NATIONAL RIVERS AUTHORITY
AWDURDOD AFONYDD CENEDLAETHOL

WELSH REGION
RHANBARTH CYMRU

[redacted]

NRA

Guardians of the Water Environment
Diogelwyr Amgylchedd Dŵr

SSO IMPROVEMENT STRATEGY
(Proposed method of priority assessment)

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SSO IMPROVEMENT STRATEGY

1. INTRODUCTION

Dwr Cymru have identified and allowed for £72m "within K" for SSO improvements over the next 20 years. This equates to an average annual expenditure of £3.6m p.a. and identifies a nominal spend of £60K per installation for the 1200 overflows originally identified (thus allowing pro rata 60 overflows p.a. to be improved where appropriate). This in itself may be insufficient to meet the generally more stringent consent conditions now being promulgated particularly in relation to screening. Furthermore, current estimates of the total number of overflows in existence in the Welsh Region are in the region of 2,000 such installations. Hence the available capital is likely to be insufficient to address the whole problem and there will need to be rigorous prioritisation of expenditure and a robust case may need to be made for an adjustment of 'K' to more realistic levels.

Clearly, there are strong grounds for developing an SSO improvement strategy in order to ensure that Welsh Water make best use of the £72m committed to improvements and to determine the extent to which 'K' might need adjustment to meet the requirements of NRA policy. It has thus been agreed that the above should be urgently progressed in 3 phases:

2. OUTLINE OF PROPOSED METHOD

Phase I

The rapid development of criteria for assessing the impact of SSO's and identifying priorities for attention. These criteria should reflect the scale of the problem and the general level of knowledge about the performance and effectiveness of individual SSOs.

Phase II

An intensive application of the criteria to the 2,000 overflows currently identified.

Phase III

To be concerned with the production of a strategy for improvement, and refined as the information database and tools develop. The strategy will be required within 2 years, if it is to play any part in the periodic review of "K", likely in 1994.

Several existing pieces of work have been identified as suitable starting points for Phase I, namely:

1. W W Northern Division - SSO Improvements Strategy (September 1987)

2. NRA S E Division - SSO Improvements Priority Listing (1990)

3. W W South West Division - Assessment of Swansea Sewerage SSO's

4. W W List of Existing 2000 Overflows (to be supplied)

Overflows located at sewage treatment works and/or discharging to estuarine and coastal waters are addressed as separate entities. In both of the above cases the reason for their separation relates to current attitudes toward the nature of their potential solutions and not the nature of the problems which they generate.

The criteria to be used to identify unacceptable SSOs and the information requirements necessary to be able to apply the criteria are outlined separately in Appendix 1. Explanatory notes amplifying the type of information required to assist completion of the forms and detailing why the information is required and what it is to be used for are also supplied separately (Appendix 2).

Finally, the criteria are to be applied under Phase II using the decision tree and scoring system provided in Appendix 3. Six primary groupings are ultimately identified:

Priority 1	(Highest)
Priority 2	
Priority 3A	
Priority 3B	
Priority 4	
Priority 5	(Lowest)

It is proposed that these groupings are further reassessed in order to ascertain any geographical/sewerage system links, thus optimising sewerage sytem expenditure.

3. RESOURCE IMPLICATIONS

The collection and collation of the information database has obvious resource implications. The level of technical know-how required to be able to make a reasonable judgement about each of the 80 fields is indicated in the following matrix. Clearly, if all 2,000 overflows were tackled, ca.160,000 bits of information will need to be collected and stored in a suitable database. Such a database would be best operated using a system such as "ORACLE" on the NRA mainframe or mini-system for ease of access and updating. Given the lack of in-house expertise, external analysts would need to be contracted in order to create the simple database envisaged. Projected costs are of the order of £8K (2K per week).

Irrespective of the explicit provision of additional temporary staff (see below) it is also important to note the extensive level of involvement, principally desk based, required of Dwr Cymru in order to identify the key characteristics of all 2,000 installations. Such a commitment must be adequately resourced in terms of the time made available. Extensive local knowledge support will also need to be provided to staff grades 1 to 4, by NRA Pollution Control grade 6 to 8 staff.

PART I : SSO DETAILS

QUESTION NO.	STAFF GRADE/CONTEXT					
	1/2(E&Q)	3/4(E&Q)	6-8(E&Q)	6-8(EAU)	PLC (ADVICE)	DESK/FIELD
1	*					D
2 (a)	*					D
2 (b)	*					D
2				*		D
3		*(T)			*	D/F
4		*			*	D/F
5		*(T)			*	D/F
6					*	D
7		*			*	D
8		*			*	D
9		*			*	D
10		*			*	D
11		*			*	D
12		*		*	*	D
13		*		*	*	D
14				*	*	D
15				*	*	D
16	*					D
17			*	*	*	D
18		*			*	D
19		*		*		D

T - this indicates a training requirement (using staff Grade 6 - 8) at a cost of £150 per day.

PART II : SSO OPERATIONAL OBSERVATIONS						
QUESTION NO.	STAFF GRADE/CONTEXT					
	1/2(E&Q)	3/4(E&Q)	6-8(E&Q)	6-8(EAU)	PLC (ADVICE)	DESK/FIELD
1		*	LK			D/F
2		*	LK			D
3		*	LK			D
4		*	LK			D
5		*	LK			D
6	*		LK			D/F
7		*	LK			D/F

LK - Local knowledge support likely to be required to assist Grade 3/4 staff.

PART III : RECEIVING WATER DETAILS (INLAND CASE)						
QUESTION NO.	STAFF GRADE/CONTEXT					
	1/2(E&Q	3/4(E&Q)	6-8(E&Q)	6-8(EAU)	PLC (ADVICE)	DESK/FIELD
1	*					D
2	*					D
3	*				*	D
4		*(Hydrology)			*	D
5		*(Hydrology)			*	D
6	*				*	D
7			*		*	D/F
8		*			*	D/F
9			*	*(Biologist)	*	D/F
10			*	*(Biologist)	*	F
11	*(IF,N)			*(IF,Y)	*	F
12			*		*	D

PART IV : RECEIVING WATER DETAILS (ESTUARY/COASTAL LOCATIONS)						
QUESTION NO.	STAFF GRADE/CONTEXT					
	1/2(E&Q)	3/4(E&Q)	6-8(E&Q)	6-8(EAU)	PLC (ADVICE)	DESK/FIELD
1				*		D
2				*		D
3				*		D
4				*		D
5				*		D

The NRA has no budgetary provision to put towards this work, hence the group is looking to Welsh Water to resource it in the light of the following benefits envisaged:

(i) to enable sensible negotiations with the Director General on "K"

(ii) to evaluate the impact of NRA policy on "K" and/or the timescale for remedial works

(iii) to facilitate sensible discussions with the NRA on the impact of higher consent standards on cost/timetable/scale aspects of remedial programmes.

A broad indication of likely costs are summarised below:

		£K
1.	IT Database Development Costs (4 weeks at 2K per week)	8
2.	Site Visits : (6 months) 6 staff (3 groups of 2 for safety reasons) 1 x Grade 5 plus 5 x Grade 3	28.2
3.	Form Completion and Decision Tree Calculation: (6 months) 1 x Grade 5 (11,508 p.a.) 5 x Grade 3 (8,982 p.a.)	28.2
4.	Transport Provision: (6 months) 3 vehicles (1 per pair) (1.7K per vehicle)	5.1
5.	Oncosts (Travelling etc). 6 x Superannuation (19%) 6 x Expenses (50%)	10.7 28.2
6.	Training Costs: Plant and Site Visits: 6 days at £150 per day	0.9
	TOTAL COST	109.3K

The above costs have been identified in the light of the following key assumptions, they are equivalent to 0.15% of total projected spend or 3% of the projected annual average expenditure on SSO improvements:

(1) IT Database development costs reflect the need to contract out the work for a database handling some 160,000 bits of information.

(2) Site visits will need to be made in pairs for safety reasons when visiting installations.

(3) All 2,000 sites are to be visited at a rate of 6 installations per day per pair of operatives.

(4) Transport provision and expenses are likely to be extensive due to the number and geographical spread of sites.

(5) A project manager should be appointed and made responsible for project progress.

The above costs are notwithstanding those time resource commitments required of both NRA and Welsh Water staff offering advice and information to the project team.

4. RECOMMENDATIONS

1. That the Group accept the principal that WW/NRA will collaborate on the strategy as defined.

2. That the group endorse the strategy development methodology outlined.

3. That the group endorse the method of recovering the data advocated within the required timescale identified.

4. That WW accept the principal that it will resource the additional staff required to complete the work.

5. That the resource requirements should be refined within two months, with a view to agreeing the final budgets.

6. That the group accept the IT implications of the approved programme.

7. That the project be managed and administered jointly by WW/NRA, but based within the NRA operational structures.

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APPENDIX 1 : STORM SEWER OVERFLOW INFORMATION DATABASE FORMS

STORM SEWER OVERFLOW INFORMATION DATABASE

PART I : SSO DETAILS

1. SSO Reference No: _____

2a. SSO Location: _____ 2b. At STW (Y/N): ☐

NGR : _____ 2c. To Estuarine or Coastal Waters (Y/N) ☐

Hydrometric Ref:

(If Y, answer PART IV, NOT PART III)

Other (specify)

3. SSO Type: (Tick one)
- ☐ High Side Weir
- ☐ Low Side Weir
- ☐ Vortex
- ☐ Stilling pond
- ☐ Hole-in-wall
- ☐ Hydro-dynamic-separator
- Other (Please specify) _____

4. Storage Provision: (Tick one)

		Size (m3)
☐	On-line	☐
☐	Off-line	☐
☐	None	

5. Screening Provision: (Tick one)

		Aperture Size (mm)
☐	Bar Screen	☐
☐	Drum Screen	☐
☐	Grab Screens	☐
☐	Continuous - Chain Screens	☐
☐	Rolled Screens	☐
☐	Scum Boards	☐
☐	None	☐
	Other (please specify) _____	

6. Date of Installation : (Tick one)
- ☐ Pre 1940
- ☐ Pre 1970
- ☐ Post 1970
- ☐ Post 1980

7. Total Population Served:
- ☐ Measured
- ☐ Estimate
- ☐ Don't Know

8. Infiltration: Measured ☐ m^3/D

Estimate ☐ % of DWF

Don't know ☐

9. Weir Setting: Measured ☐ m^3d

Estimate ☐ x DWF

Actual/Original DWF (A/O) ☐

Don't know ☐

10. Industrial Effluent: Y/N _____

If (Y):

Measured ☐ m^3/D

Estimate ☐ % of DWF

Don't know ☐

11. Dry Weather Flow: Measured: ☐ m^3/d

Estimate (P X G + I + E): ☐ m^3/d

Don't know ☐

12. Where there is no industrial effluent component (see 10)

Mean DWF Quality:

Measured: BOD = ☐ mgl^{-1}

AMM.N = ☐ mgl^{-1}

SS = ☐ mgl^{-1}

OR Estimate (Tick appropriate box)

	HIGH		MEDIUM		LOW	
BOD	<600	☐	<400	☐	<200	☐
AMM.N	< 45	☐	< 30	☐	< 15	☐
SS	<450	☐	<300	☐	<150	☐
BACTI	Above Average	☐	Average	☐	Below Average	☐

13. Where there is a significant industrial effluent component (see 10) Mean Combined Domestic and Industrial DWF Quality:

Measured : BOD = [ ] mgl^{-1}

AMM.N = [ ] mgl^{-1}

SS = [ ] mgl^{-1}

Measured : TOXIC (Y/N) [ ]

If Y: Specify:_____

Mean concentration in effluent = [ ] mg/l

OR Estimate: (Tick one)

- [ ] Better than Domestic
- [ ] Worse than Domestic
- [ ] Don't know
- [ ] Toxic Component (Y/N)

Specify:_____

- [ ] Better than Domestic
- [ ] Worse than Domestic
- [ ] Don't know

14. Steepness of Sewered Catchment (major sewer average gradient) (Tick one)

- [ ] > 1 : 50
- [ ] < 1 : 50

15. Sewer Sediment Problems: (Tick one)

- [ ] Yes
- [ ] No
- [ ] Don't know

16. Mean Annual Rainfall (Nearest Gauge): [ ] mm p.a.

17. Proportion of Impermeable Area:

HIGH		NORMAL		LOW	
>40%	[ ]	30-40%	[ ]	<30%	[ ]

18. Proportion of population served by a combined system:

100% (Y / N) [ ]

(IF N) [ ] %

Don't know [ ]

19. Typical Spill Concentration:

Measured:	BOD	=	mgl^{-1}
	AMM.N	=	
	SS	=	
	TOXIC (See 13)	=	

Domestic only Estimate: (Tick one of):

	BOD		AMM.N		SS	
Flat catchments (< 1 : 50)	125		10		400	
Steep catchments (> 1 : 50)	75		6		350	
DWF Multiplier (Flat catchments)	0.5 x DWF		0.3 x DWF		1.5 x DWF	
DWF Multiplier (Steep catchments)	0.3 x DWF		0.3 x DWF		1.5 x DWF	

mgl^{-1}

Domestic plus Industrial Estimate:

	mgl^{-1}
BOD	
AMM.N	
SS	
TOXIC (See 13)	

PART II : SSO OPERATIONAL OBSERVATIONS

	FREQUENCY				
	HIGH	MEDIUM	LOW (<1 p.a.) (where applic.)	NEVER	DON'T KNOW
1. Operation in Dry Weather					
2. Public Complaint Record					
3. Blockage Problems					
4. Visual Impact Complaints					
5. Fish Mortality					
6. Ease of Public Access					
7. Frequency of Public Viewing					
8. Sensitivity of Location					

PART III : RECEIVING WATER DETAILS (INLAND CASE)

1a. Receiving Water Name: _____

1b. Receiving Water Nature:

Inland	☐	If Estuarine/Coastal go to PART IV
Estuarine	☐	
Coastal	☐	

2. Upstream Reach Reference: NGR: _____
(and/or)
Hydrometric Ref: _____

3. Downstream Reach Reference: NGR: _____
(and/or)
Hydrometric Ref: _____

4. Mean Daily Flow:

Measured	☐	m^3/d
Estimate	☐	m^3/d
Don't know	☐	

5. 95%ile Low Flow:

Measured	☐	m^3/d
Estimate	☐	m^3/d
Don't know	☐	

6. Dilution (95%ile River : Sewer DWF)
(Tick as appropriate)

LOW		MEDIUM		HIGH	
<3:1	☐	3-7:1	☐	>8:1	☐

7. Reaeration Capacity :
(Tick as appropriate)

R1	Drainage Ditch/Backwaters	☐
R2	Sluggish Streams (eg <0.1 ms^{-1})	☐
R3	Streams of Low Velocity (eg >0.1-0.2 ms^{-1})	☐
R4	Streams of Average Velocity (eg 0.2-0.5 ms^{-1})	☐
R5	Streams of High Velocity (eg >0.5ms^{-1})	☐
R6	Rapids (eg >1.0 ms^{-1})	☐

8. NWC Class of Receiving Reach (upstream): (Tick as appropriate)

	1	2	3/4
Classified	☐	☐	☐
Unclassified (Nominal)	☐	☐	☐

9. Biological Quality of Receiving Reach (Upstream):

	1	2	3	4/5
Classified (BMWP)				
Unclassified (Nominal)				

10. Sewage Fungus Presence:

		Extent (If Yes) (High/Medium/Low)
Above (Y / N)		
Below (Y / N)		
Don't know		

11. Sewerage Derived Litter:

		Extent (If Yes) (H / M / L)	Type (If H/M)			
			Cotton	Paper	Plastic	Rubber
Above (Y / N)						
Below (Y / N)						
Don't know						

12. Receiving Water Uses/Objectives:

LTQO (Actual)	1		2		3		4	
LTQO (Nominal)								

	Salmonid (S)		Cyprinid (C)		
Designated Fisheries				none	
Nominal Fisheries	S		C	none	
Potable Abstraction (Y/N)					
Stock Watering (Y/N)					
Irrigation (Y/N)					
Conservation (designated) (Y/N)					
Recreational Use (Y/N)					
(If Yes) Contact Use (Y/N)					

Type _____

PART IV : RECEIVING WATER DETAILS (ESTUARY/COASTAL LOCATION)

1. Receiving Water Details:

1a. Receiving Water Name: _____

1b. Receiving Water Nature:

Estuarine	☐
Coastal	☐
Barrage	☐
Other	☐

Specify: _____

2. Receiving Water Stretch Reference: NGR: _____
(and/or)
Hydrometric Ref: _____

3. Receiving Water Flow/Volume Conditions:

(a) If Estuarine : River 95%ile low flow ☐ m^3 s

(b) If Coastal : A M I D <10 ☐ 10-100 ☐ >100 ☐ : 1

(c) If Barrage : Minimum Impounded Volume ☐ m^3

4. Receiving Water Uses/Objectives/Standards

(a) If Estuarine:

(1) DOE/NWC Classified A ☐ B ☐ C ☐ D ☐

(2) Nominal A ☐ B ☐ C ☐ D ☐

(3) Migratory Fish (Y/N) ☐

(4) Commercial Shell Fishery (Y/N) ☐

(5) Basic Amenity (Y/N) ☐

(b) If Coastal:

Discharging directly or adjacent to EC Designated Bathing (Y/N) ☐

Discharging directly or adjacent to Non EC Designated Bathing (Y/N) ☐

Discharging directly or adjacent to Water Contact Based Recreation (Y/N) ☐

Basic Amenity (Y/N) ☐

(c) If Barrage: (1) Migratory Fish (Y/N) ☐

(2) Water Contact Based Recreation (Y/N) ☐

(3) Basic Amenity (Y/N) ☐

5. Likely Receiving Water Impacts of SSO (Actual/Potential):

(a) If Estuarine: (1) Aesthetics: Does it result in recognisable Faecal Solids? (Y/N) ☐

(2) Does it result in Persistent Plastics/ Sewage Debris? (Y/N) ☐

(3) Does it result in unacceptable bacteriological impacts to :

i. Recreational Waters (Y/N) ☐
ii. Shellfishery (Y/N) ☐
iii. EC Designated Beaches (Y/N) ☐
iv. Nearby EC Designated Beaches (Y/N) ☐
v. Don't know ☐

(4) Dispersive Characteristics:

High ☐
Low ☐
Don't know ☐

(5) Does it discharge at or below low water? (Y/N) ☐

(6) Unacceptable Impact on the following water quality criteria:

D O (Y/N) ☐
Ammonia (Y/N) ☐
Toxic (Y/N) ☐
Don't know ☐

(b) If Coastal :

(1) Aesthetics: Does it result in recognisable Faecal Solids? (Y/N) ☐

(2) Does it result in Persistent Plastics/Sewage Debris (Y/N) ☐

(3) Does it result in unacceptable Bacteriological Impacts to:
- i. Recreational Waters (Y/N) ☐
- ii. Shellfishery (Y/N) ☐
- iii. EC Designated Beaches (Y/N) ☐
- iv. Nearby EC Designated Beaches (Y/N) ☐
- v. Non EC Beaches (Y/N) ☐
- vi. Nearby Non EC Beaches (Y/N) ☐

(4) Dilution Standards
- i. Effluent dilution standard (100:1) (Y/N) ☐
- ii. A M I D (at LWMS) ☐
  - < 10 ☐
  - 10 - 100 ☐
  - > 100 ☐

(5) Dispersive Characteristics:
- High ☐
- Low ☐
- Don't know ☐

(6) Bacteriological Compliance Effects:
- EC Bathing Waters (Y/N) ☐
- Non EC Bathing Waters (Y/N) ☐

(c) If Barrage :

(1) Aesthetics: Does it result in recognisable Faecal Solids? (Y/N) ☐

(2) Does it result in Persistent Plastics/Sewage Debris? (Y/N) ☐

(3) Does it result in significant Bacteriological Impacts (Y/N) ☐

(4) Dispersive Characteristics:
- High ☐
- Low ☐
- Don't know ☐

(5) Does it result in significant Water Quality Impacts:
- DO (Y/N) ☐
- Ammonia (Y/N) ☐
- Toxics (Y/N) ☐

APPENDIX 2: SSO INFORMATION DATABASE EXPLANATORY NOTES

EXPLANATORY NOTES

PART I : SSO DETAILS

Question No:	Notes
2a	To ensure some indication of location, NGR is required. Ultimately a Hydrometric Reference should be supplied, to enable overflow groupings on the same severage system to be identified.
2b	To ensure that separate attention is given to overflows at STW's, where solutions are potentially less complicated and the situation more directly controllable.
2c	To ensure that those overflows discharging to estuary and coastal waters receive specific attention in relation to the anticipated uses of the receiving water (see Part IV).
3	Different installation designs have been proven to perform at different levels of satisfaction (WRc ER 304E, April 1988). Overflow types are best identified by an example visit. This will have obvious training and hence cost implications (i.e. 1 day at Grade 8 ca. £150).
4	Storage improves the quality of the spill water by offering first foul flush retention capabilities and the settlement of some solids. If provided, indicate size or capacity.
5	The aperture size recorded should relate to the maximum aperture dimension. Screening provision types are again best identified by an example visit. Training cost implications again of the order of ca. £150 per man day.
6	The age of the installation will generally reflect the relative progress in optimising SSO design.
7	Relates to the total population served by the total length of sewer above the point of overflow (i.e. this is accumulative).
9	Where weir settings are estimated on the basis of DWF multiples, it is important to note whether the originally identified DWF is still applicable or that it has changed substantially (more likely for older installations).
12	Where there is no significant industrial effluent component, DWF quality can be estimated by reference to average figures produced by WRc (WRc ER 317E).
13	Where there is a significant industrial effluent component, the combined DWF quality should be reported or estimated.
14	This feature acts as a surrogate indicator for the likelihood of significant sewer sediment accumulation in line with the reasoning identified in WRc's Interim Planning Procedure (ER 317E).

15 Normally, this can only be determined by past experience of such problems or visual inspection at key manholes. Such sediment problems are likely to lead to blockage and potential gross solids contamination during first foul flush conditions.

16 Used as a surrogate to estimate likely frequency of operation, coupled with information in 17.

17 This variable might indicate the likelihood of more or less spills than would normally be experienced in typical areas covered by paving, roofing and road materials. It indicates the proportion of the sewered catchment covered by impermeable materials.

18 Combined systems are more likely to spill effluent of a poorer quality due to the presence of all crude inputs at the time of spill. Inclusion of separately sewered sections will generally reduce spill strength, but increase spill frequency.

19 Typical spill concentrations will rarely be measured, but can be estimated from extensive data collation work done by WRc (WRc ER 317E). Where significant industrial organic loads are present, estimates are likely to be elevated over and above those indicated for domestic only situations.

PART II : SSO OPERATIONAL OBSERVATIONS

Question No:	Notes
4	To reflect the frequency of complaints relating to any visual impacts of the SSO including gross solids, litter and sewage fungus effects.
6	An indication of the ease with which the SSO could be viewed and therefore visual impact experienced.
7	An indication of the actual level of public viewing.
8	An indication of the potential to cause offence due to its location: e.g. High - centre of a housing estate e.g. Low - into a ditch located well away from housing

PART III : RECEIVING WATER DETAILS (INLAND CASE)

Question No:	Notes
1b	Identifies receiving water as inland, estuarine or coastal and redirects response to Part III or Part IV.
2	Where NWC classified stretches are applicable, both NGR and hydrometric reference are provided. If the receiving water stretch is unclassified, just provide NGR.
3	As in 2. above.
4	Measured/estimated immediately above the point of discharge.
5	As in 4. above.
6	Dilution of potential spill, 95%ile river flow to sewer DWF. A measure of the likely assimilative capacity even at times of low river flow. Derived from CSO study experience and the 1912 Royal Commission recommendations for continuous discharges.
7	An indication of the potential for assimilating organic inputs with significant oxygen depletion. Taken from the IWU Consents Procedure Circular 87/8.
8	This is intended to assess the immediate impacts of the SSO and therefore only covers the upstream receiving water quality. Pollution control staff are requested to make a reasonable judgement.
9	As in 8. above. Any unclassified receiving waters allocated a nominal biological class should be assessed in consultation with divisional EAU biologists.
10	Included to give some indication of any gross impacts. Sewage fungus presence should be assessed by divisional EAU staff where there is any doubt.
11	The extent of contamination can only be judged after a training visit to representative sites on the Taff. The classes are taken from those identified in the Taff Litter Survey (Davies, 1989).
12	These will eventually be superseded by Statutory Quality Objectives.

PART IV : RECEIVING WATER DETAILS (ESTUARINE/COASTAL LOCATIONS)

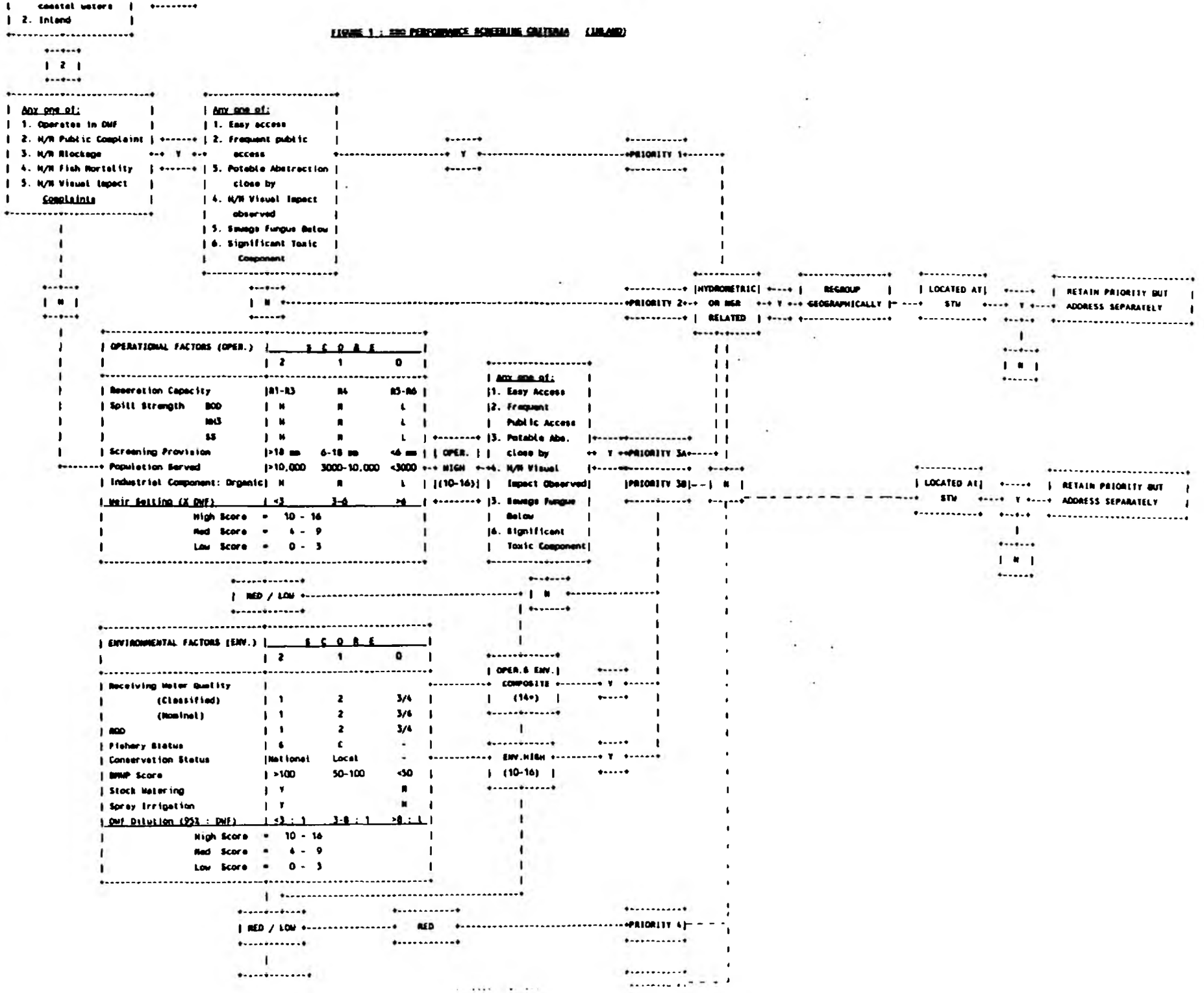
This Section is to be completed by EAU staff, consulting pollution control staff where local knowledge is insufficient.

Question No:	Notes
3	A measure of the available assimilative capacity in dilution terms. Available Minimum Initial Dilution Levels are requested relative to Low Water Mean Spring Tidal States.
4	An indication of the potential uses of the receiving waters.
5	An indication of actual and/or potential impacts to receiving waters.

APPENDIX 3 : STORM SEWER OVERFLOW IMPROVEMENT STRATEGY DECISION TREE AND SCORING MECHANISM FOR PRIORITY IDENTIFICATION

STORM SEWER OVERFLOW : DECISION DIAGRAM

It is suggested that the following two decision diagrams are applied to the collated information, in an effort to identify those overflows which merit priority attention in Dwr Cymru's Capital programme.


1. Discharge to estuarine or coastal waters
2. Inland
Go to Fig.2
FIGURE 1 : ??? PERFORMANCE SCREENING CRITERIA (INLAND)
2
Any one of:
1. Operates in DWF
2. H/M Public Complaint
3. H/M Blockage
4. H/M Fish Mortality
5. H/M Visual Impact Complaints
Y
Any one of:
1. Easy access
2. Frequent public access
5. Potable Abstraction close by
4. H/M Visual Impact observed
5. Sewage Fungus Below
6. Significant Toxic Component
Y
PRIORITY 1
N
HYDROMETRIC OR NGR RELATED
REGROUP GEOGRAPHICALLY
LOCATED AT STW
RETAIN PRIORITY BUT ADDRESS SEPARATELY
PRIORITY 2
OPERATIONAL FACTORS (OPER.)
SCORE
Reservoir Capacity 2: B1-B3 1: B4 0: B5-B6
Spill Strength BOD 2: H 1: M 0: L
NH3 2: H 1: M 0: L
SS 2: H 1: M 0: L
Screening Provision 2: >10 mm 1: 6-10 mm 0: <6 mm
Population Served 2: >10,000 1: 3000-10,000 0: <3000
Industrial Component: Organic 2: H 1: M 0: L
Weir Setting (X DWF) 2: <3 1: 3-6 0: >6
High Score = 10 - 16
Med Score = 6 - 9
Low Score = 0 - 5
OPER. HIGH (10-16)
Any one of:
1. Easy Access
2. Frequent Public Access
3. Potable Abs. close by
4. H/M Visual Impact Observed
5. Sewage Fungus Below
6. Significant Toxic Component
Y
PRIORITY 3A
PRIORITY 3B
LOCATED AT STW
RETAIN PRIORITY BUT ADDRESS SEPARATELY
RED / LOW
N
ENVIRONMENTAL FACTORS (ENV.)
SCORE
Receiving Water Quality (Classified) 2: 1 1: 2 0: 3/4
(Nominal) 2: 1 1: 2 0: 3/4
BOD 2: 1 1: 2 0: 3/4
Fishery Status 2: A 1: C 0: -
Conservation Status 2: National 1: Local 0: -
BMWP Score 2: >100 1: 50-100 0: <50
Stock Watering 2: Y 0: N
Spray Irrigation 2: Y 0: N
DWF Dilution (95% : DWF) 2: <3 : 1 1: 3-8 : 1 0: >8 : 1
High Score = 10 - 16
Med Score = 6 - 9
Low Score = 0 - 5
OPER.& ENV. COMPOSITE (14+)
ENV.HIGH (10-16)
Y
N
RED / LOW
RED
PRIORITY 4

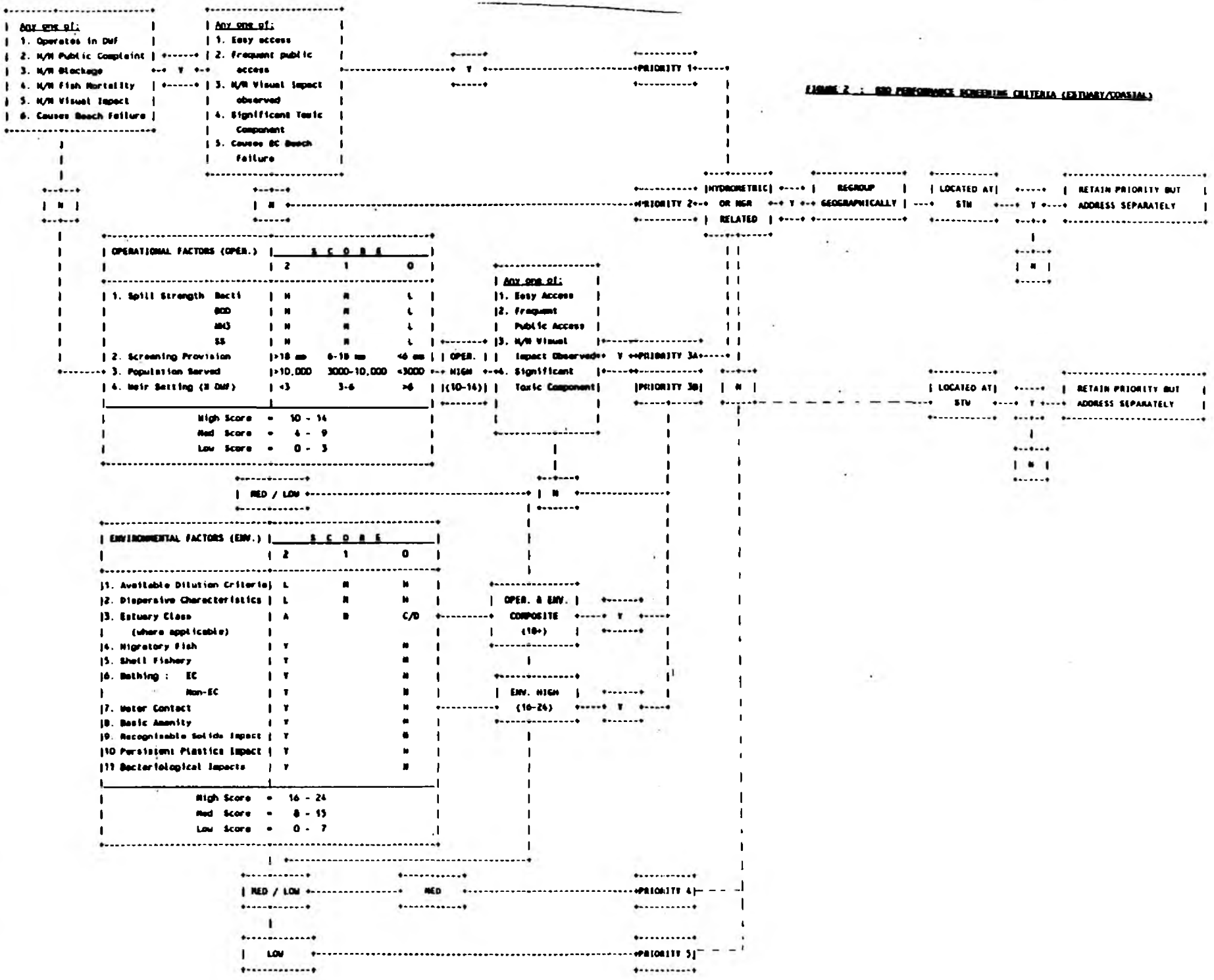


FIGURE 2 : BOD PERFORMANCE SCREENING CRITERIA (ESTUARY/COASTAL)