Workshop 1
Coastal erosion – planning options

Task

- To define the hazard band thresholds
- Define the strategic planning outcome for each hazard band

Mapping the relative susceptibility of the coastal area to erosion and recession.

Pairwise comparison method

- Potentially All Pairwise RanKings of all possible Alternatives (PAPRKiA)
- Qualitative assessment - based on the decision makers preference
- Gives an overall rank to each feature
- Two types of pairs – dominated (implicitly ranked) and un-dominated pairs
- Criteria:
  - Is one more likely to occur than the other?
  - Which has a greater area subject to an event?
  - How broad is the category, does it encompass more than one coastal erosion hazard type
  - Which presents the greater hazard to areas of existing or likely future development?“
  - Are land use controls required by State Policy

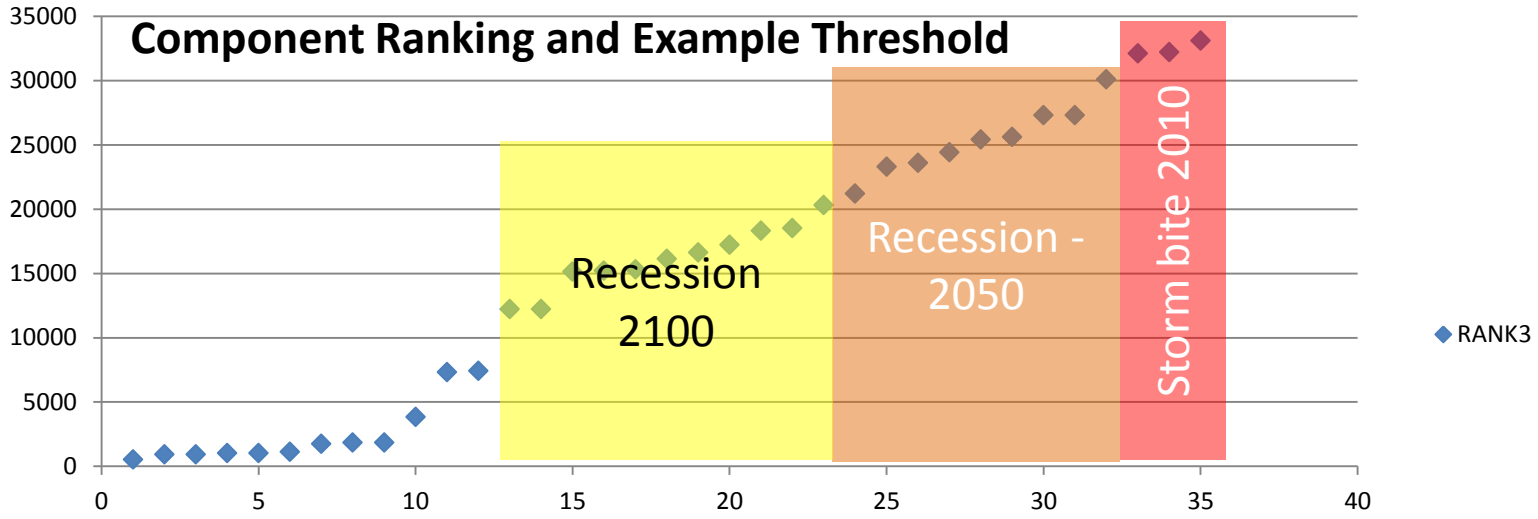
What does it tell us?

- The relative importance for intervention from land use planning
- It is a decision support tool – it does not make the decisions

Pairwise assessment of relative importance of row2 against column A for Land Use Planning Controls	Score	Rank
Acceptable hazard zone (open coast soft sed. shore) – landwards of likely and possible natural recession limits	529	1
Acceptable hazard zone (sheltered soft sed. shore) – landwards of likely and possible natural recession limits	925	2
Acceptable hazard zone (steep to cliffed hard rocks)	925	3
Acceptable hazard zone (open coast soft sed. shore) – to possible natural recession limit	1024	4
Acceptable hazard zone (soft sed. shores backed by moderately rising hard bedrock)	1024	5
Acceptable hazard zone (open coast soft sed. shore) – to likely natural recession limit	1123	6
Acceptable hazard zone (all gently to moderately sloping 'pure' hard rock shores)	**1726**	**7**
Acceptable hazard zone (normal soft rocks)	1825	8
Acceptable hazard zone (very coarse boulder clay soft rocks)	1825	9
Acceptable - Resilient artificial shores	3823	10
Acceptable hazard zone (sheltered soft sed. shore) – to possible natural recession limit	7324	11
Acceptable hazard zone (sheltered soft sed. shore) – to likely natural recession limit	7423	12
Recession (S3) to 2100 hazard zone (sheltered soft sed. shore) – to possible natural recession limit	12220	13
Longer-term potential settling & slumping hazard (very coarse boulder clay soft rocks) – 20m	12220	14
Recession to 2100 distance - Resilient artificial shores	15118	15
Recession (S3) to 2050 hazard zone (sheltered soft sed. shore) – to possible natural recession limit	15217	16
Recession (S3) to 2100 hazard zone (open coast soft sed. shore) – to possible natural recession limit	15316	17
Recession to 2050 distance - Resilient artificial shores	16117	18
Recession (S3) to 2100 hazard zone (sheltered soft sed. shore) – to likely natural recession limit	16612	19
Stormbite distance - Resilient artificial shores	17215	20
Longer-term (to 2100) potential recession hazard zone (steep to cliffed hard rocks)	18313	21
Recession (S3) to 2100 hazard zone (open coast soft sed. shore) – to likely natural recession limit	**18511**	**22**
Recession (S3) to 2050 hazard zone (open coast soft sed. shore) – to possible natural recession limit	20311	23
Longer-term potential recession hazard zone (normal soft rocks) – 63m to 2100	21211	24
Medium-term (to 2050) potential recession hazard zone (steep to cliffed hard rocks)	23308	25
Recession (S3) to 2050 hazard zone (sheltered soft sed. shore) – to likely natural recession limit	23605	26
Recession (S3) to 2050 hazard zone (open coast soft sed. shore) – to likely natural recession limit	**24406**	**27**
Medium-term potential recession hazard zone (normal soft rocks) – 28m to 2050	25405	28
Storm bite (S1 + S5) hazard zone (open coast soft sed. shore) – to possible natural recession limit	25603	29
Storm bite (S1 + S5) hazard zone (sheltered soft sed. shore) – to possible natural recession limit	27304	30
Near-term hazard zone (steep to cliffed hard rocks)	27304	31
Near-term potential recession hazard zone (normal soft rocks) – 14m to 2030	30103	32
Storm bite (S1 + S5) hazard zone (soft sed. shores backed by moderately rising hard bedrock)	32101	33
Storm bite (S1 + S5) hazard zone (open coast soft sed. shore) – to likely natural recession limit	**32200**	**34**
Storm bite (S1 + S5) hazard zone (sheltered soft sed. shore) – to likely natural recession limit	33100	35

Understanding the mapping - Pairwise

Tasmania
Explore the possibilities

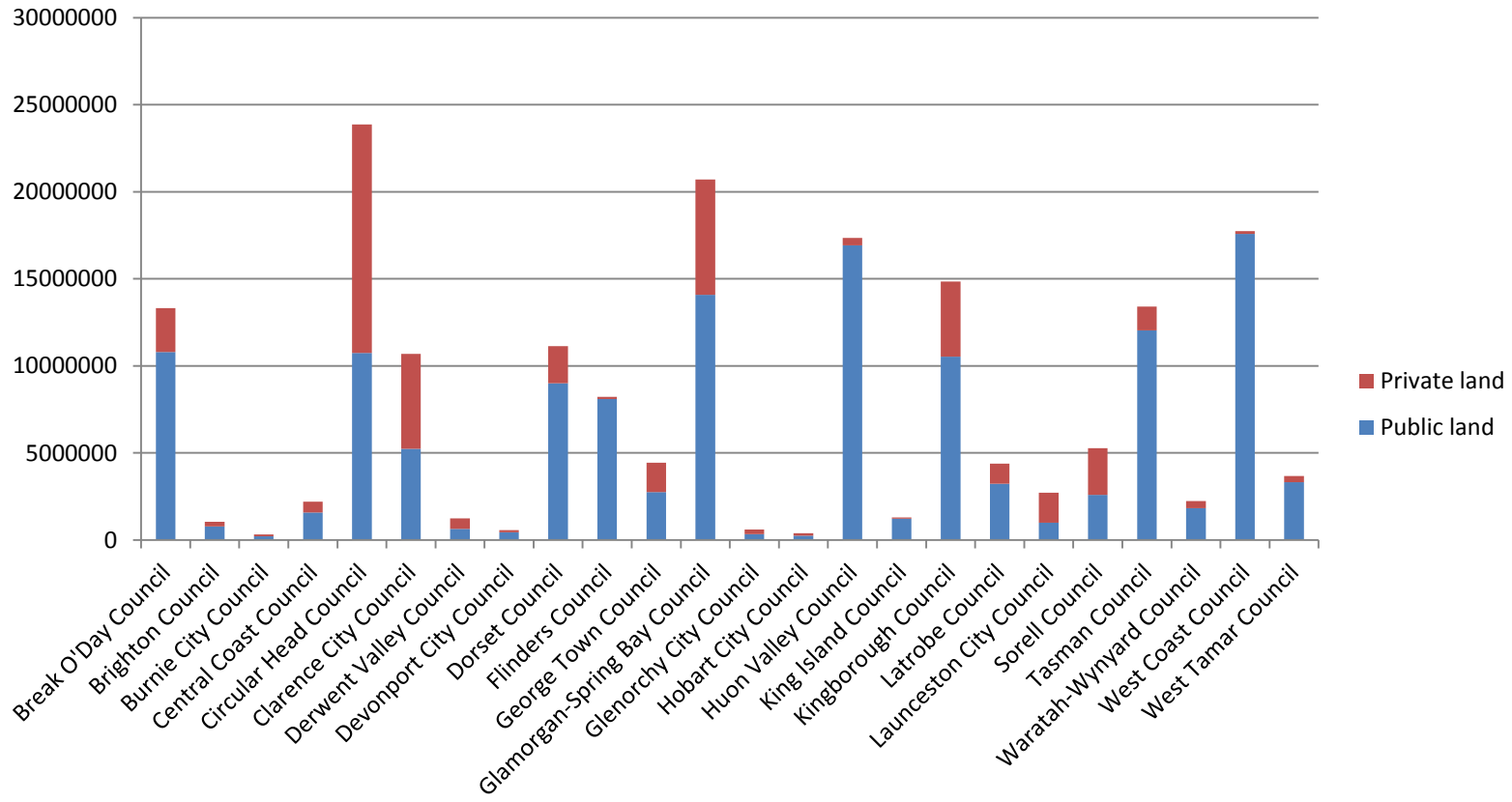

Component Ranking and Example Threshold
35000
30000
25000
20000
15000
10000
5000
0
0
5
10
15
20
25
30
35
40
Recession 2100
Recession - 2050
Storm bite 2010
RANK3

Area (Ha) susceptible to erosion and recession

LGA	Acceptable (Ha)	Acceptable (%)	Low (Ha)	Low (%)	Medium(Ha)	Medium (%)	High(Ha)	High (%)	Total (Ha)	Total (%)
Circular Head Council	87,091	97%	1,091	1.2%	469	0.5%	828	0.9%	89479	1
Glamorgan-Spring Bay Council	24,066	92%	1,059	4.1%	367	1.4%	644	2.5%	26135	1
Break O'Day Council	11,080	89%	438	3.5%	337	2.7%	558	4.5%	12413	1
Dorset Council	61,658	98%	487	0.8%	202	0.3%	426	0.7%	62772	1
Flinders Council*	106,698	99%	399	0.4%	0	0.0%	423	0.4%	107520	1
Kingborough Council	8,508	85%	1,000	10.0%	181	1.8%	304	3.0%	9993	1
Clarence City Council	13,275	93%	461	3.2%	338	2.4%	271	1.9%	14344	1
Tasman Council	5,008	79%	1,032	16.3%	39	0.6%	270	4.3%	6349	1
Huon Valley Council*	21,769	93%	1,517	6.5%	9	0.0%	208	0.9%	23504	1
Sorell Council	4,901	90%	184	3.4%	148	2.7%	197	3.6%	5429	1
West Tamar Council	15,289	96%	151	0.9%	383	2.4%	96	0.6%	15919	1
Latrobe Council	14,261	97%	102	0.7%	241	1.6%	96	0.7%	14700	1
George Town Council	22,658	98%	166	0.7%	194	0.8%	85	0.4%	23102	1
Central Coast Council	1,678	88%	83	4.4%	54	2.9%	84	4.4%	1899	1
West Coast Council*	82,293	98%	786	0.9%	926	1.1%	61	0.1%	84066	1
Waratah-Wynyard Council	2,550	92%	132	4.8%	41	1.5%	51	1.8%	2774	1
Derwent Valley Council	595	83%	39	5.5%	42	5.8%	43	5.9%	719	1
King Island Council*	29,316	100%	90	0.3%	0	0.0%	39	0.1%	29445	1
Launceston City Council	5,084	95%	107	2.0%	128	2.4%	38	0.7%	5357	1
Brighton Council	967	90%	37	3.5%	39	3.7%	29	2.7%	1072	1
Devonport City Council	894	94%	35	3.7%	8	0.8%	13	1.4%	950	1
Burnie City Council	343	92%	17	4.5%	8	2.2%	7	1.7%	375	1
Glenorchy City Council	1,248	95%	31	2.3%	26	2.0%	3	0.3%	1308	1
Hobart City Council	875	96%	30	3.2%	7	0.7%	3	0.3%	914	1
Southern Midlands Council	427	100%	0	0.0%	0	0.0%	0	0.0%	427	1
								1		
Grand Total	522,532	97%	9,473	1.8%	4,186	0.8%	4,775	0.9%	540965	

Note: (*) Soft sediment data for natural recession limits storm bite buffers for West Coast, King Island, Flinders Island, Huon Valley councils is incomplete.

Public versus private tenure in the low – medium – high hazards bands



Note: (*) Soft sediment data for natural recession limits storm bite buffers for West Coast, King Island, Flinders Island, Huon Valley councils is incomplete.

Number of residential buildings susceptible to erosion and recession

		Acceptable		Low		Medium		High		Total (Low - Medium - High)	
LGA	**Total number of Residences in each LGA**	Count	Proportion (%)	Count	Proportion (%)	Count	Proportion (%)	Count	Proportion (%)	**Count**	Proportion of total residences in each LGA
Break O'Day Council	**3441**	1703	89%	82	4%	97	5%	30	1.6%	**209**	6%
West Tamar Council	**8208**	4620	92%	89	2%	296	6%	19	0.4%	**404**	5%
George Town Council	**2660**	2183	95%	9	0%	104	5%	11	0.5%	**124**	5%
Waratah-Wynyard Council	**4777**	2862	93%	139	5%	45	1%	16	0.5%	**200**	4%
Glamorgan-Spring Bay Council	**3148**	1003	89%	57	5%	32	3%	39	3.4%	**128**	4%
Clarence City Council	**18906**	5590	90%	420	7%	69	1%	102	1.7%	**591**	3%
Kingborough Council	**13135**	2071	84%	257	10%	126	5%	23	0.9%	**406**	3%
Sorell Council	**7849**	2071	90%	182	8%	35	2%	9	0.4%	**226**	3%
Latrobe Council	**3592**	1579	94%	37	2%	65	4%	1	0.1%	**103**	3%
Tasman Council	**1894**	465	90%	38	7%	9	2%	4	0.8%	**51**	3%
Central Coast Council	**6135**	3509	96%	130	4%	14	0%	18	0.5%	**162**	3%
Flinders Council*	**639**	314	96%		0%		0%	14	4.3%	**14**	2%
Circular Head Council	**2177**	1468	97%	36	2%	6	0%	1	0.1%	**43**	2%
West Coast Council*	**2793**	367	89%	7	2%	39	9%		0.0%	**46**	2%
Huon Valley Council*	**6204**	1362	94%	22	2%	12	1%	46	3.2%	**80**	1%
Brighton Council	**5103**	789	94%	24	3%	28	3%		0.0%	**52**	1%
Hobart City Council	**16865**	5232	98%	92	2%	7	0%	8	0.1%	**107**	1%
Glenorchy City Council	**16245**	4641	98%	34	1%	49	1%		0.0%	**83**	1%
Burnie City Council	**7014**	558	95%	25	4%	1	0%	2	0.3%	**28**	0%
Dorset Council	**2568**	815	99%	5	1%		0%		0.0%	**5**	0%
Devonport City Council	**9627**	2210	99%	17	1%	1	0%		0.0%	**18**	0%
Derwent Valley Council	**3384**	263	98%	3	1%	3	1%		0.0%	**6**	0%
Launceston City Council	**23242**	6753	100%	1	0%	15	0%		0.0%	**16**	0%
King Island Council*	**931**	330	100%		0%		0%		0.0%	**0**	0%
Southern Midlands Council	**1214**	76	100%		0%		0%		0.0%	**0**	0%
Grand Total	**74384**	52834	94%	1706	3.0%	1053	1.9%	343	0.6%	**3102**	4%

Note: (*) Soft sediment data for natural recession limits storm bite buffers for West Coast, King Island, Flinders Island, Huon Valley councils is incomplete.

Southern	Guide		Strengths / weakness
Acceptable to Low	point at which risks can no longer be managed solely through non-planning measures.		
Low to Medium	point at which development controls (e.g. siting and building controls) are not adequate to mitigate risks.		
Medium to High	point at which it can be presumed that use and development should not be located in the area.		
Extra high	Locations Currently impacted by normal tide range Significant public/ private costs Protection measures unable to be used?		

Thresholds for the bands

Pairwise assessment of relative importance of row2 against column A for Landuse Planning Controls	Rank	Hazard Band
Acceptable hazard zone (open coast soft sed. shore) – landwards of likely and possible natural recession limits	1	h
Acceptable hazard zone (sheltered soft sed. shore) – landwards of likely and possible natural recession limits	2	
Acceptable hazard zone (steep to cliffed hard rocks)	3	
Acceptable hazard zone (open coast soft sed. shore) – to possible natural recession limit	4	
Acceptable hazard zone (soft sed. shores backed by moderately rising hard bedrock)	5	
Acceptable hazard zone (open coast soft sed. shore) – to likely natural recession limit	6	
Acceptable hazard zone (all gently to moderately sloping 'pure' hard rock shores)	**7**	
Acceptable hazard zone (normal soft rocks)	8	
Acceptable hazard zone (very coarse boulder clay soft rocks)	9	
Acceptable - Resilient artificial shores	10	
Acceptable hazard zone (sheltered soft sed. shore) – to possible natural recession limit	11	
Acceptable hazard zone (sheltered soft sed. shore) – to likely natural recession limit	12	
Recession (S3) to 2100 hazard zone (sheltered soft sed. shore) – to possible natural recession limit	13	
Longer-term potential settling & slumping hazard (very coarse boulder clay soft rocks) – 20m	14	
Recession to 2100 distance - Resilient artificial shores	15	
Recession (S3) to 2050 hazard zone (sheltered soft sed. shore) – to possible natural recession limit	16	
Recession (S3) to 2100 hazard zone (open coast soft sed. shore) – to possible natural recession limit	17	
Recession to 2050 distance - Resilient artificial shores	18	
Recession (S3) to 2100 hazard zone (sheltered soft sed. shore) – to likely natural recession limit	19	
Stormbite distance - Resilient artificial shores	20	
Longer-term (to 2100) potential recession hazard zone (steep to cliffed hard rocks)	21	
Recession (S3) to 2100 hazard zone (open coast soft sed. shore) – to likely natural recession limit	**22**	
Recession (S3) to 2050 hazard zone (open coast soft sed. shore) – to possible natural recession limit	23	
Longer-term potential recession hazard zone (normal soft rocks) – 63m to 2100	24	
Medium-term (to 2050) potential recession hazard zone (steep to cliffed hard rocks)	25	
Recession (S3) to 2050 hazard zone (sheltered soft sed. shore) – to likely natural recession limit	26	
Recession (S3) to 2050 hazard zone (open coast soft sed. shore) – to likely natural recession limit	**27**	
Medium-term potential recession hazard zone (normal soft rocks) – 28m to 2050	28	
Storm bite (S1 + S5) hazard zone (open coast soft sed. shore) – to possible natural recession limit	29	
Storm bite (S1 + S5) hazard zone (sheltered soft sed. shore) – to possible natural recession limit	30	
Near-term hazard zone (steep to cliffed hard rocks)	31	
Near-term potential recession hazard zone (normal soft rocks) – 14m to 2030	32	
Storm bite (S1 + S5) hazard zone (soft sed. shores backed by moderately rising hard bedrock)	33	
Storm bite (S1 + S5) hazard zone (open coast soft sed. shore) – to likely natural recession limit	**34**	
Storm bite (S1 + S5) hazard zone (sheltered soft sed. shore) – to likely natural recession limit	35	

• Workshop 1 - Develop the hazard matrix

- **Develop - Control Level**
  - See example consequence statements, what is the balance between emergency management, land use planning, and building control
- **Develop - Strategic Planning Level**
  - Should the area be avoided through settlement planning, zoning or regional strategies
- **Consider - Use or Development Controls**
  - Direct guidance for acceptable solutions or performance criteria in a code
  - Life controls on use and developments?

Coastal inundation planning matrix

Acceptable Band	White or clear on the hazard map.
Hazard exposure	A costal recession or erosion events are an unlikely event in 2100
Control Level	Development and use is not subject to control
Strategic Planning	No impacts on land use strategies or change to zoning required.
Guidance on Use Standards	No hazard specific controls. No controls are required to bring the use into an acceptable risk level.
Guidance on Development Standards	No hazard specific controls. No controls are required to bring the development into an acceptable risk level.

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Low Band	Yellow on the hazard map.
Hazard exposure	This area has been modelling as identified that the area is vulnerable to a *coastal recession in 2100 based on current sea level rise models and the geomorphology of the area.*
Control Level	*Whilst non-construction requirements are not necessary for most use and development, controls may be necessary to reduce the risks associated with vulnerable and hazardous uses or post –disaster and catastrophic risk-based use to ensure that risks are tolerable.*
Strategic Planning	*Where broader planning considerations support the development of the area, the low band should not inhibit use or development.*
Guidance on Use Standards	Residential and other use and occasional or temporary use … • Existing urban areas • Greenfield / brownfield development Vulnerable and hazardous uses … Post–disaster and catastrophic risk based use …
Guidance on Development Standards	Ancillary structures ... Minor extensions … Infill/ new buildings, habitable buildings and large extensions, and minor utilities … Major subdivision and major works …

Tasmania
Explore the possibilities

Medium Band	Orange on the landslide hazard map.
Hazard exposure	The area is exposed *to a coastal recession or erosion in 2050 based on current sea level rise models* and the geomorphology of the area.
Control Level	*Planning controls are necessary for all use and development to ensure that risks are tolerable (as recommended by AGS 2007a). Any vulnerable or hazardous use will only be allowed in exceptional circumstances.*
Strategic Planning	*Where there is no compelling reason to include land identified in this band for development, it should be zoned for open space, rural, or environmental purposes.* *Compelling reasons may include that it is an existing residential area, and further development will be infill. Alternatively, a risk assessment may be required to demonstrate that a proposed zoning is reasonable and avoids areas of high or very high risk.*
Guidance on Use Standards	Residential and other use and occasional or temporary use … • Existing urban areas • Greenfield / brownfield development Vulnerable and hazardous uses … Post–disaster and catastrophic risk based use …
Guidance on Development standards	Ancillary structures … Minor extensions…. Infill/ new buildings, habitable buildings and large extensions, and minor utilities … Major subdivision and major works …

Tasmania
Explore the possibilities

High Band	Red on the hazard map.
Hazard exposure	The site is exposed to storm based erosion due to current climatic conditions and the geomorphology of the area.
Control Level	All use and development would require significant investigation and an engineered solution to mitigate the natural hazard and enable the development to achieve and maintain a tolerable level of risk, however, the mitigation measures may never achieve comprehensive levels of security and safety.
Strategic Planning	Strategies should discourage all development except vital community infrastructure that cannot be reasonably located elsewhere. Strategies must indicate appropriate zoning and overlays to provide a clear message to the public and the drafters of local government planning schemes to ensure use and development is generally prohibited except under special circumstances.
Guidance on Use Standards	Residential and other use and occasional or temporary use … • Existing urban areas • Greenfield / brownfield development Vulnerable and hazardous uses … Post–disaster and catastrophic risk based use …
Guidance on Development Standards	Ancillary structures … Minor extensions…. Infill/ new buildings, habitable buildings and large extensions, and minor utilities … Major subdivision and major works

• Workshop 2 - Develop the hazard matrix

- **Review - Control Level**
  - See example consequence statements, what is the balance between emergency management, land use planning, and building control
- **Review - Strategic Planning Level**
  - Should the area be avoided through settlement planning, zoning or regional strategies
- **Develop - Use or Development Controls**
  - Direct guidance for acceptable solutions or performance criteria in a code
  - Life controls on use and developments?