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July 30, 2020

To,
Member Secretary,
Goa State Pollution Control Board,
Nr. Pilerne Industrial Estate,
Opp. Saligao Seminary,
Saligao-Bardez,
Goa 403511

Dear Madam,

Subject: Environmental Statement for the year 2019-20

Please find enclosed herewith the "Environmental Statement" for the year 2019-20 in Form – V in compliance with Rule-14 of the Environment (Protection) (Second Amendment) Rules, 1992.

Hope the information provided meets your requirement.

Thanking you,

Yours truly,
For **Zuari Agro Chemicals Ltd.**

N.G. Dessai
Chief General Manger-Operations

Enclosed: as above

ZUARI AGRO CHEMICALS LIMITED
CIN No.: L65910GA2009PLC006177
Registered Office: Jaikisaan Bhawan, Zuarinagar, Goa - 403 726, India
Tel: +0832 2592180, 2592181, 6752399
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ZUARI AGRO CHEMICALS LTD, ZUARINAGAR, GOA

FORM - V

Environmental Statement for the financial year ending 31st March, 2020

PART – A

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

Mr. Sunil Sethy
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 2019-20, MT
1	Ammonia *	346500	145631
2	Urea	495000	232657
3	Complex Grades in NPK-A plant	500000	170165.370
4	Complex Grades in NPK-B plant	500000	21409.950
5	Carbon Dioxide**	34400	Nil

(* Intermediate Product used for captive consumption)
(**By-Product)

(iv) Year of Establishment

1967 (Actual commercial production started in 1973)

(v) Date of the last Environmental Statement submitted

July 30, 2019

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 **

Industry Effluent generated – Nil (Zero Liquid Discharge)

(* 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 2018-19	**During the current financial year 2019-20**
Urea	7.34 M^3 / MT	7.83 M^3 / MT
Complex Grades in NPK-A plant	0.3522 M^3 / MT	0.699 M^3 / MT
Complex Grades in NPK-B plant	0.3651 M^3 / MT	1.1032 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 2018-19	**During the current financial year 2019-20**
Natural Gas	Ammonia (Intermediate product for captive consumption)	0.405	0.427
Ammonia	Urea	0.58	0.58
CO_2		0.760	0.753

Name of Raw Material *	Name of Products	Consumption of Raw Material per unit of Output (MT/MT)	
		During the previous financial year 2018-19	During the current financial year 2019-20
Ammonia P_2O_5 H_2SO_4 Filler Urea	18:46:00 grade (Samrat)	0.2076 0.4612 0.0438 0.0418 0.0233	0.2077 0.4700 0.0421 0.0680 0.0320
Ammonia P_2O_5 Potash H_2SO_4 Filler	10:26:26 grade (Samarth)	0.1243 0.2677 0.4378 0.0054 0.0568	0.1273 0.2669 0.4234 0.0050 0.0319
Ammonia P_2O_5 Potash H_2SO_4 Filler	12:32:16 grade (Sampatti)	0.1469 0.3260 0.2716 0.0116 0.0573	0.1542 0.3303 0.2610 0.0063 0.0828
Ammonia P_2O_5 Potash H_2SO_4 Filler Urea	19:19:19 grade (Sampoorna)	0.0827 0.1962 0.3239 0.0113 0.0193 0.2824	0.0862 0.1960 0.3090 0.0151 0.0384 0.2850
Ammonia P_2O_5 Potash H_2SO_4 Filler	14:35:14 grade (Saubhagya)	0.1753 0.3555 0.2361 0.0463 0.0257	-
Ammonia P_2O_5 H_2SO_4 Filler Urea	28:28:00 grade (Uramphos)	-	0.1250 0.2916 0.0148 0.0144 0.4049

(* 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)

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 / Nm3 *	Percentage of variation from prescribed standards with reasons
(a) Water	NIL	NIL	N.A
(b) Air			
i) Particulate Matter from Prilling Tower – Urea plant	---	86.52	Less by 42.32%
ii) Particulate Matter from Dust Separator – Urea plant	---	49.29	Less by 67.14%
iii) Ammonia from Fumes Stack – NPK-A plant	0.82	---	Less by 91.8%
iv) Particulate Matter from Dryer Stack – NPK-A plant	---	50.05	Less by 66.63%
v) Particulate Matter from Dedusting Stack – NPK-A plant	---	53.60	Less by 64.26%
vi) Ammonia from NPK-B Stack	2.77	---	Less by 72.8%
vii) Particulate Matter from NPK-B Stack	---	42.87	Less by 71.42%
viii) SO_2 from Boiler Stack	1.98	16.36	NA
ix) NOx from Boiler Stack	---	109.69	NA
x) Particulate Matter from Boiler Stack	---	30.42	NA
xi) SO_2 from DG Set stack	2.21	---	Less by 97.90 %
xii) Particulate Matter from DG Stack	---	41.63	Less by 72.24%
xiii) NOx from DG Stack	---	131 ppmv	Less by 88.09%
xiv) NMHC from DG Stack	---	12.41	Less by 91.72%
xv) CO from DG Stack	---	34.24	Less by 77.17%

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

PART – D

Hazardous Waste

[As specified under Hazardous Waste & Other Wastes (Mgt. & Transboudary Movement) Rules, 2016]

Hazardous Waste	Total Quantity	
	During the previous financial year 2018-19	During the current financial year 2019-20
(a) From Process		
(i) Used / Spent Oil under H.W.Category No.5.1	32.155 MT	22.218 MT
(ii) Spent Catalyst under H.W.Category No.18.1	149.438 MT	Nil
(iii) Furnace Oil Tank cleaning sludge under H.W. Category No.3.1	53.7 MT	13.77 MT
(iv)Wastes or Residue containing oil under H.W. Category No. 5.2	0.09 MT	0.32 MT
(v) Empty barrels / container/liner contaminated with hazardous chemicals under H.W. Category No. 33.1	Nil	226 Nos. (4.630 MT)
(b) From pollution control facilities		
(i) ETP sludge under H.W Category No.35.3	42 MT	31 MT
(c) (i) Quantity recycled / reused within Unit	42 MT ETP Sludge	31 MT ETP Sludge
(ii) to authorized recycler (Used/Spent Oil)	32.155 MT	22.218 MT
(iii) to authorized recycler (Spent Catalyst)	114.735 MT	34.703 MT
(iv) to authorized recycler (Furnace oil Tank cleaning residue)	38.610 MT	25.66 MT
(v) to authorized recycler (Wastes or Residue containing oil)	0.09 MT	Nil
(vi) to authorized recycler (Empty barrels/container/liner contaminated with hazardous chemicals)	Nil	226 Nos. (4.630 MT)

PART – E

Solid Wastes

Solid Waste from Process	Total Quantity	
	During the previous financial year 2018-19	During the current financial year 2019-20
(a) From Process		
(i) DM plant Resin material	Approx. 4 m^3	Nil
(ii) Sand from WTP filters	Approx. 9 m^3	Nil
(iii) Activated carbon from WTP filters	Approx. 5 m^3	Nil
(b) From pollution control facilities		
(i) STP Sludge	Approx. 2 m^3	Approx. 2 m^3
(c) (i) Quantity recycled / re-utilized within unit	Approx. 20 m^3 (Sand, Resin material, Activated Carbon and STP sludge)	Approx. 2 m^3 of STP sludge
(ii) Quantity Sold	NIL	NIL
(iii) Disposed	NIL	NIL

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 recycler registered with CPCB and having valid authorization of SPCB
Furnace Oil Tank sludge & cleaning residue	Oil sludge & cleaning residue	Sold to recycler registered with CPCB and having valid authorization of SPCB
Spent Catalyst	Spent catalyst containing metals/oxides like Ni, Cu, Zn, Fe, Co, Mo etc.in different composition	Sold to recycler registered with CPCB and having valid authorization of SPCB
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
Wastes or Residues containing oil	Cotton gloves/cloth/rags containing oil	Given to recyclers registered with CPCB and having valid authorization of SPCB.
Empty barrels/ container/liner contaminated with hazardous chemicals	Discarded barrels/ container/liner contaminated with hazardous chemicals	The empty drums after washing are given to authorized recyclers.
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 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. 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) 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.

(ii) The Reverse Osmosis unit in our ETP provides enhanced treatment and recovery/recycle of treated water from the wastewater/effluent.

(iii) The debottlenecking project for enhanced capacity of NPK plant-A and NPK plant-B along with product mix change is completed. The revamped Scrubbing Systems in the NPK-A and NPK-B Plants have been very effective such that the Ammonia emissions are well below the prescribed emission norms.

(iv) Rain water harvesting for storage in the form of captive lake of 235 MG capacity already exists. In April 2014, with the new agreement of water supply with Water Resources Department, Goa, we have totally stopped utilizing the bore wells water.

(v) 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.

(vi) The Company has also undertaken community welfare measures like development and maintenance of Children's Park at Municipal garden in Vasco city, maintenance of bus stop shelters at various locations all over Goa state, maintenance of public gardens in Vasco city, awarding scholarships, Set up Skill Development Centre in trades like Electrician, conducting health camps like malaria awareness, supply of safe drinking water, distribution of free saplings as a part of tree plantation drive etc. as part of Corporate Social Responsibility Schemes.

(vii) Continuous Ambient Air Quality Monitoring Station is present that continuously monitors PM10, PM2.5, NH3, SO2 and NO2. The station also provides weather data.

(viii) The Company continues to maintain the Zero Liquid Discharge status. The final effluent discharge pipeline is being continuously monitored by means of provisions of a camera and a flow meter. The Monitoring is done on a "Real Time" basis as these are hooked up to the CPCB and GSPCB server/system.

(ix) We have also installed continuous stack emission monitoring system (CEMS) for Reformer stack of Ammonia plant for monitoring NOx, DG stack for monitoring Particulate Matter and Fumes stack of NPK-A Plant & NPK-B stack for monitoring of Ammonia parameter. The data from Reformer stack, DG stack, NPK-A Fume stack and NPK-B stack has been linked to the GSPCB and CPCB server.

PART – I

Any other particulars for improving the quality of Environment

(i) Regular monitoring of process stack emissions once in three months and regular monitoring of ambient air quality around the complex at four strategic CPCB identified locations twice a week by an accredited MoEF&CC 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.

(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. continues to maintain Zero Liquid 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 are disposing off our e-waste to the authorized recycler in compliance with The E-waste (Management) Rules, 2016.

(vii) Bio-Medical Waste disposed off as per the Bio-Medical Waste Authorization obtained from GSPCB.

(viii) Other solid materials like product spillages, off specification products, ETP sludge are recycled back to process directly or along with the filler material in NPK-A and NPK-B plants.

(ix) 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.

(x) 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 suitable internal lining measures have been adopted to make the ponds seepage proof.

(xi) 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.

(xii) Regular generation of meteorological data like wind speed, wind direction, temperatures and wind rose diagrams by maintaining thermo-hydrograph and data logger.

(xiii) 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.

(xiv) Health, Sanitation, and Livelihood Program (SAHYOG) in partnership with NGO "Margdarshak" have carried out several training programs including workshops on sanitation hygiene and health with school children in Zuarinagar, Zari and Velsao.

(xv) Development and maintenance of approx. 50% of area around the factory complex as greenbelt to mitigate the effect of fugitive emissions and noise as per CPCB guidelines.

(xvi) 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 General Manager level is dedicated to be in-charge of overall environmental management functions and he is ably assisted by a dedicated team. Besides, environment management is also one of the mainstream functions of all the section heads who contribute in their own way.

(xvii) Various activities such as cleanliness drives, Quiz competitions, etc. were held during World Environment Week to promote awareness and impart knowledge on various environmental issues.

(xviii) Training on Environment Management Systems are regularly provided to employees and contract workers.

(xix) Zuari Agro Chemicals Limited is certified for excellence in "PROTECT & SUSTAIN" stewardship by International Fertilizer Industry Association (IFA).

(xx) The Company had successfully achieved certification of internationally recognized Environment, Occupational Health and Safety Standards ISO 14001: 2004 and OHSAS 18001:2007 in the year 2015. The company continues its Environment, Safety & Health initiatives and has completed the transition of ISO 14001:2004 to ISO 14001:2015 and migration of OHSAS 18001:2007 to ISO 45001:2018 and achieved the certification in May 2019 through TUV Nord.