

DRAFT ROADMAP - Bramley Off-Site Investigation, Risk Assessment and Remediation

v1. 4/ July 2024



This roadmap outlines a coherent strategy to further investigate, risk assess and implement appropriate remedial measures associated with off-site areas in Bramley.

Detailed Quantitative Risk Assessment for Controlled Waters / Human Health

Further detailed risk assessment has always been a recognised stage requirement to establish site specific criteria for Unacceptable Risk and associated Remedial Objectives, beyond the immediate requirements for the removal of recoverable floating fuel at the PFS.

We have the significant advantage of having off site data, which continues to build. In all instances, empirical data supersedes modelled scenarios with respect to risk based decision making for contaminated land management.

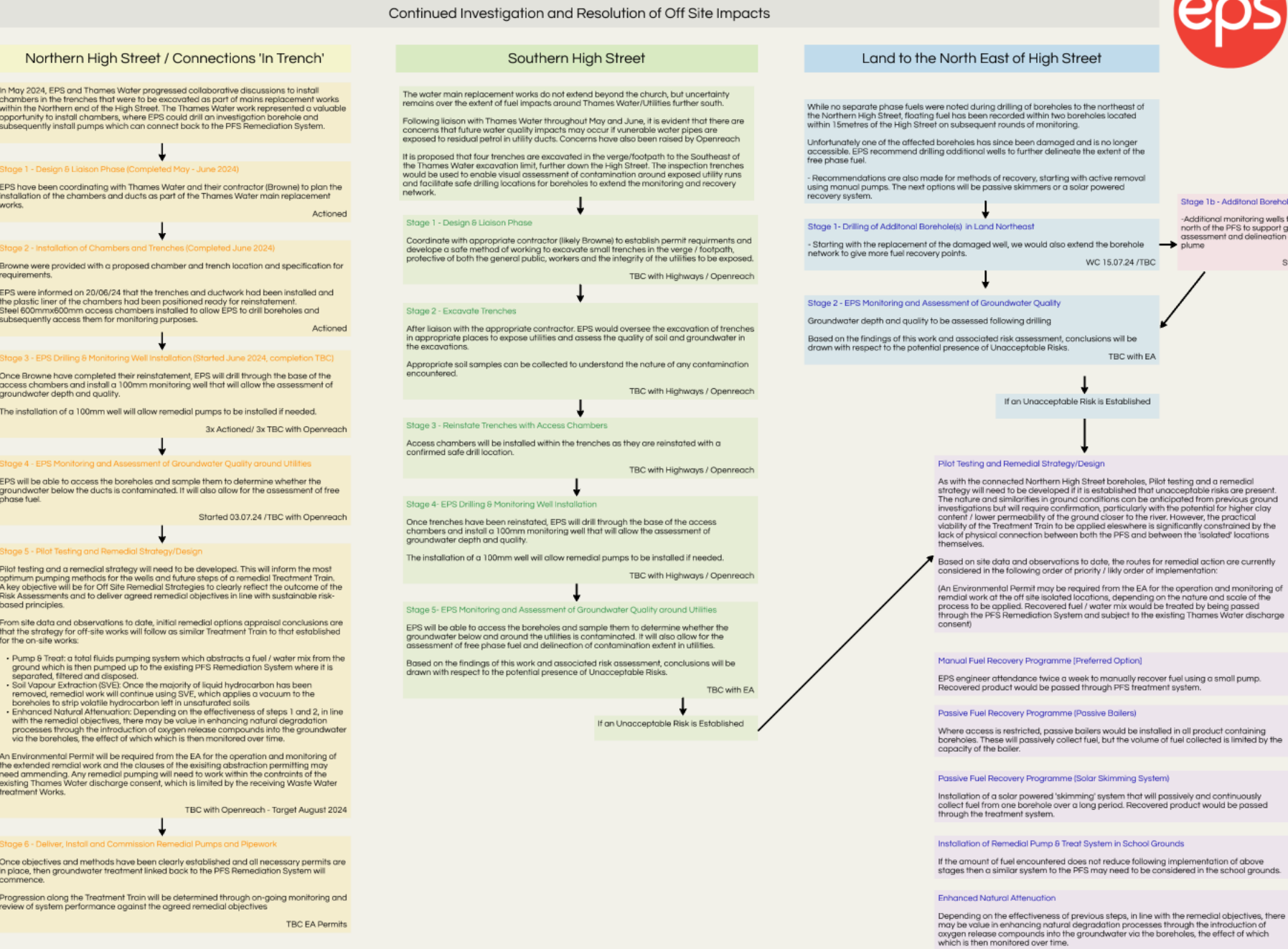
The remit of the detailed risk assessment will cover both Controlled Waters (Environment Agency) and Human Health (WBC) and will include an appropriate degree of Sustainability Assessment in line with current risk based principles.

Further risk assessment to below ground utility assets will continue in parallel, with a recognised need to establish agreed, evidence based conditions which constitute unacceptable risk to specific utilities.

Ultimately, the objective of these Risk Assessments is to establish agreed end points, reflecting Business As Usual and the removal of Unacceptable Risks

TIMELINE: Draft Controlled Waters and Human Health DQRA to be provided to EA and WBC for discussion within August 2024

August 2024



Detailed Quantitative Risk Assessment (DQRA) Controlled Waters / Human Health

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Connected 'In Trench' / Northern High Street

In May 2024, EPS and Thames Water progressed collaborative discussions to install chambers in the trenches that were to be excavated as part of mains replacement works within the Northern end of the High Street. The Thames Water work represented a valuable opportunity to install chambers, where EPS could drill an investigation borehole and subsequently install pumps which can connect back to the PFS Remediation System.



Started Summer 2024

Stage 1 - Design & Liaison Phase (Completed May - June 2024)

EPS have been coordinating with Thames Water and their contractor (Browne) to plan the installation of the chambers and ducts as part of the Thames Water main replacement works.

Actioned



Stage 2 - Installation of Chambers and Trenches (Completed June 2024)

Browne were provided with a proposed chamber and trench location and specification for requirements.

EPS were informed on 20/06/24 that the trenches and ductwork had been installed and the plastic liner of the chambers had been positioned ready for reinstatement. Steel 600mmx600mm access chambers installed to allow EPS to drill boreholes and subsequently access them for monitoring purposes.

Actioned



Stage 3 - EPS Drilling & Monitoring Well Installation (Started June 2024, completion TBC)

Once Browne have completed their reinstatement, EPS will drill through the base of the access chambers and install a 100mm monitoring well that will allow the assessment of groundwater depth and quality.

The installation of a 100mm well will allow remedial pumps to be installed if needed.

3x Actioned/ 3x TBC with Openreach



Stage 4 - EPS Monitoring and Assessment of Groundwater Quality around Utilities

EPS will be able to access the boreholes and sample them to determine whether the groundwater below the ducts is contaminated. It will also allow for the assessment of free phase fuel.

WC03.07.24 /TBC with Openreach



Stage 5 - Pilot Testing and Remedial Strategy/Design

Pilot testing and a remedial strategy will need to be developed. This will inform the most optimum pumping methods for the wells and future steps of a remedial Treatment Train. A key objective will be for Off Site Remedial Strategies to clearly reflect the outcome of the Risk Assessments and to deliver agreed remedial objectives in line with sustainable risk-based principles.

From site data and observations to date, initial remedial options appraisal conclusions are that the strategy for off-site works will follow as similar Treatment Train to that established for the on-site works:

- Pump & Treat: a total fluids pumping system which abstracts a fuel / water mix from the ground which is then pumped up to the existing PFS Remediation System where it is separated, filtered and disposed.
- Soil Vapour Extraction (SVE): Once the majority of liquid hydrocarbon has been removed, remedial work will continue using SVE, which applies a vacuum to the boreholes to strip volatile hydrocarbon left in unsaturated soils
- Enhanced Natural Attenuation: Depending on the effectiveness of steps 1 and 2, in line with the remedial objectives, there may be value in enhancing natural degradation processes through the introduction of oxygen release compounds into the groundwater via the boreholes, the effect of which which is then monitored over time.

An Environmental Permit will be required from the EA for the operation and monitoring of the extended remedial work and the clauses of the existing abstraction permitting may need amending. Any remedial pumping will need to work within the constraints of the existing Thames Water discharge consent, which is limited by the receiving Waste Water treatment Works.

TBC with Openreach - Target August 2024



Stage 6 - Deliver, install and Commission Remedial Pumps and Pipework

Once objectives and methods have been clearly established and all necessary permits are in place, then groundwater treatment linked back to the PFS Remediation System will commence.

Progression along the Treatment Train will be determined through on-going monitoring and review of system performance against the agreed remedial objectives

TBC EA Permits

Southern High Street

The water main replacement works do not extend beyond the church, but uncertainty remains over the extent of fuel impacts around Thames Water/Utilities further south.

Following liaison with Thames Water throughout May and June, it is evident that there are concerns that future water quality impacts may occur if vulnerable water pipes are exposed to residual petrol in utility ducts. Concerns have also been raised by Openreach

It is proposed that four trenches are excavated in the verge/footpath to the Southeast of the Thames Water excavation limit, further down the High Street. The inspection trenches would be used to enable visual assessment of contamination around exposed utility runs and facilitate safe drilling locations for boreholes to extend the monitoring and recovery network.



Stage 1 - Design & Liaison Phase

Coordinate with appropriate contractor (likely Browne) to establish permit requirements and develop a safe method of working to excavate small trenches in the verge / footpath, protective of both the general public, workers and the integrity of the utilities to be exposed.

TBC with Highways / Openreach



Stage 2 - Excavate Trenches

After liaison with the appropriate contractor, EPS would oversee the excavation of trenches in appropriate places to expose utilities and assess the quality of soil and groundwater in the excavations.

Appropriate soil samples can be collected to understand the nature of any contamination encountered.

TBC with Highways / Openreach



Stage 3 - Reinstate Trenches with Access Chambers

Access chambers will be installed within the trenches as they are reinstated with a confirmed safe drill location.

TBC with Highways / Openreach



Stage 4- EPS Drilling & Monitoring Well Installation

Once trenches have been reinstated, EPS will drill through the base of the access chambers and install a 100mm monitoring well that will allow the assessment of groundwater depth and quality.

The installation of a 100mm well will allow remedial pumps to be installed if needed.

TBC with Highways / Openreach



Stage 5- EPS Monitoring and Assessment of Groundwater Quality around Utilities

EPS will be able to access the boreholes and sample them to determine whether the groundwater below and around the utilities is contaminated. It will also allow for the assessment of free phase fuel.

Based on the findings of this work and associated risk assessment, conclusions will be drawn with respect to the potential presence of Unacceptable Risks.

TBC with EA

Land Northeast of High Street

While no separate phase fuels were noted during drilling of boreholes to the northeast of the Northern High Street, floating fuel has been recorded within two boreholes located within 15metres of the High Street on subsequent rounds of monitoring.

Unfortunately one of the affected boreholes has since been damaged and is no longer accessible. EPS recommend drilling additional wells to further delineate the extent of the free phase fuel.

- Recommendations are also made for methods of recovery, starting with active removal using manual pumps . The next options will be passive skimmers or a solar powered recovery system.

