

Drainage and Wastewater Management Plans (DWMPs)

Workshop for the Arun and Western Streams DWMP

Tuesday 11th May 2021



from
**Southern
Water** 

The logo graphic for Southern Water, featuring three stylized blue waves of varying lengths, with the longest wave on the right.

Agenda

- Welcome and Purpose of the workshop
- Presentation: Problem Characterisation
- Break Out Session 1: Understanding the risks and identifying our strategy
- **BREAK**
- Presentation: Options Development and Appraisal
- Break Out Session 2: Identifying generic options
- Prioritising Wastewater Catchments
- Next steps



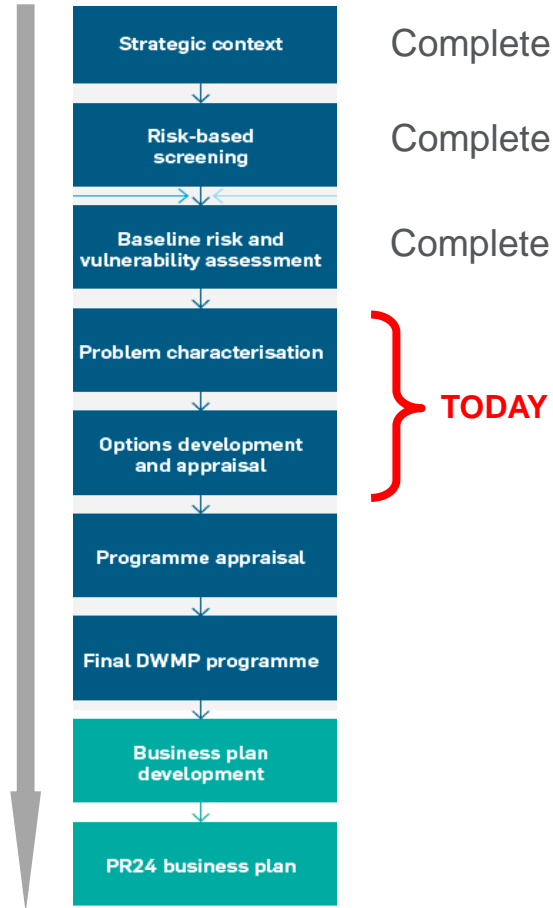
Welcome and Purpose

Kaylass Ramlagan

Strategy Manager, Asset Strategy & Planning



DWMP Process: Where are we now?



Our aim today is to:

- Understand the problem: risks, causes and drivers
- Start the Options Development and Appraisal process by selecting generic options
- Prioritise catchments for detailed planning



Purpose of the Workshop

- Determine the investment strategy for all wastewater catchments within the Arun and Western Streams river basin
- Start the options development and appraisal process by selecting generic options to progress to the detailed planning stage
- Prioritise wastewater catchments for the detailed planning stage; and
- Identify where we can work with partner organisations on the detailed (level 3) plans

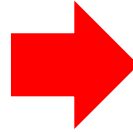


Presentation: Problem Characterisation

Problem Characterisation

3 parts:

1. Causes and drivers of risks



Drivers of Risks



Customer



Hydraulics



Operational



Quality



Unknown



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Drivers

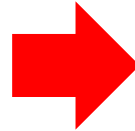
A **Driver** is “a factor which causes a particular risk to happen or develop”. For the DWMP, it is the category associated with the cause of the risk, as set out below.

Driver	Definition	Examples
Hydraulic	Risks dependent on the capacity of the sewer network to cope with current or future flows generated in the catchment	Rain water, surface water, highway run-off, and river flooding entering into combined or separate foul sewers. Infiltration from surface or groundwater.
Operational	Risks associated with our asset management and operational management activities	Asset failures such as sewer collapse, leaking sewers, pump breakdowns and power supply faults.
Customer	Risks dependent on the activities and behaviours of our customers.	Misconnections of surface water to foul sewers (or vice versa). Blockages caused by disposing of fats, oils and grease into sewer or flushing of baby wipes, nappies etc. Unconsented trade waste or chemicals being poured into drains.
Quality	Risks associated with the treatment capacity and flow and quality compliance of our wastewater treatment works	Unable to achieve permits specified by the Environment Agency, lack of adequate treatment capacity for the flow arriving at the treatment works.

Problem Characterisation

3 parts:

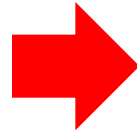
1. Causes and drivers of risk
2. Identifying Catchment Strategy



Problem Characterisation

3 parts:

1. Causes and drivers of risks
2. Identifying Catchment Strategy
3. Strategic Needs and Complexity Assessment



		Strategic needs score ("How big is the problem?")			
		Negligible	Small	Medium	Large
		1-2	3-4	5-6	7-8
Complexity factors score ("How difficult is it to solve")	High (8+)	Teal	Yellow	Red	Red
	Medium (5-7)	Teal	Teal	Yellow	Yellow
	Low (<4)	Teal	Teal	Teal	Yellow



Purpose of Catchment Strategies

- Moves us to longer term thinking (25 year plan)
- Provides a clear statement of intent for our customers
- Align our whole business to get behind it and deliver
- Provides a focus for where investment is needed, and when
- Supports our investment planning



Catchment Investment Strategies

Do Nothing

- No investment.
- Baseline upon which to judge the cost effectiveness of doing 'something'

Maintain

- Current performance within acceptable limits and no major concerns for future.
- Continue to maintain. Replace assets like for like when needing replacement.
- Accept that climate change and growth may cause slight deterioration in levels of performance

Sustain

- Current performance acceptable, but risks will increase in the future.
- Continue to maintain, but as assets need replacing look to increase capacity to keep pace with climate change, development and asset condition to sustain the existing level of performance into the future

Enhance

- Current performance is unacceptable. The causes are mostly operational.
- Enhance current maintenance programmes (opex with some capital maintenance) to improve performance e.g. asset replacement/upgrades to improve reliability. No significant new assets or infrastructure required.

Prepare

- Current risks and performance are acceptable at the current time.
- Maintain existing system and performance levels, but actively invest now to **plan and prepare** for future risks and performance issues (e.g. where significant growth planned, or future tightening of permits). Invest in data collection, surveys, model build and feasibility studies (not design).

Defer

- Current performance acceptable at current time, but concerns about future risks in longer term. Risks expected to be easy to resolve.
- Continue to maintain, but defer decision and our consideration of options for capital investment for future rounds of the DWMP

Improve

- Current performance unacceptable. Need to reduce the current risks
- Actively look to invest capital funding in the short term to address current performance issues (and allow for future changes when implementing improvements)

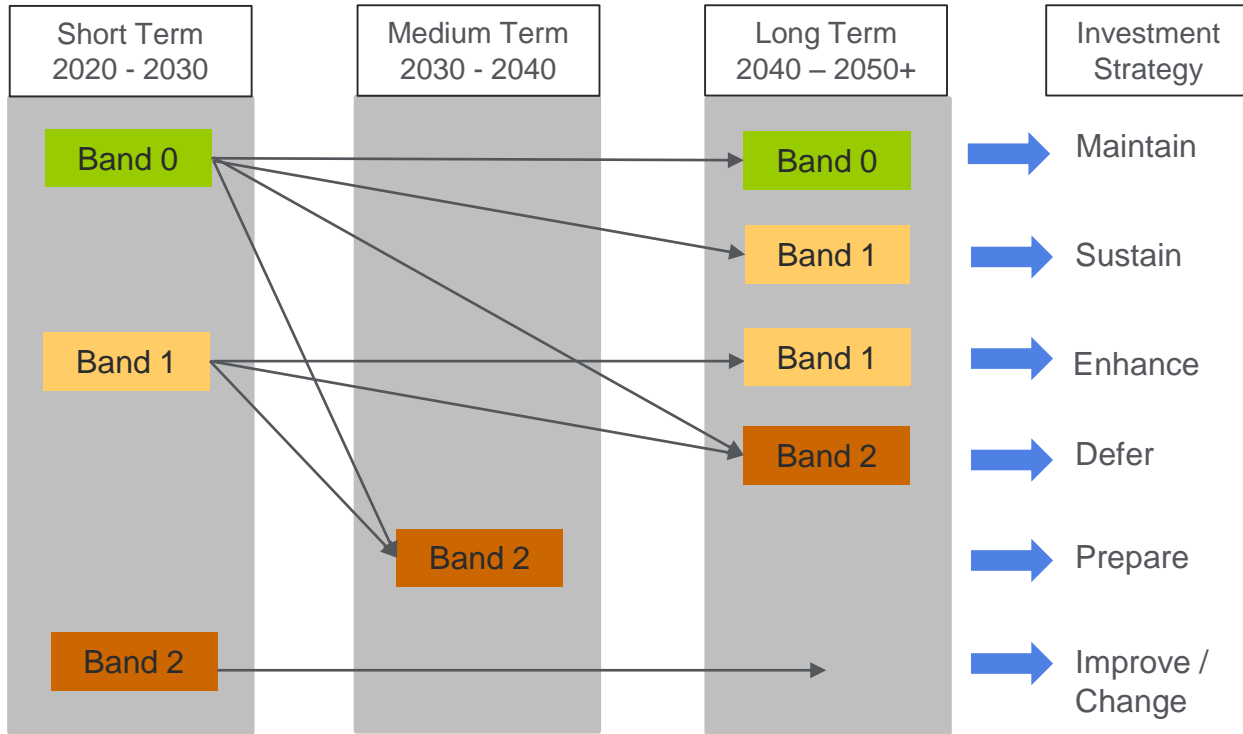
Change

- Current or future risk are/will be unacceptable, and the causes mean that the current system is not sustainable
- Changes to the wastewater system needed i.e. new technology, discharge to alternative water body / transfer, additional treatment, re-use. Potential requirement for WINEP investment.

LEVEL OF EFFORT



Determining our Investment Strategies



BRAVA Results: Arun and Western Streams

NF	Not Flagged *
NA	Not Applicable **
0	Not Significant
1	Moderately Significant
2	Very Significant

Wastewater Catchment Reference	Wastewater Catchment Reference	Population Equivalent	Sewer Length (KM)	Planning Objective													
				Internal Sewer Flooding Risk	Pollution Risk	Sewer Collapse Risk	Risk of Sewer Flooding in a 1 in 50 year storm	Storm Overflow performance	Risk of WTW Compliance Failure	Risk of flooding due to Hydraulic Overload	Dry Weather Flow Compliance	Good Ecological Status / Potential	Surface Water Management	Nutrient Neutrality	Groundwater Pollution	Bathing Waters	Shellfish Waters
				2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020
FORW	FORD	132,208	1,131.729	1	0	1	2	2	0	0	0	1	2	NA	0	2	NA
HONE	HORSHAM NEW	66,861	617.831	0	1	0	2	1	1	1	0	1	2	2	0	NA	NA
CHIC	CHICHESTER	34,623	221.286	2	0	1	1	2	0	1	0	0	2	0	NA	NA	2
SIDL	SIDLESHAM	25,167	272.693	1	1	1	2	2	0	1	1	0	0	2	0	0	NA
LIDS	LIDSEY	21,708	199.746	0	2	0	1	2	0	1	1	1	0	2	0	2	NA
THOR	THORNHAM	21,339	215.890	2	0	0	1	2	0	1	1	0	0	2	0	0	1
PETE	PETERSFIELD	17,104	214.081	1	0	2	1	0	1	2	1	0	0	1	0	NA	NA
SOAM	SOUTH AMBERSHAM	10,708	180.859	0	2	2	0	2	0	0	0	1	0	2	0	NA	NA
PAGM	PAGHAM	9,664	112.015	0	0	0	0	1	0	0	1	0	0	2	0	0	NA
PULB	PULBOROUGH	9,224	101.341	0	0	0	0	1	0	0	0	0	0	NA	0	NA	NA
BILL	BILLINGSHURST	7,999	79.575	0	0	0	2	2	0	2	1	0	0	NA	0	NA	NA
STOR	STORRINGTON	7,961	63.561	0	0	0	0	1	0	0	0	1	0	2	0	NA	NA
LISS	LISS	6,592	83.151	0	0	0	1	0	0	0	1	0	0	2	0	NA	NA
TANG	TANGMERE	5,045	44.986	0	0	2	1	0	0	1	0	0	0	1	1	2	NA
BOSH	BOSHAM	3,922	53.203	0	2	0	1	0	0	1	0	0	0	1	1	0	1
LOXW	LOXWOOD	3,761	59.619	0	0	0	1	2	1	1	1	2	0	2	0	NA	NA
CHID	CHIDDINGFOLD	2,834	40.225	0	2	0	1	2	0	0	0	2	0	2	0	NA	NA
LAVA	LAVANT	2,674	42.410	0	0	0	1	2	0	1	0	1	0	2	0	NA	NA
PETW	PETWORTH	2,634	26.982	0	0	0	0	2	0	0	0	0	0	2	0	NA	NA
RUDG	CHEPHURST COPSE RUDGWICK	2,523	24.929	0	0	0	2	0	0	0	1	0	0	2	0	NA	NA
FERN	FERNHURST	2,000	15.378	0	0	0	2	0	0	2	0	0	0	1	0	NA	NA
WAAM	WARNHAM	1,295	12.902	0	0	0	0	2	2	2	0	1	0	2	0	NA	NA
SLIN	SLINFOLD	1,217	12.903	0	0	0	0	1	0	1	0	1	0	2	0	NA	NA
WISB	WISBOROUGH GREEN	1,197	22.031	0	0	0	0	0	0	1	0	2	0	2	0	NA	NA
MANN	MANNINGS HEATH	1,078	14.456	0	0	0	1	2	0	0	0	0	0	2	0	NA	NA
HATG	SOUTH HARTING	968	12.043	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA
ROGA	ROGATE	943	13.433	0	0	0	0	0	0	1	0	1	0	1	0	NA	NA
COLW	COLDWALTHAM	880	10.345	0	0	0	0	0	0	0	0	0	0	1	0	NA	NA
CLAP	CLAPHAM	798	9.604	0	0	0	0	NA	0	0	0	0	0	1	0	NA	NA
FITT	FITTLEWORTH	743	11.574	0	0	0	0	2	1	0	0	1	0	1	0	NA	NA
KIRD	KIRDFORD	695	11.142	0	0	0	0	0	0	0	0	2	0	1	0	NA	NA
NORT	NORTHCHAPEL	603	5.402	0	0	0	0	0	1	0	0	2	0	1	0	NA	NA
AMBE	AMBERLEY	571	10.966	0	0	0	0	NA	0	0	0	0	0	1	0	NA	NA
BURI	BURITON	510	7.176	0	1	0	0	0	0	0	0	1	0	1	0	NA	NA
BURY	BURY	481	9.313	0	0	0	0	2	0	1	0	0	0	1	0		
GRAY	GRAYSWOOD	415	2.945	0	0	0	0	2	0	0	0	2	0	1	0		
TILL	TILLINGTON	404	7.065	0	0	0	0	NA	0	0	0	0	0	1	0		
FAYG	FAYGATE	371	1.311	0	0	0	0	NA	0	0	0	0	0	NA	0		

Results shown for 2020 only

Suggested Catchment Strategies

Catchment Ref	Wastewater Catchment	Population	Investment Strategy
BILL	BILLINGSHURST	7,999	Improve
BOSH	BOSHAM	3,922	Improve
BURI	BURITON	510	Improve
BURY	BURY	481	Improve
CHIC	CHICHESTER	34,623	Improve
CHID	CHIDDINGFOLD	2,834	Improve
DUNC	DUNCTON	90	Improve
FITT	FITTLEWORTH	743	Improve
FOGR	FOREST GREEN	315	Improve
FORW	FORD	132,208	Improve
GRAY	GRAYSWOOD	415	Improve
HARD	HARDHAM	26	Improve
HONE	HORSHAM NEW	66,861	Improve
KIRD	KIRDFORD	695	Improve
LAVA	LAVANT	2,674	Improve
LIDS	LIDSEY	21,708	Improve
LISS	LISS	6,592	Improve
LOXW	LOXWOOD	3,761	Improve
MANN	MANNINGS HEATH	1,078	Improve
NORT	NORTHCHAPEL	603	Improve

37 improve

OCKE	OCKLEY EAST	212	Improve
OCKW	OCKLEY WEST	315	Improve
PAGM	PAGHAM	9,664	Improve
PETE	PETERSFIELD	17,104	Improve
PETW	PETWORTH	2,634	Improve
PULB	PULBOROUGH	9,224	Improve
ROGA	ROGATE	943	Improve
RUDG	CHEPHURST COPSE RUDGWICK	2,523	Improve
SIDL	SIDLESHAM	25,167	Improve
SLIN	SLINFOLD	1,217	Improve
SOAM	SOUTH AMBERSHAM	10,708	Improve
STOR	STORRINGTON	7,961	Improve
TANG	TANGMERE	5,045	Improve
THOR	THORNHAM	21,339	Improve
TROT	TROTTON	143	Improve
WAAM	WARNHAM	1,295	Improve
WISB	WISBOROUGH GREEN	1,197	Improve



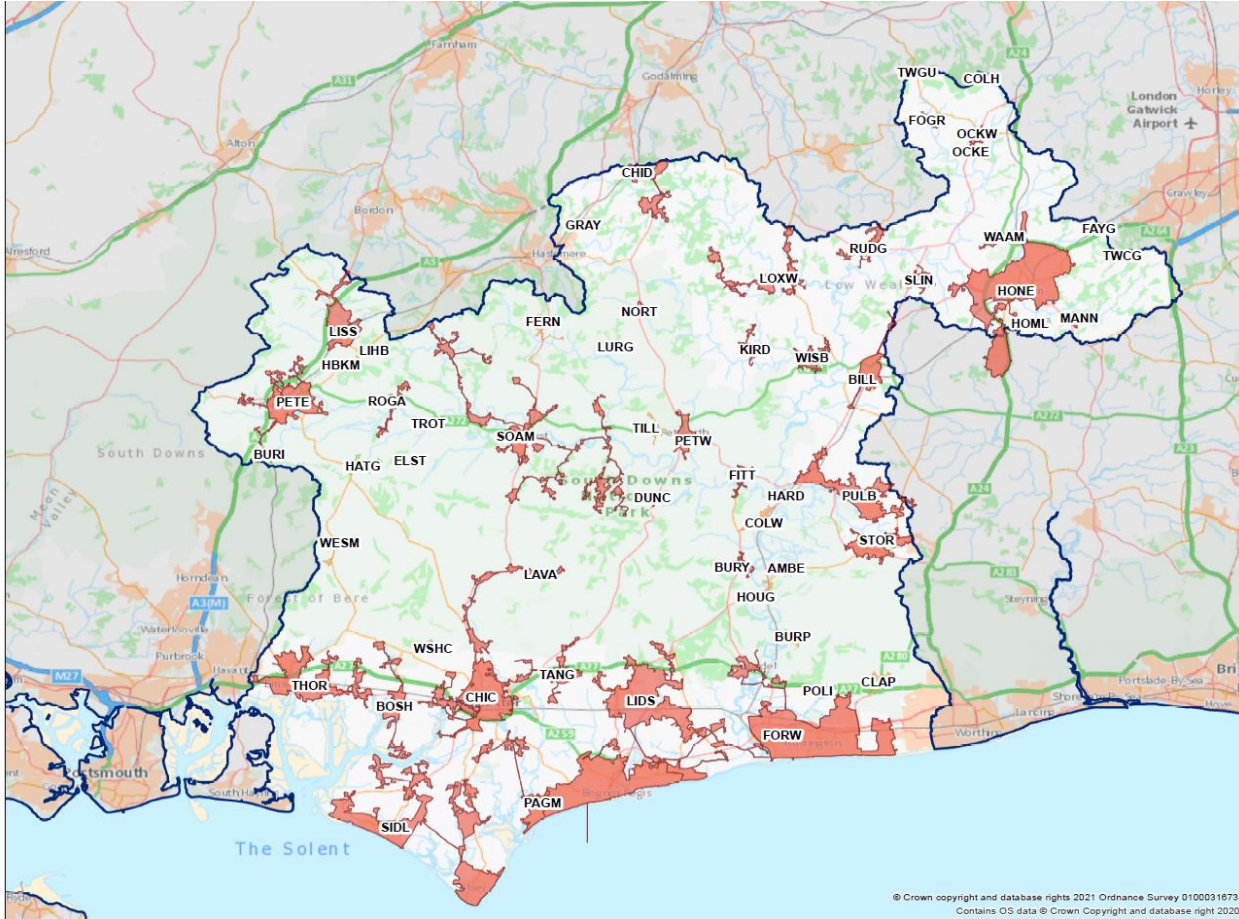
Suggested Catchment Strategies

Catchment Ref	Wastewater Catchment	Population	BRAVA Results 2020 No. of POs in each band			Investment Strategy
			0	1	2	
FERN	FERNHURST	2,000	9	1	2	Prepare
COLW	COLDWALTHAM	880	11	1	0	Prepare
CLAP	CLAPHAM	798	10	1	0	Prepare
TWHA	HASLEMERE	112	0	0	0	Maintain
AMBE	AMBERLEY	571	10	1	0	Prepare
TILL	TILLINGTON	404	10	1	0	Prepare
WESM	WEST MARDEN	309	10	1	0	Prepare
LURG	LURGASHALL	212	10	1	0	Prepare
BURP	BURPHAM	168	9	1	0	Prepare
HOUG	HOUGHTON	121	9	1	0	Prepare
TWGU	GUILDFORD WTW	102	8	1	0	Prepare
LIHB	LISS HILLBROW	82	10	1	0	Prepare
HBKM	HILLBROW KNOWLES MEADOW	58	10	1	0	Prepare
POLI	POLING	36	9	1	0	Prepare
HATG	SOUTH HARTING	968	12	0	0	Maintain
COLH	COLDHARBOUR	147	9	0	0	Maintain
TWCG	COLGATE THAMES	132	0	0	0	Maintain
WESS	WEST STOKE	64	0	0	0	Maintain
HOML	MAGPIE LANE HORSHAM	38	0	0	0	Maintain
TWCP	COLGATE PRIVATE	28	0	0	0	Maintain
ELST	ELSTED	18	0	0	0	Maintain
WSHC	HILLSIDE COTTAGES WEST STOKE	17	0	0	0	Maintain
FAYG	FAYGATE	371	10	0	0	Sustain

23 not “Improve”



Suggested Catchment Strategies: Arun and Western Streams



- 60 sewer catchments
- 56 WTWs
- 502 WPS
- 4012km sewers
- 12% area
- 93% homes connected



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Questions

Break Out Session 1

Instructions for Break-Out Session 1

For each wastewater catchment:

1. Review the BRAVA results and decide the appropriate catchment investment strategy; and
2. Review the causes of the risks and decide the appropriate drivers

Time allowed: 30 minutes



Plenary: Feedback from Break-Outs

Poll 1



Options Development and Appraisal (ODA)

DWMPs: Identifying and Developing Options

Generic Options

Screening Questions:

- Could this generic option be utilised to manage and/or reduce the risks identified in the BRAVA?

Unconstrained Options

Screening Questions:

- Is the option **technically feasible** given site, operational or option-specific circumstances?
- Is it **cost effective** (based on a simple high, medium, low cost assessment)?
- Does the option achieve the required **outcome**?
- Are there **environmental risks** that cannot be mitigated or benefits provided?
- Would the option likely be supported by **customers**?
- Risk and uncertainty – does the option provide **resilience** against future uncertainties?

Constrained Options

Screening Questions:













- 1. Feasibility and risk:**
 - Customer acceptability?
 - Political acceptability?
 - Timeline for implementation
 - Dependencies
 - 'Third parties'
 - Planning and regulatory constraints
- 2. Engineering and cost:**
 - Engineering complexity
 - Cost
- 3. Performance:**
 - Outcomes
 - Flexibility to adapt
 - Resilience
- 4. Operational**
- 5. Environmental**
 - High Level Screening (SEA, HRA, WFD, Biodiversity Net Gain, Natural Capital)

Feasible Options

Provide for each Feasible Option:

- A description of the option
- A description of how the option being described differs from baseline activities
- Scale of the benefits to be achieved against single or multiple planning objectives.
- An assessment of customers' likely support for the option.
- An estimate of the time needed to investigate and implement the option, including the earliest start date.
- An assessment of the risks and uncertainty associated with the option.
- An assessment of the flexibility of the option to adapt to future uncertainty.
- An explanation of whether the option depends on an existing scheme or a proposed option, or is mutually exclusive with another option.
- An assessment of factors or constraints specific to the option (e.g. planning risks).
- A description of how the option will be utilised and impact on costs.
- An assessment of the environmental impacts of the option
- A Habitats Regulations Assessment if an option could affect any designated European site.
- An assessment of the costs and benefits.

DWMPs: Generic Options

Type of Measures	Generic Option Categories	Icon	Examples of Generic Options
Source (Demand) Measures (to reduce likelihood)	Control / Reduce surface water run-off		Natural Flood Management; rural land management and catchment management; SuDS including blue and green infrastructure; storm management
	Reduce groundwater levels		Reduce leakage from water supply pipes; pump away schemes to locally lower groundwater near sewer network
	Improve quality of wastewater		Domestic and business customer education; incentives and behaviour change (reduce Fats, Oils & Grease, wet wipes etc.); monitoring trade waste at source; on-site black water and/or greywater pre-treatment
	Reduce the quantity / demand		Water efficient appliances; water efficient measures; blackwater and/or greywater re-use; treatment at source
Pathway (Supply) Measures (to reduce likelihood)	Improve Sewer Network		Asset optimisation; additional network capacity; storage; separate flows; operational improvements; structural repairs; re-line sewer pipe and manholes; smart networks.
	Improve Treatment Quality		Increase treatment capacity; rationalisation of treatment works (centralisation / decentralisation); install tertiary plant; UV plant or disinfection facilities; innovation; improve Technical Achievable Limits; new WTWs
	Wastewater Transfer to treatment elsewhere		Transfer flow to other network or treatment sites; transport sewage by tanker to other sites
Receptor Measures (to reduce consequences)	Mitigate impacts on Air Quality		Carbon offsetting; noise suppression /filtering; odour control and treatments
	Improve Land and Soils		Sludge soil enhancement
	Mitigate impacts on receiving waters		River enhancement, aeration
	Reduce impact on properties		Property flood resilience; non-return valves; flood guards / doors; air brick covers
Other	Study / Investigation		Additional data required; hydraulic model development; WQ monitoring and modelling



Break Out Session 2

Instructions for Break-Out Session

Task:













Based on your understanding of the risks, causes and the drivers from the first break-out session

..... now identify the **generic options** to progress in the detailed planning for the wastewater catchment

Time allowed: 30 minutes



Break-out Groups: Template to complete

Planning Objectives		Driver	Type of Measures	Generic Option Categories	Icon	Take Forward?	Reasons	Examples of Generic Options
PO1	Pollution	Operational	Source (Demand) Measures (to reduce likelihood)	Control / Reduce surface water run-off		N		Natural Flood Management; rural land management and catchment management; SuDS including blue and green infrastructure; storm management
PO3	Sewer Collapse Risk	Operational		Reduce groundwater levels		N		Reduce leakage from water supply pipes; pump away schemes to locally lower groundwater near sewer network
PO4	1 in 50 year	Hydraulic		Improve quality of wastewater		N		Domestic and business customer education; incentives and behaviour change (reduce Fats, Oils & Grease, wet wipes etc.); monitoring trade waste at source; on-site black water and/or greywater pre-treatment
BP09	Good Ecological status	Quality		Reduce the quantity / demand		N		Water efficient appliances; water efficient measures; blackwater and/or greywater re-use; treatment at source
BP10	Surface Water flooding	Hydraulic	Pathway (Supply) Measures (to reduce likelihood)	Improve Sewer Network		N		Asset optimisation; additional network capacity; storage; separate flows; operational improvements; structural repairs; re-line sewer pipe and manholes; smart networks.
BP12	Groundwater Pollution	Operational		Improve Treatment Quality		N		Increase treatment capacity; rationalisation of treatment works (centralisation / de-centralisation); install tertiary plant; UV plant or disinfection facilities; innovation; improve Technical Achievable Limits; new WTWs
BP13	Bathing Waters	Customer		Wastewater Transfer to treatment elsewhere		N		Transfer flow to other network or treatment sites; transport sewage by tanker to other sites
			Receptor Measures (to reduce consequences)	Mitigate impacts on Air Quality		N/A	Not included in first round of DWMPs	Carbon offsetting; noise suppression /filtering; odour control and treatments
				Improve Land and Soils		N/A	Not included in first round of DWMPs	Sludge soil enhancement
				Mitigate impacts on receiving waters		N		River enhancement, aeration
				Reduce impact on properties		N		Property flood resilience; non-return valves; flood guards / doors; air brick covers
			Other	Study / Investigation		N		Additional data required; hydraulic model development; WQ monitoring and modelling



Plenary: Feedback from Break-Outs

Poll 2

Prioritising Wastewater Catchments

Prioritising Wastewater Catchments

- How to prioritise the wastewater catchments on the Arun and Western Streams for next stage of the DWMP?
- Where do we start?
- Which catchments should we do first?
- Would you like to work with us on any of these catchments?

Prioritising Wastewater Catchments

Catchment Ref	Wastewater Catchment	Population	BRAVA Results 2020 No. of POs in each band			Investment Strategy	PC Matrix
			0	1	2		
LIDS	LIDSEY	21,708	5	4	4	Improve	Yellow
FORW	FORD	132,208	5	3	4	Improve	Yellow
CHIC	CHICHESTER	34,623	6	3	4	Improve	Yellow
SOAM	SOUTH AMBERSHAM	10,708	7	1	4	Improve	Yellow
CHID	CHIDDINGFOLD	2,834	7	1	4	Improve	Green
WAAM	WARNHAM	1,295	7	1	4	Improve	Green
HONE	HORSHAM NEW	66,861	4	5	3	Improve	Yellow
SIDL	SIDLESHAM	25,167	5	5	3	Improve	Yellow
THOR	THORNHAM	21,339	7	4	3	Improve	Yellow
LOXW	LOXWOOD	3,761	5	4	3	Improve	Green
BILL	BILLINGSHURST	7,999	7	1	3	Improve	Green
PETE	PETERSFIELD	17,104	5	5	2	Improve	Green
TANG	TANGMERE	5,045	7	4	2	Improve	Green
LAVA	LAVANT	2,674	7	3	2	Improve	Green
RUDG	CHEPHURST COPSE RUDGWICK	2,523	9	1	2	Improve	Green
WISB	WISBOROUGH GREEN	1,197	9	1	2	Improve	Green
MANN	MANNINGS HEATH	1,078	9	1	2	Improve	Green
GRAY	GRAYSWOOD	415	9	1	2	Improve	Green
FERN	FERNHURST	2,000	9	1	2	Prepare	Green
PETW	PETWORTH	2,634	10	0	2	Improve	Green
BOSH	BOSHAM	3,922	8	5	1	Improve	Green
SLIN	SLINFOLD	1,217	8	3	1	Improve	Green
FITT	FITTLEWORTH	743	8	3	1	Improve	Green
PAGM	PAGHAM	9,664	10	2	1	Improve	Green
STOR	STORRINGTON	7,961	9	2	1	Improve	Green
LISS	LISS	6,592	9	2	1	Improve	Green
NORT	NORTHCHAPEL	603	9	2	1	Improve	Green
BURY	BURY	481	9	2	1	Improve	Green
KIRD	KIRDFORD	695	10	1	1	Improve	Green
ROGA	ROGATE	943	9	3	0	Improve	Green

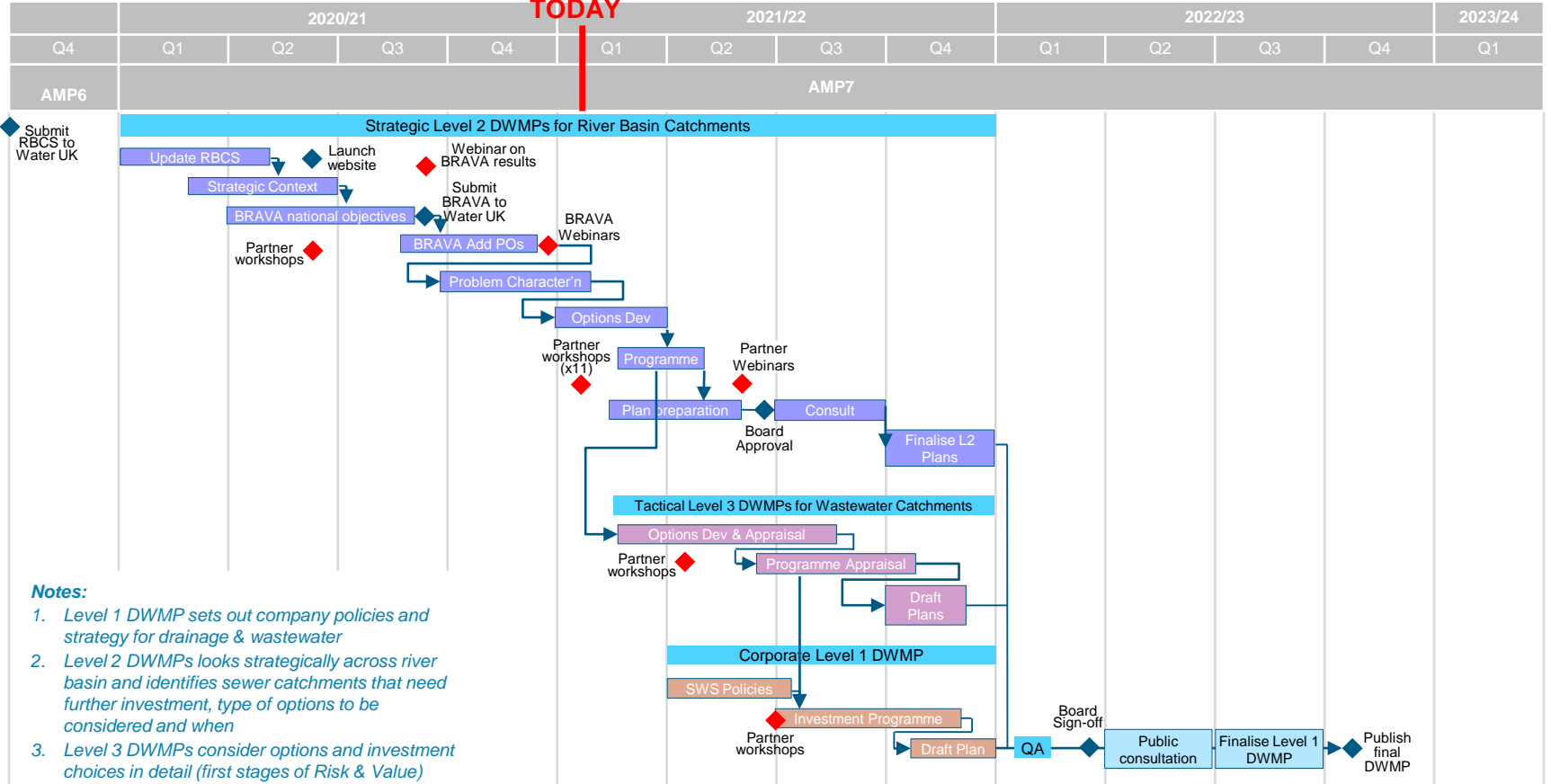
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Next Steps



DWMP High-Level Delivery Programme



Questions



Summary



Summary of Workshop

What have we done today?

- Looked at causes and drivers of the risks
- Identified the catchment investment strategy for a wastewater catchment
- Determined the generic options to take forward and which to reject
- Prioritised the wastewater catchments in the Arun and Western Streams river basin
- Started thinking about where we may be able to work together on plans for individual wastewater catchments



Poll 3



Thank you for participating today

Website: www.southernwater.co.uk/dwmp

Contact us: DWMP@southernwater.co.uk



from
**Southern
Water** 

The Southern Water logo consists of three stylized, wavy blue lines of varying lengths, positioned to the right of the text "Southern Water".