

Quaternary Report No. 6

2016 (October, November and December)

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

Quaternary Environmental Monitoring Report

January 2017

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 (January 2017) 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"	The original location. It is located along the access road of the New Bohol Airport in Brgy Tawala, Panglao, Bohol.
	N 09°35'37.7"	E 123°47'04.0"	A relocated station. It is located about 2.4 km Northeast of the original station (Access Road to Airport). It is situated in front of Ericflo Inn/restaurant and is about 10 meters away from the center of the national road.
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.

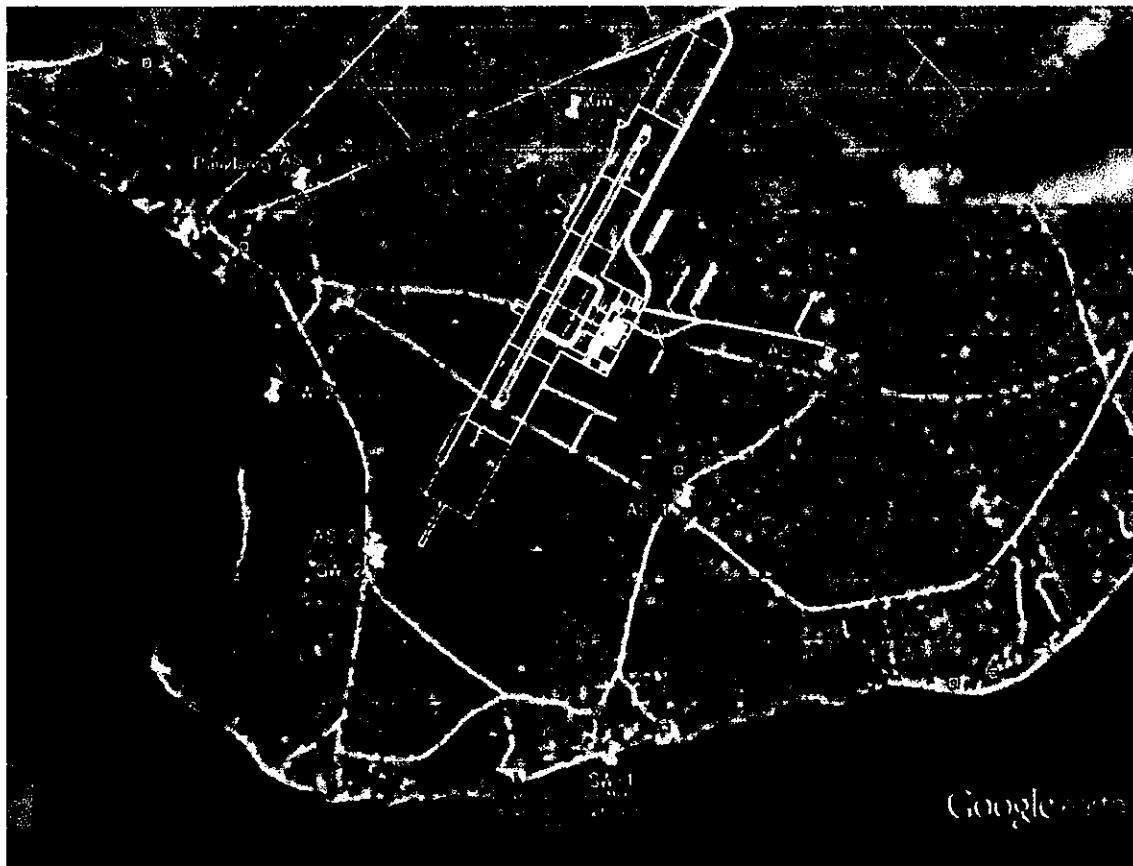


Figure 1. Location of Samplings and Measurement

• **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	October	50.0	87.13	209.9	230
		November	209.9			
		December	<1.5			
	Sta.2	October	69.5	111.27	188.4	
		November	188.4			
		December	75.9			
	Sta.3	October	3.4	44.8	126.4	
		November	126.4			
		December	4.6			
	Sta.4	October	6.9	166.2	487.0	
		** November	487.0			
		December	4.7			
	Sta.5	October	186.3	104.63	186.3	
		November	59.8			
		December	67.8			
TSP/Fugitive Dust-(Visual)	Sta.1, 2, 3, 5	October - December	Weekly inspection: Negative			
	Sta.4	October	(1)*: 1 st , 2 nd , 3 rd and 4 th week: Dust from Construction Work			
		November	(2)*: 1 st , 2 nd , 3 rd , 4 th week: Negative			
		December	(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 SSE-S-SSW-SSE, 2nd week: S-WSW-W-WSW, 3rd week: S-S-SSE-SSE and 4th week: ESE-NNW-NW-NW, the on-going construction activities affect not much the quality of the ambient air on this area in terms of dust

(2)*: 1st week: Wind Direction NNE-NNE-N-N, 2nd week: N-ESE-NNW-WSW, 3rd week: NE-NE-NE-NE and 4th week: NE-NE-NE-NE, the directions show that on-going construction activities doesn't show any trace of dust

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

**November - A relocated station which is 2.4 km northeast of the original station (Access Road to Airport)

• **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	October	7.60	6.68	7.60	6-9
		November	4.97			
		December	7.46			
	SS (mg/L)	October	<0.1	<0.1	<0.1	No more than 60 mg/L
		November	<0.1			

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(1) Country's Standards
	BOD (mg/L)	September	<0.1			increase
		October	1	2.67	4	15
		November	4			
		December	3			
	COD (mg/L)	October	21	13.67	21	-
		November	13			
		December	7			
	Nitrogen (mg/L)	October	1.025	0.657	1.025	10
		November	0.850			
		December	0.097			
	Phosphorus (mg/L)	October	<0.003	0.0217	0.059	0.4
		November	0.059			
		December	<0.003			
	Oil/Grease (mg/L)	October	<1	<1	<1	5
		November	<1			
December		<1				

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(2) Country's Standards
GW.2	pH	October	7.93	6.90	7.93	6 - 9
		November	4.93			
		December	7.83			
	SS (mg/L)	October	<0.1	<0.1	<0.1	No more than 60 mg/L increase
		November	<0.1			
		December	<0.1			
	BOD (mg/L)	October	2	1.67	2	15
		November	2			
		December	1			
	COD (mg/L)	October	16	11.33	16	-
		November	15			
		December	3			
	Nitrogen (mg/L)	October	0.700	0.483	0.700	10
		November	0.650			
		December	0.100			
	Phosphorus (mg/L)	October	<0.003	0.024	0.065	0.4
		November	0.065			
		December	<0.003			
	Oil/Grease (mg/L)	October	<1	<1	<1	5
		November	<1			
		December	<1			

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

Note: Phenols and Siltation were excluded from the monitoring parameters. Phenols come from industrial activities and no industrial exist in the area. Siltation does not exist since no surface water exist at the site. There is no available water at the soaking pond.

Sea Water Quality

Parameter	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(4) Country's Standards
Color	SW-1	October	10	8.33	10	No abnormal discoloration from unnatural
		November	10			
		December	5			

Parameter	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(4) Country's Standards
	SW-2	October	10	8.33	10	causes
		November	10			
		December	5			

*(4) Standard: DAO34 (Class SB)

- **Waste**

The generated wastes for the months of October, November and December 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	October	61	69	83	50
		November	62			
		December	83			
	Sta.2	October	64	75	88	65
		November	72			
		December	88			
	Sta.3	October	62	68	81	65
		November	61			
		December	81			
	Sta.4	October	69	66	69	55
		** November	63			
		December	65			
	Sta.5	October	61	72	87	50
		November	68			
		September	87			
Hearing	Sta.1-Sta.5	October-December	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

** November - A relocated station which is 2.4 km northeast of the original station (Access Road to Airport)

3. Natural Environment

- **Ecosystem**

Monitoring Item	Monitoring Results during Report Period
The two endangered species (<i>molave [Vitex parviflora Juss.] and bolong-eta [diospyros pilosathera]</i>) listed in the Biodiversity Assessment Report of the Bohol New Airport	The MMT-Executive Committee, approved a Resolution recommending to DOTr that the bidding for the procurement of Biodiversity Conservation Project (Reforestation) will be undertaken by the

Monitoring Item	Monitoring Results during Report Period
site	<p>Department of Environment and Natural Resources-Region VII thru a Memorandum of Agreement (MOA). Said MOA was already signed by DENR Region VII and now for signature of the DOTr concerned official.</p> <p>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 (2) identified endangered species will be planted in the Municipalities of Loay, Guindulman, Daus 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 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 will be 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	Ornaments	Coconut	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 to update on the status of reforestation project and to verify on the availability of the land previously compromised verbally by 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 checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring
Noise	<input type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards	Continuous monitoring
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

For TSP, Station 4 reached the allowable limit of 300 ug/Nm³ for the month of November. High level of TSP was observed due to the current construction activities by resident and not from construction activities. But on the months of October and December, the TSP values were within the allowable limit.

There is no exceedance on the parameter analyzed for the water quality both seawater and groundwater are all within the standards.

All stations for noise monitoring exceeded the allowable limit because the island became busy area compared to the time when the baseline survey was conducted. The causes of the high records of noise quality are passing vehicles, nocturnal insects, activities by the residents nearby, children playing inside the school compound and due to the presence of MMT Technical Committee to witness the actual conduct of noise sampling (month of November).

Attachment 1: Waste Management

1.1 October 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)	61 kg	0	0	61 kg	61 kg	The dumping site is at Panglao Municipality
Waste from Construction work	Area of Temporary Facilities	Compostable	82 kg	82 kg	0	0	82 kg	82 kg
		Plastic Bottles	0	0	0	0	0	Recycled
		Cartons	54 kg	0	0	0	54 kg	Recycled
		Tin Cans	0	0	0	0	0	0
	Mixed Hard Plastics	62 kg	0	0	0	62 kg	Recycled	
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled

1.2 November 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)	450 kg	0	0	450 kg	450 kg	The dumping site is at Panglao Municipality
Waste from Construction work	Area of Temporary Facilities	Compostable	158 kg	158 kg	0	0	0	Composted
		Plastic Bottles	0	0	0	0	0	
		Cartons	95 kg	0	0	0	95 kg	Recycled
		Tin Cans	0	0	0	0	0	Recycled
	Mixed Hard Plastics	28 kg	28 kg	0	0	0	Recycled	
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled

1.3 December 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)	298 kg	0	0	298 kg	298 kg	The dumping site is at Panglao Municipality
Waste from Construction work	Area of Temporary Facilities	Compostable	113 kg	113 kg	0	0	0	Composted
		Plastic Bottles	38 kg	0	0	0	38 kg	Recycled
		Cartons	48 kg	0	0	0	48 kg	Recycled
		Tin Cans	39 kg	0	0	0	39 kg	Recycled
		Metals	0	0	0	0	0	Recycled
		Mixed Hard Plastics	36 kg	0	0	0	36 kg	Recycled
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled