Option 1	SWS_SNZ_HI-REU_RE1_ALL_for20	Recycling (SNZ): Littlehampton WTW with river discharge (15Ml/d)
Option 2	SWS_SNZ_HI-ROC_RE1_ALL_hsb-rcm	Groundwater (SNZ): New borehole at Petworth (4Ml/d)
Option 3	SWS_SNZ_HI-TFR_RZ5_ALL_tilmore-hardha p 10	Bulk import (SNZ): SEW RZ5 to Pulborough
Option 4	SWS_SNZ_HI-REU_RE1_ALL_env_cu_chu2_conju	Recycling (SNZ): Horsham WTW with storage at Pulborough (6.8Ml/d)
Option 5	SWS_SNZ_HI-GRW_ALL_ALL_rogate	Petersfield refurbishment (1.96 Ml/d)
Water body type		River
Hydromorph designation		not designated artifical or heavily modified
Water body ID		GB107041012810
Water body name		Western Rother

Option description and potential effects:

The 2 schemes SWS_SNZ_HI-TFR_RZ5_ALL_tilmore-hardha p 10 and SWS_SNZ_HI-REU_RE1_ALL_env_cu_chu2_conju only have construction activities that may impact the surface waterbodies and it is assumed that this can be completed without deteriorating the WFD status and therefore do not influence the cumulative assessment

The SWS_SNZ_HI-REU_RE1_ALL_for20 scheme proposes the transfer of treated effluent from Littlehampton WwTW to a new discharge point to the western River Rother upstream of the Pulborough SWS abstraction. This option would require the construction of new in-channel infrastructure, and a new discharge into the Western Rother.

The SWS_SNZ_HI-ROC_RE1_ALL_hsb-rcm (hsb-rcm) scheme proposes to return SWS to service with a new borehole. The option is to drill a new replacement borehole for Petworth WSW in Sussex North Area. As the borehole is out of service the RA abstraction is expected to increase by 4 Ml/d. The increased abstraction from the groundwater source within license limits is likely to impact the Petworth stream (GB107041012780) which discharges to the River Rother (GB107041012810).

Scheme BR_Rog proposes return of Petersfield groundwater abstraction to service. The increased abstraction (within existing licence limits) from the Greensand may impact on flows in the Western Rother (GB107041012810) and downstream.

The increased groundwater abstraction due to SWS_SNZ_HI-ROC_RE1_ALL_hsb-rcm and BR_Rog could potentially reduce upstream flows prior to the discharge point of SWS_SNZ_HI-REU_RE1_ALL_for20 and therefore change the assumption of river dilution capacity that would be used to define the water quality standards of the treated effluent discharge. This in turn could lead to a deterioration in physico-chemical quality elements, particularly since point source water industry discharge is the RNAG for the moderate phosphate sub- quality element. This cumulative impact does not change the possible outcomes and uncertainties in the stage 2 assessment of each scheme but their potential interaction requires further assessment with respect to WFD compliance.

The Hanham Gauging station, 300m downstream of the discharge point, has Q95 flows of 1.08 m3/s or 93.31 ML/d based on NRFA data for the period 1959-2022.The ALS for Arun and Western Stream states that for AP 1 (Lower Rother e.g. Hanham Gauge) there is no water available at Q95 and Q75, restricted water available at Q50 and available water at Q30. The net change in surface water flow is a minimum of +9 Ml/d if a highly conservative estimate of 100% of groundwater abstraction is allocated to the surface water body (15 Ml/d gain, minus 4 Ml/d and 1.96 Ml/d abstractions). Therefore it is unlikely that there would be a negative cumulative impact of river flow reduction on WFD status elements, however this requires further consideration depending on the variation in treated effluent discharge over time.

	Baseline Status		Reasons for not achieving good status					Assessment of option		
Status element	RBMP2 status (2015)	2019 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments
Phytoplankton								(hsb-rcm) - Increase in abstraction within licence limits may affect flow in Petworth stream discharging to the River Rother. Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish, invertebrate and macrophyte/phytobenthos populations.	Non-compliant (low conf.)	n/a
Invertebrates	High	Good						SWS_SNZ_HI-REU_RE1_ALL_for20 -The new discharge is meant to augment river flows to support further abstraction in the river and is therefore unlikely to deteriorate the water body status. However new discharge of treated effluent into River Rother could potentially result in physico chemical effects that could impact on biological status elements, which may be further impacted by potentially lower flows due to increased abstraction upstream due to SWS_SNZ_HI-ROC_RE1_ALL_hsb-rcm	Non-compliant (low conf.)	n/a
Macrophytes/ phytobenthos	Mod	Good							Non-compliant (low conf.)	n/a
Phys-chem water quality (in support of ecological status)	Mod	Mod			Phosphate - Point source water industry. Confirmed. Also Diffuse - source poor soil management			The impact of a reduction in river baseflow prior to the treated effluent discarhge point will need to be understood alongside the further assessment required to consider the final characteristics of the new discharge and ensure that water quality is not compromised, particularly given the likely connectivity between the river and the Arun Valley SAC, SPA and Ramsar.	Non-compliant (low conf.)	Non-compliant (low conf.)
Chemicals	Good	Bad	Fails due to Mercury and its Compounds, Perfluorooctane sulphonate (PFOS), Polybrominated diphenyl ethers (PBDE)					In theory the discharge associated with SWS_SNZ_HI-REU_RE1_ALL_for20 with could introduce new chemicals to this waterbody, or increase loading of chemicals already present. This would need further assessment.	Non-compliant (low conf.)	Non-compliant (low conf.)
RBMP2 water body measures			N/A as not designated heavily modified						N/a	N/a
									Non-compliant (low conf.)	

Option 1	SWS_KMW_HI-RSR_RE1_ALL_rab1	Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d)
Option 2	WR_PWR_Bew3_CONJU	Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d)
Option 3		

Water body type	Lake
Hydromorph designation	Heavily Modified
Water body ID	GB30644398
Water body name	Bewl Water

Option description and potential effects:

The two options that affect Bewl Reservoir and the downstream/upstream catchment are:

The Rab1 option is the raising of the Bewl Reservoir top water level by 0.4m to increase storage and yield. The impact this may have on the hydromorphology of the reservoir is uncertain but likely temporary. It is likely to have short-term impacts on water quality associated with the flooded margins, and potential longer-term changes as a result of changes to water depths, storage times and mixing. Modeling would be required to determine whether this would be a positive or a negative change.

The bew3_conju scheme is a treated effluent recycling scheme discharging to Bewl reservoir (GB30644398). This could potentially result in physico-chemical effects that could impact on biological status elements (see water quality below). Macrophytes are already at Poor status, and the option could make it more difficult to achieve future improvements. Further assessment is therefore required to consider the final characteristics of the new discharge and ensure that water quality is not compromised.

Cumulatively, these two schemes may both have negative impacts on the Physico-chemical water quality status of the water body, whilst the treated effluent discharge scheme could have an impact on the chemical quality status. How these two schemes will interact will depend on the results of the further assessment of the final characteristic of the water quality of the new discharge and the modelling of the water quality impact of reservoir storage change. Therefore the potential for deterioration of each status element will remain at the highest potential designated in each stage 2 screening assessment

	Baseline Status		Reasons for not achieving good status					Assessment of option		
Status element	RBMP2 status (2015)	2019 interim Status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments
Phytoplankton	n/a	n/a						Raising the reservoir will alter the hydro-morphology of the reservoir, with likely temporary impacts on marginal vegetation and water quality, although it is expected that this would equilibrate over time. Longer-term impacts on water quality could occur, as described below, which would have potential implications for biology.	n/a	n/a
Invertebrates	n/a	n/a						The new discharge of treated effluent could potentially result in physico-chemical effects that could impact on biological status elements (see water quality below). Macrophytes are already at Poor status, and the option could make it more difficult to achieve future improvements.	n/a	n/a
Macrophytes/ phytobenthos	Poor	Poor						The installation of new discharge infrastructure and the increase in inflow to the lake may have a minor influence on the hydromorphology of the water body, although this may be positive if it helps to maintain water levels during dry periods, so is expected to be compliant.	Non-compliant (med. conf.)	Non-compliant (med. conf.)
Phys-chem water quality (in support of ecological status)	Poor	Mod			Total phosphorus - point source sewage discharge - responsible sector water industry (confirmed)			A new discharge into the reservoir could potentially change the physico-chemistry of the water body, for example by increasing nutrient concentrations, changing dissolved oxygen concentrations, and changing water temperature. The water body already fails for phosphate, which is at Poor status, and the introduction of treated effluent (depending on the final discharge quality) could worsen this or prevent future improvements. This is particularly a risk if the option was used during drought periods, i.e. with low water levels and high temperatures. Further assessment is therefore required to consider the final characteristics of the new discharge. Raising the reservoir will alter the hydro-morphology of the reservoir. It is likely to have short-term impacts on water quality associated with the flooded margins, and potential longer-term changes as a result of changes to water depths, storage times and mixing. Modelling would be required to determine whether this would be a positive or a negative change, and how these two options would interact.	Non-compliant (med. conf.)	Non-compliant (med. conf.)
Chemicals	Good	Bad	Fails for Mercury and Its Compounds, Perfluorooctane sulphonate (PFOS) and Polybrominated diphenyl ethers (PBDE)					The discharge could introduce new or increased concentrations of chemicals in to the water body. This will require further review to determine the relative concentrations of chemicals in the discharge and receiving water. The change in reservoir storage would be unlikely to impact the status of the chemical elements.	Non-compliant (low conf.)	Non-compliant (low conf.)
RBMP2 water body measures			Heavily modified for drinking water supply and water regulation (i, ii) Working with physical form and function - 3. Re-engineer river IN PLACE. Water management - 42. Access to feeder-streams, 45. Good downstream DO levels, 46. Good downstream temperature, 43. Downstream flow regime. ALL IN PLACE WITH THE EXCEPTION OF 43. Structural modification - 18. Reduce fish entrainment. IN PLACE					It is assumed that current release arrangements from the reservoir would be retained. However, the increased storage is likely to result in delayed refill and associated spills, and potentially reduced total spills. This could be an impediment to the improvement of measure 43 (downstream flow regime) It is assumed that the new discharge would be appropriately designed. The scheme could provide some benefit to these measures by helping to maintain water levels in the reservoir and thereby facilitating downstream flows and access to feeder streams	Non-compliant (low conf.)	Non-compliant (low conf.)
								Overall assessment of WFD Regulations compliance of the option in this water body	Non-compliant (med. conf.)	

Option 1	SWS_KMW_HI-RSR_RE1_ALL_rab1	Storage (SHZ): Raising Bewl Reservoir 0.4m (3Ml/d)
Option 2	WR_PWR_Bew3_CONJU	Recycling (SHZ): Tonbridge to Bewl (5.7Ml/d)
Option 3		
Water body type		River
Hydromorph designation		Heavily Modified
Water body ID		GB106040018500
Water body name		Bewl

Option description and potential effects:

These two options affect Bewl Reservoir and the downstream/upstream catchment.
The Rab1 option is the raising of the Bewl Reservoir top water level by 0.4m to increase storage and yield. This is Non-compliant (low conf.) in stage 2 screening due to the potential impact on the waterbody downstream of Bewl Water. Increased storage could delay and reduce the overall number of spills into the Bewl waterbody altering the hydromorphology downstream which could have negative consequences on ecological status elements. This scheme may cause a reduction in high flows by reducing the occurrence of overflow over the spillway during peak flow periods. The ALS states that for Q50 there is no water available for licensing and Q30 has restricted water available for licensing.

The bew3_conju scheme is a treated effluent recycling scheme discharging to Bewl reservoir (GB30644398) which during operation of the option could potentially result in physico-chemical effects that could impact on biological status elements of GB30644398. Macrophytes are already at Poor status, and the option could make it more difficult to achieve future improvements.

The Bewl Reservoir provides a compensation flow downstream and therefore any changes to the physico-chemical quality of the Bewl Water may have an impact on the downstream waterbody (GB106040018500). However, the Bewl river WB currently has a High Phosphate classification and Good biological quality elements. Therefore, the current physico-chemical status of Bewl Water Reservoir is not deteriorating the downstream river water body. An assessment of whether further deterioration of the Bewl Reservoir physico-chemical effects could impact the downstream surface water body would be required but this remains potentially non compliant low-confidence based on the current WFD status of each waterbody.

The combination of these two downstream impacts on hydromorphology and physico-chemical status may lead to impacts on ecology, however the likelihood is low-confidence without further investigation. The changes to the WFD assessment on this waterbody (GB106040018500) for option SWS_KMW_HI-RSR_RE1_ALL_rab1 are to change the Phys-chem water quality status element potential for deterioration from Uncertain to Potentially non-compliant (low conf.).

	Baseline Status		Reasons for not achieving good status					Assessment of option		
Status element	RBMP2 status (2015)	2019 interim Status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments
Fish	Poor	Good						Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish, invertebrate and macrophyte/phytobenthos populations. Treated effluent discharge may further deteriorate the phosphorous physico-chemical status element of Bewl Water Reservoir which releases compensation flows to the downstream water body. This may potentially deteriorate the physico-chemical quality elements of the downstream water body GB106040018500 and consequently the biological quality elements.	Non-compliant (low conf.)	n/a
Invertebrates	Good	Good							Non-compliant (low conf.)	n/a
Macrophytes/ phytobenthos	n/a	n/a							n/a	n/a
Phys-chem water quality (in support of ecological status)	Good	Good						Changes to storage and associated changes to depth, mixing and retention times may affect water quality in the reservoir and therefore could affect downstream water quality. The impact of treated effluent discharge on the water quality of Bewl Reservoir may have an impact on the physico-chemical status of the downstream Bewl SWB through the release of compensation flows. However, the current WFD status of the Bewl is not currently impacted by the compensation release from Bewl Reservoir.	Non-compliant (low conf.)	n/a
Chemicals	Good	Bad	Confirmed - Mercury, PBDE, reason not determined					The SWS_KMW_HI-RSR_RE1_ALL_rab1 scheme is not expected to change the status of chemical elements within the reservoir or downstream. However the discharge may introduce new or increased concentrations of chemicals downstream therefore this will require further review to determine the relative concentrations of chemicals in the discharge and receiving water.	Non-compliant (low conf.)	n/a
RBMP2 water body measures			not known at water body scale						n/a	n/a
								Overall assessment of WFD Regulations compliance of the option in this water body	Non-compliant (low conf.)	

Option 1	SWS_HWZ_HI-TFR_HSE_CNO_oan1	Interzonal transfer (HSE-HWZ): Lower itchen WSW to Yew Hill bi-directional (74Ml/d)
Option 2	SWS_HAZ_HI-TFR_HWZ_ALL_oan2	Interzonal transfer (HWZ-HAZ): Winchester to Andover bi-directional (15Ml/d)
Option 3	SWS_HKZ_HI-TFR_HAZ_ALL_oan3	Interzonal transfer (HAZ-HKZ): Andover to Kingsclere bi-directional (10Ml/d)
Option 4	SWS_HSE_HI-TFR_PRT_ALL_pwc2	Bulk import (HSE): PWC Source A to Lower itchen WSW (21Ml/d)
Option 5	Ott MM to Otter 90	Bulk import (HSE): Havant Thicket Reservoir to Lower itchen WSW (90Ml/d)
Option 6	SWS_PWE_HI-REU_RE1_ALL_60toht v0.1	Recycling (HSE): Recharge of Havant Thicket from Portsmouth Harbour WTW (60Ml/d)
Water body type		River
Hydromorph designation		not designated artifical or heavily modified
Water body ID		GB107042022580
Water body name		Itchen

Option description and potential effects:

The 3 schemes oan1, oan2 and oan3 are the same option with variable outputs, and the pipeline construction does not cross the Itchen watercourse.

The POT_TOTT_90 and Ott MM to Otter 90 are also the same scheme, and propose 4 separate watercourse crossing. Therefore there are 3 schemes in this waterbody that require construction activities that cross the Itchen watercourse across a 1km stretch of river. The screening of these options assumes the construction activities will be WFD compliant through the use of trenchless or other appropriate construction methods. These schemes are still WFD compliant after the cumulative assessment, assuming
the correct construction methods are used, the timing and occurence of these construction activities is appropriate to avoid any deterioration of the WFD elements, and there is adequate water quality and ecological monitoring of the waterbody to identify any impacts due to construction.

	Baseline Status		Reasons for not achieving good status					Assessment of option		
Status element	RBMP2 status (2015)	2019 status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments
Phytoplankton	High	High						No change to Stage 2 Screening assessment for either option	Compliant (med. conf.)	n/a
Invertebrates	High	High							Compliant (med. conf.)	Compliant (med. conf.)
Macrophytes/ phytobenthos	High		Probable				Investigations into classification status - indicates uncertain there is a problem.		Compliant (med. conf.)	n/a
Phys-chem water quality (in support of ecological status)	High	High						No change to Stage 2 Screening assessment for either option	Compliant (med. conf.)	n/a
Chemicals			Fail due to Benzo(g-h-i)perylene, Mercury and Its Compounds, Polybrominated diphenyl ethers (PBDE)					No change to Stage 2 Screening assessment for either option	Compliant (med. conf.)	Compliant (med. conf.)
RBMP2 water body measures			n/a (as not heavily modified or artificial)					N/a		
								Overall assessment of WFD Regulations compliance of the option in this water body	Compliant (med. conf.)	

Option 1	SWS_IOW_HI-GRW_ALL_ALL_nw_gwa_kni_westi	Groundwater (IOW): New boreholes at Newchurch (LGS) (1.9Ml/d)
Option 2	SWS_IOW_HI-REU_RE1_ALL_sey9	Recycling (IOW): Sandown (8.5Ml/d)
Option 3	SWS_IOW_HI-GRW_ALL_ALL_br_less	Groundwater (IOW): New borehole at Eastern Yar3 (1.5Ml/d)
Water body type		River
Hydromorph designation		Heavily Modified
Water body ID		GB107101005971
Water body name		Eastern Yar (Lower)

Option description and potential effects:

SWS_IOW_HI-REU_RE1_ALL_sey9 (sey9) proposes the transfer of treated effluent from Sandown WwTW (currently discharged to sea), to support flows in the Eastern River Yar upstream of the Sandown WSW abstraction at Alverstone . Potential impacts could occur as a result of the construction of new in-channel infrastructure, and the discharge of treated effluent during operation. The disharge site would be located in the upper catchment of the Eatern River Yar, upstream of the Alverstone Marshes SSSI.

SWS_IOW_HI-GRW_ALL_ALL_nw_gwa_kni_westi (kni_westi) scheme proposes to maximise the source output from Newchurch Lower Green Sand (LGS) to its licensed capacity by replacing all 3 boreholes. The scheme output would result in a 4.5 Ml/d increase in abstraction above RA. The Newchurch LGS site is located approximately 700m from the Alverstone Marshes GWDTE SSSI, the boreholes abstract from the IOW Lower Greensand GWB (GB40701G502900). The increased abstraction is likely to result in a reduction in baseflow to the Eastern Yar and GWDTE which could have resulting impacts on biological status elements.

SWS_IOW_HI-GRW_ALL_ALL_br_less (br_less) scheme proposes to drill a replacement borehole for Eastern Yar3 . The source is also located in the IOW Cental Downs Chalk GWB within 700m of Wroxall Stream (GB107101006210) which discharges to the Eastern Yar (Lower) SWB. The source is only used intermittently, and is used to augment the Yar, thereby offsetting any flow impacts and is assessed as WFD compliant. Therefore it is possible that use of Eastern Yar3 (WR171) may help to offset impact by the increased Newchurch LGS abstraction however this would need further investigation.

The Alverstone gauging station measures flow on the Eastern Yar downstream from the Alverton Marshes GWDTE and upstream from the confluence of Scotchells Bk with the Eastern Yar. Q95 flows are 0.05 m3/s or 4.32 Ml/d. The impact of the abstraction, if impacting on river flows, could therefore be substantial, but would be offset by the increase in discharge into the Eastern Yar, as well as by the Eastern Yar3 augmentation if it was in use. However the impact of reduction in baseflow on the dilution capacity of the river, particularly in low flows, prior to discharge needs to be properly investigated when considering the water quality requirements of the discharge.

The cumulative impact of these schemes is therefore that the Eastern Yar3 augmentation source and Sandown WwTW effluent discharge options would offset the reduction in baseflow due to the increase in RA abstraction from the Newchurch LGS groundwater source option. However, this needs to be investigated properly to understand the likely allocation of groundwater abstraction to the surface water body, the spatial impact on the GWDTE and the implication for the water quality requirements of the treated effluent discharge.

	Baseline Status		Reasons for not achieving good status					Assessment of option		
Status element	RBMP2 status (2015)	2019 interim status	Flow	Morphology	Sanitary water	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments
Fish	High	High						The geology underlying SWB (GB107101005971) indicates a likely high degree of continuity between groundwater in the Central Downs Chalk and Lower Greensand GWB and surface water bodies. Therefore increases to RA abstraction fthrough the br_less and kni_westi schemes may reduce baseflow to the streams discharging to the Eastern Yar (Lower). Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish and invertebrate populations. Additionally there is a potential for direct and downstream impact on the nearby GWDTE SSSI. The 2022 Cycle 3 classifications have downgraded DO and Phosphate elements to moderate, from High and Good respectively in 2019, although no RNAG is available currently. A reduction in baseflow may impact on the dilution capacity of the Eastern Yar (Lower). The resultant changes in physico-chemical quality elements may have a corresponding impact on ecological elements. Since the new discharge under the Sey9 scheme may also affect the physico-chemistry the resultant impact could be exacerbated by the lower baseflow, especially during low flows. Higher flows on the Eastern Yar after the treated effluent discharge may also counteract the reduced baseflow due to groundwater abstraction from the Newchurch LGS abstraction. Further investigation is required to understand whether any changes to physico-chemistry could affect ecological classifications and what the impact of groundwater abstraction will be on the surface water bodies.	Non-compliant (low conf.)	n/a
Invertebrates	High	Good					No RNAG Available for 2022		Non-compliant (low conf.)	Non-compliant (low conf.)
Macrophytes/ phytobenthos	n/a	n/a							Non-compliant (low conf.)	Non-compliant (low conf.)
Phys-chem water quality (in support of ecological status)	Mod	Good			Historical iron issues allocated to point source - water industry.			Reduction in flow, particularly during times of low flow, could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature), potentially causing a deterioration in status. It is possible that a new discharge of treated effluent could introduce new chemicals or increase the loading of chemicals currently present in the water body. Since both options have a potential to deteriorate the physico chemistry classification elements, particularly DO and Phosphate, further investigation are required to determine whether changes to these elements may result in impacts upon biological quality elements.	Non-compliant (low conf.)	Non-compliant (low conf.)
Chemicals	Good	Fail	Fail due to Perfluorooctane sulphonate (PFOS) and Polybrominated diphenyl ethers (PBDE)					None of the options would introduce new priority or priority hazardous chemicals. An investigation into the likely reduction in flows caused by the kni_westi and br_less schemes is required to understand whether the dilution capacity of the SWB and downstream Eastern Yar (Lower) could further deteriorate the chemical status.	Non-compliant (low conf.)	Non-compliant (low conf.)
RBMP2 water body measures			"Heavily modified use - Flood protection Physical form and function - 2.remove obsolete structures, 6 In channel morph diversity, 8.Re-opening culverts ALL NOT IN PLACE. 10 Flood bunds, 12. Floodplain connectivity. 4 Remove or soften hard bank ALL IN PLACE "					It is expected that the Water recycling discharge option would be beneficial to RBMP measures, by retaining more flow in the river	Compliant (low conf.)	Compliant (low conf.)
									"Non-compliant (low conf.)"	

Option 1	SWS_HAZ_HI-GRW_ALL_ALL_chi	Groundwater (HAZ): Recommission Chilbolton (0.5Ml/d)	Option description and potential effects: The Chilbolton option involves bringing the site back into service earlier by installing nitrate treatments This would increase abstraction above recent actual, but within current licence. The Kings Somborne option involves the development of a new borehole and pump capacity to increase the DO from the site from the current 1.5Ml/d to the licence 4Ml/d giving a potential benefit of 2.5Ml/d. The Romsey option involves 3 replacement boreholes to increase DO on site. Scheme output is 13.7Ml/d. No additional treatment is required.Replacement borehole locations are distant from existing borehole locations and require new pipelines to connect to WSW. The Test MAR option involves recharge of the confined chalk aquifer from mains water in winter months, with subsequent onsite abstraction from the same aquifer ins summer/autumn critical low flow periods. Treatment is avaibable on site and it is assumed that there is sufficient treatment capacity for the abstracted water. The scheme assumes an extended pilot trial period, with subsequent development of the MAR scheme. Expected DO from the developed scheme is 15Ml/d.
Option 2	SWS_HRZ_HI-GRW_ALL_ALL_hor	Groundwater (HRZ): Remove constraints at Kings Sombourne (2.5Ml/d)	
Option 3	SWS_HSW_HI-GRW_ALL_ALL_nw_gwa_tim_westi	Groundwater (HRZ): New boreholes at Romsey (4.8Ml/d)	
Option 4	SWS_HSW_HI-GRW_RE1_ALL_str_asr_tes_westi	Groundwater (HSW): Test MAR (5.5 Ml/d)	
Water body type		Groundwater	
Water body ID		GB40701G501200	
Water body name		River Test Chalk	

	Baseline Status			Assessment of option		
Status element	RBMP2 status (2015)	2019 interim status	**Reasons for not achieving good status**	Assessment	Potential for deterioration	Potential for introduction of impediments
Dependent surface water body status	Good	Good		Increase in abstraction in the unconfined Chalk within licence limits (from the Chilbolton, Kings Somborne and Romsey options) may affect flow in nearby River Test. ALS shows there is restricted water available at Q95 with water available at Q70, Q50, Q30. Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish and invertebrate populations. However, restricted water availability applies only further downstream, and is protected by a HOF. Therefore, local impacts, within existing licence, should be acceptable and downstream impacts avoided by HOF (and potentially associated reduction in other sources). The Test MAR option is not expected to affect river flows because it would abstract from the confined aquifer	Compliant (low conf.)	
Ground water dependent terrestrial ecosystem test	Good	Good		No GWDTEs are likely to be affected by this option	Compliant (low conf.)	
Saline intrusion	Good	Good		The potential for saline intrusion into the aquifer is considered to be low given the distance from the coast and the lack of saline intrusion at these sources historically.	Compliant (high conf.)	
Water balance	Good	Good		Increased abstraction from the Chilbolton, Kings Somborne and Romsey options will reduce the surplus in the water balance. However as the increase in abstraction will be within the current licence, it is relatively unlikely to result in deterioration of status. The Test MAR option involves recharge of the confined Chalk, and is designed to maintain water balance.	Compliant (low conf.)	
Chemical (overall)	Poor	Poor	Drinking Water Protected Area and General Chemical Test: Natural conditions- groundwater status recovery time	For the Test MAR option, the water will be pre-treated and hence will not introduce any new chemicals to the groundwater body. The other options also will not introduce any new chemicals to the groundwater body.	Compliant (med. conf.)	
RBMP2 water body measures			not known at water body scale		n/a	
				Overall assessment of WFD Regulations compliance of the option in this water body	Compliant (low. conf.)	

Option 1	SWS_SNZ_HI-GRW_ALL_ALL_Petersfield	Groundwater (SNZ): Petersfield refurbishment (1.6Ml/d)	Option description and potential effects: The Petersfield Refurbishment option will transfer excess water for enhanced treatment at Midhurst , with refurbishment of Petersfield and borehole rehabilitation. The Reinstate West Chiltington option will bring the groundwater source back into service by constructing a new treatment plant and flood resilience measures at the site. The Petworth option will involve drilling a new replacement borehole to allow the source to be brought back in to service All three options will increase groundwaterabstraction from the Greensand above recent levels, but within the existing licence quantity. The increase in abstraction could potentially have impacts on river flows or GWDTEs
Option 2	SWS_SNZ_HI-GRW_ALL_ALL_smockalley	Groundwater (SNZ): Reinstate West Chiltington (3.1Ml/d)	
Option 3	SWS_SNZ_HI-ROC_RE1_CNO_hsb-rcm	Groundwater (SNZ): New borehole at Petworth (4Ml/d)	
Water body type		Groundwater	
Water body ID		GB40701G503100	
Water body name		Lower Greensand Arun & Western Streams	

	Baseline Status			Assessment of option		
Status element	RBMP2 status (2015)	2019 interim status	**Reasons for not achieving good status**	Assessment	Potential for deterioration	Potential for introduction of impediments
Dependent surface water body status	Good	Good		The Arun and Western Streams ALS (June 2022) has restricted water available in the Arun & Western Streams Greensand. SWS are currently undertaking a WINEP investigation to develop the Pulborough groundwater model (which covers the Greensand water body) and assess potential impacts of abstraction on rivers and designated sites. Until the WINEP investigation concludes, it must be assumed that impacts on dependent surface waters or GWDTEs are possible. This is in line with the ALS current conclusion that there is restricted water available at the groundwater body level.	Non-compliant (low conf.)	
Ground water dependent terrestrial ecosystem test	Good	Good			Non-compliant (low conf.)	
Saline intrusion	Good	Good		This is an inland groundwater body with no current issues with saline intrusion, and the increased rate of abstraction would be highly unlikely to result in deterioration	Compliant (high conf.)	
Water balance	Good	Good		As the water balance is currently Good, and abstraction would be within licence, it is assumed that this option would not result in deterioration of the water balance test. However, this conclusion will be subject to the Pulborough groundwater modelling and associated WINEP investigation being finalised	Compliant (low conf.)	
Chemical (overall)	Poor	Poor	Drinking Water Protected Area- poor nutrient management		Compliant (med. conf.)	
RBMP2 water body measures						
				Overall assessment of WFD Regulations compliance of the option in this water body	Non-compliant (low conf.)	

			Option description and potential effects:
			There are 2 schemes in this waterbody: HSB-RCM and tilmore-hardha p 10. The hsb-rcm scheme would increase the RA abstraction from the Petworth WSW borehole source which may cause a reduction in flow of the Petworth stream which discharges into the Western Rother. The hardha_p_10 scheme has no operational activity in this waterbody and any pipeline construction acitivites are assumed to use methods that prevent short or long term risk to WFD deterioration. Therefore, there would be no cumulative effects in this water body catchment, beyond the conclusions for the new borehole at Petworth (hsb-rcm) alone
Option 1	SWS_SNZ_HI-ROC_RE1_ALL_hsb-rcm	Groundwater (SNZ): New borehole at Petworth (4Ml/d)	
Option 2	SWS_SNZ_HI-TFR_RZ5_ALL_tilmore-hardha p 10	Bulk import (SNZ): SEW RZ5 to Pulborough	
Water body type		River	
Hydromorph designation		not designated artificial or heavily modified	
Water body ID		GB107041012780	
Water body name		Petworth Stream	

	Baseline Status		Reasons for not achieving good status					Assessment of option		
Status element	RBMP2 status (2015)	2019 interim status	Flow	Morphology	Sanitary water quality	Nutrients	Other	Assessment	Potential for deterioration	Potential for introduction of impediments
Fish	Good	Good						Increase in abstraction within licence limits may affect flow in nearby stream discharging to the River Rother. ALS shows there is no water available at Q95 and Q70. Restricted water available at Q50. Geology indicates likely high degree of continuity between groundwater and surface water. Changes to the hydrological regime, river continuity and morphological conditions due to change in baseflow could impact fish, invertebrate and macrophyte/phytobenthos populations.	Non-compliant (low conf.)	n/a
Invertebrates	Good	Good							Non-compliant (low conf.)	n/a
Macrophytes/ phytobenthos	Mod	Mod							Non-compliant (low conf.)	Non-compliant (low conf.)
Phys-chem water quality (in support of ecological status)	Mod	Mod				Phosphate	Probable - Diffuse Pollution - Phosphate, Dissolved Oxygen - Water Industry groundwater abstraction	Reduction in flow, particularly during times of low flow, could result in changes to physico-chemical quality elements (e.g. BOD, DO, pH, temperature), potentially causing a deterioration in status. The CDE indicate that Phosphate contributions are a key RNAG, flow reductions could exacerbate this issue.	Non-compliant (low conf.)	Non-compliant (low conf.)
Chemicals		Fail	Confirmed - Mercury, PBDE					These options would not introduce new priority or priority hazardous chemicals. While reduced flows could reduce dilution of point source discharges, this is unlikely to influence the classification of any chemicals, particularly those that are ubiquitous.	Compliant (low conf.)	Compliant (low conf.)
RBMP2 water body measures			N/a						n/a	n/a
									Non-compliant (low conf.)	