

Report
of the

Joint Committee Constituted by
Hon'ble NGT

In reference to
Original Application
No.261/2024(CZ); Devidas
Khatri V/s State of Rajasthan &
Ors,

Members of the Joint Committee: -

- 1. Smt. Kavita Godara, Sub Divisional Officer, Bikaner.**
- 2. Shri Rajkumar Meena, Regional Officer, RSPCB, Bikaner**

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Factual & action taken report in compliance of Hon'ble National Green Tribunal Central Zone, Bhopal order dated 13-12-2024 in the matter of OA 261/2024 (CZ), Devidas Khatri V/s State of Rajasthan & Ors

Hon'ble National Green Tribunal, Central Zone Bench, Bhopal vide order dated 13-12-2024 issued following order/instructions in the matter of OA 261/2024(CZ) of Devidas Khatri V/s State of Rajasthan & Ors: -

- “ 1. The grievance of the applicant is violation of environmental norms and laws by respondent nos. 04 to 19, units engaged in manufacturing of plaster of Paris in Khara Industrial Area in Tehsil & District – Bikaner, Rajasthan.
2. It is further contended that the irregular and unchecked operation of these units led to severe pollution as per the newspaper articles the AQI of the disputed area was 900, which is very high. As per the news articles the residents of Khara Village are directly affected and are suffering from disease like Asthma etc.
3. It is further alleged that these units are in operation in violation of environmental laws extracting ground water without due permission of the Central Ground Water Authority and they are violating the conditions stipulated in the consent to operate issued to them by the State Pollution Control Board.
4. A substantial issue of environment has been raised.
7. We deem it just and proper to call a report on the matter in issue, in present Original Application, from a Joint Committee consisting of: -
- (i) One representative from the Collector Bikaner, Rajasthan
- (ii) One Representative from the State Pollution Control Board, Rajasthan
8. The Committee is directed to visit the place and submit the factual and action taken report with the list of units operating in the field with detail of consent conditions within six weeks. The State PCB will be the nodal agency for coordination and logistic support.”

Copy of The National Green Tribunal, Central Zone Bench, Bhopal order dated 13-12-2024 is enclosed at **Annexure-R-1**.

Constitution of the Joint Committee: -

In compliance of above Hon'ble Tribunal order dated 13-12-2024, the following officials have been nominated as members of Joint Committee by respective departments: -

1. Smt. Kavita Godara SDM, Bikaner (Representative from Collector, Bikaner, Rajasthan).
2. Shri Rajkumar Meena, Regional Officer, RSPCB, Bikaner (Representative from State Pollution Control Board, Rajasthan).

Copies of the nomination letters are enclosed at **Annexure-R-2**.

Introduction: -

The OA No 261/2024 (CZ) of Devidas Khatri V/s State of Rajasthan & Ors is related with violation of environmental norms and laws by plaster of paris (POP) manufacturing industries in Khara Industrial Area (i.e. Growth Centre, Khara). Plaster of Paris industries are covered under orange category as per categorization of industries/project/ process/activities/mines issued vide State Board office order no. F14(23)/Policy/RPCB/Plg/153 to189 dated 02-06-2020. Copy of the categorization dated 02-06-2020 is enclosed at **Annexure-R-3**.

➤ About plaster of paris industries: -

The majority of gypsum deposits are found in the Bikaner District and nearby areas. Gypsum mineral is the only raw material used in plaster of paris manufacturing. Plaster of Paris contains the calcium sulfate hemihydrates ($\text{CaSO}_4 \cdot 0.5 \text{H}_2\text{O}$). This is prepared by heating the gypsum which contains calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) at temperature about 150°C ($140-180^\circ\text{C}$). Gypsum shapes the POP when heated to such a temperature. Majorly Plaster of Paris industries are situated in Bikaner District in different clusters.

➤ **Manufacturing process of Plaster of Paris: -**

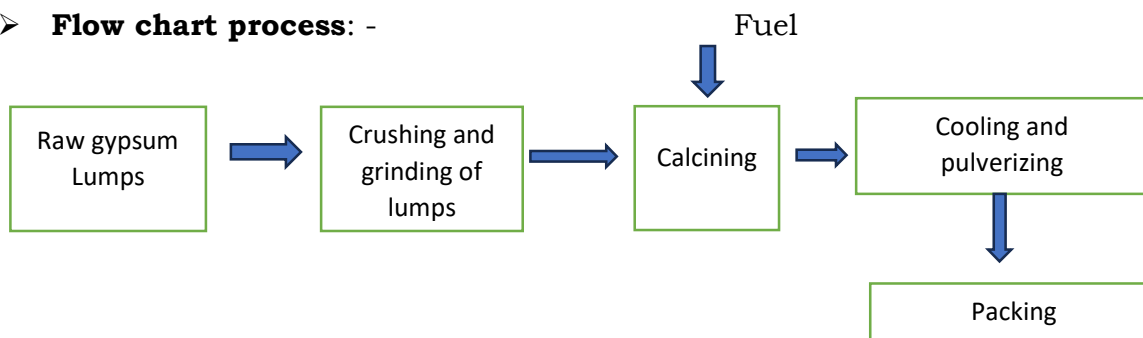
Plaster of paris industries are running on old and obsolete technology due to no advancement in technology. Plaster of paris manufacturing is batch process. Firstly, gypsum is crushed in hammer mill/jaw crusher to reduce the size of gypsum. After that, the crushed gypsum is stored in hopper with the help of bucket elevators. Gypsum is fed into rotary drum calciner from hopper for calcination process.

The Rotary Drum calciners are horizontal drums, rotating along the horizontal shaft at slow speed of around 10-12 rpm. The gypsum (inside rotary drum calciner) is heated in the furnace so that the temperature rises to 140-180 °C inside the drum for 1 to 2 hrs for removing physical moisture. To convert gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) into Plaster of paris ($\text{CaSO}_4 \cdot 0.5\text{H}_2\text{O}$) by one and half molecules of water is removed. Furnace temperature is subjectively maintained at around 400-450 °C.

The calcined plaster of paris after cooling is fed with the help of bucket elevator in the pulveriser for reducing size and packed in airtight bags.

There is no use of water during manufacturing of Plaster of Paris in these industries and water is used only for drinking purpose only.

➤ **Flow chart process: -**



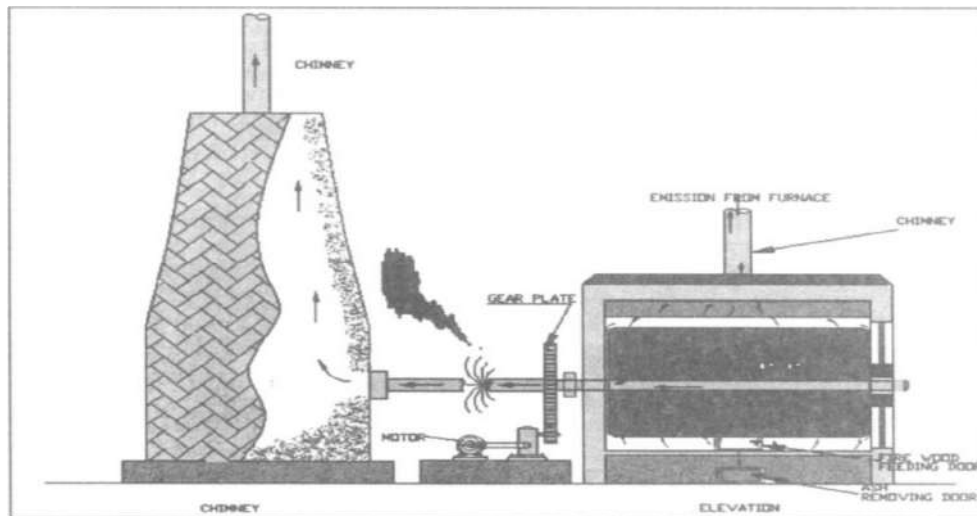
➤ **Type of fuel used: -**

Agro waste and wood are most commonly used fuel in calciner furnace.

➤ **Source of air emissions in plaster of paris industries: -**

All the dust emissions are primarily fugitive in nature and are generated due to raw material storage, material handling, vehicular movement, crushing of lump and pulverizing activities. During calcining process, stack emission is also generated from calciner drum and flue gases emission from calciner furnace.

The major source of dust emission is the drum vent pipe and combustion gas emissions from furnace during calcination. During calcination, as the gypsum is heated, the water vapour is liberated while coming out of drum calciner outlet, which also carries fine dust particles of gypsum/POP along with them. A gap is left between calciner drum vent and stack to smell the steam, so that it becomes clear that the process of making the plaster of paris has been completed.



Flow diagram of Calcination process and emissions source

➤ **Details of pollution control measures adopted by Plaster of paris industries: -**

The emissions from rotary drum calciner are dispersed into atmosphere by natural draft through a trapezoidal stack. The water vapors pass through the stack and the dust being moist gets settled at the bottom of the stack from where it is removed and reused. Industries has provided stacks about 11 meters at calciner furnaces for emissions generated from furnaces.

Earlier, a study was conducted by CPCB in 2007 on Plaster of Paris industries for development of environmental standards and preparing comprehensive industry document for Plaster of Paris industries. Plaster of Paris industries has adopted Pollution Control Measures as suggested in the aforesaid study. Copy of development of environmental standards and preparing comprehensive industry document for Plaster of Paris industries by CPCB in 2007 is enclosed at **Annexure-R-4**.

Field Visit by the Joint Committee: -

The Joint Committee has visited the Growth Centre, Khara and industries of plaster of paris, nearby area of Khara village on date 28-01-2024 for the verification of status of Industries and industrial area. During visit Shri Surendra Prasad Sharma, Regional Manager, RIICO Ltd. was also present. Details during the visit are mentioned as under: -

- a. RIICO Ltd has established Growth Centre, Khara in the year of 1994 in Bikaner District. Growth Centre, Khara has been developed in different specified zone i.e general zone, ceramic zone, mineral zones. Copy of office order issued on date 12-05-1994 by M/s RIICO Ltd for development of Growth Centre, Khara (I Phase) is enclosed at **Annexure-R-5**. Copy of Growth Centre, Khara maps are enclosed at **Annexure-R-6**.
- b. One mineral zone of Growth Centre, Khara is situated adjacent to the Khara Village. Distance between Growth Centre, Khara and village khara is approx 30 meters.

- c. Some plaster of paris industries is also established in converted private land in village Khara. Distance of plaster of paris industries from village khara those situated on converted land is approx 1.5 to 2 Km.
- d. Total 120 plaster of paris industries are situated in Village Khara (in RIICO allotted land and converted land). Presently 82 industries were found operational, 36 industries were found non-operational and 2 industries were found closed. Details of 120 plaster of paris industries along with Consent status and status of upgradation work of air pollution control measures adopted by industries is enclosed at **Annexure-R-7**.
- e. 76 plasters of paris industries were found established in mineral zone & in general zone of Growth Centre, Khara. During visit, 56 plaster of paris industries out of 76 industries were found operational. 18 plaster of paris industries were found non-operational and 2 industries were found closed. RSPCB has been issued Closure direction against 4 industries out of 18 industries. Remaining 14 industries have done self-closure until they have not done upgradation work in air pollution control measures.
- f. 44 plasters of paris industries are also situated in converted private land in village Khara. 26 plasters of paris industries out of 44 industries was found operational. Remaining 18 plaster of paris industries was found non-operational. RSPCB has been issued Closure direction against 3 industries out of 18 industries. Remaining 15 industries have done self-closure until they have not done upgradation work in air pollution control measures.
- g. Details of plaster of paris industries and their air pollution control measures status as mentioned respondent no 04 to 19 in OA 261/2024(CZ) of Devidas Khatri V/s State of Rajasthan & Ors is enclosed at **Annexure- R-8**.
- h. Details of containing consent condition of plaster of paris unit M/s Mahendra Enterprises, G-1-40, IGC, Khara is enclosed at **Annexure- R-9**.


31/01/2025



- i. During inspection, major source of air pollution in plaster of paris industries are material handling, vehicular movement, crushing of lump and pulverizing activities. Stack emission is also generated from calciner drum and flue gas from calciner furnace. For control of air pollution industries has adopted following measures: -
- Material handling: - Flexile tarpaulin has been provided at raw materials.
 - Vehicular movement: - Water sprinkling has been provided for dust suppressions within premises.
 - Crushing of lumps: - Covered hammer mills/jaw crushers and bucket elevators has been covered with metals sheets.
 - Pulverizing activities: - dust collector and bag filters has been provided for at pulverizer. Pulverizer is also installed in closed shed.
 - Drum Vent: - Industries have provided covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.
 - Calciner furnace: - Industry has provided dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.
- j. All Plaster of paris industries are small scale industries and established in clusters, where raw material is easily available and approachable. During visit it is also observed that the main reason of arising air pollution is large number of plasters of paris industries situated in small cluster area.
- k. During visit, Committee has also observed that road dust, dumping of industrial waste on road side and damaged roads are also source of air pollution in Growth centre Khara.
- l. During visit, clean of road side waste was underway by RIICO Ltd. Shri Surendra Prasad Sharma, Regional Manager, RIICO Ltd informed that they have given contract to Nagar Nigam, Bikaner for cleaning and repairing works to roads and other maintenance work in Growth Centre,

Khara. Copy of RIICO letter dated 24-07-2024 along with minutes of meeting is enclosed at **Annexure- R-10**.

- m. Shri Surendra Prasad Sharma, Regional Manager, RIICO Ltd informed that cleaning of industrial area and lifting of road side dump industrial waste will be completed in coming month. Also informed that they will done regular cleaning of roads in Growth Centre, Khara for control of fugitive emissions generated due to vehicular movement.
- n. During visit, there is no tubewell/borewell was found in any plaster of paris industries. Representative of informed that due to salty ground water, Bore well has not been done in Industries. Shri Surendra Prasad Sharma, Regional Manager, RIICO Ltd informed that water requirement is being met out by supply through IGNP, Canal.

Action taken report of RSPCB: -

- I. A complaint regarding arising air pollution due to operation of plaster of paris industries in Khara village was received in Regional Office, RSPCB, Bikaner through e-mail on date 23-10-2024. Therefore, visit of industrial area and nearby area of village khara was conducted in the presence of villagers on date 24-10-2024. A representation was also received during visit on date 24-10-2024 by villagers of Khara. Copy of complaint received on e-mail on date 23-10-2024 and representation received during survey is enclosed at **Annexure-R-11**. Copy of visit conducted during presence of villagers on date 24-10-2024 is enclosed at **Annexure-R-12**.
- II. On the basis of visit dated 24-10-2024, three survey teams had been constituted by Regional Officer, Bikaner to verify the latest status of pollution control measures adopted by Plaster of Paris industries and ambient air quality monitoring was also conducted in village at different locations from 07-11-2024 to 17-11-2024. Copy of office order dated 28-10-2024 for constitution of teams for survey of Plaster of Paris

industries is enclosed at **Annexure-R-13**. Details of air quality monitoring conducted in village at different locations from 07-11-2024 to 17-11-2024 is enclosed at **Annexure-14**.

- III. On the basis of ambient air quality result of village Khara, a team was also deputed on date 18-11-2024 by State Board and team Official's had visited Khara Industrial Area and village Khara on date 19-11-2024 and 20-11-2024. Copy of team visit report dated 19-11-2024 and 20-11-2024 is enclosed at **Annexure-15**.
- IV. After knowing air quality of Village Khara, Khara Growth Center Udyog Sangh has submitted a letter on 25-11-2024 regarding self-closure of industries until they have not received advancement in air pollution control measures. Therefore, a team has also deputed vide State Board order date 08-12-2024 for guidance of the Plaster of Paris unit for advancement in pollution control measures from 09-12-2024. Copy of Khara Growth Center Udyog Sangh letter dated 25-11-2024 is enclosed at **Annexure-16** and State Board letter dated 08-12-2024 is enclosed at **Annexure-17**.
- V. Closure direction has been issued against nine Plaster of Paris industries situated in Khara so far on the basis of non-compliances observed during visit. List of closure direction issued is enclosed at **Annexure-18**.
- VI. D.O. letter has been also written to RIICO on date 16-01-2025 with requesting to improve the road conditions of Khara industrial area. D.O. letter written to RIICO on date 16-01-2025 is enclosed at **Annexure-19**.
- VII. Head Office has constituted two teams for conducting stack/fugitive monitoring of plaster of paris industries. Copy of Head Office order dated 24-01-2025 is enclosed at **Annexure-20**.

A meeting was held on 10-12-2024 in the chairmanship of District Collector, Bikaner in the matter of air pollution in Khara Industrial Area. Copy of minutes of meeting is enclosed at **Annexure-21**.

Recommendation: -

On the basis of observations made during site visit and facts brought in the notice, the Joint Committee recommends that: -

1. M/s RIICO Ltd. may ensure that regular cleaning of industrial area and lifting of road side dump waste will be completed at the earliest.
2. Industries and industrial Association may ensure to developed dense plantation on road side in industrial Area.
3. M/s RIICO Ltd. may also ensure repairing of roads at the earliest and also efforts made for construct metallic roads in mineral zone.
4. Industrial association, Khara may also ensure the provisions of metallic roads in converted land area.


21/01/2025
(Rajkumar Meena)
Regional Officer
RSPCB, Bikaner


(Kavita Godara)
Sub Divisional Officer
Bikaner



In Growth Centre Khara



In Growth Centre Khara



Village Area adjacent to RIICO Growth Center Khara



RIICO Growth Centre Khara Roads



Present Status of PCM in POP Industries

Item No. 01

**BEFORE THE NATIONAL GREEN TRIBUNAL
CENTRAL ZONE BENCH, BHOPAL
(Through Video Conferencing)**

Original Application No. 261/2024(CZ)

Devidas Khatri

Applicant(s)

Vs

State of Rajasthan & Ors.

Respondent(s)

Date of Hearing: **13.12.2024**

**CORAM: HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. A SENTHIL VEL, EXPERT MEMBER**

For Applicant (s): Mr. Rohit Kumar Tuteja, Adv.

For Respondent(s): None.

ORDER

1. The grievance of the applicant is violation of environmental norms and laws by respondent nos. 04 to 19, units engaged in manufacturing of plaster of Paris in Khara Industrial Area in Tehsil & District – Bikaner, Rajasthan.
2. It is further contended that the irregular and unchecked operation of these units led to severe pollution as per the newspaper articles the AQI of the disputed area was 900, which is very high. As per the news articles the residents of Khara Village are directly affected and are suffering from disease like Asthma etc.
3. It is further alleged that these units are in operation in violation of environmental laws extracting ground water without due permission of the Central Ground Water Authority and they are violating the conditions stipulated in the consent to operate issued to them by the State Pollution Control Board.
4. A substantial issue of environment has been raised.
5. Issue notice to the respondents, returnable within four weeks. Respondents are directed to submit their reply within six weeks

1

through E-filing portal, preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF.

6. Applicant is directed to take necessary steps for service to the respondents by both ways and also on available email.
7. We deem it just and proper to call a report on the matter in issue in present Original Application, from a Joint Committee consisting of:
 - i. One representative from the Collector, Bikaner, Rajasthan
 - ii. One representative from State Pollution Control Board, Rajasthan.
8. The Committee is directed to visit the place and submit the factual and action taken report with the list of units operating in the field with detail of consent conditions within six weeks. The State PCB will be the nodal agency for coordination and logistic support.
9. Applicant is directed to supply the copy of the application and relevant documents to the Committee and Respondent(s) within a week and after compliance of service, the applicant has to submit an affidavit that the notice and copy of the application have been served upon the Committee and respondent(s).
10. The report in the matter be filed by the Committee through email at ngtczbbho-mp@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

List it on **04th February, 2025.**

Sheo Kumar Singh, JM

Dr. A. Senthil Vel, EM

13th December, 2024
O.A No. 261/2024(CZ)
PN

कार्यालय जिला कलक्टर, बीकानेर

क्रमांक: सीबी/सामान्य/एनजीटी/2024/28732

दिनांक: 27.12.2024

आदेश

माननीय राष्ट्रीय हरित प्राधिकरण, केन्द्रीय क्षेत्र, बैंच भोपाल द्वारा प्रकरण संख्या 261/24 (सीजेड), देवीदास खत्री बनाम स्टेट आदि में जारी आदेश दिनांक 13.12.2024 के आदेशानुसार संयुक्त समिति का गठन किये जाने हेतु निर्देशित किया गया है। अतः माननीय राष्ट्रीय हरित प्राधिकरण के निर्देशों की पालना में निम्नानुसार कमेटी का गठन किया जाता है:-

1.	जिला कलक्टर की ओर से नामित प्रतिनिधि	उपखंड अधिकारी, बीकानेर
2.	राजस्थान राज्य प्रदूषण नियंत्रण बोर्ड, जयपुर की ओर प्रकरण में जिले की ओर से नामित नोडल अधिकारी	क्षेत्रीय अधिकारी, राजस्थान राज्य प्रदूषण नियंत्रण, बोर्ड, बीछवाल, बीकानेर

कमेटी में नियुक्त अधिकारीगण को निर्देशित किया जाता है कि प्रकरण में वर्णित स्थान का निरीक्षण कर माननीय राष्ट्रीय हरित प्राधिकरण द्वारा उक्त उल्लेखित आदेश में वर्णित निर्देशों की पालना सुनिश्चित कराते हुए पर्याप्त समयावधि पूर्व तथ्यात्मक जांच एवं कार्यवाही रिपोर्ट माननीय प्राधिकरण को प्रस्तुत करते हुये इस कार्यालय को अवगत करावें।

(नमता वृष्णि)

जिला कलक्टर, बीकानेर

दिनांक: 27.12.2024

क्रमांक: सीबी/सामान्य/एनजीटी/2024/28733-741

प्रतिलिपि:- निम्न को सूचनार्थ, आवश्यक कार्यवाही हेतु प्रेषित है:-

1. सदस्य सचिव, राजस्थान राज्य प्रदूषण नियंत्रण बोर्ड, जयपुर
2. प्रभारी अधिकारी विधि शाखा कार्यालय हाजा
3. अति.जिला कलक्टर, नगर/प्रशासन, बीकानेर
4. महाप्रबंधक, जिला उद्योग केन्द्र, बीकानेर
5. उपखण्ड अधिकारी जिला बीकानेर
6. क्षेत्रीय अधिकारी, राजस्थान राज्य प्रदूषण नियंत्रण बोर्ड, बीछवाल बीकानेर
7. क्षेत्रीय अधिकारी, रीको लि. बीकानेर
8. निजी सचिव, जिला कलक्टर महोदया बीकानेर
9.

जिला कलक्टर, बीकानेर

Signature valid

Digitally signed by Namrata Vrishni
Designation: Collector & District
Magistrate
Date: 2024.12.27 11:17:27 IST
Reason: Approved



Rajasthan State Pollution Control Board

Headquarter, 4, Institutional Area, JhalanaDoongri, Jaipur-302004

Phone :0141- 2716804, 2716800 e-mail : member-secretary@rpcb.nic.in

Helpline No. : 0141-2716877

No. F.10 (679) RPCB/Legal/NGT/2024/1524-1525

Date: 20-12-2024

Regional Officer,
Rajasthan State Pollution Control Board,
Bikaner.
Mobile No.: 9413447806
Email: [ro.bikaner\[at\]gmail\[dot\]com](mailto:ro.bikaner[at]gmail[dot]com)

Subject – Regarding the Hon'ble National Green Tribunal(CZ) Bench, Bhopal order dated 13.12.2024 passed in Original Application No. 261/2024 (CZ) titled as Devidas Khatri V/State of Rajasthan & Ors.

Sir,

With reference to above subject matter, it is to inform that the Hon'ble NGT has passed an order dated 13.12.2024 and directed inter-alia as follow:-

"7. We deem it just and proper to call a report on the matter in issue in present Original Application, from a Joint Committee consisting of:

- i. One representative from the Collector, Bikaner, Rajasthan***
- ii. One representative from State Pollution Control Board, Rajasthan.***

8. The Committee is directed to visit the place and submit the factual and action taken report with the list of units operating in the field with detail of consent conditions within six weeks. The State PCB will be the nodal agency for coordination and logistic support."

In light of the aforesaid order dated 13.12.2024, you are hereby nominated as member of the committee constituted vide the aforesaid order on behalf of the RSPCB with the direction to ensure compliance of the Hon'ble NGT dated 13.12.2024. Copy of the Hon'ble NGT order dated 13.12.2024 is being enclosed for ready reference.

Enclosed-As above

(Vijai N.)
Member Secretary

Copy to following for information/necessary action –

1. District Collector, Bikaner, Rajasthan.

Member Secretary

Signature valid *ok*

Digitally signed by N. Vijai
Designation: Member Secretary
Date: 2024.12.19 20:50:14 IST
Reason: Approved





Rajasthan State Pollution Control Board

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F14/ (23)Policy/RPCB/Plg / 153 to 189

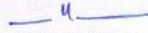
Date: 02/06/2020

Office Order

In suppression to earlier office order no. F14/ (23)Policy/RPCB/Plg/01-44 dated 08.05.2018, the State Board regarding the categorization of the industries/ projects/ processes/ activities/ mines for the purpose of consent mechanism, revised categorization for consent mechanism shall be as follows:

1. Red Category of industries/ projects/ processes/ activities/ mines : Annexure A
2. Orange Category of industries/ projects/ processes/ activities/ mines : Annexure B
3. Green Category of industries/ projects/ processes/ activities/ mines : Annexure C

This bears approval of the competent authority.


(Dr Vijai Singhal)
Member Secretary

F14/ (23)Policy/RPCB/Plg

Date:

Copy forwarded to the following for information and necessary action:

1. The Principal Secretary, Department of Environment, Government of Rajasthan, Jaipur.
2. P.S. to Chairperson, RSPCB, Jaipur.
3. Sr.PA to Member Secretary, RSPCB, Jaipur.
4. The CEE/CSO/CAO/HOO, RSPCB, Jaipur.
5. The Group In-Charge, CPP/Textile/Mines & SCMG DS/ HOGM/ MUID/CD & Legal /PDF, Training Project & IEC/ Plastic & Liquid Waste/Hazardous Waste Cell/ BMW, ECC, Solid & E-waste/ PCV, Complaints, Grievances, VIP & EC Compliance/ RTI cell, RSPCB, Jaipur.
6. The Regional Officer, Regional Office, RSPCB, Alwar/ Balotra/ Bharatpur/ Bhiwadi/ Bhilwara/ Bikaner/ Chittorgarh/ Jaipur South/ Jaipur North/ Jodhpur/ Kishangarh/ Kota/ Pali/ Sikar/ Udaipur.
7. GIC (IT), with directions to upload on the State Board's website.
8. Sh Arun Joshi, Joint Director (PRO), DIPR, Jaipur.
9. Guard File.


Member Secretary

Category: Red

S. No.	Industry Sector
1	Aerial rope way
2	Airports and Commercial Air Strips
3	Any industry/ industrial activity/ process/ operation/ facility not covered in any of the categorization and having coal fired boiler with steam generation capacity more than 5 T/hr
4	Asbestos and asbestos based industries
5	Automobiles Manufacturing (Integrated Facilities)
6	Basic Chemicals and electro chemicals and its derivatives including manufacture of acids
7	Cement/Clinker Manufacturing
8	Chemical Fertilizer (excluding formulation)
9	Chlor Alkali
10	Chlorates, perchlorates and peroxides
11	Chlorine, fluorine, bromine, iodine, and their compounds
12	Coke making, liquefaction, coal tar distillation or fuel gas making
13	Coke oven plant
14	Common treatment and disposal facilities (CETP, TSDF, E-Waste recycling, CBMWTF Effluent conveyance project, incinerators, MSW sanitary landfill sites, STP and Fecal Sludge Treatment Plant)
15	Dairy and dairy products - large and medium scale
16	DG set of capacity of ≥ 5 MVA Capacity
17	Dyes and Dye-Intermediates
18	Emulsion of oil & water
19	Fermentation industry including manufacture of yeast, Malt, beer, distillation of alcohol (ENA) (distillery)- Large & Medium Scale
20	Fiber glass production and processing (Excluding moulding)
21	Fire crackers manufacturing and bulk storage facilities
22	Halogenated hydrocarbons
23	Handloom/ Carpet weaving (with dyeing and bleaching operation)
24	Health care establishment (As defined in BMW Rules)
25	Heavy engineering including Ship Building (With investment on Plant & Machineries more than Rs. 10 Crores)
26	Heavy water plant
27	Hotels (3 Star & Above) and/or Hotels having 100 rooms and above
28	Industrial carbon including electrodes and graphite blocks, activated carbons, carbon black
29	Industrial Estate/ Parks/ Complexes/ Areas/ Export Processing Zones/ SEZs/ Biotech Parks/ Leather Complexes (except solar and wind Industrial Estate/ Parks/ Complexes having areas upto 500 hectares)
30	Industrial gases namely :- a) Chemical gases: Acetylene, hydrogen, chlorine, fluorine, ammonia, sulphur dioxide, ethylene, hydrogen sulphide, phosphine; b) Hydrocarbon gases: Methane, ethane, propane
31	Industries engaged in recycling/ reprocessing/ recovery/ reuse of Hazardous Waste under schedule IV and other schedule of Hazardous Waste (M, H & TBM) Rules, 2016 and its amendments and Municipal Solid Waste (M & H) Rules, 2000 and its amendments
32	Industry or process involving foundry operations having capacity ≥ 5 MT/hr
33	Industry or process involving metal surface treatment or process such as pickling/ plating/ electroplating/ heat treatment/ phosphating or finishing and anodising/ enameling/ galvanizing
34	Ink, Pigment and Intermediates other than formulation
35	Iron and Steel (Involving processing from ore/integrated steel plants) and or Sponge Iron industries

Category: Red

S. No.	Industry Sector
36	Isolated storage of hazardous chemicals (as per schedule of Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989 as amended)
37	Lead acid battery manufacturing (excluding assembling & charging of acid lead battery)
38	LPG bottling plant
39	Manufacturing of explosives, detonators, fuses including management and handling activities
40	Manufacturing of Glue and Gelatin
41	Manufacturing of Lead Glass
42	Manufacturing of lubricating oils, greases or petroleum based products (excluding blending only)
43	Manufacturing of paints, Varnishes, pigments and intermediate (excluding blending/ mixing)
44	Mining and/or ore beneficiation
45	Non-alcoholic beverages (soft drink) & bottling of alcohol/ non alcoholic products- Large & Medium
46	Nuclear power plants
47	Oil & Gas extraction including CBM (Offshore & onshore extraction through drilling wells)
48	Oil and gas transportation pipeline (having DG set of more than or equal to 5 MVA)
49	Oil refinery (Mineral oil or Petro Refineries)
50	Organic chemicals manufacturing (excluding formulation)
51	Pesticide specific intermediates
52	Pesticides (Technical) (excluding formulation)
53	Petrochemicals (Manufacture of and not merely use of as raw material)
54	Pharmaceuticals (excluding formulation)
55	Phosphate rock processing plant
56	Phosphorous and its compounds
57	Photographic films and its chemicals
58	Ports & Harbours, Jetties and Dredging Operations
59	Power generation plants (excluding Solar and Wind Renewable Power Plant of all capacity and mini hydal plant of less than 25 MW)
60	Primary metalurgical units such as aluminium ,copper, iron, zinc, lead etc.
61	Processes involving chlorinated hydrocarbons
62	Processing of nuclear fuel
63	Pulp and/or paper manufacturing
64	Pyrolysis Plant
65	Railway Locomotive workshops/ integrated Road transport workshop
66	Railway Stations (Outward passenger handled \geq 10 million per year)
67	River valley project
68	Ship breaking activities
69	Slaughter houses (as per the notification S. O. 270(E) dated 26.03.2001) and meat processing industries, bone mill, processing of animal horns, hoofs and other body parts
70	Sugar (excluding Khandsari)
71	Synthetic detergents and soaps (large and medium scale)
72	Synthetic fibers including rayon, tyre cord, polyester filament yarn
73	Synthetic leather, foam and related products except isolated moulding
74	Synthetic Rubber, Tyre and tube manufacutring- Large & Medium
75	Tanneries
76	Vegetable oils including solvent extraction and refinery/ hydrogenated oils
77	Yarn/ textile processing involving any effluent/ emission-generating process, bleaching, dyeing, printing and scouring
78	Ferrous and nonferrous metal extraction involving different furnaces through melting, refining, reprocessing, casting and alloy making

Ag

Category : Orange

S. No.	Industry Sector
1	Aluminum and copper extraction from scarp using oil fired furnace
2	Any industry/ industrial activity/ process/ operation/ facility which is not covered in Red or Green category but having coal fired boiler with steam generation capacity upto 5 T/hr
3	Assembly and charging of acid lead battery / Dry cell battery (more than 10 battery per day)
4	Automobile servicing, repairing and painting (with washing)
5	Ayurvedic and Homeopathic medicine (with Boiler)
6	Bakery/ Confectionery/ Sweets production (with production capacity \geq 1tpd with oil, gas or electrical oven)
7	Bio Fuel (with boiler and/or using organic solvents)
8	Brickfields (excluding fly ash brick manufacturing using lime process)
9	Building and construction project \geq 20000 Sq. M township and area devepoment project 5 hectare and more/ dwelling units 50 and more
10	Candy Manufacturing - Large & Medium Scale
11	Cashew nut processing
12	Ceramic, Refractories
13	CFL, tube light bulb and so on
14	Chanachur and laddoo from puffed and beaten rice(muri and chira)
15	Coal Washeries
16	Coated electrode manufacturing
17	Coffee seed processing
18	Coke briquetting (except sun-drying)
19	Compact disc, computer floppy & cassette manufacturing
20	Cotton ginning & processing (Large and Medium Scale units)
21	Cutting, sizing and polishing of marble, granite, kota stone and other stones (Except edge cutting & Chowkhat making)
22	Dairy and dairy products (small scale)
23	DG set of capacity $>$ 1MVA but $<$ 5 MVA) (Isolated)
24	Dismantling of rolling stocks (wagons/coaches)
25	Dry coal processing industries involving ore sintering, palletisation, grinding, pulverization.
26	Fermentation industry including manufacture of yeast, Malt, beer, distillation of alcohol (ENA)(distillery)- Small Scale
27	Fertilizer (granulation and formulation only)
28	Fish feed,poultry feed and cattle feed
29	Fish processing and packaging
30	Flakes from rejected PET bottle
31	Flour mills (with washing)
32	Food & food processing including fruits & vegetable processing, food additives
33	Footwears without leather footwears
34	Forging of ferrous & non- ferrous metal (using oil or gas fired furnaces)
35	Formulation of Pesticides, agro chemicals and so on and R&D Facilities

02.06.2020



Category : Orange

S. No.	Industry Sector
36	Formulation/ paletization of camphor tablets, naphthalene balls from camphor/ naphthalene powders
37	Gems and jewellery (using furnace and metal finishing)
38	Glass and fiber glass moulding
39	Gravure printing, digital printing on flex, vinyl
40	Guar and guar gum
41	Gypsum board
42	Handloom/ Carpet weaving (Dry process- Large & Medium scale)
43	Heavy engineering including Ship Building (With investment on Plant & Machineries less than Rs. 10 Crores)
44	Hot mix plants
45	Hotels (Less than 3 star) and/ or Hotels having more than 20 rooms and less than 100 rooms
46	Ice cream manufacturing
47	Industry not covered in any other category and having source of Air and/or Water pollution
48	Industry or process involving foundry operations having capacity < 5MT/hr
49	Jute processing without dyeing
50	Lime manufacturing (Using Lime Kiln)
51	Liquid floor cleaner, black phenyl, liquid soap, glycerol monostearate manufacturing
52	Manufacture of mirror from sheet glass
53	Manufacture of Starch/Saggo
54	Manufacturing of Glass (Except Lead Glass)
55	Manufacturing of iodized salt from crude/ raw salt
56	Manufacturing of mosquito repellent
57	Manufacturing of Paints, Varnishes, pigments and intermediate (blending/mixing only)
58	Manufacturing of silica gel
59	Manufacturing of toothpowder, toothpaste, talcum powder and other cosmetic items
60	Marriage Gardens/ Lawns with land area more than 2500 sq.m
61	Mechanized laundry using oil fired boiler
62	Metal fabrication with painting operation
63	Mineral grinding (including hydrated lime without kiln)
64	Mineral Processing / Separation plant (crushing, screening and washing)
65	Modular wooden furniture from particle board, MDF, Swan timber etc, Ceiling tiles/ partition board from saw dust, wood chips etc. & other agricultural waste using synthetic adhesive resin, wooden box making (With Boiler)
66	New highway construction projects
67	Non-alcoholic beverages(soft drink) & bottling of alcohol/non alcoholic products- Small Scale
68	Oil and gas transportation pipeline (having DG set of more than 1 MVA and less than 5 MVA) and/or having gas based power plant of more than 5 MW
69	Organic chemicals manufacturing (formulation)
70	Parboiled rice mill
71	Pharmaceutical formulation and for R&D purpose (for sustained release/extended release of drugs only)

02.06.2020



Category : Orange

S. No.	Industry Sector
72	Plaster of paris
73	Ply board manufacturing including veneer & laminate using boiler and thermal fluid heater
74	Potable alcohol (IMFL) by blending, bottling of alcoholic products
75	Power press
76	Printing Ink manufacturing (Formulation)
77	Printing or etching of glass sheet using hydrofluoric acid
78	Printing press
79	Producer gas plant using conventional up-drift coal gasification (linked to rolling mills, glass and ceramic industry, refractories for dedicated fuel supply)
80	Railway Stations (Outward passenger handled >1million to <10 million per year)
81	Reprocessing of waste plastic
82	Restaurant > 25 Seats
83	Scrapping centres (for end of life of vehicles and other scraps such as plant and machineries, structural material, railway coaches and wagons etc.)
84	Spinning & weaving and yarn doubling - Large & Medium Scale
85	Spray painting, paint baking, paint stripping
86	Stone crushers
87	Surgical and medical products including prophylactics and latex
88	Synthetic detergents and soaps [excluding soap manufacturing (handmade without steam boiling) and synthetic detergents formulation] - small scale
89	Synthetic resins
90	Synthetic rubber and foam moulding
91	Synthetic Rubber, Tyre and tube manufacutring- Small Scale
92	Teflon based products
93	Thermocol manufacturing (with Boiler)
94	Thermometer making
95	Tobacco products including cigarettes and tobacco/ opium processing
96	Transformer repairing/ manufacturing
97	Tyres and tubes vulcanization/hot retreading
98	Water treatment plant
99	Wet mix macadam
100	Wire drawing & Wire netting

02.06.2020

Category : GREEN

S. No.	Industry Sector
1	All types of Commercial testing laboratories (except diagnostic centres)
2	Assembling of Acid lead battery (up to 10 batteries per day excluding lead plate casting)
3	Automobile fuel outlet (Only dispensing) having adequate arrangements for vapor collection during dispensing
4	Automobile servicing & repairing (without washing)
5	Ayurvedic and Homeopathic medicine (without Boiler)
6	Bakery/Confectionery/Sweets production (with production capacity <1tpd with oil, gas or electrical oven)
7	Bamboo & Cane product including Manufacturing from cane and bamboo of shopping bags, ornament boxes (only dry operations)
8	Bi-axially oriented PP Film along with metalising operation
9	Bio Fertilizer
10	Bio Fuel (without boiler and/or using organic solvent)
11	Bio/agro waste based briquettes by dry pressing only (sun drying) without using toxic or hazardous wastes
12	Blending of melamine resins & different power, additives by physical mixing
13	Book Binding.
14	Building and construction project from 2,500 to <20,000 sq.m built up area
15	Candy Manufacturing (SSI)
16	Cardboard or corrugated box and paper products (excluding paper or pulp manufacturing and without using boiler)
17	Carpentry and wooden furniture manufacturing with the help of electrical (motorized) machines such as electric wood planner, steel saw cutting circular blade etc.
18	Cement products (without using Asbestos) like pipe, pillar, jali, well ring, block/ tiles etc.
19	Coke briquetting (sun drying)
20	Cold Rolling Mill
21	Compressed Biogas / Biogas plants except domestic biogas digester
22	Cottage Industry for manufacturing of pickle , papad, badi, mangodi etc.
23	Cottage Industry for manufacturing of spices (Spices Mills)
24	Cotton ginning & processing (small scale units)
25	Dal Mills
26	Decoration of ceramic cups & plates by electric furnace
27	Diesel Generator sets (<1 MVA) (isolated)
28	Distilled water (without boiler)
29	Edge cutting and Choukhat making
30	Engineering and Fabrication units (without metal treatment)
31	Facility of handling, storage and transportation of food grains in bulk
32	Fly ash export, transport and disposal facilities
33	Garment manufacturing (washing without detergent)
34	Glass, ceramic, earthen potteries and tile manufacturing using electrical kiln or not involving fossil fuel kilns
35	Glue from starch (physical mixing)
36	Handicrafts Unit without furnace and surface treatment
37	Handloom/ Carpet weaving (Dry process- SSI)
38	Hotels (upto 20 rooms)
39	Insulation and other coated papers (excluding paper or pulp manufacturing) manufacturing
40	Jobbing and machining
41	Leather footwear and leather products (excluding tanning and hide processing)
42	Lubricating oils, greases or petroleum based products (only blending at normal temperature)
43	Manufacturing of handicrafts/decorative/fancy items, only dry processes with no source of air emissions

02.06.2020

Category : GREEN

S. No.	Industry Sector
44	Manufacturing of optical lenses (using electrical furnace)
45	Manufacturing of pasted veneers without using boiler or Thermic Fluid Heater or by sundering
46	Marriage Gardens/ Lawns with land area \leq 2500 sq.m
47	Metal utensils (Dry mechanical operations only)
48	Mineral stack yards/ Railway sidings
49	Mineralized water
50	Modular wooden furniture from particle board, MDF, Swan timber etc, Ceiling tiles/ partition board from saw dust, wood chips etc. & other agricultural waste using synthetic adhesive resin, wooden box making (With Out Boiler)
51	Oil and gas transportation pipeline (having small gas based power plant up to 5 MWs and/ or upto D. G. sets of 1 MVA)
52	Oil mill ghani & extraction (no hydrogenation/refining/ solvent extraction)
53	Packing materials manufacturing from non asbestos fibre, vegetable fibre yarn
54	Phenyl/ Toilet cleaner formulation & Bottling
55	Polythene & plastic processed products manufacturing (virgin plastics)
56	Poultry, hatchery, Piggery
57	Power looms (without dyeing and bleaching)
58	Puffed rice (muri) (using oil, gas or electrical heating system)
59	Pulverisation of bamboo and scrapwood
60	Railway Stations (Outward passenger handled \leq 1million per year)
61	Ready mix cement concrete
62	Reel manufacturing
63	Reprocessing of waste cotton
64	Restaurant (\leq 25 seats)
65	Rice Mill (Rice hullers only)
66	Rubber goods industry (with baby boiler only)
67	Saw mill
68	Seasoning of wood in steam heated chamber
69	Soap manufacturing (Handmade without steam boiling)
70	Spinning & weaving , yarn doubling (SSI)
71	Steeping and processing of grains
72	Stone carving (non-power operated tools)
73	Storage of ice-cream
74	Tea processing
75	Tyre retreading by cold process
76	Personal Protective Gears such as face masks, personnel protective equipment (PPEs) etc.

COINDS/74/2007

**DEVELOPMENT OF
ENVIRONMENTAL STANDARDS
AND PREPARING COMPREHENSIVE
INDUSTRY DOCUMENT FOR
PLASTER OF PARIS INDUSTRIES**



**CENTRAL POLLUTION CONTROL BOARD
MINISTRY OF ENVIRONMENT & FORESTS
Website: www.cpcb.nic.in e-mail: cpcb@nic.in
May 2007**

COINDS/74/2007

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**CENTRAL POLLUTION CONTROL BOARD
MINISTRY OF ENVIRONMENT & FORESTS**

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(भारत सरकार का संगठन)

पर्यावरण एवं वन मंत्रालय

Central Pollution Control Board

(A Govt. of India Organisation)

Ministry of Environment & Forests

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FOREWORD

The Central Pollution Control Board (CPCB) brings out publications entitled "Comprehensive Industry Document series (COINDS)" based on the industry-wise studies. These reports are intended to cover various aspects of different types of industrial units in the country with respect to their number, locations, capacities, types of product, usage of raw materials, process adopted, waste minimisation and pollution prevention & control measures. The Minimal National Standards (MINAS) have been evolved as a result of the COINDS. The present report entitled "Development of Environmental Standards and Preparing Comprehensive Industry Document for Plaster of Paris Industry" is the latest one being published by the CPCB.

The study for the report was conducted on behalf of the CPCB by National Productivity Council, New Delhi. The help and assistance extended by the State Pollution Control Boards and plaster of paris manufacturing units during the conduct of this study are gratefully acknowledged. Shri Ajay Aggarwal, EE and Ms. L.J. Pavithra AEE, coordinated the activities to develop the standards. Shri T Venugopal, Director and Shri R. C. Saxena, SEE worked hard in preparing this report under the guidance of Dr. B. Sengupta, Member Secretary.

It is hoped that this report would be useful to the plaster of paris industrial units, regulatory agencies, consultants and others interested in pollution control.



(J. M. Mauskar)

May, 2007

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Annexures

1. List of Industries
2. Energy Consumption Profile of PoP Industries
3. PoP Cluster Profiles

CHAPTER 1

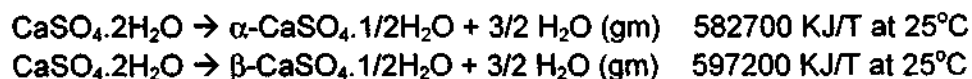
INDUSTRY PROFILE

1.0 INDUSTRY PROFILE:

To have comprehensive view of POP sector and to provide holistic approach to development of standards the industry scenario is outlined to present their importance and contribution to economic activity, employment potential, end uses, varying process and technology, scales, waste management, location etc.

1.1 About POP:

Plaster of Paris (POP) chemically is hemi-hydrate of calcium sulfate produced by calcinations / heat treatment of gypsum, a di-hydrate of calcium sulfate. It finds its application in various areas of construction, ceramic, chalk pieces, medical (dental and surgical), sculpting, etc. Physically POP is described in α and β form, α referring to crystalline form and β referring to amorphous form. In India only β form is produced and all further discussion refers to only this form. The Chemical reactions involved in the production of POP are as under.



Plaster of Paris is being produced in small-scale industry in various clusters and a few large-scale industries. In producing POP different types/forms of gypsum are used, and depending on end use and quality requirements process parameters are altered. Majority of the industries are in Small scale sector and variations in terms of turnover, machinery used in processing exists in these industries based on location of industry and end use of POP. This chapter describes the industrial scenario outlining different common and differential factors in this sector in the following sections.

1.2 Industry Inventory:

In India, there are about 400 POP industries in small-scale sector and three large scale industries located all over India. The small-scale industries are located primarily near the raw material source that is gypsum while the large-scale industry seems to be located near the end use market. The rationale for this seems to be because of low value addition in small scale industry the skills requirement is less and processing near the source of raw material reduces transportation cost in terms of reduced material for transportation as moisture weight is reduced due to removal of moisture (physical and bound) from raw material. In large scale industry, the need for value addition and for other raw materials like specialty papers, skilled man power and servicing industry makes the location of source of raw material less important.

In small scale industries the industries are located in clusters with informal structures and owned by family entrepreneurs. The majority and largest of POP industry clusters are in Biakner, Churu, Hanumangarh in Rajasthan with more than 300 units and smaller clusters in Jammu in Jammu and Kashmir, New Jalpaiguri in West Bengal, Rajpalayam and Trichur in Tamilnadu. The number of units is more in Rajasthan on account of Gypsum availability, which has 98% of total mines and also the government provides subsidy of about Rs 300000/ for small scale industry to encourage industrial growth. The large scale industries are all owned by British Plaster Board of United Kingdom and are located near the three metro cities to cater to the metro markets.

The present total production of POP is estimated to be in the range of 5000 TPD with Rajasthan producing up to 75-80 % of POP and the rest by other clusters. The large scale industry contributes to 8% of production which is likely to increase as consumer preference turns to plaster board instead of plaster because of ease of use, better insulation properties due to addition of other materials along with POP, reduction in application time and hence reduction in construction time activity.

The location-wise distribution of small scale POP industries with their capacity range is given in table 1.1 and of large scale industries in table 1.2 below.

Table-1.1: Small scale POP industry- location wise distribution and capacity range

S.No.	State where POP industries exist	Area	No. of Industries	Scale ¹	Total Production TPD
1	Rajasthan	Bikaner, Churu Hamumangarh	300	10-20 TPD	3500
2	Jammu & Kashmir	Jammu	10-12		200
3	West Bengal	Siliguri	10-12		200
4	Tamilnadu	Rajapalayam	30-40		500

Table-1.2: Large scale POP industry - location wise distribution and capacity range

S.No.	State where POP industries exist	Area	No. of Industries	Total Production TPD
1	Haryana	Jind	1	200
2	Tamilnadu	Chennai	1	200
3	Maharashtra	Wadi	1	200

The lists of industries in various parts of the country are given in Annexure-1. The map shown in Annexure-2 depicts the location of POP units and their number in different parts of industry.

1.3 Classification of POP Industry :

Plaster of Paris (POP) can be classified based on end use in construction, plaster board, ceramic, chalk pieces, medical, sculpting etc is undertaken in small scale industry. They can be classified as small and large based on variations in production capacity. In small scale industries production capacities vary from 10-20 tons per day and in large scale industry the capacity is in excess of 200 tons per day. The general classification as small and large is therefore relevant for development of environmental standards in POP sector.

POP production as such is not classified in industrial classification code NIC but is combined with producing end use product as shown in Table 1.3. Since the classification does not segregate POP produced for further processing for end use and also the industry produces one or more of the products in the same location by varying process conditions, classification using industrial code is not relevant for considering development of environmental standards for POP.

¹ The variation in scale is due to changes in production pattern between different seasons and also due to differences in marketing capabilities of each industry

Table 1.3: Industrial classification codes for gypsum and plaster

NIC Code	Sector
26992	Manufacture of gypsum boards
26952	Manufacturing of other plaster products
26949	Manufacturing of other plaster, n.e.c.
26951	Manufacturing of plaster statues
26945	Manufacturing of plasters of calcinated gypsum
26945	Manufacturing of plasters of calcium sulphate

The production process parameters and time of processing adopted for various end uses varies greatly as shown in table 1.4.

Table-1.4: POP end uses and major process parameter changes

End Product	Calcining Temperature(°C) ²	Calcining Time (hrs) ³
Building grade	150-200	1-2
Gypsum Board	158	4-5
Ceramic grade	145-160	3-5
Chalk	120	1
Medical	150-200	3-5

As can be seen from table 2.10 depending on end use, raw material and product quality produced the turnover in terms of product quantity changes. The turnover in monetary terms is not linear in relationship with product quantity as price of POP produced based on end use varies by ten folds. While theoretically, it is possible to classify the industry based on end use, practically this classification is not possible because in small scale industry all POP end use products are manufactured in one industry, also depending on the market requirement. Only gypsum board is exclusively produced in large scale industries from POP.

1.4 POP Capacity Utilization, Consumption areas and Markets:

POP consumption is directly linked with construction activity and increases during summer and winter seasons and reduces during rainy season as the construction activity is not undertaken during this season and also the production in small scale ceramic industries, sculpting activities where atmospheric drying is practiced will be less than normal and energy required for calcination increases due to wet gypsum. In line with this capacity utilization varies from 2-3 shifts in summer and winter seasons to single shift or no production in rainy season. The average capacity utilization hence can be considered to be 60-70% in the industry.

POP industry in small scale sector is located near to the raw material source but the product is also sold as near to their production location as transportation costs are more (in case of Rajasthan clusters or almost equal to raw material in other clusters. The clusters in Rajasthan supplies building grade POP to nearby construction industry in Delhi, Jaipur cities, ceramic grade POP to ceramic clusters in Gujarat and to large scale ceramic industries in North and Western India besides supplying medical plaster to surgical plaster molds preparation units. The cluster in Jammu mainly supplies to

² The variation in calcining temperature is due to raw material quality variance, product quality that is being produced (some units produce low quality POP).

³ The variation in calcining time is due to low quality product being produced and also due to moisture variations in raw material.

construction industry in Jammu region and to ceramic industry in northern region. The Jalpaiguri cluster supplies only to construction industry in eastern region mainly cities like Calcutta. The Raipalayam cluster supplies to ceramic, construction and chalk industry in southern India.

The large scale POP industry producing gypsum board is mainly marketing board in cities to upmarket real estate buildings and are trying to reach to mass market level.

1.5 Future Growth Prospectus:

The growth prospectus of the industry is intertwined with the construction and ceramic industry and POP industry cumulatively is expected to grow at 10-15% in line with construction and cement industry which is expected to grow between 9-12% per year⁴.

The usage of plaster board is confined to high end offices and real estate and the medium and low range buildings still use POP powder as the cost of board (approx Rs50/ m²) is high as compared to POP powder whose cost varies from Rs 1100-2000 per ton depending on the location of sale, quality of POP and quantity of sale.

With more large scale plaster board industries coming up the cost of transportation is likely to reduce and so also the cost of board. This may tilt the market choice towards plaster board and affect the small scale industry producing building grade POP. However, this scenario is not expected to arise in the near future, as the imported plasterboard being marketed in India is available cheaper than indigenously prepared. The market for ceramic grade POP is likely to grow at 10-12% in consonance with ceramic industry⁵. But the market for chalk, medical and other grades is not likely to change much as chalk boards is being increasingly replaced by white boards, dental and surgical molds are designed to make them lighter by changes in molds making process and value additions. Also the volume of POP used for these purposes is relatively insignificant. In these grades while usage of POP may remain stagnant the possibility of value addition and increasing turnover is high and the requirements being low small scale industries can benefit by technology and know-how adoption.

The constraint for growth is reported to be easy availability of gypsum. The entire gypsum supply source is governed by State Mining Development Corporations in Rajasthan and Jammu & Kashmir. In Jalpaiguri the gypsum availability is governed by the POP industrial scenario and gypsum market in Bhutan.

It can be concluded that future growth of POP industry in short term over a period of 5 years will be volume driven because of boom in real estate industries. In the long term the growth is not expected in volume terms but will be dictated by governments policy towards small scale industries, the subsidies it continues to give, industries own efforts in moving into value added products by collaborations and know how absorption.

⁴ Source: All India Cement Manufacturers Associations, Indian Brand Equity Foundation

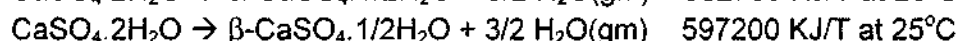
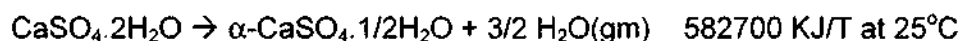
⁵ Source: Indian Council of Ceramic Tiles and Sanitaryware

CHAPTER 2

PRODUCTION PROCESS

2.1 PRINCIPLES OF POP PRODUCTION:

The principal of POP manufacturing is to convert gypsum, dihydrate form of Calcium Sulphate to POP, hemi-hydrate of Calcium sulfate by controlled heating. Hence production of POP involves dehydration of gypsum and preparing it in usable form (powder). Based on end use application and heats of hydration two types of POP are produced namely, α and β type POP. α type POP is characterized by crystalline nature of POP while β type of POP is characterized by amorphous nature of POP. The reaction sequence of α and β type is given below.



The difference in heats of hydration and other properties like settling time, strength and hardness are utilized for making appropriate choice of application or end use.

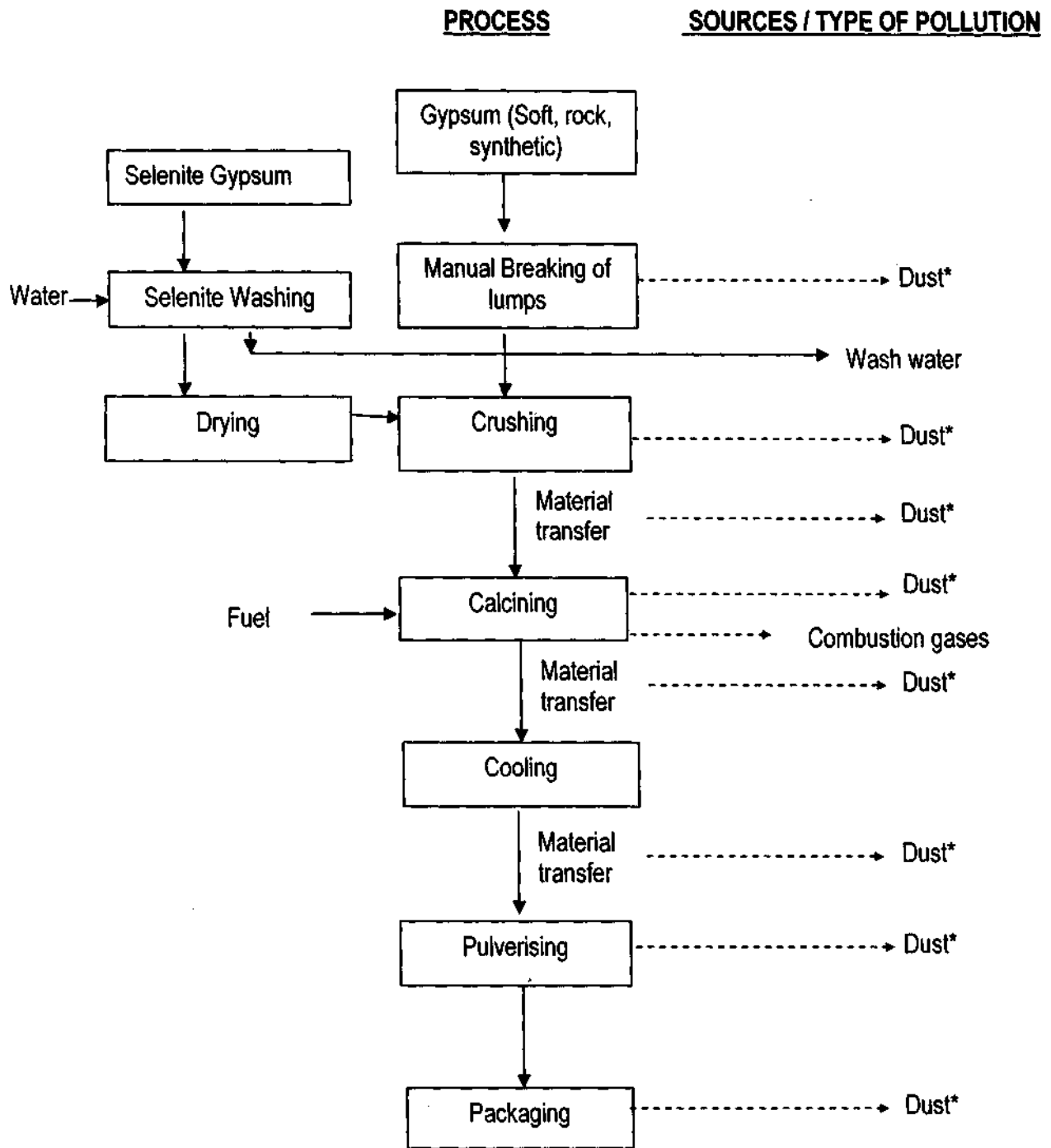
In India only β form of POP is produced, therefore only β form POP is discussed further on. On heating the entire gypsum is not converted into POP but some portion gets converted to anhydrite form of gypsum and some gypsum that wont get dehydrated. The presence of anhydrite and gypsum has bearing on setting of plaster. It is reported in literature that for a typical POP the composition will be 82-89 % hemihydrate, 5-10% dihydrate, 5% anhydrite and 5-7% inerts and additives. The desired quality parameters for end use as discussed in section 5.6 can be achieved by different POP compositions attained by settling calcination process control and adding additives. The possibility of attaining the same desired characteristics through different means make the entrepreneurs control and keep confidential the knowledge of process control. The physical properties of gypsum and POP are given in table 2.1.

Table-2.1: Physical properties of gypsum and POP⁶

Property	Gypsum	POP
Molecular Weight	172.17	145.15
Density g/cm ³	2.31	2.62-2.64
Hardness, Mohs	1.5	
Water of crystallization, wt%	20.92	6.21
Water solubility @ 20°C g/100g of solution	0.21	0.88

The general POP manufacturing process and associated sources of pollution are similar in all the units, though process conditions vary depending on end use, raw material source etc. The various operations and process undertaken in POP manufacturing are detailed below. The generalized POP manufacturing process and associated sources of pollution is given in Fig 2.1 and the equipment plan diagram is given in Fig 2.2.

⁶ Source: Ulmans-Vol A4.



* All the dust emissions indicated above are primarily **fugitive** in nature and are generated because of manual handling and dry crushing /grinding activities

Fig 2.1: Flow Diagram For POP Manufacturing

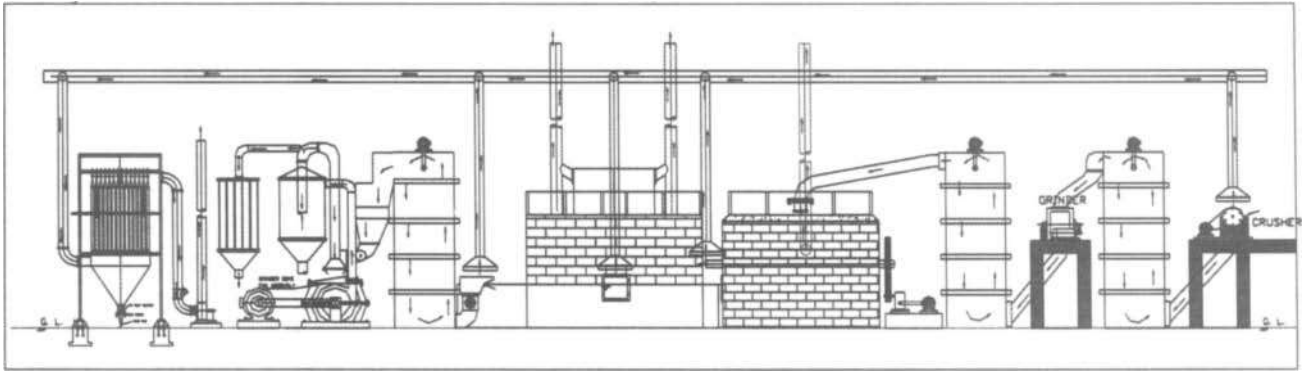


Fig 2.2: Equipment Plan Diagram

The individual process operations involved in the POP manufacturing along with type of equipments used and the sources of pollution are described in the further sections of this chapter.

2.2 RAW MATERIAL CLEANING

The gypsum transported from mine to manufacturing sites may required to be beneficiated depending on presence of impurities. The lump and rock type gypsum are processed directly, the selenite and marine gypsum are washed with water before being processed further. During washing, the gypsum is loaded into a inclined rotating cylindrical screen from one end and the water is continuously sprayed over the material through a perforated tube. The salt, fine silt and other impurities are dissolved or carried away with water and clean material is collected from other end. Water carrying impurities is collected in the sedimentation tank where the silt gets settled and overflowing clean water is collected in other tank from where it is recycled back. The collected silt is removed periodically and make-up water is added when required.

The sludge generated from cleaning of gypsum is sold to cement manufacturers or disposed of in low lying areas. The selenitic gypsum washing mechanism is presented in the figure 2.3 below.

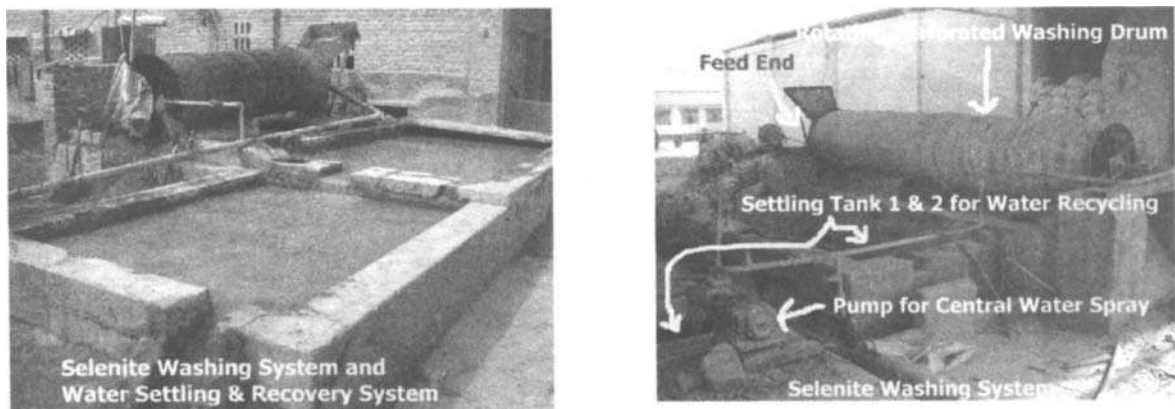


Fig.2.3: Selenite Gypsum washing

2.3 RAW MATERIAL CRUSHING

Raw or cleaned Gypsum is crushed to 25-100 mesh size. Raw gypsum obtained from mines in lumps form is broken to smaller pieces manually in the varying sizes of upto 150 mm. These lumps are crushed to uniform sizes in the range of 25- 100 mesh in the crushers. The crushing may be carried out in a hammer mill or attrition mill or jaw crusher depending on type of raw material and desired product. The various types of crusher in use in POP industry are briefly described. The typical size range of crushed material obtained from different clusters (Building grade at Bikaner & Ceramic grade at Jammu) is given in table 2.2.

Table 2.2 : Size range of crushed gypsum from various clusters

Sieve Analysis	Bikaner	Jammu
% passing through 4 mm Sieve	-	100
% passing through 2 mm Sieve	-	99.1
% passing through 1 mm Sieve	-	95.7
% passing through 710 mic. Sieve	-	92.2
% passing through 500 mic. Sieve	-	88.45
% passing through 355 mic. Sieve	100	83.5
% passing through 250 mic. Sieve	99.99	79.9
% passing through 150 mic. Sieve	99.98	72.5
% passing through 90 mic. Sieve	99.89	67.5
% passing through 45 mic. Sieve	98	52.7

During raw material loading and removing from crushers fugitive dust is generated. The quantity of dust that is dispersed on the shop floor is described in later sections.

The various types of crushing machinery used in Indian industries are briefly described below.

2.3.1 Attrition Mills:

Attrition mills (like used for flour milling) are widely used for raw material crushing in small scale units at Rajasthan. This mill works on the principal of shearing force. The raw gypsum of 100-150 mm size is grounded to 20-50 mesh. A typical attrition mill used in the POP industry is shown in the photograph at figure 2.4.

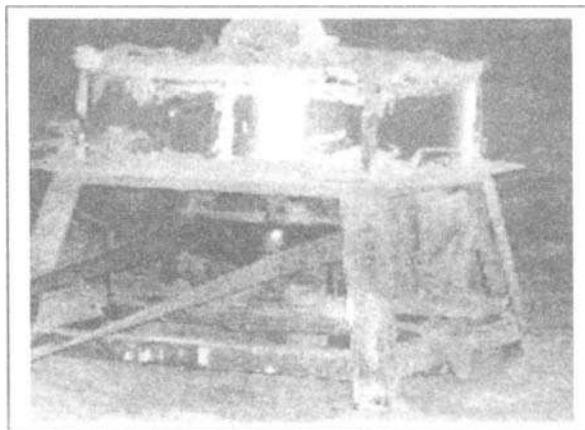


Fig 2.4: Attrition Mill

2.3.2 Jaw Crusher

Jaw crushers are the most commonly used crushers in all clusters and large scale industry except in clusters of Rajasthan. In Jaw Crusher the feed is compressed between a stationary and a movable surface. These crushers are made with jaw widths varying from about 2" to 48" and the running speed varies from about 100 to 400 RPM. General specifications of the Jaw Crushers used in POP industries are given in table 2.3 and a typical Jaw crusher used is photographically shown in figure 2.5.

Table-2.3: Jaw Crushers used in India & Energy Consumption/ TPH

Jaw Crusher Size	Discharge Opening Range	Production Capacity Range	Drive Motor Power	Electricity Consumption/TPH
Inches x Inches	inch	TPH	HP	HP/TPH
36X24	3 - 5	75 - 160	75	1 - 2.1
24X15	2 - 5	30- 80	35	0.9 - 2.3
16X10	1.5 - 4	15 - 45	15	1.0 - 3.0

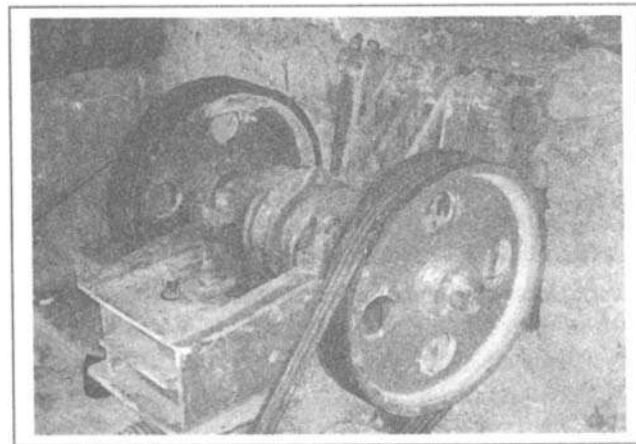


Fig 2.5: Jaw Crusher

2.3.3 Hammer Mill

Hammer Mill is also widely used for gypsum crushing, sometimes as stand alone or after pre-crushing in jaw crusher. In these mills hammers are attached to the rotor via pivots so that they are deflected when they hit strong and particularly large stones. The grinding action results from impact and attrition between the lumps or particles of the material being ground. The fineness of product can be regulated by changing rotor speed, feed rate, or clearance between hammers & grinding plates as well as by changing the number & type of hammers used & the size of discharge opening. In most cases the crushing zone is surrounded by grate bars so that fragments which are larger than the openings of the grating are retained in the crushing zone. The images of the hammer mills used in India are shown in figure 2.6

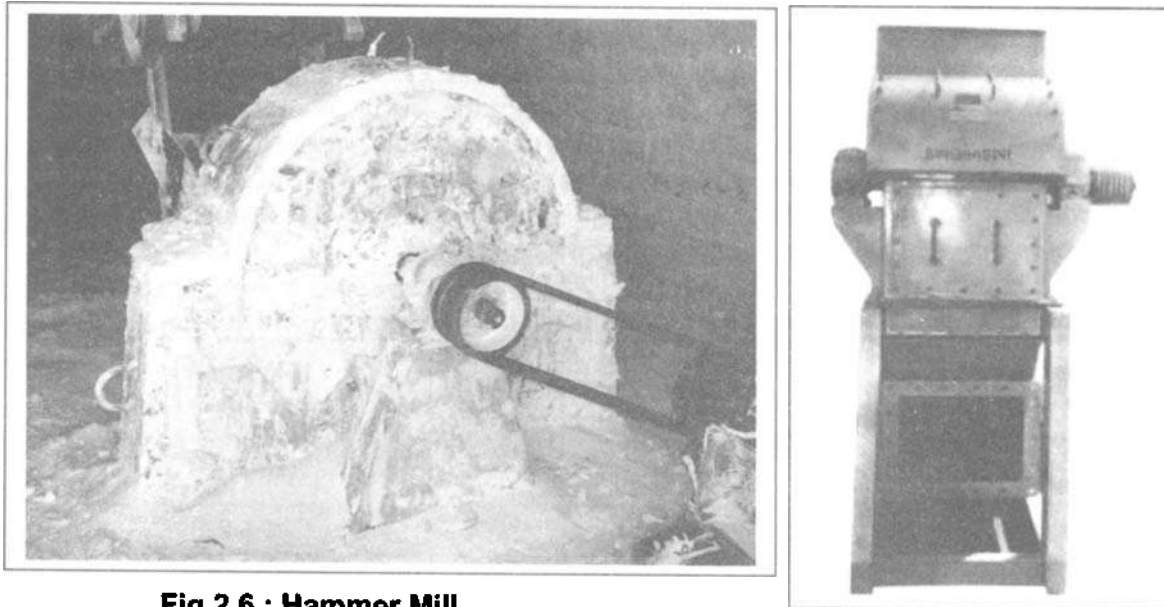


Fig 2.6 : Hammer Mill

2.4 SCREENING

In most of the small-scale units the crushed material is conveyed to calciner through bucket elevators and is fed manually to calciner. The crushed gypsum is screened using vibratory screens to 3-4 different grades and is reported to have better quality differentiation as smaller sizes have most of silt and other impurities. However this phenomenon of screening is observed in only one unit where detailed studies were conducted.

As the screens are not enclosed and in the absence of any dust extraction system, the fugitive dust emissions are generated while screening and gets dispersed on the shop floor.

2.5 CALCINATION

The crushed gypsum is conveyed near the calciner from where it is fed into calciner, manually (in small/medium scale units). The calciner is heated in the furnace at a temperature of 120-200°C for 1 to 4 hrs to remove physical moisture and $\frac{1}{4}$ chemically bound moisture in gypsum to convert it to POP. Firewood is the most commonly used fuel in calciner furnace in small scale industries while diesel or furnace oil is the preferred fuel in large scale industry. Calcined POP is taken out manually from calciner and spreaded in an open space inside the shed to cool in small scale industry and in large scale industry heat recovery through heat exchanger is practiced. A Schematic diagram of calciner and emissions sources is given in figure 2.7. As indicated in the figure the major source of dust emission is the drum vent pipe besides combustion gas emissions from furnace.

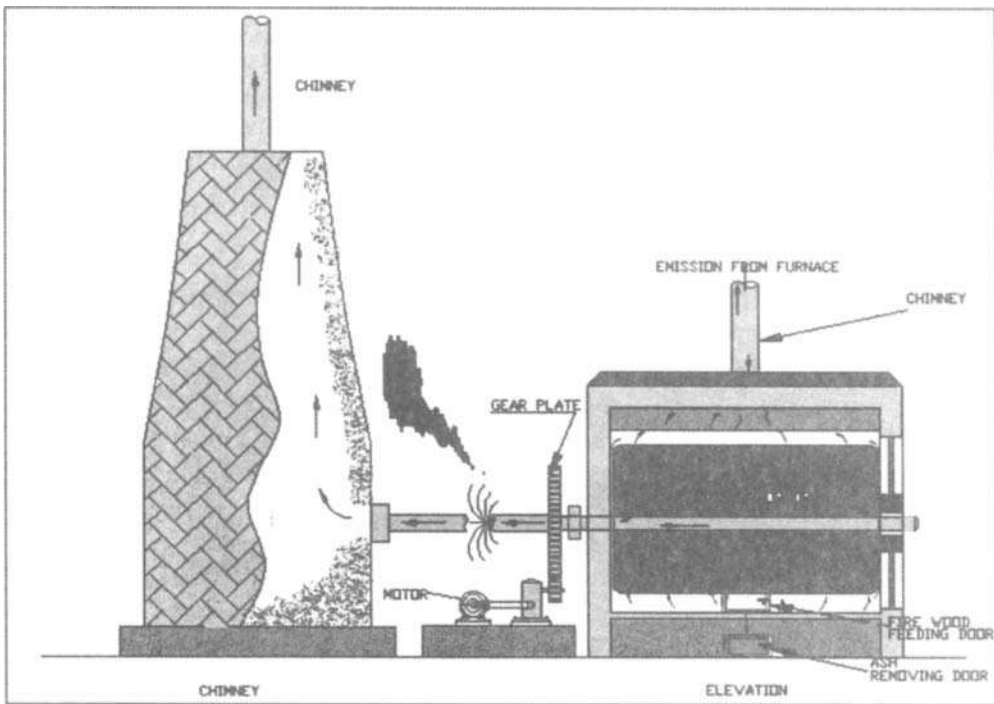


Fig 2.7: Schematic Diagram of Drum Calciner System

The various types of calciners used in India and their pollution generation status is described below:

2.5.1 Rotary Drum calciner

The Rotary Drum calciners are horizontal drums, made up of mild steel, rotating along the horizontal shaft at slow speed of around 10-12 rpm. The batch capacity of drum is in the tune of 1 ton and the batch time varies from 1.5 hrs to 4 hrs, depending on desired quality & end use of product. This type of calciner is predominantly used in clusters of Rajasthan and is gaining in popularity in Jammu and Jalpaiguri clusters. The drum is heated so that gypsum (inside drum) temperature rises to 160-200°C. Wood is the fuel commonly used barring few units in Siliguri where coal and FO is used. The usage varies from 100-400 Kg wood per ton of POP produced. The material is manual fed and removed from calcinator from same end.

Dust emissions occur during manual loading & unloading of the calciner, during revolution of drum through steam vent pipe of 4 inch size and flue gas is emitted from calciner furnace. In Jammu the calciner steam vent pipe is let out in an enclosed chamber where dust gets settled in the chamber. In Rajasthan it is vented out through a chimney but the connection of the vent to chimney is broken in most industries causing emissions to disperse in shop floor. Typical drum calciner is shown in the photograph at figure 2.8



Fig 2.8: Rotary Drum Calciner

2.5.2 Pan type Calciner

The Pan type calciners are stationary calciners wherein the material is gently agitated through chain agitator inside the pan. Here the material is heated in two stages; pre-heat chamber (where it is heated upto 80-100°C through flue gases of main chamber), and in main chamber where it is heated upto desired temp of 180°C for 3-4 hrs. Batch capacity of these calciners is 600-800 kg.

Fugitive dust emissions are generated during manual loading & unloading of the calciner and combustion flue gases are emitted via calciner furnace stack. A photograph and an illustrative diagram of the pan type calciner are presented in the Figure 2.9 & 2.10 respectively.

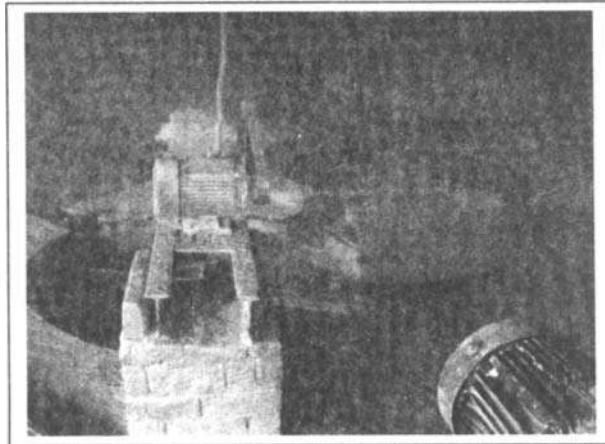


Fig 2.9: Pan Calciner

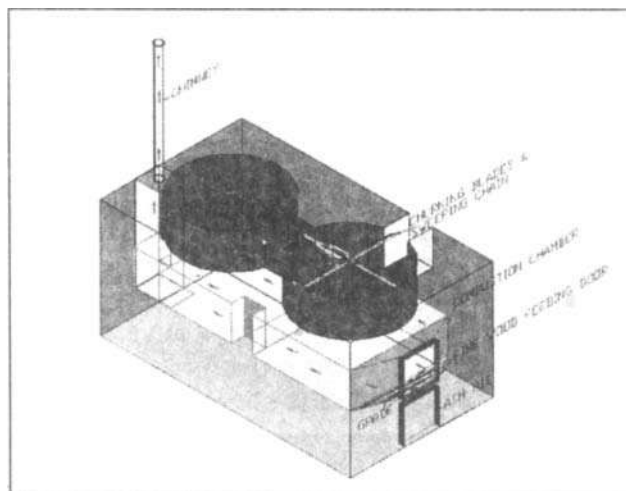


Fig 2.10: Schematic diagram of Pan Calciner system

2.5.3 Kettle Calciner

These are the continuous type of calciners used in large scale units, producing POP at the rate of 10-12 T/hr. In India Kettle type continuous calciner with combined drier and grinder is used in large scale industry with a capacity of 10-12 T/hr. The temperature of

calcining is about 158oC and time of calcinations is around 4-5 hours. The specific fuel oil reported to be used is 28-32 liters per ton of POP.

Since the kettle is enclosed loading and unloading of calciner is done automatically through enclosed system and emissions are directed to ESP or bag filter to control emissions and recover material. The kettle type calciner is shown & illustrated in figure 2.11

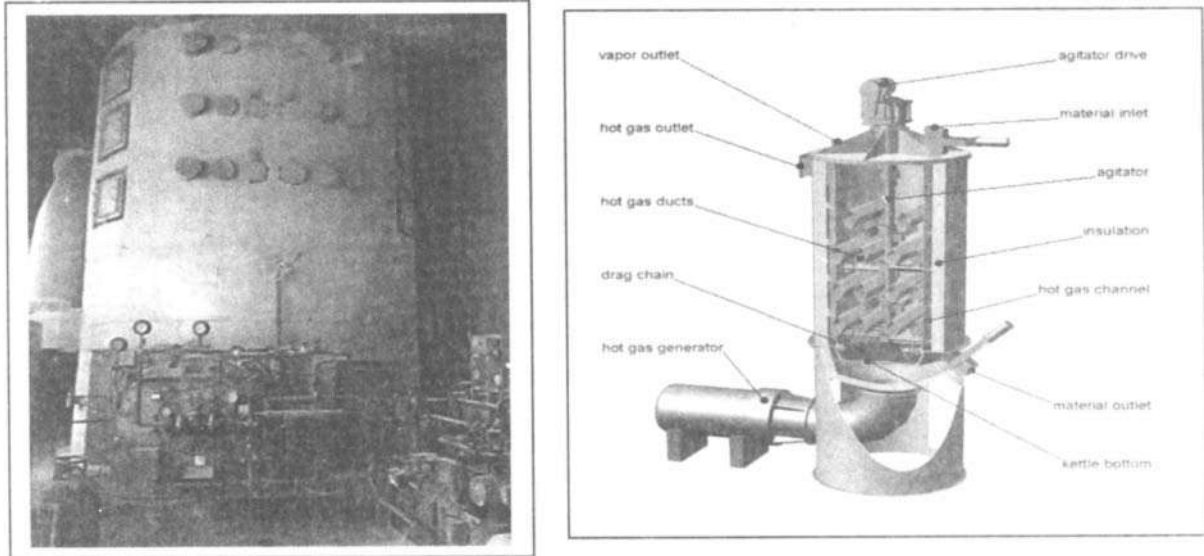


Fig 2.11 : Continuous Kettle Calciner

2.6 PULVERIZATION

The calcined POP after cooling is manually fed in the pulveriser and grounded further to about 200-mesh size. Air is blown through grinder, which lifts the ground calcined POP. Silica particles (impurity in gypsum) gets collected at side outlet of hammer mill due to density difference between silica and POP particles from where they are removed manually and disposed. The POP particles are airlifted into cyclone, where particles of size 200-250 mesh are collected from the bottom of cyclone and finer particles gets carried away from cyclone into a bag filter or recycled back to the end of pulveriser. The POP collected from cyclones and bag filter is mixed as per the product specification and packed in bags as final product. The finer particles are passed into an open type bag-filter and collected from the bag filter hopper. The POP particles collected from bag filter are combined with particles from cyclone and sold off.

Dust emissions occur during loading of calcined material and through punctured bags of bag filter. The figure 2.12 shows an actual pulverizer, material collection and emission control system. The hazy picture is due to high ambient dust emissions generated from the system. The POP pulverization system is illustrated in the figure 2.13

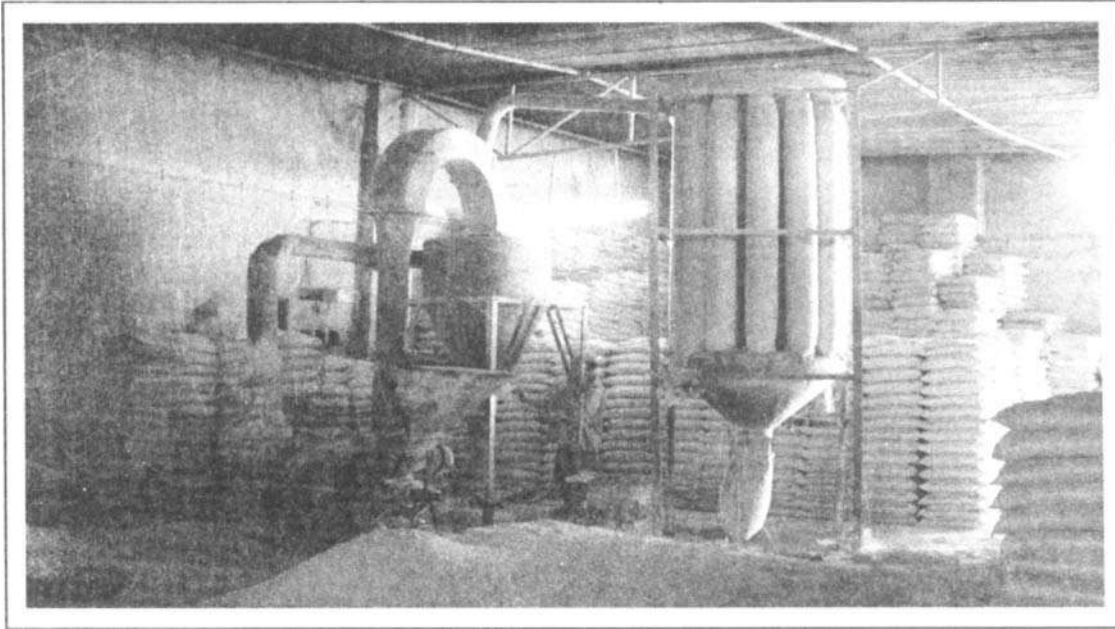


Fig 2.12 : Pulveriser and Product collector

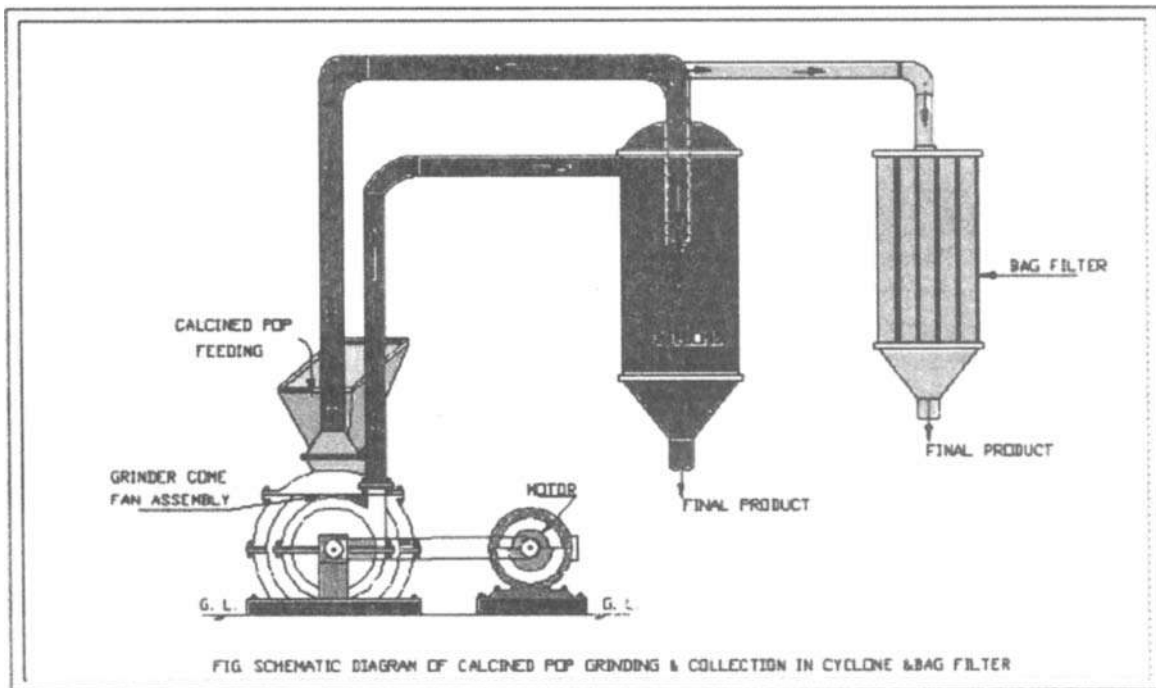


Fig 2.13 : Product pulveriser and collector schematic diagram

CHAPTER 3

FIELD STUDY: RESULTS & COMPLIANCE

3 FIELD STUDY SCOPE

The detailed filed studies were carried out in 11 representative POP manufacturing units located in different parts of countries. The activities carried out during the filed studies were:

- Preparation of general layout of plant
- Identification of sources of pollution (air, water, solid)
- Air quality monitoring in ambient surroundings & at shop floor levels.
- Stack monitoring at calciner stack & furnace stack.
- Noise monitoring.
- Collection of wastewater samples, wherever raw material is being washed.
- Sieve analysis of raw materials & product
- Establish the energy consumption pattern with respect to electrical energy & thermal energy.
- Performance evaluation of pollution control system, if any.

This chapter presents the field study findings in respect of the air pollution, water pollution, solid waste & noise pollution. The findings under these heads are discussed under the following sections:

3.1 Air Pollution

The predominant environmental concern in POP manufacturing process is the fugitive dust emission generated from 4 major operations. Table 3.1 compiles the major activities, process operations, and fugitive emission sources.

Table-3.1 : Sources of Emissions from POP Manufacturing

Activity	Process Sources	Fugitive Dust Sources
Raw Material Crushing	Crusher Screen Conveyor transfer points	Stockpiles Conveying Crusher leakages
Calcination	Calciner outlet Furnace outlet	Feeding point Calciner Product removal Stockpiles
Pulverisation	Pulveriser Furnace outlet	Feeding point Crusher leakages Bag filter leakages

Material conveyance	Manual handling operations using pan type carriers (Thasla).
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The study results of dust concentration monitored at different areas are given in the following sections.

3.1.1 Emission during Raw material crushing operation

During crushing dust is generated at crusher feed, discharge points and any leakage areas. The dust concentration levels in shop floor in raw material crushing section are given in table 3.2.

Table 3.2 : Emissions from raw material grinding

S.No	Name of Cluster	Dust concentration (range) $\mu\text{g}/\text{m}^3$			Remarks
		General Range	Minimum	Maximum	
1	Bikaner	22000	6395	30260	Minimum occurred because the crushing operation was carried for 4 hrs. Maximum occurred because of high winds.
2	Jammu	19000	17700	19230	
3	New Jalpaigudi		831		During study period because of rains crushing was not in operation fully and only 3 hr crushing operation was carried out leading to only ϕ data
4	Rajapalayam	21000	9224	21000	Minimum due to 5 hrs of crusher operation in one un

It can be seen the average range of dust emissions from raw material crushing is around 20000 $\mu\text{g}/\text{m}^3$ as compared to the prescribed level of 10000 $\mu\text{g}/\text{m}^3$ under the factories act.

3.1.2 Emissions during calcination

During calcinations there are two major sources of air pollutions i) emission from calciner and ii) flue gas from calciner furnace.

In the calciner, as the material is heated, the water vapors are liberated which while coming out of calciner outlet, carries fine dust particles of gypsum/POP along with them. This dust emission is high in rotary drum calciner as during drum rotation material fall causes higher emissions as compared to pan type

calciner where material is agitated gently with chain type agitator which is clear from the data given in table 3.3.

The emissions from rotary drum calciner are dispersed into atmosphere by natural draft through a trapezoidal stack. The water vapors pass through the stack and the dust being moist gets settled at the bottom of the stack from where it is removed and reused. However in most of the units it was observed that the stack was bypassed and the dust gets dispersed into shop floor as the duct connecting stack and calciner gets choked due to moist dust emissions and effects the calciner performance.

In pan type calciner water vapor emissions are the only emissions that occur during calcinations. Other dust emissions occur during material transfer into and out of pan type calciner. Some of the units have installed a settling chamber having 3-4 baffles on pan type calciner before discharging emissions into atmosphere.

Table -3.3 below gives emissions arising out of rotary drum calciner and pan type calciner stack.

Table 3.3 : Calciner Stack Emissions

Source	Region	Dust concentration (mg/Nm ³)	Remark
Rotary Drum Calciner	Bikaner	5239	
Pan Type Calciner	Jammu	Not Measured	As the Calciner was not attached to stack
	Jalpaigudi	3365	
	Rajapalyam	Not Measured	As the Calciner was not attached to stack

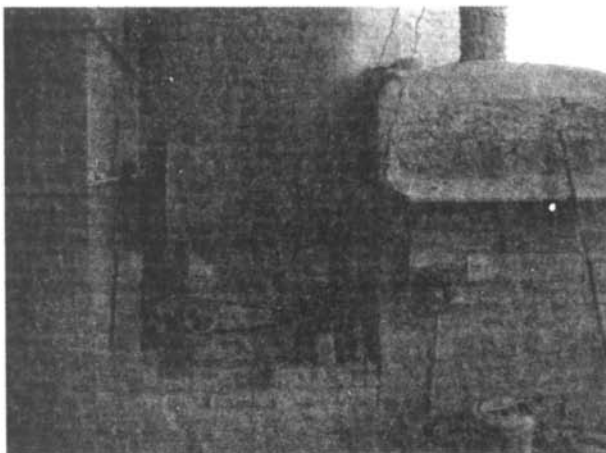


Fig 3.1 : Emissions from Drum Calciner

In calciner furnace, wood, coal or furnace oil is used as fuel. In most of the industries, the flue gases are let in the atmosphere without any air pollution control system. The emissions from furnaces using F.O. & diesel are less as compare to those using wood and coal.

The composition of flue gas and dust concentration measured in various units is summarized in table 3.4.

Table 3.4: Emissions from Calciner Furnace:

Source	Region	Dust conc. (mg/Nm ³)	Remark
Furnace (wood)	Bikaner	48	
	Jammu	116 - 788	The high is during startup of the furnace.
	Rajapalyam	364 - 1001	The high is during startup of the furnace.
Furnace (Coal)	Jalpaigudi	1573	
Furnace (oil/diesel)	Jalpaigudi	87	

As can be seen from table 3.4, the emissions from furnace are meeting the prescribed standards for reheating furnaces.

The emissions from the calciner drum vent are point emission and are relatively high compared to general emission standard of 150 mg/NM³. As no specific standards are prescribed till now, there is a need to have a control system for these emissions and to develop the emission standard for calciner drum vent.

3.1.3 Emissions from product grinding section

In case of product grinding, emissions occur while feeding material to crusher/grinder. After grinding the product is air carried and separated in a cyclone followed by open type bag filter (without enclosure of bags). Due to product grinding the powder gets heated and hence to cool the powder POP the product is conveyed by air. The product grinder in combination with cyclone and bag filter is located inside the enclosed shed where calcined gypsum is spread for cooling.

The cyclone and bag filter attached to product grinder is to capture the product and in the process emissions also gets reduced. Besides these no control systems or measures are adopted or practiced.

Monitoring is carried out near product grinder and near combined emission source emanating from calcined gypsum cooling, feeding crusher and emissions from leakages and are tabulated in table 3.5.

Table 3.5: Emissions from product grinding section

S.No	Name of Cluster	Dust concentration (range) micro g /m ³			Remarks
		General Range	Minimum	Maximum	
1	Bikaner	15000	9711	15000	Minimum occurred in the case of isolated bag filter from the product classification system.
2	Jammu	17000	6646	17607	Minimum is due to new bag filters and careful conveying of material to grinder. Maximum is due to two grinding system operating at same shop floor
3	New Jalpaigudi	6000	5280	5730	This is due to liquid nature of POP after calcinations and as a result during cooling emissions is relatively less.
4	Rajapalaya m	Product grinding not practiced			

It can be seen the average range of dust emissions from raw material crushing is around 15000 µg /m³ as compared to the prescribed level of 10000µg /m³ under the factories act.

3.1.4 Emissions during material handling and Transfer

During material handling and transfer, gypsum/POP is transported from one point to another, manually or through conveyors. High particulates emission is there from material handling operations, mostly at transfer points and at inlet & outlet of equipments (crushers, calciners etc.). The workers cover their face with clothes which act as dust filter. Besides this measure no control system or protection measures are being followed.

3.1.5 Emission from stockpiles

The raw material, the intermediate product, and product placed in open areas on shop floor for cooling, making different product mix, generate dust emissions by virtue of manual handling and increased material transfer points. The raw material is generally in lumps but has lot of dust associated with it which is re-entrained with blowing wind and movement of vehicles in the plant.

No control systems are adopted. Water is not sprayed on raw material stock piles as it will cause increase in fuel consumption during calcining.

3.1.6 Emission to ambient air:

Ambient air quality with respect to suspended particulate matter was monitored in all the clusters and found to be with in the existing standard limits except in case of Bikaner cluster where the back ground concentration itself is high as indicated in table 3.6.

Table 3.6: SPM levels in ambient air

S.No	Name of Cluster	Dust concentration (range) micro g /m ³		Remarks
		Back Ground Conc.	At units boundary	
1	Bikaner	500	600-700	
2	Jammu	150	250	The boundary wall is far from shop floor and is limiting the effect of dust generated during process
3	New Jaipaigudi	100	120-150	Low values due to rain and damp weather at the time of study
4	Rajapalayam	240	270-400	The boundary wall is far from shop floor and is limiting the effect of dust generated during process

In Rajasthan area where the weather is hot and windy due to desert conditions for most part of year the ambient dust concentrations in residential zone itself exceeds the industrial ambient standards. In other areas, the ambient air dust concentrations are with in the prescribed limits 500µg/m³.

3.2 Water Pollution

Wastewater is generated from POP manufacturing units in washing of Selenitic and marine gypsum which contain salt, silica, silts and other impurities. The wastewater generated during washing however is recycled back after sedimentation of impurities in settling tanks in all the units. Only the sludge is removed periodically and make-up water is added when required. Wastewater sample from marine gypsum washing was taken from sedimentation tank and analysed for relevant parameters. The wastewater characteristics are summarized in table 3.7.

Table 3.7: Characteristics of wastewater from marine gypsum washing

SL.No.	Location	pH	Chloride mg/l	TDS mg/l	TSS mg/l
1.	Marine Gypsum Washing (Inlet)	7.61	4150	11130	13610
2.	Marine Gypsum Washing (Outlet)	7.03	4000	10060	57

For marine gypsum washing the TDS concentration is found to be higher than the general discharge standard of 2100 mg/l prescribed by CPCB for surface water and land discharge.

3.3 Solid Waste

Solid waste is generated from settling of gypsum wash water, deposits on calciner drum, deposits in calciner stack bottom and from burning of fire wood.

Literature survey indicates gypsum ores does not contain any hazardous materials, and hence the sludge generated is not expected to contain any hazardous substance either. However as a measure of caution the mixed solid waste sample was analysed to assess presence of heavy metals in the hazardous range (refer table 3.8). The analytical results indicate that the solid waste is not hazardous as per Hazardous Waste (Management & Handling) Rules 2003.

Table 3.8: characteristics of sludge:

SL.No.	Location	Pb	Fe	Cr	Cu	Ni	Zn
1.	Gypsum Washing Sludge	13.7	139.2	26.7	13.9	18.7	40.1

All values in mg/Kg

The calciner stack bottom deposits are being reported to be reused by units studied. The solid waste generated from marine gypsum washing is reported to be sold to cement manufacturers. The solid waste generated from selenitic gypsum is being disposed in low lying areas.

The fire ash generated around 0.15 - 0.25 Kg per Kg wood burned from burning wood is disposed in low lying areas.

3.4 Noise Pollution

There are a number of sources from which noise arises in POP manufacturing like crushers, pulverizes etc. In small & medium scale units, most of these sources are intermittent, generated during the time of the breaking of raw material, product grinding etc. Calciner does not generate high noise levels as compared to crushers. Conveyor movement is also a source of continuous noise, especially the ill-maintained conveyor systems.

During the filed studies it was observed that though the noise levels were high at shop floor levels, the noise levels at unit boundaries in ambient conditions were within the prescribed standard of 75 db(A) by CPCB for industrial zone as can be seen from table 3.9.

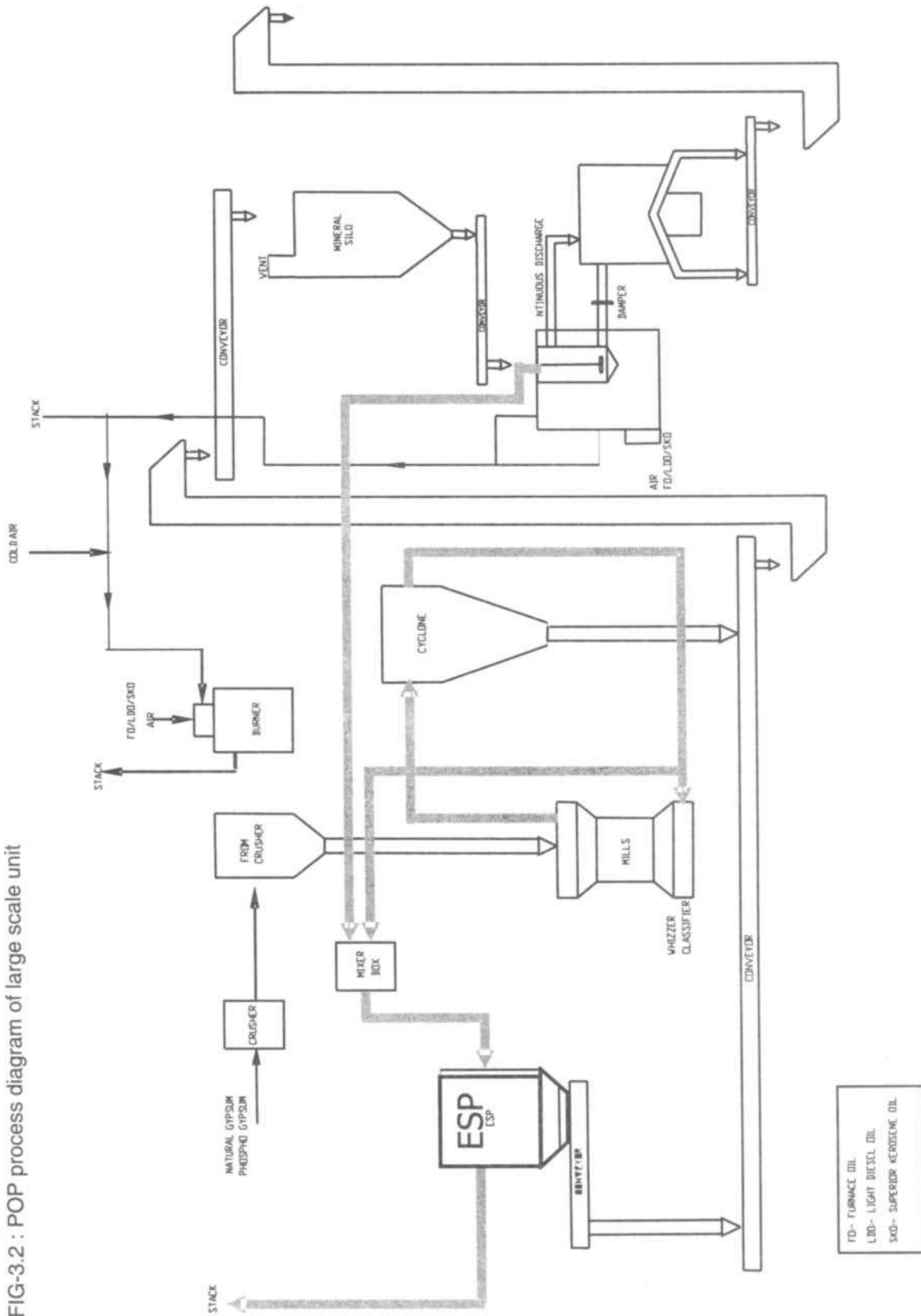
Table3.9: Noise levels in various industrial clusters

S.No	Location	Noise Levels Average in dB (A)			
		Bikaner	Jammu	New Jalpaigudi	Rajapalayam
1.	Main Gate	59.0	56.3	42.1	53.4
2.	Office Building	59.4	58.8	43.4	55.85
3.	Near Pulveriser	85.5	85.2	82.8	85.9
4.	Near Calciner	72.0	71.3	82.8	80.2
5.	Near RM crusher & conveyer	77.0	74.2	83.6	84.0
6.	Near boundary wall	61.6	55.8	43.1	54.3
7.	Near boundary wall	66.2	56.2	46.6	50.3
8.	Near boundary wall	58.1	57.3	43.8	45.1

3.5 For Large Scale units

Presently there are two large-scale industries manufacturing POP with installed capacity of 200 TPD. In these industries the technology is integrated with grinding, drying and calcining done in a integrated kettle calciner with heat recovery arrangements and the material conveyance is done in enclosed conveyors so that emissions don't occur. More over, since the process is managed through process control room, workers are not exposed to emissions during normal production process unless there is a break down or maintenance problem arises. At venting points installed for safety reasons localized bag filter on vents are provided. The calciner furnace gases are partly recycled back to grinding cum predrying section to recover flue gas heat. The dust generated in material feeding any other areas in the system is extracted and directed through ESP, or bag filter before venting through the stack into atmosphere. The process flow diagram of POP manufacturing and sources of dust emissions are depicted in Figure 3.2 below:

FIG-3.2 : POP process diagram of large scale unit



The raw material storing yard is enclosed by fencing wall, which act as wind breaking wall and to minimizes the wind blown dust. The belt conveyers are also covered to reduce fugitive emissions.

Considering the above factors shop floor air quality monitoring is conducted near calciner, raw material crusher and raw material storage yard and the results tabulated in table 3.10.

TABLE 3.10 : Suspended dust particle concentration from various sections.

S.No.	Section	Dust concentration (range) micro g /m ³
1.	Calciner (Kettle type)	9034
2.	Raw Material Crusher	4745
3.	Raw Material Storage yard	4285

The furnace gases are vented directly though a chimney and calciner moisture and gases are vented through the stack connected to an ESP. The results of the stack monitoring conducted on these locations are given in table 3.11.

TABLE 3.11 : Stack Monitoring results from various sections.

Source	APCD	Dust conc. (mg/Nm ³)	Remark
Furnace Stack (LDO)	-	135	
	Electrostatic Precipitator	47920	

As can be seen from table 28 SPM concentrations are within the threshold limits prescribed under factories act (10 mg/m³). LDO is used as fuel in furnace .The stack emissions from furnace are within the prescribed limits (150mg/NM³ @12% CO₂) of HSPCB.

However the emissions from Milling cum Calciner stack are found to be in the range of 47920 mg/Nm³ exceeding the limits by huge margin despite being passed through ESP. The high dust concentration was attributed to the malfunctioning ESP at the time of study.

3.6 Conclusions

The outcome of field studies in small & large-scale POP units located in different parts of country could be summarized as below:

- The dust emissions at calciner section in large scale units is in the range of 9000 micro g/m³ though the unit is having closed and mechanized syste. It would be difficult for small scale units, where material are handled manually at all stages, to maintain dust emissions lower than this value.

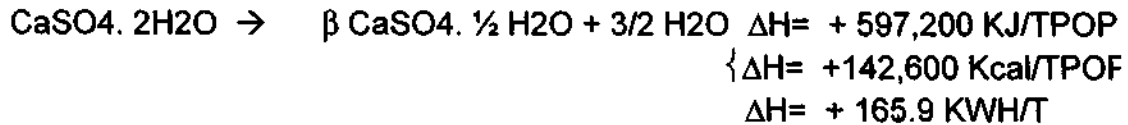
- If the raw material storage (or other plant operation) is near the unit boundary, it is not possible to maintain SPM of 500 micro g/m³ (prescribed standard) at unit boundary. However farther is the distance between material handling point and plant boundary, there are better prospects of meeting the standards as observed in case on New Jalpaigudi units. Considerable impact of green belt (trees & vegetation) has been observed in reducing the dust levels at unit boundaries.
- Climatic conditions play due role in maintaining dust levels in ambient air. In Bikaner & Rajaplayam where climate is hot & dry, dust concentration in ambient air are found to be high whereas in New Jalpaigudi, dust concentration are quite low as weather is cold & damp.
- Clay type gypsum (Rajasthan) is prone to generate more dust compare to rock (Jammu, NJP) and marine gypsum (Rajaplayam)
- Wastewater, noise & solid waste pollution is not significant as far as POP industries are concern.

CHAPTER 4

FILED STUDY: MATERIAL AND ENERGY BALANCE

4 INTRODUCTION:

POP is produced by calcining gypsum as per the equation below.



An overall material balance is derived using the stoichiometric principle combined with data concerning impurities in raw material collected from units. Production of POP is an endothermic reaction as indicated in the equation below. The thermal energy requirements and balancing cannot be calculated as per the equation because of variations in physical moisture in gypsum, it involves combustion efficiency, heat transfer efficiency from combustion chamber to calciner material, insulation and other factors. Considering the many variable factors that influence energy consumption, energy balance is done by measuring the actual fuel (wood, oil) and electricity consumed in representative units. The sections below detail the overall material and energy balance conducted.

4.1 Overall Material Balance For Producing 1ton Of Pop

4.1.1 Material Balance Basis :

$\text{CaSO}_4 \cdot 2\text{H}_2\text{O} + \text{IMPURITIES}$ (As is basis) = 1.25 Ton

4.1.2 Assumptions :

- Assume Moisture Content = 0.5%
- Impurities other than gypsum = 5%
- Dust loss in RM crushing is assumed to be recycled back.
- Dust loss in Calcining is collected and used back.

4.1.3 Material Balance:

- H_2O loss (physical) = 0.006Ton
- H_2O loss (Chemical) = 0.2 Ton
- Product Grinding losses including removal of impurities = 0.01 (1 assumed based on data provided by units)
- Product obtained = 0.98 Ton
- Specific Product obtained = 0.8 Ton POP / Ton Gypsum

The overall material balance indicates the major difference between raw material utilized and product obtained is due to removal of physical and chemically bound moisture followed by partial removal of impurities. Considering this factor it can be concluded that conducting overall material balancing will not provide any indicators to pollutant generation and possibilities of resource conservation.

4.2 Energy Consumption Pattern:

In POP manufacturing thermal energy is used in calcinations and electric energy is used in driving motors, conveyors etc.

The share of thermal & electrical energy and its price in the units in cluster is as depicted

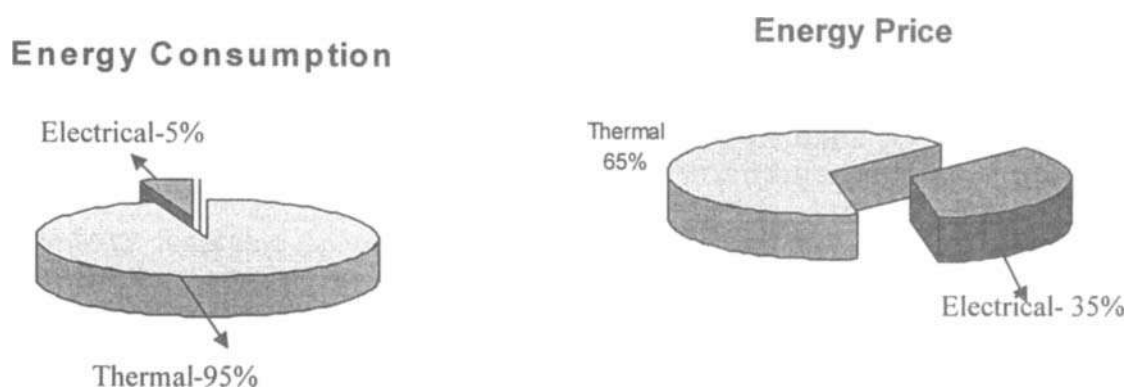


Fig 4.1: Energy Consumption Distribution

Though electricity constitutes only 5 % of the total energy consumption, its share in energy price is almost 35%, mainly due to its high cost compared to the cheap wood used by the units in the furnaces for thermal energy.

Thermal energy is used for calcining gypsum. In large scale units flue gas heat recovery, heat recovery from product cooling helps improve thermal energy efficiency however in small scale units heat recovery is not practiced. However, the study has shown by improving insulation and controlling draft path a saving of 15% of fuel is possible (for details refer Annexure -2 Energy Profile). A schematic diagram of the existing vs proposed is given below which potentially can reduce fuel consumption by 15%.

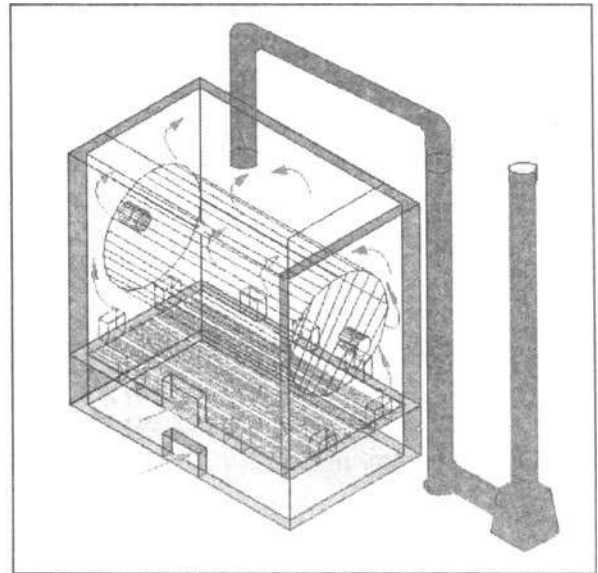
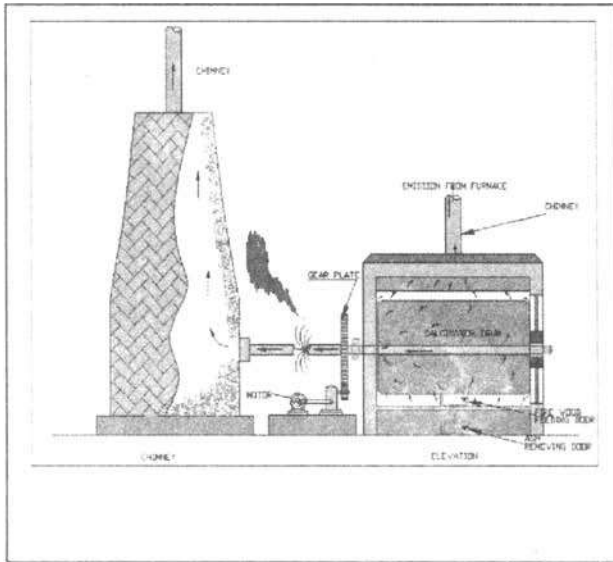


Fig 4.2 : Existing and recommended furnace flue path.

The pulverizing machine motor is having a share of around 85 % in the total electrical energy consumption of the plant. All units maintain a power factor as required by state electricity boards to avail discounts in billing and avoid fine by installing capacitors.

The study results indicate potential in conserving electrical consumption is marginal as the units are already following best practices to reduce electricity bill. Thermal energy studies indicate potential to save fuel by 15% by furnace modifications. Improved heat recovery may not be possible but considering the high capital costs for heat exchangers.

CHAPTER – 5

APPLICABLE CONTROL SYSTEMS & THEIR COST ECONOMICS

5 INTRODUCTION:

Dust Control Systems are selected based on dust load, particle size distribution and dust characteristics like resistivity, wettability, explosive nature chemical reactivity etc. There are no extraction or control systems at raw material crushing and product grinding feed point hence no particle size distribution analysis could be done. Hence for design of control system the dust collected in Respirable particulate sampler in raw material crushing and product grinding sections of shopfloor is taken as basis as these emissions contain more than 80 % particles in the size range of >10 microns (Refer shop floor dust concentration in raw material crusher sections of unit reports). POP is hygroscopic in nature and is also partially soluble. The general properties of gypsum and POP are given in table 5.1.

Table-5.1: Physical properties of gypsum and POP⁷

Property	Gypsum	POP
Molecular Weight	172.17	145.15
Density g/cm ³	2.31	2.62-2.64
Hardness, Mohs	1.5	
Water of crystallization, wt%	20.92	6.21
Water solubility @ 20°C g/100g of solution	0.21	0.88

5.1 Base Line Data:

Based on the dust loading, particle size, collection efficiency and space requirements technically feasible control systems that can be adopted for POP industries were considered and are tabulated in table 5.2 below.

Table 5.2: Technically Feasible control systems⁸

Types of Dust Collecting Equipment	Particle size	Loading	Collection Efficiency	Pressure Loss	Gas Velocity	Size Range Limits,	Space Required (relative)
	μ	mg/m ³	wt%	Gas (inch WG)	(m/s)	m3/s	
Settling Chamber	>50	>11449	<50	<0.2	1.5-3	None	Large
Baffle Chamber	>50	>11449	<50	0.1-0.5	5-10	None	Medium
Cyclone	>10	>2290	<85	0.5-3	10-20.5	23.6	Medium

⁷ Source: *Ulmans-Vol A4.*

⁸ Source: *Gordon D Sargent, Nopco Chem Divn. from Chemical Engg Jan 27-1969*

Impingement	>10	>2290	<90	1-2	15-31	None	Small
Fabric Filters	>0.2	>229	<99	2-6	0.05	94.4	Large
Definition of Concentration or loading, Light Loading =1100-4600, Moderate loading = 4600-11500 Heavy loading = 11500+ mg/m ³							
Definition of particle size : Fine = 50% particles in 0.5-7 μ range, Medium = 50% particles in 7-15 μ range, Coarse =50% particles over 15 μ range							

5.2 Cost Comparison of technical alternatives:

Since the costs of adopting each control system has a bearing on overall profitability and viability if the unit cost economics of each feasible system is done to assess best low cost system. The cost economics of feasible alternatives are tabulated in table 5.3 below.

Table 5.3 : Cost comparison of various control systems.

	Cost (Rs)	Remarks
Settling Chamber	50000- 100000/-	Low cost options
Baffle Chamber	75000-150000/-	
Cyclone	50000-100000/-	Despite low cost recurring costs of power will be high
Impingement	50000-100000/-	
Fabric Filters (enclosed shaker mechanism or pulse jet)	500000-1000000/-	Very high initial and recurring costs.

Based on the above evaluation it can be noted that fabric filters are not economically viable. Among the techno-economically viable alternatives considering the high dust loading it is recommended that a baffle settling chamber, cyclone will be a appropriate control system considering particle cut diameter ($d_c < 10\mu$) and average dust loading in the range of 3000-4000 mg/m³.

CHAPTER – 6

ASSESSMENT OF ECONOMIC VIABILITY OF ADOPTING ALTERNATE CONTROL SYSTEMS

6 INTRODUCTION

The economic analysis of POP industry is done to assess the capacity of industry to pay for and maintain pollution control systems. In conducting the assessment, data on fixed capital costs, operating costs for man, material & machine, depreciation were taken from interviews with different plant personnel across the country and working capital estimate and changes in profit margins due to installation and maintenance of control systems were considered.

The fixed costs pertaining to machinery, land and variable cost pertaining to raw materials gypsum and wood is found to vary from location to location. Considering the different variations the economic assessment is done for Rajasthan cluster and all other clusters combined.

Each cost component details and assessment results are presented in following sections.

6.1 Fixed Costs:

Fixed costs for a POP industry includes crushers, grinders, motors, calciners, material conveyors, cyclone and bag filter product collection system etc along with the cost of land, civil and mechanical erection costs. Table 6.1 gives the different fixed capital cost elements for a unit of production capacity of 10-20 Tons POP/day.

Table 6.1: Fixed Capital Investment (Plant & Machinery)

No.	ITEM	Cost (lakh Rs.)
1.	Jaw Crusher/Attrition mill/	0.50
2.	Hammer Mill	0.50
3.	Bucket elevator	0.50
4.	Calciner (2 No.) with furnace	5.00
5.	Pulveriser	2.50
6.	DG set 50 KVA (Captive Power Generation)	2.00 (optional)
7.	Control Systems (if any)	0.50
8.	Motors	1.00
9.	Structural	1.00
10.	Miscellaneous electrical, starters	0.50
11.	Civil work, structure, Lab & office etc.	1.00- 3.00
	Total Capital Investment	12.00-17.00

* Land cost which may vary (Rs.100000-10,00,000 in Bikaner) largely depending on area to area, is not included

6.2 Variable Costs:

General operational costs include raw materials, fuel, electricity, labor etc. Typical cost details of these variables for 10 tons/day capacity POP production is given in table 6.2.

Table 6.2: Annual Operating Costs for a unit of 10TPD building grade POP production capacity

ITEM	Cost /annum (lakh Rs.)	Specific cost (Cost/ton)
Raw Material Cost (including transportation)	20.0	Rs. 330/ton
Electricity Cost (@ 0.75 lakhs per month)	9.0	Rs. 150/ton
Labour Cost (20 persons @ 2500 per month)	6.0	Rs. 100/ton
Fuel cost (300 kg /ton @ Rs.1.0/ kg)	15.0	Rs. 250/ton
Miscellaneous (10 %)**	5.0	Rs. 100/ton
Total		Rs. 930/ton

** Miscellaneous costs include charges like maintenance, marketing, etc.

6.3 Sales Price of different POP grades:

Sales price of POP is based on raw material especially gypsum cost, cost of transportation (Cost of transportation is reported to be equal to or more than the raw material cost), product end use and product quality. The variable price for same grade POP can be attributed to variations in quality and the standing of unit among different purchase markets. Typical reported sales prices in small scale units for different POP grades are given in table 6.3.

Table 6.3: Sale price for different POP grades from Bikaner Cluster:

Type of POP	Sale price
Ordinary PoP (Building grade)	Rs.1000/T
Super Fine PoP	Rs. 1100/T
Ceramic grade PoP	Rs. 2000-5000/T
Total annual Sale (annual turnover) for production of 3000 T/yr @ Rs1100/ton of POP on average	Rs. 33,00,000

6.4 Ability to pay for Control Systems:

To assess the industry's economic health and the feasibility to install pollution control systems different profit/loss scenarios were worked out based on the fixed, variable costs and sales price data collected from the units. Three scenarios were considered each for Rajasthan and all other combined clusters were assessed. The three scenarios considered were the cost of Pollution control system of Rs2 lakhs, 3lakhs and 5lakhs and their impact on profitability, annual burden as sales turnover, investment as percentage of total capital cost.

In working out these scenarios the following assumptions were made:

1. The production capacity of 10 tons/day of POP is taken to reflect the worst case scenario in financial terms to arrive at the units ability to invest financial resources.
2. All fixed costs were annualised and the annualized cost is worked out considering the life of machinery as 7 years and interest rate of 12% per annum. (This assumption was made as some units reported that machinery life is 10 years for certain equipment and 5 years for certain equipment)
3. Straight line depreciation was considered.
4. Taxation rate of 10% is assumed.
5. Management and Staff salary is assumed to be Rs 40000/ per month.
6. Cost of packing bags @ Rs1/bag is assumed.
7. 5% of operating costs is assumed for marketing and maintenance.

The different scenarios worked are projected in a tabular format in table 6.4 below.

Table 6.4: Economic Analysis for Industry's Capacity Assessment for Expenditure on PCS

S.No	COSTING PARAMETERS	Rajasthan						Rest Clusters						
		Scenario -1		Scenario -2		Scenario -3		Scenario -1		Scenario -2		Scenario -3		
		Rs.(in lakhs)	Rs/Ton POP	Rs.(in lakhs)	Rs/Ton POP	Rs.(in lakhs)	Rs/Ton POP	Rs.(in lakhs)	Rs/Ton POP	Rs.(in lakhs)	Rs/Ton POP	Rs.(in lakhs)	Rs/Ton POP	
WITHOUT CONTROL SYSTEM														
1	Investment	15.00		15.00		15.00		20.00		20.00		20.00		20.00
4	Total Plant Investment for Product, P [2+3]													
5	Annualised Cost	3.29	109.56	3.29	109.56	3.29	109.56	4.38	146.08	4.38	146.08	4.38	146.08	4.38
6	Raw material and Operating Costs:	Rs/yr (lakhs)		Rs/yr (lakhs)		Rs/yr (lakhs)		Rs/yr (lakhs)		Rs/yr (lakhs)		Rs/yr (lakhs)		Rs/yr (lakhs)
7	Raw Material, RM	9.9	330	9.9	330	9.9	330	45	1500	45	1500	45	1500	
15	Total Operating Cost (Ex RM) [Sum 9:15]	19.48	649.23	19.48	649.23	19.48	649.23	20.19	673.04	20.19	673.04	20.19	673.04	
17	Total Cost [5+7+15]	32.66	1089.00	32.66	1089.00	32.66	1089.00	69.57	2319.00	69.57	2319.00	69.57	2319.00	
18	Sales before tax OR Sales Revenue	34.5	1150	34.5	1150	34.5	1150	72	2400	72	2400	72	2400	
19	Profit Margin Before tax	1.84	61.00	1.84	61.00	1.84	61.00	2.43	81.00	2.43	81.00	2.43	81.00	
21	Profit Margin after tax	1.7	54.9	1.7	54.9	1.7	54.9	2.2	72.9	2.2	72.9	2.2	72.9	
22	Profit as % of sales	4.8		4.8		4.8		3.0		3.0		3.0		
WITH CONTROL SYSTEM														
23	Cost of control equipments (Lakh Rs)	2		3		5		2		3		5		
24	Cost of control equpt as % of Fixed Equipment	11.8		16.7		25		9.1		13		20		
25	Annualised Cost of Control Equipment	0.35		0.53		0.88		0.35		0.53		0.88		
26	Annual Burden due to Maintenance of Equpt.	0.1		0.15		0.25		0.1		0.15		0.25		
27	Depreciation	0.2		0.3		0.5		0.2		0.3		0.5		
28	Total Annual Burden due to pollution control	0.65		0.98		1.63		0.65		0.98		1.63		
29	Total Cost With Control Equpt {17 + 28}	33.31		33.64		34.29		70.22		70.55		71.20		
32	Profit Margin after tax	1.1	17.8	0.8		0.2		1.6		1.3		0.7		
33	Profit as % of sales	3.1		2.2		0.5		2.2		1.8		1.0		
POLLUTION CONTROL SYSTEM IMPACT														
34	Annual burden as % of profit (after tax)	61		127		886		41		75		228		
35	Annual burden as % of Sales Turnover	1.9		2.8		4.7		0.9		1.4		2.3		

6.5 Analysis of different scenarios

From the above tables it can be observed that:

- Investment of above Rs 3lakhs on pollution control systems will reduce profit margin below 0.8%. It is considered profit margin below 0.8% will reduce the sustaining capability of industry in the existing setup
- Annual pollution Control burden as % of profit for a investment of Rs3 lakh on pollution control system is 127% and as % of sales turnover is 2.8. It is considered the burden as % of sales turnover should not exceed 3% for sustenance of the industry

6.6 Conclusions:

Based on the economic analysis it is considered the units may be in a position to invest upto Rs 3.0 lakhs on pollution control systems.

CHAPTER – 7

STANDARDS DEVELOPED

7 INTRODUCTION:

In formulating the standards conclusions of the study pertaining to the following factors was considered.

- Profile of the industry and its location.
- Overall material and energy balance.
- Process and technology issues.
- Ambient air quality conditions.
- Economic feasibility to assess the capacity to pay for pollution control.
- Technical feasible control system that fits the economic criteria.
- Overall standards

7.1 Standards Approach:

7.1.1 Approach considering Profile of the industry and its location:

More than 75% of the industries are located in Rajasthan considering cheaper and abundant availability of raw material. The process technologies are locally standardized and are influencing the technologies in other regions of India as well. Though ISI process standards are existing for equipment, considering ease of use and lower maintenance cost and lower capital cost industries in Jammu and Jalpaiguri clusters are adopting the technologies localized in Rajasthan.

In view of the above it is considered appropriate to give greater weightage for basing standards on POP industries located in Rajasthan as any future technological shifts will occur from the clusters of Rajasthan. This is due to the fact raw material, fuel and land costs are cheaper in Rajasthan compared to any other cluster and enterprising units can experiment and try to move up the value chain.

7.1.2 Approach Based on Overall Material and Energy Balance:

As can be seen from chapter 7 POP production involves dehydrating gypsum to its hemi-hydrate form and whatever spillages and leakages occur can be recycled/reused. If any wastage occurs like silica removal from product grinder is difficult to monitor. Hence standards with respect to wastage per ton of POP produced is not being proposed.

With respect to energy balance, the generalized energy audit study indicates potential of fuel (wood) conservation to the tune of 15%, but which requires basic furnace modification and units can be encouraged to modify based on demonstration studies that can be sponsored by CPCB/MoEF. The emissions

in terms of CO₂, and dust emissions at startup, ash removal etc can be reduced by this.

Units in Jalpaiguri are using LDO but this more due to non-availability of wood and the space required to save wood during monsoon season. Bharat Petroleum on experimental basis funded a project to encourage LPG but the overall cost of LPG being very high (even with subsidy) in relation to wood made them to abandon the project. All units are preferably using wood as it is the cheapest. Considering wood is a bio-fuel which can be regenerated with a reforestation, units are accustomed to use wood furnace technology, furnace design is standardized, it is recommended a demonstration study be conducted to improve efficiency and reduce emissions.

7.1.3 Approach based on Process and Technology Issues :

In the entire production process, fugitive dust emissions emanate from raw material & product grinding, calcination in rotating drum and product classification system. The approach considers fugitive dust extraction from the following sources.

7.1.3.1 Raw Material Crusher :

It is proposed to extract the fugitive dust emissions from the raw material crusher and pass through a pollution control system.

7.1.3.2 Drum Calciner :

It is proposed to modify the existing arrangement for dust conveying to stack and to introduce a dust emission control system.

7.1.3.3 Product Grinder Classifier (Bagfilter) :

Product grinder classifier is already attached with an open, inside out cleaning type bag-filter leading to discharge of filtered air (containing whatever little particulate matter) back into shop-floor. In case of the current scenario due to any leaks not only emissions increases but it also deteriorates the shop-floor environment drastically. In view of the above it is proposed that the existing bag-filter may be enclosed and all the dust emissions may be emitted via a stack. Also, it is proposed to install an extraction system at the product feed point and to connect the duct to the air inlet of classifier before the fan.

Fugitive dust emissions from the product cooling are not proposed to be extracted owing to huge suction requirements to capture the dust emissions from the large cooling zone and also as the workers would still be exposed despite extraction system. Further fugitive dust emissions from the pan type calciner are not proposed to be extracted owing to physical locational constraints.

POP industries in large scale have extraction points on calciner, storage bins connected to control systems like ESP's. Also, the vent points on different vessels are provided with envelope filters to control the emissions.

7.1.3.4 Approach Based on Economic FEASIBILITY:

Based on economic analysis (refer Chapter 9) it is considered units can invest Rs3 lakhs fixed investment on pollution control systems which amounts to about 17% of total fixed cost.

7.2 STANDARDS PROPOSED:

Based on the above approach and study the following standards are being proposed

Based on the field studies and keeping in view the technical feasibility & economic evaluation the proposed pollution control systems for capturing and controlling the fugitive dust emissions for different locations along with proposed standards are as described below:

7.2.1 Raw Material Crusher :

It is proposed to extract the fugitive dust emissions from the raw material crusher using flanged opening hood. Keeping in view that the raw material crusher emissions contain more than 80 % particles in the size range of >10 microns (Refer shop floor dust concentration in raw material crusher sections of unit reports), these extracted emissions are proposed to be captured using cyclone ($d_c < 10$ microns) as the Dust Control System. Further based on the NPC's earlier studies, the average dust loading in the range of 3000-4000 mg/m^3 and considering the average efficiency of Cyclone as 75%, the proposed emission standard from the cyclone stack is 1000 mg/m^3 .

7.2.2 Drum Calciner :

It is proposed to modify the existing arrangement for dust conveyance from drum to stack. It is proposed that rotating moisture / dust outlet sleeve of the calciner drum be covered with slightly oversized fixed pipe leading to the stack. The proposed control system for the emission control is baffle chamber. The proposed baffle chamber needs to be created in the stack bottom by arranging horizontal baffle plates. The baffle chamber should also have a easy cleaning system as it would be required to be cleaned at least once a day. (5240 mg/Nm^3) Based on the NPC's studies, the average dust loading in the range of 5000 mg/m^3 and considering the average efficiency of baffle type settling chamber as 50%, the proposed emission standard from the baffle type settling chamber stack is 2500 mg/m^3 .

7.2.3 Product Grinder and Classifier (Bagfilter) :

Product grinder classifier is already attached with an open, inside out cleaning type bag-filter leading to discharge of filtered air (containing whatever little particulate matter) back into shop-floor. In case of the current scenario due to any leaks not only emissions increases but it also deteriorates the shop-floor environment drastically. In view of the above it is proposed that the existing bag-filter may be enclosed and all the dust emissions may be emitted via a stack.

Also, it is proposed that the product feed point to grinder should install an extraction system using flanged opening hood and the ducting to be connected to the air inlet of classifier before the fan.

A standard of 150 mg/Nm³ is proposed for the bag filter system.

7.2.4 Ambient Air Quality standards:

It is observed that all the units in Jammu, Jalpaiguri and Rajpalayam clusters are meeting the prescribed ambient air quality standards for industrial zone (500 µg/m³) and is in the range of 300-350 µg/m³. However none of the units in the Bikaner cluster is meeting the currently prescribed ambient air quality standard (in respect of suspended particulate matter) of 500 µg/m³ primarily due to high background concentration in the 500-600 micro gram/M³ which is due to high wind and dust conditions owing to desert conditions prevalent in Rajasthan. Further the studies indicate that the industry's contribution to the ambient dust concentration (i.e. actual ambient dust concentration – background dust concentration, measured at unit boundary) is generally in the range of 200 to 250 µg/m³. In view of the above it is proposed in Jammu, Jalpaiguri and Rajpalyam clusters the existing ambient air quality standards for industrial zones be continued, while for Bikaner and other clusters in Rajasthan, it is proposed to relax the standard in view of high back ground concentration due to dusty weather to 700 micro gram/M³. Further it is recommended that this standard be construed as the average of the measurements in upstream & downstream wind directions at the unit boundary (and not near the equipment, which has been the case till now in some clusters).

7.2.5 Water

Water is used in washing of selenitic gypsum in Rajasthan and marine gypsum in Rajpalayam. In washing selenitic gypsum the main impurity is clay and in marine gypsum it is salt.

Owing to water scarcity in Rajasthan the water used for selenitic gypsum washing is reused after allowing the impurities to settle in a settling tank. In recommending the continuation of this practice it is proposed to impose Zero Discharge standard on these units.

In Rajpalayam the marine gypsum is obtained from salt mines. This gypsum is either washed at the salt mine or in the unit premises. Considering the ground water contamination from the washing liquor contain TDS in the range of 10000-12000 mg/l, it is proposed to ban the washing activity in the unit

premises and recommended to have washing facilities at salt mining location itself to avoid the problem of ground water contamination.

7.2.6 Noise :

The noise levels measured in all the units are in the range of 55 to 65 db(A) and are found to be within the existing prescribed noise levels of 75 db(A) applicable for industrial zone. Considering the economic non-viability of investing further in noise reduction it is recommended that the existing standard of 75 db(A) be continued.

7.2.7 Solid waste

Solid waste is generated from settling of gypsum wash water, deposits on calciner drum, deposits in calciner stack bottom and from burning of fire wood.

Literature survey indicates gypsum ores does not contain any hazardous materials, and hence the sludge generated is not expected to contain any hazardous substance either. However as a measure of caution the mixed solid waste sample was analysed to assess presence of heavy metals in the hazardous range. The analytical results indicate that the solid waste is not hazardous as per Hazardous Waste (Management & Handling) Rules 2003.

The calciner stack bottom deposits are being reported to be reused by units studied. The solid waste generated from marine gypsum washing is reported to be sold to cement manufacturers. The solid waste generated from selenitic gypsum is being disposed in low lying areas.

The fire ash generated from burning wood is disposed in low lying areas.

In view of the solid waste not being hazardous, it is recommended that the solid waste can be used for designated land filling areas or may be disposed off in municipal land fills.

7.3 Recommended Standards : Large Scale POP units (>100 TPD)

All large scale units have sourced their technologies from developed countries. Considering the economies of scale, and the sourcing of technology, know how and best practices totally from the partners they are in a position economically and technically to meet the standards of 150 mg/Nm³ from the stack, 10 mg/Nm³ in shop floor and <500µg/m³ in ambient air. Also, dust containment measures like spraying water on roads to reduce emissions from vehicular movement is recommended.

In respect of standards for noise, solid waste and water, it is recommended to follow the same standards as applicable (proposed in section 6.3 above) to small scale POP units.

ANNEXURE – 1

2.1 POP units in Rajasthan

1	Vinayak Minerals and Plasters B- 2, Agroha Heritage, Office No- B- 30, Vidyadhar Nagar, Jaipur- 302023 India Ph: - 0091- 141- 2232415, 2709665 Fax: - 0091- 141- 2329713 Cell: - 0091- 98281- 14665 Email: vinayakplaster@ hotmail. Com
2	KUMAR INDUSTRIES F-92,93, Bichhwal Industrial area,, BIKANER, Rajasthan Ph; 91-0151-2250943
3	JAYESH INDUSTRIES, G-1-40 Industrial Area, Near PNB, Barmer, Rajasthan 91-2982-223221
4	Mr. Sanjay Chandna Ramnath Industries 32, Industrial Area, Road No. 5, Rani Bazar, Bikaner – 334001 Rajasthan Fax : 91- 151-548639, 204230(F) Tel : 91-151-546414- 203646(R) (Mobile: 98292-18112)
5	Mr. Arun Jain Padmabati Palster Industries G-1-114 Bichhwal Industrial Area Bikaner - 334006 Rajasthan Tel : 91-151-525518(O) 91-151- 523727, 251181(F) 91-151-202527, 520227(R)
6	Mr. Arun Jain Lucky Paint and Chemical Industries B-12 Industrial Area, Bikaner – 334001, Rajasthan
7	Mr. Ashok Banthia Jain Plast and Mineral Industries E-185 Bichhwal Industrial Area Bikaner - 334006 Rajasthan Tel : 91-151- 251064, 250641(F) Fax: 91-151-529237 H.O :91-151- 544427, 525027
8	Mr. Purushottam Sharma Shree Plasters F-336, Industrial Growth Center, Khara, Bikaner Rajasthan (Mob: 9829019245) Tel : 91-151-523036(R) Tel : 91-1522-60125(F) Jaipur Off : 751245
9	Mr. Sunil Sharma Laxmi Industries E-59 Bichhwal Industrial Area Bikaner – 334006 Rajasthan (Mob: 98292-17749) Tel : 91-151- 250749, 259925(O) Tel : 91-151- 205323, 542216(R) Fax : 91-151-522041 E-mail : laxmi151@yahoo.co.in

10	Mr. Panmal Jain Pawan Industries F-47 Bichhwal Industrial Area Bikaner – 334006 Rajasthan Tel : 91-151-270908 E-mail : pawan270@yahoo.co.in
11	Mr. Ashok Banthia Oswal Plaster Industries F-193 Bichhwal Industrial Area Bikaner – 334006 Rajasthan Tel : 91-151- 251064, 250641(F) Tel : 91-151- 200027, 544427(R) Fax: 91-151-529237E- mail : plaster@sancharnet.in
12	Mr. Kishor Pareek Sudarshan Industries F-43(A), 2nd Phase Bichhwal Industrial Area Bikaner – 334006 Rajasthan Tel : 91-151- 2250711(F) Tel : 91-151- 2529594, 2203100(R) E-mail : sudarshan11@yahoo.com
13	Mr. Pawan Kumar Gakhar, Bikaner Enterprises F-96, Bikaner Industrial Area, Bikaner- 334 006 Rajasthan (Mob: 98292 67517) Tel : 91-151-2250578, 2259905(F) Tel : 91-151-2250765
14	Neelkanth Minechem E-63, RIICO Ind. Area, Boranada 342001 Jodhpur Phone: 91-291-331133 FAX: 91-2931-81311 Email: neelkanth_minechem@rediffmail.com
15	SHRI GURU JAMBHESHWAR PLASTER INDUSTRIES Bhagirath Tatarwal Sadar Bazar, Bajju BIKANER
16	Mr. Pawan Kumar ALFA INDUSTRIES F-169, Fase-I, Ind. Area, Bichhwal, Bikaner
17	ARHIND ENTERPRISES F49, Phase-I, Ind. Area Bichwal, Bikaner
18	BIKANER PLASTER MINRELS F-18, Phase-II, Ind. Area, Bichhwal, Bikaner
19	Mr. Nasib Chand Agarwal JAIN OWALA MUKHI F-165, Phase-I, Ind. Area, Bichhwal, Bikaner Phone(O): 2250379

20	Mr.M L Rathi KUMAR INDUSTRIES C/o M G Rathi, F /92-93, Bichhwal Ind Area Bikaner - 334 006, Rajasthan (India) Phone(O): 250943 520484 Phone(R): 200147 203857
21	LAXMI INDUSTRIES E-59, Bichhwal Industrial Area, Bikaner Phone(O): 2250749
22	Mr. Puran Chand MARUTI MINRALS F-168, Phase-I, Ind. Area, Bichhwal, Bikaner Phone(O): 2250380
23	MODERN PLASTER WORKS Keshar Das 17-18, Ind. Area Rani Bazar, Bikaner
24	PADMAWATI PLASTER INDUSTRIES 1st Floor, Jain Market, Bikaner Phone(O): 2521181
25	Mr. Pawan Cochar PAWAN INDUSTRIES F-48, phase-I, Bich. Ind. Area, Bikaner
26	RAJ PLASTERS PVT. LTD. 17-18 Floor, Industrial Area,Rani Bazar, Bikaner Phone(O): 2523012
30	RISHAB ENTERPRISES Banthia Chowk, Bikaner Phone(O): 2525518
31	SATYA PLASTER INDUSTRIES Mr. Himanshu Sharma C/o Dr. Surendra Mohan Sharma, E/60 B, Bichhwal Ind Area, Bikaner Phone(O): 2250644 Phone(R): 2526045 Fax(O):91151, 522041
32	Yogender SHANTA SALES CO. F-166, Phase-I, Ind. Area, Bichhwal, Bikaner
33	SUPER MAX IND. F-265, Phase-I, Ind. Area, Bichhwal, Bikaner Phone(O): 2250288
34	VIKRAM INDUSTRIES Surender Kumar Manot 35, Ind. Area Rani Bazar, Bikaner

35	SWASTIK LIME & CHEMICALS Srigopal Singhania C/o Hardwari Nand Singhania, 31, Industrial Area, Raod No.5, Bikaner, Rajasthan Phone(O): 2520421 Phone(R): 2521851 Mobile:94141 38383
36	Vijay Joshi JOSHI DYERS & MINERALS C/o Tara Chand Joshi, F/203 Bichhwal Ind. Area, Bikaner Phone(O): 2250325 Phone(R): 2202005 Pager No.:451009
27	KRISHAN GOPAL Budwar Street, Near Ambedkar Circle, Bikaner Phone(O): 2523371
28	Mr Vishnudutt SHREE PLASTER 6-C-106 , Industrial Area, Nokha
29	Umang Stone International - Deoli, Rajasthan (India)
30	Agarwal Mineral Ind. F-162, BIA
31	Agarwal Plaster Ind.
32	Anant Plaster Ind.
33	Arvind Enterprises, F-49, Bikaner
34	Bikaner Refractories 99-100 IA Bikaner
35	Choraria Industries IA Bikaner
36	Hindustan Minerals Industries G-330, IGC Khara
37	Lokesh Minerals H-116, Bikaner
38	Oswal Minerals & Plaster Industries F-194, BIA, Bikaner.
39	P.D. Plasters F-12 , BIA
40	Parmeshwari Industries F-191, BIA, Bikaner
41	Pavitra Industries F-335, IGC Khara.

42	Pawan Industries F-47, KIA
43	R.R. Woollen Mills 21-C (I) Rani Bazar IA, Bikaner.
44	Rakesh Woollen Industries 126-IA
45	Rathi Iron Industries 135 IA, Bikaner
46	Rathi Woollens E-54, BIA
47	Saswani Woollens RBIA, Bikaner.
48	Shiv Industries F-189, BIA, Bikaner.
49	Shri Ganpati Woollen Mills 57/66 IA, Bikaner.
50	Shri Basukinath Udyog, G-109,BIA, Bikaner.
51	Sudersena Industries, F-43(A) Place -11, BIA, Bikaner
52	Vikram Processes RBIA, Bikaner
53	Agarwal Plaster Industries Sadulpur (Churu)
54	Beniwal Plaster Vill. Seruna Distt. Churu
55	Bhagawati Plaster Udhog Sohawa to Banif Road, Sohwa
56	Crown Plaster (India) RIA, Sardarshan (Churu)
57	Devi Kripa Plaster Industries Jhadsar- Taranagar Road, TN
58	Duggar Udhog RIA,Sardarsahar (Churu)
59	Ganpati Plaster Udhog RIA, Sardarsahar (Churu)
60	Goyal Plaster Udhog Sohawa Taranagar (Churu)
61	Hind Plaster Industries Sahwa, Taranagar

62	Hindustan Plaster Udhog V. O. P. Kirsal, Taranagar F-96,Bikanergar
63	Inder Plaster Udhog Taranagar (Churu)
64	JAI Shree Plaster Deerwas taranagar
65	Laxmi Plaster Udhog Taranagar, Churu
66	M. G. Plaster Udhog Sahawa
67	Mahalaxmi Plaster Udhog Kirsali,Kadwan (Taranagar)
68	National Plaster Industries Sardarsahar,Churu
69	prem Plaster RIA,Sardarsahar (Churu)
70	Salimar Plaster & Chemicals RIA, Sardarsahar (Churu)
71	Sardarsahar Plaster & Minerals RIA, Sardarsahar (Churu)
72	Shanker & Shanker Minerals RIA, Sardarsahar (Churu)
73	Shri Ganesh Plaster Udhog VPO-Sahawa,Taranagar
74	Shri Mahaveer plaster Udhog VPO-Sahawa,Taranagar
75	Shri Ram Industries VPO- Sahawa,Taranagar
76	Shri Ram Plasters Rajgarth Road, Taranagar
77	Siddarth Industries RIA, Sadarsahar (Churu)
78	Swami Industries V. P. Deeraws (Churu)
79	Tiger Plaster RIA, Sardarsahar
80	Anjali Plaster Udhog Vill-9MSR, T-Bahdara, HMGH
81	National GyPlasters D-23, RIA, Hanumangath Jn.

82	Rajasthan Plasters D-19/B, RIA, Hanumangath Jn.
83	Subham Plasters Rajpura, T. Bhadra, Hanumangath
84	Tushar Industries RIA, Nohar Hanumangath
85	Sihag plaster Vill-Bojhala, T-Bhadra HMGH
86	Ambika Plaster Udhyog Chak- Deidaspur, T
87	Anjali Plaster Udhyog Vill-9MSR, T-Bahdara, HMGH
88	Balaji Plaster Udhyog RIA, Nohar
89	Bhagawati Plaster Show Road ,Rajpura
90	Ganpati Plaster Udhyog Vill Maxdarpura
91	Gawri plaster Industries RIA, Nohar
92	Hindustan Gyp Board Industries Vill
93	J. D. Plaster (P) Ltd. RIA, Nohar
94	Jagdamba Plaster Industries Vill-Danasar T
95	Jai Shanker Plaster Udhyog
96	Jain Mineral & Chemical
97	Laxmi Plaster Udhyog Vill- Dhannasar, T
98	Mia Durga Plaster Udhyog Vill
99	National Gyplasters D-23, RIA
100	Rajasthan Plasters D-19/B, RIA
101	Reshmi Gypsum RIA, Hanumangath

102	Shiva plaster Industries RIA, Nohar
103	Shree R.D. Plaster Industries 29,30-F RIA, Nohar
104	Shri Durga Plaster Dungrana Road
105	Shri Laxmi Gypsum Vill-Bojhala, T.Bhadra
106	Sihag Plaster Udhyog Bojhala, T-Bhadra
107	Subham Plasters Rajpura, T. Bhadra
108	Tushar Industries RIA, Nohar

2.2 POP units in Haryana

1	Quality Minerals, 7A Industrial Estate, Hisar
2	J.B. Industry, Delhi Road, Hisar

2.3 POP units in Chattisgarh

1	Sudhir Plaster Works Plot No. 67, Sector-B, Sirgitti, I/A Bilaspur
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2.4 POP units in West Bengal

1	Shiv Shakti Cements Industries, P-27, Dabgram Industrial Estate, Satellite Township, Fulbari, Jalpaiguri
2	Jindal Foods Pvt Ltd. Telepara, Sakoaghora, Jalpaiguri
3	Agro Chem Industries, Jugivilta, P.O: Balaram, Jalpaiguri
4	Mitasa Chemicals (P) Ltd. Jatiakali P.O: Fulbarihat Jalpaiguri
5	Rajdhani Chemicals Pvt Ltd. Jhingabasti P.O: Matigara Darjeeling

2.6 POP units in Tamilnadu

1	Raj Plasters R.S.No. 500/2, Vadugapatti, Srivillipputhur Taluk
2	Safari Plaster, 83-25, Cholapuram, Rajapalyam Taluk, Virudhunagar (Dist)
3	Alfari Plasters (P) Ltd. 852, Malayadipatti, Rajapalayam
4	Ashok Industries. Malayadipatti, Rajapalayam
5	Sri Venkateshwara Products, North Venganalur Mudangiar Road, Rajapalayam
6	Sri Bharath Ramachand Products, 533/3, North Venganallur, Mudangiar Road, Rajapalayam
7	Vinayaga Plasters, Vannampatti, Srivilliputhur Road, Rajapalayam
8	Sri Balamurugan Chemicals, Idayankulam, Srivilliputhur Road, Rajapalayam
9	Sri Balavignesh Chemicals, Idayankulam, Srivilliputhur Road, Rajapalayam
10	Sri Balaji Plasters, S.Ramalingapuram, Rajapalayam
11	Asirvatham Industries, M-19, Thiruvalluvar Nagar, Rajapalayam
12	Sivakasi Electro Chemicals Limited, Amathur Village, Virudhunagar District
13	Ganesh Plaster Industry, Pethurediapatti, Sattur Taluk, Virudhunagar District
14	Sri Balamurugan Enterprises (Unit-1), SIPCOT Industrial Complex, Thoothkudi
15	Sona Chem, Kovilpatti Road, Nagampatti Village, Kovilpatti
17	Gemplaster Industries, 51-Mani Nagar, 3rd Mile, Pudukudi, Thoothukudi-8
18	Alum & Allied Chemicals Pvt.Ltd; A- 1, Sakthi Co-op Industrial Estate, Pollachi-642 003
19	Jayshree Industries, Gandhipuram, Gandhinagar Post, Udumalpet-642 154

20	Sri Balamurugan Enterprises (Unit-II), SIPCOT Industrial Complex, Thoothkudi
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POP units in Karnataka

1	Panade Industries (India), No.129, P.B.Road, Nipani, Belaguam District, Karnataka
2	Perfect Plaster of Paris, Plot No. 15 (B), Belgaum

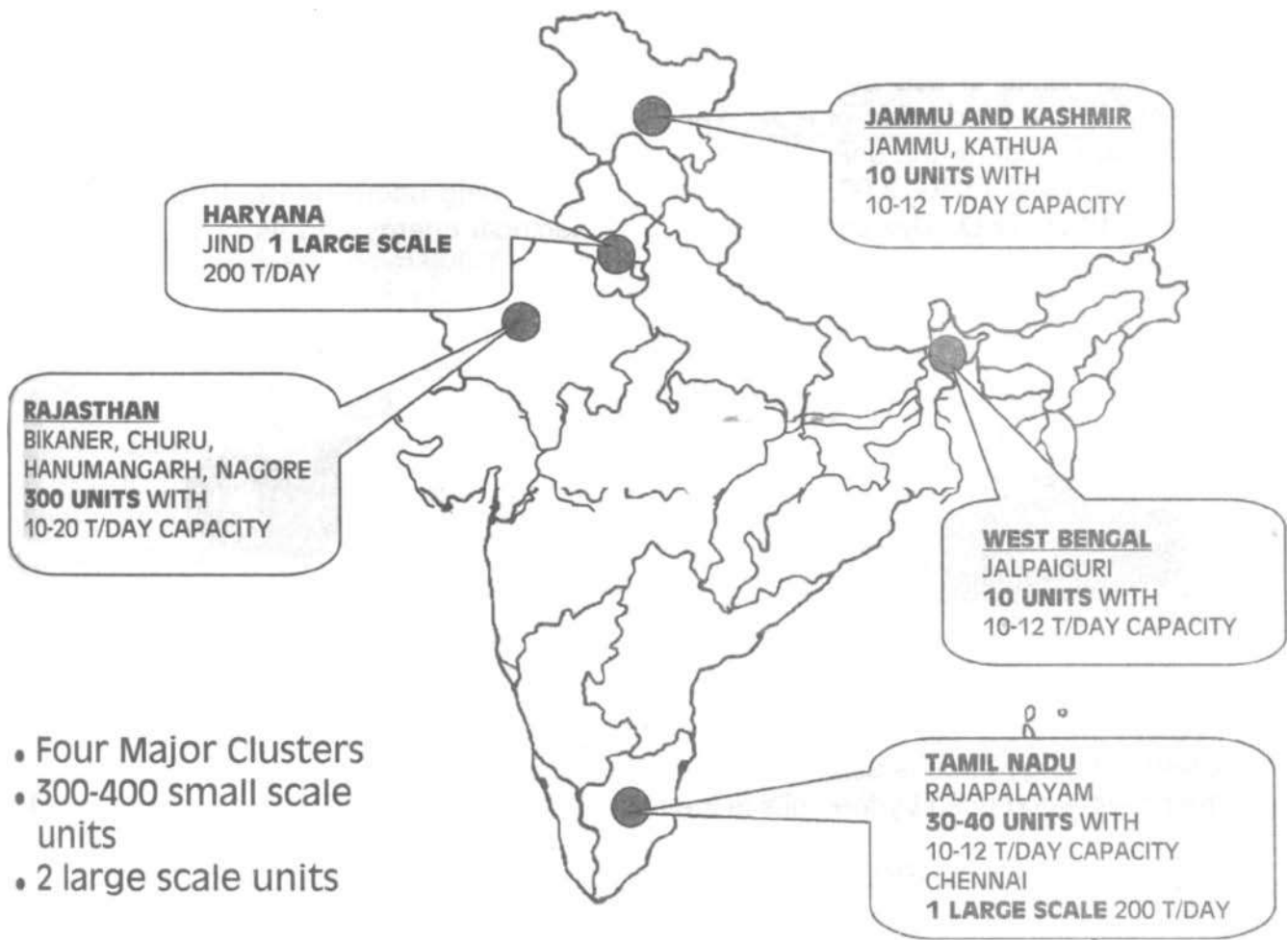
POP units in Gujarat

1	Mr. Mahendra bhai Patel, Shreeji Minerals Plot No. 83 to 86, G.I.D.C Estate P.Box No. 29 Anjar - 370 110 Kachchh, Gujarat India (Mobile - 98253 -29222) Tel : 91-2836- 242910 (O/F) Tel : 91-2836-242310
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2.7 PoP units in other states

1	Nine Star Novelties Private Limited - Kolkata, West Bengal (India)
2	Tamilnadu Agencies - Tuticorin, Tamil Nadu (India)
3	SRINIVASA PLASTERS 17-1- 389/18-b, Prashanth Nagar Colony, Saidabad, Hyderabad - 500 059, India +(91)-(40)-4530098 +(91)-(40)-4531720
4	SCIENTO PLASTER WORKS 2637/1, Bengali Mohalla, Kali Bri Road, Ambala Cantt - 133 001, India+(91)-(171)-640108
5	REGENT PLASTER BOARDS & PRODUCTS 54 Habibullah road, T.nagar Chennai- 600017 +91 44 282 28264
6	ALFA TRANSFORMERS LIMITED #3337, Mancheswar Industrial Estate, Ma, Bhubaneswar, Orissa 91-674-581036 Fax(s) : 91-674-580495
7	GUJARAT HEALTHCARE 434, G.I.D.C. Estate, Odhav, Ahmedabad, Gujurat 91-79-2891643 Fax(s) : 91-79- 2890632
8	Mr. Mukesh Bhai Patel Tirupati Products Nagnath Chowk Upleta - 360 490 Dist : Rajkot (Gujarat) Tel : 0285620058,21858 (O) Tel : 02856 21859 (R)Mob : 98252 21859
9	Mr. Jantilal R. Patel Shree Umiya Minerals VIDI Road, Opp. Bhadeshwar Temple, P.Box No. 11 Anjar - 370 110 Kachchh Gujarat, India Tel : 91- 2836-242422, 243887 (O/F)Fax : 91-2836- 241822Tel : 91-2836-243293
10	Mr. Gordhan bhai Patel Venus Chemicals Industries (98252-25540) Plot No. 151-B, Adipur – 370205 Kachchh Gujarat, India Tel:91-2836-260345, 261318(O)Tel : 91-2836-260340,261725
11	Supreme Exports, 701, Anna Nagar, Madurai, Tamil Nadu 91-0452-5537782
12	Mr. Rakesh Upadhyaya, Excel Exports (India) 172,Okhla DSIDC Sheds, Industrial Area, Phase I, New Delhi (India)-110020 Phone No.: 91-11- 6814079,6813892 Fax: 91-11-6810961 E- Mail: ru@vsnl.com

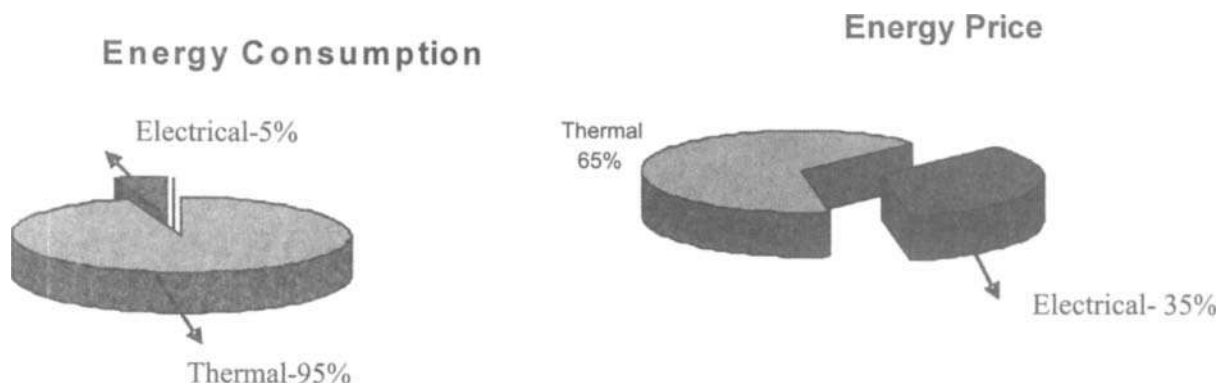
POP INDUSTRIAL SCENARIO-INDIA



ENERGY CONSUMPTION PROFILE OF POP INDUSTRIES

1. ENERGY SCENARIO

The POP units in use both thermal (wood, Coal and Diesel) & electrical energy for the production of POP. The monthly average energy consumption and energy cost for the units may range from 1,50,000 KWh to 3,00,000 KWh and Rs 50,000 to Rs 2,00,000 respectively depending upon the production rate of 10-20 TPD. The share of thermal & electrical energy and its price in the units in cluster is as depicted



Though electricity constitutes only 5 % of the total energy consumption, its share in energy price is almost 35%, mainly due to its high cost compared to the cheap wood used by the units in the furnaces for thermal energy.

2. ELECTRICAL ENERGY

Electrical energy is mainly used for driving motors of pulverising machines, drum rotor, conveyor etc. The pulverizing machine motor is having a share of around 85 % in the total electrical energy consumption of the plant. The units mainly depends on State Electricity Boards (SEB) for electrical requirement with few units having back up of small capacity DG sets (15 KVA). Generally two part tariff is imparted with demand charges (Eg : Rs 80/KVA) and energy charges (Eg : Rs 3.75/KWh). SEB's gives incentive for high power factor, which is 1% of energy charges for every 1% increase in power factor above 0.95 and impose penalty for power factor below 0.9. In order to keep the power factor above 0.9 the units may install capacitor near all the major motors.

2.1 Thermal Energy

Wood is the source of thermal energy for most of the units. Wood is available locally and at present the units are getting it at a price of Rs 1.25/kg to Rs 2/ kg. The wood is used in the calcining furnace. The design of calcining furnace is similar in almost all the units. The average external dimensions of the furnace is 12'x7' with 13.5" wall thickness. The furnace wall is made of firebrick and red brick. The operator feeds the wood from the front door and

the entire flush of furnace is made of CI grate. The air for combustion enters from the bottom of the furnace (The ash is removed from the same opening) and the chimney, which is placed at top of the furnace, creates the suction. The average wood consumption among the units varies from 175 kg/ton to 300 kg/ton of POP.

3. OBSERVATION AND SUGGESTION

i. Electrical

Awareness among majority of units regarding electrical energy conservation is nil. It was observed that some of the motors especially calciner drum motor are highly over rated.

The single largest motor in the units is for pulverising machine motor used for driving the fan as well as the crusher. The measurement revealed that loading in different unit varies from unit to unit. The average loading of the above motor during normal running condition varies from 40% to 75%. Energy efficient motor may not be economically attractive for those units, whose motor loading is above 50% and for those motors, which is 40% loaded individual analyses may be required as the payback depends on the actual number of working hours.

- The easier solution for these cases is installation of star delta auto controller (average saving of Rs 30000/- with an investment of Rs 25000/-). The pay back for such an installation in a typical plant is around 10 months.
- Though most of the units are using capacitors, its actual performance is not monitored properly and hence they are not getting benefit of power factor rebate. It is suggested to monitor it regularly (at least once in a month) and for all new installations capacitors of appropriate capacity may be installed to maintain the average monthly power factor of 0.98.
- Among the units in which detailed studies were conducted, it was observed that the units were pay penalty due to crossing over of the maximum demand. It is suggested not to switch on all the motors, which will prevent the rise in demand above contract maximum demand in most cases. Keeping in mind the limited margin available with the units, it is suggested to keep a minimum five minutes gap for switching on the motors.

ii. Thermal

The average furnace temperature is maintained at 425-450 Deg. It was observed that chimney does not have a damper and the furnace temperature during the start up was found to be around 45 Degree.

The major lacuna in the existing furnaces are given below:

The combustion is improper due to choking of grates, which causes channelisation of combustion air. Apart from this, as chimney is kept at the top, proper utilization of flue gas is not being taking place. Since the chimney is always in open position, proper draft control is also not possible and also the furnace become cold during the start up time causing time loss and increased fuel consumption.

Inadequacies in maintaining & controlling uniform furnace temperature resulting in uneven temperature.

- ⇒ It is suggested to provide a CI plate, which will act as a damper in the existing chimney, which can be closed when the furnace is shut down at the end of the day. The damper may be opened fully during the start up of the furnace. It was expected that this simple measure can result in a saving of 50 kg/wood per day which can result in annual saving of around Rs 20,000/ annum.
- ⇒ It is suggested to modify the furnace design, wherein the furnace draft can be controlled properly. The easiest way of modifying the existing furnace, is to change the location of chimney, the details are as given in Fig 7.2 (Chapter – 7). The modified location of chimney will provide better access to workers to control the draft with the help of the damper. Instead of drawing combustion air from bottom of the furnace, air pockets are provided at different location (parallel to furnace hearth). The air pockets are provided of two brick size, and the workers can control the air by damper adjustment as well as by closing the air pockets by bricks. The present ash door will be closed with the help of hook and will be opened only when it is essential to remove the ash that has been collected. It is expected that a minimum of 15% wood saving can be achieved by this modification and the investment required for modification of around Rs 20,000/-. The annual saving envisaged by this modification is Rs 1,25,000 lakh and the pay back of investment will be with in two months.
- ⇒ The furnace has three doors made of CI of 2'x2' size and the surface temperature is in the range of 225-250 Deg. It is suggested to provide ceramic fibers in the two side doors and mineral wool in the front door. The ceramic fiber is not suggested in the front door as it may be subjected to a lot of wear & tear due to frequent loading of fire woods. The investment Rs 5000/- incurred will be paid back with in a few months.

The estimated annual wood saving by the cluster by adopting the modified design for the calcining furnace is around 28000 Tons (@ 300 Units & average production of 10 T of POP /Unit).

With an entirely new furnace design it is expected to reduce the wood consumption even further.

ANNEXURE - 3

POP CLUSTER PROFILES

1. POP CLUSTER PROFILES

In India there are four POP clusters in Rajasthan, Jammu and Kashmir, West Bengal and Tamilnadu of which Rajasthan has the largest number of units totaling 400. The other clusters are very small in comparison with 10-20 units in each cluster. The key features of each of the clusters is briefly described in the following sections.

1.1 Bikaner cluster

1.1.1 Introduction:

The state of Rajasthan is rich in gypsum mines accounting to about 94% mineable gypsum in India. Most of the mines are located in Bikaner, Hanumangarh, Churu, Jaisalmer, Nagore districts of Rajasthan. Plaster of Paris (POP) is manufactured from gypsum. As such most of the POP units are located in and around the districts where gypsum is easily available. It is reported that about 300 units exist in the region and about 70 units has obtained consent to establish. The list of POP manufacturing units in Rajasthan region from is enclosed at **Annexure-I**. This profile outlines status of the sector in terms of scales of operation, raw material availability, costs of operation, types of POP products, indigenous technology available, difficulties in upgrading technology, possibility of upgrading or introducing new technology, present environmental status with respect to applicable standards, their implementation and means by which implementation and monitoring mechanisms can be strengthened and opportunities for cleaner production in Plaster of Paris manufacturing units in Bikaner.

1.1.2 Scales of operation:

Typically each unit employs one or two calciners and depending on this size of disintegrator (Gypsum crusher), pulveriser (POP –Calcined gypsum-grinder) of locally standardized capacity is installed. The product from pulveriser is captured through a cyclone and the emissions from cyclone are passed through a open bag filter. Bucket elevators are mostly used for conveying material in the industries

In this sector two types of disintegrators, namely, hammer mill or attrition mill is used to reduce the gypsum ore size to 20-30 mesh. Capacity of each calciner is 1 ton/batch with batch time varying from 1.5 hour to 3 hours and daily capacity of 10-15T/ day. The calciner drum is attached to motor of 3 HP capacity through a gear box which controls the drum speed at 5 RPM. All

calciners are wood fired with specific consumption of 100-150 Kg/day of wood.

Each unit employs about 6 persons per shift per calciner.

Two types of Pulverisor, namely Raymond mill (Hammer Mill) and attrition mills are used to grind the product to 200-250 mesh.

1.1.3 Types of Gypsum used:

Generally two types of gypsum is used in Bikaner region. The major type of gypsum is considered to be amorphous in nature and contain impurities like clay and is used for building grade and low quality ceramic moulds. The second type of gypsum is crystalline in nature called as selenitic gypsum, which contains selenite. This is transparent, imparts whiteness to the POP, and gives longer cycle time to the mould. Only three or four units use this selenitic gypsum for producing ceramic and surgical grade POP.

Clay Gypsum purity = 55-75%
Selenite Gypsum Purity = 95+%

1.1.4 Beneficiation of Gypsum:

Selenitic gypsum is washed in cyclic rotating drum with water spraying from center of drum along the length side. The clayey gypsum is processed directly after crushing in a disintegrator.

1.1.5 Machinery suppliers and their specifications for POP:

Equipment	Size	Motor (HP)	Capacity	Cost (Rs)	Supplier
Disintegrator (Hammer Mill)	24'	10	1 T/batch	20000	1,2,3
	30'	15	2 T/batch	35000	
	36'	25	3 T/batch	60000	
Disintegrator (Attrition Mill)					
Calcinator (Ball Mill Type) Gear Box Motor drive	5 RPM	3	1 T/batch	110000	1,2,3
				16000	
				5000	
(Vertical Mill) – German Type Indian Type					
Bucket Elevator Motor	27" X 9' X	3		30000	1,2,3
	24'			5000	

1. Tapadia Industries
2. Star Engineering Works
3. Laxmi Engineering Works

1.1.6 Financial/ Investment details:

Calciners (2 Nos) Ball mill type	= Rs 2,50,000/-
Grinder + Elevator	= Rs50,000/-
Pulveriser	= Rs 2,50,000/-
Land (2000 Sq.m)	= Rs 6,00,000 – 8,00,000/-
Working Capital	= Rs 8,00,000/- = 2 Months Production
Annual Turnover	= 20-50 lakhs
Wood	= Rs 100/- quintal of wood
Electricity (super fine building material)	= Rs100-120/- ton of POP (super fine building material)
Electricity (toy material)	= Rs 60-80/- ton of POP (commercial/ POP toy material)
Electricity (building material)	= Rs100-150/ ton of POP (building material)
Electricity (Ceramic grade)	= Rs 400/- ton of POP (Ceramic grade)
Labor cost	= Rs 125/- Ton of POP
Clay gypsum	= Rs 200/-T
Freight charge for gypsum	= Rs 150/- T to Bikaner
Final product cost (Approx.)	= Rs 800/-T
Sale price (Super fine)	= Rs 1100/-T
Sale Price (Ceramic)	= Rs 2000-5000 T/- month

1.1.7 Types of POP produced in the cluster:

The variation in POP is based on end use. POP is used mainly as building plaster, for ceramic moulds, and in small varying amounts as surgical plaster, chalk pieces etc. The variation is brought about by grinding to varying mesh sizes and calcining time and temperature variation.

1.1.8 Status of Pollution

Air pollution generated during POP manufacturing is major cause of concern for this sector. The dryness of weather, winds, barren land, clustered location of units, all these factors further aggravates the air pollution problem. Even in the adjoining areas, the air pollution is found to be quite high (as compare to standards). None of the manufacturing units have taken any abatement measures primarily because of small setup of the units and high cots of available pollution control technologies.

Wastewater is generated during gypsum (selenite) beneficiation is very small in quantity and doesn't have any parameter of concern, barring TSS, which could be easily removed before the wastewater is discharged to drain. The solid sludge generated during gypsum beneficiation and calcination is not categorized under hazardous waste and could be disposed on land.

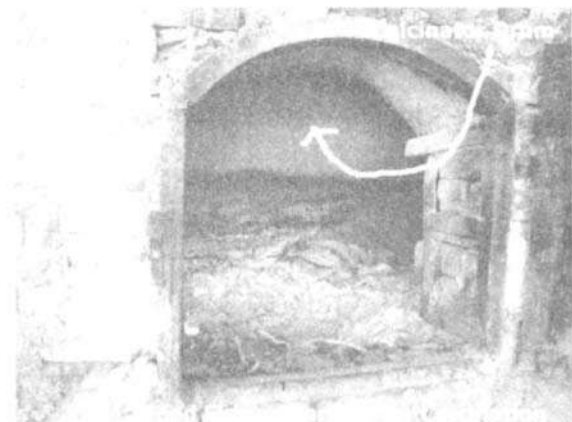
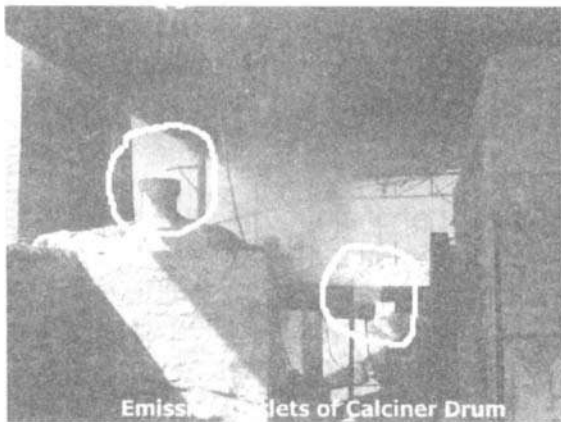
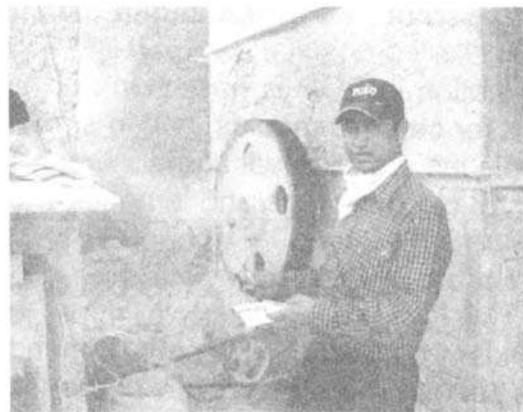
1.1.9 Reasons for growth of these POP clusters:

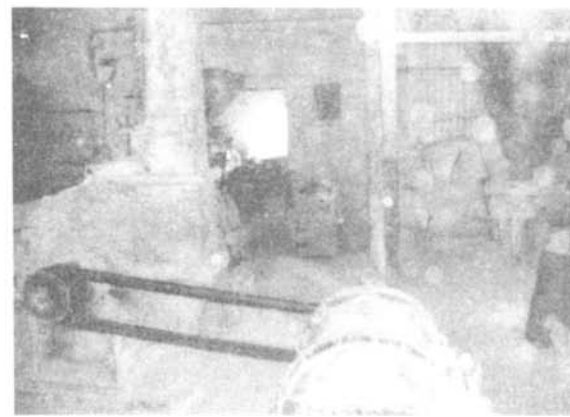
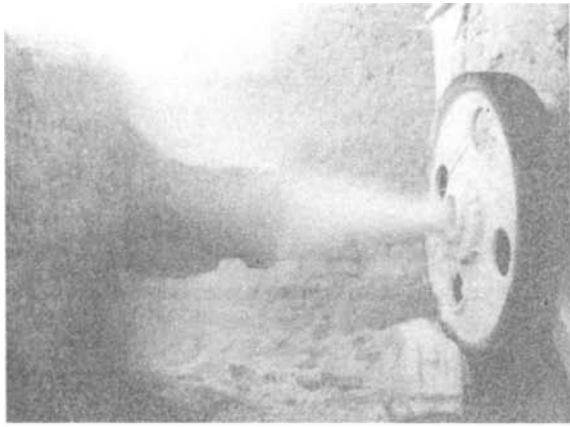
- ✍ Easy and sufficient gypsum availability.

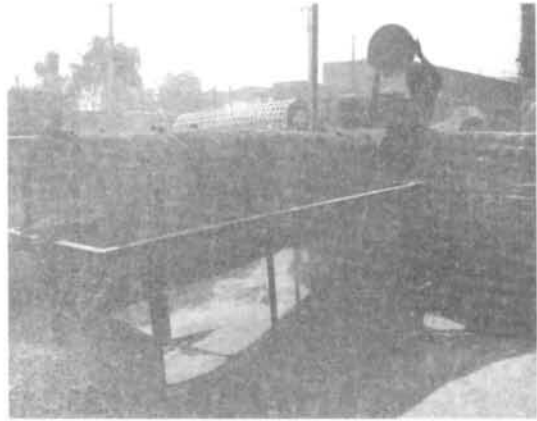
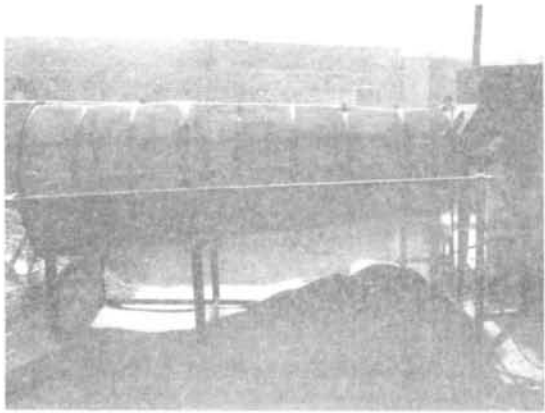
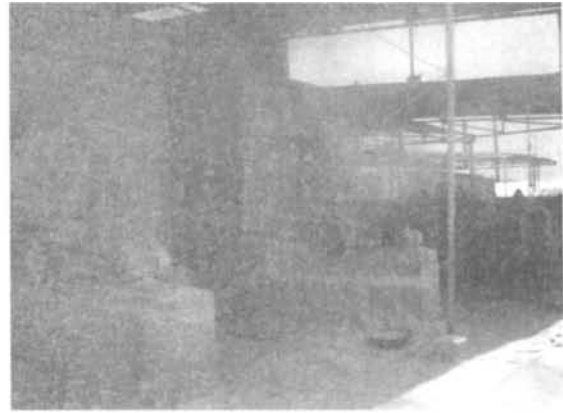
- ✍ Encouragement of state government in terms of subsidy (for small scale industries to the tune of Rs 3 lakhs) for setting up of industries.
- ✍ Indigenous and local technology that is easy to adopt.
- ✍ Quality of gypsum suitable to market needs.
- ✍ Major consuming markets in the vicinity (Delhi, Jaipur markets for building grade, Gujarat for ceramics etc).

1.1.10 Problems faced:

- ✍ Gypsum rationing through Rajasthan State Mines and Minerals Corporation Ltd (RSMM). The monopoly nature of RSMM makes them less concerned about quality of gypsum being supplied to small scale manufacturers.
- ✍ Old and (obsolete) technology.
- ✍ Low end scale of operation.
- ✍ Little to no value addition in products.
- ✍ Failure of technology development institutions to provide customized support for automation or product development or technology upgradation.







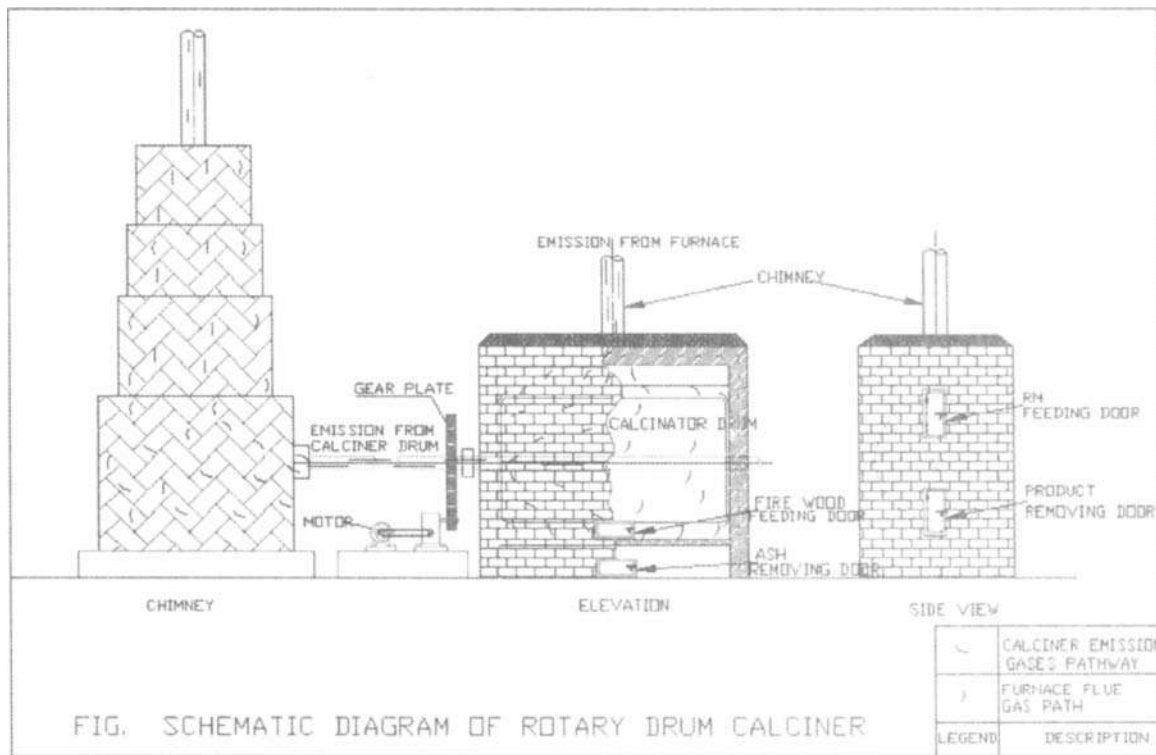
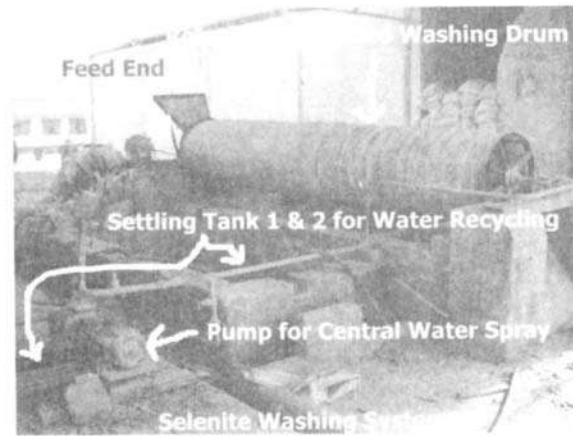
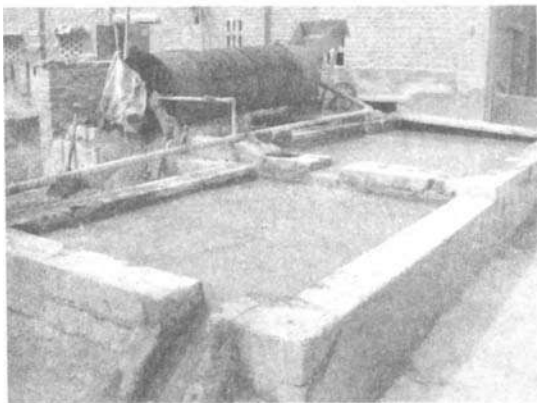


FIG. SCHEMATIC DIAGRAM OF ROTARY DRUM CALCINER



1.2 Jammu Cluster

1.1.1 Introduction:

The Jammu province is another area where gypsum (rock type) is available, though the quantity is very meager as compare to that in Rajasthan area. The gypsum in Jammu reportedly accounts to 3-4 % of total quantity available in India. The rock gypsum mines located around Jammu area are source of raw material supply to about 10-12 small to medium scale POP manufacturing units, scattered in different industrial areas in and around Jammu as Bari Brahmna, Kathua. The list of POP manufacturing units in Jammu region is enclosed at **Annexure-I**. In contrast to Rajasthan, units in Jammu may not form a cluster, however the region is widely known for its POP manufacturing.

1.1.2 Scales of operation:

In most the units, raw material (gypsum) crushing is combination of single toggle jaw crusher followed by hammer mill. Typically each unit employs two to four pan type calciners, depending on size of Gypsum crusher and pulveriser (POP crusher). The product from pulveriser is captured through a cyclone and the emissions from cyclone are passed through open bag filter. Bucket elevators are mostly used for conveying material in the industries

The gypsum grinding has in general capacity of 1 ton/hr, is used to reduce the gypsum size to 20-30 mesh. The crushed gypsum is fed to two-stage pan type calciner where it is preheated (to 80-90°C) in first stage and calcined to POP at 180°C in second stage with capacity of about 1 ton/batch with batch time varying from 2 hour to 3 hours. During calcination, the material is slowly agitated through agitator moving at 12-13 rpm attached with 5 hp mptors. The calciners are wood fired with specific consumption of 100-150 Kg/day of wood. The product (POP) is grinded in pulveriser, generally Hammer Mill, to 200-250 mesh and packed in bags. The total capacity of typical unit is 10-15 T/day and monthly capacity in the tune of 150-300 Ton.

Some of the units are reportedly in the process of putting up rotatory drum type calciners along with pan types as these have comparatively high production capacities.

1.1.3 Types of Gypsum used:

The type of gypsum available in Jammu area is categorized as rock gypsum, has comparatively harder structure and is obtained by blasting rocks in mountains. The gypsum mines, however, are located at a distance from manufacturing units and therefore transportation cost is crucial factor that decides profitability of the units. The rock gypsum is whitish in color and has high purity. The gypsum doesn't require any beneficiation and is used as such. This type of gypsum is considered for producing ceramic, pottery and surgical/dental grade POP, apart from building grade. The general composition of gypsum is as given below:

Composition in %	Rock Gypsum
------------------	-------------

CaO	26.65
H2O	-
CO2	-
SO3	38.693
SiO2	14.06
R2O3	1.57
MgO	0.253
Fe2O3	1.57
Loss in Ignition	18.68

1.1.4 Machinery suppliers and their specifications for POP:

Equipment	Size	Motor (HP)	Capacity	Cost (Rs)
Disintegrator (Jaw Crusher)	Single toggle	5		25,000
Disintegrator (Hammer Mill)	24'	10	1 T/batch	20000
	30'	15	2 T/batch	35000
	36'	25	3 T/batch	60000
Calcinator (Pan Type)	5 RPM	3	1 T/batch	110000
Gear Box				16000
Motor drive				5000
(Vertical Mill) – German Type				
Indian Type				
Bucket Elevator	27" X 9' X 24'	3		30000
Motor				5000

1.1.5 Types of POP produced in the cluster:

The variation in POP is based on end use. POP is used mainly as building plaster, for ceramic moulds, pottery and as surgical plaster. The variation is brought about by grinding to varying mesh sizes and calcining time and temperature variation.

1.1.6 Status of Pollution

Air pollution generated during POP manufacturing is major cause of concern. However, though high dust pollution is observed at shop floor levels, it is within the prescribed standards in ambient conditions mainly due to use of pan type calciners and scattered location of POP units. Also most of the units have taken precautions such as growing tree at unit periphery, to suppress the dust generation within unit premises. However, none of the manufacturing units have taken any air pollution abatement measures, primarily because of

small setup of the units and high costs of available pollution control technologies.

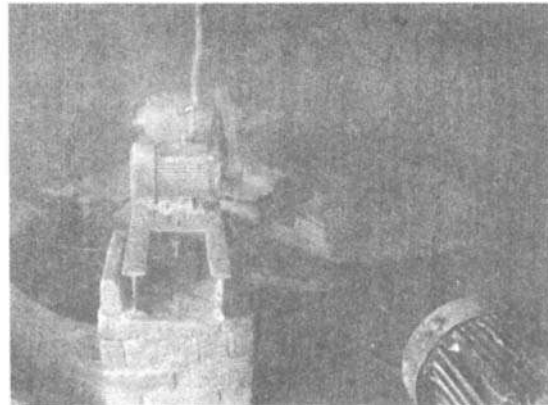
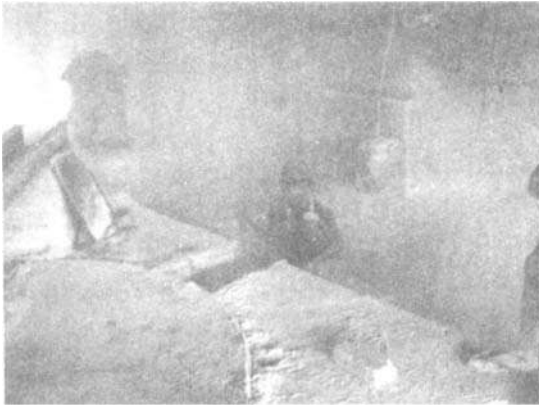
There is no source of wastewater as rock gypsum is not beneficiated. The solid waste generated during calcination is also very less and could be disposed on land.

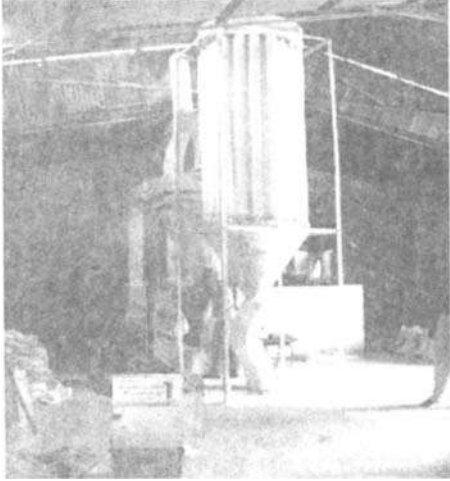
1.1.7 Reasons for growth of these POP clusters:

- ✗ Adequate gypsum availability.
- ✗ Encouragement of state government in terms of subsidy (for small scale industries to the tune of Rs 3 lakhs) for setting up of industries.
- ✗ Indigenous and local technology that is easy to adopt.
- ✗ Quality of gypsum suitable to market needs.
- ✗ Major consuming markets in the vicinity (Delhi, Punjab, Haryana, etc).

1.1.8 Problems faced:

- ✗ Old and (obsolete) technology.
- ✗ Low-end scale of operation.
- ✗ High cost of raw material transportation
- ✗ Little to no value addition in products.
- ✗ Failure of technology development institutions to provide customized support for automation or product development or technology upgradation.
- ✗ Pollution (precisely air pollution) generated from such industries is a concern





1.2 New Jalpaigudi Cluster

1.2.1 Introduction:

The New Jalpaigudi region cater the POP requirements of eastern & northeastern part of country as West Bengal, Orissa, Assam, Bihar etc. Raw material used here is rock gypsum, which is attained (imported) from neighboring country Bhutan. Similar to Jammu region, there are about 10-12 small to medium scale POP manufacturing units, scattered in different industrial areas in and around New Jalpaigudi. The list of POP manufacturing units in New Jalpaigudi is enclosed at **Annexure-I**.

1.2.2 Scales of operation:

The technology used here is similar to that in Jammu area. Raw material (gypsum) is crushed in jaw crusher followed by hammer mill and is calcined. Though most of the units have pan or vertical kiln type calciners, some units have installed rotary drum type calciners also. Typically each unit employs two to four calciners. The product from pulveriser is captured through a cyclone and the emissions from cyclone are passed through open bag filter. Bucket elevators are mostly used for conveying material in the industries

The gypsum grinding, having in general capacity of 1 ton/hr, is used to reduce the gypsum size to 20-30 mesh. The crushed gypsum is fed to calciner where it is calcined to POP at 180°C. The capacity of one batch is about 1 ton/batch with batch time varying from 2 hour to 3 hours. The unit in New Jalpaigudi region are using diesel, furnace oil and coal as fuel rather than wood, the most common fuel used in other areas. The product (POP) is grinded in pulveriser, generally Hammer Mill, to 200-250 mesh and packed in bags. The total capacity of typical unit is 10-20 T/day and monthly capacity in the tune of 300-600 Ton.

1.2.3 Types of Gypsum used:

The rock gypsum used in this area is import from Bhutan and therefore transportation cost of gypsum is crucial factor that decides profitability of the units. The rock gypsum is whitish in color and has high purity. The gypsum doesn't require any beneficiation and is used as such. This type of gypsum is considered for producing ceramic, pottery and surgical/dental grade POP, apart from building grade. The general composition of gypsum is as given below:

Composition in %	Rock Gypsum
CaO	26.65
H ₂ O	-
CO ₂	-
SO ₃	38.693
SiO ₂	14.06
R ₂ O ₃	1.57
MgO	0.253

Fe ₂ O ₃	1.57
Loss in Ignition	18.68

1.2.4 Machinery suppliers and their specifications for POP:

Equipment	Size	Motor (HP)	Capacity	Cost (Rs)
Disintegrator (Jaw Crusher)	Single toggle	5-7.5	1 T/hr	25000
Disintegrator (Hammer Mill)	24'	10	1 T/batch	20000
	30'	15	2 T/batch	35000
	36'	25	3 T/batch	60000
Calcinator (Pan Type) Gear Box Motor drive	5 RPM	3	1 T/batch	110000
(Vertical Mill) – German Type				16000
Indian Type				5000
Bucket Elevator Motor	27" X 9' X 24'	3		30000 5000
Pollution control system	Bag filter dust extraction system	-	-	3,00,000

1.2.5 Types of POP produced in the cluster:

The variation in POP is based on end use. POP is used mainly as building plaster, for ceramic moulds, pottery and as surgical plaster. The variation is brought about by grinding to varying mesh sizes and calcining time and temperature variation.

1.2.6 Status of Pollution

As mentioned above, air pollution generated during POP manufacturing is major cause of concern. However, in Jalpaigudi units are scattered and located in remote areas with lot green cover. Also, the climatic conditions in the area are quite damp and humid. That is the reason though there is high dust pollution at shop floor, ambient conditions are well within the prescribed standards. In addition, the units have installed dust extraction system supported by bag filter to control the dust emissions from different sources, though the system is not operating properly in most of the units.

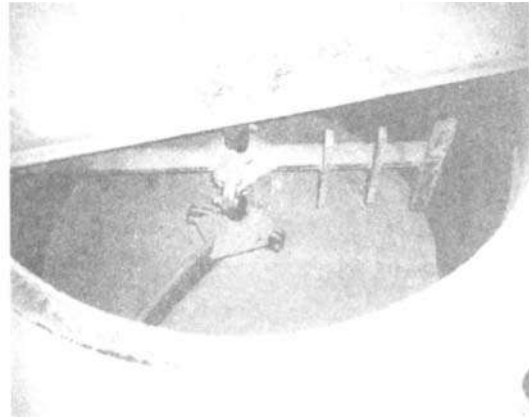
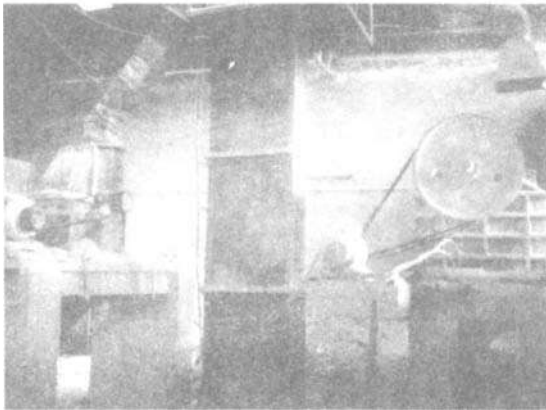
There is no source of wastewater as rock gypsum is not beneficiated. The solid waste generated during calcination is also very less and could be disposed on land.

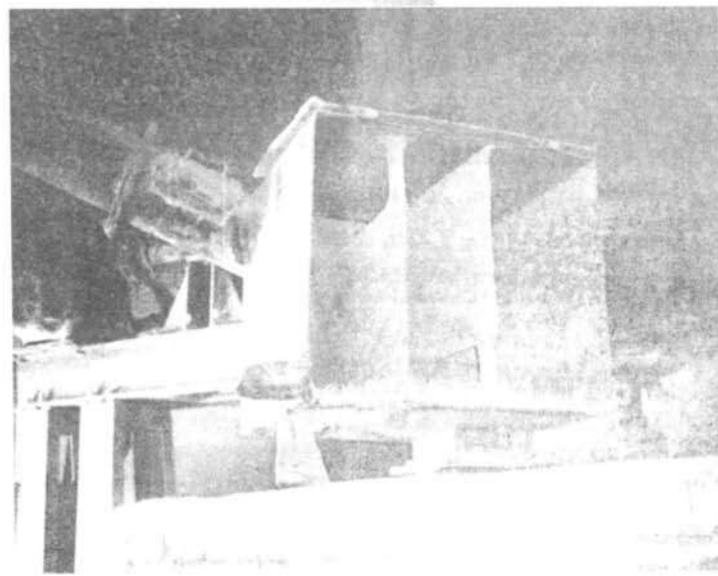
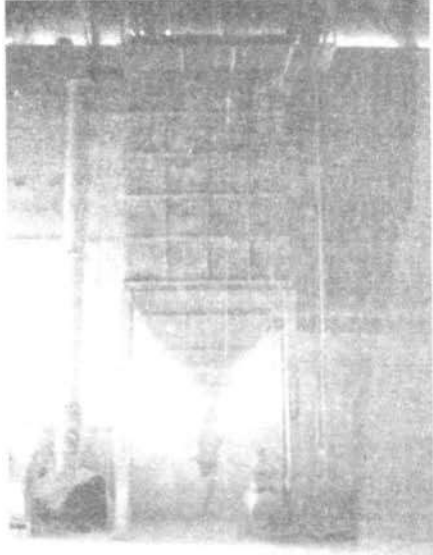
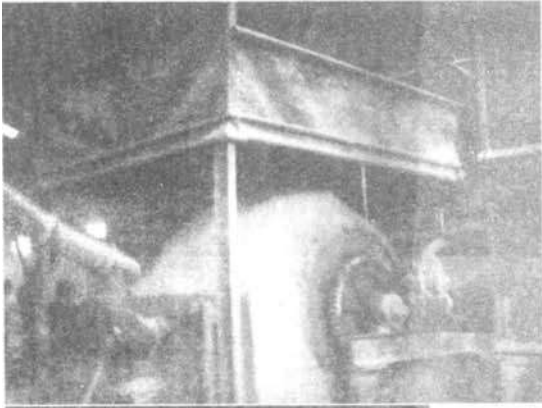
1.2.7 Reasons for growth of these POP clusters:

- ✍ Adequate gypsum availability.
- ✍ Indigenous and local technology that is easy to adopt.
- ✍ Quality of gypsum suitable to market needs.
- ✍ Major consuming markets in the vicinity (Easter part of India etc).

1.2.8 Problems faced:

- ✍ Old and (obsolete) technology.
- ✍ Low-end scale of operation.
- ✍ High raw material transportation cost
- ✍ Little to no value addition in products.
- ✍ Failure of technology development institutions to provide customized support for automation or product development or technology upgradation.
- ✍ Pollution (precisely air pollution) generated from such industries is a concern





1.4 Rajpalayam Cluster

The key features of Rajpalayam cluster are:

- The Rajpalayam there are about 8-10 small to medium scale POP manufacturing units with production capacity ranges between 300-450 TPM.
- Primarily building and ceramic grade POP is manufactured.
- The main raw material used is marine gypsum is used. The marine gypsum is acquired from the coastal areas, which have sedimented on the fields during salt manufacturing.
- The units have closed pan/vertical type calciners
- Firewood is the main fuel used in the furnaces.
- In these areas, only raw material is grinded to required sizes, the product grinding after calcination is not practiced.
- No pollution control systems are is installed in any of the units.
- Further growth of this cluster is restricted because raw material availability is dependent on salt mining which itself is restrained in expanding capacity.



No. IPI/GM(M).GC/92/234

Dated: 12 May, 1994

OFFICE ORDER

Annexure R-5

The Management of the Corporation is pleased to accord sanction for development of Growth Centre Khara (I phase), Bikaner at an estimated cost of Rs. 1118.92 lacs as per details given below:-

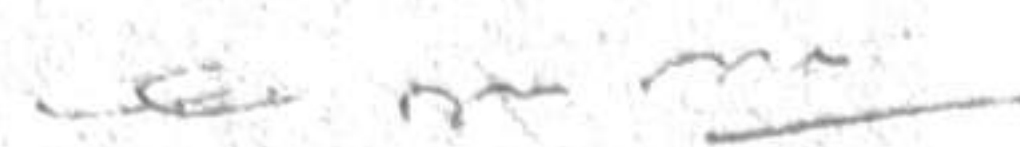
Total Area - 688.11 Acres Saleable Area - 364.82 Acres.

Land in possession 782 Right 2 Right
 A. Direct Charges. 1 Acre = 1.6 Right Amount (Rs. in lacs)

1.	<u>Land and Development</u>	
	i) Compensation of Land	45.06
	ii) Survey & Demarcation	5.16
	iii) Levelling of Land	57.42
2.	<u>Industrial Infrastructure</u>	
	i) Constn. of Road	90.67
	ii) Constn. of C.D. Works	33.56
	iii) Constn. of Drains	164.34
	iv) Arboriculture	32.34
3.	Water Supply Scheme	186.80
4.	<u>Power Supply Scheme</u>	
	(a) Laying of power Line	300.00
	(b) Street Lighting	32.00
5.	<u>Social Infrastructure</u>	
	(a) Constn. of Passenger Shed	8.29
	(b) Constn. of Post Office Building	
6.	<u>Other Amenities</u>	
	(a) Constn. of office building	20.39
	(b) Constn. of Police Outpost building	
		976.03
B.	<u>Indirect Charges</u>	
	i) Pre-operative Expenses	
	ii) Interest during constn. period	142.89
	iii) Contingencies	
		1118.92


contd ...2/-

This bears approval of the Chairman and Managing Director.


(K.N. Mathur)
General Manager(M)

Copy to :-

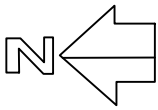
1. Sr. P.S. to Chairman & Managing Director - for kind information of CMD.
2. P.S. to Executive Director - for kind information of E.D.
3. P.A. to Financial Advisor - for kind information of F.A.
4. Advisor (Infra).
5. Manager(Finance-IPI)
6. P.A. to Adcl. Chief Engineer(Civil)/ S.E. (Power).
7. Regional Manager, RIICO Ltd., Bikaner - for information and necessary action.
8. RM (P&D)/RM (Tech)/DTP. // Dy. Manager (F-IPI)
9. M (F-IPI)/AM(Lnd)/AM (Law)/ M(P&D)/ Section Incharge (P&D)/ Accountant


General Manager(M)

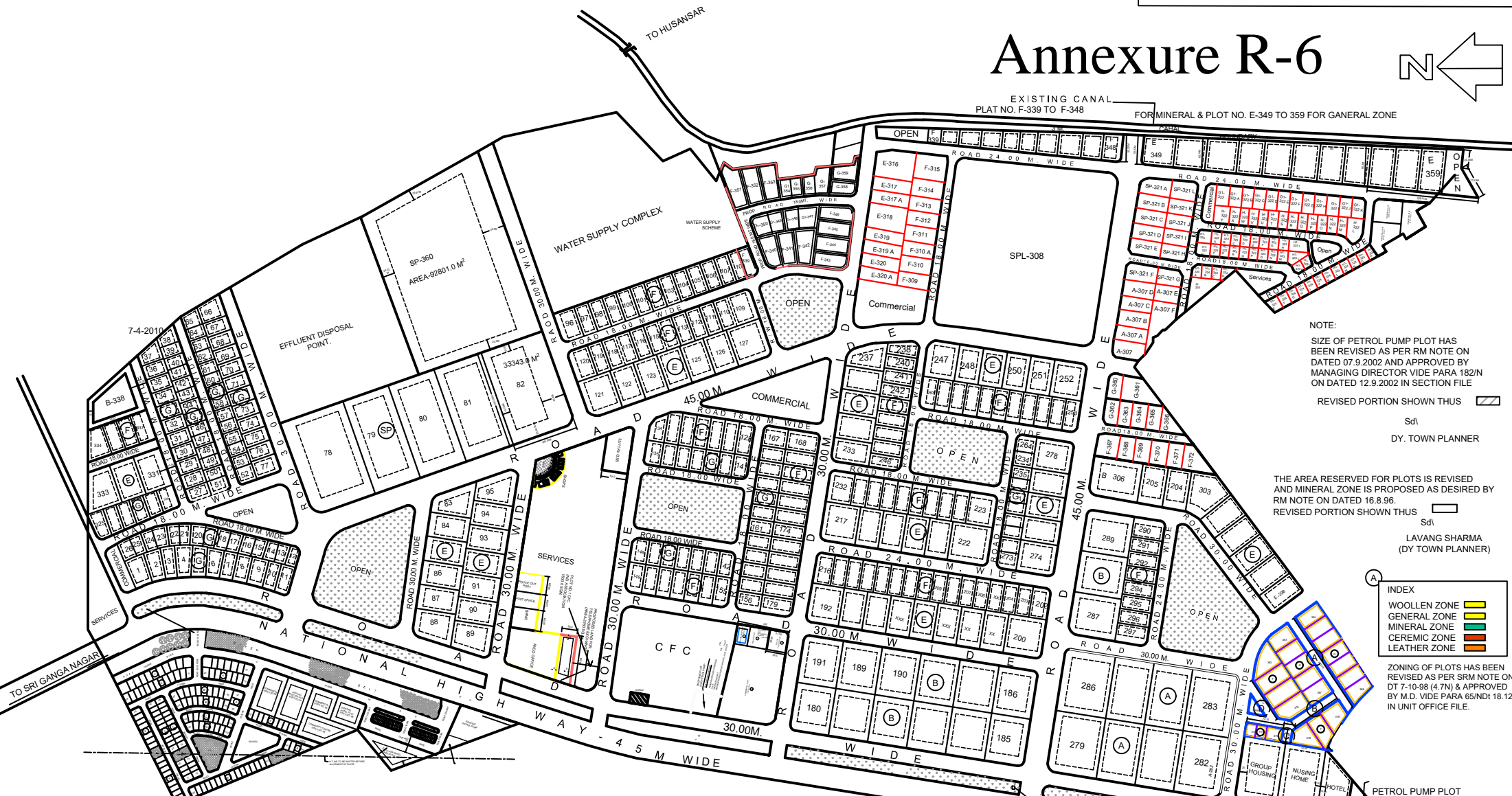
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Annexure R-6



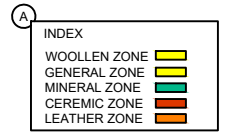
EXISTING CANAL
PLAT NO. F-339 TO F-348
FOR MINERAL & PLOT NO. E-349 TO 359 FOR GENERAL ZONE



NOTE:
SIZE OF PETROL PUMP PLOT HAS BEEN REVISED AS PER RM NOTE ON DATED 07.9.2002 AND APPROVED BY MANAGING DIRECTOR VIDE PARA 182/N ON DATED 12.9.2002 IN SECTION FILE

REVISED PORTION SHOWN THUS
Sd/
DY. TOWN PLANNER

THE AREA RESERVED FOR PLOTS IS REVISED AND MINERAL ZONE IS PROPOSED AS DESIRED BY RM NOTE ON DATED 16.8.96.
REVISED PORTION SHOWN THUS
Sd/
LAVANG SHARMA
(DY TOWN PLANNER)



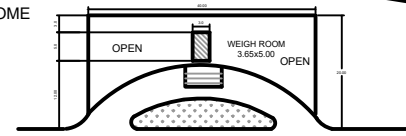
ZONING OF PLOTS HAS BEEN REVISED AS PER SRM NOTE ON DT 7-10-98 (4.7N) & APPROVED BY M.D. VIDE PARA 65/ND/18.12.98 IN UNIT OFFICE FILE.

NOTE:
AS PER PROPOSAL BY UNIT OFFICE THE RESERVE FOR SERVICES CHANGE FOR IND. PURPOSE PLOT NO. SP-82 THE PLOT APPROVED BY M.D. AS VIDE PARA NO 90/N ON DATE 19-3-08 IN SECTION FILE

REVISED PORTION SHOWN THUS
Sd/
DY. TOWN PLANNER

- BUILDING PARAMETER FOR GROUP HOUSING, HOTEL & NURSING HOME**
1. SET BACKS - AS PER SCHEME
 2. GROUND COVERAGE - 35%
 3. MAXIMUM HEIGHT - 15.00 Mt.
 4. F.A.R. - 1.50 GROUP HOUSING
- 1.00 HOTEL & NURSING HOME
 5. PARKING - 1PCU / 100 SQ.Mt. **HULT** UP AREA
OR 20 BEDS FOR NURSING HOME

REVISED PORTION SHOWN THUS



ROAD 30.00 WIDE
DETAIL PLAN

WATER HUT
FOR DETAIL REF. DRG. NO IPI/250/84 Dt 31-1-84

NOTE:
1. PROPOSED SITE FOR WEIGH BRIDGE MARKED AS PER SRM LETTER NO 398 Dt 22-4-2000 AND APPROVED BY CMD VIDE 143/N Dt 2-5-2000 IN SECTION FILE

Sd/
DY. TOWN PLANNER

LAY-OUT PLAN OF INDUSTRIAL GROWTH CENTRE KHARA, BIKANER.

SCALE - 1 CM = 80 MTS.

K h a r a V i l l a g e

P r i v a t e C o n v e r t e d L a n d



TYPE	SIZE IN MTS.	AREA IN SQ. MTS.	NOS.

ALLOTED	PLOTS	UNITS
	NOS. _____	NOS. _____
	NOS. _____	NOS. _____

- INDEX :-
- 1. GENERAL ZONE :-
 - 2. CERAMIC ZONE :-
 - 3. MINERAL ZONE :-

List of POP Industries in Khara

S. No.	Name of Unit	Address of Unit	Land Status	Present status	PCM status	Consent Validity	Remark
1	Siyag Plaster	G-27, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/03/2028	
2	Diloeya Industries	G-31, Industrial Area, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/01/2028	
3	Shree Bajrang Industries	E-332, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/10/2029	
4	G.R. Industries(Old Name-Pavitra Plaster Industries)	F- 335 IGC, Khara, Dist.	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/10/2032	Expansion app. Under consideration at this office
5	Maa Karni Plaster of Paris Industries	E-333-A, RIICO Industrial Growth Center (IGC), Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/10/2027	
6	Shri Sidhi Vinayak Industries	F-334, Industrial Growth Centre, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/03/2033	
7	Mitharwal Plaster	E-333, IGC, Khara	Established on RIICO Land	Non-Operational	No upgradation	31/03/2033	
8	Diloeya Plasto Chem	G-32, Industrial Growth Centre, Khara, Bikaner.	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/08/2033	
9	Shyam Plaster Industries	G-35, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/12/2027	
10	J. K. chemical industries	G-36, RIICO Industrial Growth Center (IGC), Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2031	
11	Shree Jai balaji plaster	G-37 & G-37(A) IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/06/2031	
12	Amrat Plaster (Old Name- Leela Paper Box)	G-1-47, IGC, Khara,	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2034	
13	Dev Industries	G1-45, IGC Khara, Bikaner	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/05/2033	
14	Panwar Palster Industries	G-1-42& 43, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/06/2027	
15	Parihar Enterprises	G-41 IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/05/2026	
16	Mahendra Enterprises (G.R. Industries)	G-1-40, IGC Khara	Established on RIICO Land	Non-Operational	No upgradation	30/04/2031	
17	Shri Ashapura Industries	G1-55, IGC Khara, Bikaner	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/07/2033	
18	Ganpati Industries	G-74 , IGC Khara, Bikaner	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/06/2028	
19	Sakarni Plaster	G-73, IGC, Khara	Established on RIICO Land	Non-Operational	Upgradation work of air pollution control measures completed	Application pending	Gas based plant
20	Jai Durga Plaster Industries	G-70-71, RIICO Industrial Growth Center (IGC), Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	
21	Mohit Enterprises	G-68-69, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	
22	Diloeya Plaster	F-342, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	29/02/2028	
23	Pooja Plasters	F-343, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	

24	Kanhiya Plaster Industries (old name- Maihar Plater Industries)	F-341, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/12/2032	
25	Panwar Industries (Old Name-Kedar Upadhyay)	F-347, IGC, Khara	Established on RIICO Land	Non-Operational	No upgradation	Closure Direction issued	Closure Direction Issued on 04.01.2025
26	Super Trading Company	F-345, IGC Khara	Established on RIICO Land	Non-Operational	Under Installation	Application pending	
27	Diloeya Chemicals & Minerals	F-340, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	29/02/2028	
28	Raj Plaster Industries (old.-Karni Industries)	F-313, IGC, Khara,	Established on RIICO Land	Non-Operational	Under Installation	31/03/2027	
29	Rajasthan Sales (Old Name-Standard Plaster Industries)	F-312, IGC, Khara	Established on RIICO Land	Non-Operational	Under Installation	Application pending	
30	MSR Minerals	G-1-356 & 357, IGC Khara	Established on RIICO Land	Non-Operational	Under Installation	Application pending	
31	Amit chemicals & minerals (R.S. Minerals)	G-1- 355, IGC khara	Established on RIICO Land	Non-Operational	Upgradation work of air pollution control measures completed	Closure Direction issued	Closure Direction Issued on 06.01.2025
32	M/s White rock Industries	F-108 IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/12/2026	
33	M/s White crystal	F-339 IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	29/02/2028	
34	M/s Daga Industries	G-1/349-50 IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	Application pending	
35	M/s Vishvakarma Plaster	F-342 IGC Khara	Established on RIICO Land	Non-Operational	Under Installation	31/03/2032	
36	M/s shree Ram trading comp.	F-343 IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	Application pending	
37	M/s Gangai Nath Plaster (Old Name- M/s Balaji Plaster Udhdyog)	F-346 IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2029	
38	M/s Shakambari Plaster (Old Name- M/s Jaishree plaster)	F-348 IGC Khara	Established on RIICO Land	Closed	Not applicable	30/04/2028	Recently closed
39	Godara Industries	F-309, IGC, Khara	Established on RIICO Land	Non-Operational	No upgradation	31/12/2032	
40	Shiv Plaster Industries	F-310, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	Application pending	
41	B.R. Plaster and Chemicals	E-349, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31-03-2028	
42	Super Trading Company (Old Name-Jai Maa Udyog)	E-351, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/08/2033	
43	Oswal Plaster Products	G-321 (L) IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	
44	Om Industries,	SP 321 A IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
45	Vipul Minerals (Old Name-Shri Kapil Muni Plaster of Paris)	E-359, RIICO IGC, Khara	Established on RIICO Land	Non-Operational	Under Installation	28/02/2027	
46	Aggarwal Udyog	E-358, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/10/2032	

47	Oswal Mineral & Plaster Udyog (Old Name Shree Salasar Plaster Industries)	E-356, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31-05-2027	
48	S.P. Delu Plasto Chem (Old-Global Industries)	E-355, IGC, Khara	Established on RIICO Land	Non-Operational	No upgradation	Closure Direction issued	Closure Direction Issued on 07.01.2025
49	Vikas Minerals (Old-Jai Maa Plaster Industries)	G-1-322 (E), IGC, Khara	Established on RIICO Land	Non-Operational	No upgradation	Application pending	
50	Jambeshwar Plaster	E-352, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/11/2028	
51	Agarwal Plaster Works	SP-321 D, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
52	Ferrous Crete (India) Pvt. Ltd.	Plot No A-307 C IGC,Khara,Bikaner	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/07/2031	
53	North India Plaster	A-307,IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	
54	Ferrous Crete (India) Pvt. Ltd.	G-307 F, IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/07/2031	
55	M/S Samrathal Plaster	SP-321, IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/08/2028	
56	M.R Enterprises	SP-321 (E), IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/09/2033	
57	Bidawat Enterprises	A-307(B), IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/11/2033	
58	Banthia plaster Industries	F-367, IGC Khara	Established on RIICO Land	Closed	Not applicable	31/12/2032	Recently closed
59	Namarta Minerals & Chemicals	G-360, IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2028	
60	Royale Plaster (Old Name-Sunrise Minerals)	G-321 (G) Near Bnharat Gas Plant IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/08/2033	
61	Rishab industries	G-321 (H) G-323 (J),IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	
62	Adarsh plaster udyog	G-321(j), IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/03/2028	
63	Dahiya Gyp-Tech Industries	H-322 & H-322 (N), Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2028	
64	Kothari Plaster	H-322 (O) & (P), IGC, Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
65	Samrathal Minerals	H-322 R, H-322 Q I.G.C, Khara, Bikaner	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31-12-2033	
66	Kothari Industries	H-322 (W) & H-322 (X) Khara	Established on RIICO Land	Non-Operational	Under Installation	31-05-2027	
67	Kamla Enterprises	Plot No. 165, K A Project near IGC, Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/12/2025	
68	Om Vishnu Chemicals & Minerals	Plot No. 159 (C) K.A. Project, Near IGC, Khara	On Converted land	Non-Operational	No upgradation	Closure Direction issued	Closure Direction Issued on 06.01.2025

69	M/s Balaji plaster pvt. Limited	Plot No.-155, H1-324(D), IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/06/2028	
70	M/s Rashmee Enterprises	H-324(H,I,J), IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2028	
71	M/s Bhaskar Industries	159-B,K.A, Project Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	
72	M/s Delu Plasto Chem	H1-323G, Khara Bikaner	Established on RIICO Land	Non-Operational	No upgradation	30/04/2028	
73	M/s Swastic chemicals & plaster	Khasra No.-651,K.A Project-II, Khara Bikaner	On Converted land	Non-Operational	Under Installation	29/05/2027	
74	M/s Shiv Shakti Industries	Khasra No.-651, Khara Bikaner	On Converted land	Non-Operational	Under Installation	31/05/2027	
75	G.K.L.Plaster (old name- jai shree balaji mineral product)	H-1-324(E), H-1-324(F) & H-1-324(G), IGC Khara Bikaner Bikaner	Established on RIICO Land	Non-Operational	No upgradation	Closure Direction issued	Closure Direction Issued on 07.01.2025
76	M/s Bidawat plaster industries	A-113, K.A Project, near IGC Khara, Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
77	M/s M.S. Industries	G-366, IGC Khara, Bikaenr	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
78	M/S Prime Plaster	G-364, IGC Khara Bikaner	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/09/2028	
79	M/s SMR industries	G-361, IGC Khara, Bikaner	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/09/2033	
80	M/s Natural Gypsum Industries	Plot No-152, K.A project, IGC Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	30/06/2028	
81	M/s Amega Industries	Plot No-115, K.A project, IGC Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
82	M/s Amit Chemicals & Minerals	Plot No-118, K.A project, IGC Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	29/02/2028	
83	M/s Baba plaster (Rajshree Industries)	Plot No-132,(Kh.No-609-10),Near IGC Khara	On Converted land	Non-Operational	No upgradation	31-07-2031	
84	M/s Shree Ram Plaster Industries	Plot No-146, K.A project, IGC Khara	On Converted land	Non-Operational	Upgradation work of air pollution control measures completed	Application pending	
85	Kalpatru Minerals	Plot No-145, K.A project, IGC Khara	On Converted land	Non-Operational	Upgradation work of air pollution control measures completed	Application pending	
86	M/s Suraj Industries	Plot No-149, K.A project, IGC Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
87	M/s Laxmi Industries	Plot No-127, K.A project, IGC Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/10/2028	
88	M/s Raja Plaster industries	Plot No-126, K.A project, IGC Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/05/2028	
89	R.K. Minerals	G-158, IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	
90	Kapilesh Industries	F-207, IGC Khara	Established on RIICO Land	Operational	Upgradation work of air pollution control measures completed	30/04/2027	
91	Shree Shyam Industries	F-206, IGC Khara	Established on RIICO Land	Non-Operational	Under Installation	31/01/2027	
92	M/s Bikaji Plaster	Kh. 651, Rohi Khara, Near IGC	On Converted land	Operational	Upgradation work of air pollution control measures completed	31-07-2027	

93	M/s BRD Industries (Jai Laxmi Plaster)	Kh. No-651,IGC Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	30-09-2028	
94	M/s Godara Industries	Kh. No-610, Plot No.-05, K.A Project, Bikaner, Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	29/02/2028	
95	M/s Om Shiv Plaster	Khasra No. 610, Plot No.-04, K. A Project Khara, Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	29/02/2028	
96	M/s J.B Plaster	Kh. No.-610, K.A Project Khara, Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
97	M/s Shree Krishna Plaster Industries	Plot No.-03(Kh., No-610), K.A Project Khara, Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	29/02/2032	
98	M/s Omkar Plaster (Panwar Industries)	Plot No-08, Kh. No-610,K.A project, Khara, Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/07/2029	
99	M/s KCC Plaster	Plot No.-02, K.A Project Khara, Bikaner	On Converted land	Non-Operational	Under Installation	30/04/2032	
100	M/s Khichar PlastoChem	Plot No.-10, K.A Project, Khara, Bikaner	On Converted land	Non-Operational	Under Installation	29/02/2028	
101	M/s Surya Plaster Udhog(M/s Shree Ganesh Enterprises)	Kh. No.-651, Khara	On Converted land	Non-Operational	Under Installation	31/05/2027	
102	Om Gypsum	Khasara No. 651, Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	30/04/2028	
103	Bheruji Plaster Industries	Khasra No. 651, Near IGC Khara,	On Converted land	Non-Operational	No upgradation	30/06/2032	
104	R.K. Minerals (Old name- Laxmi Plaster Udyog)	159 (A) K.A. Project, Near IGC , Khara	On Converted land	Non-Operational	No upgradation	Closure Direction issued	Closure Direction Issued on 06.01.2025
105	Jai Baba Industries	D-105, K.A. Projects	On Converted land	Operational	Upgradation work of air pollution control measures completed	30/06/2028	
106	Lalit Gypsum Plaster Industries	Chak-1 JMD, 24th KM, NH-15, Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/01/2028	
107	Aastha Décor	Khars no. 286 NH 15 Opposite Reliance Petrol Pump, Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/01/2032	
108	M/S Siyag plaster	Kh. No.-651, Khara	On Converted land	Non-Operational	Under Installation	30/09/2028	
109	M/s Siyag Chemicals & minerals	Khasra No. 651 of Rohi Khara, Near IGC, Khara	On Converted land	Operational	Upgradation work of air pollution control measures completed	28/02/2034	
110	M/s Samta Enterprises (Somani enterprises)	Khasra No 651, K.A Project, Khara Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	29-02-2028	
111	M/s Hind Plaster	Khasra No 651, K.A Project, Khara Bikaner	On Converted land	Non-Operational	Under Installation	30/11/2033	
112	M/s Rahul plaster	Khasra No. 651, Near IGC Khara, 10 K.A. Project	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/12/2032	
113	M/s Shantinath Industries	Chak-1, Murba No. 148/37, 24 JMD Stone Near Vill- Khara, Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/08/2033	
114	M/s Ronak Enterprises	Plot No. 114 KA Project, Near IGC Khara, Bikaner	On Converted land	Non-Operational	Upgradation work of air pollution control measures completed	Closure Direction issued	Closure Direction Issued on 06.01.2025
115	M/s Karni Industries	B-113 K.A. Project, IGC Khara	On Converted land	Non-Operational	No upgradation	31/05/2027	

116	M/s R. R. Plaster	Plot No. 139, KA Project, Near IGC Khara, Bikaner	On Converted land	Non-Operational	No upgradation	31-05-2027	
117	M/s Shanti Industries	Plot No. 138, KA Project, Near IGC Khara, Bikaner	On Converted land	Non-Operational	Under Installation	31/01/2028	
118	M/s Chetna plaster	Plot No. 130, KA Project, Near IGC Khara, Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	30/04/2028	
119	M/s Indoplaster	Plot No. 105 B, KA Project, Near IGC Khara, Bikaner	On Converted land	Operational	Upgradation work of air pollution control measures completed	31/05/2027	
120	M/s J.M. Plaster (Virat Industries)	Plot no. A-105, In front of Millenium wools, near rajasthan dharm kanta, Road No. 01, KA Project, Near IGC Khara, Bikaner	On Converted land	Non-Operational	No upgradation	30-11-2033	

Status of industries during visit (Respondent No 4-19)

S. No.	Name of Unit	Address of Unit	Land Status	Present status	PCM status	Consent Validity
1	M/s Amit Chemicals & Minerals (Old name M/s Akash Industries)	Plot No-118, K.A project, IGC Khara	On Converted land	Operational	<p>☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.</p> <p>☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.</p>	29/02/2028
2	M/s Gangai Nath Plaster (Old Name- M/s Balaji Plaster Udhog)	F-346 IGC Khara	Established on RIICO Land	Operational	<p>☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.</p> <p>☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.</p>	30/04/2029
3	Banthia plaster Industries	F-367, IGC Khara	Established on RIICO Land	Closed	Not applicable	31/12/2032
4	Diloeya Chemicals & Minerals	F-340, IGC, Khara	Established on RIICO Land	Operational	<p>☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.</p> <p>☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.</p>	29/02/2028
5	Diloeya Plaster	F-342, IGC, Khara	Established on RIICO Land	Operational	<p>☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.</p> <p>☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.</p>	29/02/2028
6	M/s Godara Industries	Kh. No-610, Plot No.-05, K.A Project, Bikaner, Khara	On Converted land	Operational	<p>☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.</p> <p>☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.</p>	29/02/2028
7	M/s BRD Industries (Old Name M/s Jai Laxmi Plaster)	Kh. No-651, IGC Khara	On Converted land	Operational	<p>☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.</p> <p>☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.</p>	30-09-2028

8	M/s Shakambari Plaster (Old Name- M/s Jaishree plaster)	F-348 IGC Khara	Established on RIICO Land	Closed	Not applicable	30/04/2028
9	Jambeshwar Plaster	E-352, IGC, Khara	Established on RIICO Land	Operational	☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam. ☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.	30/11/2028
10	Namarta Minerals & Chemicals	G-360, IGC Khara	Established on RIICO Land	Operational	☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam. ☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.	30/04/2028
11	M/s Natural Gypsum Industries	Plot No-152, K.A project, IGC Khara	On Converted land	Operational	☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam. ☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.	30/06/2028
12	M/s Om Shiv Plaster	Khasra No. 610, Plot No.-04, K. A Project Khara, Bikaner	On Converted land	Operational	☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam. ☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.	29/02/2028
13	M/S Prime Plaster	G-364, IGC Khara Bikaner	Established on RIICO Land	Operational	☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam. ☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.	30/09/2028
14	Siyag Plaster	G-27, IGC, Khara	Established on RIICO Land	Operational	☑ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam. ☑ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.	31/03/2028

15	M/s White crystal	F-339 IGC Khara	Established on RIICO Land	Operational	<p>☒ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.</p> <p>☒ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.</p>	29/02/2028
16	M/s White rock Industries	F-108 IGC Khara	Established on RIICO Land	Operational	<p>☒ Drum Vent: - covered room with gate to check steam at vent pipe of drum and one settling chamber followed by stack and one downward pipe to collect steam.</p> <p>☒ Calciner furnace: - dust collectors followed by wet scrubber and stack for control of air emissions generated from burning of fuel.</p>	31/12/2026



Head Office (CD)

Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 141-5159600 Fax: 0141-5159697



Revised Consent

Annexure R-9

File No : F(Tech)/Bikaner(Bikaner)/4654(1)/2017-2018/284-286

Order No: 2021-2022/CD/6494

Date: 27/05/2021

Unit Id : 11506

M/s Mahendra Enterprises

G-1-40, Industrial Growth Centre , Khara Tehsil:Bikaner

District:Bikaner

Sub: Consent to Operate under section 21(4) of the Air (Prevention & Control of Pollution) Act, 1981.

Ref: Your application for Consent to Operate dated 13/10/2020 and subsequent correspondence.

Sir,

Consent to Operate under the provisions of section 21/(4) of the Air (Prevention & Control of Pollution) Act, 1981, (hereinafter to be referred as the Air Act) as amended to date and rules & the orders issued thereunder **is hereby granted** for your **POP Unit plant** situated at **G-1-40, Industrial Growth Centre Khara Tehsil:Bikaner District:Bikaner** , Rajasthan, subject to the following conditions:-

- 1 That this Consent to Operate is valid for a period from **27/05/2021** to **30/04/2031** .
- 2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below.

Particular	Type	Quantity with Unit
PLASTER OF PARIS	Product	15.00 MT PER DAY

- 3 That this consent to operate is for existing plant, process & capacity and separate consent to establish/operate is required to be taken for any addition / modification / alteration in process or change in capacity or change in fuel.
- 4 That the quantity of effluent generation along with mode of disposal for the treated effluent shall be as under:

Type of effluent	Max. effluent generation (KLD)	Recycled Qty of Effluent (KLD)	Disposed Qty of effluent (KLD)and mode of disposal
Domestic Sewage	0.800	NIL	0.800 Septic Tank and Soakpit



Head Office (CD)

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Revised Consent

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Order No : 2021-2022/CD/6494

Date: 27/05/2021

Unit Id : 11506

- 5 That the sources of air emissions along with pollution control measures and the emission standards for the prescribed parameters shall be as under:

Sources of Air Emissions	Pollution Control Measures	Prescribed	
		Parameter	Standard
Calcliner(15MT PER ANNUM)	ADEQUATE STACK HEIGHT , Gravity Settling Chamber	Particulate Matter	500 mg/NM3
Rotary Kiln(15MT PER DAY)	ADEQUATE STACK HEIGHT , Gravity Settling Chamber	Particulate Matter	500 mg/NM3

- 6 That the **POP Unit plant** will comply with the standards as prescribed vide MOEF notification No. GSR 826(E) dated 16th November, 2009 with respect to National Ambient Air Quality Standards.
- 7 That this consent to operate is valid for the manufacturing of products mentioned at condition no.2 i.e. Plaster of Paris upto 15.0 MT/day only.
- 8 That the total capital investment of the unit as on 31/03/2020 as per the C.A certificate submitted is Rs. 20.34 Lacs which includes the cost of land, building, plant & machinery and miscellaneous assets. In case of any increase in total capital investment additional fee as per the fee notification dated 26/05/2016 shall be required to be deposited.
- 9 That industry shall not carryout any modification/change in process or manufacture/produce any other products/byproducts, which require environment clearance as per the provisions of Environment Impact Assessment Notification dated 14/09/2006, notified by Ministry of Environment & Forests, Government of India.
- 10 That total water consumption shall not exceed 1.0 KLD(for domestic use only) which shall be sourced from RIICO supply only.
- 11 That neither any ground water will be abstracted nor any ground water abstraction structure shall be constructed without obtaining prior permission from the Central Ground Water Authority (CGWA).



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- 12 That water shall not be used in manufacturing process and thus no trade effluent shall be generated.
- 13 That the domestic effluent(0.8 KLD) shall be treated through scientifically designed septic tank followed by soak pit.
- 14 That no treated /untreated effluent shall be discharged inside or outside the premises and industry shall maintain complete zero discharge status outside the premises
- 15 That suitable metering arrangement shall be provided & maintained at intake of raw water, process/ domestic water consumption to measure daily water consumption, domestic effluent generation and disposed off.
- 16 That the industry shall not use pet coke/furnace oil in any process/service/utility in compliance to the order dated 17/11/2017 of Hon'ble Supreme Court, wherein ban has been imposed on the use of pet coke and furnace oil in the State of Rajasthan.
- 17 That the industry shall provide and maintain stack of atleast ten meters above ground level or three meters above the top of shed or building of the industry whichever is more and adequate air pollution control measures to achieve the prescribed norms as mentioned at condition no.5 at calciner(1 no) and rotary kiln(1 no) and it shall be ensured that air pollution control measures are operational whenever the plant is operated.
- 18 That industry shall provide & maintain safe and adequate infrastructural facilities for stack emission monitoring at the stack of calciner and rotary kiln.
- 19 That effective control measures shall be provided and maintained to control fugitive emissions at lump crusher, pulveriser, raw material handling and during processing, transportation, packing etc.
- 20 That the industry shall comply with emission standards for stacks as well as fugitive as prescribed by MoEF vide gazette notification dated 05/02/2010 for Plaster of Paris manufacturing units.
- 21 That industry shall provide and maintain wall to wall carpeting in vehicle movement areas within premises to avoid re-entrainment of road dust.
- 22 That industry shall undertake regular cleaning and wetting of roads for control of fugitive dust emissions.
- 23 That the industry shall maintain good housekeeping all the time.
- 24 The industry shall ensure proper channelization of the fugitive emissions from the various activities / processes or provide adequate control systems for the same. These arrangements shall be maintained in good conditions and operated properly so as to preserve clean and safe environment in and around the premises of the unit.



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Order No : 2021-2022/CD/6494

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Unit Id : 11506

- 25 That the industry shall carryout effluent sampling and ambient air quality/stack emission/process emission monitoring as the case may be and submit yearly analysis report from laboratory recognized by Ministry of Environment & Forests(MoEF), Government of India/Rajasthan State Pollution Control Board.
- 26 That the industry shall comply with provisions of the Hazardous Waste (Management, Handling & Trans-boundary Movement) Rules, 2016 and disposal of hazardous waste shall be ensured in according with the Rules(if applicable).
- 27 That industry shall not install any other sources of Air pollution/Water pollution without obtaining prior Consent to Establish from the State Board.
- 28 That the Industry shall develop plantation in 33% of total plot area to maintain air quality around the Industry and maintain good housekeeping in the premises.
- 29 That industry shall undertake suitable measures for rain water harvesting for artificial recharge of ground water.
- 30 That emission/effluents found to be discharged in excess of the standards prescribed shall be punishable under section 43 of the Water Act and under section 37 of the Air Act.
- 31 That any incorrect information submitted in the consent application form or declaration shall make the industry liable for legal action under section 42 of the Water Act and under section 38 of the Air Act.
- 32 That this consent is valid subject to fulfilment of all the other statutory requirements in other laws/Acts/Rules as applicable
- 33 That, in case, the industry is found flouting any of the conditions of the consent to operate the bank guarantee submitted of Rs. 15,000/- and Rs. 1500/- with validity upto 05/11/2025 and 09/03/2026 respectively shall be forfeited without any further notice.
- 34 That industry shall submit yearly compliance report of consent conditions to this office as well as Regional Office, Bikaner.
- 35 That this revised consent letter shall supercede the earlier consent letter no F(Tech)/Bikaner(Bikaner)/4654(1)/2017-2018/272-274 dated 27/05/2021
- 36 That, notwithstanding anything provided hereinabove, the State Board shall have power and reserves its right, as contained **under section 21(6) of the Air Act** to review anyone or all the conditions imposed here in above and to make such variation as it deemed fit for the purpose of **Air Act**.



Head Office (CD)

Rajasthan State Pollution Control Board
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Date: 27/05/2021

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37 That the grant of this **Consent to Operate** is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.

38 That the grant of this **Consent to Operate** shall not, in any way, adversely affect or jeopardize the legal proceeding, if any, instituted in the past or that could be instituted against you by the State Board for violation of the provisions of the Act or the Rules made thereunder.

This **Consent to Operate** shall also be subject, besides the aforesaid specific conditions, to the general conditions given in the enclosed Annexure. The project proponent will comply with the provisions of the **Air Act** and to such other conditions as may, from time to time, be specified, by the State Board under the provisions of the aforesaid Act(s). Please note that, non compliance of any of the above stated conditions would tantamount to revocation of **Consent to Operate** and project proponent / occupier shall be liable for legal action under the relevant provisions of the said Act(s).

This bears the approval of the competent authority.

Yours Sincerely

Group Incharge[CD]

(A): **Copy To:-**

- 1 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Bikaner to ensure the compliance.
- 2 Master File.

Group Incharge[CD]



Rajasthan State Industrial Development
& Investment Corporation Ltd.
(A Rajasthan Government Undertaking)
Unit Office, Industrial Area, Bichwal,
Bikaner-334006
Tel/Fax: 0151-2250023 (O)
CIN No.: U13100RJ1969SGC001263
GSTIN: 08AABCR4695J1ZW
Email: Bikaner@riico.co.in

क्रमांक : यू.(18)/2024-25/1586
दिनांक : 24.07.2024

आयुक्त
नगर निगम,
बीकानेर।

विषय:—रीको औद्योगिक क्षेत्रों से सड़क नाली की साफ-सफाई व मरम्मत एवं स्ट्रीट लाइट की मरम्मत के संबंध में।
संदर्भ:—आपका पत्रांक 10055 दिनांक 11.07.2024, 10786 दिनांक 19.07.2024 आपका ई-मेल दिनांक 23.07.2024 एवं इस कार्यालय का दिनांक 23.07.2024

महोदय,

उपरोक्त विषयांतर्गत एवं संदर्भित पत्रों के क्रम में निवेदन है कि पूर्व में आपके कार्यालय पत्र 10786 दिनांक 19.07.2024 औद्योगिक क्षेत्र बीछवाल, करणी एवं रानीबाजार के सड़क एवं नाली सफाई के राशि रु. 12312000/- के लिगेसी वेस्ट एवं अगले छ माह के राशि रु. 47803446/- के तकमीने कुल राशि रु. 6.01 करोड़, इसके अतिरिक्त राशि रु. 37.65 करोड़ के सिविल वर्क, स्ट्रीट लाइट कार्य एवं यांत्रिक कार्य के तकमीने उपलब्ध करवाए गए थे। रीको बीकानेर द्वारा उक्त औद्योगिक क्षेत्रों में पिछले एक महीने में वर्षा ऋतु को देखते हुए एवं उद्यमियों की परेशानियों को देखते हुए महत्वपूर्ण चिन्हित स्थानों पर नाली सफाई का कार्य करवा लिया गया था। इसलिए इस कार्यालय के पत्र दिनांक 23.07.2024 पर आपके अधीक्षण अभियंता एवं सहायक अभियंता (पर्यावरण) से चर्चा हुई। चर्चानुसार खारा औद्योगिक क्षेत्र को शामिल करते हुए सड़क एवं नालियों को लिगेसी सफाई के संशोधित तकमीने राशि रु. 6732000/- के आपके ईमेल दिनांक 23.07.2024 द्वारा रीको को उपलब्ध करवाए गए हैं।

पूर्व में दिनांक 06.05.2024 जिला कलक्टर बीकानेर की अध्यक्षता में हुई बैठक में हुई चर्चानुसार रीको द्वारा नगर निगम को कुछ अग्रिम राशि उपलब्ध करवाई जानी थी।

अतः आपसे अनुरोध है कि मानसून सत्र के मद्देनजर सर्वप्रथम औद्योगिक क्षेत्र की नालियों की सफाई एवं लिगेसी वेस्ट प्रथम चरण में तुरंत हटाया जाना है तथा अन्य कार्य द्वितीय चरण में वर्षा ऋतु के बाद करवाए जाने प्रस्तावित है। अतः प्रथम चरण में साफ-सफाई हेतु प्राप्त संशोधित तकमीनों की राशि रु. 6732000/- में से कार्य करवाए जाने हेतु कितनी राशि उपलब्ध करवानी है एवं बाकी की अग्रिम राशि एवं शेष भुगतान की शर्तों के साथ नगर निगम द्वारा लिए जाने वाले सुपरविजन चार्ज बताए जाने की कृपा करें। जिससे उक्त सभी स्वीकृतियां रीको के सक्षम स्तर से लेकर आपको उपलब्ध करवाई जा सकें एवं तुरंत प्रभाव से कार्य प्रारंभ किया जा सके।

सधन्यवाद।
भवदीय

(एस.के. गर्ग)
वरिष्ठ उपमहाप्रबंधक
रीको बीकानेर।

RajKaj Ref
9195651



Signature valid

Digitally signed by Sunil Kumar Garg
Designation : Senior Deputy General
Manager

Date: 2024.07.24 10:38:59 IST

Reason: Approved

Head Office : Udyog Bhawan, Tilak Marg, Bikaner-334005, Rajasthan (India)
Phone : 0141-2227751(6 Lines), 5113201 (6Lines), Fax : 0141-25104804, Email: riico.co.in,
Website : www.riico.co.in

बैठक कार्यवाही विवरण

जिला कलक्टर महोदया की अध्यक्षता में बैठक नोटिस क्रमांक 729 दिनांक 01.05.2024 के क्रम में जिला कलक्टर कक्ष में आज दिनांक 06.05.2024 को रीको बीकानेर के अधीन औद्योगिक क्षेत्रों में मरम्मत एवं रख-रखाव के कार्य के सम्बन्ध में सम्बन्धित विभागों की समीक्षा बैठक का आयोजन किया गया। जिसमें निम्न अधिकारी/कर्मचारी उपस्थित हुए:-

1. श्री अशोक आसीजा, आयुक्त नगर निगम बीकानेर।
2. श्री राजेश पुरोहित, अधीक्षण अभियन्ता, जलदाय विभाग, बीकानेर।
3. श्री एस. के. गर्ग, वरिष्ठ उप महाप्रबन्धक, रीको, बीकानेर।
4. श्रीमती मंजू नैण गोदारा, महाप्रबन्धक, जिला उद्योग एवं वाणिज्य केन्द्र, बीकानेर।
5. श्रीमती विनिता, अधिशाषी अधिकारी, नगर पालिका, नोखा।
6. श्रीमती भाग्यश्री गोदारा, पी. आर. ओ., बीकानेर।

बैठक में श्री एस. पी. शर्मा क्षेत्रीय प्रबन्धक रीको बीकानेर, श्री ओम प्रकाश चौधरी सहायक अभियन्ता नगर निगम बीकानेर, श्री मोहित कुमार सिंघल, सहायक क्षेत्रीय प्रबन्धक, रीको, बीकानेर भी उपस्थित हुए। बैठक मुख्यतः औद्योगिक क्षेत्र बीछवल, करणी एवं खारा के मरम्मत एवं रख-रखाव के कार्य नगर निगम बीकानेर को एवं औद्योगिक क्षेत्र नोखा के मरम्मत एवं रख-रखाव के कार्य नगरपालिका नोखा द्वारा कराये जाने हेतु निम्न बिन्दुओं पर विस्तृत चर्चा की गई।

1. **सड़क सीमा की साफ-सफाई का कार्य :-** वरिष्ठ उप महाप्रबन्धक रीको बीकानेर द्वारा अवगत करवाया गया कि औद्योगिक क्षेत्रों में सड़को की साफ-सफाई एवं रखरखाव के कार्य के अंतर्गत सड़क सीमा में पड़े हुए ठोस अपशिष्ट के निस्तारण एवं जंगल सफाई का कार्य नगर निगम बीकानेर के द्वारा कराये जाने प्रस्तावित है।

बैठक में आयुक्त नगर निगम बीकानेर द्वारा बताया गया कि औद्योगिक क्षेत्र में सड़क सीमा में जंगल सफाई एवं रखरखाव कार्य निगम द्वारा करवा दिये जायेंगे। सफाई के उपरान्त निकलने वाले ठोस अपशिष्ट के निस्तारण हेतु भूमि/भूखण्ड/डंपिंग ग्राउण्ड की सुनिश्चितता रीको एवं नगर निगम द्वारा मौके पर निरीक्षण उपरान्त कर लिया जावेगा।

वरिष्ठ उप महाप्रबन्धक रीको बीकानेर द्वारा अवगत करवाया गया कि साफ सफाई के दौरान निकलने वाले ठोस अपशिष्ट का निस्तारण नगर निगम के डम्पिंग यार्ड में किया जा सकता है। इस पर अध्यक्ष महोदय द्वारा निर्देशित किया गया कि औद्योगिक क्षेत्रों का संयुक्त मौका निरीक्षण किये जाने के उपरान्त स्थान निर्धारण कर लिया जावेगा।

बैठक में अधिशाषी अधिकारी नगर पालिका नोखा, बीकानेर द्वारा बताया गया कि औद्योगिक क्षेत्रों नोखा में सड़को की साफ सफाई एवं रख-रखाव के कार्य करवाये जाने पर अपनी सहमति प्रदान की।

RajKaj Ref
7026008**Signature valid**

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Manager
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2. **नालियों की साफ-सफाई का कार्य :-** वरिष्ठ उप महाप्रबन्धक रीको बीकानेर द्वारा अवगत करवाया गया कि रीको के नगर निगम, बीकानेर के कार्यक्षेत्र में स्थित औद्योगिक क्षेत्र करणी, बीछवाल, एवं खारा एवं नगरपालिका, नोखा के कार्य क्षेत्र में स्थित औद्योगिक क्षेत्र नोखा में नालियों की नियमित साफ-सफाई एवं रखरखाव का कार्य नगर निगम बीकानेर से करवाया जाना प्रस्तावित है

इस बिन्दु पर आयुक्त नगर निगम द्वारा उपरोक्तानुसार अपने कार्यक्षेत्र में नालियों की नियमित साफ-सफाई का कार्य किये जाने में अपनी सहमति प्रदान की।

इसी प्रकार अधिशाषी अधिकारी नगर पालिका नोखा द्वारा भी औद्योगिक क्षेत्र में नोखा में नालियों की साफ सफाई, का कार्य करवाये जाने पर अपनी सहमति प्रदान की।

3. **स्ट्रीट लाईट की मरम्मत एवं रख-रखाव का कार्य :-** वरिष्ठ उप महाप्रबन्धक रीको बीकानेर द्वारा अवगत करवाया गया कि रीको बीकानेर के अधीन औद्योगिक क्षेत्र करणी, बीछवाल एवं खारा में स्ट्रीट लाईट की मरम्मत एवं रख-रखाव का कार्य नगर निगम बीकानेर के द्वारा एवं औद्योगिक क्षेत्र नोखा के स्ट्रीट लाईट की मरम्मत एवं रख-रखाव का कार्य नगरपालिका नोखा द्वारा करवाया जाना प्रस्तावित है।

बैठक में आयुक्त नगर निगम बीकानेर एवं अधिशाषी अधिकारी नगरपालिका नोखा द्वारा बताया गया कि औद्योगिक क्षेत्रों में स्ट्रीट लाईट की मरम्मत एवं रख-रखाव का कार्य संबंधित निकायों द्वारा करवा दिया जावेगा।

4. **औद्योगिक क्षेत्रों पीने के पानी हेतु जलापूर्ति का कार्य :-** वरिष्ठ उप महाप्रबन्धक रीको बीकानेर द्वारा अवगत करवाया गया कि वर्तमान में रीको बीकानेर के अधीन औद्योगिक क्षेत्र करणी एवं बीछवाल में रीको द्वारा नलकुपों के माध्यम से औद्योगिक इकाईयों को पीने का पानी उपलब्ध करवाया जा रहा है। इस पानी का मानक पीने योग्य मानक से काफी अधिक है। इसी प्रकार औद्योगिक क्षेत्र नोखा में भूजल की अनुपलब्धता के कारण औद्योगिक इकाईयों को पीने के पानी उपलब्ध करवा जाना संभव नहीं हो पा रहा है। अतः जलदाय विभाग, बीकानेर द्वारा अतः औद्योगिक क्षेत्र करणी, बीछवाल एवं नोखा में जलापूर्ति जलदाय विभाग, बीकानेर द्वारा किया जाना प्रस्तावित है।

बैठक में उपस्थित अधीक्षण अभियन्ता, जलदाय विभाग, द्वारा अवगत कराया गया कि औद्योगिक क्षेत्र करणी एवं बीछवाल में औद्योगिक इकाईओं को पीने का पानी वर्तमान में उपलब्ध कराया जाना संभव नहीं है। जलदाय विभाग के अधीन वर्तमान में निर्माणाधीन परियोजना के पूर्ण होने पश्चात् ही इस संबंध में अग्रिम कार्यवाही की जा सकती है एवं रीको को उपलब्ध करवाये जाने वाले पानी की मात्रा की गणना उपलब्ध करवाया जाना तभी संभव हो सकेगा। औद्योगिक क्षेत्र नोखा में वर्तमान में जलदाय विभाग की परियोजना पर भी कार्य प्रगतिरत है। इसके पूर्ण होने के उपरान्त रीको को औद्योगिक क्षेत्र नोखा की इकाईयों को पीने का पानी उपलब्ध करवाये जाने पर किया जाना संभव हो सकेगा।

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Designation: Senior Deputy Genl
Manager
Date: 2024.05.10 10:42:57 IST

5. **जलप्रदाय योजना का संचालन एवं रख-रखाव का कार्य** :- वरिष्ठ उप महाप्रबन्धक रीको बीकानेर द्वारा यह भी अवगत करवाया गया कि औद्योगिक क्षेत्र करणी, बीछवाल, खारा, नोखा एवं नापासर में जलप्रदाय योजना के नियमित संचालन एवं रख-रखाव का कार्य जलदाय विभाग द्वारा किया जाना प्रस्तावित है।

अधीक्षण अभियन्ता, जलदाय विभाग, द्वारा अवगत कराया गया कि औद्योगिक क्षेत्रों में जलापूर्ति के कार्यों के नियमित संचालन, एवं रख-रखाव का कार्य जलदाय विभाग के सक्षम स्तर से स्वीकृति के उपरान्त ही किया जाना सम्भव हो सकेगा।

6. **औद्योगिक क्षेत्रों में स्थित आवासीय कॉलोनी के हस्तान्तरण बाबत**:- वरिष्ठ उप महाप्रबन्धक रीको बीकानेर द्वारा बैठक में अवगत करवाया गया कि रीको बीकानेर के अधीन औद्योगिक क्षेत्रों में स्थित आवासीय कॉलोनियां में सड़को एवं नलियों की नियमित साफ-सफाई, घर-घर कचरा संग्रहण एवं शौचालय से निकलने वाले अपशिष्ट के निस्तारण के समाधान हेतु आवासीय कॉलोनी बीछवाल, एसडब्ल्यूएम बीछवाल, आवासीय कॉलोनी करणी एवं आवासीय कॉलोनी खारा को नगर निगम बीकानेर को हस्तांतरित किया जाना उचित है। वर्तमान में इन आवासीय कॉलोनियों के आवंटी रीको की वर्तमान व्यवस्था से संतुष्ट नहीं है एवं आवासीय कॉलोनियों के आवंटियों की मांग भी है कि रीको आवासीय कॉलोनियां नगर निगम को हस्तांतरित कर दी जावे जिससे सेनिटेशन की व्यवस्था संतोषप्रद हो सके। नगर विकास न्यास एवं राजस्थान आवासन मंडल की तर्ज पर पूर्व में रीको द्वारा रीको की इन्द्रविहार आवासीय कॉलोनी नगर निगम कोटा को हस्तांतरित की गई है।

बैठक में आयुक्त नगर निगम बीकानेर द्वारा बताया गया कि रीको के औद्योगिक क्षेत्रों में स्थित आवासीय कॉलोनीयों को हस्तांतरित किये जाने में निगम को कोई कठिनाई नहीं है एवं इस बाबत अपनी मौखिक सहमति प्रदान की गई। फिर भी नगर निगम के सक्षम स्तर से स्वीकृति के उपरान्त ही हस्तांतरण की कार्यवाही की जा सकेगी।

जिला कलेक्टर महोदया द्वारा वरिष्ठ उप महाप्रबन्धक रीको बीकानेर को निर्देशित किया गया कि रीको बीकानेर के अधीन औद्योगिक क्षेत्रों में स्थित आवासीय कॉलोनी बीछवाल, एसडब्ल्यूएम बीछवाला, आवासीय कॉलोनी करणी एवं आवासीय कॉलोनी खारा को नगर निगम बीकानेर को हस्तांतरित किये जाने के प्रस्ताव स्वीकृति हेतु मुख्यालय प्रेषित कर दिये जावे।

• आयुक्त नगर निगम बीकानेर एवं अधिशाषी अधिकारी नोखा द्वारा अवगत कराया गया कि रीको बीकानेर के अधीन संबंधित औद्योगिक क्षेत्रों में विभिन्न मरम्मत एवं रख-रखाव के कार्यों के मौका निरीक्षण उपरान्त तकमीने तैयार कर रीको का प्रस्तुत करने के उपरान्त तकमीने के अनुसार कार्य आरम्भ करने से पूर्व कुछ अग्रिम राशि जमा करवा जाना प्रस्तावित है।

RajKaj Ref
7026008

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Digitally signed by Suman Kumar Garg
Designation: Senior Deputy General
Manager
Date: 2024.05.13 10:42:57 IST
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वरिष्ठ उप महाप्रबन्धक रीको बीकानेर द्वारा बैठक में अवगत करवाया गया कि इस संबंधित निकायों से प्राप्त तकमीनों के अनुसार अग्रिम राशि निगम मुख्यालय से आवश्यक स्वीकृति के उपरान्त जमा करवा दी जावेगी।

- अध्यक्ष महोदया द्वारा आयुक्त नगर निगम बीकानेर, वरिष्ठ उप महाप्रबन्धक रीको बीकानेर एवं अधिशाषी अधिकारी नगर पालिका नोखा द्वारा औद्योगिक क्षेत्रों के रख-रखाव के सम्बन्ध में अविलम्ब ही संयुक्त मौका निरीक्षण किया जाकर अग्रिम कार्यवाही किये जाने हेतु निर्देशित किया गया।

अन्त में बैठक सधन्यवाद समाप्त हुई।

(एस. के. गर्ग)

इकाई प्रभारी

रीको, बीकानेर

प्रतिलिपि निम्न को सूचनार्थ एवं आवश्यक कार्यवाही हेतु:-

1. जिला कलेक्टर, बीकानेर।
2. सलाहकार (इन्फ्रा), रीको जयपुर।
3. आयुक्त नगर निगम बीकानेर।
4. सलाहकार (एएण्डएम), रीको जयपुर।
5. वित्तीय सलाहकार, रीको जयपुर।
6. महाप्रबन्धक(सिविल), रीको जयपुर।
7. अधीक्षण अभियन्ता, जलदाय विभाग, बीकानेर।
8. महाप्रबन्धक, जिला उद्योग एवं वाणिज्य केन्द्र, बीकानेर।
9. अधिशाषी अधिकारी, नगर पालिका, नोखा।

प्रतिलिपि निम्न को भी सूचनार्थ

1. वरिष्ठ निजि सचिव, प्रबन्ध निदेशक, रीको, जयपुर।

(एस. के. गर्ग)

इकाई प्रभारी

रीको, बीकानेर

RajKaj Ref
7026008

Signature valid

Digitally signed by S. K. Garg
Designation: Senior Deputy Gen
Manager
Date: 2024.05.10:42:57 IST
Reason: Approved



ग्राम खारा (बीकानेर) प्रदूषण एक प्रकार का हानिकारक पदार्थ है जो चिमनियों से निकलने वाले धुएं से छोटे बच्चों बूढ़े व्यक्तियों व सभी जीवों को नुकसान पहुंचता है , बल्कि जीव जंतुओं पशु पक्षियों व पेड़ पौधों को नुकसान पहुंचता है। आज इसके परिणाम स्वरूप खारा गांव के निवासियों का अस्तित्व खतरे में है अतः आपसे निवेदन है कि जल्द से जल्द कार्रवाई करें.. सधन्यवाद

bhairusingh khara <bhairusinghkhara@gmail.com>
To: "ro.bikaner@gmail.com" <ro.bikaner@gmail.com>

Wed, Oct 23, 2024 at 11:27 AM

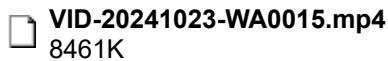
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श्री मान,

माननीय मुख्यमंत्री महोदय,

राजस्थान सरकार



विषय:- ग्राम पंचायत खारा औद्योगिक क्षेत्र खारा जिला बीकानेर के वायु-प्रदूषण कर मानव जीवन को खतरे में डालने वाले औद्योगिक संयंत्रों को तत्काल बंद करने तथा साथ ही औद्योगिक संयंत्रों से निकलने वाले प्रदूषित पानी के निस्तारण हेतु अपशिष्ट उपचार संयंत्र (CEPT) स्थापित करवाने की पालना करवाने बाबत

मान्यवर ,

उपरोक्त विषय संदर्भ में यह है कि प्रत्येक भारतीय नागरिक को भारतीय संविधान का अनुच्छेद 21 जीवन और व्यक्तिगत स्वतंत्रता की सुरक्षा के मौलिक अधिकार की गारंटी देता है

भारतीय संविधान का अनुच्छेद 21 कहता है कि "किसी भी व्यक्ति को विधि द्वारा स्थापित प्रक्रिया के अतिरिक्त उसके जीवन और वैयक्तिक स्वतंत्रता के अधिकार से वंचित नहीं किया जा सकता है"

केन्द्र सरकार व राज्य सरकार कि जिम्मेदारी है कि प्रत्येक व्यक्ति स्वच्छ वातावरण में जीवन यापन कर सके इसके लिए केंद्र एवं राज्य सरकार पर्यावरण संरक्षण के लिए उतरदायी है

लेकिन यह पत्र लिखते हुए बहुत खेद हो रहा है कि लगातार ग्राम पंचायत खारा द्वारा समय समय पर प्रदूषण नियंत्रण बोर्ड, बीकानेर को अवगत करवाने के बावजूद आदिनांक तक वायु-प्रदूषण (निवारण एवं नियंत्रण) अधिनियम, 1981 के उपबंधों की पालना शून्य भी नहीं हो रही है

अतः निम्न बिन्दुओं पर पालना सुनिश्चित करवाई जाए -

1:- यह है कि ग्राम पंचायत खारा में औद्योगिक संयंत्रों द्वारा उत्सर्जित प्रदूषण की जांच हेतु लगातार AQI यंत्र 24x7 घंटे कम से कम 10-15 दिन वायु-प्रदूषण की जांच करने हेतु आबादी क्षेत्र जो औद्योगिक क्षेत्र की इकाइयों से मात्र 50 मीटर दूरी पर है अथवा राजकीय उच्च माध्यमिक विद्यालय खारा में लगाकर

गाँव के प्रतिनिधि मंडल से दो या दो अधिक व्यक्ति शामिल कर जांच रिपोर्ट तैयार कर एक सत्यापित प्रति ग्राम पंचायत खारा के प्रतिनिधि मंडल को उपलब्ध कराई जावे जो भविष्य में राष्ट्रीय हरित अधिकरण अधिनियम, 2010 के उपबंधों के अनुसार अपील की आगामी कार्रवाई कर सके

2:- वायु-प्रदूषण (निवारण एवं नियंत्रण) अधिनियम, 1981 के तहत ऐसे औद्योगिक संयंत्र जो केंद्र एवं राज्य सरकार द्वारा स्थापित केंद्रीय प्रदूषण नियंत्रण बोर्ड तथा राज्य प्रदूषण नियंत्रण बोर्ड द्वारा विहित नियमों की अवहेलना करके वायु-प्रदूषण साथ ही पर्यावरण प्रदूषण अधिनियम, का उल्लंघन करते हैं जिनकी विशेष जांच अभियान चलाकर जांच कर तत्काल केंद्रीय प्रदूषण नियंत्रण बोर्ड व राज्य नियंत्रण बोर्ड के संज्ञान में लाते हुए विधि सम्मत कठोरतापूर्वक कार्रवाई करवाए

ग्राम पंचायत खारा के समस्त ग्रामीण वायु-प्रदूषण से भयंकर पीड़ित हैं साथ ही साथ वायु-प्रदूषण से होने वाली समस्त बीमारियों से जुझ रहे हैं जिसके लिए सरकार विशेष स्वास्थ्य जांच शिविर लगाए

नोट:-

पर्यावरण प्रदूषण की समस्या पर ग्राम पंचायत खारा के ग्रामीण आर-पार की लड़ाई (लोकतान्त्रिक) लड़ने को तैयार हैं

पत्राचार की अनदेखी पर ग्रामीणों के आगामी कदम के लिए स्वयं प्रशासन एवं सरकार जिम्मेदार होगी

श्रीमान जी से पुनः सादर अनुरोध है कि मानव स्वास्थ्य को प्रभावित करने वाली इकाईयों पर सख्त कार्रवाई के आदेश कर ग्राम पंचायत खारा के ग्रामीणों को राहत प्रदान करें

संलग्न :-

फोटो व विडियो

समाचार पत्रों की खबरे

पूर्व पत्राचार आदि

सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रतिलिपि:-

1:- मुख्य सचिव, भारत सरकार

2:-मुख्य सचिव,सरकार राजस्थान

3:-केन्द्रीय प्रदूषण नियंत्रण मंडल, दिल्ली

4:-राज्य प्रदूषण नियंत्रण मंडल,जयपुर

5:-वन एवं पर्यावरण मंत्री,भारत सरकार

6:-वन एवं पर्यावरण मंत्री राजस्थान सरकार

7:-क्षेत्रीय प्रबंधक प्रदूषण नियंत्रण बोर्ड, बीकानेर को लेख है कि जल्द से जल्द ग्राम पंचायत खारा मे मानव स्वास्थ्य को प्रभावित करने वाले जहरीले धूए (POP की फैक्ट्रियो से जिप्सम व पराली का धुंआ),अन्य औद्योगिको द्वारा उत्सर्जित जहरीला धुआं व पर्यावरण के संरक्षण के अभाव के चलते वायु-प्रदूषण (निवारण एवं नियंत्रण) अधिनियम, 1981 के प्रावधान के उल्लंघन के चलते विधि अंतर्गत आवश्यक कार्रवाई कर ग्राम पंचायत खारा को प्रदूषण रहित क्षेत्र घोषित करवाए

7:-जिला कलक्टर, बीकानेर

8:-उपखंड अधिकारी,बीकानेर

9:-राष्ट्रीय मानवाधिकार आयोग,दिल्ली

10:-राज्य मानवाधिकार आयोग, राजस्थान सरकार

11:-मानव कल्याण एवं स्वास्थ्य मंत्रालय, भारत सरकार

- 1) पूर्ण सिंह S/o लाल सिंह 9829027554 पूर
- 2) विजय सिंह S/o जेम सिंह 9950021191
- 3) हरि सिंह S/o मूर सिंह 9829385283
- 4) अमर सिंह S/o हरि सिंह 8233646556 हरि सिंह
- 5) जगमाल सिंह S/o मदन सिंह 9928725149 जगमाल सिंह
- 6) मरार सिंह S/o परमानंद 9950353649
- 7) विजय सिंह S/o शंकर सिंह 6350131431 विजय सिंह
- 8) सुकमल सिंह S/o विक्रम सिंह 8107732285 सुकमल सिंह
- 9) महेन्द्र सिंह S/o जाल सिंह 9484251775 महेन्द्र सिंह
- 10) प्रकाश मेघवाल S/o गोपलराज 7742904118 प्रकाश
- 11) लक्ष्मी सिंह S/o सुरजराज 7073287835 लक्ष्मी सिंह
- 12) मंगेश सिंह S/o जेम सिंह 8561817580 मंगेश सिंह
- 13) अरजराज S/o जतराज 9928725143 अरजराज
- 14) नरमल S/o गेदगलाल 9414264667 नरमल
- 15) कलारज S/o कपूरलाल 94618-29646 कलारज
- 16) सुरेश सिंह S/o सुरजराज 6376292254 सुरेश सिंह
- 17) महाराज S/o दीशराम 9782727258 महाराज
- 18) नाल S/o नरमल 9001165484 नाल
- 19) हीरालाल S/o सुदरामा सुभार 9782898929 हीरालाल
- 20) गौपाल S/o जेमराज कुमावत 8963821542 गौपाल
- 21) राज S/o राज 8209718943 राज
- 22) राज S/o राज 6375428705 राज
- 23) Dinesh S/o nathu S/o 9610442704 Dinesh
- 24) Hanumanth S/o Jala Ram 7221815849 Hanumanth

138

विष्णु भाई 8% 2014 आर 9079797739

गुरेन्द्र कुमार बी० गणेशराम 9079696042

किशोरपालीसिंह जी० गी० दे० 7733055170

सुन्दर सिंह श्री शिखर सिंह 7340460822

मोहनसिंह श्री श्याम 7778971036 मरिच

पुनमसिंह अ० चक्रवर्ती 9782891780

शिवोपाध्याय

982846991

9636280740

प्रेमसिंह श्री मोहनसिंह

889030740

शिवरामसिंह श्री कुशलसिंह

9540816043

अजीतसिंह श्री अशोकसिंह

9799717161 ~~20~~

मरानी श्री मोहनसिंह

8890100728 मरानीसिंह

अंजुसिंह श्री अशोकसिंह

7014658932 अंजुसिंह

श्यामसिंह श्री

7731073815

अंवरलाल श्री अंवरलाल

9929848915

सात्मचन्द्र श्री अंवरलाल परीक 7731073815



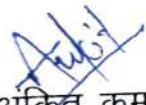
क्षेत्रीय कार्यालय
राजस्थान राज्य प्रदूषण नियंत्रण मण्डल
प्लॉट नम्बर स्पेशल 33, बीछवाल औद्योगिक क्षेत्र,
बीकानेर



Website:- environment.rajasthan.gov.in Phone:- 0151-2250006 RSPCB
Helpline No :- 18001806127

खारा निरीक्षण/सर्वे रिपोर्ट

ई-मेल से प्राप्त शिकायत दिनांक 23.10.2024 के संदर्भ में अद्योहस्ताक्षरकर्ताओं द्वारा ग्राम खारा तहसील व जिला-बीकानेर का सर्वे दिनांक 24.10.2024 को किया गया। निरीक्षण के दौरान खारा ग्रामवासियों के प्रतिनिधि श्रीमान गजे सिंह ने अवगत करवाया कि ग्राम के पास स्थित रीको औद्योगिक क्षेत्र, खारा औद्योगिक एवं आसपास क्षेत्र में संचालित लगभग 125 पीओपी कारखानों से अत्यधिक मात्रा में वायु प्रदूषण हो रहा है जिससे कि ग्रामवासियों को अस्थमा व अन्य बीमारियों से ग्रस्त हो रहे हैं साथ ही ग्रामवासियों द्वारा लिखित में ज्ञापन दिया कि उक्त पीओपी कि ईकाइयों को यहां से कहीं और स्थानांतरण किया जावे। इसके बाद मण्डल अधिकारियों द्वारा ग्रामवासियों के साथ रीको औद्योगिक क्षेत्र, खारा की सड़कों का निरीक्षण/सर्वे किया गया। निरीक्षण के दौरान ग्रामवासियों द्वारा बताया गया कि औद्योगिक क्षेत्र कि सड़को कि नियमित रूप से सफाई नहीं हो रही है। निरीक्षण के दौरान वाहनों की आवाजाही से सड़को पर धूलकण उड़ते पाये गये जिसकी वजह से आस-पास के क्षेत्र में fugitive emissions से इन्कार नहीं किया जा सकता तथा साथ ही उद्योगों का ठोस अपशिष्ट भी खुले में पाया गया जिसका वैज्ञानिक तरीके से निस्तारण अतिआवश्यक है। उक्त सर्वे के दौरान पाया गया कि क्षेत्र में स्थित पीओपी इकाइयों के प्रदूषण नियंत्रण व्यवस्था की वर्तमान स्थिति का सर्वे किया जाना अत्यन्त आवश्यक है।


अंकित कुमार
कनिष्ठ वैज्ञानिक अधिकारी


राजकुमार मीणा
क्षेत्रीय अधिकारी



Regional office Tel :- 0151-2250006
Rajasthan State Pollution Control Board
Plot No. 33 Special, Bichhawal Industrial Area, Bikaner

No. :- RPCB/RO/BKN/2024-25/

Date

कार्यालय आदेश

खारा ग्रामवासियों से प्राप्त ई मेल प्लास्टर ऑफ पेरिस इकाईयों द्वारा फैलाये जा रहे प्रदूषण के सम्बन्ध में प्राप्त शिकायत के सत्यापन हेतु इस कार्यालय द्वारा ग्रामवासियों के साथ ग्राम खारा एवं आस-पास के क्षेत्र का निरीक्षण किया गया। इसी क्रम में उक्त क्षेत्र में स्थित प्लास्टर ऑफ पेरिस इकाईयों के सर्वे/निरीक्षण हेतु निम्न दलों का गठन किया जाता है:-

दल 1

1. श्री अंकित कुमार, कनिष्ठ वैज्ञानिक अधिकारी
2. सुश्री प्रिती कँवर, कनिष्ठ पर्यावरण अभियन्ता


दल 2

1. सुश्री वीनू सिंघल, कनिष्ठ वैज्ञानिक अधिकारी
2. श्रीमति ज्योति मेव, कनिष्ठ पर्यावरण अभियन्ता

दल 3

1. श्रीमति सीमा गोस्वामी, कनिष्ठ वैज्ञानिक अधिकारी
2. श्री राधेश्याम स्वामी, कनिष्ठ पर्यावरण अभियन्ता

उक्त दल को निर्देशित किया जाता है कि वे उक्त क्षेत्र का निरीक्षण कर रिपोर्ट अधोहस्ताक्षकर्ता को 5 दिवस के भीतर प्रस्तुत करें।



 (राजकुमार मीणा)
 क्षेत्रीय अधिकारी e/c

No. :- RPCB/RO/BKN/2024-25/3043-3048

Date 28/10/2024

प्रतिलिपि निम्न को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित:-

1. श्री अंकित कुमार, कनिष्ठ वैज्ञानिक अधिकारी, रा.रा.प्र.नि.म., बीकानेर।
2. सुश्री वीनू सिंघल, कनिष्ठ वैज्ञानिक अधिकारी, रा.रा.प्र.नि.म., बीकानेर।
3. श्रीमति ज्योति मेव, कनिष्ठ पर्यावरण अभियन्ता, रा.रा.प्र.नि.म., बीकानेर।
4. श्रीमति सीमा गोस्वामी, कनिष्ठ वैज्ञानिक अधिकारी, रा.रा.प्र.नि.म., बीकानेर।
5. सुश्री प्रिती कँवर, कनिष्ठ पर्यावरण अभियन्ता, रा.रा.प्र.नि.म., बीकानेर।
6. श्री राधेश्याम स्वामी, कनिष्ठ पर्यावरण अभियन्ता, रा.रा.प्र.नि.म., बीकानेर।


 क्षेत्रीय अधिकारी
 141

Ambient Air Monitoring at Khara						
S. NO	Date of Sample Collection	Type of Monitoring (Ambient/Fugitive/ Stack)	Point of collection	PM10	SO2	NO2
1	06.11.2024	Ambient	Ambient Air Quality Monitoring at House of Mr. Puran Singh (Near Govt. Sr. Sec. School, Khara)	1143	9.84	32.48
2	07.11.2024	Ambient	Ambient Air Quality Monitoring at House of Mr. Puran Singh (Near Govt. Sr. Sec. School, Khara)	1528	9.71	28.01
3	08.11.2024	Ambient	Ambient Air Quality Monitoring at House of Mr. Puran Singh (Near Govt. Sr. Sec. School, Khara)	1075	8.94	26.59
4	11.11.2024	Ambient	Ambient Air Quality Monitoring at House of Ramu Ram ji	1123	8.94	29.66
5	12.11.2024	Ambient	Ambient Air Quality Monitoring at House of Ramu Ram ji	964	9.68	27.88
6	13.11.2024	Ambient	Ambient Air Quality Monitoring at House of Ramu Ram ji	1189	9.33	25.49
7	14.11.2024	Ambient	Ambient Air Quality Monitoring at House of Kishan Singh Suther	398	7.4	20.81
8	15.11.2024	Ambient	Ambient Air Quality Monitoring at House of Kishan Singh Suther	505	8.36	21.17
9	16.11.2024	Ambient	Ambient Air Quality Monitoring at House of Kishan Singh Suther	557	8.75	22.01
10	17.11.2024	Ambient	Ambient Air Quality Monitoring at House of Kishan Singh Suther	467	9.37	20.84

FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Report No. : 2472

Report On : 20/11/2024

I hereby certify that I Ms Garima Mishra, State Board Analyst duly appointed under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981 received on the 18/11/2024 from Seema Goswami, JSO, Bikaner ,RSPCB Bikaner a sample of Ambient Air Quality of House of Kishan singh Suthar , Village -Khara , Bikaner Collected from Ambient Air Quality Monitoring at House of Kishan Singh Suthar Collected on 17/11/2024. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on 20/11/2024 and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	20.84
2	Particulate Matter (PM ₁₀) µg/m ³	467
3	Sulphur Dioxide as SO ₂ ug/m ³	9.37

The condition of the seals, fastening and container on receipt was as follows : Intact

Signed This On 20/11/2024

Ms Garima Mishra

BOARD ANALYST

Rajasthan State Pollution Control Board

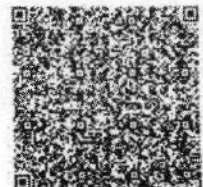
Regional Office Bikaner

33, Phase-II, Bichwal Industrial Area, Bikaner

Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.20 12:47:59 IST
Reason: Self Attested
Location:



FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Report No. : 2471

Report On : 19/11/2024

I hereby certify that I **Ms Garima Mishra**, State Board Analyst duly appointed under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981 received on the 17/11/2024 from **Seema Goswami, JSO, Bikaner, RSPCB Bikaner** a sample of **Ambient Air Quality of House of Kishan Singh Suthar, Village -Khara, Bikaner** Collected from **Ambient Air Quality Monitoring at House of Kishan Singh Suthar** Collected on **16/11/2024**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **19/11/2024** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	22.01
2	Particulate Matter (PM ₁₀) µg/m ³	557
3	Sulphur Dioxide as SO ₂ µg/m ³	8.75

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **19/11/2024**

Ms Garima Mishra
BOARD ANALYST

Rajasthan State Pollution Control Board

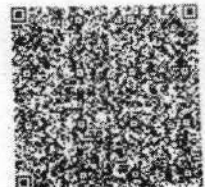
Regional Office Bikaner

33, Phase-II, Bichwal Industrial Area, Bikaner

Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.19 16:09:09 IST
Reason: Self Attested
Location:



FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Report No. : 2470

Report On : 18/11/2024

I hereby certify that I **Ms Garima Mishra**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **16/11/2024** from **Seema Goswami, JSO, Bikaner, RSPCB Bikaner** a sample of **Ambient Air Quality of House of Kishan Singh Suthar, Village -Khara, Bikaner** Collected from **Ambient Air Quality Monitoring at House of Kishan Singh Suthar** Collected on **15/11/2024**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/11/2024** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	21.17
2	Particulate Matter (PM ₁₀) µg/m ³	505
3	Sulphur Dioxide as SO ₂ ug/m ³	8.36

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **18/11/2024**

Ms Garima Mishra

BOARD ANALYST

Rajasthan State Pollution Control Board

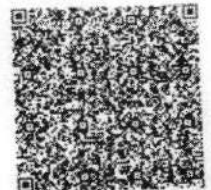
Regional Office Bikaner

33, Phase-II, Bichwal Industrial Area, Bikaner

Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.18 14:53:46 IST
Reason: Self Attested
Location:



FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Report No. : 2469

Report On : 18/11/2024

I hereby certify that I **Ms Garima Mishra**, State Board Analyst duly appointed under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981 received on the 15/11/2024 from **Seema Goswami, JSO, Bikaner, RSPCB Bikaner** a sample of **Ambient Air Quality of House of Kishan Singh Suthar, Village -Khara, Bikaner** Collected from **Ambient Air Quality Monitoring at House of Kishan Singh Suthar** Collected on **14/11/2024**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/11/2024** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	20.81
2	Particulate Matter (PM ₁₀) µg/m ³	398
3	Sulphur Dioxide as SO ₂ ug/m ³	7.40

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **18/11/2024**

Ms Garima Mishra

BOARD ANALYST

Rajasthan State Pollution Control Board

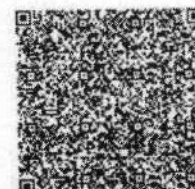
Regional Office Bikaner

33, Phase-II, Bichwal Industrial Area, Bikaner

Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.18 14:52:39 IST
Reason: Self signed
Location:



FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Report No. : 2468

Report On : 18/11/2024

I hereby certify that I **Ms Garima Mishra**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **14/11/2024** from **Seema Goswami, JSO, Bikaner ,RSPCB Bikaner** a sample of **Ambient Air Quality of House of Mr. Ramu Ram Ji , Village-Khara, Tehsil Dist.-Bikaner , Bikaner** Collected from **Ambient Air Quality Monitoring at House of Ramu Ram ji** Collected on **13/11/2024**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/11/2024** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	25.49
2	Particulate Matter (PM ₁₀) µg/m ³	1189
3	Sulphur Dioxide as SO ₂ ug/m ³	9.33

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **18/11/2024**

Ms Garima Mishra

BOARD ANALYST

Rajasthan State Pollution Control Board

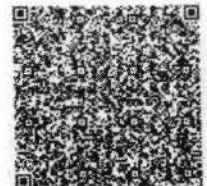
Regional Office Bikaner

33, Phase-II, Bichwal Industrial Area, Bikaner

Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.18 15:46 IST
Reason: Self Attested
Location:



FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Report No. : 2467

Report On : 18/11/2024

I hereby certify that I **Ms Garima Mishra**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **13/11/2024** from **Seema Goswami, JSO, Bikaner, RSPCB Bikaner** a sample of **Ambient Air Quality of House of Mr. Ramu Ram Ji, Village-Khara, Tehsil Dist.-Bikaner, Bikaner** Collected from **Ambient Air Quality Monitoring at House of Ramu Ram Ji** Collected on **12/11/2024**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **18/11/2024** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	27.88
2	Particulate Matter (PM ₁₀) µg/m ³	964
3	Sulphur Dioxide as SO ₂ ug/m ³	9.68

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **18/11/2024**

Ms Garima Mishra

BOARD ANALYST

Rajasthan State Pollution Control Board

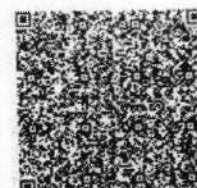
Regional Office Bikaner

33, Phase-II, Bichwal Industrial Area, Bikaner

Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.18 16:54:16:54 IST
Reason: Self signed
Location:



FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Report No. : 2465

Report On : 13/11/2024

I hereby certify that I Ms Garima Mishra, State Board Analyst duly appointed under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981 received on the 12/11/2024 from VEENU SINGHAL, JSO, Bikaner ,RSPCB Bikaner a sample of Ambient Air Quality of House of Mr. Ramu Ram Ji , Village-Khara, Tehsil Dist.-Bikaner , Bikaner Collected from Ambient Air Quality Monitoring at House of Ramu Ram Ji Collected on 11/11/2024. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on 13/11/2024 and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	29.66
2	Particulate Matter (PM ₁₀) µg/m ³	1123
3	Sulphur Dioxide as SO ₂ ug/m ³	8.94

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On 13/11/2024

Ms Garima Mishra

BOARD ANALYST

Rajasthan State Pollution Control Board

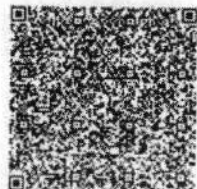
Regional Office Bikaner

33, Phase-II, Bichwal Industrial Area, Bikaner

Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.13 13:08:59 IST
Reason: Self-attested
Location:



FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)

Report No. : 2463

Report On : 12/11/2024

I hereby certify that I Ms Garima Mishra, State Board Analyst duly appointed under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981 received on the 11/11/2024 from VEENU SINGHAL, JSO, Bikaner ,RSPCB Bikaner a sample of Ambient Air Quality of House of Mr. Puran Singh , Village-Khara , Tehsil and District -Bikaner Collected from Ambient Air Quality Monitoring at House of Mr. Puran Singh (Near Govt. Sr. Sec. School, Khara) Collected on 08/11/2024. The Sample was in a condition fit for analysis as reported below :- I further certify that I have analyzed the aforementioned sample on 12/11/2024 and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	26.59
2	Particulate Matter (PM ₁₀) µg/m ³	1075
3	Sulphur Dioxide as SO ₂ ug/m ³	8.94

The condition of the seals, fastening and container on receipt was as follows : **Intact**

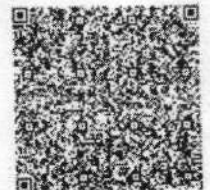
Signed This On 12/11/2024

Ms Garima Mishra
BOARD ANALYST

Rajasthan State Pollution Control Board
Regional Office Bikaner
33, Phase-II, Bichwal Industrial Area, Bikaner
Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.12 16:27:15 IST
Reason: Self Attested
Location:



FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)

Report No. : 2462

Report On : 12/11/2024

I hereby certify that I Ms Garima Mishra, State Board Analyst duly appointed under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981 received on the 08/11/2024 from ANKIT KUMAR, JSO, Bikaner ,RSPCB Bikaner a sample of Ambient Air Quality of House of Mr. Puran Singh , Village-Khara , Tehsil and District -Bikaner Collected from Ambient Air Quality Monitoring at House of Mr. Puran Singh (Near Govt. Sr. Sec. School, Khara) Collected on 07/11/2024. The Sample was in a condition fit for analysis as reported below :- I further certify that I have analyzed the aforementioned sample on 12/11/2024 and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	28.01
2	Particulate Matter (PM ₁₀) µg/m ³	1528
3	Sulphur Dioxide as SO ₂ ug/m ³	9.71

The condition of the seals, fastening and container on receipt was as follows : Intact

Signed This On 12/11/2024

Ms Garima Mishra
BOARD ANALYST

Rajasthan State Pollution Control Board
Regional Office Bikaner
33, Phase-II, Bichwal Industrial Area, Bikaner
Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.17 18:26:08 IST
Reason: Self Attested
Location:



FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Report No. : 2461

Report On : 12/11/2024

I hereby certify that I **Ms Garima Mishra**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **07/11/2024** from **ANKIT KUMAR, JSO, Bikaner ,RSPCB Bikaner** a sample of **Ambient Air Quality of House of Mr. Puran Singh , Village-Khara , Tehsil and District -Bikaner** Collected from **Ambient Air Quality Monitoring at House of Mr. Puran Singh (Near Govt. Sr. Sec. School, Khara)** Collected on **06/11/2024**. The Sample was in a condition fit for analysis as reported below :-
I further certify that I have analyzed the aforementioned sample on **12/11/2024** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Nitrogen Dioxide as NO ₂ µg/M ³	32.48
2	Particulate Matter (PM ₁₀) µg/m ³	1143
3	Sulphur Dioxide as SO ₂ ug/m ³	9.84

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **12/11/2024**

Ms Garima Mishra

BOARD ANALYST

Rajasthan State Pollution Control Board

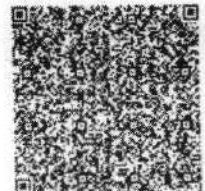
Regional Office Bikaner

33, Phase-II, Bichwal Industrial Area, Bikaner

Phone: 0151-2250006

Signature valid

Digitally signed by Garima Mishra
Date: 2024.11.12 06:24:13 IST
Reason: Self Attested
Location:





RAJASTHAN STATE POLLUTION CONTROL BOARD

Yashwantrao Chavan Marg, Institutional Area, Jhalana Doongri, Jaipur (Rajasthan)

Phone no. 0141- 27168049, 2716800, Helpline - 0141-2716877

Member Secretary,
RSPCB, Jaipur.

Sub: Visit report of Khara Industrial Area, Bikaner.

Ref: Complaint received regarding air pollution in Khara village, Bikaner.

Sir,

With reference to above, POP cluster in Khara Industrial area was visited on 19.11.2024 and 20.11.2024 by officials of this office. Detailed visit report is enclosed for further necessary action please.

Encl.:- As above

Yours sincerely,


(Prema Lal)

Chief Environmental Engineer

Visit report of Plaster of Paris industries situated near Village Khara, Tehsil and District, Bikaner

In compliance of direction issued in meeting held on 18-11-2024, a team was deputed for the verification of complaint regarding air pollution in Khara village due to POP industries situated in Khara industrial area in Bikaner. The team of following officials visited the Khara Industrial Area and Khara village on date 19-11-2024 and 20-11-2024:

1. Sh. Prema Lal, CEE, RSPCB, Jaipur
2. Dr. Manoj Meena, Supdt. SO, RSPCB, Jaipur
3. Dr. Mahesh Malav, SO, RSPCB, Jaipur

During visit, representatives of village Khara and representative of Khara Industrial Association were also present.

1. Background: -

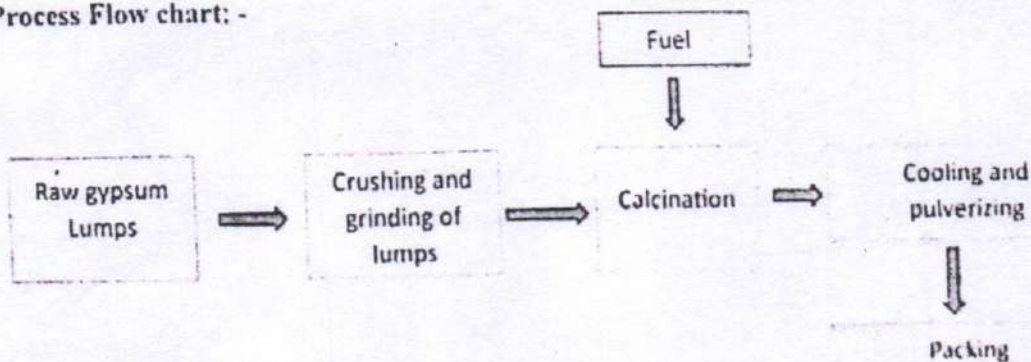
Khara industrial area in Bikaner has been developed by RIICO in different specified zones i.e. General Zone (1 nos.), Ceramic Zone (1 nos.) and Mineral Zone (3 nos.) (Map enclosed as Annexure - 1). In Khara Industrial Area 177 industries are operational. Major industries in Khara Industrial Area are plaster of paris units (78 Nos.), clay grinding (10 Nos.), Woollen processing (13 Nos.), Dal Mill (26 Nos.), insulator manufacturing (11 Nos), Gas bottling plant (1 Nos), lead batteries (02 nos) and 36 other small categories of industries.

Out of 3 mineral zones of RIICO, one zone is situated adjacent to the Khara Village in which 53 industries are situated. Out of these 53 industries, 40 industries are POP manufacturing units (Annexure-2). Distance between mineral zone and village khara is approx 10 mtr. A Govt. Sr. Sec. school is also situated near this mineral zone.

2. Details about Plaster of Paris industries: -

Plaster of Paris (POP) chemically is Hemi-hydrate of calcium sulphate ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$) produced by calcinations/heat treatment of gypsum, a di-hydrate of calcium sulphate ($\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$). All industries are small scale units having conventional batch process of producing POP ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$). POP industries are having rotary calciner drum of capacity 1 to 2 Ton, where gypsum is heated to produce POP. Wood/Mustard Husk is used a fuel. Average Batch period is 1 to 1.5 hrs Hours and Avg. Production capacity per Drum is 10 TPD with fuel consumption of husk 800-1000 kg per day.

Process Flow chart: -



Plaster of Paris industry is running on old and obsolete technology due to no advancement in technology that results in emissions in huge quantity causing air pollution problem in the surrounding areas. All the dust emissions are primarily fugitive in nature and are generated during

(Signature)

(Signature)

(Signature)

Visit report of Plaster of Paris industries situated near Village Khara, Tehsil and District, Bikaner

In compliance of direction issued in meeting held on 18-11-2024, a team was deputed for the verification of complaint regarding air pollution in Khara village due to POP industries situated in Khara industrial area in Bikaner. The team of following officials visited the Khara Industrial Area and Khara village on date 19-11-2024 and 20-11-2024:

1. Sh. Prema Lal, CEE, RSPCB, Jaipur
2. Dr. Manoj Meena, Supdt. SO, RSPCB, Jaipur
3. Dr. Mahesh Malav, SO, RSPCB, Jaipur

During visit, representatives of village Khara and representative of Khara Industrial Association were also present.

1. Background: -

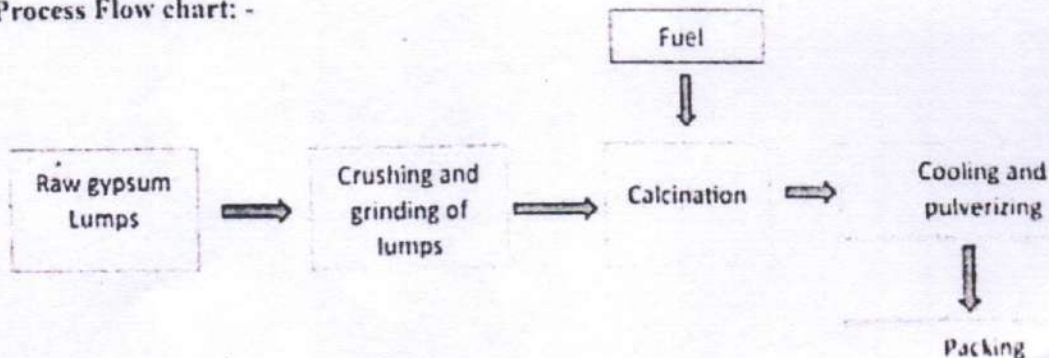
Khara industrial area in Bikaner has been developed by RIICO in different specified zones i.e. General Zone (1 nos.), Ceramic Zone (1 nos.) and Mineral Zone (3 nos.) (Map enclosed as Annexure - 1). In Khara Industrial Area 177 industries are operational. Major industries in Khara Industrial Area are plaster of paris units (78 Nos.), clay grinding (10 Nos.), Woollen processing (13 Nos.), Dal Mill (26 Nos.), insulator manufacturing (11 Nos), Gas bottling plant (1 Nos), lead batteries (02 nos) and 36 other small categories of industries.

Out of 3 mineral zones of RIICO, one zone is situated adjacent to the Khara Village in which 53 industries are situated. Out of these 53 industries, 40 industries are POP manufacturing units (Annexure-2). Distance between mineral zone and village khara is approx 10 mtr. A Govt. Sr. Sec. school is also situated near this mineral zone.

2. Details about Plaster of Paris industries: -

Plaster of Paris (POP) chemically is Hemi-hydrate of calcium sulphate ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$) produced by calcinations/heat treatment of gypsum, a di-hydrate of calcium sulphate ($\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$). All industries are small scale units having conventional batch process of producing POP ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$). POP industries are having rotary calciner drum of capacity 1 to 2 Ton, where gypsum is heated to produce POP. Wood/Mustard Husk is used a fuel. Average Batch period is 1 to 1.5 hrs Hours and Avg. Production capacity per Drum is 10 TPD with fuel consumption of husk 800-1000 kg per day.

Process Flow chart: -



Plaster of Paris industry is running on old and obsolete technology due to no advancement in technology that results in emissions in huge quantity causing air pollution problem in the surrounding areas. All the dust emissions are primarily fugitive in nature and are generated during

Mb

hij

AM

raw material storage, material handling, vehicular movement, crushing of lump and pulverizing activities. During calcining process, stack emission is also generated from calciner drum and flue gas from calciner furnace (Photo enclosed as annexure-6).

3. Details received from Regional Office: -

A complaint was received through e-mail on date 23-10-2024 regarding rising air pollution due to operation of plaster of paris along with proof of photos and video. Therefore, visit of village Khara and RIICO Industrial Area, Khara was conducted by Regional Officer in the presence of resident of Khara on date 24-10-2024. On the basis of finding during visit, three teams were constituted by Regional Office to conduct detailed survey of Khara Industrial Area.

Total 72 industries (plaster of paris as on 21-11-2024) were inspected during survey of Khara industrial area and 53 show cause notices for intended closure direction have been issued till date.

Ambient air quality monitoring were conducted in village Khara from 06-11-2024 to 17-11-2024 for 10 days at three different locations to collect the data of ambient air quality of Khara village, results of which are given in Table-1 (Location map as annexure -3). Ambient monitoring of Khara Industrial Area was conducted from 14-10-2024 to 16-10-2024 by CAAQMS mobile van. Details of parameters (PM10, PM2.5) analyzed by CAAQMS mobile van is given in Table-2

Table: 1 Results of ambient air quality monitoring for 10 days at three different locations of Khara village

Date	Location	PM10 ($\mu\text{g}/\text{m}^3$)
06-11-2024	House of Puran Singh, behind Govt. Sr. Sec. School, Khara	1143
07-11-2024		1528
08-11-2024		1075
11-11-2024	near boundary of Khara village and POP cluster	1123
12-11-2024		964
13-11-2024		1189
14-11-2024	House of Sh Kishan Singh Suthar, Village- Khara (In the middle of the Village)	398
15-11-2024		505
16-11-2024		557
17-11-2024		467

Table: 2 Analysis results of parameters analyzed by mobile van CAAQMS

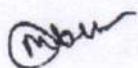
Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM2.5 ($\mu\text{g}/\text{m}^3$)
14-10-2024	1440	346
15-10-2024	1277	238
16-10-2024	3129	790

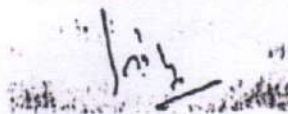
4. Team Observations: -

Team of RSPCB officials visited the Khara Industrial Area, Bikaner on date 19-11-2024 (night time) and 20-11-2024 (day time) regarding problem of air pollution in Khara village.

During visit, following observations were made:

1. During night visit, heavy emissions were observed from stack of calciner drums and calciner furnaces as plume was clearly visible over the industrial area and village. Fugitive emission was also observed due to various activities i.e. material handling, vehicular movement (Photos enclosed as annexure-6).







2. Sup.
- II. Team visited Government Senior Secondary School, Khara and observed POP dust deposition on plant and land in school premises. School Principal reported that children are getting sick due to the air pollution from the industrial area (Annexure -4).
 - III. Team also visited Khara village and observed POP dust deposition on plants and houses in village.
 - IV. During visit, POP units situated in mineral zone near village were found non-operational. Although, few industries were visited to check status of Pollution Control Measures (PCM) installed in POP industries.
 - V. Majority of Plaster of Paris units have been established in mineral zone, which was situated adjacent to the village Khara. Plaster of Paris industries is having rotary calciner drum, where gypsum is heated to produce Plaster of Paris (PoP). For heating of gypsum, a furnace is constructed around the drum. Wood/Mustard Husk is used as a fuel in calciner furnace (Photo enclosed as annexure-6). However, some industries were conducting trials to shift to gaseous/electric fuel to alleviate the problem of air pollution.
 - VI. Major source of air pollution in Plaster of Paris industries are as follows: -
 - Fugitive emission from crushing of lump by crusher and grinding activities of gypsum.
 - Stack emission from calciner drum and flue gas from calciner furnace.
 - Fugitive emission from raw material storage, material handling, vehicular movement.
 - VII. Stack cum settling chambers has been provided at calciner drum as pollution control measures. But they were found to be inefficient to control dust emission from the units.
 - VIII. Lump crushers have been installed without cover by the POP units. Raw material was not covered properly and housekeeping was very poor as dust was found spread everywhere within the premises.
 - IX. Most of the roads of the mineral zone were found damaged. Physical conditions of roads reveal that cleaning of roads has not been done since long. Due to which fugitive emission was taking place by the movement of vehicles.
 - X. Regular cleaning of premises of PoP has not been done, which is also causing fugitive emissions in nearby area.
 - XI. During visit, water spraying was found on roads and within premises of Plaster of Paris units.
 - XII. POP industries were non-operational during the visit. Therefore, team conducted ambient monitoring nearby Khara Village to know the air quality during non-operational condition of POP cluster. Analysis Results obtained during non-operational condition were compared with the results in operational condition of the POP cluster and indicated significant reduction in PM10 concentrations. 72.7 % reduction was observed on the boundary of Khara village and POP cluster while 48.1% reduction was observed in the middle of the village (Table-3).

Table: 3 Percentage reductions in PM10 concentrations

S. N.	Location	Average PM10 concentration in operational condition ($\mu\text{g}/\text{m}^3$)	Average PM10 concentration in non-operational condition ($\mu\text{g}/\text{m}^3$)	Reduction in PM10 concentration (%)
1.	On the boundary of Khara village and POP cluster	1092	298	72.7
2.	In the middle of the Village	482	250	48.1

- XIII. During visit PM10 concentration in upwind direction of the cluster was $185 \mu\text{g}/\text{m}^3$.

(Signature)

(Signature)

(Signature)


XIV. As depicted in wind rose diagrams, during winters prevalent wind direction is from south-west to North-East in Bikaner region. CAAQM station is situated on upwind side of POP cluster thus it can be concluded that emission occurring in the Khara industrial area has no significant effect on the AQI of Bikaner. PM10 values of Khara village and AQI of CAAQM station, Bikaner are tabulated below (Google map & Windrose diagram enclosed as annexure-5).


Table: 4 PM10 values of Khara village and AQI of CAAQM station, Bikaner

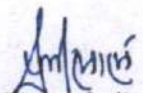
Date	PM10 Value of Monitored Location in Khara Village in $\mu\text{g}/\text{m}^3$	AQI of CAAQM Station, Bikaner
06 Nov.2024	1143	204
07 Nov. 2024	1528	205
08 Nov. 2024	1075	176
11 Nov. 2024	1123	186
12 Nov. 2024	964	249
13 Nov. 2024	1189	295
14 Nov.2024	398	249
15 Nov. 2024	505	201
16 Nov. 2024	557	307
17 Nov.2024	467	346

Recommendation:-

- Looking to the gravity of air pollution problem in the Khara village, closer direction may be issued to the POP industries situated in the mineral zone near village.
- To control emission from stacks/fugitive emission, following measures may be adopted:
 - ✓ Adequate pollution control measures like wet scrubber with dust collector with reactor/furnace stack may be adopted. However, controlling emission from process stack is difficult in these types of units. Therefore, a study may be conducted to find out best suitable Pollution Control Measure (PCM) for POP industry.
 - ✓ To control fugitive emission in industrial premises, raw material should be properly covered. Housekeeping, plantation needs to be improved and daily water spraying in the premise of unit may be ensured.
 - ✓ To control fugitive emission due to vehicular movement in the unit premises, vehicle movement area should be metallic and units may be directed to use dumping yard of RIICO for the disposal of dust.
 - ✓ A letter may be sent to RIICO to construct metallic road in mineral zone and to remove waste dumped near road sides and ensure routine cleaning of the roads.
- The main reason of complaint is that POP units are situated in a cluster nearby village. Khara village is also situated in downwind direction of Khara Industrial Area. Therefore, to permanently resolve the issue the POP cluster may be shifted to another location by the RIICO.


(Dr. Mahesh Malav)
Scientific Officer


(Dr. Manoj Kumar Meena)
Supdt. Scientific Officer


(Prema Lal)
Chief Environmental Engineer



खारा ग्रोथ सेन्टर उद्योग संघ



उद्योग संघ भवन, औद्योगिक केन्द्र, खारा, बीकानेर (बीकानेर)

अध्यक्ष

परविन्द्रसिंह राठौड़

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मो. 9785070306

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गौरव खत्री

मो. 9414447386

सेवाने
श्रीमान श्रीजिज्य अधिकारी महोदय
राजस्थान प्रदूषण नियंत्रण बोर्ड
बीकानेर.

JESUR
25/11/24

25/11/24

विषय :- पुरानी पद्धति से संचालित समस्त POP इकाइयों को नवीन पद्धति से प्रदूषण नियंत्रण उपकरण सुझाने तक स्थगित कर देने बाबत

मान्यवर

निवेदन है कि खारामें करीब 100 POP इकाइयां संचालित हैं ये सभी अति सूक्ष्म कण उद्योग की श्रेणी में आते हैं ये समस्त इकाइयों CPCB के द्वारा 2007 में कार्यादि गये अध्यायन में बताये गये नियमों के आधार पर ही संचालित हैं ये सभी इकाइयां एक समूह में स्थित हैं और सभी इकाइयां पुरानी पद्धति के आधार पर ही चल रही हैं।

इस क्षेत्र में सड़कों के धूलान पहले से ही अत्यधिक खराब है। RIICO द्वारा सड़कों की सफाई कई स्थानों से नहीं हुई है जिससे भी वायु प्रदूषण अत्यधिक हो रहा है।

जैसे ही हम POP उद्योगों को ज्ञात हुआ कि खारा के आस पास वायु गुणवत्ता की स्थिति खराब है तब हमारे सभी POP उद्योगों द्वारा यह निर्णय लिया गया है कि जब तक प्रदूषण भंडल बारा वायु प्रदूषण को कम करने के लिये लक्ष्य पर्याप्त उपकरण सुझाये नहीं जायेंगे तब तक खारा क्षेत्र की सभी इकाइयां पूर्ण रूप से सर्व सहमति से बंद रखी जायेगी।

हमारे सभी POP उद्योग पुरानी पद्धति से ही संचालित हैं एवं वायु प्रदूषण कम करने के संदर्भ में कोई भी अध्यायन ना ही किसी संस्था द्वारा और किसी भी विभाग के द्वारा नहीं किया गया है।



[Handwritten Signature]



खारा ग्रोथ सेन्टर उद्योग संघ



उद्योग संघ भवन, औद्योगिक केन्द्र, खारा, बीकानेर (बीकानेर)

अध्यक्ष

परविन्द्रसिंह राठौड़

मो. 9414138804

सचिव

प्रकाश सोनावत

मो. 9785070306

कोषाध्यक्ष

गौरव खत्री

मो. 9414447386

निवेदन है कि प्रेडल द्वारा अब तक POP उद्योगों में वायु प्रदूषण को कम करने के उपकरण नहीं जुटाये जायेगीं तब तक खारा से कि सभी POP इकाईयां पूर्ण रूप से सर्वसहमति से बंद रखी जायेगी।

सह-मकाद

सचिव

प्रकाश सोनावत



Rajasthan State Pollution Control Board

Headquarter, 4, Institutional Area, Jhalana Doongri, Jaipur-302004
Phone : 0141- 2716804, 2716800 e-mail : member-secretary@rspcb.nic.in
Helpline No. : 0141-2716877

Registered/Email

F.14/Tech/Complaint (Bikaner-20)/RPCB/Misc/462-469

Date:-08.12.2024

Office Order

For verification of the complaint regarding air pollution due to Plaster of Paris (POP) units in cluster at Khara Industrial Area Bikaner, a team of Head Office, RSPCB visited the site during 19.11.2024 to 20.11.2024. The visit report reveals that there is inadequacy of the Pollution Control Measures (PCM) in the POP units which need to be improved at the earliest. Further, representations have been received from these units seeking guidance for improvement in the pollution control measures.

In view of the above, a team of following Board Officers is hereby deputed to camp at Bikaner from 09.12.2024 for guidance of the POP units:

1. Sh. Prema Lal, CEE, RSPCB, Jaipur
2. Sh. Deepak Tanwar, SEE, RSPCB, Jaipur
3. Sh. Ankur Pathak, EE, RSPCB, Jaipur

The team, in association with the Regional Office, RSPCB Bikaner shall facilitate the units for dissemination of proper knowledge to the members by a small training and collaborating with PCM manufacturing industries.

This bears approval of the competent authority.

(Vijai N.)

Member Secretary

Date-08.12.2024

F.14/Tech/Complaint (Bikaner-20)/RPCB/Misc/462-469

Copy to the following for information/necessary action:

1. PS to the Chairperson, RSPCB, Jaipur
2. Sh. Prema Lal, CEE, RSPCB, Jaipur.
3. Sh. Deepak Tanwar, SEE, RSPCB, Jaipur
4. Sh. Ankur Pathak, EE, RSPCB, Jaipur.
5. RO, RSPCB, Bikaner to extend required support to the team.
6. GIC (Adm), RSPCB, Jaipur to arrange vehicle for the team.
7. Master File, Miscellaneous Cell, RSPCB, Jaipur.

RajKaj Ref
12298538



Signature Not Verified

Digitally signed by N. Vijai
Designation : Member Secretary
Date: 2024.12.08 12:58:00 IST
Reason: Approved

List of Closure Direction Issued in Khara

Sr. No	Name of Unit	Address of Unit	Tehsil	District	Closure issued
1	Shri Siddhi Vinayak Industries	F-334, IGC, Khara, Bikaner	Bikaner	Bikaner	Closure direction issued vide letter no F.Tech/(CD-761)/RPCB/CD/UID-108122/1435-1439 dated 13/02/2023
2	Mitherwal POP Industires	E-333, IGC, Khara, Bikaner	Bikaner	Bikaner	Closure direction issued vide letter noF.Tech/(CD-762)/RPCB/CD/UID-35572/1430-1434 dated 13/02/2023
3	Panwar Industries (Old Name-Kedar Upadhyay)	F-347, IGC, Khara	Bikaner	Bikaner	Closure Direction issued vide letter no 4257-4262 dated 04.01.2025
4	Amit chemicals & minerals	G-1- 355, IGC khara	Bikaner	Bikaner	Closure Direction issued vide letter no 4279-4284 dated 06.01.2025
5	R.K. Minerals (Laxmi Plaster Udyog)	15, K.A. Pproject, Near IGC Khara	Bikaner	Bikaner	Closure Direction issued vide letter no 4268-4272 dated 06.01.2025
6	Om Vishnu Chemicals & Minerals	159(C), K.A.Project, near IGC Khara	Bikaner	Bikaner	Closure Direction issued vide letter no 4285-4289 dated 06.01.2025
7	M/s Ronak Enterprises	Plot No. 114 KA Project, Near IGC Khara, Bikaner	Bikaner	Bikaner	Closure Direction issued vide letter no 4263-4267 dated 06.01.2025
8	S.P. Delu Plasto Chem (Old-Global Industries)	E-355, IGC, Khara	Bikaner	Bikaner	Closure Direction issued vide letter no 4298-4303 dated 07.01.2025
9	G.K.L.Plaster (old name- jai shree balaji mineral product)	H-1-324(E), H-1-324(F) & H-1-324(G), IGC Khara Bikaner Bikaner	Bikaner	Bikaner	Closure Direction issued vide letter no 4310-4315 dated 07.01.2025

VIJAI N.
IFS
Member Secretary



Dear Inderjeet,

D.O. No.F.14/Gen-196/Bikaner/RSPCB/B&I/ 794
Date: 16/01/2025

I would like to invite your attention towards the matter related to problem of air pollution in Khara Village due to Plaster of Paris (POP) industries situated in Khara Industrial Area, Bikaner. In this matter a team of senior officials of RSPCB has visited the Khara Industrial Area, Bikaner on 19.11.2024 & 20.11.2024.

As per the observations of the RSPCB Team, most of the roads of the Mineral Zone were found damaged. Physical conditions of roads reveal that cleaning of roads has not been done since long. This majorly contributes to the fugitive emissions due to movement of vehicles.

The above issue of air pollution of Khara Industrial Area, Bikaner is a violation of regulations and is also required to be addressed immediately by M/s RIICO Ltd.

For abatement of air pollution in Khara Industrial Area, Bikaner, as per the observations and suggestions made by the RSPCB Team, following actions are immediately required to be taken by M/s RIICO Ltd.:-

- i. Construction of metallic roads in mineral zone.
- ii. Removal of all the waste dumped near road sides.
- iii. Routine cleaning of the roads in the area.

You are, therefore, requested to look into the matter and issue necessary directions to the concerned officials to take action as per the suggested measures by officials of RSPCB and to submit the compliance report to the Regional Office, State Pollution Control Board, Bikaner.

Best wishes.

(Vijai N.)

Member Secretary

Sh. Inderjeet Singh
Managing Director,
RIICO Ltd.,
Udhyog Bhawan,
Tilak Marg, C-Scheme, Jaipur
E-mail: md@riico.co.in



Rajasthan State Pollution Control Board

Headquarter, 4, Institutional Area, JhalanaDoongri, Jaipur-302004

Phone :0141-2711263,2716802 e-mail : member-secretary@rpcb.nic.in

RSPCB HelpLineNo. :0141-2716877

Office Order

The following teams of Board Officials are constituted to carry out Stack/Fugitive emission monitoring of the POP units situated in Khara Industrial Area, Bikaner from 27/01/2025 to 31/01/2025. The teams shall work in supervision of Sh. Santosh Kumar Basethia, GIC- Advance Lab & PMRMC Cell:

Team 1

1. Dr. Mahesh Kumar Malav, SO, Air Lab
2. Sh. Pawan Kumar, JSO, Air Lab

Team 2

1. Sh. Dayaram, SO, OCEMS Cell
2. Sh. Deepak Jeliya, JSO, Water & Microbiology Lab

The deputed officers shall work in coordination with the Regional Officer, RSPCB, Bikaner. Applicable TA/DA will be payable as per the norms.

(Vijai N.)
(Member Secretary)

File No. F11(114)/RSPCB/Air/96-104

Date: - 24.1.25

Copy to following for information/Necessary action:

1. P.S. to Chairperson, RSPCB, Jaipur.
2. Financial Advisor, RSPCB, Jaipur.
3. GIC- Admin, RSPCB, Jaipur to arrange monitoring vehicle.
4. Regional Officer, Regional Office, RSPCB, Bikaner for information.
5. Sh. Santosh Kumar Basethia, GIC- Advance Lab & PMRMC Cell.
6. Dr. Mahesh Malav, SO, Air Lab.
7. Sh. Dayaram, SO, OCEMS Cell.
8. Sh. Pawan Kumar, JSO, Air Lab.
9. Sh. Deepak Jeliya, JSO, Water & Microbiology Lab.

Signature valid

Digitally signed by Member Secretary
Designation: Member Secretary
Date: 2025.01.24 10:37:33 IST
Reason: Approved



o/c



रा.रा.प्र.नि.म./क्षे.का./बीका/जन-152/4111-4114

दिनांक:- 27/12/2024

खारा औद्योगिक क्षेत्र में उत्पन्न वायु प्रदूषण की समस्या के सम्बन्ध में जिला कलक्टर की अध्यक्षता में आयोजित बैठक दिनांक 10.12.2024 का कार्यवाही विवरण

कार्यालय जिला कलक्टर, बीकानेर द्वारा जारी आदेश दिनांक 06.12.2024 में प्रदत्त निर्देशों के क्रम में खारा औद्योगिक क्षेत्र में उत्पन्न वायु प्रदूषण की समस्या के सम्बन्ध में एक बैठक का आयोजन दिनांक 10.12.2024 को प्रातः 11.00 बजे जिला कलक्टर महोदया के कक्ष में किया गया। उक्त बैठक में श्री एस.के.गर्ग (उपमहाप्रबन्धक), इकाई प्रभारी, रीको लिमिटेड, बीकानेर, श्री गिरीश व्यास, सहायक पर्यावरण अभियन्ता, क्षेत्रीय कार्यालय, राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, बीकानेर तथा खारा उद्योग संघ के प्रतिनिधि श्री सीताराम, श्री बजरंग, श्री अमित कुमार एवं श्री रामसिंह उपस्थित रहे।

प्रदूषण नियंत्रण मण्डल के प्रतिनिधि द्वारा जिला कलक्टर महोदया को अवगत करवाया गया कि उक्त समस्या खारा औद्योगिक क्षेत्र में संचालित विभिन्न प्लास्टर ऑफ पेरिस द्वारा किये जा रहे वायु प्रदूषण के कारण उत्पन्न हुई है। ये सभी प्लास्टर ऑफ पेरिस उद्योग खारा गांव से सटे हुए रीको के औद्योगिक क्षेत्र आई.जी.सी. खारा में स्थित हैं जो कि रीको लिमिटेड, बीकानेर द्वारा तीन समूहो जनरल जोन, सिरैमिक जोन एवं मिनरल जोन में विकसित किया गया है जिसमें से एक मिनरल जोन खारा गांव से लगभग 20 मीटर की दूरी पर ही स्थित है। सभी प्लास्टर ऑफ पेरिस उद्योगों द्वारा संचालन के दौरान काफी मात्रा में फ्यूजिटिव उत्सर्जन किया जाता है जो कि खारा गांव में वायु प्रदूषण की समस्या का मुख्य कारण है।

प्रदूषण नियंत्रण मण्डल के प्रतिनिधि द्वारा यह भी अवगत करवाया गया कि खारा गाँव में प्लास्टर ऑफ पेरिस उद्योगों द्वारा प्रदूषण फैलाने के संबंध में शिकायत पूर्व में क्षेत्रीय कार्यालय, बीकानेर को दिनांक 23 अक्टूबर 2024 को प्राप्त हुई थी जिसका सत्यापन दिनांक 24 अक्टूबर 2024 को गांव वालो की उपस्थिति में किया गया एवं इस संदर्भ में खारा औद्योगिक क्षेत्र में स्थित प्लास्टर ऑफ पेरिस ईकाईयों के सर्वे/निरीक्षण हेतु क्षेत्रीय कार्यालय, राजस्थान राज्य प्रदूषण नियंत्रण मंडल, बीकानेर द्वारा आदेश दिनांक 28.10.2024 के माध्यम से तीन दलों का गठन किया गया है। सर्वे के दौरान नियमों की पालना करते नहीं पाये जाने वाले प्लास्टर ऑफ पेरिस उद्योगों को वायु (प्रदूषण नियंत्रण एवं रोकथाम) अधिनियम, 1981 के प्रावधानों के अन्तर्गत कारण बताओ नोटिस जारी किए जा चुके हैं। साथ ही क्षेत्रीय कार्यालय, बीकानेर द्वारा दिनांक 06.11.2024 से 17.11.2024 के मध्य खारा गाँव में 3 अलग-अलग स्थानों पर परिवेशीय वायु की गुणवत्ता की जाँच करवाई गई तथा बाद में दिनांक 20.11.2024 को प्लास्टर ऑफ पेरिस उद्योग संचालित नहीं होने के दौरान भी खारा गाँव में परिवेशीय वायु की गुणवत्ता की जाँच करवाई गई है। खारा औद्योगिक क्षेत्र में स्थित प्लास्टर ऑफ पेरिस उद्योगों के निरीक्षण हेतु मंडल मुख्यालय, राजस्थान राज्य प्रदूषण नियंत्रण मंडल, जयपुर द्वारा भी एक कमेटी का गठन किया गया था। उक्त कमेटी द्वारा खारा गांव के पास स्थित प्लास्टर ऑफ पेरिस उद्योगों का निरीक्षण दिनांक 19, 20 एवं 21 नवंबर को किया गया एवं जाँच रिपोर्ट मण्डल मुख्यालय को प्रस्तुत की गई जिसमें बताया गया कि प्लास्टर ऑफ पेरिस उद्योगों द्वारा प्रदूषण नियंत्रण हेतु उचित उपाय नहीं किये गये हैं। तत्पश्चात मण्डल मुख्यालय, जयपुर के आदेश दिनांक 08.12.2024 के द्वारा खारा औद्योगिक क्षेत्र में संचालित प्लास्टर ऑफ पेरिस उद्योगों के प्रतिनिधियों को प्रशिक्षण देने एवं उपयुक्त प्रदूषण नियंत्रण उपाय लागू करवाने एक टीम का गठन किया गया है।

जिला कलक्टर महोदया द्वारा प्रदूषण नियंत्रण मण्डल के प्रतिनिधि को उक्त कमेटी द्वारा दी गई रिपोर्ट से अवगत करवाने हेतु निर्देशित किया गया तथा खारा गाँव में उक्त प्रदूषण के कारण अस्वस्थ हुए ग्रामवासियों के बारे में जानकारी चाही गई। जिसके प्रत्युत्तर में प्रदूषण नियंत्रण मण्डल के प्रतिनिधि द्वारा उक्त जानकारी नहीं होना बताया गया। जिला कलक्टर महोदया द्वारा प्रदूषण नियंत्रण मण्डल के प्रतिनिधि को उक्त बैठक के कार्यवाही विवरण की प्रति मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी, बीकानेर को प्रेषित कर खारा गाँव में प्रदूषण के कारण अस्वस्थ लोगों की जानकारी प्राप्त करने हेतु निर्देशित किया।



क्षेत्रीय कार्यालय
राजस्थान राज्य प्रदूषण नियंत्रण मण्डल
प्लॉट नम्बर स्पेशल 33, बीछवाल औद्योगिक क्षेत्र,
बीकानेर




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खारा उद्योग संघ के प्रतिनिधि श्री रामसिंह द्वारा आक्षेप किया गया कि सभी प्लास्टर ऑफ पेरिस इकाईयों द्वारा प्रदूषण नियंत्रण हेतु आवश्यक सुधार किये जा रहे हैं परन्तु रीको द्वारा खारा औद्योगिक क्षेत्र में सड़क एवं सफाई की समुचित व्यवस्था नहीं किये जाने के कारण औद्योगिक क्षेत्र में काफी मात्रा में धूल जमी हुई है एवं वाहनों के आवागमन के दौरान उड़ती है जो कि क्षेत्र में वायु प्रदूषण की समस्या का मुख्य कारण है। इसके प्रत्युत्तर में रीको के उपमहाप्रबन्धक द्वारा अवगत करवाया गया कि खारा औद्योगिक क्षेत्र की सड़कों के पेचवर्क के वर्क ऑर्डर जारी कर दिये गये हैं एवं साफ सफाई हेतु नगर निगम, बीकानेर को वर्क ऑर्डर दे दिया गया है। रीको के प्रतिनिधि द्वारा बताया गया कि खारा औद्योगिक क्षेत्र में स्थित प्लास्टर ऑफ पेरिस उद्योगों द्वारा सर्विस चार्ज जमा नहीं करवाया गया है जिसके अभाव में बुनियादी सुविधाएँ उपलब्ध करवाना सम्भव नहीं है। खारा उद्योग संघ के प्रतिनिधि श्री अमित कुमार द्वारा आक्षेप किया गया कि रीको द्वारा खारा औद्योगिक क्षेत्र में ग्रीन बेल्ट विकसित नहीं किया गया है जिसके प्रत्युत्तर में रीको के प्रतिनिधि द्वारा बताया गया कि खारा औद्योगिक क्षेत्र में स्थित प्लास्टर ऑफ पेरिस उद्योगों द्वारा उद्योग परिसर की चारदीवारी का निर्माण नहीं किया जाता है एवं ठोस अपशिष्ट को परिसर के बाहर डाल दिया जाता है। जिला कलक्टर महोदया द्वारा इस सम्बन्ध में खारा उद्योग संघ के प्रतिनिधियों को सर्विस टैक्स जल्द जमा करवाने एवं रीको के प्रतिनिधि को साफ सफाई एवं सड़क की समुचित व्यवस्था करने हेतु निर्देशित किया।


खारा संघ के प्रतिनिधि श्री सीताराम द्वारा कहा गया कि पिछले 15 दिन से सभी प्लास्टर ऑफ पेरिस उद्योग बंद है परन्तु क्षेत्र में प्रदूषण की समस्या वर्तमान में भी व्याप्त है जिसका मुख्य कारण रीको द्वारा क्षेत्र का उचित रखरखाव नहीं किया जाना है। प्रदूषण नियंत्रण मण्डल द्वारा सर्वे कर सभी उद्योगों को बन्द करवाने सम्बन्धी कारण बताओ नोटिस जारी किये गये हैं एवं मात्र 15 दिन का समय दिया गया है जो कि सुधार करने की दृष्टि से बहुत कम है। सभी उद्योगों को सुधार करने हेतु एक माह का समय दिया जाये एवं तब तक उद्योगों को चालू रखने की स्वीकृति दी जाये। जिसके प्रत्युत्तर में प्रदूषण नियंत्रण विभाग के प्रतिनिधि द्वारा अवगत करवाया गया कि वर्तमान में राज्य मण्डल द्वारा किसी भी उद्योग को बन्द करने के निर्देश जारी नहीं किये गये हैं। राज्य मण्डल द्वारा गठित टीम की अनुशंसा के आधार पर प्लास्टर ऑफ पेरिस उद्योगों को प्रदूषण नियंत्रण के उचित उपाय लगाने हेतु निर्देशित किया जायेगा। खारा संघ के प्रतिनिधि श्री बजरंग द्वारा कहा गया कि प्रदूषण नियंत्रण विभाग के दल द्वारा बताये गये सुझाव काफी महंगे हैं एवं प्लास्टर ऑफ पेरिस उद्योग इन्हे लागू करने हेतु आर्थिक रूप से सक्षम नहीं है अतः उद्योगों द्वारा स्थानीय स्वदेशी तकनीक पर किये गये प्रदूषण नियंत्रण के उपायों को लागू करवाने हेतु प्रदूषण नियंत्रण विभाग को निर्देशित किया जाये। इस क्रम में जिला कलक्टर महोदया द्वारा प्रदूषण नियंत्रण विभाग के प्रतिनिधि को प्लास्टर ऑफ पेरिस उद्योगों की आर्थिक स्थिति को ध्यान में रखते हुए प्रदूषण नियंत्रण उपायों को लगवाने हेतु निर्देशित किया गया।

अन्त में सभी आगन्तुकों का धन्यवाद ज्ञापित करते हुए बैठक समाप्त की गई।


(राजकुमार मीणा)
क्षेत्रीय अधिकारी

प्रतिलिपि:-

1. जिला कलक्टर महोदया, बीकानेर को सूचनार्थ।
2. उपमहाप्रबन्धक एवं इकाई प्रभारी, रीको लिमिटेड, बीकानेर को सूचनार्थ एवं पालनार्थ।
3. मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी, बीकानेर को प्रेषित कर लेख है कि खारा गाँव में प्रदूषण के कारण अस्वस्थ हुए लोगों की सूची मय जानकारी उपलब्ध करवाने का श्रम करे।
4. अध्यक्ष खारा उद्योग संघ, बीकानेर को सूचनार्थ।


क्षेत्रीय अधिकारी