

Environmental Monitoring Report of Formosa II

Construction Phase (2021 January to March)

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"> 1. Species composition: No birds were documented in this quarter. 2. Protected species: No birds were documented in this quarter. Thus, no protected species were documented. 3. Flying Altitude: No birds were documented in this quarter. Thus, no flying altitude is recorded. 	—
	Coastal birds	<ol style="list-style-type: none"> 1. Xihu National Wetland 2. Periphery coast 	<ol style="list-style-type: none"> 1. 9 orders, 16 families, 33 species and 5,855 individuals were documented. 2. Protected species: 6 protected species were recorded, including Greater painted-snipe (II), Black-winged kite (II), Crested serpent eagle (II), Common kestrel (II), Peregrine falcon (II) and Brown shrike (III). 	—

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"> 1. Flying direction: mainly NE. 2. Activity mode: In regard to activity frequency, there are less than 5 recordings for any hour in this quarter. Overall, activity frequency is relatively higher in the early night compared to late night, with max frequency occurring at the 2100 time period. 20.3% of the tracks pass the wind farm area. 	—
	Under construction-Fishery	3 survey lines in wind farm area	<ol style="list-style-type: none"> 1. Fish: 11 families, 12 species and 60 individuals. Round scad takes the majority. 2. Fish egg: 9 families and 10 genre, 2,160 eggs. Black porgy of Sparidae takes the majority. 3. Fish larva: 2 families and 2 genre, 2 individuals. Including Bartailed flathead of Platycephalidae family and Stonefish of Scorpaenidae family. 	—

Monitoring Item	Monitoring Site	Monitoring Result Summary	Measures & Effects
<p>Under construction- Underwater Noise (including cetacean acoustic survey)</p>	<p>2 stations within wind farm area</p>	<p>1. Whistles: 340 whistles were documented in this quarter.</p> <p>(1) Time Distribution For the survey spots, not including HM-1 which did not have any detections, whistles are mostly detected between 0400-1100.</p> <p>(2) Tidal Distribution Not including HM-1 which did not have any detections, whistles detection rate was higher when within 3 hours of a low tide.</p> <p>2. Clicks: 491 clicks were documented in this quarter.</p> <p>(1) Time Distribution For the survey spots, not including HM-1 and HM-3 which did not have any detections, most of the clicks were detected from 0400-0800.</p> <p>(2) Tidal Distribution For the survey spots, not including HM-1 and HM-3 which did not have any detections, most of the clicks were detected between morning high tide and low tide.</p>	<p>—</p>

Monitoring Item	Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction- Marine Water Quality	10 stations within wind farm area	pH value is 8.1-8.2, water temperature is between 16.4-16.9°C, dissolved oxygen is between 6.3-6.5 mg/L, salinity is between 33.3-33.6 psu, transparency is between 60-70 cm, Coliform group is between <10-20 mg/L, Chlorophyll a is between 0.5-0.9 mg/L, BOD is between 0.6-0.8 mg/L, SS is between 4.0-9.4 mg/L, fat is ND. mg/L.	
Under construction- Marine and intertidal ecology	10 stations within wind farm area	<ol style="list-style-type: none"> 1. Marine ecology: phytoplankton: 4 phylum, 47 genus, 105 species; Chlorophyll a is between 0.01-0.61 µg/L, zooplankton: 9 phylum, 22 genre; benthic organism: 9 orders, 12 families, 12 genre. 2. Intertidal ecology: Benthic organism: 7 orders, 12 families and 13 species 	
Under construction- Terrestrial Ecology	Terrestrial power transmission system (including step-down station, land cable and its periphery)	<ol style="list-style-type: none"> 1. Plantation : 64 families, 172 genre and 240 species were recorded. 5 rare species were recorded, including Taiwan Incense Cedar, Lanyu Podocarp, Common Garcinia, Seremban and Fan Palm, all are cultivated. 2. Mammal : 1 orders, 2 families, 8 species and 5 individuals of mammals; 1 order, 1 family, 6 species of bats were recorded. No protected species were recorded. 3. Amphibian : No amphibians were recorded this quarter. No protected species were recorded. 4. Reptile : 1 orders 1 families, 2 species and 126 individuals were recorded. No protected species were recorded. 5. Butterfly : 3 families, 18 species and 855 individuals were recorded. No protected species were recorded. 6. Bird : 8 orders, 21 families, 34 species were recorded. 2 protected species Crested goshawk (II) and Black-winged kite (II) were recorded. 	—

Monitoring Item	Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction- Intertidal Ecology	Planned important wetland in Chunan	<ol style="list-style-type: none"> 1. Plantation : 8 orders, 9 genre and 9 species were recorded. No rare species were observed. 2. Fish : 2 families, 2 species and 848 individuals were recorded. No protected species were recorded. 3. Crabs and Shrimps : 4 families, 4 species and 79 individuals were recorded. No protected species were recorded. 4. Conch : 4 families, 4 species and 36 individuals were recorded. No protected species were recorded. 5. Aquatic insects (including Odonata) : for Odonata, 2 families, 2 species and 13 individuals were recorded; for aquatic insects, 5 orders, 11 families, 11 species and 428 individuals were recorded. No protected species were recorded. 	—
Under construction- Cultural Heritage (Archeology monitoring during onshore construction)	excavation area	Archeology monitoring for this project has been completed as of December 11 th , 2020. In the future, archeology monitoring will be conducted during excavation if excavation is conducted.	—

Monitoring Item	Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction-Air Quality	1 station in residency around booster station	<p>Day average value for TSP is 98$\mu\text{g}/\text{m}^3$, Day average value for PM₁₀ is 55$\mu\text{g}/\text{m}^3$, Day average value for PM_{2.5} is 38$\mu\text{g}/\text{m}^3$, Hourly max average value for SO₂ is 2 ppb, and day average value is 1 ppb. Hourly max average value for NO is 19 ppb, and day average value is 7 ppb. Hourly max average value for NO₂ is 34 ppb, and day average value is 16 ppb. Hourly max average value for CO is 0.4 ppm, and average value in 8 hours is 0.3 ppm. Hourly max average value for O₃ is 65 ppb, and average value in 8 hours is 57 ppb. Major wind direction is NNE, day average wind speed is 1.4m/s. This quarter, PM_{2.5} has exceeded air quality standards. All other monitoring items comply with air quality standards. No abnormal issue is observed.</p>	<p>This quarter, the day average value for PM_{2.5} is 38$\mu\text{g}/\text{m}^3$ at the monitoring station which is slightly higher than the air quality standard of 35$\mu\text{g}/\text{m}^3$. In reference to the Toufen air quality station of the EPA, which is close to the construction area, the day average value for PM_{2.5} was 39$\mu\text{g}/\text{m}^3$ on March 15th, 2021. This indicates air quality was poor during the day of monitoring and is probably a large-scale change in air quality rather than a change caused by construction of the project. Monitoring will be continued to clarify the changes</p>

Monitoring Item		Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction-Noise Vibration	Noise Vibration	<ol style="list-style-type: none"> 1. 1 station in residency around booster station 2. 1 station in residency along land cable 3. Zhonggang Cihyu Temple 	<ol style="list-style-type: none"> 1. Noise : In all stations (residency around booster station, residency along land cable and Zhonggang Cihyu Temple) L_{day}, L_{night} and $L_{midnight}$ are between 56.3-61.3 dB(A), 49.9-60.6 dB(A) and 48.9-52.8 dB(A) respectively. Value of each station/time section comply to Second Type of Construction Noise Control Standard where is 8m or above away from road. 2. Vibration : In all stations (residency around booster station, residency along land cable and Zhonggang Cihyu Temple) $L_{v10_{day}}$ and $L_{v10_{night}}$ are between 30.0-39.2dB dB and 30.0-34.1 dB respectively. Value of each station/time section comply to Japanese Control Standards of First Type of Zone. 	—
	Construction Noise	1 station in booster station periphery (1m)	<ol style="list-style-type: none"> 1. Normal frequency (20Hz-20kHz) : L_{max} is between 73.9-81.5 dB(A), L_{eq} is between 62.6-66.2 dB(A), monitoring results comply with Second Type of Construction Noise Control Standard. 2. Low frequency(20 Hz-200 Hz) : $L_{eq,LF}$ is between 37.1-41.4 dB dB(A). Monitoring results comply with Second Type of Construction Noise Control Standard. 	—

Monitoring Item	Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction-Groundwater Quality	1. water output location 2. Planned important wetland in Chunan	<p>1. Water output location : pH value is between 7.9-8.0; BOD is between 1.0-1.6 mg/L; COD is between 3.2-6.5 mg/L, SS is between 2.4-12.5 mg/L, Ammonia nitrogen is between 0.09-0.17 mg/L, ADMI is N.D. mg/L, fat is between N.D.-3.8 mg/L, water temperature is between 16.3-23.5°C, NO3-N is between 0.45-0.78, TP is between 0.03-0.07 mg/L, Dissolved oxygen is between 6.2-7.6 mg/L. All items comply to water quality standard for construction water output.</p> <p>2. Planned important wetland in Chunan : pH value is between 7.7-8.4; BOD is between 12.1-17.3 mg/L; COD is between 60.3-77.0 mg/L, SS is between 10.6-25.2 mg/L, Ammonia nitrogen is between 0.06-0.12 mg/L, ADMI is between 50-65 mg/L, fat is between N.D.-3.5 mg/L, water temperature is between 16.1-24.0°C, NO3-N is between 0.02-0.28, TP is between 0.36-0.55 mg/L, Dissolved oxygen is between 3.8-6.3 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.</p>	<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: https://wetland-tw.tcd.gov.tw/). 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>