EXECUTIVE SUMMARY

ENVIRONMENTAL IMPACT ASSESSMENT

AND

ENVIRONMENTAL MANAGEMENT PLAN

FOR

PUBLIC HEARING
FOR

JUNAD DEEP EXTN.
OC

(WANI NORTH AREA, WCL)

JUNE -2012
(UPDATED)

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EXECUTIVE SUMMARY

1.1 INTRODUCTION:

This is expansion of existing Junad Opencast with mine able reserve of 6.13 Mt and with maximum coal production target of 1.50 MTPA. The life of the mine is about 8 years.

1.2 NEED OF THE PROJECT

There is a substantial gap between demand and availability of coal for the mines of WCL as a whole. It is in national interest to open new mines/projects & to go for expansion of existing projects urgently so as to meet the requirement of coal for power and various other sectors.

The justification of this mine has been studied in the light of estimated demand for non-coking coal from power sector in Maharashtra and production forecast from existing, completed and ongoing projects of WCL.

1.2.1 LOCATION & COMMUNICATION

Junad Deep OC Extn. mine is located in the Yavatmal district of Maharashtra state. It is bounded by Latitudes 20^{o} 01' 05" to 20^{o} 04' 10" N & Longitudes 79^{o} 03' 09" to 79^{o} 05' 00" E and falling in Survey of India Topo Sheet No. 55 P/4.

The existing mine is at a distance of about 140 km from Nagpur . However, the block is presently connected by a 3 km fair weather road with Aheri village which, in turn, is connected with Wani town towards North-West by a 19 km metalled road. The block may also be approached by a 3 km road from Ukni / Pimpalgaon project which is also being connected with Wani town via Bhalar village.

1.2.2 TOPOGRAPHY & DRAINAGE :-

The area of Junad Extension OC mine exhibits gently undulating topography. The general slope of the ground is from west to east. The elevation varies from 180 m to 195 m. The Wardha River flowing from north to south is the main drainage channel of the area.

1.2.3 CLIMATE :-

Junad block has extreme climate with temp. of 48^{0} C during summer months and about 10^{0} C during winter months . The average annual rainfall is about 1250 mm.

1.2.4 PRESENT LAND USE PATTERN :-

The entire land to be acquired for extension of the Junad OC project is covered by black cotton soil and is fertile and is generally used for growing mainly the cash crops like cotton, sugarcane, chillies etc apart from standard agricultural products like rice , wheat & jawar. No village is falling in the proposed leasehold boundary of the project. All the land losers will be given compensation as per Company's norms.

1.2.5 SITE DESCRIPTION: -

The study area has been divided into two heads

- Core Zone
- Buffer Zone

a) **Core zone**: The core zone consists of the mining leasehold area where mining and allied activities take place. The core zone comprises of 449.63 ha of land. The land usage is given below.

Sl. No	Land Particulars	Total Land
1.	Agricultural land	443.53 ha
2.	Waste Land (Govt. Land)	6.10 ha
3.	Forest Land	-
Total		**449.63 ha**

b) **FEATURES IN BUFFER ZONE**

Sl. No.	**FEATURES**	**DETAILS**	**DISTANCE FROM MINE**
1	Industries	Nil	**Nil**
2	Railway Lines	Wani Railway Siding	About 9.0 km
3	State Highway	State Highway No.- 84	About 5.0 km
4	Other Coal Mines	Ukni OC, Pimpalgaon OC , Kolar Pimpri OC	3.0 – 5.0 km
5	Water Bodies	Wardha River	125 m from mine boundary
6	Human Settlement	40 villages & WCL township within buffer zone	

1.2.6 JUSTIFICATION: -

There is a substantial gap between demand and availability of coal for the mines of WCL as a whole. It is in national interest to open new mines/projects urgently so as to meet the requirement of coal for power and various other sectors.

The justification of this mine has been studied in the light of estimated demand for non-coking coal from power sector in Maharashtra and production forecast from existing, completed and ongoing projects of WCL.

1.3 SOURCES OF DATA

This report has been formulated using various data from the following sources:

Sl. No.	Type of Data	Sources
1	Mining and economic parameters and other miscellaneous data	CMPDIL and Wani North Area, WCL.
2	Environmental data including meteorological data, air quality, dust fall rate, water quality and noise level data.	Environmental-data generation for proposed Junad Extn. (Deep) OC of Wani North Area of WCL, Maharashtra carried out by CMPDI.
3	Socio-economic study & Land use/cover mapping buffer zone.	Census data & base line Socio - Economic survey.
4	Flora and fauna	Survey Report prepared by the competent authority in this field.
5	Surface hydrology and hydrogeology	CMPDIL, RI- IV, Nagpur.
6	Meteorological data	Environmental-data generation for Junad. Extn (Deep) OC of Wani North Area Maharashtra carried out by CMPDI.
7	Land use/cover mapping core zone.	As per State Govt. Record, data supplied by the concerned WCL area office.

2.1 GEOLOGY OF THE MINING BLOCK

The geological formation encountered in the present quarriable area are as follows :-

Formation	Thickness (m)		Lithology
	Minimum	Maximum	
Soil	3.00	24.00	Black clayey soil and sandy soil
	(MWJ-24)	(MWJ-27)	
Kamthis	6.00	101.00	Yellow, brown, red, yellowish white ferruginous sandstone, occasionally grey sandy shale/shale.
	(MWJ-37)	(MWJ-12)	
Barakar	12.78	133.55	Grey white medium to grey sandstone with shale, coal seams with shaly coal, etc.
	(MWJ-20)	(MWJ-27)	

GEOLOGICAL STRUCTURE

Only 3 faults viz. Fault F3-F3, F4-F4 and F5-F5 are intersected in quarry. The fault F3-F3 is minor in nature and throw is 5 m. The throw of F4-F4 & F5-F5 is 20 m towards NE and 40 m SW respectively.

GEO - MINING PARAMETERS

Sl. No.	**Particulars**	EXTENSION QUARRY
1.	FACE LENGTH (km)	
a)	On the floor of composite seam	1.15 – 1.28
b)	On surface	1.50 – 1.70
2.	DEPTH UPTO FLOOR OF COMPOSITE SEAM(m)	
a)	Initial	30 - 88
b)	Final	170
3.	WIDTH BELOW THE DECOALED VOID OF EXISTING OC (m)	
a)	On the floor of composite seam	250 - 325
b)	On surface	400 – 525
4.	AREA OF THE QUARRY (ha)	
a)	On the floor	35.20
b)	On surface	70.50
5.	GRADIENT OF SEAM	1 in 3
6.	GRADE OF SEAM (WITH 5 CM CONTAMINATION)	E
7.	U.H.V. (WITH 5 CM CONTAMINATION)	**3822**
8.	AVG. SEAM THICKNESS(m)	17
9.	NET MINEABLE RESERVES (Mt)	**6.13**
10.	Average stripping ratio (t:m^3)	1:8.26

The shovel dumper system of mining with horizontal slicing method is recommended for the proposed extension project with sump at the bottom-most horizon bench in the coal seam.

2.2 WASTE DISPOSAL & REHANDLING OF EXISTING OB DUMP

Two external OB dumps are proposed in dip side of the extended quarry beyond the major boundary Fault F1-F1 at a depth ranging from 350-400 m at the floor of coal seam. The main external OB dump No.1 lies exactly in the dip side of extended quarry from Aheri village in north to approach road for the project in south. The dump No.1 is proposed keeping safe distance from Pragati Nagar township, existing water pipeline, Wardha river and approach road to the project. External OB dump No.2 is located on other side of approach road.

In addition, about 10.33 Mm^3 of OB already dumped by existing Junad OC in dip side of the quarry over coal bearing area where Junad Extension OCP is proposed also requires to be rehandled. The capacity of external OB dumps proposed is about 60.20 Mm^3. Remaining 0.75 Mm^3 of OB will be used is construction of safety embankment. The break up of OB quantities in external OB dumps is given in following table.

No.	Dump	Capacity in Mm^3		
		0-30m	30 -60m	Total
i)	Dump – 1	25.70	16.92	42.65
ii)	Dump – 2	5.80	2.17	17.55
Total				60.20

The entire extension quarry which is 50.62 M.Cu.m. of existing Junad OC mine is dumped in dump no. 1 and 2 . About 10.33 M.Cu.m. of OB to be rehandled will also be dumped in dump no.2 (9.58 M.Cu.m.) and also used for construction of embankment(0.75 M.Cu.m.).

The external dumps have two benches each of 30m height and final angle of slope is proposed to be kept at maximum 28^o.

A small coal handling plant is already in operation, installed at Pimpalgaon project (about 5 km away) for Junad OCP. The same CHP will cater to the needs of Junad Extension OC.

The CHP has facilities For crushing of coal to (-)200 mm size .The crushed coal is being loaded in trucks by pay loader and transported to Wani Siding for rail despatch.

Break up is given below .

Sl. No.	Particulars	Land already acquired in existing Junad OC Mine	Land to be acquired under proposed Junad Extn. OC Mine	Total
1.	Agricultural Land		269.25 ha*	
2.	Waste Land (Govt. Land)	174.28 ha	6.10ha	449.63 ha
3.	Forest Land	NIL	NIL	NIL
	TOTAL	174.28 ha	275.35 ha	449.63 ha

* This 269.25ha of land to be acquired includes 5.20 ha of land of Kolar pimpri extn oc and 13.85 ha of acquired land by existing pimpalgaon oc project. Both the projects are adjacent to Junad extension OC mine.

{Source of Data: - Sanctioned Project Report}

Changes of Land Use during Mining:

Sl. No.	Particulars	Area (ha)
1	Quarry Area	101.70
2	External OB Dump	175.00
3	Infrastructure including approach road etc.	15.00
4	Diversion of Nala	00.00
5	Embankment	20.00
6	Area needed for rationalization & safe blasting zone	137.93
	TOTAL	**449.63**

The Plantation programme will be as follows (considering 2500 Plants/ha) :

(Area figures are in ha)

Sl. No.	Particulars	Ext.OB Dump		Backfilled Area		Vacant Land		Total	
		Area (Ha)	Nos.	Area (Ha)	Nos.	Area (Ha)	Nos.	Area (Ha)	Nos.
1.	At the end of 5th Yr.	140.00	350000	-	-	-		140.00	350000
2.	At the end of 10th Yr & end of mine life	175.00	437500	-	-	20	50000	195	487500

The post-mining scenario can be summarized as below :

Sl. No	Particulars	Plantation	Void	Public Use	Undisturbed	Total
1.	External OB Dump	175.00	-	-	-	175.00
2.	Excavation		101.70	-	-	101.70
3.	Infrastructure	3.00	-	7.00-	-	10.00
4.	Diversion of/ Roads/ nalla/ Embankment	17.00	-	8.00	-	25.00
5.	Rationalisation of Mine boundary & Blasting zone	-	-	-	137.93	137.93
Total		**195.00**	**101.70**	**15.00**	**137.93**	**449.63**

2.3 Base line Environmental Scenario

Baseline data on environmental quality for winter season are collected for 90 days during the period from 01st December`09 to 28th February`2010. The study carried out during the said period is reported below.

APPROACH METHODOLOGY

Micrometeorological data generation

A meteorology station has been set up at Core zone and micrometeorological parameters like wind velocity, wind direction, temperature, relative humidity, cloud cover etc. are recorded on hourly basis for 90 days from 01st December`09 to 28th Februarty`2010 representing winter season. Daily rainfall also has been recorded and reported.

Ambient air quality monitoring

Ambient air quality was monitored at 6 locations i.e. one in core zone and the remaining five in buffer zone. A total of 24 samples (24-hrly) for SPM & RPM and 72 samples (8-hrly) for SO_2 and NO_x samples were collected from each location during the study period and analyzed.

Water quality monitoring

Representative water samples 6 nos. namely ETP Inlet and Outlet,Project site (W1 & W2), Drinking Water,Borgaon village (W3), Handpump,Aheri village (W4), Wardha river U/s (W5) and Wardha river D/s (W6) were collected, preserved and transported to R&C Environmental Engg. Laboratory, Chennai and analyzed as per standard methods.

Noise levels recording

Noise levels were recorded by using CYGNET Integrated sound level meter (100X) from six ambient air quality locations during day time and night time at an interval of four hours for one day.

Soil quality monitoring

Soil samples from three locations namely one in OB dump soil, Corzone (S1), Agri.Land, Aheri village (S2) and Agri.land, Borgaon village (S3) were collected at depths of 30, 60 and 100 cms and analysed for various physico-chemical and fertility parameters.

DATA ANALYSIS AND RESULTS

Micrometeorology

The wind velocity readings were ranging from 0.4 – 13.6 km/hr. Predominant wind was from North-East (NE) direction. The maximum temperature recorded was 26.0°C and the minimum was 11.0°C. The mean relative humidity was found to 64.5% and no rainfall was recorded during the study period.

Air quality

Core zone

SPM and RPM values are ranging from 226 - 294 μg/m³ and 112 μg/m³ to 138 μg/m³ respectively. SO_2 and NO_x values are varying between 6.4 to 12.0 μg/m³ and 8.9 to 16.6 μg/m³ respectively. ***All the values are found to be well within the Standards for Coalmines stipulated by Ministry of Environment & Forests (MoEF).***

Buffer zone

SPM and RPM values are ranging from 126 μg/m³ to 180 μg/m³ and 42 μg/m³ to 80 μg/m³ respectively. SO_2 and NO_x values are varying between 5.6 – 11.4 and 7.1 – 12.5 μg/m³ respectively. A***ll RPM, SO_2 and NO_x values are well within the CPCB norms.***

Water quality

The water samples (6 Nos.) collected from different water sources ie. Wastewater, Surface & ground water etc. are analyzed as per procedures outlined in IS : 2488 / IS : 3025 / AWWA / APHA.

At all locations, oil and grease, phenolic compounds, cyanides, sulphides and insecticides are found to be absent and all heavy metal values except Iron are found to be below the detectable limit.
In general, water quality at six locations is found to be within the prescribed limits.

Noise levels

Mean L_{eq} noise levels at day time and night time are ranging from 45.2 to 63.8 dB(A) and 40.6 to 58.6 dB(A) respectively in the study area. While comparing with IS: 4954 - 1986 norms for acceptable outdoor noise levels in residential area (55 dB(A)) in respect of buffer zone and Industrial area (75 dB(A)) in respect of core zone.

Soil quality

The soil quality of the project area appears to be good and would support vegetation after suitable reclamation / modification.

CONCLUSIONS

The following conclusions are drawn based on the baseline data collected at core and buffer zone area.

i) Ambient air quality parameters viz., RPM, SO_2 and NOx are well within the CPCB norms for industrial, Commercial, Residential and other areas.
ii) The quality of mine discharge is good. Further, the ground water quality is also good and is well within the norms of IS : 10500-1991.
iii) Most of the noise levels recorded are generally less than 65 dB(A) and are well within the acceptable outdoor noise levels in residential areas in respect of buffer zone and Industrial area in respect of core zone as per the norms of IS: 4954 - 1986.
iv) The soil quality in the project area appears to be good and would support vegetation after suitable reclamation measures.

2.4 Anticipated Impacts & Pollution Control Measures

AIR POLLUTION IMPACT ASSESSMENT

The impact assessment has been carried out dealing with the following points:

(a) Phase-wise inventory of air pollution emission sources
(b) Impact assessment

a. Phase-wise inventory of air pollution emission sources

The pollution sources are obvious and to assess the impact, the project life is divided into following time frames:

- Operation phase
- Post-operational stage

The activities associated with these time frames and having impact on the ambient air quality along with the pollutants are enumerated in the following sections:

❁ Operational phase

During this phase, activities necessary for mining of coal, its handling and transport are taken up. Such activities having impact on ambient air quality are detailed below:

(i)	Drilling	: Dust
(ii)	Blasting of coal and overburden	: Dust and noxious gases
(iii)	Handling of coal	: Dust and noxious gases
(iv)	Overburden handling	: Dust and noxious gases
(v)	Dump formation (internal)	: Dust and exhaust fumes from dumpers and dust till the development of green cover
(vi)	Movement of vehicles	: Dust and noxious fumes

❁ Post-operational stage

During this stage of the project, the activities related to the closure of mine are to be carried out. Preparation of mine closure plan shall be carried out during the period four to five years before the closure of the mine. Some of the activities for the closure are:

Modifications in physical and biological reclamation of backfilled area

- Salvaging and shifting operation of HEMMs and other equipment
- Clearing of coal and other materials, restoration of infrastructure area & colony area to the extent possible and necessary if not useful for other projects
- Management of hydrology and hydrogeology.
- Redeployment of workforce, etc.
- Arrangement & implementation of post-operation monitoring mainly keeping watch, vigil, etc.

The activities having impact on the ambient air quality are enumerated below:

(i)	Movement of HEMMs for physical reclamation of backfilled area	:	Dust and obnoxious fumes
(ii)	Movement of vehicles for shifting and salvaging operation of HEMMs and other equipment	:	Dust and obnoxious fumes
(iii)	Movement of vehicles for clearing of coal and other materials	:	Dust and obnoxious gases

b. Impact assessment

The mining and its related activities create ambient air pollution. The impact of mining on ambient air quality are highlighted in the following paragraphs:

(a) The ambient air quality is influenced due to the presence of RPM, SPM, SO_2, NOx, etc., which are generated due to various activities like drilling, blasting and handling related to the project. Further, the ambient air quality is affected marginally to a varying degree due to the mining activities of other nearby opencast and underground coal mines of the same coalfield. The concentration of pollutants may vary depending upon the various micro-meteorological parameters and the seasons of a year.

(b) The baseline ambient air quality has been generated at six locations surrounding the proposed site of Junad OC to assess the present ambient air quality scenario corresponding to the pre-mining status of the proposed project. The details of baseline data have been given in previous chapter. All the monitored parameters are well below the permissible limit. Thus it can be concluded that although the mine under consideration is operating since long but ambient air quality in the surrounding area has not been affected adversely.

Now, with the start of the proposed expansion project, there is likelihood of addition of pollution to the existing concentration level of different attributes of ambient air. Efforts will be made by implementation of proper abatement measures so as to maintain the sinking capacity of ambient air to absorb the additional load , if any , thereby maintaining the quality of ambient air to the pre – mining level to the extent possible.

(c) Now in order to assess the likely contribution of pollution due to proposed expansion mining activities , air quality data of mine activity area of Pimpalgaon OCP have been considered to prove the fact that an operating mine with same production capacity of proposed expansion project , generates pollution load , even in dry season , well below the limit values, so the pollution load from proposed project will be much much less.

(d) Further, as per TOR received from MOEF, AAQ Prediction modeling has been done with ISCT – 3 and it has been found that there will be insignificant increase in the level of pollutants as such there will be negligible impact on the Ambient air quality due to proposed expansion of the mine.

Existing Ambient Air Quality Monitoring

The ambient air quality monitoring is being carried out on regular basis as per the Env (Protection) Amendment Rule, 2000 so as to ascertain the likely load of various air pollutants and thereby suitably modifying the various control measures. The details of data recorded at Junad OCP from Quarter Ending March 2012 to March 2011 is given in Chapter – IV and it is seen that all parameters are within the permissible limits.

AIR POLLUTION CONTROL MEASURES

Since Junad OC is an operating mine, the environmental monitoring data generation is being done at four locations on regular basis as per the Env (Protection) Amendment Rule published Vide Gazette of dated 25.9.2000. In addition to data generation, following abatement measures have also been taken in order to suppress the dust and noxious gases generation to the maximum possible extent.

Drilling Operations

In order to reduce dust generated by drilling operation wet drilling is done.

Blasting Operation

In order to minimize the generation of dust during blasting, the following measures are adopted:

(a) Blast holes are properly placed/spaced/positioned.

(b Blast is properly designed in respect of hole-spacing. Hole placing and blast design are looked into as a fresh case every time, by a competent Blasting Officer who takes into consideration the actual geo-mining conditions of the site.

(c) Blasting is being done between shifts or during the rest interval when the minimum number of persons is present around the blast area. In order to quickly disperse the dust generated in blasting operations, blasting is avoided when there is wind. Blasting is avoided in the mornings and during cloudy situations.

(d) Adaptation of Controlled Blasting Technique as permitted by DGMS.

Loading & Transport

Movement of vehicles and HEMM on haul roads, particularly when they are un - metalled, is another major source of dust generation. To minimize dust generation due to this operation, the following abatement measures will be taken.

(a) All long-life haul roads and service roads are properly constructed and metalled. Unmetalled roads are being kept free of ruts, potholes etc.

(b) All haul-roads are regularly sprayed with water. Water sprinklers are regularly used in the project.

(c) Overloading of vehicles are avoided.

(d) Covering of loaded trucks by tarpauline.

(e) Regular cleaning of transportation roads.

(f) Adequate green belt have been developed all along the coal transportation road on both sides.

All the above-mentioned control measures will be continued during the balance life of the project.

OB Dumps

On the dump slopes and top surface, plantation of grass and trees will be done in phases and the details are as follows ;-

The Plantation programme will be as follows (considering 2500 Plants/ha) :

(Area figures are in ha)

Sl. No.	Particulars	Ext.OB Dump		Backfilled Area		Vacant Land		Total	
		Area (Ha)	Nos.	Area (Ha)	Nos.	Area (Ha)	Nos.	Area (Ha)	Nos.
1.	At the end of 5th Yr.	140.00	350000	-	-	-		140.00	350000
2.	At the end of 10th Yr & end of mine life	175.00	437500	-	-	20	50000	195	487500

Coal Handling Plant

Lot of dust is generated in coal handling plant during operations like coal crushing, transfer and conveying. Following abatement measures are adopted for Coal Handling Plant.

i) Enclosure of the crusher house where maximum dust is generated. Also installation of dust suppression system in the crusher house (specially above the hopper in such a way that air borne dust is suppressed without adding much water to the coal).

ii) Minimising the height of coal-fall at transfer points (to reduce dust formation) and, if necessary, installing dust suppression measures.

iii) Enclosure of the belt conveyor to reduce the generation of dust due to blowing wind.

iv) Creation of a green belt on both sides of belt conveyors and around coal stocks and the CHP building.

Noxious gasses are emitted through exhaust fumes during the operation of diesel / petrol operated equipment. In order to reduce such emission, regular maintenance of the diesel / petrol operated vehicles will also be carried out so that the emissions from these vehicles are under control. However, wherever, the condition will permit, petrol / diesel operated HEMM will be replaced by electrically operated ones.

Water sprinkling on coal stock/face, blanketing of exposed surface will be carried out to avoid spontaneous heating and minimize air pollution.

WATER QUALITY

Impact Assessment on Water

Identification of the sources of water pollution

Likely sources of water pollution from this project along with the type of pollutants are as follows:

(i)	Sanitary (domestic) wastewater	: Suspended solids and BOD.
(ii)	Industrial wastewater from workshop	: Suspended solids, oil & grease;
(iii)	Wastewater from mine	: Suspended solids of coal, clay and oil;
(iv)	Surface run-off passing through coal stockpiles	: Suspended solids;
(v)	Storm water from leasehold area and built-up area	: Suspended solids.

- **Impact assessment**

Mining and its related activities may create water quality problems. The impact of mining at the project on both surface and ground water sources has been assessed and given below:

(a) Surface water sources

- Deterioration of water quality and pollution of water bodies due to discharge of mine effluent, if not treated. Change in relief pattern due to mining may cause flooding, siltation, choking and pollution. Mitigatory measures would involve provision of (i) garland drains on periphery to prevent surface run-off from entering into the quarry , (ii) catch drain around the dumps for avoiding siltation and (iii) sedimentation ponds for reducing the pollution of surface water bodies.

- Possible overflow of water from nearby rivers/nallahs must be safeguarded by stone pitching and strengthening the embankment along the side of the water course

- In order to assess the existing quality of surface as well as ground water quality surrounding the project site , water samples from six locations have been collected & analysed . The details are incorporated in the previous chapter. All the parameters are well within the permissible limit.

- The mine water discharge quality of existing opencast project is being monitored regularly as per Env. (Protection) Amendment Rule , 2000 . The result indicates that even in untreated condition mine pumped out water does not contain any pollution load.

- However, due care will be taken to treat the mine water discharge by sedimentation for the proposed project. Effluents from workshop is continue to be treated in ETP and moreover water will be mostly recycled in Workshop & CHP. As such, possibility of adverse impact on natural watercourses after mixing is very remote. Garland drain around the OB dump & coal dump will be made to avoid siltation of natural water course.

Based on the data collected at the existing coal mine, it can be concluded that the impact due to proposed mining operation, the adverse impacts on water both surface as well as ground water will be insignificant. The data from March 2012 to March 2011 is given Chapter – IV and found to be within the prescribed permissible limits.

WATER POLLUTION CONTROL MEASURES

Salient controls measures have been taken are as follows:

i) Industrial Effluent

The wastewater from workshop and CHP, which normally remain laden with oil and grease, suspended and dissolved solids etc. are treated in the Effluent Treatment Plant (ETP). Clear water coming out from the treatment plant is taken into the closed water circuit and recycled for its reuse. All parameter of ETP waste discharge are monitored regularly as per Env. (Protection) Amendment Rule, 2000 and found to be within permissible limits.

ii) Mine Water

Most of the suspended particles are settled in the mine sump as initial settlement and the supernatant water is pumped out. This water is passed through sedimentation pond on surface, before being discharged in to natural drain.

iii) Surface Run-off

Adequate numbers of vegetation will be grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it also reduces surface run-off, which helps averting siltation of natural watercourses.

Catch drains of suitable size have been provided around periphery of the OB dump as well as soil dumps to arrest site and sediment flows from the respective dump sites.

In case of OB benches in the quarry, cross drainage have been provided which carries silt and sediments into main sump made at the floor of the seam which will accumulate all the silts and act as first stage settling pond. The water is then pumped out through pumps on to the surface and discharged in to surface settling tank/sedimentation pond. The clear water from the surface sedimentation tank is used for watering the mine area, roads and green belt development. The catch drains mentioned above are regularly desilted and maintained properly. In addition, garland drains have also been provided around the periphery of the excavated area, which carries surface run off and the drains are regularly desilted before onset of monsoon. These drains allows accumulation of silt materials and sufficient retention time for settling of silt materials.

The domestic sewage disposal arrangement has been provided in the township.
Regular water quality/effluent quality monitoring is also carried out so as to ascertain the likely load of pollutants and thereby suitably modifying the control measures.

The existing water pollution control measures can be summarized as below :-

EXISTING WATER POLLUTION CONTROL MEASURES

- **MINE WATER :- TWO STAGE SEDIMENTATION**

  - ✓ **INITIAL SEDIMENTATION - AT MINE SUMP (SIZE- 800mX60mX4m)**
  - ✓ **FINAL SEDIMENTATION - SEDIMENTATION POND AT SURFACE (SIZE- 24mX8mX1.5m)**

- **INDUSTRIAL / WORKSHOP EFFLUENT:**

  - ✓ **WORKSHOP EFFLUENT IS BEING TREATED IN WORKSHOP ETP .**

- DOMESTIC EFFLUENT:

  - ✓ **THERE IS ONE INTEGRATED DOMESTIC EFFLUENT TREATMENT PLANT AT COMBINED TOWNSHIP(0.6MLD) AT BHALAR.**

In addition to the above, provision have also been made for augmentation/ strengthening of existing sedimentation pond as well as Workshop Effluent Treatment Plant.

NOISE QUALITY

In order to assess the existing ambient noise level in the surrounding of proposed project site corresponding to pre-mining scenario ,baseline noise level data has been generated & details are enclosed as Annexure – III. All the values are well within the permissible limit.

Proposed mine would be associated with following activities that may generate noise during operation :

(a) Drilling
(b) Blasting
(c) Shovel operation
(d) Dozing
(e) Movement of dumper
(f) Operation of CHP / Workshop

The following are some of the important activities responsible for high noise level generation, with their expected noise levels :

a. All mining activities i.e. drilling, blasting, shoveling, dozing and dumping are associated with high noise level [about 100 dB(A)].

b. Operation of most HEMMs produce high noise level. The noise level are in range of 80 – 100 dB(A). Noise level have been found to be related to engine capacity.

c. Crusher – General noise level due to crusher ranges from 90 dB(A) – 105 dB(A). Some of noisy equipment produce noise whose level is around 120 dB(A).

The average sound pressure level of some of the HEMM associated with mining operation which are responsible for high noise level generation are as follows :

EQUIPMENT	NOISE LEVEL [dB(A)]
Dozer	98
Dumper	92
Power shovel	93
Drilling machine	96

ACCEPTABLE INDUSTRIAL NOISE LEVEL

As per Env. (Protection) Amendment Rules, 2000 the ambient air quality standards in respect of noise in industrial , commercial , residential and silence zones area as follows :

Sl. No.	Category of area	Limits [dB(A)]	
		Day time (6.00 AM to 10.00 PM)	Night time (10.00 PM to 6.00 AM)
1.	Industrial	75	70
2.	Commercial	65	55
3.	Residential	55	45
4.	Silence zone	50	40

Assessment of the degree of noise to which a workplace noise is harmful, is done by comparing the values measured at workplace to the permissible limit adopted by statutory bodies like DGMS.

The Director General of Mines Safety vide their circular no. DG (Tech.)/18 of 1975 has prescribed the permissible limit for noise level as 90 dB(A) , for the workers engaged in mining occupation likely to be exposed to in an 8 hour shift period with unprotected ear . Whereas , the following table shows the maximum permissible noise exposure levels , as per American Standards , for the industrial workers.

Exposure time (Hrs./day)	Noise level [dB(A)]
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	108
0.25 or less	115
EXPOSURE TO PULSE OR IMPACT NOISE SHOULD NOT EXCEED 140 dB(A)	

Now to assess the likely contribution from proposed expansion project , the ambient noise level of an operating mine of the same area with same capacity has been taken into consideration. It is observed that noise level recorded near workshop (mine activity area & major source of noise in opencast mines) of Pimpalgaon OCP are well within the permissible limit. The details of data generated at Junad OCP and Pimpalgaon OCP from March 2012 to March 2011are given in Chapter – IV and found to be within the prescribed permissible limits.

NOISE POLLUTION CONTROL MEASURES

Monitoring of the noise control will be carried out on regular basis as per the Env (Protection) Amendment Rule 2000. While planning for an effective noise attenuation measures, the concept of source, path and receiver has been considered.

(A) Noise Control at Source

There are two areas where the noise generation can be checked at source.

(i) Proper Design

Since the generation of noise can be reduced by reducing the vibration amplitude, the area of vibrating part and frequency of vibration will be taken care that all loose contact between metal parts avoided.

Shock absorbing pads will be fixed in the foundation of vibrating equipment / machines. In case of aerodynamic noise producing sources, mufflers will be provided with the machines.

(ii) Proper Maintenance

All machines and equipment will be properly maintained. Sound muffler system and bearing lubricating system etc. of equipment will be kept in proper condition.

(A) Noise control in Transmission Path

The measures are to be taken for control of noise along the transmission path have been put in following two categories:

(i) Air borne path
(ii) Ground borne path

(i) Air Borne Path

The control in air – borne path has been planned in a number of ways as:

(a) The crusher house, screen house etc., which are source of high level noise generation are to be enclosed.
(b) Planting of furrows of trees along the thick foliage around the compound and wall of CHP, workshop and other industrial buildings. This will reduce the spread of noise. It can be also used as an acoustic enclosure to reduce ambient noise.

(ii) Ground Borne Path

It has been proposed to provide vibration isolators in the form of vibration absorbing pads placed at the base of vibrating equipment.

(C) Noise Control at Receiver End

Even after adopting above measures, if desired noise level is not achieved at receiver end, in that case, following measures are suggested:

(a) The workers exposed to high noise level are provided with earplugs.

(b) Provision of enclosed booths at the worksite to protect worker from noisy environment.

IMPACT ON LAND

LAND USE (CORE ZONE)(contd.)

SL. NO	PARTICULARS	LAND ALREADY ACQUIRED	LAND TO BE ACQUIRED	TOTAL
1.	AGRICULTURAL LAND	174.28 ha	269.25 ha	443.53 ha
2.	GOVT. LAND (WASTE LAND)	--	6.10 ha	6.10 ha
3.	FOREST LAND	NIL	NIL	NIL
TOTAL		174.28 ha	275.35 ha	449.63 ha

The during-mining land use is as follows: -

CHANGE IN LAND USE DURING MINING

SL. NO.	PARTICULARS	AREA (ha)
1	QUARRY AREA	101.70
2	EXT. OB DUMP	175.00
3	INFRASTRUCTURE INCLUDING APPROACH ROAD ETC.	15.00
4	EMBANKMENT	20.00
5	BLASTING ZONE	70.50
6	RATIONALISATION AREA	67.43
	TOTAL	449.63

LAND RECLAMATION / LAND MANAGEMENT

The following activities have been proposed for reclamation of land.

1. Backfilling of the excavated area to the extent possible.

2. Leveling of the backfilled area and carpeting with the topsoil.

3. Creation of garland drains in order to arrest the silt load, due to erosion, to enter into natural watercourses during surface run-off.

4. Grass, legumes and different types of plants etc. will be planted on such reclaimed land in order to make it, as far as possible, conducive to agricultural growth.

5. Technical and biological reclamation of external OB dump.

The density of trees is around 2000 – 2500 plants/Ha.

SOLID WASTE MANAGEMENT (PROPOSED)

SL. NO.	PARTICULARS	DISPOSAL OF SOLID WASTE (M.Cu.m.)		
		EXTERNAL OB DUMP	EMBANKMENT	TOTAL
1.	SOLID WASTE (OVER BURDEN)	60.20	0.75	60.95

EXISTING STATUS OF OB REMOVAL –

i. OB REMOVED – 15.0 M.Cu.m.
ii. OB IN EXTERNAL DUMP – 14.50 M.Cu.m.
iii. OB IN EMBANKMENT - 0.50 M.Cu.m.

Points for reclamation of void of Junad OC Extn. mine

i. Due to steep gradient and in order to maintain proper haul road of 1 in 16 gradient it will not be possible for backfilling of the void in the present proposal.

ii. In order to backfill the void of Junad Extn. OC to the extent of –35 m it is proposed that the OB of adjacent Pimpalgaon Extn. OC could be utilized.

iii. The approx. quantity of OB of proposed Pimpalgaon Extn . OC is 200 M.Cu.m. and is at a distance of about 5 k.m.

iv. This will simultaneously help in reduction of land required for external OB dump of proposed Pimpalgaon Extn. OC.

END OF MINING SCENARIO (AREA IN ha)

SL. NO.	PARTICULARS	PLANTATION	VOID	PUBLIC USE	UNDIST-URBED AREA	TOTAL
1	EXTERNAL OB DUMP	175.0	-	-	-	175.0
2	EXCAVATION	-	101.70	-	-	101.70
3	INFRASTRUCTURE	3.0	-	7.0	-	10.0
4	DIVERSION OF ROAD / EMBANKMENT	17.0	-	8.0	-	25.0
5	RATIONALISATION OF MINE BOUNDARY & BLASTING ZONE	-	-	-	137.93	137.93
	TOTAL	195.0	101.70	15.0	137.93	449.63

3.0 ENVIRONMENTAL MONITORING –

The environmental monitoring programme at present is being carried at the mine and will be continued as per details given below: -

SN	Items	Parameters	Frequency	No. of Stations
1	Ambient Air Quality Monitoring	SPM, RPM, SO2, Nox, CO & Fugitive dust	Every Fortnight as per EPA, Rule 2000	4
2	Water Quality Monitoring	1) 4 Parameters viz. p H, Total Suspended Solids (TSS), Chemical Oxygen Demand (COD) & Oil and Grease. 2) 35 Parameters	Every Fortnight Once in a Year	2
3	Noise Quality Monitoring	Noise Levels	Every Fortnight	2
4	Environmental Statement		Annual	
5	Ground Water Level Monitoring & Quality	Water Level & Quality Parameters.	Water Level – Quarterly. Water Quality – Yearly.	In Buffer Zone Villages.
6	Compliance Report of EC Conditions	All conditions both Specific & General	1st June & 1st December	Not Applicable

4.0 PUBLIC CONSULTATION

To ascertain the concern of local affected and others who have a plausible stake in environmental impacts of the project / activity public consultation will be done at project site or close proximity for local affected persons with the following activities.

i) The process in which public would be directly involved or participate and indirect responses would be received through different modes of communications.
ii) District Magistrate will preside over the Public Hearing process to get public concerns incorporated in the EIA report.
iii) Videography of proceedings would be done and would be enclosed with the application for Expert Committee.
iv) The proceedings will be signed by DM/ADM in the same day of hearing.

The proceedings will be displayed in web site and other Govt. offices.

5.0 PROJECT BENEFITS

The benefits of the project can be summarized as below:-

- The physical infrastructure in the area will be improved substantially by following ways:-

a) Development of road, thereby improving the communication.
b) Improvement in Power, Telephone (including Mobile) facility.
c) Improvement in Health Care facility & Educational facility.
d) Improvement in Market / Trade & Business.

- The social infrastructure by way of cultural mixing of people of other states with local community glorifying "UNITY IN DIVERSITY".

- Substantial employment in the project & indirect employment for business & trading, contractor, transportation, vehicle contractor, nursery development.

6.0 ENVIRONMENT MANAGEMENT PLAN

Close monitoring of the environment and implementation of various protective measures discussed in the report forms an important part of EMP. In the earlier chapters the causes of various pollutions along with the preventive and mitigating measures have been discussed. In this chapter description of the administrative aspects of ensuring that mitigative measures are implemented and their effectiveness monitored, after approval of the EIA is being discussed.

MONITORING ORGANISATION

To have a close watch on the environmental condition and implementation of the various measures suggested, a multi-disciplinary approach is essential.

(a) WCL headquarter acts as an apex body which supervises the activities relating to environment at project level through the General Manager.

(b) General Manager of the area coordinates the activities of various disciplines in the area to render all necessary assistance at the implementing level i.e. the Project. Area Nodal Officer (Environment) monitors all aspects of environment on behalf of the General Manager. He also takes suitable steps for generation of environment data along with its analysis and interpretations.

As far as plantation is concerned horticulturist with suitable backup staff shall be provided in the area for undertaking the plantation jobs including raising of a nursery. Plantation will have to be done on a large area. Therefore, it may be desired that an outside agency may have to be employed for this purpose. The horticulturist along with the supervisor shall only monitor and guide the agency for selection of site, treatment of soil, selection of species etc.

(c) Sub Area Manager is responsible for mechanical reclamation of the area. He is also responsible for biological reclamation with the assistance of GM's office.

ORGANISATION FOR ENVIRONMENT MANAGEMENT

Sl. No.	Measures/Actions		Agency
1.	Environmental Control	1	Chief General Manager, Wani North Area
		2	Nodal Officer, (Environment), Wani North Area
		3	Sub Area Manager, Junad OC
		4	Staff Officer (Civil), Wani North Area
		5	Environmental Cell (WCL H.Q.)
2.	Environmental Monitoring	1	Chief General Manager, Wani North Area
		2	Staff Officer (Civil), Wani North Area
		3	Nodal Officer (Environment), Wani North Area
		4	Sub Area Manager, Junad OC.
		5	Environment Cell of WCL Headquarters
		6	Environmental Laboratory of CMPDI, RI-IV
3.	Reclamation	1	Sub Area Manager, Junad OC.
		2	Nodal Officer (Environment), Wani North Area
		3	Environmental Supervisor
		4	Horticulturist

7.0 CONCLUSION

From earlier paragraphs, it can be inferred that the adverse impact on physical environmental attributes due to proposed mine is almost insignificant/ negligible.

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