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Certified Company



 **SARDA**
SARDA ENERGY & MINERALS LTD.
SEML/ENV/MAN/4755
01.07.2018

The Additional Principal Chief Conservator of Forests (C),
Ministry of Environment, Forest & Climate Change
Regional Office, Western Central Zone,
Ground Floor, East Wing, New Secretariat Building,
Civil Lines, Nagpur-440001,


Sub:-Submission of Compliance Report of conditions stipulated in Environmental Clearance vide letter no. J-11011/45/2012-IA.II (I) dated 28/10/2016 for Regularization of existing 6,00,000 TPA Iron Ore Pelletization Plant at Phase I of Siltara Industrial Growth Center, Mandhar, Raipur, Chhattisgarh of M/s Sarda Energy & Minerals Limited .

Dear Sir,

In context with the subject cited matter, we would like to submit Point wise compliance status of all the conditions mentioned in the Environmental Clearance vide letter No. J-11011/45/2012- IA II (I) dated 28th October, 2016 as Annexure -I

Thanking you,

Your faithfully
For Sarda Energy & Minerals Limited,


P.S. Dutta Gupta
Authorized Signatory

Encl: a/a

- CC: (I) The Zonal Officer, CPCB, Zonal Office (Central), 3rd Floor, Sahkar Bhawan, North T.T. Nagar, Bhopal – 462 003.
- (II) The Member Secretary, CECB, "Paryavash Bhawan", North Block, Sector -19 , Naya Raipur (C.G.). – 492 002

Point wise compliance status of all the conditions mentioned in the Environmental Clearance vide letter no. J-11011/45/2012-IA.II (I) dated 28/10/2016

S. L	(A) SPECIFIC CONDITIONS	COMPLIANCE STATUS
I.	The project proponent shall install 24x7 air monitoring devices to monitor air emissions as provided by the CPCB and submit report to Ministry and its Regional Office.	<p>We have established four ambient air quality-monitoring stations in the downward direction as well as where maximum ground level concentration of SPM, SO₂ and NO_x are anticipated in consultation with the CECB. The data on ambient air quality and stack emission is being regularly submitted at CECB monthly basis.</p> <p>A copy of the Monitoring Reports from Jan 2018 to April 2018 attached herewith as Annexure – I</p>
II.	Continuous stack monitoring facilities for all the stacks shall be provided and sufficient air pollution control devices viz Electrostatic Precipitator (ESP), bag house, bag filters etc. shall be provided to keep the emission levels below 50 mg/Nm ³ and installing energy efficient technology.	<p>We have installed opacity meter in our Pelletization Plant stack, for continuous particulate matter emission monitoring. Additionally, we have installed Online Continuous Stack emission monitoring facilities for gaseous emissions i.e. NO_x and SO₂ along with data transfer facility. The data is being continuously transferred to CECB and CPCB server.</p> <p>We have also installed high efficiency four fields Electro Static Precipitator at travelling Grate for control the flue gas emission and are running very efficiently.</p> <p>We have installed & commissioned Bag Filter & dry fog system i.e. chemical based dust suppression system (FILSPRAY – 51) at raw material handling sections, coal fines bin, annular cooler discharge section, product stock house, junction / transfer points of material handling and crushers, to control the dust emission which are being operated regularly</p>
III.	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16 th November, 2009 shall be followed.	Noted and is being/will be complied with.
IV.	Gaseous emission levels including secondary fugitive emissions from all the	Noted and is being/will be complied with.

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S. L	(A) SPECIFIC CONDITIONS	COMPLIANCE STATUS
	sources shall be controlled within the latest permissible limits issued by the Ministry vide G.S.R. 414(E) dated 30 th May, 2008 and regularly monitored, Guidelines / Code of Practice issued by the CPCB shall be followed.	
V.	The PP shall install scrubber or upgrade the existing scrubbers within one year to reduce SO _x emission which will be verified by the regional office.	<i>Noted shall be complied with. However the sulphur emission is being monitored regularly through a continuous online emission monitoring system with is well within the prescribed limit.</i>
VI.	Vehicular pollution due to transportation of raw material and finished product shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.	<i>We have installed and commissioned captive Railway siding with Wagon Tippler and Stacker Reclaimer inside the premises for transportation of Raw material. This in hand will help in minimizing the vehicular emission caused due to transportation of Raw materials & Finished products.</i>
VII.	The internal roads should be designed such that the fire tenders should reach upto 10 meters of any unit.	<i>The internal road network is designed accordingly.</i>
VIII.	Zero effluent discharge shall be strictly followed and no wastewater shall be discharged outside the premises.	<i>No Industrial effluents are being generated from our Pellet Plant. Water is being used for process mixing and equipment cooling. The process water evaporated at the time of heating of pellets. The cooling blow down water is re-circulating in a close system and some make up water is being added for evaporation losses. We have provided concrete settling tanks for settling & collection of cooling blow down water. Domestic waste water is being treated in septic tanks attached with soak pit inside the factory premises. We are not discharging any effluent outside the premises. The concept of zero discharge condition is being maintained all the time.</i>

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S. L	(A) SPECIFIC CONDITIONS	COMPLIANCE STATUS
IX.	Regular monitoring of influent and effluent surface, sub-surface and ground waters shall be ensured and treated wastewater shall meet the norms prescribed by the State Pollution Control Board or described under the E(P) Act whichever are more stringent.	<i>Regular monitoring of influent and effluent surface, sub-surface and ground waters shall be ensured</i> <i>Quality of treated waste water is being maintained well within the prescribed standard of Board published in Gazette Notification dated 25.03.1988.</i>
X.	Proper handling, storage, utilization and disposal of all the solid waste shall be ensured and regular report regarding toxic metal content in the waste material and its composition, end use of solid/hazardous waste shall be submitted to the Ministry's Regional Office, SPCB and CPCB.	<i>We have made arrangement for collection, storage, transportation and disposal of all solid waste. The solid waste generated from pollution control equipment is being collected manually and all dust is being recycled back to process again for Pelletization. All raw materials, fuel and solid waste is being stored in covered shed for avoid any fugitive emission. We have made arrangement for the same</i>
XI.	A time bound action plan shall be submitted for reduction in solid waste, its proper utilization and disposal.	<i>The only solid waste being generated from our pellet plant is ESP and Bag filter Dust which is being recycled back as raw material.</i>
XII.	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 and subsequent amendment in 2003 and 2009. All the fly ash shall be provided to cement and brick manufacturers for further utilization and Memorandum of Understanding shall be submitted to the Ministry's Regional Office at Nagpur.	<i>We are using fly ash brick, fly ash block and fly ash tiles etc. for construction activities in the plant premises. All boundary wall of the plant, we have utilizing fly ash bricks, blocks for construction.</i>
XIII.	A Risk and Disaster Management Plan shall be prepared and a copy submitted to the Ministry's Regional Office, SPCB and CPCB within 3 months of issue of environment clearance letter.	<i>The Risk and Disaster Management Plan has been prepared and is being submitted as Annexure – 2.</i>
XIV.	Green belt shall be developed in at least 33% of the project area by planting native and broad leaved species in consultation with local DFO and local communities as Per the CPCB guidelines. The green belt should be development within 1 year time form the date of grant of Environmental Clearance.	<i>In order to green belt development, we have planted about 1,838 no of saplings in the plant premises in the Year 2017-18, thus the total Plantation done 67,948 No. of Saplings. We have developed We assure that we will develop green belt in the plant 33% of the total plant area.</i>
XV.	At least 2.5% of the total cost of the project shall be earmarked based on Public	<i>We have earmarked 2.5% of the total cost of the project towards the Enterprise Social</i>

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S. L	(A) SPECIFIC CONDITIONS	COMPLIANCE STATUS
	Hearing issues, locals need and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office. Implementation of such program shall be ensured by constituting a Committee comprising of the proponent, representatives of village Pauchayat and District Administration. Action taken report in this regard shall be submitted to the Ministry's Regional Office.	Commitment. Action Plan is being prepared and shall be submitted shortly.
XVI.	The proponent shall prepare a detailed CSR Plan for every year for the next 5 years for the existing cum-expansion project, which includes village-wise, sector-wise (Health, Education, Sanitation, Health, Skill Development and infrastructure requirements such as strengthening of village roads, avenue plantation, etc) activities in consultation with the local communities and administration. The CSR Plan will include the amount of 2% retain annual profits as provided for in Clause 135 of the Companies Act, 2013 which provides for 2% of the average net profits of previous 3years towards CSR activities for life of the project. A separate buget head shall becreated and the annual capital and revenue expenditure on various activities of the Plan shall be submitted as part of the Compliance Report to RO, The details of the CSR Plan shall also be uploaded on the company website and shall also be provided in the Annual Report of the company. The plan so prepared shall be based on SMART (Specific, Measurable, Achievable, Relevant and Time bound) concept. Theexpenditure should be aimed at sustainable development and direct free distributionand temporary relief should not be included.	An amount of 2% of the average net profits of previous 3years is being retained as Prescribed CSR expenditure. Which includes Healthcare, Education, Social projects, Environment, Art & Culture, Help to widows, Sports, and Rural development projects. The Corporate Social Responsibility details carried out since F.Y. 2014-15 till Nov 2017 is enclosed as Annexure –3 . The detailed CSR expenditure has been provided in the Annual Report of the company and the same is being uploaded on the company website.
XVII.	The Company shall submit within three months their policy towards Corporate Environment Responsibility which shall	SEML has laid down integrated QEHS Policy singed by CMD approved by Board of Directors.

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S. L	(A) SPECIFIC CONDITIONS	COMPLIANCE STATUS
	inter-aha address (i) Standard operating process / procedure to being into focus any infringement/deviation/ violation of environmental or forest norms/conditions, (ii) Hierarchical system or Administrative order of the Company to deal with environmental issues and ensuring compliance to the environmental clearance conditions and (iii) System of reporting of non-compliance/violation environmental norms to the Board of Directors of the company and/or stakeholders or shareholders	<p>QEHS Policy is enclosed as Annexure-4</p> <p>SEML is IMS certified company and all the activity based evaluation is carried out considering preventive measures and corrective actions compiling all statutory requirements.</p> <p>Copy of the ISO 14001:2004 certificate enclosed as Annexure-5</p> <p>Details of the Hierarchical system or Administrative order to deal with environmental issues and ensuring compliance to the environmental clearance conditions and system of reporting of non-compliance is enclosed as Annexure-6</p>
VIII.	The project proponent shall provide for solar light system for all common areas, streetlights, villages, parking around project area and maintain the same regularly.	Noted, shall be implemented shortly.
XIX.	The project proponent shall provide for LED lights In their offices and residential areas.	Noted, has been implemented
XX.	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	No new construction work is required for our existing operational 0.6 MTPA Pelletization Plant.

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GENERAL CONDITIONS

S. L	TERMS & CONDITIONS	COMPLIANCE
I.	The project authorities must strictly adhere to the stipulations made by the Chhattisgarh Environment Conservation Board and the State Government.	We are complying with all the conditions stipulated in the consent issued by CECB under Water & Air Act.
II.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEFCC).	No further expansion or modifications in the plant will be carried out without prior approval of the Ministry of Environment and Forests
III.	At least four ambient air quality monitoring stations should be established in the downward direction as well as where maximum ground level concentration of PM ₁₀ , PM _{2.5} , SO ₂ and NO _x are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Nagpur and the SPCB/CPCB once in six months.	Four Ambient Air Quality monitoring station established in the premises in the downward direction as well as where maximum ground level concentration of PM ₁₀ , PM _{2.5} , SO ₂ and NO _x are anticipated in consultation with the CECB. We are regular monitoring ambient air quality & stack emission. Monitoring report is being submitted to Board on monthly basis. Copy of the Ambient Air Quality monitoring reports for last 6 months is enclosed herewith as Annexure-7
IV.	Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19 th May, 1993 and 31st December, 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.	<i>Noted and is being/shall be complied with.</i>
V.	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75dBA (daytime) and 70 dBA (nighttime).	Effective control measures for attenuation of noise generated from various machinery and operations is being practiced to control the noise within permissible limits. We have already provided acoustic hoods, silencers, enclosures etc. on all sources of noise generation in the existing plant. The ambient noise level is being maintained well below the prescribed standards.
VI.	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Occupational Health surveillance of the workers has been conducted periodically and corrective measures are taken. The records are being maintained as per the Factories Act.
VII.	The company shall develop rain water	We have adopted rainwater harvesting

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	harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.	technique in the plant premises for recharge of the ground water table.
VIII.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.	We will comply/ are compiling with all the environmental protection measures and safeguards recommended in the EIA/EMP report. We have undertaken socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc. and in future will also continue the same.
IX.	Requisite funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change (MoEFCC) as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Nagpur. The funds so provided shall not be diverted for any other purpose.	We have Requisite funds towards capital and recurring cost/annum for environmental protection measures to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. We will submit an implementation schedule for implementing all the conditions stipulated in Environmental Clearance to the Regional Office of the Ministry at Bhopal. We assure that the funds earmarked for environmental protection will not be diverted for any other purpose. The expenditure against pollution control and Environment management in the Year 2016 -2017 is enclosed as Annexure 7 .
X.	A copy of clearance letter shall be sent by the proponent to concerned Panchayat Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any from whom suggestions /representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.	A copy of clearance letter has been sent to the Sarpanch, Gram Panchayat Mandhar, vide our letter no SEML/ENV/MAN/4452 dated 07.11.2016 A copy of the environment clearance has been uploaded on the company's web site www.seml.co.in

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XI.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEFCC at Nagpur. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM ₁₀ , SO ₂ , NO _x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	Agreed, will be complied with.
XII.	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEFCC, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Nagpur / CPCB / SPCB shall monitor the stipulated conditions.	Agreed, will be complied with.
XIII.	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environment sent to the respective Regional Office of the MOEFCC at Nagpur by e-mail.	The Environment Statement report for each financial year ending 31st March in Form-V is being submitted regularly to Board as per the provision of Environment (Protection) amendment Rules, 1993
XIV.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forests and Climate Change (MoEFCC) at http://envfor.nic.in . This	We had published in two local Hindi Newspapers i.e. Patrika and Hari Bhumi, Raipur on 05.11.2016 regarding grant of Environmental Clearance for Regularization of existing 6,00,000 TPA Iron Ore Pelletization Plant at Mandhar, Raipur...

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	shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office at Nagpur.	
XV.	Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	The said project is under operation and all the major capital investments have already been made.
10.0	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Noted
11.0	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Noted
12.0	The above conditions shall be enforced, inter-alia under the provisions of the Water(Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules.	Noted

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SEML/2017-18/HSE/MRM/1254
6 February, 2018

To,
The Regional Officer
Chhattisgarh Environment Conservation Board
Kabir Nagar Commercial Complex
Chhattisgarh Housing Board Colony
Kabir Nagar, Raipur (C.G.)

SUB: Stack Emission and Ambient Air Quality Monitoring Report for the Month of 'January, 2018

Dear Sir,

Please find attached herewith the monthly report of stack and ambient air monitoring being conducted at our Pellet Plant in the month of **January, 2018**. The result of stack and ambient air monitoring are as follows:

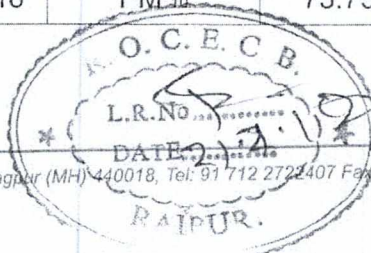
STACK AIR MONITORING

SL. NO.	LOCATION	DATE	RESULT (mg/Nm ³)	PRESCRIBED STANDARD (mg/Nm ³)
1.	Pellet Plant	23/01/18	36.30	50

AMBIENT AIR MONITORING RESULT

SL. NO.	LOCATION	DATE	PARAMETER S	RESULT (µgm/m ³)	PRESCRIBED STANDARD (µgm/m ³)
1.	In Motion Weigh Bridge	16/01/18	PM ₁₀	78.03	100
			PM _{2.5}	33.60	60
			SO ₂	26.35	80
			NO _x	28.15	80
2.	Security Post Barrier # 2	18/01/18	PM ₁₀	70.10	100
			PM _{2.5}	25.32	60
			SO ₂	26.87	80
			NO _x	28.32	80
3.	Sub Station	17/01/18	PM ₁₀	73.73	100


Registered Office : 73/A, Central Avenue, Nagpur (MH) 440018, Tel: 91 712 2722407 Fax: 0712-2722107 India



			PM _{2.5}	25.83	60
			SO ₂	24.87	80
			NO _x	25.81	80
4.	Old Civil Office (Near Cabin)	18/01/18	PM ₁₀	78.03	100
			PM _{2.5}	28.72	60
			SO ₂	27.36	80
			NO _x	29.68	80

All the pollution control equipment run without any stoppage for the entire month.
I hope you will find it in order.

FOR SARDA ENERGY & MINERALS LTD.,


A. K. NANDA
VP (PELLET PLANT)

CC: Member Secretary
Chhattisgarh Environment Conservation Board
Paryavash Bhavan North Block
Sec. 19 naya Raipur
492002

Industrial Growth Center, Siltara
Raipur (CG) 493111, India
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CIN OF SEML IS

L27100MH1973PLC 016617

SEML/2017-18/HSE/MRM/1326
6 March, 2018

To,

The Regional Officer
Chhattisgarh Environment Conservation Board
Kabir Nagar Commercial Complex
Chhattisgarh Housing Board Colony
Kabir Nagar, Raipur (C.G.)

SUB: Stack Emission and Ambient Air Quality Monitoring Report for the Month
of February, 2018

Dear Sir,

Please find attached herewith the monthly report of stack and ambient air monitoring being conducted at our Pellet Plant in the month of February, 2018. The result of stack and ambient air monitoring are as follows:

STACK AIR MONITORING

SL. NO.	LOCATION	DATE	RESULT (mg/Nm ³)	PRESCRIBED STANDARD (mg/Nm ³)
1.	Pellet Plant	12/02/18	38.10	50

AMBIENT AIR MONITORING RESULT

SL. NO.	LOCATION	DATE	PARAMETER S	RESULT (µgm/m ³)	PRESCRIBED STANDARD (µgm/m ³)
1.	In Motion Weigh Bridge	07/02/18	PM ₁₀	65.46	100
			PM _{2.5}	30.30	60
			SO ₂	25.15	80
			NO _x	27.16	80
2.	Security Post Barrier # 2	07/02/18	PM ₁₀	78.19	100
			PM _{2.5}	31.81	60
			SO ₂	27.12	80
			NO _x	28.15	80

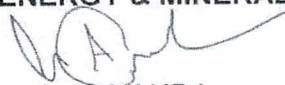


Registered Office : 73/A, Central Avenue, Shri Ram Niketan, Nagpur (MH) 440018, Tel: 91 712 2722407 Fax: 0712-2722407 India

3.	Sub Station	08/02/18	PM ₁₀	67.63	100
			PM _{2.5}	22.52	60
			SO ₂	28.46	80
			NO _x	29.41	80
4.	Old Civil Office (Near Cabin)	08/02/18	PM ₁₀	70.50	100
			PM _{2.5}	34.8	60
			SO ₂	26.42	80
			NO _x	28.15	80

All the pollution control equipment run without any stoppage for the entire month.
I hope you will find it in order.

FOR SARDA ENERGY & MINERALS LTD.,


A. K. NANDA
VP (PELLET PLANT)

CC: Member Secretary
Chhattisgarh Environment Conservation Board
Paryavash Bhavan North Block
Sec. 19 naya Raipur
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CIN OF SEML IS

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SEML/2017-18/HSE/MRM/24
6 April, 2018

To,
The Regional Officer
Chhattisgarh Environment Conservation Board
Kabir Nagar Commercial Complex
Chhattisgarh Housing Board Colony
Kabir Nagar, Raipur (C.G.)

SUB: Stack Emission and Ambient Air Quality Monitoring Report for the Month of March, 2018

Dear Sir,

Please find attached herewith the monthly report of stack and ambient air monitoring being conducted at our Pellet Plant in the month of **March, 2018**. The result of stack and ambient air monitoring are as follows:

STACK AIR MONITORING

SL. NO.	LOCATION	DATE	RESULT (mg/Nm ³)	PRESCRIBED STANDARD (mg/Nm ³)
1.	Pellet Plant	Shutdown		50

AMBIENT AIR MONITORING RESULT

SL. NO.	LOCATION	DATE	PARAMETER S	RESULT (µgm/m ³)	PRESCRIBED STANDARD (µgm/m ³)
1.	In Motion Weigh Bridge	21/03/18	PM ₁₀	86.05	100
			PM _{2.5}	34.18	60
			SO ₂	33.48	80
			NO _x	34.15	80
2.	Security Post Barrier # 2	21/03/18	PM ₁₀	78.09	100
			PM _{2.5}	28.33	60
			SO ₂	29.45	80
			NO _x	31.00	80

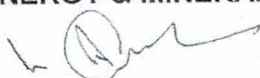


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3.	Sub Station	20/03/18	PM ₁₀	92.98	100
			PM _{2.5}	37.32	60
			SO ₂	31.45	80
			NO _x	34.98	80
4.	Old Civil Office (Near Cabin)	20/03/18	PM ₁₀	73.10	100
			PM _{2.5}	25.80	60
			SO ₂	30.18	80
			NO _x	32.42	80

All the pollution control equipment run without any stoppage for the entire month.
I hope you will find it in order.

FOR SARDA ENERGY & MINERALS LTD.,


A. K. NANDA
VP (PELLET PLANT)

CC: Member Secretary
Chhattisgarh Environment Conservation Board
Paryavash Bhavan North Block
Sec. 19 naya Raipur
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SEML/2018-19/HSE/MRM/26
6 May, 2018

To,
The Regional Officer
Chhattisgarh Environment Conservation Board
Kabir Nagar Commercial Complex
Chhattisgarh Housing Board Colony
Kabir Nagar, Raipur (C.G.)

SUB: Stack Emission and Ambient Air Quality Monitoring Report for the Month of April, 2018

Dear Sir,

Please find attached herewith the monthly report of stack and ambient air monitoring being conducted at our Pellet Plant in the month of **April, 2018**. The result of stack and ambient air monitoring are as follows:

STACK AIR MONITORING

SL. NO.	LOCATION	DATE	RESULT (mg/Nm ³)	PRESCRIBED STANDARD (mg/Nm ³)
1.	Pellet Plant	13/04/18	43.10	50

AMBIENT AIR MONITORING RESULT

SL. NO.	LOCATION	DATE	PARAMETER S	RESULT (µgm/m ³)	PRESCRIBED STANDARD (µgm/m ³)
1.	In Motion Weigh Bridge	23/04/18	PM ₁₀	87.99	100
			PM _{2.5}	33.3	60
			SO ₂	36.45	80
			NO _x	38.44	80
2.	Security Post Barrier # 2	23/04/18	PM ₁₀	91.51	100
			PM _{2.5}	37.22	60
			SO ₂	31.44	80




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			NO _x	34.15	80
3.	Sub Station	22/04/18	PM ₁₀	77.86	100
			PM _{2.5}	31.18	60
			SO ₂	34.12	80
			NO _x	36.18	80
4.	Old Civil Office (Near Cabin)	22/04/18	PM ₁₀	73.24	100
			PM _{2.5}	29.81	60
			SO ₂	31.18	80
			NO _x	33.45	80

All the pollution control equipment run without any stoppage for the entire month.
I hope you will find it in order.

FOR SARDA ENERGY & MINERALS LTD.,


A. K. NANDA
VP (PELLET PLANT)

CC: Member Secretary
Chhattisgarh Environment Conservation Board
Paryavash Bhavan North Block
Sec. 19 naya Raipur
492002

Industrial Growth Center, Siltara
Raipur (CG) 493111, India
Tel: +91 771 2216100
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PAN No.: AAACR6149L
CIN : L27100MH1973PLC 016617
www.seml.co.in
info@seml.co.in

An ISO 9001, ISO 14001 & OHSAS 18001
Certified Company



SEML/2018-19/HSE/MRM/jub
6 June, 2018

To,
The Regional Officer
Chhattisgarh Environment Conservation Board
Kabir Nagar Commercial Complex
Chhattisgarh Housing Board Colony
Kabir Nagar, Raipur (C.G.)

SUB: Stack Emission and Ambient Air Quality Monitoring Report for the Month of May, 2018

Dear Sir,

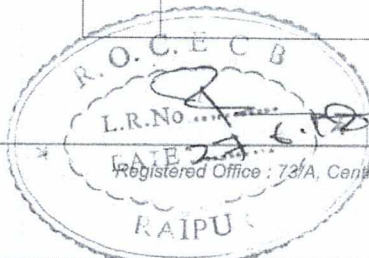
Please find attached herewith the monthly report of stack and ambient air monitoring being conducted at our Pellet Plant in the month of **May, 2018**. The result of stack and ambient air monitoring are as follows:

STACK AIR MONITORING

SL. NO.	LOCATION	DATE	RESULT (mg/Nm ³)	PRESCRIBED STANDARD (mg/Nm ³)
1.	Pellet Plant	15/05/18	41.3	50

AMBIENT AIR MONITORING RESULT

SL. NO.	LOCATION	DATE	PARAMETER S	RESULT (µgm/m ³)	PRESCRIBED STANDARD (µgm/m ³)
1.	In Motion Weigh Bridge	21/05/18	PM ₁₀	88.02	100
			PM _{2.5}	35.79	60
			SO ₂	29.15	80
			NO _x	31.45	80
2.	Security Post Barrier # 2	21/05/18	PM ₁₀	81.34	100
			PM _{2.5}	32.66	60
			SO ₂	32.11	80
			NO _x	33.45	80



Registered Office : 73/A, Central Avenue, Nagpur (MH) 440018, Tel: 91 712 2722407 Fax: 0712-2722107 India

3.	Sub Station	20/05/18	PM ₁₀	88.07	100
			PM _{2.5}	35.97	60
			SO ₂	30.48	80
			NO _x	32.33	80
4.	Old Civil Office (Near Cabin)	20/05/18	PM ₁₀	73.25	100
			PM _{2.5}	28.26	60
			SO ₂	36.42	80
			NO _x	38.44	80

All the pollution control equipment run without any stoppage for the entire month.
I hope you will find it in order.

FOR SARDA ENERGY & MINERALS LTD.,


A. K. NANDA
VP (PELLET PLANT)

CC: Member Secretary
Chhattisgarh Environment Conservation Board
Paryavash Bhavan North Block
Sec. 19 naya Raipur
492002

Annexure - 2

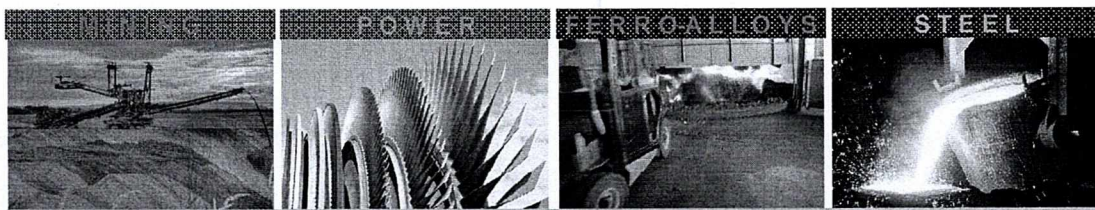
PLAN

OF

PELLET



Synergy in Energy



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SILTARA INDUSTRIAL GROWTH CENTER, MANDHAR RAIPUR [C.G.]

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SARDA ENERGY & MINERALS LTD.
PHASE-1, INDUSTRIAL GROWTH CENTRE,
SILTARA, MANDHAR RAIPUR [C.G.] - 493111

FORWARDS NAME & ADDRESS OF OCCUPIERS

The Risk & Disaster Management plan of SARDA ENERGY & MINERALS LTD. (Pellet Plant), PHASE-1, INDUSTRIAL GROWTH CENTRE, SILTARA MANDHR, RAIPUR (C.G.) in a book from is released herewith for all. Employees concerning with handling of the Emergency if arises any, due to reasons whatsoever, related to operations, maintenance and functioning of the plant.

The plan is a statutory requirement under the Indian Factories Act -1948 with an intention to arrange and gear-up facilities to combat the emergency if any, in an effective way to ensure minimum possible loss to the human beings and to the properties involved and to make situation in order within minimum possible time period.

As such, I request all employees to actively participate in the action plan of Risk & Disaster Management plan as per role given to them. To make ourselves operational at any stage of emergency.

Sing of Occupier

NAME & ADDRESS OF OCCUPIER
Shri. P. K. Jain
B – 501, Ashoka Ratan,
Vidhan Sabha Road Raipur Chhattisgarh
492001

3. SALIENT FEATURES

3.1 Details of occupier / Director

S.NO	NAME	ADDRESS
01	Shri. P. K. Jain	B – 501, Ashoka Ratan, Vidhan Sabha Road Raipur Chhattisgarh 492001

1. Govt License No. : 9027/9027/B-1/RPR/2m(i)
2. Pollution Consent No. Air : 6520/TS/CECB/2017
No. Water : 6522/TS/CECB/2017
3. Connected load : Above 5000 HP
4. Other Govt. License/Excise : AKVN/R/DC/6814 dated 23/07/1999
5. No. labors : Less than 1000

3.2 Production Capacity

S. No.	Name of product	Production Capacity
1	IRON ORE PELLET	6,00,000 MTA

4. INTRODUCTION PLANT LOCATION AND LAYOUT

Developments and advancement in science have made impossible possible. A few decades back the thoughts and ideas of human beings, which were dreams, have now become reality. Man has been continuously conquering over nature. This advancement in science will continue and shall continue to bring more and more comforts and amenities to human being by adding new and unknown dimensions to technology. Similarly in Industrial Development man has made tremendous advancement since the first day of inventing to generate and use fire and other source of energy like Petrol, Gas, and Electricity Nuclear Fuel has been invented. All these sources of technology, Science and Energy on one side brings happiness and comforts, when used properly and wisely, but on the other hand to create agonies and disasters if misused, mishandled, neglected, indiscriminately used or carelessly used.

In view of the above facts SARDA ENERGY & MINERALS LTD. [Integrated Steel Plant] Industrial Growth Centre, Siltara, Mandhar, Raipur [C.G.] is a large scale steel unit set up for Pelletisation of iron ore, prepared this REVISED ON SITE EMERGENCY PLAN 2017-2019 on properly studying through the process of manufacturing, types of raw materials. Energy required involvement of human Personnel, types of plant and machinery and plant location etc. This REVISED ON SITE EMERGENCY PLAN 2017-2019 has been prepared in brief to provide all information.

Regarding dangers, including health hazards arising from the exposure to or handling of the material or substances in the manufacture, transportation, storage and other process, workers engaged in the factory and to the general public living in the vicinity of the factory the safety measures required to be taken in the event of an accident taking place, It is hoped that this emergency plan shall further help to safe guard health.

4.1 Plant location

SARDA ENERGY & MINERALS LTD. is situated about 16kms away from Raipur city in Industrial Growth center phase-I Siltara, and Raipur. It is well connected with Bombay-Howrah rail line and 1kms from National Highway No.200 (Bilaspur Road).The site is not located at densely populated area but it is out the village of SILTARA in Industrial Growth Center.

4.2 Human habitation near plant

S. No.	Name of the Village	Population	Distance from Plant
1	Girod	3500	1.0KM
2	Mandhar	9000	1.0 Km

4.3 Amenities

1	Petrol Pump	2.0 KM
2	Market / Local Bazar - Siltara	1.0 KM
3	Hospital	3.0 KM
4	Police Station Dharsiwa Phone No.07721-268225	5.0 Km

4.4 Plant layout

The Overall plant layout is divided into two parts viz.

MAIN PLANT AREA CORPORATE OFFICE

Since the areas mentioned at (B) above is not engaged with any manufacture process of staking of raw materials and finished products, there is no risk and danger in these areas. Yet the impact of any emergency, if arises at main plant, may affect these areas. Hence these areas are also incorporated in the SARDA ENERGY & MINERALS LTD. [Integrated Steel Plant] Industrial Growth Center, Siltara, Mandhar, Raipur [C.G.]

NECESSITY OF ACTION PLAN

EVEN A SINGLE ACCIDENT FAILS ALL WISE PLANNING:

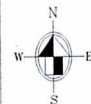
In spite of several efforts to prevent the accidents in an industry, the possibility of occurrence of any accident cannot be ignored, that may result adverse effect may minimize with the help of ON-SITE and OFF-SITE prevalent authorities and public. It is in concept that emergency planning becomes necessary. This planning is helpful in reducing all kinds of damage and hazard.

The Emergency plan / Action Plan / Disaster control plan is nothing but an action plan for handling Emergency in an Industry. Therefore, we have taken-up such planning for this unit.

Key plan / layout plan is enclosed for reference

SYMBOL LEGEND

OTHER'S LAND



LEGEND:-

ALREADY APPROVED

- 1 Railway Yard
- 2 Raw Material Stockyard
- 3 Pellet Plant
- 4 Ore Grinding & Filtration Plant
- 5 L.B.S.S.-1
- 6 Wagon Tippler
- 7 Plant Water Storage
- 8 Raw Water Reservoir
- 9 Make-up Water Pump house
- 10 Time Office
- 11 Officer Canteen
- 12 Stores
- 13 Diesel Station
- 14 Weigh Bridge
- 15 Temporary Project Office
- 16 Construction Power Supply
- 17 Truck Unloader
- 18 Iron Ore Crushing Plant
- 19 Security Room
- 20 Toilet Block

FOR APPROVAL

- 21 Fire fighting Station
- 22 Solar Power Plant & Control Room
- 23 Assembly Room
- 24 Batching Section
- 25 Automobile Shop
- 26 Office (11)
- 27 Office (2)
- 28 Stacker & Wagon tippler - Office
- 29 Lubrication Shed for Wagon tippler
- 30 132 KV Sub Station
- 31 Tailing Pond - Slurry
- 32 Pump House for Tailing Pond
- 33 Grinding Unit - H.G.M.S. Bldg
- 34 R.H.M.S. - Office
- 35 R.H.M.S. - Maintenance Room
- 36 Deduster Unit
- 37 E.S.P.
- 38 Rain Water Harvesting Pond
- 39 Sub Station & Main Control Room
- 40 Compressor House for Grinding Plant
- 41 Compressor House for Pneumatic System
- 42 Car Parking Shed
- 43 Silo for Pneumatic System
- 44 Cycle Stand
- 45 B.S.M.L. Tower
- 46 L.D.O. Tank
- 47 First Aid Center
- 48 Amul Shop
- 49 Main Work Shop (Proposed/Capex)
- 50 Gassifier (Proposed/Capex)

SYMBOL LEGEND

PRECAST BOUNDARY WALL

PROPOSED RAZOR WIRE

WATER GUN POINT

HYDRANT POINT

EMERGENCY CONTROL CENTER - ECC

ASSEMBLY POINT



OF MANIHAR RLY. STATION
@ Km. 81.8/87

SARDA ENERGY & MINERALS LIMITED				INDUSTRIAL GROWTH CENTRE, SULTARA, RAIPUR	
PAPER	SCALE	PROJ.	ISP	EQUIP.	PELLET PLANT
1	06.12.12	AS PER EXISTING SITE CONDITION	DESIGNED		
2	25.02.12	DRG. GENERALLY REVISED	DRAWN	SRVINDRA S.P. SARDAR	06.12.12
3	10.09.11	DRG. GENERALLY REVISED	CHECKED	S.K. SOM	
4	02.04.11	DRG. GENERALLY REVISED	APPROVED		
5	06.12.10	BENEFICIATION PLANT REVISED			
6	01.12.10				

GENERAL LAYOUT PLAN

OF PELLET PLANT

SEML/MAN/C/192

REV:7/6

5

6. OBJECTIVE OF ON-SITE

The main objective of involving the Emergency and Disaster Management Plan is, to create a procedure and infrastructure based on the combined resources of the factory as well as the external services, with a view to minimize damage and losses arising out of emergency and disastrous situation in the plant premises, which may directly or indirectly affect the employee, the property of the company and the local community.

The objective may further be classified as under:

1. To identify casualty, damage and, to carry out the rescue operation and the treatment of persons affected by the emergency.
2. To safe guard other persons not affected by the emergency so far.
3. To keep the damage to the property and to the environment at a minimum level.
4. To initially contain the impact of incident and ultimately bring the incident under control.
5. To provide authentic information to outsiders and the media.
6. To accomplish rehabilitation of the affected persons, if any.
7. Preservation of relevant records.
8. To investigate in to the causes of emergency situation with a view to prevent its recurrence in future.

7. MANUFACTURING PROCESS

Pellet making Process

Concentrate Iron ore (Filter cake) is used to make pellet in different below stages

Pellet making process (Indurations) of green balls means their thermal treatment in the following stages:

1. Drying of green balls.
2. Heating of dried pellets & oxidation of magnetic pellets up to indurations temperature.
3. Firing at indurations temperature.
4. Cooling of indurate pellets

Major Equipment/Area:

1. Proportionate Building
2. Mixer
3. Disc pelletize
4. Travelling grate
5. Rotary kiln
6. Annular cooler

In Proportionate building Filter cake and all additives (Limestone Bentonite and coal mixed in control manner.

Material then convey into the mixer for uniform mixing. Mixed material convey to disc pelletisation for green ball(unfired pellet)making.

Green ball convey to travelling grate for indurations and for roasting in kiln. hot material discharge into the annular cooler from kiln. all heat recovered from annular cooler and finished pellet discharge in finish product conveyor.

Induration:

Induration Process is carried out in three stages viz. Drying, preheating and sintering. The first & second stages are performed in the traveling grate. The green balls are passed through the traveling grate, which is 2.8m W * 39m L and divided in three zones viz. 2 drying and 2 pre-heating. The green balls are dried and heating is in the physically static condition. During this process the pellets balls gain sufficient strength to withstand the condition of the rotary kiln. The hot air from kiln and cooler are used in the traveling grate utilizing and recovering maximum heat from waste gases.

In the third stage, the preheated pellets are fed into the rotary kiln of 4 m dia * 30m long. The kiln is fired from the discharge end. The pre-heated pellets are further heated and roasted up to the temperature of 1250 to 1300°C and discharged into circular cooler. Imported coal containing less than 15% ash is considered as fuel for the kiln. The coal is pulverized in a pulverization mill and fired into the kiln through suitable firing burners. The secondary air for burning of fuel is pre-heated air available from the cooler.

Cooling:

Rotary cooler receives hot pellets with temperature up to 1300°C. Coming from rotary kiln. Annular cooler has 9 air blast boxes divided in 3 zones. Every zone has its own blower to blast the

air from bottom. The hot air from the first zone is used as concentration is well within the permissible limits of pollution norms. Volume of cooling air in all three zones is regulated automatically through the temperature control loops as per the requirements. Cold Pellets at about 80°C are discharges on heat resistant conveyors and conveyed to the stockpile/loading yard.

Stacking and Shipment:

The pellets are subsequently natural cooled in air and transported to stockyard for further shipment.

Waste Gas Treatment and dust recovery:

The hot gas exhausted from wind boxes at two sides of the preheating zone of traveling grate are sent for cyclic utilization, these two parts of gas will be respectively cleaned by No.1 and No.2 de-duster(highly efficient multi-cyclone de-duster).The exhaust gas from traveling grate will pass through ESP(Electro Static Precipitator)and it ill be discharged to atmosphere via induced fan and stack. The chimney discharged shall be well within the national emission standards.

Dust from the wind box of traveling grate and dust collected through de-duster ESP's shall be collected and conveyed to a Dust Hopper. This is ground together with iron ore fines at grinding mill Almost all the dust and spillage are re-circulated and recovered.

Process Control and Automation:

A microprocessor based centralized control system has been considered for process monitoring, control, safety, date locking and management information. Process Flow Diagram is attached with this proposal.

8. STORAGE OF HAZARDOUS SUBSTANCE

S. N.	Name of hazardous chemical	DETAILS OF STORAGE ARRANGEMENTS				Other security arrangement in leakage condition	PPE's to be used.
		MSDS Enclosed (Yes/No)	Maximum storage capacity	Mode of storage (stored in bags, ground/underground, overhead tank its capacity)	controlling arrangement (dike valve/bund valve etc.		
1.	L.P.G. (For commercial use)	Yes	25 Nos.	Open shed	Regulator	Keep in Separate area	Fire & Explosive
2.	Coal	-	800 MT	Open Stock Yard	Hydrant point	-do-	Fire Hydrant
3.	Iron Ore	-	800 MT	Open Stock Yard	-	-do-	NA
4.	Oxygen (For Gas cutting)	Yes	50 Nos	7.0 CUM cylinders [Separate open shed above the ground)	Regulator	-do-	Fire & Explosive 50 meters from storage area
5.	L.D.O	Yes	250 Liters.	Above M.S. Storage Tank	Cap	-do-	Fire & Explosive
6.	Coke	-	2200 mt	Open Stock Yard	Hydrant point	-do-	Fire Hydrant
7.	Iron Ore	-	2200 mt	Open Stock Yard	Hydrant point	-do-	Fire Hydrant
8.	Bantonite	-	4400 mt				
9	HSD	Yes	20KL	M S Tank	Dike wall	-do-	-do-

9. RISK ANALYSIS AND POSSIBLE HAZARD

After studying of process we found the most dangerous points of possible. Fire and other accidents and listed them below in order of their seriousness.

S. N.	Task	Sub -Task	Hazards	Risk	Existing control
	PLANT START-UP ACTIVITIES				
1	T.G., KILN AND ANNUAL COOLER INSPECTION WORK				
1.1		INSPECTION AND CLEANING OF ANY FOREIGN MATERIALS & DEBRIS			
1.1.1			EMISSION OF DUST	EXPOSURE TO DUST	NOSE MASK, SAFETY GOGGLE, SAFETY SHOE, COTTON WITH LEATHER HAND GLOVES
1.1.2			UNEVEN SURFACE	SLIPS, TRIPS & FALLS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, 24 VOLTS INSPECTION LAMP, COTTON WITH LEATHER HAND GLOVES
1.2		CHECKING THE SEALING OF ALL DOORS AND MAN HOLES DUMMY OF T.G., KILN & ANNULLER COOLER			
1.2.1			UNEVEN SURFACE	SLIPS, TRIPS & FALLS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, 24 VOLTS INSPECTION LAMP, COTTON WITH LEATHER HAND GLOVES
2	TRIAL OF ALL DRIVES & EQUIPMENTS				
2.1		TRIAL OF CONVEYOR			

DISASTER MANAGEMENT PLAN – PELLET PLANT

2.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET, COTTON WITH LEATHER HAND GLOVES
2.1.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
2.2		TRIAL OF FANS			
2.2.1			GENERATION OF SPARK	EXPOSURE TO SPARKS / SPLATTER / SPLASH,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET
2.2.2			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET, COTTON WITH LEATHER HAND GLOVES
2.3		TRAIL OF TRAVELING GRATE & OVER SIZE AND UNDER SIZE ROLLER SCREEN			
2.3.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET, COTTON WITH LEATHER HAND GLOVES
2.4		TRAIL OF KILN / COOLER DRIVES			
2.4.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET, COTTON WITH LEATHER HAND GLOVES
2.6		TRAIL OF DISC PELLETIZER			
2.6.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET, COTTON WITH LEATHER HAND GLOVES
3	TO START CB FAN				
3.1		C.B. FAN START UP AND DAMPER ADJUSTMENT			
3.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET
4	OIL FIRING FOR PLANT START-UP				
4.1		OIL PUMP START UP			

DISASTER MANAGEMENT PLAN – PELLET PLANT

4.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	EXPOSURE TO FIRE	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET, COTTON WITH LEATHER HAND GLOVES
4.1.2			SPILLAGE	SLIPS, TRIPS & FALLS	CLEANING AND SAND SPREADING/ WATER FLUSHING
4.2		IGNITE OIL BY FLAMBAU			
4.2.1			SPILLAGE	SLIPS, TRIPS & FALLS	CLEANING AND SAND SPREADING/ WATER FLUSHING
4.2.2			FIRE	EXPOSURE O FIRE	ALUMINISED SUIT,SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK, FACE SHIELD WITH HELMET FIRE EXTINGUISHER,WATER WITH HOSE PIPE TO AVOID ENJURY
4.2.3			EMISSION OF FUMES	EXPOSURE TO FUMES	NOSE MASK, SAFETY GOGGLE, FACE SHIELD WITH HELMET
5	ID FAN START				
5.1		TO START ID FAN			
5.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET , EMERGENCY STOP SWITCH AND GAURDS.
5.2		TO CLOSE STACK CAP			
5.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET , EMERGENCY STOP SWITCH .
6	FEEDING SYSTEM OF RAW MATERIAL				
6.1		START WEIGH FEEDERS AND BELT CONVEYOR			
6.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET , EMERGENCY STOP SWITCH AND HANDGLOVES.
6.1.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
6.1.3			EMISSION OF DUST	EXPOSURE TO DUST	NOSE MASK, SAFETY GOGGLES, SAFETY SHOE, COTTON WITH

DISASTER MANAGEMENT PLAN – PELLET PLANT

					LEATHER HAND GLOVES
7	MIXING OF RAW MATERIAL				
7.1		START MIXED MATERIAL DISCHARGE CONVEYOR			
7.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, EMERGENCY STOP SWITCH AND HANDGLOVES.
7.1.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
7.2		START BAG FILTER			
7.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
7.2.3			EMISSION OF DUST.	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, NOSE MASK.
7.3		START ALL MOTOR OF MIXER MACHINE AND COOLING FAN			
7.3.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
8	GREEN BALL MAKING				
8.1		START GREEN BALL DISCHARGE CONVEYOR			
8.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
8.2		START VOLUMETRIC FEEDER			
8.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, EMERGENCY STOP SWITCH AND HANDGLOVES.
8.2.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING

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8.2.3			EMISSION OF DUST	EXPOSURE TO DUST	NOSE MASK, SAFETY GOGGLES, SAFETY SHOE, COTTON WITH LEATHER HAND GLOVES
8.3		START ALL LUB PUMP AND MAIN MOTOR OF DISC			
8.3.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
8.3.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
9	TO START INJECTION SYSTEM				
9.1		START ROOT BLOWER			
9.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, EMERGENCY STOP SWITCH, GURDS
9.2		START COAL INJECTOR			
9.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, EMERGENCY STOP SWITCH. AND CHAIN COVER GAURD.
9.2.2			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, EMERGENCY STOP SWITCH. AND TAIL PULLEY & HEAD PULLEY GUARD.
9.3		START INJECTION SCREW FEEDER			
9.3.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, EMERGENCY STOP SWITCH. AND TAIL PULLEY & HEAD PULLEY GUARD.
9.3.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
9.3.3			EMISSION OF DUST	EXPOSURE TO DUST	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET, NOSE MASK AND BAG-FILTER.
10	START HOT AIR FAN				
10.1		TO START HOT			

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		AIR FAN			
10.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET , EMERGENCY STOP SWITCH AND GAURDS.
11	DRYING AND PREAHEATING – TRAVILLING GRATE				
11.1		START DRY RETURN BELT			
11.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
11.1.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
11.2		START HDLD VALVE			
11.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
11.3		START GREEN BALL RETURN BELT			
11.3.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
11.3.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
11.4		START UNDERSIZE, WIDE BELT AND OVERSIZE			
11.4.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
11.4.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
11.5		START TRAVELLING GRATE MAIN MOTOR			
11.5.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.

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11.5.2			WORKING NEAR HOT MATERIAL	CONTACT WITH HOT MATERIAL	USE OF PPES I.E NOSE MASK & GOGGLES. COTTON WITH LEATHER HAND GLOVES
12	START PELLET COOLING – ANNULAR COOLER.				
12.1		START FINISHED PRODUCT CONVEYOR BELT			
12.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
12.1.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
12.2		TO START BAG FILTER			
12.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
12.2.2			SPILLAGE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
12.2.3			EMISSION OF DUST.	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET , NOSE MASK.
12.3		START COOLER MAIN MOTOR AND COOLER BLOWER			
12.3.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY-HELMET, NOSE MASK, EMERGENCY STOP SWITCH AND GAURDS.
12.4		PRODUCT SCREENING ACTIVITY			
12.4.1			EMISSION OF DUST	EXPOSURE TO DUST / SOLVENT FUMES,	USE OF PPE I.E DUST MASK & GOGGLES.
12.4.2			SPILLAGE, UNEVEN SURFACE	SLIPS, TRIPS & FALLS	PROPER ILLUMINATION , GOOD HOUSEKEEPING , USE OF PPE,
	OPERATION ACTIVITIES				
13	RAW MATERIAL				

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	STORAGE AT YARD				
13.1		MATERIAL CONVEYING THROUGH CONVEYOR (OUTPUT PRODUCT)			
13.1.1			EMISSION OF DUST	EXPOSURE TO DUST / SOLVENT FUMES,	USE OF PPE I.E DUST MASK & GOGGLES.
13.1.2			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / FALLS	ELIMINATING SHARP EDGES & GUARDING ALL ROTATING OBJECTS.
13.1.4			SPILLAGE, UNEVEN SURFACE	SLIPS, TRIPS & FALLS	PROPER ILLUMINATION , GOOD HOUSEKEEPING , USE OF PPE,
13.2		STORAGE OF PELLET			
13.2.1			WORKING NEAR HOT MATERIAL	CONTACT WITH HOT MATERIAL	USE OF PPE I.E DUST MASK & GOGGLES. COTTON WITH LEATHER HAND GLOVES, WATER SPRAY PROVISION
13.2.2			WORKING ON /NEAR MOBILE EQUIPMENT	HIT BY VEHICLE OVERTURNING / TRIP OVER /TUMBLE OVER /FALL OVER,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK,FLUOROSCENT JACKET.
13.2.3			EMISSION OF DUST	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
13.3		STORAGE OF LIME STONE AND BENTONITE			
13.3.1			EMISSION OF DUST	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
13.4		STORAGE OF COAL AT SHED			
13.4.1			WORKING ON /NEAR MOBILE EQUIPMENT	HIT BY VEHICLE OVERTURNING / TRIP OVER /TUMBLE OVER /FALL OVER,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK,FLUOROSCENT JACKET.
13.4.2			FIRE	EXPOSURE O FIRE	WATER SPRINKLES
13.4.3			EMISSION OF DUST, FUMES	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
14	RAW MATERIAL PREPARATION				

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14.1		MATERIAL LOADING FOR FEEDING BY LOADER TIPPER			
14.1.1			WORKING ON /NEAR MOBILE EQUIPMENT	HIT BY VEHICLE OVERTURNING / TRIP OVER /TUMBLE OVER /FALL OVER,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK,FLUOROSCENT JACKET.
14.1.2			SPILLAGE, UNEVEN SURFACE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
14.1.3			EMISSION OF DUST	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
14.2		DUMPING OF MATERIAL AT GROUND HOPPER BY TIPPER/LOADER			
14.2.1			WORKING ON /NEAR MOBILE EQUIPMENT	HIT BY VEHICLE OVERTURNING / TRIP OVER /TUMBLE OVER /FALL OVER,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK,FLUOROSCENT JACKET.
14.2.2			SPILLAGE, UNEVEN SURFACE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
14.2.3			EMISSION OF DUST	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
14.3		TO CONVEY MATERIAL BY BELT CONVEYING			
14.3.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET .
14.3.2			SPILLAGE, UNEVEN SURFACE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
14.3.3			EMISSION OF DUST	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
15	RAW MATERIAL FEEDING				
15.1		TO CHECK BIN LEVEL			
15.1.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET .
15.1.2			EMISSION OF DUST.	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
15.2		MATERIAL			

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		FEEDING BY BELT CONVEYOR			
15.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET .
15.2.2			EMISSION OF DUST.	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
16	FINISHED PRODUCT				
16.1		COOLING OF PRODUCT & BY- PRODUCT(WHEN DISCHARGE MATERIAL TEMPERATURE IS HIGH)			
16.1.1			EMISSION OF DUST.	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
16.2		FINISHED PRODUCT CONVEYING BY COOLER DISCHARGE BELT CONVEYOR			
16.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET .
16.2.2			EMISSION OF DUST.	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
17	BACK FLOW CHUTE OPERATION				
17.1		TO START WATER SPRINKLER			
17.1.1			EMISSION OF DUST, FUMES	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
17.1.2			WORKING IN CONFINED SPACE	EXPOSURE TO TOXIC GASES ,FIRE AND EXPLOSION, EXPOSURE TO HOT CONDITIONS	ALUMINISED SUIT,SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK, FACE SHIELD WITH HELMET,
17.2		BACK FLOW CHUTE FLAP OPEN			

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17.2.1			WORKING IN CONFINED SPACE	EXPOSURE TO TOXIC GASES ,FIRE AND EXPLOSION, EXPOSURE TO HOT CONDITIONS	ALUMINISED SUIT,SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK, FACE SHIELD WITH HELMET,
17.2.2			EMISSION OF DUST, FUMES	EXPOSURE TO DUST / SOLVENT FUMES,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK.
17.2.3			FIRE	EXPOSURE O FIRE/ EXPLOSION	ALUMINISED SUIT,SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET ,NOSE MASK, FACE SHIELD WITH HELMET,
17.3		KILN OUTLET – ACCRETION REMOVEL WORK			
17.3.1			WORKING NEAR HOT MATERIAL	CONTACT WITH HOT MATERIAL	SAFETY SHOE,SAFETY HELMET ,NOSE MASK, FACE SHIELD WITH HELMET,
	SHUT DOWN ACTIVITIES				
18	OPEN ALL DOOR				
18.1		MAIN HOLE, KILN OUTLET DOOR T.G. DOOR AND COOLER DOOR OPEN			
18.1.1			WORKING NEAR HOT MATERIAL	CONTACT WITH HOT MATERIAL	USE OF PPE I.E DUST MASK & GOGGLES. COTTON WITH LEATHER HAND GLOVES, WATER SPRAY PROVISION
18.1.2			EMISSION FINE DUST	AIR POLLUTION,LAND CONTAMINATION	USE OF PPE I.E DUST MASK & GOGGLES.
19	CASTABLE PATCHING WORK				
19.1		ANCHOR WELDING			
19.1.1			GENERATION OF SPARK, SPATTER ETC	EXPOSURE TO SPARKS / SPLATTER / SPLASH,	SAFETY GOGGLE, SAFETY SHOE,SAFETY HELMET .
19.1.2			WORKING NEAR POWER SUPPLY	ELECTRIC SHOCK	LEATER HAND GLOVES
19.2		CASTABLE SHIFTING WORK			
19.2.1			LIFTING OF HEAVY OBJECTS	EXCESSIVE STRAIN	BREAK DURING THE WORK

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19.2.2			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET .
19.2.3			WORKING AT HEIGHTS	FALL FROM HEIGHT, HIT BY FALLING OBJECTS AT LOWER LEVEL	USE OF SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET , NOSE MASK. & SAFETY BELT
19.2.4			FALLING OF OBJECTS	FALL FROM HEIGHT, HIT BY FALLING OBJECTS AT LOWER LEVEL	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET .
19.3		CASTABLE WORK			
19.3.1			WORKING IN CONFINED SPACE	FALLING LOOSE MATERIAL	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET , NOSE MASK, FACE SHIELD WITH HELMET, ALLUMINISED HAND-GLOVES.
19.3.2			EMISSION OF DUST	EXPOSURE TO DUST	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET , NOSE MASK.
19.3.3			FALLING OF ACCRETION	HIT BY FALLING OBJECT	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET.
20	CLOSE ALL DOORS				
20.1		KILN, COOLER AND T.G.			
20.1.1			LIFTING OF HEAVY OBJECTS	EXCESSIVE STRAIN	BREAK DURING THE WORK
20.1.2			UNEVEN SURFACE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
21	HOUSE KEEPING				
21.1		MATERIAL CLEANING INSIDE KILN, COOLER AND TG DUCT LINE			
21.1.1			WORKING IN CONFINED SPACE	OXYGEN DEFICIENCY	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET , NOSE MASK, FACE SHIELD WITH HELMET, ALLUMINISED HAND-GLOVES.
21.1.2			FALLING OF ACCRETION	HIT BY FALLING OBJECT	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET.
21.2		WORKING AT ALL GROUND HOPPER			

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21.2.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	GAURDS & SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET
21.2.2			SPILLAGE, UNEVEN SURFACE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
21.3		MATERIAL CLEANING AND SHIFTING			
21.3.1			WORKING ON /NEAR MOBILE EQUIPMENT	HIT BY VEHICLE OVERTURNING / TRIP OVER /TUMBLE OVER /FALL OVER	RECRUITING TRAINED DRIVERS BY CHECKING THEIR LICENSE & FITNESS CERTIFICATE & VEHICLE FITNESS CHECKING.
21.3.2			SPILLAGE, UNEVEN SURFACE	SLIPS, TRIPS & FALLS	PROPER ILLUMINATION , GOOD HOUSEKEEPING , USE OF PPE,
21.3.3			EMISSION OF DUST	EXPOSURE TO DUST / SOLVENT FUMES,	USE OF PPE I.E DUST MASK & GOGGLES.
21.4		ALL BELT CONVEYOR DECK & GALLERY.			
21.4.1			WORKING NEAR MOVING MACHINERY/EQUIPMENT	BEING HIT BY MOVING OBJECT / CAUGHT BETWEEN OBJECTS	GAURDS & SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET
21.4.2			SPILLAGE, UNEVEN SURFACE	SLIPS, TRIPS & FALLS	FREQUENT CLEANING
21.4.3			EMISSION OF FUMES	EXPOSURE TO FUMES	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET , NOSE MASK.
21.4.4			RELEASE OF ENERGY	EXPOSURE TO DUST & EXPOSURE TO ENERGY	SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET , NOSE MASK, HAND-GLOVES.
21.4.5			WORKING AT HEIGHTS	FALL FROM HEIGHT, HIT BY FALLING OBJECTS AT LOWER LEVEL	ALERT HORN & SAFETY GOGGLE, SAFETY SHOE, SAFETY HELMET .

10. IMMEDIATE ACTION TO BE TAKEN IN CASE OF MISHAP IN LABORATORY

S. No.	Accident Case	First Aid
1	Combustible liquid	Don't run about, lie down and roll on the floor wrap the victim by blanket.
2	Large Heat burn	Treat with gauze, thoroughly soaked in normal saline.
3	Small heat burn	Treat with antibiotic cream.
4	Skin of eye effected with Caustic liquid	Immediately wash with clean water, Wash off Caustic liquid from the skin or Eye at the nearest tap.
	Skin affected by;	
A	Acid	Apply sodium Bicarbonate solution.
B	Alkali	Apply dilute ammonium chloride solution.
C	Bromide	Apply dilute ammonia as quickly as possible. Then apply a thick paste of Sodium Bicarbonate and water.
D	Silver Nitrate	Apply normal saline solution.
5	Discomfort due to treating small quantities of chloride or Bromium	Cautiously sniff ammonia gas from bottle of dilute ammonia solution.
6	Chemical in mouth	Split chemical from mouth and wash mouth thoroughly with water.
7	Cuts	Apply Mentholated spirit and soft cream.

11. PRECAUTION TO BE OBSERVED WHILE PERFORMING JOBS AT HEIGHT

- Use proper and strong ladder.
- Put ladder in proper place.
- Clean oil and grease from the floor or place.
- Attach hook at the top of the ladder.
- A slight mistake may cause fatal accident.
- If required engage man to hold the ladder on the ground.
- Check the site before work.
- Tie up the tools in use to avoid falling.
- Always use proper tools.
- Fully understand the work to be done before going at height.
- Forget not that the safety belt is a life saving device for those who are working at High level.

USE THE PROPER TOOLS

- Don't use improper tools.
- Tool should be in good working.
- Take help of Supervisor for proper selection and use of particular tools.
- Choose spanner of exact size.
- Electrical tools must be tested first before use.
- Tools must be used properly and only when their exclusive use is required.
- Do not use knife when screwdrivers is required.
- Do not through the tools to pass it on to your fellow worker it is a wrong practice. It may hit or injure.
- To follow work permit system (working at height)
- Always use fall arrester / safety belt (fully body double lanyard) while working at height.
- If working platform is more than 2.0m above ground, always use safety belt.

12. FIRE HAZARDOUS AND ITS PREVENTION

First form of energy known to human being is life. Man has worshiped it but uncontrolled let fire cause HAVOC and can be damage to un extents.

FOR PREVENTION FIRE FOLLOWING POINT ARE SUGGESTED.

1. Whenever highly inflammable goods are stored, electrical appliances should not be used continuously.
2. Do not Kept waste papers, waste wooden piece along with inflammable goods at a place.
3. Store inflammable liquids, lubricants in paper container, tins with tight with tight lid and also put label on it.
4. Knowledge of fire extinguisher should be provided to the employees where the equipment is places and not in use.
5. Keep open fires from away bedclothes.
6. All should be educated about the consequences of storing petrol, kerosene near store and tools room.
7. Inspect your room/area periodically and put inflammable items, clothes, etc. Away from store/tools rooms.
8. Alternative proves fruitful in fighting fire hazards and saving society from huge loss of person and property.
9. Keep fire-fighting equipment in good working condition.
10. Train fire personnel in fire fighting to face situation in mishap.

13. ELECTRICAL HAZARDS AND PRECAUTIONARY MEASURES

The electricity injury may occur. It may be caused by direct current, alternate current, from lightening. The securities of the injury are electrical shock depend upon:

- The amount of current flowing through the body.
- The path of current is taken through body to the earth; current passing through chest is more dangerous than a relatively stronger current passing through the lower limbs.
- Length of time is in contact.
- Type of electric energy AC/DC.
- Physical condition of victim.

Following signs and symptoms are found in electric shock.

1. Sudden scream
2. May be able to release hand, which holds the live points.
3. Burn.
4. Severe pain
5. Cries loud and falls on the ground
6. Unconsciousness.
7. Breathing impaired or stopped
8. Burns leading to severe surgical shock

Explosion: Explosion is mainly of following nature:

Explosions of the equipment generally occur in all filter transformers or all circuit breakers

Explosion of all filter equipment or cable is usually due to overheating is responsible defective or damaged equipment is the main cause of an explosion.

Periodically testing of T/R and cables will be done to avoid explosion, COCO2 relay, and release valve periodically checking.

Power Cables

They are secured properly and protected from physical hazards. All junction boxes are protected and supported. Checking of earthing in necessary.

All cable gantries protected with fire retardant cable coating with 1200 degree Centigrade protection up to 60 minutes.

To avoid accidents by electricity following safety measures are adopted:

1. Open/ damaged plugs, wires an switches etc are not used.
2. The electrical equipment with screwdrivers etc. Are not touched unless and until the supply to be cut off.
3. The equipment is not touched with wet hands when supply's there
4. Many machines in single point are not connected otherwise risk of fire and safe.
5. Loose and hanging wires are not kept but fittings are kept proper and safe.
6. Broken plugs are not used
7. Plug top of three pins only for small machines are used because one of the pin is preserved

- for earthing. (Industrial type)
8. Connect the equipment with supply through plug, match for holding the terminals are not attached
 9. Water is not poured to extinguish the fire caused by electric. Cut off supply by main switch immediately CO@ and fire extinguishers are used.
 10. Before carrying out repairing of equipment, the main switch is put off and fuses are taken out.
 11. Fuse wire of proper size used.
 12. Any equipment in one socket is not connected to avoid extra load on it.
 13. Proper cares should be taken to save electrocuted.
 14. Affected person is touched after switching off or operating it with the help off dry rope or bamboo wooden stick etc. Provide first aid applying artificial breathing system to the affected person.
 15. Rubber insulated tools and rubber hand gloves for working during supply or in HT line are used.
 16. Where there is danger section board is fixed to keep anyone away from the site
 17. Always use equipment of ISI marks is preferred.

The above precautions and practice certainly occurs from the accidents in factory as well as at home.

14. EMERGENCY CONTROL CENTER

EMERGENCY CONTROL CENTER (E.C.C.) is established at the near at the ISP, Gate, Mandhar.

The Chief Incident Controller in association with, the key personnel will manage the E.C.C. And Sr. Officers of outside agencies called in for assistance. No other personnel shall be allowed to access to the E.C.C.

FACILITIES AVAILABLE AT E.C.C.: The Emergency CONTROL CENTER is equipped with the following data /information:

1. Safety data pertaining to the hazardous materials likely to cause emergency.
2. Procedure of major and special fire fighting, rescue operations, first-aid, artificial respiration system, etc.

The following facilities are available at emergency

1. Important personal protective equipment

No. of emergency respirators kits available.	No. of self contained breathing apparatus.	No. of Airline respirators.	No. of canister respirators	Other PPEs	Neutralization Facility Provided For Neutralizing Chemical
15	8	NIL	12	Annexure-1	Since there is no chemical are used or product as a waits in our unit. Generated scrap is filled in low ling area of factory.

Have been kept in emergency kit Glass cabinet at the following prominent location:

CONTROL ROOM

1. Only in the event of any emergency, the personal protective equipment kept in the " Emergency Glass Cabinet " shall be used.
2. Following Personal Protective Equipment will be readily available in the aforesaid " Emergency kit".
3. Self Breathing Apparatus with oxygen portable cylinder.(45min.duration) Canister with mask.

Canister with mask.

(a) Hand Gloves;

For Electrical works (Rubber Hand Gloves)	10 Pairs
For hot works (Aluminized Hand Gloves)	05 Pairs
For metal handling works (leather hand gloves)	10 Pairs
P.V.C. Aprons and hood(Aluminized)	10 No.
Gumboot (Heat resistant up to 1000°C)	10 No.
Special gum boot kept on ECC up to 1000°C heat resistant.	

Safety Belt Full body harness (General purpose)	05 Pairs
Safety belt for Electrical Works	05 pairs.
Aluminized shoes and apron	05Nos.each
Safety and chemical goggles	15
Helmet	10

The above items shall be inspected and ensured serviceable by the concerned Shift In-charge Engineers of the location on regular intervals.

Any damage/ deterioration/defect noticed in any of the above-mentioned personal protective equipment shall be highlighted in the record register to be maintained by the shift in-charge Engineer and accordingly, replacement of the same shall be ensured.

2. FIRE PREVENTION FACILITIES

1. As on date, we possess the following fire fighting system to combat with fire.
2. Fire extinguishers of various capacity and types
3. Fire beater hook.
4. Fire buckets
5. Hose Reel
6. Fire Blanket

3. LOCATION TYPE, QUANTITY OF FIRST -AID FIRE FIGHTING EQUIPMENT

Fire extinguisher & its capacity	Fire tender trailer pump its capacity	Maximum quantity of foam & foaming agents available	Water jet producer	Water storage tank and its capacity	No. of hydrant point and their locations	No. of hose reel & total length
List of fire fighting facility [A] in next page	4000LPM	4000 liters	Fire pump of 50 HP producing jet up to 40kg/cm ²	1 O/H Tank 50 kl cap and 1400KL Cap. GWT	26 Point Location as per map enclosed	8 Nos. 20Meters Each total 160 Meters.

The following fire fighting system is established for the plant;

1. Hydrant system
2. Sprinkler system
3. Foam system
4. Fire tender/multipurpose
5. Fire pump 225 LPM

15. FIRE PREVENTION AND FIRE CONTROL MANAGEMENT

The following fire fighting system is established for the plant

LIST OF FIRE FIGHTING FACILITY [A]

SL.N	DESCRIPTION	QTY IN NOS
1	Dry chemical powder type 25kg. Capacity fire extinguishers Trolley mounted.	10
2	Dry chemical powder type 10kg. Capacity fire extinguishers complete set with initial Refill.	25
3	Dry chemical powder type 5kg. Capacity fire extinguishers complete set with initial Refill.	25
4	CO2 type fire extinguisher 09kg. Capacity fire extinguishers complete set with initial refill	08
5	CO2 type fire extinguisher 4.5kg. Capacity fire extinguishers complete set with initial refill	20
6	Mechanical foam type 50ltr. Capacity fire extinguisher trolley mounted etc.	10
7	Fire bucket 9ltr. capacity	35
8	Fire Hydrant Point - Already laid up to approx. 2 km charged line.	
9	Lighting Arrestors	2

Municipal Corporation has a Fire Fighting Brigade and is just 12kms. away in case of any major fire occurred and one firefighting brigade facility is also available at Bhilai steel plant through Manager. In case of any emergency they can be called.

In addition to above, arrangements are being made to send an officer to acquire requisite fire qualification.

4. EMERGENCY ALARMING SYSTEM

An electronic ALARM facility is available at site

S.N	NATURE OF EMERGENCY	TYPE OF ALARM
1	Normal factory siren	Continuous blow for 15 seconds (once only)
2	Fire emergency	Blow for 10 (ten) seconds and off for 05 (five) seconds. to be repeated 03 (three) times
3	Emergency siren for leakage and other emergency	Blow for 15 (fifteen) seconds and off for 05 (five) seconds. to be repeated 05 (five) times
4	All clear siren for general public	Blow for 20 (twenty) seconds and off for 05 (five) seconds. to be repeated 05 (five) times

16. WORK ENVIRONMENT QUALITY AS PER POLLUTION

Industry will provide adequate facility for treatment of industrial and domestic effluent and shall ensure that the treated effluent quality meets the standards prescribed by Board published in Gazette Notification dated 25.3.88. No effluent shall be discharged outside of the factory premises in any circumstances. Open recirculating cooling system shall be provided for reuse of cooling water. The water used for cooling shall be cooled in cooling tower and re-use in the system again for cooling purpose. Equalisation / neutralization tank cum settling tank shall be provided for treatment of cooling water blow down. Domestic effluent shall be treated in septic tanks and soak pits. Treated effluent shall be utilized either in process or for plantation within premises. Industry shall make arrangement of suitable drains / pipe networks to ensure adequate flow for full utilization of treated effluent inside the premises. No effluent shall be discharged out of premises under any circumstances. The major parameters of treated effluent shall be maintained within the limits as follows;

	Parameter	Limit
1	pH	6.5 – 8.5
2	TSS	100
3	BOD	30
4	COD	250
5	Oil and Grease	10

Ambient Air

Chhattisgarh Environment Conservation Board may further stipulate stringent limit depending upon environmental conditions.

Ambient air quality within the factory premises shall not exceed the standards prescribed by Board in Gazette Notification dated 18.09.2009. The ambient air quality within the premises shall not exceed the following limits;

	Parameter	Limit ($\mu\text{gm}/\text{m}^3$)
1	PM 10	100
2	PM 2.5	60
3	SO ₂	80
4	NO _x	80

Industry shall ensure the ground level concentration of pollutant in ambient air within standard prescribed for residential, rural areas in the nearby residential / rural areas due to establishment/commissioning of plant.

1. Intercoms
2. Telephones
3. Blown up area map
4. District Telephone directory
5. Emergency lights.
6. Wind directions socks and speed indicator. KEPT IN E.C.C
7. On-Site Emergency

17. ASSEMBLY POINT

EVACUATION

In an emergency it is almost certain to evacuate affected personnel from inside the factory to a safer place. It is also essential to non-essential workers to streamline Emergency Action Plan activities and ensuring safety of those people. The evacuation will be affected after getting information from Works Incident Controller soon after emergency arises. On evacuation, all works staff and employees other than notified members, shall be assembled at the assembly points for receiving further information etc.

ASSEMBLY POINT

- The point near main gate has been marked as Assembly Point for the purpose defined above.
- As soon as the non-essential staff and employees come to know about emergency, they shall reach to the assembly point without delaying further to ensure their safety and security.

ALTERNATIVE ASSEMBLY POINT

- In the event of any problem, if arises so, to establish Assembly Point at plant, the Alternate Assembly Point has been ear marked in the site plan. All employees and staff assembled at the Assembly point shall abide to the information's and action plan made known to them either by C.I.C or W.I.C. Or their representative.
- The non-essential work staff and employees shall not leave the assembly point unless and until asked for by the competent authority.
- Near Project Office.

18. ACTION PLAN

18.1 FIRST INFORMATION OF EMERGENCY

As soon as an Emergency is noticed by any of the staff, he shall shout "fire" "aag" "aag" to divert the attention of the people of the Emergency and subsequently informed of the emergency by telephone to the shift Engineer and to the Security /Fire officer/ CIC/ MANAGER.

The Shift Engineer and the Security / Fire Officer shall immediately inform of the Emergency to the Chief Incident Controller and the works Incident Controller. In addition to this, they shall also inform to the Telephone operator so as to intimate to all notified team members and others accordingly. Emergency sirens should be sound to let the all persons know about the emergency. All the crew members should run to the E.C.C. All other workers / persons should run to the assembly point. CIC/WIC should also visit the SPOT OF FIRE OR OTHER EMERGENCY. By assessing the situation CIC instruct all crew members to meet the emergency with available resources. The outside help like fire brigades, ambulance van and police assistance may be called by CIC if he wants.

The Emergency Action Plan defines responsibilities of the following personnel;

1. Chief incident controller
2. Works incident controller
3. Key personnel and
4. Non-key personnel during the emergency.

In addition to above, the following actions will also be taken during the emergency period by CIC:

1. Declaration of emergency
2. Giving all clear signal

Further, the responsibility of EMERGENCY CONTROL CENTER has also been defined in the action plan.

1. Responsibility of chief incident controller

The overall in charge i.e. OCCUPIER/MANAGER shall be the Chief Incident Controller in case of emergency, if any arises.

The Chief Incident Controller (CIC) shall assume overall responsibility for the factory / storage site and its personnel.

The C.I.C. shall be responsible;

- To assess the magnitude of the situation and to decided if the affected staff needs evacuation from the assembly points to identify safer place.
- After consulting the WORKERS INCIDENT CONTROLLER, to Declare EMERGENCY IN THE PLANT.
- GIVING ALL CLEAR SIGNAL when normal condition comes after emergency is over
- To exercise direct operational control over the areas other than those affected.
- To undertake a continuous review of possible developments and, assess in consultation with key personnel as to whether shut down the plant or any section thereof. And the need of evacuation of personnel.

- To liaise with Sr. Officials of Police, Fire Brigade, Medical Authorities and Factories Inspectorate. And provide advice on possible effect on areas outside the factory premises as well as head of Personnel.
- To look after rehabilitation of affected personnel on discontinuation of Emergency.
- To issue authorized statement to news media and ensure that evidence is preserved for enquirers to be conducted by departmental as well as statutory authorities.

2. Responsibility of works incident controller

- Manager shall be the works incident Controller (WIC). The W.I.C. Shall immediately rush to the incident site as soon as he comes to know about the emergency and, shall take overall charge. He shall subsequently inform to the Chief Incident Controller.
- He will assess the extent of the emergency and decide if major emergency exist and inform the Communication Officer accordingly.

He shall be responsible

- To direct all operations to stop within the affected area taking in to consideration priorities for safety of personnel, minimum damage to the plant, property and environment and minimum loss materials.
- To provide advice and information to the Fire & Security officer and the local fire service.
- To ensure that all non- essential workers / staff of the affected areas are evacuated to assembly point and that the affected areas are searched for casualties.
- To set -up communication points and establishes contact with Emergency Control Center in the event of areas of electric supply causing disruption in Public Address System (PAS) and internal telephones.
- To report on all significant and developments to the Communication Officer, and
- To have regard to the need to preserve the evidence so as to facilitate any inquiry into the cause and circumstances which caused or escalated the emergency.

3. Key personnel (List shown in emergency crews page No 65.)

Apart from the Chief Incident Controller and Works Incident Controller, there shall be other key personnel who will be responsible to assist the C.I.C and the W.I.C as well as to carry out the job assign to them in connection with combating with emergency.

The Key Personnel includes;

Shift Engineers / mechanic for –

1. Operation (Production)
2. Mechanical Maintenance
3. Electrical & Instrument
4. Quality Control

Head of personnel and officers connected with I.R. And Labor Welfare, and Safety, Medical Officer, In charge of Security and Fire.

A list of the key personnel along with their telephone numbers and their residential address shall be made available to all concerned suitably.

Wherever and whenever required, the key personnel in addition to their job assigned, shall assist the Chief Incident Controller and Works Incident Controller.

4. Essential staff

To streamline the activities in connection with combating the Emergency, Personnel selected shall be known as Essential Staff. This may include steno / Typist. Attendant, Messengers, Driver and Supervisors etc depending up on the services required by either. C.I.C or W.I.C or key personnel

It will be the responsibility of Works Incident Controller to identify the essential staff from work Task Force and ask them to report at the define control center so as to ensure their availability.

It will be the responsibility of works Incident Controller to remove all employees and other personnel (other than the notified team members, key personnel and the essential staff) from their work place to the Assembly Points.

5. Post -emergency activities

As soon as the emergency is over the CIC/WIC will go to the incident site to check whether everything is o.k. After their satisfactions normal factory siren will be sound giving all clear signal and work will again start as usual.

6. Post- emergency operation

After the fire, is extinguished from entire place / area the concerning team in charge will inform to the CIC/WIC about the situation so that all clear signal will be sounded on the electric siren by the consultation with CIC and WIC.

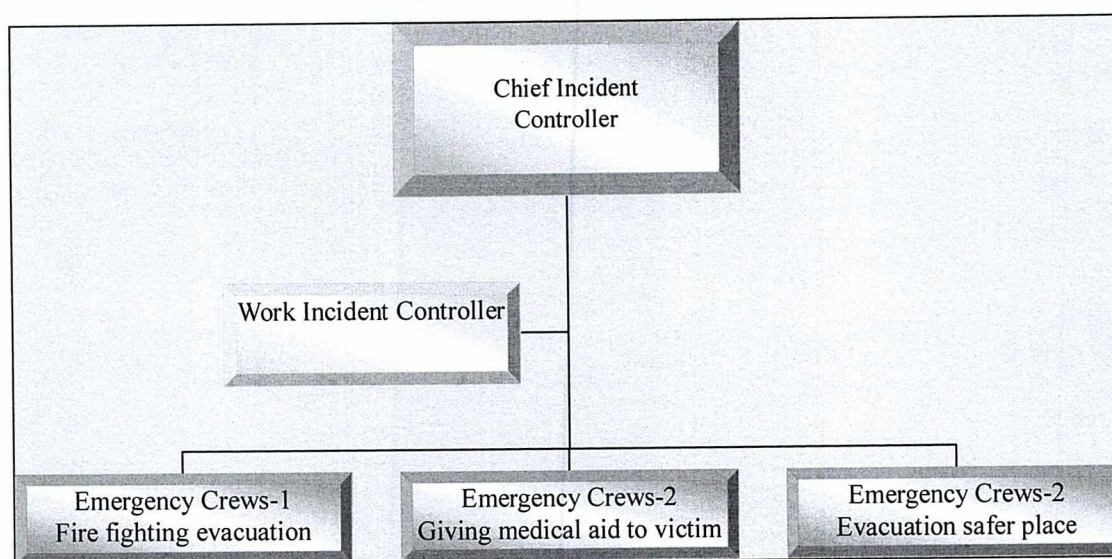
All Clear Signal

After overcoming of emergency arise, works incident controller will communicate to CIC about it. After verification of status, the CIC will communicate and announce the all-clear instruction to sound the All clear signal.

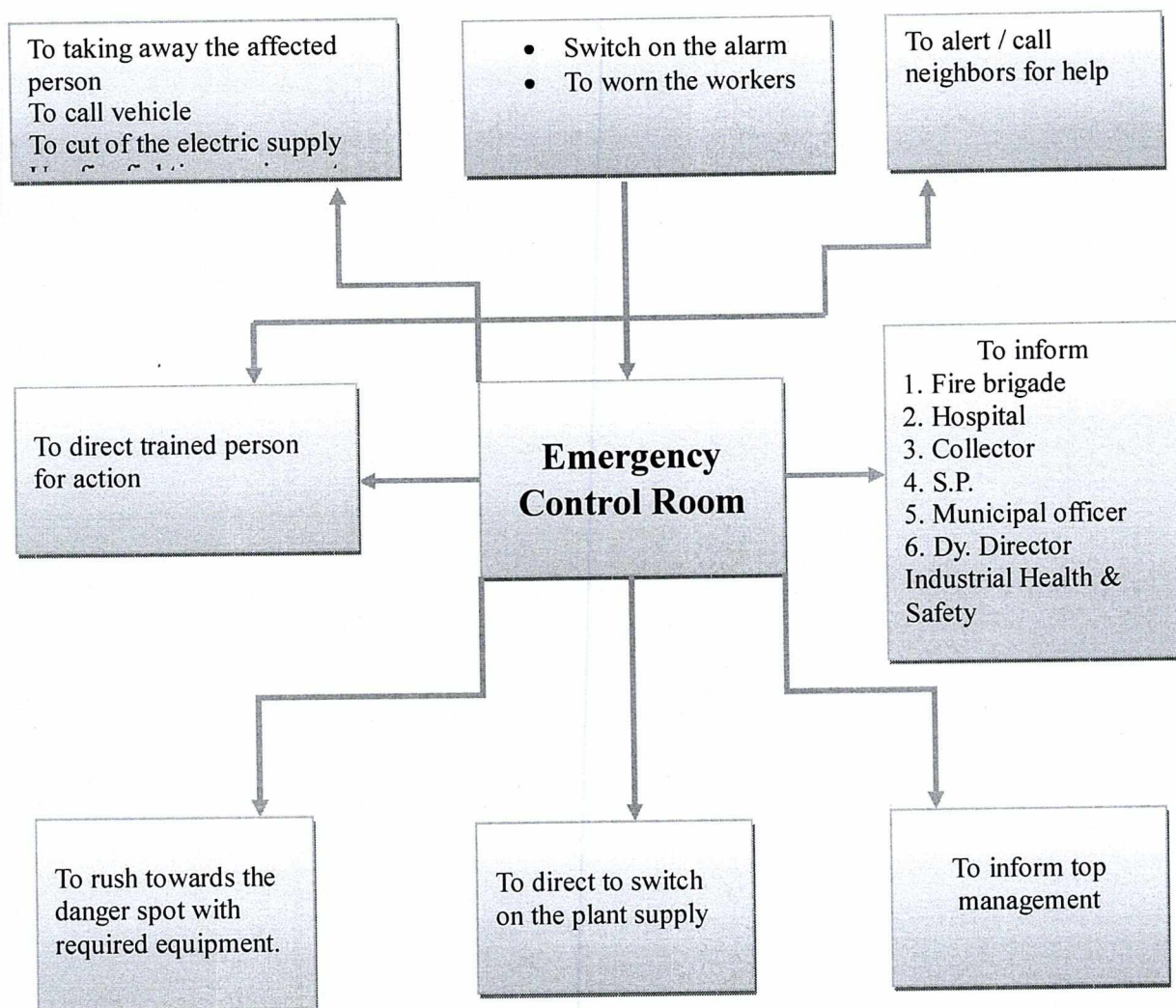
Action of salvage team

1. After overcoming the emergency occurred in factory. The salvage team will act to clean / normalize and to decontaminate the affected Areas / Section, so that working / production can be restarted.
2. The Action taken by Salvage teams is as follows:
3. Clean / Remove the vapors of toxic material present in atmosphere by means of exhaust / sucking equipment.
4. Proper checking / maintenance of all plant and machineries of affected section and to maintain them in working condition.
5. Find out the reason due to which emergency has occurred and after analyzing develop corrected plan that it will not be repeated in future.
6. Inform to CIC after making affected area as well as it was, for restarting the production / taken in use.

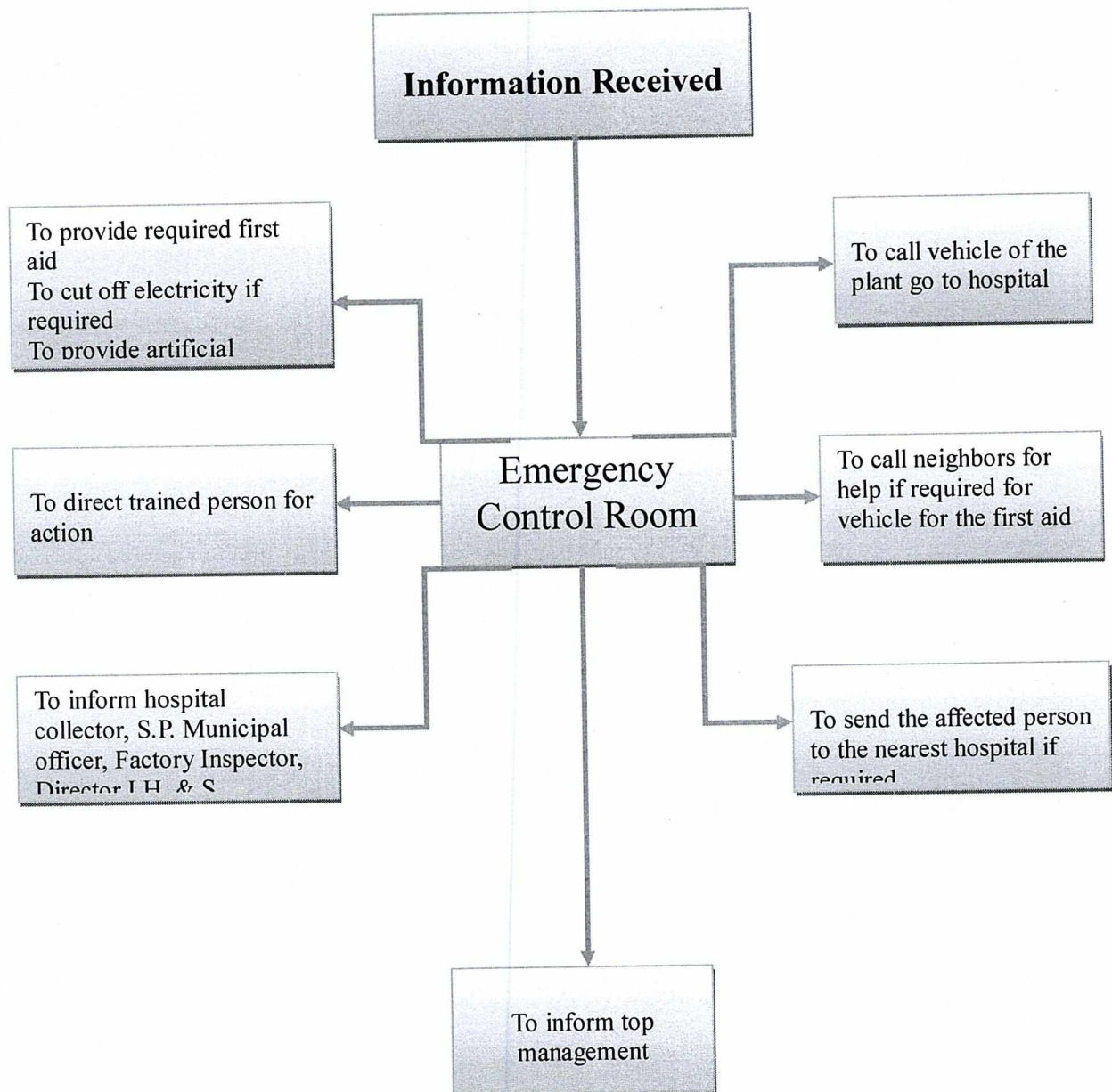
18.2 ACTION PLAN SET UP



18.3 EMERGENCY PLAN IN CASE OF FIRE



18.4 EMERGENCY PLAN IN CASE OF ANY ACCIDENT EXCEPT FIRE



19. EMERGENCY CREWS

Following team shall be notified for deployment in case of any emergency. The responsibilities of this team will be defined in next- pages; they will work as per roll given to them. They will follow the instruction of C.I.C/W.I.C.

Emergency crew 1- Fire fighting

S.No.	Name	Address	Phone No./Mobile No.
1	Mr. Amit Kumar Mishra	Sarda Energy & Minerals Limited, Phase-I, Siltara	09827178687 , 09425211191
2	Mr. Sameer Rath	"	9617147954
3	Mr. Md.Javed Khan	"	9827875470
4	Mr. Mr Kamaljeet Singh	"	9754061200
5	Mr. Roshan Jangde	"	9827156840
6	Mr. Shishir Kumar Rath	"	8223956232
7	Mr. Pitamber Prasad Nishad	"	8120790893
8	Mr. Nohar Lal Sahu	"	7697109950
9	Mr. Mayaram Jaiswal	"	9926817647
10	Mr. Ajay Kumar	"	8435766194
11	Mr. Bhupendra Kumar	"	9575481394
12	Mr. Bharat Sahu	"	7805029504
13	Mr. O.P Verma	"	9753275741
14	Mr. Doman Banjare	"	9009085987
15	Mr.Hemant Tandan	"	9009017080
16	Mr.Sunil Chadrakar	"	8962816829
OTHER FIRE BRIGADE CALLED FROM OUT SIDE			

Emergency crew 2- Medical Aid

S.No.	Name	Address	Phone No./Mobile No.
1	Dr. Kamal Rathi Medical officer	Sarda Energy & Minerals Limited, Phase-I, Siltara	9425505332
2	Dr. G.S. Devangan	"	9229993636
3	Mr. Jogendra Sahu	"	9752515377
4	Mr. N. Chandrakar	"	9755145050
5	Mr. Tikendra Verma	"	9009383365
6	Mr. Thakur Ram Verma	"	9926615090
7	Mr. Nomesvar Sahu	"	9826183733
8	Mr. Manharan Lal Yadav	"	9669460941
OTHER DOCTOR TEAMS CALLED FROM OUT SIDE			

Emergency crew 3- Evacuation

S.No.	Name	Address	Phone No./Mobile No.
1	Mr. A K Singh	Sarda Energy & Minerals Limited, Phase-I, Siltara	9425247097
2	Mr. Deepak Kumar	"	8965974883
3	Mr. P N Mishra	"	8359081821
4	Mr. Khemlal Verma	"	0771-2216444
5	Mr. Karamjeet Singh	"	7587039057
6	Mr. Khemlala Sahu	"	9669799146
7	Mr. Gopal Sahu	"	9340542395
8	Mr. Lukesh Nirmalkar	"	9039080767
9	Mr. Mayaram Jaiswal	"	9926817647
10	Mr. M K Das	"	8889690916

20. RESPONSIBILITIES OF THE CREWS

Emergency crew 1- Fire fighting

1. To identify the source of hazard and to neutralize contain it according to prevailing circumstances.
2. To isolate remaining plant and keep that in safe condition.
3. To organize safe shut down of the plant, if necessary.
4. To organize all support services like operation of fire pumps, sprinkler system, etc
5. Attend to all emergency maintenance jobs on top priority.
6. To take steps to contain or reduce the level of hazard created due to disaster.
7. To organize additional facilities as desired.
8. To rush the fire spot and extinguish the fire.
9. To seek help from outside fire fighting agency through the notified. Officers, if the fire is out of control under the existing system.
10. To evacuate persons affected due to whatever reason.
11. To maintain the communication network in working condition.
12. To attend urgent repairs in the communications system, if required.
13. To arrange messengers for communication urgent message when needed so.
14. To send messengers to families of victims immediately.
15. To help authorities to communicate with external or internal authorities/official.
16. To OPEN all gates.
17. To bar entry of unauthorized persons.
18. To permit, with minimum delay, the entry of authorized personnel and outside agencies, vehicles etc. All who have come to extend their help in emergency
19. To give all clear signal when emergency is over

Emergency crew 2- Medical aid

1. To allow the ambulance/evacuation vehicles, etc to go to through gates without normal check
2. To rescue the casualties on priority basis.
3. To transport casualties to First-aid post, safe place, or to Medical Centers.

Emergency crew 3- Evacuation

1. To account the personnel
2. To help in search of missing personnel.
3. To pass information to the kith and kid of fatal or serious injured persons.
4. To arrange required safety equipment.
5. To record accidents.
6. To collect and reserve evidences in connection with accident inquiries.
7. To guide authorities on all safety related issues.

21. ROLL CALL SYSTEM / OTHER ACTION / INFORMATION

The time office will maintain the all register for attendances of all workers as per act. The gate pass will be issued to each Labor. Proper record of visitors will also keep.

OUTSIDE DANGEROUS:

The outside danger will be take up with the help of police and safety guards. Proper record of visitors will also keep. Outside emergency includes earthquakes, storm, and lightening air crash, collapse of infra structure/building(s), deliberate acts to cause sabotage etc.

21.1 EARTHQUAKE AND FLOOD:

- Earthquakes present unique problems as they upset the complete infrastructure necessary for rescue and restoration of normalcy. For example, it could prevent emergency personnel from reaching victims. It increases the risk of fire and electrical shock, could result in complete failure of the telephone and other communication systems, disruption of water for firefighting/other reasons and increases the possibility of burst pipelines carrying petroleum oils. It could, in addition, prevent ambulances evacuating victims, fire personnel from reaching the fire incident areas result in major structural debris causing secondary damage and most importantly, could affect the entire emergency. Damage from falling structural debris could signal an end to conventional plans.
- The main actions for earthquake incidents include preventive (pre incident), during incident and post incident actions. Each earthquake, depending up on its intensity (as measured modified Mercalli scale) would have different extent of damage. Some mild earthquake could result in minor tremor felt within and perhaps outside the administration building, major ones could result in complete destruction of storage tanks, rupture of pipelines and complete collapse of admin block building. Some of the precaution that is important includes.
- Basic earthquake related training to staff (behavior during earthquake, how to recognize, dos and don't etc)
- As blackout is possible, a kit containing flashlights, portable radio, basic tools etc should be available for emergency.
- Basic precaution such as sitting away from wall hanging items, bolting of almirahs to the wall rather than loosely lying cupboards, pasting tape to the glasses to avoid excessive shattering.
- Action during an earthquake would depend up on the severity of the quake and the extent of damage- however, the basic steps for safeguarding the safety (top most criterion) include:
- Activation of the fire orders, as fires is likely in case of major earthquakes. Pipelines would be expected to rupture, as too would storage tanks-this would result as large scale spillage and possible fire of the oil. The fire fighting system is likely to be incapacitated. In addition, power supply maybe (most likely) cut off. Most likely therefore, the offside plan would be need to be activated, as fatalities beyond the depot boundary wall are likely to be affected.

The main action would involve:

- Cutting off the power supply(if not cut off on its own already) to avoid electrical shocks, fires
- Halting any unloading/loading operations if in progress by emergency stoppage of pumps.
- Sending away road tank-truck to safe zone for further instructions

Any major oil spillage could also overflow the dykes wall and spread around. Halting and minimizing this flow of oil may be attempted where practical and if possible without endangering

human life.

For personnel, important instructions include:

- Drop cover and hold
- Get under a heavy table or desk and hold on, or sit or stand against inside wall if inside the admin block and unable come out. If possible to come out without difficulty, assemble outside the admin block to avoid fatality due to structural collapse.
- Keep away from windows as these may shatter/crack resulting in possible injury.
- If indoors in admin block, stay there.
- If outdoors, stay outdoors away from fall an object (lighting poles, pipe racks, structural roof etc) falling debris, trees, and power lines.
- TT drivers should drive to clear spot and stay in the tanker. They must avoid stopping on or under pipe racks.

Post earthquake actions are extremely important and these include:

- Expect aftershock. They are just as serious as the main earth quake. Many Earthquakes in the past were multiple tremor ones, not a single quake
- Put on shoes to protect from broken glass. Chap-pals etc. are to be avoided at any cost
- Check for injuries and fires(secondary fires could be raging)
- Use a flashlight to inspect for damage.
- Do not go into damage area unless specifically trained to do so.
- Do not use telephone except in emergencies
- Do not use vehicle except in emergencies
- Use a portable radio for information.
- Assist in rescue of co-workers and other person who could be present at the terminal as per the fire orders.

21.2 FLOODS:

Floods are natural calamities that have the potential to cause widespread damage to human being and property. Flood planning is perhaps the best protection against flood damage. Floods however occur after pre-warming, enabling advance action. Flood could completely submerge process equipment, building, pipelines and damage storage tanks. Most importantly, floods could result in drawing death and injury. Main action during flood revolves around the following;

- Cut-off electrical supply to prevent electrocution.
- Switch-off/discontinuous all operation at the installation.
- Establish contact with the flood control room (Government) for up to date status.
- Flood damage control method includes.
- Keep insurance papers, important documents, and other valuables in safe deposit box at a safe location.
- Have flood kit containing portable radio, flashlight, and emergency supplies.
- Move furniture and other items to higher levels in advance.
- Listen to portable radio for up-to-the minute information.
- Use telephones only for life threatening emergencies.
- Evacuate, if necessary and follow instructions.
- Do not walk or drive through flood waters.
- Stay off bridges where water is covering them.
- Keep out storm drains and irrigation ditches
- Use a flashlight to check for damage.
- Stay out of the distaste area.

- Do not use vehicle except in emergencies.

21.3 BOMB HOAX/THREAT

- In case of receiving a bomb threat at the depots, the following action are advised
- Be calm and composed and don't show sign of panic.
- Try and gain the trust of the caller by simple method (may be given your first name(if comfortable only), say you are new to the depot etc) Be polite and courteous on the phone.
- Engage the caller for as long as possible as it may help later to trace the call or could help the caller give away critical hints. Do not ever let the caller hang up quickly.
- Try and note down(on piece of paper) attributes of the caller such as accent, any background noise(station, airport, busy highway, hotel, TV in living room etc) This evidence could be crucial.
- Do not show any sign of sarcasm on the phone (could set off the undesired reaction) or that you do not consider the call to be of a serious nature.
- Let the caller think you are fully convinced that his/her threats are genuine.
- Try and gain the confidence of the caller by engaging in serious conversation.
- Try and find out from the caller the location of the bomb, what type of bomb and other information, which could be useful.
- In case of threats by some terrorist organizations, try and engage in conversation9if confident) on ideological causes, how this move would realize their objective etc. However, only trained staff should do this.

SURROUNDING DANGEROUS FACTORY/PETROL PUMP

There are some hazardous factories are located near factory.

SURROUNDING DANGEROUS FACTORY/PETROL PUMP

There is no hazardous factories are located near us

21.4 EMERGENCY LIGHT SYSTEM:

In case of failure of current from C.S.E.B. Generator is installed TO Start Emergency Meeting Systems Like pumps, emergency Lights etc.

Wind direction/speed indicator

Are installed in top of office building control room.

Reporting Method;

The CIC and WIC will inform by telephone/in writing to Sr. Officer of police, fire brigade, medical authorities and factories inspectorate and provide advice on possible effects on areas outside the factory premises as well as head of personnel.

21.5 INFORMING FAMILIES OF VICTIMS:

There is a record register in which address of each labor/staff is recorded persons will be send to address of victims to inform about the injured members.

21.6 METEOROLOGICAL DATA

The direction of wind of their this area is generally from south west north east as there is no sea

SARDA ENERGY & MINERALS LTD.



Central Pollution Control Board

Ministry of Environment & Forests, Govt of India, Parivesh Bhawan, East Arjun Nagar, Delhi - 110032

MATERIAL SAFETY DATA SHEETS

347

Liquefied petroleum gas

1. CHEMICAL IDENTITY

Chemical Name : Liquefied petroleum gas

Chemical Classification: Flammable

Trade Name :

Synonyms: LPG, Bottled gas, Compressed petroleum gas, Propane-butane-(propylene), Pyrofax

Formula : C₃H₈-C₃H₆-C₄H₁₀-C₄H₈ (**CAS No:** 68476-85-7 **UN No:** 1075

Regulated Identification

Shipping Name : Petroleum gases, Liquefied

Hazchem Code : 2YE

Codes / Label : Class 2.1, Flammable

Hazardous Waste ID No : 5

HAZARDOUS INGREDIENTS	C.A.S. No.	HAZARDOUS INGREDIENTS	C.A.S. No.
-----------------------	------------	-----------------------	------------

1 Liquefied petroleum gas	68476-85-7
---------------------------	------------

3 Propylene	115-07-1
-------------	----------

2 Butane	106-97-8
----------	----------

4

2. PHYSICAL / CHEMICAL DATA

Boiling Pt. °C: -42

Physical State: Gas at 15 deg C and 1 atm

Appearance: Colourless

Melting Pt °C: - 188

Vapour Pressure @ 35°C mmHg: 7875.65 mm Hg (propane)

Odour: Mercaptan added for odour warning

Vapour Density(Air =1): 1.45 - 2.0

Solubility in water at 30°C g/100ml: Immiscible

Others: Soluble in organic solvents, alcohol

Specific Gravity (Water =1): 0.51 - 0.58 at - 50 C

pH :

3. FIRE / EXPLOSION HAZARD DATA

Flammability : Yes

LEL: 1.9

Flash Point °C in OC:

TDG Flammability: 2

UEL: 9.5

Flash Point °C in CC: 104.4 (Propane), 60 (Butane)

Autoignition Temperature °C : 466.1 Propane , 405 Butane

Explosion sensitivity to impact: May explode.

Explosion sensitivity to static Electricity: May explode.

Hazardous Combustion Products : Emits CO, CO₂

Hazardous Polymerization : Will not occur.

Combustible Liquid: Yes

Explosive Material: No

Corrosive Material No

Flammable Material: Yes

Oxidiser : No

Others:

Pyrophoric Material: No

Organic Peroxide : No

4. REACTIVITY DATA

Chemical Stability : Stable

Incompatibility with other material : Strong oxidisers

Reactivity : No reaction with common materials but may react with oxidising

Liquefied petroleum gas

Page 1 of 3

materials.

Hazardous :
Reaction Products

5. HEALTH HAZARD DATA

Routes of entry: Inhalation, Ingestion, Skin and Eyes

Effects of Exposure / Symptoms:

Concentration in air greater than 10 % causes dizziness in few minutes. 1 % conc. Gives the same symptoms in 10 mts. High concentration causes asphyxiation. Liquid on skin causes frostbite.

Emergency Treatment :

Inhalation: Remove the victim to fresh air area. Provide artificial resuscitation.

Skin: Remove the wetted clothes and wash the affected area with plenty of water.

Eyes: Flush with plenty of water for 15 mins. Seek medical aid.

Ingestion: Seek medical assistance.

LD50 (oral-rat) mg/kg:

STEL: 1250 ppm (2180 mg/m³) (in UK)

LC50 (rat) mg/kg:

Odour Threshold: 5000 to 20000 ppm

Permissible Exposure Limit: 1000 ppm (1800 mg/m³)

TLV (ACGIH) : 1000 ppm (1800 mg/m³)

NFPA Hazard	Health	Flammability	Reactivity	Special
Signals	4	1	0	

6. PREVENTIVE MEASURES

Personal Protective : Avoid contact with liquid or gas. Provide hand gloves, safety goggles .
Equipment Gas mask, protective overclothing and shoes.

Handling : All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.

Storage : Keep in tightly closed cylinders in a cool, well ventilated area , away from heat, flame , sparks.

Precautions :

7. EMERGENCY / FIRST AID MEASURES

FIRE:

Fire Extinguishing Media: CO₂ , dry chemical powder, water spray

Special Procedure : Keep the containers cool by spraying water if exposed to fire or heat, otherwise containers will explode in fire.

Unusual Hazards :

EXPOSURE: First Aid Measures:

Inhalation: Remove the victim to fresh air area. Provide artificial resuscitation.

Skin: Remove the wetted clothes and wash the affected area with plenty of water.

Eyes: Flush with plenty of water for 15 mins. Seek medical aid.

Ingestion: Seek medical assistance.

Antidotes / Dosages:

SPILLS :

Steps To Be Taken : Shut off leaks if without risk. Warn everybody that air mixture is explosive.

Waste Disposal Method: Allow gas to burn under control.

8. ADDITIONAL INFORMATION / REFERENCES

Avoid contact with oxidisers. Olefinic impurities may lead to narcotic effect. The gas is a simple asphyxiant. A very dangerous hazard when exposed to heat or flame.

9. MANUFACTURERS / SUPPLIERS DATA

NAME OF FIRM :

MAILING ADDRESS :

TELEPHONE / TELEX NOS :

TELEGRAPHIC ADDRESS :

OTHERS :

Contact person

in Emergency :

Local Bodies involved :

Standard Packing :

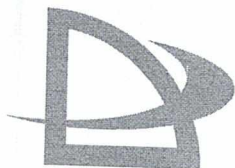
Trem Card Details / Ref :

10. DISCLAIMER

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End of document

Total No. of Pages: 3

**Material Safety Data Sheet: Oxygen**

Product Name: Oxygen	CAS: 7782-44-7
Oxygen; Oxygen, compressed (D.O.T.)	DOT I.D No.: UN 1072
Chemical Name and Synonyms: Oxygen	DOT Hazard Class: Division 2.2
Formula: O ₂	Chemical Family: Oxidizer

HEALTH HAZARD DATA**Time Weighted Average Exposure Limit:**

None established (ACGIH 1994-1995). Oxygen is the "vital element" in the atmosphere in which we live and breathe.

Symptoms of Exposure:

Breathing high concentrations (greater than 75 molar percent) causes symptoms of hyperoxia which includes cramps, nausea, dizziness, hypothermia, amblyopia, respiratory difficulties, bradycardia, fainting spells, and convulsions capable of leading to death. For additional information on hyperoxia, see Compressed Gas Association's Pamphlet P-14.

Toxicological Properties:

- The property is that hyperoxia which leads to pneumonia. Concentrations between 25 and 75 molar percent present a risk of inflammation of organic matter in the body.
- Oxygen is not listed in the LARC, NTP or by OSHA as a carcinogen or potential carcinogen.
- Persons in ill health where such illness would be aggravated by exposure to oxygen should not be allowed to work with or handle this product.

Recommended First Aid Treatment:

Prompt medical attention is mandatory in all cases of overexposure to oxygen. Rescue personnel should be cognizant of extreme fire hazard associated with oxygen-rich atmosphere.

Conscious persons should be assisted to an uncontaminated area and breathe fresh air. They should be kept warm and quiet. The physician should be informed that the victim is experiencing hyperoxia.

Unconscious persons should be moved to an uncontaminated area and given assisted respiration. When breathing has been restored, treatment should be as above. Continues treatment should be symptomatic and supportive.

Hazardous Mixtures of other Liquids, Solids or Gases: Oxygen vigorously accelerates combustion. Contact with all flammable materials should be avoided. Some materials that are not flammable in air will burn in pure oxygen or oxygen-enriched atmospheres.	
PHYSICAL DATA	
Boiling Point: -297.3°F (-182.9°C)	Liquid Density at Boiling Point: 71.23 lb/ft ³ (1141 kg/m ³)
Vapor Pressure @ 70°F (21.1°C) = Above the critical temperature of -181.1°F (-118.4°C)	Gas Density at 70°F. 1 atm .0725 lb/ft ³ (1.161 kg/m ³)
Solubility in Water: Slightly	Freezing Point: -361.8°F (-218.8°C)
Evaporation Rate: N/A (Gas)	Specific Gravity (AIR=1) @ 70°F (21.1°C) = 1.11
Appearance and Odor: Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method used): N/A Gas	Auto Ignition Temperature: N/A	Flammable Limits % by Volume: LEL N/A UEL N/A
Extinguishing Media: Copious quantities of water for fires with oxygen as the oxidizer. I		Electrical Classification: Nonhazardous
Special Fire fighting Procedures: If possible, stop the flow of oxygen, which is supporting the fire. If cylinders are involved in a fire, safely relocate or keep cool with water spray.		
Unusual Fire and Explosion Hazards: Vigorously accelerates combustion.		

REACTIVITY DATA

Stability: Stable

Incompatibility (Materials to Avoid): None

Hazardous Decomposition Products: All flammable materials

Hazardous Polymerization: Will not occur

Conditions to Avoid: None

SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled:

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.

Waste disposal methods:

Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify type): Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

Ventilation: See Local Exhaust

Local Exhaust: To prevent accumulation above 25 molar percent.

Protective Gloves: As required; any material

Eye Protection: Safety goggles or glasses

Other Protective Equipment: Safety shoes, safety shower

SPECIAL PRECAUTIONS

Special Labeling Information:

DOT Shipping Name: Oxygen, Compressed

DOT Hazard Class: Division 2.2

DOT Shipping Label: Nonflammable Gas

I.D. No.: UN 1072

Special Handling Recommendation:

Use only in well-ventilated areas. Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure-reducing regulator when connecting cylinder to lower pressure (<3,000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. For additional handling recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14, and G-4.

Special Storage Recommendations:

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits and away from full or empty stored cylinders which contain flammable products. Do not allow the temperature where cylinders are stored to exceed 125F (52C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in -first out" inventory system to prevent full cylinders being stored for excessive periods of time. For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14, and G-4.

Other Recommendations or Precautions:

Oxygen should not be used as a substitute for compressed air in pneumatic equipment since this type generally contains flammable lubricants. Equipment to contain oxygen must be "cleaned for oxygen service." See Compressed Gas Association Pamphlet G-4.1. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases.

Special Packaging Recommendations:

Carbon steels and low alloy steels are acceptable for use at lower pressures. For high pressure applications use stainless steels, copper and its alloys, nickel and its alloys, brass, bronze, silicon alloys, Monel®, Inconel®, or beryllium. Lead and silver or lead and tin alloys are good gasketing materials. Teflon® and Kel-F® are the preferred nonmetal gaskets. Special Note: It should be recognized that the ignition temperature of metals and nonmetals in pure oxygen service decreases with increasing oxygen pressure.

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Material Safety data sheet

High Speed Diesel

Fire extinguishing media: Foam, Carbon dioxide, Dry Chemical Powder. Water may be used to cool fire-exposed containers.

Special procedure: Shut off leak, if safe to do so, .Keep non-involved people away from spill site. Eliminate all sources of ignition.

Unusual hazards: it will spread along the ground and collect in sewers

Exposure:

Skin contact ; in case of contact with Skin flush with fresh water, remove containment clothing,

Inhalation: in case of excessive inhalation move the victim to fresh air, If problem in breathing give artificial respiration; give oxygen. obtain medical assistance

Ingestion: Give water to conscious victim to drink; do not induce vomiting.

Antidotes/Dosages: N.A.

Spills:

Steps to be taken Shut off leak, if safe to do so, .Keep non-involved people away from spill site. Eliminate all sources of ignition. Prevent spill entering in to sewers, for Major spillage contact Emergency services

Waste Disposal method: N.A.

8. Additional Information /reference

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9. Manufacture/Suppliers Data

Manufacture(Name Of Firm.) : Hindustan Petroleum Corporation
Supplier/Dealers Data.
Name
Mailing address
Telephone
Contact Persons

10. DISCLAIMER

Information contained in this material data sheet is believed to be reliable but no representation, guaranty or warranties of any kind are made for suitability for particular application or result o be obtained from it. It is up the seller to ensure the Product sold by them is relevant to information contained in MSDS

Material Safety data sheet

High Speed Diesel

<i>Combustible liquid:</i> Yes	<i>Explosive material:</i> Yes	<i>Corrosive material:</i> No
<i>Flammable material ;</i> yes	Oxidiser: N.A.	
<i>Pyrophoric material:</i> N.A.	<i>Organic peroxide:</i> N.A.	

4. Reactivity data

<i>Chemical stability:</i> Stable
<i>Incompatibility with other material:</i> oxidizers such Peroxides ,Nitric acid and Perchorates
<i>Hazardous reaction products:</i> on fire it will liberate some amount of carbon monoxide, sulphur dioxide Nitrogen oxide. and other aromatic hydrocarbons

5. Health Hazard data

<i>Routes of entry:</i> : Inhalation, Skin absorption ,ingestion				
<i>Effects of Exposure / symptoms:</i> excessive inhalation Vapors cause rapid breathing, excitability, staggering, headache, fatigue, nausea and vomiting, dizziness, drowsiness, narcosis convulsions, coma,				
Skin Contact: Skin-dryness, cracking, irritation eyes watering, stinging and inflammation.				
<i>Emergency treatment:</i> In case of eye or Skin contact, flush with plenty of water. Remove soaked clothing. in case of excessive inhalation move the victim to fresh air, obtain medical assistance				
<i>L.D₅₀ (Oral-Rat) :</i> > 5g/kg	<i>L.C₅₀: (rat 4hrs)</i> 5g/m ³			
<i>Permissible Exposure limit:</i> N.A.	<i>Odour threshold:</i> N.A.			
<i>TLV (ACGIH) :</i> 800 ppm	<i>STEL:</i> N.A.			
<i>NFPA Hazard signals</i>	<i>Health</i>	<i>Flammability</i>	<i>Reactivity/Stability</i>	<i>Special</i>
	1	2	0	-

6. Preventive measures

<i>Personal Protective equipment:</i> Canister type gas mask. PVC or Rubber. Goggles giving complete protection to eyes. Eye wash fountain with safety shower.
<i>Handling and storage precautions:</i> Do not expose to heat and naked lights, keep containers and valves closed when not in use.

7. Emergency and first aid measures

Fire:

Material Safety data sheet
High Speed Diesel

MATERIAL SAFETY DATA SHEET
Diesel oil/HSD

1. Chemical identity

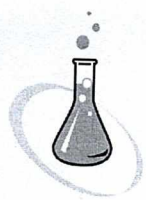
<i>Chemical name:</i> Diesel Oil		<i>Chemical classification:</i> Flammable liquid	
<i>Synonyms:</i> Automotive Diesel Oil		<i>Trade name:</i> HSD	
<i>Formula Range:</i> C ₁₃ - C ₁₈		<i>C.A.S. NO.</i> 68476-30-2.	<i>U.N.NO.</i> 1202
<i>Regulated identification</i>		<i>Shipping name:</i> HSD	
<i>Codes/Label:</i> .		<i>Hazchem code</i> class 3	
		<i>Hazardous waste :</i> N.A.	
<i>Hazardous ingredients</i>	<i>C.A.S.NO.</i>	<i>Hazardous ingredients</i>	<i>C.A.S.NO.</i>
Diesel	68476-30-2	Benzene Trace	71-43-2
		Naphthalene Trace	91-20-3
		Sulphur Trace	7704-34-9
Diesel is complex mixture of hydrocarbons .It's exact composition depends on the source of crude oil from which it is produced and the refining methods used			

2. Physical and chemical data

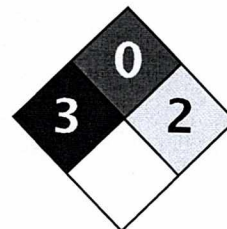
<i>Boiling point/Range (deg.C) :</i> 215 - 376. <i>Physical state:</i> Liquid. <i>Appearance:</i> yellowish brown	
<i>Melting/freezing point (deg.C) :</i> N. A.	
<i>Vapour pressure:</i> 2.12 to 26mm Hg at 21 deg C.	
<i>Odour:</i> Perceptible odour	
<i>Vapour density:</i> N.A.	
<i>Solubility in water @ 30 deg.C:</i> Insoluble	
<i>Specific gravity:</i> 0.86 - 0.90 at 20 deg C	
<i>Others:</i> Pour Point: 6 - 18 deg. C.	

3. Fire and explosion Hazard data

<i>Flammability:</i> Yes	<i>LEL:</i> 0.6%	<i>Flash point(deg C) :</i> 32 (OC)
<i>TDG Flammability:</i> class 3 .	<i>UEL:</i> 6%	<i>Flash point(deg C) :</i> N.A. (CC)
<i>Auto Ignition Temp :</i> 225 deg. C		
<i>Explosion sensitivity to impact:</i> not sensitive to Mechanical Impact.		
<i>Explosion sensitivity to static electricity:</i> For vapors sensitivity exist		
<i>Hazardous Combustion Products:</i> carbon monoxide, Nitrogen oxide. and other aromatic hydrocarbons		
<i>Hazardous Polymerization:</i> N.A.		



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Health	3
Fire	0
Reactivity	2
Personal Protection	

Material Safety Data Sheet Sulfuric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sulfuric acid

Catalog Codes: SLS2539, SLS1741, SLS3166, SLS2371, SLS3793

CAS#: 7664-93-9

RTECS: WS5600000

TSCA: TSCA 8(b) inventory: Sulfuric acid

CI#: Not applicable.

Synonym: Oil of Vitriol; Sulfuric Acid

Chemical Name: Hydrogen sulfate

Chemical Formula: H₂-SO₄

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sulfuric acid	7664-93-9	95 - 98

Toxicological Data on Ingredients: Sulfuric acid: ORAL (LD50): Acute: 2140 mg/kg [Rat.]. VAPOR (LC50): Acute: 510 mg/m 2 hours [Rat]. 320 mg/m 2 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH.

MUTAGENIC EFFECTS: Not available.

TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.

The substance may be toxic to kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion:

Products of combustion are not available since material is non-flammable. However, products of decomposition include fumes of oxides of sulfur. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas. Reacts with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.

Fire Hazards in Presence of Various Substances: Combustible materials

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available.

Risks of explosion of the product in presence of static discharge: Not available.

Slightly explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:

Metal acetylides (Monocesium and Monorubidium), and carbides ignite with concentrated sulfuric acid.

White Phosphorous + boiling Sulfuric acid or its vapor ignites on contact.

May ignite other combustible materials.

May cause fire when sulfuric acid is mixed with Cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorous (III) oxide, and oxidizing agents such as chlorates, halogens, permanganates.

Special Remarks on Explosion Hazards:

Mixtures of sulfuric acid and any of the following can explode: p-nitrotoluene, pentasilver

trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride, carbides, nitro compounds, nitrates, carbides, phosphorous, iodides, picrates, fulminates, dienes, alcohols (when heated)

Nitramide decomposes explosively on contact with concentrated sulfuric acid.

1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decomposition.

Section 6: Accidental Release Measures

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:

Corrosive liquid. Poisonous liquid.

Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.

May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage:

Hygroscopic. Reacts violently with water. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 1 STEL: 3 (mg/m3) [Australia] Inhalation

TWA: 1 (mg/m3) from OSHA (PEL) [United States] Inhalation

TWA: 1 STEL: 3 (mg/m3) from ACGIH (TLV) [United States] [1999] Inhalation

TWA: 1 (mg/m3) from NIOSH [United States] Inhalation

TWA: 1 (mg/m3) [United Kingdom (UK)] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Thick oily liquid.)

Odor: Odorless, but has a choking odor when hot.

Taste: Marked acid taste. (Strong.)

Molecular Weight: 98.08 g/mole

Color: Colorless.

pH (1% soln/water): Acidic.

Boiling Point:

270°C (518°F) - 340 deg. C

Decomposes at 340 deg. C

Melting Point: -35°C (-31°F) to 10.36 deg. C (93% to 100% purity)

Critical Temperature: Not available.

Specific Gravity: 1.84 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: 3.4 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Easily soluble in cold water.

Sulfuric is soluble in water with liberation of much heat.

Soluble in ethyl alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability:

Conditions to Avoid: Incompatible materials, excess heat, combustible material materials, organic materials, exposure to moist air or water, oxidizers, amines, bases.
Always add the acid to water, never the reverse.

Incompatibility with various substances:

Reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.

Corrosivity:

Extremely corrosive in presence of aluminum, of copper, of stainless steel(316).

Highly corrosive in presence of stainless steel(304).

Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Hygroscopic. Strong oxidizer. Reacts violently with water and alcohol especially when water is added to the product.

Incompatible (can react explosively or dangerously) with the following: ACETIC ACID, ACRYLIC ACID, AMMONIUM HYDROXIDE, CRESOL, CUMENE, DICHLOROETHYL ETHER, ETHYLENE CYANOHYDRIN, ETHYLENEIMINE, NITRIC ACID, 2-NITROPROPANE, PROPYLENE OXIDE, SULFOLANE, VINYLIDENE CHLORIDE, DIETHYLENE GLYCOL MONOMETHYL ETHER, ETHYL ACETATE, ETHYLENE CYANOHYDRIN, ETHYLENE GLYCOL MONOETHYL ETHER ACETATE, GLYOXAL, METHYL ETHYL KETONE, dehydrating agents, organic materials, moisture (water), Acetic anhydride, Acetone, cyanohydrin, Acetone+nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile+water, Alcohols + hydrogen peroxide, ally compounds such as Allyl alcohol, and Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium triperchromate, Aniline, Bromate + metals, Bromine pentafluoride, n-Butyraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxime, chlorinates, Chlorates + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthlene + sulfur, Diisobutylene, p-dimethylaminobenzaldehyde, 1,3-Diazidobenzene, Dimethylbenzylcarbinol + hydrogen peroxide, Epichlorohydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol and other glycols, , Ethylenimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mesityl oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycerides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphate, Perchlorates, Perchloric acid, Permanganates + benzene, 1-Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate and other permanganates, halogens, amines, Potassium Permanganate + Potassium chloride, Potassium Permanganate + water, Propiolactone (beta)-, Pyridine, Rubidium acetylene carbide, Silver permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thallium (I) azidodithiocarbonate, Zinc chlorate, Zinc iodide, azides, carbonates, cyanides, sulfides, sulfites, alkali hydrides, carboxylic acid anhydrides, nitriles, olefinic organics, aqueous acids, cyclopentadiene, cyano-alcohols, metal acetylides, Hydrogen gas is generated by the action of the acid on most metals (i.e. lead, copper, tin, zinc, aluminum, etc.). Concentrated sulfuric acid oxidizes, dehydrates, or sulfonates most organic compounds.

Special Remarks on Corrosivity:

Non-corrosive to lead and mild steel, but dillute acid attacks most metals.

Attacks many metals releasing hydrogen.

Minor corrosive effect on bronze.

No corrosion data on brass or zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.

Acute oral toxicity (LD50): 2140 mg/kg [Rat.].

Acute toxicity of the vapor (LC50): 320 mg/m³ 2 hours [Mouse].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH.

May cause damage to the following organs: kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth.

Other Toxic Effects on Humans:

Extremely hazardous in case of inhalation (lung corrosive).

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

Mutagenicity: Cytogenetic Analysis: Hamster, ovary = 4mmol/L

Reproductive effects: May cause adverse reproductive effects based on animal data. Developmental abnormalities (musculoskeletal) in rabbits at a dose of 20 mg/m³ for 7 hrs.(RTECS)

Teratogenicity: neither embryotoxic, fetotoxic, nor teratogenic in mice or rabbits at inhaled doses producing some maternal toxicity

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects:

Skin: Causes severe skin irritation and burns. Continued contact can cause tissue necrosis.

Eye: Causes severe eye irritation and burns. May cause irreversible eye injury.

Ingestion: Harmful if swallowed. May cause permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the stomach, GI bleeding, edema of the glottis, necrosis and scarring, and sudden circulatory collapse(similar to acute inhalation). It may also cause systemic toxicity with acidosis.

Inhalation: May cause severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, shortness of breath, and delayed lung edema. Causes chemical burns to the respiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Cause corrosive action on mucous membranes. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Circulatory shock is often the immediate cause of death. May also affect teeth(changes in teeth and supporting structures - erosion, discoloration).

Chronic Potential Health Effects:

Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and cardiovascular system, heart (ischemic heart leisons), and respiratory system/lungs(pulmonary edema, lung damage), teeth (dental discoloration, erosion).

Skin: Prolonged or repeated skin contact may cause dermatitis, an allergic skin reaction.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 49 mg/l 48 hours [bluegill/sunfish].

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Sulfuric acid may be placed in sealed container or absorbed in vermiculite, dry sand, earth, or a similar material. It may also be diluted and neutralized. Be sure to consult with local or regional authorities (waste regulators) prior to any disposal. Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sulfuric acid UNNA: 1830 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information**Federal and State Regulations:**

Illinois toxic substances disclosure to employee act: Sulfuric acid
New York release reporting list: Sulfuric acid
Rhode Island RTK hazardous substances: Sulfuric acid
Pennsylvania RTK: Sulfuric acid
Minnesota: Sulfuric acid
Massachusetts RTK: Sulfuric acid
New Jersey: Sulfuric acid
California Director's List of Hazardous Substances (8 CCR 339): Sulfuric acid
Tennessee RTK: Sulfuric acid
TSCA 8(b) inventory: Sulfuric acid
SARA 302/304/311/312 extremely hazardous substances: Sulfuric acid
SARA 313 toxic chemical notification and release reporting: Sulfuric acid
CERCLA: Hazardous substances.: Sulfuric acid: 1000 lbs. (453.6 kg)

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:**WHMIS (Canada):**

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS E: Corrosive liquid.

DSCL (EEC):

R35- Causes severe burns.
S2- Keep out of the reach of children.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S30- Never add water to this product.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection:**National Fire Protection Association (U.S.A.):****Health:** 3**Flammability:** 0**Reactivity:** 2**Specific hazard:****Protective Equipment:**

Gloves.

Full suit.

Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Face shield.

Section 16: Other Information**References:**

- Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec.
- The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
- Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.

Other Special Considerations: Not available.**Created:** 10/09/2005 11:58 PM**Last Updated:** 11/06/2008 12:00 PM

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Central Pollution Control Board

Ministry of Environment & Forests, Govt of India, Parivesh Bhawan, East Arjun Nagar, Delhi - 110032

MATERIAL SAFETY DATA SHEETS

313

Hydrochloric acid (gas)

1. CHEMICAL IDENTITY

Chemical Name : Hydrochloric acid (gas)

Chemical Classification: Toxic, Corrosive

Trade Name :

Synonyms: Anhydrous hydrogen chloride, Anhydrous hydrochloric acid

Formula : HCl

CAS No: 7647-01-0

UN No: 1050

Regulated Identification

Shipping Name : Hydrochloric acid, Gas

Hazchem Code : 2RE

Codes / Label : Class 2.3, Toxic, Corrosive

Hazardous Waste ID No :

HAZARDOUS INGREDIENTS

C.A.S. No.

HAZARDOUS INGREDIENTS

C.A.S. No.

1 Hydrochloric acid (gas) 7647-01-0

3

2

4

2. PHYSICAL / CHEMICAL DATA

Boiling Pt. °C: -85.06

Physical State: Gas

Appearance: A colourless gas.

Melting Pt °C: -114.9

Vapour Pressure @ 35°C mmHg: 31701.2 mmHg (21.1 deg C)

Odour: Pungent odour.

Vapour Density(Air =1): 1.64 g/l

Solubility in water at 30°C g/100ml: 82.3 g/100 mL at 0 deg C

Others:

Specific Gravity (Water =1): 1.18 g/cm 3

pH :

3. FIRE / EXPLOSION HAZARD DATA

Flammability :

LEL:

Flash Point °C in OC: 11

TDG Flammability:

UEL:

Flash Point °C in CC:

Autoignition Temperature °C :

Explosion sensitivity to impact:

Explosion sensitivity to static Electricity:

Hazardous Combustion Products : At high temperatures, it decomposes into hydrogen and chlorine

Hazardous Polymerization :

Combustible Liquid:

Explosive Material:

Corrosive Material Yes

Flammable Material:

Oxidiser : No

Others:

Pyrophoric Material:

Organic Peroxide :

4. REACTIVITY DATA

Chemical Stability : Stable - contact with common metals produces hydrogen which may form explosive mixtures with air.

Incompatibility with other material : Hydroxides, amines, alkalis, copper, brass, zinc and many other metals.

Reactivity : Reacts rapidly and exothermically with bases of all kinds. Reacts exothermically with carbonates and hydrogen carbonates to generate

carbon dioxide. Reacts with sulfides, carbides, borides, phosphides, many metals to generate flammable hydrogen gas.

Hazardous : Carbon dioxide, flammable hydrogen gas.

Reaction Products

5. HEALTH HAZARD DATA

Routes of entry: Inhalation, Ingestion, Skin and Eyes

Effects of Exposure / Symptoms:

Inhalation : Changes in breathing pattern, irritation, changes in pulmonary function, corrosion and edema of the respiratory tract, chronic bronchitis and noncardiogenic pulmonary edema have been observed. **Ingestion :** Gastritis, burns, gastric hemorrhage, dilation, edema, necrosis, and strictures may occur. **Skin :** Burns, ulceration, scarring, blanching, and irritation may occur. **Eye :** Dental discoloration or erosion, bleeding gums, corneal necrosis, inflammation of the eye, eye and nasal irritation, nasal ulceration, nose bleeds, throat irritation and ulceration have been observed.

Emergency Treatment :

Inhalation: Remove person to fresh air; keep him warm and quiet and get medical attention immediately; start artificial respiration if breathing stops.

Skin: Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.

Eyes: Irrigate exposed eyes with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

Ingestion: Have person drink water or milk; do not induce vomiting.

LD50 (oral-rat) mg/kg:	STEL:
LC50 (rat) mg/kg:	Odour Threshold: 7.0 mg/m ³
Permissible Exposure Limit: 5 ppm (7 mg/m ³)	TLV (ACGIH) : 5 ppm (7 mg/m ³)

NFPA Hazard	Health	Flammability	Reactivity	Special
Signals	3	0	1	

6. PREVENTIVE MEASURES

Personal Protective Equipment : Wear appropriate chemical protective clothing. Wear positive pressure self-contained breathing apparatus.

Handling : Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. Emergency eyewash fountains and safety showers should be available in the immediate vicinity of potential exposure. Do not puncture or incinerate containers.

Storage : Keep away from oxidizing agents, particularly nitric acid and chlorates. Safeguard containers against mechanical injury.

Precautions :

7. EMERGENCY / FIRST AID MEASURES

FIRE:

Fire Extinguishing Media : Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.)

Special Procedure : Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. Use water spray to knock-

down vapors.

Unusual Hazards

: Vapors from liquefied gas are initially heavier than air and spread along ground. Some of these materials may react violently with water. Containers may explode when heated. Ruptured cylinders may rocket.

EXPOSURE: First Aid Measures:

Inhalation: Remove person to fresh air; keep him warm and quiet and get medical attention immediately; start artificial respiration if breathing stops.

Skin: Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.

Eyes: Irrigate exposed eyes with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

Ingestion: Have person drink water or milk; do not induce vomiting.

Antidotes / Dosages:

SPILLS :

Steps To Be Taken : Attempt to stop leak if without undue personnel hazard.

Waste Disposal Method: See "Additional information".

8. ADDITIONAL INFORMATION / REFERENCES

Material may burn but does not ignite readily.

Contact with common metals produces hydrogen which may form explosive mixtures with air.

Spillage treatment: Keep material out of water sources and sewers. Use water spray to knock-down vapors. Neutralize spilled material with crushed limestone, soda ash, or lime. Do not use water on material itself. Vapor knockdown water is corrosive or toxic and should be diked for containment. Land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete.

9. MANUFACTURERS / SUPPLIERS DATA

NAME OF FIRM :

MAILING ADDRESS :

TELEPHONE / TELEX NOS :

TELEGRAPHIC ADDRESS :

OTHERS :

Contact person

in Emergency :

Local Bodies involved :

Standard Packing :

Trem Card Details / Ref :

10. DISCLAIMER

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End of document

Total No. of Pages: 3

Corporate Social Responsibility

All Fig: INR Lac

Sl. No	Particulars	2014-15	2015-16	2016-17	2017-18*
1	Healthcare	48.29	37.89	16.58	25.17
2	Education	61.33	125.17	119.12	35.85
3	Social projects	27.33	5.56	13.15	7.92
4	Environment	11.83	14.81	8.74	
5	Art & Culture	23.47	7.86	4.98	
6	Help to widows	0.72	0	0	
7	Sports	8.05	11.85	0	1.46
8	Rural development projects	39.03	1.44	8.77	17.49
9	Administrative Expenses	7.47	7.91	8.32	4.85
A	Total CSR Expenditure	227.52	212.49	179.66	92.75
B	Average net profit of the Company for last three financial years	11,775	11,647	7,716	9,048.96
C	Prescribed CSR expenditure (2% of net profit as computed above)	235.51	240.92	182.74	184.06
D	Amount unspent [#]	7.99	28.43	3.08	91.31

Note:

*

Upto November 2017

#

Including Amount unspent during Previous Year



Industrial Growth Center, Siltara
Raipur (CG) 493111, India
Tel: +91 771 2216100
Fax : +91 771 2216198/99
PAN No.: AAACR6149L
www.seml.co.in
info@seml.co.in

An ISO 9001, ISO 14001 & OHSAS 18001
Certified Company



CIN OF SEML IS

L27100MH1973PLC 016617

Quality, Occupational Health & Safety and Environment (QHSE) Policy

We at "Sarda Energy & Minerals Limited (SEML)" are committed to:

achieve sustainable growth, excellence in **Quality of Products, Environmental performance** and maintain **Zero Tolerance in Occupational Health & Safety** to the maximum satisfaction of relevant interested parties.

This goal shall be achieved through:

- Establishing and maintaining a policy that is appropriate to the purpose and context of the organization ;
- Addressing risks and opportunities that bring improvement to the Organization ;
- Prevention of defects, pollution, incidents & ill health through effective teamwork & involvement of people ;
- Commitment to fulfill all applicable Statutory & Regulatory compliance obligations ;
- Commitment to the protection of environment, sustainable resource use including waste management ;
- Adopting safe work practice and safety culture in all aspects of business operations ;
- Commitment to continual improvement in performance related to quality, Environment, Occupational Health & Safety.

The above policy provides a framework for setting Quality, Environment & Occupational Health & Safety objectives. The same is communicated and understood by all persons working for or on behalf of SEML and make available to the public and relevant interested parties as documented information.

Raipur

Issue No-02, Date - March 31st, 2017

Kamal K. Sarda

Chairman & Managing Director

ABS Quality Evaluations

Certificate Of Conformance

This is to certify that the Quality Management System of:

Sarda Energy & Minerals Limited
Phase - 1, Industrial Growth Center
Siltara, Raipur, Chhattisgarh 493 111
India

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

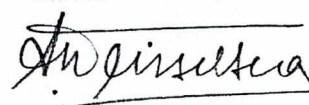
ISO 9001:2015

The Quality Management System is applicable to:

CAPTIVE POWER GENERATION
MANUFACTURING AND SALE OF IRON ORE PELLETS, SPONGE IRON, STEEL BILLETS, STEEL WIRE RODS & HB WIRE, FERRO ALLOYS, ECO BRICKS & ECO BLOCKS AS PER RELEVANT STANDARD AND CUSTOMER SPECIFICATION

This certificate may be found on the ABS QE Website (www.abs-qe.com). For certificates issued in the People's Republic of China information may also be verified on the CNCA website (www.cnca.gov.cn).

Certificate No: 43269
 Certification Date: 11 September 2015
 Effective Date: 03 November 2017
 Expiration Date: 31 October 2020
 Issue Date: 03 November 2017



Alex Weisselberg, President



Validity of this certificate is based on the successful completion of the periodic surveillance audits of the management system defined by the above scope and is contingent upon prompt, written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.

ABS Quality Evaluations, Inc. 16855 Northchase Drive, Houston, TX 77060, U.S.A.

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ABS Quality Evaluations

ISO 9001:2015

Certificate Of Conformance

ANNEX

Certificate No: 43269

Sarda Energy & Minerals Limited

At Below Facilities:

Facility: INTEGRATED STEEL PLANT
VILLAGE MANDHAR
RAIPUR, Chhattisgarh 493111
India

Activity: Manufacturing of Iron Ore Pellets

Facility: VANIJYA BHAVAN, DEVENDRA NAGAR
RAIPUR, Chhattisgarh 492001
India

Activity: Marketing, Raw Material Purchasing-Ferro Alloys



Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.

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ABS Quality Evaluations

Certificate Of Conformance

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Siltara, Raipur, Chhattisgarh 493 111
India

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

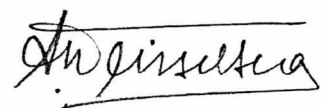
ISO 14001:2015

The Environment Management System is applicable to:

CAPTIVE POWER GENERATION.
MANUFACTURING AND SALE OF IRON ORE PELLETS, SPONGE IRON, STEEL BILLETS, STEEL WIRE RODS & HB WIRE, FERRO ALLOYS, ECO BRICKS & ECO BLOCKS AS PER RELEVANT STANDARD AND CUSTOMER SPECIFICATION.

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Certificate No: 50247
Certification Date: 15 March 2015
Effective Date: 01 November 2017
Expiration Date: 31 October 2020
Issue Date: 01 November 2017



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ISO 14001:2015

Certificate Of Conformance

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Certificate No: 50247

Sarda Energy & Minerals Limited

At Below Facilities:

Facility: INTEGRATED STEEL PLANT
VILLAGE MANDHAR
RAIPUR, Chhattisgarh 493111
India

Activity: Manufacturing of Iron Ore Pellets

Facility: VANIJYA BHAVAN, DEVENDRA NAGAR
RAIPUR, Chhattisgarh 492001
India

Activity: Marketing, Raw Material Purchasing-Ferro Alloys



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Certificate Of Conformance

This is to certify that the Health and Safety Management System of:

Sarda Energy & Minerals Limited

Phase - 1, Industrial Growth Center

Siltara, Raipur, Chhattisgarh 493 111

India

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

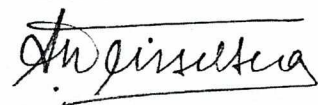
OHSAS 18001:2007

The Health and Safety Management System is applicable to:

CAPTIVE POWER GENERATION, MANUFACTURING OF IRON ORE PELLETS, SPONGE IRON, STEEL BILLETS, STEEL WIRE ROD, HARD BLACK WIRE AND FERRO ALLOYS AS PER RELEVANT STANDARD AND CUSTOMER SPECIFICATION

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Certificate No: 50254
Certification Date: 14 March 2015
Effective Date: 01 November 2017
Expiration Date: 31 October 2020
Issue Date: 01 November 2017



Alex Weisselberg, President



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OHSAS 18001:2007

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Certificate No: 50254

Sarda Energy & Minerals Limited

At Below Facilities:

Facility: INTEGRATED STEEL PLANT
VILLAGE MANDHAR
RAIPUR, Chhattisgarh 493111
India

Activity: Manufacturing of Iron Ore Pellets

Facility: VANIJYA BHAVAN, DEVENDRA NAGAR
RAIPUR, Chhattisgarh 492001
India

Activity: Marketing, Raw Material Purchasing-Ferro Alloys



Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.

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Environment Management Cell

Plant Head (Sr. Vice President)		
Head – Health, Safety & Environment (Sr. Manager)		
Manager (Horticulture)	Asst. Manager (Environment)	Asst. Manager QC (Environment)
Officer	Sr. Officer	Chemists
Supervisors	Supervisors	Lab. Assistant
Gardeners	Workers	
Workers		

Full

Annexure - 7.

**Sarda Energy & Minerals Limited
(0.6 MTPA Pellet Plant at Phase – I of Siltara Industrial Growth Center,
Mandhar, Raipur)**

EXPENDITURE AGAINST POLLUTION CONTROL IN 2016-17

S. NO.	NAME OF SECTION	AMOUNT (INR)
1	Energy charges for running of ESPs (42, 29,651 units consumed @ Rs 3.6/Unit)	1,52,26,746
2	Maintenance charges for Pollution Control Equipments	1,02,748
3	Cleaning charges	14,500
5	Green Belt Development / Plantation	16,79,575
6	Environment Monitoring Charges	86,872
	TOTAL	17,110,441

