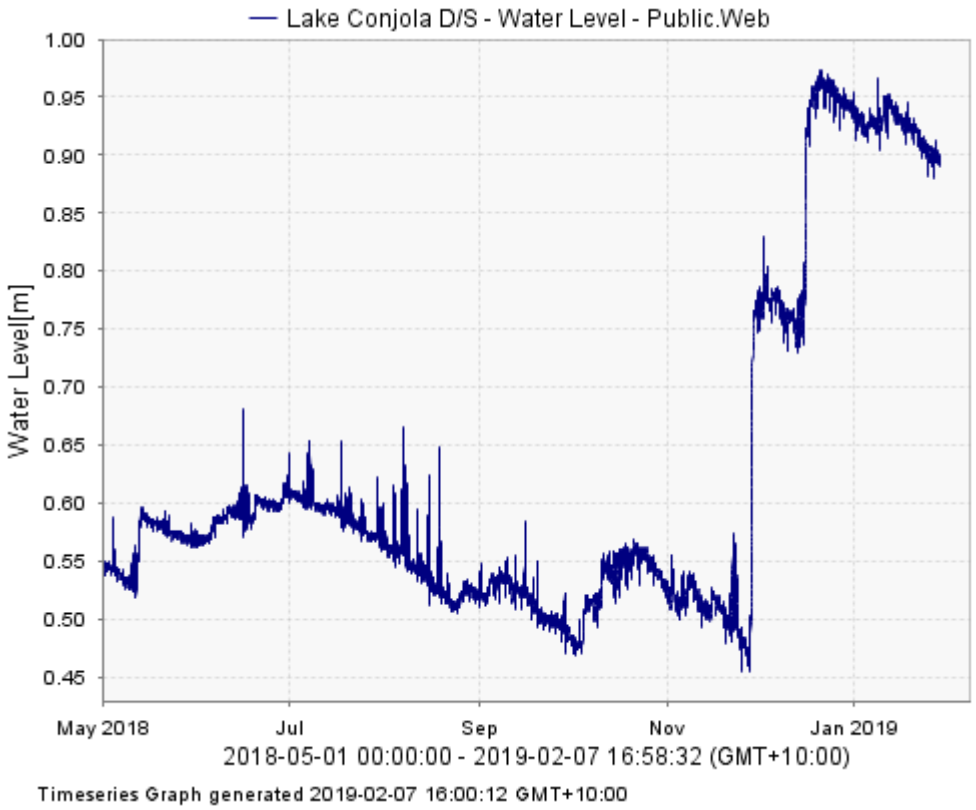
Lake Conjola

Summary of OH&S Treats and Risks Assessment

February 2019

Prevailing Conditions

- Closed entrance conditions for 10 months (reported end April 2018)
- Elevated lake water levels ranging from 0.5m AHD (April 2018) to 0.96m AHD (January 2019). Presently 0.89m AHD as at 12.10pm 08.02.19



Absence of tidal flushing

1. Stagnation issues (algal blooms) due to nutrient levels and impacts natural attenuation processes that mitigate nutrients which pose a potential risk to the aquatic ecosystem. *(Earth 2 Water CRSS pages 28)*
2. These potential risks extend to humans and precautionary measures such as signage during high risk periods (summer, closed entrance) and groundwater extraction may be required. *(Earth 2 Water CRSS pages 3 and 4)*
3. Macro algal mats recorded/reported in October 2018 and malodorous waterways in November 2018 - ongoing
4. Increased number / variety of eye(s), ears, nose, throat, stomach illnesses and skin infections reported (letter/social media) through late 2018 / early 2019

Decline in water quality /clarity and increased water temperature...

1. Limited recreational bathing throughout the Lake, largely preferring cooler, clearer, water conditions at the beach
2. Exposure to hazardous conditions (7/10) on an unpatrolled beach
3. Impaired sea rescue capability as rescue craft cannot access open water through the entrance
4. Difficulty assessing water depth and/or observe submerged objects on the lake bed throughout the Lake
5. Uncertainty in navigating craft throughout the Lake due to above
6. Increased number / variety of reported / recorded foot, leg, back, head injuries (letter/social media)

Extended period of foreshore inundation...

1. Foreshore areas (private and public) experienced 3 months of continual water-logged conditions or inundation since the November 2018 rainfalls which increased lake water levels to between 0.75m AHD and 0.87m AHD
2. Seawalls either completely or partly submerged with slippery surfaces due to algal growth
3. Increasingly unstable seawalls from water-logged conditions / over cresting boat wash
4. Ground slumping / sink holes behind these structures
5. Submerged / slippery boat ramps throughout the entrance and estuary (apart from Cunjarong)
6. Increased water levels, loss in clarity and slippery surface make simple launch / retrieval difficult
7. Boat wash over cresting seawalls undermines these structures
8. Submerged jetties particularly difficult to observe
9. Fallen and falling trees along the foreshore with numerous reports of fallen branches and trees with no audible / visible warning
10. Heightened levels of undue stress (mental health and well-being) due to prolonged fear / increased risk posed by sudden flooding, constant BOM/IA Alert storm warnings, as well as loss of visual and physical amenity
11. Moderate to extreme presence of mosquitoes and ticks in heavily vegetated foreshore areas

Threats	Hazards + Risks
Closed Entrance	… No tidal flushing > stagnation … Excess TN/TP > Ecosystem + User Groups … E/E/N/T/Skin infections
Degraded Water Conditions (Quality/Clarity/Temperature)	… Cleaner/clearer/cooler water at hazardous beach … Impaired access for open sea rescues … Difficult to assess depth/observe submerged objects / obstacles
High Water Levels + Foreshore Inundation	… Slippery / unstable /submerged seawalls … Unstable ground /slumping / sink holes … Boat wash over cresting foreshore … Boat ramps / jetties slippery + submerged conditions … Fallen / falling trees + branches … Mental health issues > prolonged / undue stress over flooding + loss of visual / physical amenity …Malodorous / Mosquitoes / Ticks

Foreshore Threats & Risks

Legend
+ - Boat ramp
T - Fallen tree
• – Jetty
- Oyster Lease
- Seawalls

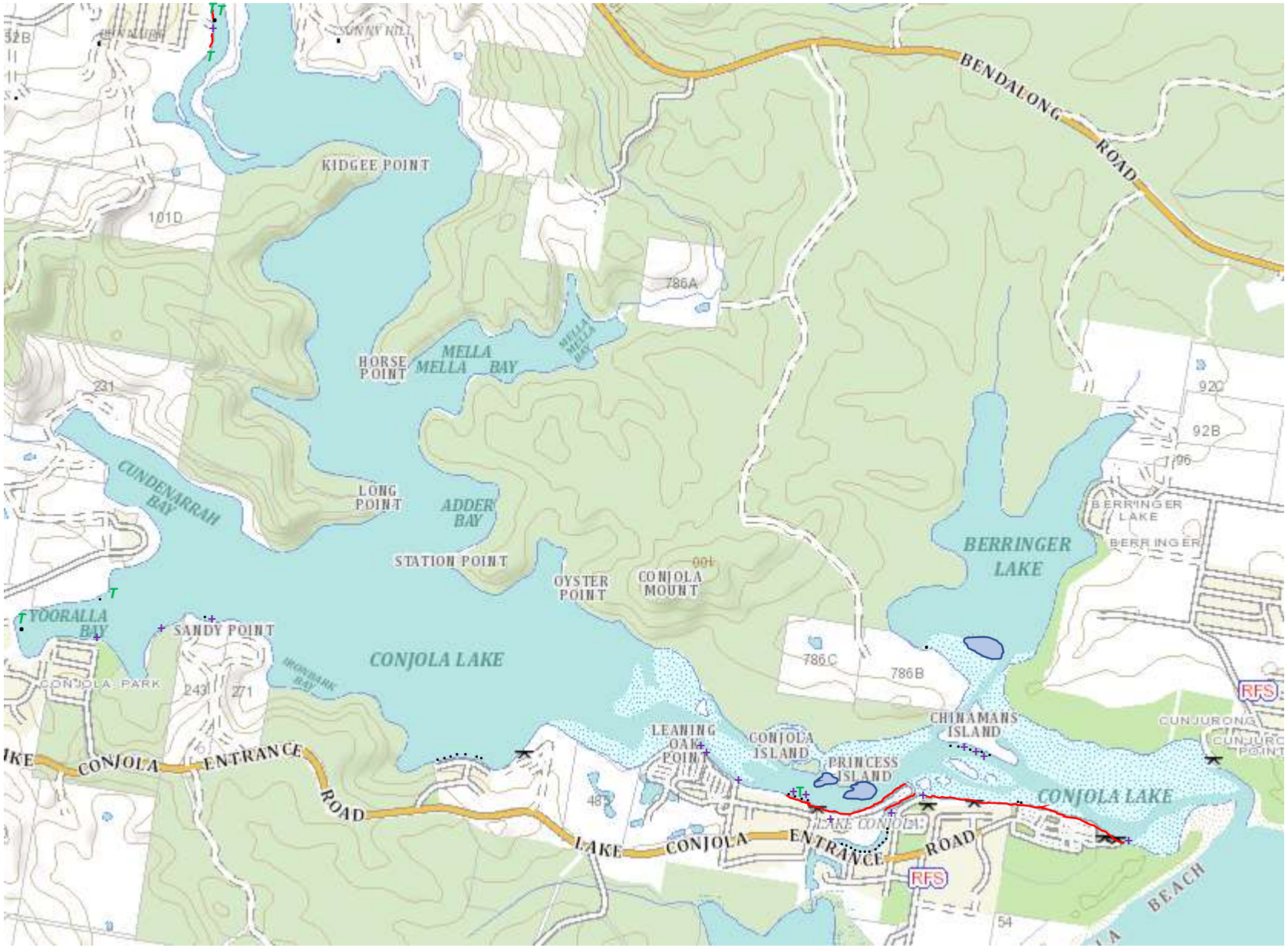


Table 1 Water Temperatures

Sample Location	3-Jan-19 17:30	17-Jan-19 17:30	24-Jan-19 17:30
1	31	30	30
2	30	29	30
3	29	29	30
4	28	29	31
5	29	30	31
6	29	30	31
7	31	30	30
8	31	30	29
9	30	30	30
10	30	30	31
11	29	29	30
12	31	30	31
13	31	29	31
14	30	30	30
15	31	31	30
16	28	29	29
17	29	29	29
18	29	28	29
19	28	28	30
20	30	31	31
21	31	30	30
22	30	29	29
23	30	30	30
24	30	30	31
25	31	30	31
26	29	30	30
27	28	29	30

Source : Webster, P., Webster, D., 3 Jan 2019/ 17 Jan 19 / 24 Jan 19

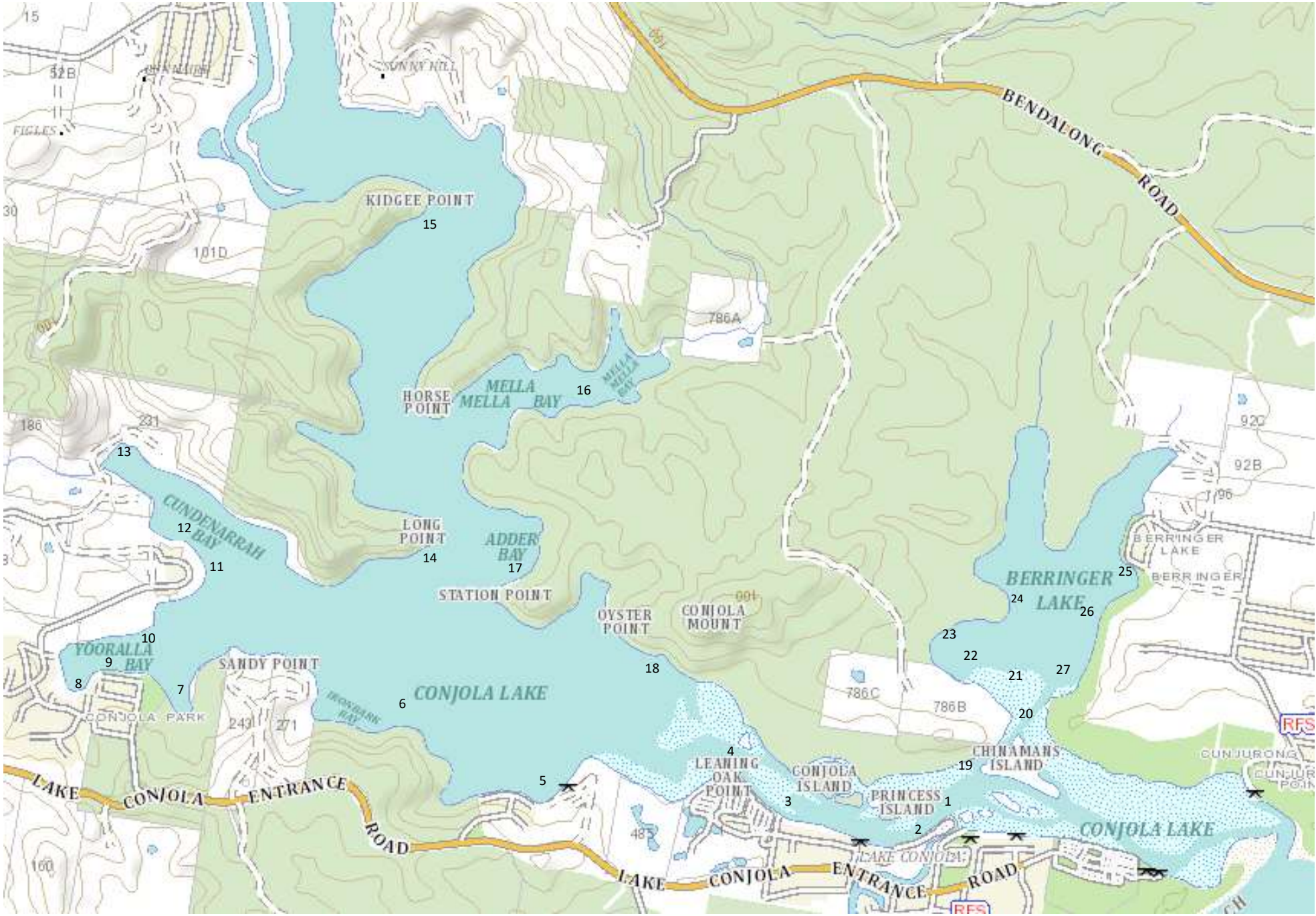


TABLE 2: Sample Location A				
Date	Water Temp		Air Temp	
	8:30AM	4:30PM	8:30AM	4:30PM
25-Jan		32.7		
26-Jan	28.7	30.5		
27-Jan	28.6	30.8		
28-Jan	28.1	26.3		23
29-Jan	25.5	28.8	23	27
30-Jan	26.8	28.5	22	26
31-Jan	26.9		24	
1-Feb	24.6	24.6	15	19
2-Feb	23	24.9	18	25
3-Feb	23.8	26.7	22	27
4-Feb	25.1	26.5	23	27
5-Feb	25.6	25.5	22	22
6-Feb	24		21	
Source: Kerves R				

TABLE 3: Sample Location B				
25-Jan	29.4	30.7		
26-Jan	29.6	30.4		
27-Jan	29.4	30.3		
28-Jan	28.3	28.7		
29-Jan	26.9	29.8		
30-Jan	28.3	29.7		
31-Jan	28.4	30.2		
1-Feb	27.7	26.2		
2-Feb	24.8	26.3		
3-Feb	26.5	28.4		
4-Feb	27.2	29.5		
5-Feb	27.7	27.4		
6-Feb	26.6			
Source: Dale, J				

Table 1.4 – Summary of Foreshore Threats and Risks as at 09.02.2019

... 5.907km of public and private foreshore partially or fully inundated

... Above includes 1.53km of partially or fully submerged rock seawalls

... Beach profile throughout entire Lake (with the exception of Killarney Point) submerged with no easy access

... Increased concentration of water skiing / wakeboarding craft at this location

... 37 public and private jetties/slipways partially or totally submerged

... 12 public and private boat ramps partially or fully submerged – all slippery from alga and/or wave overtopping

... 2 remnant oyster lease structures partially submerged in navigable channels

... 6 recently fallen significant trees added to waterway

Source: Albiez, M; Jessup R; Treloar D