

Appendix 10-2

Water Framework Directive Compliance Statement

East Reading Mass Rapid Transit Scheme

Water Framework Directive Compliance Statement

On behalf of:



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Contents

1	Introduction	1
1.1	Background	1
1.2	The Water Framework Directive.....	1
2	Scheme Overview.....	2
2.1	Site Description and Location.....	2
2.2	Geology and Groundwater	2
2.3	Surface Water Features	3
2.4	Proposed Development.....	4
3	Screening Assessment.....	5
3.1	Methodology	5
3.2	Waterbody Status and Catchment objectives	6
3.3	Step 1: Screening Proposed Works	12
4	Step 2: Assessment of Potential Impacts.....	14
4.1	WFD Surface Water Bodies - Rivers.....	14
4.2	WFD Surface Water Body – Lake	16
4.3	WFD Groundwater Water Body.....	16
4.4	Construction Phase	16
4.5	Cumulative Effects Assessment.....	17
4.6	Assessment of Compliance with the WFD Objectives	18
5	Summary and Conclusions.....	19

Figures

Figure 2-1: Site Location	2
Figure 3-1: EA WFD Methodology (2016) - sourced from EA Doc No 488_10.....	5
Figure 3-2: Site Location in Comparison to WFD Water Bodies	6
Figure 3-3: Location of Kennet and Holy Brook WFD Water Body	7
Figure 3-4: Location of Thames (Wallingford to Caversham)	8
Figure 3-5: Location of Thames (Reading to Cookham) WFD Water Body.....	9
Figure 3-6: Location of Sonning Eye Gravel Pit WFD Water Body	10
Figure 3-7: Location of Berkshire Downs Chalk WFD Groundwater Body	11

Appendices

Appendix A	Proposal Information
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1 Introduction

1.1 Background

- 1.1.1 Peter Brett Associates LLP (PBA) has been appointed by Reading Borough Council (RBC) Highways and Transport Department to produce a Water Framework Directive (WFD) Compliance Statement to support a planning application for the proposed East Reading Mass Rapid Transit (MRT) scheme.
- 1.1.2 The scheme consists of the construction of a segregated fast-track public transport, footway and cycleway, comprising concrete bridge structure with a river span of 59.5m and a land span of 316m, supported by concrete columns, steel beams and reinforced soil embankment, together with new footpath links and existing footpath alterations, replacement supermarket car parking provision, junction improvements and landscaping.
- 1.1.3 The East MRT is proposed to run adjacent to the proposed Thames Valley Park Park and Ride scheme (TVP P&R), providing a link to Napier Road, Reading town centre and the railway station. It will run to the south of the River Thames and crosses the River Kennet at Kennetmouth.
- 1.1.4 This WFD Compliance Statement will detail the potential impact that the scheme and associated works could have on the watercourse's ability to meet WFD requirements.
- 1.1.5 Relevant reports and drawings are summarised within the document and, where appropriate, included in the Appendices.

1.2 The Water Framework Directive

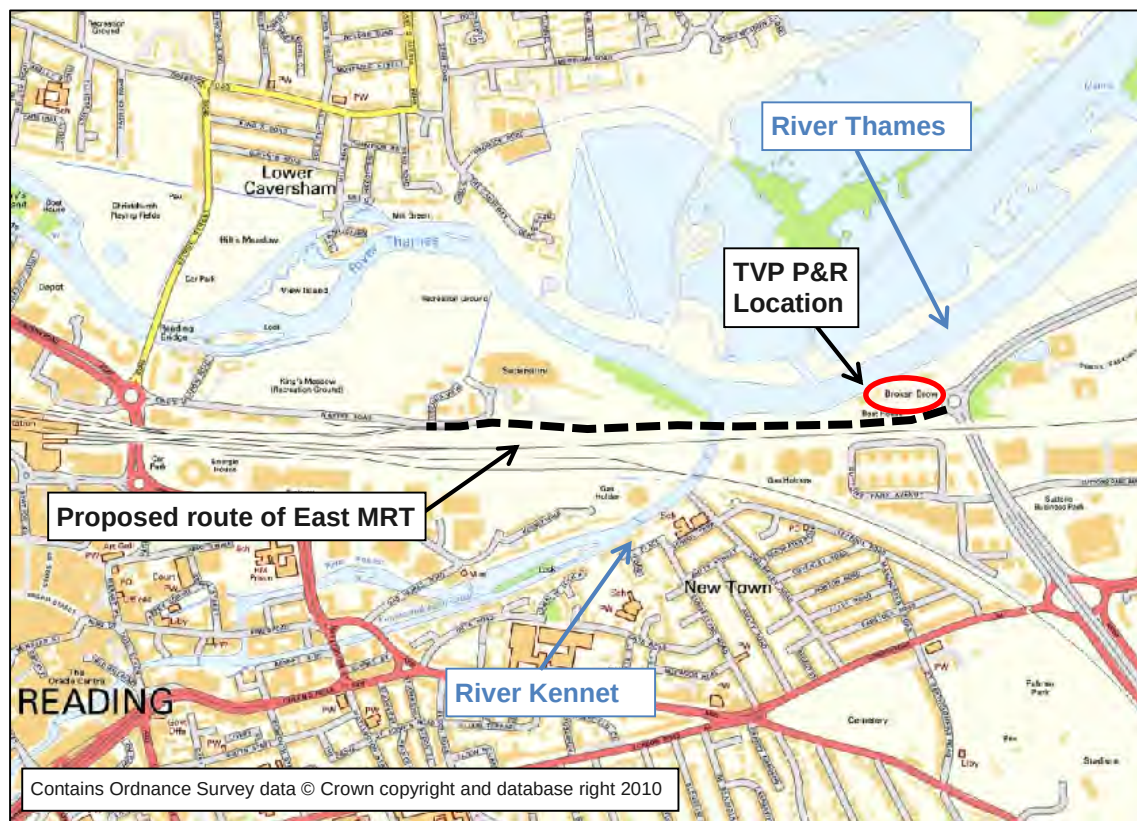
- 1.2.1 The WFD was transposed into law in England and Wales by the Water Environment Regulations 2003. These Regulations implement a holistic approach to the management, protection and monitoring of the water environment. The aim of the WFD is to prevent further deterioration in water resources (volume and quality); protect and enhance the status of aquatic ecosystems and associated wetlands; promote sustainable water consumption; and, contribute to mitigating the effects of floods and droughts.
- 1.2.2 The key objectives of the WFD are to prevent deterioration in the status of water bodies and aim to achieve good ecological and chemical status/potential (including quantitative status in groundwater bodies) by 2021. Water bodies must also comply with standards and objectives of Protected Areas (i.e. an area designated under another European Directive, such as a Special Area of Conservation or Special Protection Area), where these apply. In addition, discharges, emissions and losses of priority substances to surface water bodies must be progressively reduced and emissions of priority hazardous substances prevented. Finally, action must be taken to reverse any identified sustained upward trend in pollution concentrations in groundwater bodies.
- 1.2.3 The Thames River Basin Management Plan (RBMP, 2015) is the applicable management plan for the site and has been used to assess the impacts of the proposals.

2 Scheme Overview

2.1 Site Description and Location

- 2.1.1 The proposed East MRT runs from Napier Road along a route to the immediate south of the Tesco Extra superstore and carpark (parallel with the railway line to the south), crossing the River Kennet at Kennetmouth, and continuing west along a corridor between the River Thames and the railway line to run adjacent to the TVP P&R.
- 2.1.2 The proposed public transport route, cycleway and footway alignment provides a continuation of the existing Napier Road, and runs through land which is currently unused.
- 2.1.3 The proportion of the site west of the River Kennet lies within the administrative boundary of the Borough of Reading, whereas the land east of the River Kennet lies within Wokingham Borough.

Figure 2-1: Site Location



2.2 Geology and Groundwater

- 2.2.1 According to the British Geological Society 'Geology of Britain Viewer', the site is underlain by a bedrock of *Seafood Chalk Formation* and *Newhaven Chalk Formation*, and is overlain with superficial layers of *Alluvium – Clay, Silt, Sand and Gravel*.
- 2.2.2 Based on the Cranfield University online 'Soilscapes' website, the site lies within Soilscapes 20, '*loamy and clayey floodplain soils with naturally high groundwater*'.

2.3 Surface Water Features

- 2.3.1 For the purpose of this study, the area of interest includes the WFD water body which runs through the site, the downstream WFD water body, and the groundwater water body.
- 2.3.2 The site is located at the confluence of the River Kennet with the River Thames. At this point, three WFD designated water bodies are present, which are listed below.
- 2.3.3 The following surface water features, three of which are WFD designated water bodies, are present in the vicinity of the site:
- River Kennet – Kennet and Holy Brook WFD designated water body;
 - River Thames – Thames (Wallingford to Caversham) WFD designated water body;
 - River Thames – Thames (Reading to Cookham) WFD designated water body;
 - Caversham Lakes;
 - Sonning Eye gravel pit WFD designated lake; and
 - Berkshire Downs Chalk WFD designated groundwater body.

River Kennet

- 2.3.4 The River Kennet is a chalk stream and a major tributary of the River Thames. It rises in Marlborough and has its confluence with the River Thames at Reading. The Kennet has a catchment area of approximately 1,146km².
- 2.3.5 The River Kennet contains four WFD designated water bodies, from source to confluence. Of the four water bodies, the Kennet and Holy Brook, designated between Aldermaston (SU587641) and the River Thames confluence at Caversham (SU730738), is the most relevant for this scheme. The designated reach is approximately 29.8km long, and drains an area of 48.9km².
- 2.3.6 The site is located immediately west and east of Kennetmouth, the confluence of the River Kennet with the River Thames. At this point, three WFD designated river water bodies are present; one reach on the River Kennet, and two on the River Thames.

River Thames

- 2.3.7 The River Thames is the longest river in England, rising in Cirencester and flowing through London. It covers an area of approximately 9,938km² up to its tidal limit at Teddington.
- 2.3.8 The site is bounded to the north by the River Thames, which, at this location, is split into two WFD designated reaches. The western half of the site is situated within the Thames (Wallingford to Caversham) WFD designated water body, and the eastern half is situated within the downstream Thames (Reading to Cookham) WFD designated water body.
- 2.3.9 The Thames (Wallingford to Caversham) water body is designated between Shillingford (SU578932) and Caversham (SU730738), at the confluence of the River Thames and River Kennet. The designated reach is approximately 39.4km long, and drains an area of 186.5km².
- 2.3.10 The Thames (Reading to Cookham) water body is designated between Caversham (SU730738) and east of Cookham (SU908850). The designated reach is approximately 38.3km long, and drains an area of 238.6km².

Caversham Lakes

- 2.3.11 Caversham Lakes are located approximately 230m north of the site. The lakes are formed from former gravel pits, which have since been infilled. The lakes are currently used for a number of leisure activities, including rowing, sailing, water skiing, angling and boating. The Lakes are not WFD designated water bodies, however they are hydraulically connected to Sonning Eye gravel pit and the River Thames.

Sonning Eye Gravel Pit

- 2.3.12 Sonning Eye gravel pit is the eastern most section of the Caversham Lakes, and is located approximately 1.8km north east of the site (SU745753). It is a WFD designated water body with a surface area of 0.6km².

Berkshire Downs Chalk

- 2.3.13 The Berkshire Downs Chalk is the WFD designated groundwater body that underlies the site. It covers a large area of 990.3km², including the majority of the River Kennet catchment area, between Marlborough, Swindon, Hungerford and Reading.

2.4 Proposed Development

- 2.4.1 The proposed development is described as follows.

“Construction of a segregated fast-track public transport, pedestrian and cycle bridge and viaduct, comprising concrete bridge structure with a river span of 59.5m and a land span of 316m, supported by concrete columns, steel beams and reinforced soil embankment, together with new footpath links and existing footpath alterations, replacement supermarket car parking provision, junction improvements and landscaping.”

- 2.4.2 The proposed development comprises the following:

- creation of a new route for public transport only, including footway and cycleway between Napier Road and the A3290 at Thames Valley Park, running adjacent to proposed TVP P&R;
- the erection of a new bridge over the River Kennet;
- formation of a new T-junction with Napier Road;
- connection to the proposed TVP P&R;
- development of new and improved footpath links to Tesco and the towpath; and
- associated infrastructure and landscaping.

- 2.4.3 The route extends from the A3290 and A4 (Thames Valley Business Park) along the southern bank of the River Thames and north of the Great Western Railway Line. The route crosses the mouth of the River Kennet and then travels along Napier Road into to Central Reading.

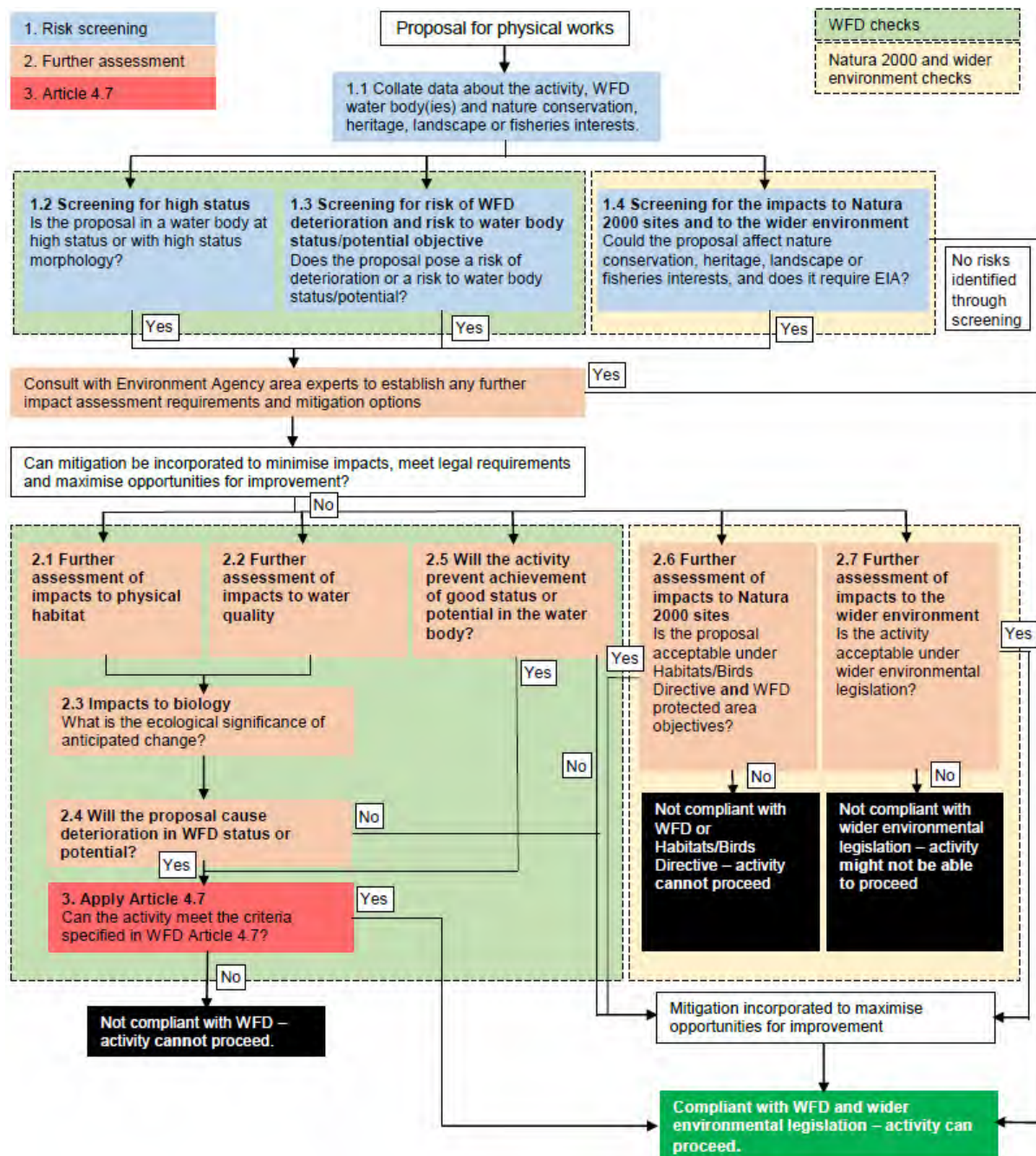
- 2.4.4 The proposed scheme comprises an approach public transport route, cycleway and footway off Napier Road, an approach embankment leading to the bridge with a 59m span. The section of carriageway to the west of the River Kennet will be constructed on a viaduct.

3 Screening Assessment

3.1 Methodology

3.1.1 The Environment Agency (EA) recommended methodology for WFD assessment, demonstrated in **Figure 3-1**, was followed and is detailed throughout **Section 3.3**.

Figure 3-1: EA WFD Methodology (2016) - sourced from EA Doc No 488_10¹

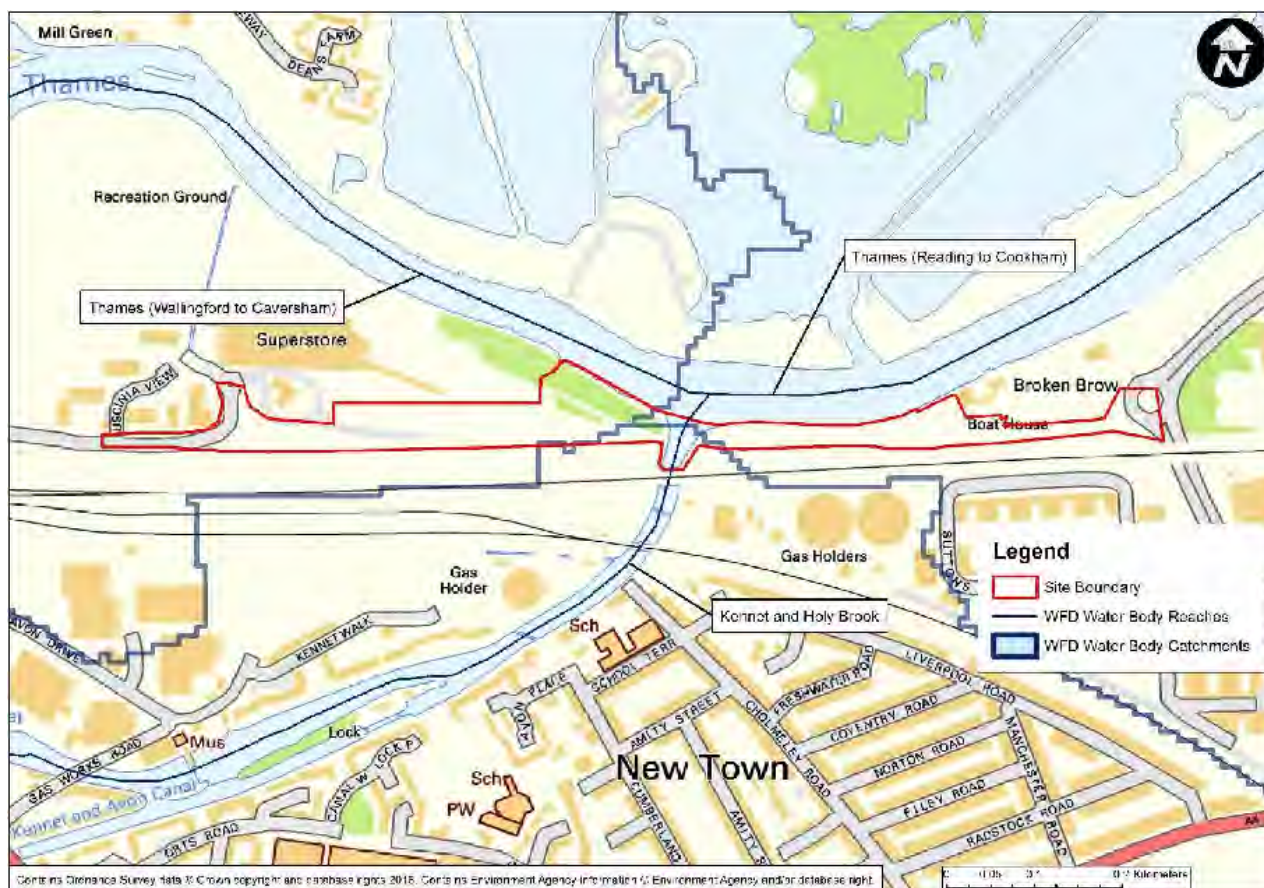


¹ Environment Agency, 2016, *Protecting and improving the water environment: Water Framework Directive compliance of physical works in rivers* (Doc No 488_10)

3.2 Waterbody Status and Catchment objectives

- 3.2.1 The Thames RBMP, December 2015, identifies that the site lies within two management catchments, specifically the Thames and South Chilterns, and the Kennet and Tributaries. The proposed development is located within the Thames (Wallingford to Caversham), Kennet and Holy Brook, and Thames (Reading to Cookham) WFD designated water bodies as indicated in **Figure 3-2**.

Figure 3-2: Site Location in Comparison to WFD Water Bodies



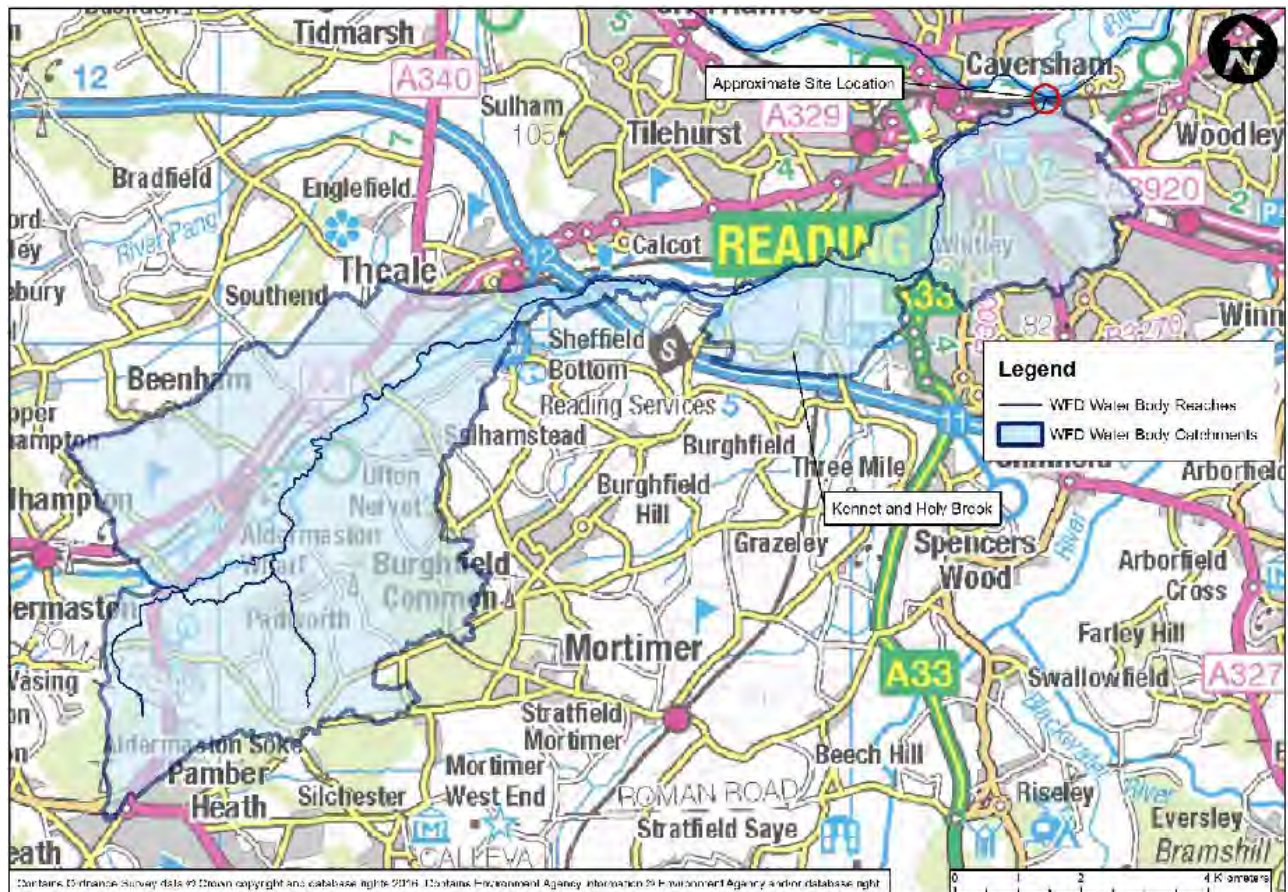
- 3.2.2 Since 2009 the EA has completed annual assessments of the water body with the view of updating the RBMP. The Cycle 2 data, accessed via the EA's Catchment Data Explorer (<http://environment.data.gov.uk/catchment-planning/>), therefore provides the best available information, which was used to inform this assessment.

WFD Water Body and Classifications: Kennet and Holy Brook

- 3.2.3 The Kennet and Holy Brook WFD water body (GB106039023140), located between Aldermaston and Caversham (see **Figure 3-3**), is a designated Heavily Modified Water Body (HMWB), which is currently (Cycle 2) classified as at overall moderate potential, driven by an ecological classification of moderate potential.
- 3.2.4 Ecologically, the failure is driven by a moderate potential for fish, and a moderate or less potential for mitigation measures assessment. The 'mitigation measures assessment' element demonstrates whether appropriate measures are in place in order to mitigate the impacts of any modification on ecology of the water body. A classification of moderate or less implies that there are not appropriate mitigation measures in place.

- 3.2.5 According to the EA Reasons for Not Achieving Good status (RNAG) data of December 2015, the failure of the sub-elements fish and mitigation measures assessment are due to a number of reasons. These reasons fall under the National Significant Water Management Issue (SWMI) category of physical modification, including barriers to fish migration, land drainage, and recreation.
- 3.2.6 The chemical status of the water body was classified as at good status for Cycle 2. The water body is not currently meeting its WFD objective of achieving good potential by 2027.

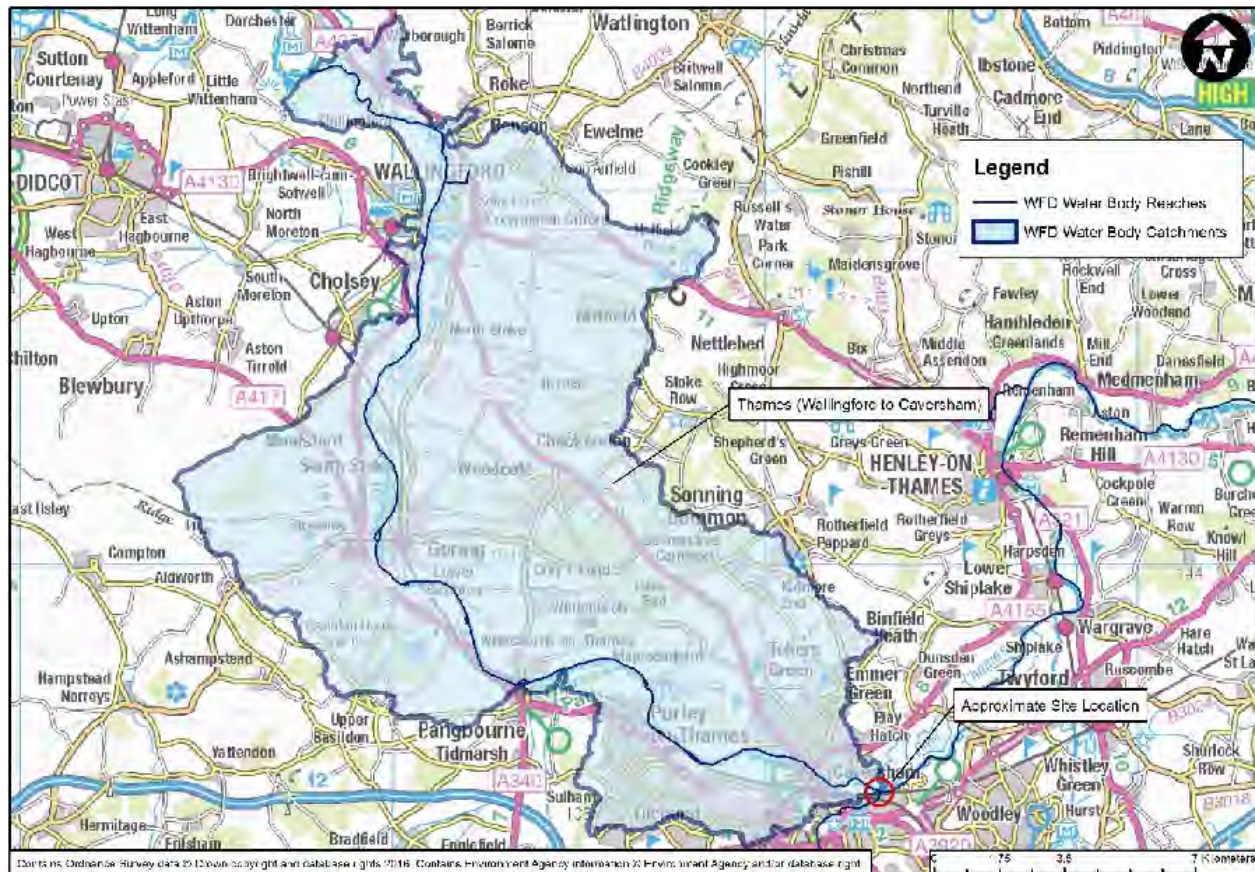
Figure 3-3: Location of Kennet and Holy Brook WFD Water Body



WFD Water Body and Classifications: Thames (Wallingford to Caversham)

- 3.2.7 The Thames (Wallingford to Caversham) WFD water body (GB106039030331), located between Shillingford and Caversham (see **Figure 3-4**), is a designated HMWB, which is currently (Cycle 2) classified as at overall moderate potential, driven by an ecological classification of moderate potential.
- 3.2.8 Ecologically, the failure is driven by a number of elements. Invertebrates, phosphate and triclosan have all be assessed as at moderate potential, and mitigation measures assessment has been assessed as at moderate or less potential.
- 3.2.9 According to the EA Reasons for Not Achieving Good status (RNAG) data of December 2015, the failure of the sub-elements phosphates and triclosan is due to a number of reasons. These reasons fall under the National Significant Water Management Issue (SWMI) category of pollution, including rural areas and waste water. The pollution is caused by a combination of sewage discharge (continuous diffuse and point), and agriculture and land management.

- Figure 3-4: Location of Thames (Wallingford to Caversham)**



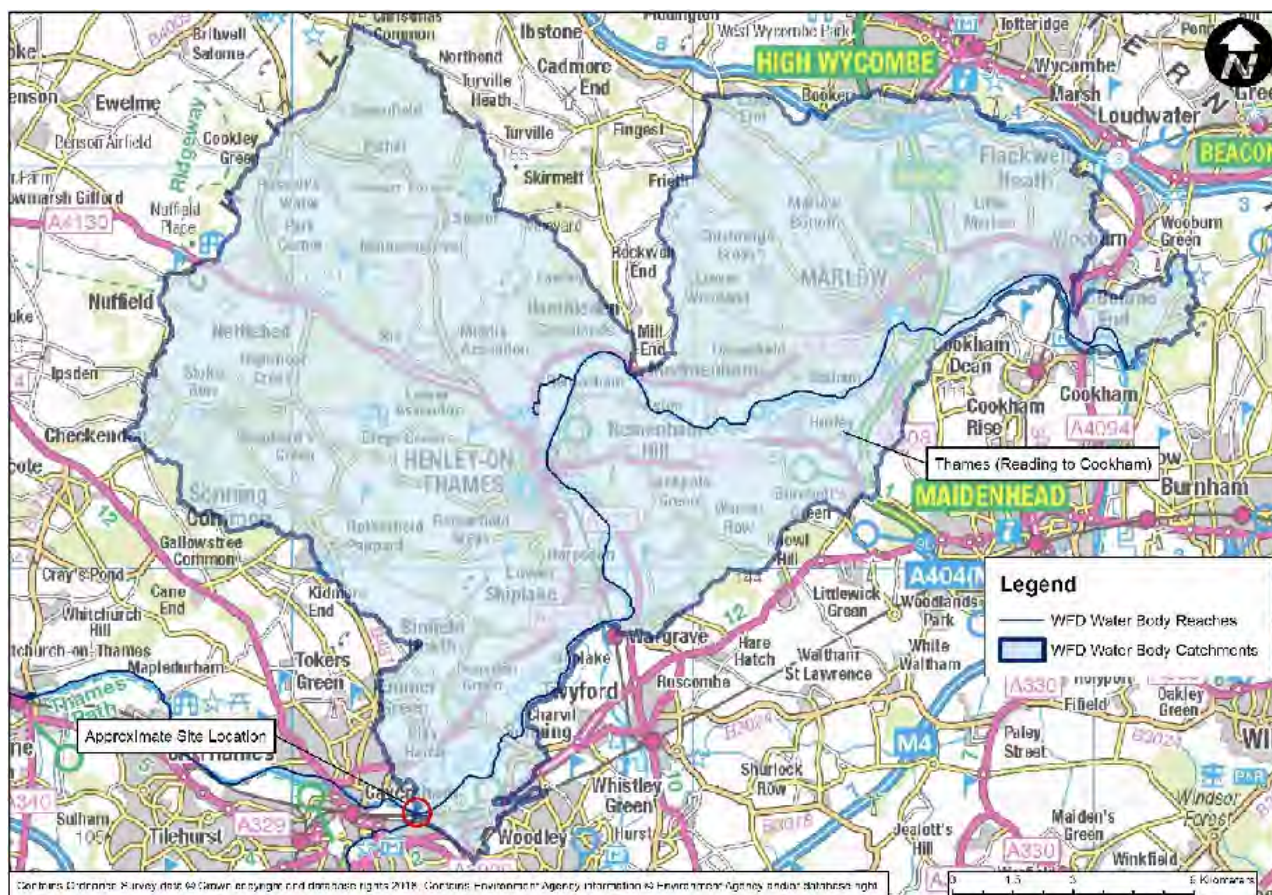
3.2.11 The Thames (Reading to Cookham) WFD water body (GB106039023233), located between Caversham and east of Cookham, (see **Figure 3-5**), is a designated HMWB, which is currently (Cycle 2) classified as at overall moderate potential, driven by an ecological classification of moderate potential.

3.2.12 Ecologically, the failure is driven by the moderate potential of phosphate, and the moderate or less potential of mitigation measures assessment.

3.2.13 According to the EA Reasons for Not Achieving Good status (RNAG) data of December 2015, the failure of the sub-elements phosphate and mitigation measures assessment are due to a number of reasons. These reasons fall under the National Significant Water Management Issue (SWMI) category of physical modification and pollution (waste water). The mitigation measures assessment was confirmed to have failed as a result of the pressures caused by navigation (including ports), and recreation. Failure of phosphate is suspected to be caused by point sources resultant from continuous sewage discharge.

3.2.14 The chemical status of the water body was classified as at good status for Cycle 2. The water body has therefore met its WFD objective of moderate potential by 2015.

Figure 3-5: Location of Thames (Reading to Cookham) WFD Water Body



WFD Water Body and Classifications: Sonning Eye Gravel Pits

- 3.2.15 The Sonning Eye gravel pits WFD water body (GB30642393), located west of Sonning (see **Figure 3-6**), is an artificial lake which is currently (Cycle 2) classified as at overall good potential. The water body has retained this good potential from Cycle 1.
- 3.2.16 All ecological elements and sub-elements are classified as at good or high potential, with the exception of supporting elements (surface water), specifically expert judgement, an element used when there is limited or no monitoring data available. This is classified as at moderate potential, with the objective of achieving good potential by 2015.
- 3.2.17 In this instance, the failure of the element 'expert judgement' did not cause the overall failure of the water body due to the observed data, use of statistical analysis, and evidence of good potential collated for Cycle 1 (2009). This provided a stronger evidence base for assigning the Cycle 2 overall potential than expert judgement. The expert judgement sub-element therefore provides an indication of the potential of the water body in Cycle 2, however, further evidence and observed data are required to alter the overall potential of the water body in Cycle 3.
- 3.2.18 The chemical status of the water body was classified as at good status for Cycle 2. The water body has therefore met its WFD objective of moderate potential by 2015.

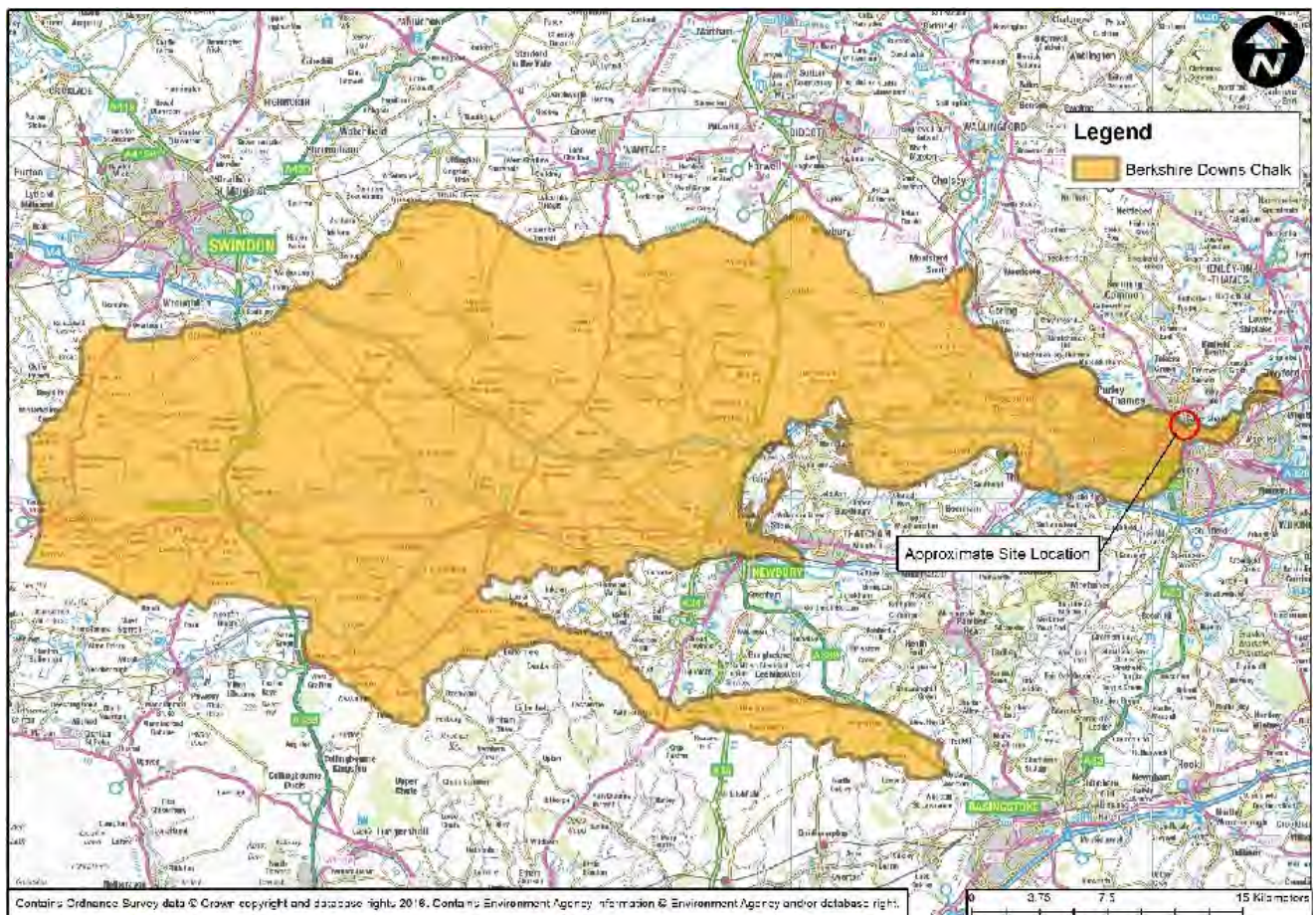
Figure 3-6: Location of Sonning Eye Gravel Pit WFD Water Body



WFD Groundwater Body and Classifications: Berkshire Downs Chalk

- 3.2.19 The Berkshire Downs Chalk WFD groundwater body (GB40601G600900), located between Marlborough and Reading (see **Figure 3-7**) is currently (Cycle 2) classified as at overall poor status.
- 3.2.20 The failure is driven by a number of failing elements, including quantitative dependent surface water body status, quantitative water balance, chemical drinking water protected area, and general chemical test.
- 3.2.21 According to the EA Reasons for Not Achieving Good status (RNAG) data of December 2015, the failure of the chemical drinking water protected area has the probable cause of pollution from rural areas, specifically mixed agriculture.
- 3.2.22 Although the groundwater body is currently failing, it has therefore met its WFD objective of overall poor status by 2015.

Figure 3-7: Location of Berkshire Downs Chalk WFD Groundwater Body



Thames Basin RBMP Objectives

3.2.23 The 2015 RBMP identifies a number of contributions made to achieve measures and identify future aims for the Kennet and tributaries management catchment, and the Thames and South Chilterns management catchment.

Kennet and Tributaries:

- Implementing habitat restoration and fish passage improvement schemes in the Middle Kennet and Lambourn to improve fish populations and improve hydromorphology by reducing the impact of impoundments;
- Reducing nitrate and phosphate pollution in the Middle Kennet and tributaries;
- Improve understanding of the relationship between water quality and algal growth, and implement a scheme to reduce the problems of algae and its impacts on plants;
- Improve the water quality of the Kennet and Avon Canal; and
- Improve treated waste water from small point source inputs.

Thames and South Chilterns:

- Habitat improvement projects creating a significant number and range of new habitats for fish and invertebrates;

- Reducing impacts of point source and diffuse source pollution;
- Increasing the amount of wetland areas across the Thames catchment; and
- Removal of fish barriers along the Thames river corridor.

3.2.24 It notes that the three main issues within the Kennet and tributaries management catchment are the interrelated impacts of nutrients, sediments and algal growth; channel modification and degradation of habitats; and pressures from abstraction within the catchment.

3.2.25 Within the Thames and South Chilterns management catchment, the three main issues are diffuse pollution from both rural and urban sources, point source pollution and habitat degradation.

3.3 Step 1: Screening Proposed Works

1.2 Screening for High Status

3.3.1 The proposed works are to be completed within the area designated as a combination of the Kennet and Holy Brook, Thames (Wallingford to Caversham), and the Thames (Reading to Cookham) WFD water bodies. The groundwater body, Berkshire Downs Chalk, which underlies the site is currently at poor overall status.

3.3.2 These water bodies are currently at overall moderate potential, meaning the works will not pose a risk to an existing high status or potential, and is therefore compliant with risk assessment step 1.2 of the EA's process for ensuring physical works to water bodies meet legal requirements under WFD and under wider environmental legislation.

1.3 Screening for Risk of WFD Deterioration and Risk to Water Body Status/Potential Objective

3.3.3 The proposed works include:

- Vegetation clearance;
- Construction of a public transport route, cycleway and footway; and
- Construction of compensatory flood storage areas.

3.3.4 The proposed development does not fall into the low risk activity register category 'Bridges and Crossings', as detailed by Table 1 of EA Doc No 488_10¹, due to the proposed works on the banks.

3.3.5 The proposed development was therefore screened against Table 2 of EA Doc No 488_10¹ to determine the risk category. Table 2 determined the works to be within risk category 1, the lowest risk category. The traffic light assigned to the works, at present, is amber, as a Flood Risk Activity Permit has not yet been submitted or approved. The risks of local and cumulative impacts will therefore need to be assessed for all relevant WFD water bodies within the vicinity of the site.

3.3.6 The site is currently vacant, disused and largely covered by dense vegetation including mature and semi-mature trees and shrub, and therefore the disruption of the land through works to clear vegetation and construct flood storage areas may result in the disturbance of pollutants or contaminants. The land use of the site will be altered, which could introduce additional pollutants from urban sources.

3.3.7 The proposed works do not include works to the channel, and therefore the hydromorphology of the river will not be impacted, is not necessary to assess.

3.3.8 The failing elements will also be assessed to determine potential impacts of the proposed works upon the water body's ability to reach WFD objectives, or their potential to cause further deterioration, outlining appropriate mitigation measures where necessary. The below WFD components and elements have therefore been screened in for assessment and discussed in **Section 4:**

- Biological quality elements
 - Fish
 - Invertebrates
- Physico-chemical quality elements
 - Phosphate
- Chemical elements

1.4 Screening for Impacts to Natura 2000 Sites and to the Wider Environment

3.3.9 An assessment of existing Natura 2000 sites was completed. It was found that there are no existing Natura 2000 sites within a 1km buffer of the site.

3.3.10 National and international designations, including Ramsar sites, Special Areas of Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI), and Biodiversity Action Plan (BAP) Habitats, were also assessed to determine whether wider environmental impacts would occur on significant locations. There are no nationally or internationally designated sites within a 1km buffer of the site.

3.3.11 The lack of designated sites within the vicinity of the site suggests that works will not impact upon Natura 2000 sites, nationally or internationally designated sites. The proposed works are therefore compliant with step 1.4 of the EA's process for ensuring physical works to water bodies are compliant with legal requirements under wider environmental legislation.

4 Step 2: Assessment of Potential Impacts

4.1 WFD Surface Water Bodies - Rivers

- 4.1.1 The site is located at the downstream extents of the Thames (Wallingford to Caversham) and Kennet and Holy Brook WFD water bodies, and the upstream extent of the Thames (Reading to Cookham) water body, and covers an area equivalent to 0.01% of the combined total catchment area. Any impacts that may occur will be negligible, due to the small size of the site, the nature of the proposed works and the proposed land use of the site. The scheme will therefore have negligible impacts upon the Caversham Lakes due to their small scale and localised nature. Caversham Lakes will therefore remain in a condition comparable to existing and therefore further assessment is not required.

Biological Quality Elements

- 4.1.2 Within the Kennet and Holy Brook WFD water body the biological quality element 'fish' is the only failing element. The reasons for not achieving good potential have been stated within **Section 3.1** as barriers to fish migration and land drainage, categorised as agriculture and rural land management. These are suspected reasons for failure, and are therefore not confirmed.
- 4.1.3 The proposed development is not designed to alter the barriers currently in existence within the River Kennet.
- 4.1.4 Within the Thames (Wallingford to Caversham) WFD water body the biological quality element 'invertebrates' is the only failing element. The reasons for not achieving good potential have not been stated within the EA's Catchment Data Explorer, or the EA RNAG data of December 2015, however, a significant improvement from bad potential to moderate potential between Cycle 1 and Cycle 2 has been recorded.
- 4.1.5 Invertebrates are particularly sensitive to organic pollutants, and WFD water bodies are therefore assessed in relation to these. The largest source of organic pollution is sewage effluent, but can also originate from urban runoff, industrial effluents and farm waste. The proposed works is not expected to increase the volume of inorganic pollutants being discharged from these sources into this water body, the Kennet and Holy Brook water body, or the Thames (Reading to Cookham) water body.
- 4.1.6 The proposed works will marginally alter the drainage within the site however, the alteration is minor. It is therefore not expected to compound the current impact on fish due to land drainage from agricultural and rural land management within the WFD water body catchment area.
- 4.1.7 The proposed development will marginally increase the volume of urban runoff in the area and therefore may result in the water body receiving an increased volume. The implementation of an efficient surface water management plan, however, specifically a SuDS treatment train, is designed to mitigate against this and prevent against possible deterioration of WFD potential.
- 4.1.8 Within the Thames (Reading to Cookham) WFD water body there are no failing biological quality elements, and the water body is classified as at high potential for this element, particularly with regards to invertebrates. The EA's Catchment Data Explorer shows an improvement from good potential to high potential of invertebrates and the overall biological quality element between Cycle 1 and Cycle 2. It is currently exceeding the WFD objective for this element (good by 2015).
- 4.1.9 The proposed development is not expected to introduce significant sources of pollution, specifically organic pollution, which could compromise the current potential of the sub-element 'invertebrates'. It is also not anticipated that barriers will be introduced to the River Thames, therefore preventing against compromising the current potential of the sub-element 'fish'.

- 4.1.10 The proposed development incorporates sufficient mitigation measures to prevent against causing deterioration of the current potential of the biological quality element 'fish', and compromising their ability to achieve good potential in the future, and is therefore considered compliant with WFD with regards to biological quality elements.

Physico-Chemical Quality Elements

- 4.1.11 Within the Kennet and Holy Brook WFD water body there are no failing physico-chemical quality elements, and the water body is classified as at good potential, meeting the WFD objectives for this element (good by 2015).
- 4.1.12 The proposed development does not include works to the watercourse, and the changes in land use, from disused land to public transport route, cycleway and footway, is not expected to cause deterioration to the sub-elements.
- 4.1.13 Within the Thames (Wallingford to Caversham) and Thames (Reading to Cookham) WFD water bodies the physico-chemical element 'phosphate' is the only failing element. The EA RNAG December 2015 data states the probable cause of failure is a combination of point source pollution from sewage discharge, and diffuse source pollution from rural areas, specifically mixed agricultural sources, for Thames (Wallingford to Caversham), and suspected point source pollution from continuous sewage discharge for Thames (Reading to Cookham).
- 4.1.14 The proposed development does not increase existing pressure on sewage treatment works (STW) and therefore is not expected to increase sources of phosphate pollution within the water bodies from this pressure.
- 4.1.15 The proposed development does not increase the rural area over which the water body drains, and therefore is not expected to increase sources of phosphate pollution within the water bodies from this pressure.
- 4.1.16 The proposed development is therefore not expected to cause deterioration of the current potential of the physico-chemical quality element 'phosphates', nor compromise their ability to achieve good potential in the future, and is therefore considered compliant with WFD with regards to biological quality elements.

Chemical Elements

- 4.1.17 The Kennet and Holy Brook, Thames (Wallingford to Caversham), and Thames (Reading to Cookham) WFD designated water bodies are all currently classified as at good chemical status, with all assessed chemical sub-elements achieving good status, remaining consistent with the good chemical status achieved in 2009 (Cycle 1). The water bodies have therefore met their WFD objectives of good by 2015.
- 4.1.18 The proposed change in land use from disused land to public transport route, cycleway and footway use will result in additional pollutants associated with road-runoff, particularly silts and hydrocarbons, being present on site and potentially entering the watercourse.
- 4.1.19 The development proposal incorporates the SuDS 'treatment train' principles, whereby surface water runoff is allowed to pass through several different SuDS before reaching the receiving watercourse or water bodies. This will effectively control and manage the potential additional pollutants which may be present as a result of the scheme, and are designed to prevent the pollutants from entering the WFD designated water bodies. The details of this treatment train will be finalised at the detailed design stage.
- 4.1.20 The proposed development therefore incorporates sufficient mitigation measures to prevent against causing deterioration of the current chemical status of the Kennet and Holy Brook, Thames (Wallingford to Caversham), and Thames (Reading to Cookham) WFD designated

water bodies, prevents against compromising the water bodies' ability to maintain good status in the future, and is therefore considered compliant with WFD with regards to chemical elements.

4.2 WFD Surface Water Body – Lake

- 4.2.1 The Sonning Eye gravel pit WFD designated water body is located approximately 1.8km north east of the site, approximately 1.1km west of Sonning. The proposed development and associated works will not have far reaching impacts due to the localised nature of the works, and the efficient surface water management strategy, including SuDS treatment train, being in place to mitigate against any potential changes as a result of the proposed land use of the development.
- 4.2.2 Sonning Eye gravel pit is located downstream of Caversham Lakes and will therefore receive water from the lakes and the upstream WFD designated water bodies Kennet and Holy Brook, Thames (Wallingford to Caversham), and Thames (Reading to Cookham). As stated above in **Section 4.1**, the impact of the scheme on these water bodies is negligible, and therefore the change in volume and quality of water that the Sonning Eye gravel pit will receive in normal conditions will be negligible.
- 4.2.3 The proposed development will therefore have a negligible impact on the WFD potential of the designed Sonning Eye gravel pit, is not expected to cause deterioration of WFD potential or prevent against maintaining good potential in the future, and is therefore considered compliant with WFD.

4.3 WFD Groundwater Water Body

- 4.3.1 The site is underlain by the Berkshire Downs Chalk WFD designated groundwater body. The proposed development and associated works involve the installation of piled foundations. These foundations could provide a pathway through overlying Alluvium for migration of potential contaminants from the Made Ground to the Aquifer at depth. This has been identified at an early stage, and therefore appropriate mitigation has been embedded to the proposed works.
- 4.3.2 To minimise or prevent the potential for groundwater contamination, any piles installed as part of the scheme will be designed and installed in accordance with the Environment Agency guidance for piling in potentially contaminated sites (EA, 2001² and 2002³). These mitigation measures will serve to prevent against potentially impacting upon the Berkshire Downs Chalk WFD designated groundwater body.
- 4.3.3 The proposed development therefore includes sufficient mitigation measures to prevent against causing deterioration of the current status and compromising the groundwater body's ability to achieve good status in the future, and is therefore considered compliant with WFD with regards to the quantitative and chemical elements.

Delivery of GES/P Improvement Measures

4.4 Construction Phase

- 4.4.1 Construction activities will include the clearance of vegetation, topsoil stripping and stockpiling, establishment of compound areas, excavation and site levelling/re-profiling to create

² Environment Agency, 2001, Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention. National Groundwater & Contaminated Land Centre report: NC/99/73. Environment Agency, Solihull, West Midlands.

³ Environment Agency, 2002, Piling into Contaminated Sites, Environment Agency, Bristol.

development platforms, preparation of public transport route, cycleway and footway, and construction of foundations.

- 4.4.2 Construction activities also have the potential to give rise to the contamination of surface water and groundwater resulting from spilled hydrocarbons/petrochemicals from construction plants and the mobilisation of silts and contaminants during soil stripping and earthworks operations, potentially leading to increased silt loading in watercourses.
- 4.4.3 Increased silt and mobilised soil matter within the River Kennet and River Thames watercourses could potentially impact the WFD designations.
- 4.4.4 In order to prevent against introducing increased silt and soil matter to the watercourses, best practice construction techniques will be used, and a Code of Construction Practice (CoCP) or Construction Environmental Management Plan (CEMP) are expected to be implemented to control and mitigate impacts upon WFD designated water bodies.
- 4.4.5 It has been identified that the proposed development and associated works will involve the installation of piled foundations. During construction, there is potential to introduce pollutants to the underlying groundwater if installed incorrectly and without appropriate mitigation measures in place.
- 4.4.6 As detailed in **Section 4.3** above, any piles installation will be completed in accordance with the relevant EA guidance^{2,3} for piling in potentially contaminated sites. These mitigation measures will serve to prevent against potentially impacting upon the Berkshire Downs Chalk WFD designated groundwater body.
- 4.4.7 The impacts of the construction can therefore be mitigated against through the use of best practice techniques, a robust CoCP/CEMP, and following relevant EA guidance for the works. Any residual impacts are expected to be short term and temporary in nature, limited to the construction phase, and are not anticipated to have any lasting impacts upon the surface water or groundwater WFD designated water bodies.

4.5 Cumulative Effects Assessment

- 4.5.1 **Sections 4.1, 4.2, 4.3 and 4.4** demonstrate that the scheme does not compromise the ability of the surface water or groundwater WFD designated water bodies to achieve WFD objectives or RBMP objectives, and are therefore compliant with WFD. Whilst the scheme has been assessed in isolation, the combined impact of the scheme and other nearby proposed developments must be assessed.
- 4.5.2 The recently approved TVP P&R, located approximately 500m east of the confluence of the River Kennet with the River Thames, will be utilised in conjunction with the proposed public transport route, cycleway and footway. The impacts of the East Reading MRT scheme in combination with the TVP P&R facility will therefore be assessed.
- 4.5.3 The East Reading MRT scheme will provide an additional route for the TVP P&R, increasing the connectivity of the facilities with a wider area of Reading and introduces a public transport connection where one does not currently exist. The post-completion impacts associated with the two schemes will therefore be due to increased urban runoff through reducing green space in the area, and subsequent pollution associated with these urban areas, including car parking and public transport routes (fuel spillages etc.). Without mitigation measures in place, there could be an increase in hydrocarbons associated with vehicle fuel entering the WFD designated water bodies.
- 4.5.4 The TVP P&R scheme was submitted to Wokingham Borough Council in June 2016 and approved in November 2016 (application number 161596 'Land to the West of Thames Valley Park Drive RG6 1PT'). Within the FRA submitted as part of the application, water quality

management was considered. Permeable paving was identified as the surface material for the parking areas, which provided sufficient mitigation against on-site pollution as part of the scheme, which was in line with recommendations within the SuDS Manual. For areas that were not to be served by permeable paving, it was recommended that proprietary treatment systems, such as oil interceptors and silt traps, were used to protect potential receptors of on-site discharge.

- 4.5.5 The TVP P&R scheme therefore provided sufficient mitigation measures to prevent against negatively impacting upon the potential of the receiving WFD designated water body.
- 4.5.6 Within this East Reading MRT scheme, in accordance with SuDS principles, a treatment train, including oil interceptors, will be implemented to prevent against negative impacts on WFD designated water bodies in the vicinity of the site, specifically in relation to the increase in urban area and therefore urban runoff.
- 4.5.7 The cumulative impacts of the two schemes are therefore efficiently managed within the two schemes. It is therefore not anticipated that the combined schemes compromise the ability of the surface water or groundwater WFD designated water bodies to achieve WFD objectives or RBMP objectives, and are therefore considered compliant with WFD

4.6 Assessment of Compliance with the WFD Objectives

- 4.6.1 The above summarises the proposal and the associated mitigation measures, both embedded and additional, which have been included within the scheme. This has allowed the assessment of whether the scheme is compliant with the WFD, and contributes to the delivery of the WFD objectives.
- 4.6.2 The above details demonstrate that the proposed works are not expected to have a detrimental impact on the objectives of the WFD, and are therefore considered compliant with the WFD.

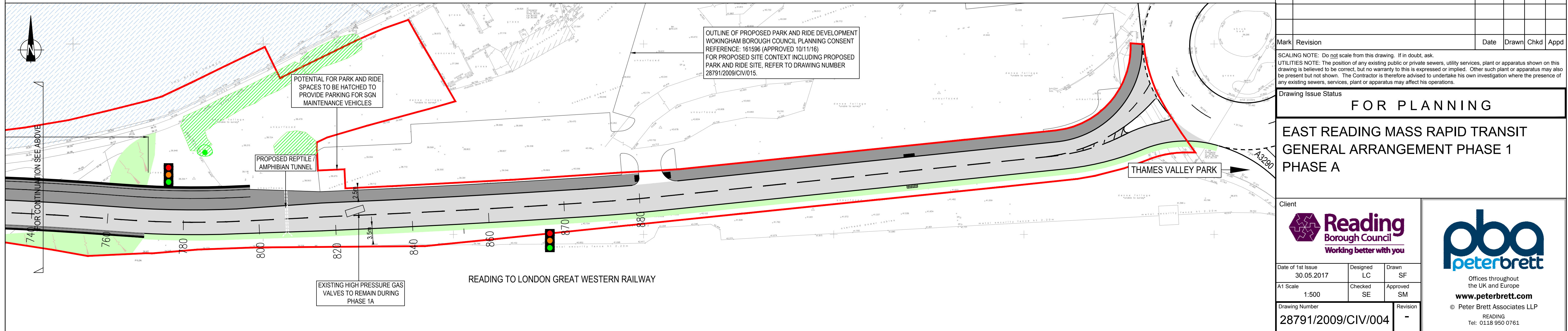
5 Summary and Conclusions

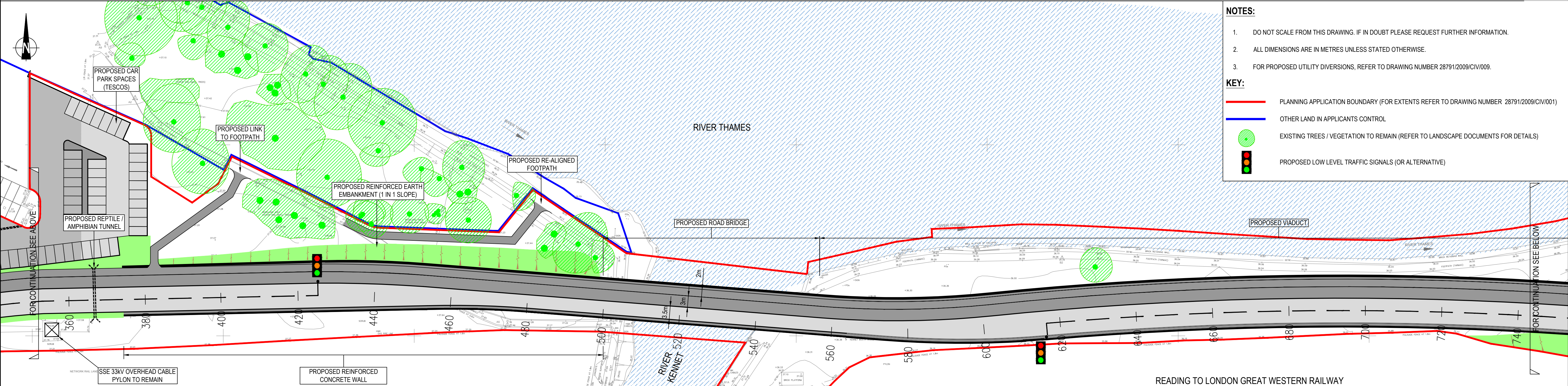
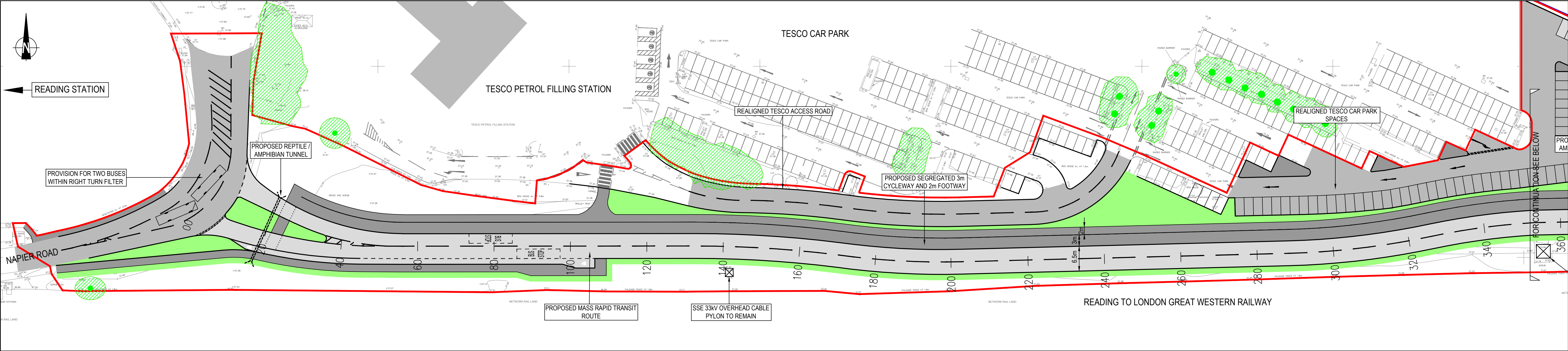
- 5.1.1 This Water Framework Directive (WFD) Compliance Statement has been prepared by Peter Brett Associates LLP (PBA) to support a planning application for the proposed East Reading Mass Rapid Transit (MRT) scheme.
- 5.1.2 The works to be completed within the vicinity of the WFD water bodies within the site, specifically the Kennet and Holy Brook, Thames (Wallingford to Caversham), and Thames (Reading to Cookham), which could potentially impact the Berkshire Downs Chalk groundwater body, have been assessed within this WFD Compliance Statement.
- 5.1.3 It has demonstrated that the proposed construction of a public transport route, cycleway and footway, connecting the area on the left bank of the River Kennet with that on the right bank at Thames Valley Park, will not have significant long term impacts on the water quality within any of the aforementioned WFD water bodies.
- 5.1.4 The proposals do not result in a significant change away from baseline conditions, and, as demonstrated, are not expected to result in deterioration of the current overall moderate WFD potential of the three river water body reaches, the overall good potential of the Sonning Eye gravel pit water body, or the overall poor status of the Berkshire Downs Chalk WFD groundwater body.
- 5.1.5 The temporary impacts during the construction phase will be minimised through the adoption and best practice techniques and the implementation of a robust Code of Construction Practice (CoCP) and/or Construction Environmental Management Plan (CEMP). The Environment Agency guidance for piling in potentially contaminated land will be adhered to in order to prevent against contamination of groundwater.
- 5.1.6 The works are not anticipated to affect the ability for the key actions identified in the River Basin Management Plan to be implemented for the catchment.
- 5.1.7 As such, the works are compliant with the WFD and, in combination with the appropriate mitigation measures, are not expected to prevent the water bodies from achieving good ecological potential in the future.

Appendix A Proposal Information

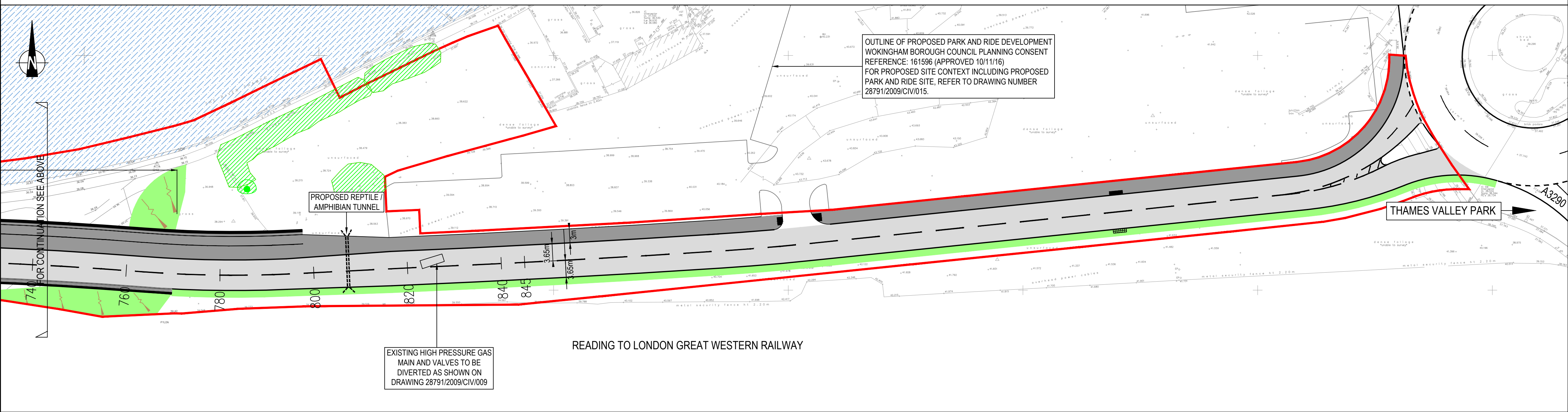
Proposal drawings for East Reading Mass Rapid Transit, completed by PBA, dated May - June 2017

- 28791/2009/CIV/004 - General Arrangement Phase 1 Phase A
- 28791/2009/CIV/005 - General Arrangement Phase 1 Phase B – BSGN Valve Diversion Undertaken
- 28791/2009/CIV/008 - Proposed Surface Water Drainage Strategy





- NOTES:**
- DO NOT SCALE FROM THIS DRAWING. IF IN DOUBT PLEASE REQUEST FURTHER INFORMATION.
 - ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
 - FOR PROPOSED UTILITY DIVERSIONS, REFER TO DRAWING NUMBER 28791/2009/CIV/009.
- KEY:**
- PLANNING APPLICATION BOUNDARY (FOR EXTENTS REFER TO DRAWING NUMBER 28791/2009/CIV/001)
 - OTHER LAND IN APPLICANTS CONTROL
 - EXISTING TREES / VEGETATION TO REMAIN (REFER TO LANDSCAPE DOCUMENTS FOR DETAILS)
 - PROPOSED LOW LEVEL TRAFFIC SIGNALS (OR ALTERNATIVE)



OUTLINE OF PROPOSED PARK AND RIDE DEVELOPMENT
WOKINGHAM BOROUGH COUNCIL PLANNING CONSENT
REFERENCE: 161596 (APPROVED 10/11/16)
FOR PROPOSED SITE CONTEXT INCLUDING PROPOSED
PARK AND RIDE SITE, REFER TO DRAWING NUMBER
28791/2009/CIV/015.

Mark	Revision	Date	Drawn	Chkd	Appd

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

Drawing Issue Status

FOR PLANNING

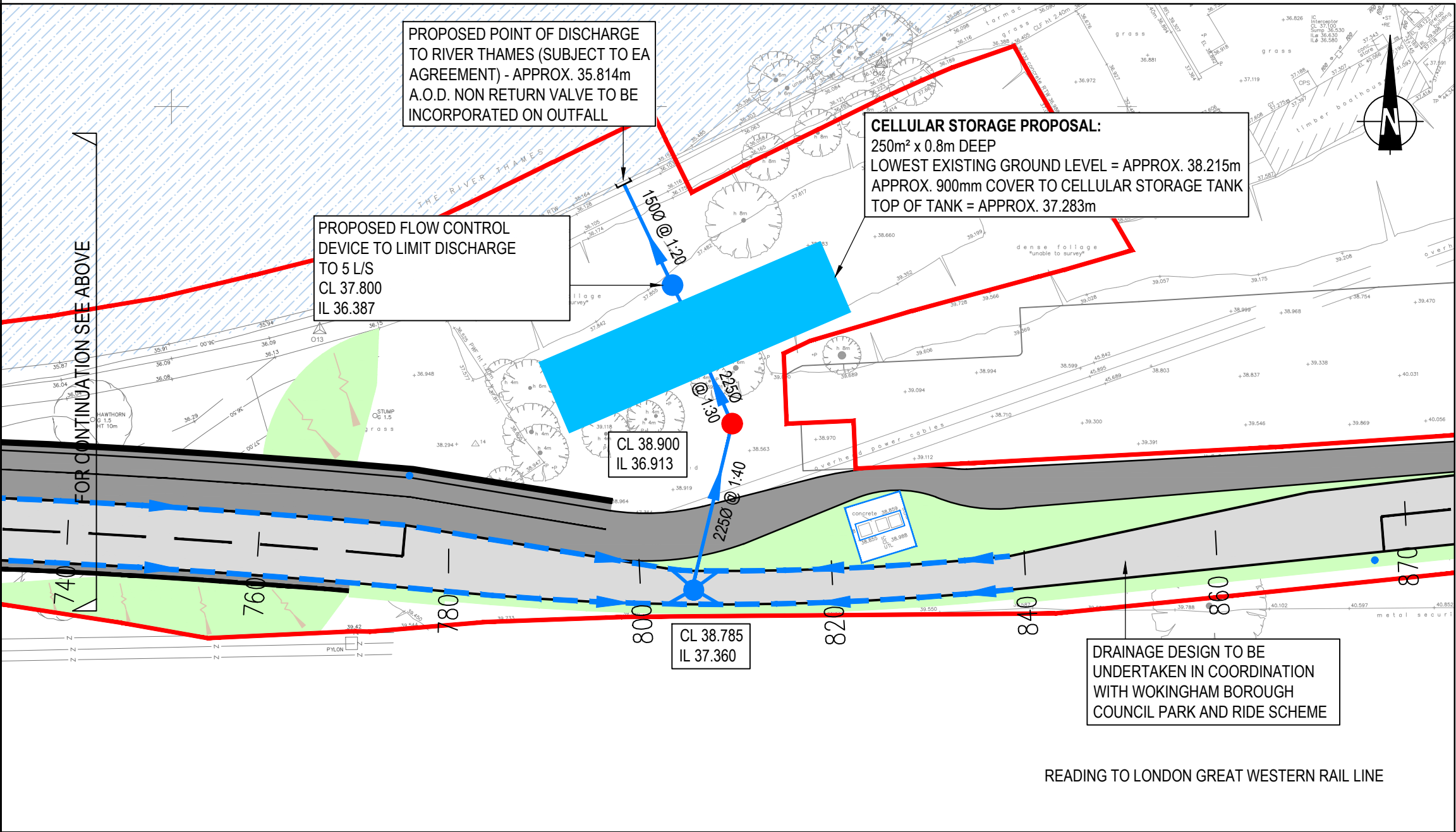
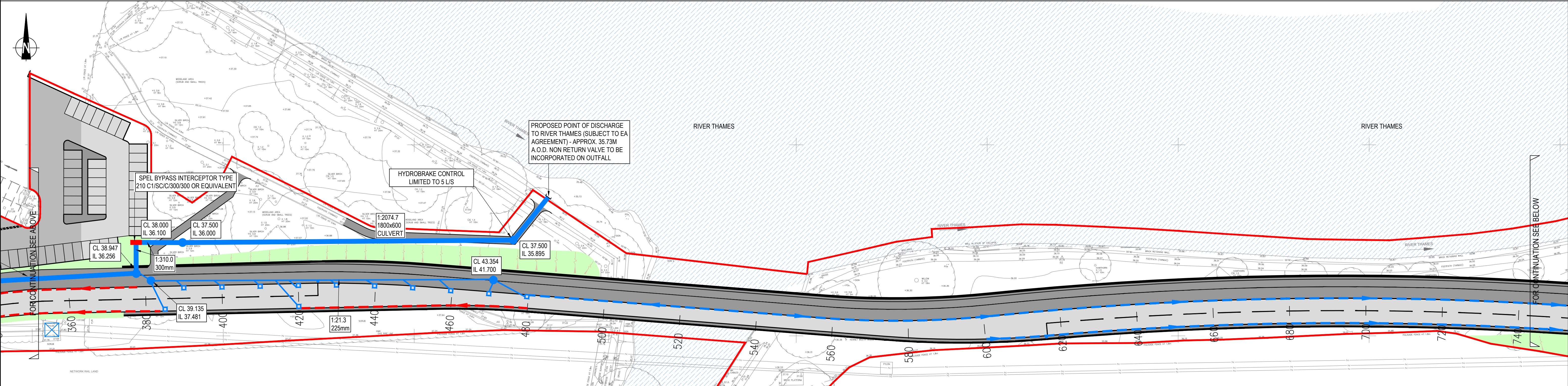
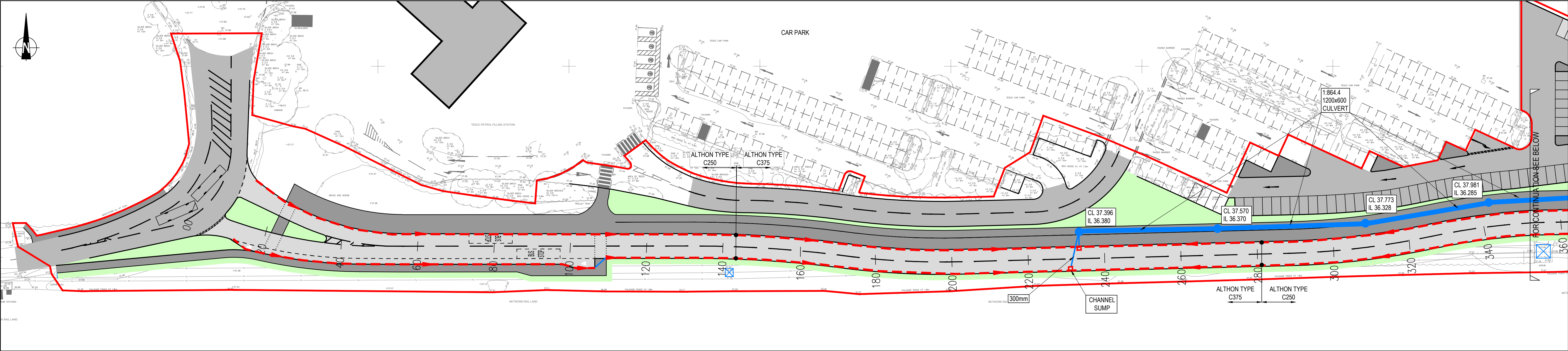
**EAST READING MASS RAPID TRANSIT
GENERAL ARRANGEMENT PHASE 1
PHASE B - SGN VALVE DIVERSION
UNDERTAKEN**

Client

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READING
Tel: 0118 950 0761

Date of 1st Issue	30.05.2017	Designed	LC	Drawn	SF
A1 Scale	1:500	Checked	SE	Approved	SM
Drawing Number	28791/2009/CIV/005	Revision	-		



NOTES:

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- ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
- STRATEGIC DRAINAGE LAYOUT SHOWN IS SUBJECT TO DETAILED DESIGN.
- FOR FURTHER INFORMATION ON THE SURFACE WATER DRAINAGE STRATEGY, REFER TO EAST READING MASS RAPID TRANSIT SCHEME FLOOD RISK ASSESSMENT.

KEY:

- PLANNING APPLICATION RED LINE BOUNDARY
- PROPOSED COMBINED KERB DRAINAGE SYSTEM / FLOW DIRECTION
- PROPOSED HIGH CAPACITY DRAINAGE CHANNEL (ALTHON OR SIMILAR APPROVED SYSTEM) / FLOW DIRECTION
- PROPOSED TANKED CELLULAR STORAGE (WRAPPED IN GEOMEMBRANE) EXACT LOCATION TO BE CONFIRMED DURING DETAILED DESIGN
- PROPOSED SURFACE WATER DRAINAGE CARRIER PIPE / FLOW DIRECTION
- PROPOSED SURFACE WATER DRAINAGE MANHOLE
- PROPOSED OIL INTERCEPTOR
- WATERBODY
- PROPOSED GULLY

Mark	Revision	Date	Drawn	Chkd	Appd

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FOR PLANNING

EAST READING MASS RAPID TRANSIT

PROPOSED SURFACE WATER DRAINAGE STRATEGY



Reading
Borough Council
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Date of 1st Issue
08.06.2017

A1 Scale
1:500

Drawing Number
28791/2009/CIV/008

Designed
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File Location: \\pba\cfr\projects\28791\cfr\bf\is\scheme\03 east reading mrt\civils\cad\dwg\28791_2009_civ_008 - proposed surface water drainage strategy.dwg