ZUARI AGRO CHEMICALS LTD, ZUARINAGAR, GOA

FORM - V

Environmental Statement for the financial year ending 31st March, 2013

PART – A

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

Mr. Suresh Krishnan
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

Sr. No.	Product	Installed Production Capacity MT/ Year	Actual Production for 2012-13, MT
1	Ammonia *	220000	226535
2	Urea	376200	386718
3	Complex Grades in NPK-A plant	150000	97138
4	Complex Grades in NPK-B plant	150000	152505
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

July 12, 2012

PART – B

Water and Raw Material Consumption

(i) Water Consumption **M^3 / Day** (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^3 / Day)

Name of Products	**Process water consumption per unit of product output**	
	During the previous financial year 2011-12	**During the current financial year 2012-13**
Urea	8.84 M^3 / MT	8.79 M^3 / MT
Complex Grades in NPK-A plant	0.166 M^3 / MT	0.202 M^3 / MT
Complex Grades in NPK-B plant	0.099 M^3 / MT	0.117 M^3 / 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 2011-12	**During the current financial year 2012-13**
Naphtha (includes Fuel Naphtha also)	Ammonia (Intermediate product for captive consumption)	0.837	0.781#
Natural Gas #		-------	0.048
Ammonia	Urea	0.580	0.58
CO_2		0.754	0.765

Name of Raw Material *	Name of Products	Consumption of Raw Material per unit of Output (MT/MT)	
		During the previous financial year 2011-12	During the current financial year 2012-13
Ammonia P_2O_5 H_2SO_4 Filler	18:46:00 grade (Samrat)	0.225 0.460 0.049 0.072	0.224 0.461 0.045 0.056
Ammonia P_2O_5 Potash H_2SO_4 Filler	10:26:26 grade (Samarth)	0.123 0.261 0.438 0.012 0.061	0.126 0.261 0.441 0.012 0.061
Ammonia P_2O_5 Potash H_2SO_4 Filler	12:32:16 grade (Sampatti)	0.150 0.321 0.269 0.022 0.090	0.148 0.320 0.273 0.021 0.087
Ammonia P_2O_5 Potash H_2SO_4 Filler Urea	19:19:19 grade (Sampoorna)	0.087 0.190 0.330 0.019 0.006 0.274	0.088 0.190 0.330 0.017 0.008 0.275

(* 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)

(# Natural Gas intake started from February 14, 2013 and continued till March 24, 2013. During this period, both Natural Gas as well as Naphtha were 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)

Pollutants	Quantity of pollutants discharged (mass / day) Kg / Hr *	Concentration of pollutants in discharge (mass / vol.) Mg / M3 *	Percentage of variation from prescribed standards with reasons
(a) Water	NIL	NIL	N.A
(b) Air			
i) Particulate Matter from Prilling Tower – Urea plant	---	37.67	Less by 74.88%
ii) Particulate Matter from Dust Separator – Urea plant	---	41.23	Less by 72.51%
iii) Ammonia from Off Gas Absorber – Urea plant	2.28	---	Less by 77.20%
iv) Ammonia from Amm. Recovery Absorber – Urea plant	1.01	---	Less by 89.90%
v) Ammonia from Fumes Stack – NPK-A plant	1.43	---	Less by 85.70%
vi) Particulate Matter from Dryer Stack – NPK-A plant	---	41.73	Less by 72.18%
vii) Particulate Matter from Dedusting Stack – NPK-A plant	---	43.57	Less by 70.95%
viii) Ammonia from NPK-B Stack	3.98	---	Less by 60.20%
ix) Particulate Matter from NPK-B Stack	---	44.98	Less by 70.01%
x) SO2 from Boiler Stack	402.09	---	Less by 49.86%
xi) Particulate Matter from Boiler Stack	---	124.02	Less by 17.32%
xii) SO2 from DG Set stack	9.8	---	Less by 90.71%
xiii) Particulate Matter from DG Stack	---	67.60	Less by 54.93%
xiv) NOX from DG Stack	---	149.64 ppm	Less by 86.39%
xv) NMHC from DG Stack	---	4.80	Less by 96.80%
xvi) CO from DG Stack	---	6.22	Less by 95.85%

(* 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]

Hazardous Waste	**Total Quantity**	
	During the previous financial year 2011-12	**During the current financial year 2012-13**
(a) From Process (i) Used / Spent Oil under H.W. Category No.5.1 (ii) Spent Catalyst under H.W.Category No.18.1 (iii) Furnace Oil Tank cleaning sludge under H.W.Category No.3.1	 16.9 MT NIL 106.49 MT	 3.29 MT 23.26 MT 37.58 MT
(b) From pollution control facilities (i) ETP sludge under H.W.Category No.34.3	 35 MT	 40 MT
(c)(i) Quantity recycled / reused within Unit (ii) Sold (used/spent Oil) (iii) Sold (Spent Catalyst) (iv) Sold (Furnace oil Tank cleaning residue)	35 MT ETP Sludge 16.9 MT NIL 106.49 MT	40 MT ETP Sludge 3.29 MT 23.26 MT 37.58 MT

PART – E

Solid Wastes

Solid Waste from Process	**Total Quantity**	
	During the previous financial year 2011-12	**During the current financial year 2012-13**
(a) From Process (i) DM plant resin material (ii) Sand from filters (iii) Activated carbon from filters	 Approx. 4 M^3 Approx. 24 M^3 Approx. 4 M^3	 NIL Approx. 50 M^3 Approx. 20 M^3
(b) From pollution control facilities (i) STP Sludge	Approx. 1 M^3	Approx. 3 M^3
(c) (i) Quantity recycled / reused within unit (ii) Quantity Sold (iii) Disposed (Resin material, Sand, Active Carbon & STP sludge)	NIL NIL Approx. 33 M^3	Approx. 50M^3(Sand) NIL Approx. 20 M^3

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

Waste	Composition	Disposal Practice adopted
Hazardous Waste		
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
Solid Waste from Process		
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. 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) Several Energy savings measures implemented over last few years have reduced the specific energy consumption of Urea which has reduced Furnace Oil consumption in our Utility Boilers and hence reduced the emissions. Every year some energy saving measures are implemented.

(ii) We have installed Reverse Osmosis unit in our ETP for enhanced treatment and recovery/recycle of treated water from our wastewater/effluent.

(iii) We have completed the process of revamping 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 in our Ammonia & Utilities plant since February 2013 thereby reducing the emission levels of CO2 and SO2 substantially through the flue gases in Ammonia & Utilities plants.

(iv) We have initiated the process of revamping of our scrubbing system in NPK-A and NPK-B plants for further reduction of the emission levels. The technical study by our Consultant for NPK- A plant is completed and we are in the process of implementing the same.

(v) 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.

(vi) 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.

(vii) 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.

(viii) 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.

(ix) 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.

(x) We are also in the process of installing continuous stack emission monitoring unit for our common stack of our Utilities Boilers.

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 Banagalore.

(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) Naphtha/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 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.