

**ZUARI AGRO CHEMICALS LTD, ZUARINAGAR, GOA**

**FORM - V**

**Environmental Statement for the financial year ending 31<sup>st</sup> March, 2015**

**PART – A**

(i) **Name and Address of the Owner / Occupier of the Industry, Operation or Process**

Mr. Kapil Mehan  
Managing Director  
Zuari Agro Chemicals Ltd.  
(Fertilizer Division)  
Jaikisaan Bhawan  
Zuarinagar – 403 726  
Goa

(ii) **Industry Category ----- Primary – (STC Code) / Secondary – (SIC Code)**

Chemical Fertilizer Industry (Nitrogenous and Complex Grades)

(ii) **Production Capacity – Units**

<b>Sr. No.</b>	<b>Product</b>	<b>Installed Production Capacity MT/ Year</b>	<b>Actual Production for 2014-15, MT</b>
1	Ammonia *	220000	211120
2	Urea	376200	363408
3	Complex Grades in NPK-A plant	150000	287995.6
4	Complex Grades in NPK-B plant	150000	353335.65
5	Liquid Argon	2.2 Million SM3	NIL

(\* Intermediate Product used for captive consumption)

(iv) **Year of Establishment**

1967 ( Actual commercial production started in 1973 )

(v) **Date of the last Environmental Statement submitted**

August 6, 2014

**PART – B**

**Water and Raw Material Consumption**

<b>(i) Water Consumption</b>	<b>M<sup>3</sup> / Day</b> (Based on typical water balance at Avg. plant loads)
Process	3470 *
Cooling	5630
Domestic	470
 Total	 9570 **

(\* includes Boiler feed water make up, Treated water etc.)

\*\*excludes Avg. colony water supply of about 400 M<sup>3</sup> / Day)

Name of Products	Process water consumption per unit of product output	
	During the previous financial year 2013-14	During the current financial year 2014-15
Urea	8.72 M <sup>3</sup> / MT	8.46 M <sup>3</sup> / MT
Complex Grades in NPK-A plant	0.074 M <sup>3</sup> / MT	0.0719 M <sup>3</sup> / MT
Complex Grades in NPK-B plant	0.070 M <sup>3</sup> / MT	0.0541M <sup>3</sup> / MT

(\* Process water consumption requirement of NPK-A and NPK-B plants is met by recycling the effluent/ waste water from Effluent Treatment Plant)

**(i) Raw Material Consumption**

Name of Raw Material *	Name of Products	Consumption of Raw Material per unit of Output ( MT/MT )	
		During the previous financial year 2013-14	During the current financial year 2014-15
Naphtha ( includes Fuel Naphtha also )	Ammonia (Intermediate product for captive consumption)	0.075 <sup>#</sup>	–
Natural Gas <sup>#</sup>		0.664	0.710
Ammonia CO <sub>2</sub>	Urea	0.58 0.752	0.58 0.755

Name of Raw Material *	Name of Products	Consumption of Raw Material per unit of Output ( MT/MT )	
		During the previous financial year 2013-14	During the current financial year 2014-15
Ammonia P <sub>2</sub> O <sub>5</sub> H <sub>2</sub> SO <sub>4</sub> Filler	18:46:00 grade (Samrat)	0.224 0.462 0.062 0.074	0.1990 0.4157 0.0555 0.041
Ammonia P <sub>2</sub> O <sub>5</sub> Potash H <sub>2</sub> SO <sub>4</sub> Filler	10:26:26 grade (Samarth)	0.126 0.260 0.485 0.009 0.055	0.1223 0.2602 0.444 0.0042 0.060
Ammonia P <sub>2</sub> O <sub>5</sub> Potash H <sub>2</sub> SO <sub>4</sub> Filler	12:32:16 grade (Sampatti)	0.150 0.321 0.276 0.022 0.074	0.1480 0.3209 0.2790 0.0064 0.083
Ammonia P <sub>2</sub> O <sub>5</sub> Potash H <sub>2</sub> SO <sub>4</sub> Filler Urea	19:19:19 grade (Sampoorna)	0.088 0.190 0.333 0.032 0.024 0.275	0.0681 0.1901 0.3330 0.0335 0.005 0.2913

(\* Industry may use codes if disclosing the details of raw materials would violate contractual obligations, otherwise all industries have to name the raw materials used)

(# Plant started running totally on Natural Gas from October 2013. During the period from June 2013 to September 2013, both Natural Gas as well as Naphtha was used as feed and fuel and hence the ratio does not become comparable)

**PART – C**

**Pollution discharged to Environment / Unit of Output**

(Parameters as specified in the consent issued)

<b>Pollutants</b>	<b>Quantity of pollutants discharged ( mass / day ) Kg / Hr *</b>	<b>Concentration of pollutants in discharge (mass / vol. ) mg / M3 *</b>	<b>Percentage of variation from prescribed standards with reasons</b>
(a) Water	NIL	NIL	N.A
(b) Air			
i) Particulate Matter from Prilling Tower – Urea plant	---	68.96	Less by 54.02%
ii) Particulate Matter from Dust Separator – Urea plant	---	53.81	Less by 64.12%
iii) Ammonia from Off Gas Absorber – Urea plant	2.46	---	Less by 75.4%
iv) Ammonia from Amm. Recovery Absorber – Urea plant	1.90	---	Less by 81%
v) Ammonia from Fumes Stack – NPK-A plant	2.18	---	Less by 78.2%
vi) Particulate Matter from Dryer Stack – NPK-A plant	---	46.75	Less by 68.83%
vii) Particulate Matter from Dedusting Stack – NPK-A plant	---	54.02	Less by 63.98%
viii) Ammonia from NPK-B Stack	4.04	---	Less by 59.6%
ix) Particulate Matter from NPK-B Stack	---	53.74	Less by 64.17%
x) SO <sub>2</sub> from Boiler Stack	1.21	---	NA
xi) Particulate Matter from Boiler Stack	---	37.57	NA
xii) SO <sub>2</sub> from DG Set stack	6.71	---	Less by 93.66%
xiii) Particulate Matter from DG Stack	---	53.67	Less by 64.22%
xiv) NO <sub>X</sub> from DG Stack	---	173.54 ppm	Less by 84.22%
xv) NMHC from DG Stack	---	5.87	Less by 96.08%
xvi) CO from DG Stack	---	7.94	Less by 94.70%

(\* Annual average values expressed at 25 deg. Centigrade, Atm. Pr. & 0 % moisture)

**PART – D**

**Hazardous Waste**

[As specified under Hazardous Waste (Mgt. & Handling) Rules, 2008]

<b>Hazardous Waste</b>	<b>Total Quantity</b>	
	<b>During the previous financial year 2013-14</b>	<b>During the current financial year 2014-15</b>
(a) From Process		
(i) Used / Spent Oil under H.W. Category No.5.1	13.14 MT	27.74 MT
(ii) Spent Catalyst under H.W.Category No.18.1	5.8 MT	33.02 MT
(iii) Furnace Oil Tank cleaning sludge under H.W.Category No.3.1	52.78 MT	244.29 MT
(b) From pollution control facilities		
(i) ETP sludge under H.W.Category No.34.3	38 MT	36 MT
(c)(i) Quantity recycled / reused within Unit	38 MT ETP Sludge	36 MT ETP Sludge
(ii) Sold ( used/spent Oil)	13.14 MT	27.74 MT
(iii) Sold ( Spent Catalyst)	5.8 MT	33.02 MT
(iv) Sold ( Furnace oil Tank cleaning residue)	52.78 MT	244.29 MT

**PART – E**

**Solid Wastes**

<b>Solid Waste from Process</b>	<b>Total Quantity</b>	
	<b>During the previous financial year 2013-14</b>	<b>During the current financial year 2014-15</b>
(a) From Process		
(i) DM plant resin material	Approx.4 M <sup>3</sup>	Approx. 4 M <sup>3</sup>
(ii) Sand from filters	Approx. 20 M <sup>3</sup>	Approx. 20 M <sup>3</sup>
(iii) Activated carbon from filters	Approx. 3 M <sup>3</sup>	Approx. 4 M <sup>3</sup>
(b) From pollution control facilities		
(i) STP Sludge	Approx. 2 M <sup>3</sup>	Approx. 1.5 M <sup>3</sup>
(c) (i) Quantity recycled / reused within unit	Approx. 20M <sup>3</sup> (Sand)	Approx. 20M <sup>3</sup> (Sand)
(ii) Quantity Sold	NIL	NIL
(iii) Disposed (Resin material, Sand, Active Carbon & STP sludge)	Approx. 9 M <sup>3</sup>	Approx. 9.5 M <sup>3</sup>

## PART – F

**Please specify the characterizations (in terms of composition and quantum) of Hazardous as well as Solid Wastes and indicate the disposal practice adopted for both these categories of wastes**

<b>Waste</b>	<b>Composition</b>	<b>Disposal Practice adopted</b>
<b>Hazardous Waste</b>		
Used / Spent Oil	Used Oil	Sold to CPCB registered and SPCB Authorized Vendors/Recyclers only for reprocessing.
Furnace Oil Tank sludge & cleaning residue	Oil sludge & cleaning residue	Sold to CPCB registered and SPCB Authorized Vendors/Recyclers only for reprocessing.
Spent Catalyst	Spent catalyst containing metals/oxides like Ni, Cu, Zn, Fe, Co, Mo etc.in different composition	Sold to CPCB registered and SPCB Authorized Vendors/Recyclers only for reprocessing.
ETP Sludge	Amm./Urea nitrogen, Phosphate, Sulphate, KCl, Salts of Na, Ca, Mg & Suspended solids	Recovered into process as recycle along with filler material in NPK-A and NPK-B plants
<b>Solid Waste from Process</b>		
DM plant resin material	Water insoluble co-polymers	Used along with backfilling material for structure / building foundation, road construction etc.
Sand from filters		Used along with backfilling material for structure / building foundation, road construction etc.
Activated carbon from filters	Carbon material	Used along with backfilling material for structure / building foundation, road construction etc.
STP Sludge	Organic matter	Used as bio-fertilizer for trees in our green belt.

## **PART – G**

### **Impact of pollution abatement measures taken on conservation of natural resources and on cost of production**

Pollution control measures are an integral part of our processes and every effort is made to reduce the amount of effluent/emission and waste generation in the manufacturing process & associated activities. This has resulted in reduction of consumption of water, raw materials and energy over a period of time. This has also resulted in reduction of effluent/emission generation at source itself and in re-use/recycling/recovery of nutrients from the effluent/wastes. Also recently in April 2014 with the new agreement of water supply with Water Resources Department, Goa we have totally stopped utilizing the borewells water. Ultimately all these measures have certainly added to the conservation of natural resources and cost savings. However, the exact impact of this on cost of production is difficult to quantify and thus is intangible.

## **PART – H**

### **Additional measures / Investment proposal for Environmental Protection including abatement of pollution, prevention of pollution**

- (i) Our CO<sub>2</sub> absorption system in Ammonia plant has been changed and converted totally to non-arsenic based.
- (ii) Several Energy savings measures implemented over last few years have reduced the specific energy consumption of Urea which has reduced Fuel consumption in our Utility Boilers and hence reduced the emissions. Every year some energy saving measures are implemented.
- (iii) We have installed Reverse Osmosis unit in our ETP for enhanced treatment and recovery/recycle of treated water from our wastewater/effluent.
- (iv) We have completed the process of retrofitting the Ammonia plant for changeover of feedstock and fuel from Naphtha to Natural Gas/Regassified Liquid Natural Gas and reduction of specific energy consumption and also changeover of fuel from Furnace oil to NG/RLNG in Utilities boilers. We have started using Gas as fuel and feed in our Ammonia & Utilities plant from October 2013 thereby reducing the emission levels of CO<sub>2</sub>, SO<sub>2</sub> (by 99 %) and Particulate Matter (by 77%) substantially through the flue gases in Ammonia & Utilities plants.
- (v) We are in the process of revamping of our scrubbing system in NPK-A and NPK-B plants for further reduction of the emission levels. The revamped plants is expected to go onstream shortly.

- (vi) During the revamp/debottlenecking the capacity of Ammonia, Urea, NPK-A & NPK-B plants, a capital investment of approx. Rs.25 Crores has been earmarked for implementing the schemes meant for protection of environment.
- (vii) Rain water harvesting for storage in the form of captive lake of 235 MG capacity already exists. Additional measures for rain water harvesting consisting of ground water recharge structures and mini artificial aquifer recharge structures for recharge of ground water around factory premises are implemented in October/November 2009. Further additional measures for charging of ground water are done in the years 2011 & 2012. Also recently in April 2014 with the new agreement of water supply with Water Resources Department, Goa we have totally stopped utilizing the bore wells water.
- (viii) During its operation for last four decades, Zuari Agro Chemicals Ltd. has already undertaken many eco-development measures like afforestation, creation and maintenance of green belt around the factory premises etc. The Company has also undertaken community welfare measures like providing land for sulabh toilets for general public in the neighborhood, development of neighboring govt. school playground, maintenance of public gardens in Vasco city, beautification of highway road divider etc as part of Corporate Social Responsibility Schemes.
- (ix) We have installed and commissioned the continuous ambient air quality monitoring unit at an AAQM station in February 2013. This station measures five parameters on continuous basis.
- (x) We are zero effluent discharge unit. Still we have installed online monitoring instruments for measurement of pH, Conductivity & Temperature of our final effluent discharge in the event of any emergency disposal.
- (xi) We have installed and commissioned continuous stack emission monitoring station for our common stack of our Utilities Boilers in July 2013. This station measures three parameters on continuous basis.



## **PART – I**

### **Any other particulars for improving the quality of Environment**

- (i) Regular monitoring of process stack emissions once in a month and regular monitoring of ambient air quality around the complex at four strategic CPCB identified locations twice a week by an accredited MoEF recognized laboratory is being carried out. The results of stacks as well as ambient air quality monitoring are well within the standards prescribed by CPCB/SPCB. The monitored results are also displayed on electronic display boards located in public domain. The summaries of results are also sent to the office of RO-MoEF and ZO-CPCB at Bangalore.
- (ii) Work zone environment monitoring for ammonia and noise at various locations inside the factory premises and the ambient noise level at different locations around factory premises is carried out. The results of monitoring conform to the limits prescribed.
- (iii) All the wastewater generated within the factory premises is given primary/secondary treatment and then recycled to NPK-A and NPK-B plants for process use or to cooling towers as part make up water. The domestic effluent is treated in Sewage Treatment Plant and the treated domestic effluent is totally recycled to cooling towers as make up. Zuari Agro Chemicals Ltd, Goa continues to maintain zero effluent discharge status.
- (iv) Every effort is made to reduce the generation of effluent/emission/wastes at the source itself and to explore the possibility of reusing/recycling of the wastes that are generated.
- (v) Hazardous Wastes like used/spent oil, furnace oil tank sludge/cleaning residue and spent catalysts that are generated are stored separately and sold to only those Vendors registered with CPCB as Recyclers and having Consents/Authorization from State Pollution Control Boards.
- (vi) We have also started disposing off our e-waste to the authorized recycler in compliance with The E-waste (Handling & Management) Rules, 2011.
- (vii) Other solid materials like product spillages, off specification products, acid tank sludge and ETP sludge are recycled back to process directly or along with the filler material in NPK-A and NPK-B plants.
- (viii) Efficient and effective management of cooling water quality control program for operating the cooling towers at higher cycles of concentration to reduce the generation of cooling tower blow-down effluent.
- (ix) Effluent storage ponds like acidic/alkali effluent ponds at Water Treatment Plant, Settling ponds/Holding pond/Guard pond at Effluent Treatment Plant are regularly

cleaned, inspected, repaired if required and chemically resistant epoxy coated from inside to avoid any seepage.

- (x) Natural Gas/Ammonia/Chlorine sensors are installed at strategic locations inside the plant premises for early detection of any leak and corrective measures. These sensors are regularly checked for proper functioning.
- (xi) Regular generation of meteorological data like wind speed, wind direction, temperatures and wind rose diagrams by maintaining thermo-hydrograph and data logger.
- (xii) As is the practice every year, tree plantation drive (Van Mahotsav) is carried out during monsoon. More area around the factory complex is being developed as green belt and saplings of various plants are distributed to the neighboring villagers free of cost.
- (xiii) Maintenance of approx. 260 hectares of green belt around the factory complex to mitigate the effect of fugitive emissions and noise as per CPCB guidelines.
- (xiv) Zuari is in operation for over four decades. A full fledged laboratory with necessary facilities is created for carrying out analysis and monitoring. Stack emission and ambient air quality monitoring is carried out by MoEF recognized external laboratory as stipulated by GSPCB. A person of Deputy General Manager level is dedicated to be in-charge of overall environmental management functions and he is ably assisted by a dedicated Environment Engineer. Besides, environment management is also one of the mainstream functions of all the section heads who contribute in their own way.