

## **Annex G ARR Blockage Assessment Form**

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# BLOCKAGE ASSESMENT FORM



STRUCTURE :

OPENING WIDTH: **Catchment Assessment**

DEBRIS TYPE/MATERIAL/L<sub>10</sub>/SOURCE AREA - *There may be more than one material type to consider!*

Debris Type/Material	L <sub>10</sub>	Source Area	How Assessed
Floating, non-floating, urban	1.5	Middle Harbour Southern Catchments	Aerial and TUFLOW result assessments

DEBRIS AVAILABILITY (HML) – *for the selected debris type/size and its source area*

Availability	Typical Source Area Characteristics	Notes
High	<ul style="list-style-type: none"> <li>Dense forest, thick vegetation, extensive canopy, difficult to walk through with considerable fallen limbs, leaves and high levels of floor litter.</li> <li>Streams with boulder/cobble beds and steep bed slopes and banks showing signs of substantial past bed/bank movements.</li> <li>Arid areas, where loose vegetation and exposed loose soils occur and vegetation is sparse.</li> <li>Urban areas that are not well maintained and/or old paling fences, sheds, cars and/or stored loose material etc., are present on the floodplain close to the water course.</li> </ul>	Catchment classified as having a medium debris availability
Medium	<ul style="list-style-type: none"> <li>State forest areas with clear understory, grazing land with stands of trees</li> <li>Source areas generally falling between the High and Low categories.</li> </ul>	
Low	<ul style="list-style-type: none"> <li>Well maintained rural lands and paddocks, with minimal outbuildings</li> <li>Streams with moderate to flat slopes and stable beds and banks.</li> <li>Arid areas where vegetation is deep rooted and soils resistant to scour</li> <li>Urban areas that are well maintained with limited debris present in the source area.</li> </ul>	

DEBRIS MOBILITY (HML) - *for the selected debris type/size and its source area*

Mobility	Typical Source Area Characteristics	Notes
High	<ul style="list-style-type: none"> <li>Steep source area with fast response times and high annual rainfall and/or storm intensities and/or source areas subject to high rainfall intensities with sparse vegetation cover.</li> <li>Receiving streams that frequently overtop their banks.</li> <li>Main debris source areas close to streams</li> </ul>	Catchment area has both steep source area and high annual rainfall - high debris mobility
Medium	<ul style="list-style-type: none"> <li>Source areas generally falling between the High and Low categories.</li> </ul>	
Low	<ul style="list-style-type: none"> <li>Low rainfall intensities and large, flat source areas.</li> <li>Receiving streams that infrequently overtop their banks.</li> <li>Main source areas well away from streams</li> </ul>	

DEBRIS TRANSPORTABILITY (HML) - *for the selected debris type/size and stream characteristics*

Transportability	Typical Transporting Stream Characteristics	Notes
High		Catchment has steep bed slopes and high stream velocity - high debris transportability
Medium		
Low		

# BLOCKAGE ASSESMENT FORM



## SITE BASED DEBRIS POTENTIAL 1%AEP (HML) - for the selected debris type/size arriving at the site

Debris Potential	Combinations of the Above (any order)	Notes
DP <sub>High</sub>	HHH or HHM	HHM
DP <sub>Medium</sub>	MMM or HML or HMM or HLL	
DP <sub>Low</sub>	LLL or MML or MLL	Eg. MML, therefore DP <sub>Low</sub> selected

## AEP ADJUSTED SITE DEBRIS POTENTIAL (HML) - for the selected debris type/size

Event AEP	At Site 1% AEP Debris Potential			AEP Adjusted At Site Debris potential
	DP <sub>High</sub>	DP <sub>Medium</sub>	DP <sub>Low</sub>	
AEP > 5% (frequent)	Medium	Low	Low	Eg. Low
AEP 5% - AEP 0.5%	High	Medium	Low	Eg. Low
AEP < 0.5% (rare)	High	High	Medium	Eg. Medium

## Debris Blockage

### MOST LIKELY DESIGN INLET BLOCKAGE LEVEL (B<sub>DES</sub>%) for the selected debris type/size

Control Dimension Inlet Width W (m)	At-Site Debris Potential (Generally)		
	High	Medium	Low
W < L <sub>10</sub>	100%	50%	25%
W ≥ L <sub>10</sub> ≤ 3*L <sub>10</sub>	20%	10%	0%
W > 3*L <sub>10</sub>	10%	0%	0%

Event AEP	Bdes %
AEP > 5% (frequent)	Eg. Low – 0%
AEP 5% - AEP 0.5%	Eg. Low – 0%
AEP < 0.5% (rare)	Eg. Medium – 10%

Refer Guideline if opening H < 0.33W



## Barrel Blockage

The following tables are only relevant to sites subject to a significant debris load of sediment. Where inlet blockage and barrel blockage are both likely, the blockage producing the greatest impact on flood behaviour should be used in design.

### LIKELIHOOD OF SEDIMENT BEING DEPOSITED IN THE BARREL OR WATERWAY (HML)

Peak Velocity Through Structure (m/sec)	Mean Sediment Size Present				
	Clay/Silt 0.001 to 0.04 mm	Sand 0.04 to 2 mm	Gravel 2 to 63 mm	Cobbles 63 to 200 mm	Boulders >200 mm
≥ 3	L	L	L	L	M
1.0 to < 3.0	L	L	L	M	M
0.5 to < 1.0	L	L	L	M	H
0.1 to < 0.5	L	L	M	H	H
< 0.1	L	M	H	H	H

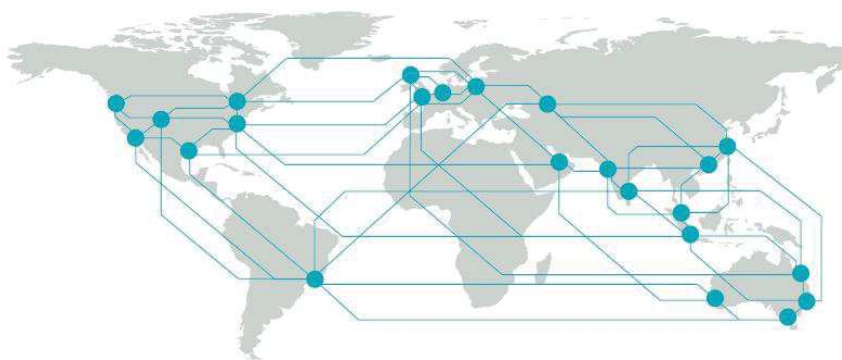
Likelihood of Sediment: Eg. Medium

**MOST LIKELY DESIGN BARREL BLOCKAGE (Bdes%) for sediment of a particular mean size is then;**

Likelihood That Deposition Occurs	AEP Adjusted Sediment Potential		
	High	Medium	Low
High	100%	60%	25%
Medium	60%	40%	15%
Low	25%	15%	0%

Event AEP	Bdes %
AEP > 5% (frequent)	Eg. Low – 15%
AEP 5% - AEP 0.5%	Eg. Low – 15%
AEP < 0.5% (rare)	Eg. Medium – 40%

**For modelling blockage mechanism (type, location and timing), refer to Guideline Table 8**



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