आईआरईएल (इंडिया) लिमिटेड

IREL (INDIA) LIMITED

(Formerly Indian Rare Earths Limited)

(भारत सरकार का उपक्रम / A Govt. of India Undertaking)

चवरा, कोल्लम - 691 583, केरल राज्य, भारत

Chavara, Kollam – 691 583, Kerala State, INDIA

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ISO 9001:2015, ISO 14001:2015 & OHSAS 18001:2007 Company

CH/S&E/ENV-AUDIT/2020
April 22, 2020

To

The Member Secretary
Kerala State Pollution Control Board
Pilamoodu Junction, Pattom P.O.
Thiruvananthapuram – 695004

Sir,

Sub : Environmental Audit Report for 2019-20

Please find enclosed herewith the Environment Audit Report for the year 2019-2020 for your kind information and records.

Kind Regards,

Yours Truly,
For IREL(India) Limited

22/4/2020
S.SURYA KUMAR
CGM & HEAD

Encl : as above.

Copy to : The Environmental Engineer, KSPCB, District Office
Ushus Building, Chamakkada, Kollam

File

IREL(India) Limited, CHAVARA

ENVIRONMENTAL STATEMENT FOR FY- 2019-20

PART-A

I) Name and Address of the owner/Occupier of the industry Operation or Process : Shri. S.Surya kumar
CGM & Head
Chavara Plant,
IREL(India) Limited,
Chavara – 691 583, Kerala.

II) Date of the last environmental audit report Submitted : July 23, 2019

IREL(India)Limited , Chavara, A Government of India Undertaking (under the Dept. of Atomic Energy) is engaged in mining and processing of beach sand minerals from the west coast of India along a coastal length of 22.5 kms between Neendakara in the south and Kayamkulam in the North with an average width of 200 m. The Chavara Unit is located on the older lease hold area of IRE at 1.5 kms from the NH-47 (Kanyakumari – Salem Highway) at a distance of 13 kms from the district Headquarters at Kollam and 80 kms away from the Capital city of Thiruvananthapuram.

The mineral sand from different mining areas is fed to HUP (Heavy Up gradation Plant), where it is passed through a set of spirals and is separated into heavies and tailings (lighter) fractions. The Heavies are passed through WHIMS (Wet High Intensity Magnetic Separator) to get magnetic and non-magnetic fractions. The dewatered WHIMS magnetic fraction from HUP is dried in a Fluidised Bed Dryer and is fed to the High Tension Separators (HTS) to get conducting fraction, which is the Ilmenite product; and non-conducting fraction, which is enriched in Monazite, is sent to the Monazite plant for further processing.

The dewatered WHIMS non-magnetic fraction from HUP is dried in another fluidized bed drier and fed to the High Tension Separator to get conducting and non-conducting fractions. The conducting fraction is fed to Magnetic separators to get three fractions viz. (i) Magnetics (Ilmenite product), (ii) Non- magnetics (RUTILE product) and also a middling fractions (LEUCOXENE product).

The non-conducting fraction from the HTS in rutile plant is fed to another set of magnetic separators, the magnetic fraction of which is fed to Monazite circuit, being rich in Monazite content. The non-magnetic fraction is fed to Floatex Density Separators, the overflow of which is rejected and the under flow is fed to spirals circuit. The heavies fraction from these spirals is further upgraded through wet tables, Magnetic separators, HTS etc to produce ZIRCON product. The tailings

fraction from the spirals is treated in Kelsey Jig and wet tables to recover ZIRCON. The tailings fraction from Kelsey Jig is treated in spirals, Floatation Cell etc to produce SILLIMANITE product.

The Chavara unit has the following plants/ facilities:

1. One Dredge & Wet Up gradation Plant consists of Dredge & Pre-concentration facilities at V.T.Mining area.
2. Heavy Up gradation Plant (HUP)
3. Fluidized Bed Driers (FBD)
4. Mineral Separation Plant (MSP)
5. Zircon Opacifier Plant (ZOP)

PART-B

WATER AND RAW MATERIAL CONSUMPTION

I. Water Consumption (m^3/d)

Process : 2612.2

Cooling : 2.095

Domestic : 61.7

Name of the Products	Water Consumption per t during the year 2018-19	Water Consumption per t during the year 2019-20
Heavy Minerals (All combined)	16.84	15.11

Note: Water Consumption per ton of products has been assessed on the basis of total production of heavy minerals (combined) and fresh water consumed for process and domestic purpose. About 75% of process water is re-circulated.

II) Raw Material Consumption

Sl. No.	Name of raw Material	Name of the Product	Input MT	Output MT	Consumption of raw material per unit of output during	
					2018-19	2019-20
1.	Raw sand from all Mining areas	Surface Mining /	262847	262847	**	**

		Beach Washings				
3.	Raw sand processed in the Heavy Up gradation Plant	HUP Heavies (Mag + Non-mag)	257857	64724	2.99	3.98
4.	HUP output processed in the Mineral Separation Plant(MSP)	Ilmenite, Rutile, Zircon, Sillimanite, Leucoxene	64724	55812	1.32	1.15
5.	Zircon fed in the Zircon Opacifier Plant (ZOP)	Zirflor	1295.48	1303.2	0.95	0.99
6.	Furnace oil(Liters)	Used in the MSP for Mineral Processing	693422	---	Negligibly small	
8.	HSD Oil(Liters)		342049	---		
9.	Oleic acid (Kg)		8345	---		
10.	Sodium Silicate (Kg)		3550	---		
11.	Soda Ash (Kg)		8400	---		

At present there are mainly two sources of raw material. The Inland Deposit is being dredged or excavated by Excavator and tipper combination and upgraded by the pre concentration plant and the Beach washing is being collected at the sea shore with the help of heavy earth moving machineries. Both these fractions are blended and upgraded in the Heavy Up gradation Plant. The output from HUP (Magnetic & non-magnetic fractions) are separately fed to the Mineral Separation Plant for separation of heavy minerals, viz., Ilmenite, Rutile, Zircon, Sillimanite, Leucoxene, etc. Furnace oil and High Speed Diesel Oil are used in the MSP for the operation of Driers.

PART C

POLLUTION GENERATED

(Parameters specified in the consent issued)

Pollutants	Quantity of Pollution generated	Percentage of variation from prescribed standard with reasons
Water M.S.P	37312	All pollutants are within the limits fixed by Kerala State Pollution Control Board

Note: Mining and Mineral Separation involve only physical operations. In mineral separation process water is used for preparation of sand slurry. About 75% of the water used is recirculated.

a. Analysis of effluent :

Sl. No.	Parameter	Unit	Range	Average	Tolerance limit fixed by KSPCB
1.	pH	---	6.79 – 8.87	7.43	6.0-8.0
2.	Suspended solids	ppm	10 – 64.5	7.42	100
3.	Gross Alpha	Bq / l	0.12	0.06	3.7
4.	Gross Beta	Bq / l	0.13	0.06	37

b. Air (Stack Monitoring)

i) Location: Ilmenite FBD

Sl. No	Parameter	Unit	Range	Average	Tolerance limit fixed by KSPCB
1	Flowrate	Nm^3/h	2337 - 2917	2214	12000
2	PM	mg/ Nm^3	19 - 69	23	150
3	SO_2	mg/ Nm^3	225 – 345	242	1200
4	CO	mg/ Nm^3	Less than 12.5	Less than 12.5	250

ii) Location: Rutile FBD

Sl. No	Parameter	Unit	Range	Average	Tolerance limit fixed by KSPCB

1	Flow rate	Nm^3/h	4065 - 4570	3583	12000
2	PM	mg/ Nm^3	25 – 78	28	150
3	SO_2	mg/ Nm^3	215 - 324	267	1200
4	CO	mg/ Nm^3	Less than 12.5	Less than 12.5	250

iii) Location: Zircon FBD

Sl. No	Parameter	Unit	Range	Average	Tolerance limit fixed by KSPCB
1	Flowrate	Nm^3/h	1289 - 1670	1192	6000
2	PM	mg/ Nm^3	35 – 57	28	150
3	SO_2	mg/ Nm^3	187 - 255	219	1200
4	CO	mg/ Nm^3	Less than 12.5	Less than 12.5	250

iv) Location: Sillimanite FBD

Sl. No	Parameter	Unit	Range	Average	Tolerance limit fixed by KSPCB
1	Flowrate	Nm^3/h	1875 – 2094	1382	6000
2	PM	mg/ Nm^3	40 – 75	28	150
3	SO_2	mg/ Nm^3	141 - 222	197	1200
4	CO	mg/ Nm^3	Less than 12.5	Less than 12.5	250

v) Location: Rutile Shaft Drier

Sl. No	Parameter	Unit	Range	Average	Tolerance limit fixed by KSPCB
1	Flowrate	Nm^3/h	417 - 472	434	600
2	PM	mg/ Nm^3	37 - 76	24	150
3	SO_2	mg/ Nm^3	215 - 472	261	1200
4	CO	mg/ Nm^3	Less than 12.5	Less than 12.5	250

vi) Location: Zircon Shaft Drier

Sl. No	Parameter	Unit	Range	Average	Tolerance limit fixed by KSPCB

1	Flowrate	Nm^3/h	205 - 345	332	600
2	PM	mg/ Nm^3	28 - 58	26	150
3	SO_2	mg/ Nm^3	203 - 290	256	1200
4	CO	mg/ Nm^3	Less than 12.5	Less than 12.5	250

vii) Location: Monazite Shaft Drier

Sl. No	Parameter	Unit	Range	Average	Tolerance limit fixed by KSPCB
1	Flow rate	Nm^3/h	465 - 669	635	600
2	PM	mg/ Nm^3	21 - 71	26	150
3	SO_2	mg/ Nm^3	194 - 329	236	1200
4	CO	mg/ Nm^3	Less than 12.5	Less than 12.5	250

Note: The main source of gaseous emission to atmosphere is from burning of furnace oil and HSD in shaft driers and fluidized bed driers. Data given above are prepared on the basis of analysis reports by M/s Standard[s] Environmental & Analytical Laboratories, Kochi. In all cases CO concentration was less than 12.5mg/ Nm^3.

PART –D

HAZARDOUS WASTES

As specified under the hazardous wastes/ management and handling rules 1989,

Hazardous wastes	Total Quantity in Kg during the year 2018-19	Total Quantity in Kg during the year 2019-20
a. From process	NIL	NIL
b. From pollution control facilities	(*i*)	(*ii*)

i. In 2018-19, 852 litres of spent oil collected for disposal.
ii. In 2019-20 , 20 litres of spent oil collected for disposal.

PART-E
SOLID WASTES

Solid wastes	Total Quantity in MT during the year 2018-19	Total Quantity in MT during the year 2019-20
Sand rejects from DWUP	NIL	NIL
Sand rejects from HUP	164430	193133
Tailings from MSP	20136	8912

Note: Since only physical methods are used for the mining and heavy mineral separation, no chemical wastes are produced in the process. The reject sands from the DWUP, HUP constitute the original sand devoid of Heavy Minerals. The tailings from the MSP consist of quartz, shell and the unrecovered minerals in the concentrate feed. In the HUP, both the raw sand from inland mining and Beach Washings are fed together for further up gradation.

PART-F

Please specify the characteristics in terms of concentration and quantum) of Hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

I. Characteristics of solid wastes

The operation of DWUP and HUP enriches the heavy minerals from beach sand and the residuals rejected. The rejects contain original raw sand devoid of heavy minerals.

The tailing from the MSP constitutes negligible quantity of unrecovered minerals such as Ilmenite, Garnet and Sillimanite.

II. Disposal practices

The reject sand from dredge mining and concentration is used for backfilling mined out areas.

PART-G

Impact of the pollution control measures on conservation of natural resources and consequently on the cost of production.

Adequate pollution control equipments like expansion chambers, multi cyclones,filter bag system etc. are provided to reduce atmospheric

emissions. The FBD has built-in dust collection arrangement. The sand rejects are utilized for back-filling the mined out areas which are brought back to the original contour by appropriate landscape management. Afforestation and green belt programmes, aimed at improving the quality of environment, are undertaken on regular basis. All these measures lead to increase in the cost of production.

PART-H

Various types of sapling collected from Social Forestry department of Kerala Government ,are being planted regularly in the refilled areas.

PART-I

Any other particulars in respect of environmental protection and abatement of pollution.

Effluent Treatment Plant for segregating waste oil from Automobile workshop area is in operation and the treated water is being used for gardening purpose in IREL. During this year apart from new plantation all efforts were taken for nursing the sapling planted during the previous years.

For IREL(India) Limited,

21/4/2020

In charge (S,E,F&T)

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