



# **Green and Golden Bell Frog Monitoring, Arncliffe, December 2020 - February 2021**

Prepared by AMBS Ecology & Heritage Pty Ltd  
for Transport for NSW

Final Report

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# 1 Introduction

## 1.1 Background

AMBS Ecology & Heritage Pty Ltd (AMBS) was commissioned by Transport for NSW to undertake monitoring of the Green and Golden Bell Frog (*Litoria aurea*) (GGBF) at Arncliffe. This quarterly report presents the results of monitoring and other GGBF management actions undertaken by AMBS for the three-month period December 2020 to February 2021 inclusive.

## 1.2 Study Area

The Study Area includes the following locations (Figure 1.1):

- New M5 Marsh Street habitat area – an area set aside for the establishment of potential GGBF habitat, including three ponds and surrounding terrestrial habitat, located between Marsh Street and Eve Street;
- “Perimeter” and “Creek” areas outside of the New M5 Marsh Street habitat area;
- RTA Ponds – two ponds constructed about 20 years ago as replacement habitat for the GGBF, by the NSW Roads and Traffic Authority, when the existing M5 was built, located near the Marsh Street/M5 intersection and adjacent to the Kogarah Golf Course;
- Enhancement Area – six small ponds located near a drainage line that runs along the southern boundary of the Kogarah Golf Course, east of the RTA ponds;
- Kogarah Golf Course – a golf course located between Marsh Street and the Cooks River, which contains a number of ponds, including some where GGBFs have been recorded;
- Extended search area in Barton Park – parts of the area between the golf course and Spring Street where GGBFs have been recorded or potentially suitable habitat occurs;
- Eastern Frog Corridor – a passageway below the M5, between the Golf Course and Barton Park, which currently contains a pedestrian/bicycle path and a fenced-off containment pond.

## 1.3 Scope and Methodology

Monitoring and management of the GGBF at Arncliffe included:

- tadpole surveys and water quality measurements in the New M5 Marsh Street habitat area, RTA Ponds, Enhancement Area, Kogarah Golf Course and the extended search area in Barton Park;
- nocturnal frog surveys in the New M5 Marsh Street habitat area, RTA Ponds, Enhancement Area, Kogarah Golf Course, Perimeter, Creek, Eastern Frog Corridor and the extended search area in Barton Park;
- removal of Striped Marsh Frogs (*Limnodynastes peronii*) from the New M5 Marsh Street habitat area (under Office of Environment and Heritage [OEH] Licence);
- release of captive-bred tadpoles into the New M5 Marsh Street habitat area;
- regular checks and support feeding of tadpoles in the New M5 Marsh Street habitat area;
- maintenance inspections at the New M5 Marsh Street habitat area, RTA Ponds and Enhancement Area.

Tadpole and water quality surveys were undertaken on:

- 21 December 2020 by Dr Arthur White and Carl Corden;
- 28 January 2021 by Chris Jackson and Lachlan Pettit;
- 25 February 2021 by Dr Arthur White and Glenn Muir.

Survey techniques followed those previously undertaken by Dr White and described in the GGBF Plan of Management (PoM) (ELA 2018) and included: dip net sweeps and watching for tadpole

activity; identification and staging of any tadpoles captured; and use of a hand-held probe to take water quality measurements. Maintenance inspections of the New M5 Marsh Street habitat area, the RTA Ponds and the Enhancement Area were undertaken concurrently with the tadpole and water quality surveys.

Nocturnal frog surveys were undertaken on:

- 17 December 2020 in the New M5 Marsh Street habitat area (Chris Jackson, Lachlan Pettit, Mark Semeniuk and Sarsha Gorrissen);
- 22 December 2020 in the RTA Ponds, Enhancement Area, Kogarah Golf Course, Perimeter, Creek, Eastern Frog Corridor and the extended search area at Barton Park (Chris Jackson, Lachlan Pettit, Glenn Muir and Sarsha Gorissen);
- 28 January 2021 in the New M5 Marsh Street habitat area (Chris Jackson, Mark Semeniuk, Sarsha Gorissen and Lachlan Pettit);
- 3 February 2021 in the RTA Ponds, Enhancement Area, Kogarah Golf Course, Perimeter, Creek, Eastern Frog Corridor and the extended search area at Barton Park (Chris Jackson, Carl Corden, David James and Henry Cook).

GGBF tadpoles were transported from Symbio Wildlife Park on 3 December and 17 December 2020 and 12 and 29 January 2021 and released into the ponds in the New M5 Marsh Street habitat area. Tadpoles were also released into RTA Pond West on 3 December 2020. A sample of the tadpoles were released into custom-built enclosures placed in each pond, to assist with monitoring the post-release health and development of the tadpoles.

After release, tadpoles were checked every 30 minutes for a period of 4 hours and then checked once every 2-4 days for at least 2 weeks. Each check involved counting the number of live tadpoles in each of the cages, observations of tadpoles in the ponds, checking water levels and (if necessary) adding water to the ponds, checking for presence of any metamorphosed animals, and feeding the tadpoles. Net sweeps were avoided in order to minimise disturbance. The visual surveys noted any sick or dead tadpoles, behaviours, use of habitats and presence of predators. A small amount of supplementary food was provided.



Figure 1.1: Study area.

## 2 Results

### 2.1 Water Quality Monitoring

Results of the water quality measurements in comparison with threshold values indicated by Mahony and Beranak are summarised in Table 2.1. Raw data are provided in Appendix 1. All water quality variables were within the overall GGBF tadpole survival thresholds described by Mahony and Beranak, in all ponds holding water, except for salinity in the Mangrove Pond on Kogarah Golf Course. Turbidity was acceptable in all ponds.

Water was present throughout the survey period in all ponds in the New M5 Marsh Street habitat area, the RTA ponds and Kogarah Golf Course. Water levels in the Enhancement Area ponds varied throughout the survey period. All of the Enhancement Area ponds were dry in December 2020, with the exception of Pond 5 which was almost dry. These ponds were also dry in January 2021, with the exception of Pond 4, which was almost dry. Ponds 1 and 2 were full in February 2021 and Pond 3 was also holding water. Pond 4, Pond 5 and Pond 6 were almost dry in February 2021.

All of the ponds in the extended search area in Barton Park were too dry to sample throughout the survey period, with the exception of Landing Lights East which held water in a deep pool throughout the survey period. There was no access to the Number 9 pond or the Northern Phragmites site in the extended search area in Barton Park.

**Table 2.1: Summary of water quality results.**

Area	Pond	Temperature			Salinity			Dissolved O <sup>2</sup>			pH		
		Dec	Jan	Feb	Dec	Jan	Feb	Dec	Jan	Feb	Dec	Jan	Feb
Marsh Street Habitat	A	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
	B	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
	C	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
RTA Ponds	East	-	Pass	Pass	-	Pass	Pass	-	Pass	Pass	-	Pass*	Pass
	West	-	Pass	Pass	-	Pass	Pass	-	Pass	Pass	-	Pass	Pass
Enhancement Area	1	Dry	Dry	Pass*	Dry	Dry	Pass	Dry	Dry	Pass	Dry	Dry	Pass
	2	Dry	Dry	Pass*	Dry	Dry	Pass	Dry	Dry	Pass	Dry	Dry	Pass
	3	Dry	Dry	Pass*	Dry	Dry	Pass	Dry	Dry	Pass	Dry	Dry	Pass
	4	Dry	Pass	Dry	Dry	Pass	Dry	Dry	Pass	Dry	Dry	Pass*	Dry
	5	Pass	Dry	Dry	Pass	Dry	Dry	Pass	Dry	Dry	Pass*	Dry	Dry
	6	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Kogarah Golf Course	Circular	Pass	Dry	Pass	Pass*	Dry	Pass*	Pass	Dry	Pass	Pass	Dry	Pass
	Long	Pass	Pass	Pass	Pass*	Pass	Pass*	Pass	Pass	Pass	Pass	Pass	Pass
	Mangr.	Pass	Pass	Pass*	Fail	Fail	Fail	Pass	Pass	Pass	Pass	Pass	Pass
Barton Park	Eastern Channel	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	South Phragmt	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	Bend Swamp	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	South Jungle	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	D Range Wetland	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	LL East	Pass	Pass	Pass	Pass	Pass*	Pass*	Pass	Pass	Pass	Pass	Pass	Pass
	LL West	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

\*indicates outside higher survival threshold but within overall survival threshold as described in Mahony and Beranak

## 2.2 Tadpole Monitoring

The combined results of the tadpole monitoring surveys undertaken in December 2020, January and February 2021 are summarised in Table 2.2.

Two (2) GGBF tadpoles were recorded from Pond B in the New M5 Marsh Street habitat area during targeted tadpole monitoring surveys. No other GGBF tadpoles were observed in the New M5 Marsh Street habitat area prior to the release of the captive-bred animals from Symbio Wildlife Park. GGBF tadpoles were observed in all ponds following the releases, but the density of pond vegetation made net sweeps difficult and few animals were captured during the standardised net sweeps.

GGBF tadpoles were recorded from the western RTA Pond during targeted tadpole monitoring surveys (2) and during nocturnal GGBF surveys (3). No GGBF tadpoles were recorded in any other ponds outside of the New M5 Marsh Street habitat area during surveys.

Tadpoles of two other frog species were recorded across the survey area during targeted tadpole surveys. Peron's Tree Frog (*Litoria peronii*) tadpoles were recorded in Pond B and Pond C of the New M5 Marsh Street habitat area and the western RTA Pond. Striped Marsh Frog tadpoles were recorded from all ponds within the New M5 Marsh Street habitat area as well as Enhancement Area Pond 4.

**Table 2.2: Summary of tadpole net sweep results.**

Area	Pond	Tadpoles Present	Species	Number and Stage			
				A	B	C	D
New M5 Marsh Street habitat area	A	Yes	<i>Limnodynastes peronii</i>	0	7	2	0
	B	Yes	<i>Litoria aurea</i>	0	2	0	0
			<i>Litoria peronii</i>	0	6	0	0
			<i>Limnodynastes peronii</i>	0	2	0	0
	C	Yes	<i>Litoria peronii</i>	0	1	0	0
			<i>Limnodynastes peronii</i>	0	2	0	0
RTA Ponds	Eastern	Yes	<i>Limnodynastes peronii</i>	1	3	0	0
	Western	Yes	<i>Litoria aurea</i>	0	2	0	0
			<i>Litoria peronii</i>	3	3	1	0
Enhancement Area	1	No					
	2	No					
	3	No					
	4	Yes	<i>Limnodynastes peronii</i>	0	20	0	0
	5	No					
	6	No					
Kogarah Golf Course	Circular	No					
	Long	No					
	Mangrove	No					
Extended search area in Barton Park	Eastern Channel	No					
	No.9 Pond	No Access					
	Southern Phragmites	No					
	Northern Phragmites	No Access					
	Bend Swamp	No					
	Southern Jungle	No					
	Landing Lights East	No					
	Landing Lights West	No					
Driving Range Wetland	No						

### 2.3 Nocturnal GGBF Monitoring in the New M5 Marsh Street habitat area

Sixty (60) GGBFs were captured and processed during timed searches in the New M5 Marsh Street habitat area (Table 2.3). Seven (7) were recaptured frogs and twenty-seven (27) were juveniles.

The average weight and SVL of GGBF captured were generally higher in January 2021 than in December 2020.

An additional 102 GGBFs were recorded (heard or observed) but not captured in the Swale, Perimeter and other (opportunistic) parts of New M5 Marsh Street habitat area. This includes 94 individuals (92 of which were juveniles/metamorphs) recorded from the Perimeter area on 28 January 2021.

**Table 2.3: GGBF survey results, New M5 Marsh Street habitat area**

Date	Pond	Recorded	Captures Number of juvenile / Subadult	Number of recaptures	Number microchipped	Total	Average SVL (cm)	Average weight (g)
17 Dec 2020	A	13	11	1	1	13	40.07	5.32
	B	7	4	1	2	7	45.14	10.27
	C	19	12	2	5	19	45.58	14.87
	Swale	0	0	0	0	0	-	-
	Perimeter	0	0	0	0	0	-	-
28 Jan 2021	A	2	0	1	1	2	69.90	25.40
	B	8	0	1	7	8	62.06	17.81
	C	9	0	0	9	9	58.50	15.94
	Swale	8	0	0	0	0	-	-
	Perimeter	94	0	0	0	0	-	-
	Opportunistic	2	0	1	1	2	79.85	51.45

Other frog species recorded in the New M5 Marsh Street habitat area were Striped Marsh Frogs and Peron's Tree Frogs.

### 2.4 Nocturnal Frog Monitoring in the Wider Study Area

Results of the frog monitoring surveys in the wider study area are summarised in Table 2.4. GGBFs were recorded in a number of sites outside of the New M5 Marsh Street habitat area, including the western RTA Pond, the Creek area, the Eastern Frog Corridor, Enhancement Area Pond 2, in three ponds on the Kogarah Golf Course and at the Landing Lights East site in the extended search area at Barton Park (Figure 2.1). Nineteen (19) GGBFs were captured and processed during nocturnal frog monitoring across the wider study area (outside of the New M5 Marsh Street habitat area). Of these, 2 were recaptures and 2 were juveniles (not microchipped).

Striped Marsh Frogs were recorded in the Eastern Frog Corridor, Enhancement Area, Kogarah Golf Course and the extended search area at Barton Park. The Eastern Dwarf Tree Frog (*Litoria fallax*) was recorded in the western RTA pond. Peron's Tree Frog was recorded the Eastern Frog Corridor, the western RTA pond and the extended search area at Barton Park. The Common Eastern Froglet was recorded at the western RTA pond and Enhancement Area Pond 1.

Table 2.4: Summary of frog survey results

Area	Pond	Frogs Present	Species	Number	Comment
Eastern Frog Corridor and Creek area	Creek (west)	Yes	<i>Limnodynastes peronii</i>	3	
	Creek (east)	Yes	<i>Litoria aurea</i>	2	1 juvenile and 1 adult (recaptured)
			<i>Litoria peronii</i>	2	
	Underpass	Yes	<i>Litoria peronii</i>	1	
			<i>Limnodynastes peronii</i>	3	
RTA Ponds	East	No			
	West	Yes	<i>Litoria aurea</i>	2	Also 3 tadpoles
			<i>Litoria fallax</i>	1	
			<i>Litoria peronii</i>	9	
			<i>Crinia signifera</i>	2	
Enhancement Area	1	Yes	<i>Litoria peronii</i>	2	
			<i>Crinia signifera</i>	1	
	2	Yes	<i>Litoria aurea</i>	1	
	3	No			
	4	No			
	5	No			
Kogarah Golf Course	Circular	Yes	<i>Litoria aurea</i>	2	2 adults (1 recaptured)
	Long	Yes	<i>Litoria aurea</i>	1	1 adult
	Eastern	No			
	Skinny	Yes	<i>Litoria aurea</i>	1	1 adult (not captured)
	Northern	No			
	Mangrove	No			
Barton Park	Number 9 Pond	-			
	Eastern Channel	No			
	Southern Phragmites	No			
	Bend Swamp	No			
	Southern Jungle	No			
	Driving Range Wetland	Yes	<i>Limnodynastes peronii</i>	1	
	Landing Lights West	No			
	Landing Lights East	Yes	<i>Litoria aurea</i>	4	



Figure 2.1: Location of GGBFs observed.

## 2.5 Maintenance Observations

### 2.5.1 New M5 Marsh Street habitat area

At the time of the site inspections all ponds within the new M5 Marsh Street habitat area were holding water and no Plague Minnow (*Gambusia* sp.) were observed. Overall, aquatic vegetation in all ponds was healthy and spreading, in particular Typha in Pond B and Typha and Spike Rush in Pond A.

The damaged demountable building and fence still require repair or replacement. The temporary repair on the fence remains effective although there is no lip on the frog fence preventing frogs from climbing out.

Weed control activities during the monitoring period focused primarily on cutting and hand weeding of herbaceous weeds and exotic grasses throughout the New M5 Marsh Street habitat area. Weeds targeted were; *Aster subulatus*, *Bidens pilosa*, *Brassica* sp., *Celtis occidentalis*, *Conyza* sp., *Echium plantagineum*, *Ehrharta erecta*, *Ipomoea indica*, *Lantana camara*, *Megathyrus maximus*, *Paspalum dilatatum*, *Pennisetum clandestinum*, *Senecio madagascariensis*, *Sida rhombifolia*, *Solanum nigrum*, *Sonchus oleraceus* and *Verbena bonariensis*.

### 2.5.2 RTA Ponds

No Plague Minnow were recorded in either of the RTA Ponds during water quality and tadpole surveys in December 2020, January and February 2021. Water levels in the Eastern Pond were recorded as too low to dip net for tadpoles in January 2021, but had increased to ½ full in February 2021. Water was present in the Western Pond in January 2021 and this pond was also ½ full in February 2021.

Hand removal of herbaceous weeds undertaken throughout the north-west portion of the RTA Ponds site in late February 2021. Weeds targeted were; *Ageratina adenophora*, *Aster subulatus*, *Bidens pilosa*, *Camphora cinnamomum*, *Conyza bonariensis*, *Parietaria judaica*, *Rumex sagittatus*, *Senecio madagascariensis*, *Sida rhombifolia*, *Solanum nigrum*, *Sonchus oleraceus* and *Verbena bonariensis*.

### 2.5.3 Enhancement Area

All Enhancement Area ponds were dry in the December 2020 survey period with the exception of Pond 5 which was almost dry (water levels were too low to sample tadpoles). Pond 1 and Pond 2 were full in February 2021 and Pond 3 also held water. Pond 4 and Pond 5 were effectively dry in February 2021. Pond 6 remained dry throughout the survey period.

All Enhancement Area ponds with the exception of Pond 2 were overgrown with grasses throughout the survey period.

## 3 Discussion

The nocturnal frog surveys undertaken in December 2020, January and February 2021 were the second round of surveys for the 2020-2021 season. The results of the current surveys indicate that the population of GGBFs in the New M5 Marsh Street habitat area continue to occupy the site. Adult frogs were captured in December 2020 and January 2021, including a number of recaptured individuals. Large numbers of juvenile GGBFs were also recorded.

A small number of GGBFs were also found in the Creek area, the Eastern Frog Corridor, the RTA ponds, Kogarah Golf Course and in the Enhancement Area. Four GGBF were found at the Landing

Lights East Pond in the extended search area in Barton Park. All frogs observed or captured appeared in a healthy condition.

## 4 References

ELA (2018). *Green and Golden Bell Frog Plan of Management - Arncliffe*. Prepared by Eco Logical Australia for NSW Roads and Maritime Services.

Mahony, M. and Beranak C. (undated). *Water Quality parameters measured to assess suitability for Green and Golden Bell Frog occupancy*. Unpublished report provided to NSW Roads and Maritime Services.

## Appendix 1: Water Quality Results

Table 5: Water Quality Results for 21 December 2020

Location	Pond	General Condition	mVpH	pH	ORP [mV]	% Sat (DO%)	Diss. O2 [mg/l]	Conduct [uS/cm]	Resist [ms/cm]	TDS ppm	Salinity (PSU)	Turbidity [FNU]	Temp [C°]	Gambusia
Marsh Street habitat area	A	100%	-51.5	7.8	-33.7	20.1	1.85	331	303	160	0.15	1.6	21.9	No
	B	100%	-40.6	7.6	-19.6	34.1	2.44	1628	1535	814	0.82	1.5	22	No
	C	100%	-58.8	7.9	-55.9	15.2	1.95	477	455	238	0.23	0.5	22.6	No
RTA ponds	Western	Not Sampled	-	-	-	-	-	-	-	-	-	-	-	-
	Eastern	Not Sampled	-	-	-	-	-	-	-	-	-	-	-	-
Enhancement Area	1	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	2	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	3	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	4	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	47.3	6.1	-146.8	3.6	0.31	225	212	110	0.1	9.7	21.7	No
	6	Dry	-	-	-	-	-	-	-	-	-	-	-	-
Kogarah Golf Course	Circular	Very low	-30.6	7.3	-109.9	5.2	0.42	8175	8284	4353	4.86	21.3	22.4	yes
	Long	50%	-35.7	7.6	-114.9	8.1	0.68	7432	7113	3723	4.12	44.1	22.6	yes
	Mangrove	100%	-29.4	7.5	-135.9	11.2	0.77	52.4	49.15	26.24	36.6	24.8	21.7	yes
Barton Park	South Phrag.	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	Bend Swamp	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	South Jungle	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	LLE East	50%	-81.1	8.3	-90.5	9.5	0.77	6764	6574	3381	3.7	92.9	23.5	No
	LL West	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	DR Wetland	Dry	-	-	-	-	-	-	-	-	-	-	-	-

**Table 6: Water Quality Results for 28 January/3 February 2021**

Location	Pond	General Condition	mVpH	pH	ORP [mV]	% Sat (DO%)	Diss. O2 [mg/l]	Conduct [uS/cm]	Resist [ms/cm]	TDS ppm	Salinity (PSU)	Turbidity [FNU]	Temp [C°]	Gambusia
Marsh Street habitat area	A	-	-28.9	7.45	486.3	15.1	1.31	358	340	179	0.17	27.4	22.48	-
	B	-	-16.7	7.23	489.5	12	1.04	1857	1764	928	0.94	2.6	22.36	-
	C	-	-16.1	7.22	89.8	8.9	0.76	492	473	246	0.24	57.9	23.01	-
RTA ponds	Western	-	-34.1	7.55	-69.4	7.6	0.67	933	872	466	0.46	48.2	21.59	-
	Eastern	-	28.6	6.44	17.5	2.9	0.27	332	303	166	0.16	11.1	20.47	-
Enhancement Area	1	Dry	-	-	-	-	-	-	-	-	-	-	-	No
	2	Dry	-	-	-	-	-	-	-	-	-	-	-	No
	3	Dry	-	-	-	-	-	-	-	-	-	-	-	No
	4	almost dry	48.9	6.8	-198.1	3.2	0.29	229	312	82	0.1	5.8	23.2	No
	5	Dry	-	-	-	-	-	-	-	-	-	-	-	No
	6	Dry	-	-	-	-	-	-	-	-	-	-	-	No
Kogarah Golf Course	Circular	Dry	-	-	-	-	-	-	-	-	-	-	-	No
	Long	50%	-9.8	7.1	76	6.9	2.8	198	5.2	4899	2.8	41.3	24.61	Many
	Mangrove	100%	-32.3	7.47	-8.6	9.8	1.8	19.02	48.55	22	29.69	29.1	22.8	Many
Barton Park	East Channel	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	South Phrag	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	Bend Swamp	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	South Jungle	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	LL East	25%	-42.6	7.7	-319.3	3.9	0.32	12.5	12.16	6252	7.17	134	23.58	-
	LL West	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	DR Wetland	Dry	-	-	-	-	-	-	-	-	-	-	-	-

**Table 7: Water Quality Results for 24 February 2021**

Location	Pond	General Condition	mVpH	pH	ORP [mV]	% Sat (DO%)	Diss. O2 [mg/l]	Conduct [uS/cm]	Resist [ms/cm]	TDS ppm	Salinity (PSU)	Turbidity [FNU]	Temp [C°]	Gambusia
Marsh Street habitat area	A	100%	-44	7	171.5	10.5	0.95	297	220	149	0.14	3.6	20.2	No
	B	100%	-7.9	7.1	177.2	14.9	1.32	1522	1379	762	0.77	1.3	20	No
	C	100%	-35.1	7.6	164.9	16.3	1.39	481	244	244	0.23	1.8	22	No
RTA ponds	Western	50%	-63.3	8.1	51.3	48.8	4.37	459	415	228	0.22	72.3	20.1	No
	Eastern	50%	-38.1	7.6	94.3	40	3.57	170	158	86	0.08	228	20.7	No
Enhancement Area	1	100%	-4.2	7	191.1	28.9	2.65	213	190	107	0.1	7.1	19.2	No
	2	100%	-25	7.4	175.4	27.7	2.53	204	184	103	0.1	2.8	19.6	No
	3	-	-40.3	7.6	158.6	26.1	2.41	182	162	91	0.09	5.9	19.3	No
	4	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	5	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	6	Dry	-	-	-	-	-	-	-	-	-	-	-	-
Kogarah Golf Course	Circular	Very low	-42.9	7.7	143.9	48.2	4.03	11840	11030	5970	6.87	32.6	21.2	yes
	Long	100%	-37.1	7.6	-1.6	37.6	3.18	9036	8482	4522	5.07	6	21.7	yes
	Mangrove	100%	-23.6	7.4	-119.7	40.4	3.15	29440	26530	14120	17.4	40.8	19.9	yes
Barton Park	East Channel	Not Survyed	-	-	-	-	-	-	-	-	-	-	-	-
	South Phrag	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	Bend Swamp	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	South Jungle	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	LL East	100%	.25.2	7.4	-6.6	34.5	2.99	9843	8942	4944	5.59	2.5	20	No
	LL West	Dry	-	-	-	-	-	-	-	-	-	-	-	-
	DR Wetland	Dry	-	-	-	-	-	-	-	-	-	-	-	-