

Appendix B - ASSET INVENTORY AND SYSTEM PERFORMANCE

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ASSET INVENTORY AND SYSTEM PERFORMANCE

B1 Objectives and format of the submission

B1.1 Objectives of the submission

The objectives of this submission are to:

1. Enable SW to produce a strategic framework that provides stewardship output measures, set against investment levels for each asset category.
2. Enable SW to summarise the information base upon which its plans for the management of both underground and surface assets are prepared. This is to demonstrate to the Commission that the information is adequate for the purposes of efficient management and operation of the asset networks and represents a comprehensive and systematic basis for the long-term stewardship of assets in respect of financial performance and customer service.
3. Enable SW to summarise the latest investigations and audits of its asset stock as at 31st March 2008 and demonstrate compliance with its general duty to maintain sustainable stewardship and performance of its assets and the service they provide to customers.

Service to customers will be assessed from information provided for the Commission's levels of service indicators in other Sections of the business plan submission. This will be based on objective general indicators of asset performance, such as mains bursts and sewer collapses, and also on data published or otherwise available from:

- The Drinking Water Quality Regulator.
- The Scottish Environment Protection Agency.

B1.2 Format of the submission

The Asset Inventory and System Performance submission (AI) shall consist of three main elements:

A report on information systems used in preparation of the submission
Completed Asset Inventory tables B1 – B6
Commentary on the AI tables

B2 Guidance for Scottish Water

B2.1 Report on information used for asset management planning

SW is required to submit a report setting down details of the information systems that underpin the management of its assets in accordance with the guidance in this section of these requirements. It is not anticipated that this section of the submission shall be longer than 40 pages.

The Commission wishes to be satisfied that SW has a credible approach to managing its assets, leading to informed decisions for investment. SW is required to

summarise, in free format or tabular form, the critical tools used to manage its networks of assets. The submission to the Commission shall include

- A clear statement of the coverage of SW distribution zone studies and drainage area plans (see below).
- Confirmation that information systems used by SW indicate the operational costs & customer service performance of the mains and record network improvements made to meet distribution quality undertakings given by SW to the Scottish Government.
- An explanation of how customer information, such as complaints of low water pressure, interruptions to water supply and sewer flooding is incorporated into SW asset management plans and used to maintain and improve serviceability to customers.

Distribution studies & drainage area plans

The report should include

- A schedule of all distribution zones and drainage areas, indicating those for which studies and plans have been carried out or are in progress and the date of the last update of each study and plan.
- The population served in each zone/area.
- Links between these zones/areas and other sections of SW asset network not covered by the studies and plans.
- The degree of compliance of the studies and plans with the definitions set out in Annual Return Table D5 lines 9 & 10.
- The frequency at which the studies and plans are being updated.
- A statement of the proportion of the sewer network that is now covered by mapping. This will separately cover critical and non-critical sewers.

SW is also required to submit a typical distribution zone study and a typical drainage area plan as an annex to this section of the submission.

B2.2 Completed Asset Inventory tables B1 – B6

SW is required to complete the AI tables B1 – B6, summarising SW's surveys of its asset stock valuation, asset life categories and summary asset life profiles, condition, and performance as at 31 March 2008, as set out in the annexes to these requirements.

There is no formal requirement for SW to carry out a full re-survey of its entire asset base for the purpose of providing data for this submission. However, SW will need to ensure that the relevant parts of the Action Plan arising from the Information Project have been addressed. This will include:

- All asset data gaps have been secured or can be filled using suitable statistical methodologies.

Detailed reporting guidance for the asset condition and performance grading systems are set out in the annexes to these reporting requirements.

Each Table shall be signed off by the responsible officer.

B2.3 Commentary on the AI tables

SW is required to submit a commentary responding to the general guidance below and in detail for each block and line in the Tables. This should outline all assets where £100k equivalent asset replacement cost, or more, lies in condition or performance grades 4 or 5. This information, taken together with the relevant confidence grading, will give the Commission a clearer understanding of the robustness of the figures in the Tables.

B2.4 General Requirements

Material Assumptions

'Material' in this context shall be taken as any assumption that singly or in combination with others, has a significant effect on the Table information.

SW is expected to report on assumptions made for:

- allocations to size band
- asset life category (summary table B1 only)
- unit costs used to determine the modern equivalent asset value (MEAV)
- asset condition grading
- asset performance grading

Methodologies

SW commentary should provide a summary description of the methodologies used which will include (but is not limited to) the following:

- Extrapolation of condition data on network assets, by Bayesian statistics or by other methodologies such as straight-line projection;
- Estimation of data to fill gaps by engineering judgement
- Data resulting from distribution zone studies or drainage area plans;

Quality Assurance

SW is required to provide a statement of the quality assurance procedures used in relation to the production of the submission.

B3 Guidance for the Reporter

The Reporter should assess the consistency of Scottish Water's asset inventory with previous submissions and how the necessary data capture and storage is implemented across its business. Specifically, the Reporter should check that Scottish Water has provided clear reasons for any significant fluctuations in the total Modern Equivalent Asset Value (MEAV), and the split of this total by both condition and performance gradings.

Given issues with previous Annual Returns, the Reporter should verify any similar 'additions' to the assessed inventory in Scottish Water's revision of its total MEAV. The Reporter should note any information provided by Scottish Water as to the refinement of estimated asset numbers, units or lengths. Any such information and/or justification should be presented in a manner consistent with the data and commentary in other sections of the business plan submission.

With regard to condition and performance assessments, the Reporter should comment on any apparent improvement or deterioration within the various asset groups, and how these may relate to the assets' useful lives or programmes of maintenance or replacement. The Reporter should also note changes to the associated confidence grades, both in terms of accuracy and reliability, and examine the reasons attached to any movement in these assessments themselves.

The Reporter should ensure that Scottish Water is using the appropriate definitions and guidelines (refer to Appendices 3 & 4) in assigning condition and performance grades on the established '1-5' scales. Scottish Water should have sufficient processes in place to ensure consistency of assessment across its business and asset base, and to limit the subjectivity of judgments.

The Reporter should note any assertion from Scottish Water as to the relationship between the condition and performance assessments for any given asset group. For example, performance may, to some extent, be interpreted as a function of asset condition and operational policy. The Reporter should explore the potential for reporting a breakdown of the MEAV for each asset group in a 5x5 'matrix' of condition against performance, such that there is no overlap between the two assessments as reported at present.

The Reporter should highlight any commentary relating to asset 'serviceability' and Scottish Water's assessment of the capacity of asset groups to fulfil their specified role regardless of relative condition or performance.

The Reporter should comment on any observed change in the proportion of redundant and decommissioned assets, and how these contribute to Scottish Water's overall valuations.

Overall, the Reporter should make some judgement of the suitability of the MEAV measure for assessing the asset base, and how the condition and the performance grading are assigned on this basis. The Reporter should consider this methodology in relation to those used in other utility businesses, specifically the water industry in England and Wales.

ANNEX B1

Definitions used within the Asset Inventory

These definitions are grouped into two categories: (a) Asset & Process and (b) Operation and Impact of the asset.

a) Asset & Process

“Process”

A series of operations performed in the collection, treatment or distribution of water or wastewater. The key process areas are:

- Water abstraction
- Water treatment
- Water distribution
- Sewage collection (via sewers)
- Sewage treatment and disposal
- Sludge treatment facilities and disposal
- Support Services – the provision of a management process to support the processes above

“Sub-process”

A discrete stage within a process that performs a defined key function. A sub-process is delivered by a sub-asset. Examples of sub-processes:

- Primary settlement
- Chlorination
- Sludge stabilisation (e.g. digestion).

“Asset Category”

The set of assets that provide the same type of process. For example:

- For water treatment works “SW1 treatment works” is an asset category.
- For sewage treatment works “Tertiary treatment only” is an asset category.

“Asset”

The set of one or more sub-assets designed to provide a particular type of process. Examples of this would include:

- A water treatment works; a distribution main; etc.
- A sewage treatment works; a CSO; etc.
- A computer; a vehicle.

Each asset will fall into a particular Asset Category, depending on the type of process.

“Sub-Asset”

A physical item, which has a cash value in terms of MEAV that enables a sub-process to be carried out. For example:

- A slow sand-filter on a water treatment works.
- An in-line sewage pumping station on the sewerage network.

“Sub-Asset Type”

A major component part of a sub-asset. For example in a pumping station on a water works, the sub-assets could typically be:

- The control building.
- The civil substructure and internal pipework.

- The M&E components such as pumps and switchgear.
- The ICA equipment

b) Operation and Impact of the Asset

“Capability”

The ability of an asset or sub-asset to meet the required quality or standard and/or throughput, during normal operation. An example of capacity would be:

- The ability of a settlement tank to operate within design limits at peak flow.

“Condition”

The physical state or reliability of a sub-asset; i.e. it is a measure of its deterioration at any time. It can be expressed in terms of an asset’s estimated remaining life, as well as a physical description.

“Performance”

The capability of an asset to deliver a required level of service, during normal operation.

“Reliability”

The ability of a sub-asset to continuously deliver normal operation without breakdown.

ANNEX B2

Guidance on completion of Asset Inventory tables B1 – B6

General guidance

Each line of Tables B2 – B6 requires some or all of the following data to be input. The Summary Table B1 is calculated from the other tables with the exception of allocation of Gross and Net MEAV by asset life, which is input. SW should ensure that no input cell is left blank. If the information is unknown or not applicable, then a zero should be entered in the cell with an appropriate explanation in the commentary.

Guidance is provided in separate sections below for each of the generic table 'blocks' of columns:

Summary of Asset Stock

Gross & Net Modern Equivalent Asset Value

MEAV allocated to Asset life categories (Summary table B1 only)

Asset Condition grading – Annex B3

Asset Performance grading – Annex B4

Line by line definitions are provided in Annex B5

New, Decommissioned and redundant assets

The 'New' column is used for the cost of new assets. It is determined from the investment plan and only contains new assets created under the purpose of Quality & Standards, Growth and Enhanced Service Levels. Base expenditure is not included, as this does not increase the value of the asset stock; it only improves its performance, condition or risk levels.

Where decommissioned (and "mothballed") assets or sub-assets have been included in the lines entries the value and type of those decommissioned assets must be stated in the line commentary. SW is required to confirm that the values of decommissioned assets are included in both the gross and net MEAV.

Existing redundant assets or sub-assets shall not be entered in the Tables. The columns for redundant assets are intended for existing commissioned assets that will in future become redundant. On this basis, to keep account of reductions in the asset stock, the 'Redn' columns will include all future redundant assets or sub-assets.

Confidence grade guidance

For Tables B1-B6 the reliability and accuracy of information submitted shall be assessed and assigned a confidence grade in the columns headed CG.

The confidence grade system has been established to provide a reasoned basis for undertakers to qualify information in respect to reliability and accuracy. It is essential that proper care and a high level of application are given by SW and its Reporter to the assignment of confidence grades to data requiring such annexation. A quality-assured approach should be employed in the methodology used to assign confidence grades, particularly if sampling techniques are in place.

Reliability and Accuracy Bands

Reliability and accuracy bands are shown in the tables below.

Table B2.1 – Reliability Bands

Reliability Band	Description
A	Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment.
B	As A, but with minor shortcomings. Examples include old assessment, some missing documentation, some reliance on unconfirmed reports, some use of extrapolation.
C	Extrapolation from limited sample for which Grade A or B data is available.
D	Unconfirmed verbal reports, cursory inspections or analysis.

Table B2.2 – Accuracy Bands

Accuracy Band	Accuracy to or within +/-	but outside +/-
1	1%	
2	5%	1%
3	10%	5%
4	25%	10%
5	50%	25%
6	100%	50%
X	Accuracy outside +/- 100 %, zero or small numbers or otherwise incompatible (see table below)	

The X grade is generally only likely to be appropriate where a zero has been entered.

Confidence Grade Definition

The confidence grade is a combination of the reliability and accuracy band, for example:

A2 Data based on sound records etc. (A, highly reliable) and estimated to be within +/- 5% (accuracy band 2);

C4 Data based on extrapolation from a limited sample (C, unreliable) and estimated to be within +/- 25% (accuracy band 4);

AX Data based on sound records etc. (A, highly reliable) but value too small to calculate meaningful accuracy percentage.

Certain reliability and accuracy band combinations are considered to be incompatible and these are blocked out in the table below:

Table B2.3 – Compatible Confidence Grades

Compatible Confidence Grades				
Accuracy Band	Reliability Band			
	A	B	C	D
1	A1			
2	A2	B2	C2	
3	A3	B3	C3	D3
4	A4	B4	C4	D4
5			C5	D5
6				D6
X	AX	BX	CX	DX

Systems for the acquisition, collation and presentation of regulatory data are expected to improve over time. In most cases, a target confidence grade of A2, A3, B2 or better is expected. Where confidence grades are below these levels, SW should report on its action plans for improvement in the commentary for the table concerned. SW should justify in its reports where action plans are limited to the achievement of A4, B3, B4 or C2 levels. Any deterioration in confidence grades from those reported in the previous Annual Return should be explained together with the action plan for improvement as appropriate. Reports on action plans should include the projected confidence grades, but confidence grades entered in the tables should reflect the current status of the data and not the future status it is intended to achieve.

Column block guidance

Summary of Asset Stock

Except where stated, the number, length or area, depending on the units indicated by the line, of each asset type shall be allocated by size bands as defined in Tables B7 for the water service, B8 for the wastewater service and B9 for support services;

Gross and Net Modern Equivalent Asset Value (MEAV)

SW is required to confirm that the basis for the derivation of the unit costs for the purpose of calculating the gross Modern Equivalent Asset Value (MEAV) shall be the same as those used by SW to estimate the standard costs required from time to time in the Cost Base and those used to prepare estimates of future expenditure requirements. Costs shall include land.

- The gross MEAV represents the equivalent replacement cost of the asset and should reflect both the most technically up to date new asset and the most technically up-to-date method of constructing that asset.

It is apparent that the development of new technologies may cause the overall replacement costs of some assets to fall in real terms. For example the development of no-dig techniques in pipeline construction have, in addition to the lower costs associated with the use of modern pipeline materials, caused the cost of replacing some pipelines to fall. In such cases, the gross MEAV of existing assets should be reassessed to reflect both the up-to-date method of construction and lower material costs. SW should state in the commentary how they determined where the reassessment of a MEAV of a particular asset was appropriate because of the development of new technologies and materials.

- The net MEAV, for non-infrastructure assets shall be calculated on an asset-by-asset basis using the following relationship:

$$\text{Net MEAV} = \text{Gross MEAV} \times \frac{\text{Asset remaining life}}{\text{Expected overall asset life}}$$

- The MEAV on all buildings owned and maintained by SW should be based on market value.
- Where land values exceed £100,000 or are greater than 15% of the value of the asset, the average unit price of land included in the gross MEAV valuations for each type of asset should be stated in the commentary. The value assigned to any land included in gross MEAVs should be identified separately in the commentary, along with the basis for this valuation. It is anticipated that existing use valuation will be the basis for the majority of land.
- Price indexation to bring the MEAVs up to base year 2007-08 prices is given in the Annual Return Reporting Requirements and Definitions Manual. Average 2007-08 financial year prices should be used.

The following definition of gross Modern Equivalent Asset (“MEA”) value and net MEA value are extracted from Rules and Guidelines for Accounting for Current Costs and Regulatory Values; Regulatory Accounting Rule 1; Part 1 – Explanatory Note, Paragraph 1.7.4:

“**The gross MEA** value is what it would cost to replace an old asset with a technically up-to-date new asset with the same service capability allowing for any difference both in the quality of output and in operating costs. The **net MEA** value is the depreciated value, taking into account the remaining service potential of an old asset compared with a new asset, and is stated gross of third party contributions.”

MEAV by Asset life categories (Summary table B1 only)

The summary table B1 has an additional breakdown for Gross and Net MEAV by asset life category.

Assets are categorised in terms of very short, short, medium, medium long and long life, non-depreciable, land and decommissioned as set out below:

Very short: assets having a life of up to 5 years, e.g. vehicles and computer equipment.

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- Short: assets having a life of 6 to 15 years, e.g. some ICA plant, telemetry, heavy vehicles and plant.
- Medium: generally mechanical assets having a life of 16 to 30 years, e.g. pumping units and associated electrical plant, process plant, filter bed media, glass coated steel storage tanks.
- Med/long: generally mechanical assets having a life of 31 to 50 years e.g. filter bed structures, site fencing, GRP covers and kiosks.
- Long: generally operational structures including service reservoirs, treatment work structures, inter-process pipe work and filter bed structures. Such assets will have a life exceeding 50 years.
- Non-Depr: (non-depreciable) infrastructure assets.
- Dcm: decommissioned assets, which are not being used operationally, but are mothballed and are being maintained for future usage. This category does not include redundant assets, which are also out of operational service, but are not being maintained for future usage and are available for disposal.
- Land: the land on which the asset type is situated and any surplus land.

Each asset type will consist of a combination of some of the above categories and SW shall state the value of these elements expressed as a gross MEAV of the asset type as indicated in Tables B1 – B6.

Condition grading

The total gross MEAV shall be allocated to condition grades as defined in Annex B3.

Performance grading

The total gross MEAV shall be allocated as performance grades as defined in Annex B4.

ANNEX B3

Guidance for Asset Condition Grading

Asset condition grades shall be assigned at individual sub-asset level or groups of assets according to Tables B1 – B6.

The basis of the asset condition grades for below ground assets shall comply with the general classifications for assets groups set out below:

- Water mains, sewage and sludge pumping mains Table B3.1
- Communications pipes Table B3.2
- Sewers, other sewer structures and sea outfalls Table B3.3

The basis for asset condition grades for above ground assets shall comply with the general classification for asset groups set out below:

- Civil structures & buildings sub-assets Table B3.4
- Mechanical & electrical sub-assets Table B3.5

SW may have aligned the asset condition grades to its own specific available asset information. Such alternative definitions of asset condition need to be consistent with the definitions set out in Tables B3.1-B3.5, so that reliable comparisons can be made within Scotland and across England and Wales. Any such alternative definitions shall be described in the commentary accompanying Tables B2 – B6 and shall be reconciled to the condition grades set out in this annex. Best practice suggests that this condition grading should be based on more than one methodology, for example for water mains, pipe wall thickness is usually considered with burst rates and performance to customers.

Table B3.1 - Water Mains, Sewage or Sludge Pumping Mains

Condition Grade	General Meaning
1 Very good	Modern pipe material designed to current standards with no evidence of internal or external degradation. No bursts have occurred.
2 Good	As condition 1, but not designed to current standards in respect of pressure ratings, design specification or corrosion protection. Deterioration causing minimal influences on levels of service. There is less than 1 burst/km/yr of main.
3 Adequate	Water mains, sewage or sludge pumping mains are generally sound. However, a few pipewall or joint failures or evidence of some external or internal degradation. Some deterioration beginning to be reflected in levels of service. There are less than 3 bursts/km/yr of main.
4 Poor	Water mains, sewage or sludge pumping mains with a significant level of joint failures or evidence of significant external or internal degradation or likely to cause a marked deterioration in levels of service. Some asset replacement or rehabilitation needed within the medium term. There are between 3 - 5 bursts/km/yr.
5 Very Poor	Unsound water mains, sewage or sludge pumping mains with extensive pipe failures, or significant external or internal degradation. There are more than 5 bursts/km/yr.

Table B3.2 – Communications Pipes

Condition Grade	General Meaning
1 Very good	Modern pipe material designed to current standards with no evidence of internal or external degradation.
2 Good	As condition 1, but not designed to current standards in respect of pressure ratings, design specification or corrosion protection. Deterioration causing minimal influences on levels of service.
3 Adequate	Communications pipes are generally sound, however, a few failures requiring replacement or repair. Some deterioration beginning to be reflected in levels of service.
4 Poor	Communications pipes with a significant level of failures requiring replacement or repair, with evidence of significant external or internal degradation or likely to cause a marked deterioration in levels of service. Some asset replacement or rehabilitation needed within the medium term.
5 Very Poor	Unsound communications pipes with high level of failure, or significant external or internal degradation, which has failed or is about to fail, causing unacceptable levels of service. No life expectancy, requiring urgent replacement or repair.

Table B3.3 - Sewers, Other Sewer Structures and Sea Outfalls (to be treated as Other Sewers)

Condition Grade	General Meaning
1 Very Good	No structural defects.
2 Good	<p>For brick sewers, (< 3 ring) Minor cracking or no deformation or loss of bricks and mortar loss confined to surface and line and level as built and connections satisfactory.</p> <p>For other sewers, Circumferential cracking or moderate joint defects.</p>
3 Adequate	<p>For brick sewers, Deformation 0-5%, no fracture and only moderate mortar loss or displaced bricks or total mortar loss without other defects or occasional defective connections.</p> <p>For other sewers, Deformation 0-5% and cracked or fractured or longitudinal/multiple cracking or occasional fractures or severe joint defects or minor loss of level or badly made connections.</p>
4 Poor	<p>For brick sewers, Deformation 5-10% and fractured or total mortar loss or small number of missing bricks or displaced/hanging brickwork or moderate loss of level or frequent badly made connections or dropped invert.</p> <p>For other Sewers, Deformation 5-10% and cracked or fractured or broken or serious loss of level.</p>
5 Very Poor	<p>For brick sewers, Already collapsed or deformation > 10% and fractured or extensive areas of missing bricks and/or displaced/hanging brickwork or missing invert.</p> <p>For other sewers, Already collapsed or deformation >10% and cracked or fractured or broken or extensive areas of missing fabric.</p>

Table B3.4 - Classification for Civil Structures & Buildings Sub-Assets

Condition Grade	General Meaning	Expected Durability	Capital maintenance
1 Very Good	Sound modern structure, well maintained in "as new" condition.	Asset adequate for the medium term with only routine maintenance	Foreseen in the long term
2 Good	Sound modern structure, well maintained, but showing signs of minor wear and tear and/or deterioration of surfaces. No evidence of corrosion in structural steel components.	Needs to be re-inspected in the medium term. Unlikely to require more than normal maintenance in the medium term	Foreseen in the long term
3 Moderate	Functionally sound structure but appearance affected by minor cracking or staining, but no leakage to/from vessels with potable water. Buildings have more than superficial wear and tear as columns are affected by rust staining, minor cracking of brickwork or masonry, with barely adequate pointing. Minor leakage to/from vessels not containing potable water.	Will need maintenance in the short to medium term	Potential for capital maintenance in medium term to prevent deterioration to Grade 4
4 Poor	Structure functioning and just safe but with problems due to significant leakage, cracking, spalling, loss of stability or deformation. Buildings have roof leaks, rising damp, rotting structural woodwork, decayed brickwork or pointing. Corrosion substantially reducing size of structural member(s). Danger of contamination of potable water.	Needs almost immediate maintenance	Needed in short term
5 Very Poor	Out of commission because unsafe to use, corrosion causing significant reduction in size of structural member(s) and overstressing, contamination of potable water has been a serious problem.	Out of commission. Requires immediate replacement.	Needed urgently in short term

Table B3.5 - Classification for Mechanical & Electrical Sub-Assets

Condition Grade	General Meaning	Expected Durability	Capital maintenance
1 Very Good	Electrically safe. Sound units generally in "as new" condition	Asset adequate for the medium term with only routine maintenance	Foreseen in the long term
2 Good	Electrically safe. In reasonable condition, but showing signs of minor wear and tear protective coatings still intact.	Some action may be needed in the medium term	Foreseen in the medium term
3 Moderate	Electrically safe. All components functioning reasonably well. Early signs of significant, rather than superficial wear and tear apparent, more than superficial corrosion. Minor failures or breakdowns have occurred.	Some action will be needed in the medium term	Potential for capital maintenance in medium term to prevent deterioration to Grade 4
4 Poor	Electrically safe. Still functioning, but repeated failures/breakdowns. Significant maintenance costs being incurred.	Needs almost immediate action	Needed in short term to prevent deterioration to Grade 5
5 Very Poor	Electrically unsafe, not working, in extremely poor condition and/or frequently breaking down (in excess of 12 times per year). Health and safety risk.	Requires immediate action.	Needed urgently in short term

ANNEX B4

Guidance for Asset Performance Assessment

Asset performance grades shall be assigned at individual sub-asset level or groups of assets according to Tables B2 – B6.

An asset that is performing satisfactorily should not require significant work to maintain its performance in the following five years. After five years, the assessment of investment needs would look to forecasts of growth in requirements and deterioration of the serviceability of the asset.

The basis for asset performance shall comply with the general classification as set out below.

Water mains	Table B4.1
Sewage pumping mains	Table B4.2
Sewers, other structures and sea outfalls	Table B4.3
Above ground assets, including other structures	Table B4.4

SW shall use the above performance grading system classifications or alternatively state and use an appropriate performance grading system that is consistent with that given in Tables B4.1- B4.4.

SW may wish to develop and define a range of performance indicators for specific asset types or groups of assets and to state threshold levels for capital maintenance expenditure. In this case, SW shall exclude all aspects considered under the asset condition grading system as set out in Annex B3 of these requirements. By way of example and for guidance purposes only, typical sample asset performance indicators are included as follows:

Sewage treatment works (typical)	Table B4.5
Biological filters (typical)	Table B4.6

Similar grading systems may be prepared for other asset groups such as water treatment works and sewer structures.

Table B4.1 - Water Mains

Performance Grade	General Meaning
1 Excellent	Smooth bored mains and communication pipes not subject to corrosion or with sound factory applied linings, no operational performance problems.
2 Good	As 1, but with loose deposits that is noticeable under abnormal flow conditions, slight tuberculation which may give a rough surface, but does not substantially reduce the cross-sectional area of the pipe. May require routine flushing or air scouring.
3 Moderate	Some problems with loose deposits or deterioration of linings leading to occasional complaints. Risk of quality failure. Pipe with tuberculation causing up to 20% blockage by encrustation.
4 Borderline	Frequent problems causing complaints, water quality known to have failed on more than one occasion under normal operating condition during previous twelve months. Mains with tuberculation causing 20-40% blockage by encrustation.
5 Fail	Main suffering severe problems of infestations and loose deposits. Water quality cannot be ensured. Mains with tuberculation causing >40% blocking by encrustation.

Note: For water mains: references to water quality do not apply to non-potable water.

Table B4.2 - Sewage Pumping Mains

Performance Grade	General Meaning
1 Excellent	Smooth bored mains not subject to corrosion or with sound factory applied linings, no operational problems.
2 Good	As 1, but with loose deposits that is noticeable under abnormal flow conditions, slight tuberculation which may give a rough surface, but does not substantially reduce the cross-section area of the pipe. May require routine flushing or desilting.
3 Moderate	Some problems with loose deposits or deterioration of linings leading to occasional blockage. History of occasional pipe with tuberculation causing up to 20% blockage by encrustation.
4 Borderline	Frequent problems causing blockage on more than one occasion under normal operating condition during previous twelve months. Mains with tuberculation causing 20-40% blockage by encrustation.
5 Fail	Mains suffering severe problems of blockage. Pumping performance cannot be ensured. Mains with tuberculation causing >40% blockage by encrustation.

Table B4.3 - Sewers and Sea Outfalls

Performance Grade	General Meaning
1 Excellent	Properly designed, with self-cleansing velocity, no deposition or operational performance problems.
2 Good	As 1, but with sliming or minor deposition causing some hydraulic loss of pipe capacity.
3 Moderate	Sewers with some sliming and deposition, minor backfalls causing loss of pipe capacity and surcharging of sewer at times of peak flow.
4 Borderline	Sewers which need to be occasionally cleaned out to prevent blockages, blockages within sewer occurring less than 1 in 5 years due to silting, which can lead to external flooding of property.
5 Fail	Sewers requiring excessive desilting, or other excessive maintenance to prevent flooding of property or premature operation of storm overflows.

Table B4.4 - Above Ground Assets including Other Sewer Structures

Performance Grade	Description	General Meaning
1 Excellent	(100% on all aspects)	Meets all design and statutory requirements at all times and under all demand conditions. Meets SW's internal standards at all times in terms of performance.
2 Good	(100% on key aspects or > 95% on other aspects)	As 1, but shows minor performance shortcomings in non-critical aspects or under extreme demand or climatic conditions.
3 Moderate	(equivalent to > 90% on all aspects)	Asset meets all statutory and performance criteria under all normal conditions, but has minor shortcomings under extreme operational or climatic conditions.
4 Borderline	(equivalent to > 75% on all aspects)	Performance or operational shortcomings have a significant effect on asset function/effectiveness when capacity exceeds 115% of average throughput or major shortcoming on one or more key aspects.
5 Fail	(equivalent to < 75% on all aspects)	Substantially incapable of meeting externally imposed and SW's internal standards except under normal or reduced operating conditions.

Table B4.5 - Sewage Treatment Works (typical)

Performance grades are provided for:

- The overall works as an asset equated to consent conditions and,
- Individual sub-process stages or sub-assets, which may have proven failings or are in such a poor physical state that process failure can be assumed or anticipated. This performance may also impact directly or may contribute to the overall poor performance of the works.

Performance Grade	General Meaning
1 Excellent	Hardly ever has a sanitary determinand failure and no more than 20% of look-up table allowance where more than 100 samples are taken per year. No non-sanitary failures.
2 Good	More than 20% and less than 50% of look-up table allowance for sanitary determinand failures. No non-sanitary failures.
3 Moderate	Some cause for concern. More than 50% of look-up table allowance for sanitary determinand failures, but still a slight margin for further failures before becoming borderline (Grade 4). No non-sanitary failures.
4 Borderline	Cause for concern, due to isolated, but explainable breaches of the consent. The next failure of sanitary determinand will cause failure of consent. No non-sanitary failures, although there is less than 5% margin on any one determinand during the last year.
5 Fail	Recurrent consent failures on either sanitary or non-sanitary determinands or exceedance of discharge rate.

Table B4.6 - Typical Biological Filters (Conventional)

Performance Grade	General Meaning
1 Excellent	Media appropriate and in good condition. No ponding at any time. Performance is such that it can deal with effluent from inefficient or overloaded primary settlement stage.
2 Good	Media appropriate and in good condition. No ponding at any time. While able to produce excellent results, its own performance depends on primary settlement stage being efficient in solids removal.
3 Moderate	Some cause for concern. Some ponding occurs at times. May be causing or contributing to the overall works performance being Grade 3, or worse. Its own performance is very dependent on the performance of the primary settlement stage being better than that required to meet design parameters and/or because there is a need for recirculation.
4 Borderline	Cause for concern. Significantly overloaded. Quite severe ponding occurs for parts of the year and there are significant amounts of growth on the media. It is the main cause for the overall works performance being Grade 4, or Grade 3, where the efficiency of other units partly compensates.
5 Fail	Severe ponding all year long. Significant amounts of growth on the media. Water flows across parts of the surface of the beds to a point where it can either escape or pass through only part of the media. Irrespective of the efficiency of other parts of the plant it is the main cause of the overall works performance being grade 4 or 5.

ANNEX B5

General Information and Line Definitions for Tables B1 – B6

Annex B5 General

For all asset categories, there are six asset size bands available and these are defined in Tables B7 – B9. Five of these, Bands 1-5, map directly to the original Ofwat asset categories, whilst Band 0 is a new Band for Scotland.

The Line descriptions are consistent with those in WICS' Annual Return Reporting Requirements in section D.

Annex B5.1 Summary: Table B1 line definitions

B1.1	Water resources [104]	£m (3sf)
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Full line title: Water resources – Summary asset information

Definition: Water resources totals, which include: Gross Modern Equivalent Asset Value (MEAV); the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV for Non-depreciable & Decommissioned assets and Land).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B2.1 to B2.3. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.2	Water mains [105]	£m (3sf)
-------------	--------------------------	-----------------

Full line title: Water mains – Summary asset information

Definition: Water mains totals, which include: Gross Modern Equivalent Asset Value (MEAV); the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV for Non-depreciable & Decommissioned assets and Land).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B2.4 to B2.7. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.3	Water treatment works [101]	£m (3sf)
-------------	------------------------------------	-----------------

Full line title: Water treatment works – Summary asset information

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Definition: Water treatment works totals, which include: Gross Modern Equivalent Asset Value (MEAV), Net MEAV; the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B3.1 to B3.8. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.4	Water storage [102]	£m (3sf)
-------------	----------------------------	-----------------

Full line title: Water storage – Summary asset information

Definition: Water storage totals, which include: Gross Modern Equivalent Asset Value (MEAV), Net MEAV; the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B3.9 to B3.10. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.5	Water pumping stations [103]	£m (3sf)
-------------	-------------------------------------	-----------------

Full line title: Water pumping stations – Summary asset information

Definition: Water pumping stations totals, which include: Gross Modern Equivalent Asset Value (MEAV), Net MEAV; the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B3.11 to B3.13. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.6	Sewers [106]	£m (3sf)
-------------	---------------------	-----------------

Full line title: Sewers – Summary asset information

Definition: Sewers totals, which include: Gross Modern Equivalent Asset Value (MEAV); the value of Gross MEAV for:

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- Asset life category (Gross and Net MEAV for Non-depreciable & Decommissioned assets and Land).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B4.1 to B4.3. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.7	Sewer Structures [107]	£m (3sf)
-------------	-------------------------------	-----------------

Full line title: Sewer structures – Summary asset information

Definition: Sewer structure totals, which include: Gross Modern Equivalent Asset Value (MEAV); the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV for Non-depreciable & Decommissioned assets and Land).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B4.4 to B4.5. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.8	Sea outfalls [108]	£m (3sf)
-------------	---------------------------	-----------------

Full line title: Sea outfalls – Summary asset information

Definition: Sea outfalls totals, which include: Gross Modern Equivalent Asset Value (MEAV); the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV for Non-depreciable & Decommissioned assets and Land).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B4.6 to B4.7. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.9	Sewage pumping stations [109]	£m (3sf)
-------------	--------------------------------------	-----------------

Full line title: Sewage pumping stations – Summary asset information

Definition: Sewer pumping stations totals, which include: Gross Modern Equivalent Asset Value (MEAV), Net MEAV; the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV).

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- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B5.1 to B5.2. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

H1.10	Sewage treatment works [110]	£m (3sf)
--------------	-------------------------------------	-----------------

Full line title: Sewage treatment works – Summary asset information

Definition: Sewage treatment works totals, which include: Gross Modern Equivalent Asset Value (MEAV), Net MEAV; the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV)
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B5.3 to B5.7. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.11	Sludge treatment facilities by disposal type [111]	£m (3sf)
--------------	---	-----------------

Full line title: Sludge treatment facilities by disposal type – Summary asset information

Definition: Sludge treatment facilities by disposal type totals, which include: Gross Modern Equivalent Asset Value (MEAV), Net MEAV; the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B5.8 to B5.13. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

B1.12	Support Services [112]	£m (3sf)
--------------	-------------------------------	-----------------

Full line title: Support services – Summary asset information

Definition: Support services totals, which include: Gross Modern Equivalent Asset Value (MEAV), Net MEAV; the value of Gross MEAV for:

- Asset life category (Gross and Net MEAV).
- Asset condition grades: New, 1 to 5, Dcm. & Redn.
- Asset performance grades: New, 1 to 5, Dcm. & Redn.

Processing rules: This line is calculated and is the sum of lines B6.1 to B6.3. The confidence grades are not calculated, but should be assessed on an overall basis.

Annual Return 2007 reference:

Annex B5.2 Water infrastructure: Table B2 line definitions

All reference numbers are to the line description only. Column descriptions are defined separately in Annex B2 above.

B2.1	Dams and impounding reservoirs	nr (3sf)
-------------	---------------------------------------	-----------------

Full line title: Water resources - dams and impounding reservoirs

Definition: All dams and impounding reservoirs used for holding raw water. This line shall include all ancillary structures, pumped storage reservoirs and bank side storage facilities.

Processing rules: Input field.

Annual Return 2007 reference: AR H3.1

B2.2	Raw water intakes (lochs and burns)	nr (3sf)
-------------	--	-----------------

Full line title: Water resources – raw water intakes (lochs and burns)

Definition: All intake structures and associated works including screens and penstocks for the direct gravity abstraction of water from lochs, burns and springs.

Processing rules: Input field.

Annual Return 2007 reference: AR H3.2

B2.3	Raw water aqueducts	km (3sf)
-------------	----------------------------	-----------------

Full line title: Water resources – raw water aqueducts

Definition: All mains or conveyors associated with the transfer of raw water either between sources or from source to treatment. Exclude mains carrying water of potable quality on entry to the main.

Processing rules: Input field.

Annual Return 2007 reference: AR H3.3

B2.4	Mains potable (i.d.)	km (3sf)
-------------	-----------------------------	-----------------

Full line title: Potable water mains (i.d.)

Definition: The length of all potable water mains. Include all elements of distribution assets and system ancillaries. Include facilities intended for standby and emergency supplies.

Processing rules: Input field.

Annual Return 2007 reference: AR H3.4

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B2.5	Mains non-potable (i.d.)	km (3sf)
-------------	---------------------------------	-----------------

Full line title: Other water mains (i.d.)

Definition: The length of all raw and partially treated water mains, such as used for the delivery of untreated water directly to industrial customers or to golf courses. Exclude raw water mains classified as aqueducts under water resources. Include all partially treated industrial process water or fire-fighting mains.

Processing rules: Input field.

Annual Return 2007 reference: AR H3.5

B2.6	Communication pipes (lead)	nr (3sf)
-------------	-----------------------------------	-----------------

Full line title: Customer communication pipes (lead)

Definition: The total number of lead communication pipes within the undertaker's supply area. SW should make clear in the accompanying commentary document what they have based the MEAV value on, ideally in line with best practice in England and Wales.

Processing rules: Input field.

Annual Return 2007 reference: AR H3.6

B2.7	Communication pipes (other)	nr (3sf)
-------------	------------------------------------	-----------------

Full line title: Customer communication pipes (other materials)

Definition: The total number of communication pipes, excluding lead, within the undertaker's supply area. SW should make clear in the accompanying Commentary document what they have based the MEAV value on, ideally in line with best practice in England and Wales.

Processing rules: Input field.

Annual Return 2007 reference: AR H3.7

B2.8	Water meters	nr (3sf)
-------------	---------------------	-----------------

Full line title: Customer meters

Definition: The total number of customer water meters split household/non-household within the undertaker's supply area.

Processing rules: Input field.

Annual Return 2007 reference: AR H3.8

Annex B5.3 Water non-infrastructure: Table B3 line definitions

All reference numbers are to the line description only. Column descriptions are defined separately in Annex B2 above.

B3.1	SW0 treatment works	nr (3sf)
-------------	----------------------------	-----------------

Full line title: Water treatment works – Type SW0

Definition: Simple disinfection (e.g. marginal chlorination) with no physical treatment. The number of works shall be allocated to size bands according to their peak hydraulic capacity.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.1

B3.2	SW1 treatment works	nr (3sf)
-------------	----------------------------	-----------------

Full line title: Water treatment works – Type SW1

Definition: Simple disinfection (e.g. marginal chlorination) plus simple physical treatment only (e.g. filtration and disinfection). The number of works shall be allocated to size bands according to their peak hydraulic capacity.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.2

B3.3	SW2 treatment works	nr (3sf)
-------------	----------------------------	-----------------

Full line title: Water treatment works – type SW2

Definition: Single stage complex physical or chemical treatment (e.g. super chlorination, flocculation or biofiltration) but excluding nitrate or pesticide removal, plumbosolvency treatment (e.g. GAC, orthophosphate dosing or ion exchange). Works shall be allocated to size bands according to their peak hydraulic capacity.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.3

B3.4	SW3 treatment works	nr (3sf)
-------------	----------------------------	-----------------

Full line title: Water treatment works – type SW3

Definition: More than one stage of complex treatment including nitrate or pesticide removal, plumbosolvency treatment (e.g. GAC, orthophosphate dosing or ion exchange). Works shall be allocated to size bands according to their peak hydraulic capacity.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.4

B3.5	GW0 treatment works	nr (3sf)
-------------	----------------------------	-----------------

Full line title: Water treatment works – type GW0

Definition: Simple disinfection only. Works shall be allocated to size bands according to their peak hydraulic capacity.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.5

B3.6	GW1 treatment works	nr (3sf)
-------------	----------------------------	-----------------

Full line title: Water treatment works – type GW1

Definition: Simple disinfection (e.g. marginal chlorination) plus simple physical treatment only (e.g. filtration and disinfection). Works shall be allocated to size bands according to their peak hydraulic capacity.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.6

B3.7	GW2 treatment works	nr (3sf)
-------------	----------------------------	-----------------

Full line title: Water treatment works – type GW2

Definition: Single stage complex physical or chemical treatment (e.g. super chlorination, flocculation or biofiltration) but excluding nitrate or pesticide removal, plumbosolvency treatment (e.g. GAC, orthophosphate dosing or ion exchange). Works shall be allocated to size bands according to their peak hydraulic capacity.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.7

B3.8	GW3 treatment works	nr (3sf)
-------------	----------------------------	-----------------

Full line title: Water treatment works – type GW3

Definition: More than one stage of complex treatment including nitrate or pesticide removal, plumbosolvency treatment (e.g. GAC, orthophosphate dosing or ion exchange). Works shall be allocated to size bands according to their peak hydraulic capacity.

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Processing rules: Input field.

Annual Return 2007 reference: AR H2.8

B3.9	Service reservoirs	nr (3sf)
-------------	---------------------------	-----------------

Full line title: Storage – service reservoirs

Definition: The number of treated water service reservoirs within the water supply system including treated water reservoirs at water treatment works and any secondary disinfection plant on reservoir sites. Include break pressure tanks.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.9

B3.10	Water towers	nr (3sf)
--------------	---------------------	-----------------

Full line title: Storage – water towers

Definition: The number of treated water service towers within the water supply system.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.10

B3.11	Intake pumping stations	nr (3sf)
--------------	--------------------------------	-----------------

Full line title: Intake pumping stations

Definition: The number of intake pumping stations associated with potable, non-potable and raw water systems. Inter-stage pumping stations at water treatment works are included as part of the treatment process so exclude from this line.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.11

B3.12	Source pumping stations	nr (3sf)
--------------	--------------------------------	-----------------

Full line title: Source pumping stations

Definition: The number of source pumping stations associated with potable, non-potable and raw water systems. Include in line transfer pumping, bore holes and wells requiring simple disinfection prior to forwarding into the supply system. Include works high level pumping stations.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.12

B3.13	Booster pumping stations	nr (3sf)
--------------	---------------------------------	-----------------

Full line title: Booster pumping stations

Definition: The number of booster pumping stations within the distribution system.

Processing rules: Input field.

Annual Return 2007 reference: AR H2.13

Annex B5.4 Wastewater infrastructure: Table B4 line definitions

All reference numbers are to the line description only. Column descriptions are defined separately in Annex B2 above.

B4.1	Critical sewers	km (3sf)
-------------	------------------------	-----------------

Full line title: Critical sewers

Definition: The total length of all critical sewers. Definition of “critical” comes from the WRC Sewerage Rehabilitation Manual. **Critical sewers** are those whose collapse repairs will be expensive or disruptive or those, which are considered to be strategically important. The principal structural criterion is that if a sewer should fail, the subsequent costs would be significantly higher than if rehabilitated before failure [more precise definition will be found in the WRC manual].

Processing rules: Input field.

Annual Return 2007 reference: AR H4.1

B4.2	Non-critical sewers	km (3sf)
-------------	----------------------------	-----------------

Full line title: Non-critical sewers

Definition: The total length of all non-critical sewers. All sewers not covered by the definitions of critical sewers.

Processing rules: Input field.

Annual Return 2007 reference: AR H4.2

B4.3	Sewage and sludge pumping mains	km (3sf)
-------------	--	-----------------

Full line title: Sewage and sludge pumping mains

Definition: The total length of all sewage pumping mains. This category also includes sludge pumping mains between treatment sites, but not those that deliver sludge on a single site.

Processing rules: Input field.

Annual Return 2007 reference: AR H4.3

B4.4	Combined sewer/emergency overflows	nr (3sf)
-------------	---	-----------------

Full line title: Sewer structures – combined sewer/emergency overflows

Definition: The number of combined sewer/emergency overflows banded by capacity (1/s) whose failure would incur significant investment or cause major environmental damage.

Processing rules: Input field.

Annual Return 2007 reference: AR H4.4

B4.5	Other sewer structures	nr (3sf)
-------------	-------------------------------	-----------------

Full line title: Other sewer structures

Definition: The number of other sewer structures banded by volume (m³) whose failure would incur significant investment or cause major environmental damage. Include tanks and lagoons associated with critical sewers.

Processing rules: Input field.

Annual Return 2007 reference: AR H4.5

B4.6	Short sea outfalls	nr (3sf)
-------------	---------------------------	-----------------

Full line title: Short sea outfalls

Definition: The number of all pipelines used for the disposal of foul and surface water and sewage effluent to the marine environment including diffusers, less than or equal to 500 metres in length. Exclude headworks, which should be included in the appropriate treatment category.

Processing rules: Input field.

Annual Return 2007 reference: AR H4.6

B4.7	Long sea outfalls	nr (3sf)
-------------	--------------------------	-----------------

Full line title: Long sea outfalls

Definition: The number of all pipelines used for the disposal of foul and surface water and sewage effluent to the marine environment including diffusers, greater than 500 metres in length. Exclude headworks, which should be included in the appropriate treatment category.

Processing rules: Input field.

Annual Return 2007 reference: AR H4.7

Annex B5.5 Wastewater non-infrastructure: Table H5 line definitions

All reference numbers are to the line description only. Column descriptions are defined separately in section H4.4 above.

B5.1	Sewage pumping stations (in-line)	nr (3sf)
-------------	--	-----------------

Full line title: Sewage pumping stations (in-line)

Definition: Total number of in-line sewage pumping stations. For these purposes a pumping station is defined as an individual site (i.e. **not** an individual pump). Include both foul, combined and stormwater pumping stations. Exclude all terminal sewage pumping stations situated both on the sewerage system and on treatment works (and exclude treatment inter-stage pumping).
[See WICS' Annual Return Reporting Requirements and Definitions Manual, section Table E, line 16].

Processing rules: Input field.

Annual Return 2007 reference: AR H5.1

B5.2	Sewage pumping stations (terminal)	nr (3sf)
-------------	---	-----------------

Full line title: Sewage pumping stations (terminal)

Definition: Total number of terminal sewage pumping stations. For these purposes a pumping station is defined as an individual site (i.e. **not** an individual pump). Include both foul, combined and stormwater pumping stations. Exclude all in-line sewage pumping stations on the sewerage system. Include terminal pumping stations on treatment works, but exclude inter-stage pumping.

[See WICs Annual Return Reporting Requirements and Definitions Manual, section Table E line 16].

Processing rules: Input field.

Annual Return 2007 reference: AR H5.2

B5.3	Cess and Septic Tanks	nr (3sf)
-------------	------------------------------	-----------------

Full line title: Sewage treatment – Cess and Septic Tanks

Definition: The number of SW owned cess and septic tanks, whose treatment does not involve preliminary treatment, such as simple screening or grit removal. Note that maceration of sewage is not, on its own, regarded as a preliminary treatment, as the breakdown of gross solids (with no removal) does not reduce BOD and could lead to an increase in the BOD effluent. This category also does not

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include septic tanks followed by reed beds or other form of secondary treatment, which should be included in H5.6.

Processing rules: Input field

Annual Return 2007 reference: AR H5.3

B5.4	Preliminary treatment only	nr (3sf)
-------------	-----------------------------------	-----------------

Full line title: Sewage treatment works – preliminary treatment only

Definition: The number of sewage treatment works whose treatment methods involve at least simple screening or grit removal but is not sufficient to be classed as primary treatment. Headworks to marine discharges comprising simple screening or grit removal should be included in this category. Note that maceration of sewage is not, on its own, regarded as a preliminary treatment as the breakdown of gross solids (with no removal) does not reduce BOD and could lead to an increase in the BOD effluent.

Processing rules: Input field

Annual Return 2007 reference: AR H5.4

B5.5	Primary treatment only	nr (3sf)
-------------	-------------------------------	-----------------

Full line title: Sewage treatment works – primary treatment

Definition: The number of sewage treatment works whose treatment methods are restricted to primary treatment (screening, comminution, maceration, grit and detritus removal, pre-aeration and grease removal, storm tanks, plus primary sedimentation, including where assisted by the addition of chemicals e.g. Clariflow).

Processing rules: Input field

Annual Return 2007 reference: AR H5.5

B5.6	Secondary treatment only	nr (3sf)
-------------	---------------------------------	-----------------

Full line title: Sewage treatment works – secondary treatment

Definition: As primary plus works whose treatment methods include activated sludge (including diffused air aeration, coarse bubble aeration, mechanical aeration, oxygen injection, submerged filters) and other equivalent techniques including deep shaft process, extended aeration (single, double and triple ditches) and biological aerated filters as secondary treatment. Also include works whose treatment methods include rotating biological contractors and biological filtration (including conventional filtration, high rate filtration, alternating double filtration and double filtration), root zone

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treatment (where necessary as a secondary treatment stage).

Processing rules: Input field

Annual Return 2007 reference: AR H5.6

B5.7	Tertiary treatment only	nr (3sf)
-------------	--------------------------------	-----------------

Full line title: Sewage treatment works – tertiary treatment

Definition: The number of sewage treatment works comprising a preliminary, primary, secondary and tertiary A1, A2, B1 and B2 treatment, as defined in the Annual Return Reporting Requirements and Definitions Manual in Section E.

Processing rules: Input field

Annual Return 2007 reference: AR H5.7

B5.8	Sludge treatment - liquid disposal	nr (3sf)
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Full line title: Sludge treatment facilities – liquid disposal

Definition: All sludge treatment plant in which the sludge is digested and only supernatant water drawn-off prior to final disposal. Include all sludge treatment plant, which changes the nature of the raw sludge prior to its final disposal, excluding sludge holding tanks included under sewage treatment works.

Processing rules: Input field

Annual Return 2007 reference: AR H5.8

B5.9	Sludge treatment - cake disposal	nr (3sf)
-------------	---	-----------------

Full line title: Sludge treatment facilities – cake disposal

Definition: All sludge treatment plant in which the sludge is dewatered using centrifuges or presses prior to final disposal. Include all sludge treatment plant, which changes the nature of the raw sludge prior to its final disposal, excluding sludge holding tanks included under sewage treatment works. May be preceded by digestion or conditioning.

Processing rules: Input field

Annual Return 2007 reference: AR H5.9

B5.10	Sludge treatment - compost disposal	nr (3sf)
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Full line title: Sludge treatment facilities – compost disposal

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Definition: All sludge treatment plant in which the sludge is composted prior to final disposal. Include all sludge treatment plant, which changes the nature of the raw sludge prior to its final disposal, excluding sludge holding tanks included under sewage treatment works. May be preceded by other processes prior to composting.

Processing rules: Input field

Annual Return 2007 reference: AR H5.10

B5.11	Sludge treatment – dried pellet disposal	nr (3sf)
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Full line title: Sludge treatment facilities – dried pellet disposal

Definition: All sludge treatment plant in which the sludge is dried prior to final disposal. Include all sludge treatment plant, which changes the nature of the raw sludge prior to its final disposal, excluding sludge holding tanks included under sewage treatment works. May be preceded by digestion or dewatering using centrifuges or presses within sludge disposal facility.

Processing rules: Input field

Annual Return 2007 reference: AR H5.11

B5.12	Sludge treatment - ash disposal	nr (3sf)
--------------	--	-----------------

Full line title: Sludge treatment facilities – ash disposal

Definition: All sludge treatment plant in which the sludge is incinerated prior to final disposal. Include all sludge treatment plant, which changes the nature of the raw sludge prior to its final disposal, excluding sludge holding tanks included under sewage treatment works. May be preceded by digestion or dewatering using centrifuges or presses within sludge disposal facility.

Processing rules: Input field

Annual Return 2007 reference: AR H5.12

B5.13	Sludge treatment - other disposal	nr (3sf)
--------------	--	-----------------

Full line title: Sludge treatment facilities – other disposal

Definition: All sludge treatment plant not covered in liquid, cake, compost or ash disposal. Include all sludge treatment plant, which changes the nature of the raw sludge prior to its final disposal, excluding sludge holding tanks included under sewage treatment works.

Processing rules: Input field

Annual Return 2007 reference: AR H5.13

Annex B5.6 Support Services: Table H6 line definitions

All reference numbers are to the line description only. Column descriptions are defined separately in section 4.4 above.

B6.1	Offices & Laboratories	m² & nr (3sf)
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Full line title: Support Services – offices and laboratories

Definition: The total area of offices and laboratories utilised for the water and wastewater service within SW.

Processing rules: Input field

Annual Return 2007 reference: AR H6.1

B6.2	Depots & workshops	m² & nr (3sf)
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Full line title: Support Services – depots and workshops

Definition: The total area of depots and workshops utilised for the water and wastewater service within SW.

Processing rules: Input field

Annual Return 2007 reference: AR H6.2

B6.3	Control Centres	m² & nr (3sf)
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Full line title: Support Services – control centres

Definition: The total area of control centres utilised for the water and wastewater service within SW.

Processing rules: Input field

Annual Return 2007 reference: AR H6.3

B6.4	Vehicles & Plant	£m (3sf)
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Full line title: Support Services – vehicles & plant

Definition: The total replacement cost of vehicles and plant used for the water and wastewater service within SW.

Processing rules: Input field

Annual Return 2007 reference: AR H6.4

B6.5	Telemetry systems	% & nr (3sf)
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Full line title: Support Services – telemetry systems

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Definition: The percentage of SW's operational sites covered by telemetry systems. Also to be input in this line are the number of telemetry outstations installed at operational sites.

Processing rules: Input field

Annual Return 2007 reference: AR H6.5

B6.6	Information Systems	nr (3sf)
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Full line title: Support Services – information systems

Definition: The total number of laptops, desktops & servers utilised to support the water and wastewater service within SW.

Annual Return 2007 reference: AR H6.6

B6.7	Other non-operational assets	nr (3sf)
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Full line title: Other non-operational assets

Definition: All other non-operational, owned and maintained assets, including other property and land (e.g. farms, houses, tourist complexes, non-operational land, etc, which are not included in B6.1-B6.6). This Line excludes any leased assets.

Processing rules: Input field

Annual Return 2007 reference: AR H6.7

ANNEX B6

EXAMPLES FOR INTERPRETATION OF THE CLASSIFICATION OF WATER TREATMENT WORKS

Annex B6 General

For the eight water asset categories of SW0, SW1, SW2, SW3; GW0, GW1, GW2 & GW3 there are occasions when there are difficulties in interpretation.

Surface (S) or Ground (G) Source	Outline Description
SW0	Simple disinfection only
SW1	Simple physical treatment only (e.g. filtration and disinfection)
SW2	Simple physical treatment, chemical treatment and disinfection only
SW3	Methods involving additional stages of physical and chemical treatment (e.g. activated carbon, disinfection with ozone)
GW0	Simple disinfection only
GW1	Simple physical treatment only (e.g. filtration and disinfection)
GW2	Single stage complex physical or chemical treatment and disinfection (e.g. for nitrate or pesticide removal)
GW3	More than one stage of complex groundwater treatment (e.g. for both nitrate and pesticide removal)