

Table 1 – WaSC Public Foul Sewer Networks (Capacity Analysis – Schedule of Differing Assessment Criteria)

APPENDIX 1

WaSC Case study No. Green field/brownfield	Total Dwellings	Estimated Discharge Foul: L/sec	Network Analysis Demand	Cost	Reinforcement Required	Cost	Comments
South West Water Case study (1)	435	20.1	Yes	?	Yes	£345k	Foul discharge to existing CS - assessment modelling software used - InfoWorks CS v10.5. Allowance included for future connexions/cross-connexions of 5.0m ² – no factual basis to support this. In addition, network improvement included dealing with groundwater infiltration and system repairs. Developer expected to fund full cost.
Thames Water Case study (2)				?			Off-site FS requisition with correspondence from WaSC seeking to justify the imposition of a Grampian style planning condition that will effectively restrict development.
Severn Trent Water Case study (3)	200	9.26	Yes	?			Foul discharge to existing public foul sewerage network – assessment modelling used InfoWorks CS v9.5. Foul system evaluated on 1 in 20 and 1 in 40 year
South West Water Case study (4) (Public foul sewer network analysis report dated August 2013)	200	2.74*	Yes	?	Yes	£864k	*The assessment of foul run-off appears to have been based on a water consumption rate of 150 litres/person/day and a dwelling occupancy rate of around 2.5 persons/dwelling. The subsequent application of 3 x DWF and an assessment based on a 1 in 30 year rainfall return period completes the foul discharge criteria – note; this does not accord with SfA 6 th edition. In determining network capacity consultants retained by SWW have used InfoWorks CS model and allowed for 10% infiltration and a further factor of safety of 1,3m ² contributing impermeable area for illicit connections to the foul system. The preoccupation of SWW is the impact on existing CSOs rather than the capacity of the existing 225mm public foul sewers passing through the site. The solution presented by SWW is a new 150 diameter foul sewer, 1.4km in length paid for by the developer and provided by way of a S98 requisition. A sewer of this size will have significantly greater capacity than what will be required for the development.
Thames Water Case study (5) (Public foul sewer analysis report dated January 2015) Greenfield site	520 + 420 pupil school	24.1 (Housing only)	Yes	?	Yes	£500k*	*Based on the network improvements that have been suggested, the cost of the works that the developer is being expected to fund has been estimated at around £500k. The consultant retained by TWUL has made no attempt to determine the foul sewer discharge from the development but has modelled the foul sewer network on a 1 in 20 year rainfall return period due to the level of infiltration that is being experienced. It has identified infiltration as the root cause for reduced capacity.

WaSC Site No.	Total Dwellings	Estimated Discharge Foul: L/sec	Network Analysis Demand	Cost	Reinforcement Required	Cost	Comments
Thames Water Case study (6) (Public foul sewer network analysis dated February 2015) (3 No. greenfield sites)	124	5.096 ⁽¹⁾	Yes	?	Yes	£250k ⁽²⁾	<p>⁽¹⁾ This is 11% less than the discharge criteria applied in SfA 6th edition.</p> <p>⁽²⁾ Based on the network improvements that have been suggested, the cost of the works that the developer is being expected to fund has been estimated at around £250k.</p> <p>The network has been modelled on a 1 in 20 year rainfall return period due to the level of infiltration into the foul sewer network.</p>
Thames Water Case study (7) (Public foul sewer analysis provided April 2015) Green field site to be developed with 100 private dwellings & 67 bed care home	100 ⁽¹⁾	5.92 ⁽¹⁾	Yes	?	Yes	Not identified	<p>⁽¹⁾ Discharge from first 50 dwellings based on 3600 litres/dwelling; the balance used a discharge rate of 600 litres/dwelling. The care home discharge has been based on 750 litres/bed space. The resultant total discharge for the residential element is 47.5% lower than would be expected using the criteria identified in SfA 6th edition.</p> <p>The network has again been modelled on a 1 in 20 year rainfall return period due to the level of infiltration into the public foul sewer network.</p>
Welsh Water Case study (8) Green field site Active Nov 2014 to present	c105	4.86	Yes	£20k	TBC	TBC	<p>Planning condition restricting development imposed by the LPA at the specific request of Welsh Water, who in turn demanded that the developer fully fund a network analysis of the existing foul/CS network due to perceived capacity limitations. The analysis work undertaken took over 6 months. Welsh Water also insisted that their services be retained on a 'contractual basis' and would not entertain any developer correspondence caveated 'without prejudice'.</p> <p>Welsh Water have relied on WaPUG guidance dated 2002 for the purpose of undertaking the public sewer network analysis. Welsh Water also sought to factor into their analysis a significant contribution from surface water infiltration, albeit based on a particular rainfall intensity. This particular rainfall event had failed to materialise until late into the evaluation process therefore WW wrote to the developer and advised that a delay was to be expected and for the developer to pay over an additional £737/week for an indeterminate period.</p>

WaSC Site No.	Total Dwellings	Estimated Discharge Foul: L/sec	Network Analysis Demand	Cost	Reinforcement Required	Cost	Comments
Wessex Water <i>Case study (9)</i>	?	?	Yes	?	Yes	c£500k	Off-site public foul sewer network improvements imposed by Wessex Water
Thames Water <i>Case study (10)</i> Green field site (Currently active)	c90	c4.0	Yes	TBC	Yes	TBC	Originally TWUL confirmed that there were no capacity restrictions/limitation in their public foul sewer network. This was reversed in correspondence a short while after the initial confirmation and at the time the developer entered the planning process. TWUL sought to have a 'Grampian' style planning condition imposed.
Thames Water <i>Case study (11)</i> Green field site Active throughout 2014	65	3.01	Yes	£11k	Yes	TBC	TWUL again factored into their existing public foul sewer network analysis a significant contribution to account for rainfall induced infiltration. Cost of off-site network improvement works TBC.
Southern Water <i>Case study (12)</i> (Currently active)	50	2.32	Yes	£5k?	Yes	£183k	<p>Southern Water insisted on undertaking the off-site improvements in a timescale that is still to be confirmed. This makes project programming and subsequent cash flow considerations difficult to crystallise by the developer. Similarly, the ability to commence the marketing of new homes with confidence and to provide customers with realistic completion dates for contract completion on new homes.</p> <p>Southern Water have also sought to influence matters by recommending to the LPA that planning conditions are imposed that effectively restrict the occupation of new homes until off-site public foul sewer improvements are certified complete.</p>
Thames Water <i>Case study 13</i> (Currently active)	80	3.7	Yes	£12k	Yes	TBC	TWUL approach and requirements similar to other residential developments in their area.
Welsh Water Case study (14) Sept 2013 to present	?	?	Yes	£35k	TBC	TBC	WW also charging VAT on the cost of undertaking a combined sewer network analysis.
Cumulative Costs				£83k		£2642k	

TABLE 1 NOTES

1. The status of the site, i.e. green field or brownfield has been cited whenever this has been known.
2. The table represents the current, known position as of August 2015.
3. If the WaSC is not cited in this schedule then it does not follow the same approach of those WaSCs that have been referred to.
4. This short schedule represents a randomly chosen abstract of several case studies that have been brought to the attention of HBF, in particular over the last 18 months or so.
5. From the evidence/data provided it is quite clear that surface water infiltration is being relied upon in the majority of cases to justify the necessity for off-site public foul/CS sewer network reinforcement.
6. The evidence identifies no consistency in the assessment methodologies, some of which are now quite dated. Similarly, additional factors of safety to account for illicit connections and so called 'urban creep'. Moreover, there appears to be no robust scientific rationale to support these additional factors of safety. Furthermore, they reflect drainage matters that should be dealt with through other aspects of a WaSC AMP submission.
7. The peak foul flow discharges identified in the various case studies are quite minor and in many instances are of a magnitude that would have little if indeed any detrimental effect on existing foul/combined public sewer networks.
8. The evidence confirms that demands for network analysis are presented to developers as a fait accompli with few if indeed any opportunities to challenge what is being demanded. Similarly, the practical and legislative aspects of any input/assessment parameters.
9. Developer demands for robust supporting evidence are being strenuously resisted by a number of WaSCs despite the earlier decision by the EU Upper Tribunal that they must disclose.