

# Environmental Monitoring Report of Formosa II

Construction Phase (2021 October to December)

## Monitoring & Improvement Summary

Monitoring Item		Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction-Bird Ecology	Offshore Bird	Wind farm and its periphery	<ol style="list-style-type: none"> <li>1. Species composition: 6 families, 12 species and 73 individuals were recorded in this quarter.</li> <li>2. Protected species: 1 protected species was recorded, including Little tern (II).</li> <li>3. Flying Altitude: 98.6% of recordings were below 25m; and 1.37% of recordings were between 26-196m, accounted for by 1 recording of an unknown species.</li> </ol>	—
	Coastal birds	<ol style="list-style-type: none"> <li>1. Xihu National Wetland</li> <li>2. Periphery coast</li> </ol>	<ol style="list-style-type: none"> <li>1. 8 orders, 16 families, 38 species and 5,234 individuals were recorded.</li> <li>2. Protected species: 7 protected species were recorded, including Black-faced spoonbill (I), Greater painted-snipe (II), Chinese egret (II), Osprey (II), Black-winged kite (II), Taiwan hwamei (II) and Brown shrike (III).</li> </ol>	—

Monitoring Item		Monitoring Site	Monitoring Result Summary	Measures & Effects
	Nighttime Radar	Wind farm located at Chunan (north coast of Chunggang estuary) and Houlong (Haowang Cape)	<ol style="list-style-type: none"> <li>1. Flying direction: The main flying direction is SW.</li> <li>2. Activity mode: At nighttime, activity frequency for most time periods were between 6-17 records. Max frequency occurred at the 1800 and 0200 time periods. 14.0% of the tracks passed the wind farm area.</li> </ol>	—
	Under construction-Fishery	3 survey lines in wind farm area	<ol style="list-style-type: none"> <li>1. Fish: 11 families, 15 species and 126 individuals. Big-head pennah croaker takes the majority.</li> <li>2. Fish egg: 8 families, 10 genera, and 830 eggs. Silver sillago of Sillaginidae family takes the majority.</li> <li>3. Fish larva: 10 families and 11 genera, 47 individuals. Red-mouthed tigerfish of Terapontidae family takes the majority.</li> </ol>	—
	Under construction-Underwater Noise (including cetacean acoustic survey)	2 stations within wind farm area	<ol style="list-style-type: none"> <li>1. Whistles: Only 9 whistles were detected in the HM-3 station. No whistles were recorded in the remaining stations this quarter.</li> <li>2. Clicks: Only 247 clicks were detected in the HM-1 station. No clicks were recorded in the remaining stations this quarter.</li> </ol>	—

Monitoring Item	Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction- Marine Water Quality	10 stations within wind farm area	pH value is 8.2, water temperature is between 26.6-27.4°C, dissolved oxygen is 6.2 mg/L, salinity is between 33.3-33.7 psu, transparency is between 40-60 cm, Coliform group is between <10-85 mg/L, Chlorophyll a is between 0.7-1.6 mg/L, BOD is between 0.8-1.1 mg/L, SS is between 1.4-6.8 mg/L, fat is between N.D.-0.6 mg/L.	
Under construction- Marine and intertidal ecology	10 stations within wind farm area	<ol style="list-style-type: none"> <li>1. Marine ecology: phytoplankton: 5 phylum, 60 genus, 131 species; Chlorophyll a is between 0.52-9.30 µg/L, zooplankton: 13 phylum, 33 genre; benthic organism: 11 orders, 15 families, 18 species.</li> <li>2. Intertidal ecology: Benthic organism: 7 orders, 9 families and 10 species</li> </ol>	
Under construction- Terrestrial Ecology	Terrestrial power transmission system (including step-down station, land cable and its periphery)	<ol style="list-style-type: none"> <li>1. Plantation: 97 families, 274 genera and 364 species were recorded. 6 rare species were recorded, including Lanyu podocarp, Common garcinia, Myoporum bontioides, Seremban, Fan palm, and Kandelia obovata all are cultivated.</li> <li>2. Mammal: 3 orders, 7 families, 16 species and 22 individuals of mammals; 1 order, 3 family, 9 species of bats were recorded. No protected species were recorded.</li> <li>3. Amphibian: 5 families, 5 species and 61 individuals were recorded. No protected species were recorded.</li> <li>4. Reptile: 6 families, 9 species and 68 individuals were recorded. No protected species were recorded.</li> <li>5. Butterfly: 5 families, 12 subfamilies, 39 species and 242 individuals were recorded. No protected species were recorded.</li> <li>6. Bird: 24 families, 46 species, and 646 individuals were recorded. 2 protected species Black-winged kite (II) and Brown shrike (III) were recorded.</li> </ol>	—

Monitoring Item	Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction- Intertidal Ecology	Planned important wetland in Chunan	<ol style="list-style-type: none"> <li>1. Plantation: 8 families, 9 genera and 10 species were recorded. No rare species were recorded.</li> <li>2. Fish: 6 families, 7 species and 179 individuals were recorded. No protected species were recorded.</li> <li>3. Crabs and Shrimps: 6 families, 9 species and 162 individuals were recorded. No protected species were recorded.</li> <li>4. Conch: 4 families, 4 species and 185 individuals were recorded. No protected species were recorded.</li> <li>5. Aquatic insects (including Odonata): for Odonata, 4 families, 10 species and 95 individuals were recorded; for aquatic insects, 3 orders, 6 families, and 248 individuals were recorded. No protected species were recorded.</li> </ol>	—
Under construction- Cultural Heritage (Archeology monitoring during onshore construction)	Excavation area	Archeology monitoring for this project has been completed as of December 11 <sup>th</sup> , 2020. In the future, archeology monitoring will be conducted during excavation when conducted.	—
Under construction- Air Quality	1 station in residency around booster station	Day average value for TSP is 65 µg/m <sup>3</sup> , Day average value for PM <sub>10</sub> is 34 µg/m <sup>3</sup> , Day average value for PM <sub>2.5</sub> is 10 µg/m <sup>3</sup> , Hourly max average value for SO <sub>2</sub> is 2 ppb, and day average value is 2 ppb. Hourly max average value for NO is 18 ppb, and day average value is 5 ppb. Hourly max average value for NO <sub>2</sub> is 21 ppb, and day average value is 13 ppb. Hourly max average value for CO is 0.3 ppm, and average value in 8 hours is 0.3 ppm. Hourly max average value for O <sub>3</sub> is 52 ppb, and average value in 8 hours is 45 ppb. Major wind direction is E, day average wind speed is 1.2 m/s. This quarter, all monitoring items comply with air quality standards. No abnormal issue is observed.	—

Monitoring Item		Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction-Noise Vibration	Noise Vibration	<ol style="list-style-type: none"> <li>1. 1 station in residency around booster station</li> <li>2. 1 station in residency along land cable</li> <li>3. Zhonggang Cihyu Temple</li> </ol>	<ol style="list-style-type: none"> <li>1. Noise: In all stations (residency around booster station, residency along land cable and Zhonggang Cihyu Temple), <math>L_{day}</math>, <math>L_{night}</math> and <math>L_{midnight}</math> are between 49.5-60.8 dB(A), 49.1-58.1 dB(A) and 48.9-52.4 dB(A), respectively. Value of each station/time section comply to Second Type of Construction Noise Control Standards near roads wider than 8m wide.</li> <li>2. Vibration: In all stations (residency around booster station, residency along land cable and Zhonggang Cihyu Temple), <math>L_{v10}</math> day and <math>L_{v10}</math> night are between 31.7-40.8 dB dB and 30.0-32.7 dB, respectively. Value of each station/time section comply to Japanese Control Standards of First Type of Zone.</li> </ol>	—
	Construction Noise	1 station in booster station periphery (1m)	The booster station for this project acquired an use permit in March 26 <sup>th</sup> , 2021 (府商建字 No. 110046365). As there is no longer any construction activity for the booster station, personnel were sent to confirm that data for construction noise (in booster station periphery (1m), including normal and low frequency) cannot be recorded in this quarter. The project will continue to send personnel to confirm the conditions.	—

Monitoring Item	Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction-Groundwater Quality	<ol style="list-style-type: none"> <li>1. Water output location</li> <li>2. Planned important wetland in Chunan</li> </ol>	<ol style="list-style-type: none"> <li>1. Water output location: The booster station for this project acquired an use permit in March 26<sup>th</sup>, 2021 (府商建字 No. 110046365). As there is no longer any construction activity for the booster station there is also no longer any wastewater discharge. Personnel was sent to confirm that data for groundwater (water output location) cannot be recorded. The project will continue to send personnel to confirm the conditions.</li> <li>2. Planned important wetland in Chunan: pH value is between 8.1-8.3; BOD is between 39.2-44.4 mg/L; COD is between 128-167 mg/L, SS is between 22-33 mg/L, Ammonia nitrogen is between 0.08-0.10 mg/L, ADMI is between 50-62 g/L, fat is between 3.1-7.2 mg/L, water temperature is between 23.0-33.1°C, NO3-N is between 0.07-0.14, TP is between 0.10-0.16 mg/L, Dissolved oxygen is between 4.1-6.7 mg/L. This quarter, BOD has exceeded class IV water body quality standards. All other monitoring items comply to class IV water body quality standard.</li> </ol>	<p>BOD measured in EIA and DA phases is also higher than class IV water body quality standard (referring to Protection Project of National Important Wetlands: <a href="https://wetland-tw.tcd.gov.tw/">https://wetland-tw.tcd.gov.tw/</a>). It is inferred that the value is affected by organic pollutants in water from agriculture, water cultural, household and industry discharged into the wetland, which belongs to background value and is not caused by the construction of the Project.</p> <p>Monitoring will be continued to clarify the changes.</p>