

**MINISTRY OF HEALTH**

**Department of Health**

**Occupational of Health**



**Technical Report on Investigation  
of  
Physical Environmental Baselines  
as a component of  
Environmental Impact Assessment  
for  
Thilawar Special Economic Zone  
Petroleum Oil and Lubricant Project**

**May, 2013**

**Technical Report on Investigation of Physical Environmental Baselines**  
**as a Component of Environmental Impact Assessment for**  
**Thilawar Special Economic Zone, Petroleum Oil and Lubricant Project**  
**FEBRUARY, 2013**

**1. Introduction**

The proposed project could also include the following elements and components (associated infrastructure): tanks for storage of crude oil, raw materials, refined petroleum products, and feedstock, petroleum coke storage and handling facility; marine terminals for shipping and receiving crude oil, raw materials, refined petroleum products, feedstock and construction material, pipelines and electrical power lines. The environmental assessment will examine the potential environmental effects (both positive and negative) of the petroleum oil and lubricants (POL) project area, environmental situations along the river side related with POL projects and operation of all related facilities and infrastructure, and will identify appropriate mitigation measures.

**2. Objective**

The objective of this report was to express the baseline data on the quality of physical environment of the Thilawar special economic zone project area as a component of the Environmental Impact Assessment.

**3. Sampling Sites**

All Project sites are permitted from the government authority. There are along the Yangon river at sea gate and total area is 94272 sq meter. Therefore, 2 sample sites opposite end of the project area are chosen for the ambient air Quality Monitoring. For the assessment of the ambient air quality and sound level, two sampling sites are chosen in the Myat Myitta Mon Co. Ltd, one site is on the gate and another is river side (table. 1a and 1b).

<b>Table 1a: Air Quality Sample Sites</b>		
<b>Sr. No</b>	<b>Description</b>	<b>Location</b>
1	Gate on Myat Myitta Mon Co. Ltd.	N: 16° 40' 38.3'' E: 096° 14' 56.2''
2	River side on Myat Myitta Mon Co. Ltd.	N: 16° 40' 21.0'' E: 096° 14' 38.3''

<b>Table 1b: Acoustic Quality Sample Site Locations</b>		
<b>Sr. No</b>	<b>Description</b>	<b>Location</b>
1	Gate on Myat Myitta Mon Co. Ltd.	N: 16° 40' 36.6'' E: 096° 14' 54.2''
2	River side on Myat Myitta Mon Co. Ltd.	N: 16° 40' 22.6'' E: 096° 14' 39.8''

#### **4. Sampling period**

Air quality sampling and sound level were done for 24 hr on February, 2013.

#### **5. Base line Quality of Physical Environments**

##### **5.1 Ambient Air Quality**

##### **5.1.1 Parameters**

Total Suspended Particulate Matter, Respiratory Particulate Matter (PM<sub>10</sub>), Sulphur dioxide (SO<sub>2</sub>) and Nitrogen dioxide (NO<sub>2</sub>) in 24hr mean and Nitrogen dioxide for 1hr.

##### **5.1.2 Frequency**

The report covers the observations for the baseline data obtained in one cross-sectional survey.

##### **5.1.3 Method**

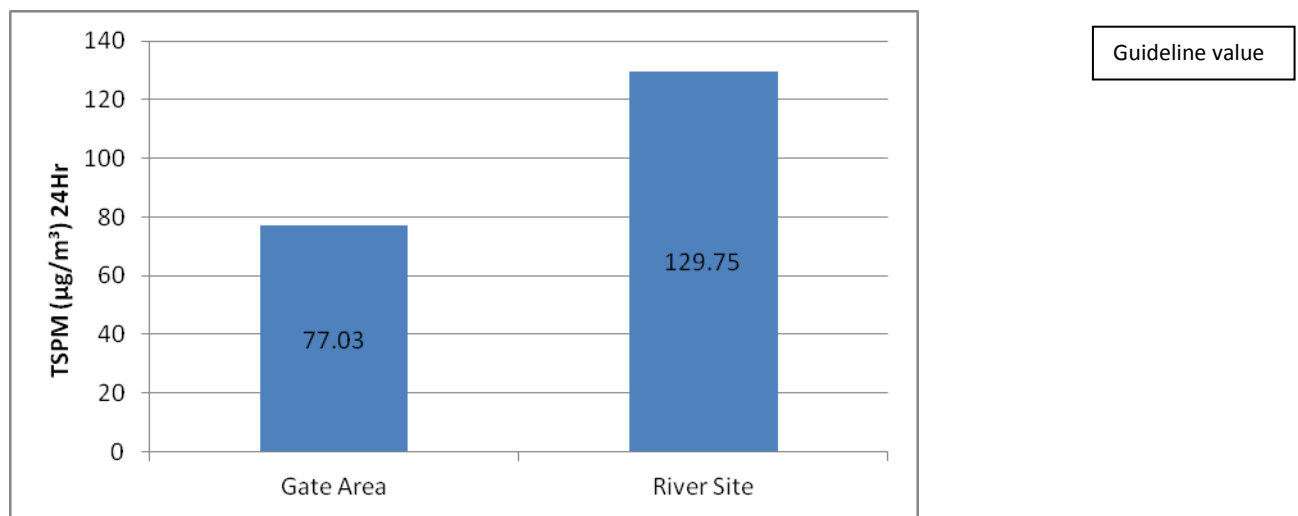
Ambient air sampling was conducted on two sites of Project area. Each sampling period was based on 24-hour measurement level of TSPM and PM<sub>10</sub> using high volume air sampler with glass-fibered filter and SO<sub>2</sub> and NO<sub>2</sub> with adsorbent liquids for each gas. The principle of TSPM and PM<sub>10</sub> sampling applied gravity metric-high volume method and measured by using microbalance. For SO<sub>2</sub> and NO<sub>2</sub>, the titration method is used to get the level.

#### 5.1.4 Ambient Air Quality

**Tabel 2: Ambient Air Quality**

Sample No.	Description	TSPM ( $\mu\text{g}/\text{m}^3$ ) 24Hr	PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ ) 24Hr	SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ ) 24Hr	NO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ ) 24Hr	NO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ ) 1Hr
1	Gate of the Co.	77.3	29.72	0.02	7.6	42.35
2	River side of the Co.	129.75	32.54	0.02	0.51	61.17

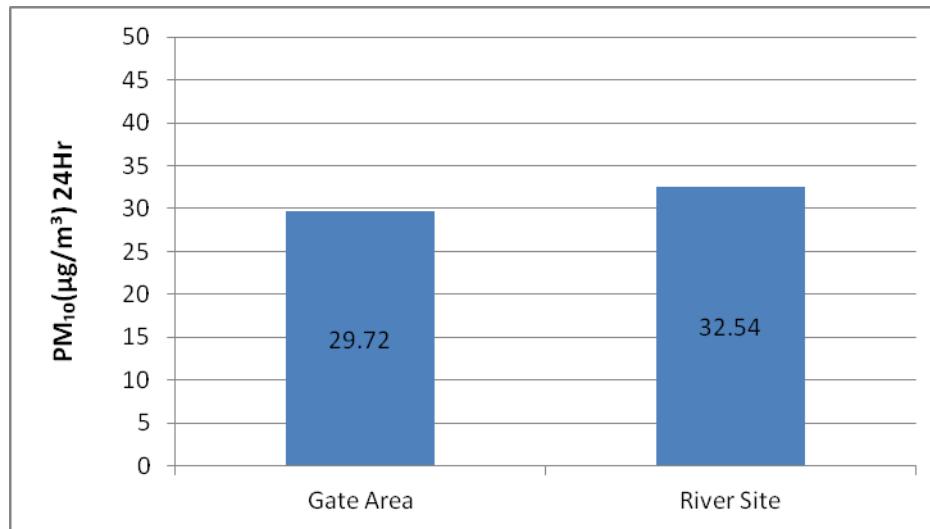
##### 5.1.4.1 Total Suspended Particulate Matter (TSPM)



**Figure 1: Total Suspended Particulate Matter (TSPM) concentration in sample sites**

The Result of Total Suspended Particulate Matter (TSPM) from both sample sites showed low concentration than guide line values ( $200\mu\text{gm}/\text{m}^3$ ).

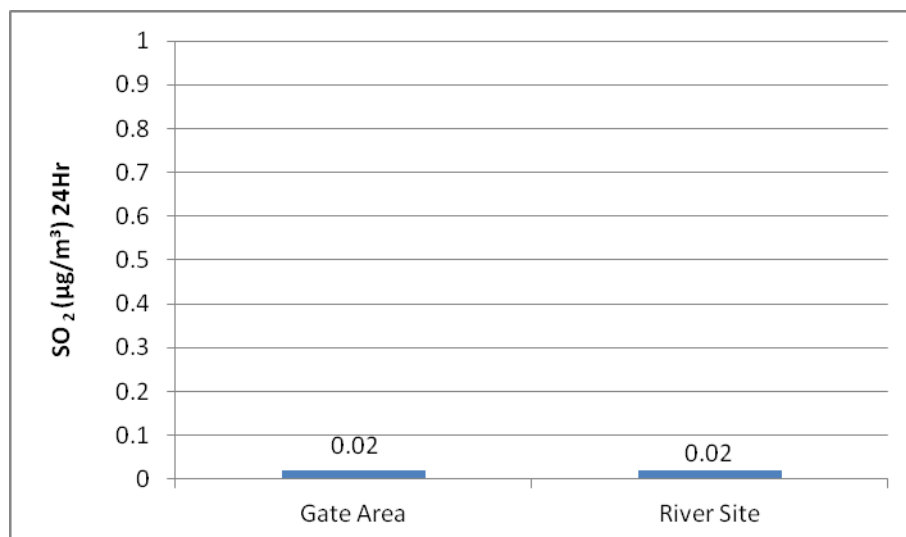
#### 5.1.4.2 Respiratory Particulate Matter (PM<sub>10</sub>)



**Figure 2: Respiratory Particulate Matter (PM<sub>10</sub>) concentration in sample sites**

The Result of Respiratory Particulate Matter (PM<sub>10</sub>) from both sample sites showed 29.27 µgm/m<sup>3</sup> and 32.54 µgm/m<sup>3</sup> and lower concentration than WHO guide line values (50 µgm/m<sup>3</sup>) in both sites.

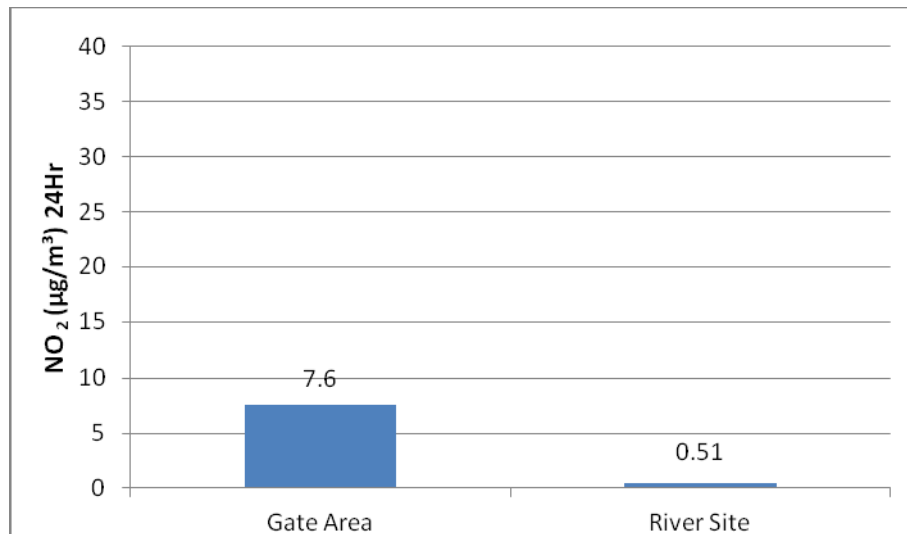
#### 5.1.4.3 Sulphur Dioxide (SO<sub>2</sub>)



**Figure 3: Sulphur Dioxide (SO<sub>2</sub>) concentration in sample sites**

The Result of Sulphur Dioxide (SO<sub>2</sub>) from both sample sites showed 0.02 µgm/m<sup>3</sup> and 0.02µgm/m<sup>3</sup> and lower concentration than WHO guide line values (20 µgm/m<sup>3</sup>) in both sites.

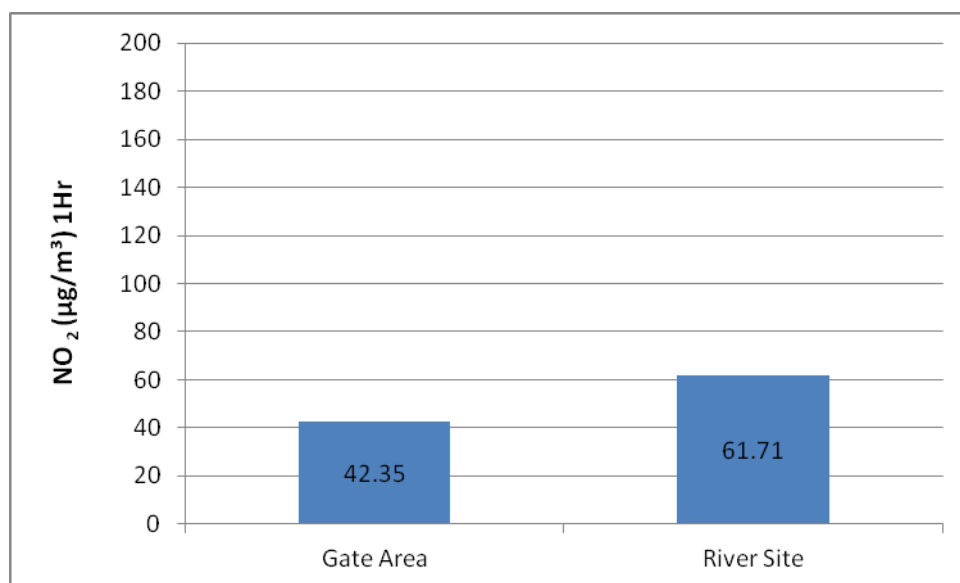
#### 5.1.4.4 Nitrogen Dioxide (NO<sub>2</sub>)



**Figure 4: Nitrogen Dioxide (NO<sub>2</sub>) concentration for 24hr mean in sample sites**

The Result of Nitrogen Dioxide (NO<sub>2</sub>) from both sample sites for 24hr mean showed 7.6 µgm/m<sup>3</sup> and 0.51 µgm/m<sup>3</sup> and lower concentration than WHO guide line values (40 µgm/m<sup>3</sup>) in both sites.

The Result of Nitrogen Dioxide (NO<sub>2</sub>) from both sample sites for 1hr mean showed 42.35 µgm/m<sup>3</sup> and 61.17 µgm/m<sup>3</sup> and also lower concentration than WHO guide line values (200 µgm/m<sup>3</sup>) in both sites.



**Figure 5: Nitrogen Dioxide (NO<sub>2</sub>) concentration for 1hr mean in sample sites**

## 5.2 Acoustic Environment

### 5.2.1 Parameters

Maximum sound pressure level (L<sub>max</sub>) and the equivalent continuous sound level (L<sub>eq</sub>) are measured at two sample sites of the Project areas.

### 5.2.2 Frequency

The report covers the observations for the baseline data obtained in one cross-sectional survey.

### 5.2.3 Method

Acoustic environment monitoring was performed in accordance with standard procedures adopted by American Conference of Governmental Industrial Hygienist (ACGIH) which is currently used in Myanmar.

### 5.2.4 Condition of acoustic environment

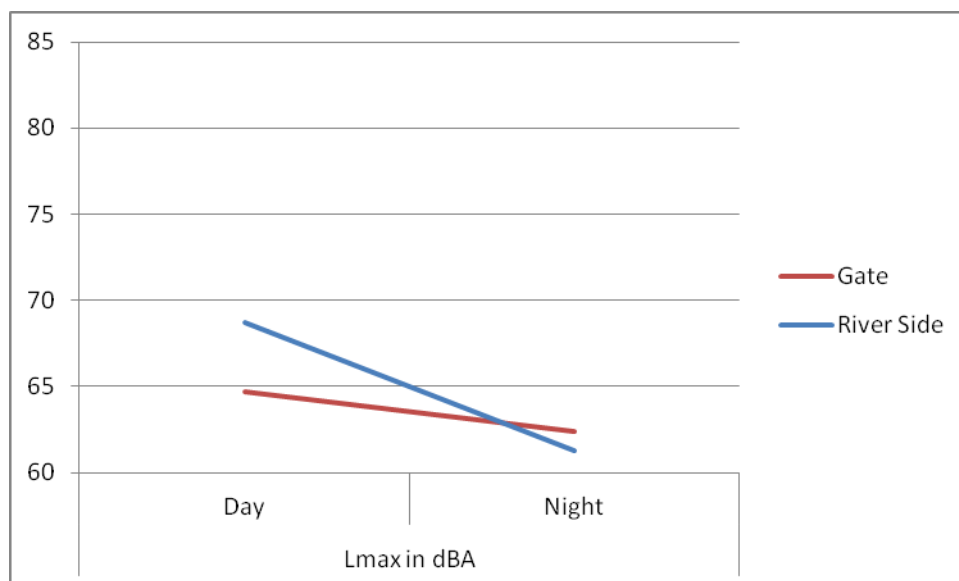
**Table 3: Measurement of Ambient Noise by sample sites.**

Time of Measurement	Gate (dBA)	River Side(dBA)
7:30	63.39	74.67
8:30	60.99	65.87
9:30	62.07	71.69
10:30	65.28	63.01
11:30	63.47	63.87
12:30	60.69	67.97
13:30	61.63	69.75
14:30	64.97	71.61
15:30	73.43	72.85
16:30	65.71	74.12
17:30	65.34	68.13
18:30	69.33	65.41
19:30	66.29	70.3
20:30	63.44	61.72
21:30	63.71	68.13
22:30	63.56	68.33
23:30	59.61	63.21
0:30	57.88	64.31
1:30	64.53	58.24
2:30	64.2	59.03
3:30	62.63	56.64
4:30	58.92	56.87
5:30	62.52	63.94
6:30	67.2	59.79

**Table 4: Quality of Ambient Noise.**

Sample No.	Description	Lmax in dBA		Leq in dBA	
		Day	Night	Day	Night
1	Gate of the Co.	64.73	62.4	77.99	72.77
2	River side of the Co.	68.72	61.27	81.94	72.42

#### 5.2.4.1 Maximum sound pressure level (LMax)



**Figure 6: Maximum sound pressure level (LMax) in sample sites**

Lmax, 24hr for Gate area = 63.87 dBA

Lmax, 24hr for River Side area = 66.02 dBA

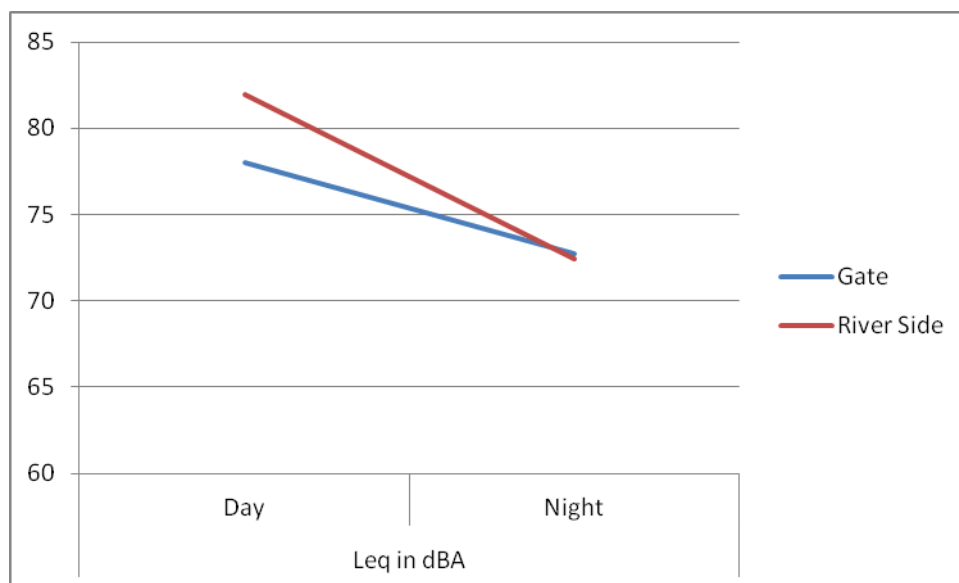
Maximum sound pressure level (Lmax), square root of mean of the square of the measurement values (RMS) in day is 64.73 dBA at the Gate area and 68.72 dBA at River Side area and these in night is 62.4 dBA at the Gate area and 61.27 dBA at River Side area. All values are increased that the position of observation should be taken into account.

#### 5.2.4.2 Equivalent continuous sound level ( $L_{eq}$ )

$L_{eq}$ , 24hr for Gate area = 76.67 dBA

$L_{eq}$ , 24hr for River Side area = 80.18 dBA

Equivalent continuous sound level ( $L_{eq}$ ), the constant noise level that would result in the same total sound energy being produced over a given period, in day is 77.99 dBA at the Gate area and 81.94 dBA at River Side area and these in night is 72.77 dBA at the Gate area and 72.42 dBA at River Side area. All values are increased that the position of observation should be taken into account.



**Figure 7: Equivalent continuous sound level ( $L_{eq}$ ) in sample sites**

## 6. Conclusion

The results of this survey showed that the baseline data of physical environment in observed area satisfied the environmental guidelines. The findings may be concluded only for this particular study period.

## 7. Recommendation

For the better applicability, it needs to reassess for seasonal variation. Furthermore, during construction phase and operation phase, continuous monitoring will be needed to complete the environmental impact assessment of a development project.