EXECUTIVE SUMMARY

ON

ENVIRONMENTAL IMPACT ASSESSMENT

&

ENVIRONMENTAL MANAGEMENT PLAN

(EIA/EMP)

FOR

REGULARIZATION OF EXISTING AN MELT PLANT ALONG WITH PRODUCTION ENHANCEMENT FROM 1.4 LMT TO 1.9 LMT PER YEAR AT EXISTING RCF FACILITY, TROMBAY, MAHARASHTRA

OF

Let us grow together

RASHTRIYA CHEMICALS AND FERTILIZERS (RCF)

Prepared By

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List 'A' - Accredited EIA Consultant Organization by QCI-NABET

Certificate No. NABET/EIA/1821/SA 0124 (07th Jan, 2021)

JOB NO: EN-00252 **July, 2021**

EXECUTIVE SUMMARY

The EIA report has been prepared based on standard TOR in addition to Generic requirement as per EIA notification, 2006. It has been covered in 12 no. of chapters along with the supporting annexure excluding executive summary*.*

BACKGROUND

RCF is one of the most revered Public Sector Undertaking (PSU) of the Ministry of Chemical and Fertilizers of Government of India. It was established in 1978 after re-organization of Fertilizer Corporation of India (FCI).

RCF, a Public Sector Undertaking is engaged in the manufacture and marketing of Fertilizers and Industrial Chemicals. The company has presently two manufacturing units, located at Trombay and Thal, both in Maharashtra. The Trombay unit of RCF produces Urea, Complex Fertilizers, Bio-fertilizers, 100% water soluble fertilizer and variety of industrial chemicals such as Ammonia, Methanol, dilute Nitric Acid, Concentrated Nitric Acid, Sodium Nitrite/ Nitrate, Ammonium Bi-carbonate, Sulphuric acid, Ammonium Nitrate (AN), Argon etc.

In view of emerging new market and surge in demand of Ammonium Nitrate due to import restrictions during COVID-19 pandemic, it is essential to increase the existing production quantity by from 1.40 to 1.90 Lakh MT per annum using inherent production capacity of the plant.

In this regard, RCF pursued MPCB for amendment in Consent to Operate (CTO), who advised to obtain environmental clearance for the existing plant and enhanced production quantity as well in order to renew existing CTO. Thus, proposal for regularization of existing AN melt plant along with production enhancement and subsequent grant of environmental clearance is felt essential.

As per EIA Notification, published in Gazette of India, Extraordinary Part-II, Section-3, sub-section (ii) of Ministry of Environment & Forest dated 14.09. 2006 and subsequent amendments, the proposed project falls in Activity 5(a), Category-A of “List of Projects or Activities Requiring Prior Environmental Clearance”. All projects or activities included as Category ‘A’ in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, shall require prior environmental clearance from the Central Government in the Ministry of Environment Forests and Climate Change (MoEF&CC) on the recommendations of an Expert Appraisal Committee (EAC) constituted by the Central Government for the purposes of this notification.

The Environmental Impact Assessment and Management Plan has been undertaken to fulfill the basic requirement for protection of the environment according to the *standard TOR granted on 15.06.2021 vide letter no.* ***No.IA-J-11011/240/2021-IA-II(I)*** *against proposal no.* ***IA/MH/IND3/214585/2021*** *F.No.* ***IA-J-11011/240/2021-IA-II(I)*** *for conducting environment impact assessment study for chemical fertilizers and information to be included in EIA/EMP report* issued by the MoEFCC for seeking environmental clearance.

PROJECT PROPOSAL

RCF, Trombay at present, is producing AN-melt @ 1.4 LMT per annum (424.24 MT per day @330 Working days) using Ammonia and dilute Nitric acid in Calcium Ammonium Nitrate (CAN) section of existing Ammonium Nitro Phosphate (ANP) plant after in-house modification of AN Melt section of ANP plant. RCF can safely produce upto 600 MTPD AN Melt from existing plant. So the enhanced production is possible without any modification / addition in the existing plant. There is increase in demand for AN melt in recent past from PSUs like Coal India Limited, especially post COVID-19 pandemic. In view of the national vision of "Atmanirbhar Bharat" and to meet the growing domestic demand, it is proposed to regularize existing AN Melt plant along with production enhancement from 1.4 Lakh MTPA to 1.9 Lakh MTPA (considering production of 575 MTPD and 330 stream days) of AN Melt.

DETAILS OF EIA CONSULTANT

Projects & Development India Limited (PDIL), a premier engineering and NABET accredited EIA consultant organization (NABET/EIA/1821/SA 0124), have been retained by RCF for preparation of EIA Report, online submission and obtaining environmental clearance from MoEF&CC..

PDIL is a Mini Ratna, Category-I, Govt. of India Undertaking under Department of Fertilizers. PDIL is an ISO 9001:2015, ISO-45001:2018 Certified and ISO/IEC 17020:2012 accredited premier Engineering & Consultancy Organization which has played pivotal role in the growth of Indian Fertilizer Industry.

PROJECT COST & COMPLETION SCHEDULE

A nominal cost of Rs. 61.75 lakh have been envisaged to be incurred as the existing plant has capacity to produce AN Melt @ 1.9 LMT and does not require any modification in the existing facility.

PROJECT LOCATION

RCF Trombay Unit is located in Chembur Industrial Area in Ward M west, Chembur, suburban Mumbai, Maharashtra around geo-coordinates of 19002'10.579" North and 72053'19.233" East at an altitude of about 6m from MSL. Chembur is a suburb in eastern Mumbai. Eastern Express Highway is located at a distance of about 1 km from the unit. Chhatrapati Shivaji International Airport is located in north direction at a distance of about 6 km from Trombay Unit.

NEED & BENEFITS

The need and justification of the proposed project is summarized as under:

1. There is increase in demand for AN melt from PSUs like Coal India Limited. In view of the national vision of "*Atmanirbhar Bharat*" and to meet the growing domestic demand, RCF proposes to regularize existing AN Melt plant along with production enhancement from 1.40 to 1.90 Lakh MT per annum.
2. The project is of national interest for self-sufficiency in Ammonium Nitrate production and in-turn for the securing energy supply of the country as Ammonium Nitrate is mainly used in Coal Mining which is primarily used in Thermal Power Generation plants.
3. Use of Ammonium Nitrate in the production of fertilizers and explosive materials has significantly grown over the years and taken a major share of the organic chemicals market.
4. AN is popular for its readiness to mix with the soil and hence, is used as a favourable crop fertilizer to improve nitrogen content of soil.
5. It is also used for hay fertilization and pasture due to its less susceptibility towards volatilization losses in comparison with the Urea-based fertilizers.
6. It is a solution for foliar sprays that enables the plant to absorb the necessary elements through their leaves.

PRESENT ENVIRONMENTAL STATUS

Climate & Meteorology

The climate of the study area falls under tropical wet and dry climate under the *Köppen climate classification*, with seven months of dryness and peak of rains in July. The cooler season from December to February are followed by the summer season from March to June.

Ambient temperature was in the range of 24.5 to 35.9^{0}C

Relative humidity was in the range of 37.5 to 96.4%.

The rainfall 0.0 mm – 54 mm

Soil Environment

The soils of the area have following characteristics:

The texture of soil in the study area was sandy loam.

Level of Nitrogen as N ranged between 276.8 to 295.5 mg/Kg

Level of Phosphorous as P_2O_5 ranged between 54.8 to 72.8 mg/Kg.

Level of Potash as K_2O ranged between 128.4 & 140.0 mg/Kg

The proposed project activity will not impart any visible impact on the soil component of the environment.

Air Environment

Air pollution due to NOx and SO_2 does not invite any adverse comments. For CEPI calculation w.r.t. air component, only 03 parameters viz. – $PM_{2.5}$, SO_2 & NOx have been considered.

Table-E1
Summary of Air Quality

LOCATION CODE	PM_{10}/100			$PM_{2.5}$/60			SO_2/80			NO_2/80			AQI
	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	
SA1	50	78	63.8	23	47	35.3	16	23.2	19.8	31.9	45.2	37.5	Satisfactory
SA2	42	82	62.7	19	50	35.0	13.5	24.5	19.4	26.8	47.4	36.8	Satisfactory
SA3	36	86	62.3	16	52	35.0	10.5	23.8	17.8	22.5	49.8	36.4	Satisfactory
SA4	54	77	65.0	16.2	36.6	27.8	16.2	25.5	19.6	32.1	52.8	40.6	Satisfactory
SA5	49	75	61.1	24.9	39.2	30.4	15.2	23.9	18.4	31.2	46.5	37.8	Satisfactory
SA6	49	77	61.3	22.5	34.1	28.2	13.2	20.6	16.6	30.1	45.5	37.6	Satisfactory
SA7	47	74	60.0	21.6	33.7	27.2	16	23.2	19.8	29.5	46.5	37.0	Satisfactory
SA8	45	70	57.9	20	45	32.9	13.5	24.5	19.4	28.0	43.1	34.9	Satisfactory

The air environment has a good buffering and tolerance capacity to remain in the II category of (satisfactory) as per the study conducted by PDIL. Thus no noticeable impact of air environment due to the project during construction and operation has been envisaged.

National Air Quality Index

AQI	Possible Health impacts
Good (0–50)	Minimal Impact
Satisfactory (51–100)	Minor breathing discomfort to sensitive people
Moderate (101–200)	Breathing discomfort to the people with lung, heart disease, children and older adults
Poor (201–300)	Breathing discomfort to people on prolonged exposure
Very Poor (301–400)	Respiratory illness to the people on prolonged exposure
Severe (>400)	Respiratory effects even on healthy people

The AQI dwells between good to satisfactory as per categorization under Swachchh Bharat Abhiyaan with health impact of minor breathing discomfort to sensitive people. It has been envisaged that the proposed plant will have well sustainable impact on the air component of the environment.

Water Environment

Eight numbers of ground water and eight numbers of surface water samples have been collected and characterized during the study period. The calculation of Pollution Index is as follows:

Where,

$$EF = \frac{\text{Analytical value}}{\text{Standard}}$$

$$SNLF = \frac{\text{EF X No. of samples exceeding standard}}{\text{Total No. of sample under study}}$$

Table- E2
Calculation of EPI for Surface Water within study area

PARAMETERS	STANDARD AS PER IS: 10500	SW	
		EF	SNLF
Total Dissolved Solids	500	33.40	25.05
Total Alkalinity	200	0.92	0.11
Total Hardness	300	11.16	8.37
Chloride as Cl	250	36.41	22.76
Sulphate as SO_4	200	4.02	3.02
Nitrate as NO_3	45	0.58	0.07

Table – E3
Calculation of EPI for Ground Water within study area

PARAMETERS	STANDARD AS PER IS: 10500	GW	
		EF	SNLF
Total Dissolved Solids	500	1.26	0.95
Total Alkalinity	200	0.72	0.09
Total Hardness	300	1.23	0.92
Chloride as Cl	250	0.98	0.61
Sulphate as SO_4	200	0.26	0.19

Nitrate as NO_3	45	0.03	0.00
Iron as Fe	0.3	1.26	0.95

Total water requirement for enhanced production is 270 m^3/day. Effluent generated in each process plant at RCF is collected in in-house ETP of capacity 120 KL/hr for the treatment of 2880 KLD of waste water. Efforts are being made to minimize the generation of effluent and also to recycle the effluent to the maximum extent in the plant. If it is not possible to recycle the effluent, it is pumped to the common integrated ETP provided for treating the effluents. Effluent treatment plant comprises of physico-chemical and biological method for treatment of effluent. After the treatment, treated effluent is discharged to sea via Mahul creek. Data regarding overflow (pH, flow Ammonical Nitrogen) is online transmitted online portal to Maharashtra Pollution Control Board and Central Pollution Control Board.

The existing rate of effluent generation from the AN Melt plant is approximately 1 m^3 per MT of AN Melt (i.e. about 424.24 m^3/day) will be continue to generate by an amount of 50 m^3/day during the shutdown period in present case.

Noise Environment

Table- E4
Estimation of HSD Affected Persons

Location Code	Name of Location	Day time $L_{eq.}$ Value dB(A)	Night time $L_{eq.}$ Value dB(A)	% HSD	
				Day	Night
SN1	AAQMS,1	63.7	55.4	14.21	8.24
SN2	AAQMS,2	61.7	52.0	12.59	6.38
SN3	AAQMS,3	63.4	52.9	13.96	6.84
SN4	AAQMS,4	62.8	52.8	13.47	6.79
SN5	Near Priyadarshini	56.8	49.5	9.10	5.24
SN6	Near I-Max Wadala	57.3	48.0	9.42	4.64
SN7	RCF Colony Gate IV	56.8	50.3	9.10	5.58
SN8	Gangadhar Deshmukh Hall	30.8	32.5	2.56	2.40

**HSD: highly sleep disturbed, *HA: Highly Annoyed Persons* HA> HSD in the area.

It is envisaged that proposed plant will have no impact on the noise component of the environment during normal operation of the plant.

Risk Analysis

This chapter covers ten failure cases with multiple scenarios in each in the existing and proposed plant. Iso-risk contours have been plotted by PHAST Risk Micro software of M/s DNV Technica, by considering proposed project and other allied facilities which infers that acceptable limit of individual risk of $1.0x10^{-9}$ per year remains mainly confined within the plant premises. The Societal Risk has been observed in acceptable region.

Hence, the plant operations may be considered environmentally safe from risk point of view.

The downwind distances to GLC of Ammonia may extend beyond factory boundary in case of major failure. Hence, the population outside should be made aware of the properties of gas/s and what to do in case of gas leakage.

Socio-Economic Status

The 10 km radius study area around RCF Fertilizer complex covers 23 wards/ villages falling in Kurla, Sion, Chembur, Maravali Church. Wadala Truck Terminus, Sewri Fort etc. The total population of the entire wards/villages under study area was 33,10,657 (District Census handbook - 2011). Under the category of sex ratio, the number of females per 1000 males is 869. The social compositions in the study area are such that nearly 5.34 % of total population is Scheduled Caste population and 0.80% of total population is Scheduled Tribe population. The literacy rate in the study area was 81.4% out of which the literacy rate in male category is 84.3% whereas the literacy rate is 77.9% in female category and both are far above the national average.

Flora & Fauna

The surrounding area of RCF at Trombay, Mumbai has different kinds of habitats namely mangrove forest, tidal lagoon, mudflats, scrub vegetation and roadside plantations. No adverse impact has been estimated due to operation activity on the existing flora & fauna of the study area.

Traffic

All raw material and utilities required will be fulfilled through RCF existing facility no additional transport requirement for Raw material and utilities. There will be nominal increase in traffic due to transportation for supply of enhanced product but the existing infrastructure is so that it can smoothly accumulate the increase load. Traffic study is reveals that any adverse impact on the environment as well as existing traffic network is not envisaged.

ENVIRONMENTAL IMPACT

It is an existing project and limited to capacity enhancement no construction activity is envisaged, An impact of wastewater discharge has been assessed as per CPCB Guidelines based on calculation of EF & SNLF and the degree of pollution has been estimated as *LOW*. Overall environmental impact on all the components viz. climate, meteorology, air, water, soil, noise, flora-fauna & socio-economic shall be well within the

sustainable limit rather will have positive impact in terms of providing employment opportunity. As per the Study no adverse impact on environment is envisaged.

ENVIRONMENTAL MANAGEMENT PLAN

Solid Waste Management

Operation Phase: RCF is relentlessly adopting the recent technology for the benefit of environment and to maintain the profitability even after the increase in the cost of raw material. Emphasis is given on adoption of 4R methodology (Reduce, Recover, Reuse and Recycle).

Air Environment

Emissions are envisaged from the following sources:

- Gases emission mostly consists of water vapors and traces of ammonia (3-5 ppm). Flue gas emission is Nil
- Fugitive emissions (from flanges, stuffing boxes etc.)
- Non-continuous emissions (venting and flaring)

The details of sources of air pollutants during operation phase shall be as follows:

AN Reactor Stack

The details of the process emissions from existing AN reactor stack system have been estimated in below Table:

Table- E5
Emission from AN Melt Stack

Capacity of Plants	1.4 Lakh MTPA (Existing) 1.9 Lakh MTPA (Proposed)
Capacity/ Gas Flow (Nm^3/hr)	3600
Exit gas velocity, m/sec	11
Height of Stack, m	35
Stack Dia, mm	250
Exhaust Gas Temperature, ^0C.	40^O C
Pollutant, NH_3	3-5 PPM
Control equipment preceding the stack	Packed bed scrubber

Fugitive emission control measure:

- For reducing the dust and AN content in gaseous emission generated in AN plant Scrubber will be used. Scrubber will be provided to clean process air of entrained ammonium nitrated dust and droplets of ammonium nitrate solution.
- Sprinkler system for project site.
- Dust extraction system will be provided at appropriate locations.

- Stack height as per the CPCB norms shall be provided to all air pollution emission process.
- Three safety relief valves and two vacuum relief valves shall be provided for release of ammonia vapor in case of total control system failure. One Auto flare valve shall be provided to release the vapor to flare stack in case of tank over pressurization during normal as well as ship unloading operation.
- Generation of atmospheric dust during construction phase due to movement of vehicles and earthmovers as well as due to filling and leveling shall be controlled through spray of water.
- The afforestation plan shall be aimed to cover all the vacant areas around the facilities.
- Concentrations of atmospheric pollutants shall be monitored regularly.

Water Environment

Water Supply & Consumption in existing plants

Effluent generated in each process plant at RCF is collected in in-house ETP of capacity 120 KL/hr for the treatment of 2880 KLD of waste water. Efforts are being made to minimize the generation of effluent and also to recycle the effluent to the maximum extent in the plant itself. If it is not possible to recycle the effluent, it is pumped to the common integrated ETP provided for treating the effluents. Effluent treatment plant comprises of physico-chemical and biological method for treatment of effluent. After the treatment, treated effluent is discharged to sea via Mahul creek. Data regarding overflow (pH, flow Ammonical Nitrogen) is transmitted online to Maharashtra Pollution Control Board and Central Pollution Control Board.

GREEN BELT DEVELOPMENT

Areas to be Afforested

While preparing the layout plan for locating the different facilities, extreme care shall be taken to preserve the existing plantation to the extent possible. Trees, lawns and gardens have been developed within the premises to cover all the vacant areas.

Table- E6
Status of Green belt at RCF, Trombay

	Square Meter	Hectare
Open space availability at Trombay Unit	932,738	93.27
Plantation area	344,348	34.43
%		37%
Area of Existing Plant Process Unit	247	0.02

Noise Environment

Measures for control and mitigation are as follows:

- The high noise level generating equipment will be provided within acoustic walls.
- A proper green belt development program has been formulated.
- Control rooms shall be provided with acoustic walls.
- During visits to the areas of higher noise levels, the operational and maintenance personnel will use earplugs as a safety measure.
- Moving parts of equipment and earthmovers shall be properly maintained and lubricated to minimize the generation of noise.

CONCLUSION

The proposal for the enhancement of capacity from the 1.4 Lakh MT per annum to 1.9 Lakh MT per annum of Existing AN Melt plant doesn't envisage any adverse environmental impacts on the surrounding environment.

Removal of vegetation is not expected as no construction work will be carried out. The green belt will also be strengthened to contain the dust and noise due to various activities. Hence no significant impact on ecology is expected during construction phase.

RCF has also been involved in executing various Corporate Sustainability Activities, which address issues on environment and community. The RCF has been consistently working for the betterment of community and its contribution in this area has a long history. RCF is taking up various activities related to CSR much before the incorporation of CSR activity under Company's Act 2013

At the vent of the reactor, Acid scrubber is attached to scrub out the ammonia contain from the fume. Hence, there would be negligible emission during project operation and no impact on the environment envisaged.

Based on the EIA study and various safety and security measures mentioned above for the proposal for production enhancement project, it may be inferred that the project may be considered acceptable from environment point of view.