

Quaternary Report No. 5

2016 (July, August and September)

**New Bohol Airport Construction
and
Sustainable Environment Protection Project**

Quaternary Environmental Monitoring Report

October 2016

Department of Transportation (DOTr)

The Monitoring Form is prepared based on Attachment 8 (1) of the Appraisal MD.

1. Responses/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
Water Quality, Air Quality, Noise level, Dust and Solid Waste	The environmental monitoring is carried out once a month during Construction/Operation Phase. The total number of monitoring is 42 times. The Quaternary Environmental Monitoring Report (QEMR) will be submitted to JICA quarterly by DOTr.

DOTr prepared Quaternary Environmental Monitoring Report (October 2016) based on the field survey report carried out by Chiyoda-Mitsubishi JV.

2. Mitigation Measures

(A) Pre-Construction/Construction Phase

- **Sampling/Measurement Points**

Sampling Points of Water

Sta. ID No.	GPS Reading		Description of Sampling Stations
	Longitude	Latitude	
GW-1	N 09°35'05.7"	E 123°46'14.5"	It is located at Airport Site Brgy. Tawala, Panglao, Bohol. Owned by deceased Mr. Leoncio Boncaron.
GW-2	N 09°33'30.6"	E 123°45'28.4"	It is located inside the compound of former Brgy. Captain Mr. Avito Arcay which is in front of the Brgy. Hall of Brgy. Danao crossing the municipal road in the municipality of Panglao, Bohol.
SW-1	N 09°32'51.1"	E 123°46'22.2"	This is situated about 100 meters away from the seashore which is in front of the Alona Kew Beach in Brgy. Tawal, Panglao, Bohol.
SW-2	N 09°34'05.0"	E 123°45'03.1"	This is located inside mangrove trees about 150 meters away from seashore in Brgy. Danao, Panglao, Bohol

Air Quality, Noise Level and Dust

Sta. ID No.	GPS Readings		Description of Sampling Station
	Longitude	Latitude	
Sta-1	N 09°33'42.3"	E 123°46'40.1"	It is located in front of Tawala Elementary School in Brgy. Tawala, Panglao, Bohol. It is situated about 10 meters away from center of the municipal road and about 35 meters from the classrooms.

Sta. ID No.	GPS Readings		Description of Sampling Station
	Longitude	Latitude	
Sta-2	N 09°33'32.9"	E 123°45'27.0"	It is situated almost in front of the Brgy Hall of Brgy Danao, Panglao, Bohol. It is about 7 meters away from the center of the municipal road.
Sta-3	N 09°34'50.4"	E 123°45'08.4"	It is about 30 meters away in front of the municipal hall building of Panglao and about 25 meters from center of the municipal road.
Sta-4	N 09°34'19.9"	E 123°46'28.9"	It is located along access road of the proposed new Bohol airport in Brgy Tawala, Panglao, Bohol.
Sta-5	N 09°34'10.4"	E 123°47'14.5"	It is located in front of Bohol Elementary School in Brgy Bolod, Panglao. It is about 2 meters away from the perimeter fence of the school and 5 meters away from center of the municipal road.



Figure 1. Location of Samplings and Measurement

• Air Quality (Ambient Air Quality)

Remarks: Measurement Point-shown in Figure 1, Frequency – once a month, Method-High Volume Sampler/Gravimetric Method

Item	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*1) Country's Standards
TSP/Fugitive Dust (ug/m3)	Sta.1	July	68.5	38.93	68.5	230
		August	12.4			
		September	35.9			
	Sta.2	July	230.1	143.87	230.1	
		August	74.7			
		September	126.8			
	Sta.3	July	35.5	49.73	81.6	
		August	32.1			
		September	81.6			
	Sta.4	July	81.3	69.27	98.3	
		August	98.3			
		September	28.2			
	Sta.5	July	290.1	158.63	290.1	
		August	151.4			
		September	34.4			
TSP/Fugitive Dust-(Visual)	Sta.1, 2, 3, 5	July – September	Weekly inspection: Negative			
	Sta.4	July August September	(1)*: 1 st , 2 nd , 3 rd and 4 th week: Dust from Construction Work (2)*: 1 st , 2 nd , 3 rd , 4 th week: Dust from Construction Work (3)*: 1 st , 2 nd , 3 rd , 4 th week: Negative			

*1) Standard: DAO 14/DAO2000-81 National Ambient Air Quality Guideline Values

Note:

(1)*: 1st week: Wind Direction SSW-SW-SSW-SW, 2nd week: ESE-S-S-SSE, 3rd week: ENE-E-SSW-WNW and 4th week: NNE-N-SSW-S, the on-going construction activities does not affect much the quality of the ambient air on this area in terms of dust

(2)*: 1st week: Wind Direction SW-SW-SW-SW, 2nd week: SW-SW-SW-WSW, 3rd week: WSW-SW-SW-SW and 4th week: SSW-SSW-S-SSE, the directions show that on-going construction activities doesn't show any trace of dust

(3)*: 1st week: Wind Direction SW-SW-SSW-SSE, 2nd week: WSW-WSW-SW-WSW, 3rd week: ENE-NE-NW-WSW and 4th week: SSW-SSW-S-SSW, the directions show that on-going construction activities doesn't show any trace of dust

• Water Quality (Ambient Water Quality)

Remarks: Measurement Point-shown in Figure 1 (there is no water in soaking area), Frequency – once a month

Well Water Quality

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(1) Country's Standards
GW.1	pH	July	7.57	7.55	7.60	6-9
		August	7.60			
		September	7.47			
	SS (mg/L)	July	<0.1	<0.1	<0.1	No more than 60 mg/L increase
		August	<0.1			
		September	<0.1			

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(1) Country's Standards
	BOD (mg/L)	July	1	1	1	15
		August	<1			
		September	1			
	COD (mg/L)	July	6	32	77	-
		August	77			
		September	14			
	Nitrogen (mg/L)	July	1.897	1.792	1.987	10
		August	1.987			
		September	1.493			
	Phosphorus (mg/L)	July	0.802	0.269	0.802	0.4
		August	<0.003			
		September	<0.003			
Oil/Grease (mg/L)	July	<1	<1	<1	5	
	August	<1				
	September	<1				

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(2) Country's Standards
GW.2	pH	July	8.17	8.08	8.17	6 - 9
		August	8.00			
		September	8.07			
	SS (mg/L)	July	<0.1	<0.1	<0.1	No more than 60 mg/L increase
		August	<0.1			
		September	<0.1			
	BOD (mg/L)	July	1	1	1	15
		August	<1			
		September	1			
	COD (mg/L)	July	8	35	78	-
		August	78			
		September	20			
	Nitrogen (mg/L)	July	2.633	1.713	2.633	10
		August	1.462			
		September	1.044			
	Phosphorus (mg/L)	July	<0.003	<0.003	<0.003	0.4
		August	<0.003			
		September	<0.003			
	Oil/Grease (mg/L)	July	<1	<1	<1	5
		August	<1			
		September	<1			

*(1) Standard: DAO34 (Class C/D)

Note: Phenols was excluded from the monitoring parameters, because Phenols are generated from industrial activities. There are no industrial activities in this area.

Sea Water Quality

Parameter	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(4) Country's Standards
Color	SW-1	July	10	10	10	No abnormal discoloration from unnatural
		August	10			
		September	10			

Parameter	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(4) Country's Standards
	SW-2	July	10	10	10	causes
		August	10			
		September	10			

*(4) Standard: DAO34 (Class SB)

- **Waste**

The generated wastes for the months of July, August and September 2016 are shown in Attachment 1.

- **Noise**

Item	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(5) Country's Standards
Noise, db(A)	Sta.1	July	54	63	77	50
		August	59			
		September	77			
	Sta.2	July	60	69	83	65
		August	64			
		September	83			
	Sta.3	July	65	67	76	65
		August	61			
		September	76			
	Sta.4	July	55	59	65	55
		August	57			
		September	65			
	Sta.5	July	55	64	76	50
		August	61			
		September	76			
Hearing	Sta.1-Sta.5	July-September	Weekly hearing: no complain			

*(5) Standard: PD984

Area Classification: Sta. 1 – Class AA; Sta. 2 – Class B; Sta. 3 – Class B; Sta. 4 – Class A; Sta. 5 – Class AA

3. Natural Environment

- **Ecosystem**

Monitoring Item	Monitoring Results during Report Period
The two endangered species (<i>molave</i> [<i>Vitex parviflora</i> Juss.] and <i>bolong-eta</i> [<i>diospyros pilosathera</i>]) listed in the Biodiversity Assessment Report of the Bohol New Airport site	According to the MMT Executive Committee, the bidding for the procurement of Biodiversity Conservation Plan (Reforestation) will be handled by the Provincial Government of Bohol. The by the Technical Working Group of the

Monitoring Item	Monitoring Results during Report Period
	<p>– Bohol (DENR-Bohol). The Technical Working Group of the MMT-NBACSEPP will undertake the monitoring, while the over-all supervision will be under the DOTr.</p> <p>The two identified endangered species will be planted in the Municipalities of Loay, Guindulman, Dauis and Dimiao.</p>

• Tree Planting (Revised ECC requirements is 572,500 seedlings)

Monitoring Item	Monitoring Results during Report period
Number of trees planted	Not yet implemented, subject for bidding
Number of species	Not yet implemented, subject for bidding
Number of locations	Not yet implemented, subject for bidding

Information on Tree Species to be Planted and those Species are Selected

The species/seedlings considered in the reforestation project for NBACSEPP is consists of the following: 572,000 seedlings as condition in the ECC issued by DENR-EMB7; 5,104 seedlings as an ECC condition for the resettlement site; and, 46,500 seedlings as replacement to the other trees identified by DENR-CENRO in Tagbilaran City. The total number of seedlings is 624,104. In the Terms of Reference (TOR) for the procurement of seedlings, 20% of mortality was considered.

The list of trees identified for planting is shown below.

Plantation Site	Fruit Assorte	Timber Indign's	Mangrove	Beach Forest	Coffee	Cacao	Bamboo	Rattan	Orname ntals	Coconu t	Total
Dimiao	25,750	61,750	54,000								141,500
Guindulman		10,000			18,333	5,000					33,333
Loay	5,246	3,497	70,000	7,500							86,243
San Miguel	38,900	42,500			18,750	18,750			1,400		120,300
Dauis	2,445	2,444	14,000	1,500							20,389
Panglao	4,238	889	179	179					1,342		6,827
Tagbilaran	1,144										1,144
Cortes		7,778	70,000	10,833							88,611
Bilar	4,556	9,333					1,389	1,389			16,667
Baclayon	3,333	833		833						557	5,556
Loon	14,000			6,000							20,000
Maribojoc			30,000	7,500							37,500
Pilar	1,333	12,500			445	445	510	510			15,743
Alburquerque		5,000									5,000
Sikatuna	2,666				890	889					4,445
Sevilla	1,333				445	444					2,222
Alicia	3,750	8,750					510	510			13,520
Resettlement Site	3,573	510							511	510	5,104
GRAND TOTAL											624,104

Information on the Location for Planting

There are 16 municipalities and 1 city identified as the locations for planting. The total area needed is 374.92 hectares. All the identified planting sites are government-owned lands. A Memorandum of Understanding (MOU) will be signed between DOTr and LGU before the implementation of the reforestation project. The DOTr-PMO will revisit the LGUs. The table below shows the plantation sites and the required land area.

Plantation Site	Area (Has.)
Dimiao	84.57
Guindulman	28.5
Loay	29
San Miguel	103
Daus	13
Panglao	16.82
Tagbilaran	1.03
Cortes	18
Bilar	17
Baclayon	5
Loon	14
Maribojoc	8
Pilar	12
Alburquerque	3
Sikatuna	4
Sevilla	2
Alicia	11
Resettlement Site	5
GRAND TOTAL	374.92

4. Results of Environmental Monitoring

Item	Evaluation	Mitigation/Remediation Measures taken
Air Quality	<input type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards	Continuous monitoring
Water Quality	<input type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards	Continuous monitoring
Noise	<input type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards	Continuous monitoring. The access route for the deliveries of the construction materials was considered since the deliveries has already started (New location of Station 4 - July and August sampling).
Waste	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring
Odor	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring
Natural Environment	<input checked="" type="checkbox"/> impacts properly mitigated <input type="checkbox"/> mitigation measures need to be followed	Continuous monitoring
Heritage	<input checked="" type="checkbox"/> impacts properly mitigated <input type="checkbox"/> mitigation measures need to be followed	Continuous monitoring

Others	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring
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The results of the Total Suspended Particulates (TSP) for the month of July 2016, showed that Station 2 has a result of 230.10 ug/Nm³ while Station 5 is 290 ug/Nm³, which is more than the allowable limit of 230 ug/Nm³. High level of the TSP was observed due to the current construction activities being undertaken by the LGU and not from the construction activities at site. But, on the succeeding two months (August and September), the TSP values were within the allowable limit. Calm to moderate vehicular activities were observed along the nearby road.

There is no exceedance on the parameter being analyzed for the water quality. For the groundwater quality in Station 1, Phosphorus exceeded the DENR standard for drinking water (*Note: The groundwater is now being used for domestic purpose and not for drinking of the people*), while all the other parameters are within the limit. For the Parameters of Station 2 of the groundwater are all within the standards.

All stations for noise level quality monitoring exceeded the allowable limit because the island is now a busy area compared to the time when the baseline survey was conducted. The causes of the high records of noise level quality were attributed to traffic noises generated by vehicles plying the nearby roads, nocturnal insects, carpentry works nearby and children playing inside the school compound.

Attachment 1: Waste Management

1.1 July 2016

Type of Waste	Generation Point	Category	Responsibility and methodology of Waste Management					
			Collection on Site	Storage on site	Transportation to outside storage site	Collection	Dumping Site/ Recycling	Remark
Domestic Waste	Working area at the Site	Residual waste (Food wrappers, construction debris, used sacks, Styrofoam, etc)	134 kg	0	0	134 kg	134 kg	The landfill site is at Panglao Municipality
Waste from Construction work	Area of Temporary Facilities	Compostable	0	0	0	0	0	
		Plastic Bottles	7 kg	0	0	0	7 kg	Recycled
		Cartons	106 kg	0	0	0	106 kg	Recycled
		Tin Cans	0	0	0	0	0	0
		Mixed Hard Plastics	132 kg	0	0	0	132 kg	Recycled
		Used Oil	26 drums	26 drums	0	0	0	Temporary Stored
		Used Lead-Acid Battery	6 pcs	6 pcs	0	0	0	Temporary Stored
		Busted Fluorescent Bulb	24 pc	24 pc	0	0	0	Temporary Stored
	Paint Cans	16 kg	16 kg	0	0	0	Temporary Stored	
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled

1.2 August 2016

Type of Waste	Generation Point	Category	Responsibility and methodology of Waste Management					
			Collection on Site	Storage on site	Transportation to outside storage site	Collection	Dumping Site/ Recycling	Remark
Domestic Waste	Working area at the Site	Residual waste (Food wrappers, construction debris, used sacks, Styrofoam, etc)	159 kg	0	0	159 kg	159 kg	The landfill site is at Panglao Municipality
Waste from Construction work	Area of Temporary Facilities	Compostable	138 kg	138 kg	0	0	0	Composted
		Plastic Bottles	0	0	0	0	0	
		Cartons	170 kg	0	0	0	170 kg	Recycled

Type of Waste	Generation Point	Category	Responsibility and methodology of Waste Management					Remark
			Collection on Site	Storage on site	Transportation to outside storage site	Collection	Dumping Site/ Recycling	
		Tin Cans	0	0	0	0	1 kg	Recycled
		Mixed Hard Plastics	219 kg	219 kg	0	0	0	Recycled
		Used Oil	2 drums	2 drums	0	0	0	Temporary Stored
		Used Lead-Acid Battery	0	0	0	0	0	
		Busted Fluorescent Bulb	0	0	0	0	0	0
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled

1.3 September 2016

Type of Waste	Generation Point	Category	Responsibility and methodology of Waste Management					Remark
			Collection on Site	Storage on site	Transportation to outside storage site	Collection	Dumping Site/ Recycling	
Domestic Waste	Working area at the Site	Residual waste (Food wrappers, construction debris, used sacks, Styrofoam, etc)	155 kg	0	0	155 kg	155 kg	The landfill site is at Panglao Municipality
Waste from Construction work	Area of Temporary Facilities	Compostable	243 kg	243 kg	0	0	0	Composted
		Plastic Bottles	51 kg	0	0	0	51 kg	Recycled
		Cartons	100 kg	0	0	0	100 kg	Recycled
		Tin Cans	39 kg	0	0	0	39 kg	Recycled
		Metals	42 kg	0	0	0	42 kg	Recycled
		Mixed Hard Plastics	52 kg	0	0	0	52 kg	Recycled
		Used Oil	4 drums	4 drums	0	0	0	Temporary Stored
		Used Lead-Acid Battery	14 pcs	14 pcs	0	0	0	Temporary Stored
	Oil Contaminated Materials	51 pcs	51 pcs	0	0	0	Temporary Stored	
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled