

TIMOR DAM UPGRADE RECOMMENDATIONS

The following information is taken from recommendations presented in the last surveillance report for Timor Dam and subsequent dam upgrade studies and is intended to form the basis of an Action Plan for Warrumbungle Shire Council from which a program of upgrade works can be developed.

The Timor Dam Raising Concept Design Report was recently produced which outlined many of the deficiencies that exist at the current dam site and which need to be addressed urgently in order to comply with current WHS and NSW Dams Safety Committee (DSC) requirements. The recommended upgrade works are listed below along with cost estimates and associated risk/consequence scenarios.

No.	Issue	Action	Estimated Cost	Risk/Consequence	Priority
1	Damaged seepage weir. At present, not read by operators and not repaired because access is very difficult.	Construct new seepage weir with concrete box and v-notch and associated works at site of current weir. Hook up to telemetry system.	\$50,000	This is the most important instrument. It needs to be read so as to keep check on dam performance. Telemetry will provide continuous recording.	1
2	Access to seepage weir downstream of main dam to allow regular reading and to comply with current WHS requirements.	Provide access ladder and platforms down existing side slope and concrete path to seepage weir. Entry at road level above.	\$250,000	Needs to be read at least weekly to comply with DSC requirements.	1
3	Access to scour outlet downstream of main dam to allow valve maintenance and to comply with current WHS requirements	As above, provide access ladder down existing slope and concrete path to the valve block.	\$25,000 in addition to cost in above item	Allows maintenance and replacement when required. If valve does not work, it becomes a dam safety issue in that it can't be operated in the event of an emergency	1
4	Update the O&M Manual in accordance with NSW Dams Safety Committee (DSC) guidelines	Carry out update (can be done by consultant)	\$15,000	Needs to be kept up to date to allow Council staff to use	1
5	Review Dam Safety Emergency Plan and exercise 5 yearly	DSEP is being updated by PWA but needs to be reviewed annually	\$5,000 per year on average	Contact details need to be reviewed regularly in case of changes. Exercise trains dam operators how to react in time of emergency	4
6	Routine dam	Carry out inspections	Council to	Ongoing. Without	4

	inspections by Council operator(s) at least weekly using a formal routine inspection sheet signed off by Council's Water Manager	of dam and its components plus appropriate reporting	estimate but about \$20,000 per year	inspection by Council staff, Council is unaware of any issues that may arise at the dam	
7	Dam safety training for Council staff	Provide dam safety training to appropriate Council staff at least five yearly	\$4,000 every 5 years	Ongoing. Staff need to be updated on latest dam safety protocols	4
8	Dam safety specialist	Engage an experienced dam safety consultant - currently Public Works Advisory (formerly NSW Public Works)	On "do and charge" basis but about \$10,000 per year on average	Ongoing. Consultant can provide general advice and technical input as required including annual and 5 yearly surveillance inspections and data monitoring plus safety reviews	1
9	Develop electronic database including installation of telemetry system to record storage level, rainfall and seepage on a continuing basis	Set up telemetry system linked to all dam components. Establish computer gathering of data and plotting of graphical representation	\$100,000	Telemetry provides continuing monitoring of data so that Council remains fully informed of dam behaviour when operator is not in attendance	1
10	Survey monitoring system	Establish a survey monitoring system to allow survey monitoring of main arch dam on two yearly basis as required by the DSC	\$75,000 to establish system and do initial survey, then say, \$15,000 every 2 years for survey monitoring	In association with seepage reading, survey monitoring is critical in assessing the behaviour of the dam over time.	1
11	Current ladder and platform access to the trunnion is not in accordance with current WHS regulations	Replace existing access ladders and platforms to the trunnion	\$100,000	Access to the trunnion is currently not WHS compliant. Needs to be replaced	2
12	Scour valve is inoperable. New outlet system is required.	A new outlet system is recommended which includes a separate facility for environmental flows to comply with modern dam practice	\$900,000	Current standards require a minimum two valves per line to allow double isolation and isolation for regular operation of the valves for maintenance	2

				purposes. This negates the risk or possibility of the dam draining if a single valve cannot be closed properly. In addition, if one valve fails to close, the other valve can be closed to stop the flow.	
13	Trashscreen and bulkhead replacement at upstream end of scour pipe is currently corroded	Replace the trashscreen and bulkhead at the base of the trunnion	\$80,000	If allowed to totally corrode, operation and maintenance of the scour valve will be difficult	2
14	Outflow measurement	Install flow measurement device at offtake	\$50,000	Facilitates measurement of outflow. Can be connected to telemetry system	2
15	Debris clearing and desilting upstream of dam	Clear debris and silt – underwater operation	\$100,000	Enables access to back of scour and offtake	2
16	Trunnion replacement	Replace trunnion with updated buoy arrangement including base and associated work	\$500,000	Will be required in long term following corrosion to current structure	3
17	Access road to dam and security fencing	Maintain access road to main dam and saddle dam, plus security and repair where required	\$15,000 per year on average	Access to dam has to be clear for emergency, operation and maintenance personnel	4

Priority 1 = initiate within next 6 months

Priority 2 = initiate within next 2 years

Priority 3 = initiate within next 10 years

Priority 4 = ongoing

Note the estimated costs are indicative only and do not include contingencies or administration costs.