1.2. Ambient air pollutant diffusion model

To predict air pollutants emitted by moving vehicles during operation phase (with wind velocity > 1.0m/s) , the following Plume Model is used (Source: Technical Handbook for Environmental Impact Assessment of Roads, 2007 Revision, HERI).

$$C(x,y,z) = \frac{Q}{2\pi \cdot u \cdot \sigma_y \cdot \sigma_z} \exp\left(-\frac{y^2}{2\sigma y^2}\right)\left[\exp\left\{-\frac{(Z-H)^2}{2\sigma_z^2}\right\}+\exp\left\{-\frac{(Z+H)^2}{2\sigma_z^2}\right\}\right]$$

In which,

C(x,y,z) : air pollutant concentration at survey site (x,y,z) (ppm or mg/m^3)
Q : air pollutant emission rate (ml/s or mg/s)
u : vehicle average speed (m/s)
H : height of source of emission (m)
σ_y, σ_z : diffusion coefficient toward y dimension and z dimension (m)
x : distance from emission point source to survey site along the wind direction (m)
y : horizontal distance from survey point to x axis (m)
z : vertical distance from survey point to x axis (m)

σ_y, σ_z are calculated by the following formulations:
$\sigma_y = W/2 + 0.46\ L^{0.81}$ (in case of x<W/2 : $\sigma_y = W/2$) (m)
$\sigma_z = \sigma_{z0} + 0.31\ L^{0.83}$ (in case of x<W/2 : $\sigma_z = \sigma_{z0}$) (m)
In which,

L : distance from the survey point to the road side = x-W/2 (m)
x : distance from emission point source to survey site along the wind direction (m)
W : road width (m)
σ_{z0} : initial vertical diffision coefficient (m)
in case of no existing of noise barrier : $\sigma_{z0} = 1.5$
in case of existing of noise barrier : $\sigma_{z0} = 4.0$

Based on result of the EIA study relating to meteorological conditions of the Project area, input data using to predict ambient air quality for the Project are setting as following.

Table 6 Input data for prediction of ambient air quality

		Summer				Winter			
Z (m)	h (m)	Wind direct-ion	Wind velocity (m/s)	Temper-ature (°C)	Atmos-phere stability	Wind direct-ion	Wind velocity (m/s)	Temper-ature (°C)	Atmos-phere stability
1	Note*)	SE	2.5	28.2	C	NE	1.7	16.7	B

Data source: EIA Report of Tan Vu – Lach Huyen Highway Construction Project, Hanoi May 2010, Section 2.1.4

Since the wind velocity in winter (1.7m/s) is lower than the one in summer (2.5m/s), the wind

velocity in winter is selected for obtaining more conservative prediction results. In this case, predicted air pollutant concentrations (with lower wind speed) may present higher values than it is in case of summer.

And, to convert the concentration of NOx to NO_2, the following formulation is applied (Source: Technical Handbook for Environmental Impact Assessment of Roads, 2007 Revision, HERI).

$$[NO_2]_R = 0.0683[NO_x]_R^{0.499} \times \{1-\{[NO_x]_{BG}/([NO_x]_R + [NO_x]_{BG})\}\}^{0.507}$$

In which,

$[NO_2]_R$: NO_2 contributed by the road (ppm)
$[NO_x]_R$: NO_x contributed by the road (ppm)
$[NO_x]_{BG}$: background NO_x (ppm)

The following data described in the report of the study "Integrated Action Plan to Reduce Vehicle Emissions in Viet Nam" (Prepared by Multi-sectoral Action Plan Group, and chaired by Viet Nam Register, March 2002) are referred to for $[NO_x]_{BG}$.

Hanoi City (Nga Tu Vong Road Intersection), [NOx] = 0.13 mg/m^3 (in 1999).

1.3. Prediction results

Results of prediction of pollutants in ambient air in one hour in a winter day of the years 2015, 2020 and 2030 are described in the following tables.

In addition, the following background air pollutant concentrations are included to the predicted air pollutants emitted by vehicles.

Table 7 Background air pollution concentration (unit: µg/m^3)

Survey site	Survey day	SO2	NO2	SPM	CO
A1	10-Aug-08	50	42	130	3,448
	12-Aug-08	52	42	131	3,497
	Average	**51**	**42**	**131**	**3,473**
A2	10-Aug-08	46	51	93	4,019
	12-Aug-08	46	49	91	4,035
	Average	**46**	**50**	**92**	**4,027**
A3	10-Aug-08	47	35	92	3,786
	12-Aug-08	48	36	88	3,899
	Average	**48**	**36**	**90**	**3,843**
A4	10-Aug-08	62	45	119	4,128
	12-Aug-08	61	44	120	4,227
	Average	**62**	**45**	**120**	**4,178**

Data source: EIA Report of Tan Vu – Lach Huyen Highway Construction Project, Hanoi May 2010.

Table 8 Predicted air pollutant concentrations in winter at A1 (K1) survey point (h =3.3m, with background concentration added)

(unit: μg/m3)

Year	2015				2020				2030			
Distance (m)	SO2	NO2	CO	TSP	SO2	NO2	CO	TSP	SO2	NO2	CO	TSP
10	52.0	44.1	3,496	130.9	53.1	45.4	3,506	131.2	60.7	52.7	3,566	132.5
20	51.8	43.7	3,491	130.8	52.6	44.7	3,499	131.0	58.6	50.6	3,546	132.1
30	51.7	43.4	3,488	130.8	52.4	44.2	3,494	130.9	57.3	49.2	3,533	131.8
40	51.6	43.2	3,486	130.7	52.2	43.9	3,491	130.9	56.4	48.3	3,524	131.6
50	51.5	43.0	3,484	130.7	52.0	43.7	3,489	130.8	55.7	47.5	3,518	131.5
70	51.4	42.8	3,482	130.7	51.8	43.3	3,485	130.8	54.7	46.4	3,508	131.3
100	51.3	42.6	3,479	130.6	51.6	43.0	3,482	130.7	53.7	45.3	3,499	131.1
TCVN 5937-2005	350	200	30,000	300	350	200	30,000	300	350	200	30,000	300

Table 9 Predicted air pollutant concentrations in winter at A2 (K3) survey point (h =2.3m, with background concentration added)

(unit: μg/m3)

Year	2015				2020				2030			
Distance (m)	SO2	NO2	CO	TSP	SO2	NO2	CO	TSP	SO2	NO2	CO	TSP
10	46.6	51.3	4,043	92.3	47.2	52.0	4,049	92.4	49.6	54.5	4,068	92.8
20	46.5	51.0	4,039	92.2	46.9	51.5	4,044	92.3	48.7	53.4	4,058	92.6
30	46.4	50.8	4,037	92.2	46.7	51.3	4,041	92.2	48.2	52.8	4,052	92.5
40	46.3	50.7	4,035	92.1	46.6	51.1	4,039	92.2	47.9	52.4	4,048	92.4
50	46.3	50.6	4,034	92.1	46.5	50.9	4,037	92.2	47.6	52.1	4,045	92.4
70	46.2	50.5	4,033	92.1	46.4	50.7	4,035	92.1	47.3	51.6	4,042	92.3
100	46.2	50.3	4,031	92.1	46.3	50.5	4,033	92.1	46.9	51.2	4,038	92.2
TCVN 5937-2005	350	200	30,000	300	350	200	30,000	300	350	200	30,000	300

Table 10 Predicted air pollutant concentrations in winter at A3 (K4) survey point (h =3.4 m, with background concentration added)

(unit: μg/m3)

Year	2015				2020				2030			
Distance (m)	SO2	NO2	CO	TSP	SO2	NO2	CO	TSP	SO2	NO2	CO	TSP
10	48.0	36.6	3,857	90.2	48.6	37.3	3,862	90.4	50.7	39.5	3,879	90.7
20	47.9	36.4	3,854	90.2	48.3	36.9	3,858	90.3	50.0	38.7	3,871	90.6
30	47.9	36.3	3,852	90.2	48.2	36.7	3,855	90.2	49.6	38.2	3,866	90.5
40	47.8	36.1	3,850	90.1	48.1	36.5	3,854	90.2	49.3	37.8	3,863	90.4
50	47.8	36.1	3,849	90.1	48.0	36.4	3,852	90.2	49.1	37.5	3,860	90.3
70	47.7	35.9	3,848	90.1	47.9	36.2	3,850	90.1	48.7	37.1	3,857	90.3
100	47.7	35.8	3,846	90.1	47.8	36.0	3,848	90.1	48.4	36.7	3,853	90.2
TCVN 5937-2005	350	200	30,000	300	350	200	30,000	300	350	200	30,000	300

Table 11 Predicted air pollutant concentrations in winter at A4 (K5) survey point (h =4.2 m, with background concentration added)

(unit: μg/m3)

Year	2015				2020				2030			
Distance (m)	SO2	NO2	CO	TSP	SO2	NO2	CO	TSP	SO2	NO2	CO	TSP
10	62.0	45.6	4,191	119.7	62.5	46.2	4,196	119.8	64.5	48.2	4,211	120.1
20	61.9	45.4	4,188	119.7	62.3	45.9	4,192	119.8	63.9	47.5	4,205	120.0
30	61.8	45.2	4,186	119.7	62.2	45.6	4,190	119.7	63.5	47.1	4,200	119.9
40	61.8	45.1	4,185	119.6	62.1	45.5	4,188	119.7	63.2	46.7	4,197	119.9
50	61.8	45.0	4,184	119.6	62.0	45.4	4,187	119.7	63.0	46.4	4,195	119.8
70	61.7	44.9	4,183	119.6	61.9	45.2	4,185	119.6	62.7	46.1	4,191	119.8
100	61.7	44.8	4,181	119.6	61.8	45.0	4,183	119.6	62.4	45.6	4,188	119.7
TCVN 5937-2005	350	200	30,000	300	350	200	30,000	300	350	200	30,000	300

2. Impact of Noise during Operation Phase

2.1. Prediction model

Road traffic noise prediction model "ASJ RTN-Model 2003" developed by the Acoustical Society of Japan is used to predict impact of noise caused by the Project during operation phase.

The mathematical calculation equation is as follow:

$$LAeq = 10\log_{10}(\Sigma_{i=1}^{k} 10^{LAi/10} * \Delta t * N/t)$$

where

LAi	$= Lw - 8 - 20\log_{10}(r) + \Delta Ld + \Delta Lg + \Delta Lm$
Lw	: the A-weighted sound power level of a single running vehicle at the i^{th} source position (dB)
r (m)	: the direct distance from the i^{th} source position to the prediction point
ΔLd	: correction for diffraction (dB),
ΔLg	: correction for the ground effect (dB)
ΔLm	: correction for atmospheric absorption (dB)
N	: predicted traffic volume (unit/hr)
Δt	: passing time = ΔD/V
ΔD	: distance berween noise source (m)
V	: average vehicle speed (m/s)

The A-weighted sound power level of a road vehicle is given by:

$$Lw = r_1 + r_2 * \log_{10}(V) + C$$

where Lw is the sound power level [dB], V is the vehicle speed [km/h], r_1 and r_2 are regression coefficients, and C is the correction term from a reference value (the power level when the vehicle runs on a dense asphalt pavement constructed within the last several years).

For the Project, to simplify the calculation, C is intentionally obmissed, and Lw is calculated as follow:

$$Lw \text{ (big car)} = 53.2 + 30\log_{10}(v)$$
$$Lw \text{ (small car)} = 46.7 + 30\log_{10}(v)$$

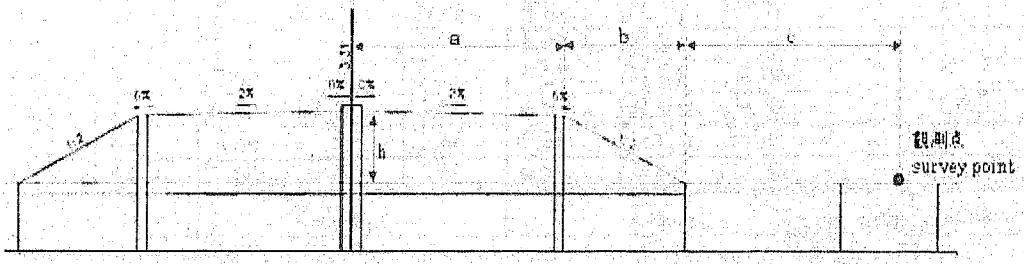
2.2. Input data

Table 12 shows the location, height of road surface, distance from the center of the road to the road side of the road section at the survey sites (A1~A4).

Table 12 Dimension of road cross-sections

(unit=m)

No.	Section	h	a	b	a+b
A1	0+600	3.3	14.75	6.2	21.35
A2	10+500	2.3	14.75	4.6	19.35
A3	12+000	3.4	14.75	6.8	21.55
A4	14+000	4.2	14.75	8.4	23.15



The distances (c) from the survey point are set as 10m. 20m, 30, 40m, 50, 70m, and 100m from the road embankment side (at the distance a+b from the road center), at 1.2 m high from the land surface.

Table 13 Hour Traffic Volume at Section of Tan Vu – Dinh Vu

(Unit: vehicles/hr)

Year	At day time (6am~18pm)			At night time (18pm~22pm)			At midnight (22pm~6am)		
	2015	2020	2030	2015	2020	2030	2015	2020	2030
Motorcycle	5,483	7,600	9,006	2,303	3,192	3,782	494	684	811
Small car	330	1,128	4,000	139	474	1,680	30	102	360
Big car	214	468	1,866	90	197	784	19	42	168

Table 14 Hour Traffic Volume at Section of Dinh Vu – Cat Hai

(Unit: vehicles/hr)

Year	At day time (6am~18pm)			At night time (18pm~22pm)			At midnight (22pm~6am)		
	2015	2020	2030	2015	2020	2030	2015	2020	2030
Motorcycle	3,461	4,728	3,722	1,454	1,986	1,563	311	425	335
Small car	208	702	1,655	88	295	695	19	63	149
Big car	88	203	606	38	86	254	8	19	54

2.3. Prediction results

Table 15 Predicted Noise Level at Survey Site A1 (K1)

(Unit: dBA)

Distance c (m)	In day-time (6am~18pm)			In night-time (18pm~22pm)			In midnight (22pm~6am)		
	2015	2020	2030	2015	2020	2030	2015	2020	2030
10	61.9	65.5	71.0	58.1	61.8	67.2	51.5	55.1	60.5
20	61.7	65.3	70.8	58.0	61.6	67.0	51.3	54.9	60.3
30	61.3	65.0	70.4	57.6	61.2	66.7	50.9	54.5	60.0
40	60.9	64.6	70.0	57.2	60.8	66.2	50.5	54.1	59.6
50	60.6	64.2	69.6	56.8	60.4	65.9	50.1	53.7	59.2
70	59.8	63.4	68.9	56.1	59.7	65.1	49.4	53.0	58.4
100	58.9	62.5	68.0	55.1	58.8	64.2	48.4	52.1	57.5
TCVN5949-1998*	75 dBA			70 dBA			50 dBA		

**Note: Allowable maximum noise level at business-service-shopping-industrial mixed residential area*

Table 16 Predicted Noise Level at Survey Site A2 (K3)

(Unit: dBA)

Distance c (m)	In day-time (6am~18pm)			In night-time (18pm~22pm)			In midnight (22pm~6am)		
	2015	2020	2030	2015	2020	2030	2015	2020	2030
10	61.4	64.9	68.5	57.6	61.1	64.7	50.9	54.5	58.0
20	60.8	64.3	67.9	57.1	60.6	64.1	50.4	53.9	57.4
30	60.2	63.7	67.3	56.5	60.0	63.5	49.8	53.3	56.8
40	59.7	63.2	66.7	55.9	59.4	63.0	49.2	52.7	56.3
50	59.1	62.7	66.2	55.4	58.9	62.4	48.7	52.2	55.7
70	58.3	61.8	65.3	54.5	58.0	61.6	47.8	51.3	54.9
100	57.2	60.7	64.3	53.4	56.9	60.5	46.7	50.3	53.8
TCVN5949-1998	60 dBA			55 dBA			50 dBA		

Table 17 Predicted Noise Level at Survey Site A3 (K4)

(Unit: dBA)

Distance c (m)	In day-time (6am~18pm)			In night-time (18pm~22pm)			In midnight (22pm~6am)		
	2015	2020	2030	2015	2020	2030	2015	2020	2030
10	59.5	63.2	66.6	55.8	59.3	62.8	49.1	52.6	56.1
20	59.4	62.9	66.5	55.6	59.1	62.7	48.9	52.5	56.0
30	59.0	62.5	66.1	55.3	58.8	62.3	48.6	52.1	55.6
40	58.6	62.2	65.7	54.9	58.4	61.9	48.2	51.7	55.2
50	58.3	61.8	65.3	54.5	58.0	61.6	47.8	51.3	54.9
70	57.5	61.1	64.6	53.8	57.3	60.8	47.1	50.6	54.1
100	56.6	60.2	63.7	52.9	56.4	59.9	46.2	49.7	53.2
TCVN5949-1998	60 dBA			55 dBA			50 dBA		

Table 18 Predicted Noise Level at Survey Site A4 (K5)

(Unit: dBA)

	In day-time (6am~18pm)			In night-time (18pm~22pm)			In midnight (22pm~6am)		
Distance c (m)	2015	2020	2030	2015	2020	2030	2015	2020	2030
10	58.5	62.0	65.6	54.7	58.3	61.8	48.0	51.6	55.1
20	58.5	62.0	65.6	54.8	58.3	61.8	48.1	51.6	55.1
30	58.3	61.8	65.4	54.5	58.1	61.6	47.8	51.4	54.9
40	58.0	61.5	65.1	54.3	57.8	61.3	47.6	51.1	54.6
50	57.7	61.2	64.8	53.9	57.4	61.0	47.2	50.8	54.3
70	57.1	60.6	64.2	53.3	56.8	60.4	46.6	50.2	53.7
100	56.3	59.8	63.3	52.5	56.0	59.6	45.8	49.4	52.9
TCVN5949-1998	60 dBA			55 dBA			50 dBA		

Appendix-8: Environmental Checklist for Tan Vu - Lach Huyen Highway Construction Project

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	1) Have EIA reports been officially completed? 2) Have EIA reports been approved by authorities of the host country's government? 3) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? 4) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	1) In 2009, the EIA report was submitted by VIDIFI (the former Project proponent) to Hai Phong City People's Committee for approval. However, in December 2009, The Prime Minister decided to transfer the Project Proponent title from VIDIFI to MoT. Therefore, under the VN regulations, it is MoT who is authorized entity to approve the EIA report. The PMU 2 under MoT revised the EIA report due to changing the Project Proponent and to be accordance with JBIC Guidelines. 2) The revised EIA report was approved by MoT on May 27, 2010 (Decision 1420/QD-BGTVT). 3) The EIA report was approved with a list of requirements. 4) Only the EIA report approval is required. No other environmental permit is required.
	(2) Explanation to the Public	1) Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public? 2) Are proper responses made to comments from the public and regulatory authorities?	1) Contents of the project, and potential impacts and proposed mitigation measures have been explained to the public, especially to five communes in the project site, under the procedure specified in the Vietnamese regulations. In addition, a consultation meeting was organized on April 28, 2010. Approximately 80 local residents and representatives of local authorities of Cat Hai District, Cat Hai Townlet, Nghia Lo Commune and Dong Bai Commune have participated the meeting. Participants

<table>
<tr><td></td><td></td><td></td><td>hade raised many comments and recommendations during the meeting. It seems that residents have been informed about outlines of the project through many formal and informal channels including hearing surveys carried out during F/S study.
2) Comments raised by local residents in the public consultation meeting had been recorded and carefully considered during the revision of EIA Report and RAP Report.</td></tr>
<tr><td>2 Mitigation Measures</td><td>(1) Air Quality</td><td>1) Is there a possibility that air pollutants emitted from various sources, such as vehicle traffic will affect ambient air quality? Does ambient air quality comply with the country's ambient air quality standards?
2) Where industrial areas already exist near the route, is there a possibility that the project will make air pollution worse?</td><td>1) Yes. The following table shows predicted data on ambient air quality.
Predicted ambient quality (unit: μg/m³) at the survey point 10m from the road embarkment side.
<table>
<tr><th></th><th></th><th>A1</th><th>A2</th><th>A3</th><th>A4</th><th>Standard*)</th></tr>
<tr><td>TSP</td><td>2015</td><td>19</td><td>45</td><td>10</td><td>2</td><td rowspan="3">300μg/m³ (1 hour average)</td></tr>
<tr><td></td><td>2022</td><td>31</td><td>71</td><td>16</td><td>3</td></tr>
<tr><td></td><td>2032</td><td>72</td><td>108</td><td>24</td><td>5</td></tr>
<tr><td>SO2</td><td>2015</td><td>112</td><td>254</td><td>56</td><td>11</td><td rowspan="3">350μg/m³ (1 hour average)</td></tr>
<tr><td></td><td>2022</td><td>207</td><td>460</td><td>102</td><td>20</td></tr>
<tr><td></td><td>2032</td><td>535</td><td>783</td><td>173</td><td>34</td></tr>
<tr><td>NO2</td><td>2015</td><td>154</td><td>354</td><td>78</td><td>15</td><td rowspan="3">200μg/m³ (1 hour average)</td></tr>
<tr><td></td><td>2022</td><td>275</td><td>620</td><td>137</td><td>27</td></tr>
<tr><td></td><td>2032</td><td>758</td><td>1134</td><td>250</td><td>49</td></tr>
<tr><td>CO</td><td>2015</td><td>2864</td><td>6622</td><td>1460</td><td>284</td><td rowspan="3">30,000 μg/m³ (1 hour)</td></tr>
<tr><td></td><td>2022</td><td>4205</td><td>9468</td><td>2088</td><td>405</td></tr>
<tr><td></td><td>2032</td><td>6205</td><td>8818</td><td>1944</td><td>378</td></tr>
</table>
*) TCVN 5937:2005 Ambient air quality standard
Proposed mitigation measures described in the EIA Report:
- Planting trees at the road sides near the populous residential areas;
- Strictly control exhaust gas and dust emission during construction</td></tr>
</table>

			- Forbid trucks with over exhaust gas to use the road during operation phase. - Carry out regular maintenance of road and bridge pavement. Spray water regularly on road surface at least 10 days/time in dry season; - Take care of trees and landscape along the road. - Carry out monitoring of ambient air quality; 2) At present, industrial areas are not yet developed along the road. However, in the near future, in the west side (Dinh Vu peninsula) the Dinh Vu Industrial Zone will be expanded and in the east side (Cat Hai Island) the Lach Huyen International Port will be developed. There is a possibility that the project will make air pollution worse.
	(2) Water Quality	1) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? 2) Is there a possibility that surface runoff from roads will contaminate water sources, such as surface water, seawater, and groundwater? 3) Do effluents from various facilities, such as toll gate and parking areas/service areas comply with the country's effluent standards and ambient water quality standards? Is there a possibility that the effluents will cause areas that do not comply with the country's ambient water quality standards?	1) Yes. Mitigation measures: - At the start of site establishment, perimeter cut-off drains to direct off-site water around the site shall be constructed and internal temporary drainage works and erosion and sediment control facilities implemented. - The Contractor shall plan his works to minimize surface excavation works during the rainy season where practicable. - Channels, earth bunds, netting, tarpaulin and or sand bag barriers shall be used on site to manage surface water runoff and minimize erosion - All exposed earth areas shall be completed and re-vegetated as soon as possible after earthworks have been completed.

		4) Is there a possibility that oceanographic changes, such as alteration of ocean currents, and reduction in seawater exchange rates (deterioration of seawater circulation) due to modification of water areas, such as shoreline modifications, reduction in water areas, and creation of new water areas will cause changes in water temperature and water quality? 5) In the case of the projects including land reclamation, are adequate measures taken to prevent contamination of surface water, seawater, and groundwater by leachates from the reclamation areas?	2) Yes. However the following mitigation measures will be included in the bidding documents and contracts, and would be carried out by contractors under supervision of General Consultant. - Drainage system and retention ponds will be constructed to collect and treat surface runoff from road prior to discharge to the local surface water bodies. A reservoir (200 ha) will be planned near the Tan Vu Interchange to collect and regulate runoff water from road on the Dinh Vu side, and other two retention ponds will be planned on the Cat Hai side (one near Ninh Tiep Hamlet, and one near Trung Hamlet) with similar functions . 3) Once the proposed mitigation measures to be strictly applied and well controlled, there is not a possibility. Sewerage from parking areas/ service areas shall be collected and treated by specified processes prior to discharge. 4) No. 5) For the land reclamation and other earthworks, the following measures are proposed. - Material stockpile sites, earthwork sites, and other construction sites where exposed land surface is vulnerable to runoff, etc. should be consolidated and/or covered; - The material stockpile site should be far away from surface water body and the area prone to surface run-off. The loose materials should be bagged and covered. Open ditch should be built around the stockpile site to intercept wastewater;

			- Construction wastes should be collected and re-used wherever possible, otherwise should be disposed in the small deposit area invulnerable to surface run-off, along with soil erosion prevention measures; - Prevent the oil leak from the operation of the machinery by the regular check; - Utilize excavated soil through recycling within the project; - Contract out treatment / dumping / recycling fo residual soil depending on soil quality.
	(3) Wastes	1) Is offshore dumping of dredged materials and soils properly performed in accordance with the country's standards to prevent impacts on the surrounding waters? 2) Are adequate measures taken to prevent discharge or dumping of hazardous materials to the surrounding water areas?	1) The sites and methods to dump dredged materials and soils will be examined carefully in the D/D stage. 2) The following measures are proposed. - Carry out analysis of toxic components of soil to be excavated; - Prohibit dumping of hazardous soils and wastes. - Obligate contractors to segregate construction wastes on-site to facilitate re-use, recycling and proper disposal; - Obligate contractors to contract out treatment/ dumping/ recycling of construction wastes to competent companies. - Waste oils, chemicals, paints and other materials used for machinery maintenance and construction shall be collected and stored in bunded areas on-site for resale/re-use or managed disposal without resulting in damage or pollution of the environment. Waste storage sites shall be located away from water areas. Designated waste storage areas shall be well maintained and cleaned regularly.

	(4) Noise and Vibration	1) Do noise and vibrations from vehicle comply with the country's standards?	1) The predicted noise level do not comply with the Vietnam country's standards. Following table shows predicted data on noise level (at the survey site located 10m from the road embankment side): *) TCVN-5949-1998 Proposed mitigation measures described in the EIA Report: - Plant trees along sections of road near the populous residential areas in Thon Hamlet and Ninh Tiep Hamlet, to mitigate impacts of noise, exhaust gas and dust to local residents; - Take care of trees planted along the road, and grasses planted at the road slope surfaces; - Install warning signs on road for horning bans and speed control at the road sections close to residential areas of Trung Hamlet and Ninh Tiep Hamlet; - Respond to monitoring results which show higher noise than projected by the EIA; - Regular maintenance on road to keep good road surface condition.

		A1	A2	A3	A4	Standard*)
6am ~ 18pm	2015	95	92	89	87	60 dBA
	2020	104	100	98	96	
	2030	115	109	106	104	
18pm ~22pm	2015	78	75	72	70	55 dBA
	2020	87	83	81	79	
	2030	98	92	89	87	
22pm ~6am	2015	70	67	65	63	50 dBA
	2020	79	76	73	71	
	2030	91	85	82	80	