EXECUTIVE SUMMARY

Environmental Impact Assessment

For

The proposed 14.5 MW Coal based Captive Co-generation Power Plant within the existing facility

at

Village Puthukkadu, Kokkarakondi, Pirivu, Puthupeerkadavu, Taluk Sathyamangalam, District Erode, Tamil Nadu

Project Proponent

M/S SRI ANDAL PAPER MILL PRIVATE LIMITED (POWER DIVISION)

EIA Consultant

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i. Introduction

Sri Andal Paper Mill group is operating three numbers of waste paper based kraft paper mills at Puthupeerkadavu Village, Sathyamangalam in Coimbatore District under the name of Sri Andal Paper Mills Pvt. Limited with 60 TPD capacity, Sri Andal Paper Mills Unit II Pvt Limited with a capacity of 200 TPD and Sri Andal Paper and Board Pvt Limited with capacity of 80 TPD. All these facilities are located contiguous to each other. These paper mills complex is supported by common facilities such as administrative block, water supply system and power distribution.

The management of M/s. Sri Andal Paper Mills Private Limited with 60 TPD capacity (hereafter referred to SAPML/Existing facility) proposes installation of a 14.5 MW coal based captive co-generation power plant within the premises of Sri Andal Paper Mill complex bearing the plot numbers of 533/1,534/4,540/8 and 541/1 to meet the power demand of all the three facilities within the complex and also to export any excess power to the state electricity grid.

The existing facility of 60 TPD capacity is manufacturing kraft paper with the recycled waste paper without deinking, bleaching and coloring processes, which was developed in the year 2000. Hence, it does not attract EIA Notification 2006 and obtaining prior Environmental Clearance (EC) was not applicable for the existing facility. However, the facility holds a valid Consent to Operate (CTO) from Tamil Nadu Pollution Control Board vide No 1808112739756 dated 14.05.2018 with the validity holding until 31.03.2023.

a) Project of Interest

The proposed project involves the installation of a coal based Captive Co-generation Power Plant of capacity 14.5 MW. The existing kraft paper manufacturing facility of SAPML has been operating depending on the power supply from the grid. To become less dependent on the grid supply, SAPML has proposed to install an onsite coal-based captive power plant of 14.5 MW to meet the power demand in the kraft paper mill complex. Imported coal will be used for the proposed power plant.

Considering the kraft paper/board demand for the rapidly growing packaging industry in India, the management of Sri Andal Paper mill envisages to expand the production capacity of the existing mill complex from current level of 200 TPD (6000 TPM) to 800 TPD (24,000 TPM) for which Consent to Establish (CTE) has already been obtained from TNPCB vide No. 1906127380740 dated 9.8.2019. However, the impacts due to expansion of the paper mill has been taken into consideration for the preparation of EIA report for the proposed project of installing the coal based Captive Co-generation Power Plant.

b) EIA Study

Although the existing paper mill facility doesn't fall under EIA Notification 2006 and its amendments, the proposed 14.5 MW coal based Captive Co-Generation Power Plant within the existing plant of Sri Andal Paper Mills Private Limited attracts the provisions of EIA Notification 2006.

The project site is located at a distance of 2.15 km from the Sathyamangalam Tiger Reserve which is a Protected area as notified under the Wild Life (Protection) Act, 1972 and 1.364 km from the declared Eco-sensitive Zone. Therefore, it attracts General Condition and thus is considered as Category "A" project under sector 1(d) of the EIA Notification 2006.

The proposed project was appraised by the Expert Appraisal Committee (Industry-1), Ministry of Environment Forest and Climate change (MoEF&CC) during the 38th Expert Appraisal Committee (EAC) meeting held on 21st February 2020and the project was accorded Terms of Reference (ToR) vide File no. J-13012/02/2020-IA-I(T) dated 13.04.2020.

The EIA study was undertaken in conformity with the guidelines of the Ministry of Environment, Forests and Climate Change (MoEF&CC) and Expert Appraisal Committee (EAC), covering all the aspects of the specific conditions mentioned in the terms of reference issued by MoEF&CC.

ii. Project Description

The proposed coal-based co-generation powerplant of 14.5 MW will be installed as part of one of the three units i.e. Sri Andal Paper Mills Pvt. Limited with a production capacity of 60 TPD. The Sri Andal paper mills complex comprises of three units which is located in an area of 64.4 Ha, whereas the proposed power plant will be installed within the premises of mill complex in the vacant land with a total area of 4.86 ha.

The details of the project configuration are presented in below table;

Table 1: Salient Features of the Proposed 14.5 MW Coal Based Power Plant

Parameter	Specifications/details
Power Generation Capacity	1 X 14.5 MW
Cost of Project	Rs. 55 Cr
Type of Fuel	Coal (Indonesian)
Source of Fuel	Imported from Indonesia - unloaded from Tuticorin Port and transported through road
Coal Requirement	450 T/day
Water Requirement	297 m^3/day (0.9 liters/kwhr)
Source of Raw water	Bhavani River
Capacity of Boiler	100 TPH at 105 kg/cm^2 working pressure
Type of Boiler	Atmospheric Fluidized Bed Combustion (AFBC)
Stack Height	70 m
Rated capacity of Turbo-generator	1x 14.5 MW

Pollution control equipment	Electrostatic precipitators with stack particulate emission less than 30 mg/Nm^3
Cost of Pollution Control Equipment	Rs. 1.5 Cr
Ash Generation	45 Tons/day
Ash disposal	Sold to brick manufacturers without storage
Total Employment generation	50 persons (During Operation)

a) Project Requirements

Land: Land requirement for the proposed 1 x 14.5 MW Captive Co-generation power plant project including associated facilities will be around 12 acres (4.86 ha) which will be housed within the vacant land available as part of the existing 60 TPD paper mill. No additional land will be acquired and hence displacement and rehabilitation of people are not envisaged.

Steam and Fuel: The proposed project involves the generation of 14.5 MW power from the captive co-generation power plant. The steam generation from the boiler is designed for 100% MCR (maximum continuous rating) flow of 100 TPH at 105 kg/cm^2 and 535$\pm$5°C while firing imported coal. The steam capacity of 85 TPH will be supplied for power generation of 14.5 MW and the remaining 15 TPH steam will be supplied to the Kraft paper manufacturing facility.

The details of the fuel requirement for the proposed project are presented in Table below;

Table 2: Details of the fuel requirement

Sl. No.	Parameter	Description
1	Type of coal	Imported Coal (Indonesian)
2	Quantity of coal	450 TPD based on 4306 Kcal/Kg of coal.
3	Mode of transportation	Proposed to be unloaded at Tuticorin Port and will be transported by road for a distance of 400 km
4	Gross Calorific value (GCV)	4306 to 5500 Kcal/kg as per the international specifications for Indonesian coal. For the purpose of worst-case peak coal consumption, lower calorific value has been considered.
5	Ash content	3% to 10% as per the international specifications for Indonesian coal. For the purpose of worst-case peak ash generation, higher value has been considered for EIA study.
6	Sulphur content	0.15% to 0.5% as per the international specifications for Indonesian coal. For the purpose of worst case peak SO_2 emission generation, higher value has been considered for EIA study.

Water: The freshwater requirement for the proposed 14.5 MW power plant will be in the order of 297 m^3/day. SAPML is permitted to draw about 750 m^3/day of water from the Bhavani River for the existing paper mill complex. In addition, for the proposed project the facility has already obtained permission from Public Works Department (Water Resource Division), Govt. of Tamil Nadu vide Order dated 20.8.2019 for the withdrawal of total freshwater of 1500 m^3/day from River Bhavani.

b) Other Supporting facilities

Coal handling and storage: The Coal Handling Plant (CHP) will be designed to operate throughout the year with coal having an ash content in the range of 3 to 10% w/w.. Imported coal (Indonesian coal) will be used for power generation. Coal will be unloaded at Tuticorin Port and will be transported by road for a distance of 400 km to the power plant and unloaded at the coal stockyard.

Ash handling and storage: The flue gas temperature after passing through the boiler will be reduced up to 135°C which passes through an ESP (Electro Static Precipitator) where the fly ash dust will be collected and conveyed to fly ash silo through the pneumatic conveying system. Suitable dust collection systems will be installed on the fly ash handling and storage silos area. The fly ash will be disposed of through bunkers for cement and fly ash brick manufacturing industries. Bottom bed ash will be collected and stored separately and will be utilized for road and village construction activities in the nearby area in association with district administration as per the fly ash utilization. No ash pond is proposed.

Air Cooled Cooling Tower: In order to conserve fresh water use in the power plant, it is proposed to install air cooled cooling tower. Due to this, fresh water use for cooling tower will be maintained less than 15 m^3/day as against the conventional water-cooled system's demand of about 700 to 1000 m^3/day.

iii. Summary of Baseline Monitoring Studies

The study area covers a 10 km radius around the boundaries of the project site. The project site (existing mill) is located at Puthukadu, Kokkarakondi Pirivu, Puduppeerkadavu village, Sathyamangalam Taluk, Erode District in the State of Tamil Nadu. The mill site lies within the coordinates of latitude 11°30' N and longitude 77°08' E. As a part of EIA, the primary baseline data monitoring has been conducted for three (3) months i.e., from 15th May 2020 to 14th August 2020 by an MoEF&CC approved & NABL accredited Environmental Testing Laboratory **M/s. Excellence Laboratory**.

The study area exhibits undulating terrain. *Bhavani river* passes through the study area in the south. *Bhavanisagar reservoir* is constructed at the upstream of the Bhavani river. The reservoir is located at an aerial distance of 4.3 km from the boundary of the facility

Soil samples were collected from eight (8) locations within the 10 km radius of the study area. The pH of the soil ranges from 6.6 to 7.9 indicating that soil characteristic which ranges from slightly acidic to moderately alkaline. The sodium and potassium content in the soil varies from 0.02-0.04% and 0.11-0.27%. The Sodium Absorption Ratio (SAR) value ranges from 25 to 61.

The predominant winds in the region blow from North-East to South-West. Ambient air quality monitoring was conducted at eight (8) locations in the study area considering the upwind and downwind direction. The average PM2.5 concentration in the study area ranged from 29.3 $\mu g/m^3$ to 34.5 $\mu g/m^3$. The average PM10 concentration in the study area ranged from 58.4 $\mu g/m^3$ to 68.9 $\mu g/m^3$. The average SO2 concentration in the study area ranged from 12.21$\mu g/m^3$ to 13.93$\mu g/m^3$. The average NOx concentration in the study area ranged from 21.66$\mu g/m^3$ to 23.77$\mu g/m^3$. The observed average concentrations of all criteria pollutants at all the locations were found to be well within the permissible range as per NAAQ standards prescribed by CPCB.

Noise levels were recorded at the project site and the other seven locations in the study area. The average day time noise levels at residential areas in the study area was found to be varying from 52.16dB(A) to 62.11dB(A) and the average night time noise levels varied from 50.04 dB(A) to 55.60 dB(A) respectively. At the existing plant site, the average noise level was found to be 56.49 dB (A) for day time and 50.70 dB (A) for night time. The observed values at few locations in the study area was observed to exceed the residential noise standards which may due to traffic noise whereas the ambient noise levels measured at project site were found to be complying with the industrial noise standards.

To assess the surface water quality in the study area, the water samples were collected at 66for the project. The TDS levels in the surface water of upstream and downstream were found to be 109 mg/l and 91 mg/l respectively. The Total Hardness of the surface water of upstream and downstream was found to be 45mg/l and 40mg/l respectively. The Biochemical oxygen demand (BOD) of water samples collected from both locations is less than 2mg/l.

To assess the groundwater quality of the study area, eight (8) groundwater sampling locations were selected. All the values of the analysis results were compared with drinking water standards as stipulated by CPCB and were found that the values are well within the permissible.

Sathyamangalam Wildlife Sanctuary (SWS) and Tiger Reserve are protected area along the Western Ghats located in the Indian state of Tamil Nadu. SWS and Sathyamangalam Tiger reserve are situated in 2.15 Km from the Project area. The Sujalkuttai-Bannari corridor is located in the Sathyamangalam RF Forest Division of Tamilnadu. Velamundi (R.F.) is a part of Sathyamangalam in Taluk situated in the Zone IV boundary between 5 to 10 KM radius from study area.

Primary Socio-economic survey was undertaken among the study area villages adjacent to the project site on 17th and 18th July 2020. Since the study was conducted during the COVID-19 pandemic situation, there was restriction in travel, to facilitate timely completion of project the representatives from the

respective study area villages were contacted virtually through video call / telephonic call and outcome of the discussion are filled in using an online socioeconomic interview schedules.

iv. Prediction of Impacts and Mitigation Measures

Area required for the proposed project will be around 12 acres (4.86 ha) which will be utilized from the vacant land available within the existing mill complex. Alternation or diversion of any natural water bodies or streams is not applicable in this scenario. As the construction activities of new installation will not necessitate any land acquisition, Rehabilitation and Resettlement (R&R) issues are not envisaged. During construction phase of the project, this project will provide indirect employment to about 200 people.

Air Quality Impacts and Mitigation Measures: The major source of emissions are Particulate Matter (PM), sulphur dioxide (SO_2) and oxides of nitrogen (NO_X) from proposed 14.5 MW coal based Captive Co-generation Power Plant. New AFBC boiler of 1x100 TPH capacity which is proposed to be under operation is considered for air quality modelling. The Indonesian coal to the tune of 450 TPD will be utilized for generating steam from the proposed AFBC boiler. As per the international specifications for Indonesian coal, Sulphur content will be varying from 0.15% to 0.5%.

Emissions from the boiler will be treated in high efficiency Electrostatic Precipitators (ESPs), and the emission from ESPs will be discharged into the stack. Based on the peak SO_2 emission release scenario, the minimum stack height required for the proposed boiler is estimated as 67 m, however stack height of 70 m is proposed for effective dispersion of pollutants in the atmosphere. No additional point source emissions from the proposed expansion of paper mill are envisaged

According to the new power plant emission regulations, the concentration of SO_2, NO_x and PM from the proposed power plants shall meet 100 mg/Nm^3, 100 mg/Nm^3 and 30 mg/Nm^3 respectively.

The fugitive dust emissions will be controlled by providing dust collectors at material transfer points and water spraying system at the storage facility.

Based on the findings of the detailed air quality modelling study, it has been inferred that the resultant cumulative concentration at the nearby villages will comply with the NAAQ Standards. The air quality modeling results indicate that the predicted GLC of the criteria pollutants envisaged from the proposed power plant gets rapidly diluted within 2 km radius. Hence the impacts on core zone of the notified ecological sensitive region is insignificant which is located at western side of the project site. Therefore, impact on the flora and faunal diversity would be negligible.

Noise emissions: SAPML has considered installing low noise generating equipment wherever applicable as per the recommended standards and guidelines. Some of the major noise generating

equipment will be housed inside the room with an average wall thickness of 230 mm to attenuate noise emissions. Based on this noise modelling analysis, it has been concluded that the additional noise emissions from the proposed project is insignificant and well within the standards prescribed by the CPCB.

Water and Wastewater: The total water requirement for the entire mill complex will be 3000 m^3/day post project scenario. 1500 m^3/day will be sourced from Bhavani River for which permission has been obtained from Public Works Department (Water Resource Division), Govt. of Tamil Nadu vide Order dated 20.8.2019. The remaining requirement of 1500 m^3/day will be met from treated wastewater generated from the process. The freshwater requirement for the proposed 14.5 MW power plant will be in the order of 297 m^3/day.

The total wastewater generation from the proposed project is about 69 m^3/day. Out of which about 24 m^3/day of wastewater generated as boiler blowdown will be directly utilized for ash quenching. Whereas wastewater generated from cooling tower bleed-off (5 m^3/day) and DM regeneration waste of 40 m^3/day will be treated in the new combined effluent treatment plant of capacity 6,300 m^3/day which is proposed to be installed within the mill complex with a low retention digester (ULRD).

No treated wastewater will be discharged outside the premises of the mill. As per the existing practices, entire quantity of wastewater generation (including the wastewater from proposed expansion project of existing kraft paper manufacturing) will be reused and recycled within the mill for processes and other applications.

The additional sewage generated due to the proposed project will be about 1.8 m^3/day which will be disposed-off through septic tank and soak pit.

Solid and Hazardous Waste Generation: The solid and hazardous waste generated from the SAPML paper mill facility during post project scenario will be disposed as per the existing practices adopted. Fly ash is the major solid waste (45 TPD) which will be generated due to the proposed project. Fly ash will be collected in dry form and stored in the silos and further given to end users for manufacturing cement and bricks. No ash pond is proposed for storing ash. Used oil is the only hazardous waste generation (1 KLA) which will be disposed-off through authorized recyclers. The facility shall obtain necessary hazardous waste authorizations for disposing the hazardous waste generated from the facility.

v. Summary and Conclusions

Employment: The project will create direct employment to about 50 persons. In addition, it would generate indirect employment to about 200 persons in the allied industries, service organizations, material handling, etc. during the operation phase. During the implementation and construction stage of the project, it will generate additional employment opportunities

CER Budget: CER Budget of Rs. 55 Lakhs has been embarked for the local community development within the vicinity of the project area for a period of 5 years.

Project Cost and EMP Budget: Out of total cost of the project (i.e.Rs. 55 Crores) about Rs. 7 Crores is allocated for environmental management and pollution control.

It is proposed to comply with all the environmental stipulated norms prescribed by CPCB/SPCB