S. M. SAIYAD, IFS
MEMBER SECRETARY
SEIAA (GUJARAT)

Government of Gujarat

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY GUJARAT

By R P A D

No. SEIAA/GUJ/TOR/5(e)/ 520 /2019 Date: 1 APR 2019

Time Limit

Sub: Terms Of Reference to M/s. Gujarat State Fertilizer And Chemicals Ltd. for setting up manufacturing plant of "Petrochemical based processing Industry" at P.O. Fertilizernagar- 391750, Vadodara.

Ref: Your Proposal No: SIA/GJ/IND2/30757/2019.

Dear Sir,

This has reference to your online application along with Form-I submitted to SEIAA. The project activity is covered in 5(e) and is of 'B' Category.

The SEAC, Gujarat vide their letter dated 01/03/2019 had recommended to the SEIAA, Gujarat, to grant the Terms Of Reference for the above-mentioned project based on its meeting held on 06/02/2019.

The proposal was considered by SEIAA, Gujarat in its meeting held on 05/03/2019 at Gandhinagar. After careful consideration, the SEIAA hereby accords Terms Of Reference to above project under the provisions of EIA Notification dated 14th September, 2006. The copy of Terms Of Reference is attached herewith.

With regards,
Yours sincerely,

(S. M. SAIYAD)
Member Secretary

Encl: As Above

Issued to:
M/s. Gujarat State Fertilizer And Chemicals Ltd.
P.O. Fertilizernagar- 391750,
Vadodara

State Level Environment Impact Assessment Authority * Gujarat * SEIAA

Terms of Reference [ToR] to M/s. Gujarat State Fertilizers And Chemicals Ltd for setting up manufacturing plant of 'Petrochemical based processing Industry' at P.O. Fertilizernagar-391750, Tal. & Dist. Vadodara

Category of the unit: 5(e)
Project status: Expansion

I. This is in reference to proposal no. SIA/GJ/IND2/30757/2019 regarding grant of Terms of Reference [ToR] for preparation of EIA/EMP report.

II. This is an existing unit engaged in organic chemicals and now proposes for expansion of synthetic organic chemical products i.e. petrochemical based processing as tabulated below:

Sr no.	Name of the Products	CAS no. / CI no.	Quantity (MT/Month)			End-use of the products
			Existing	Proposed	Total	
1	Nylon-6 Chips	25038-54-4	2035.4	1735	3770.4	Automobile, Electrical, textile, Hardware etc.
	Total		2035.4	1735	3770.4	

III. The project falls under Category B of project activity 5(e) as per the schedule of EIA Notification 2006.

IV. PP was called for presentation in the SEAC meeting dated 06/02/2019.

V. The project proponent along with their expert /consultant M/s. Eco Chem Sales & Services, Surat attended the meeting and made presentation before the committee.

VI. Salient features of the project are as under:

Sr. no.	Particulars	Details
A	Total cost of Proposed Project (Rs. in Crores):	Proposed: Rs. 20 Cr.
B	Total Plot area (sq. meter)	Existing: 3280000 Sq. m. Proposed: 0 Sq. m. Total: 3280000 Sq. m.
	Green belt area (sq. meter)	Existing: 1187000 Sq. m. Proposed: 0 Sq. m. Total: 1187000Sq. m.
C	Employment generation	Existing: 5000 Nos Proposed: 19 Nos Total:5019 Nos
D	Water	
i	Source of Water Supply (GIDC Bore well, Surface water, Tanker supply etc.)	Water source: French Well (4 Nos.) in Mahi River (GSFC's own source)
	Status of permission from the concern authority.	Permission for the water withdrawal has already being obtained vide letter No. VID/PB-2/IND/REQ 2018-19/GSFC/853 dated 21/03/2018
ii	Water consumption (KLD)	

	Existing KLD	Proposed (Additional) KLD	Total after Expansion KLD	Remarks
Domestic	10539	0.75	10539.75	
Gardening		0		
Industrial				
Process	3477	20	3497	
Washing	0	0.4	0.4	Exiting project washing included in (A) & (B)
Boiler	18035	15.8	18050.8	
Cooling				
Others	0	0	0	

SEIAA

Industrial Total	21512	36.2	21548.2	
Grand Total (A+B+C)	32051	36.95	32087.95	

1) Total water requirement for the project:32087.95KLD
2) Quantity recycled:6280.4KLD (Includes Condensate, Process Effluent & STP for gardening)
3) Total fresh water requirement: 32087.95KLD

ii) Waste water generation (KLD)

Category	Existing KLD	Proposed (Additional) KLD	Total after Expansion KLD	Remarks
Domestic	4917	0.5	4917.5	Additional sewage will be sent in existing Soak pit of Nylon 6 Plant
Industrial				
Process	1964	20	1984	Existing to ETP 1 & 2 and Additional to ETP 1
Washing	0	0.4	0.4	Existing Washing included in Pont No. (A)
Boiler	7108	1.8	7109.8	Will be sent to VECL
Cooling				
Others	0	0	0	-
Total industrial waste water	**9072**	**22.2**	**9094.2**	
Total	**13989**	**22.7**	**14011.7**	

iv) Treatment facility within premises with capacity [For existing and Proposed]
[In-house ETP (Primary, Secondary, Tertiary), MEE, Stripper, Spray Dryer, STP etc.,

- ETP-I of 880 KLD provided to treat waste water generated from proposed project

v) Mode of Disposal & Final meeting point
Treated waste water from the ETP are sent to Common Effluent Channel of VECL (Vadodara Enviro Channel Limited)

Domestic:	Domestic waste water will be sent to existing Soak pit of Nylon 6 plant
Industrial:	The waste water from the process and washing will be sent to ETP-I and treated waste water is further sent to Common Effluent Channel of VECL (Vadodara Enviro Channel Limited). The Cooling tower blow down is sent to VECL.

vi) In case of Common facility (CF) like CETP, Common Spray dryer, Common MEE, CHWIF etc.
Name of Common facility

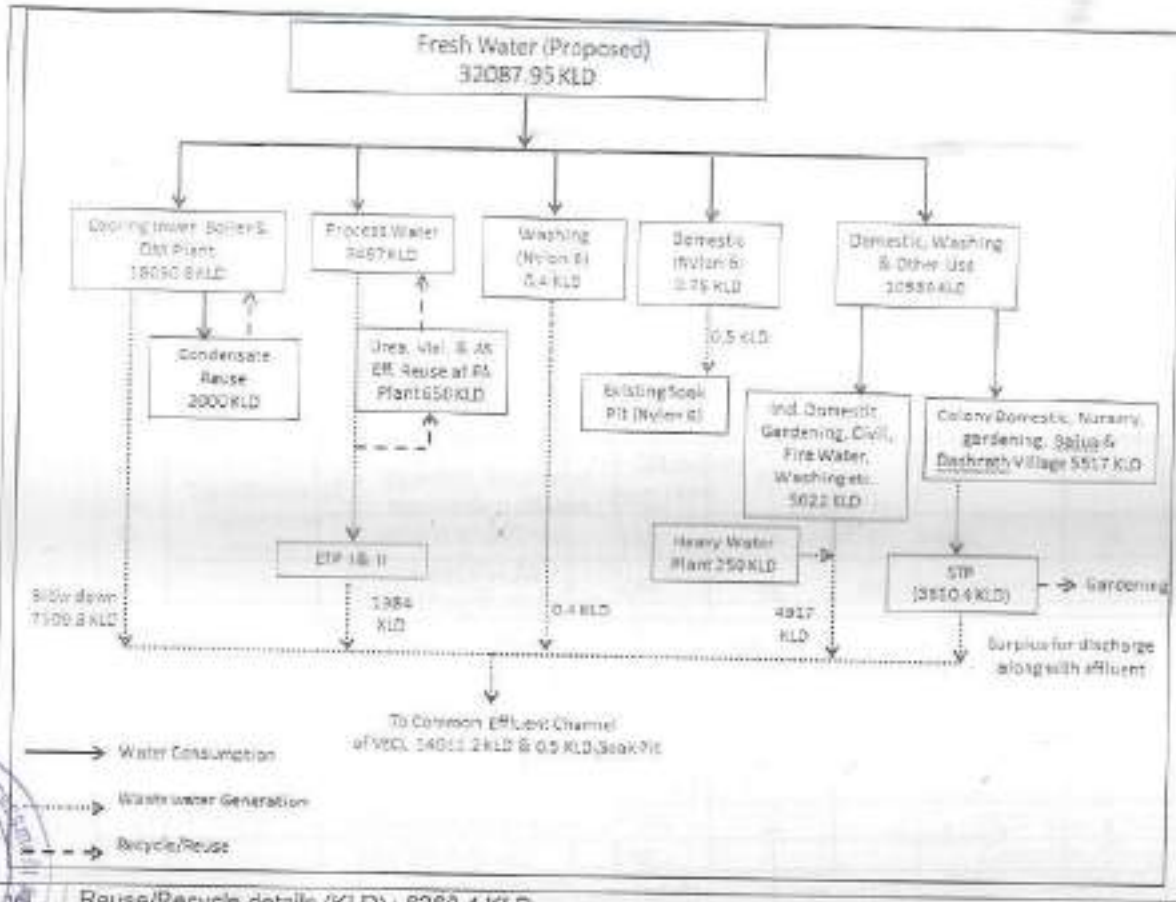
- Common Effluent Channel of VECL (Vadodara Enviro Channel Limited).

Membership of Common facility (CF): Certificate No.: VECL/13/2018-19, dated 01/04/2018

(For waste water treatment)
Treated waste water is further sent to Common Effluent Channel of VECL (Vadodara Enviro Channel Limited).

vii) **Simplified water balance diagram with reuse / recycle of waste water**

Water Balance, After Proposed Expansion:



vii	Reuse/Recycle details (KLD) : 6260.4 KLD [Source of reuse & application area] Total reuse: 6260.4 KLD	

Source of waste water for reuse with quantity in KLD	Application area with quantity in KLD
Condensate Recovery 2000 KLD	Cooling Tower, Boiler & DM plant
Process waste water 650 KLD	Reuse at Phosphoric Acid Plant
STP 3610.4 KLD	Reuse for gardening

E	Air	
i	Flue gas emission details No. of Boilers/TFH/Furnaces/DG sets etc. with capacities viz. TPH, Kcal/hr, MT/hr, KVA etc. **Existing & Proposed**	

-Existing

S. No.	Source of emission With Capacity	Stack Height (meter)	Type of Fuel	Quantity of Fuel	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures
1	Reformer (Furnace)	33	NG	5150 Nm^3/hr for methanol	PM, SO_2, NO_x	
	NG Preheater	18		231 Nm^3/hr		
2	Reformer (Furnace)	30	NG	1071 Nm^3/hr		
	NG Preheater	30	NG	91.9 Nm^3/hr		
3	Reforming Section-100	52	100 % Naphtha	46830 Nm^3/hr		
			100 % NG	32520 Nm^3/hr		
	Syn. Unit-500	30	PG	2121 Nm^3/hr	NO_x	
	CRG Unit-900	30	CRG/NG	2088/1110 Nm^3/hr		

	CRG Unit-900	30	NG	329 Nm^3/hr		Not Applicable
	Pre-desulphurization	-	TG/NG	1346.5/1445.5 Nm^3/hr		
4	Salt furnace	30	NG	300 Nm^3/hr		
5	Salt furnace	35	NG	450 Nm^3/hr		
6	Boiler 4 & 5	30	NG + LSHS	NG 3760 Nm^3/hr LSHS 3.92 T/HR (each)		
7	Boiler	70	NG + LSHS	NG 8350 Nm^3/hr LSHS 8.74 T/HR	PM, SO_2,NO_x	
8	Boiler	70	NG + LSHS	-		
9	Boiler	35	NG	8570 Nm^3/hr		
10	Waste liquor unit	22	HC	WL-I:4395 KG/HR WL-II : 405 Kg/hr		
11	IWI Unit	40	HC	5623 Kg/hr OFF GASES 2000 Nm^3/hr+2679 Kg/hr	PM, SO_2,NO_x	
12	New Boiler	70	NG + LSHS	NG: 3580 Nm^3/hr LSHS: 3.36 T/hr		
Proposed Flue Gas						
There will be no flue gas emission from Proposed project.						

ii Process gas i.e. Type of pollutant gases (SO_2, HCl, NH_3 Cl_2 NO_x etc.)

Existing & Proposed

S. No.	Specific Source of emission (Name of the Product & Process)	Type of emission	Stack/Vent Height(meter)	Air Pollution Control Measures (APCM)
Existing				
1	Prilling Tower	SPM NH_3	38	Water Scrubber
2	Prilling Tower	SPM NH_3	70	Water Scrubber
3	Condenser oxidation column	NH_3	38	H_2SO_4 Scrubber (Eff. 99.5%)
4	Dryer Outlet	SPM NH_3	15	Filter
5	Dryer Outlet	SPM NH_3	17	Filter
6	Rock grinding	SPM	30	Ventury Scrubber
7	Digester	F	20	Fume scrubber
8	Dryer & Dust Scrubber A&B	NH_3 SPM, F	30	Cyclone separator &Ventury scrubber
9	Granulator & Neutralization	NH_3, F	25	Fume Scrubber
10	Dryer	SPM	19.2	Cyclone Separator
11	Final Absorption Tower	SO_2 Acid	52	Final Absorption Tower
12	Final Absorption Tower	SO_2 Acid Mist	100	Final Absorption tower
13	D-415-3 Tower O/L	SO_2 NH_3	25	Scrubber
14	D-414-3 Tower O/L	NOx NH_3	25	De Nox unit
15	AS Dryer	SPM	30	Cyclone Separator & Scrubber

16	AS Vent Scrubber	SO_2 NH_3	30	Scrubber	
17	Process Vessels	PM	30	Scrubber	
18	Crusher, Hopper, Mixers	PM	40	Bag Filter	
Proposed Process Gas Emission					
There will be no Process gas emission from Proposed project.					

iii Fugitive emission details with its mitigation measures.

- None envisaged for proposed project

F **Hazardous waste**
(As per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016.
Existing & Proposed

Sr. No	Type/Name of Hazardous waste	Specific Source of generation (Name of the Activity, Product etc.)	Category and Schedule as per HW Rules.	Quantity (MTPA)	Management of HW
Existing					
1	ETP Sludge				
a	Biological sludge	Biological treatment of effluent	-	40 MTPA	Sell to Farmer as a soil conditioner
b	Chemical sludge	Chemical treatment of effluent & cleaning of collection tanks	34.3		Collection, Storage, Transportation & Disposal at TSDF site i.e. NECL
2	Used Oil	Various existing Plants	5.1	125 MTPA	Collection, Storage, Transportation & Disposal by selling to registered refiners
3	Discarded Container	Various existing Plants	33.3	180 MTPA	Collection, Storage, Decontamination within factory Premise
4	Spent Catalyst	Various existing Plants	17.2	35 MTPA	Collection, Storage, Transportation & Disposal by selling to registered recyclers or disposal at TSDF site i.e. NECL
5	Spent Catalyst	Various existing Plants	18.1	115 MTPA	Collection, Storage, Transportation & Disposal by selling to registered recyclers
6	Organic Waste	From F & I groups and cleaning activity	1.4	20 MTPA	Collection, Storage, Transportation & Disposal at Incineration Facility
7	Sulphur Muck	Filtration of molten sulphur at SA plants	17.1	350 MTPA	Collection, Storage, reuse &/or Transportation and Disposal at TSDF site
Proposed					
1	Used Oil	Various existing Plants	5.1	0.3 MTPA	Collection, Storage, Transportation & Disposal by selling to registered refiners

ii	Membership details of **TSDF, CHWIF** etc. **(For HW management)**	Not Applicable for proposed project as no such waste will be generated which requires disposal at TSDF/ CHWIF.
iii	Details of Non-Hazardous waste & its disposal(MSW and others)	NA

G **Solvent management**, VOC emissions etc.
Not Applicable for propose project

i Types of solvents, Details of Solvent recovery, % recovery, reuse of recovered Solvents

- Not Applicable for proposed project

ii **VOC emission** sources and its mitigation measures

- Not Applicable for proposed project

VII. **Considering the above project details, the terms of reference (ToR) are prescribed as below for the EIA study to be done covering 10 Km radial distance from the project boundary.**

1. Executive summary of the project – giving a prima facie idea of the objectives of the proposal, use of resources, justification, etc. In addition, it should provide a compilation of EIA report, including EMP and the post-project monitoring plan in brief.
2. Copy of plot holding certificate obtained from GIDC Authority. (If applicable)
3. Present land use pattern of the study area shall be given based on satellite imagery.
4. Layout plan of the factory premises. (Show all the production plants including Raw material & Products storage area). Provision of separate entry & exit and adequate margin all-round the periphery for unobstructed easy movement of the emergency vehicle / fire tenders without reversing back. Mark the same in the plant layout.
5. Technical details of the plants along with details on best available technologies (BAT), proposed technology and reasons for selecting the same.
6. Details of manufacturing process / operations of each product along with chemical reactions, mass balance, consumption of raw materials etc. Details on strategy for the implementation of cleaner production activities.
7. Full name and chemical formula of all the raw materials and products. Details on end use of each product.
8. Complete management plan for By-products/Spent acids to be generated, along with the name and address of end consumers to whom the by-product/s will be sold. Copies of agreement / MoU / letter of intent from them, showing their willingness to purchase said by-products/Spent acids from the proposed project.
9. Explore the use of renewable energy to the maximum extent possible. Details of provisions to make the project energy-efficient through of energy efficient devices and adoption of modes of alternative eco-friendly sources of energy like solar water heater, solar lighting etc. Measures proposed for energy conservation.
10. Leak Detection and Repairing Programme (LDAR) for all the volatile organic solvent proposed for use in-house with detailed chemical properties including vapor pressure. LDAR shall endeavor prevention of losses of solvents to the best minimum extent.
11. Qualitative and quantitative analysis of hazardous waste streams generation from the manufacturing process (Product wise). Explore the possibility to reuse such waste streams within premises as raw materials for other products or to convert it into valuable products instead of selling out side. Sound management of such waste streams as per the HW Rules 2016 as amended time to time. Feasibility report for utilization shall be incorporated in EIA report.
12. Action plan to reuse or consume entire quantity of spent acids/waste streams within premises to convert into valuable products instead of sending such spent acids to outside premises.
13. Detailed mass balance and water balance (including reuse-recycle, if any) along with qualitative and quantitative analysis of the each waste stream from the processes.
14. Assessment of source of the water supply with adequacy of the same to meet with the requirements for the project. Permission obtained from the GIDC for supply of raw water. Undertaking stating that no bore well shall be dug within the premises.
15. Explore the possibility of reuse / recycle and other cleaner production options for reduction of wastes. Details of methods to be adopted for the water conservation.
16. Qualitative and quantitative analysis of waste water to be generated from the manufacturing process of each product to be manufactured along with mass balance.
17. Segregation of waste streams and details on specific treatment and disposal of each stream.
18. Details of ETP including dimensions of each unit along with schematic flow diagram. Inlet, transitional and treated effluent qualities with specific efficiency of each treatment unit in reduction in respect of all concerned/regulated environmental parameters. Inlet effluent quality should be based on worst case scenario considering production of most polluting products that can be manufactured in the plant concurrently.
19. Provision of CEMS-Continuous Emission Monitoring System as per the CPCB guidelines.
20. Membership certificate and current status of common effluent channel of VECL (Vadodara Enviro Channel Limited).
21. Undertaking stating that a separate electric meter will be provided for the ETP system.
22. Copy of permission letter with quantity from the authority of GIDC drainage network, Dahej regarding confirmation for spare capacity available to take additional effluent load in GIDC drainage for final disposal to deep Sea.
23. Proposal to provide and maintain separate electric meter, operational logbook for effluent treatment systems, online meters for monitoring of flow, pH, TOC/COD, etc.
24. Application wise break-up of effluent quantity to be recycled / reused in various applications like sprinkling for dust control and green belt development etc. In case of land application, details on availability of sufficient open land for utilizing effluent for plantation / gardening. How it will be ensured that treated effluent won't flow outside the premises linked with storm water during high rainy days.

25. Plans for management, collection and disposal of waste streams to be generated from spillage, leakages, vessel washing, used container washing etc. Measures proposed for preventing effluent discharge during unforeseen circumstances.
25. One season Site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall should be incorporated.
27. Anticipated environmental impacts due to the proposed project/production may be evaluated for significance and based on corresponding likely impacts VECs (Valued Environmental Components) may be identified. Baseline studies may be conducted within the study area of 5 km for all the concerned/identified VECs and likely impacts will have to be assessed for their magnitude in order to identify mitigation measures.
28. One complete season base line ambient air quality data (except monsoon) to be given along with the dates of monitoring. The parameters to be covered shall be in accordance with the revised National Ambient Air Quality Standards as well as project specific parameters. Locations of the monitoring stations should be so decided so as to take into consideration the pre-dominant downwind direction, population zone and sensitive receptors. There should be at least one monitoring station in the upwind direction. There should be at least one monitoring station in the pre dominant downwind direction at a location where maximum ground level concentration is likely to occur.
29. Modeling indicating the likely impact on ambient air quality due to proposed activities. The details of model used and input parameters used for modeling should be provided. The air quality contours may be shown on location map clearly indicating the location of sensitive receptors, if any, and the habitation. The wind rose showing pre-dominant wind direction should also be indicated on the map. Impact due to vehicular movement shall also be included into the prediction using suitable model. Results of Air dispersion modeling should be superimposed on satellite image / geographical area map.
30. Base line status of the noise environment, impact of noise on present environment due to the project and proposed measures for noise reduction including engineering controls.
31. Specific details of (i) Process gas emission from each unit process with its quantification, (ii) Air pollution Control Measures proposed for process gas emission, (iii) Adequacy of the air pollution control measures for process gas emission, measures to achieve the GPCB norms (iv) Details of the utilities required (v) Type and quantity of fuel to be used for each utility (vi) Flue gas emission rate from each utility (vii) Air Pollution Control Measures proposed to each of the utility along with its adequacy (viii) List the sources of fugitive emission along with its quantification and proposed measures to control it.
32. Details on management of the hazardous wastes to be generated from the project stating detail of storage area for each type of waste, its handling, its utilization and disposal etc. How the manual handling of the hazardous wastes will be minimized. Methodology of de-contamination and disposal of discarded containers and its record keeping.
33. Membership of Common Environmental Infrastructure including the TSDF / Common Incineration Facility, if any.
34. Name and quantity of each type of solvents to be used for proposed production. Details of solvent recovery system including mass balance, solvent loss, recovery efficiency feasibility of reusing the recovered solvents etc. for each type of solvent.
35. A detailed EMP including the protection and mitigation measures for impact on human health and environment as well as detailed monitoring plan and environmental management cell proposed for implementation and monitoring of EMP. The EMP should also include the concept of waste-minimization, recycle/reuse/recover techniques, energy conservation, and natural resource conservation. Total capital cost and recurring cost/annum earmarked for environment pollution control measures.
36. Permission from PESO, Nagpur for storage of solvents, other toxic chemicals, if any.
37. Occupational health impacts on the workers and mitigation measures proposed to avoid the human health hazards along with the personal protective equipment to be provided. Provision of industrial hygienist and monitoring of the occupational injury to workers as well as impact on the workers. Plan for periodic medical checkup of the workers exposed. Details of work place ambient air quality monitoring plan as per Gujarat Factories Rules.
38. Details on volatile organic compounds (VOCs) from the plant operations and occupational safety and health protection measures.
38. Risk assessment including prediction of the worst-case scenario and maximum credible accident scenarios should be carried out. The worst-case scenario should take into account the maximum inventory of storage at site at any point of time. The risk contours should be plotted on the plant layout map clearly showing which of the facilities would be affected in case of an accident taking place. Based on the same, proposed safeguard measures including On-Site / Off-Site Emergency Plan should be provided.
40. MSDS of all the products and raw materials.
41. Details of hazardous characteristics and toxicity of raw materials and products to be handled and the control measures proposed to ensure safety and avoid the human health impacts. This shall include the details of Antidotes also.
42. Details of quantity of each hazardous chemical (including solvents) to be stored, Material of Construction of major hazardous chemical storage tanks, dyke details, threshold storage quantity as per schedules of the Manufacture,

Storage &Import of Hazardous Chemicals Rules of major hazardous chemicals, size of the biggest storage tank to be provided for each raw material & product etc. How the manual handling of the hazardous chemicals will be minimized?

43. Details of the separate isolated storage area for flammable chemicals. Details of flame proof electrical fittings, DCP extinguishers and other safety measures proposed. Detailed fire control plan for flammable substances and processes showing hydrant pipeline network, provision of DG Sets, fire pumps, jockey pump, toxic gas detectors etc.
44. Submit checklist in the form of Do's & Don'ts of preventive maintenance, strengthening of HSE, manufacturing utility staff for safety related measures.
45. Detailed five year greenbelt development program including annual budget, types & number of trees to be planted, area under green belt development (with map), budgetary outlay; along with commitment of the management to carry out the tree plantation activities outside the premises at appropriate places in the nearby areas and elsewhere.
46. Detailed socio-economic development measures including community welfare program most useful in the project area for the overall improvement of the environment. Submit a detailed plan for social corporate responsibilities, with appropriate budgetary provisions for the next five years and activities proposed to be carried out; specific to the current demographic status of the area.
47. Compliance of MoEFCC's OM dated 01/05/2018 regarding "Corporate Environment Responsibility" (CER). Fund allocation for Corporate Environment Responsibility (CER) shall be made as per MoEFCC's O.M. No. 22-65/2017-IA.III dated 01/05/2018 for various activities therein. The details of fund allocation and activities for CER shall be incorporated in EIA/EMP report.
48. (a) Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report. (b). Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions ? If so, it may be detailed in the EIA.
49. What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions. Details of this system may be given.
50. Records of any legal breach of Environmental laws i.e. details of show- cause notices, closure notices etc. served by the GPCB to the existing unit in last five years and actions taken then after for prevention of pollution.
51. Copies of Environmental Clearances obtained for the existing plant, its point wise compliance report.
52. Certified Compliance Report (CCR) from the concern authority as per the MoEFCC's Circular no. J-11011/618/2010- IA (II) (I) dated 30/05/2012 and Circular no. J-11013/6/2010-IA.II (Part) vide dated 07/09/2017.
53. Does the company have a system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA Report.
54. Phase wise project implementation schedule with bar chart and time frame, in terms of site development, infrastructure provision, EMS implementation etc.
55. Certificate of accreditation issued by the NABET, QCI to the environmental consultant should be incorporated in the EIA Report.
56. A tabular chart with index for point-wise compliance of above TORs.

VIII. The above menticned project specific TORs/additional TORs and the model TORs available in the MoEFCC's sector specific EIA Manual for 'Petrochemical based processing Industry' shall be considered as generic TORs for preparation of the EIA report in addition to all the relevant information as per the generic structure of EIA given in Appendix III in the EIA Notification, 2006.

IX. The project proponent shall have to apply for Environmental clearance through online portal http://environmentclearance.nic.in/ along with final EIA report.

Validity of ToR:

X. The ToRs prescribed for the project will be valid for a period of three years for submission of EIA & EMP report. ToR will lapse after three years from date of issue.

XI. The period of validity could be extended for a maximum period of one year provided an application is made by the applicant to the Regulatory Authority, at least three months before the expiry of valid period together with an updated Form-I, based on proper justification and also recommendation of the SEAC.

SEIAA