Appendix B Drought options forms (including a summary of the results of environmental assessments)

Drought options forms

Descriptions of all drought options are provided in the tables included in Appendix B. The options are described briefly, covering both demand and supply side options, including drought permit options. The information presented is split into two categories, option implementation assessment information and environmental assessment information. The information presented for the option implementation assessment for each option is as follows:

- Trigger for implementation of the option
- Benefit from the option in Ml/d through either demand saving or supply provision. The demand saving or DO of our drought options is calculated in line with our WRMP methodology which can be found in Appendix I of our WRMP 2019. The methodology used to calculate the yields for our Drought Permit options is included in our Drought Plan main document, section 6.1.4.
- Time taken to implement the option
- Permissions required and constraints relating to the option
- Risks associated with the option

Each option also includes a high level summary of the assessment of the environmental impact of the option, which is principally relevant to the drought permit options. This environmental assessment information covers:

- Risk to the environment
- Summary of potential environmental impacts
- Details of studies undertaken
- Monitoring requirements
- Mitigation actions

The table also identifies impacts the option may have on other activities.

The Appendix B tables closely follow the guidance set out in the Environment Agency's 2020 Drought Plan Guideline.

The options are presented with demand management options included first followed by supply side options which are sorted by WRZ.

Mitigation actions proposed in the EARs along with details of permits and approvals potentially required in order to implement these mitigation measures are presented in the final section of this appendix.

List of Drought Options

Companywide options

		Media campaign to encourage water efficiency
Option Implementation Assessment	**Trigger(s)** Or preceding actions	Drought Event Level (DEL) 1. May be brought in earlier if overall water resource situation warrants it. The media campaign would be enhanced as the drought event develops.
	Demand Saving or DO of Option (Mld)	The demand savings that are likely to accrue from a media campaign are very difficult to estimate. We implemented media campaigns in 2003, 2005/6 and 2012, and the data obtained over that period has been analysed. The assumption included in the LTOA / FCD as part of the savings achieved when the trigger is reached is that there would be saving of between 0 and 2.2 % for London and 0 and 3.8% for Thames Valley. This figure was reviewed following Drought Direct 11.
	Implementation Timetable Preparation time, time of year effective, duration	Preparation time is of relatively short duration as no third party permission is required. The time to implement is therefore restricted to a number of weeks, with the longest lead time item being media booking. A media campaign is effective all year round, with the largest savings likely to be achieved during the spring and summer period due to potential reductions in garden usage
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	No third party permissions are required.
	Risks associated with option	There is little risk associated with this measure.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	There is no risk to the environment associated with this drought option.
	Summary of possible Environmental Impacts	N/A
	Details of studies Undertaken & required	N/A
	Monitoring Requirements	N/A
	Mitigation Actions	N/A
	Impact on Other Activities e.g. Public, Industry etc	There will be minimal impact on other activities.

		Leakage
	Trigger(s) Or preceding actions	Drought Event Level (DEL) 1 (preceding action)/DEL 2 full implementation.
Option Implementation Assessment	**Demand Saving or DO of Option** (Mld)	A number of aspects of leakage-management can be accelerated. • Enhanced leakage activities (may yield up to 20 Ml/d when fully implemented) include: • Reduce repair time for customer side leakage (CSL) to reduce the average run-time of CSL • Increase active leakage Detection & Repair activities (including Trunk Mains) • Reduce visible Repair Cycle Times • Reduce visible leakage burst pipe inspection cycle time Enhanced Pressure management (may yield about 7 Ml/d when fully implemented) covers: • Enhance pressure management in existing schemes (this will require mitigation in tall buildings) • Acceleration of new pressure management areas
	Implementation Timetable Preparation time, time of year effective, duration	Most leakage activities require approximately 1 month planning and preparation before beginning to yield savings. The pressure management activities require significant preparation and investigation, hence will take between 3 to 6 months to implement.
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	To reduce leak repair times permissions would need to be given by the Councils and TFL to allow reduced noticing for street works.
	Risks associated with option	None
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	Low
	Summary of possible Environmental Impacts	Minor adverse effects associated with emissions as a result of construction activities and vehicle movements. Implementation of this measure may prevent other more environmentally damaging measures being required.
	Details of studies Undertaken & required	Not applicable
	Monitoring Requirements	Not applicable
	Mitigation Actions	Not applicable
	Impact on Other Activities e.g. Public, Industry etc	None

		Temporary Use Ban
Option Implementation Assessment	**Trigger(s)** Or preceding actions	DEL 2. May be brought in earlier if overall water resource situation warrants it. Will be preceded by a media campaign to encourage water efficiency.
	Demand Saving or DO of Option (Mld)	The demand savings that are likely to accrue from a temporary use ban are very difficult to estimate. In summary, it is estimated that the demand-side measures for the London WRZ, will provide cumulative savings up to and including Level 3 of 14.5%. For the Thames Valley WRZs the revised cumulative savings are 19.1%.
	Implementation Timetable Preparation time, time of year effective, duration	Preparation time is of short duration as no third party permission is required however we will provide formal notification to customers and allow for representations which will be taken into account. The time to implement is therefore restricted to 3 weeks. Temporary Use Ban will be most effective during the spring and summer growing seasons, but will retain some effectiveness throughout the year due to the impact of the other measures under the temporary use ban.
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	No third party permissions are required
	Risks associated with option	There is little risk associated with this measure.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	Risk to the environment would be minimal, as only private gardens would be affected. Implementation of this measure may prevent other more environmentally damaging measures being required.
	Summary of possible Environmental Impacts	N/A

	Details of studies Undertaken & required	N/A
	Monitoring Requirements	N/A
	Mitigation Actions	N/A
	Impact on Other Activities e.g. Public, Industry etc	The principal impact will be on domestic customers as the ban would preclude the use of hosepipes for those use categories set out under the temporary ban powers. The Temporary Use Ban would include an exemption for commercial businesses in respect of the washing of private cars and washing of windows. The elderly and disabled would also be exempt from the measures imposed under the Temporary Use Ban. There may be some impact on the horticultural business sector in general as plant buying patterns would have the potential to change during the imposition of a Temporary Use Ban

		Drought Plan Direction (England) Drought Order – Non Essential Use Ban
Option Implementation Assessment	**Trigger(s)** Or preceding actions	DEL 3. May be brought in earlier if overall water resource situation warrants it. Will be preceded by a Temporary Use Ban.
	Demand Saving or DO of Option (Mld)	The demand savings that are likely to accrue from a ban on non-essential use are very difficult to estimate. We have not had a ban on non-essential use in place since 1990 an application was made in 2006, but this was withdrawn after the situation improved. The assumption included in the LTOA / FCD for the savings achieved when the measure is implemented is that there would be a saving of between 0 and 4.4% for London and 0 and 4.8% for Thames Valley depending on time of year. This saving would be achieved together with the savings arising from the temporary use ban.
	Implementation Timetable Preparation time, time of year effective, duration	Preparation time would be required to prepare the Statement of Reasons, for the public consultation, the public hearing if required and the determination by the Secretary of State. The time to implement is therefore a likely minimum of 8 weeks but could run to 10 weeks or more.
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Permission is required from the Secretary of State. A public hearing is likely to be required in order to enable objectors representations to be heard.
	Risks associated with option	There is little risk associated with this measure.
Environmental	**Risk to the Environment** (High/Medium/Low or unknown)	Risk to the environment would be **low**, with private gardens and parks affected. Implementation of this measure may prevent other more environmentally damaging measures being required.

	Summary of possible Environmental Impacts	N/A
	Details of studies Undertaken & required	N/A
	Monitoring Requirements	N/A
	Mitigation Actions	N/A
	Impact on Other Activities e.g. Public, Industry etc	The option carries the risk of economic impact on businesses that benefit directly or indirectly from water usage that may be banned under the terms of the Drought Direction 2011. These include window cleaning businesses, building washing businesses, sports and leisure facilities, vehicle washing businesses, garden equipment and plant sellers. However, there is the potential to be selective in implementing a ban on specific uses of water that may be included in a NEUB Drought Order, which provides the opportunity to minimise economic impact where appropriate. A Regulatory Impact Assessment will be submitted with any application for Emergency Drought Orders to provide an assessment of the costs and benefits of the implementation of this option.

		Emergency Drought Order
Option Implementation Assessment	**Trigger(s)** Or preceding actions	DEL 4. May be brought in earlier if overall water resource situation warrants it, or if there are specific water resource / supply problems in localised areas. Emergency Drought Orders will be used as a last resort, when all other reasonable drought measures have been implemented.
	Demand Saving or DO of Option (Mld)	The demand savings that are likely to accrue from an emergency drought order are very difficult to estimate. We have not implemented an Emergency Drought Order. The assumption included in the LTOA / FCD for the savings achieved when the measure is implemented is that there would be saving of 18% in London and Thames Valley. The extent of the supply and demand restrictions imposed under an Emergency Drought Order can be increased where necessary, and so the demand saving will be adjusted to match the available water supply.
	Implementation Timetable Preparation time, time of year effective, duration	Preparation time would be required to prepare the Statement of Reasons, for the public consultation, the public hearing if required and the determination by the Secretary of State. Due to the likely contentious nature of the measure, it is likely that the process will take longer than the application for Ordinary Drought Orders. It is estimates therefore that the time to implement is a minimum of 8 weeks but could run to 10 weeks or more.
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Permission is required from the Secretary of State. An Inquiry would be required in order to enable objectors representations to be heard.

	Risks associated with option	In the event that the water supply situation is such that widespread supply restrictions are required, there are potentially significant public health and public order risks associated with the imposition of Emergency Drought Orders.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	Risk to the environment would depend on the seriousness of the overall water supply situation and the demand restriction measures imposed. Significant adverse effects may arise as a result of restricting water use with potential impacts for recreation and tourism assets, and businesses/economy (population and human health. It is likely, however, that if Emergency Drought Orders are required, they will not contribute significantly to any overall environmental damage caused by the lack of water resources.
	Summary of possible Environmental Impacts	N/A
	Details of studies Undertaken & required	N/A
	Monitoring Requirements	N/A
	Mitigation Actions	N/A
	Impact on Other Activities e.g. Public, Industry etc	Depending on the scale of the required demand and supply restrictions, there could potentially be significant impact on the daily lives of the public and on the economy of the affected area. A Regulatory Impact Assessment will be submitted with any application for Emergency Drought Orders to provide an assessment of the costs and benefits of the implementation of this option.

London Strategic Options

		Thames Gateway Water Treatment Works
Option Implementation Assessment	**Trigger(s)** Or preceding actions	TGWTW Operating Agreement naturalised Teddington flow remains at or below 3000Ml/d for 10 or more days and DEL (DEL) is at least DEL1.
	Demand Saving or DO of Option (Mld)	100 Ml/d
	Implementation Timetable Preparation time, time of year effective, duration	The TGWTW would take between 4-6 weeks to ramp up to full output although this may be up to 90 days if the plant has recently had significant replacement of essential components. This estimate is based on our current protocol of running the plant in the early part of the year to ensure it is in state of readiness so that the ramping up to close to maximum output is from a status of water into supply of approximately 50 Ml/d. The Environment Agency must be informed before the scheme is switched on. Normally the scheme would be implemented at lower than full output and gradually increased.

	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	We hold an abstraction licence for the scheme There is also an Operating Agreement governing use of the scheme. We would inform the Environment Agency before commencing use of the scheme as soon as it knew that there was a risk of the scheme being required.
	Risks associated with option	The scheme is low risk from a water resources perspective.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	**Low**. The abstraction is from the Thames tideway and so there is no significant impact on water resources. There is risk of fish entrainment at the intake but Thames Water has installed an acoustic fish barrier and fish entrainment protection screens. The abstraction is also operated to minimise the abstraction close to the point of low tide when the sweeping velocity at the abstraction point is at its lowest.
	Summary of possible Environmental Impacts	See above – impacts are principally related to potential for fish entrainment. Additional short-term, temporary effects on air quality and GHG emissions due to additional abstraction, treatment and pumping.
	Details of studies Undertaken & required	A fish entrainment monitoring programme has been instigated at the intake to monitor the effectiveness of the fish entrainment protection measures installed and to determine the optimum time period that abstraction should take place in relation to point of the low tide.
	Monitoring Requirements	Monitoring requirements are set out in the TGWTW OA and includes requirements to monitor fish entrainment.
	Mitigation Actions	The impacts on fish entrainment are mitigated through the acoustic fish barrier, fish entrainment protection screens and timing of abstraction to minimise risk of entrainment.
	Impact on Other Activities e.g. Public, Industry etc	The scheme has minimal impact on other activities. The operation of the scheme results in an increased discharge to the Tideway through the Beckton STW effluent outfall although this is insignificant in terms of the assimilation capacity of the Tideway and is covered through a Discharge Consent.

(1) For demand management options include percentage reduction on peak week demand

		North London Artificial Recharge Scheme
	Trigger(s) Or preceding actions	NLARS Operating Agreement. Teddington target flow reduces down to 600/400 Ml/d curve (Level 1 curve on the Lower Thames Control Diagram).
	Demand Saving or DO of Option (Mld)	The scheme is licensed for 275 Ml/d peak and 150 Ml/d average. The current peak yield is 220Ml/d which declines to 156Ml/d as the scheme is used.
Option Implementation	**Implementation Timetable** Preparation time, time of year effective, duration	The scheme is ready to operate at short notice and switch on to full operation is expected to take 7-30days. The Environment Agency must be notified before the scheme is switched on. Normally the scheme would be implemented at lower than full output and gradually increased. The scheme can be run over a period of 16 months however the yield would decline over this period as groundwater levels recede.

	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	We hold an abstraction licence for the scheme and there is also an Operating Agreement governing use of the scheme. We would inform the Environment Agency before commencing use of the scheme.
	Risks associated with option	The scheme requires the aquifer from which it abstracts to be recharged to keep it in a state of readiness for strategic use during a drought. In a prolonged drought the scheme yield is likely to reduce and so its use diminishes gradually during severe and extended drought periods. The scheme will require an extensive period of recharge, ideally over several years, following significant use during a drought and so the yield is vulnerable to periods where successive droughts follow closely without several seasons to allow recharge of the scheme. There is a low risk of WQ deterioration during extended pumping under severe drought conditions. This risk could include enhanced migration of bromate contamination towards the NLARS boreholes, but geochemical reduction of bromate in the confined aquifer will mitigate this risk.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	Low. The scheme abstracts from the confined aquifer under north London and so has no impact on surface water levels.
	Summary of possible Environmental Impacts	See above
	Details of studies Undertaken & required	
	Monitoring Requirements	Monitoring requirements are set out in the NLARS Operating Agreement and include requirements to monitor groundwater levels and water quality.
	Mitigation Actions	None required.
	Impact on Other Activities e.g. Public, Industry etc	The scheme will have an impact on groundwater levels. As part of the licence application process risks of derogation were assessed and addressed where necessary.

		WBGWS (West Berkshire Groundwater Scheme)
Option Implementation	**Trigger(s)** Or preceding actions	Level 2 on the Lower Thames Control Diagram
	Demand Saving or DO of Option (Mld)	123Ml/d reducing to 66Ml/d benefit to London. The scheme will also provide benefit to the Fobney abstraction during a severe drought as it will enable the full licence limit of 72 Ml/d to be abstracted at Fobney whilst maintaining the required residual flow down the Holy Brook of 45-50 Ml/d.

	Implementation Timetable Preparation time, time of year effective, duration	The scheme is ready to operate with a notice requirement of 28 days to be provided to the Environment Agency. The implementation time for full operation is between 2-21 days which would run concurrently with the notification period to the Environment Agency.
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	The abstraction licence for the scheme is held by the Environment Agency and so their permission is required to operate the scheme and it is the Environment Agency who would actually operate the scheme. There is an Operating Agreement governing use of the scheme, through which Thames Water would notify the Environment Agency 28 days before requiring the scheme to be implemented.
	Risks associated with option	In a prolonged drought the scheme yield is likely to reduce and so its benefit would diminish during severe and extended drought periods. Also the scheme will require an extensive period (up to 2 years of average annual rainfall) of recovery following significant use during a drought and so the yield is vulnerable to periods where successive droughts follow closely without several seasons to allow recharge of the scheme.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	**Medium.** The scheme abstracts from a series of well fields and water is discharged to watercourses in Berkshire and so has a beneficial environmental impact on these watercourses during a prolonged drought. However the impact of extensive pumping is likely to lead to suppressed groundwater levels in the months following the drought which might cause adverse environmental impact through reduction in groundwater levels at some sites.
	Summary of possible Environmental Impacts	Abstraction from the WBGWS, and associated suppressed groundwater levels, has the potential to have an impact on qualifying features of the Kennet and Lambourn Floodplain SAC and the River Lambourn SAC. The HRA concluded that LSEs could not be ruled out and a Stage 2 Appropriate Assessment was undertaken. This concluded that with consideration of a hydrometric monitoring programme and appropriate mitigation measures (previously agreed between the Environment Agency and Thames Water), no adverse effects on site integrity are anticipated from the implementation of the WBGWS.
	Details of studies Undertaken & required	The Environment Agency has undertaken a review of consents as required by the Habitats Directive, which included an assessment of the impact of the WBGWS on the Kennet and Lambourn floodplain SAC, Thatcham Reedbeds SAC and the River Lambourn SAC. Thames Water is in the process of implementing a scheme to address the potential impact of the scheme on the Thatcham Reedbeds SAC.
	Monitoring Requirements	Monitoring of river flows and groundwater levels would be required prior to, during and following operation of the scheme and this would be undertaken by Thames Water and the Environment Agency.
	Mitigation Actions	Mitigation measures will be discussed and agreed with the Environment Agency as required when the scheme is operated.
	Impact on Other Activities e.g. Public, Industry etc	The scheme will have an impact on groundwater levels and so other groundwater abstractors may find that their ability to abstract is affected if groundwater levels fall to very low levels.

		Reduction in lowest residual flow on the LTCD from 300Ml/d to 200Ml/d
Option Implementation Assessment	**Trigger(s)** Or preceding actions	The trigger for reduction in residual flow on the LTCD from 300Ml/d to 200 Ml/d would be agreed between the Environment Agency and Thames Water during a potentially severe drought following analysis of regional catchment wide groundwater levels and is likely to be implemented following the early introduction of demand side measures. The preceding actions would include media campaign, Temporary Use Ban and possibly a Non Essential Use Ban.
	Demand Saving or DO of Option (Mld)	The gain in abstraction capability would be 100 Ml/d.
	Implementation Timetable Preparation time, time of year effective, duration	The timing and duration would be dictated by the timing of the crossing of the level 3 trigger line on the LTCD. The preparation time would be the time taken to agree the measure with the Environment Agency.
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Guidance on what residual flow should be allowed over Teddington weir is outlined in the Lower Thames Control Diagram (LTCD). Agreement would be sought with the Agency to change from the guidance provided by the LTCD. The LTCD forms part of the LTOA which is enshrined in a Section 20 Agreement with the Environment Agency. Written agreement between the Environment Agency and Thames Water would be required to enable this option to be implemented. The Port of London Authority would be informed when residual flows are reduced to the lower levels.
	Risks associated with option	The option has risk associated with the ability to control residual flows down to the level of 200 Ml/d. There will also be risk to navigation as levels are likely to be difficult to maintain in the lower Thames. There is also the potential for risk to navigable levels in the Upper Tideway when residual flows over Teddington weir fall to very low levels.
	Risk to the Environment (High/Medium/Low or unknown)	**Medium.** The risks would be associated with the lower residual flow over Teddington weir with potential implications for water quality issues, which may have impact on ecology in the Tideway.
	Summary of possible Environmental Impacts	Reduced residual flow over Teddington weir could lead to water quality impacts with potential impact on ecology in the Tideway.
Environmental Assessment	**Details of studies** Undertaken & required	No specific studies have been undertaken for this option. However information from previous work carried out on the Lower Thames and the Tideway could be used if necessary to assess the potential impact, together with work carried out on modelling of water quality in the Thames Tideway.
	Monitoring Requirements	Flow monitoring would be required to ensure correct residual flow over Teddington weir was maintained.
	Mitigation Actions	No mitigation has been identified as required.
	Impact on Other Activities e.g. Public, Industry etc	The principal impact will be on navigation issues. The Environment Agency are likely to experience difficulties when the residual flow over Teddington weir is reduced to 200 Ml/d. Reduced residual flow over Teddington weir may lead to difficulties in maintaining navigable levels in the upper Tideway.

		Earlier reduction in residual flow on the LTCD
Option Implementation Assessment	**Trigger(s)** Or preceding actions	The triggers for reduction in residual flow on the LTCD would be agreed between the Environment Agency and Thames Water during a potentially severe drought following analysis of regional catchment wide groundwater levels and is likely to be implemented following the early introduction of demand side measures. The preceding actions are likely to include media campaign, and possibly Temporary Use Ban/sprinkler ban.
	Demand Saving or DO of Option (Mld)	The gain in abstraction capability would be equal to the difference in reduction agreed at each stage on the LTCD, for the period when that flow band is operable.
	Implementation Timetable Preparation time, time of year effective, duration	The preparation time would be the time taken to agree the measures with the Environment Agency.
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	Guidance on what residual flow should be allowed over Teddington weir is outlined in the Lower Thames Control Diagram (LTCD). Agreement between the Environment Agency and Thames Water is required to change from the guidance provided by the LTCD. The Port of London Authority would be informed when residual flows are reduced to the lower levels on the LTOA.
	Risks associated with option	No risks have been identified for this option.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	Risk to the environment would be **low**. The risks would be associated with the lower residual flow over Teddington weir being brought forward by a short period with potential implications for water quality issues, which may have minor impact on ecology in the Tideway.
	Summary of possible Environmental Impacts	Reduced residual flow over Teddington weir could lead to water quality impacts with potential impact on ecology in the Tideway.
	Details of studies Undertaken & required	No studies are required for this option.
	Monitoring Requirements	Flow monitoring would be required to ensure correct residual flow over Teddington weir was maintained.
	Mitigation Actions	No mitigation measures have been identified as required.
	Impact on Other Activities e.g. Public, Industry etc	None.

SWOX and Other WRZ Drought Permit Options

Assessment	Farmoor Drought Permit
Action to maintain water supply	Farmoor Drought Permit. Allows an additional 10-30Ml/d to be abstracted direct from the river in addition to that allowed by the existing licence
Risk to the environment (High, medium or low) and how you have assessed this	Medium. Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Major/Major adverse, short term effects to hydrology were identified for Reach 1, and Minor effects on velocity and level in Reach 2. There is a high risk to water quality in both the mainstem of the River Thames and distributaries, specifically with regard to SRP. Discharge pressures (STW discharges) pose a risk to water quality in both the mainstem of the River Thames and distributaries (this includes risks associated with the back pumping element of the scheme). Moderate adverse, short term effects with respect to Biodiversity, flora and fauna including moderate adverse effects regarding INNS, fish community. The macroinvertebrate components of the Thames (Leach to Evenlode) (GB106039030333) and Thames (Evenlode to Thame) (GB106039030334) water bodies are considered to be at minor risk of short-term deterioration. The fish components of the Thames (Leach to Evenlode) and Thames (Evenlode to Thame) waterbodies are considered to be at Moderate risk of short term deterioration. As the third WFD water body, Thames (Wallingford to Caversham), has been classified as bad potential, a deterioration in status is not possible, however the site is at minor short-term risk of not achieving good ecological potential Moderate adverse, short term effects to recreational use of the River Thames due to potential effects to navigation and angling. Detailed impact assessment included in the associated EARS
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency and NE.
Effects on other activities, e.g. fisheries or industry	Any potential impacts on other users are addressed in the Environmental Assessment Report. Specifically, statutory navigation may be impacted due to water levels and water quality. Angling may be impacted due to environmental factors. Public enjoyment may be compromised due to water quality issues. Didcot power station's abstraction may be affected, as may other abstractors from the Thames.

Assessment	Meysey Hampton Drought Permit
Action to maintain water supply	Meysey Hampton Drought Permit. DP allows us to pump an additional 11.37Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	Medium Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Moderate adverse, short-term hydrological effects are predicted on four reaches of river as they may remain dryer for longer as result of the drought option. This would result in medium risks to water quality as dissolved oxygen saturation levels may be affected by lower river flow. Moderate adverse, short-term effects on NERC fish species are predicted, comprising increased stress and predation on species in refuges as a result of delay in recovery of flows, reduction in species abundance or distribution as a result of changes in water quality, and impacts on spawning potential. Minor adverse effects on the local designated site Down Ampney Pits KWS may occur, however it is resilient to the impacts of desiccation as movement of water from the aquifer to surface waterbodies often ceases in dry summers. The WFD features include macroinvertebrates, macrophytes, fish and diatoms. The significance of impacts are considered to be Minor for macroinvertebrates, macrophytes and negligible for diatoms. Impacts on fish were considered to be of Minor significance in Reaches 1, 2 and 6and Moderate significance in Reaches 3 to 4. Detailed impact assessment included in the associated EARS
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Any potential impacts on other users are addressed in the Environmental Assessment Report There may be possible downstream impacts on angling, however no statutory right of navigation exists on the Ampney Brook. The effect on other abstractors in the area is very low to none. Impacts on 'Archaeology and Heritage' have been assessed as 'Negligible'. '

Assessment	Childrey Warren Drought Plan
Action to maintain water supply	Childrey Warren Drought Permit – 4.5Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	High - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Major impact, short-term, temporary effects on water levels and flows are anticipated, comprising a 100% decrease in flow on Reach 1 of Letcombe Brook and associated High risk to water quality with regard to SRP and Medium risk with regard to water temperature, ammonia and dissolved oxygen. This is likely to contribute to significant short/medium, temporary effects on biodiversity, flora and fauna (in particular effects on NERC species brown trout). A Major impact on WFD status is predicted based on the impact of the drought option on macroinvertebrates and macrophytes. Other adverse effects anticipated include changes to the distribution and abundance of invasive flora and geomorphological changes (shallower banks affected by drought action). There will also be minor, short-term drying-up of Letcombe Brook along existing trails and footpaths, and minor increases in energy use and waste generation due to abstraction and treatment of additional water. Details are provided in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency. Mitigation could be provided through use of one of the WBGWS boreholes to augment the top of the Letcombe Brook.
Effects on other activities, e.g. fisheries or industry	Potential for impact on angling, however assessed as a negligible impact and potential impacts on recreation.

Assessment	Baunton 1 Drought Permit	Baunton 2 Drought Permit
Action to maintain water supply	Baunton 1 Drought Permit - Depending on availability and demand 0-6.3 Ml/d will be abstracted	Baunton 2 Drought Permit - Increasing abstracting at Baunton, above the additional 6.3Ml/d from step 1, to the emergency level of 17Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	Medium	High

	Depending on the antecedent conditions there is a risk that additional abstraction may affect flow and water levels in the river Churn. Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.	Depending on the antecedent conditions there is a risk that additional abstraction may affect flow and water levels in the River Churn. Due to the larger volumes associated with step 2, the risk is greater. Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Major adverse effect on the upper reach of the River Churn, Moderate adverse, short-term effects on the middle reach of the River Churn and a Minor adverse effect on the lower reach of the River Churn. The upper and middle reach effect is associated with a delayed recovery of groundwater contributing to flow, with the lower reach effect associated with reduced flow from upstream. An additional reach in the River Coln will experience moderate flow reductions associated with groundwater drawdown. Moderate, adverse, short-term effects on NERC fish species are possible, as are minor (uncertain) effects on the nationally designated site North Meadow SSSI as offtakes from the River Churn support the macrophyte community at the site (uncertainty surrounds the water level management practice at the site). The River Churn (Source to Perrott's Brook) (GB106039029810), River Churn (Baunton to Cricklade) (GB106039029750), Frome - Ebley Mill to confluence River Severn (GB109054032470) and Coln - source to Coln Rogers (GB10603902999) waterbodies are considered at Minor risk of short-term deterioration of WFD status for macroinvertebrates, macrophytes and fish. Detailed impact assessment included in the associated EARs.	There are seven impacted reaches over five rivers (three reaches in the River Churn, one reach in each of the following watercourses: Cirencester watercourses, Ampney Brook, River Frome and River Coln). As a result of implementing the drought option a Major effect on hydrology is anticipated in three reaches (one reach in River Churn, one reach of the River Frome and one reach of River Coln), Moderate impact in two reaches of the River Churn , a Minor impact in one reach of Ampney Brook and a Negligible impact on the Cirencester Watercourses. With an overall assessment of major adverse, short term effects identified. Moderate, adverse, short-term effects on NERC fish species are possible, negligible effects on the nationally designated site North Meadow SSSI as offtakes from the River Churn. Landscape and visual effects are anticipated to be negligible despite the drought option being located in Cotswolds AONB, due to the natural drying of the reaches in natural drought conditions, it is unlikely that drought permit implementation will have significant impacts on the local distinctiveness of the landscape. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment

	Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.	Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Negligible impacts expected on angling and other abstractors.	Negligible impacts expected on angling and other abstractors.

Assessment	Latton Drought Permit
Action to maintain water supply	Latton Drought Permit - 5Ml/d increase in average licence limit.
Risk to the environment (High, medium or low) and how you have assessed this	Low Previous hydrogeological conceptualisation suggests that at low flows in the Churn, the additional abstraction volume at Latton draws from aquifer storage rather than at the expense of surface river flows. Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Minor adverse, short-term hydrological effects are predicted on three reaches of river as they may remain dryer for longer as result of the drought option and lead to a reduction in flows. This would result in minor to moderate adverse effects to water quality, due to reduced dissolved oxygen saturation and increased SRP concentration. Minor adverse, short-term impacts on the feasibility of some other groundwater abstractions in the study area are possible. Moderate risks to water quality in Reach 1 are anticipated, associated with the discharge from a STW. Minor adverse, short-term effects on NERC fish species brown trout, brook lamprey and eel, and Minor adverse effects on the Down Ampney Pits KWS are anticipated due to reduction in abundance or distribution of species supported by the designated site or deterioration in habitat quality, causing a decline in ecological status of the site. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place.

	Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Minor adverse, short-term impacts on the feasibility of some other groundwater abstractions in the study area are possible. Any potential impacts on other users will be addressed in the EAR. There is potential to affect other abstractors and dischargers downstream as well as other abstractors from the aquifer (small agricultural uses) bearing in mind the likely lack of any significant impacts.

Assessment	Oxford Canal Drought Permit
Action to maintain water supply	Oxford Canal Drought Permit – potentially 5-10Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	**Low .** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	A precautionary assessment based on very small increases to flow and velocity in Reach 1 of the Oxford Canal found a minor impact overall. No impacts on geomorphology, water quality and other abstractors are expected. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Low potential for other impacts. Any impact on the Canal would be agreed as acceptable with CRT.

Assessment	Ogbourne Emergency Boreholes Drought Permit
Action to maintain water supply	Ogbourne Emergency Boreholes Drought Permit - 4 Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	**Medium.** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Moderate adverse, short-term effects to water are likely as the abstraction will cause the River Og to remain dry for longer. Flow changes in the River Kennet are considered Minor, however there is a High risk to water quality associated with the Marlborough STW discharge due to reduced dilution in the River Kennet during drought permit implementation. Moderate risk to water quality is anticipated with regard to SRP in both reaches. Moderate and minor adverse, short-term effects are anticipated with respect to biodiversity, flora and fauna. Moderate impacts on fish may occur due to an extension in duration of River Og being dry, and a reduction in flows in the River Kennet. Changes in flow in the River Kennet (a designated SSSI) also have potential for moderate adverse, short-term effects on macroinvertebrates. The Middle Kennet water body is considered at moderate risk of short-term deterioration of WFD status for macroinvertebrates and fish. A minor adverse, short-term effect on angling and recreation relates is possible due to impacts on fish communities. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	There is a significant high value angling interest associated with the River Kennet. Any impacts of additional abstraction on angling will be considered. There may be recreational impacts as a result of the requirement to include temporary pipelines across footpaths and bridleways. The drought option falls within the North Wessex Downs AONB, impacts on aesthetics will be considered in the impacted reach.

Assessment	Ogbourne Drought Permit
Action to maintain water supply	Ogbourne Drought Permit - Abstract 3.5 Ml/d from the existing Osbourne boreholes used in the revoked licence.

Risk to the environment (High, medium or low) and how you have assessed this	**Medium.** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Moderate adverse effects on hydrology are expected in reach 1 due to anticipated increased dry periods and decreased wetted perimeter. Hydrological impact in Reach 2 is anticipated to be Minor. Moderate risk to water quality is anticipated with regard to SRP, and Negligible risk associated with dissolved oxygen and ammonia concentration. There is a high risk to water quality associated with the Marlborough STW discharge due to reduced dilution in the River Kennet during drought permit implementation. Minor to Moderate adverse short-term effects are anticipated with respect to biodiversity, flora and fauna. Impacts on fish may occur due to an extension in duration of River Og being dry, and a reduction in flows in the River Kennet. Changes in flow in the River Kennet (a designated SSSI) also have potential for Minor adverse, short-term effects on macroinvertebrates. The Middle Kennet water body is considered at Minor risk of short-term deterioration of WFD status for macroinvertebrates and fish. A minor adverse, short-term effect on angling and recreation relates is possible due to impacts on fish communities. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	There is a significant high value angling interest associated with the River Kennet. Any impacts of additional abstraction on angling will be considered. There may be minor impacts associated with the North Wessex Downs AONB, particularly associated with lowering of river levels

Assessment	Axford 1 Drought Permit
Action to maintain water supply	Axford 1 Drought Permit - Increase abstraction from 6Ml/d average to 13.1 Ml/d peak and average
Risk to the environment (High, medium or low) and how you have assessed this	**Medium** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated	Moderate adverse, short term reductions in flows in the River Kennet would manifest as a reduction in levels and velocities during drought permit implementation. Medium risks to water quality in the River Kennet may occur with regard to SRP. Under dry weather conditions there would be a subsequent delay in groundwater recovery, but this is unlikely to prevent recovery

sites). Assess the likely impact on WFD ecological and chemical status.	occurring during the hydrological winter (October to March). Moderate adverse, short-term effects are anticipated with respect to biodiversity, flora and fauna. Impacts regarding River Kennet SSSI Conservation Objectives are considered moderate during drought permit implementation and minor during the period of groundwater recovery. Negligible adverse effects predicted for the Kennet and Lambourn SAC. The macroinvertebrate, fish and macrophyte components of the Middle Kennet (Marlborough to Hungerford) water body (GB106039023172) would be at moderate risk of short-term deterioration or prevention of achieving GES with drought permit implementation. Potential moderate impacts on sea trout and brown trout (NERC Act Section 41 Species) between May and December with drought permit implementation as well as Moderate impacts on chalk stream habitat. Potential for minor adverse effects with respect to the change in water levels in the River Kennet and the landscape it flows through which includes the North Wessex Downs AONB. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	There is a significant high value angling interest associated with the River Kennet. Any impacts of additional abstraction on angling will be considered. Impacts on 'Archaeology and Heritage' have been assessed as 'negligible'. The drought option falls within the North Wessex Downs AONB, an assessment is included in the EAR with negligible impacts identified.

Assessment	Axford 2 Drought Permit
Action to maintain water supply	Axford 2 Drought Permit - Option would be to increase from 13.1 Ml/d to 20 Ml/d peak and average i.e. an increase of 6.9 Ml/d.
Risk to the environment (High, medium or low) and how you have assessed this	High Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Major adverse, short term hydrological effects are expected in relation to a reduction in flows for Reach 1 and 2 of the River Kennet, that would manifest as a reduction in levels and velocities during drought permit implementation. Moderate effects are expected for Reach 3 as flow reductions would be mitigated by contribution of flow from the River Dun. Medium risks to water quality in the River Kennet may occur with regard to SRP and dissolved oxygen. Under dry weather conditions, there would be a subsequent delay in groundwater recovery, but this is unlikely to prevent recovery occurring during the hydrological winter

	(October to March). Moderate adverse, short-term effects are anticipated with respect to biodiversity, flora and fauna. Impacts regarding River Kennet SSSI Conservation Objectives are considered moderate during drought permit implementation and during the period of groundwater recovery. Negligible adverse effects predicted for the Kennet and Lambourn SAC. The macroinvertebrate, fish and macrophyte components of the Middle Kennet (Marlborough to Hungerford) water body (GB106039023172) would be at Moderate risk of short-term deterioration or prevention of achieving GES with drought permit implementation. Potential moderate impacts on NERC Act Section 41 Species sea trout and brown trout and minor impacts on eel are anticipated as a result of drought permit implementation. Effects with respect to the change in water levels in the River Kennet and the landscape it flows through which includes the North Wessex Downs AONB is assessed as . Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	There is a significant high value angling interest associated with the River Kennet. Any impacts of additional abstraction on angling will be considered. Impacts on 'Archaeology and Heritage' have been assessed as 'Minor or negligible'. The drought option falls within the North Wessex Downs AONB, an assessment is included in the EAR with negligible impacts identified.

Assessment	Fobney Emergency Boreholes Drought Permit
Action to maintain water supply	Fobney emergency boreholes Drought Permit - 12 - 30Ml/d.
Risk to the environment (High, medium or low) and how you have assessed this	Low - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Four reaches will be impacted, three on the River Kennet all identified as having negligible hydrological impacts, and one on Holy Brook, identified as having a minor impact. The impact on Holy Brook would include reductions in velocities and wetted width in isolated areas where channel banks are shallower, while this would not occur on the River Kennet as it is level-controlled. Medium risks to water quality in Holy Brook may occur, comprising elevated SRP concentrations that may downgrade diatom and macrophyte status downstream. The Reading STW may present a medium water quality pressure to the River Kennet downstream of the confluence with Foudry Brook, due to influences on ammonia, dissolved oxygen saturation

	and SRP. Minor declines in habitat suitability for sensitive flora and fauna species may occur, as may moderate adverse effects due to air emissions associated with increased abstraction. Holy Brook forms part of the landscape and visual amenity value of Southcote Linear Park, and impacts on river levels may adversely impact the visual amenity of the park for walkers and those who visit the park. However, all adverse effects identified are short-term and temporary, and not expected to extend beyond six months. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place.. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	The other impacts are likely to be minor; there is a negligible impact to other abstractors. Impacts on 'Archaeology and Heritage' have been assessed as 'Negligible'.

Assessment	Fobney Direct Drought Permit
Action to maintain water supply	Fobney Direct Drought Permit - This option could provide increased flow past the Fobney Intake of between 0-20Ml/d.
Risk to the environment (High, medium or low) and how you have assessed this	**Medium -** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	If implemented, the drought permit would have a major adverse hydrological impact on Holy Brook between the Arrowhead control structure and its confluence with the River Kennet. Impacts will manifest as a reduction in lowest flows of up to 40%, along with reductions in velocities, levels and wetted widths. There would be a medium water quality risk for SRP during the drought permit implementation. Habitat availability would be negatively affected through reductions in loss of marginal habitats in localised areas, adversely affecting macroinvertebrates, macrophytes and phytobenthos, and fish. Holy Brook forms part of the landscape and visual amenity value of Southcote Linear Park, and impacts on river levels may adversely impact the visual amenity of the park for walkers and those who visit the park. However, all adverse effects identified are short-term and temporary, and not expected to extend beyond six months. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.

A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Medium impact on Southcote Linear Park and angling.

Assessment	Gatehampton Drought Permit
Action to maintain water supply	Gatehampton Drought Permit - Depending on availability and demand an increase of 3.5 Ml/d will be abstracted
Risk to the environment (High, medium or low) and how you have assessed this	Low- Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	There are negligible hydrological impacts associated with Gatehampton drought permit implementation. No impacts on biodiversity, geomorphology, water quality and other abstractors are expected. There may be minor adverse effects due to emissions to air associated with additional abstraction and proximity to nature conservation sites. All adverse effects identified are short-term and temporary. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Negligible impact on other activities.

Assessment	Pangbourne Drought Permit
Action to maintain water supply	Pangbourne Drought Permit – 7Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	**Medium-** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Negligible hydrological effects are anticipated on the River Pang from the Blue Pool to the confluence with River Thames. However, temporary adverse impacts ranging from major to negligible are anticipated on Sulham Brook. Major adverse hydrological effects are predicted due to extension of the period Sulham Brook would be dry, and major effects on water quality in Sulham Brook are also expected due to low dissolved oxygen saturation and reduced dilution of Pangbourne STW discharges. Moderate impacts on the geomorphology of Sulham Brook are possible, associated with reduced flows in areas where bank slope is shallow. Minor, short-term impacts on NERC fish species (brown trout and European eel) and notable county and regional level species and habitat (bullhead, brook lamprey and chalk streams) are possible. Negligible impacts were identified for nationally designated site Sulham and Tidmarsh Woods & Meadows SSSI. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Low Impact.

Assessment	Harpsden/Sheeplands Drought Permit
Action to maintain water supply	Harpsden Drought Permit – up to 6Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	**Low -** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects	Negligible environmental impacts identified.

(include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Low Impact.

Assessment	Albury Drought Permit
Action to maintain water supply	Albury Drought Permit – up to 6.8 Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	**Medium -** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Major adverse effects on water quality may occur due to elevated SRP concentrations, and moderate adverse hydrological effects are expected on the two reaches of Law Brook. Moderate adverse effects on NERC species (brown trout) are anticipated, as are minor adverse effects on white-clawed crayfish due to an increase in invasive macroinvertebrates resulting in increased predation. Minor effects on WFD communities are expected for Reach 1 and moderate on WFD status for fish is anticipated for Reach 2. There would be minor impacts on angling at ponds along Law Brook, and minor adverse effects associated with air and greenhouse gas emissions. Minor geomorphological changes are also expected. Adverse effects are largely limited to Reach 2 (Law Brook from Ford Cress Beds to confluence with River Tillingbourne), and are predominantly short-term and temporary. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place.

	Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Any potential impacts on other users will be addressed in the Environmental report. The drought option falls within the Surrey Hills AONB, impacts on aesthetics will be considered in the impacted reach.

Assessment	Bibury Drought Permit
Action to maintain water supply	Bibury Drought Permit – up to 5Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	Low - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Potential adverse effects identified relate to a Minor reduction in flow in both reaches on the River Coln, and associated Minor impacts water quality in lower reach of the River Coln associated with Fairford STW (associated with ammonia and dissolved oxygen). Minor impacts on NERC species, WFD status and the geomorphology of the reaches is anticipated as a result of drought option implementation. There may also be Minor adverse temporary effects related to construction. All impacts identified will be short-term and temporary. Detailed impact assessment included in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Any adverse impact on the trout farm would need to be investigated. The drought option falls within the Cotswolds AONB, impacts on aesthetics will be considered in the impacted reach.

Assessment	Playhatch Drought Permit
Action to maintain water supply	Playhatch Drought Permit - 4.1Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	Low - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	No adverse hydrological impacts identified.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	There are unlikely to be any impacts on other users.

Assessment	Shalford Drought Permit
Action to maintain water supply	Shalford Drought Permit - 5Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	Low - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Flow reductions associated with implementation of the drought permit on the River Wey upstream of the River Tillingbourne will be negligible. Downstream impacts would be proportionally less with flow contributions coming from the River Tillingbourne and Guildford STW. Negligible adverse hydrological impacts were identified, impacts on geomorphology, water quality and other abstractors are also expected to be negligible.

Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	There are unlikely to be any impacts on other users.

Assessment	Pann Mill Drought Permit
Action to maintain water supply	Pann Mill Drought Permit – 7.3Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	High - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Major adverse effects have been identified in relation to a reduction in flow in the River Wye (Reach 2 - from Pann Mill PS to Little Marlow STW discharge) to its lowest level during drought permit operation. Moderate adverse effects identified for Reach 3 with flow in the river (Wycombe Marsh Brook from 1 km downstream of Pann Mill PS to its confluence with the River Wye). Other adverse effects relate to the impacts of this low flow on biodiversity (including loss of habitat and spawning areas affecting Brown Trout), and water quality (with moderate risks to dissolved oxygen, ammonia and SRP in Reach 2). Overall moderate adverse effects on fish and macroinvertebrate communities are predicted, with potential for moderate adverse impacts on brown trout (NERC fish species) and notable macroinvertebrate species. However, all adverse effects identified are short-term and temporary. Details are provided in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.

Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Negligible

London Drought Permit Options

Assessment	Lower Thames Drought Permit
Action to maintain water supply	Lower Thames Drought Permit – Depending on agreement with the Environment Agency and water availability 100-200Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	High - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	If implemented, the drought permit would have major adverse effects on flows in the upper reaches of the fluvial Thames, mainly in terms of velocity reduction. Freshwater flows to the upper Thames Tideway will reduce, potentially completely. Moderate adverse effects are predicted on water quality in the fluvial Thames (reduced dissolved oxygen saturation and reduced phosphate dilution) which may exacerbate water quality issues in the upper Tideway with the potential for major adverse effects. Minor to Major adverse effects are expected on a range of aquatic ecological receptors, such as macroinvertebrates, macrophytes, fish and algae. The major adverse effects are predominantly associated with adverse effects to fish, including migration, the depressed river mussel, blue-green algae and WFD status for invertebrates. Adverse effects also identified with respect to Langham Pond SSSI, Dumsey Meadow SSSI and Syon Park SSSI. Major adverse effects may occur on the navigation. The combination of maintenance of water levels, restrictions on lock use, and small restrictions regarding navigability in the Thames Tideway would result in major adverse effects on boats that are navigating between the Tideway and the fluvial River Thames. Details are provided in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the

	results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Navigation in the lower Thames and the Thames Tideway may be affected by the reduced flow.

Assessment	Sundridge 1 Drought Permit	Sundridge 2 Drought Permit
Action to maintain water supply	Sundridge 1 - 0-6.64 Ml/d	Sundridge 2 - 10.64 Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	**Medium -** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.	**High -** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	If implemented, the drought permit would have Moderate adverse effects on flows in Reach 1 of the River Darent, mainly in terms of velocity and level reduction. Flow reductions associated with implementation of the drought permit on Reach 2 will be Minor. In Reach 1 there is a Medium risk to water quality due to increasing local dissolved oxygen stressors during environmental drought. Impacts on water quality in Reach 2 are negligible. Moderate adverse short term effects are anticipated on the Sevenoaks Gravel Pits SSSI due to reduction in lake levels, potential impacts on breeding birds, and potential reduction in suitability or distribution of habitats which support *Cordulia aenea*. The significance of impacts on NERC fish species were identified as minor for sea trout and moderate for brown trout, eels and water voles based on fragmentation of habitats, with reduced river flows inhibiting migration. Moderate adverse impacts on WFD status are likely based on the impact of the drought option on fish and macroinvertebrates. Moderate impacts on the distribution of some invasive species (Australian swamp stonecrop and floating pennywort) are anticipated. Minor adverse short term effects may occur on landscape values, as a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. Minor impacts to angling are predicted. The	Due to reductions in flows, velocities and levels in the River Darent, Moderate hydrological effects may occur in Reach 1 and Minor effects in Reach 2. This would also result in Moderate adverse effects to water quality in Reach 1 due to increasing local dissolved oxygen stressors during environmental drought. Moderate adverse short-term effects associated with reduced lake levels on the Sevenoaks Gravel Pits SSSI are possible, as are impacts on breeding birds and a reduction in suitability or distribution of habitats which support *Cordulia aenea*. The significance of impacts on NERC fish species are likely to be Moderate for brown trout and eels and minor for sea trout. Moderate adverse impacts may occur on WFD status of the Upper Darent (GB106040024221) waterbody due to the impact of the drought option on fish, macroinvertebrates and macrophytes and minor adverse impacts on diatom communities. Moderate impacts on GWDTEs have been identified as the ecological status of the site declines as a result of reduced abundance and distribution of supported species. Moderate impacts on the distribution of some invasive species (Australian swamp stonecrop, floating pennywort and signal crayfish) are anticipated. Minor adverse short term effects may occur on landscape values, as a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. Details are provided in the associated EARs.

	assessment has indicated that there is a minor risk to deterioration of the macroinvertebrate and macrophyte communities and a moderate risk to deterioration of the fish community within the WFD waterbody Upper Darent (GB106040024221). Details are provided in the associated EARs.	
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency
Effects on other activities, e.g. fisheries or industry	Minor adverse short term effects may occur on landscape values, as a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. Minor impacts on angling are anticipated. Moderate impacts on other surface water abstractors have also been identified.	Minor adverse short term effects may occur on landscape values, as a significant reduction in river or lake level will have a visual impact on the landscape setting of the area and the Darent Valley Path National Trail, which may be noticeable by walkers. Minor impacts on angling are anticipated. Moderate impacts on other surface water abstractors have also been identified.

Assessment	Horton Kirby (ASR) Drought Permit
Action to maintain water supply	Horton Kirby (ASR) Drought Permit – 5 Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	Low- Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Negligible adverse hydrological effects are predicted as the aquifer is confined with no continuity with the chalk or river and the option is non-consumptive with water to be abstracted being injected into the aquifer. The construction phase is restricted to the area within the existing site, and as such, it is not anticipated that any impacts associated with construction. Details are provided in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Any potential impacts on other users will be addressed in the Environmental report. Although there are not likely to be any impacts.

Assessment	Eynsford Drought Permit
Action to maintain water supply	Eynsford Drought Permit - 11.6Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	High- Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Major adverse short-term effects are predicted on one reach of the River Darent (Reach 3) as a result of a potential significant reduction in flow which may result in drying of the river. This would result in Moderate, short-term adverse effects to water quality. Major short-term effects on navigation associated with lower river levels are possible, through restricting the size of boats able to use the river. Major short-term adverse impacts on WFD status of the Middle and Lower Darent (GB106040024222) waterbody are anticipated based on the impact of the drought option on fish and macroinvertebrates. Moderate adverse effects associated with the spread of the invasive species (Australian swamp stonecrop, parrots feather and

	floating pennywort) are possible. Minor adverse short-term visual impact may occur on the landscape setting of the area and the Darent Valley Path National Trail reduction in river level will have, which may be noticeable by walkers. Details are provided in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Potential for impact on angling and abstractors downstream.

Assessment	Wansunt Drought Permit
Action to maintain water supply	Wansunt Drought Permit – 6Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	Low - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Hydrological impacts on Reach 1 of the River Cray are uncertain and assumed to be negligible, and effects on Reach 2 are also negligible as no reduction in the surface (fresh) water contribution to the tidal reaches of the lower Cray is expected as a result of increased abstraction. Details are provided in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.

Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Negligible.

Assessment	Crayford Drought Permit
Action to maintain water supply	Crayford Drought Permit – 2.8Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	**Low-** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Hydrological impacts on Reach 1 of the River Cray are uncertain and assumed to be negligible, and effects on Reach 2 are also negligible as no reduction in the surface (fresh) water contribution to the tidal reaches of the lower Cray is expected as a result of increased abstraction. Details are provided in the associated EARs
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Negligible

Assessment	Waddon Drought Permit
Action to maintain water supply	Waddon Drought Permit – 7Ml/d
Risk to the environment (High, medium or low) and how you have assessed this	**High -** Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.

Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated sites). Assess the likely impact on WFD ecological and chemical status.	Under a worst case scenario, Waddon Ponds may dry up (for up to 3 months) when they would otherwise not have without a drought permit, resulting in a Major hydrological impact. With reduction in through-flow in Waddon Ponds, there is a High risk to water quality due to increased water temperature and reduction in dissolved oxygen saturation. Moderate adverse effect on hydrology is expected with respect to the River Wandle downstream of the ponds, where the drought permit would extend the recovery of levels and flows by up to one month, and a Minor (temporary) effect on water quality in relation to SRP. These hydrological affects could result in moderate adverse, short term effects with respect to biodiversity, including Moderate adverse effects on the Wilderness Island and Wandle Valley Wetland LNRs. Overall moderate adverse effects on fish communities are predicted, with potential for major adverse impacts on European eel (NERC fish species) and moderate adverse effects to brown trout and barbel. Major impacts on invasive macroinvertebrates are anticipated in Reach 1. Moderate, temporary adverse effects were identified on the landscape values associated with Waddon Ponds, which form a local amenity feature in the London Borough of Croydon and an essential part of the landscape setting and character of the Wandle trail which is valued by walkers. Details are provided in the associated EARs.
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Potential for impact on angling, however assessed as a negligible impact. Potential impact on other abstractors (surface and groundwater) within zone of hydrological influence, currently classified as negligible.

Assessment	Increase in M2 annual licence Drought Permit
Action to maintain water supply	Increase in M2 annual licence Drought Plan
Risk to the environment (High, medium or low) and how you have assessed this	Low - Assessment undertaken in line with the Drought Plan guidelines methodology and set out in the Drought Permit Environmental assessment Reports accompanying the Drought Plan.
Summary of the likely environmental effects (include details for features of moderate and major sensitivity and minor sensitivity features from designated	Adverse effects identified are limited to negligible, temporary adverse effects.

sites). Assess the likely impact on WFD ecological and chemical status.	
Information used to understand conditions before drought or any drought actions are implemented.	Baseline monitoring and water resource situation monitoring in relation to trigger levels contained in the drought plan.
A summary of additional monitoring requirements before your application	Depending on the period for which the DP will be active, monitoring will consist of water flow, groundwater levels and water quality, environmental habitats and associated ecology. This will be run prior to, during and after the DP is in place. Monitoring will continue for 2 months post DP cessation with a repeat survey within 1 year to demonstrate system recovery. Aquatic ecology surveys would be conducted to Environment Agency specifications. Additional water quality sampling will be undertaken at appropriate locations if necessary. Details are provided in the associated EARs.
Mitigation and compensation measures	Mitigation options that are likely to be appropriate to this permit, and others, are set out in the final section of this appendix. The exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of baseline monitoring as detailed above. Potential mitigation actions specific to the impacts identified have been set out in the EAR. At the time of implementation, precise mitigation requirements will be agreed with the Environment Agency.
Effects on other activities, e.g. fisheries or industry	Negligible.

Other London Drought Options

		East London Resource Development (ELRED)
Option Implementation	**Trigger(s)** Or preceding actions	Naturalised Teddington flow remains at or below 3000Ml/d for 10 or more days and DEL is at least DEL1. The scheme is also used to meet peak demands if necessary.
	Demand Saving or DO of Option (Mld)	Licence rate of 18 Ml/d average, 20.57 Ml/d peak, Do benefit of 15.3Ml/d
	Implementation Timetable Preparation time, time of year effective, duration	ELRED would take between 7-14 days to ramp up to full output.

	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	We already hold an abstraction licence for the scheme. No further permissions are required for use of the scheme.
	Risks associated with option	The scheme is low risk from a water resources perspective.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	**Low**. The source has been licensed following testing to identify potential environmental impacts or derogation. There is a low risk of the scheme resulting in saline intrusion into the Chalk aquifer and a groundwater monitoring programme has been set up to address this potential risk.
	Summary of possible Environmental Impacts	See above – impacts are principally related to potential aquifer pollution. There is also the potential for minor, temporary adverse effects on other abstractors, however, these effects are uncertain. All adverse effects are short to medium-term and temporary.
	Details of studies Undertaken & required	A groundwater quality monitoring programme has been instigated to monitor the water quality of the regional aquifer.
	Monitoring Requirements	Monitoring requirements are set out in the ELRED licence and accompanying correspondence.
	Mitigation Actions	Mitigation actions are not required.
	Impact on Other Activities e.g. Public, Industry etc	The scheme has minimal impact on other activities.

(1) For demand management options include percentage reduction on peak week demand
(2) Environmental Impacts must include list of protected sites that may be affected.
Note: Refer to Section 5.6 for details to include on this form.

		Stratford Box
Option Implementation Assessment	**Trigger(s)** Or preceding actions	Naturalised Teddington flow remains at or below 3000Ml/d for 10 or more days and DEL is at least DEL1. The scheme is also used to meet peak demands if necessary.
	Demand Saving or DO of Option (Mld)	Stratford Box is a groundwater source in East London which is run at low level of baseload output in order to keep groundwater levels suppressed to protect Stratford International Station. The option available during a drought is to increase the output from 5Ml/d to 8 Ml/d in aggregate with Edmeston Close.
	Implementation Timetable Preparation time, time of year effective, duration	The Stratford Box option would take between 7-14 days to ramp up to full output.

	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	We already hold an abstraction licence for the scheme. No further permissions are required for use of the scheme.
	Risks associated with option	The scheme is low risk from a water resources perspective.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	**Low**. The source has been licensed following testing to identify potential environmental impacts or derogation.
	Summary of possible Environmental Impacts	Low risk of impact. Pumping is required at a low level to avoid the risk of groundwater levels rising and adversely affecting Channel Tunnel Rail Links Stratford Box assets.
	Details of studies Undertaken & required	
	Monitoring Requirements	
	Mitigation Actions	Mitigation actions are not required.
	Impact on Other Activities e.g. Public, Industry etc	The scheme has minimal impact on other activities.

(1) For demand management options include percentage reduction on peak week demand
(2) Environmental Impacts must include list of protected sites that may be affected.
Note: Refer to Section 5.6 for details to include on this form.

		Old Ford
Option Implementation Assessment	**Trigger(s)** Or preceding actions	Naturalised Teddington flow remains at or below 3000Ml/d for 10 or more days and DEL is at least DEL1. The scheme is also used to meet peak demands if necessary.
	Demand Saving or DO of Option (Mld)	4.5 Ml/d average, 4.5Ml/d peak
	Implementation Timetable Preparation time, time of year effective, duration	The Old Ford option would take between 7-14 days to ramp up to full output.

	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	We already hold an abstraction licence for the scheme. No further permissions are required for use of the scheme.
	Risks associated with option	The scheme is low risk from a water resources perspective.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	**Low.** The source has been licensed following testing to identify potential environmental impacts or derogation.
	Summary of possible Environmental Impacts	Monitoring of the groundwater quality is required around the site to assess whether the sites is at risk from contamination arising from the contaminated land around the site. This is principally for source protection rather than Environmental Impact.
	Details of studies Undertaken & required	
	Monitoring Requirements	A groundwater quality monitoring programme has been instigated to monitor the water quality of the regional aquifer around Old Ford to monitor the potential for groundwater contamination arising from the contaminated and around Old Ford. This monitoring is undertaken by consultants Atkins on behalf of the Olympic Development Authority (ODA).
	Mitigation Actions	Mitigation actions are not required.
	Impact on Other Activities e.g. Public, Industry etc	The scheme has minimal impact on other activities.

		Chingford Artificial Recharge Scheme (CHARS)
Option Implementation Assessment	**Trigger(s)** Or preceding actions	Teddington target flow reduces down to 600/400 Ml/d curve (Level 1 curve on the Lower Thames Control Diagram).
	Demand Saving or DO of Option (Mld)	15.1Ml/d reducing to 10.6Ml/d in a prolonged drought. The Chingford Artificial Recharge Scheme is a Water Treatment Works (WTW) using a number of the NLARS boreholes. It is not restricted to use under the NLARS Operating Agreement but can be used under any conditions although its use is primarily to meet peak demands and drought demands.
	Implementation Timetable Preparation time, time of year effective, duration	The CHARS option would take between 7-14 days to ramp up to full output.
	Permissions required and Constraints Including details of liaison carried out with bodies responsible for giving any permits or approvals	We already hold an abstraction licence for the scheme. No further permissions are required for use of the CHARS scheme.
	Risks associated with option	The scheme is low risk from a water resources perspective.
Environmental Assessment	**Risk to the Environment** (High/Medium/Low or unknown)	**Low**. The source has been licensed following testing to identify potential environmental impacts or derogation.
	Summary of possible Environmental Impacts	Low risk of impact.
	Details of studies Undertaken & required	
	Monitoring Requirements	Monitoring associated with the use of NLARS would be triggered when NLARS was implemented during a drought. There is no requirement for monitoring associated with the use of CHARS.
	Mitigation Actions	Mitigation actions are not required.
	Impact on Other Activities e.g. Public, Industry etc	The scheme has minimal impact on other activities.

(1) For demand management options include percentage reduction on peak week demand
(2) Environmental Impacts must include list of protected sites that may be affected.
Note: Refer to Section 5.6 for details to include on this form.

B. Notes

For each of the tables in this appendix the following should be noted:

- **Demand Saving or DO of Option**
  - For demand management options, include percentage reduction on peak week demand
- **Summary of possible Environmental Impacts**
  - Environmental Impacts must include list of protected sites that may be affected.

Mitigation Options

Many drought options have mitigation actions associated with their implementation.

The approach to mitigation required for each drought permit is set out in the associated EAR. Each mitigation action proposed is related to an ecological receptor potentially impacted to a moderate/significant degree by the implementation of a drought option. Exact mitigating actions will be determined by local conditions, the hydrological response to drought and the results of and baseline monitoring conducted prior to drought option implementation. Consequently the proposed mitigation options within each EAR is intentionally generic reflecting the fact that it is not possible to specify exact detail prior to the implementation of the permit. Table 1 sets out the mitigation actions proposed in the EARs along with details of permits and approvals potentially required in order to implement these mitigation measures.

Table 1 - Mitigation options proposed within EARs.

Feature	Impact	Mitigation	Trigger	Monitoring (to identify trigger)	Action	Responsibility	Permit or approval
Pre-drought permits general ecosystem condition	Baseline condition	General ecosystem assessment by river walkover survey, with targeted approach to sensitive locations as identified in initial walkover and discussed with Natural England and the Environment Agency. Key location determined based on consultation with Environment Agency/ Natural England and local knowledge		Benchmark monitoring to identify the most sensitive locations and habitats within the zone of influence of the drought permit.	The walkover survey will determine for each of the sensitive receptor species and communities the locations at which significant impact could occur. The survey will help to set the trigger for mitigation for the measures identified below.	Thames Water	Permission to access land may be required from landowners.

Feature	Impact	Mitigation	Trigger	Monitoring (to identify trigger)	Action	Responsibility	Permit or approval
During-drought walkover surveys	General survey to identify potential for deterioration of ecology.	Walkover survey to same specification as the baseline walkover. The frequency of walkovers to be determined based on potentially impacted features, time of year, local knowledge and discussions with Environment Agency/ Natural England		Surveillance walkovers the most sensitive locations and habitats within the zone of influence of the drought permit.	Walkover survey will monitor for each of the sensitive receptor species and communities the locations at which significant impact could occur.	Thames Water	Permission to access land may be required from landowners.
Generic approach for impacts on water quality, relevant to multiple features	Water quality deterioration at significant pressures identified	Aeration of sensitive locations Enhanced operation of STWs to improve wastewater discharge quality above consented requirement.	Significant alteration to water quality or species abundance, composition or distribution	Increased monitoring for dissolved oxygen, ammonia and feature community analysis through targeted survey of significant locations. Additional analyses of specific variables when identified as required	Operation of aeration equipment as required. Thames Water STW operational staff to advise on how best to achieve better quality discharges.	Environment Agency Thames Water	None identified
Designated Sites	Reduction in abundance or distribution of species supported by the designated site, causing a decline in ecological status of the site.	Alteration to water level control structures on the watercourse, if present.	Significant loss of habitats in sensitive period	Walkover survey (RHS+)	Co-ordination and implementation of effective water level controls on the outlet of the sensitive habitat to control water levels.	Thames Water / Managers designated sites	Permission to access land may be required from landowners. Natural England consent likely to be required for operations on designated sites (for SSSIs notice must be given to Natural England under Section 28H of the Wildlife and Countryside Act 1981 (as amended). Consent from managers of designated sites (e.g. Wildlife Trusts, local councils) also likely to be required. Flood Defence Consent may be required depending on any alterations to water level control structures identified.

Feature	Impact	Mitigation	Trigger	Monitoring (to identify trigger)	Action	Responsibility	Permit or approval
		Targeted enhancement of habitat	Reduction in ecological status of the designated site	Targeted survey (feature depended)	Implementation of habitat improvements to return the status of the designated site to pre-drought permit/order conditions.	Thames Water	Permission to access land may be required from landowners. Natural England consent likely to be required for operations on designated sites (for SSSIs notice must be given to Natural England under Section 28H of the Wildlife and Countryside Act 1981 (as amended). Consent from managers of designated sites (e.g. Wildlife Trusts, local councils) also likely to be required.
Macro-invertebrates	Loss of flow sensitive species and reduction in species diversity	Targeted habitat alteration/improvement	Insufficient flow diversity in watercourse to sustain the community diversity	Walkover (RHS+) and targeted survey	Consider targeted, localised and simple alterations to the river channel to provide a diversity in habitats that can act as functional refuges, in particular faster flowing habitat, and help aid natural recovery	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners. Flood Defence Consent may be required depending on measures proposed.
White-clawed crayfish	Stranding of individuals and reduction in available refuges	Targeted habitat alteration/improvement	Insufficient habitat at key periods in waterbody to sustain the population	Walkover survey (RHS+)	Consider targeted, localised and simple enhancement of suitable habitat to maximise habitat opportunities for white-clawed crayfish	Thames Water	Agreement with Natural England and Environment Agency. Permission to access land may be required from landowners. Flood Defence Consent may be required depending on measures proposed.
	Delay in recovery of habitat	Targeted habitat alteration/improvement	Insufficient refugia to support population or significant number of carapace indicating mortality	Targeted survey	Consider targeted, localised and simple alterations to the river channel to maximise habitat opportunities for crayfish, including the provision of refugia	Thames Water	Agreement with Natural England and Environment Agency. Permission to access land may be required from landowners. Flood Defence Consent may be required depending on measures proposed.

Feature	Impact	Mitigation	Trigger	Monitoring (to identify trigger)	Action	Responsibility	Permit or approval
Macrophytes	Loss of flow sensitive species and reduction in species diversity	Targeted habitat alteration/improvement	Insufficient flow diversity in watercourse to sustain the community diversity	Walkover (RHS+) and targeted survey. Targeted surveys to be undertaken between June-September using appropriate LEAFPACS 2 methodology)	Consider targeted, localised and simple alterations to the river channel to provide a diversity in habitats, in particular faster flowing habitat, and help aid natural recovery	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners. Flood Defence Consent may be required depending on measures proposed.
Migratory fish (including salmonids and eel)	Increased significance of obstacles as barriers to movement	Modification of any fish passes Targeted provision of either refugia or bird scarers, identified on a case-by-case basis	No alteration to abundance of species present or identification of species movement	Increased species monitoring through targeted survey of significant locations	Temporary alteration to any fish passes to provide sufficient conditions for fish to migrate past barriers to migration. Consider provision of bird scarers to deter piscivorous birds at significant locations. Bird scarers would only be used where it is possible for birds to safely move to alternative habitats.	Thames Water Environment Agency	Agreement with Environment Agency. Permission to access land may be required from landowners. Flood Defence Consent may be required depending on measures proposed.
		Capture of individuals in holding pools downstream of obstacles and relocate to suitable alternative locations Rescue and relocate stressed individuals where alternative locations can be identified Restocking		Targeted survey	Rescue surveys for fish in holding pools at significant locations where required during significant migratory periods Restocking of individuals to pre-drought population abundances only in extreme cases	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners. FR1 Consent to introduce fish from Environment Agency. FR2 Consent to electric fish from Environment Agency.
Fish community (including NERC Act Section 41 species)	Delay in recovery of flows and habitat utilisation	Targeted habitat alteration/ improvement	Insufficient flow at key periods in watercourse to sustain the population	Walkover survey (RHS+)	Consider modification to the channel characteristics to utilise the flows present at key periods to speed up recovery and shorten delay period associated with the drought permit /order.	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners. Flood Defence Consent may be required depending on measures proposed.

Feature	Impact	Mitigation	Trigger	Monitoring (to identify trigger)	Action	Responsibility	Permit or approval
		Restocking	No improvement to reach utilisation	Targeted survey	Restocking of individuals to pre-drought population abundances only in extreme cases	Thames Water Environment Agency	Agreement with Environment Agency. Permission to access land may be required from landowners. FR1 Consent to introduce fish from Environment Agency.
	Deterioration in spawning gravels at key periods	Restocking	No alteration to fine sediment concentration in spawning habitats	Targeted survey	Restocking of individuals to pre-drought population abundances only in extreme cases	Thames Water Environment Agency	Agreement with Environment Agency. Permission to access land may be required from landowners. FR1 Consent to introduce fish from Environment Agency.
	Water quality deterioration at significant pressures identified	See generic water quality mitigation approach above					
		Rescue and relocate stressed individuals where alternative locations can be identified. Restocking	Reduction in species abundance or distribution in response to a reduction in water quality	Targeted survey	Two capture/rescue surveys for fish at significant pressure location per week Restocking of individuals to pre-drought population abundances in extreme cases	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners. FR1 Consent to introduce fish from Environment Agency. FR2 Consent to electric fish from Environment Agency.
	Increased predation efficiency	Targeted provision of either refugia or bird scarers, identified on a case-by-case basis	No alteration to abundance of species present in refuge location	Increased monitoring through targeted survey of significant locations	Provision of bird scarers for operation at each significant location identified.	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners.
		Rescue and relocate stressed individuals where alternative locations can be identified Restocking		Targeted survey	Capture/rescue surveys for fish at significant locations where required Restocking of individuals to pre-drought population abundances in extreme cases	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners. FR1 Consent to introduce fish from Environment Agency. FR2 Consent to electric fish from Environment Agency.

Feature	Impact	Mitigation	Trigger	Monitoring (to identify trigger)	Action	Responsibility	Permit or approval
Invasive macro-invertebrates Signal crayfish	Replacement of native species	Habitat alteration/improvement	No change in extension to abundance and distribution	Targeted survey	Consider targeted, localised and simple alteration to the river channel to maximise refuge opportunities for crayfish to reduce necessity for dispersal as refuges are often the limiting factor.	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners. Flood Defence Consent may be required depending on measures proposed.
		Direct removal of invasive species		Targeted survey	If major risk identified, consider direct removal and appropriate disposal of signal crayfish by an appropriately trained and licensed ecologist	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners. CR1 consent from Environment Agency to remove signal crayfish.
Invasive macrophytes	Increase in distribution	Direct treatment or removal	No change in abundance or distribution	Walkover survey (RHS+)	If major risk identified, consider treatment or direct removal and appropriate disposal of invasive macrophytes	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners.
Navigation	Reduction or cessation of lock usage (if applicable)	Limited lock opening during key periods to allow movement of some boat traffic (if applicable)	Build up of boat traffic at key lock locations	Environment Agency lock keepers	Liaise and align actions with Environment Agency.	Thames Water and Environment Agency	Agreement with Environment Agency. Agreement with local boating stakeholder groups.
Other Abstractors	Temporary derogation in terms of the amount that may be abstracted	Thames Water would discuss the proposed mitigation measures and the potential for providing compensation measures with the Environment Agency and all affected parties prior to the implementation of the drought order / permit.	To be discussed with Thames Water	To be discussed with Thames Water.	Meet with abstractor to assess requirements and appropriate mitigation measure such as provision of alternative water supply if derogation due to the drought order / permit rather than environmental drought	Thames Water	None identified.

Feature	Impact	Mitigation	Trigger	Monitoring (to identify trigger)	Action	Responsibility	Permit or approval
Landscape and visual amenity	Temporary loss of landscape character/ visual amenity	None specific. Refer to mitigation options for habitats and designated sites above. Impacts are reversible following cessation of drought permit conditions.	-	None specific. Refer to monitoring for habitats and designated sites above.	None specific. Refer to mitigation options for habitats and designated sites above.	Thames Water	N/A
Angling	Altered angling success due to changes in abundance and distribution of fish.	Refer to mitigation options for fish above.	Refer to triggers for fish above.	Creel survey to identify change in angling success	None. Creel survey to inform any future drought permit applications	Thames Water	Agreement with Environment Agency. Permission to access land may be required from landowners.