Appendix A : Cost Base

Table	**1**	Water mains forecast expenditure
Block	**A**	Mains laying or replacement (excluding directional drilling)
Line	**1**	Grassland

Line Definition: Estimated proportion of water mains capital expenditure on mains laying or replacement in grassland locations during 2010-14 excluding by directional drilling.

Processing Rule: Input

AR 07 Ref:

%	1dp

Table	**1**	Water mains forecast expenditure
Block	**A**	Mains laying or replacement (excluding directional drilling)
Line	**2**	Rural\suburban highway

Line Definition: Estimated proportion of water mains capital expenditure on mains laying or replacement in rural / suburban highway locations during 2010-14 excluding by directional drilling.

Processing Rule: Input

AR 07 Ref:

%	1dp

Table	**1**	Water mains forecast expenditure
Block	**A**	Mains laying or replacement (excluding directional drilling)
Line	**3**	Urban highway

Line Definition: Estimated proportion of water mains capital expenditure on mains laying or replacement in urban highway locations during 2010-14 excluding by directional drilling.

Processing Rule: Input

AR 07 Ref:

%	1dp

Table	**1**	Water mains forecast expenditure
Block	**B**	Mains laying or replacement (directional drilling)
Line	**4**	Rural\suburban highway

Line Definition: Estimated proportion of water mains capital expenditure on mains laying or replacement by directional drilling in rural / suburban locations during 2010-14.

Processing Rule: Input

AR 07 Ref:

%	1dp

Appendix A : Cost Base

Table	**1**	Water mains forecast expenditure
Block	**B**	Mains laying or replacement (directional drilling)
Line	**5**	Urban highway

Line Definition: Estimated proportion of water mains capital expenditure on mains laying or replacement by directional drilling in urban locations during 2010-14.

Processing Rule: Input

AR 07 Ref:

%	**1dp**

Table	**1**	Water mains forecast expenditure
Block	**C**	Mains rehabilitation
Line	**6**	Relining

Line Definition: Estimated proportion of water mains capital expenditure on rehabilitation of potable water mains by surface applied internal coating during 2010-14.

Processing Rule: Input

AR 07 Ref:

%	**1dp**

Table	**1**	Water mains forecast expenditure
Block	**C**	Mains rehabilitation
Line	**7**	Pipe insertion

Line Definition: Estimated proportion of water mains capital expenditure on rehabilitation of potable water mains by pipe insertion during 2010-14.

Processing Rule: Input

AR 07 Ref:

%	**1dp**

Table	**1**	Water mains forecast expenditure
Block	**D**	Total capital expenditure
Line	**8**	Capital investment in underground water distribution activity (including block E meters)

Line Definition: Total forecast capital expenditure in underground water distribution activity (including block E meters) during 2010-14. Please state in the commentary the breakdown of the expenditure between mains, communication pipes and meters.

Processing Rule: Input

AR 07 Ref:

£m	**3dp**

Table	**2**	Water infrastructure standard costs
Block	**A**	Mains laying
Line	**1**	Nominal bore 100mm

Line Definition: Estimated cost per metre of a 100mm nominal bore pipe laid in the specified locations – grassland, rural/suburban highway and urban highway.

Processing Rule: Brought forward from Table 2.1, 2.2 and 2.3

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**A**	Mains laying
Line	**2**	Nominal bore 150mm

Line Definition: Estimated cost per metre of a 150mm nominal bore pipe laid in the specified locations – grassland, rural/suburban highway and urban highway.

Processing Rule: Brought forward from Table 2.1, 2.2 and 2.3

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**A**	Mains laying
Line	**3**	Nominal bore 200mm

Line Definition: Estimated cost per metre of a 200mm nominal bore pipe laid in the specified locations – grassland, rural/suburban highway and urban highway.

Processing Rule: Brought forward from Table 2.1, 2.2 and 2.3

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**A**	Mains laying
Line	**4**	Nominal bore 300mm

Line Definition: Estimated cost per metre of a 300mm nominal bore pipe laid in the specified locations – grassland, rural/suburban highway and urban highway.

Processing Rule: Brought forward from Table 2.1, 2.2 and 2.3

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**B**	Mains laying by directional drilling
Line	**5**	Nominal bore 100mm

Line Definition: Estimated cost per metre of a 100mm nominal bore pipe laid using directional drilling technique in the specified locations – rural/suburban highway and urban highway

Processing Rule: Brought forward from Table 2.4 and 2.5

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**B**	Mains laying by directional drilling
Line	**6**	Nominal bore 150mm

Line Definition: Estimated cost per metre of a 150mm nominal bore pipe laid using directional drilling technique in the specified locations – rural/suburban highway and urban highway.

Processing Rule: Brought forward from Table 2.4 and 2.5

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**B**	Mains laying by directional drilling
Line	**7**	Nominal bore 200mm

Line Definition: Estimated cost per metre of a 200mm nominal bore pipe laid using directional drilling technique in the specified locations – rural/suburban highway and urban highway

Processing Rule: Brought forward from Table 2.4 and 2.5

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**C**	Mains rehabilitation
Line	**8**	Nominal bore 100mm

Line Definition: Estimated cost per metre for rehabilitation of a 100mm nominal bore pipe by the specified technique – relining and pipe insertion.

Processing Rule: Brought forward from Table 2.6 and 2.7

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**C**	Mains rehabilitation
Line	**9**	Nominal bore 150mm

Line Definition: Estimated cost per metre for rehabilitation of a 150mm nominal bore pipe by the specified technique – relining and pipe insertion.

Processing Rule: Brought forward from Table 2.6 and 2.7

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**C**	Mains rehabilitation
Line	**10**	Nominal bore 200mm

Line Definition: Estimated cost per metre for rehabilitation of a 200mm nominal bore pipe by the specified technique – relining and pipe insertion.

Processing Rule: Brought forward from Table 2.6 and 2.7

AR 07 Ref: **£/m** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**D**	Communication pipes
Line	**11**	New communication pipes

Line Definition: Estimated cost per unit for new communication pipes - long side and short side.

Processing Rule: Brought forward from Table 2.8

AR 07 Ref: **£/unit** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**D**	Communication pipes
Line	**12**	Renew communication pipes

Line Definition: Estimated cost per unit for renewal of communication pipes - long side and short side.

Processing Rule: Brought forward from Table 2.8

AR 07 Ref: **£/unit** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**E**	Household meters
Line	**13**	New

Line Definition: Estimated cost per unit of installation of new meters in specified circumstances – internally, externally (excluding boundary box) and externally (including boundary box).

Processing Rule: Brought forward from Table 2.9, 2.10 and 2.11

AR 07 Ref: **£/unit** **1dp**

Table	**2**	Water infrastructure standard costs
Block	**E**	Household meters
Line	**14**	Renew

Line Definition: Estimated cost per unit for renewal of meters in specified circumstances – internally, externally (excluding boundary box) and externally (including boundary box).

Processing Rule: Brought forward from Table 2.9, 2.10 and 2.11

AR 07 Ref: **£/unit** **1dp**

Table	**3**	Water service - forecast expenditure by asset type
Block	**A**	Water resources
Line	**1**	Water resources

Line Definition: Estimated proportion of total capital expenditure on water resource assets, excluding intake and borehole pumping stations during 2010-14.

Processing Rule: Input

AR 07 Ref: **%** **1dp**

Table	**3**	Water service - forecast expenditure by asset type
Block	**B**	Water treatment works
Line	**2**	Surface water

Line Definition: Estimated proportion of total capital expenditure on surface water treatment works during 2010-14.

Processing Rule: Input

AR 07 Ref: **%** **1dp**

Table	**3**	Water service - forecast expenditure by asset type
Block	**B**	Water treatment works
Line	**3**	Ground water

Line Definition: Estimated proportion of total capital expenditure on ground water treatment works during 2010-14.

Processing Rule: Input

AR 07 Ref:

%	1dp

Table	**3**	Water service - forecast expenditure by asset type
Block	**C**	Storage
Line	**4**	Treated water storage

Line Definition: Estimated proportion of total capital expenditure on service reservoirs and water towers during 2010-14.

Processing Rule: Input

AR 07 Ref:

%	1dp

Table	**3**	Water service - forecast expenditure by asset type
Block	**D**	Pumping stations
Line	**5**	Pumping stations

Line Definition: Estimated proportion of total capital expenditure on borehole, intake and booster pumping stations during 2010-14.

Processing Rule: Input

AR 07 Ref:

%	1dp

Table	**3**	Water service - forecast expenditure by asset type
Block	**E**	Mains and customer ancillaries
Line	**6**	Potable mains

Line Definition: Estimated proportion of total capital expenditure on potable water mains during 2010-14.

Processing Rule: Input

AR 07 Ref:

%	1dp

Table	**3**	Water service - forecast expenditure by asset type
Block	**E**	Mains and customer ancillaries
Line	**7**	Communication pipes

Line Definition: Estimated proportion of total capital expenditure on all types of communication pipes during 2010-14.

Processing Rule: Input

AR 07 Ref: **%** **1dp**

Table	**3**	Water service - forecast expenditure by asset type
Block	**E**	Mains and customer ancillaries
Line	**8**	Meters

Line Definition: Estimated proportion of total capital expenditure on household and other meters during 2010-14.

Processing Rule: Input

AR 07 Ref: **%** **1dp**

Table	**3**	Water service - forecast expenditure by asset type
Block	**F**	Management and general
Line	**9**	Management and general

Line Definition: Estimated proportion of total capital expenditure on water management and general assets during 2010-14.

Processing Rule: Input

AR 07 Ref: **%** **1dp**

Table	**3**	Water service - forecast expenditure by asset type
Block	**G**	Total capital expenditure
Line	**10**	Total capital expenditure in the water service

Line Definition: Total forecast capital investment in the water service during 2010-14.

Processing Rule: Input

AR 07 Ref: **£m** **3dp**

Appendix A : Cost Base

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**1**	New treatment works type SW4, output 30Ml/d

Line Definition: Estimated cost £/Ml/day for the construction of a lowland river source treatment works, via an existing bankside storage reservoir (7 days at average treated water flow), required to deliver 30Ml/day of treated water. Provide treatment processes for category 4 surface water. Assume that raw water pH adjustment, pesticide removal, taste & odour control and plumbosolvency control is required. The risk of cryptosporidium should be taken as that for a poor lowland reservoir source and level (4) treatment under High Risk. The company should select the treatment treatment process that represents their normal practice for SW4 treatment. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). Assume screening of source water is carried out before the water reaches the treatment works i.e. no requirement for band screens.

Assume no algal problems whether toxic or not.

Assume peak raw water quality; turbidty =7NTU ; total pesticides = 0.5µg/l ; colour = 12mg/lPt/Co; dissolved iron = 30µg/l. Assume the filtration rates used in normal practice (state assumed rate in CBS) and based on full flow treatment being possible with at least one filter out of service for backwashing. Include for access to all plant in line with company normal practice and H&S requirements.Assume contact tank provides 30 minutes contact time at a treated water flow rate of 30Ml/day. Assume that the main process flow path is by gravity i.e. pumping is not needed unless the process choices would require interstage pumping. Assume that the treatment ends at the outlet of the contact tank. Do not include for the connection into supply from the contact tank outlet or for any high lift pumping. All filter backwash water and wastewater sludges from all process units are disposed of to sewer which is conveniently situated within the site. No sludge storage or treatment facilities are required.

Chemical dosing and storage should be in line with the company policy. The works is to have a peak design treated water flow of 30Ml/day. The standard cost relates to the peak capacity and the denominator is therefore also 30Ml/day.

Processing Rule: Brought forward from Table 4.1

AR 07 Ref: **£/Ml/d** **1dp**

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**2**	Replacement filtration system at an existing water treatment works type SW2, output 20Ml/d

Line Definition: Estimated cost £/Ml/day for construction of a replacement filtration system at an existing water treatment works served by a lowland river source via bankside storage reservoir (7 days at average treated water flow) delivering 20Ml/day of treated water. The risk of cryptosporidium should be taken as that for a good lowland reservoir source and Level (2) treatment. Exclude cost for an additional barrier to ensure Level 3 treatment. The treatment process indicated below is not mandatory. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). Space exists for a replacement filtration plant to be built alongside the old plant. Assume that the existing filters are to be abandoned and the decommissioning costs for this are excluded. Note that no materials or filter media is to be scavanged from the old filters.Include for a new filter backwash system and washwater return system including new tanks and equipment. No treatment or settlement of filter backwash water is required before pumping to the works inlet.

Include for the pumped return of filter backwash water to the inlet of the works following storage but exclude for all pipework from the dirty washwater return pumping station to the inlet of the works.Assume the sludge is disposed of to an existing sludge treatment centre and no additional sludge storage or additional treatment facilities are required. Assume all existing chemical dosing systems upstream and downstream of the existing filtration system are retained.Assume that the process flow path is gravity and that no intermediate pumping is required.Include for all M&E plant, instrumentation and controls associated with the filters, backwash storage and backwash pumping systems. Exclude rerouting and connection of the existing site power supply feed to the new filter and backwash MCC.Assume the filtration rates used in normal practice (state assumed rate in CBS) and based on full flow treatmnet being possible with at least one filter out of service for backwashing.

Include for access to all plant in line with company normal practice and H&S requirements.Exclude break-ins to existing pipework upstream and downstream of the existing filters and all associated interconnecting pipework to and from the new filtration plant.The denominator is 20Ml/day which is the maximum output of the plant.

Processing Rule: Brought forward from Table 4.2

AR 07 Ref: **£/Ml/d** **1dp**

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**3**	New abstraction borehole treatment works with simple disinfection only, output 5Ml/d

Line Definition: Estimated cost £/Ml/day for construction of a fixed speed abstraction borehole with an output of 5Ml/day with simple disinfection only. Total pumping head (i.e. static and friction) at the site is 45 metres. Include for the construction of a single 0.6 metre diameter borehole with a depth from existing ground level of 35 metres. The treatment process indicated below is not mandatory. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).

The borehole construction is: the top 15 metres from existing ground level is through chalk which requires a metal liner and grouting/concrete to annulus. The aquifer is greensand extending from the chalk to the bottom of the borehole. This length of 20 metres requires a screen liner and a graded gravel pack in the annular space behind the screen. At ground level include for the construction of the borehole headworks.The general arrangement is that the borehole pump delivers directly into a service reservoir. Exclude the costs of the pumping main and service reservoir.

Include for the pump, the pump riser, valves and for a length of delivery main sufficient for the dosing and mixing of chlorine, sampling for residual chlorine monitoring and control, and flow measurement.Disinfection is by simple chlorination injection and there is no contact tank. Include for the provision of chlorination equipment. Monitoring is done on inlet to the service reservoir; exclude automatic feedback control but include shut down if dose rate is not achieved. Include all equipment to meet Health and Safety requirements e.g. gas alarms. Include for performance testing and commissioning of the pump and the cost associated with 28 days continuous pumping with flow and level monitoring to verify yield and draw down for the purpose of confirming compliance with the abstraction licence requirements to the Environment Agency. Assume length of the temporary disposal pipeline is 150m.

Exclude the provision and connection of power to the main distribution/MCC for the works and telpehone network. Include for incomer/distribution/MCC panel, control panel, and all associated power, control and instrument cabling. Include all ICA equipment to monitor and control the treatment equipment and borehole pump (flow and pressure monitoring) and local cabling costs. Include borehole pump testing including necessary additional equipment.The maximum output is 5Ml/day and this is also the denominator for the standard cost.

Processing Rule: Brought forward from Table 4.3

AR 07 Ref: **£/Ml/d** **1dp**

Appendix A : Cost Base

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**4**	Reburbishment of plumbosolvency control plant , output 8Ml/d

Line Definition: Estimated cost £/Ml/day for refurbishment of plumbosolvency control equipment at an abstraction borehole with an output of 8Ml/day with simple disinfection only.

Borehole has the same specification as the works in line 3, except for the assumed chemical composition of the raw water. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).Include the cost of decommissioning and replacing the local dosing control panel, dosing skid, dosing lines and associated control equipment. Include the cost of cleaning, condition assessment, minor remedial works and reconnecting the bulk tank and bund. and reconnecting the bulk tank and bund. The new plant should allow the dose rate of orthophosphoric acid to be maintained at 1.0mgP/litre. At the point of injection the main process operating pressure is 6 bar.

Exclude the cost of removal(was disposal) of the decommissioned plant from site and disposal. Excluding the cost of temporary dosing whilst the refurbishment takes place is not required..Assume that the existing building and dosing points and flow control can be reused. Assume that the existing downstream disinfection process does not need to be refurbished.Include for off-line testing and commissioning the dosing equipment, re-connection into the main process and 7 days monitoring and optimisation when bringing the plant back into service. Explain testing and commissioning procedure (e.g off-line or on-line) in the CBS. Assume a new dosing lines are required, length 50m.

Include re-connection into the existing power and telemetry equipment, which are both located within the same building as the dosing plant. Exclude connection to local telephone network.The maximum output is 8Ml/day and this is also the denominator for the standard cost.

Processing Rule: Brought forward from Table 4.4

AR 07 Ref: **£/Ml/d** **1dp**

Appendix A : Cost Base

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**5**	Alterations to water treatment works type SW2, output 30Ml/d

Line Definition: Estimated cost £/Ml/day for the alteration to a lowland river source treatment works to retrofit a DWI approved barrier process capable of removing particles in excess of one micron to reduce the risk of cryptosporidium oocysts entering supply. This must be fitted to a works which is constructed via an existing bankside storage reservoir (7 days at average treated water flow), required to deliver 30Ml/day of treated water. There is no nitrate problem. Assume that raw water pH adjustment is not required except where such dosing is required as an integral part of the treatment processes proposed. Assume that there is no need for GAC/ozone treatment for pesticides or taste and odour control, otherwise assume full treatment. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).

The treatment process chosen should be in accordance with the Water, England and Wales – The Water Supply (Water Quality) Regulations 2000 and be in line with the advice provided in DWI information letter 10/1999 and subsequent updates and be capable of removing or retaining particles greater than 1 micron diameter. Continuous monitoring of the treated water is not required.Facilities must be included to enable the integrity tests to be carried out to comply with the above regulations and the guidance provided in DWI letter 3/2002.It should include a process which has been given technical support by DWI, so that if correctly operated continuous monitoring of the water is not required.Include all necessary chemical (including storage) and filter backwash return systems.Include interconnecting pipework between the new process units but exclude break-ins to existing pipework upstream and downstream of the new barrier process and all associated interconnecting pipework to and from the new plant.

Include for incomer/distribution/MCC panel for the new process stage and all associated power, control and instrument cabling. Include all ICA equipment to monitor and control the treatment equipment.Exclude the provision and connection of power to the main distribution/MCC for the works.Include all necessary buildings/kiosks to house mechanical and electrical equipment. Assume the site is level and the top water level of the final contact tank is the same as the lower limit of the bankside storage, thus pumping will be needed.Include chemical cleaning and disposal / neutralising system but not off site treatment.The works is to have a peak design treated water flow of 30Ml/day. The standard cost relates to the peak capacity and the denominator is therefore also 30Ml/day.

Processing Rule: Brought forward from Table 4.5

AR 07 Ref: **£/Ml/d** **1dp**

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**6**	Installation of a nitrate removal plant at a borehole treatment works with simple disinfection only, output 10Ml/d

Line Definition: Estimated cost £/Ml/day for retrofitting nitrate removal plant to an abstraction borehole with a total output of 10Ml/day with simple disinfection only. Borehole has the same specification as the works in line 3, except for the assumed chemical composition of the raw water. Output to conform with the Water, England and Wales – The Water Supply (Water Quality) Regulations 2000. The output nitrate level to be achieved should be in line with the company's normal policy. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). Nitrate removal of part of the total output of 10Ml/d and blending with the remainder to meet the quality requirement at a total output of 10Ml/d.Disinfection is by simple chlorination injection and there is no contact tank. Assume disinfection control as in line 3.

The water from the borehole has a peak nitrate concentration of 70mg/l.Assume the whole flow of the borehole needs to be treated.The general arrangement is that the borehole pump delivers directly into a service reservoir via a length of main.Assume that the nitrate removal plant will need a building/kiosk to house it.Assume there is an on-site sewer of sufficient capacity for disposal of waste and there is no need for waste storage or treatment. Include for testing and commissioning the new plant.

Exclude the provision and connection of power to the main distribution/MCC for the works. Include for incomer/distribution/MCC panel, control panel, and all associated power, control and instrument cabling.Include all ICA equipment to monitor and control the treatment equipment and local cabling costs. Exclude connection to local telephone network.The maximum output is 10Ml/day and this is also the denominator for the standard cost.

Processing Rule: Brought forward from Table 4.6

AR 07 Ref:

£/Ml/d	**1dp**

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**7**	Cryptosporidium protection to an existing borehole treatment works with simple disinfection only, output 2.5Ml/d

Line Definition: Estimated cost £/Ml/day for the alteration to an existing abstraction borehole with an output of 2.5Ml/day to retro fit a DWI approved barrier process capable of removing particles in excess of one micron to reduce the risk of cryptosporidium oocysts entering supply. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).The general arrangement is that the borehole pump delivers directly into a service reservoir. The source is considered to be at "significant risk" from cryptosporidium problems. Assume maximum raw water turbidity = 1.5 NTU. The treatment process chosen should be in accordance with the Water, England and Wales – The Water Supply (Water Quality) Regulations 2000 and be in line with the advice provided in DWI information letter 10/1999 and subsequent updates and be capable of removing or retaining particles greater than 1 micron diameter. Continuous monitoring of the treated water is not required.

Facilities must be provided to enable the integrity tests to be carried out to comply with the above regulations and the guidance provided in DWI letter 3/2002.Include interconnecting pipework between the new process units but exclude break-ins to existing pipework upstream and downstream of the new barrier process and all associated interconnecting pipework to and from the new plant. Include for incomer/distribution/MCC panel for the new process stage and all associated power, control and instrument cabling. Include all ICA equipment to monitor and control the treatment equipment. Exclude the provision and connection of power to the main distribution/MCC for the works.

Include all necessary buildings/kiosks to house mechanical and electrical equipment.

Include alterations to pumping system including break pressure / flow balancing tanks and pumping equipment to restore 7 bar normal output pressures.Include chemical cleaning and disposal neutralising system but not off site treatment.The process must treat all of the 2.5Ml/day peak flow. The standard cost relates to the peak capacity and the denominator is therefore also 2.5Ml/day.

Processing Rule: Brought forward from Table 4.7

AR 07 Ref: **£/Ml/d** **1dp**

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**8**	Refurbishment of rapid gravity filters, output 20Ml/d

Line Definition: Estimated cost for refurbishment of existing rapid gravity filtration plant. The existing works has the same specification as the works in line 3. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).The filters are designed to treat 20Ml/d. The number and area of the filters assumed must be based on company normal practice and stated in the CBS. If company filter rate policy does not determine filtration area then assume 120 m2.

Assume whole works cannot be taken off-line and therefore filters must be refurbished sequentially. The existing plant is based on the following parameters, which should be the basis for the refurbished plant (unless the company normal practice is significantly different).Assume the media depth is 1200mm comprising 600mm 14/25 sand and 600mm No 2 anthracite.Assume the air-scour rate is 60 m/h.Assume the backwash rate is 10 m/h combined with air-scour, then 45 m/h re-grade.Assume that the filter structure can be retained and that no civil or building works are required other than for the anchoring and grouting of replacement mechanical and electrical plant. The existing weir height on backwash launders is sufficient to prevent loss of media.

Wash water disposal is via existing channels which do not require refurbishment. Assume the following plant needs to be replaced. Include the cost and details such as material of each item within the CBS:- Filter floors / nozzles.- Filter media as above including allowance for removal of fines (the existing media cannot be re-used).- Filter backwash launders. - Air blowers (duty and standby) with acoustic enclosures.- Backwash pumps (duty and standby) with variable speed drives to achieve combined and re-grade wash rates above.- Backwash pipework.- Air-scour pipework.- Filtered water pipework within filter gallery.- All isolating and control valves and penstocks.- Level, flow and turbidity instruments on each filter with connections to control system.

Include MCC for all new plant (pump, blower and actuator starters and VSDs) and control system including panel(s) local to filters, plant level plc(s) and interface to existing site SCADA system but excluding modifications to existing SCADA software.

Include slow-start and run-to-waste facilities. Assume filters can be taken off line without requiring any temporary filtration plant or by-pass arrangement. Include for decommissioning of the existing plant but not removal off-site and disposal. The standard cost relates to the peak capacity and the denominator is therefore also 20Ml/day

Processing Rule: Brought forward from Table 4.8

AR 07 Ref: **£/Ml/d** **1dp**

Appendix A : Cost Base

Table	**4**	Water non-infrastructure standard costs
Block	**A**	Water treatment works
Line	**9**	Replacement of disinfection plant, output 12Ml/d

Line Definition: Estimated cost for replacement of existing potable water disinfection plant. The scope is to replace the sodium hypochlorite dosing plant at an existing water treatment works, output 12Ml/d. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).Include the cost for decommisioning the existing plant but not the cost for removal off-site and disposal.Assume that the existing hypochlorite storage tanks, pipework to and from the contact tank (including inline plant such as flowmeters, mixers , dosing and sampling points can all be retained). The existing buildings, pipe and cable ducts are in good condition and do not need repair. De-chlorination and ammoniation are not required.

Assume the replacement can be carried out off-line and neither temporary disinfection plant or bypass arrangements are required.Provide a replacement sodium hypochlorite dosing plant for a 12 Ml/d plant flow. Assume normal dose of 1.5mg/l and maximum dose of 2.5mg/l. Assume duty standby dosing and motive water pumps are required.Include the costs of the associated skid mounted pipework, valves and instrumentation (including analysers).Include new duty and standby dosing pipes to the injection point. Assume the dosing skids are 50m away from the injection point. Include housing, power and waste lines and assume sample water is handled in line with normal company practice.

Include new sample points to be located at the exit from contact tank and downstream of the mixer at the injection point.Assume chlorine analysers are required adjacent to sample points to minimise control loop times.Control system to be based on local plc with interface to main plant SCADA with capability of local and remote control. Primary control on initial dose rate with secondary control to maintain preset residual from contact tank outlet. All of which is located within the existing disinfection building.The standard cost relates to the peak capacity and the denominator is therefore also 12Ml/day.

Processing Rule: Brought forward from Table 4.9

AR 07 Ref: **£/Ml/d** **1dp**

Table	**4**	Water non-infrastructure standard costs
Block	**B**	Storage
Line	**10**	New service reservoir, capacity 4Ml

Line Definition: Estimated cost £/Ml for the construction of a new service reservoir of capacity 4Ml. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). The reservoir is a conventional half in the ground and half out semi-buried structure. The capacity of the reservoir is 4Ml from top water level to floor, with the top water level being 4m above the floor. The ground has adequate bearing capacity and there are no flotation problems.The reservoir is to have two compartments with full height dividing wall and roof membrane. The pipework comprises an inlet, outlet, washout and overflow to each compartment. Each individual pipework run terminates at a valve chamber 10 metres from the reservoir

(include all necessary valves). All pipework is 300mm diameter. Include flow metering on the inlet to the tank.

Booster chlorination is not required.ICA panel, telemetry and sampling taps are to be provided and located in a new kiosk. Instrumentation is limited to level monitoring of each cell. No automated water quality sampling equipment is to be provided. Exclude the cost of the power supply connection and telephone line connection.Provide lockable access covers but no other form of security and any equipment necessary for safe access into the contact tank .State the material assumed for the construction of the service reservoir within the CBS.Assume LPC4 standard access covers to meet SEMD requirements. Include for full disinfection and hydraulic test (include the costs for emptying and re-filling the tank).

The standard cost is expressed in £/Ml. The denominator for the standard cost estimate is 4Ml.

Processing Rule: Brought forward from Table 4.10

AR 07 Ref: **£/Ml** **1dp**

Appendix A : Cost Base

Table	**4**	Water non-infrastructure standard costs
Block	**B**	Storage
Line	**11**	Refurbishment of service reservoir, capacity 1Ml

Line Definition: Estimated cost £/Ml for refurbishment of a 1Ml capacity service reservoir with conventional half-in\half-out water retaining reinforced concrete construction, earth covered and grassed. The reservoir roof has cracking which permits ingress of groundwater, and seepage from side wall cracks is evident on drained inspection. There have been coliform failures of samples taken from the reservoir. The reservoir has recently been cleaned. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).1. The existing asset comprises:- A two compartment reservoir. Each compartment is 10m x 10m x 5m water depth and may be isolated in turn. - Although the roof is cracked it is structurally sound and does not need to be replaced. However mechanically driven plant is not allowed on the roof.- There is no existing roof membrane; and the walls and floor are structurally sound but there is inadequate cover to the reinforcement.- There are no handholds at roof level.- During the refurbishment there is no requirement for temporary storage or bypass arrangements.

2. The asset deficiencies to be remedied are:- Cracks in the roof are present to a total 10m in length and run through the full depth of the roof slab.- Construction joints in the floors and walls over a length of 160m are defective and leaking.- The walls contain several areas of superficial defective concrete, which need to be broken out back to the steel reinforcement and repaired. Total area 3.5 sq. m.- All internal pipework is externally corroded but structurally sound and in good operating order. In total there are 25m of 200mm diameter pipework.- All internal surfaces of the reservoir are eroded and there is insufficient cover to the steel reinforcement. All internal surfaces comprising floor, walls and roof soffit are to be rendered in accordance with the company's standard practice.- There are 4 No. roof ventilators with 150mm diameter holes into the roof which are potential causes of contamination.- 2 No. existing access covers and brick manways (1200mm x1200mm clear opening) are potential sources of contamination and inadequately secure. New covers and manways are to be provided in accordance with the company's standard practice.

New LPC4 standard access covers are to be provided to meet SEMD requirements. Manways are to be provided in accordance with the company's standard practice.- Appropriate roof repairs shall be undertaken incorporating membrane, drainage system and finishes in accordance with standard company practice. Assume existing and conveniently sited manhole is available into which roof\perimeter drainage can be connected and 2 No. existing ladders 4.5m long are corroded and unsafe.- Include for full disinfection and hydraulic test (include the costs for emptying and re-filling the tank).- Assume all excavated material can be stored on site. Include costs for replacing excavated material and regrassing.- Ensure all internal materials satisfy Regulation 31 of the Water Supply (Water Quality) Regulations 2000.The standard cost is expressed in £/Ml. The denominator for the standard cost estimate is 1Ml.

Processing Rule: Brought forward from Table 4.11

AR 07 Ref: **£/Ml** **1dp**

Table	**4**	Water non-infrastructure standard costs
Block	**C**	Pumping stations
Line	**12**	Replacement of variable speed pumps, output 6 to 9Ml/d

Line Definition: Estimated cost £/Ml/day for the installation of two replacement shaft driven variable speed pumpsets in one dry well (one duty, one assist), motors and associated control equipment. Average output is 6Ml/day and peak output required is 9Ml/day. The total pumping head (i.e. static and friction) at the site is 45-60 metres at average output and 90 metres at peak output. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). The pumps are vertical units installed in a dry well, depth floor to floor 6m. Each is able to deliver up to 6 Ml/d when operating singly and up to 9Ml/d when operating as a parallel pair. Motors are mounted at ground floor level. Good vehicular access is available up to the door of the pumping station. A lifting gantry is available within the pumping station at the upper level to provide clean unobstructed lifts to both pumps and to load and off-load pumps from a vehicle. The existing pump house is in good condition and does not require any modifications.Output into supply can be maintained by a single pump whilst the other is being changed. There is no requirement to provide temporary pumping arrangements during the work. Include temporary ICA panel.

Include for isolating each pump and motor, disconnecting power cables, removal and disposal of pumps, support plinths, motors, holding down bolts, spindles, all valves (suction, non-return and delivery valves) and remove all interconnecting pipework. Disconnect and remove existing ICA panel, PLC (hardware and software), level control instrumentation associated with pump control, proximity switches on the non-return valves, telemetry and associated cabling. Include for decommissioning all plant but not removal off site and disposal.Include for off loading, installation, aligning replacement pumps and motors and reconnecting the existing power cables to the existing pump starters via retained cable tray and ducts. Include for a new suction, non-return and delivery valve on each pump. Install new pipework to re-connect the new pipes into the existing suction and delivery manifolds. Include for new bolt sets and gaskets. Constructing new plinths to receive the replacement pumps. Assume that the access aperture in the pump house floor above each pump requires no additional work and that the new motor bed plate requires no modification to accept thenew motor fixings.

Include for a new ICA panel including new PLC (hardware and software), telemetry outstation, marshalling and cabling equipment and connections to the power supply in the existing MCC. Include for installation of new level control instrumentation, proximity switches and new cabling between instruments and the new ICA panel. Assume existing variable speed control equipment i.e. invertor drives, is suitable for the new motors and assume the capacity of the existing switchgear, incomer and transformer are adequate and do not require additional works. Reconnection to the network is not required.The standard cost is expressed in £/Ml/day. The denominator for the standard cost estimate is 9 Ml/day.

Processing Rule: Brought forward from Table 4.12

AR 07 Ref: **£/Ml/d** **1dp**

Appendix A : Cost Base

Table	**4**	Water non-infrastructure standard costs
Block	**C**	Pumping stations
Line	**13**	New fixed-speed pumpset, output 10Ml/d

Line Definition: Estimated cost £/Ml/day for installation of a new fixed speed pumpset to be installed at an existing high lift pumping station. The pump is required to deliver 10 Ml/day against a total pumping head (i.e. static and friction) of 75 metres. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). Assume there is good vehicular access up to the door of the pumping station and a lifting gantry is available within the pumping station to provide clean unobstructed lifts to existing and new pumps and to load and off load pumps from a vehicle. Installation work can be carried out without affecting the operation of the existing station. There is no requirement to provide any temporary pumping arrangements during the work. The existing pump house is in good condition and does not require any modifications.The existing pumping station is suitable for the installation of horizontal close coupled units. Assume there is no existing plant to decommission and remove.

Include for off loading, installation and aligning of the new pump, motor and baseplate, including the construction of a new plinth. Include for a new non-return valve and make-up pipework to connect to the existing isolation valves on the existing suction and delivery manifolds. Include for new bolt sets and gaskets and for removing the blank flanges (on the existing isolating valves). Include connecting a new power cable to an existing pump starter via existing cable tray and ducts.The existing PLC can be retained but needs to be reprogrammed. Include new pressure and level instrumentation, additional telemetry outstation, marshalling and cabling and connections to the power supply, within in the existing MCC. Include for a new ICA panel and cabling for control instrumentation and local telemetry (including traywork, ducting, clipping and testing).

Assume the switchgear, starters, incomer and transformer are adequate and do not require additional works. Assume allowance for this additional equipment has been made in the sizing of the existing MCC and ICA panels.The standard cost is expressed in £/Ml/day. The denominator for the standard cost estimate is 10Ml/day.

Processing Rule: Brought forward from Table 4.13

AR 07 Ref: **£/Ml/d** **1dp**

Table	**4**	Water non-infrastructure standard costs
Block	**C**	Pumping stations
Line	**14**	Replacement motor control centre for an existing variable speed pumping station, 90kW total installed motor capacity

Line Definition: Estimated cost £/kW for the installation of a replacement front access Form 4 motor control centre (MCC) for an existing pumping station. Assume the capacity of the existing transformer and DNO incomer are adequate and do not require additional works. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).The new MCC includes two duty/standby starter compartments, with inverters each rated at 45kW, isolation section for incoming 3-phase 400V feed, generator socket and manual change over compartment, distribution section, small power and lighting section for the pump house only, signal marshalling section and full height control section. Assume the DNO metering and cut outs are separately located adjacent to the panel and that the existing mains feed cable to the MCC is reused. Assume no ancillary electrical plant exists on site and that additional feeder sections and isolators are not required.

Include for the following ICA in the control section; telemetry outstation, power supply, PLC (hardware and software), manifold pressure transmitters and marshalling rack. Include for connection of all signal cables to the marshalling section and for FAT and SAT testing of the complete MCC installation.

Good vehicular access is available up to the door of the pumping station such that a vehicle mounted hydraulic lifting arm to the kiosk doors can offload the new MCC. Assume the double access door to the kiosk is of sufficient height to accept the unit and that it can be readily manoeuvred into position by trolley. Include for off loading and installation of the replacement MCC and for reconnecting existing power and signal cables. Include for new cable runs in existing cable tray and ducts between the new pressure transmitters and the control section.The existing MCC will need to be removed prior to the new installation. Assume the existing support plinth, cable ducts, cover plates or support steel etc can be reused without further modification to the kiosk or base. Include for temporary works provision to maintain operation of the pumping station for the duration of the installation phase by either temporary starter panel/controls for the existing pumps or additional over-pumping. Include for isolating and decommissioning the existing MCC, disconnecting power and signal cables, but not for removal and disposal of the redundant unit off site and disposal.

There is no change required to any of the following which are retained: cable runs (other than connection points to the existing panel) pumps, pipework, covers, guide rails, pump plinth, kiosk or building services.The denominator is 90kW irrespective of whether the starters selected have slightly more or less than the specified 90kW.

Processing Rule: Brought forward from Table 4.14

AR 07 Ref:	**£/kW**	**1dp**

Table	**5**	Sewerage forecast expenditure
Block	**A**	Sewer laying or replacement (excluding pipe jacking or micro tunnelling)
Line	**1**	Sewer laying or replacement - grassland

Line Definition: Estimated proportion of sewer capital expenditure on sewer laying or replacement in grassland locations during 2010-14. Exclude by pipejacking or microtunnelling.

Processing Rule: Input

AR 07 Ref:	**%**	**1dp**

Table	**5**	Sewerage forecast expenditure
Block	**A**	Sewer laying or replacement (excluding pipe jacking or micro tunnelling)
Line	**2**	Sewer laying or replacement - rural / suburban highway

Line Definition: Estimated proportion of sewer capital expenditure on sewer laying or replacement in rural / suburban highway locations during 2010-14. Exclude by pipejacking or microtunnelling.

Processing Rule: Input

AR 07 Ref: | **%** | **1dp**

Table	**5**	Sewerage forecast expenditure
Block	**A**	Sewer laying or replacement (excluding pipe jacking or micro tunnelling)
Line	**3**	Sewer laying or replacement - urban highway

Line Definition: Estimated proportion of sewer capital expenditure on sewer laying or replacement in urban highway locations during 2010-14. Exclude by pipejacking or microtunnelling.

Processing Rule: Input

AR 07 Ref: | **%** | **1dp**

Table	**5**	Sewerage forecast expenditure
Block	**B**	Sewer rehabilitation
Line	**4**	Sewer rehabilitation - no dig/ reline

Line Definition: Estimated proportion of sewer capital expenditure on rehabilitation of sewers by no dig/ reline techniques during 2010-14.

Processing Rule: Input

AR 07 Ref: | **%** | **1dp**

Table	**5**	Sewerage forecast expenditure
Block	**C**	Total capital expenditure
Line	**5**	Capital investment in critical and non-critical sewers

Line Definition: Total forecast capital investment in critical and non-critical sewers during 2010-14.

Processing Rule: Input

AR 07 Ref: | **£m** | **3dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**A**	Sewer laying
Line	**1**	Sewer laying - diameter 150mm

Line Definition: Estimated cost per metre of a 150mm diameter sewer laid in the specified locations - grassland, rural/suburban highway and urban highway

Processing Rule: Brought forward from Table 6.1, 6.2 and 6.3

AR 07 Ref: **£/m** **1dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**A**	Sewer laying
Line	**2**	Sewer laying - diameter 225mm

Line Definition: Estimated cost per metre of a 225mm diameter sewer laid in the specified locations - grassland, rural/suburban highway and urban highway.

Processing Rule: Brought forward from Table 6.1, 6.2 and 6.3

AR 07 Ref: **£/m** **1dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**A**	Sewer laying
Line	**3**	Sewer laying - diameter 300mm

Line Definition: Estimated cost per metre of a 300mm diameter sewer laid in the specified locations - grassland, rural/suburban highway and urban highway.

Processing Rule: Brought forward from Table 6.1, 6.2 and 6.3

AR 07 Ref: **£/m** **1dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**A**	Sewer laying
Line	**4**	Sewer laying - diameter 450mm

Line Definition: Estimated cost per metre of a 450mm diameter sewer laid in the specified locations - grassland, rural/suburban highway and urban highway.

Processing Rule: Brought forward from Table 6.1, 6.2 and 6.3

AR 07 Ref: **£/m** **1dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**B**	Sewer rehabilitation
Line	**5**	Sewer rehabilitation - diameter 150mm

Line Definition: Estimated cost per metre for rehabilitation of a 150mm diameter sewer by the specified technique - no dig/ reline.

Processing Rule: Brought forward from Table 6.4

AR 07 Ref: **£/m** **1dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**B**	Sewer rehabilitation
Line	**6**	Sewer rehabilitation - diameter 225mm

Line Definition: Estimated cost per metre for rehabilitation of a 225mm diameter sewer by the specified technique - no dig/ reline.

Processing Rule: Brought forward from Table 6.4

AR 07 Ref: **£/m** **1dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**B**	Sewer rehabilitation
Line	**7**	Sewer rehabilitation - diameter 300mm

Line Definition: Estimated cost per metre for rehabilitation of a 300mm diameter sewer by the specified technique - no dig/ reline.

Processing Rule: Brought forward from Table 6.4

AR 07 Ref: **£/m** **1dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**B**	Sewer rehabilitation
Line	**8**	Sewer rehabilitation - diameter 450mm

Line Definition: Estimated cost per metre for rehabilitation of a 450mm diameter sewer by the specified technique - no dig/ reline.

Processing Rule: Brought forward from Table 6.4

AR 07 Ref: **£/m** **1dp**

Table	**6**	Sewerage infrastructure standard costs
Block	**B**	Sewer rehabilitation
Line	**9**	Sewer rehabilitation - diameter 600mm

Line Definition: Estimated cost per metre for rehabilitation of a 600mm diameter sewer by the specified technique - no dig/ reline.

Processing Rule: Brought forward from Table 6.4

AR 07 Ref: **£/m** **1dp**

Table	**7**	Wastewater service - forecast expenditure by asset type
Block	**A**	Sewers
Line	**1**	Sewers

Line Definition: Estimated proportion of total capital expenditure on sewers during 2010-14.

Processing Rule: Input

AR 07 Ref: **%** **1dp**

Table	**7**	Wastewater service - forecast expenditure by asset type
Block	**B**	Sewer structures
Line	**2**	Sewer structures

Line Definition: Estimated proportion of total capital expenditure on sewer structures during 2010-14.

Processing Rule: Input

AR 07 Ref: **%** **1dp**

Table	**7**	Wastewater service - forecast expenditure by asset type
Block	**C**	Sewage pumping stations
Line	**3**	Sewage pumping stations

Line Definition: Estimated proportion of total capital expenditure on sewage pumping stations during 2010-14.

Processing Rule: Input

AR 07 Ref: **%** **1dp**

Table	**7**	Wastewater service - forecast expenditure by asset type
Block	**D**	Sewage treatment works
Line	**4**	Sewage treatment works

Line Definition: Estimated proportion of total capital expenditure on all sewage treatment works during 2010-14.

Processing Rule: Input

AR 07 Ref: | **%** | **1dp**

Table	**7**	Wastewater service - forecast expenditure by asset type
Block	**E**	Sea outfalls
Line	**5**	Sea outfalls and headworks

Line Definition: Estimated proportion of total capital expenditure on sea outfalls and headworks during 2010-14.

Processing Rule: Input

AR 07 Ref: | **%** | **1dp**

Table	**7**	Wastewater service - forecast expenditure by asset type
Block	**F**	Sludge treatment and disposal
Line	**6**	Sludge treatment and disposal

Line Definition: Estimated proportion of total capital expenditure on sludge treatment and disposal during 2010-14.

Processing Rule: Input

AR 07 Ref: | **%** | **1dp**

Table	**7**	Wastewater service - forecast expenditure by asset type
Block	**G**	Management and general
Line	**7**	Management and general

Line Definition: Estimated proportion of total capital expenditure on sewerage management and general assets during 2010-14.

Processing Rule: Input

AR 07 Ref: | **%** | **1dp**

Table	**7**	Wastewater service - forecast expenditure by asset type
Block	**H**	Total capital expenditure
Line	**8**	Total capital investment in the sewerage service

Line Definition: Total forecast capital investment in sewerage service assets during 2010-14.

Processing Rule: Input

AR 07 Ref: **£m** **3dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**A**	Sewer structures
Line	**1**	Storage tank to combined sewer overflow, capacity 750m3

Line Definition: Estimated cost per unit for a storage tank of capacity 750m³ required on the discharge pipe from a combined sewer overflow. Assume that a site is available immediately adjacent to the pipe in a public park and that (other than the switchgear kiosk menti

Include for a 10m length of inlet and outlet pipework, with the outlet pipework at a depth of 900mm to the crown of the pipe. Include inlet/ outlet chambers.Include for circulating pumps or alternative method to minimise deposition of solids.Include for switchgear assuming direct on line starting housed in a new adjacent kiosk.Exclude provision of a mains power supply but include for power cables from the kiosk to all pumps. Include ICA and telemetry. Make no provision for overflow event recorder or odour control.The standard cost is expressed in £/unit. The denominator for the standard cost estimate is unity.

Processing Rule: Brought forward from table 8.1

AR 07 Ref: **£/unit** **1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**A**	Sewer structures
Line	**2**	Large storage tank to a combined sewer overflow, capacity 3,000m³

Line Definition: Estimated cost per unit for a storage tank of capacity 3,000m³ required on the discharge pipe from a combined sewer overflow. Assume that a site is available immediately adjacent to the pipe in a public park and that (other than the switchgear kiosk menti

Include for a 10m length of inlet and outlet pipework, with the outlet pipework at a depth of 900mm to the crown of the pipe. Include inlet/outlet chambers.Include for circulating pumps or alternative method to minimise deposition of solids.Include for switchgear assuming direct on line starting housed in a new adjacent kiosk.Exclude provision of a mains power supply but include for power cables from the kiosk to all pumps. Include ICA and telemetry. Make no provision for overflow event recorder or odour control.The standard cost is expressed in £/unit. The denominator for the standard cost estimate is unity.

Processing Rule: Brought forward from table 8.2

AR 07 Ref: **£/unit** **1dp**

Appendix A : Cost Base

Table	**8**	Wastewater non-infrastructure standard costs
Block	**A**	Sewer structures
Line	**3**	Combined sewer overflow chamber with powered screen

Line Definition: Estimated cost per unit for a combined sewer overflow chamber with a powered screen to be constructed off-line on an existing sewer network. On completion the sewer will be diverted to allow flows through the CSO with the pass forward flows rejoining the existing sewer. Assume that a site is available adjacent to the existing pipe in a public park and that (other than the kiosk mentioned below) only secure access covers are to be permitted at ground level. The site is well drained and has never been subject to flooding. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).The existing trunk sewer is 600mm internal diameter, 2.5 metres deep to invert.Include excavation and construction costs of a reinforced concrete chamber. Include access covers, ladders and vents in line with the company normal practice. Guard rails are not required.Assume the following flow regime: Dry weather flow in sewer is 30 l/s; Peak design storm inflow to chamber (1 in 5 year return period event) is 650 l/s; Continuation flow from chamber is 120 l/s. Top water level in chamber during design storm event is 750mm above the invert level of the incoming pipe. Maximum design storm flow (1 in 30 year event) is 750 l/s at which the top water level in the chamber must not exceed 900mm above the invert level of the incoming pipe.

Include for pass forward flow control by a throttle on the outlet from the chamber.Include for a 10m length of inlet pipework and outlet pipework, with the outlet pipework at a depth of 900mm to the crown of the pipe. Include inlet/ outlet chambers.Assume a powered 6mm screen to be installed on the weir. The screen shall be of a self cleaning design that returns any retained storm debris to the sewer continuation flow.Allow for a 600mm internal diameter overflow pipe from the chamber 20m long, 2.5m deep discharging into a new manhole on an existing outfall pipe.Assume unsurcharged design flow conditions in the overflow and continuation pipes.Allow adequate access to the chamber for routine maintenance and removal of the screen and sampling downstream of the weir.

Include for a screen control panel and any instrumentation required for operation of the screen. Assume the control panel is located in a new kiosk adjacent to the chamber. Include for telemetry but make no provision for overflow event recorder or odour control.Assume that a three phase mains supply is available adjacent to the kiosk but make no allowance for the incoming power supply connection or for DNO metering within the kiosk sizing. There is no requirement for temporary pumping.The chamber design should take cognisance of the guidance note “Design of CSO Chambers to Incorporate Screens” produced by the Wastewater Planning Users Group (WaPUG), 2001.The standard cost is expressed in £/unit. The denominator for the standard cost estimate is unity.

Processing Rule: Brought forward from table 8.3

AR 07 Ref: **£/unit** **1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**B**	Sewage pumping stations
Line	**4**	Replacement dry well pumps and motors for an existing pumping station, 30kW total capacity

Line Definition: Estimated cost £/kW for the installation of replacement fixed speed pumps and motors (1 duty, 1 standby) with a total installed capacity 30 kW, in an existing sewage dry well pumping station. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). Good vehicular access is available up to the door of the pumping station. A lifting gantry is available within the pumping station at the upper level to provide clean unobstructed lifts to both pumps and for loading and off loading pumps from vehicles. Assume that the access aperture in the pump house floor above each pump requires no additional work. The existing building is in a good condition and does not require any modifications.Sewage flows can be handled by a single pump whilst the other is being changed. There is therefore no requirement to provide temporary pumps, over-pumping or tankering arrangements during the work.The existing pumps are vertical spindle pump/motor units, with the pump installed in the dry well and the motor above at floor level. Include for isolating each pump and motor, disconnecting power cables, decommissioning of pumps, support plinths, motors, holding down bolts, spindles, motor bed plates but not removal off site and disposal. Assume the existing valves (suction, non-return and delivery valves) and the make up pieces between pump suction and delivery connections are reusable.

The new replacement pumps are to be dry well mounted submersibles, each capable of passing 100mm diameter solids and the duty of each pump is 150 l/s at 8m total pumping head (i.e. static and friction). Construct new plinths to receive the replacement submersible pumps. Include for new bolt sets and gaskets. Include for off loading, installation and connecting new power cables to the existing pump starters via retained cable tray and ducts.Include for the removal and disposal of the existing ICA panel, level control instrumentation associated with pump control, proximity switches on the non-return valves and associated cabling off site. Include for installation of new level control instrumentation, proximity switches and new cabling between instruments and the new ICA panel. No flow metering or condition monitoring instrumentation is required. Include for a new ICA panel including new PLC (hardware and software), instrumentation, and telemetry outstation, marshalling and cabling and connections to the power supply in the existing MCC.

Assume the capacity of the existing switchgear, pump starters, incomer and transformer are adequate and do not require additional works.Price on the basis that the installation forms part of a planned capital maintenance contract.The denominator is 30kW irrespective of whether the pumps selected have a combined rated power of slightly more or less than the specified 30kW. State the combined rated power.

Processing Rule: Brought forward from table 8.4

AR 07 Ref: **£/kW** **1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**B**	Sewage pumping stations
Line	**5**	Replacement submersible pumps for an existing pumping station, 12kW total capacity

Line Definition: Estimated cost £/kW for the installation of replacement fixed speed pumps (1 duty, 1 standby) with a total installed capacity 12 kW, in an existing sewage wet well pumping station. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). Good vehicular access is available up to the door of the pumping station. A lifting gantry or davit is available within the pumping station, which provides clean unobstructed lifts to both pumps. The lifting chains for the pumps are accessible from the surface, as are the cable disconnection points and there is no need to enter the wet well. The existing kiosk is in a good condition and can be reused.Sewage flows can be handled by a single pump whilst the other is being changed. There is therefore no requirement to provide temporary pumps, over-pumping or tankering arrangements during the work.

Include for isolating each pump and disconnecting power cables, decommissioning pumps but not removal off site and disposal. Assume the existing valves (non-return and delivery), support plinths, pipework and wet well covers can be reused.Replacement submersible pumps are to be installed via guide rails, in the wet well, with each capable of passing 100mm diameter solids. The duty of each pump is 45 l/s at 8m head. Include for reconnecting power cables through existing ducts, to the pump starters. Include for decommissioning of the existing ICA panel, level control instrumentation associated with pump control and associated cabling off site. Assume the capacity of the existing switchgear, pump starters, incomer and transformer are adequate and do not require additional works.Include for a new ICA panel including new PLC (hardware and software), instrumentation, and telemetry outstation, marshalling and cabling and connections to the power supply in the existing MCC. Include for installation of new level control instrumentation and new cabling but not removal off site and disposal.

No flow metering or condition monitoring instrumentation is required.Price on the basis that the installation forms part of a planned capital maintenance contract.The denominator is 12kW irrespective of whether the pumps selected have a combined rated power of slightly more or less than the specified 12kW.

Processing Rule: Brought forward from table 8.5

AR 07 Ref:

£/kW	**1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**B**	Sewage pumping stations
Line	**6**	Upsize existing wet well in-line pumping station from 12kW to 30kW capacity

Line Definition: Estimated cost £/kW for the installation of replacement fixed speed submersible pumps (1 duty, 1 standby) with a total installed capacity 30 kW, in an existing sewage wet well pumping station with a current capacity of 12kW. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). Good vehicular access is available up to the door of the pumping station. A lifting gantry or davit is available at the pumping station to provide clean unobstructed lifts to both pumps. The lifting chains for the pumps are accessible from the surface, as are the cable disconnection points and there is no need to enter the wet well. The existing kiosk is in a good condition and can be reused.The wet well needs to be isolated from sewage flows for the duration of the work. Assume a 30kW pump is adequate to provide the required over-pumping capacity and that a suitable manhole is located just upstream of the wet well and that the adjacent valve chamber has a suitable Bauer coupling for this purpose.

Include for isolating each pump, disconnecting power cables, decommissioning of pumps, pump plinth and guide rails but not removal off site and disposal. The rising main and station pipework capacities are adequate for the increased pass forward flow. Assume the existing non-return and isolation valves, pipework and wet well covers can be reused.Replacement pumps are to be installed via guide rails, in the wet well, with each capable of passing 100mm diameter solids. The duty of each pump is 150 l/s at 8m head. Include for connecting new power cables through existing ducts, to the existing pump starters. Include for decommissioning the existing ICA panel, level control instrumentation associated with pump control, proximity switches on the non-return valves, and associated cabling but not the removal off site and disposal. Assume the capacity of the existing switchgear, pump starters, incomer, and transformer are adequate and do not require additional works.

Include for a new ICA panel including new PLC (hardware and software), instrumentation, and telemetry equipment and connections to the power supply in the existing MCC.Include for installation of new level control instrumentation, proximity switches and new cabling between instruments and the new ICA panel. No flow metering or condition monitoring instrumentation is required. Price on the basis that the installation forms part of a planned capital maintenance contract.The denominator is 30kW irrespective of whether the pumps selected have a combined rated power of slightly more or less than the specified 30kW.State the combined rated power.

Processing Rule: Brought forward from table 8.6

AR 07 Ref: **£/kW** **1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**B**	Sewage pumping stations
Line	**7**	Replacement motor control centre for an existing sewage pumping station, 90kW total installed motor capacity

Line Definition: Estimated cost £/kW for the installation of a replacement front access Form 4 motor control centre for an existing fixed speed sewage pumping station. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). The existing MCC will be removed prior to the new installation. Assume the existing support plinth, cable trench, cover plates or support steel etc can be reused without further modification to the kiosk or base. Include for temporary works provision to maintain operation of the pumping station for the duration of the installation phase by either temporary starter panel/controls for the existing pumps, additional over-pumping or tankering arrangements. Include for isolating and decommissioning the existing MCC, disconnecting power and signal cables, but not removal of the redundant unit off site and disposal. Assume the capacity of the existing transformer and DNO incomer are adequate and do not require additional works.

Good vehicular access is available up to the door of the pumping station such that a vehicle mounted hydraulic lifting arm to the kiosk doors can offload the new motor control centre. Assume the double access door to the kiosk is of sufficient height to accept the unit and that it can be readily manoeuvred into position by trolley. The new motor control centre should include two duty/standby starter compartments, with soft starters each rated at 45kW, isolation section for incoming 3-phase 400V feed, generator socket and manual change over compartment, distribution section, small power and lighting section for the pump house only, signal marshalling section and full height control section. Assume the DNO metering and cut outs are separately located adjacent to the panel and that the existing mains feed cable to the MCC is reused. Assume no ancillary electrical plant exists on site and that additional feeder sections and isolators are not required. Include for reconnecting existing power and signal cables. Include for new cable runs in existing cable tray and ducts between the new level controls and the control section.

Include for the following ICA in the control section; telemetry outstation, power supply, PLC, level transmitter and marshalling rack. Include for connection of all signal cables to the marshalling section and for FAT and SAT testing of the complete MCC installation. The denominator is 90kW irrespective of whether the starters selected have slightly more or less than the specified 90kW.

Processing Rule: Brought forward from table 8.7

AR 07 Ref: **£/kW** **1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**C**	Sewage treatment works
Line	**8**	First time rural sewage treatment, p.e. 200

Line Definition: Estimated cost £/kg BOD5/day for construction of first time rural treatment works, treating up to 6 DWF and serving a population equivalent of 200. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Stru

Include interconnecting pipework between process units.Include all necessary buildings/kiosks to house mechanical and electrical equipment.Exclude the provision and connection of power to the main distribution/MCC for the works.Include for incomer/distribution/MCC panel, control panel, and all associated power, control and instrument cabling.Include all ICA equipment to monitor and control the treatment equipment.The design capacity and denominator is 12 kg of BOD5/day.

Processing Rule: Brought forward from table 8.8

AR 07 Ref: **kg BOD /d** **1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**C**	Sewage treatment works
Line	**9**	Installation of denitrification at existing secondary works, p.e. 40,000

Line Definition: Estimated cost £/kg BOD5/day for the installation of denitrification at an existing secondary works treating up to 3 DWF, to meet UWWTD standards for inland discharge, and serving a population equivalent of 40,000. DWF is 10,000m³/day. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS). The consent requirements, based on composite samples, are: flows up to 30,000 m3/day: BOD5: 25; SS: 35; NH3: 5; P: no limit; N: annual mean 15 [mg/l]. Upper tier: assume that this is not critical to the process design.The existing works provides secondary treatment based on percolating filters. It is satisfactory in all respects. The works is operating at its design loading of 2,400kg BOD5/day and it is able to achieve 95%ile compliance with BOD5: 25; SS: 35; NH3: 5 [mg/l] standard.

The side stream or tertiary plant is to have hydraulic capacity for 30,000 m³/day plus return liquors.Any additional sludge treatment relating to this process that is provided should include a raw sludge holding tank with 24 hours capacity, covered wit

Include all necessary buildings/kiosks to house mechanical and electrical equipment. Include telemetry equipment and local cabling but exclude connection to local network.The design capacity and denominator is 2,400 kg of BOD5/day.

Processing Rule: Brought forward from table 8.9

AR 07 Ref: **kg BOD /d** **1dp**

Appendix A : Cost Base

Table	**8**	Wastewater non-infrastructure standard costs
Block	**C**	Sewage treatment works
Line	**10**	Additional nutrient removal at existing secondary works, p.e. 4,000

Line Definition: Estimated cost £/kg BOD5/day for construction of an additional treatment stage at an existing works treating up to 3 DWF, to meet UWWTD standards for inland discharge, and serving a population equivalent of 4,000. DWF is 1,000m³/day. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).The consent requirements, based on composite samples, are; flows up to 3,000 m3/day: BOD5: 25; SS: 35; NH3: 5; P: annual mean 2; N: no limit [mg/l]. Upper tier: assume that this is not critical to the process design.The existing works provides secondary treatment based on percolating filters. The existing works are satisfactory in all respects. The works is operating at its is design loading of 240kg BOD5/day and it is able to achieve 95%ile compliance with BOD5: 25; SS: 35; NH3: 5 [mg/l] standard.

Any additional sludge treatment relating to this process that is provided should include a raw sludge holding tank with 24 hours capacity, covered with vents for abstraction to an odour control plant. Assume sewage alkalinity is sufficiently high that additional alkalinity dosing is not required. Include interconnecting pipework between the new process units but exclude break-ins to existing pipework upstream and downstream of the existing new nutrient removal plant and all associated interconnecting pipework to and from the new plant. Include for incomer/distribution/MCC panel, control panel for the new process stage and all associated power, control and instrument cabling. Include all ICA equipment to monitor and control the treatment equipment. Exclude the provision and connection of power to the main distribution/MCC for the works.

Include all necessary buildings/kiosks to house mechanical and electrical equipment. Include telemetry equipment and local cabling but exclude connection to local network.The design capacity and denominator is 240 kg of BOD5/day.

Processing Rule: Brought forward from table 8.10

AR 07 Ref:

BOD5/d	**1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**C**	Sewage treatment works
Line	**11**	Additional ammonia removal at existing secondary works, p.e. 2,000

Line Definition: Estimated cost £/kg BOD5/day for construction of an additional stage of treatment for ammonia removal at an existing works serving a population equivalent of 2,000 and treating up to 3 DWF. DWF is 400m³/day. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).The consent requirements, based on composite samples, are; flows up to 1,200 m3/day: BOD5: 25; SS: 35; NH3: 5; [mg/l]. Upper tier: assume that this is not critical to the process design.The existing works provides secondary treatment based on primary settlement, percolating filters and humus tanks. It is satisfactory in all respects. The works is operating at its design loading of 120kg BOD5/day and it is currently able to achieve 95%ile compliance with BOD5: 25; SS: 35; NH3: 20 [mg/l] standard.The side stream or tertiary plant is to have hydraulic capacity for 3,000 m3/day plus return liquors.

The DWF and population equivalent stated above, should be used in conjunction with the company capita consumption standards to derive the full flow to treatment and infiltration levels.The additional plant is to have hydraulic capacity for 1,200 m3/day.Any additional sludge treatment relating to this process should include a raw sludge holding tank with 24 hours capacity, covered with vents for abstraction to an odour control plant. Assume sewage alkalinity is sufficiently high that additional alkalinity dosing is not required. Exclude the provision and connection of power to the main distribution/MCC for the works. Include for incomer/distribution/MCC panel for the new process stage and all associated power, control and instrument cabling. Include all ICA equipment to monitor and control the treatment equipment.

Include all necessary buildings/kiosks to house mechanical and electrical equipment.Include telemetry equipment and local cabling but exclude connection to local network.The denominator is the design capacity of the works i.e. 120kg of BOD5/day.

Processing Rule: Brought forward from table 8.11

AR 07 Ref:

BOD5/d	**1dp**

Appendix A : Cost Base

Table	**8**	Wastewater non-infrastructure standard costs
Block	**C**	Sewage treatment works
Line	**12**	Replacement UV disinfection at existing treatment works, p.e. 5,000

Line Definition: Estimated cost £/m³/day for replacement of a UV disinfection plant at an existing treatment works serving a population equivalent of 5,000 and treating a flow of up to 6 DWF (DWF is 1,500m³/day). Treatment works discharges to coastal waters. The cost and

All capacity including standby is to be replaced. Include the cost of isolating and decommissioning and removal off site of the existing UV plant but not removal off site and disposal. The existing isolation valves at the inlet and outlet of the disinfection chamber/ channel can be used. Temporary treatment or bypass arrangements are not required. Disconnect from the local MCC (to be retained), decomission and remove the existing instrumentation and associated cabling. The existing kiosk is in good condition and can be reused.Rebuild channels and replace frames for UV lamps. Provide new lamps. Replace all instrumentation needed to monitor and control the plant, including provision of the associated cabling. The existing cable ducts can be reused. Reconnect to the existing MCC and install new ICA panel. Exclude the provision and connection of power to the main distribution/MCC for the works. Reprogramme the existing telemetry equipment but exclude connection to local network.

The denominator is the design flow of 9,000m³/day.

Processing Rule: Brought forward from table 8.12

AR 07 Ref: **£/m /d** **1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**C**	Sewage treatment works
Line	**13**	Replacement sewage treatment works inlet screens

Line Definition: Estimated cost £/unit for replacing fine screens at an existing inlet works. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).The existing works comprises 2 No. inlet channels, each having nominal dimensions of 1200mm wide and normal operating depth (excluding freeboard) of 1000mm. The normal flow speed is 0.5m/s. The screens can be safely isolated by existing penstocks, which are in good condition. There are existing duty/standby screen channels and one channel must remain open during the construction period. Temporary over-pumping is not required. Assume the existing civil works are serviceable and do not require any modifications. Assume existing access and decking is serviceable and do not require any modifications.nclude decommissioning of the existing screens and ancillaries but not removal off-site and disposal. Assume ancillaries are as new equipment specified below, and include washing and compaction plant.

Provide duty/standby screens with 6mm mesh (screen to 6mm in two dimensions).State the assumed hydraulic loading rate within the CBS. State the assumed blinding factor / % blinded. Include a screen cleaning system assuming adequate supply of service water (final effluent) is available from a point adjacent to the inlet works. Provide booster pumps and self-washing filter to protect washwater nozzles from blockage.Provide a screenings conveyor (wash channel type) with grit trap and cover. Include for screenings washing and compacting plant and skip loading gantry (for moving screenings into skip). Exclude the cost of the screenings skip. Assume the plant can be located adjacent to the inlet works. Assume all effluent can be discharged to the nearby site drainage.

Provide a new ICA panel including new PLC (hardware and software) for local control and interface with site control system for remote control. Include for all necessary instrumentation to monitor and control the plant (including differential level transmitters to indicate head loss through the screens). Provide a new MCC for the screens and associated plant including all cabling equipment and connections to the power supply in the existing main MCC. Assume the existing electrical supply has sufficient capacity.The standard cost is expressed in £/unit (i.e. per screen). The denominator for the standard cost estimate is unity.

Processing Rule: Brought forward from table 8.13

AR 07 Ref: **£/unit** **1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**D**	Sludge treatment and disposal
Line	**14**	Extension to existing conventional sludge treatment facility, additional throughput 3 ttds per annum

Line Definition: Extension to an existing mesophilic anaerobic digestion sludge treatment facility to achieve conventional treatment standards as defined in the BRC/ADAS/Water UK Safe Sludge Matrix. Catchment area is domestic in nature. Assume the feed sludge is 6% dry solids. The treatment process indicated below is not mandatory. The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).An existing plant of 2 thousand tonnes of dry solids (ttds) per annum is to be extended to provide a total throughput of 5 ttds per annum. State the final % of dry solids assumed to be achieved within the CBS.Assume the existing facility receives raw sludge from primary sedimentation tanks followed by secondary activated sludge plants. Assume the catchments are predominantly residential and commercial, with light industry only (no chemical or food industries).

Assume disposal of liquors to local WWTW which has sufficient capacity.

Include cost for upsizing sludge reception centre to take the additional sludge volumes by provision of additional holding / storage capacity complete with mixers, pipework and valve . Any tanks are to be covered, with vents for abstraction to an odour control plant. Assume the existing sludge thickening/dewatering plant has adequate capacity.Assume the off site disposal facility is available up to 50 hours per week.Include the cost for provision of mesophilic anaerobic digestion to treat additional throughput of 3 ttds per annum.Include cost for the provision of power, cables, telemetry, cabling and instrumentation (to demonstrate compliance with maintaining digestion at 32-35oC for 14 days).

Include for odour control (provide covers with odour control vents to appropriate vessels only).The standard cost is expressed in £/ttds/annum. The denominator for the standard cost estimate is 3ttds/annum.

Processing Rule: Brought forward from table 8.14

AR 07 Ref:

£/ttds/a	**1dp**

Table	**8**	Wastewater non-infrastructure standard costs
Block	**D**	Sludge treatment and disposal
Line	**15**	Refurbishment of belt sludge thickeners

Line Definition: Estimate for the replacement of a belt sludge thickener at an existing sewage treatment works. The works is sized for a population equivalent of 50,000. The sludge is a mixture of primary and secondary sludges so the thickener is to be replaced with belt type thickener(s). The cost and associated assumptions of the costed process design are to be given on the Cost Breakdown Structure (CBS).Assume the existing building and civil works are in good condition and can be re-used. There is no requirement for emporary treatment or bypass arrangements. The sludge thickening plant can be shut down for the duration of the construction.Include decommisioning and removal of existing thickener, sludge transfer pumps, poly dosing plant, potable and washwater booster sets and ancillaries.

Provide new belt thickener(s) designed to produce sludge of 6% from an activated sludge type sewage treatment plant sized for a population equivalent of 50,000 producing effluent to 30/21/10 standard. Include for duty/ standby operation.State assumed ttds/day. Provide sludge transfer pumps (in line with company practice) complete with motors and gearboxes. Include for duty and standby arrangement as per thickener configuration. Each pump should be equipped with over pressure protection.Include for new poly dosing plant, potable booster pumps and washwater equipmentProvide all interconnecting pipework including isolating valves.

Provide a new MCC in a separate air-locked room within the building. Include all necessary power and control cables to a new plc and interface to existing site control system in control room 50m away. Provide all necssary instrumentation for monitoring and controling the thickeners. Assume the existing electrical supply has sufficient capacity. Assume the exsiting cable trays and ducts can be reused.The standard cost should be the total cost for the refurbishment. There is no denominator.

Processing Rule: Brought forward from table 8.15

AR 07 Ref:	**£/ttds/a**	**1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**A**	Mains laying - grassland
Line	**1**	Mains laying nominal bore 100mm in grassland

Line Definition: Estimated cost per metre of a 100mm nominal bore pipe laid in grassland, assuming that depth of cover to the mains is 900mm to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 2.1)

AR 07 Ref:	**£/m**	**1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**A**	Mains laying - grassland
Line	**2**	Mains laying nominal bore 200mm in grassland

Line Definition: Estimated cost per metre of a 200mm nominal bore pipe laid in grassland, assuming that depth of cover to the mains is 900mm to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 2.1)

AR 07 Ref:	**£/m**	**1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**A**	Mains laying - grassland
Line	**3**	Mains laying nominal bore 300mm in grassland

Line Definition: Estimated cost per metre of a 300mm nominal bore pipe laid in grassland, assuming that depth of cover to the mains is 900mm to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 2.1)

AR 07 Ref: **£/m** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**B**	Mains laying - rural/suburban highway
Line	**4**	Mains laying nominal bore 100mm in rural/suburban highway

Line Definition: Estimated cost per metre of a 100mm nominal bore pipe laid in rural/suburban highway assuming that depth of cover to the mains is 900mm to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 2.2)

AR 07 Ref: **£/m** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**B**	Mains laying - rural/suburban highway
Line	**5**	Mains laying nominal bore 200mm in rural/suburban highway

Line Definition: Estimated cost per metre of a 200mm nominal bore pipe laid in rural/suburban highway assuming that depth of cover to the mains is 900mm to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 2.2)

AR 07 Ref: **£/m** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**B**	Mains laying - rural/suburban highway
Line	**6**	Mains laying nominal bore 300mm in rural/suburban highway

Line Definition: Estimated cost per metre of a 300mm nominal bore pipe laid in rural/suburban highway assuming that depth of cover to the mains is 900mm to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 2.2)

AR 07 Ref: **£/m** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**C**	Mains rehabilitation
Line	**7**	Mains rehabilitation nominal bore 100mm PU relining

Line Definition: Estimated cost per metre for rehabilitation by PU relining of a 100mm nominal bore pipe, assuming that depth of cover to the mains is 900mm to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 2.6)

AR 07 Ref: **£/m** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**D**	Water treatment works
Line	**8**	Alterations to water treatment works type SW2, output 30Ml/d

Line Definition: Estimated cost £/Ml/day for the alteration to a lowland river source treatment works to retrofit a DWI approved barrier process capable of removing particles in excess of one micron to reduce the risk of cryptosporidium oocysts entering supply. This must be fitted to a works which is constructed via an existing bankside storage reservoir (7 days at average treated water flow), required to deliver 30Ml/day of treated water. There is no nitrate problem. Assume that raw water pH adjustment is not required except where such dosing is required as an integral part of the treatment processes proposed. Assume that there is no need for GAC/ozone treatment for pesticides or taste and odour control, otherwise assume full treatment.

Processing Rule: Input / Brought Forward(Table 4.5)

AR 07 Ref: **£/Ml/d** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**D**	Water treatment works
Line	**9**	Cryptosporidium protection to an existing borehole treatment works providing simple disinfection only, output 2.5Ml/d

Line Definition: Estimated cost £/Ml/day for the alteration to an existing abstraction borehole with an output of 2.5Ml/day to retro fit a DWI approved barrier process capable of removing particles in excess of one micron to reduce the risk of cryptosporidium oocysts entering supply.

Processing Rule: Input / Brought Forward(Table 4.7)

AR 07 Ref: **£/Ml/d** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**E**	Storage
Line	**10**	New service reservoir, capacity 4Ml

Line Definition: Estimated cost £/Ml for the construction of a new service reservoir of capacity 4Ml.

Processing Rule: Input / Brought Forward(Table 4.10)

AR 07 Ref: **£/Ml** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**F**	Pumping stations
Line	**11**	Replacement of variable speed pumps, output 6 to 9 Ml/d

Line Definition: Estimated cost £/Ml/day for the installation of two replacement shaft driven variable speed pumpsets in one dry well (one duty, one assist), motors and associated control equipment. Average output is 6Ml/day and peak output required is 9Ml/day. The total pumping head (i.e. static and friction) at the site is 45-60 metres at average output and 90 metres at peak output.

Processing Rule: Input / Brought Forward(Table 4.12)

AR 07 Ref: **£/Ml/d** **1dp**

Table	**9**	Water service standard costs - Comparison with 2005 unit costs
Block	**F**	Pumping stations
Line	**12**	New fixed-speed pumpset, output 10Ml/d

Line Definition: Estimated cost £/Ml/day for installation of a new fixed speed pumpset to be installed at an existing high lift pumping station. The pump is required to deliver 10 Ml/day against a total pumping head (i.e. static and friction) of 75 metres.

Processing Rule: Input / Brought Forward(Table 4.13)

AR 07 Ref: **£/Ml/d** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**A**	Sewer laying - grassland
Line	**1**	Diameter 150mm

Line Definition: Estimated cost per metre of a 150mm diameter sewer laid in grassland assuming depth of cover is 2.0m to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 6.1)

AR 07 Ref: **£/m** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**A**	Sewer laying - grassland
Line	**2**	Diameter 300mm

Line Definition: Estimated cost per metre of a 300mm diameter sewer laid in grassland assuming depth of cover is 2.0m to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 6.1)

AR 07 Ref: **£/m** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**A**	Sewer laying - grassland
Line	**3**	Diameter 450mm

Line Definition: Estimated cost per metre of a 450mm diameter sewer laid in grassland assuming depth of cover is 2.0m to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 6.1)

AR 07 Ref: **£/m** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**B**	Sewer laying - rural/suburban highway
Line	**4**	Diameter 150mm

Line Definition: Estimated cost per metre of a 150mm diameter sewer laid in rural/suburban highway assuming depth of cover is 2.0m to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 6.2)

AR 07 Ref: **£/m** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**B**	Sewer laying - rural/suburban highway
Line	**5**	Diameter 300mm

Line Definition: Estimated cost per metre of a 300mm diameter sewer laid in rural/suburban highway assuming depth of cover is 2.0m to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 6.2)

AR 07 Ref: **£/m** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**B**	Sewer laying - rural/suburban highway
Line	**6**	Diameter 450mm

Line Definition: Estimated cost per metre of a 450mm diameter sewer laid in rural/suburban highway assuming depth of cover is 2.0m to the crown of the pipe.

Processing Rule: Input / Brought Forward(Table 6.2)

AR 07 Ref: **£/m** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**C**	Sewer rehabilitation
Line	**7**	No dig/reline - Diameter 225mm

Line Definition: Estimated cost per metre for rehabilitation of a 150mm diameter sewer by the specified technique - no dig/ reline

Processing Rule: Input / Brought Forward(Table 6.4)

AR 07 Ref: **£/m** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**D**	Sewer structures
Line	**8**	Storage tank to combined sewer overflow, capacity 750m3

Line Definition: Estimated cost per unit for a 2-hour storage tank of capacity 750 cubic metres required on the discharge pipe from a combined sewer overflow. Assume that a site is available immediately adjacent to the line of the pipe in a public park, and that only secure access covers are to be permitted at ground level. The site is well drained and has never been subject to flooding, but groundwater can rise to 1 metre below ground level

Processing Rule: Input / Brought Forward(Table 8.1)

AR 07 Ref: **£/unit** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**E**	Sewage pumping stations
Line	**9**	Replacement dry well pumps and motors for an existing pumping station, 30kW capacity

Line Definition: Estimated cost £/kW for the installation of replacement fixed speed pumps and motors (1 duty, 1 standby) with a total installed capacity 30 kW, in an existing sewage dry well pumping station.

Processing Rule: Input / Brought Forward(Table 8.4)

AR 07 Ref: **£/kW** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**E**	Sewage pumping stations
Line	**10**	Upsize existing wet well pumping station from 12kW to 30kW capacity

Line Definition: Estimated cost £/kW for the installation of replacement fixed speed submersible pumps (1 duty, 1 standby) with a total installed capacity 30 kW, in an existing sewage wet well pumping station with a current capacity of 12kW.

Processing Rule: Input / Brought Forward(Table 8.6)

AR 07 Ref: **£/kW** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**F**	Sewage treatment works
Line	**11**	Installation of denitrification at existing secondary works, p.e. 40,000

Line Definition: Estimated cost £/kg BOD5/day for the installation of denitrification at an existing secondary works treating up to 3 DWF, to meet UWWTD standards for inland discharge, and serving a population equivalent of 40,000. DWF is 10,000m³/day.

Processing Rule: Input / Brought Forward(Table 8.9)

AR 07 Ref: **BOD5/d** **1dp**

Table	**10**	Wastewater service standard costs - Comparison with 2005 unit costs
Block	**F**	Sewage treatment works
Line	**12**	Additional ammonia removal at existing secondary works, p.e. 2,000

Line Definition: Estimated cost £/kg BOD5/day for construction of an additional stage of treatment for ammonia removal at an existing works serving a population equivalent of 2,000 and treating up to 3 DWF. DWF is 400m³/day.

Processing Rule: Input / Brought Forward(Table 8.11)

AR 07 Ref: **BOD5/d** **1dp**