

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
Original Application No. 400/2019

In The Matter of: -

Social Action for Forest & Environment (SAFE)

Applicant(s)

Versus

Union of India & Ors.

Respondent(s)

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Anand Kumar

(Anand Kumar)
Scientist 'E'

Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar
Delhi-110032

Place: Delhi

Dated: 25.02.2021

**Interim Report on study of advance batch automated tyre pyrolysis plants in the matter of
O.A. No. 400 of 2019 before Hon'ble NGT (Principal Bench) New Delhi**

1.0 Background

In the above matter, CPCB vide its status and compliance report submitted before Hon'ble NGT on 18-12-2019 stated that it intends to carry out study of advance batch automated plants as well as existing batch plants vis-à-vis continuous plant to ascertain whether existing batch plants would be able to meet environmental concerns or advance batch automated plants are required to address the environmental concerns. It further stated that based on the outcome of the study it can be determined that whether existing batch/or advance batch automated plant is required or only continuous plants be allowed. CPCB had planned to complete the study within a period of four months starting from January 2020.

Hon'ble NGT (PB) vide its order dated 06-01-2020 directed that let the study be carried out with the involvement of NEERI and IIT, Delhi. (Copy of the order is at Annexure – A)

2.0 Actions taken by CPCB in compliance with Hon'ble NGT (PB) order dated 06.01.2020

In compliance of above order, CPCB requested IIT, Delhi and NEERI, Nagpur to nominate their representatives for carrying out the above stated study. Accordingly, the following nominations were received:

- Dr. K.V. George, Sr. Principal Scientist, CSIR - NEERI; and
- Prof. Shantanu Roy, Chemical Engineering Department, IIT Delhi

From CPCB, Shri Anand Kumar, Additional Director & Head WM- III Division represented CPCB in deciding the framework and protocol of the study. He also coordinated for carrying out the studies with NEERI, IIT Delhi and RDs of CPCB.

Due to unprecedented COVID 19 pandemic and resulting lockdowns the study could not be taken up as per proposed timeline. A meeting was convened through video conference (VC) on 19-06-2020 on the approach to be adopted, frame work and scope of the study. Dr. K.V. George, Sr. Principal Scientist, CSIR – NEERI, Prof. Shantanu Roy, Chemical Engineering Department, IIT Delhi and Shri Anand Kumar, AD & Head, WM – III Division, CPCB participated in the VC.

In the said VC it was agreed to carry out virtual tour through video conference of four tyre pyrolysis units (3 advanced batch automated process and 01 continuous process unit). Accordingly, virtual tours were organised in respect of the following advance batch automated plant as mentioned below:

- i. M/s Pairan pyrolysis Pvt. Ltd S 20, Tannery zone, SIPCOT Perundurai, Erode, Tamil Nadu (carried out on 30.09.2020);
- ii. M/s Narmada Industries, Manurethi Road, Siltara Phase-2, Raipur, Chhattisgarh (carried out on 05.10.2020);
- iii. M/s Excel Industries Kolhapur, Maharashtra (carried out on 08.10.2020);
- iv. M/s Royal Carbon Black Pvt Ltd, Village Vanivali, Patalganga, Khalapur, Raigad, Maharashtra (carried out on 30.11.2020)

In the above virtual tours, representatives of the respective Regional Directorate of CPCB also participated. CPCB again convened a VC with representatives of NEERI & IIT Delhi on 25.11.2020 to decide on protocols, parameters and any other actions required for completing the study. During the VC it was decided to carry out actual monitoring at 04 units where virtual tours were carried out earlier. Accordingly, in consultation with representatives from NEERI & IIT Delhi, protocol for carrying out field monitoring was finalized.

3.0 Study Protocol designed for carrying out field monitoring and number & type of plants to be studied

For completing the study, it was decided that seven plants (three advance batch, three existing batch and one continuous plant) will be studied. Following study protocol was finalised for carrying out the study.

- Monitoring will be carried out at both work zone/place as well as in ambient environment for monitoring ambient air quality. Following parameters to be monitored:
 - Work Place Monitoring (8 hr monitoring): Respirable dust (PM₁₀, PM_{2.5}), CO, VOCs, B(a)P.
 - Ambient Air Quality Monitoring (24 hr monitoring): PM₁₀, PM_{2.5}, B(a)P, VOCs.
- In case of batch process monitoring to be carried out at work zone/place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of charcoal /fine carbon for comparison purpose.
- For ambient air quality, monitoring to be carried out for 24 hours during operation of the plant at two locations.
- Detailed analysis of tyre pyrolysis oil in terms of its sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content (as per schedule V Part B of HoWM rules 2016).
- Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be analysed.
- Locations and numbers of sensors/alarms.
- Survey of minimum 10 persons in the adjoining areas (within 1km radius) through questionnaire including health assessment like respiratory problem, nausea and vomiting (questionnaire attached- Annexure- B)
- Health assessment of workers through questionnaire including respiratory problem, nausea and vomiting (questionnaire attached - Annexure - C).
- Any other parameter of interest if found to be useful during the study may also be included.

3.2 Number and type of Plants to be studied:

As submitted before the Hon'ble NGT that studies of advance batch automated plant, existing batch automated plant and continuous type plant would be carried out. Accordingly, it was decided to carry out study of **three advance batch automated plants, three existing batch plants and one continuous type plant**. Study of the following **three-advance batch automated plant** was carried out.

S.No	Type of Unit	Unit details	Date	Carried out by through
1	Advanced Batch Automated Process	M/s Pairan pyrolysis Pvt. Ltd S 20, Tannery zone, SIPCOT Perundurai, Erode, Tamil Nadu	06-07, January 2021	RD-Chennai
2	Advanced Batch Automated Process	M/s Excel Industries Kolhapur, Maharashtra	07-08 February, 2021	RD-Pune
3	Advanced Batch Automated Process	M/s Narmada Industries, Manurethi Road, Siltara Phase-2, Raipur, Chhattisgarh	09-11, February 2021	RD-Bhopal

A dry visit of tyre pyrolysis unit at M/s Centramac, M.G. Road, Hapur, UP has been made on 13-02-2021 by CPCB team along with Prof. Shantanu Roy, Chemical Engineering Department, I.I.T. Delhi. The unit was non-operational during the visit.

Study of existing batch plants located in the State of UP, Haryana, Punjab and one continuous type plant located in Maharashtra will be carried out by 15th April 2021.

4.0 Summary and findings of study at M/s Pairan pyrolysis Pvt. Ltd S 20, Tannery Zone, SIPCOT Perundurai, Erode, Tamil Nadu., (Advanced Batch Automated Process), M/s Narmada Industries, Siltara Industrial Area Phase-2, Raipur Chhattisgarh (Advanced Batch Automated Process) and M/s. Excel Industries (unit-2), Hatkanangale, Kolhapur.

4.1 Summary of M/s Pairan pyrolysis Pvt. Ltd S 20, Tannery Zone, SIPCOT Perundurai, Erode, Tamil Nadu

From the study report of CPCB RD, Chennai it is observed that the monitored parameters in the ambient air that is PM 2.5, PM 10 and CO are within the permissible limit. The value of Benzo (a) Pyrene is below the limit of quantification (BLQ) and value of benzene is nil.

Air quality of the work zone was also monitored. Parameters such as PM 2.5, PM 10, CO, Benzo-a-Pyrene (BaP), Dichloromethane, Toluene, Benzene and volatile organic compounds (VoCs) were monitored. The value of volatile organic compounds (M-XYLENE, O-XYLENE, Ethylbenzene, Styrene, Isopropyl benzene, 1,2,4-trimethylbenzene, 1,4-dichlorobenzene, 1,3,5-trimethylbenzene, Naphthalene) are within the permissible exposure limit (PEL) of 8 hr TWA prescribed by OSHA.

During the study the analysis of tyre pyrolysis oil (TPO) was also carried out. There is no specific standard prescribed for oil derived from waste/scrap tyres. So the TPO was compared with the specification of fuel derived from the waste oil as notified in Hazardous and Other Waste (Management and transboundary) Rules, 2016 Schedule – V Part – B. The parameters tested were Sediment, Lead as Pb, Arsenic as As, Cadmium as Cd + Chromium as Cr + Nickel as Ni, , Polyaromatic Hydrocarbons (PAH), Total Halogens as Cl, Polychlorinated Biphenyls(PCB), Sulphur as S, and Water Content. All parameters are found within the specification limits. Values of Arsenic as As, PCB and PAH are below the limit of quantification (BLQ). The calorific value of the TPO is 6347 Kcal /kg.

Health Survey of persons in adjoining areas within 1 km radius and of the workers within the factory premises was carried out through separate questionnaires (Enclosure – II and Enclosure – III) prepared for this purpose. From the survey of 10 persons within 1 km radius of industry, it was observed that presently there is no issue related to odour. However, around 2.0 years ago odour was an issue. Also no health related issue was reported. From the survey of workers within the factory premise 7 workers were surveyed and no health issue was reported. As per the survey, it was observed that the workers do not have any health issue.

The detailed report including comments on environmental concerns is enclosed at Annexure-D.

4.2 Summary of M/s Narmada Industries, Manurethi Road, Siltara Phase-2, Raipur, Chhattisgarh

From the study report of CPCB RD, Bhopal it is observed that in the ambient air quality the monitored parameter Benzo (a) Pyrene is below the detection limit (BDL). PM_{2.5} is within permissible limit at one location (Main Gate) and exceeding the permissible limit at the second location. Value of PM₁₀ is exceeding the permissible limit at both the locations.

Air quality of the work zone was also monitored at three different locations for 08 hours. Parameters such as PM_{2.5}, PM₁₀, CO, Benzo-a-Pyrene (BaP), total volatile organic compounds (TVOCs) were monitored. The value of Benzo-a-Pyrene (BaP) is below detection limit (BDL). The value of PM_{2.5}, PM₁₀ monitored at three location ranged between 57-70 $\mu\text{g}/\text{m}^3$ and 232-169 $\mu\text{g}/\text{m}^3$ respectively. The value of total VOCs is ranged between 0.093 to 0.125 $\mu\text{g}/\text{m}^3$.

During the study the analysis of tyre pyrolysis oil (TPO) was also carried out. There is no specific standard prescribed for oil derived from waste/scrap tyres. So the TPO was compared with the specification of fuel derived from the waste oil as notified in Hazardous and Other Waste (Management and transboundary) Rules, 2016 Schedule – V Part – B. The parameters tested were Sediment, Lead as Pb, Arsenic as As, Cadmium as Cd, Chromium as Cr, Nickel as Ni, Polyaromatic Hydrocarbons (PAH), Total Halogens as Cl, Polychlorinated Biphenyls(PCB), Sulphur as S, and Water Content. All parameters are found within the specification limits. Values of Arsenic as As, Lead as Pb, Cadmium as Cd are absent and PCB and PAH are below detection limit (BDL).

Health Survey of persons in adjoining areas within 1 km radius could not be possible as there was no village in the periphery of 1 KM. Health Survey of the workers within the factory premises was carried out through separate questionnaires (Enclosure – III) prepared for this

purpose. Total 10 workers within the factory premise were surveyed and no health issue was reported. As per the survey, it was observed that the workers do not have health issue. The detailed report including comments on environmental concerns is enclosed at Annexure- E.

4.3 Summary of M/s. Excel Industries (unit-2), Hatkanangale, Kolhapur

From the study report of CPCB RD, Pune it is observed that the monitored parameters in the ambient air that is PM2.5 and PM10 are within the permissible limit. The value of CO and Benzo (a) Pyrene are below the limit of quantification (BLQ).

Air quality of the work zone was also monitored at three different locations for 08 hours. Parameters such as PM2.5, PM10, CO, Benzo-a-Pyrene (BaP) and total volatile organic compounds (TVOCs) were monitored. The value of CO, Benzo-a-Pyrene (BaP) are below the limit of quantification (BLQ). The value of PM2.5, PM10 monitored at three location ranged between 21-23 µg/m³ and 55-58 µg/m³ respectively. The value of total VOCs is ranged between 0.1 to 0.9 ppm while door opened for steel scrap removal and during loading Carbon Black from Reactor to bag.

During the study the analysis of tyre pyrolysis oil (TPO) was also carried out. There is no specific standard prescribed for oil derived from waste/scrap tyres. So the TPO was compared with the specification of fuel derived from the waste oil as notified in Hazardous and Other Waste (Management and transboundary) Rules, 2016 Schedule – V Part – B. The parameters tested were Sediment, Lead as Pb, Arsenic as As, Cadmium as Cd, Chromium as Cr, Nickel as Ni, Polyaromatic Hydrocarbons (PAH), Total Halogens as Cl, Polychlorinated Biphenyls(PCB), Sulphur as S, and Water Content. All parameters are found within the permissible limits. Values of Arsenic as As, Lead as Pb, Cadmium as Cd and Chromium as Cr, Polychlorinated Biphenyls(PCB), Polyaromatic Hydrocarbons (PAH) and water content are below the limit of quantification (BLQ). The calorific value of the TPO is 9100 g/Cal.

Health assessment of workers and survey of persons in the adjoining areas (within 1 km radius) through questionnaire may not be applicable in this plant as the operation was resumed its operation only on the day of monitoring (i.e. 07/2/2021) after direction dated 21/12/2019 to close down the production. The CPCB and NEERI officials didn't observed impacts on their health (like eye irritation, nausea, headache, etc.) while in the plant during the two days of study periods. However, odour was felt in the plant shed to the scale of 4 (when rated at scale of 10) and scale of 1-3 at various other locations of the plant premises. The detailed report including comments on environmental concerns is enclosed at Annexure- F.

The above are the finding of three units namely M/s Pairan pyrolysis Pvt. Ltd S 20, Tannery zone, SIPCOT Perundurai, Erode, Tamil Nadu, M/s Narmada Industries, Manurethi Road, Siltara Phase-2, Raipur, Chhattisgarh and M/s Excel Industries Kolhapur, Maharashtra. CPCB has also scheduled such studies in the state of UP, Haryana, Punjab for existing batch type units and one continuous type unit at Maharashtra by 15th April 2021

It is humbly prayed to the Hon'ble NGT that time till 30th April 2021 may please be granted to CPCB for submission of final report. The final report along with collective findings on the adequacy of advance batch type for meeting the environmental concerns vs existing batch type vis a vis continuous batch type will be filed by 30th April 2021.

Item No. 05

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

Original Application No. 400/2019
(I.A. No. 403/2019, I.A. No. 611/2019, I.A. No. 615/2019 & I.A. No.
08/2020)

(With reports dated 18.12.2019 & 03.01.2020)

Social Action for Forest & Environment (SAFE)

Applicant(s)

Versus

Union of India & Ors.

Respondent(s)

Date of hearing: 06.01.2020

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE S.P WANGDI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER
HON'BLE MR. SIDDHANTA DAS, EXPERT MEMBER

For Applicant(s): Mr. Sanjay Upadhyay and Mr. Salik Shafique,
Advocates
Mr. Raj Panjwani, Senior Advocate for I.A. No.
403/2019
Mr. Ankit Lodaya, Advocate for I.A. No. 08/2019

For Respondent(s): Mr. Daleep Dhyani, Advocate for UPPCB
Mr. Divya Prakash Pande, Advocate for CPCB and
MoEF&CC

ORDER

- The issue for consideration is the absence of proper management of End-of-Life Tyres/Waste Tyres (ELTs) in accordance with the Environment (Protection) Act, 1986, Environment (Protection) Rules, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, CPCB Guidelines for Environmentally Sound Management of End of Life Vehicles, 2016 and Standard Operating Procedure (SOP) issued by the MoEF&CC.

it was observed that the reason of non-compliance is not meeting the criteria of SOP of MoEF & CC and the consent conditions issued by the SPCBs/PCCs. In case of non-compliances actions have been initiated in the form of closure directions or time specific directions for improvement or notices for compliance. The remedial measures suggested are as follows:

“Remedial Measures:

The following remedial measures are suggested for addressing the environmental concerns in the tyre pyrolysis units:

- 1) Only continuous tyre pyrolysis units be allowed and all the units having batch process be asked to switch over to continuous process within a given time frame of one year and till the time of conversion their operation be stopped;
- 2) The feed to the continuous reactors should be in the form of tyre chips and mechanical feeding system with air lock arrangements so that no air enters in the reactors.
- 3) The unit should install packed bed scrubber for control of gaseous emission and reduction of odour;
- 4) The tyre pyrolysis units should strictly follow the Standard Operating Procedures (SOPs) issued by MoEF& CC for continuous process and the consent conditions issued by SPCBs/PCCs.”

5. The report has also annexed Standard Operating Procedure (SOP) issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC) dated 24.11.2015 to the effect that ‘batch process’ leads to carbon spillage and exposure of workers. Some explosions have also been reported. Such process has major shortcomings. The recommendation is that the batch process should be switched over to ‘continuous process’ within one year. We are informed that that CPCB is going to issue a direction under Section 5 of the Environment (Protection) Act, 1986 directing switchover to ‘continuous process’ within one year.

6. Our attention has also been drawn to SOP on ‘import and recycling of waste pneumatic tyres’ to the effect that said tyres fall in Hazardous Waste Rules. Import thereof needs to be restricted to the actual users having requisite consent. It is also pointed out during the hearing that the State of Punjab issued order dated 15.11.2014 for the Location and Siting for Waste-tyre based Pyrolysis Plants and Pollution Prevention/Safety measures to be adopted by such units.

7. In view of above, it is clear that Pyrolysis process involves high level of pollution and also adversely affects

the health of the workers involved in the process. The matter being covered by the Hazardous Waste Management Rules, there is need for restrictions on import and to regulate location of such units in the light of the carrying capacity of the area.

8. Accordingly, CPCB may issue appropriate directions on the subject after due consideration of the issue. The directions should also deal with the restrictions on import so as to ensure that India does not become a dump yard for highly polluting hazardous waste material from other countries and also to ensure that health of the workers involved in the process is duly safeguarded.

9. The States wherein such 270 non-complying units are located need to take remedial action including levy of Environmental Compensation to ensure that such units comply with air, water and hazardous waste pollution norms within a reasonable time span. Let CPCB monitor the compliance and file the status and compliance report on or before 30.11.2019 by e-mail at judicial-ngt@gov.in.”

4. Accordingly, CPCB has filed status and compliance report on 18.12.2019 and additional supplementary status and compliance report on 03.01.2020. As per report dated 18.12.2019, information furnished by the 19 SPCBs and PCCs has been compiled which has been updated in the additional supplementary report dated 03.01.2020. The State wise status of compliance has been mentioned as follows:-

S. No.	States	Total number of units	Number of complying units	Non-complying units	Number of closed units	Remarks
1	Andhra Pradesh	39	06	15	18	The Board has issued closure order on 21.12.2019 to 15 number of non-complying Tyre pyrolysis units.
2.	Assam	08	05	0	03	-
3.	Bihar	18	0	2	18	All the 18 tyre pyrolysis units in the state are closed.
4.	Chhattisgarh	27	24	03	00	03 units disconnected

5. The statistics has been summed up as follows:-

“As per the action taken report as received from the SPCBs in compliance with the direction dated 04-12-2019, there are now 678 tyre pyrolysis units in 19 states of the country, an increase of 06 units over the last reported figure of 672. Out of 678 tyre pyrolysis units, 270 units are complying, 250 units are not complying and 155 units are closed/not in operation. CTO of 02 units are under renewal. Out of these two units one unit is operational and another unit is closed. 01 unit has applied for on line consent and the case is under process.

The increase in number of compliance units is mainly due to monitoring by CPCB and SPCBs. SPCBs based on direction of CPCB has started process of closing the non-compliance units. Maharashtra Pollution Control Board (MPCB) has recovered environmental compensation of Rs. 77,500/- from 3 units.”

6. Copies of directions issued by CPCB on 04.12.2019 and 30.12.2019 have been annexed which are as follows:-

04.12.2019

*“Now, THEREFORE, in exercise of the powers vested under the Section 5 of the Environment (Protection) Act, 1986, **directions are hereby issued to you to close down all such pyrolysis units in your State/UT which are not complying as on date with consent conditions and SOP of the MoEF&CC.** You are also directed to carry out strict vigilance and monitoring in complying industries to ensure continued compliance of consent conditions and SOP of MoEF&CC. You are further directed that import of polluting hazardous waste material shall be strictly regulated as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and amendment thereof.*

Action Taken Report (ATR) shall be submitted to the Central Pollution Control Board by 25.12.2019. Failing to comply with these directions, shall attract appropriate action under law.”

30.12.2019

“Now, THEREFORE, in exercise of the powers vested under the Section 5 of the Environment (Protection) Act, 1986, directions are hereby issued for regulating location of tyre pyrolysis industries in light of the carrying capacity of the area. Henceforth, any new/expansion of existing tyre pyrolysis industry be granted consent to establish or amendment in consent to establish only after assessing the carrying capacity of the area. You are also directed to ensure that health of workers involved in the tyre pyrolysis industries is safeguarded.

Action Taken Report (ATR) shall be submitted to the Central Pollution Control Board by 15.01.2020. Failing to comply with these directions, shall attract appropriate action under law.”

7. The CPCB has sought four months time to carry out further studies as follows:-

“In view of the representations from the All India Rubber & Tyre Recyclers Association, Mumbai (AIRTRA), where they have claimed that Advance Automated Plants addresses all the environmental concerns as raised by the CPCB and in view of the claim of Pyrolysis Industries Association, Punjab where they have claimed that existing batch plants are meeting the norms and SOPs, it has been decided that CPCB will carry out study of the advance batch automated plants as well as existing batch plants vis-a-vis continuous plant to ascertain whether existing would be able to meet environmental concerns or advance batch automated plants are required to address the environmental concerns. As per outcome of the study, further decision would be taken that whether existing batch/or advance batch automated plant is required or only continuous plants be allowed. CPCB has

planned to complete the said study within a period of four months starting from January 2020.”

8. Let the above study be carried out with the involvement of NEERI and IIT, Delhi. Compliance of directions already issued be overseen by the CPCB.

A further report in the matter be filed on or before 30.06.2020 by e-mail at judicial-ngt@gov.in. The report may also indicate the details of the environmental compensation assessed and recovered.

List for further consideration on 14.07.2020.

Adarsh Kumar Goel, CP

S.P Wangdi, JM

Dr. Nagin Nanda, EM

Siddhanta Das, EM

January 06, 2020
Original Application No. 400/2019
A

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	
2.	Age/ Gender	
3	Address /Contact number	
4.	Proximity of person from unit	
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	
6.	Specify if the person has any Health. Also mention duration	
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	
8.	Any feedback	

Date**Place****Name & designation of inspecting officer**

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	
2.	Age / Gender	
3.	Address /Contact Number	
4.	Designation	
5.	Work profile	
6.	Working since how many years?	
7.	Whether using PPE Kit	
8.	Work duration ?	
9.	Health condition (Details)	
10	In case of any health issues, specify duration of illness?	
11.	Any feedback	

Date

Place

Name & designation of inspecting officer

Questionnaire -1 (For persons in adjoining areas (within 1 km radius))

No.	Head	Details
1.	Name	Sh. Senthil Kumar
2.	Age/ Gender	41/Male
3	Address /Contact number	S/o, Duraisamy 10/65 Sengulam, ingur
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 ½ Years Back not Now.
6.	Specify if the person has any Health issue. Also mention duration	No Health Issue.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Not Applicable
8.	Any feedback	Nil

(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1 km radius))

No.	Head	Details
1.	Name	Sh. Tamilarasu
2.	Age/ Gender	22/Male
3	Address /Contact number	S/o Devaraj 10/65A, Sengulam, Ingur
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 Years back Not Now.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Gobi
2.	Age/ Gender	24/Male
3	Address /Contact number	10/65 Sengulam, Ingur
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Not Available.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



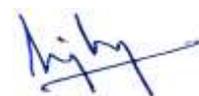
(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Smt. Sivagami Chinnan
2.	Age/ Gender	35/ Female
3	Address /Contact number	W/o Chinnan, 43,Arisana colony, Kutthampalayam, Ingur.
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Not Now. 2Years Back.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil

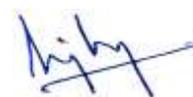


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Boopathy Raja
2.	Age/ Gender	29/Male
3	Address /Contact number	S/o Palanisamy,Nagappagowndam Palayam, kampaliyampatti.
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 Years Back not now.
6.	Specify if the person has any Health issue. Also mention duration	No Health Issue
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Not Applicable
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Smt. Kanammal
2.	Age/ Gender	66/Female
3	Address /Contact number	122 sullimettur, kambuliyampatti
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 Years back not now.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil

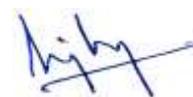
(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Chennai Maran
2.	Age/ Gender	79/Male
3	Address /Contact number	s/o Maran, 31Arjuna colony kuttapalayam, Ingur
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 Years back not now.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Smt. Vasantha mani
2.	Age/ Gender	65/Female
3	Address /Contact number	50, Utthandinayakkanputhur varapalyam, Kambiliyampatti
4.	Proximity of person from unit	3km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Nil
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Valliyammal
2.	Age/ Gender	69/Female
3	Address /Contact number	17,Sedakattur,varapalyam.
4.	Proximity of person from unit	3km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Nil
6.	Specify if the person has any Health issue. Also mention duration	Winter Season time Cold Problem.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil

(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Rajendran
2.	Age/ Gender	58/Male
3	Address /Contact number	East Sanarpalayam varapalayam
4.	Proximity of person from unit	3km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Nil
6.	Specify if the person has any Health issue. Also mention duration	Winter Season time Cold and Sinus Problem.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil

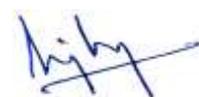


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Sengulam

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Lallbabu Mallick
2.	Age / Gender	31 / M
3.	Address /Contact Number	Gram –Purandarpur,Nabasta, Nanoor,Birbhum - 731215
4.	Designation	Operator
5.	Work profile	To operate the reactor during process (Hot) Time
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Good
10	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	Nil

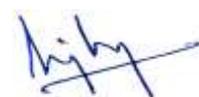


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Thakur Prasad Ram
2.	Age / Gender	55 / M
3.	Address /Contact Number	Shivmuni,Sarayakota,Saraikota,Kotwa, Narayanpur,Ballia,UP-277501
4.	Designation	Loader
5.	Work profile	To load & Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Good
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	Nil

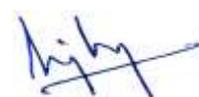


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Siddhnath
2.	Age / Gender	46 Years /M
3.	Address /Contact Number	S/o. Jay Govind, 291/18,Gahmar, Ghajipur,UP -232327
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Good
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Santhosh Kumar Yadav
2.	Age / Gender	34 / M
3.	Address /Contact Number	S/o.Mishri yadav,kudhaohwar,Ghazipur, Sammanpur,UP-233306
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Nil
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	



(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Ramanivas Kumar
2.	Age / Gender	21 / M
3.	Address /Contact Number	S/o.Kalika Singh,Gajarahi,Buxar, Bihar -802122
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Nil
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	-

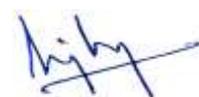


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Gharbharan
2.	Age / Gender	39 / M
3.	Address /Contact Number	S/o.Durgavijay,Fakhruddinpur,Mubarakpur, Azmagarh,Sathion,UP-276406
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Good
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	-

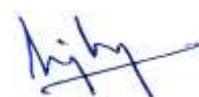


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Prakash Banvasi
2.	Age / Gender	44 / M
3.	Address /Contact Number	S/o.Sechai Banvasi,Paliwar,Paliwar, Gazipur,Paliwar,UP-275204
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Nil
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	-



(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai



CENTRAL POLLUTION CONTROL BOARD Regional Directorate (Chennai)

Status of environmental issues in operation of tyres pyrolysis units at M/S. Pairan Pyrolysis Pvt. Ltd., Sipcot, Perundurai

Spillage of carbon in the working area:

After cooling, the external chute is connected to the carbon collection point and collection bag is tied in the chute. While opening the collection point carbon particle spillage is collected through bin. After fixing the chute, the reactor is rotated slowly, the internal spiral provided in the reactor flows the carbon through the chute and collected in bag. During this process to control fugitive emission, the suction hood is operated and in the front two sides barrier is placed.



The steel is removed using the crane and stored in the open storage yard, whereas carbon deposit in the steel leads to spillage during the dragging. The unit has a tray for collecting the steel to avoid spillage of deposited carbon particle, which was not used at time of inspection. The carbon deposit shall be removed mechanically or through water washing. So appropriate measures shall be taken for removal of carbon particles deposited on the steel to avoid spillage.



Exposure of workers to fine carbon particles;

Workers are provided proper Personnel Protective Equipment such as mask, gloves, boots.

Process emission due to escape of pyro gas which remains entrapped inside reactor vessel after completion of the process and their release into atmosphere with the opening of the main door of the reactor vessel;

Before opening the reactor nitrogen gas is purged into the reactor, due to forward feeding the gas is pushed off to the next chamber (condenser & gas holding tank) and VOC meter is used by the industry to check the presence of any gas in the reactor.



VOCs monitored in the work place are within the limit of OSHA PEL standard

Escape of pyro gas directly into atmosphere through emergency release valve due to increase of pressure in the reactor vessel;

During the inspection, it was observed that the pressure and temperature were being monitored and any increase in pressure, the gas is flared. No emergency situation noticed during this monitoring period.

In case of any abnormal emergency, pressure valve is provided to release the gas into atmosphere.

Release of excess pyro gas or uncondensed gases for flaring;

Excess pyro gas is fired in the flaring chamber and the unit has also provided addition flaring system in the stack at height of 32 mts.

Odor problem in plant and in neighborhood;

As per the provided questionnaire survey carried out in nearby villages, six person said that odor issue was faced 2 years back (public informed that odour issue was faced due to rubber reclaim industry situated in that industrial area behind M/s Pairan Pyrolysis Pvt. Ltd., and there

is no issue due to operation of this unit. Whereas during inspection slight odor was observed as like in petrol pumps.

Fugitive emission of charcoal/ fine carbon particle while removing from reactor vessel and its packing into the bags;

In front of the reactor, Suction hood is provided and two sides barrier is placed to control the fugitive emission.

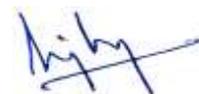
Purged water from the water seal (oil –water separator) provided to separate the water vapour from the pyro gas containing oil traces;

The unit has provided heavy duty macro emulsion fuel burner to fire oil with moisture (water) (in the ratio of 70% oil & 30% water condensate)

Spillage and floor washing containing charcoal particle and oil;

The unit has informed that mechanical/manual cleaning being carried out for removal of carbon particles. The bleed off scrubber water is sent to SEP.

The unit has provided closed loop system for oil, so that chances of oil spillage is reduced.



(R. Rajkumar)
Scientist D



CENTRAL POLLUTION CONTROL BOARD
Regional Directorate (Chennai)

STUDY ON BATCH PYROLYSIS PROCESS AT M/s. PAIRAN PYROLYSIS
PVT. LTD., SIPCOT, PERUNDURAI

1.0 Background:

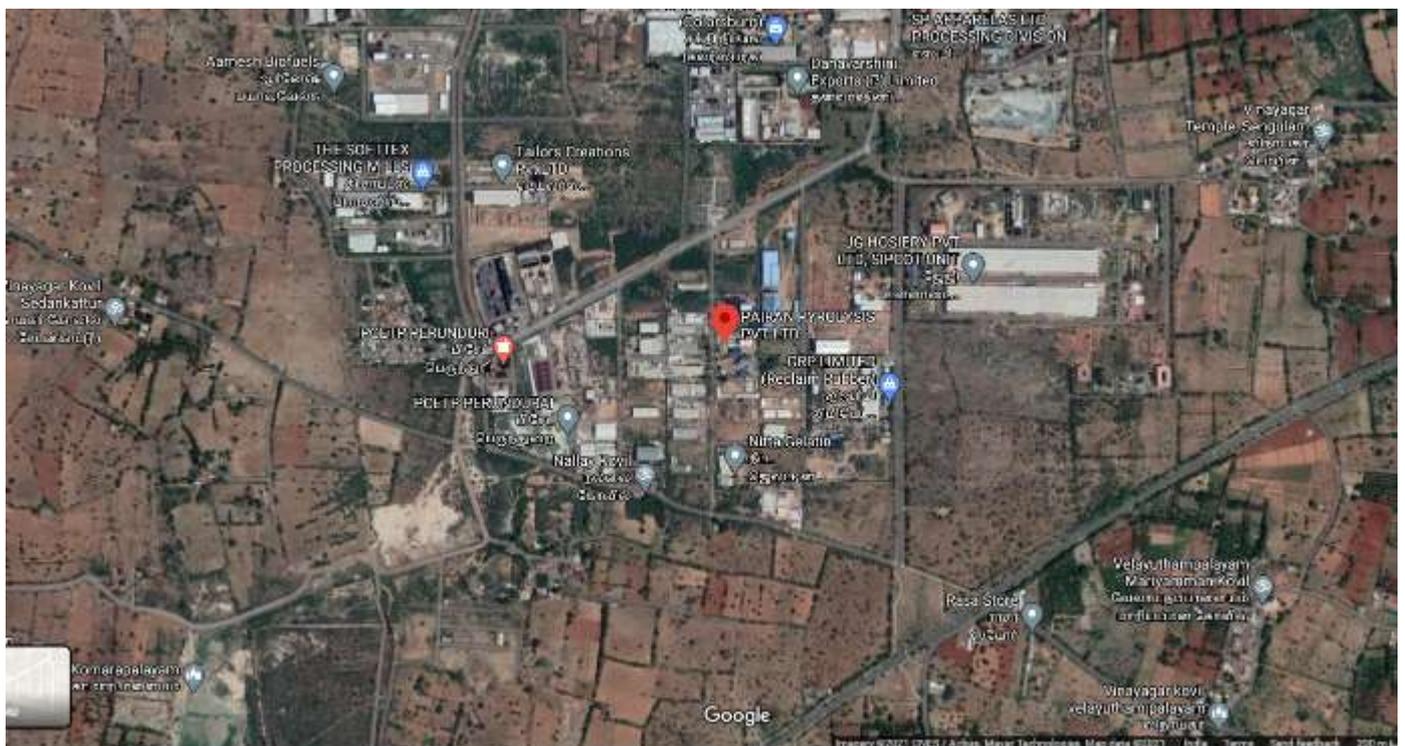
Central Pollution Control Board, Regional Directorate Chennai was directed to carry out the study at M/s Pairan Pyrolysis Pvt. Ltd., (Advanced Batch Process) with the following study protocol as suggested by the committee;

- *The monitoring will be carried out at both work place as well as ambient air quality with following parameters:*
 - *Work Place Monitoring: Respirable dust (PM_{10} , $PM_{2.5}$) (8 hr time weighted Avg), CO, VOCs, B \square P.*
 - *Ambient Air Quality Monitoring: PM_{10} , $PM_{2.5}$, B \square P, VOCs.*
- *In case of batch process monitoring to be carried out at work place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of charcoal /fine carbon for comparison purpose.*
- *For ambient air quality, monitoring to be carried out for 8 hours during operation of the plant at two locations.*
- *Detailed analysis of tyre pyrolysis oil in terms of its sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content (as per schedule V Part B of HoM rules 2016).*
- *Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be analysed.*
- *Locations and numbers of sensors/alarms.*
- *Survey of minimum 10 persons in the adjoining areas (within 1km radius) through questionnaire (draft questionnaire attached)*
- *Health assessment of workers through questionnaire (draft questionnaire attached).*
- *Any other parameter of interest if found to be useful during the study may also be included.*

Accordingly, monitoring was carried out during 06 – 07 January, 2021 and sampling was carried out through the NABL Accredited Lab M/s G Lens Innovation Labs Pvt. Ltd., Chennai.

2.0 About the industry:

M/s Pairan Pyrolysis Pvt. Ltd., is located in plot no. S-20, SIPCOT Industrial Complex, Ingur Village, Perundurai Taluk, Erode District. The nearby village Sengulam & Kuttapalayam village from the unit having aerial distance 1.25 KM & 603 m respectively.



The reactor capacity is 14 Tons of used tyre feeding per batch, whereas the unit is restricted to operate at 12 Tons capacity as per TNPCB consent. The consented quantity of production of various products are as follows;

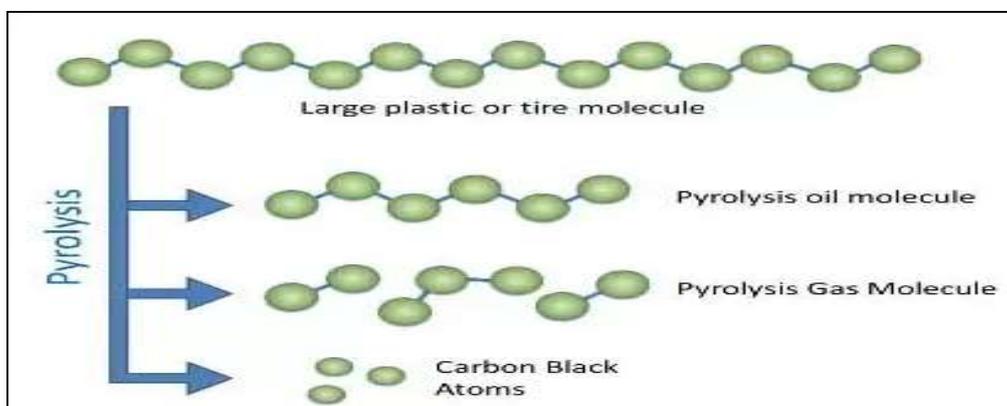
Sl. No	Description	Quantity	Unit
Product Details			
1	Fuel Oil	190	T/M
By- Product Details			
1	Carbon black	143	T/M
2	Steel Wire Scarp	58	T/M
Intermediate Product Details			
3	Gaseous Fuel	44	T/M

The consented quantity of trade effluent (scrubber bleed off) discharge through solar evaporation pond is 0.03 KLD.

The unit consists of batch pyrolysis reactor (horizontal circular air tight chamber of 2.6 m dia and 7.5 m length provided with internal spiral system), followed by Primary condenser 2 nos, Secondary condenser 4 nos., gas holding tank 1 no, Excess pyro gas firing chamber, scrubber and stack of 30 m height with flaring system.

3.0 Process Description:

Pyrolysis is a chemical reaction that involves molecular breakdown of larger molecules into smaller molecules in presence of heat. Pyrolysis is also known as thermal cracking, cracking, thermolysis, depolymerization, etc. Tyre pyrolysis is the process of converting waste tyres into products/intermediates like Pyrolysis Oil, Carbon Black, Steel Wire and Hydrocarbon Gas.



Typical Pyrolysis process

Scrap Tires are cut and are packed densely into the reactor chamber. The reactor is heated to 300 - 400 C through fuels. Initially pyrolysis oil emulsion is used for firing. After starting of process, the generated gas is condensed and oil is recovered. The uncondensed gas is further taken for firing, after cutoff of oil firing. The reactor is rotated slowly 0.5 – 2 RPM during the process. The condensed oil collected in the storage tanks connected to the individual condensers. After completion of process, the oil is taken to the final collection tank. The excess uncondensed gas is fired in a rectangular firing chamber. The exhaust from the firing chamber is connected to the scrubber followed by the stack. Flaring system is provided in the stack in case of firing the unburnt gas escape from the firing chamber.

After completion of the process, the reactor chamber is left for cooling until it reaches below 50°C. Then, the carbon is collected from the reactor by connecting the carbon chute tied with collection bag. Due to internal spiral arrangement, the carbon flows into the collection bag. To control the fugitive emission during the collection of carbon, suction hood with sprinkler is provided in the front of reactor. The suction hood is connected to the particulate collection bag.

Process timings for one batch process;

- Loading – 4 hours
- Process - 8 to 10 hours
- Cooling- 8 to 10 hours
- Carbon black and steel discharge (unloading) – 4 hours

4.0 Operation Status during inspection:

During the inspection, 10 Tons of waste cut tyres was fed to the reactor through Crane. The batch started at 11.30 AM (Day 1) and completed on Day 2 @ 4.00 PM, the total time of operation per batch 28.5 hrs. Time wise break of activities carried out is as follows;

- 11.30 AM – 01.30 PM - Waste Tyre loaded
- 2 PM – 10.40 PM - Process period
- Around 5.30 PM oil firing of reactor shifted to gas firing
- 11 PM – 12 noon – Cooling period
- 12 noon – After achieving the temperature below 50 C, unloading of carbon particles carried out till 4 PM

Temperature and pressure was noted through analog system, whereas during the operation the digital temperature & pressure sensor was not working. It was noticed that this digital system found working at initial operation & after cooling of condenser. The temperature & pressure values recorded manually is given in below table.

Time	Temperature C	Pressure Kg/cm3	Gas Tank Pressure Kg/cm3
02.50 PM	46	1 bar	-
03.10 PM	51.1	1 bar	-
03.30 PM	57.7	1 bar	-
03.50 PM	76.4	1 bar	-
04.10 PM	120.7	1 bar	-
04.30 PM	177.5	1 bar	-
04.50 PM	220	1 bar	-
05.10 PM	200	1 bar	-
05.30 PM	190	1 bar	-
05.50 PM	200	1 bar	-
06.10 PM	200	1 bar	-
06.30 PM	200	0.2	0.22
06.50 PM	200	0.2	0.22
07.00 PM	250	0.2	0.1
07.20 PM	270	0.23	0.2
07.40 PM	271	0.3	0.2
08.00 PM	280	0.2	0.15
08.20 PM	290	0.2	0.1
08.40 PM	281	0.2	0.2
09.00 PM	285	0.3	0.2
09.20 PM	295	0.2	0.2
09.40 PM	295	0.2	0.3
10.00 PM	290	0.2	0.2
10.20 PM	295	0.3	0.2
10.40 PM	300	0.3	0.2
11.00 PM	280	0.2	0.15
11.20 PM	270	0.29	0.21
11.40 PM	240	0.2	0.18
12.00 AM	210	0.15	0.09
12.30 AM	170	0.1	0.02
09.30 AM	110	-	-
12.00 noon	50	-	-

10 tons of tyre fed in the pyrolysis reactor, produces around 4200 lits of oil, approx. 3500 Kg (7 bags x 500 kg) of Carbon and approx.1.8 tons of steel.

After cooling, the external chute is connected to the carbon collection point and collection bag is tied in the chute. While opening the collection point carbon particle spillage is collected through bin. After fixing the reactor is rotated slowly, the internal spiral provided in the reactor

flows the carbon through the chute and collected in bag. During this process to control fugitive emission, the suction hood is operated and in the front two sides barrier is placed. Before opening the reactor nitrogen gas is purged.

6.0 Details of Monitoring & Analysis Report:

Based upon the batch process activity time, work place monitoring was carried out at time of loading, process, cooling & unloading and also VOC is monitored near condenser & storage tank.

Ambient Air Quality Monitoring was carried out at two locations in upward & downward wind directions for 24 hrs. The predominated wind direction is NE to SW, whereas the direction changes to SW to NE also. During the monitoring it was raining for 3.5 hrs between 02.30 AM to 06.00 AM. The sampling locations are shown in the below map.



The analysis result of ambient air quality monitoring results is given in the Table 1, 2 & 3. Toluene in the upwind found more comparatively to downwind direction. The value ranges from 12.73 $\mu\text{g}/\text{m}^3$ to 209.09 $\mu\text{g}/\text{m}^3$ and contribution is observed during night time & early

morning due to less dispersion. The contribution of toluene observed, since the station is placed near to the oil storage shed.

VOCs monitored in the work place are within the limit of OSHA PEL standard. The analysis result of work place monitoring is shown in the Table 4.

The PM10 concentration observed in the work place area during loading, process, cooling & unloading is 39.99, 30.11, 17.2 & 25.2 $\mu\text{g}/\text{m}^3$ respectively. The PM2.5 concentration observed in the work place area during loading, process, cooling & unloading is 17.31, 12.99, 8.33 & 16.3 $\mu\text{g}/\text{m}^3$ respectively. The PM concentration is observed slightly increases during loading & unloading as compared with the process & cooling time.

Table 1: Ambient Air Quality

SI.No	Parameters	Near Security Office (Downwind)	Near Steel Storage Yard (Upwind)	Standard
1	Particulate Matter (PM 10) - $\mu\text{g}/\text{m}^3$	56.4	55.5	100
2	Particulate Matter (PM 2.5)- $\mu\text{g}/\text{m}^3$	22.8	20.4	60
3	Carbon Monoxide as CO (1 hour) - mg/m^3	BDL (DL:1.14)	BDL (DL:1.14)	04
4	Benzo (a)Pyrene - ng/m^3	BLQ (LOQ:0.03)	BLQ (LOQ:0.03)	01

Table 2: VOCs in Ambient Air Monitoring (Upwind) ($\mu\text{g}/\text{m}^3$)

Sample Location	sample-1	sample-2	sample-3	24 Hrs Average
DICHLOROMETHANE	0.91	1.09	1.04	1.01
TOLUENE	12.73	94.36	209.09	105.40
BENZENE	0.00	0.00	0.00	0.00
m-XYLENE	10.61	6.40	0.56	5.86
o-XYLENE	10.62	6.34	0.42	5.79
ETHYLBENZENE	3.65	2.28	0.45	2.12
STYRENE	0.82	0.56	0.00	0.46
ISOPROPYLBENZENE	1.46	0.89	0.00	0.78
1,2,4-TRIMETHYLBENZENE	25.56	15.02	0.59	13.73
1,4-DICHLOROBENZENE	15.41	10.64	3.94	9.99
1,3,5-TRIMETHYLBENZENE	7.22	4.30	0.00	3.84
NAPHTHALENE	2.05	1.59	0.88	1.51

Table 3: VOCs in Ambient Air Monitoring (Downwind) ($\mu\text{g}/\text{m}^3$)

Sample Location	sample-1	sample-2	sample-3	24 Hrs Average
Dichloromethane	0.70	1.23	1.06	1.00
Toluene	13.34	20.15	15.24	16.24
Benzene	0.00	0.00	0.00	0
M-XYLENE	14.69	18.05	8.97	13.90
O-XYLENE	15.33	18.55	8.41	14.10
Ethylbenzene	4.52	7.61	5.39	5.84
Styrene	1.01	1.35	0.70	1.02
Isopropylbenzene	2.06	2.78	1.44	2.09
1,2,4-trimethylbenzene	44.31	48.01	16.70	36.34
1,4-dichlorobenzene	24.66	24.32	6.05	18.34
1,3,5-trimethylbenzene	13.30	14.70	5.10	11.03
Naphthalene	1.65	2.89	2.09	2.21

Table 4: Work Place Monitoring Results ($\mu\text{g}/\text{m}^3$)							$\mu\text{g}/\text{m}^3$	PPM	PPM
Sample Location	Front of reactor (Loading)	Front of reactor (process)	Front of reactor (cooling)	Front of reactor (Unloading)	Near condenser (process)	Near Storage tank (process)	Total		OSHA PEL (8 hrs)
Particulate Matter (PM 10)	39.99	30.11	17.2	25.2	-	-	-	-	-
Particulate Matter (PM 2.5)	17.31	12.99	8.33	16.3	-	-	-	-	-
Carbon Monoxide as CO	BDL (DL:1.14)	BDL (DL:1.14)	BDL (DL:1.14)	BDL (DL:1.14)	BDL (DL:1.14)	BDL (DL:1.14)	-	-	-
Benzo (a) Pyrene	-	BLQ (LOQ:0.03)	-	BLQ (LOQ:0.03)	-	-	-	-	-
Dichloromethane	5.18	0.71	0.77	2.58	1.24	1.72	12.2	0.0035	25
Toluene	494.75	15.99	21.12	77.13	19.73	334.04	962.76	0.2553	10
Benzene	2.41	0.00	0.00	0.00	0.00	1.86	4.27	0.0013	1
M-xylene	4.55	1.85	2.71	22.02	6.52	7.39	45.04	0.0103	100
O-xylene	3.12	1.38	2.19	10.92	3.22	3.19	24.02	0.0055	100
Ethylbenzene	4.46	1.05	1.99	11.54	2.78	6.66	28.48	0.0065	5
Styrene	2.10	0.00	0.88	3.76	1.77	1.86	10.37	0.0024	50
Isopropylbenzene	0.00	0.56	0.44	1.37	0.65	1.00	4.02	8.7x10⁻⁴	50
1,2,4-trimethylbenzene	3.76	4.33	6.93	7.96	18.34	2.33	43.65	0.0088	25
1,4-dichlorobenzene	25.27	3.01	9.31	8.36	63.08	70.48	179.51	0.0298	10
1,3,5-trimethylbenzene	0.00	1.36	1.92	2.98	4.10	0.96	11.32	0.0023	25
Naphthalene	6.63	1.10	1.23	3.97	22.88	1.11	36.92	0.007	0.1

The characteristics of the oil sample collected is shown in the below table 5. There is no specific standard prescribed for the oil derived from waste tyre. However, the same is compared with the specification of fuel derived from waste oil and all parameters are found within the specification.

Table 5: Oil Sample				
Sl.No	Parameters	unit	Pyrolysis Oil	Specification of fuel derived from waste oil
1	Sediment	%	0.18	0.25
2	Arsenic as As	PPM	BLQ (LOQ:1.0)	5
3	Cadmium as Cd + Chromium as Cr + Nickel as Ni	PPM	3.69	500
4	Lead as Pb	PPM	1.11	100
5	Poly aromatic Hydrocarbons	%	BLQ (LOQ:0.00025)	6
6	Polychlorinated Biphenyl	PPM	BLQ (LOQ:0.2)	< 2
7	Sulphur as S	%	0.0035%	4.5%
8	Total Halogens as Cl	mg/kg	BDL (DL:1.0)	4000
9	Water content	%	0.1	1%
10	Calorific Value	Kcal/kg	6347	

7.0 Steps taken by the unit for control of pollution:

- The unit has provided the suction hood and sprinkler system in the front of the reactor to control the fugitive emission during the operation of carbon unloading. The suction hood is connected to the bag to collect the particulate matter.
- It was informed by the unit that maximum cleaning of floors being carried out manually without using water.
- The emission from the reactor firing is connected to the scrubber followed by the common stack of height 32 m. The stack is provided with flaring system.
- The excess pyro gas is fired in the flaring chamber and connected to the scrubber followed by the common stack.
- The purge out water from the scrubbers is sent to solar evaporation pond.
- The unit has provided one methane sensors at firing chamber.

8.0 Outcome of Survey as per protocol:

- Survey of 10 persons from nearby village was carried out at Sengulam, Kutthampalayam, Kambuliyampatti & Varapalyam as per the provided questionnaire. In which six person said that odor issue was faced 2 years back and currently there is no issue due to operation of industry.
- Health assessment of workers also carried out through the questionnaire provided by the committee. As per the workers statement, they are not having any health issue.

Copy of the questionnaires are enclosed as Annexure 1 & II.

9.0 Steps required for improvement:

- Existing suction hood provided is not engineering designed, so same shall be modified accordingly to enhance appropriate suction.
- At present, the exhaust connected from suction hood is connected to collection bag, to improve efficacy of collection proper APCD shall be provided.
- The steel is removed using the crane and stored in the open storage yard, whereas carbon deposit in the steel leads to spillage during the dragging. The unit has a tray for collecting the steel to avoid spillage of deposited carbon particle, which was not used at time of inspection. The carbon deposit shall be removed mechanically or through water washing. So appropriate measures shall be taken for removal of carbon particles deposited on the steel to avoid spillage.
- Closed shed shall be provided for the storage of collected carbon and steel.

During the entire study, less particulate emission was observed. The unit has taken utmost care for control of particle emission. If such scenario is followed on day to day activity, the particulate emission during carbon unloading shall be controlled effectively.

As per scope/protocol of the work given by the committee, the unit is complying with pollution control norms and suggested to implement the above improvements said in point 9.

Improvement in the control of fugitive emission is observed after installation of APCDs. The comparison is made through google image & present photographs shown below;

Before (Google Image of March 2020)



After APCD Measures (At present)



The photograph & Videography's taken during the entire monitoring period is attached for reference.


(R. Rajkumar)
Scientist D

View of Plant



Loading



Excess Gas Flaring



Carbon Unloading





Suction Hood Exhaust connected to Bag





क्षेत्रीय निदेशालय (मध्य), भोपाल
केन्द्रीय प्रदूषण नियंत्रण बोर्ड
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार)

RDC/Legal/NGT-PB/400(19)/2019/195

Date: 16.02.2021

To,

Shri Anand Kumar
AD& DH, Waste Management- III
Central Pollution Control Board
Parivesh Bhawan
East Arjun Nagar
Delhi-110032

Sub: Study of Tyre Pyrolysis plant of M/s Narmada Industries at Raipur in CG- reg.

Ref: Your email dated 01.02.2021

Respected Sir,

With reference to the above, the officials from Regional Directorate CPCB Bhopal has conducted the inspection & monitoring of M/s Narmada Industries, Siltara Phase 2 Raipur, Chhattisgarh during 9th to 11th February, 2021 and the detailed report along with analysis report is submitted for necessary action.

Yours faithfully


(P. Jagan)
Regional Director

Encl: As above.

“राजभाषा हिन्दी में पत्र व्यवहार का स्वागत है”

Central pollution Control Board
Regional Directorate (central) Bhopal

**Inspection report of M/s Narmada Industries, Siltara Industrial
Area Phase-2, Raipur(CG)**

A. Back Ground :

With reference to the email received from CPCB, HO, Delhi dated 01.02.2021 in the matter of Hon'ble NGT Original Application No. 400 of 2019 in Social Action for Forest & Environment (SAFE) verses Union of India &Ors. Sh Milind Kumar Nimje Scientist C &Sh Praveen Kumar Jain scientist B fromCPCB, Regional Directorate Bhopal along with Sh. PrassanaSonkar, Assistant Environmental Engineer from CECB, Regional office, Raipur and expert memberDr. K V Gorge, Senior Principal Scientist, NEERI, Nagpur, carried out joint inspection of M/s Narmada Industries, Manurethi Road, Siltara Phase -2, Raipur, Chhattisgarh during 9th to 11th February 2021. Sh. ManeshAgrawar, Owner of the plant accompanied during visit.

During the visit the team members inspected the entire Tyre Pyrolysis plant including raw material storage area, tyre cutting machine, tyre Pyrolysis reactor in accordance with the protocol developed for the study and understand the manufacturing process and probable pollution generation sources. The photographs taken during the visit are enclosed at **Annexure-I**.

CPCB Regional Directorate Bhopal has engaged M/s Anacon Laboratory, Nagpur who is a an EPA recognized laboratory for monitoring of Ambient Air Quality, Work Place Monitoring and collection of Tyre Pyrolysis Oil (TPO) sample for detailed characterization.

B. Sampling and analysis

- M/s Anacon Laboratory has carried out the ambient Air Quality in the plant premises at 2 locations for 24 hours for PM10, PM2.5, BaP, VOCs.and Work Place Monitoring at 3 locations for 8 hr time weighted avg for PM10, PM2.5, CO, VOCs, BaP. During the monitoring the plant was in operation. The monitoring work was done during 9thto 11th February, 2021. the Laboratory has also collected the Tyre Pyrolysis Oil (TPO) sample for analysis of its Sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, total halogens, PCBs, and water content (as per schedule V part B of HoM Rules, 2016).purposes.

Table 1: Ambient Air Quality Monitoring Report of M/s. Narmada Industry, Raipur(CG)
(monitoring date 9th to 11th February 2021)

Parameters	Main gate (Plant Entry)	Near the stack of Reactor 3 & 4 backside	CPCB Standard (24 hrs)
Particular Matter (PM ₁₀) µg/m ³	169.38	310.67	100
Particular Matter (PM _{2.5}) µg/m ³	54.02	72.15	60
Total VOCs µg/m ³	0.111	0.132	--
Benzo-Pyrene (as BaP) ng/m ³	BDL (DL 0.01)	BDL (DL 0.01)	1.0 Annual

- Ambient air quality was monitored at 2 locations i.e. plant main gate and back side of reactor 3&4 stack for 24 hours for PM₁₀, PM_{2.5}, VOCs & Benzo-Pyrene. It can be seen from the above table that the PM₁₀ values are exceeding the limits at both the monitored locations, PM_{2.5} value is exceeding at one location i.e. back side of reactor 3&4 stack and all other parameters are within the limits.

Table 2: Work Zone air quality monitoring report of M/s. Narmada Industry,
Raipur(CG)
(8 hour monitoring during 9th to 11th February 2021)

Parameters	Near Reactor 1 & 2	Near Reactor 3 & 4	Near oil Tank	CPCB Standard (8 hrs)
Particular Matter (PM ₁₀) µg/m ³	168.76	232.25	191.48	100 (24 hrs)
Particular Matter (PM _{2.5}) µg/m ³	57.11	69.50	62.35	60 (24 hrs)
Carbon Monoxide (as CO) mg/m ³	0.572	0.634	0.590	2.0 (8 hrs)
Total VOCs µg/m ³	0.104	0.125	0.093	---
Benzo-Pyrene (as BaP) ng/m ³	BDL (DL 0.01)	BDL (DL 0.01)	BDL (DL 0.01)	1.0 (Annual)

- Work Zone air quality monitoring done at 3 locations i.e. Near Reactor 1 & 2, Near Reactor 3 & 4 and Near oil Tank for 8 hours duration. It can be seen from the above table that the PM₁₀ values are exceeding the limits at all the 3 locations and PM_{2.5} values exceeding at 2 locations, Carbon Monoxide values are also found within the limits and the VOCs values are found in the range of 0.093 ng/m³ to 0.125 and Benzo-pyrene value in Below Detected limit (detection limit 0.01 ng/m³.)

Table 3: Tyre Pyrolysis Oil analysis report of M/s. Narmada Industry, Raipur(CG)

S. No.	Parameters	Test Result	CPCB Specification as per Schedule V part B (fuel derived from waste oil)
1.	Lead (as Pb) ppm	Absent	Max. 100
2.	Arsenic (as As) ppm	Absent	Max. 5
3.	Cadmium (as Cd) ppm	Absent	Max. 500
4.	Chromium (as Cr) ppm	0.004	
5.	Nickel (as Ni) ppm	0.002	
6.	Sediment %	< 0.1	0.25
7.	Total Halogens ppm	146.45	4000
8.	Sulphur	0.47	4.5
9.	Calorific value Kcal/Kg	10265	--
10.	Water Content %	< 0.1	1
11.	Poly chlorinated biphenyls (PCB)	BDL(DL 0.01)	Max. 2000
12.	Poly Aromatic Hydrocarbon (PAH)	BDL (DL 0.03)	Max. 6 %

- The tyre pyrolysis oil analysis report reveals that all the analyzed values are within the limits specified by CPCB. The Poly chlorinated biphenyls analysis work is under progress.
- The detailed laboratory analysis reports of ambient air quality, work zone air quality and oil analysis reports are enclosed at **Annexure-II**.

C. Health Assessment details of the workers:

- For health assessment of workers working in the plant the team Interacted with 10 Nos. of workers and filled up the Questionnaire and the same is enclosed at **Annexure-III**.
- There was no villages are found located in the periphery of 1 KM of the unit as the unit is located in the Siltara Industrial Area to study the impact of pollutants on health of local people in adjoining area.

D. During the visit the following points are also observed:

M/s Narmada Industries has located in the common premises(M/s Indra Metal Works, M/s Jagdamba Power and M/s Sagar Energy Ltd) of around 04 industries at Siltara Phase -2 industrial area Raipur.No boundary wall and gates constructed within the premises of industries these industries but common display board provided at main gate for all the industries name without address.The plant was situated 1 km away from any residential settlement. Industry has sufficient space in the plant premises.The process area is concrete but internal road are kuttcha . the Google map view of view of the plant is given at **Figure 1**.

1. The unit is involved in production of Tyre Pyrolysis Oil (TPO), carbon black and steel scrap from the scrap tyre. As per the CTO the total production capacity of Tyre Pyrolysis Oil is 6000 MTA. The unit is having 4 reactors of 5 Ton capacity each where the Pyrolysis process occurs in 150 °C and the oil produced is collected after condensation. During the visit only one reactor was in operation with full feeding load. The unit has installed bag filter and ventury scrubber as air pollution control devices. Carbon black and steel scrap produced during the process as by-products are sold to open market by the unit. During process the waste gases are also generated which are collected in balloons and reused as a fuel in the reactor during pyrolysis. The tyre pyrolysis process description with process flow chart is enclosed at **Annexure-IV**.
2. The industry has installed all the plant and machineries which are required for tyre pyrolysis plant like Tyre Cutting Machine, Reactor, Heavy oil collector tank, Condensor tank, Compressor, Screw conveyor etc. The details of plant and machineries is given at **Annexure-V**.
3. Consent to operate under Water and Air Acts are issued from CECB which is valid up to 31.7.2024. Copy of consent is enclosed at **Annexure-VI**.
4. The industry has not even applied for HW authorization under HW rules 2016. As informed by Sh. Manish Agarwal, owner of the plant that the tyre pyrolysis oil production process is not hazardous and no hazardous waste generated but it was verified from the SOP that the tyre pyrolysis plants should obtain the HW authorization.
5. Raw material (waste tyre) purchased from local market and stored openly in the premises. During the visit around 250 ton waste tyre and around 10 ton wood chips used as a fuel are stored openly. The industry is using tanker water as a source of raw water for process as well as domestic purposes. Around 8 KL water is used in the process and 2 KL for domestic purposes.
6. There are 04 reactor installed have 5 ton capacity each to process waste tyre for production of pyrolysis oil. All the four reactors are attached through common duct with common bag filter as APCD. During process the carbon dust is also collected through separate duct attached with tractor. The all dust called black carbon is a byproduct which is being used in ink industry, cement industry, paint industry etc. The tyre pyrolysis oil used as a fuel and by-product i.e black carbon and iron wires were sold in local market.
7. About 1 ton capacity Tyre cutter installed in the premises but as per the SOP iron wire tyre processed in the reactor. As intimated by Sh. Manish Agrawal if without wire tyre particles deposits on the inner walls of reactor and may block the reactor therefore with wire tyre has been used in the process.
8. During the visit it was observed that the carbon was handled in the plant through screw conveyors from which jumbo bags were filled. During the carbon discharge process dust collectors were used for fugitive emission control. Industrial vacuum cleaners were used in case of any spillages.

9. The mechanized bag filling process with dust collector was installed and found effective in arresting fugitive emission and there was very less exposure occurs to the workers with carbon particles in the process. The team interacted with 10 workers in the plant and spoke about their medical history. It was informed that none of the workers had such medical history of underlying respiratory problems.
10. The plant is using nitrogen after process completion to purge the reactor of any pyro-gas remaining entrapped inside reactor vessel. During the visit no such escape was observed in to the atmosphere during opening of main reactor door.
11. The plant has connected the pressure release valve to the flaring system where the gas was burnt in case of such emergency release. During night time gas flaring was going on the date of visit.
12. During the visit odor was observed slightly near the pyro oil storage tank and pungent smell was also observed near by the waste gas collection balloon area. there is no odor found in other than these two areas.
13. The industry has provided dust collectors to capture the fugitive emissions from the the reactor doors during carbon discharge and packing area. During visit no such fugitives emissions were observed.
14. The industry has made cemented flooring at all the plant and machinery areas. The purged water from oil seal has been collected in a pit and sent to 2 KLD capacity ETP where it was treated in a multi-step process to remove oil and carbon from the water. The treated water has been reused in the plant. The wastewater spillages and floor washings also collected separately and treated in the same ETP. During the visit the ETP was not in fully operational and not maintaining the records of ETP sludge etc. the ETP flow chart is enclosed at **Annexure-VII**.
15. Fire extinguisher install in the process area for preventing any fire accident and the workers were found using PPEs i.e. helmet, hand gloves and mask during handling of raw materials.

E. Recommendations:

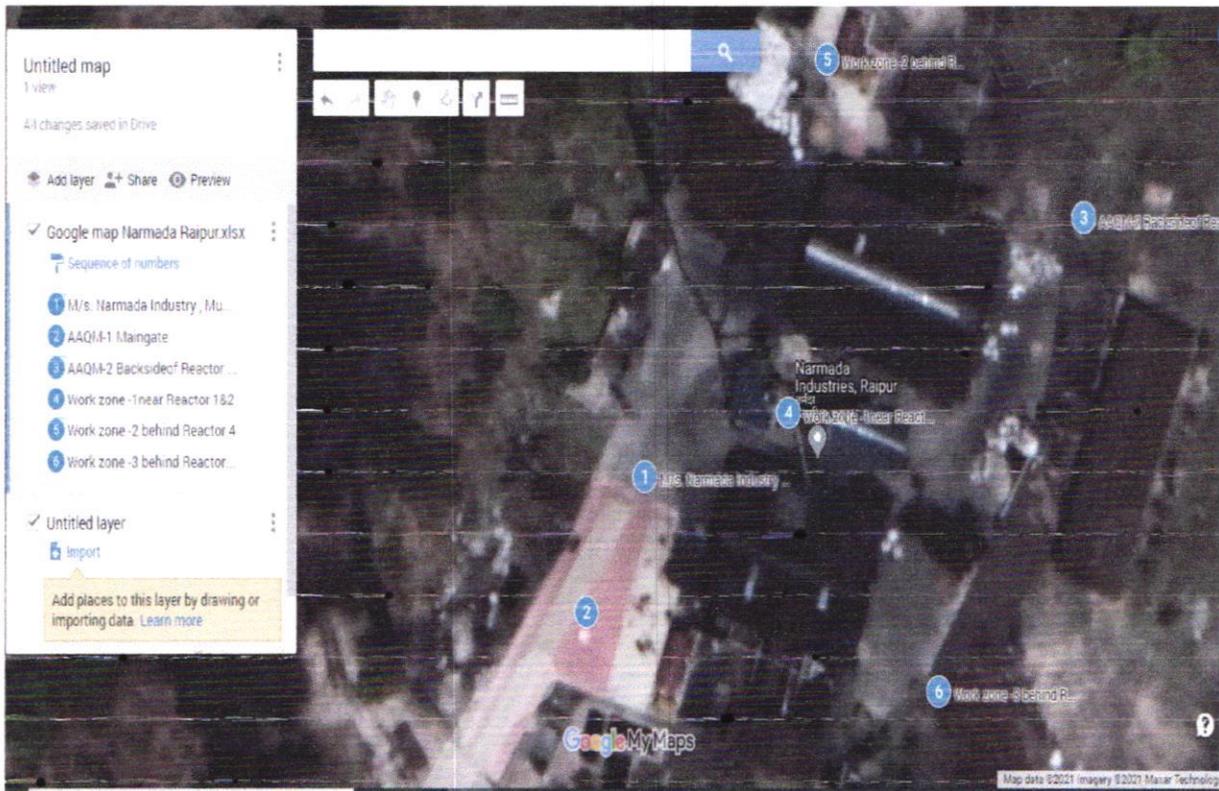
- 1) To obtain the HW authorization under HW Rules 2016 and implement the conditions mentioned there in
- 2) To operate ETP and maintain records properly
- 3) To take necessary steps to prevent odor in the plant
- 4) To make the approach road cemented
- 5) To earmark and store the raw materials in covered area instead of open and kutchha area to prevent fugitive emission .

- 6) The PM10 and PM 2.5 values in the ambient air quality and work place air quality are exceeding the limits, therefore necessary directions may be issued to the industry for corrective measures.


(Praveen Kumar Jain)
Scientist 'B'

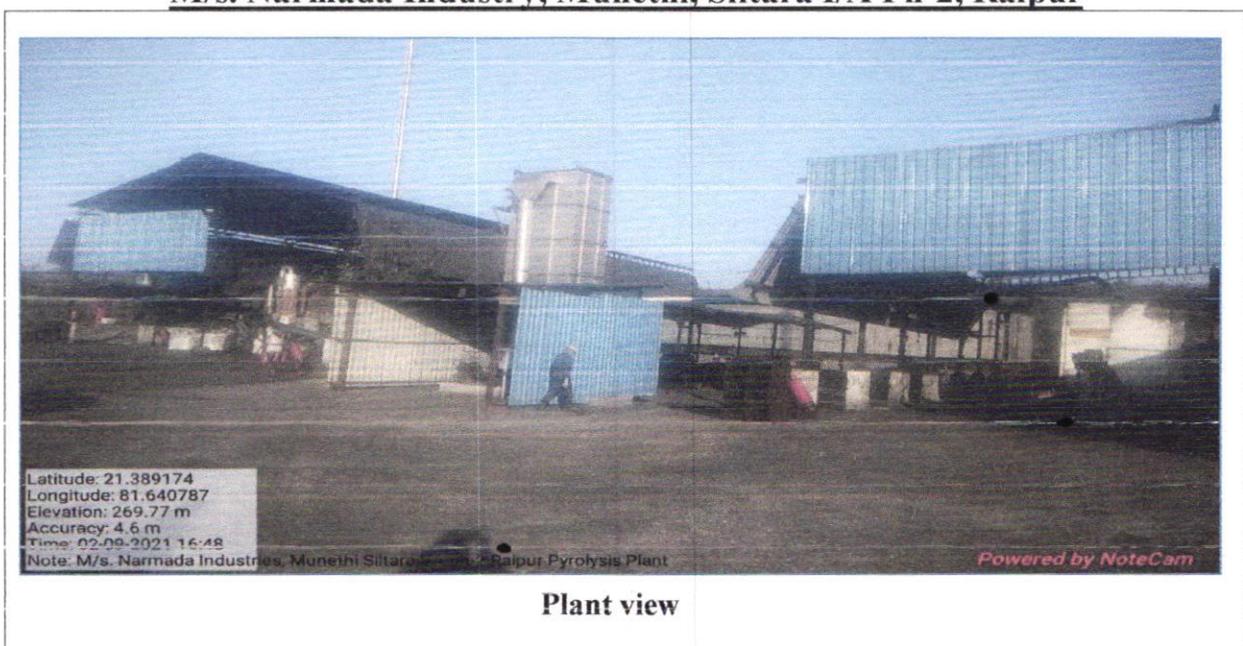

(Milind Nimje)
Scientist 'C'

Figure 1: Google map view of M/s. Narmada Industry , Raipur (CG)

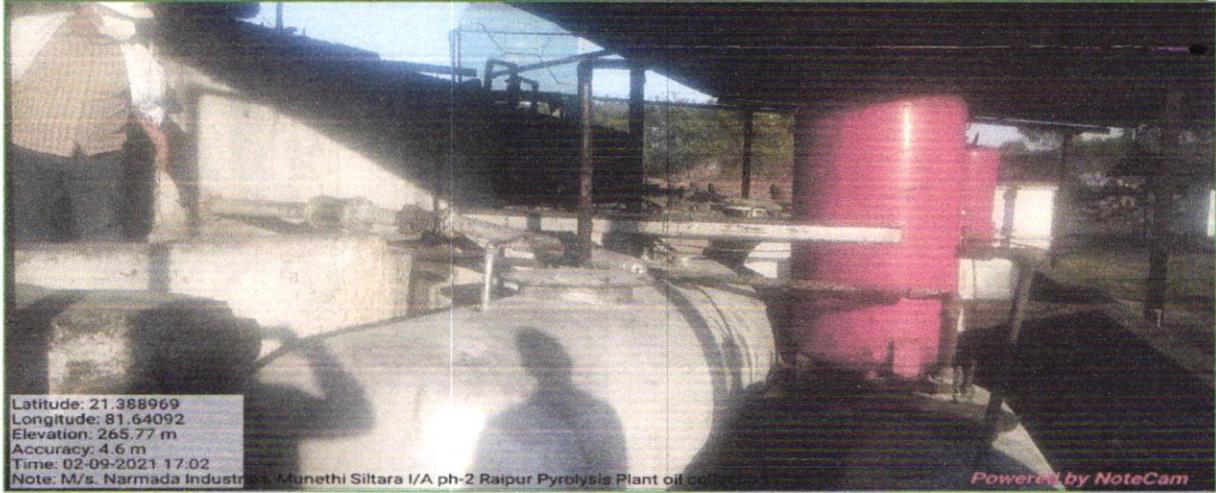


*Annexure
I*

**Photographs taken during the visit and monitoring time at
M/s. Narmada Industry, Munethi, Siltara I/A Ph-2, Raipur**



Plant view



Pyro oil Collection tank



Reactor inner view



Latitude: 21.389309
Longitude: 81.641359
Elevation: 265.77 m
Accuracy: 4.6 m
Time: 02-09-2021 17:30
Note: M/s. Narmada Industries, Munethi Siltara I/A ph-2 Raipur Pyrolysis Plant Gas Balloon Area collection

Powered by NoteCam

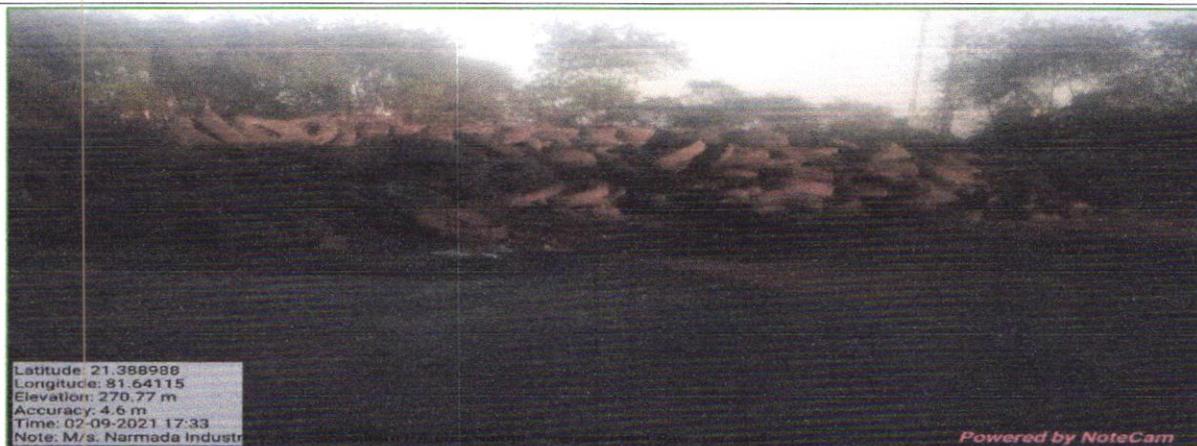
Screw conveyer Carbon Collection



Latitude: 21.389287
Longitude: 81.64138
Elevation: 272.77 m
Accuracy: 6.1 m
Time: 02-09-2021 17:31
Note: M/s. Narmada Industries, Munethi Siltara I/A ph-2 Raipur Pyrolysis Plant Gas Balloon Area collection

Powered by NoteCam

Gas Collection Balloon



Latitude: 21.388988
Longitude: 81.64115
Elevation: 270.77 m
Accuracy: 4.6 m
Time: 02-09-2021 17:33
Note: M/s. Narmada Industries, Munethi Siltara I/A ph-2 Raipur Pyrolysis Plant Raw Tyre Store Area

Powered by NoteCam

Raw Tyre store area



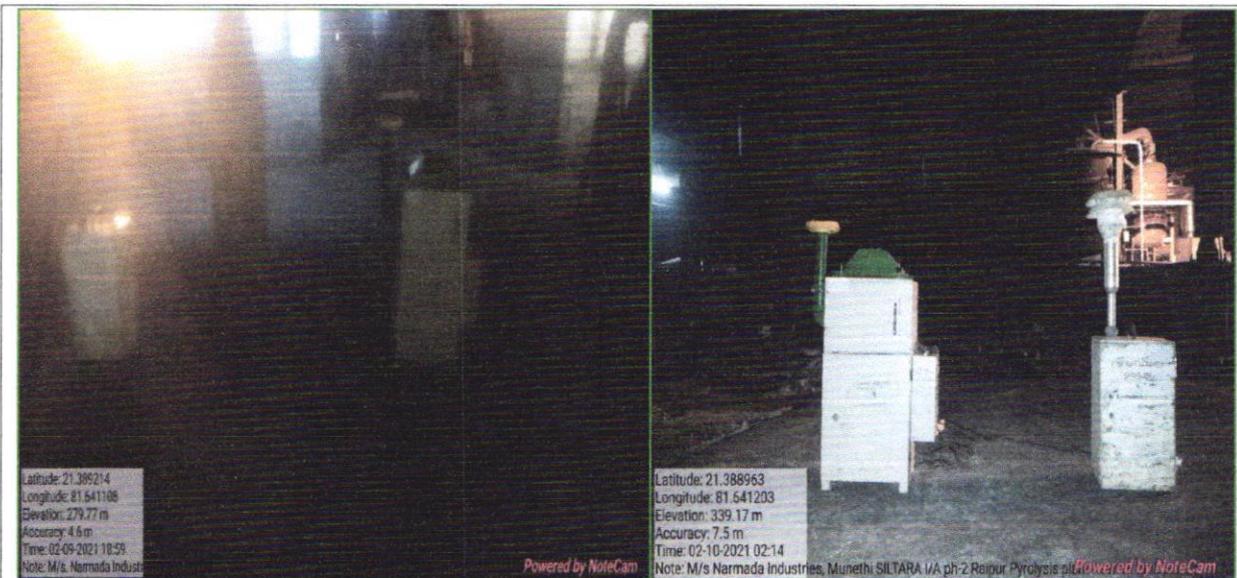
Inspecting team member verify the Stored Carbon black



Inspecting team discuss with Plant Owner



Scrap wire Yard



Monitoring of Work Zone area (8 hour)



AAQM monitoring at Main Gate & Back



After completion of Monitoring Sample seal

Ambient Air Quality Analysis Report

Report Code: AN/AA/2021/1-2

Issue Date: 15/02/2021

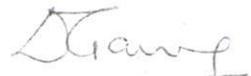
Issued To : **Central Pollution Control Board**
Central Zone, Bhopal
Madhya Pradesh.

Name of Site : **M/s Narmada Industries**
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-2
Sample Description : Ambient Air
Sample Drawn On : 10/02/2021 to 11/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : **Nr. Plant Entry Gate**
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 24 Irs.
Ambient Temperature : 23°C
Average Flow Rate of SPM : 1.1 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
A	Particulate Matter (PM ₁₀)-A	IS:5182 (Part 23)	140.19	µg / m ³	--
B	Particulate Matter (PM ₁₀)-B	IS:5182 (Part 23)	240.42	µg / m ³	--
C	Particulate Matter (PM ₁₀)-C	IS:5182 (Part 23)	127.52	µg / m ³	--
1	Particulate Matter (PM ₁₀)-Avg.	IS:5182 (Part 23)	169.38	µg / m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	54.02	µg / m ³	60 (24 hrs)
3	Total VOCs	IS:5182 (Part 11)	0.111	µg / m ³	--
4	Benzo(a)Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng / m ³	1.0 (annual)

Notes:- 1) • AAQ Sampling time for A = 10:40 to 18:40, for B = 18:45 to 02:45 and for C = 02:50 to 10:50.
2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.


Authorized Signatory

- ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 Certified
- Recognized By Ministry of Environment & Forests (MoEF), New Delhi
- Approved by : Food Safety & Standards Authority of India under FSS Act:
- Bureau of Indian Standards (BIS); Agricultural & Processed Food Products Export Development Authority (APEDA);
- Export inspection council (EIC); AGMARK.

Ambient Air Quality Analysis Report

Report Code: AN/AA/2021/1-1

Issue Date: 15/02/2021

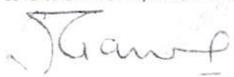
Issued To : **Central Pollution Control Board**
Central Zone, Bhopal
Madhya Pradesh.

Name of Site : **M/s Narmada Industries**
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-1
Sample Description : Ambient Air
Sample Drawn On : 10/02/2021 to 11/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : **Nr. Stack of Reactor 3 & 4 backside**
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 24 Hrs.
Ambient Temperature : 23°C
Average Flow Rate of SPM : 1.2 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
A	Particulate Matter (PM ₁₀) A	IS:5182 (Part 23)	373.60	µg /m ³	
B	Particulate Matter (PM ₁₀)-B	IS:5182 (Part 23)	210.18	µg /m ³	--
C	Particulate Matter (PM ₁₀)-C	IS:5182 (Part 23)	348.23	µg /m ³	--
1	Particulate Matter (PM ₁₀)-Avg.	IS:5182 (Part 23)	310.67	µg /m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	72.15	µg /m ³	60 (24 hrs)
3	Total VOCs	IS:5182 (Part 11)	0.132	µg /m ³	--
4	Benzo(a)Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng / m ³	1.0 (annual)

Notes:- 1) •AAQ Sampling time for A = 2:55 to 10:55, for B = 11:03 to 19:03 and for C = 19:10 to 3:10.
2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.


Authorized Signatory

- ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 Certified
- Recognized By Ministry of Environment & Forests (MoEF), New Delhi
- Approved by : Food Safety & Standards Authority of India under FSS Act;
- Bureau of Indian Standards (BIS); Agricultural & Processed Food Products Export Development Authority (APEDA);
- Export inspection council (EIC); AGMARK.

Fugitive Emission Analysis Report

Report Code: AN/FE/2021/1-3

Issue Date: 15/02/2021

Issued To : **Central Pollution Control Board**
Central Zone, Bhopal
Madhya Pradesh.

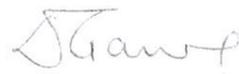
Name of Site : **M/s Narmada Industries**
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-3
Sample Description : Work Place
Sample Drawn On : 09/02/2021 to 10/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : **Nr. Reactor 1 & 2**
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 8 Hrs.
Ambient Temperature : 20°C
Average Flow Rate of SPM : 1.1 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
1	Particulate Matter (PM ₁₀)	IS:5182 (Part 23)	168.76	µg/m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	57.11	µg/m ³	60 (24 hrs)
3	Carbon Monoxide (as CO)	IS:5182 (Part 10)	0.572	mg/m ³	2.0 (8 hrs)
4	Total VOCs	IS:5182 (Part 11)	0.104	µg/m ³	--
5	Benzo-Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng/m ³	1.0 (annual)

Notes:- 1) • Work Place Sampling time = 18:00 (9/2/2021) to 2:00 (10/2/2021).

2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.


Authorized Signatory

- ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 Certified
- Recognized By Ministry of Environment & Forests (MoEF), New Delhi
- Approved by : Food Safety & Standards Authority of India under FSS Act;
- Bureau of Indian Standards (BIS); Agricultural & Processed Food Products Export Development Authority (APEDA);
- Export inspection council (EIC); AGMARK.

Fugitive Emission Analysis Report

Report Code: AN/FE/2021/1-4

Issue Date: 15/02/2021

Issued To : **Central Pollution Control Board**
Central Zone, Bhopal
Madhya Pradesh.

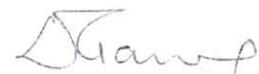
Name of Site : **M/s Narmada Industries**
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-4
Sample Description : Work Place
Sample Drawn On : 09/02/2021 to 10/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : **Nr. Reactor 3 & 4**
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 8 Irs.
Ambient Temperature : 20°C
Average Flow Rate of SPM : 1.2 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
1	Particulate Matter (PM ₁₀)	IS:5182 (Part 23)	232.25	µg /m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	69.50	µg /m ³	60 (24 hrs)
3	Carbon Monoxide (as CO)	IS:5182 (Part 10)	0.634	mg /m ³	2.0 (8 hrs)
4	Total VOCs	IS:5182 (Part 11)	0.125	µg /m ³	--
5	Benzo-Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng / m ³	1.0 (annual)

Notes:- 1) • Work Place Sampling time = 18:35 (9/2/2021) to 02:35 (10/2/2021).

2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.



Authorized Signatory



MARK OF PROGRESS FOR BETTER ENVIRONMENT & HEALTH

ANACON LABORATORIES PVT. LTD.

- ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 Certified
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- Bureau of Indian Standards (BIS); Agricultural & Processed Food Products Export Development Authority (APEDA);
- Export inspection council (EIC); AGMARK.

Fugitive Emission Analysis Report

Report Code: AN/FE/2021/1-5

Issue Date: 15/02/2021

Issued To : **Central Pollution Control Board**
Central Zone, Bhopal
Madhya Pradesh.

Name of Site : **M/s Narmada Industries**
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-5
Sample Description : Work Place
Sample Drawn On : 10/02/2021 to 10/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : **Nr. Oil Tank**
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 8 Irs.
Ambient Temperature : 21°C
Average Flow Rate of SPM : 1.1 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
1	Particulate Matter (PM ₁₀)	IS:5182 (Part 23)	191.48	µg/m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	62.35	µg/m ³	60 (24 hrs)
3	Carbon Monoxide (as CO)	IS:5182 (Part 10)	0.590	mg/m ³	2.0 (8 hrs)
4	Total VOCs	IS:5182 (Part 11)	0.093	µg/m ³	--
5	Benzo-Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng/m ³	1.0 (annual)

Notes:- 1) • Work Place Sampling time = 02:15 (10/2/2021) to 10:15 (10/2/2021).

2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

Authorized Signatory

Laboratory address : FP-34, 35, Food Park, 5 Star Industrial Estate, MIDC Butibori, Nagpur : 441 122.
Email : support@anacon.in

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- Export inspection council (EIC); AGMARK.

Test Report No. : ALPL/13022021/03-1 dated 13.02.2021

Page 1 of 2

Issued To : M/s Central Pollution Control Board, Bhopal Narmada Industries, Satara, Phase-2, Raipur. Kind Attention : Dr. Ranu C. Verma	Sample Inward No. 2021/EG-141/01-1	Analysis Start 12.02.2021
	Inward Date 12.02.2021	Analysis End 13.02.2021
	Reference ALPL/2020-21/Proposal/Mon21-03022021-1	
	Reference Date 03.02.2021	Sample Category General
Sample Name Tyre Pyrolysis Oil	Sample Particulars / Details Not mentioned	Quantity Received 2 L
Sample Collected By Anacon representative Mr. Ved Prakash Sharma, Date-11.02.21		Description / Physical condition/Packaging Dark brown colour liquid/Satisfactory/In sealed plastic bottle
Tests Required : Lead, Arsenic, Cadmium, Chromium, Nickel, Polychlorinated biphenyls, Sediment, Total halogens, Sulfur, Calorific value, Water content		

TEST RESULTS

S.N.	Test Parameter	Measurement Unit		CPCB Specifications as per Schedule V Part B (Fuel derived from waste oil)	Test Result
1	Lead (as Pb)	ppm	3040 of SW-846	Max. 100	Absent
2	Arsenic (as As)	ppm	3040 of SW-846	Max. 5	Absent
3	Cadmium (as Cd)	ppm	3040 of SW-846	Max. 500	Absent
4	Chromium (as Cr)	ppm	3040 of SW-846		0.004
5	Nickel (as Ni)	ppm	3040 of SW-846		0.002
8	Sediment	%	IS 1448 (Part 30)	0.25	< 0.1
9	Total halogens	ppm	Ion Selective Method	4000	146.45
10	Sulphur	%	IS 1448 (Part 34)	4.5	0.47
11	Calorific value	Kcal/kg	IS 1448 (Part 6)	-	1026.5
12	Water content	%	IS 1448 (Part 40)	1	< 0.1
13	Polychlorinated biphenyls			Max. 2000	BDL. (DL-0.03)
	2,2,5-Trichlorobiphenyl	µg/kg	GCMS/MS		
	2,4,4-Trichlorobiphenyl	µg/kg	GCMS/MS		
	2,2,5,5-Tetrachlorobiphenyl	µg/kg	GCMS/MS		
	2,2,4,5,5-Pentachlorobiphenyl	µg/kg	GCMS/MS		
	2,2,3,4,4,5-Hexachlorobiphenyl	µg/kg	GCMS/MS		
	2,2,4,4,5,5-Hexachlorobiphenyl	µg/kg	GCMS/MS		
	2,2,3,4,4,5,5-Heptachlorobiphenyl	µg/kg	GCMS/MS		

NOTES : • Please see watermark "Original Test Report" to confirm the authenticity of this report. • Results shall be referred to tested sample(s) and applicable to tested parameters only. • Test report shall not be reproduced except in full without prior written approval of Anacon Labs. • Liability of Anacon Labs is limited to invoiced amount only. • Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise.

Verified By

Authorized Signatory


Sonali Gharpure
Technical Manager


Mangesh Fande
Technical Manager


Shashikant Satdeve
Sr. Chemist


Swati Shrivastava
Technical Manager

Laboratory address : FP-34, 35, Food Park, 5 Star Industrial Estate, MIDC Butibori, Nagpur - 441 122.
Email : support@anacon.in

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Test Report No. : ALPL/13022021/03-1 dated 13.02.2021

Page 2 of 2

Issued To : M/s Central Pollution Control Board, Bhopal Narmada Industries, Satara, Phase-2, Raipur. Kind Attention : Dr. Ranu C. Verma	Sample Inward No. 2021/EG-141/01-1	Analysis Start 12.02.2021
	Inward Date 12.02.2021	Analysis End 13.02.2021
	Reference ALPL/2020-21/Proposal/Mon21-03022021-1	Sample Category General
	Reference Date 03.02.2021	
Sample Name Tyre Pyrolysis Oil	Sample Particulars / Details Not mentioned	Quantity Received 2 L
Sample Collected By Anacon representative Mr. Ved Prakash Sharma, Date-11.02.21		Description / Physical condition/Packaging Dark brown colour liquid/Satisfactory/In sealed plastic bottle
Tests Required : Polynuclear aromatic hydrocarbon		

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	CPCB Specifications as per Schedule V Part B (Fuel derived from waste oil)	Test Result
14	Polynuclear aromatic hydrocarbons (PAH)				
	Naphthalene	µg/kg	GCMS/MS	Max. 6%	BDL (DL-0.03)
	Acenaphthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Acenaphthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Flourene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Phenanthrene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Anthracene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Fluoranthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Pyrene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(a) anthracene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Chrysene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(b) fluoranthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(k) fluoranthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(a) pyrene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(ah)anthracene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Indene (1,2,3-cd) pyrene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo (ghi) pyrene	µg/kg	GCMS/MS		BDL (DL-0.03)

NOTES : • Please see watermark "Original Test Report" to confirm the authenticity of this report. • Results shall be referred to tested sample(s) and applicable to tested parameters only. • Test report shall not be reproduced except in full without prior written approval of Anacon Labs. • Liability of Anacon Labs is limited to invoiced amount only. • Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise.

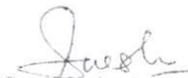
REMARKS : As requested by the client, sample was tested for above parameters only. The submitted sample complies with Specification CPCB Specifications as per Schedule V Part B (Fuel derived from waste Oil) for the tested parameters.

Verified by



Sonali Gharpure
Technical Manager

Authorized Signatory



Swati Shrivastava
Technical Manager

Annexure III

NARMADA INDUSTRIES

WORKS : Plot No. 129, Munrethi Road, Near Jagdamba Power and Alloy, Siltara Phase II, Raipur (C.G.)
Phone : 0771-4054754, Mob.: 97525-43700, 94255-05170

09.02.2021

Ref.

Date :.....

TO WHOM SO EVER IT MAY CONCERN

THIS IS HERE BY TO DECLARE THAT THERE IS NO RESIDNETIAL SETTLEMENT IN RADIUS OF 1 KM OF OUR PLANT .ON THE EAST SIDE OF OUR PLANT THERE IS POWER AND STEEL PLANT ,ON THE NORTH SIDE THERE IS OPEN YARD OF STEEL INDUSTRY ,ON THE SOUTH SIDE THERE IS SPONGE IRON PLANT ,ON THE WEST SIDE THERE IS AN OPEN AREA .

WE ARE SETTLED IN SILTARA INDUSTRIAL AREA PHASE 2 WHICH IS 15KM AWAY FROM RAIPUR .

FOR NARMADA INDUSTRIES
NARMADA INDUSTRIES

Ahuka

PROPRIETOR

GOVERNMENT OF CHHATTISGARH



LICENCE TO WORK A FACTORY

(Form No. 3 prescribed under Rule 5 of C.G. Factories Rules 1962)

Licence No. : CG-04-1723-5/RPR-1315-5/2930/2m(i)/A/3677-1281

(Mention This Number invariably in all correspondences with this office)

Fees Paid Rs. : Rs. 53800

E-Challan No.	Amount	Date
66160819000389	45000	16/08/2019

Licence is hereby granted to **Amit Khemka** occupier of **M/S NARMADA INDUSTRIES** located at **NEAR JAGDAMBA POWER & ALLOYS LTD. MURETHI ROAD, PHASE-2, SILTARA**, District **RAIPUR**

(Subject to the provisions of the Factories Act, 1948 and the rules made there under and the conditions annexed here with)

Valid only for the premises at the above location (as per the plans approved under the Factories Act and Rules) for use as a factory employing not more than **20** (in words **Twenty Only**) / **0** (**Zero Only - CPP**) workers on any one day during the year and having installed motive power **not exceeding 100** Horse Power (in words **One Hundred Only**) where the manufacturing process of **PYROLYSIS OIL BY TYRE PYROLYSIS** will be carried by him. This licence shall remain in force till the 31st day of December, **2020-2024**

Excess Fees: **225**

Place : **RAIPUR**

Date : **17/10/2019**

ANTHONY TIRKEY
Dy. Chief Inspector of Factories

Digitally signed by
ANTHONY TIRKEY
Date: 2019.10.17
16:07:09 +05'30'

Chhattisgarh

Note: The authenticity of this certificate be verified at www.cglabour.nic.in.

(This licence shall be framed and exhibited in the factory and shall be made available to the factory Inspector on demand)

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Akshay Kumar Dubey
2.	Age/ Gender	29/ Male
3.	Address/Contact Number	Village - Murrekhi, po- Alhara, Dist - Raipur (CG) Mob - 7415680000
4.	Designation	office work
5.	Work profile	office work
6.	Working since how many years?	8 years
7.	Whether using PPE Kit	NA
8.	Work duration ?	8 hours
9.	Health condition (Details)	No oral
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/09/24

Place Village - Murrekhi,
Alhara, Raipur

 09/09/24

Name & designation of inspecting officer



Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Firangi Lal
2.	Age/ Gender	29/ Male
3.	Address/Contact Number	Village - Kanai Sukli, Dist. - Janjgir chapa (C.G.)
4.	Designation	Operator
5.	Work profile	Operates plant
6.	Working since how many years?	3 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/2024

Place Village - Munsoethi,
Elhara, Raipur


 09/02/24

Name & designation of inspecting officer



Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sanjay Dubey
2.	Age/ Gender	
3.	Address/Contact Number	Village - Charoda, Dist - Durg (C.G.) Mob- 741587000
4.	Designation	Plant Head
5.	Work profile	Overall Management of Plant
6.	Working since how many years?	5 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 Hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/21

Place Village - Mursethi, Gtara
(C.G.)


 09/02/21

Name & designation of inspecting officer



Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Puneet Chauhan
2.	Age/ Gender	30/ Male
3.	Address/Contact Number	Village - Kukera Kapasda, Dist - Raipur (C.G.) Mob-7415686000
4.	Designation	Electrician
5.	Work profile	Electric fitting work
6.	Working since how many years?	5 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 Hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/2024
 Village - Mursathi,
 Place & Hora (Raipur) C.G.


 Name & designation of inspecting officer


Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Ram Khilawan Chaudhary
2.	Age/ Gender	60/Male
3.	Address/Contact Number	Village - Morwahi, Dist:- Gawala pandra Morwahi (C.C.)
4.	Designation	Welder
5.	Work profile	Maintenance work
6.	Working since how many years?	8 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/21

Place Murwahi, Sillaha, Raipur
(C.C.)


 09/2/21

Name & designation of inspecting officer



Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Narottam Yadav
2.	Age/ Gender	29 / Male
3.	Address/Contact Number	Sillasa Village - Gauda, Nandagarh, Dist:- Berhampur Mob- 798743357 (G)
4.	Designation	Welder
5.	Work profile	Main maintenance work
6.	Working since how many years?	2 months
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	nil
11.	Any feedback	

Date 09/02/21
Place Munsehi, Sillasa,
Rajpur


Name & designation of inspecting officer
9.02.21

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Roshan Sidar
2.	Age/ Gender	28/Male
3.	Address/Contact Number	# Raigarh (CG)
4.	Designation	Helper of operator
5.	Work profile	Helps in operating the plant
6.	Working since how many years?	2.5 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 Hours
9.	Health condition (Details)	Normal
10	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/21

Place village-Munrothi,
Siltara, Raipur


Name & designation of inspecting officer

09.02.21

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Itwari Banjara
2.	Age/ Gender	35/ Male
3.	Address/Contact Number	Village - Desara, Dist:- Bemetara (CG) Mob:- 8225915936
4.	Designation	Operator
5.	Work profile	Operates the plant
6.	Working since how many years?	4 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/2024

Place Village - Mansethi,
Sihora, Raipur


 Name & designation of inspecting officer

09/02/24

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sanjay Sahy
2.	Age/ Gender	30/ Male
3.	Address/Contact Number	Village - Bhimbhoni, Dist - Bemetara (C.G.) Mob. :- 6268387236
4.	Designation	Operator
5.	Work profile	Operate the plant from Control room
6.	Working since how many years?	7 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/2021

Place Village - Munsothi,
Siltara, Raipur



Name & designation of inspecting officer

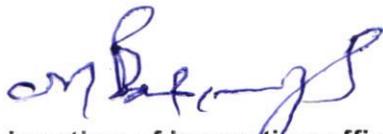
09/02/2021

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Lakeshwar Kaushik
2.	Age/ Gender	35/ Male
3.	Address/Contact Number	Village - Mandhar, Distt :- Raipur Mob :- 7415684000
4.	Designation	Fitter
5.	Work profile	Looks over maintainance of the plant
6.	Working since how many years?	5 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	2 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/2021

Place Village - Munrethi,
Sitara, Raipur


 Name & designation of inspecting officer

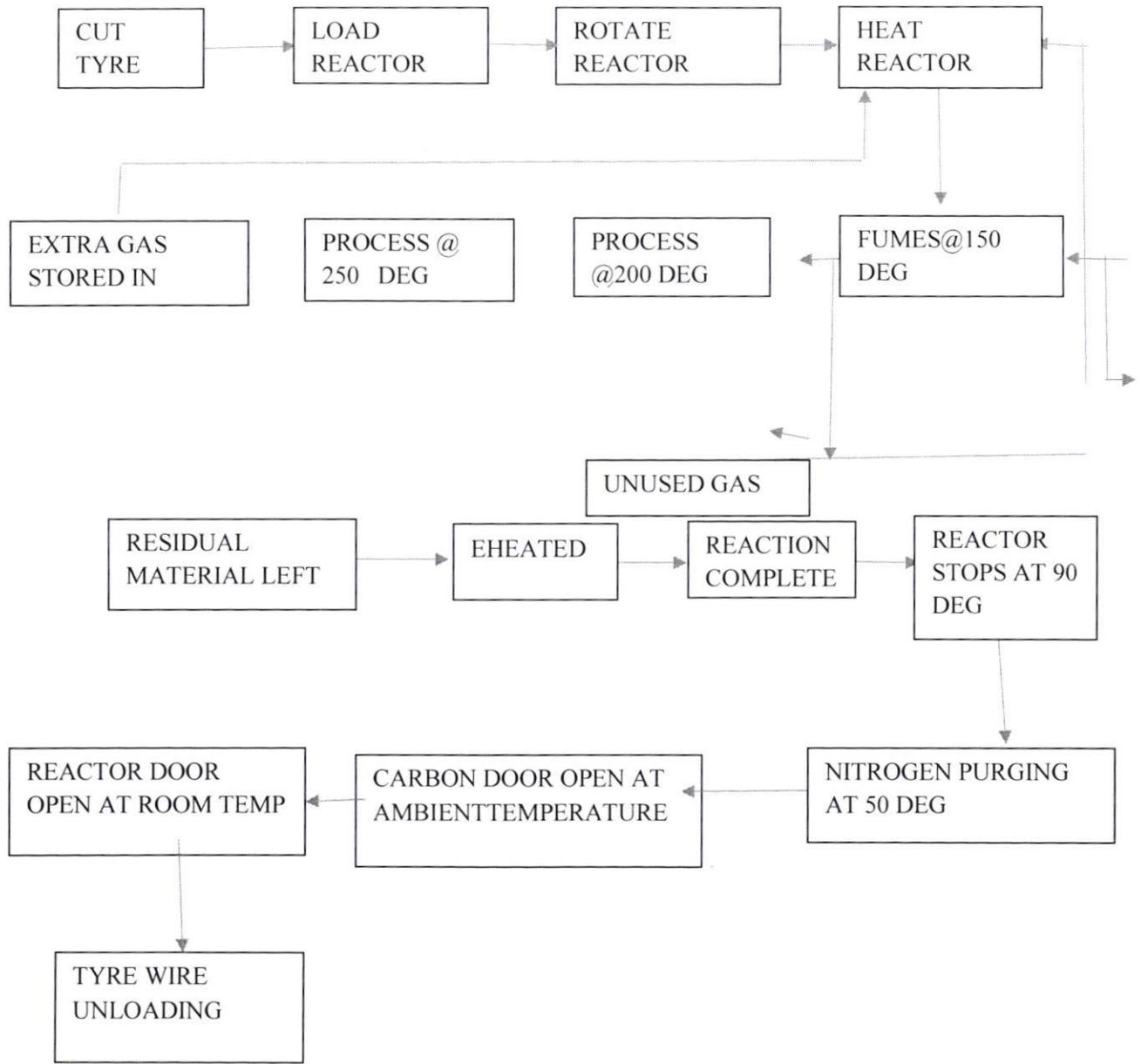
09/02/21

ANNEXURE-IV

Manufacturing Process description: Pyrolysis of scrap tyres offers an environmentally and economically attractive method for transforming waste tires into useful products, heat and electrical energy. Pyrolysis refers to the thermal decomposition of scrap tyres either in the absence or lack of oxygen. Scrap tyres are an excellent fuel because of their high calorific value. The process of Batch type Tyre Pyrolysis Plants is as given below:-

- The tyres are cut using machines and weighed. The cut tyres are loaded into the reactors. While loading the workers are provided with appropriate safety gears including N95 masks, goggles, gloves, safety shoes and covered clothing. The workers are rotated at regular intervals.
- Before light up, the opening of the reactor connecting to the condensing pipeline is checked. The reactor door is closed properly. Inspection of the machine parts are done.
- The process begins with rotation of reactor and heating it up with the stored gas.
- The heating continues, gases and fumes start getting produced at 150 degree Celsius. The gases move into the condensers for condensation. Uncondensed gases are reused for heating the reactors. The reactor is maintained at 200 degrees for 1.5-2 hrs and then increased to 250 degrees where it is maintained for 3 to 4 hrs. The gases after condensation get converted into oil. The extra uncondensed gases during this period are stored in the gas balloon for the next batch.
- Most of the pyrolysis process is completed at this stage, this causes the gas production to reduce eventually and the reactor temperature begins to drop. The reactor is heated again to be sure that the residual material is completely pyrolysed.
- Once the temperature starts falling, reactor runs on the residual gas which eventually shuts down and reactor temperature eventually drops to 90 degree Celsius. After which reactor rotation is stopped.
- Once the reactor temperature reaches 50-degree Celsius, reactor is purged with Nitrogen. The reactor is rotated for half an hour after Nitrogen is purged.
- Once the reactor reaches ambient temperature, the carbon door is opened. The reactor rotates in the closed chamber. The carbon dust is stored in 1 tonne carbon bags. Rotatory screw conveyor is used to fill the bags. Dust collector captures the air borne carbon particles in the chamber and prevents them to be leaked to atmosphere.
- Once all the carbon black is emptied from the reactor, the main door is opened, and the steel scrap is unloaded using winch machine.

Process flow chart of Tyre Pyrolysis plant



ANNEXURE -V

**List of Machines used in Tyre Pyrolysis Plant i.e. M/s Narmada Industries,
Siltara Industrial Area Phase-2, Raipur**

S. No.	Name of Machinery	Quantity / capacity	Dimension	Attachments
1.	Tyre Cutting Machine	02 no.	--	7.5 HP Motor
2.	Reactor	04 no.	5 ton. each 2.2 X 6 meter	--
3.	Heavy oil collector tank	04 no.	Length – 1.8x0.8 meter	connected to reactors
4.	Condensor tank	4 nos	Size - 8 x 5 meter	connected to heavy oil collector tank
5.	Processed light oil tanks	4 no.	Length -4.4 x1.05 meter	connected to condenser tank
6.	Processed heavy oil tank	4 no.	Length 1.6 x 6.5 meter	connected to heavy oil connector tank
7.	Gas flow control chamber	4 no	Length-1.65 x 8 meter,	attached to processed light oil tank
8.	Gas storage balloon	02 Capacity= 100 m ³	--	connected to gas flow control chamber
9.	Compressor	01 no.		attached to gas storage balloon – Motor- 7.H.P.
10.	Chimney	02 no.	Height-100 ft, diameter- 1.2 meter at bottom	----
11.	Flare stack	02 no.	---	Attachment- attached to the gas flow control chamber
12.	Screw conveyor-	4 no. Capacity- 1 tonne/hr	length- 4.6 meter, diameter-.4 meter	---
13.	Oil storage tank	4 no. Capacity-28 m ³ volume	Length – 6.35 x2.4 meter,	---
14.	Scrubber	4 no.	Length-3.1 meter, diameter -.8 meter	attached to the reactors
15.	Moisture storage tank-	2 no. volume -19 m ³	diameter-2.2 x 5 meter	----
16.	ETP tank -	01 no	length-9.2 x2.5 x2 meter	---
17.	Dust collector	01 no. 10,000 cfm		Motar 11 KW



REGIONAL OFFICE

C.G. Environment Conservation Board
New H.I.G. 9-10-11, Tatibandh, Raipur(C.G.)

Annexure
VI

No. 795- /RO/TS/CECB/2011
To,

Raipur, Dated 05/07/2011

M/s Narmada Industries

Kh.No. 119-120, Village - Munrethi,
Siltara, Phase-II, Raipur (C.G.)

Sub: Grant of consent under section 21 of the Air (Prevention and Control of Pollution) Act, 1981.

Ref: Your application received at this office-dated 07.06.2011 and subsequent correspondence ending dated 02.07.2011.

With reference to your above application, consent is hereby granted subject to the terms and conditions incorporated in the schedule annexed here to for a period of 12 months from the first day of the month of commissioning of the plant.

This consent is valid for following products & production capacity: -

	Name of Product		Production Capacity
1	Re-Processed Oil, Coaltar Pitch	☉	6,000 M.T./Year (Six Thousand Metric Ton Per Year)

Conditions: -

- 1 The date of commissioning of the industry shall be informed at least one month in advance.
- 2 Industry shall install appropriate air pollution control equipment at all points of emission and shall ensure that these are always kept running and in good working order all the time. In case of any failure it shall be immediately rectified or some alternate arrangement be made.
- 3 The industry shall burn or process the raw materials in fully closed chamber.
- 4 Emission of air pollutants from stack shall not exceed following limits
Particulate Matter - 50 mg/Nm³.
- 5 Ambient air quality, at boundary of industry premises shall conform to the standards prescribed by the Board.
- 6 Minimum height of all the stacks shall not be less than 30 meter. Arrangement of porthole, platform and ladder etc shall be made for monitoring purposes at appropriate height of the stack.
- 7 The industry shall use only furnace oil as a fuel in the proposed unit as per the proposal submitted by the industry.
- 8 The industry shall provide suitable air pollution control equipment gas absorber & scrubber at the proposed unit to bring the emission up to the prescribed standard. Industry shall have to install separate electric metering arrangement for the running of all pollution control equipments.
- 9 The industry shall do extensive tree plantation in and around the factory premises for improvement of environment in general.
- 10 Industry shall adopt good house keeping practices inside the factory premises.
- 11 Industry shall submit ambient air quality monitoring report to the Board

- regularly i.e. once in every six months.
- 12 The industry shall provide proper and safe arrangement for handling and disposal of solid waste.
 - 13 All the raw materials, finished products, solid wastes etc. shall be stored in the platform above ground level within covered shed.
 - 14 The industry shall submit land diversion certificate from competent authority within a period of one month from the date of issue of this consent letter.
 - 15 All the construction activities for establishment of industry shall be carried out exclusively using fly ash bricks/blocks and other products based on fly ash as far as possible.
 - 16 The industry shall obtain Authorization under Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 (If required).
 - 17 The industry shall take proper action to control the noise pollution. The noise level should not exceed the limit 75 dB(A) during the day time and 70 dB(A) during the night time within the factory premises.
 - 18 Industry shall obtain statutory clearances/permissions from concerned central/state government departments, boards, bodies and corporations etc. before establishment of the unit.
 - 19 The issuance of this consent does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or local laws or regulations.
 - 20 Any change in production capacity/process/raw material used etc. shall be intimated to the board for any enhancement of the above prior permission of the Board shall be obtained.
 - 21 The industry shall be commissioned within the period of five years from the date of issue of this consent letter. In case the industry is not commissioned within the stipulated period the consent shall be treated as cancelled.
 - 22 The Board reserves the right to amend/Cancel any of the above conditions or add new conditions as and when deemed necessary.
 - 23 This consent is valid for the stated period and has to be renewed every year. Application which annual license fee in this regard shall reach the office 4 months before the expiry of this consent.

Please acknowledge the receipt of this letter.

For & on behalf of C.G. Environment Conservation Board

[Signature]
Regional Officer

Regional Office, C.G. Environment Conservation Board

C.G. Environment Conservation Board
New H.I.S. Road, G. Farbandh,
RAIPUR (C.G.)

Endt.No. 796
Copy to :-

/RO/TS/CECB/2011
Raipur, Dated 05/07/2011
Chief Engineer (Raipur Region), Chhattisgarh State Power Distribution Company Ltd., Gudiyari for information & necessary action please. The electricity connection to the unit may be given w.r.t. above mention consent.

[Signature]
Regional Officer

Regional Office, C.G. Environment Conservation Board

C.G. Environment Conservation Board
New H.I.S. Road, G. Farbandh,
RAIPUR (C.G.)



REGIONAL OFFICE
C.G. Environment Conservation Board
New H.I.G. 9-10-11, Tatibandh, Raipur(C.G.)

No. 797 /RO/TS/CECB/2011

Raipur, Dated 05/07/2011

To,

M/s Narmada Industries
 Kh.No. 119-120, Village - Munrethi,
 Siltara, Phase-II, Raipur (C.G.)

Sub: Consent of the Board under Section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974.

Ref: Your application received at this office-dated 07.06.2011 and subsequent correspondence ending dated 02.07.2011.

-0-

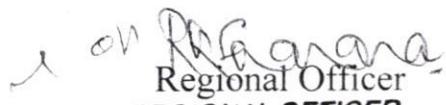
With reference to your above application, consent is hereby granted subject to the terms and conditions incorporated in the schedule annexed hereto for a period of twelve months from the first day of the month of commissioning of the plant.

This consent is valid for following products & production capacity: -

	Name of Product		Production Capacity
1	Re-Processed Oil, Coaltar Pitch	☞	6,000 M.T./Year (Six Thousand Metric Ton Per Year)

Please acknowledge the receipt of this letter.

For & on behalf of C.G. Environment Conservation Board


 Regional Officer
 Regional Office, C.G. Environment Conservation Board
 C.G. Environment Conservation Board
 New H.I.G. 9-10-11, Tatibandh,
 RAIPUR (C.G.)

Endt.No. 798 /RO/TS/CECB/2011

Raipur, Dated 05/07/2011

Copy to :-

Chief Engineer (Raipur Region), Chhattisgarh State Power Distribution Company Ltd., Gudiyari for information & necessary action please. The electricity connection to the unit may be given w.r.t. above mention consent.


 Regional Officer
 Regional Office, C.G. Environment Conservation Board
 C.G. Environment Conservation Board
 New H.I.G. 9-10-11, Tatibandh,
 RAIPUR (C.G.)



REGIONAL OFFICE

**C.G. Environment Conservation Board New H.I.G. 9-10-11, Tatibandh,
Raipur(C.G.)**

CONSENT LETTER

No. **2444** /RO/TS/CECB/2011

Raipur, Dated **05/07/2011**

Sub: Consent **M/s Narmada Industries, Kh.No. 119-120, Village - Munrethi, Siltara, Phase-II, Raipur (C.G.)** for the discharge of effluent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974.

Ref: Your application received at this office-dated 07.06.2011 and subsequent correspondence ending dated 02.07.2011.

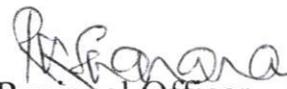
of **M/s Narmada Industries, Kh.No. 119-120, Village - Munrethi, Siltara, Phase-II, Raipur (C.G.)** (expiry date.....)

- 1 With reference to the above application for consent to discharge effluent into the natural water courses under the Water (Prevention & Control of Pollution) Act, 1974, here-in-after referred to as the Act **M/s Narmada Industries, Kh.No. 119-120, Village - Munrethi, Siltara, Phase-II, Raipur (C.G.)** is authorized by the State Board to discharge its industrial and other effluents arising out of their premises into the local stream/river/well in accordance with the general and special conditions as mentioned in the Annexure.
- 2 This consent shall be valid for **12 months from the first day of the month of commissioning of the plant.**

This consent is valid for following product & production capacity: -

	Name of Product		Production Capacity
1	Re-Processed Oil, Coaltar Pitch	☞	6,000 M.T./Year (Six Thousand Metric Ton Per Year)

For & on behalf of C.G. Environment Conservation Board

e ol

Regional Officer
Regional Office, **C.G. Environment Conservation Board**
New H.I.G. 9-10-11, Tatibandh,
RAIPUR (C.G.)

Enclosure: Annexure

(I)
ANNEXURE

M/s Narmada Industries,
Location of factory :- Kh.No. 119-120, total area - 0.5 acre at Village -
Munrethi, Siltara, Phase-II, Raipur (C.G.)

Vide consent No.2444 /RO/ Raipur / NP/ TS /CECB/2011, Dt. 05.07.2011

A. GENERAL CONDITIONS: -

1. All discharges authorized shall be consistent with terms and conditions of this Consent facility expansions, production, increases or process Modifications which result in new or increased discharges of pollutants must be reported by submission of a new Consent, application or if such new, or increased discharge does not violate the effluent limitations specified in the Consent, by submission to the Board details of such new or increased discharges of pollutants in which case the consent may be modified to specify effluent limitations for any pollutants not identified and limited here in the discharge of any pollutant more frequently than or at a level in excess of that identified and authorized by the Consent shall constitute a violation of the terms and conditions of the Consent.
2. After notice and opportunity for the hearing, this consent may be modified, suspended or revoked by the Board in whole or in part during its term for cause including, but not limited to the following: -
 - (a) Violation of any terms and conditions of this Consent.
 - (b) Obtaining this Consent by misrepresentation or failure to disclose fully all relevant facts.
 - (c) A change in any condition that requires temporary or permanent reduction or elimination of the authorized discharge.
3. Notwithstanding para (2) above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established for a toxic pollutant which is present in the discharge authorized here in and such standard or prohibition is more stringent than any limitation upon such pollutant in this Consent the Consent shall be revised or modified in accordance with the toxic effluent standard or prohibition that the Board may consider and the applicant shall be so notified.
4. The applicant shall allow the staff of Chhattisgarh Environment Conservation Board and/or their authorized representative, upon the Presentation or credentials:
 - (a) To enter upon the applicant's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this Consent.

- (b) To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this Consent.
 - (c) To inspect at reasonable times any monitoring equipment or monitoring method required in this Consent; or
 - (d) To sample at reasonable times any discharge or pollutants.
5. The Application shall at all times maintain in goods working order and operate as efficiently as possible all treatment or control facilities of system installed or used by him to achieve compliance with the terms and conditions of this Consent.
 6. The issuance of this Consent does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorized any injury to private property or any invasion of personal rights, nor any infringement of Central, State or local laws or regulation.
 7. The Consent does not authorize or approve the construction of any physical structures or facilities or the undertaking of any work in any watercourse.
 8. The specific effluent limitations and other pollution controls applicable to the discharge permitted here in are set forth below specific conditions. Also sets forth below are self-monitoring and reporting requirements. Unless otherwise specified, the applicant shall submit duplicate original copies of all reports to the Chhattisgarh Environment Conservation Board. Except for date determined to be confidential all such reports shall be available for public inspection at the office of the Chhattisgarh Environment Conservation Board. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provide for in section 42 of the Act.

B. SPECIAL CONDITIONS: -

1. Initial Effluent limitation during the period beginning on the effective date of this consent and lasting until **One Calendar Year** discharge from outfalls shall be limited and monitored by the applicant as specified below: -

- (a) The following shall be limited by the applicant as specified.

S.No.	Effluent Characteristics	Discharge Limitation				Monitoring Requirements	
		Average		Maximum		Frequency of Measurement*	Type of Sample†
		Mg/l	Kg/Day	Mg/l	Kg/Day		

* Daily/Weekly/Monthly/Tri-monthly.

† Grab/24 Hours Composite

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In Addition to above discharge shall be limited and monitored as specified below:

S.No.	Effluent Characteristics	Discharge Limitation				Monitoring Requirements	
		Average		Maximum		Frequency of Measurement*	Type of Sample†
		Mg/l	Kg/Day	Mg/l	Kg/Day		

* Daily/Weekly/Monthly/Tri-monthly.

† Grab/24 Hours Composite

For the purpose of this sub-section, the daily average discharge is the total discharge by weight during the calendar month divided by the number of days in month the production or commercial facility was operating for the purpose of the sub-section the daily maximum discharge means the total discharge by weight during any calendar day.

(b) The PH shall not be less than 5.5 or greater than 9.0

2. Final effluent Limitation: - During the period beginning 1st day of the month of commissioning of the industry and lasting until the date of expiration of this Consent, discharge from the outfalls shall be limited and monitored by the applicant as specified below:-

(a) The following shall be limited and monitored by the applicant as specified.

S.No.	Effluent Characteristics	Discharge Limitation				Monitoring Requirements	
		Average		Maximum		Frequency of Measurement*	Type of Sample†
		Mg/l	Kg/Day	Mg/l	Kg/Day		
1	B.O.D.	--	--	30	0.03	Monthly	24 hours Composite
2	C.O.D.	--	--	250	0.25		
3	S.S.	--	--	100	0.10		
	pH 5.5 to 9.0 Flow : 1.0 m ³ /day					Daily	Grab

* Daily/Weekly/Monthly/Tri-monthly.

† Grab/24 Hours Composite

Additionally, outfalls shall be monitored as follows:

- (i) Flow, Temperature and Total solids: One per Month
- (ii) Grab Samples Maximum discharge temperature above upstream receiving water shall be in accordance with the standard of ISI at 40⁰ C.
- (iii) Uniform as per ISI at 40⁰ C.

The temperature shall be monitored once per month on each outfall. For the purpose of the sub-section the daily average is the total discharge by

weight during calendar month divided by the number of days in month that the production or commercial facility was operating for the purpose of this sub-section, the daily maximum discharge means the total discharge by weight during any calendar day.

(b) The pH shall not be less than 5.5 or greater than 9.0 for outfalls. The samples are taken as monthly, grab samples.

3. Schedule of Compliance for effluent Limitation: - The applicant shall achieve compliance with the effluent limitation: specified above for discharge from outfalls in accordance with the following schedule:

- | | | |
|--|---|---------|
| (i) Report of Progress | : | Monthly |
| (ii) Completion of final plans by | : | |
| (iii) Award of contract of other commitment of financing | : | |
| (iv) Commencement of construction by | : | |
| (v) Report of construction progress | : | |
| (vi) Completion of construction by | : | |
| (vii) Attainment of operational level by | : | |

Please see on page No 13

(a) The applicant shall submit to the Consent issuing Authority the required report of progress or where a specific action is required in (a) above to be taken by a certain date a written notice of compliance or non-compliance with each of the above scheduled dates, post marked not later than 14 days following each elapsed date. Each notice of compliance shall include the following: -

- (1) A short description of the non-compliance.
- (2) A description of any action taken or proposed by the applicant to comply with the elapsed scheduled requirement without further delay.
- (3) An estimate of any factors which tend to explain or mitigate the non-compliance, and
- (4) An estimate of the date, the applicant will comply with the elapsed scheduled requirement and assessment of the possibility that the applicant will meet the next scheduled requirement time.

4. Compilation of monitoring Date

(a) Samples and measurements taken to meet the monitoring requirements specified above shall be representative of the volume and nature of monitored discharge.

(b) Following promulgation of guidelines establishing test procedures for the analysis of pollutants, all sampling and analytical methods used to the meet monitoring requirements specified above shall conform to such guidelines. Unless otherwise specified sampling and analytical methods shall conform to the latest edition of the Indian Standard specifications and here it is not specified the guidelines as per standard methods for the

examination of Water & Waste Waters 13th Edition of the American Public Health Association, New York U.S.A. shall be used.

- (c) The applicant shall take samples and measurement to meet the monthly requirements specified above at the location indicated below:

POINT OF SAMPLING

- (i) Outfalls of waste.
(ii) 100 meters from point to confluence, down stream to river or lake.

5. Recording of Monitoring activities and Results:

- (a) The applicant shall make and maintain records of all information resulting from monitoring activities by this Consent.
- (b) The applicant shall record for each measurement of sample take pursuant to the requirements of this Consent that following information:
- (1) The date exact place and time of sampling
 - (2) The dates on which analysis were performed.
 - (3) Who performed the analysis.
 - (4) The analytical techniques of methods use and
 - (5) The result of all required analysis.
- (c) If applicant monitors any pollutant more frequently as is required as is by this Consent he shall include the results of such monitoring in the calculation and reporting of values required in the discharge monitoring reports, which may be prescribed by the Board, such increased frequency shall be indicated on the Discharge Monitoring Report from.
- (d) The applicant shall retain for a minimum of 3 years all records of monitoring activities and result including all records of calibration and maintenance of instrumentation and original strip chart regarding continuous monitoring instrumentation. The period or retention shall be extant during the course of any unresolved litigation regarding the discharge of pollutants by the applicant or when requested by the Central or State Board.

6. Reporting of Monitoring Results:

- (a) Monitoring information required by this Consent shall be summarized and reported by submitting a Discharge Monitoring Report form duly filled in and signed, to the Board's office at the following address:
Chhattisgarh Environment Conservation Board, New H.I.G. 9-10-11, Tatibandh, Raipur(C.G.).
- (b) Each submitted Discharge Monitoring Report shall be signed as follows:

- (i) If submitted by Corporation by a Principal Executive Officer of at least the level of Vice-President or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the discharge Monitoring Report originates,
 - (ii) If submitted by a partnership by a general partner.
 - (iii) If submitted by a sole proprietor, the proprietor,
 - (iv) If submitted by a Municipal, State or Central Government or other public enterprises, by a Principal Executive Officer, ranking elected official commanding officer, or other duly authorized employee.
- (c) All information submitted on the Discharge Monitoring From shall be based upon measurements and sampling carried out during the three previous calendar months. The first Discharge Monitoring Report shall be submitted for a period ending 60 days from issuance. Thereafter reporting period shall end on the last date of each month. The applicant shall submit a Discharge Monitoring Report post marked no later than 28th day of the month following each completed reporting period.
7. Limitation of Discharge of Oil Hazardous Substance in harmful quantities: The applicant shall not discharge oil in quantities defined as harmful in regulations. In addition the applicant shall not discharge hazardous substance into natural watercourse in quantities defined as harmful in regulations promulgated by the Board. Nothing in this Consent shall be deemed to preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities, or penalties to which the applicant is or may be subject to clauses.
8. Limitation of visible Floating Solids and Foam: During the period beginning date of issuance and lasting until the date of expiration of this Consent the applicant shall not discharge floating solids or visible foam.
9. Disposal of Collected Solids:
- (a) Intake Water Treatment: Solids Sludge, dirt, silt or other pollutant separated from or resulting from treatment of intake or supply waters period to use by the applicant shall be disposed of in such a manner as to prevent any pollutant from such materials from entering any such water. Any live fish, shell fish or other animals collected or trapped as a result of intake water screening or treatment may be returned to water shall be disposed of in such a manner as to prevent any pollutants from such materials from entering natural water,
 - (b) Waste water Treatment, Solids sludge, filter, backwash of other pollutant removed from or resulting from treatment or control of waste waters

shall be disposed of in such a manner as to prevent any pollutants from such materials from entering natural water.

10. Non-compliance with Effluent Limitations:

- (A) If for any reason the applicant does not comply with or will be unable to comply with or will be unable to comply with any daily maximum effluent limitations specified in this Consent the applicant shall immediately notify the Consent issuing authority or his designee by telephone No. 2573897 and provide the Consent issuing Authority with the following information in writing within 5 days of such notification:
 - (a) Cause of non-compliance
 - (b) A description of the non-complying discharge including its impact upon the receiving water.
 - (c) Anticipated the time condition of non-compliance is expected to continue or if such condition has been corrected, the duration of non-compliance.
 - (d) Steps taken by the applicant to reduce and eliminate the non-complying discharge and;
 - (e) Steps to be taken by the applicant to prevent recurrence of conditions of not compliance.
- (B) The applicant shall take all responsible steps to minimize any adverse impact to natural waters resulting from non-compliance with any effluent limitation specified in this Consent including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.
- (C) Nothing in this Consent shall be constructed to relieve the applicant from civil or criminal penalties for non-compliance, whether or not such non-compliance is due to factors beyond his control such as equipment break down electric power failure, accident or natural disaster.

Limitation of Batch Discharge.

SPECIAL CONDITIONS

11. Provision for Electric Power Failure: The applicant shall either-

- (a) No later than certify in writing to the consent issuing authority that applicant has installed or provided for an alternative electric power sources sufficient to operate all facilities utilized by the applicant to maintain compliance with the terms and conditions of the Consent or.

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- (b) No later than 30 days after the effective date of his Consent, certify in writing to the consent issuing authority that upon the reduction, loss, or failure of one or more of the primary sources of electric power to any facilities utilized by he applicant to maintain compliance with the terms and conditions of his consent, the applicant shall halt, reduce or otherwise Control production and/or all discharges in order to maintain compliance with the terms conditions of this Consent.
12. Prohibition of By-pass of Treatment Facilities: The diversion or by-pass of any discharge from facility utilized by the applicant to maintain compliance with the terms and conditions of this Consent is prohibited except:
- (a) Where unavoidable to prevent loss of life severe property damage, or
- (b) Where excessive storm drainage or run of f would damage any facilities necessary for compliance with the terms and conditions of this Consent. The applicant shall immediately notify the consent issuing authorities in writing of each such diversion or by-pass in accordance with the procedure specified above for reporting non-compliance.
13. Spill Prevention and Containment Plan: Within 90 days of the effective date of the Consent the applicant shall prepare and submit to the consent issuing authority; a Spill Prevention; Containment and Countermeasure Plan for the facility covered by this Consent. Such plan shall include the following information and procedures relating to the prevention of spills and unauthorized discharges or oil and hazardous substances;
- (a) A description of a reporting system to be used to notify immediately persons responsible for management of a facility and appropriate State and Central authorities;
- (b) A description of equipment or facilities (including overall facility) for the prevention, containment of spills and unauthorized discharge;
- (c) A list of all oil and hazardous materials used processed or stored at the facility including the normal quantity maintained on the premises for each listed material;
- (d) A brief description of any spills or unauthorized discharge which occurred during the 36 months period preceding the effective date of this Consent and subsequent measures taken by the applicant or reduce the possibility or further spills or unauthorized discharges; and.
- (e) An implementation schedule for additional equipment or facilities which might be required for sub para (b) above but which are not yet operational.

SPECIAL CONDITIONS

Additional Conditions: -

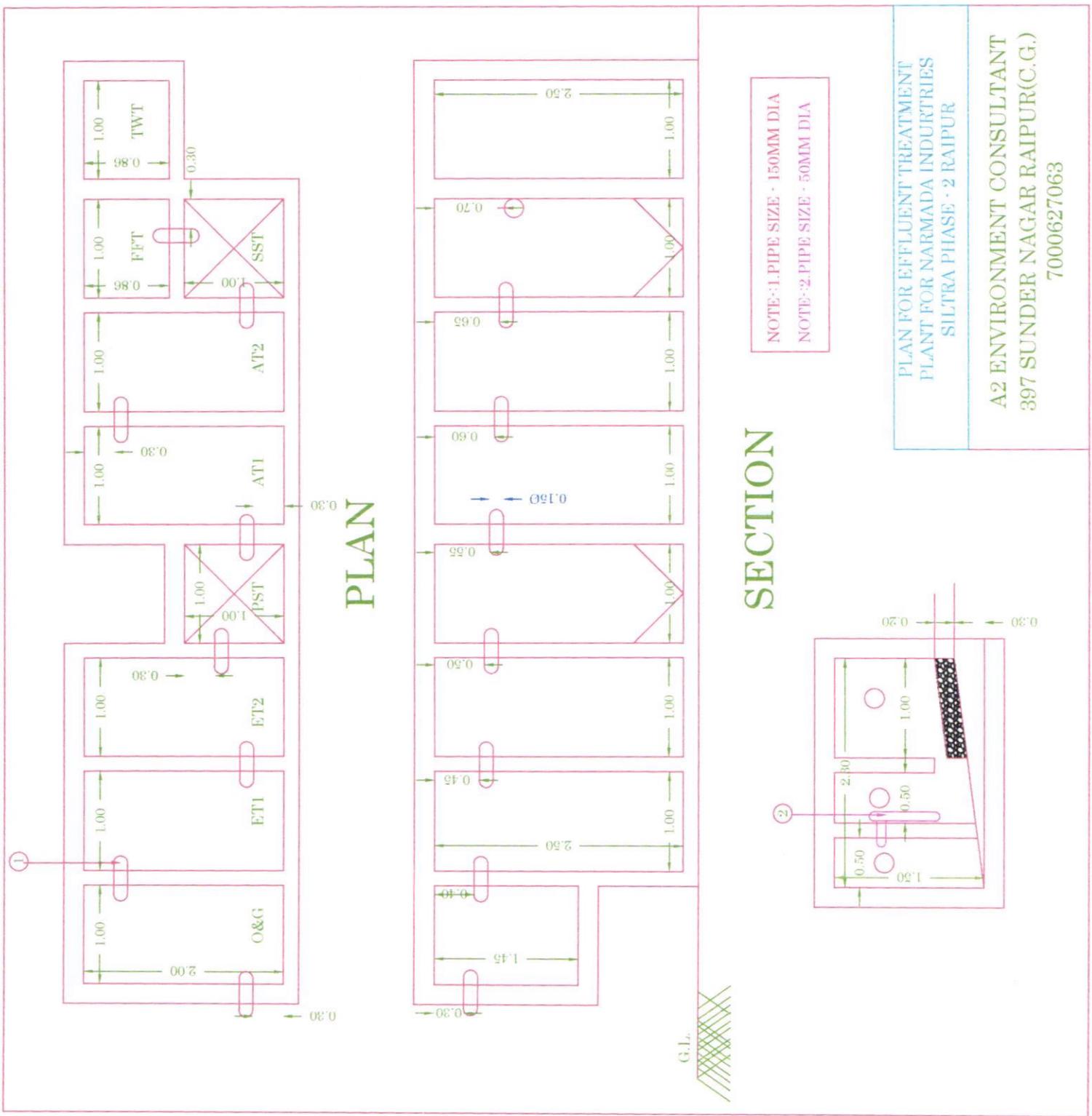
- 1 The date of commissioning of the industry shall be informed at least one month in advance.
- 2 The industry shall have to provide adequate facility for proper treatment of industrial and domestic effluent. The industry shall ensure that the treated effluent conforms to standard prescribed by the Board.
- 3 The industry shall take effective steps for full utilization of treated effluent for land use within the premises. The concept of "Zero discharge" shall be maintained all the time.
- 4 Regular monitoring report of the treated effluent shall be submitted to the Board every month.
- 5 The industry shall take effective step for extensive tree plantation in and around their premises for general improvement of environmental conditions.
- 6 Industry shall adopt good house keeping practices inside the factory premises. All the internal roads should be made pucca.
- 7 The industry shall make proper and safe arrangement for safe disposal of solid waste and sludge.
- 8 All the construction activities for establishment of industry shall be carried out exclusively using fly ash bricks/blocks and other products based on fly ash as far as possible.
- 9 The industry shall obtain Authorization under Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 (If required).
- 10 The Industry shall adopt Rain Water Harvesting system for the conservation of ground water.
- 11 The industry shall submit land diversion certificate from competent authority within a period of one month from the date of issue of this consent letter.
- 12 Industry shall obtain statutory clearances/permissions from concerned central/state government departments, boards, bodies and corporations etc. before establishment of the unit.
- 13 The issuance of this consent does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or local laws or regulations.

- 14 Any change in production capacity/process/raw material used etc. shall be intimated to the board for any enhancement of the above prior permission of the Board shall be obtained.
- 15 The industry shall be commissioned within the period of five years from the date of issue of this consent letter. In case the industry is not commissioned within the stipulated period the consent shall be treated as cancelled.
- 16 The Board reserves the right to amend/Cancel any of the above conditions or add new conditions as and when deemed necessary.

This consent and the authorization to discharge shall expire on midnight on the day after **12 months from the first day of the month of commissioning of the plant**. The applicant shall not discharge after the date of expiration. The applicant shall submit such information, forms and fees as required by the Board not later than 180 days prior to the above date of expiration.

By authority of Chhattisgarh Environment Conservation Board


Regional Officer
Regional Office, C.G. Environment Conservation Board
C.G. Environment Conservation Board
Raipur (C.G.)
H. P.O. B. 10, 11, Tadbandh,
RAIPUR (C.G.)



PLAN

SECTION

NOTE: 1. PIPE SIZE - 150MM DIA
 NOTE: 2. PIPE SIZE - 50MM DIA

PLAN FOR EFFLUENT TREATMENT
 PLANT FOR NARMADA INDUSTRIES
 SILTRA PHASE - 2 RAIPUR
 A2 ENVIRONMENT CONSULTANT
 397 SUNDER NAGAR RAIPUR(C.G.)
 7000627063

STUDY REPORT ON THE BATCH PYROLYSIS PROCESS AT M/S. EXCEL INDUSTRIES (UNIT 2), HATKANANGALE, KOLHAPUR.

1. Background:

Central Pollution Control Board, Regional Directorate, Pune, was directed to carry out the study at M/s Excel Industries (Unit-2), Phase-1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, Kolhapur (Maharashtra) with the following study protocol;

- ❖ The monitoring will be carried out at both work place as well as in ambient environment for air quality with following parameters:
 - Work Place Monitoring (08 hourly): Respirable dust (PM₁₀, PM_{2.5}) CO, VOCs, Benzo(a)pyrene.
 - Ambient Air Quality Monitoring (24 hourly): PM₁₀, PM_{2.5}, VOCs, Benzo(a)pyrene.
- ❖ In case of batch process, monitoring to be carried out at work place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of charcoal / fine carbon for comparison purpose.
- ❖ For ambient air quality, monitoring to be carried out for 8 hours during operation of the plant at two locations.
- ❖ Detailed analysis of tyre pyrolysis oil in terms of its sulphur content, calorific value, sediment, lead, arsenic, cadmium + chromium + nickel, PAH, Total halogens, PCBs and water content (as per schedule V part B of HoM rules 2016).
- ❖ Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be analyzed.
- ❖ Locations and numbers of sensors / alarms.
- ❖ Survey of minimum 10 persons in the adjoining areas (within 1 km radius) through questionnaire (draft questionnaire attached)
- ❖ Health assessment of workers through questionnaire (draft questionnaire attached)
- ❖ Any other parameter of interest if found to be useful during the study may also be included.

Accordingly, monitoring was carried out during 07 – 08 February, 2021 at the aforesaid M/s Excel Industries (Unit-2), Hatkanangale, Kolhapur, and sampling was carried out through a laboratory- M/s Bureau Veritas India Pvt. Limited recognized under the Environment (Protection) Act, 1986. Mr. F. Santhosh Benedict represented as team leader from the laboratory side during the sampling. The following officials participated during the same:

- (i) Shri Bharat K Sharma, Regional Director, Central Pollution Control Board, Regional Directorate Pune, and;
- (ii) Dr. K V George, Scientist & Head - APC Division, National Environmental Engineering Research Institute, Nagpur

The Regional Officer and other officials from the Kolhapur Regional Office, Maharashtra Pollution Control Board, also participated during the studies. Shri. Sameer Wathare (Plant owner), Mr. Ram Bahadur Ram (Plant Operator) and other representatives of the plant operator were also present during the studies.

2. About the Industry:

M/s Excel Industries (Unit-2) is located at Phase -1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, District Kolhapur (Maharashtra). Google Map showing location of the plant is given in Fig. 1.

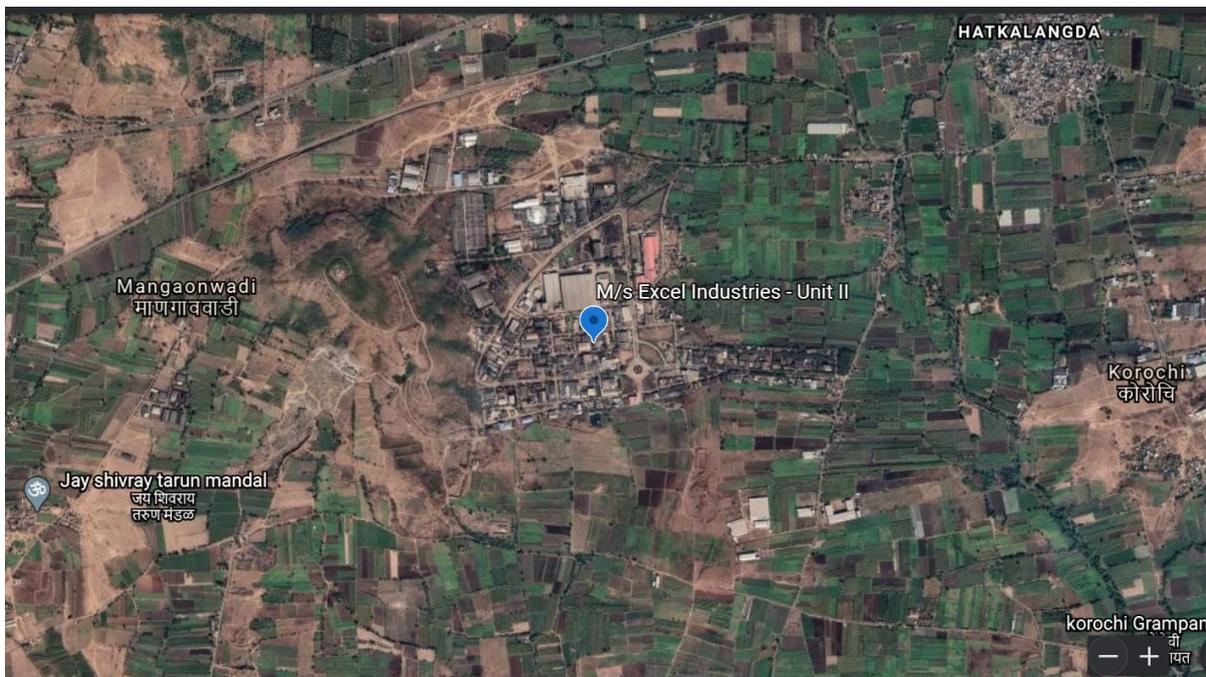


Fig. 1: Google Map showing location of M/s Excel Industries (Unit-2) in Phase -1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, District Kolhapur

The unit is engaged in Tyre Waste pyrolysis and has been granted Consent to Operate under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 by Maharashtra Pollution Control Board (MPCB) vide letter dated 13/9/2019 having validity till 13/9/2019. The unit started operation of its plant on 16/9/2019. The unit was directed by MPCB vide letter dated 21/12/2019 to close down the production activity forthwith till the time of conversion from batch

process to continuous tyre pyrolysis activity. MPCB, however, revoked the said direction of production closure vide letter dated 01/2/2021 and also renewed the Consent to Operate till 31/8/2023 vide letter dated 01/2/2021. Copy of the said Consent to Operate dated 13/9/2019; closure direction dated 21/12/2019; revocation order dated 01/2/2021 of closure direction, and renewed Consent to Operate dated 01/2/2021 are given at Annexure I, II, III and IV respectively.

The unit has been granted Consent to Operate for manufacturing of the following:

Table 1: Product and Quantity as per the Consent to Operate

Sr. No.	Product Name	Maximum Quantity	Unit
1.	Rubber Pyrolysis Oil	3800	Kg/D
Byproducts			
2.	Carbon Black Powder	3500	Kg/D
3.	Steel Wire	1500	Kg/D

The consented daily quantity of sewage effluent from the industry is 1 m³.

3. Process description and Plant & Machineries:

Pyrolysis is a chemical reaction that involves molecular breakdown of larger molecules into smaller molecules in presence of heat but in absence of air. Pyrolysis is also known as thermal cracking, cracking, thermolysis, depolymerization, etc. Tyre pyrolysis is the process of converting waste tyres into products / intermediates like pyrolysis oil, carbon black, steel scrap and hydrocarbon gas.

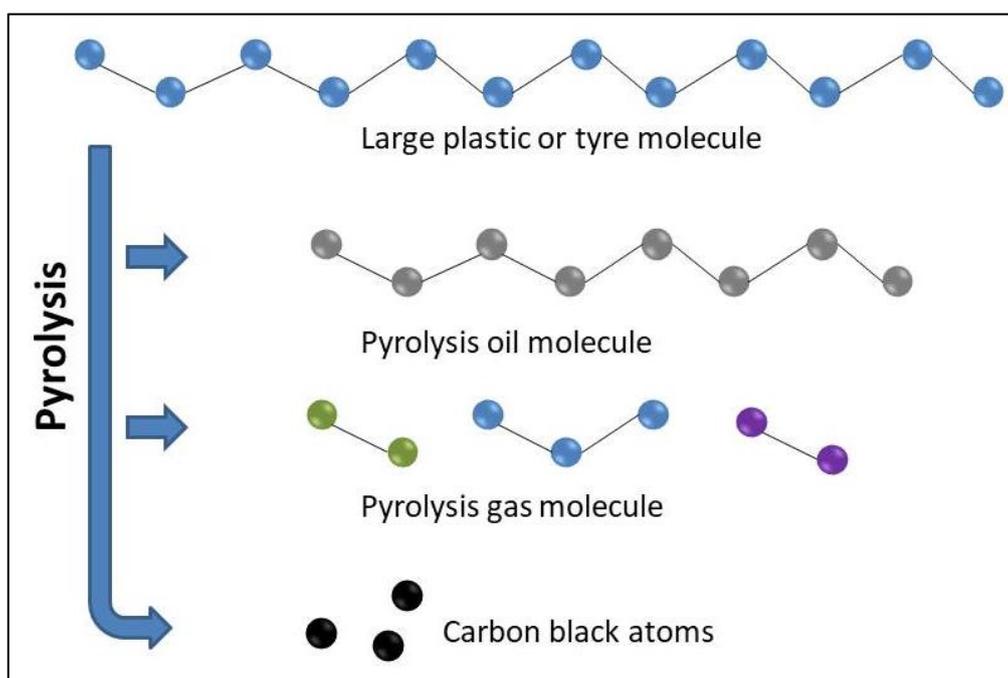


Fig. 2: Typical Pyrolysis Process

Scrap tyres i.e Tyre Wastes collected at the stockyard are segregated and cut into pieces (if not procured in cut pieces) in open within the plant premises. It was informed that waste tyres of four wheelers or bigger tyres (usually not two wheeler tyres) are cut into pieces using cutter machine, if required. These tyre wastes (containing steel within) from stockyard are loaded into the Tyre Pyrolysis Reactor using Telescopic Handler Tractor. The Tyre Pyrolysis Reactor is rotary horizontal cylinder of diameter 2600 mm and length 7500 mm mounted on ground and has provision of heating outer jacket of the cylinder using burners (02 gas fired and 03 oil fired burners) at the bottom. Top of outer jacket of the Reactor is connected to the stack through ducting, Wet Scrubber, ID Fan and stack of height of about 30 m from the ground.

Back of the Tyre Pyrolysis Reactor is connected to the Primary Tank, where some of the gases are condensed and deposited along with some Carbon which are transferred to the oil collection tank. The uncondensed gases are, thereafter, passed into the Pass Condenser, followed by Water Pass Tank for further condensation. From Water Pass Tank, the gases enter into 03 Horizontal Condensers. Water from Cooling Tower is passed through Pass Condenser, Water Pass Tank and the Horizontal Condensers and the oil thus produced on condensation is collected in storage tanks. The uncondensed gases, after Horizontal Condensers, pass into the Uncondensed Gas Tank. The uncondensed gases are used in heating of the Reactor and the excess uncondensed gases are transferred to the Flaring System. The flaring is done at top of the Stack (installed for dispersion of emission from the burners) after passing the uncondensed gas through Packed Bed Scrubber. The oil from the oil tanks is passed into the oil separation tank for condensed water and oil separation. The condensed water mixed with oil is used during the initial heating of the Reactor through the burners. The collected oil is then transferred to the storage tanks (25 KL x 3 nos.) which has vents at the top.

The tyre pyrolysis is carried out in batches. The unit representative informed that the Pyrolysis Reactor capacity is of about 7 to 12 MT of Tyre wastes per batch and batch period is of 22-27 hours depending upon types of tyres (nylon or radial) and quantity being fed into the Reactor. Smaller the size of tyre pieces higher the tyre quantity loading into the Reactor.

Each batch starts with loading of tyre or tyre pieces (along with embedded steel mesh) into the Reactor followed by closure of gate of the Reactor. The loading may usually takes about 2-3 hours. Once the gate is closed, indirect heating of the Reactor is started with the oil fired burner and oil (containing condensed water too) derived from the tyre pyrolysis process is used as fuel. During thermal decomposition of tyre waste in the Reactor, the pyrolysis gases starts liberating at about 120 °C and the Reactor temperature is maintained to maximum of 500 °C. The gases so produced are condensed in the condensers and collected in tanks along with the moisture/condensed water. The heating is switched from oil to uncondensed pyrolysis gases as soon as the same is produced during heating of the Reactor. The Reactor heating is of about 9-12 hours. After this, cooling of the Reactor is carried out for about 10-14 hours during which Nitrogen gas purging is done in the Reactor when the Reactor temperature is cooled to about 70 °C and thereafter Carbon Black Powder from the Reactor is packed into jumbo bags. The Reactor is kept rotating during cooling cycle and air is passed through the Blower at bottom of the Reactor and hot air from top of the Reactor is dispersed through the Stack. Once the Reactor temperature falls below 50°C, gate of the Reactor is opened and Steel Scrap is unloaded using Telescopic Handler Tractor.

For Nitrogen gas purging into the Reactor, the unit uses Nitrogen Gas Cylinders which are brought in front of gate of the Reactor. The Reactor gate has arrangement for pipe connection to transfer Nitrogen gas from the cylinders. Usually, 2-3 Nitrogen Gas Cylinders (capacity of 7 m³) are used in each batch while Reactor keeps rotating.

Bagging of Carbon Black powder from the reactor is carried out by placing jumbo bags in a pit in front of gate of the Reactor. The Reactor gate has arrangement for flexible pipe connection to transfer Carbon Black powder from the Reactor to the Jumbo Bags without opening the Reactor gate. The Reactor is rotated in reverse direction for transfer of carbon black from reactor to the jumbo bag through a pipe connected to the gate of reactor and in this operation Reactor gate remains locked. The Spiral Winding arrangement in the Reactor channelizes the same towards gate side of the Reactor and towards opening where the flexible pipe is attached to the Reactor gate. The transfer of Carbon Black Powder from the reactor to jumbo bag is carried out mechanically without

any manual intervention except placing of flexible pipes into the Reactor gate, placing of jumbo bags and fastening of jumbo bags when filled.

The unit has installed an Effluent Treatment Plant of capacity 0.5 KLD. It has a Chemical Dosing Tank, Settling Tank and Carbon and Sand Filter. The treated water will be used for gardening within the plant premises.

Photographs of various plant & machineries are given in Appendix.

There is a Diesel Generator set of 63 KVA with acoustic enclosure.

4. Safety Arrangement

- A bypass pipe arrangement has been made from Reactor gate to the Primary oil Tank to facilitate the gases from the Reactor to directly bypass to the Primary Oil Tank (which is connected to various condensers, Uncondensed Gas Collection Tank and flaring system) in the event of choking/blockage in the Reactor end or the Bellow fitted to the Reactor. Pressures of the Reactor and Primary Oil Tank are measured and in the event of differential pressure of more than 0.02 kg/cm² between the same, the said bypass arrangement gets activated and also burners gets switched off. A PLC based arrangement has been installed for the said safety activation.
- One Sensor for Methane and CO has also been installed fitted with Hooter system inside the plant shed.
- The workers of the unit were observed using PPE such as boots, helmets and gloves.

5. Fire Safety Arrangement

The unit has installed 09 nos. of Foam based Fire Extinguisher at various locations within the plant premises and one powder based Fire extinguisher in the plant shed.

6. Operational Parameters during the Study Period:

During the inspection, about 7.1 Tons of Tyre wastes was fed into the reactor. The feeding into the Reactor was carried out during at 7:00 AM (Day 1 – 07.02.2021) and the batch was completed at completed at 9:45 PM (Day 2 – 08.02.2021). Readings of temperatures and pressures from the digital display system connected to temperature and pressure sensors along with heating, cooling, Nitrogen Gas purging, Carbon Black Powder Bagging and Steel Scrap removal periods are given in Table 2.

Table 2: Various activities during Tyre Waste Pyrolysis and readings of temperatures and pressures

Date	Time	Temperature		Pressure kg/cm ²		Activities
		Primary Tank	Pyrolysis Reactor	Primary Tank	Pyrolysis Reactor	
07.02.2021	7.00 PM To 9.50 PM					Tyre Feeding to the Reactor
	9.55 PM	33	36	0.02	0.01	Heating of the Pyrolysis Reactor started by switching on the Burners
	10.45 PM	34	46	0.02	0.01	
	11.30 PM	35	55	0.02	0.01	
12.15 AM	39	85	0.02	0.01		
08.02.2021	1.10 AM	52	120	0.13	0.13	Cooling of the Pyrolysis Reactor started by switching off the Burners
	2.15 AM	94	183	0.32	0.31	
	2.51 AM	125	239	0.35	0.31	
	3.52 Am	190	312	0.29	0.29	
	4.59 AM	378	418	0.33	0.32	
	5.50 AM	344	402	0.20	0.19	
	6.50 AM	376	449	0.30	0.30	
	7.24 AM	341	491	0.26	0.26	
	8.10 AM	206	444	0.02	0.02	
	12.30 PM	46	151	0.02	0.01	
	1.30 PM	44	128	0.02	0.01	<ul style="list-style-type: none"> • 1st Nitrogen purging process started at 6.30 PM and ended at 6.40 PM • 1st Carbon Bagging process started at 6.45 PM and ended at 7.40 PM • 2nd Carbon Bagging started at 7.45 PM and ended at 8.45 PM • 2nd Nitrogen purging started at 8.00 PM and ended at 8.15 PM
	2.30 PM	43	108	0.02	0.01	
	3.30 PM	43	94	0.02	0.01	
	4.30 PM	42	82	0.02	0.01	
	5.30 PM	41	75	0.02	0.01	
	6.30 PM	40	69	0.02	0.01	
	7.30 PM	38	62	0.02	0.01	
	8.30 PM	37	57	0.02	0.01	
	9.08 PM	36	55	0.02	0.01	
	9.20 PM To 9.45 PM					

7. Inputs and yields during the Tyre Waste pyrolysis process:

Details of input and yields from the said batch 26 hours 45 minutes are as below:

- (i) Tyre Wastes Fed into the Pyrolysis Reactor – 7100 kg
- (ii) Oil retrieved - 2660 kg
- (iii) Carbon Black Powder retrieved – 2450 kg
- (iv) Steel Scrap extract retrieved – 1050 kg
- (v) Condensed water collected in oil collection tanks – 50 L

8. Monitoring & Sampling

The unit premises is of about 33,000 sq. ft. and surrounded by other units except at North side where there is a road. The plant shed is about 5000 sq. ft. (west end of the unit premises) wherein the Reactor, various Condensers, Uncondensed Gas Collection Tank and oil collection Tanks are placed. The shed is fully open from the front side, fully enclosed from the back side and half enclosed from both sides of shed. Storage Tanks (25 KL x 3 nos.) are placed near North boundary of the unit premises and adjacent to the plant shed. There is a 1000 sq ft. shed for storing Carbon Black Powder and Steel Scrap. The Tyre Wastes are kept in open spaces of the plant premises.

The layout of different sections in the plant premises are shown in map in Fig 3.

Fig. 3: Layout of different sections in the plant premises of M/s Excel Industries (Unit-2) in Phase -1, Laxmi Industrial Area, Hatkanangale, District Kolhapur



8.1 Ambient Air Quality Monitoring:

Selection of Ambient Air Quality Monitoring Stations were done based on field conditions, site suitability and disrupted power supply availability and three stations (viz. within plant premises at about 45 m aerial distance towards NE direction; outside boundary of the plant premises at about 10 m aerial distance towards SE direction, and; outside boundary of the plant premises at about 50 m aerial distance towards NW direction of the Pyrolysis Reactor) were selected. Locations of the said three Ambient Air Quality Monitoring Stations are shown in google map in Fig. 4.

Ambient Air Quality Monitoring at these three stations were carried out for 24 hours starting from heating of the Tyre Pyrolysis Reactor for parameters viz. PM10; PM2.5; CO; Total VOCs and Benzo(a)pyrene. The predominant wind direction was observed towards South-West.

Fig. 4: Locations of the three Ambient Air Quality Monitoring Stations are shown in google map



8.2 Work Zone Monitoring:

Work zone air quality was monitored at three different locations for 08 hours for PM10; PM2.5; CO; Total VOCs (TVOC) and Benzo(a)pyrene. These locations are (i) SE direction of the Reactor; (ii) Behind the Reactor & near to the Condensers & Condensed Gas Tank i.e. West Side at the back of the Reactor, and; (iii) Near to middle and North side of the Reactor. The same have been named as Work Zone- Station 1, 2 and 3 respectively.

TVOC monitoring were also carried out near the Oil Storage Tank area where 25 KL x 03 nos. of Oil Storage Tanks are installed as well as near the Reactor while Carbon Black Powder bagging and Reactor gate opened for steel scrap unloading.

8.3 Oil Sampling

The oil derived from the Tyre Waste pyrolysis process were sampled for analysis of Sulphur; Calorific Value; Sediment; Lead; Arsenic; Nickel; Cadmium; Chromium; PAH; Total Halogens; PCBs, and; Water Content.

9. Analysis Results

Analysis results of various parameters monitored & analysed by Laboratory – M/s Bureau Veritas India Pvt. Limited is given at Annexure-V. The work zone air quality results at various locations are compiled and tabulated as below:

Table 3: Work-zone Air Quality Results at various locations

Sl. No.	Station	Duration of Sampling	Analysis Results				
			PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	Benzo(a) pyrene ^a (ng/m ³)	CO ^b (mg/m ³)	TVOC (ppm)
1.	Station 1 (Near Reactor and towards SE direction of the Reactor)	03:00 PM to 11:00 PM (08/2/2021) During cooling of the Pyrolysis Reactor, Nitrogen purging, Carbon Black Powder bagging and opening of Reactor gate for steel scrap unloading	56.3	22.6	< 2	<1	0.1 to 0.5
2.	Station 2 (Near to the Condensers & Condensed Gas Tank i.e. West Side of the Reactor)	10:05 PM (07/2/2021) to 6:05 AM (08/2/2021) During heating of the Pyrolysis Reactor	58.1	22.9	< 2	< 1	0.4 to 1
3.	Station 3 (Near to middle and North side of the Reactor)	9:50 PM (07/2/2021) to 5:50 AM (08/2/2021) During heating of the Pyrolysis Reactor	55.4	22.1	< 2	< 1	0.2 to 0.5

^a 1ng/m³ as Limit of Quantification

^b 2mg/m³ as Limit of Quantification

- (i) TVOC results in front of the Reactor door (near door) while door opened for steel scrap removal from the Reactor are 0.2 - 0.8 ppm. The TVOC results (at about 2 m distance in front of the Reactor) while loading Carbon Black from Reactor to bag and while door opened for steel scrap removal from Reactor are 0.2-0.9 ppm and 0.1-0.2 ppm respectively.
The TVOC results near the Oil Storage Tank area (where 25 KL x 03 nos. of Oil Storage Tanks are installed) are 0.1-0.2 ppm.
- (ii) The monitored ambient air quality parameters reveal that the same are complying with the respective concentration prescribed under the National Ambient Air Quality Standards notified vide B-29016/20/90/PCI-I dated 18/11/2009 under the Air (Prevention and Control of Pollution) Act, 1981. Calorific value of the same has been reported as 9100 g/Cal.
- (iii) The analysis results of oil derived from the Tyre Waste pyrolysis process reveal that it meets the prescribed "Specification of fuel derived from waste oil" notified under Part B of Schedule V of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

10. Observations:

- (a) Health assessment of workers and survey of persons in the adjoining areas (within 1 km radius) through questionnaire may not be applicable in this plant as the operation was resumed its operation only on the day of monitoring (i.e. 07/2/2021) after direction dated 21/12/2019 to close down the production. Further, the unit operated only for about 03 months i.e. w.e.f. 16/9/2019 prior to such closure direction.
The CPCB and NEERI officials didn't observed impacts on their health (like eye irritation, nausea, headache, etc.) while in the plant during the two days of study periods. However, odour was felt in the plant shed to the scale of 4 (when rated at scale of 10) and scale of 1-3 at various other locations of the plant premises.
- (b) Additional Fire Fighting arrangement like Sprinkler system, Fire Hydrant, etc. may require to be installed and necessary clearance from the concerned Fire Department be obtained by the plant operator.
- (c) Although the plant operator claims that condensate water will be used along with oil for initial heating of the Tyre Pyrolysis Reactor but the MoEF&CC's SOP stipulates that such condensate be treated in suitable ETP. In this regard, in the installed ETP, there is need to install O&G Trap and Treated Water Collection Tank. Further, analysis be carried out for generated waste water generated and treated waste water vis-à-vis its suitability for gardening.
- (d) Small fugitive emissions (from combustion of fuel) from outer jacket of the Reactor was observed due to damage of glass wool packing in the Reactor. The same needs to be properly packed.

- (e)
- (i) Fugitive emissions were observed for a short duration of about a minute while opening Reactor gate for Steel Scrap unloading.
 - (ii) No significant visual fugitive emission was observed while unloading of Carbon Black Powder from the Reactor. Minor Carbon Black Powder spillage was observed on floor while manual fastening of filled jumbo bags. The same are cleaned using vacuum cleaner.
- However, analysis results, as given at Table 3, reveal that the 8 hours Time Weighted Average (TWA) does not show significant changes in PM10, PM2.5, CO and Benzo(a)pyrene during heating of the Pyrolysis Reactor or during cooling of the Pyrolysis Reactor, Nitrogen purging, Carbon Black Powder bagging and opening of Reactor gate for steel scrap unloading.
- The TVOC results reveal that the same have higher concentration near to the Condensers & Condensed Gas Tank (i.e. West Side of the Reactor) as compared to the other work-zone locations.
- (f) The provisions stipulated in the MoEF&CC's SOP about degassing/cooling and to that of Consent to Operate (CTO) do not sync with each other as CTO stipulates for Carbon Dioxide gas for degassing of the Reactor whereas the MoEF&CC's SOP stipulate for Nitrogen purging.
 - (g) The unit shall also obtain authorization under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, for handling, storage and processing of Tyre Wastes and generation, storage, packaging and selling/disposal of used oil from DG set and other hazardous wastes generated to authorized recyclers/disposal facility operators.
 - (h) The plant operator informed that Oil; Carbon Black Powder, and; Steel scrap are sold through traders for use as fuel in Pharma, Cement, Foundry Furnace, etc. industries; Cement Plant, and; metal industries respectively.



(Bharat K Sharma)
Regional Director
Central Pollution Control Board
Regional Directorate Pune,



(K V George)
Scientist & Head - APC Division
National Environmental Engineering
Research Institute, Nagpur

Dated : 25/2/2021

MAHARASHTRA POLLUTION CONTROL BOARD**REGIONAL OFFICE KOLHAPUR**

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Visit At : <http://mpcb.gov.in>

Red/S.S.I/

Date: 13/09/2019

Consent No: RO-KOLHAPUR/CONSENT/1909000399/2019

Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal of Authorization under Rule 6 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

[To be referred as Water Act, Air Act and HW (M&TM) Rules respectively].
CONSENT is hereby granted to

M/S. EXCEL INDUSTRIES (UNIT-2)
PHASE-1, SECTOR-B, PLOT NO 57 TO 60,,LAXMI
INDUSTRIAL AREA, HATKANANGALE,KOLHAPUR
TALUKA HATKANAGLE
DIST. KOLHAPUR.

Located in the area declared under the provisions of the Water Act, Air act and Authorization under the provisions of HW (M&H) Rules and amendments thereto subject to the provisions of the Act and the Rules and the Orders that may be made further and subject to the following terms and conditions:

1. The Consent to Operate is granted for a period up to: 31-08-2020.

2. The Consent is valid for the manufacture of -

Sr. No.	Product Name	Maximum Quantity	UOM
1	Rubber Pyrolysis Oil	3800	KG/D
By Products			
2	CARBON BLACK POWDER	3500	Kg/D
3	STEEL WIRE	1500	Kg/D

3. CONDITIONS UNDER WATER ACT:

(i) The daily quantity of trade effluent from the factory shall be Nil.

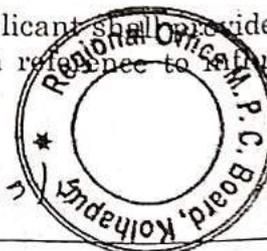
(ii) The daily quantity of sewage effluent from the factory shall not exceed 1.60M³.

(iii) Trade Effluent Treatment: NA

(iv) Trade Effluent Disposal: NA

(v) Sewage Effluent Treatment: The applicant shall provide comprehensive treatment system as is warranted with reference to effluent quality and

MPCB-CONSENT-0000064460



operate and maintain the same continuously so as to achieve the quality of treated effluent to the following standards.

- | | | | | |
|-----|-------------------|---------------|-----|-------|
| (1) | Suspended Solids | Not to exceed | 100 | mg/l. |
| (2) | BOD 3 days 27o C. | Not to exceed | 100 | mg/l. |

(vi) **Sewage Effluent Disposal:** The treated domestic effluent shall be soaked in a soak pit, which shall be got cleaned periodically. Overflow, if any, shall be used on land for gardening / plantation only.

(vii) **Non-Hazardous Solid Wastes:**

Sr. No.	Type Of Waste	Quantity	UOM	Disposal
01	Boiler Ash	40	Kg/D	Sell to Brick Manufacturer.

(viii) **Other Conditions:** Industry shall monitor effluent quality at outlet regularly.

4. The daily water consumption for the following categories is as under:

- | | | | |
|-------|-------------------------|-----|----------|
| (i) | Domestic | ... | 1.20 CMD |
| (ii) | Industrial Processing | ... | 0.00 CMD |
| (iii) | Industrial Cooling | ... | 1.00 CMD |
| (iv) | Agriculture / Gardening | ... | 0.00 CMD |

5. **CONDITIONS UNDER AIR ACT :**

- (i) The applicant shall install a comprehensive control system consisting of control equipments as is warranted with reference to generation of emission and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards:

A) **Control Equipment:**

1. Air Control equipment of adequate capacity shall be provided to limit the emission.
2. Industry shall provide fume extraction system followed by dust collection system to carbon black handling section (s).
3. Industry shall provide dust collector followed by wet scrubber to Pyrolysis Kilns/Reactors.
4. There shall not be any secondary (fugitive) emission.
5. Industry shall install sensors for gases like CO along with alarms set at suitable threshold limit. The necessary piping arrangements for gases along with sensors shall be done in the work environment so as ensure safe operational practices.

B) **Standards for Emissions of Air Pollutants:**

- (i) TPM Not to exceed 150 mg/Nm³.
- (ii) So₂ Not to exceed 1.2 Kg/Day.

6. **Conditions for D.G. Set : NA**

7. **Standards for Stack Emissions:**

- (i) The applicant shall observe the following fuel pattern:-

Sr. No.	Type Of Fuel	Quantity	UOM
1	Biomass Briquettes	1.0	Ton/D
2	HSD	4.0	Lit/Hr

Raw 13/3/16



- (ii) The applicant shall erect the chimney(s) of the following specifications:-

Sr. No.	Chimney Attached To	Height in Mtrs.
1	Reactor	6.0 or 5 meters above the Shed height which is higher side.
2	DG Set (30 KVA)	1.5 meter above the roof.

- (iii) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
- (iv) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
- (vi) Other Conditions:
- 1) The industry shall provide adequate mechanical dust collector, Scrubber to furnace.
 - 2) The industry shall not cause any nuisance in surrounding area.
 - 3) The industry shall monitor stack emissions and ambient air Quality Regularly.

8. Conditions Under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 :

- (i) The Industry shall handle hazardous wastes as specified below.

Sr. No.	Type Of Waste	Quantity	UOM	Disposal
---------	---------------	----------	-----	----------

Industry shall not generate any hazardous waste material.

- a) Whenever due to any accident or gas leakage other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body the production process shall be stopped by taking all necessary safety measures. Industry shall also monitor the emission and ensure that the emission do not cause any harm or nuisance in the surrounding. The industry shall not restart the process without permission of the Board and other statutory organization as require under the law.

9. Specific Conditions:-

- i. Industry shall make necessary provisions for storage of carbon dioxide gas which is used for degassing of the rector to vent

- out off gases through condenser-water-burning chamber where these gases are burnt into flame. The degassing of reactor by carbon dioxide shall be done so as to ensure safe closure of the batch process.
- ii. The flue gases from burning chamber, if any specification during startup and burring of excess off gases from reactor, shall be vent out through chimney having adequate height 11 mtrs. Or as per provision of emission regulation Part-IV issued by CPCB whichever is higher.
 - iii. Industry shall be use clean fuel such a LPG/PNG during startup of the reactor.
 - iv. Industry shall ensure that there are no leakage from reactor piping so as to minimize fugitive emissions. The records of preventive maintenance schedule of burner, Reactor vessel pyrolysis chamber and allied piping shall be maintained and made available for inspection during official visits.
 - v. The pyrolysis oil condensed from the vessel shall be collected in storage tanks located in earmarked areas. The pipelines shall be equipped with floating valve so as to avoid spillage due to overflow.
 - vi. There shall not be spillage of pyrolysis oil in and around the factory premises.
 - vii. Pyrolysis oil tanks shall be provided with arrangement of dyke wall and necessary safety arrangements.
 - viii. The vent of pyrolysis oil tanks shall be equipped with adequate Capacity carbon filters so as to minimize emissions of off gases to avoid smell nuisance. The carbon filter's media (fine carbon Particle size) shall be replaced periodically to ensure effective Adsorption of gases.
 - ix. Industry shall maintain logbook which will specify plant operation time, raw material dead stock product logistics along with their specifications, logistics of carbon dioxide records of preventive maintenance etc. The records shall be made available to officials during inspections.
 - x. Industry shall make earmarked storage area for raw materials which shall be covered with shed. The storage area shall have cement concrete flooring with plinth height of 0.5 Mtrs. above the ground.
 - xi. Industry shall maintain minimum distance of 10 Mtrs. between Plant area, raw material storage area, carbon black storage area and pyrolysis oil storage area.
 - xii. Industry shall keep 10 Mtrs free passage area within work environment so as to get direct access to plant / raw material storage / carbon black storage area and pyrolysis oil storage area in case of emergencies.
 - xiii. Adequate firefighting system shall be provided as per prevailing norms laid down by competent authority.

- xiv. The industry shall comply provisions of "The Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989".
- xv. The rules and regulations notified by Ministry of Law and Justice, Govt. of India regarding Public Liabilities Insurance Act, 1991 shall be followed.
- xvi. Industry shall prepare on site and off site disasters management Plan which shall be approved by competent authorities.
- xvii. Industry shall not carry out further processing of pyrolysis oil.
- xviii. The byproducts like steel wire shall be collected properly and Stored in closed shed.

10. Industry shall comply with following additional conditions:

- i. The applicant maintain good housekeeping and take adequate measures for control of pollution from all sources so as not to cause nuisance to surrounding area / inhabitants.
- ii. The applicant bring minimum 33% of the available open land under green coverage/ tree plantation.
- iii. Solid waste - The non-hazardous solid waste arising in the factory premises, sweepings, etc., be disposed of scientifically so as not to cause any nuisance / pollution. The applicant take necessary permissions from civic authorities for disposal to dumping ground.
- iv. The applicant provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the applicant to maintain compliance with the terms and conditions of the consent. In the absence, the applicant stop, reduce or otherwise, control production to abide by terms & conditions of this consent regarding pollution levels.
- v. The applicant not change or alter quantity, quality, the rate of discharge, temperature or the mode of the effluent / emissions or hazardous wastes or control equipment's provided for without previous written permission of the Board.
- vi. The applicant provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous wastes to the Board staff at the terminal or designated points and pay to the Board for the services rendered in this behalf.
- vii. The applicant make an application for renewal of the consent at least 60 days before the date of the expiry of the consent.
- viii. The firm submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as pre the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
- ix. As inspection book be opened and made available to the Board's officers during their visit to the applicant.

11. Other conditions :

- i. Suitable sensor will be installed to ensure that all gases from the Reactor have been evacuated before opening of the reactor for Transfer of carbon black / steel wire.
- ii. That the produced carbon black will be conveyed through Hydraulic / screw conveyor in closed conditions. The carbon black generated from the manufacturing process can also be conveyed / collected / handled by using any other suitable technology, provided the state Board considers the technology to be appropriate.

- iii. It shall be ensured that all the materials have been completely Removed from the reactor for which a glass inspection window with provision of lights (illumination) shall be provided at the outer enclosures of the reactor the end of the conveyor will be attached to a bagging plant where all the carbon black will be Bagged in HDPE bags and the bags will be properly sealed.
- iv. The bagging plant will be equipped with requisite air pollution Control arrangements such as dust extraction system, bag filter to Arrest all the carbon particles which may get air borne during Bagging process and a vent of minimum height of 11 m from the Ground level.
- v. Industry shall carry out ambient air quality monitoring at three Locations simultaneously within their premises in consultation with the Regional Officer to monitor RSPM, carbon monoxide and methane I ethane gases at least once in three months through a recognized laboratory or by the industry It will be ensured that monitoring Shall be carried out only during the period when the plant is in operation
12. Board reserves the right to review, amend, suspend, revoke Etc. this consent and the same be binding on the industry.
13. This consent shall not be construed as exemption from obtaining necessary NOC/permission from any other Government agencies.
14. Industry shall obtain consent to operate before starting commercial Production.
15. Industry shall obtain permission of CGWA for use of ground water.
16. The Capital investment of the industry is Rs. 95.71 Lacs.

Bank Guarantee for Tyre Pyrolysis units.			
S. No.	Condition No of consent	Bank Guarantee Amount (Rs.)	Time Period
01	Towards Provision and operation and maintenance of (Air & Water) Pollution control system	1.00 lakh	Continuous (Extend the BG of consent to Establish)
02	a) Towards provision and operation of suitable sensors for gas, temperature & pressure installed inside the reactor to regulate safe operation of the reactor & proper collection system for toxic gasses. b) Towards provision of operation of hydraulic/screw conveyor for conveyance of the produced carbon black in closed conditions.	1.00 Lakh	Continuous (Extend the BG of consent to Establish)

17. Industry shall strictly follow the guidelines for tyre Retreading & Recycling Prepared by MPCB.



Ravi 13/1/19

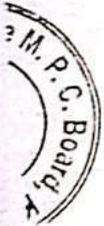
(R. VINDRA ANDHALE)
REGIONAL OFFICER, KOLHAPUR

To,
M/S. EXCEL INDUSTRIES (UNIT-2)
PHASE-1, SECTOR-B, PLOT NO 57 TO 60,
LAXMI INDUSTRIAL AREA, HATKANANGALE,
TALUKA HATKANAGLE
DIST. KOLHAPUR.

Received Consent fee of -

Online Payment Details (E-Payment)

Sr no.	Unique No	Description	Payment added	Transaction number	Transaction Date	Approved On	Status
1	MPCB- CONSENT- 0000064460	Consent Fee	5000.00	TXN1901001235	11-01-2019	11-01- 2019	Success



Copy submitted to:

1. The Member Secretary, MPC Board, Mumbai.
2. The Chief Accounts Officer, MPC Board, Mumbai.
3. Statistical wing/Air wing/Hazardous Management wing, MPC Board, Mumbai

Copy to :-

1. The Sub Regional Officer, MPC Board, Kolhapur.

MPCB-CONSENT-0000064460

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MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL OFFICE, KOLHAPUR.

Tel. No. (0231) 2652952,
2660448

Fax No. (0231) 2652952

E-mail: rokolhapur@mpcb.gov.in



Udyog Bhavan,

Near Collector Office,

Kolhapur - 416 003.

Website: <http://mpcb.mah.nic.in>

No. MPCB/RO/KOP/KOP - 445/2019

Date: 21 / 12 / 2019

To,

M/s. Excel Industries Unit -2,
Phase -1, Sector- B, Plot No. 57 to 60,
Laxmi Industrial Area, Hatkanangle,
Tal. Hatkanangle, Dist. Kolhapur.

Sub :- Directions under Section 33A of the Water (Prevention & Control of Pollution) Act, 1974 and under Section 31A of the Air (Prevention & Control of Pollution) Act, 1981.

- Ref :-
- 1) Consent to Operate granted by the Board dated
 - 2) Office Memorandum issued by MOEF & CC for Standard Operating Procedures (SOPs) With regard to recycling from waste pneumatic tyres vide F. No. 23-61/2015- HSMD, Gol vide Dtd 24/11/2015.
 - 3) Order dated 19/09/2019 passed by the Hon'ble National Green Tribunal, Principal Bench, New Delhi in O.A. Application No. 400/2019.
 - 4) Report received from Sub-Regional Officer, MPCB.

WHEREAS, it is obligatory on your part to comply with the conditions stipulated under Consent to Operate granted by the Board to your unit under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974, under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and under Rule 5 of the Hazardous Wastes (Management & Trans-Boundary Movement) Rules, 2016. **AND WHEREAS**, it is also obligatory on your part to provide adequate pollution control systems and operate & maintain the same continuously and effectively so as to achieve the standards prescribed under Environment (Protection) Act, 1986 and to avoid any sort of pollution problem in the surrounding area.

AND WHEREAS, it is obligatory on your part to comply with the Office Memorandum issued by MOEF & CC for Standard Operating Procedures (SOPs) With regard to recycling from waste pneumatic tyres, used PET Bottle Scrap, lead scrap / used lead scrap/used lead batteries and recovery of TPO from tyres scrap regarding vide F. No. 23-61/2015- HSMD, Gol vide Dtd 24/11/2015.

AND WHEREAS, it is obligatory on your part to comply with the order passed by the Hon'ble National Green Tribunal vide above reference (3) and submit the compliance report thereof to the Board accordingly.

AND WHEREAS, the Sub-Regional Officer of the Board at Kolhapur reported vide above reference (4) that,

1. Your unit is engaged in carrying out the Pyrolysis activities in batch process.
2. You have not obtained CHWTSDF Membership
3. You have not provided effluent treatment plant.
4. You have not provided pack packed bed scrubber.

AND WHEREAS, the Hon'ble National Green Tribunal, Principal Bench, New Delhi has passed an order on 19/09/2019 in O.A. No. 400/2019 filed by Social Action for Forest & Environment v/s. Union of India & Others wherein it is mentioned as "In most of the cases, it was observed that the reason of non-compliance is not meeting the criteria of SOP of MoEF & CC and the Consent conditions issued by the SPCBs/PCCs. In case of non-compliances actions have been initiated in the form of Closure Directions or time specific directions for improvement or notices for compliances. The remedial measures suggested are as follows".

1. Only continuous tyre pyrolysis units be allowed and all the units having batch process be asked to switch over to continuous process within a given time frame of one year and till the time of conversion their operation be stopped.
2. The feed to the continuous reactors should be in the form of tyre chips and mechanical feeding system with air lock arrangements so that no air enters in the reactor.
3. The unit should install packed bed scrubber for control of gases emission and reduction of odour.
4. If unit excess pyro gas if any should be flaring system of adequate capacity considering the emergency situation in which the entire gas may be flared the flaring should be done at a minimum height of 30 meters.
5. The tyre pyrolysis unit should strictly follow the Standards Operating Procedures (SOPs) issued by MoEF & CC for continuous process and the Consent conditions issued by SPCBs/PCCs.

NOW THEREFORE you are directed to close down the production activity forthwith till the time of conversion from batch process to continuous tyre pyrolysis activity. In case, you fail to comply with the above directions, the Board will have no any other option than to issue Closure Directions with disconnection of electricity and water supply of your unit including levy of environmental compensation, which may be noted.

FOR AND BEHALF OF M.P.C. BOARD

Ravi 21/12/2019
(Ravindra Andhale)
Regional Officer, Kolhapur.

Copy submitted to :-

1. The Joint Director (APC), MPCB, Mumbai.

Copy to :

1. The Sub-Regional Officer, MPCB, Kolhapur – You are directed to serve the directions to the industry and for necessary follow up for compliance accordingly.

MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL OFFICE, KOLHAPUR.

TEL. No. (0231) 2652952,
2660448
FAX No. (0231) 2652952
E-MAIL: ROKOLHAPUR@MPCB.GOV.IN



UDYOG BHAVAN,
NEAR COLLECTOR OFFICE,
KOLHAPUR - 416 003.
WEBSITE: HTTP://MPCB.MAH.NIC.IN

No. MPCB/RO/KOP/DIR/ 204/2019.

Date: 02/11/2019

To,

M/s Excel Industries Unit 2,
Phase-I, Sector-B, Plot No. 57 To 60,
Laxmi Industrial Area, Hatkanangale,
Tal. Hatkanangale,
Dist. Kolhapur.

Sub: Directions under section 33 A of Water (Prevention & Control of Pollution) Act, 1974, 31 A of Air (Prevention & Control of Pollution) Act, 1981 & Hazardous Waste (M & TM) Rules, 2016.

Ref : 1) Consent granted by the Board.
2) Hon'ble NGT PB, New Delhi passed order dtd. 19-09-2019.
3) Letter received from JD (APC) regarding compliance of NGT order OA 400/2019 dtd. 19-09-2019 on 25-10-2019.

WHEREAS, you are operating your industry in 'Pollution Prevention Area' under the provisions of Water (Prevention & Control of Pollution) Act, 1974 & Air (Prevention & Control of Pollution) Act, 1981.

AND WHEREAS, Board has granted consent to your industrial plant subject to certain terms & conditions more precisely defined under section 26 of the Water (P & CP) Act, 1974 & under section 21 of the Air (P & CP) Act, 1981 & Hazardous Waste (Management & Transboundary Movement) Rules, 2016.

AND WHEREAS, it is obligatory on your part to provide full-fledged effluent treatment plant & Air pollution control arrangements for treatment & disposal of industrial effluent, air emissions & to operate the same round the clock so as to meet the standards prescribed by the Board under the provisions of the Water (P & CP) Act, 1974, Air (P & CP) Act, 1981 & Hazardous Waste (M & TM) Rules, 2016.

AND WHEREAS, Hon'ble National Green Tribunal, Principal Bench, New Delhi has passed an Order dtd. 19/09/2019 in O.A. No. 400/2019 filed by Social Action for Forest & Environmental v/s. Union of India & Others.

AND WHEREAS, the Sub - Regional Officer, Kolhapur has reported that your industry is engaged in carrying tyre pyrolysis activity in batch process and not complying with the standard Operating Procedures (SOP's) issued by MoEF and CC.

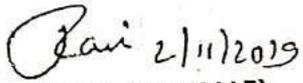
NOW THEREFORE, in exercise of the powers conferred upon me by the Board under section 33A of Water (Prevention & Control of Pollution) Act, 1974 in its 126th meeting held on 08-02-2000. I Ravindra Andhale, Regional Officer, Maharashtra Pollution Control Board, Kolhapur hereby issued following directions-

- i) You shall upgrade height of stack to 30 meters within 30 days from the date of issuance of direction.
- ii) You shall switch over from batch process to continuous process within a given time frame of one year and till the time of conversion your operation should be stopped.
- iii) You shall scrupulously follow the standard Operating Procedures (SOP's) issued by MoEF and CC and consent conditions stipulated by the Board.
- iv) You shall submit undertaking in time bound manner for up-gradation of stack height upto 30meters and also switch over the batch process to continuous process within a given time frame of one year.

You are further directed to file your compliance to these direction, in case, you fail to comply with these direction, the Board will have no option than to initiate further legal action including closure direction with disconnection of Electricity/ Water supply against your industry, which may please be noted.

This is issued with approval of competent authorities of Board.

FOR AND ON BEHALF OF THE BOARD


(RAVINDRA ANDHALE)
REGIONAL OFFICER, KOLHAPUR

Copy submitted for favour of Information :-

- The Member Secretary, M.P.C. Board, Mumbai.
- Joint Director (APC), M.P.C. Board, Mumbai.
- Joint Director (WPC), M.P.C. Board, Mumbai.

Copy to-

- The Sub-Regional Officer, M. P. C. Board, Kolhapur :- You are requested to serve the direction and keep the follow up and report the compliance from time to time.
- Master file.

Annexure-III

MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL OFFICE, KOLHAPUR.

Tel. No. (0231) 2652952,
2660448
Fax No. (0231) 2652952
E-mail:
rokolhapur@mpcb.gov.in



Udyog Bhavan,
Near Collector Office,
Kolhapur - 416 003.
Website: <http://mpcb.mah.nic.in>

No. MPCB/RO/KOP/SROK/Rest/ 869 /2021

Date: 01/02/2021

To,
M/s Excel Industries (Unit-2,
Phase-I, Sector-B, Plot No. 57 To 60,
Laxmi Industrial Area, Hatkanangale,
Tal. Hatkanangale,
Dist. Kolhapur.

Sub: Conditional Direction u/s 33A of Water (Prevention & Control of Pollution) Act, 1974, 31 A of Air (Prevention & Control of Pollution) Act, 1981.

- Ref :** 1) Consent granted by the Board dtd. 13-09-2019.
2) Hon'ble NGT PB, New Delhi passed order dtd. 19-09-2019.
3) Letter received from JD (APC) regarding compliance of NGT order OA 400/2019 dtd. 19-09-2019 on 25-10-2019.
4) Direction issued by the Board for compliance of SOP's dtd. 02-11-2019.
5) Direction for Closure issued dtd. 21-12-2019.
6) Industry submitted compliance vide letter dtd. 05-10-2020.
7) Undertaking submitted by the industry.

.....

We refer to the Direction of Closure issued under section 33A of Water (Prevention & Control of Pollution) Act, 1974, 31 A of Air (Prevention & Control of Pollution) Act, 1981 and under the Hazardous Waste (M & TM) Rules, 2016 as amended with respect to the non-compliance/ violations observed by Sub- Regional Office, Kolhapur. We refer to your reply requesting to grant permission to restart manufacturing activity vide reference no (7) and also conditional restart approved by competent authority of the Board.

In view of steps taken by you and compliance verified by Board Officials, you are allowed to restart your manufacturing activities subject to compliance of the following conditions.

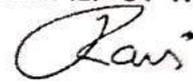
- 1) **Industry shall switch over from advanced batch process to continuous process within a given time frame of one year and submit compliance the same.**

- ii) Industry shall scrupulously follow the standard Operating Procedures (SOP's) issued by MoEF and CC and consent conditions stipulated by the Board.
- iii) Industry shall provide sufficient capacity Air Pollution Control System and same shall be operated and maintained round 'O' clock regularly.
- iv) Industry shall submit the fresh Bank Guarantee of Rs. 25,000/- towards compliance of above conditions in favour of Regional Officer, MPC Board, Kolhapur within 15 days.

These Directions are issued under the powers confirmed upon me by the Board under section 33A of Water (Prevention & Control of Pollution) Act, 1974 & 31 A of Air (Prevention & Control of Pollution) Act, 1981 with approval of competent authority. These directions shall be scrupulously followed. In case of non-compliances observed Board will have no options than to initiate stringent action including forfeiture of BG and issuance of final Directions which may please be noted.

This is issued with approval of competent authority.

FOR AND ON BEHALF OF THE BOARD



**(RAVINDRA ANDHALE)
REGIONAL OFFICER, KOLHAPUR**

Copy submitted for information.

1. The Member Secretary, M.P.C. Board, Mumbai.
2. Joint Director (WPC), M.P.C. Board, Mumbai.

Copy to:

1. Law Officer, M.P.C. Board, Mumbai.
 2. Sub-Regional Officer, M.P.C. Board, Kolhapur.
- He is directed to serve the direction to the industry. MSED CO. Ltd, and irrigation dept. & keep vigilance & report the compliance accordingly.

MAHARASHTRA POLLUTION CONTROL BOARD

REGIONAL OFFICE KOLHAPUR

Phone : 0231-2652952 /2660448



Udyog Bhawan Near Collector Office,

Fax : 0231-2652952

Email : rokolhapur@mpcb.gov.in

Kolhapur - 416003

Visit At : <http://mpcb.gov.in>

Red/S.S.I/

Date: 01/02/2021

Consent No: RO-KOLHAPUR/CONSENT/2102000243/2021

Renewal of Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal of Authorization under Rule 6 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

[To be referred as Water Act, Air Act and HW (M&TM) Rules respectively].
CONSENT is hereby granted to

M/S. EXCEL INDUSTRIES (UNIT-2)
PHASE-1, SECTOR-B, PLOT NO 57 TO 60,,LAXMI
INDUSTRIAL AREA, HATKANANGALE,KOLHAPUR
TALUKA HATKANAGLE
DIST. KOLHAPUR.

Located in the area declared under the provisions of the Water Act, Air act and Authorization under the provisions of HW (M&H) Rules and amendments thereto subject to the provisions of the Act and the Rules and the Orders that may be made further and subject to the following terms and conditions:

1. The Consent to Operate is granted for a period up to: 31-08-2023
2. The Consent is valid for the manufacture of -

Sr. No.	Product Name	Maximum Quantity	UOM
1	Rubber Pyrolysis Oil	3800	KG/D
By Products			
2	CARBON BLACK POWDER	3500	Kg/D
3	STEEL WIRE	1500	Kg/D

3. CONDITIONS UNDER WATER ACT:

- (i) The daily quantity of trade effluent from the factory shall be Nil.
- (ii) The daily quantity of sewage effluent from the factory shall not exceed 1.00M³.
- (iii) Trade Effluent Treatment: NA
- (iv) Trade Effluent Disposal: NA
- (v) Sewage Effluent Treatment: The applicant shall provide comprehensive treatment system as is warranted with reference to influent quality and

MPCB-CONSENT-0000097281

Peris

Page 1 of 7

operate and maintain the same continuously so as to achieve the quality of treated effluent to the following standards.

(1)	Suspended Solids	Not to exceed	100	mg/l.
(2)	BOD 3 days 27o C.	Not to exceed	100	mg/l.

(vi) **Sewage Effluent Disposal:** The treated domestic effluent shall be soaked in a soak pit, which shall be got cleaned periodically. Overflow, if any, shall be used on land for gardening / plantation only.

(vii) **Non-Hazardous Solid Wastes:**

Sr. No.	Type Of Waste	Quantity	UOM	Disposal
01	Boiler Ash	40	Kg/D	Sell to Brick Manufacturer.

(viii) **Other Conditions:** Industry shall monitor effluent quality at outlet regularly.

4. The daily water consumption for the following categories is as under:

(i)	Domestic	...	1.20 CMD
(ii)	Industrial Processing	...	0.00 CMD
(iii)	Industrial Cooling	...	1.00 CMD
(iv)	Agriculture / Gardening	...	0.00 CMD

5. **CONDITIONS UNDER AIR ACT :**

(i) The applicant shall install a comprehensive control system consisting of control equipments as is warranted with reference to generation of emission and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards:

A) **Control Equipment:**

1. Air Control equipment of adequate capacity shall be provided to limit the emission.
2. Industry shall provide fume extraction system followed by dust collection system to carbon black handling section (s).
3. Industry shall provide dust collector followed by wet scrubber to Pyrolysis Kilns/Reactors.
4. There shall not be any secondary (fugitive) emission.
5. Industry shall install sensors for gases like CO along with alarms set at suitable threshold limit. The necessary piping arrangements for gases along with sensors shall be done in the work environment so as ensure safe operational practices.

B) **Standards for Emissions of Air Pollutants:**

- (i) TPM Not to exceed 150 mg/Nm³.
- (ii) So₂ Not to exceed 1.2 Kg/Day.

6. **Conditions for D.G. Set : NA**

7. **Standards for Stack Emissions:**

(i) The applicant shall observe the following fuel pattern:-

Sr. No.	Type Of Fuel	Quantity	UOM
1	Biomass Briquettes	1.0	Ton/D
2	HSD	4.0	Lit/Hr

- (ii) The applicant shall erect the chimney(s) of the following specifications:-

Sr. No.	Chimney Attached To	Height in Mtrs.
1	Reactor	11.00
2	DG Set (30 KVA)	1.5 meter above the roof.

- (iii) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
- (iv) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
- (vi) Other Conditions:
- 1) The industry shall provide adequate mechanical dust collector, Scrubber to furnace.
 - 2) The industry shall not cause any nuisance in surrounding area.
 - 3) The industry shall monitor stack emissions and ambient air Quality Regularly.

8. Conditions Under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 :

- (i) The Industry shall handle hazardous wastes as specified below.

Sr. No.	Type Of Waste	Quantity	UOM	Disposal
---------	---------------	----------	-----	----------

Industry shall not generate any hazardous waste material.

- a) Whenever due to any accident or gas leakage other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body the production process shall be stopped by taking all necessary safety measures. Industry shall also monitor the emission and ensure that the emission do not cause any harm or nuisance in the surrounding. The industry shall not restart the process without permission of the Board and other statutory organization as require under the law.

9. Specific Conditions:-

- i. Industry shall make necessary provisions for storage of carbon dioxide gas which is used for degassing of the rector to vent out off gases through condenser-water-burning chamber where these gases are burnt into flame. The degassing of

- reactor by carbon dioxide shall be done so as to ensure safe closure of the batch process.
- ii. The flue gases from burning chamber, if any specification during startup and burring of excess off gases from rector, shall be vent out through chimney having adequate height 11 mtrs. Or as per provision of emission regulation Part-IV issued by CPCB whichever is higher.
 - iii. Industry shall be use clean fuel such a LPG/PNG during startup of the reactor.
 - iv. Industry shall ensure that there are no leakage from reactor piping so as to minimize fugitive emissions. The records of preventive maintence schedule of burner. Reactor vessel pyrolysis chamber and allied piping shall be maintained and made available for inspection during official visits.
 - v. The pyrolysis oil condensed from the vessel shall be collected in storage tanks located in earmarked areas. The pipelines shall be equipped with floating valve so as to avoid spillage due to overflow.
 - vi. There shall not be spillage of pyrolysis oil in and around the factory premises.
 - vii. Pyrolysis oil tanks shall be provided with arrangement of dyke wall and necessary safety arrangements.
 - viii. The vent of pyrolysis oil tanks shall be equipped with adequate Capacity carbon filters so as to minimize emissions of off gases to avoid smell nuisance. The carbon filter's media (fine carbon Particle size) shall be replaced periodically to ensure effective Adsorption of gases.
 - ix. Industry shall maintain logbook which will specify plant operation time, raw material dead stock product logistics along with their specifications, logistics of carbon dioxide, records of preventive maintenance etc. The records shall be made available to officials during inspections.
 - x. Industry shall make earmarked storage area for raw materials which shall be covered with shed. The storage area shall have cement concrete flooring with plinth height of 0.5 Mtrs. above the ground.
 - xi. Industry shall maintain minimum distance of 10 Mtrs. between Plant area, raw material storage area, carbon black storage area and pyrolysis oil storage area.
 - xii. Industry shall keep 10 Mtrs free passage area within work environment so as to get direct access to plant / raw material storage / carbon black storage area and pyrolysis oil storage area in case of emergencies.
 - xiii. Adequate firefighting system shall be provided as per prevailing norms laid down by competent authority.
 - xiv. The industry shall comply provisions of "The Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989".

xv. The rules and regulations notified by Ministry of Law and Justice, Govt. of India regarding Public Liabilities Insurance Act, 1991 shall be followed.

xvi. Industry shall prepare on site and off site disasters management Plan which shall be approved by competent authorities.

xvii. Industry shall not carry out further processing of pyrolysis oil.

xviii. The byproducts like steel wire shall be collected properly and Stored in closed shed.

10. Industry shall comply with following additional conditions:

- i. The applicant maintain good housekeeping and take adequate measures for control of pollution from all sources so as not to cause nuisance to surrounding area / inhabitants.
- ii. The applicant bring minimum 33% of the available open land under green coverage/ tree plantation.
- iii. Solid waste – The non-hazardous solid waste arising in the factory premises, sweepings, etc., be disposed of scientifically so as not to cause any nuisance / pollution. The applicant take necessary permissions from civic authorities for disposal to dumping ground.
- iv. The applicant provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the applicant to maintain compliance with the terms and conditions of the consent. In the absence, the applicant stop, reduce or otherwise, control production to abide by terms & conditions of this consent regarding pollution levels.
- v. The applicant not change or alter quantity, quality, the rate of discharge, temperature or the mode of the effluent / emissions or hazardous wastes or control equipment's provided for without previous written permission of the Board.
- vi. The applicant provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous wastes to the Board staff at the terminal or designated points and pay to the Board for the services rendered in this behalf.
- vii. The applicant make an application for renewal of the consent at least 60 days before the date of the expiry of the consent.
- viii. The firm submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as pre the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
- ix. An inspection book be opened and made available to the Board's officers during their visit to the applicant.

11. Other conditions :

- i. Suitable sensor will be installed to ensure that all gases from the Reactor have been evacuated before opening of the reactor for Transfer of carbon black / steel wire.
- ii. That the produced carbon black will be conveyed through Hydraulic / screw conveyor in closed conditions. The carbon black generated from the manufacturing process can also be conveyed / collected / handled by using any other suitable technology, provided the state Board considers the technology to be appropriate.
- iii. It shall be ensured that all the materials have been completely

Removed from the reactor for which a glass inspection window with provision of lights (illumination) shall be provided at the outer enclosures of the reactor the end of the conveyor will be attached to a bagging plant where all the carbon black will be Bagged in HDPE bags and the bags will be properly sealed.

iv. The bagging plant will be equipped with requisite air pollution Control arrangements such as dust extraction system, bag filter to Arrest all the carbon particles which may get air borne during Bagging process and a vent of minimum height of 11 m from the Ground level.

v. Industry shall carry out ambient air quality monitoring at three Locations simultaneously within their premises in consultation with the Regional Officer to monitor RSPM, carbon monoxide and methane I ethane gases at least once in three months through a recognized laboratory or by the industry It will be ensured that monitoring Shall be carried out only during the period when the plant is in operation

12. Board reserves the right to review, amend, suspend, revoke Etc. this consent and the same be binding on the industry.

13. This consent shall not be construed as exemption from obtaining necessary NOC/permission from any other Government agencies.

14. Industry shall obtain consent to operate before starting commercial Production.

15. Industry shall obtain permission of CGWA for use of ground water.

16. Industry shall scrupulously follow the standard Operating Procedures (SOP's) issued by MoEF and CC and consent conditions stipulated by the Board.

17. The Capital investment of the industry is Rs. 95.71 Lacs.

Bank Guarantee for Tyre Pyrolysis units.			
S. No.	Condition No of consent	Bank Guarantee Amount (Rs.)	Time Period
01	Towards Provision and operation and maintenance of (Air & Water) Pollution control system	1.00 lakh	Continuous (Extend the BG of previous consent condition)
02	a) Towards provision and operation of suitable sensors for gas, temperature & pressure installed inside the reactor to regulate safe operation of the reactor & proper collection system for toxic gasses. b) Towards provision of operation of hydraulic/screw conveyor for conveyance of the	1.00 Lakh	Continuous (Extend the BG of previous consent condition)

produced carbon black in closed conditions.		
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18. Industry shall strictly follow the guidelines for tyre Retreading & Recycling Prepared by MPCB.

Ravi

(RAVINDRA ANDHALE)
REGIONAL OFFICER, KOLHAPUR

To,
M/S. EXCEL INDUSTRIES (UNIT-2)
PHASE-1, SECTOR-B, PLOT NO 57 TO 60,
LAXMI INDUSTRIAL AREA, HATKANANGALE,
TALUKA HATKANAGLE
DIST. KOLHAPUR.

Received Consent fee of -

Online Payment Details (E-Payment)

Sr no	Unique No	Description	Payment added	Transaction number	Transaction Date	Approved On	Status
1	MPCB-CONSENT-0000097281	Consent Fee	25000.00	TXN2008002060	30-08-2020	30-08-2020	Success

Consent fees of Rs. 10,000/- is balance with the Board.

Copy submitted to:

1. The Member Secretary, MPC Board, Mumbai.
2. The Chief Accounts Officer, MPC Board, Mumbai.
3. Statistical wing/Air wing/Hazardous Management wing, MPC Board, Mumbai.

Copy to :-

1. The Sub Regional Officer, MPC Board, Kolhapur.



**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:

M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-001

Report Date : 22.02.2021

Internal Sample Number : 490993

Page : 1 of 2

Sample Details:

Sample description : Ambient Air Quality

Received on : 10.02.2021

Location : AAQMS - Station 1
(Towards NE direction of the Pyrolysis Reactor)

Analysis

Commenced on : 11.02.2021

Sampling Date & time : From : 09.10 PM on 07.02.2021

Completed on : 22.02.2021

To : 09.10 PM on 08.02.2021

Relative Humidity : 48 %

Ambient Condition : Clear

Average Temperature : 18 °C

Average Wind Direction : East North East to West South West

Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards, CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	52.6	IS 5182 (Part 23) :2006 (RA: 2017)	24 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	20.4	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

.....Contd.....

Authorised Signatory

M.RAMESH
MANAGER

Terms and Conditions :

- ❖ The test results relate only to the items tested.
- ❖ The test report shall not be reproduced in full or part without the written approval of BVIL.
- ❖ The test items will not be retained for more than 15 days from the date of issue of test report excepts in the case as required by the applicable regulations.
- ❖ The Laboratory's responsibility under this report is limited to proven willful negligence and will in no case be more than the invoiced amount.
- ❖ A satisfactory test report in no way implies that the product so tested is approved by NABL.
- ❖ Laboratory is not responsible for the authenticity of photocopied test reports.

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Sl No. : 24666/2020-21



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TEST REPORT

Report Number : BV/CHEN/21/02/1013-001

Report Date : 22.02.2021

Internal Sample Number : 490993

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.30pm	0.1	229.4
07.02.21	10.30pm	0.2	458.8
07.02.21	11.40pm	0.1	229.4
08.02.21	12.45am	0.1	229.4
08.02.21	01.40am	0.1	229.4
08.02.21	02.55am	0.1	229.4
08.02.21	03.40am	0.1	229.4
08.02.21	04.30am	0.1	229.4
08.02.21	05.45am	0.1	229.4
08.02.21	06.20am	0.1	229.4
08.02.21	07.55am	0.1	229.4
08.02.21	08.40am	0.1	229.4
08.02.21	09.35am	0.1	229.4
08.02.21	10.30am	0.1	229.4
08.02.21	11.30am	0.1	229.4
08.02.21	12.40pm	0.1	229.4
08.02.21	01.45pm	0.1	229.4
08.02.21	02.30pm	0.1	229.4
08.02.21	03.20pm	0.1	229.4
08.02.21	04.35pm	0.1	229.4
08.02.21	05.20pm	0.1	229.4
08.02.21	06.50pm	0.1	229.4
08.02.21	07.35pm	0.1	229.4
08.02.21	08.55pm	0.2	458.8
08.02.21	09.30pm	0.1	229.4

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

M.RAMESH
MANAGER

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SI No. : 15073/2020-21

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TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-002
Internal Sample Number : 490994

Report Date : 22.02.2021
Page : 1 of 2
Received on : 10.02.2021

Sample Details:

Sample description : Ambient Air Quality
Location : AAQMS - Station 2
(Towards SE direction of the Pyrolysis Reactor)
Sampling Date & time : From : 09.25 PM on 07.02.2021
To : 09.25 PM on 08.02.2021

Analysis
Commenced on : 11.02.2021
Completed on : 22.02.2021

Relative Humidity : 48 %
Ambient Condition : Clear
Average Temperature : 18 °C
Average Wind Direction : East North East to West South West
Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	57.1	IS 5182 (Part 23) :2006 (RA: 2017)	24 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	24.3	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

.....Contd.....

Authorised Signatory

M.RAMESH
MANAGER

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SI No. : 24667/2020-21



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VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-002

Report Date : 22.02.2021

Internal Sample Number : 490994

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.40pm	0.3	688.3
07.02.21	10.40pm	0.3	688.3
07.02.21	11.40pm	0.3	688.3
08.02.21	12.55am	0.3	688.3
08.02.21	01.50am	0.3	688.3
08.02.21	02.45am	0.2	458.8
08.02.21	03.50am	0.2	458.8
08.02.21	04.40am	0.2	458.8
08.02.21	05.55am	0.2	458.8
08.02.21	06.30am	0.1	229.4
08.02.21	07.35am	0.1	229.4
08.02.21	08.45am	0.1	229.4
08.02.21	09.55am	0.1	229.4
08.02.21	10.45am	0.1	229.4
08.02.21	11.25am	0.1	229.4
08.02.21	12.30pm	0.1	229.4
08.02.21	01.35pm	0.1	229.4
08.02.21	02.55pm	0.1	229.4
08.02.21	03.30pm	0.1	229.4
08.02.21	04.50pm	0.1	229.4
08.02.21	05.30pm	0.1	229.4
08.02.21	06.40pm	0.1	229.4
08.02.21	07.55pm	0.3	688.3
08.02.21	08.45pm	0.3	688.3
08.02.21	09.40pm	0.2	458.8

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

M.RAMESH
MANAGER

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SI No. : 15074/2020-21

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TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-003
Internal Sample Number : 490995

Report Date : 22.02.2021
Page : 1 of 2
Received on : 10.02.2021

Sample Details:

Sample description : Ambient Air Quality
Location : AAQMS - Station 3
Towards NW direction of the Pyrolysis Reactor
Sampling Date & time : From : 09.40 PM on 07.02.2021
To : 09.40 PM on 08.02.2021
Relative Humidity : 48 %
Ambient Condition : Clear
Average Temperature : 18 °C
Average Wind Direction : East North East to West South West
Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Analysis
Commenced on : 11.02.2021
Completed on : 22.02.2021

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	54.5	IS 5182 (Part 23) :2006 (RA: 2017)	24 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	21.8	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

.....Contd.....

Authorised Signatory

M.RAMESH
MANAGER

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SI No. : 24668/2020-21



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-003

Report Date : 22.02.2021

Internal Sample Number : 490995

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.45pm	0.2	458.8
07.02.21	10.50pm	0.2	458.8
07.02.21	11.55pm	0.2	458.8
08.02.21	12.35am	0.2	458.8
08.02.21	01.55am	0.1	229.4
08.02.21	02.30am	0.1	229.4
08.02.21	03.55am	0.1	229.4
08.02.21	04.50am	0.1	229.4
08.02.21	05.35am	0.1	229.4
08.02.21	06.40am	0.1	229.4
08.02.21	07.30am	0.1	229.4
08.02.21	08.35am	0.1	229.4
08.02.21	09.45am	0.1	229.4
08.02.21	10.40am	0.1	229.4
08.02.21	11.35am	0.1	229.4
08.02.21	12.20pm	0.1	229.4
08.02.21	01.30pm	0.1	229.4
08.02.21	02.45pm	0.1	229.4
08.02.21	03.35pm	0.1	229.4
08.02.21	04.40pm	0.1	229.4
08.02.21	05.25pm	0.1	229.4
08.02.21	06.30pm	0.1	229.4
08.02.21	07.45pm	0.2	458.8
08.02.21	08.35pm	0.2	458.8
08.02.21	09.45pm	0.2	458.8

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

**M.RAMESH
MANAGER**

Bureau Veritas India Pvt.Ltd.

F2, Thiru.Vi. Ka. Industrial Estate,
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Phone : +91 44 - 4967 4000, 4967 4002, 4028
Web : www.bureauveritas.co.in
SI No. : 15075/2020-21

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VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045.

Report Number : BV/CHEN/21/02/1013-004
Internal Sample Number : 490996

Report Date : 22.02.2021
Page : 1 of 2
Received on : 10.02.2021

Sample Details:

Sample description : Work Zone
Location : Work Zone - Station 1
(SE direction from Adjacent of the reactor)
Sampling Date & time : From : 09.50 PM on 07.02.2021
To : 05.50 AM on 08.02.2021

Analysis
Commenced on : 11.02.2021
Completed on : 22.02.2021

Relative Humidity : 48 %
Ambient Condition : Clear
Average Temperature : 18 °C
Average Wind Direction : East North East to West South West
Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	56.3	IS 5182 (Part 23) :2006 (RA: 2017)	8 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	22.6	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	8 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 8 hours monitoring for SI.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

..... Contd.....

Terms and Conditions :

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- ❖ The test report shall not be reproduced in full or part without the written approval of BVIL.
- ❖ The test items will not be retained for more than 15 days from the date of issue of test report excepts in the case as required by the applicable regulations.
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Authorised Signatory

M.RAMESH
MANAGER

Bureau Veritas India Pvt.Ltd.

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Web : www.bureauveritas.co.in
SI No. : 24669/2020-21



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-004

Report Date : 22.02.2021

Internal Sample Number : 490996

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.55pm	0.2	458.8
07.02.21	10.20pm	0.5	1147.2
07.02.21	11.30pm	0.4	917.7
08.02.21	12.35am	0.4	917.7
08.02.21	01.30am	0.4	917.7
08.02.21	02.45am	0.2	458.8
08.02.21	03.30am	0.2	458.8
08.02.21	04.20am	0.2	458.8
08.02.21	05.30am	0.1	229.4

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

M. RAMESH
MANAGER

Bureau Veritas India Pvt.Ltd.

F2, Thiru.Vi. Ka. Industrial Estate,
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SI No. : 15076/2020-21

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**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-005
Internal Sample Number : 490997

Report Date : 22.02.2021

Page : 1 of 2

Sample Details:

Sample description : Work Zone
Location : Work Zone - Station 2

Received on : 10.02.2021

Analysis

Commenced on : 11.02.2021

Behind the Reactor & near to the Condensers &
Condensed Gas Tank

Completed on : 22.02.2021

(Towards West Side of the back of the Pyrolysis Reactor)

Sampling Date & time : From : 10.05 PM on 07.02.2021
To : 06.05 AM on 08.02.2021

Relative Humidity : 48 %

Ambient Condition : Clear

Average Temperature : 18 °C

Average Wind Direction : East North East to West South West

Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	58.1	IS 5182 (Part 23) :2006 (RA: 2017)	8 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	22.9	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	8 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 8hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

Authorised Signatory

M.RAMESH

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Web : www.bureauveritas.co.in

Sl No. : 24670/2020-21

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**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-005

Report Date : 22.02.2021

Internal Sample Number : 490997

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m ³
07.02.21	09.55pm	0.5	1147.2
07.02.21	10.20pm	1.0	2294.4
07.02.21	11.30pm	1.0	2294.4
08.02.21	12.35am	0.9	2065.0
08.02.21	01.30am	1.0	2294.4
08.02.21	02.45am	0.5	1147.2
08.02.21	03.30am	0.5	1147.2
08.02.21	04.20am	0.5	1147.2
08.02.21	05.30am	0.4	917.7

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

**M RAMESH
MANAGER**

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**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-006

Report Date : 22.02.2021

Internal Sample Number : 490998

Page : 1 of 4

Sample Details:

Sample description : Work Zone
Location : Work Zone - Station 3
Near to middle of the Reactor
(Towards North side of the reactor)

Received on : 10.02.2021

Analysis

Commenced on : 11.02.2021
Completed on : 22.02.2021

Sampling Date & time : From : 03.00 PM on 08.02.2021
To : 11.00 PM on 08.02.2021

Relative Humidity : 27 %

Ambient Condition : Clear

Average Temperature : 27 °C

Average Wind Direction : North North West to South South East

Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	55.4	IS 5182 (Part 23) :2006 (RA: 2017)	8 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	21.1	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	8 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 8 hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

Authorised Signatory

M.RAMESH

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Sl No. : 24671/2020-21

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TEST REPORT

**BUREAU
VERITAS**

Report Number : BV/CHEN/21/02/1013-006

Report Date : 22.02.2021

Internal Sample Number : 490998

Page : 2 of 4

Location: Infront of the Reactor door (near door)

Date	Time	TVOC Results (while door opened for steel scrap removal from reactor)	
		in PPM	in ug/m3
08.02.21	09.10pm	0.6	1376.6
08.02.21	09.20pm	0.8	1835.5
08.02.21	09.35pm	0.7	1606.1
08.02.21	09.45pm	0.4	917.7
08.02.21	10.05pm	0.3	688.3
08.02.21	10.15pm	0.2	458.8

Location: Infront of the Reactor door at 2 meter distance

Date	Time	TVOC Results (while door opened for steel scrap removal from reactor)	
		in PPM	in ug/m3
08.02.21	09.10pm	0.2	458.8
08.02.21	09.20pm	0.2	458.8
08.02.21	09.35pm	0.2	458.8
08.02.21	09.45pm	0.1	229.4
08.02.21	10.05pm	0.1	229.4
08.02.21	10.15pm	0.1	229.4

Location: Infront of the Reactor door at 2 meter distance

Date	Time	TVOC Results (while loading carbon black from reactor to bag)	
		in PPM	in ug/m3
08.02.21	06.45pm	0.4	917.7
08.02.21	06.55pm	0.9	2065.0
08.02.21	07.05pm	0.8	1835.5
08.02.21	07.15pm	0.8	1835.5
08.02.21	07.30pm	0.6	1376.6
08.02.21	07.45pm	0.5	1147.2
08.02.21	08.00pm	0.4	917.7
08.02.21	08.15pm	0.3	688.3
08.02.21	08.30pm	0.2	458.8
08.02.21	08.40pm	0.2	458.8

.....Contd.....

Authorised Signatory

M.RAMESH

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TEST REPORT

Report Number : BV/CHEN/21/02/1013-006

Report Date : 22.02.2021

Internal Sample Number : 490998

Page : 3 of 4

Location: Near OIL Storage Tank

Date	Time	TVOC Results as Iso-Butylene	
		in PPM	in ug/m3
07.02.21	10.00pm	0.1	229.4
07.02.21	11.05pm	0.2	458.8
07.02.21	12.05am	0.2	458.8
08.02.21	01.10am	0.3	688.3
08.02.21	02.15am	0.2	458.8
08.02.21	03.00am	0.1	229.4
08.02.21	04.05am	0.1	229.4
08.02.21	05.15am	0.2	458.8
08.02.21	06.10am	0.1	229.4
08.02.21	07.05am	0.1	229.4
08.02.21	08.00am	0.1	229.4
08.02.21	09.10am	0.1	229.4
08.02.21	01.19am	0.1	229.4
08.02.21	10.15am	0.1	229.4
08.02.21	11.05am	0.1	229.4
08.02.21	12.10pm	0.1	229.4
08.02.21	01.00pm	0.1	229.4
08.02.21	02.15pm	0.1	229.4
08.02.21	03.10pm	0.1	229.4
08.02.21	04.00pm	0.1	229.4
08.02.21	05.05pm	0.1	229.4
08.02.21	06.10pm	0.1	229.4
08.02.21	07.15pm	0.2	458.8
08.02.21	08.00pm	0.2	458.8
08.02.21	09.55pm	0.2	458.8

.....Contd.....

Authorised Signatory

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SI No. : 15079/2020-21

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VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-006

Report Date : 22.02.2021

Internal Sample Number : 490998

Page : 4 of 4

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.55pm	0.3	596.6
07.02.21	10.20pm	0.5	1147.2
07.02.21	11.30pm	0.5	1147.2
08.02.21	12.35am	0.5	1147.2
08.02.21	01.30am	0.4	917.7
08.02.21	02.45am	0.4	917.7
08.02.21	03.30am	0.4	917.7
08.02.21	04.20am	0.3	596.6
08.02.21	05.30am	0.2	458.8

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

**M.RAMESH
MANAGER**

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TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045.

Report Number : BV/CHEN/21/02/1012-001
Internal Sample Number : 490987

Report Date : 20.02.2021

Page No. : 1 of 2

Sample Details:

Sample Description : Pyrolysis Oil
Quantity : 2.5 L
Sampled By / Date : Bureau Veritas Representative Mr. F.Santhosh Benedict
Sampling Data Sheet dated : 08.02.2021
Sample Location : M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045.
Sampling Procedure : BVILCH/QMS/SOP-012

Received On : 10.02.2021

Commenced On : 11.02.2021

Completed On : 20.02.2021

Sl. No.	Test Parameters	Unit of Measurement	Results	Method of Testing/ Instrument used
1.	Lead as Pb	mg/kg	BLQ (LOQ:1.0)	USEPA 3031
2.	Arsenic as As	mg/kg	BLQ (LOQ:1.0)	
3.	Cadmium as Cd	mg/kg	BLQ (LOQ:1.0)	
4.	Nickel as Ni	mg/kg	BLQ (LOQ:1.0)	
5.	Chromium as Cr	mg/kg	BLQ (LOQ:1.0)	
6.	Sulphur Content	% by mass	0.12	ASTM D 129 - 13
7.	Calorific Value	Cal/g	9100	ASTM D 240 - 14
8.	Sediments	% by mass	0.20	ASTM D 4988
9.	Total Halogens as Cl	mg/kg	683	USEPA 5050
10.	Water Content	% by mass	BLQ (LOQ:0.05)	ASTM D 95 - 13

..... Contd.

Authorised Signatory

M.RAMESH

MANAGER

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Sl No. : 24680/2020-21

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**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1012-001

Report Date : 20.02.2021

Internal Sample Number : 490987

Page No. : 2 of 2

Sl. No.	Test Parameters	Unit of Measurement	Results	Method of Testing/ Instrument used
11.	Polychlorinated Biphenyls	mg/kg	BLQ (LOQ:1.0)	USEPA 8082 A
12.	Polynuclear Aromatic Hydrocarbons	% by mass	BLQ (LOQ:0.01)	USEPA 8100

BLQ - Below Limit of Quantification / LOQ - Limit of Quantification.

.....End.....
Report Prepared by: S.saran.

Authorised Signatory

M.RAMESH

MANAGER

Bureau Veritas India Pvt.Ltd.

F2, Thiru.Vi. Ka. Industrial Estate,

Phase III, Ekkattuthangal, Guindy, Chennai - 600 032.

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SI No. : 15081/2020-21

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Appendix

Photographs taken during the study of M/s Excel Industries (Unit-2), Phase-1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, Kolhapur (Maharashtra) during Feb 7-8, 2021



AAQM Station Location – 01



AAQM Station Location – 02



AAQM Station Location – 03



Stockyard



Tyre Cutter



Loading of Waste Tyre into Pyrolysis Reactor



Pyrolysis Reactor Loaded with Tyre Waste



Tyre Pyrolysis Reactor



PLC Control Panel



**Digital Display of Pyrolysis Reactor
Temperature and Pressure**



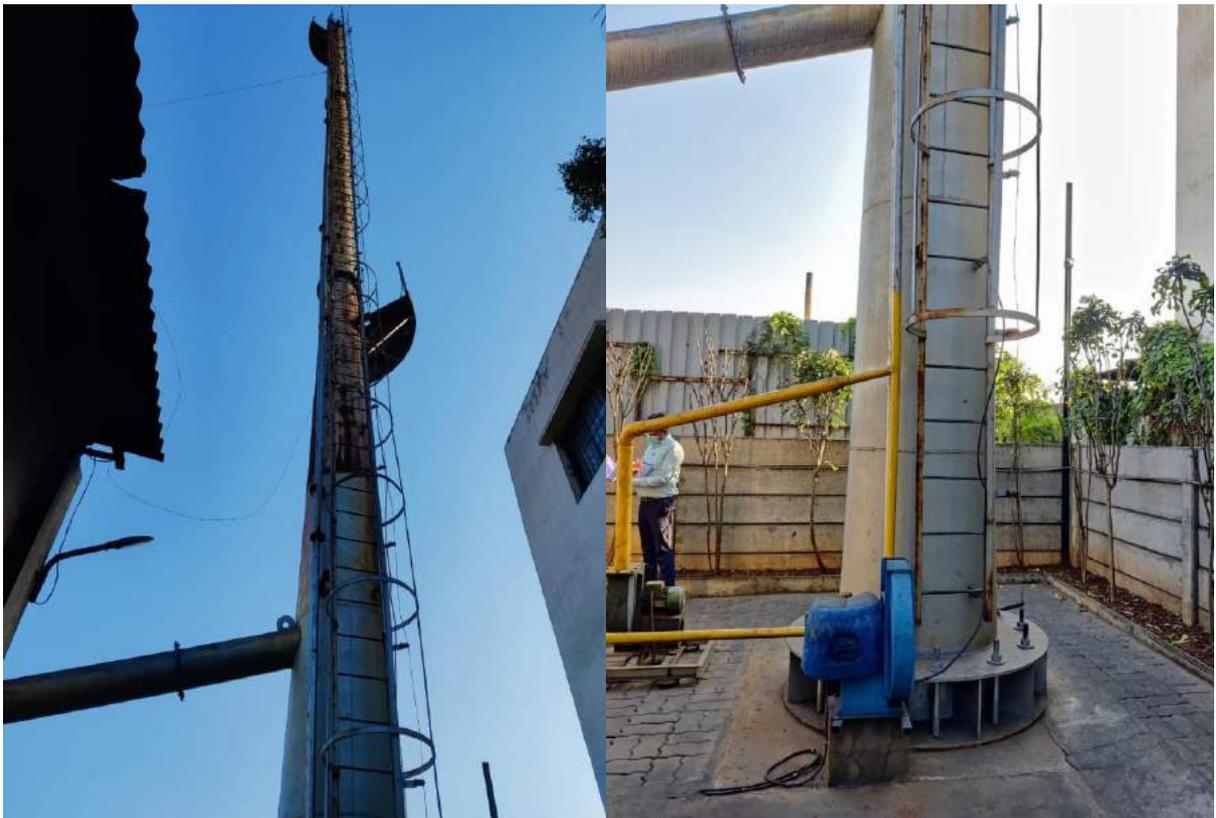
Digital Display attached to CO and CH₄ Sensors



Assembly of Condensers



Oil Storage Tanks



Stack Attached to Condenser



Nitrogen Purging before Opening the Reactor Gate



Fugitive emission on opening the reactor gate



Unloading of Steel Scrap



Steel Scrap Loaded on the Trolley



Carbon Black powder Bagging from the Reactor



Vacuum Cleaner used to Clean Carbon Black Spillage



Pyrolysis Unit Workers Wearing PPE