

Summary of Air Dispersion Modelling

The emission distribution model has been prepared for ambient air quality by Widya Cipta Buana Co. Ltd. and includes impact of the project based on Modelling Results. Following are the conclusions & Recommendations from this report:

I. Basis & Conclusion

1. Technical Specification of chimney is:
 - a. Height is 120 m
 - b. Diameter of bottom is 7 m, and top diameter is 2.5 m
 - c. Flue gas velocity is 22.5 m/s
 - d. Temperature in top of chimney is 50 °C
2. Coal consumption is: 720 TPD, so the quantity of ash from the coal combustion is 2.43 TPH or 58.32 TPD.
3. The quantity of bottom ash directly conveyed to ash storage is 5.832 TPD
4. Ash content with ESP of efficiency 99.8 % is 52.39 TPD, and ash emission to ambient air is 0.105 TPD
5. Ash emission with ESP efficiency of 99.8 % is 11.01 mg/Nm³ which is well within in limit of emission as per Decree of Environmental Ministry No. 13 year 1995, regarding emission standard for Power Plant based on Coal. The standard for ash is 150 mg/Nm³.
6. SO₂ gas production from coal combustion is 413.999 kg/h or 9.94 TPD.
7. Emission of SO₂ gas without FGD is 114,999.99 mg/sec or 1,041,76 mg/m³. With FGD of 70 % efficiency, the emission will be 3,499.99 mg/sec or 312.53 mg/m³. Standard is 750 mg/Nm³.
8. By operation of FGD with 70 % efficiency, the following items will be consumed :
 - a) Lime stone (CaCO₃) = 9.0216 TPD
 - b) Water consumption = 16.24 m³/day
 - c) Gypsum production = 12.27 TPD
9. NO_x gas production and emitted to air ambient quality is 507 mg/Nm³: hence the result is within the limit. Standard for NO_x is 850 mg/Nm³.
10. CO gas emission to air ambient quality is 3.84 TPD
11. The stability of atmosphere at day is C class (not stable) and at nights E class (stable.)

12. Concentration of dust maximum on day average based on annual modelling in the night in month of December is 40.55 ug/m³ and reduces with distance till (upto) 2,750 m. South side (Tegalnangklak Kampong and Pasimpih Kampong). The standard of dust as per Government Regulation No.41 year 1999, for 1 (one) year is 90 ug/m³.
13. Average Concentration maximum of SO₂ gas based on monthly modelling is in the month of April at day at 52.62 ug/m³. This value falls to southeast around of Kembang kuning 2. The standard of air ambient for SO₂ gas according Government Regulation No. 41 year 1999 for 1 hour measurement is 900 ug / m³. Thus the maximum value is within the specified limit.
14. The increment of average concentration at day max. of NO_x gas as per Monthly modelling happens in April at day at 67.68 ug/m³ that will fall to south-east around with village Kembang Kuning 2. The standard of air ambient for NO₂ area gas according Government Regulation No. 41 year 1999 for 1 hour measurement is 400 ug/m³, for 24 hr (1 day) is 150 ug/m³, and for 1 year is 100 ug/m³.
15. Following residential areas fall in the range of 750 – 7500 m of the plant location: Cikuya locality, Kembang Kuning 1 and 2, Tegal Nangklak, Sampih 1 and 2, Gunung Batu, Pasanggrahan, Sayangheulang, Cilegong and Cibong locality.
16. Wind direction dominant (based on BMG (Geophysical & Meteorological Station) Kalijati – Subang) is from East on May – October, so the potential impact falls in to the residential area of Cikuya locality near Jatiluhur Lake. During December – January, dominant wind direction is North West and potential impact falls in to Gunung Batu locality. During February – March, dominant wind direction is from west and potential impact falls in to Kembang Kuning 1 Kampong. During March, dominant wind direction is from East and potential impact falls to locality Sampih 1 & 2.

II. Recommendations :

1. Installation of Electrostatic Precipitator (ESP) unit with minimal efficiency 99.5% and optimal 99.8% and to be operated for 24 hr. (continuous).
2. Installation of FGD unit with efficiency 70% to be provided and operated for 24 hr continuous.
3. Monitoring system by active sampling method for air ambient quality monitoring needed for two seasons (summer and rainy) with twice sampling and measurement at day and at night.
4. Monitoring by passive sampling can be done continuously, for example for dust by “Dust Fall” method and for gas with “Tube”.

5. Measurement parameters are: particulate / dust, SO₂, NO_x, measurement time at day and at night, the period and monitoring location is :

- a) March : Cipeuteuy Kampong and Sampih.
- b) June : Cikuya Kampong and Kembang Kuning
- c) September : Cikuya 2 Kampong and Kembang Kuning 2
- d) December : Tegalnangklak Kampong and Cilegong.

6. Meteorology Instrument to be installed at power plant location including wind direction and air temperature. Minimum one year data result will be used for correction of model because all of meteorology data has been taken from BMG Kalijati Subang which is slightly far from project location, especially for wind direction whose prediction is not precise.

NOTE: The main Air Dispersion Modelling report consists of about 400 pages including about 104 Isopleths. The Report is available for Study by concerned persons at Jakarta and Purwakarta. The following Isopleths are made available with this document:

- 1. Annual Average for SO₂ during day
- 2. Annual Average for SO₂ during Night
- 3. Annual Average for NO_x during day
- 4. Annual Average for NO_x during Night
- 5. Annual Average for CO during day
- 6. Annual Average for CO during Night
- 7. Annual Average for PM during day
- 8. Annual Average for PM during Night
- 9. Tables for Annual and Daily Maximum Emissions