

## 6.10 Contaminated Land

### 6.10.1 Relevant Policies

#### NPPF (whole scheme)

New development should also be appropriate for its location taking account of ground conditions and land instability including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation (Paragraph 121).

#### Wyre Forest (Trimpley PAC Dosing, RIPS, Pipeline)

Any land contamination issues must be fully addressed with appropriate remediation measures identified where required (Policy CP01: Delivering Sustainable Development Standards of the Wyre Forest Core Strategy).

**Wychavon (Pipeline)**

Proposals for the development of contaminated land will only be permitted where adequate remediation methods will be employed to alleviate the risk of harm to human health and the wider environment. (Policy ENV22: Contaminated and Unstable Land of the Wychavon Local Plan and Policy SWDP31: Pollution of the emerging South Worcestershire Development Plan).

**Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Where land contamination is suspected a site survey is required (Policy ES7: Sites Suspected of Contamination of the Bromsgrove District Local Plan). Development should be made suitable for the proposed final use and an appropriate remediation scheme and long term monitoring and maintenance scheme will be required in support of any planning application (Policy BDP19: High Quality Design of the emerging Bromsgrove District Plan).

**Birmingham (Frankley WTW)**

Any site suspected of being contaminated should be assessed and where necessary a remediation strategy will be required to ensure the site is suitable for its proposed use (Policies 3.14E: and Design Principles for Sustainable Development and 3.73: Water and Drainage of the Birmingham Unitary Development Plan).

**6.10.2 Review**

The majority of the scheme is proposed on previously undeveloped land where the potential impacts in relation to contaminated land are limited. The proposed route of the pipeline avoids major landfills and potential areas of contaminated land where practicable. This includes Wilden Industrial Estate and Bonemill Tip where the pipeline is proposed to be tunnelled beneath the A451 dual carriageway, the River Stour and the canal, passing beneath and avoiding the landfill (the tunnel would be approximately 10m below the base of the landfill). The proposed route of the pipeline does however pass through and/or adjacent to the potential contaminated land sites of Burlish Top, Bonemill Tip and the M5 tunnel crossing.

Two potential locations for the pumping station associated with the Lickhill intake were investigated (Lickhill Upper and Lickhill Lower). It was concluded that the site with the least potential impact on local receptors (including residents and local properties), particularly in relation to potential landscape and visual impacts, was the Lickhill Upper site, which is now the proposed site for the pumping station. The proposed location of the pumping station and a section of the transfer pipeline are however located within a defined area of permitted landfills (Lickhill Quarry and Blackstone Quarry). These landfills have been restored following recent closure. Relatively low level soil and groundwater contaminants have been recorded within the waste deposits and groundwater beneath, including trace fibres of asbestos and organic contaminants. Significant elevated ground gases have been recorded at the site during monitoring. The proposed pumping station design comprises the removal of landfill waste beneath the proposed footprint of the pumping station building and the use of piled foundations through the landfill. A detailed construction method statement for excavating the landfill waste and for piling would be prepared for the site.

At the Frankley WTW site the proposed works comprise the excavation of a significant quantity of materials above (existing stockpile) and below ground (infilled treatment tanks). Limited ground investigation has been undertaken within the infilled treatment tanks and there is a potential that significant soil contaminants may be encountered during excavation of these tanks.

Chapter 12 (Geology and Contaminated Land) of the ES details a range of mitigation measures which would be employed to ensure the scheme would not result in harm to the natural environment or to human health. This would include adoption of industry best practice with regards to the management of the construction phase, the adoption of an appropriate remediation strategy for any sites containing contaminated land, and the implementation of a long term ground water and ground gas monitoring programme where required to assess the associated risk prior to construction, during construction and for a defined period post construction. It is therefore expected that the scheme would comply with planning policies relating to contaminated land.

## 6.11 Geology

### 6.11.1 Relevant Policies

#### NPPF (whole scheme)

Planning policies should seek to minimise impacts on geodiversity, by preventing harm to geological conservation interests (Paragraph 117).

#### Wyre Forest (Trimbley PAC Dosing, RIPS, Pipeline)

The geodiversity of the District, including Local Geological Sites (LGSs) should be protected and enhanced (Policy CP14: Providing Opportunities for Local Biodiversity and Geodiversity of the Wyre Forest Core Strategy and Policy SAL.UP5: Providing Opportunities for Safeguarding Local Biodiversity and Geodiversity of the Wyre Forest Site Allocations and Policies Local Plan). Any detrimental impacts on locally important geological sites will not be permitted unless:

- i. *"There are no reasonable alternative means of meeting the need for the development nationally, or within the region, County or District, as appropriate to the particular level of importance of the site; and*
- ii. *The reasons for the development outweigh the nature conservation value of the site itself and the need to safeguard the nature conservation value of the national, regional, County or District network of such sites. If harm is caused, appropriate mitigation measures should be implemented." (Policy SAL.UP5: Providing Opportunities for Safeguarding Local Biodiversity and Geodiversity of the Wyre Forest Site Allocations and Policies Local Plan.)"*

#### Wychavon (Pipeline)

Sites of Special Scientific Interest (SSSIs), Regionally Important Geological and Geomorphological Sites (RIGGSs), and Local Geological Sites (LGSs) should be protected (Policy ENV9: Regionally Important Geological and Geomorphological Sites of the Wychavon Local Plan and Policy SWDP22: Biodiversity and Geodiversity of the emerging South Worcestershire Development Plan). Specifically, emerging Policy SWDP22: Biodiversity and Geodiversity states that development that would compromise the favourable conservation status of SSSIs or LGSs will only be permitted if the need for the development outweighs the importance of the geodiversity interest, there is no reasonable alternative site available and compensatory provision can be provided.

#### Bromsgrove (Pipeline, BPT, Frankley WTW Extension)

Developments are expected to protect, restore, enhance and create core areas of high nature conservation value including sites with geological interest. They should also contribute to the conservation and enhancement of geodiversity where appropriate, in line with the objectives and actions in the Worcestershire Geodiversity Action Plan (BDP21: Natural Environment of the Emerging Bromsgrove District Plan).

#### Birmingham (Frankley WTW)

Both the adopted and emerging plans support the retention, enhancement and restoration of sites of both national and local importance for geology (Policy 3.38: Nature Conservation of the Birmingham Unitary Development Plan and Policy TP8: Biodiversity and Geodiversity of the emerging Birmingham Development Plan). Emerging Policy TP8 states that development which causes harm (directly or indirectly) to local sites of importance for geology or important geological features will only be permitted if:

- The strategic need for the proposal outweighs the need to safeguard the importance of the designated site or geological feature and no alternative site is available which will meet the need.
- Damage is minimised and measures can be put in place to mitigate remaining impacts.
- Where damage cannot be avoided or fully mitigated, appropriate compensation is secured.

### 6.11.2 Review

In identifying route and site options for the scheme, extensive constraints mapping was used to ensure that the development would avoid statutory designated nature conservation sites (including those designated for geological interests) as far as practicable. A programme of public consultation was held during the period October 2014 to January 2015. One of the outcomes of the public consultation was concern expressed by residents of the village of Wilden within Wyre Forest to the proposed pipeline route. This location comprises a significant 'pinch-point' between the urban areas of Kidderminster to the north and Stourport to the south. The proposed route alignment presented at the public exhibitions comprised a trenchless crossing of Wilden Lane located at a gap between properties within the village. However, the location is sensitive due to adjacent residential properties, a school, village hall and Grade II listed church and residents were concerned about potential impacts due to noise, traffic, and vibration. A possible alternative crossing involving a tunnel at the northern end of the village had been identified but was not presented at the public consultation as it passed beneath the River Stour Floodplain SSSI (a geological SSSI).

In response to the issues raised by Wilden's residents, an assessment of the likely impacts to the SSSI as a result of the alternative route alignment was carried out (Wilden Marsh and Meadows/River Stour Floodplain SSSI Assessment, Jacobs, July 2015 (please refer to Appendix 13.1 of the Environmental Statement)). An intrusive site investigation determined that the depth of the tunnel and location of the associated launch and reception shafts would be such that there would be no direct impact on the interest features of the SSSI.

No potential for adverse impacts to geological conservation interests within Wychavon, Bromsgrove or Birmingham would be likely as a result of the proposed scheme. There would therefore be no conflict with planning policy in this regard.

## 6.12 Flood Risk

### 6.12.1 Relevant Policies

#### NPPF (whole scheme)

Paragraph 100 of the NPPF states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development in a high flood risk area is necessary, it should be made safe without increasing flood risk elsewhere. When determining planning applications, local planning authorities should ensure that flood risk is not increased elsewhere and only allow development in areas at risk of flooding where, informed by a site-specific flood risk assessment following the Sequential Test, and if required the Exception Test, it can be demonstrated that:

- within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location;
- development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be managed safely, including by emergency planning; and
- it gives priority to the use of sustainable drainage systems (SuDS).

Planning Practice Guidance (Flood Risk and Coastal Change) defines fluvial flood zones as:

- Flood Zone 3b relates to the functional flood plain where water has to flow or be stored in times of flood.
- Flood Zone 3a is defined as an area where the annual likelihood of fluvial flooding is greater than 1% (1 in 100) Annual Exceedance Probability (AEP).
- Flood Zone 2 is defined as an area where the annual likelihood of fluvial flooding is less than 1% (1 in 100) AEP but greater than 0.1% (1 in 1000) AEP.
- Flood Zone 1 is defined as an area where the annual likelihood of fluvial flooding is less than 0.1% (1 in 1000) AEP.

All developments with a footprint which is partially at risk of fluvial flooding with a likelihood greater than 0.1% (Flood Zones 2 and 3), or which is greater in extent than 1ha, are required to demonstrate that they are

appropriate for the flood risk affecting the development footprint. Types of development are given vulnerability classifications to determine whether they are appropriate for a given Flood Zone.

The vulnerability classification of essential utility infrastructure which has to be located in a flood risk area for operational reasons is that of 'Essential Infrastructure'. This means that the development would be appropriate in Flood Zone 1 and Flood Zone 2 but would require the application of an Exception Test if any part of the proposed development footprint is within Flood Zone 3a or 3b. Developments must also demonstrate that they will not increase flood risk to neighbouring, upstream and downstream receptors. This must make an allowance for the expected increases in rainfall and flood flows due to climate change. Other water transmission infrastructure, including pumping stations, is classed as 'Water-Compatible Development'. This means that the development would be compatible with Flood Zones 1, 2 and 3a. In Flood Zone 3b the development would need to be designed and constructed to remain operational and safe for users during times of flood, result in no net loss of floodplain storage, not impede water flows, and not increase flood risk elsewhere.

#### **Wyre Forest (Trimbley PAC Dosing, RIPS, Pipeline)**

The adopted Wyre Forest Core Strategy predates the NPPF and its policy relating to flood risk refers to Planning Policy Statement 25: Development and Flood Risk which has now been superseded by the NPPF. The adopted Wyre Forest Site Allocations and Policies Local Plan requires developers to have regard to the Worcestershire Local Flood Risk Management Strategy (Policy SAL.CC7: Water Management) but does not include any further policies relating to flood risk. Decisions should therefore be made in accordance with the policies of the NPPF with regard to flood risk.

Policy SAL.CC7: Water Management requires development to incorporate SuDS which are designed to take account of the effects of climate change, mitigate for flood risk, promote biodiversity and water quality, provide for enhanced landscape and good quality spaces, and integrate with the layout and infrastructure of the development.

#### **Wychavon (Pipeline)**

The flood risk policies contained in the adopted Wychavon Local Plan predate the NPPF, while Policy SWDP28: Management of Flood Risk of the emerging South Worcestershire Development Plan aligns with the requirements of the NPPF. Also in line with the policies of the NPPF is Policy SWDP29: Sustainable Drainage Systems which requires development proposals to demonstrate that site drainage and run-off will be managed in a sustainable and co-ordinated way and manage surface water through SuDS. This should mimic the natural drainage network and culverting should be avoided. Post-development surface water run-off rates on greenfield sites should at least equal greenfield rates and proposals on brownfield land should show a 20% reduction in surface run-off rates.

#### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

The flood risk policies contained in the NPPF should be given the greatest weight given that the policies in the adopted Bromsgrove District Plan pre-date the NPPF and Policy BDP23: Water Management of the emerging Bromsgrove District Plan supports the NPPF. Policy BDP23: Water Management also requires developments to set aside land for SuDS.

#### **Birmingham (Frankley WTW)**

The emerging Birmingham Development Plan requires Flood Risk Assessments to be prepared in accordance with the requirements of national policy (Policy TP6: Managing Flood Risk). Greenfield runoff rates should be achieved for greenfield sites and brownfield sites at flood risk, and a 20% reduction in run-off rates should be achieved for all other brownfield sites. SuDS should also be utilised in order to minimise flood risk.

#### **6.12.2 Review**

In accordance with the NPPF, FRA's have been prepared for both the construction and operational periods for the pipeline, the BPT, the river intake and pumping station, Frankley WTW and Trimbley WTW (please refer to

Appendices 15.1 to 15.8 of the ES). Each FRA assessed the level of risk posed to the proposed development item as well as the potential impact of the development elsewhere. Potential risks have been identified in certain locations along the pipeline route for the construction phase, including potential risks to pipeline construction due to working in the floodplain. With the implementation of proposed mitigation (including use of temporary drainage channels and minimising storage within the floodplain) residual flood risks have been assessed as low. For each component of the scheme a Surface Water Drainage Strategy has been prepared which has informed the development of the drainage design. Further details can be found in the relevant FRAs.

#### Pipeline (All Local Planning Authorities)

Given the location of the River Severn in relation to Frankley WTW it would be necessary for the pipeline to cross all flood zones (1, 2 and 3). It would not be possible to divert the pipeline around the River Stour and as such the development could not feasibly be located in an area of lower flood risk. Although the pipeline would cross areas with a high likelihood of flooding, the pipeline and associated valves and structures are not vulnerable to the effects of flooding and the flood risk to the pipeline itself has therefore been assessed as low. With the provision of mitigation including the siting of above ground structures (e.g. air valves) outside of the flood plain/flow routes, the replacement of any land drains affected by the pipeline on a “like for like” basis, and the construction of the pipeline from welded steel to minimise the risk of a full bore rupture, it is not expected that the pipeline would result in a net loss of floodplain storage, impede water flows, or increase flood risk elsewhere.

#### River Intake and Pumping Station (Wyre Forest)

Given the nature of the river intake, it would be located in Flood Zone 3. It has however been designed to structurally withstand the high flows associated with fluvial flood events and would remain operational even if fully submerged. The pumping station would be located within Flood Zone 1 to ensure that the instrumentation and electrical cabling/telemetry is located in an area at low risk of flooding. In addition to this, all pipework and vents on the sides and rear of the pumping station building would be located 300mm above ground level to prevent water ingress. Where this is not feasible, then pipes and vents would be sealed. In addition, all vulnerable items associated with the pumping station would be elevated 100mm above floor level. In addition, all subsurface elements associated with the pumping station would be designed to prevent water ingress and to withstand the upward hydraulic pressure associated with rising groundwater levels.

Minor increases in peak water depths within the floodplain are predicted upstream during both construction and operation; however this increase occurs in an area of natural floodplain and would not result in any increase in flood extent. No additional properties are predicted to be at risk as a result of the development.

All surface water runoff from the impermeable areas surrounding the pumping station would be managed on site where it would be channelled into an attenuation and infiltration zone and allowed to infiltrate into bedrock. At the river intake, reinforced grass would be used to mitigate the risk of increased surface runoff from the access track.

#### Break pressure tank (Bromsgrove)

The proposed BPT site is located within Flood Zone 1 and is considered to be at low risk from surface water flooding. As the development would be at moderate risk of groundwater flooding, due to the potential for the level of the water table to fluctuate seasonally beneath the site and the fact that a number of development items are located entirely below ground level, the proposed structures would be designed to withstand hydraulic uplift and prevent water ingress. While there is a risk of the emergency overflow system for the BPT becoming operational and discharging into Fenn Brook, there are a series of in-built emergency cut-off valves in the design which would automatically shut down the supply to the BPT. Therefore the probability of this event occurring is considered to be extremely low.

Sustainable drainage options have been considered and it is proposed to construct the BPT with a grassed roof top. Any rainwater captured on the roof that has not infiltrated/evaporated would be drained through a network of roof collector drains. All surface water collected into drainage network would be channelled into an attenuation/infiltration tank and discharged at no greater than greenfield rates into the Fenn Brook watercourse.

### Frankley WTW (Bromsgrove and Birmingham)

The WTW and surrounding land is located within Flood Zone 1 and is at low risk of flooding. The proposed development would involve the creation of new areas of impermeable hard standing, which would generate additional surface water runoff from the site. This FRA presents a surface water drainage scheme that would ensure that the additional volume of surface water generated would be managed in a sustainable manner and that the proposed scheme would not lead to an increase in surface water flood risk elsewhere.

Runoff from certain areas of the proposed development would be considered 'contaminated' and would be attenuated and stored as part of STWL's wastewater treatment process. For the remainder of the surface water drainage, it is proposed to re-use existing infrastructure within the WTW to attenuate the surface water run-off, before discharge into Merritt's Brook at a rate equivalent to greenfield run-off. Soakaways and infiltration techniques were investigated but were found to be inappropriate given the ground conditions at the site.

### Trimley (Wyre Forest)

The WTW is located within Flood Zone 1 and is at low risk of flooding. The River Severn is located near to the site although the proposed development would be set at an elevation far above its floodplain. In addition, the proposed development would not involve any alteration to, or significant interaction with, fluvial watercourses. The proposed development would involve the creation of a small area of new impermeable hard standing, which would generate a small amount of additional surface water runoff from the site. The storm water drainage from this new impermeable area would be discharged into STWL's existing sludge lagoon at the Trimley WTW before being released into the River Severn. This measure would ensure that the proposed scheme would not lead to an increase in surface water flood risk elsewhere.

Overall, with the implementation of mitigation (including the design of structures to withstand flood events and the incorporation of SuDS) to ensure the development is not at risk of flooding, and does not result in increased risk of flooding elsewhere, no conflict with planning policy is expected with regard to flood risk.

## **6.13 Water Quality and Quantity**

### **6.13.1 Relevant Policies**

#### **NPPF (whole scheme)**

Paragraph 109 of the NPPF requires development to contribute to and enhance the natural and local environment by preventing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of water pollution.

#### **Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)**

Policy SAL.CC7: Water Management of the Wyre Forest Site Allocations and Policies Local Plan states that development proposals should:

- Not lead to deterioration of EU Water Framework Directive water body status;
- Not have a negative impact on water quality, either directly through pollution of surface or groundwater, or indirectly through overloading of Wastewater Treatment Works;
- Help to conserve and enhance watercourses.

#### **Wychavon (Pipeline)**

Development that would result in an unacceptable risk to the quality and/or quantity of the water environment will not be permitted (Policy RES4: Conserving Water Resources of the Wychavon Local Plan and Policies SWDP30: Water Resources, Efficiency and Treatment and SWDP31: Pollution of the emerging South Worcestershire Development Plan).

**Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Developments that protect and enhance water quality (including groundwater) will be supported (Policy ES4: Groundwater Protection of the Bromsgrove District Local Plan and Policy BDP23: Water Management of the emerging Bromsgrove District Plan).

**Birmingham (Frankley WTW)**

Water resources within Birmingham should be protected by minimising the use of water and improving water quality. New development is therefore expected to take account of any effects it might have on water including the impact on the water table. New development should avoid polluting ground and surface water, and any development involving the use of chemicals should include adequate pollution prevention measures. Where feasible, surface run-off and contaminated water should be treated at source, through the use of “natural” features such as reed beds (3.71 – 3.76: Water and Drainage of the Birmingham Unitary Development Plan). Proposals should also demonstrate compliance with the Water Framework Directive by exploring opportunities to help meet its targets (Policy TP6: Managing Flood Risk of the Emerging Birmingham Development Plan).

**6.13.2 Review**

An assessment of the impacts of the proposed scheme on surface and ground water quality and quantity is presented in Chapters 13 and 14 of the Environmental Statement. Chapter 13 (Hydrogeology) of the ES outlines the mitigation proposed to ensure that impacts to groundwater during construction are minimised. This would include monitoring of key receptors (including the River Severn, aquifers, licensed groundwater abstractions, Wilden Pool and Wilden Marsh and Meadows SSSI) which would trigger further mitigation such as water treatment or recharging where water levels or quality found to be significantly impacted. No significant impacts to groundwater are anticipated during operation of the scheme.

Chapter 14 (Water Quality, Hydrology and Geomorphology) of the ES outlines the mitigation proposed to minimise impacts to surface water. This would include the use of directional drilling to cross the major watercourses along the pipeline route. The intake would also be constructed in the dry using a coffer dam and best practice silt management techniques such as silt curtains and fencing to minimise the release of sediments during construction works in and adjacent to the River Severn.

During operation, the abstraction of water from the River Severn would be mitigated by timing of the abstraction during the autumn/winter months when sufficient flow is present in the river, as determined by Environment Agency Hands-off-Flow (HoF) constraints. An abstraction licence application will be submitted to the Environment Agency in parallel with the Planning Applications for a 50 day period of abstraction during the period October- March. It is not expected that the temporary reduction in downstream flows during operational periods would have significant effects on downstream users or Water Framework Directive status. Detailed operating procedures would also be implemented to control and manage the sweetening flow and BioBullet / PAC dosing regimes during operation to reduce the potential for contamination of surface waters.

Overall, with the appropriate mitigation as detailed in the Environmental Statement, no conflict with planning policy is expected with regard to water quality and quantity.

**6.14 Noise****6.14.1 Relevant Policies****NPPF (whole scheme)**

Paragraph 109 of the NPPF lists a range of ways in which the planning system should contribute to and enhance the local environment and this includes preventing both new and existing development from contributing to unacceptable levels of noise pollution. Paragraph 123 goes on to state that planning decisions should aim to:

- “*avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”*

### **Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)**

Appendix B of the Wyre Forest Site Allocations and Policies Local Plan states that local noise policies have been replaced by the policies contained within the NPPF.

### **Wychavon (Pipeline)**

In line with national planning policy, development should be designed in order to avoid adverse impacts on amenity, health and wellbeing (Policy GD2: General Development Control of Wychavon Local Plan and Policy SWDP31: Pollution of the emerging South Worcestershire Development Plan).

### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Proposals for development that is potentially noisy are required to be located in areas where noise will not be an important consideration or where impacts can be minimised (Policy ES14A: Noise Sensitive Development of the Bromsgrove District Local Plan). In addition to maximising distances between noise sources and noise sensitive users Policy BDP19: Policy High Quality Design of the emerging Bromsgrove District Plan highlights the importance of taking into account the implications of existing night time use of the locality and incorporating sufficient soft landscaping and other measures to reduce noise pollution.

### **Birmingham (Frankley WTW)**

Policy TP36: Health of the emerging Birmingham Development Plan outlines Birmingham’s commitment to reducing health inequalities and improvement of quality of life through a variety of means including by reducing noise.

#### **6.14.2 Review**

Chapter 17 (Noise and Vibration) of the Environmental Statement presents the results of the assessment of noise and vibration as a result of both construction and operation of the scheme.

The construction noise assessment followed the guidance contained in BS 5228 to establish potential noise and vibration impacts at those receptors located closest to the proposed construction works. In some areas, specific mitigation measures, such as the use of temporary noise barriers, have been proposed to reduce the magnitude of noise and vibration impacts arising from construction activities. However, in most cases, adverse construction impacts would be of short duration due to the transient nature of pipeline construction works.

Some activities have the potential to lead to significant effects, for example at the two closest properties to Frankley WTW (Fir Lodge and Frankley Lodge Farm), for properties in closest proximity to the drive and/or receipt shafts for the tunnel crossings beneath the M5 motorway and the A491, and for Torestin and The Corn House on Woodfield Lane. However with appropriate mitigation measures incorporated into the construction operations significant adverse noise and vibration effects are not generally expected at these locations.

However, for properties in closest proximity to the drive and receipt shafts for the tunnel crossing beneath the A449 and the Droitwich to Kidderminster railway line, it is anticipated that specific mitigation measures (such as temporary noise barriers around the shaft sites and reducing the numbers of plant and equipment in

simultaneous use) would be required. Even with appropriate mitigation in place, properties in this area could still experience significant effects (with noise levels greater than 65 dB) for the weeks when the tunnel shafts are constructed.

It is anticipated that a scheme of noise and vibration monitoring would be agreed with the relevant Environmental Health Departments, and noise and vibration limits be contained within any agreed Construction Environmental Management Plan.

Significant increases in noise levels (of between 6 and 9 dB) as a result of construction traffic have been predicted for the nine properties located in close proximity to Waterworks Drive for the entire Frankley WTW extension construction programme. There do not appear to be any feasible mitigation options for the uplift in road traffic along this road. However it should be noted that existing traffic flows on Waterworks Drive are very low, so whilst a significant increase in noise level is predicted, the absolute levels would remain lower than currently experienced on many of the roads in the immediate vicinity (such as Merritt's Brook Lane).

The operational noise assessment has referred to the guidance contained in a number of documents, including BS 4142, WHO Guidance, BS 8233 and local planning guidance in the assessment of the likelihood of adverse noise impacts arising from the operation of the permanent installations. At each location, noise levels as a result of the proposed operations have been predicted for the closest sensitive receptors. Significant effects are not predicted for the river intake, pumping station, BPT or WTW and no additional mitigation is proposed. However at Trimley, specific noise mitigation, such as the use of acoustic enclosures for external noise sources, has been proposed in order to reduce the likelihood of adverse impacts. With appropriate mitigation measures incorporated into the detailed design, significant effects are not expected during the operational phase of the project, and no conflict with planning policy is therefore likely in the long term.

## **6.15 Air Quality**

### **6.15.1 Relevant Policies**

#### **NPPF (whole scheme)**

The NPPF states that new development should be prevented from contributing to unacceptable levels of air pollution (paragraph 109). Emphasis is placed on ensuring compliance with and contribution towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas.

#### **Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)**

Although Policy CP03: Promoting Transport Choice and Accessibility of the Wyre Forest District Core Strategy, relates largely to issues surrounding transport, it also requires proposals for new development to consider their impact on air quality, particularly for areas within or adjacent to Air Quality Management Areas.

#### **Wychavon (Pipeline)**

Development must be designed so as to avoid significant adverse impact from all forms of pollution including fumes, smell and any others which affect the air, land and water environments (Policy SWDP31: of the emerging South Worcestershire Development Plan).

#### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Air quality, including any proposed mitigation measures, will be considered in the assessment of any planning applications (BDP1: Policy Sustainable Development Principles of the emerging Bromsgrove District Plan). All new developments with a floor space greater than 1000sqm or 0.5 hectare must not increase nitrogen dioxide ( $\text{NO}_2$ ), particulate matter (PM10) and carbon dioxide ( $\text{CO}_2$ ) emissions from transport and should be accompanied by an assessment of the likely impact of the development on local air quality and comply with current best practice guidance (Policy BDP19: High Quality Design of the emerging Bromsgrove District Plan).

**Birmingham (Frankley WTW)**

The implications of new development for air quality will be taken into account when assessing planning applications within the city (Policy 3.78: Air Quality of the Birmingham Unitary Development Plan).

**6.15.2 Review**

No adverse impacts on air quality or odour emissions are expected during the operation of the scheme. Chapter 18 (Air Quality and Odour) of the ES identifies that the scheme has the potential to have the following environmental impacts during construction:

- Potential effects from dust during the demolition and construction works associated with the proposed development.
- Potential effects of emissions of odours from the construction at Lickhill associated with the removal of landfill waste.

A range of mitigation measures would be included within the CEMP for the proposed development (a draft of which is available in Appendix 4.2 of the Environmental Statement). This would be agreed with the relevant local authorities prior to the start of construction in order to ensure that the development would not result in unacceptable dust nuisance impacts at adjacent receptors. Details of the mitigation proposed are included in Section 18.5 of the Environmental Statement. The mitigation has been identified based on recommended Institute of Air Quality Management (IAQM) guidance for the levels of risk identified, and include standard dust mitigation measures for construction such as dust suppression and use of wheel-washing, and the erection of solid screens or barriers around dusty activities or site boundaries that are at least as high as any stockpiles on site (this is required at Frankley WTW where concrete would be crushed on site).

It is also proposed to prepare an Odour Management Plan prior to the commencement of works at the Lickhill Quarry site where odour emissions are likely to occur from excavation activities. Mitigation measures recommended in the Environmental Statement include the use of odour suppression to control emissions and ensuring waste is not exposed when the site is not active. With appropriate implementation and management of odour mitigation measures during the construction phase, it is expected that the proposed development would not be likely to generate unacceptable odour impacts at adjacent receptors at Lickhill, including nearby residential properties, during the construction stage.

Despite the existing Frankley WTW being located wholly within the Birmingham County Council Air Quality Management Area, no impacts are expected on any Air Quality Management Areas as a result of the scheme.

Overall, with the appropriate mitigation as outlined in the Environmental Statement, no conflict with planning policy is expected with regard to air quality or odour.

**6.16 Materials and Waste****6.16.1 Relevant Policies****NPPF and National Planning Policy for Waste (whole scheme)**

The NPPF does not contain specific policies relating to waste as these are covered by the National Planning Policy for Waste. It does however support and encourage minimising waste (paragraph 7) and the reuse of existing resources (paragraph 17).

The National Planning Policy for Waste encourages the protection of human health and the environment by producing less waste and by using it as a resource wherever practicable. It aims for more sustainable waste management and moving the management of waste up the ‘waste hierarchy’ of prevention, preparing for reuse, recycling and other recovery, and disposing only as a last resort.

The National Waste Management Plan for England highlights that the UK is committed to meeting its target under the Waste Framework Directive of recovering at least 70% by weight of construction and demolition waste

by 2020. In support of this, paragraph 8 of the National Planning Policy for Waste seeks to ensure that the handling of waste during both the construction and operation of a development maximises opportunities to reuse/recover, and minimises off-site disposal.

### **Wyre Forest (Trimley PAC Dosing, RIPS, Pipeline)**

Any development built within 250m of an existing or planned waste management facility will be required to demonstrate that the proposed development does not prevent, hinder or unreasonably restrict the operation of the waste development (Policy WCS16: New Development Proposed on or Near to Existing Waste Management Facilities of the Worcestershire Waste Core Strategy Local Plan).

### **Wychavon (Pipeline)**

In line with national policy, new development is expected to safeguard natural resources by reducing the need to use primary resources and reducing/reusing waste on-site (SWDP33: Minerals of the emerging South Worcestershire Development Plan). In addition, any development built within 250m of an existing or planned waste management facility will be required to demonstrate that the proposed development does not prevent, hinder or unreasonably restrict the operation of the waste development (Policy SWDP33: Waste of the emerging South Worcestershire Development Plan and Policy WCS16: New Development Proposed on or Near to Existing Waste Management Facilities of the Worcestershire Waste Core Strategy Local Plan).

### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Development within Bromsgrove should have regard for the waste hierarchy (Policy BDP1: Sustainable Development Principles of the emerging Bromsgrove District Plan). In addition, any development built within 250m of an existing or planned waste management facility will be required to demonstrate that the proposed development does not prevent, hinder or unreasonably restrict the operation of the waste development (Policy WCS16: New Development Proposed on or Near to Existing Waste Management Facilities of the Worcestershire Waste Core Strategy Local Plan).

### **Birmingham (Frankley WTW)**

New development should be designed and constructed in line with the principles of sustainability and should therefore consider the type and source of materials used, and move the management of waste up the waste hierarchy (Policy 3.70: New Development and Waste of the Birmingham Unitary Development Plan and Policies TP3: Sustainable Construction and TP13: Sustainable Management of the City's Waste of the emerging Birmingham Development Plan).

#### **6.16.2 Review**

A search of the Worcestershire Waste Core Strategy Web-GIS tool has identified that the proposed scheme is located within 250m of four waste sites, all of which are located within Wyre Forest District. Two of these (Lickhill Quarry and Blackstone Quarry) are no longer in use and so the scheme would not restrict their operation. By tunnelling the pipeline beneath Bonemill household recycling centre, any adverse impacts on its operation would be avoided. The pipeline would pass within 100m of Summerway landfill and waste transfer facility however no impacts to its operation are anticipated.

During construction, mitigation measures for materials used on-site would be managed by the development of a CEMP (a draft of which is available in Appendix 4.2 of the Environmental Statement) which would include a detailed Site Waste Management Plan (SWMP), Materials Management Plan (MMP) and Soils Management Plan (SMP).

The use of sustainably sourced materials and recycled or secondary materials would be considered throughout the procurement process where practicable. Consideration would also be given to sourcing recycled or secondary materials locally.

Excavated material from the pipeline would largely be reused as backfill. The two main sources of wastes would come from the construction of the pumping station and the upgrade works at Frankley WTW. The construction

of the pumping station building and compound would comprise the excavation of landfill waste (approximately 10,000m<sup>3</sup>). The works at Frankley WTW comprise the excavation of a large material stockpile and infilled below ground tanks (approximately 182,000m<sup>3</sup>). These two elements would produce a significant quantity of excess waste materials requiring management, treatment, reuse, recycling and/or disposal offsite.

The SWMP would seek to ensure that all generated wastes are evaluated against the waste management hierarchy of prevention, reuse, recycling, recovery and disposal. This evaluation would be used to derive management options that would achieve the highest possible performance levels within the hierarchy.

A site specific waste management strategy would be developed to identify the procedure and methodology for disposal of the waste for offsite treatment and recycling of landfill waste materials at Lickhill Quarry for the pumping station construction. The SWMP would detail information on the waste carriers and the soil treatment facilities that would be used.

The excavation of stockpile and infill materials at Frankley WWT for the upgrade construction work would also require a waste management strategy to be developed to identify the procedure and methodology for treatment and recycling of the waste onsite for potential reuse and the quantity required to be disposed offsite as excess material. Materials from Frankley WTW likely to be processed onsite (e.g. screening, crushing) for reuse. It has been estimated that approximately 73,000m<sup>3</sup> would be reused for landscaping purposes. The excess materials should be reused in other construction projects, where appropriate, by making the materials available on the CL:AIRE Register<sup>3</sup> of materials website.

The SWMP would identify waste to landfill targets to work towards the aim of recovering at least 70 per cent by weight of non-hazardous construction and demolition waste in order to reflect STWL aspirations and current government policy.

Once operational, the proposed development is not likely to require significant quantities of materials or produce significant quantities of waste.

Overall, by avoiding active landfill and waste sites as far as practicable, and seeking to achieve the highest performance levels possible within the waste hierarchy, no conflict with planning policy is expected with regard to materials and waste.

## **6.17 Sustainability**

### **6.17.1 Relevant Policies**

#### **NPPF (whole scheme)**

The NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development. It sets out twelve principles that the planning system should follow including supporting the transition to a low carbon future, taking account of climate change, encouraging the reuse of existing resources and the use of renewable resources (paragraphs 17 and 93). New development is encouraged to minimise energy consumption (paragraph 96) and should be planned to avoid increased vulnerability to the range of impacts arising from climate change (paragraph 99).

#### **Wyre Forest (Trimbley PAC Dosing, RIPS, Pipeline)**

Within Wyre Forest District, all new developments are required to demonstrate how they will reduce their impact on the environment through design, siting, layout, orientation, construction methods and materials. They should seek to maximise energy conservation and efficiency, and major new developments should achieve a minimum of 10% of energy requirements from on-site low or zero carbon energy sources. All new developments are required to demonstrate that they have considered the impact of climate change upon them and that they are

<sup>3</sup> Contaminated Land: Applications in Real Environments: <http://www.claire.co.uk/>

suitable for the predicted changes in climate (CP01: Delivering Sustainable Development Standards of the Wyre Forest Core Strategy).

### **Wychavon (Pipeline)**

The design of new development should incorporate suitable approaches to sustainable construction including reducing the need for use of primary materials (by reducing, reusing and recycling waste on-site) and using substitute or secondary and recycled materials and minerals waste within development (Policy SWDP 21: Design of the emerging South Worcestershire Development Plan).

### **Bromsgrove (Pipeline, BPT, Frankley WTW Extension)**

Future development within Bromsgrove District should be designed with sustainability in mind so that present demands do not compromise the ability of future generations to meet their own demands and enjoy a high quality environment. In considering all proposals for development regard will be had to conserving energy resources and improving energy efficiency of buildings (Policies DS13: Sustainable Development and ES11: Energy Efficiency of Buildings of the Bromsgrove District Plan).

### **Birmingham (Frankley WTW)**

Paragraph 3.14 of the Birmingham Unitary Development Plan advises that good design can help to promote and secure sustainable forms of development. This is also reflected in the emerging Birmingham Development Plan which encourages opportunities to make sustainable design integral to development such as energy generating features (Policy PG3: Place Making). Adapting to climate change, the use of renewable energy sources and minimising energy consumption are important requirements in the emerging Birmingham Development, and this is supported by a range of proposed policies including:

- By 2027 the City Council is committed to reducing carbon dioxide emissions produced in the city by 60% from 1990 levels (Policy TP2: Adapting to Climate Change).
- New developments are required to reduce CO<sub>2</sub> emissions (Policy TP3: Sustainable Construction).
- The use of low and zero carbon energy sources and technologies is promoted and encouraged (Policy TP4: Low and Zero Carbon Energy Generation).

Sustainability should not only be considered with regard to the operational phase of a development but also during construction. Adopted Policy 3.70A: New Development and Waste of the Birmingham Unitary Development Plan requires proposals to be accompanied by a '*comprehensive, detailed and practical scheme for dealing with the waste that is likely to arise both at the construction phase and during the life of the development*'. Proposed Policy TP3: Sustainable Construction of the emerging Birmingham Development Plan requires sustainability to be considered more comprehensively during the construction phase:

*'New development should be designed and constructed to sustainability standards which:*

- *Maximise energy efficiency and the use of low carbon energy.*
- *Conserve water and minimise flood risk.*
- *Consider the type and source of the materials used.*
- *Minimise waste and maximise recycling during construction and operation.*
- *Are flexible and adaptable to future occupier needs.*
- *Incorporate measures to enhance biodiversity value.'*

#### **6.17.2 Review**

In the UK, increased frequency and severity of flooding is the climate change impact likely to have the greatest consequences and therefore much of the planning framework focusses on flooding. For BRP, climate change scenarios have been included in the hydrological and hydraulic assessments and have influenced the design of the scheme and elements of the design, particularly those near watercourses, such as at the River Intake and

Pumping Station, have been sited accordingly to minimise the flood risk. Further information on this is provided in Chapter 15 (Flood Risk) of the Environmental Statement.

There is broad scientific consensus that our climate has changed and would continue to change due to the influence of anthropogenic (man-made) greenhouse gas (GHG) emissions, including but not limited to carbon dioxide (CO<sub>2</sub>). Low and Zero Carbon (LZC) technologies and a range of energy efficiency measures have been considered as part of the design process for BRP and incorporated where feasible. These include:

- The recovery of heat from the Pumping Station at Lickhill was considered, where cooling water is required for the pumps during the 50 day operating period every one to two years. If this were available for more sustained time periods then it may have provided a viable opportunity to export low-carbon heat for use on site, or to nearby residential or commercial properties. However, as it would only be operational for such limited time periods the investment required could not be justified and would provide limited environmental benefit.
- An assessment has been conducted into the feasibility of installing a hydropower turbine at Trimley Pumping Station. The concept considered was to make use of the sweetening flow that gravitates EVA water from Clent Hills Pass during the period when Trimley Pumping Station is not being used. A range of different turbine sizes and types were considered but none were economically viable, therefore this was not investigated further.
- Assessments into the viability of installing wind or solar photovoltaics were carried out for the Pumping Station and the BPT. Despite initial promise, onsite constraints prevented viability to include renewable generation within the footprint of the BRP scheme elements.
- At Frankley WTW, modern energy efficient processes are proposed throughout the site.

STWL has a range of corporate objectives aiming to protect the wider environment and has committed to climate change mitigation aiming to reduce their carbon footprint by 6% between 2015 and 2020 through a range of different incentives including:

- Increasing energy efficiency of their operations and sites.
- Increase on-site renewable energy generation at both clean water and waste water sites. The target is to increase the amount of electricity produced from renewable energy technologies to meet 50% of Severn Trent Waters own electricity demand by 2020.
- Minimising fuel use on transport.

As part of STWLs programme and separately from the BRP proposals, STWL has plans to develop several large solar photovoltaic arrays at their operational sites including at Trimley WTW and Frankley WTW. The aim is that these solar panels would contribute towards powering the existing operations at the sites.

The design of the scheme has also been undertaken to maximise the re-use of existing assets and materials. Some examples are given below, which would result in minimising requirements for new resources and energy use during construction, with associated carbon benefits:

- Disinfection chemicals would be used instead of energy-intensive on-site production from brine for new works.
- Pipes, ducts and processes would be re-used or extended where possible rather than new build (e.g. re-use of GAC pumping station, extension of limewater system).

Adoption of a Site Waste Management Plan would help to ensure materials are disposed of, reused and recycled where appropriate, saving carbon and mitigating against climate change to some extent (refer to Section 6.16).

By taking account of climate change, encouraging the reuse of existing resources and the use of renewable resources, no conflict with planning policy is expected.

## 6.18 Employment

Employment is a key issue across the relevant LPAs and Birmingham City Council in particular views new development as an opportunity to address this. Policy TP25: Local Employment of the emerging Birmingham Development Plan therefore encourages developers to sign up to targets for the recruitment and training of local people during the construction phase of a development, and to use the local supply chain where appropriate.

Chapter 20 (Community and Socio-Economics) of the Environmental Statement provides estimates of the workforce likely to be employed on the construction of the scheme. It has been estimated that the construction phase of the project would generate 179 full time equivalent jobs, either safeguarded with the contractor company or additional local employment. .

The contractor would be working with specialist pipeline/tunnelling contractors who have extensive experience of placing apprentices within their delivery teams and have committed to ensuring opportunities would be advertised to individuals from the local area using a network of local organisations.

STWL and the contractor would also work with the Birmingham City Council (BCC) Employment Access Team, and the Greater Birmingham and Solihull Local Enterprise Partnership (LEP) who support the recruitment of local people into major construction and infrastructure projects around Birmingham. The Greater Birmingham and Solihull LEP bring together a variety of parties including local job centres, training providers and colleges and would work with the contractor to understand project requirements and timescales once the project is in the construction phase.

The sourcing and transportation of labour, materials and plant to and from the BRP is also likely to lead to opportunities for local and regionally based companies to secure supplier contracts. There is also expected to be a certain level of employment in the construction industry supply chain relating to the proposed BRP, although the degree to which this produces local benefits depends on the specific contractual situations at the time of construction. Once the preferred contractor has understood the requirements they would organise 'Meet the Buyer Events' to provide guidance to prospective suppliers.

The contractor would also be encouraged to enlist the assistance of the [www.finditinBirmingham.com](http://www.finditinBirmingham.com) and [www.finditinWorcestershire.com](http://www.finditinWorcestershire.com) online business communities to advertise opportunities in the local area. These organisations have the capability to help deliver effective Meet the Buyer events and target the right local companies and business.

## 7. Summary and Conclusion

The main objective of the BRP is to provide resilience to the water supply to Birmingham, which is currently highly dependent on the EVA carrying water from the Elan Valley in mid Wales. Around 1.2 million STWL customers in the Birmingham area are currently reliant on Elan Valley water from the reservoir in mid-Wales. The water is transported 119 km via the EVA to Frankley WTW. In order for STWL to facilitate future maintenance of the EVA it is necessary to provide an alternative source of water for the duration of the works. The BRP would be operated for periods of around 50 days at a time, during the autumn or winter months when river levels are sufficiently high to enable abstraction without any significant environmental or social impacts. It is anticipated that one 50 day EVA outage would be planned every one to two years, subject to water availability in the river.

This Statement has been prepared to cover the whole BRP scheme which is subject to five separate planning applications (as listed in Section 1 of this report). The scheme comprises:

- **All LPAs (Wyre Forest, Wychavon, Bromsgrove and Birmingham)** - Approximately 25km of pipeline running from the River Severn at Lickhill in Wyre Forest, through Wychavon and Bromsgrove, to Frankley WTW in Birmingham.
- **Wyre Forest District Council only** - New river intake on the River Severn and pumping station at Lickhill. PAC plant and works to the existing pumping station at Trimley WTW are also proposed to allow the new abstraction to be supplemented by increased abstraction from STWL's existing operational site at Trimley WTW in Wyre Forest.
- **Bromsgrove District Council** only - A BPT and PAC dosing units located near the village of Romsley, at the high point along the pipeline route, and an extension to Frankley WTW to allow treatment of River Severn water, which has higher treatment requirements compared to the Elan Valley water which it currently receives.
- **Birmingham City Council** only – Upgrade works within Frankley WTW.

In identifying route and site options for the scheme, extensive constraints mapping and consultation with local communities has been used to ensure that the development would avoid residential areas, sensitive environmental sites and land allocated or safeguarded for future development as far as possible. Where this has not been possible, the scheme has been engineered to ensure any potential impacts are minimised. This includes by tunnelling the pipeline at a number of locations including:

- under the River Stour and the Staffordshire and Worcestershire Canal;
- to the north of Wilden to avoid impacts to the River Stour Floodplain SSSI, residential properties, Wilden Industrial Estate and Wilden Motocross Track; and
- under major transport network routes.

Extensive mitigation has been designed to avoid or reduce significant environmental impacts to acceptable levels and a holistic approach has been used to develop an overall package of mitigation for the entire scheme. This includes replacement habitat to support impacted species. In addition, a range of enhancement measures are proposed including habitat creation, the provision of a 'living wall' at Frankley WTW and a 'green roof' at the BPT, and the replacement of three trees for every one lost across the scheme. In terms of the proposed above ground structures, their location, siting, materials and design have all been carefully considered during the design process in order to minimise impacts on the landscape and visual amenity. Landscape mounding at the pumping station and Frankley WTW sites have been carefully designed to balance the need to respect local landscape character and reduce visual impacts. Wherever practicable, the retention and protection of woodland and trees has been sought, including those along the pipeline route and a planting scheme has been designed so as to restore landscape pattern and character, screen views of the proposed structures, as well as to provide wildlife habitat to connect with and enhance local biodiversity.

Mitigation is also proposed to ensure the development is not at risk of flooding and does not result in increased risk of flooding elsewhere. This includes the design of structures to withstand flood events and the incorporation of SuDS where site conditions allow. To ensure the scheme would not result in significant harm to the natural

environment or human health as a result of contaminants, a remediation and mitigation strategy would be adopted for any identified contaminated land which would include the implementation of a long term ground water and ground gas monitoring programme where required to assess the associated risk from contaminated land during and post construction.

Some of the potential impacts identified are associated solely with the construction period of the scheme and are therefore temporary in nature. A range of mitigation measures are proposed to minimise construction impacts on local receptors (including nearby residents) including the use of temporary noise barriers, earth bunds, and odour management (at Lickhill). In addition, defined construction traffic routes and the use of trenchless crossings techniques on all major roads and a number of minor roads is proposed in order to minimise the number of temporary closures and traffic management required.

Because of the nature of the development, there is no suitable alternative to its location within the Green Belt. Space within the existing Frankley Water Treatment Works has been utilised as far as possible, and where new buildings are proposed in the Green Belt, their location, siting, design and materials have been carefully chosen so as to minimise impacts on the openness of the area. The fundamental principles of the Green Belt would not be compromised and any development impacts would be minimised. Overall, the proposed scheme would provide resilience to the water supply of Birmingham, thereby supporting the social and economic objectives of the city for sustainable development. Therefore, although it is accepted that the proposed river intake, pumping station, break pressure tank and the extension to Frankley Water Treatment Works are, by definition, inappropriate development within the Green Belt, the benefits of the proposed scheme as discussed here offer sufficient weight to satisfy the very special circumstances governing such development in the Green Belt.

Overall, the scheme complies with the relevant spatial policies and provides a sustainable balance between the localised environmental disturbance and the social and economic benefits of providing a resilient water supply for the city of Birmingham.

## Appendix A. Lighting Requirements

### A.1 Introduction

The above ground infrastructure associated with the Birmingham Resilience Project (BRP) would require external lighting for safe operation and maintenance. This statement describes the statutory, Severn Trent Water (STW), and project requirements that have been considered in the lighting design at the river intake, pumping station, break pressure tank (BPT), Trimley water treatment works (WTW), and Frankley WTW.

### A.2 Design Input Data

#### A.2.1 Statutory Requirements

Statutory requirements, HSG38 Lighting at Work, for the lighting are incorporated into STW's requirements, see section 2.2.

#### A.2.2 STW Requirements

STW requirements for the lighting are contained in the STW Design Manual Cross Functional: E&M Plant DM0106-03, Site Lighting Section. Key elements are repeated below.

##### *External Lighting*

##### External Access Lighting

*Where a site is likely to be visited more than 4 times a year in the dark, the external access lighting should be provided for the main process areas, main site facility areas and routes between. As part of feasibility/design it is necessary to decide if a permanent lighting system is appropriate and it is essential that the site owner / maintainer is involved in this decision.*

*If it is anticipated that someone will need to visit during the hours of darkness (immediate response alarm, etc.), external site access lighting will be required to the: main process areas; main site facility areas; and routes between.*

*Sensor controlled 'quick start' light fittings (PIRs) should be considered to allow automatic illumination of the route to the main control panel/ kiosk / building unless they can be accidentally activated by passers-by or would be subjected to extreme vandalism.*

*Consideration should be given to the grouping and positioning of light switches, the following scenario should be used: someone attending the site in the dark, who has never visited that site before. Where possible, switches to light other areas of the site/ process should be located within the entry points of the main processes or buildings.*

*Under normal circumstances, no lighting provision is likely to be required for an access road to a site.*

*Main entrance gates will not normally be provided with lighting due to power unavailability, accidental/deliberate activation by passers-by or areas subject to vandalism. Main entrance gate lighting should be considered, subject to a risk assessment, where appropriate measures have been taken to mitigate the above issues. Gates with access control should be provided with appropriate fixed lighting.*

*Where fixed lighting is to be installed, it must provide adequate illumination to allow staff to safely enter and walk around sites paying particular attention to the avoidance of shadows to steps/stairs and changes in level along pedestrian routes.*

*Care should be taken to avoid light pollution beyond the site boundary particularly in areas subject to vandalism where lighting columns are easily targeted.*

***Examples of Scenarios:*****1. Small unmanned site accessed from highway by a track/drive:**

No lighting to access track or drive.

*PIR quick start lighting required on access route to main building / kiosk. Gate to be illuminated only if third parties cannot deliberately or accidentally activate the lighting and power is available to that part of site.*

**2. Site on or adjacent to the highway -**

*PIR quick start lighting required to building / kiosk, only if third parties cannot deliberately or accidentally activate the lighting.*

**3. Main processes/ facilities/ wells etc. with immediate response alarm or likely to require attendance greater than 4 times per year during the hours of darkness-**

*Fixed access lighting required to illuminate main process areas, site facilities and routes between. This lighting should be controlled by switches for unmanned sites grouped and located in the entry point of the main building/ kiosk / process area.*

**External Task Lighting**

*Where tasks are to be carried out externally and the level of illumination provided is below the minimum required for that task, at a frequency of more than 4 times per year, permanent fixed task lighting should be provided. Additionally, RCD protected sockets should be provided for supplementary localised portable lighting where appropriate (e.g. areas where there are significant mechanical and electrical assets, illumination inside a piece of equipment). Positioning of sockets must take into account the resultant trip hazards generated from trailing leads. Sockets must also be isolated separately to the main panel, so that when process equipment is isolated, the lighting socket will still function.*

*For tasks required to be carried out at a frequency of less than 4 times per year, RCD protected sockets should be provided for localised temporary lighting.*

*If the site/installation has no power supply and a cost/safety justification for lighting cannot be made, portable generators/lighting and/or torches should be considered as an alternative.*

***Examples of Scenarios*****1. Main processes/ facilities/ wells etc. with immediate response alarm or likely to require attendance greater than 4 times per year during the hours of darkness-**

*Fixed task lighting required to illuminate main task areas. Additional RCD protected sockets to be provided for additional temporary task lighting.*

**2. Processes/ areas likely to require attendance less than 4 times per year during the hours of darkness-**

*RCD protected sockets required for temporary task lighting.*

**External Levels of Illumination**

*Outdoor lighting illuminance levels should comply with the following table and be determined as part of the design process.*

<i>Extract from HSG38 Lighting at Work<sup>(1)</sup></i>			<i>Typical STW locations</i>
<i>Activity</i>	<i>Average Illuminance (Lux) lx.</i>	<i>Minimum Measured Illuminance (Lux) lx.</i>	
<i>Movement of people, machines and vehicles.</i>	20	5	<i>General external lighting where required for vehicular movement or pedestrian movement on a flat level surface.</i>
<i>Movement of people, machines and vehicles in hazardous areas; rough work not requiring any perception of detail.</i>	50	20	<i>General external lighting where required for pedestrian movement at different levels / steps or loading bay areas</i>
<i>Work requiring limited perception of detail.</i>	100	50	<i>General process plant illumination. Wells &amp; tanks.</i>
<i>Work requiring perception of detail.</i>	200	100	<i>Specific areas of process plant.</i>
<i>Work requiring perception of fine detail.</i>	500	200	

### A.2.3 Project Requirements

Key project requirements that have an impact on the lighting design are detailed below:

- It is anticipated that BRP would operate for one 50 day EVA outage every one to two years, subject to water availability in the river. The remainder (majority) of the time the raw water supply system would operate in a sweetening mode where a small flow of water from Frankley WTW back to the river Severn is used to keep the system clear from significant biological fouling. These limited operating durations have been considered as part of the lighting design.
- The system would be operated remotely from Frankley WTW. As such the intake, pumping station and BPT would be unmanned in both operating modes. Personnel would only be present at the facilities during maintenance or testing. No specific lighting measures are required to support the security classification and associated protective measures (such as CCTV, access control etc.) to ensure the resilience of these facilities.
- The new process treatment works at Frankley WTW would become part of the overall works at Frankley WTW, operating 24 hours a day for 365 days a year.
- The security lighting and fencing has been carefully designed to match the existing at the WTW. The new systems would be enhanced at various locations to comply with Government Regulations.

## A.3 Lighting Design

### A.3.1 General

The lighting would only be in operation when STW personnel are present at the facilities outside daylight hours. Activities requiring site attendance such as maintenance are anticipated to be monthly visits during day light hours. Typically it would be a rare and unusual occurrence for the facilities to be illuminated, examples would be:

- Security alert by the CCTV or Redeye systems requiring a site visit to inspect or secure the facility.
- An unplanned plant failure requiring urgent intervention to prevent an unsafe condition or further equipment damage. The facility can be fully operated and shutdown from Frankley WTW so this would be an unusual occurrence.

### A.3.2 Intake

Lighting would be provided to ensure an average illumination level of 20Lux (in accordance with the STW Design Manual) to ensure safe movement of people, machines and vehicles on a flat level surface.

The lighting would be manually switched by STW personnel on arrival at the intake. The lighting control switch would be protected against use by non STW personnel by a lock or fob/proximity system.

Lighting would only be provided locally to the intake and would be limited to the extent of the STW facility, i.e. the approach road would not be illuminated. The lighting would comprise two floodlights mounted at 6m on poles at either end of the intake. The poles would be shared with the CCTV system.

The intake would need to withstand flood events which can submerge the entire intake up to a level of 1m. This would preclude the use of low level lighting such as bollards and handrail mounted lighting. The lighting design includes directional mounting of the luminaires with diffusers arranged to limit the spill lighting outside the Intake.

Details of the proposed lighting design are shown on drawing TLL0159679-EXT-INTAKE-RA-250615.

### A.3.3 Pumping Station

Lighting would be provided to ensure an average illumination level of 20Lux (in accordance with the STW Design Manual) to ensure safe movement of people, machines and vehicles on a flat level surface.

The lighting would be manually switched by STW personnel when they arrive at the pumping station main gate. The lighting control switch would be protected against use by non STW personnel by a lock or fob/proximity system.

Lighting would only be provided locally to the access road within the security fence and the turning area. No lighting would be provided on the three sides of the Pumping Station where there is no planned access. The lighting would comprise floodlights mounted at 6m on poles for the road and by floodlights mounted at 6m on the building cladding in the turning area. The lighting design includes directional mounting of the luminaires with diffusers arranged to limit the spill lighting outside the pumping station.

Details of the proposed lighting design are shown on drawing TLL0159679-EXT-PUMP STATION-RA-011015.

### A.3.4 Break Pressure Tank

Lighting would be provided to ensure an average illumination level of 20Lux (in accordance with the STW Design Manual) to ensure safe movement of people, machines and vehicles on a flat level surface in the road and hard standing areas. Further lighting would be provided to ensure an average illumination level of 200Lux at specific areas of process plant work requiring perception of detail at the PAC (Powdered Activated Carbon) system.

The lighting would be manually switched by STW personnel when they arrive at the BPT main gate. The lighting control switch would be protected against use by non STW personnel by a lock or fob/proximity system.

Lighting would be provided by floodlights mounted at 6m on poles for the road and hardstanding areas, and by floodlights mounted at 4m and 7m on the PAC dosing structure. Low level (1m) lighting would also be provided for the hand rail surrounding the BPT roof and PAC equipment embankment area to ensure personnel safety and safe movement. The lighting design includes directional mounting of the luminaires with diffusers arranged to limit light spill.

Details of the proposed lighting design are shown on drawing TLL0159679-EXT-BPT-RA011015.

#### **A.3.5 New Process Treatment Areas – Frankley WTW**

Lighting would be provided to ensure an average illumination of 20 Lux (in accordance with the STW design manual) to ensure safe movement of people, machines and vehicles on a flat level surface in the road and hard standing areas. These areas include roadways, areas between tanks, perimeter lighting around open tanks, pumping stations and washwater tank platforms. This general lighting would be maintained throughout the year and automatically switched on with the existing works lighting.

Further lighting would be provided to ensure an average illumination of 50 Lux at specific areas of the new process units. These areas include chemical delivery bunds, delivery laybys, rapid gravity filter (RGF) gallery, sand ballasted lamellas (SBL), and weighbridge and wheel wash areas. This lighting would be provided by floodlights mounted on 6m high poles for the road, delivery laybys and the hardstanding areas. Low level lighting would be provided for the handrails surrounding the surface water attenuation tank and dirty backwash tank to ensure personnel safety and safe movement. The lighting design includes directional mounting of the luminaires with diffusers arranged to limit the spill lighting outside the treatment areas.

Any unplanned activities outside daylight hours and during the EVA shutdown requiring lighting above the general lighting levels would be undertaken using additional task lighting.

Details of the proposed lighting design are shown on drawing TLL0159679-EXT-FR\_INLET-RA-151015 and TLL0159679-EXT-FRANKLEY-RA-071015.

#### **A.3.6 Trimbley WTW PAC Dosing**

Lighting wold be provided locally to the access road, hard standing and access points to the PAC system to ensure an average illumination level of 20Lux (in accordance with the STW Design Manual) to ensure safe movement of people, machines and vehicles on a flat level surface in the road and hard standing areas. Further lighting is provided to ensure an average illumination level of 200 Lux at specific areas of process plant Work requiring perception of detail at the PAC system.

This lighting would act in conjunction with and complement the existing lighting at the works and would comprise 6 LED lights mounted on the PAC dosing units and pump kiosk which would be manually switched by STW personnel during operational periods.

The lighting design includes directional mounting of the luminaires with diffusers arranged to limit the spill lighting outside boundary fence.