Teddington Direct River Abstraction

Preliminary Environmental Information Report

Appendix 16.3 – Health Assessment Summary Tables

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Appendix 16.3 – Health Assessment Summary Tables

A.1 Introduction

A.1.1 This appendix supports Chapter 16: Human Health of the Preliminary Environmental Information (PEI) Report for the Teddington Direct River Abstraction (TDRA) Project (the Project).

A.1.2 The appendix includes preliminary health assessment tables for each of the key Project component sites, as well as project-wide impacts and impacts relating to HGV routes.

A.1.3 At this stage the assessment is preliminary as the literature review for supporting evidence has yet to be completed and further information gathering is required to inform the health assessment. The literature review will be completed to inform the Environmental Statement. For some potential impacts, the assessment is currently uncertain.

A.1.4 The tables also set out where the health assessor considers that there are no likely significant effects on health relating to particular determinants for a particular component of the Project.

A.1.5 Only where impacts have been identified as likely on a health determinants, is this information subsequently used in preliminary human health assessment reported in Chapter 16: Human Health.

A.1.6 The sensitivity, magnitude and significance criteria used in this assessment is described in Section 16.5 of Chapter 16: Human Health

A.2 Mogden Sewage Treatment Works (STW)

Table A.1 Mogden STW Construction Effects

Theme	Health Determinant	Preliminary description of impacts	Ward (sensitivity)	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	No likely significant effect on the basis that works would be within the Mogden STW site which has no public access. See HGV Routes assessment for impacts of construction traffic to and from the site.	N/A	N/A	N/A	N/A	N/A	N/A
	Open space, leisure & play	The amenity of a small neighbourhood play space by Crofters Close/Glen Walk may be affected by noise and dust from works in the Western Work Area of Mogden STW.	Hounslow South (Medium)	Negligible	Very few people would be affected and the severity of health outcome would relate predominantly to a minor change in quality of life. It is not considered likely that most parents and children would stop using the play space. There would be a rapid reversal of this change on completion of the works.	Negligible (not significant)	It is only suggestive that impacts from construction would affect play. There is likely to only be a very limited change in the health baseline of the population due to this effect.	For sensitive children, which may include those on the autism spectrum, disruption may discourage use of the playground, which over the space of two to three years could represent a key developmental stage.
	Attractiveness of area & quality of natural environment	No likely significant effect on the basis that it is assumed that any vegetation clearance, such as on the internal face of the embankment around the Eastern Work Area, would be largely screened by the embankment and vegetation on the external facing slopes. Impacts on attractiveness and quality of built environment are addressed below under the residential amenity and community wellbeing theme.	N/A	N/A	N/A	N/A	N/A	N/A
	Social participation, interaction & support	No likely significant effect on the basis that works would be within the Mogden STW site and no notable social and community locations are expected to be affected.	N/A	N/A	N/A	N/A	N/A	N/A
Residential amenity and community	**Community safety**	No likely significant effect on the basis that works would be within the Mogden STW site which has no public access. See HGV Routes assessment for impacts of construction traffic to and from the site.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward (sensitivity)	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Biophysical environment	**Community identity, culture, resilience & influence**	No likely significant effect on the basis that works would be within the Mogden STW and the local community would already be accustomed to the presence of this facility in the baseline. See Project Wide assessment for an assessment of a more general community response to the Project as a whole.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	It is expected that task lighting required for 24/7 operation of the TBM machine, and construction of the TTP which would be up to 15m above ground level, would be visible to residents of neighbourhoods close to the Mogden STW, which may detract from the attractiveness of the area.	Hounslow South (Medium) Isleworth (High)	Negligible	Very few people would be affected and the severity of health outcome would relate predominantly to a minor change in quality of life.	Negligible (not significant)	There is likely to be a very limited change in the health baseline. Preliminary considerations of scientific literature have not identified any supported relationship between localised amenity impacts and changes to health outcomes.	No specific vulnerable groups to this impact have been identified at this stage.
	Climate change mitigation & adaptation	See Project Wide effects for an assessment in relation to climate change mitigation and adaptation. No likely significant effects are predicted on this health determinant from works at Mogden STW specifically due to the limited timescale (three years) of the construction period.	N/A	N/A	N/A	N/A	N/A	N/A
	Air quality	Chapter 13: Air Quality has identified a high risk of dust from works at Mogden STW. However, with the implementation of measures for high risk of dust set by the IAQM, the residual impact would be negligible. The air quality assessment has also identified a negligible risk of odour exposure or effect based on the findings of a ground investigation at the former landfill site at Mogden STW. There is potential for air quality impacts from construction plant (non-road mobile machinery, generator and combustion plant emissions), but these impacts are yet to be modelled and assessed.	Hounslow South (Medium) Isleworth (High)	Uncertain	The air quality assessment of emissions from non-road mobile machinery, generator and combustion plant emissions is not currently available. Air pollution causes a number of health outcomes, therefore it has potential to relate to a change in morbidity. However, in the absence of air quality assessment results, the level of health magnitude cannot yet be determined with any confidence.	Uncertain	Further information is required to inform the human health assessment.	Children, elderly and people with underlying health conditions are more sensitive to air pollution.

Theme	Health Determinant	Preliminary description of impacts	Ward (sensitivity)	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Noise & vibration	Chapter 14: Noise and Vibration has predicted significant adverse day-time noise effects during embankment piling and foundation piling works in the Eastern Work Area. The closest residents to these works would be in Bankside Close, Hillary Drive, Trevor Close and Beaumont Place (Isleworth ward) although other residents in the area also have the potential to be affected. Top soil removal for the compound areas in both the Western Work Area and Eastern Work Area is predicted to create day-time noise at a level between the lowest observable adverse effects level LOAEL and the significant observable adverse effects level (SOAEL) but has not been determined likely to be a significant effect for the reasons set out in Section 14.8 of Chapter 14: Noise and Vibration, which relate to the nature and short duration of noise expected. Night-time noise from operation of the TBM in the Western Work Area is predicted to be on the threshold of the SOAEL for night-time noise as set out in Section 14.7 of Chapter 14: Noise and Vibration. The nearest residents to these effects would be on Wainwright Grove and Harvesters Close (Hounslow South ward).	Hounslow South (Medium) Isleworth (High)	Medium magnitude	It is currently assumed that exposure to noise effects would be of medium scale and frequent over the three-year construction period. The severity of health outcomes most likely would relate to a potentially major change in quality of life due to some sleep disturbance and annoyance. There is a growing body of research linking other physiological responses to noise but the most severe outcomes are linked to long-term exposure rather than the short-term exposure expected during construction.	Moderate (adverse) Hounslow South and Isleworth population	There is a clear relationship between night-time noise and sleep disturbance which would predominantly affect some residents in Hounslow South. A small change in health baseline is anticipated here. Annoyance impacts during day and night linked to noise could be widespread and affect a small change in health baseline for the Isleworth population.	Shift workers and people with some mental health conditions may be more sensitive to noise impacts.

Theme	Health Determinant	Preliminary description of impacts	Ward (sensitivity)	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Water quality	It is anticipated that at least two storm tanks would be decommissioned during the construction of the TTP and recommissioned on completion of the works. Decommissioning of storm tanks could potentially reduce the resilience of the existing Mogden STW to major storm events during the construction phase. However, the work would be carried out while maintaining the required volume under the Environmental Permit within the storm tank provision, within only one storm tank removed from operation at a time. As described in Section 2.5 of Chapter 2, current Mogden STW permit requires seven storm tanks out of the eight total storm tanks to be in operation to meet permit storm storage within the Mogden STW site. Use of the storm tanks to construct the TTP will be conducted in accordance with this permit. No likely significant effect on groundwater is anticipated as while there is a risk of leaks and spills to groundwater resources from construction activities, it is expected that standard mitigation requirements, and risk assessments as set out in Chapter 5: Water Resources and Flood Risk Land manage these risks so that they are not significant.	Isleworth (High)	Negligible adverse	On the basis that the storm tank provision will be maintained within permit requirements, it is considered that any impact on water quality from the outfall to Isleworth Ait would relate to occasional storm events. This would represent very little change in water quality from the baseline since only one storm tank would be unavailable and effects would be reversible once the storm is over. Very low exposure to any change in water quality is expected from such low frequency events.	Negligible adverse	The decommssioning of one storm tank at a time during works at Mogden STW is unlikely to have a noticeable impact on public health priorities around water quality. Further information on this issue will be sought to further inform the human health assessment for the Environmental Statement.	No specific vulnerable groups to this impact have been identified at this stage.
	Land quality	No likely significant effect on the basis that works would be within the Mogden STW site which has no public access. While there is a likelihood of exposing contaminated materials during construction, it is expected that standard mitigation requirements, and risk assessments as set out in Chapter 10 Ground Conditions and Contaminated Land would ensure no significant risk of significant harm to human health. Chapter 11 Waste and Materials sets out how materials would be appropriately	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward (sensitivity)	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
		handled, managed, stored and/or disposed of.						
	Light pollution	Potential impacts of task lighting on 'attractiveness of area & quality of built environment' is described above. It is not anticipated that that there would be light spill from the site. The setting is in an urban context where the population would already experience baseline light pollution and it is not anticipated that the Project would have a significant impact on that context. Therefore no likely significant effect on population health due to light pollution is anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	This determinant is assessed under the Project Wide assessment TDRA on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.TDRA	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.TDRA	N/A	N/A	N/A	N/A	N/A	N/A
	Transport modes, access & connections	No likely significant effects are anticipated from works at the Mogden STW site specifically as there is no public access on site. See Project HGV Routes for effects relating to this determinant for the Project as a whole.	N/A	N/A	N/A	N/A	N/A	N/A

Table A.2 Mogden STW Operation Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	No likely significant effect on the basis that works would be within the Mogden STW site which has no public access. Once in operation, the TTP is not expected to alter physical activity patterns.	N/A	N/A	N/A	N/A	N/A	N/A
	Open space, leisure & play	No likely significant effect on the basis that works would be within the Mogden STW site which has no public access. Once in operation, the TTP is not expected to affect open space, leisure or play opportunities (see air quality under biophysical determinants for information on potential emissions from TTP operation).	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of natural environment	No likely significant effect on the basis that the works would relate to an existing operational works.	N/A	N/A	N/A	N/A	N/A	N/A
	Social participation, interaction & support	No likely significant effect on the basis that works would be within the Mogden STW site and no notable social and community locations are expected to be affected.	N/A	N/A	N/A	N/A	N/A	N/A
Residential amenity and community wellbeing	**Community safety**	No likely significant effect on the basis that works would be within the Mogden STW site which has no public access.	N/A	N/A	N/A	N/A	N/A	N/A
	Community identity, culture, resilience & influence	No likely significant effect on the basis that the works would relate to a single water industry structure within a site which is already of water industry use.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	No likely significant effect on the basis that the works would relate to a single water industry structure within a site which is already of water industry use.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Biophysical environment	**Climate change mitigation & adaptation**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to climate change mitigation and adaptation. Any effects of this component are assessed under Chapter 18: Climate Change.	N/A	N/A	N/A	N/A	N/A	N/A
	Air quality	Chapter 13 Air Quality has concluded that the effluent that will be received and treated within the planned TTP will have an extremely low (if any) odour potential and assessed the effect as negligible. Impacts of vehicle exhaust emissions were scoped out of the Air Quality assessment as not a likely significant effect on air quality during operation. As part of its scoping feedback, The London Borough of Richmond Council raised the issue of whether aerosols from the TTP could pose a human health hazard for people in the Teddington weir area. The TTP would be confined within the operational limits of the existing Mogden STW and there are no baseline issues of aerosols affecting local receptors. Furthermore the apparatus would be enclosed, removing the likelihood of a pathway between any aerosol sources and receptors. The proposed new outfall upstream of Teddington Weir would be below the water surface meaning no potential to emit aerosols. On this basis, no likely significant effects on population health are expected in relation to the air quality health determinant due to the operation of the TTP at Mogden STW.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Noise & vibration	Operation of the TTP has the potential to generate noise emissions which may affect the noise environment experienced by nearby residents.	Isleworth (High)	Negligible adverse	The noise and vibration assessment for the operation of this component was not available at the time of undertaking the human health assessment. However, it is expected that in the event that operation of the TTP is likely to generate noise significantly over baseline noise levels, then embedded mitigation would be possible through appropriate noise insulation of the TTP and specification of plant components. It is judged likely that this would have a low exposure on the population and constitute a minor change in quality of life, given the context of an urban area with surrounding traffic noise.	Minor (adverse) Isleworth population	There is potential for a limited change in health baseline where nearby residents may be conscious of the new plant, however it is considered unlikely that noise would be of a level associated with any scientific evidence for changes to health outcomes. The Environmental Noise Guidelines (WHO 2018) do not cover noise from industrial sources.	No specific vulnerable groups to this impact have been identified at this stage.
	Water quality	Operation of the Project would reduce the volume of final effluent from Mogden STW discharged to the Thames Tideway at Isleworth Ait. Operation of the TTP is expected to result in a reduction in the chemical load discharged to the estuary but there is currently insufficient data available to assess the magnitude of impact (see Chapter 5: Water Resources and Flood Risk). No likely significant population health effect is anticipated from Mogden STW. See assessment for the Burnell Site for health effects related to water quality from the proposed new TDRA outfall.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	No likely significant effect on the basis that works would be within the Mogden STW site which has no public access and there is no plausible source-pathway-receptor relationship likely to give rise to population health effects.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Light pollution	Assuming lighting is correctly installed to be directional and limit spill light, no likely population health effects relating to light pollution from operation of this component are anticipated. The setting is in an urban context where the population would already experience baseline light pollution and it is not anticipated that the Project would have a significant impact on that context.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation. TDRA	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation. TDRA	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation. TDRA	N/A	N/A	N/A	N/A	N/A	N/A
	Transport modes, access & connections	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.TDRA	N/A	N/A	N/A	N/A	N/A	N/A

A.3 Ham Street Car Park and Playing Fields

Table A.3 Ham Street Car Park and Playing Fields Construction Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	Both Ham Playing Fields and Ham Street Car Park facilitate physical activity for the local community. Ham Playing Fields is used for dog walking and informal ball games, for which there are alternative facilities available in the very near vicinity (for example King George's Field, Ham Riverside Meadow, Petersham Meadows, Ham Common). Two Public Rights of Way intersect either draft Order Limits at Ham Playing Fields (LBR footpath 34) and Ham Street Car Park (LBR footpath 133). Both routes are likely used mostly for recreational rather than active travel purposes since they do not offer direct links between communities and key destinations for employment, education or retail. Ham Street Car Park is used as an access point for walking on the River Thames Path, cycling on the National Cycle Network and accessing the River Thames for water sports, and the loss would provide a barrier to undertaking these forms of recreational physical activity. There is free on street parking available near to Ham House, but this would be less convenient for river access particularly.	Ham, Petersham and Richmond Riverside (medium)	Low adverse	The duration of impact is short term (27 months) and alternative facilities for both Ham Playing Fields and Ham Street Car Park are available locally, therefore number of people who would be dissuaded from undertaking water sports, walking or cycling as a result this aspect of the Project is likely to be very low.	Minor adverse	Given the short term nature of this impact and the fact that alternative facilities for both Ham Playing Fields and Ham Steet Car Park are available in the near vicinity, the impact on physical activity levels within the affected population is anticipated to be very limited.	To be determined. Identification of vulnerable groups will be informed by the results of the forthcoming recreational surveys.

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Open space, leisure & play	Temporary land take would reduce the available open space at Ham Playing Fields for recreational use, however there is a substantial amount of open space available to the community within close proximity to this location which would be unaffected by the Project including Ham Lands Nature Reserve, Ham Riverside Meadows and Ham Common. As described above against 'Physical activity', the loss of car parking at Ham Car Park would hinder access to the Thames for water sports and to the National Cycle Network, as well as to Ham House National Trust facility.	Ham, Petersham and Richmond Riverside (medium)	Low adverse	The duration of impact is short term (27 months) and there are numerous other accessible areas of open space locally, as well as alternative parking options for accessing the remaining unaffected areas of green space at this location. The population for which access to open space or recreational activities is notably affected is anticipated to be very low.	Minor adverse	Given the short term nature of this impact and availability of alternative provision locally, a very limited impact on health outcomes associated with access to open space is anticipated.	To be determined. Identification of vulnerable groups will be informed by the results of the forthcoming recreational surveys.
	Attractiveness of area & quality of natural environment	Noise and dust generated by construction works, along with views of construction activities, would reduce the amenity of Ham Playing Fields during construction. The compound and associated activities at this Ham Street Car Park would be visible and audible for users of the Thames Path in close proximity.	Ham, Petersham and Richmond Riverside (medium)	Negligible	The duration of impact is short term (27 months) and there are alternative facilities locally which offer equivalent opportunities for informal recreation, and therefore only a very limited number of people are anticipated to affected by reduction in amenity of Ham Playing Fields or of the very short stretch of the Thames Path which passes north of Ham Street Car Park. The severity of impact would likely relate to a minor change in quality of life for a very small proportion of the population.	Negligible (not significant)	There is likely to be a very limited change in the health baseline. Preliminary considerations of scientific literature have not identified any supported relationship between localised amenity impacts and changes to health outcomes.	To be determined. Identification of vulnerable groups will be informed by the results of the forthcoming recreational surveys.

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Social participation, interaction & support	Ham Playing Fields, and indirectly Ham Street Car Park, facilitate social participation and interaction through informal recreational activities. However as described above, there are alternative facilities of comparable standard available locally and these facilities are not known to support organised group activities.	Ham, Petersham and Richmond Riverside (medium)	Negligible	Very few people are expected to be dissuaded from using Ham Playing Fields or undertaking recreational activities that are supported by car parking at Ham Street Car Park, and also unable to access the alternative facilities available locally, and any impact on those affected would be short term in nature (27 months). The severity of impact would likely relate to a short term change in quality of life for a very small proportion of the population.	Negligible (not significant)	Given the short term nature of this impact, a very limited impact on health outcomes associated with access to open space is anticipated.	To be determined. Identification of vulnerable groups will be informed by the results of the forthcoming recreational surveys.
Residential amenity and community wellbeing	**Community safety**	Construction sites and activities would be planned and managed to ensure community safety. However, there is potential for the site compound and fencing to create areas where there is a lack of visibility, may increase risks of antisocial behaviour or other safety risks. Further information on the baseline community safety conditions and construction proposals are required to develop this assessment further.	Ham, Petersham and Richmond Riverside (medium)	Uncertain	This is a current area of uncertainty for the assessment. Further information will be sought and reported in the ES.	Uncertain	Further information is required to inform the human health assessment.	Uncertain
	Community identity, culture, resilience & influence	This assessment will be informed by the results of the community survey being undertaken as part of the socioeconomics, community, access and recreation assessment.	Ham, Petersham and Richmond Riverside (medium)	Uncertain	This is a current area of uncertainty for the assessment. Further information will be sought and reported in the ES.	Uncertain	Further information is required to inform the human health assessment.	Uncertain
	Attractiveness of area & quality of built environment	Given the nature of the location of these works within large area of open space, the main impacts would relate to quality of the natural environment as assessed above.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Biophysical environment	**Climate change mitigation & adaptation**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Air quality	The preliminary air quality assessment (Chapter 13) has identified a high risk of dust from earthworks, construction and trackout. However, with the implementation of measures for high risk of dust set by the IAQM, the residual impact would be negligible. There is potential for air quality impacts from construction plant (non-road mobile machinery, generator and combustion plant emissions), but these impacts are yet to be modelled and assessed.	Ham, Petersham & Richmond Riverside (medium)	Uncertain	The air quality assessment of emissions from non-road mobile machinery, generator and combustion plant emissions is not currently available. Air pollution causes a number of health outcomes, therefore it has potential to relate to a change in morbidity. However, in the absence of air quality assessment results, the level of health magnitude cannot yet be determined with any confidence.	Uncertain	Further information is required to inform the human health assessment.	Children, elderly and people with underlying health conditions are more sensitive to air pollution.
	Noise & vibration	Chapter 14: Noise and Vibration identifies that noise levels would exceed the Lowest Observed Adverse Effect Level (LOAEL) whilst top soil stripping is underway at Ham Riverside Playing Fields, but this is not considered a significant effect because these noise levels would only occur for less than a month.	Ham, Petersham & Richmond Riverside (medium)	Negligible	The preliminary noise assessment concludes that no significant effects are anticipated, and people using Ham Playing Fields are only likely to be doing so for very short periods of time (an hour, or maybe two) and so their duration of exposure to the noisiest activities would be very low.	Negligible (not significant)	Occasional and short-term exposure to construction noise is relatively typical of living in urban environments and it is considered that changes from this component of the Project would have a very minimal effect on the health baseline of the population due to localised annoyance.	People with mental health conditions may be more sensitive to noise impacts.
	Water quality	No likely significant effect as while there is a risk of leaks and spills to surface water and groundwater resources from construction activities, it is expected that standard mitigation requirements, and risk assessments as set out in Chapter 5: Water Resources and Flood Risk Land manage these risks so that they are not significant.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	No likely significant effect as while there is a likelihood of exposing contaminated materials during construction, it is expected that	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
		standard mitigation requirements, and risk assessments as set out in Chapter 10: Ground Conditions and Contaminated Land would ensure no significant risk of significant harm to human health. Chapter 11: Waste and Materials sets out how materials would be appropriately handled, managed, stored and/or disposed of.						
	Light pollution	Task lighting and security lighting is a potential source of light pollution in this area since the site is relatively dark in the baseline. However, there are no residential areas or other places where people are likely to be at significant risk of exposure to any impacts of spill light or glare from the site. Therefore, the source-pathway-receptor link is not complete. Furthermore, the standard mitigation to control lighting (PCR 39) will reduce the risk of obtrusive light and skyglow. On this basis no likely significant population health effects of light pollution are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation. TDRA	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation. TDRA	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Transport modes, access & connections	No likely significant effects are anticipated from works at the Ham Street Car Park and Playing Fields site specifically. See HGV Routes for effects relating to this determinant for the Project as a whole.	N/A	N/A	N/A	N/A	N/A	N/A

Table A.4 Ham Street Car Park and Playing Fields Operation Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	Chapter 15: Socioeconomic, Community and Recreation finds that the capped permanent access hatch to Intermediate Shaft E and periodic (5-10 yearly) maintenance activities would not affect the use of the site for recreational activities involving physical activity. Therefore no significant population health effects are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Open space, leisure & play	Chapter 15: Socioeconomic, Community and Recreation finds that he capped permanent access hatch to Intermediate Shaft E and periodic (5-10 yearly) maintenance activities would not affect access to or amenity of the Ham Playing Fields for recreational activities involving physical activity. Therefore no significant population health effects are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of natural environment	Ham Playing Fields and Ham Car Park would be restored to their current condition following construction of the Project, with the Intermediate Shaft access capped and covered with topsoil. No clear pathway for impact on this determinant has been identified and no significant population health effects are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Social participation, interaction & support	Ham Playing Fields and Ham Car Park would be restored to their current condition, and barring occasional maintenance access to the Intermediate Shaft there would be no disturbance to these facilities during the operational phase. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
Residential amenity and community wellbeing	**Community safety**	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Community identity, culture, resilience & influence	Ham Playing Fields and Ham Car Park would be restored to their current condition, and barring occasional maintenance access to the Intermediate Shaft there would be no disturbance to these facilities during the operational phase. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	Given the nature of the location of these works within large area of open space, the main impacts would relate to quality of the natural environment as assessed above.	N/A	N/A	N/A	N/A	N/A	N/A
Biophysical environment	**Climate change mitigation & adaptation**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Air quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Noise & vibration	As identified in Chapter 14: Noise and Vibration no noise or vibration emissions would occur from the Intermediate Shaft once operational. No significant effects are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Water quality	No significant population health effects are anticipated. Chapter 5: Water Resources and Flood Risk scopes out impacts on surface water and groundwater for Ham Street Car Park and Playing Fields.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Light pollution	No lighting is associated with operation of this component of the Project, therefore there is no source of impact.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Transport modes, access & connections	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

A.4 Burnell Avenue Site

Table A.5 Burnell Avenue Site Construction Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	The diversion of the Thames Path and National Cycle Network Route 4 during the construction works has the potential to affect physical activity, particularly for those who use the route for active travel on a frequent basis. Since the length and route of diversion route was yet to be determined at the time of this assessment, it is uncertain as to how likely the proposals would be to affect physical activity. It is likely that pedestrians would be more sensitive to the impacts than cyclists, on the basis that cyclists would pass through a diverted route relatively quickly. A further pathway to impacts on physical activity would be in the event that there is disruption or loss of amenity of the Kingston Parkrun to the extent that people are dissuaded from undertaking the Parkrun. While there are other Parkruns in the area, displacement from the Kingston Parkrun may result in overcrowding at other venues which could discourage some from undertaking the Parkrun. Restricted access to Burnell Avenue Open Space may also affect physical activity levels should people, particularly children, not be able to access alternative locations for informal recreation.	Tudor (Medium) Canbury Gardens (Medium) Ham, Petersham & Richmond Riverside (Medium)	Low adverse	The proposals are expected to affect a small minority of the population over the short-term. By using diverted routes, most people who use the Thames Path or NCN Route 4 would still be able to undertake active travel or pursue the recreational route, therefore maintaining physical activity levels. A small minority may be discouraged from the area to the degree that they reduce their physical activity levels, and this has the potential for a minor change in morbidity or moderate change in quality of life.	Minor adverse	It is only suggestive that there may be changes to physical activity levels resulting from impacts on Burnell Avenue Open Space and the diverted Thames Path and NCN Route 4. Since the proposals are short-term it is considered that changes would have a marginal effect on encouraging and promoting physical activity as an important public health intervention.	A key vulnerable group may be children aged 8 to 13 as this is an age where parents typically permit their children more licence to play or travel independently but where less than half achieve recommended levels of physical activity ((Jago et al. 2009; Schoeppe et al. 2014; OHID, 2022).

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Open space, leisure & play	During construction, a large proportion of the Burnell Avenue Open Space would be closed to the public to allow space for construction activities, site compound and storage. This would reduce the area of open space available for recreation and play (see Chapter 15 Socioeconomics, Community, Access and Recreation). Areas of green space in adjacent areas such as Ham Lands and Burnell Playing Fields would remain accessible as alternative areas for informal recreation and play. Informal access to the stretch of Thames river at the Burnell Avenue site would also be restricted, which may limit some water sports and angling, (see Chapter 15 Socioeconomics, Community, Access and Recreation).	Tudor (Medium) Canbury Gardens (Medium) Ham, Petersham & Richmond Riverside (Medium)	Low adverse	The impact is expected to relate to a moderate change in quality of life for those who use this area of open space and access to the river most. However, there are alternative areas of open space and recreational sites locally, as well as alternative access points to the river (some of which are formal access points). On this basis it is considered only a small minority of the population would have their opportunities to access open space, leisure and play restricted by the short-term construction proposals.	Minor adverse	It is only suggestive that there may be reductions in people being able to access open space, leisure and play as a result of impacts on Burnell Avenue Open Space and access to the River Thames. Since the proposals are short-term it is considered that changes would have a marginal effect on health benefits associated with open space, leisure and play.	Any recreational and sporting groups which use the space would be most affected. The results of the recreational surveys will inform the assessment for the ES. Children may be more vulnerable to the short-term loss of open space as they not have the permission or independence to access alternative sites for play, particularly as the alternative sites have more tree cover and shading which makes them more difficult for parents to supervise. However, the majority of houses on Burnell Avenue have gardens, meaning children would still have access to the outdoors.
	Attractiveness of area & quality of natural environment	The presence of hoarding and safety fencing, together with construction compounds, welfare facilities, earthworks and stockpiles, construction plant, lighting and vegetation removal would detract from the attractiveness of the green space and riverside environment in this location.	Tudor (Medium) Canbury Gardens (Medium) Ham, Petersham & Richmond Riverside (Medium)	Medium adverse	The proposals are judged likely to affect a large minority of the population within these wards, particularly those whose houses face the areas of works, and those for whom the Burnell Avenue Open Space is the nearest area of green space. Given the length of the construction period and time for vegetation to re-establish, this is expected to be a medium-term impact. The health effect would predominantly relate to a moderate change in quality-of-life.	Moderate adverse	The significance is judged to be moderate adverse. The change to the attractiveness of the green space and riverbank would be highly noticeable to local residents who are likely to be concerned about the proposals. This would likely exacerbate psychosocial stress among those most sensitive to the proposals.	Residents with riverside views are likely to be most sensitive.

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Residential amenity and community wellbeing	**Social participation, interaction & support**	The loss of access to much of the Burnell Avenue Open Space is likely to affect social interaction, particularly during times of good weather and in the event that the Kingston Parkrun is unable to go ahead. While there are other locations where people can gather and interact, the Burnell Avenue Open Space is the most geographically convenient location for the neighbourhood between Dukes Avenue, Dysart Avenue and Burnell Avenue.	Hampton Wick & South Teddington (Medium) Tudor (Medium) Canbury Gardens (Medium) Ham, Petersham & Richmond Riverside (Medium)	Low adverse	This impact is likely to affect a small minority of the population as there are other areas of public space in the neighbourhoods where people can interact. The severity of health impact would relate to a moderate change in quality-of-life in the short-term for those affected.	Minor adverse	The significance is judged to be minor adverse. Restricting access to this area of public space is considered likely to cause a slight change in health outcomes relating to social participation, interaction and support on the basis that there are other opportunities in the local area.	Vulnerable groups would be as for the 'open space, leisure and play' determinant. In particular it is likely to be an important location for children to socially interact.
	Community safety	Construction sites and activities would be planned and managed to ensure community safety. However, the creation of diversion routes and the potential for the site compound and fencing to create areas where there is a lack of visibility, may increase risks of antisocial behaviour or other safety risks. Further information on the baseline community safety conditions and construction proposals are required to develop this assessment further.	Ham, Petersham & Richmond Riverside (Medium) Tudor (Medium)	Uncertain	This is a current area of uncertainty for the assessment. Further information will be sought and reported in the ES.	Uncertain	Further information is required to inform the human health assessment.	Uncertain
	Community identity, culture, resilience & influence	This assessment will be informed by the results of the community survey being undertaken as part of the socioeconomics, community, access and recreation assessment.	Ham, Petersham & Richmond Riverside (Medium) Tudor (Medium)	Uncertain	This is a current area of uncertainty for the assessment. Further information will be sought and reported in the ES.	Uncertain	Further information is required to inform the human health assessment.	Uncertain

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Attractiveness of area & quality of built environment	The main impact at this site would be on areas of open and green space, which is assessed above under 'attractiveness of the area & quality of the natural environment' and therefore not repeated here.	Ham, Petersham & Richmond Riverside (Medium) Tudor (Medium)	N/A	N/A	N/A	Further information is required to inform the human health assessment.	Uncertain
Biophysical environment	**Climate change mitigation & adaptation**	Green and blue space is important in mitigating some health effects of climate change such as providing cooling microclimates during heatwaves. However, there are several areas of alternative green space and river access nearby. On this basis, construction at the Burnell Avenue Site is expected to have a very limited impact on this health determinant.	N/A	Low adverse	The impact would be short-term and restricted to occasional events, such as if a heatwave occurred during the construction period. In such event only a small minority of the population is likely to be affected as there are alternative areas where people can benefit from climate change mitigating factors of green and blue space. Furthermore, most houses in the area benefit from gardens which can also help mitigate health effects during heatwaves.	Minor adverse	The change due to the Project is expected to have a marginal effect on the use of green and blue space to help mitigate health effects of climate change.	Vulnerable groups would include those who depend on public spaces for access to green and blue space, which may include residents of flats on Beaufort Road and Beaufort Court. However, for these residents green space at Ham Lands is closer.
	Air quality	The preliminary air quality assessment (Chapter 13) has identified a high risk of dust from earthworks, construction and trackout. However, with the implementation of measures for high risk of dust set by the IAQM, the residual impact would be negligible. There is potential for air quality impacts from construction plant (non-road mobile machinery, generator and combustion plant emissions), but these impacts are yet to be modelled and assessed.	Ham, Petersham & Richmond Riverside (Medium) Tudor (Medium)	Uncertain	The air quality assessment of emissions from non-road mobile machinery, generator and combustion plant emissions is not currently available. Air pollution causes a number of health outcomes, therefore it has potential to relate to a change in morbidity. However, in the absence of air quality assessment results, the level of health magnitude cannot yet be determined with any confidence.	Uncertain	Further information is required to inform the human health assessment.	Children, elderly and people with underlying health conditions are more sensitive to air pollution.

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Noise & vibration	The preliminary noise and vibration assessment (Chapter 14) has predicted significant adverse effects due to noise at the Burnell Avenue Site for some of the closest residential properties (see section 14.10 for further details). The impacts would relate to day-time noise from potential piling to construct the cofferdams for the intake and outfall. The noise assessment predicts that noise impacts at other receptor locations would not be significant after consideration of the various factors set out in the noise assessment methodology.	Ham, Petersham & Richmond Riverside (Medium) Tudor (Medium)	Low adverse	It is currently assumed that a small minority of the local population would be exposed to these significant levels of day-time construction noise. This is on the assumption that impacts would affect the closest properties and that many residents would be away from their homes during the day. The severity of health outcomes most likely would relate to a moderate change in quality of life due to annoyance. There is a growing body of research linking other physiological responses to noise but the most severe outcomes are linked to long-term exposure to high levels of environmental noise rather than the short-term exposure expected during construction.	Minor adverse	Occasional and short-term exposure to construction noise is relatively typical of living in urban environments and it is considered that changes from the Project would have a slight effect on the health baseline of the population due to localised annoyance.	Shift workers and people with some mental health conditions may be more sensitive to noise impacts.

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Water quality	Chapter 5 (Water Resources and Flood Risk) sets out that construction of the outfall and intake will require use of cofferdams. Using standard good practice, release of sediment would be minimised during the installation of any cofferdam, with quantities expected not to be detectable against the natural fluctuations in sediment in the Thames and would not have an impact on water quality. Risks of mobilisation of contaminants or leaks and spills from the construction site would also be controlled through standard mitigation as set out in Chapter 5 (Water Resources and Flood Risk). However, the visibility of the works in an area well frequented by the public may lead to a degree of public concern around water quality, particularly where some sediment disturbance would likely occur during installation and subsequent removal of the cofferdams.	Hampton Wick & South Teddington (Medium) Tudor (Medium) Ham, Petersham & Richmond Riverside (Medium) South Twickenham (Low)	Low adverse	It is currently assumed that construction impacts on water quality of the River Thames would be transient to very short-term in nature, relating to occasional events during the construction period. A small minority of the population would be affected and there would be rapid reversal of effects on completion of activities. Health impacts would most likely relate to a psychosocial response to the visual appearance of any sediment that has been stirred up.	Minor adverse	Changes due to the Project construction are likely to have a marginal effect on recreational water quality.	Users of the recreational water environment including swimmers, anglers, water sports groups and residents of houseboats or whose houses are on the waterfront.
	Land quality	No likely significant effect as while there is a likelihood of exposing contaminated materials during construction, it is expected that standard mitigation requirements, and risk assessments as set out in Chapter 10: Ground Conditions and Contaminated Land would ensure no significant risk of significant harm to human health. Chapter 11: Waste and Materials sets out how materials would be appropriately handled,	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
		managed, stored and/or disposed of.						
	Light pollution	Task and security lighting has the potential to affect 'attractiveness of area & quality of natural environment' as described above. In terms of light pollution, the standard mitigation (commitment (PCR 39)) would reduce light spill as far as practicable. However, given the limited lighting present on the play space, there is potential for residents and people using routes around the site after dark, to experience obtrusive light.	Ham, Petersham & Richmond Riverside (Medium)	Negligible adverse	It is assumed that a small minority of the local population has the potential to be affected by any residual light pollution, which would be highly localised. The severity of health outcomes would relate to a minor change in quality of life and the effect would be immediately reversed on completion of construction activities.	Negligible (not significant)	Localised and temporary lighting in this area is not likely to affect public health priorities and there is little scientific basis for any notable population health effects.	Residents with windows facing the compound area are most likely to be affected.
Socioeconomic environment	**Education & training**	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Transport modes, access & connections	No likely significant effects are anticipated from works at the Burnell Avenue site specifically. See HGV Routes for effects	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
		relating to this determinant for the Project as a whole.						

Table A.6 Burnell Avenue Site Operation Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	No likely significant effects on physical activity levels are likely during operation as the use of the Burnell Avenue Site, Thames Path and NCN Route 4 would be expected to be similar to the current baseline.	N/A	N/A	N/A	N/A	N/A	N/A
	Open space, leisure & play	During operation, the Burnell Avenue Open Space is likely to be used in the same way as the baseline as shafts would be covered by topsoil and the play space would be restored. However, intake and outfall structures would create visual and physical impediments to accessing the river, including a loss of usable edge to the river at the intake structure. Furthermore there is potential to affect the desire to access areas of green and blue space close to the proposed discharge point.	Hampton Wick & South Teddington (Medium) Tudor (Medium) Ham, Petersham & Richmond Riverside (Medium)	Uncertain	The intake and outfall structures would not affect any known formal recreational entry or exit points to the river and on this basis would be expected to affect very few participants in water-based recreation. However, the effect of the discharge on discouraging river-based recreation activity is more uncertain. The findings of the recreational surveys may help inform a better understanding of public perception towards the Project.	Uncertain	Further information is required to inform the human health assessment.	Users of the recreational water environment including swimmers, anglers, and water sports groups.
	Attractiveness of area & quality of natural environment	The proposed intake and outfall structures would introduce artificial elements to locations where the riverbank is currently relatively natural in appearance. However, the impacts would be very localised.	Hampton Wick & South Teddington (Medium) Tudor (Medium) Ham, Petersham & Richmond Riverside (Medium)	Negligible adverse	The very localised nature of the impact on the attractiveness of the area is judged likely to affect very few people and would relate to a minor change in quality -of-life.	Negligible (not significant)	This effect is not considered significant to public health. This is on the basis that there would be very limited change to the health baseline of the population.	Visitors and members of the Lensbury Hotel and Watersports Centre may be more sensitive than the general population to the visual appearance.

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Social participation, interaction & support	There is no likely significant effect on social participation, interaction and support for the Burnell Avenue Open Space during operation, for example, the Parkrun would be expected to continue as in the baseline. However in the event that people are discouraged from water-based activities close to the discharge point there may be a reduction in social participation.	Hampton Wick & South Teddington (Medium) Tudor (Medium) Ham, Petersham & Richmond Riverside (Medium)	Low adverse	Even assuming a worst case scenario whereby some groups stop using the locality for water-based activities, this would have a very small scale effect on the health determinant compared with other opportunities people have for social participation, interaction and support. A small minority of the population may be affected with up to a moderate change in quality-of-life.	Minor adverse (not significant)	This effect is not considered significant to public health. This is on the basis that there would be very limited change to the health baseline of the population.	Users of the recreational water environment including swimmers, anglers, and water sports groups.
Residential amenity and community wellbeing	**Community safety**	Scoped out of operational effects as agreed in the EIA Scoping Opinion.	N/A	N/A	N/A	N/A	N/A	N/A
	Community identity, culture, resilience & influence	The Scoping Report identified that the Project has the potential to have an ongoing influence on civic pride and perceptions of the environmental quality of the River Thames.	Hampton Wick & South Teddington (Medium) Tudor (Medium) Ham, Petersham & Richmond Riverside (Medium)	Uncertain	Information from community surveys and consultation feedback is required to inform this assessment.	Uncertain	Further information is required to inform the human health assessment.	At this stage of the assessment no specific groups have been identified that may be at greater vulnerability to effects on this health determinant.
	Attractiveness of area & quality of built environment	The main impact at this site would be on areas of open and green space, which is assessed above under 'attractiveness of the area & quality of the natural environment' and therefore not repeated here.	N/A	N/A	N/A	N/A	N/A	N/A
Biophysical environment	**Climate change mitigation & adaptation**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to climate change mitigation and adaptation. Any effects of this component are assessed under Chapter 18: Climate Change.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Air quality	Scoped out of operational effects as agreed in the EIA Scoping Opinion.	N/A	N/A	N/A	N/A	N/A	N/A
	Noise & vibration	There are no significant noise sources associated with the Project at this location since infall an outfall structures do not include pumps. Therefore there is no likely significant health effect relating to operational noise.	N/A	N/A	N/A	N/A	N/A	N/A
	Water quality	The London Borough of Richmond Council has raised the issue that the treated effluent discharge will result in increased concentrations of certain chemicals and microbial hazards which may have direct health impacts on river users. The Environment Agency is yet to confirm which physical and chemical conditions will be permitted for the proposed new outfall but it is expected to be more stringent than the current permit for Mogden STW at Isleworth Ait. A risk assessment for emerging chemicals is to be undertaken.	Hampton Wick & South Teddington (Medium) Tudor (Medium) Ham, Petersham & Richmond Riverside (Medium)	Uncertain	Further information is required before an assessment can be made. This will include information on the risk assessment for emerging chemicals, and information on the permit requirements, as well as information on the recreational use of the river as informed by the surveys being undertaken to support the Socioeconomics, Community, Access and Recreation assessment.	Uncertain	Further information is required to inform the human health assessment.	At this stage of the assessment no specific groups have been identified that may be at greater vulnerability to effects on this health determinant.
	Land quality	No likely significant effect as while there is a likelihood of exposing contaminated materials during construction, it is expected that standard mitigation requirements, and risk assessments as set out in Chapter 10 Ground Conditions and Contaminated Land would ensure no significant risk of significant harm to human health. Chapter 11 Waste and Materials sets out how materials would be appropriately handled, managed, stored and/or disposed of.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Light pollution	Low-level task lights would be installed on the kiosks and at installed equipment associated with the intake. It is anticipated that these task lights will be turned on only during infrequent emergency operation/maintenance at night. Any additional lighting required for such works, would be brought to site as required. On the basis that lighting proposals are minimal during operation, no likely population health effect related to light pollution is anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	This determinant is assessed under the Project Wide assessment on the basis that it is not anticipated this component of the Project would give rise to significant effects in isolation.	N/A	N/A	N/A	N/A	N/A	N/A
	Transport modes, access & connections	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

A.5 Tudor Drive TLT Connection

Table A.7 Tudor Drive TLT Connection Construction Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	It is anticipated that there would be short term loss of access to Richmond Road Pocket Park for a period of up to fifteen months whilst the TLT Connection is constructed.	Tudor (medium)	Negligible adverse	The size and nature of this facility means it does not offer meaningful opportunities for physical activity on site, although it may indirectly facilitate active travel journeys by providing an opportunity for respite during journeys between residential areas and community facilities on Richmond Road. Alternative seating is available at the pocket park directly opposite on the northern side of Tudor Drive.	Negligible (not significant)	A very limited change to baseline health is anticipated.	Older people and people with limited mobility
	Open space, leisure & play	It is anticipated that there would be short term loss of access to Richmond Road Pocket Park for a period of up to fifteen months whilst the TLT Connection is constructed.	Tudor (medium)	Negligible adverse	The duration of impact is short term and is only likely to lead to a very minor change in quality of life for a small population. There is another pocket park located on the northern drive of Tudor Drive which provides alternative facilities.	Negligible (not significant)	A very limited change to baseline health is anticipated.	None identified at this stage. Whilst in general children are more likely to use parks and areas of open space, this
	Attractiveness of area & quality of natural environment	Richmond Pocket Park would be closed during construction and therefore the main impact would be on the surrounding built environment which is assessed below under 'Attractiveness of area and quality of built environment'	N/A	N/A	N/A	N/A	N/A	N/A
	Social participation, interaction & support	Given the scale of these works in isolation, no significant likely effect on population level health is anticipated. See Project Wide assessment for an assessment of a more general community response to the Project as a whole.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Residential amenity and community wellbeing	**Community safety**	Construction activities would be planned and managed to ensure community safety and any risks to health would be mitigated through standard construction management measures. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Community identity, culture, resilience & influence	Given the scale of these works in isolation, no significant likely effect on population level health is anticipated. See Project Wide assessment for an assessment of a more general community response to the Project as a whole.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	Construction works within Richmond Road Pocket Park would be visible and audible for walkers and cyclists using Tudor Drive and Richmond Road, and for people living, working or accessing community facilities in the immediate vicinity of these routes. However, in the context of a busy urban environment, these are considered unlikely to be particularly noticeable.	Tudor (medium)	Negligible adverse	The duration of impact would be short term and would likely relate to a minor change of quality of life for a very small number of people.	Negligible (not significant)	A very limited change to baseline health is anticipated.	None identified at this stage
Biophysical environment	**Climate change mitigation & adaptation**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Air quality	Chapter 13: Air Quality has identified a high risk of dust from construction of the TLT Connection. However, with the implementation of measures	Tudor (medium)	Uncertain	The air quality assessment of emissions from non-road mobile machinery, generator and combustion plant emissions is not currently available. Air	Uncertain	Further information is required to inform the human health assessment.	Children, elderly and people with underlying health conditions are more sensitive to air pollution.

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
		for high risk of dust set by the IAQM, the residual impact would be negligible. There is potential for air quality impacts from construction plant (non-road mobile machinery, generator and combustion plant emissions), but these impacts are yet to be modelled and assessed.			pollution causes a number of health outcomes, therefore it has potential to relate to a change in morbidity. However, in the absence of air quality assessment results, the level of health magnitude cannot yet be determined with any confidence.			
	Noise & vibration	No likely significant population level effects. Chapter 14: Noise and Vibration concludes that there would be no significant effects on residents of Tudor Drive.	N/A	N/A	N/A	N/A	N/A	N/A
	Water quality	No likely significant effect as while there is a risk of leaks and spills to groundwater resources from construction activities, it is expected that standard mitigation requirements, and risk assessments as set out in Chapter 5: Water Resources and Flood Risk Land manage these risks so that they are not significant.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	No likely significant effect as while there is a likelihood of exposing contaminated materials during construction, it is expected that standard mitigation requirements, and risk assessments as set out in Chapter 10: Ground Conditions and Contaminated Land would ensure no significant risk of significant harm to human health. Chapter 11: Waste and Materials sets out how materials would be appropriately handled,	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
		managed, stored and/or disposed of.						
	Light pollution	Task lighting and security lighting is a potential source of light pollution in this area, however since the area is already urban, there are several other sources of potential light pollution present, including car headlights on the road, the fuel station at the crossroads, the Kingston Fire Station and St George's Industrial Estate. The standard mitigation to control lighting (PCR 39) will reduce the risk of obtrusive light from construction. On this basis no likely significant population health effects of light pollution are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	No likely significant effects are anticipated from the TLT Connection specifically. See Project Wide assessment for effects relating to this determinant for the Project as a whole.	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	This determinant is scoped out of assessment for the construction stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Transport modes, access & connections	No likely significant effect. There may be intermitted disruption to access along the footway which wraps around Richmond Road Pocket Park, and it may be necessary for bus users to access to the 65 and N65 services from an alternative bus stop approximately 100m north on Richmond Road, but this would be a minor inconvenience to walkers and public transport users and would not lead to population level health effects.	N/A	N/A	N/A	N/A	N/A	N/A

Table A.8 Tudor Drive TLT Connection Operation Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	No likely significant effect. Richmond Pocket Park will be restored to current landscape and architecture design, including reprovision of furniture.	N/A	N/A	N/A	N/A	N/A	N/A
	Open space, leisure & play	No likely significant effect. Richmond Pocket Park will be restored to current landscape and architecture design, including reprovision of furniture.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of natural environment	No likely significant effect. Richmond Pocket Park will be restored to current landscape and architecture design, including reprovision of furniture.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Social participation, interaction & support	No likely significant effect. Richmond Pocket Park will be restored to current landscape and architecture design, including reprovision of furniture.	N/A	N/A	N/A	N/A	N/A	N/A
Residential amenity and community wellbeing	**Community safety**	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Community identity, culture, resilience & influence	No likely significant population level effects are anticipated. No potential pathway to impact on community identity, culture, resilience and influence has been identified.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	No likely significant population health effect. Richmond Pocket Park will be restored to current landscape and architecture design, including reprovision of furniture.	N/A	N/A	N/A	N/A	N/A	N/A
Biophysical environment	**Climate change mitigation & adaptation**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to climate change mitigation and adaptation. Any effects of this component are assessed under Chapter 18: Climate Change.	N/A	N/A	N/A	N/A	N/A	N/A
	Air quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Noise & vibration	As identified in Chapter 14: Noise and Vibration, no noise or vibration emissions would occur from the TLT Connection once operational. No likely significant population health effects are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Water quality	No pathway for impact identified between this component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Light pollution	No lighting is associated with operation of the TLT connection, therefore no source of impact.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.TDRA	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Transport modes, access & connections	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

A.6 HGV Routes

Table A.9 HGV Routes Construction Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	There would be an increase of HGV traffic on the routes to/from the TDRA construction sites. This traffic may contribute to fear and intimidation among pedestrians and cyclists, which has potential to dissuade active travel along these routes. However the changes to total volumes of traffic are estimated to be less than 30% on all affected routes and Chapter 12: Traffic and Transport predicts effects on fear and intimidation to be minor to moderate on the worst affected routes.	Isleworth (High) St Margarets and North Twickenham (Low) Ham, Petersham & Richmond Riverside (Medium)	Low adverse	It is not considered likely that the changes to volumes of additional HGV and other roads and crossing points along routes to the north of the River Thames would be noticeable enough to the extent that it would alter levels of active travel. The most noticeable change in HGV traffic would likely be Riverside Drive, between Croft Way and Dukes Avenue since these routes currently have very little HGV traffic so the construction HGVs would represent a large change from the baseline. However, the numbers of HGV movements per day (maximum of 42 on part of Dukes Avenue) would make up a small proportion of the total traffic volume (up to 5%). Given that there are streets and alternative routes that would not be affected, it is not likely that the construction traffic would affect a noticeable change in active travel among the population. On the above basis it is predicted that the magnitude of change to physical activity levels would be Low adverse.	Minor adverse	The most sensitive ward population affected would be Isleworth. Active travel is one form of physical activity and the impact from construction traffic is likely to have a marginal effect on public health priorities to increase physical activity levels in the general population.	Likely to include women, children and elderly are more likely to be intimidated by traffic conditions

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Open space, leisure & play	No likely significant population health effects anticipated. This component of the Project would not require land take from areas of open space or recreational facilities. Amenity and accessibility related effects on these facilities are assessed under 'Attractiveness of area and quality of natural environment' and 'Transport modes, access and connections' respectively.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of natural environment	Chapter 12: Traffic and Transport provides an assessment of amenity for pedestrians and cyclists (using the term NMU (non-motorised user) for these groups). For most of the HGV routes, amenity impacts are predicted to be minor or negligible due to the very small level of change in traffic volumes. It identifies that the greatest impact on amenity would be for the Thames Path National Trail where the diversion would interact with a construction traffic route where an increase in traffic flows of 60% or more would be encountered. There would also be significant changes in amenity due to traffic in the Ham Street area where there are interactions with public rights of way, King George's Fields and Ham House and Garden (refer to Chapter 15: Socioeconomics, Community, Access and Recreation for further information on effects on amenity for communities and access).	Ham, Petersham & Richmond Riverside (Medium)	Negligible adverse	Since the actual vehicle numbers are relatively low (see Table 12.37 in Chapter 12: Traffic and Transport), people walking or cycling along the affected routes would likely encounter one or two vehicles and this would likely represent occasional annoyance for very few people in the context of their use of the routes.	Minor adverse	It is not considered likely that the scale and nature of health impact would be of importance to public health priorities.	To be determined.

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Social participation, interaction & support	Chapter 12: Traffic and Transport has identified a negligible impact on traffic volumes on the road network and therefore changes to traffic are not likely to have a significant effect on outdoor meeting spaces, nor a likely significant effect on this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
Residential amenity and community wellbeing	**Community safety**	Chapter 12: Traffic and Transport predicts a number of roads where there is potential for significant impacts on road safety. This relates to routes with a baseline history of collisions and/or where there are locations where vulnerable groups are more likely to be located, such as schools, doctor's surgeries, playing fields etc. The routes where safety is predicted to be most affected are Rugby Road/B361 Whitton Road, Sandy Lane, and Ham Street (see Table 12.41 in Chapter 12: Traffic and Transport).	Whitton (Medium) St Margarets and North Twickenham (Low) Hampton Wick & South Teddington (Medium) Ham, Petersham & Richmond Riverside (medium)	Medium adverse	Although traffic collisions can result in mortality or serious injury, the changes to traffic volumes would be low and relate only to the duration of the construction phase, affecting very few people in the population.	Moderate adverse	This reflects that road safety is a matter of importance to community safety and is a public health priority.	Children, elderly, people with disabilities
	Community identity, culture, resilience & influence	No likely significant effect. No clear pathway has been identified between this component of the Project and this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	It is not likely that the volumes of HGV traffic would be of a scale to have a likely significant effect on built environment. Impacts on the less trafficked locations are assessed above under 'Attractiveness of area & quality of natural environment'.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Biophysical environment	**Climate change mitigation & adaptation**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Air quality	The modelling of construction traffic emissions is yet to be undertaken (see Chapter 13: Air Quality). The results of the air quality modelling will be addressed in the forthcoming Environmental Statement, which will allow for the human health assessment.	Uncertain	Uncertain	The air quality assessment of emissions from construction traffic is not currently available. Air pollution causes a number of health outcomes, therefore it has potential to relate to a change in morbidity. However, in the absence of air quality assessment results, the level of health magnitude cannot yet be determined with any confidence.	Uncertain	Further information is required to inform the human health assessment.	People with respiratory illnesses Children Elderly
	Noise & vibration	At this stage Chapter 14: Noise and Vibration only has data for A-roads in the study area. The chapter identifies that on the basis that the increase of traffic on the A-roads is less than 1%, an increase in noise of less than 0.1dB is expected, which would be a negligible magnitude of noise impact and not a likely significant effect. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Water quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	No likely significant effect. No clear pathway has been identified between this component of the Project and land quality.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Light pollution	No likely significant effect. Transport movements would generally be by day.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	No likely significant population health effects are anticipated from this component of the Project in isolation. See Project Wide effects for an assessment of population health in relation to this health determinant.	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	This determinant is scoped out of assessment for the construction stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Transport modes, access & connections	Chapter 13: Traffic and Transport sets out measures to be included in a construction workforce travel plan (CWTP) which include car sharing, shuttle buses from local transport hubs, walking and cycling. These are expected to reduce workforce commuting trips by 50%.	No specific wards identified at this stage. Key population group affected would be construction workers (high).	Low beneficial	The impact of construction workforce traffic on the A-road network is predicted to be negligible therefore impacts of CWTP on general population is not likely to be significant. However, impacts of the CWTP measures on construction workers as a sub-group of the population are likely to be beneficial. Since construction workers would be a relatively small minority of the general population, and the nature of the health impacts is likely to relate to minor impact on quality of life in the short-term, the magnitude of health impact is judged to be low.	Minor beneficial	The CWTP measures align with public health priorities to promote sustainable modes of transport, but the scale of the predicted impact is not likely to significantly affect population health.	Construction workers

Table A.10 HGV Routes Operation Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Open space, leisure & play	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of natural environment	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Social participation, interaction & support	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
Residential amenity and community wellbeing	**Community safety**	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Community identity, culture, resilience & influence	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
Biophysical environme	**Climate change mitigation & adaptation**	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
	Air quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Noise & vibration	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Water quality	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Light pollution	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Employment & income	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Wider societal infrastructure & resources	HGV routes would only be utilised during the construction period. No significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Transport modes, access & connections	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A

A.7 Project Wide Effects

Table A.11 Project Wide Construction Effects

Theme	Health Determinant	Preliminary description of impacts	Population (sensitivity)	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Open space, leisure & play	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of natural environment	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Social participation, interaction & support	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
Residential amenity and community wellbeing	**Community safety**	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Community identity, culture, resilience & influence	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Population (sensitivity)	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Biophysical environment	**Climate change mitigation & adaptation**	Chapter 18: Climate Change assesses that the project climate changes over the duration of the construction phase of the Project are relatively minor, and scoped out of assessment on the basis that standard good practice management techniques would be all that is required to mitigate any potential impacts. For this reason, no significant population health effects are anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Air quality	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Noise & vibration	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Water quality	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Light pollution	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
Socioeconomic environment	**Education & training**	Thames Water is looking at opportunities to use construction of the Project to support skills and educational attainment locally, and also intends to identify and local educational facilities and resources as part of a Wider Benefits and Legacy	London Borough of Hounslow (Medium) London Borough of Richmond (Very low)	Uncertain	There is currently insufficient detail regarding the nature and extent of proposals to support education and training within the study area to support an assessment of magnitude of impact on population health. This will be assessed in the	Uncertain	There is currently insufficient detail regarding the nature and extent of proposals to support education and training within the study area to support an assessment of significance of effect on population health.	None identified at this stage of assessment.

Theme	Health Determinant	Preliminary description of impacts	Population (sensitivity)	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
		Framework which will also be developed. Further details are provided in Chapter 15: Socioeconomics, Community Access and Recreation.	Royal Borough of Kingston (Very low)		Environmental Statement once further information is available.			
	Employment & income	Chapter 15: Socioeconomics, Community, Access and Recreation assesses that construction of the Project is not likely to have significant effect on employment opportunities within the Greater London Area due to the low number of roles created and the low workforce demand for those roles. For these reasons it's expected that most roles are likely to be filled through redistribution of existing jobs within the local economy.	London Borough of Hounslow (Medium) London Borough of Richmond (Very low) Royal Borough of Kingston (Very low))	Negligible	New employment opportunities are relatively low for the project compared to the local population and those roles which are created would be short term in duration.	Negligible (not significant)	Given the very limited population who would benefit from employment opportunities, no noticeable change in the baseline status of health outcomes associated with this determinant is anticipated.	None identified at this stage of assessment.
	Wider societal infrastructure & resources	This determinant is scoped out of assessment for the construction stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Transport modes, access & connections	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A

Table A.12 Project Wide Operation Effects

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Recreation, social participation and access to green and blue infrastructure	**Physical activity**	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Open space, leisure & play	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of natural environment	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Social participation, interaction & support	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
Residential amenity and community wellbeing	**Community safety**	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Community identity, culture, resilience & influence	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Attractiveness of area & quality of built environment	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Biophysical environment	**Climate change mitigation & adaptation**	The Project is a drought resilience scheme, with the key objective of the Project being to address a forecast deficit in water supply to the London region. Continued security of supply of high quality drinking water is highly important for the economy and society.	London Water Resource Zone (High)	Medium beneficial	The Project would help ensure continued potable water supply during times of drought, and is currently only anticipated to be operational relatively infrequently (once every other year, generally during the late autumn and winter). It will contribute towards resilience of supply for a large population as part of a suite of demand and resource measures implemented through the Thames Water Water Resources Management Plan (WRMP) 2024.	Moderate beneficial	Access to clean water is essential for human health and wellbeing. Water companies have a statutory duty to plan ahead to ensure a secure and resilient water supply.	Groups more vulnerable to disruption in potable water supply include young children, elderly people and people with health conditions that are dependent on additional showering or bathing or require water for medical treatments such as dialysis
	Air quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Noise & vibration	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A
	Water quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Land quality	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A
	Light pollution	Population health effects associated with this determinant are assessed for each individual component of the Project.	N/A	N/A	N/A	N/A	N/A	N/A

Theme	Health Determinant	Preliminary description of impacts	Ward and sensitivity	Magnitude	Magnitude explanation	Significance (general population)	Significance explanation	Vulnerable groups
Socioeconomic environment	**Education & training**	The opportunities for education and skills will be developed as part of the project's legacy strategy.	London Borough of Hounslow (Medium) London Borough of Richmond (Very low) Royal Borough of Kingston (Very low))	Uncertain	There is currently insufficient detail regarding the nature and extent proposals to support education and training within the study area to support an assessment of magnitude of impact on population health. This will be assessed in the Environmental Statement once further information is available.	Uncertain	There is currently insufficient detail regarding the nature and extent proposals to support education and training within the study area to support an assessment of magnitude of impact on population health. This will be assessed in the Environmental Statement once further information is available.	None identified at this stage of assessment.
	Employment & income	There is potential for businesses who are reliant on the Thames corridor downstream of Teddington Lock, such as those who directly or indirectly support water sports and recreational boating, to be adverse affected by any chance in perception of the recreational amenity of the Thames for such activities.	London Borough of Hounslow (Medium) London Borough of Richmond (Very low) Royal Borough of Kingston (Very low))	Uncertain	There is currently insufficient information available to identify those businesses who may potentially be affected. This information will be obtained through consultation and survey activities to inform an assessment to be undertaken for the Environmental Statement.	Uncertain	There is currently insufficient information available to identify those businesses who may potentially be affected. This information will be obtained through consultation and survey activities to inform an assessment to be undertaken for the Environmental Statement.	None identified at this stage of assessment.
	Wider societal infrastructure & resources	The Project involves the provision of new water supply infrastructure that will play a role in supporting the continued population and economic growth within the London Water Resource Zone.	London Water Resource Zone (High)	Low beneficial	The Project would support drought resilience within the London Water Resource Zone, and is anticipated to be operational once every other year. Whilst it would provide benefit to a very large population, it would only be used intermittently and for short term durations, and is only considered likely to contribute to improved quality of life rather than changes in morbidity.	Minor beneficial	The contribution which the Project specifically brings to water resource infrastructure within the study area is only considered likely to lead to a slight change in health baseline.	None identified at this stage of assessment.
	Transport modes, access & connections	This determinant is scoped out of assessment for the operation stage as agreed in the EIA Scoping Opinion. No likely significant population health effects anticipated.	N/A	N/A	N/A	N/A	N/A	N/A