

# ENVIRONMENTAL IMPACT ASSESSMENT

FOR

THE PROPOSED CAPACITY EXPANSION OF KUMARASWAMY IRON ORE MINE OF M/S NMDC LTD. (ML NO: 1111, WORKING AREA 477.49 HA OUT OF 639.80 HA) FROM TOTAL EXCAVATION OF 8.6 MTPA TO 16.25 MTPA (ROM IRON ORE FROM 7 MTPA TO 10 MTPA AND WASTE EXCAVATION FROM 1.6 TO 6.25 MTPA) WITH 1800 TPH CRUSHING AND SCREENING PLANT LOCATED AT DEOGIRI VILLAGE OF SANDUR TEHSIL, BALLARI DISTRICT OF KARNATAKA STATE

## EXECUTIVE SUMMARY

**TOR Reference No. : IA-J-11015/13/2021-IA-II(M)**

**UIN : VLL/ENV/2021/01/NMDC/001**

**Baseline Period : December 2020 to February 2021**

**Environmental Consultant :**



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NABET Accreditation Certificate No. : QCI/NABET/EIA/ACO/21/2126 dated 9.11.2021



(Approved Consultant)

**Project Proponent :**


एन एम डी सी



N M D C

M/s. NMDC Limited  
Kumaraswamy Iron Ore Mine  
Sandur Taluk, Ballari District, Karnataka – 583 118

**December, 2021**

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## 1.0 INTRODUCTION

NMDC Limited is a Government of India Enterprise under the administrative control of Ministry of Steel, Government of India is operating various iron ore mines in the States of Chhattisgarh and Karnataka and it is leading iron ore producer in the country.


The **Kumaraswamy Iron Ore Mine (KIOM)** (ML No.1111., M.L Area 639.80 ha) of **NMDC Limited** is an operating Iron Ore Mine with a production capacity of 7.0 million tons per annum (MTPA) of RoM and 1.6 MTPA of Waste excavation as per existing Environmental Clearance issued by MOEF&CC vide letter F.no: J-11015/93/2018-IA.II(M) dated 25.01.2021. KIOM is located in Kammathuru village of Sandur Taluka, Ballari District of Karnataka State.

Now, NMDC proposes capacity expansion of KIOM from total excavation of 8.6 MTPA to 16.25 MTPA (ROM Iron ore from 7 MTPA to 10 MTPA and Waste excavation from 1.6 to 6.25 MTPA) to meet the increasing demand of iron ore in the region as well as in the country.

As per Environmental Impact Assessment (EIA) Notification dated 14/09/2006, proposed expansion project falls under category - 'A' of project activity 1(a) Open Cast Mining' and requires prior Environmental Clearance (EC) to be obtained from Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India.

The application No: IA/KA/MIN/196028/2021 for prior EC (Form-1 and Pre-Feasibility Report) for the above capacity expansion has been submitted in Parivesh portal of MoEF&CC on 3/2/2021 and same was reviewed by the Expert Appraisal Committee (Non-Coal Mining) through the video conferencing meeting held on 24/2/2021 and 13/7/2021. MoEF&CC, New Delhi vide letter reference F. No: J-11015/13/2021-IA. II(M) dated 23/03/2021 and Amendment vide letter dated 04/08/2021 has accorded specific, Additional and standard TOR conditions for KIOM (M.L. No: 1111, M.L. Area 477.79 Ha out of 639.80 Ha) for undertaking detailed EIA/EMP study for above the capacity expansion.


The Mining lease of KIOM is valid upto 17/10/2022. NMDC has already filed an application for extension of mining lease with the Karnataka State Government on 23/02/2021 for extension of Mining lease for further period of 20 years i.e., upto 17/10/2042 under the provisions of Mineral (Mining by Government Company Rules), 2015 and Minerals Concession Rules 2021. KIOM has also obtained approval of Mining Plan from Indian Bureau of Mines, Bangalore vide letter dated 29/10/2021. The Forest clearance has obtained from MOEF&CC for 341.20 ha vide letter dated 24/7/2006, out of which, 324.70 ha falls within ML area and 16.5 ha outside ML area for conveyor, approach roads, etc. The combined Air and Water consents are valid upto 31/3/2022. The KIOM has been categorized as Category "A" project by Central Empowered Committee (CEC).

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The environmental setting of KIOM mine lease area is given in **Table-1**. The SOI Toposheet showing Mining Lease area with baseline monitoring locations in 10km radius study area is enclosed as **Figure-1**.

**TABLE-1**  
**ENVIRONMENTAL SETTING OF KIOM MINE LEASE STUDY AREA**

Sr. No.	Particulars	Details
1	M.L. Area (ML No: 1111)	639.80 Ha
2	Coordinates	Latitude: 15°00'00" N - 15°01'20" N Longitude: 76°33'55" E - 76°37'10" E
3	Toposheets	D43E12
4	Elevation above MSL	850-1078 m above Mean Sea Level
5	Present land use/ Method of Mining	Operating Mine/Opencast mine
6	Nearest highway	SH-40 connecting Sandur to Kudilgi (10 Km, NW)
7	Nearest railway station	Ranjitpura (4km, N) and Swamihalli (3.5km E)
8	Nearest airport	Vidyanagar near Toranagallu -30 km, NE;
9	Nearest town/city	Sandur (NW) – 14.5 Km, N
10	Nearest villages (From ML Boundary)	<ul style="list-style-type: none"> <li>• Kammathuru Village- 0.25 Km, NE</li> <li>• Devagirihalli Village – 0.4 Km, NE</li> <li>• Deogiri Village – 0.7 Km, E</li> <li>• Nandihalli Village – 0.7 Km, NW</li> <li>• Subbarayanahalli Village - 1.5 Km, W</li> <li>• Vittal Nagar- 2.1 Km, NE</li> <li>• Swamihalli Village- 3.8 Km, S</li> <li>• Ranjitpura- 3.2 km, N</li> <li>• Bhujanganagar- 7.1 km, N</li> <li>• Appayyanahalli (Narayanpur)- 4.9 km, E</li> </ul>
11	Hills/valleys	Kumaraswamy Hill Range Donimalai Hill Range Swamimalai Hill Range
12	Archaeologically important places	Kumaraswamy Temple at 1.0 km outside lease area in SW
13	National parks/ wildlife sanctuaries/ Elephant reserve/corridor	Nil within 10 km radius
14	Reserved / protected forest	<ul style="list-style-type: none"> <li>• Kumaraswamy Betta RF,</li> <li>• S.M block RF (S),</li> <li>• Donimalai RF (NNE),</li> <li>• Sandur R.F (NW)</li> </ul>
15	State, National Boundaries	Nil within 10 km radius
16	Streams/rivers	<ul style="list-style-type: none"> <li>• Narihalla stream (perennial)</li> <li>• Narihalla Dam (North – 9 Km)</li> </ul>
17	Defence installations	Nil within 10 km radius
18	Seismicity	The mine lease area falls under seismic

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Sr. No.	Particulars	Details
		zone-II as per IS: 1893 (Part1): 2002
19	List of major industries and mines	KSMCL (Previously MML) 1.1 km, W Karthik Mines 2.3 km, NE BKG Mines 2.5 km, W HRG Mines 4.8km, NW VESCO Mines 8.5 km, NW Tunga Mines (JSW), 10 km, NNE Bhadra Mines (JSW), 10 km, NNE NANDI Mines (JSW), Common Boundary, W & JSW Steel 16.3 km, NNE

Note: All distances mentioned are aerial from ML Boundary


## 2.0 PROJECT DESCRIPTION

The salient features of the proposed capacity expansion of KIOM are given in **Table-2**.

**TABLE-2**  
**SALIENT FEATURES OF KIOM PROJECT**

Sr. No.	Description	Particulars
2	Type of mine	Open Cast Mine
3	Method of Mining	Mechanized
4	Rated Capacity	10 MTPA ROM Iron Ore from 7 MTPA
5	Reserves / Grade	208.231 MT / 62.10% Fe (As on 01.04.2021)
6	Expected life of mine	20.5 Years
7	Ore to Waste ratio	1:0.41
8	Waste Excavation (Maximum)	6.25 MTPA from 1.6 MTPA
9	Average no. of working days	357
10	Number of shifts	3 Shifts
11	Working hours	8 Hrs.
12	Bench height & width	6-12 m height & minimum of 25-30 m width. Benches will be merged to form bench height of 12m
13	Top and Bottom Bench	1078 mRL and 850 mRL at conceptual stage
14	Present Working Benches	1072, 1066, 1060, 1054, 1048, 1042, 1036, 1030, 1024, 1018, 1012, 1006, 1000, 994 and 982 MRL
15	Waste (Till life of mine)	86.11 MT (As on 01.04.2021)
16	Ultimate pit slope	Less than 45
17	Power requirement & sources	Power required: 5000 KVA, Sources: Karnataka Power Transmission Company Limited substation at Donimalai
18	Water Requirement / Source / Permission	1800 m <sup>3</sup> /day / Narihalla Dam. Consolidated approval for with-drawl of 13.45 cusec of Water from Water Resource Deptt, Bangalore
19	Project Cost (no additional cost is involved for capacity expansion)	Rs. 898.55 Crores.

The lease hold area covers Block- B and Block- C with a strike length of 1.2 Km and 3.5 Km respectively. The width of the ore body varies from 400 to 900 metres, but the average width of the ore body within the mining lease area is about 500 metres. There is no change in method of mining and processing of ore


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for proposed capacity expansion. The increase in production shall be achieved by increasing the net utilization of mining machinery and ore processing plants. Mining will continue to be carried out by open cast pit mining method in both B and C blocks. It is proposed that existing 6m high benches will start to merge to form 12m high benches from FY 2025-26. Drilling is being carried out using 4 to 4.5" dia. drill machines for drilling of blast holes. Blasting is done by using cartridge slurry explosives and by site mixed emulsions. Blasted material is excavated by the hydraulic excavators and front-end loaders having various bucket capacities from 1.2 cum & 4.0 cum and 3.0 cum to 8.0cum respectively for achieving the planned production target and meeting the blending requirements. The waste excavation is also met with the machinery deployed as per the excavation plan. The excavated material including ROM & waste is loaded into dumpers of 85 to 100 and tippers of 25-30 T capacity for transportation of the material from mine face to crushing plant and dump yards. At present, 5 nos. of semi-fixed plants of maximum 450 TPH each are being utilised for crushing and screening ore at the Mine head. All these plants consist of primary crusher integrated with secondary crushers and screening facilities. The products are loaded on tippers by front end loader of suitable capacity and the products are stacked in designated area. The final product is being dispatched to customers by tippers and allied weigh bridge operations. The low-grade ore is suitably mixed with high grade ore to achieve desired Fe percentage and supplied to the customers.

NMDC has already constructed and commissioned crushing plant of 1800 TPH capacity in lease area and single flight downhill conveyor system of 5.5 km for transportation of ore to existing screening plant at Donimalai. The products from Screening Plant, lump and fine ore are transported through belt conveyor to existing Loading Plant at Donimalai and loaded into railway wagons and dispatched to various customers. The products lump ore and fine ore from the KIOM is also being transported to various customers through following dedicated routes.

- a) Road-Rail through Swamihalli siding (CC road of length 6 to 7 Kms from mine-head to railway siding and thereafter through rakes).
- b) Road-Rail through Ranjithpura siding (road length approximately 10 kms from mine head and thereafter through rakes).
- c) PWD Road to customer sites via Kammathuru – Narsapur- Hosalli – Babai cross – Hospet road, Tornagallu, Ballari (road distance 67km, CC road work completed up to Ballari from Narsapur covering 60Km. CC road work under progress in KIOM lease area to Kammathuru).
- d) Downhill Conveyor – Rail through Donimalai Complex Loading Plant.
- e) Road – JSW Pipe Conveyor through Subbarayanahalli– Nandihalli Siding

KIOM iron ore is being transported through trucks which are fully covered by tarpaulin sheets, so dust generated from movement of vehicle is intrinsic in nature. There is a dedicated / separate route for empty trucks to come to Kumaraswamy Mine. The iron ore is sold through e-auction being conducted by Monitoring Committee.

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### **3.0 DESCRIPTION OF THE ENVIRONMENT**

The Post Project environmental monitoring for various parameters is being carried out by recognized laboratories of MOEF&CC at KIOM. However, as a part of EIA/EMP study for proposed capacity expansion, a fresh baseline environmental status has been established for various environmental attributes within a study area. The study area comprises of core zone (Mining Lease area) and buffer zone covering an area of 10 km radius from the core zone. The major environmental disciplines covered in the EIA study includes ambient air quality, water quality, ambient noise levels, soil quality, ecology (terrestrial and aquatic), land use, geology, hydrology and demographic & socio-economic conditions. The baseline studies were carried from 1<sup>st</sup> December 2020 to 28<sup>th</sup> February 2021 representing Winter season.

#### **3.1 Land Use**

The mining lease area of 639.80 Ha comprises of 487.01 Ha Forest land and 152.79 Ha revenue land. The land use pattern of the study area indicates that 35.4% of the area is under agricultural land followed by 34.3% Forest land. The remaining area accounted for built up land, land with scrub & without scrub, barren land, mining area, water bodies etc.

#### **3.2 Soil Quality**


Five soil samples were collected from mining lease area, agriculture land, forest area, waste land etc. in the study area and analyzed for various physico-chemical and organic parameters. The texture of soil is found to be sandy clay to clay. The organic carbon is found to be medium. The Nitrogen levels in the soil are found to be good, Phosphorous levels are falling in the category of average to more than sufficient. The Potassium levels are found to be low to average.

#### **3.3 Climatology and Meteorology**

The area is characterized by very hot summer and mild winters. It experiences tropical and humid climate which shows three distinct seasons viz summer, monsoon, and winter. As per the site-specific meteorological data recorded during Winter season of FY 2020-21, temperature varies between 16.0°C to 43.9°C and relative humidity ranges between 26.9 % to 61.89%. Predominant winds are mostly from NE and followed by E and ENE directions were observed during the study period.

#### **3.4 Ambient Air Quality**

The Ambient Air Quality monitoring was carried out at eight locations. The PM<sub>2.5</sub> and PM<sub>10</sub> were observed to vary from 9.40 µg/m<sup>3</sup> to 38.40 µg/m<sup>3</sup> and 41.60 µg/m<sup>3</sup> to 70.20 µg/m<sup>3</sup> respectively. The SO<sub>2</sub> and NO<sub>x</sub> were observed to vary from 12.30 µg/m<sup>3</sup> to 22.70 µg/m<sup>3</sup> and 16.40 µg/m<sup>3</sup> to 42.30 µg/m<sup>3</sup> respectively. The CO is observed to vary from 307 µg/m<sup>3</sup> to 428 µg/m<sup>3</sup> respectively. The O<sub>3</sub> is observed to vary from 2.6 µg/m<sup>3</sup> to 8.7 µg/m<sup>3</sup> respectively. The particulate and gaseous

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pollutants are found to be well within the National Ambient Air Quality standards 2009.

### 3.5 Water Quality


Seasonal nalla called Narsapur nalla traverses from Vittalnagar, about 6 km east of the KIOM and joins Narihalla nalla at Bhujanganagar village and ultimately drains into Narihalla dam near Taranagar. A small seasonal spring flows northerly outside mine lease area called Kottarsingh Kolla at RL of 880 mRL. No prominent perennial springs are found in the study area. One surface water sample was collected from Narihalla dam. Six ground water samples were collected from different locations in the study area. All the samples were analyzed for IS: 10500 Drinking Water quality standards and they are found to be well within the limits. Further, 22 ground water samples have been collected for analyzing the water levels and water quality during monsoon, post monsoon, winter and pre monsoon seasons every year. The ground water level varies 2.07 to 44.21m during pre-monsoon 2021 and 1.09m to 26.24m during Post monsoon season 2020. There is no major variation in ground water levels except seasonal variations. The water quality of all ground water samples collected in four seasons found to be well within prescribed limits of ISO: 105000 -Drinking water standards.

### 3.6 Ambient Noise Levels

The ambient noise monitoring has been conducted at 7 different locations representing residential / rural, commercial area and silence zone in the study area. Day time, night time noise levels were found to be varying from 42.20 dB(A) to 67.1 dB(A) and 39.1 dB(A) to 63.9 dB(A) respectively. The noise levels in general found within the acceptable levels as per standards prescribed by Central Pollution Control Board (CPCB).

### 3.7 Flora & Fauna

KIOM is located in the Kumaraswamy betta Reserved Forest. It is surrounded by other reserved forests such as the S.M. Block & Tumbaraguddi RF towards south, Donimalai RF in North, Tonasgeri RF towards Southeast and others. These forests represent the natural ecology of the region and are mostly characterized by plant species such as Acacia Sps., Bauhinia Sps. etc. Flora and Fauna studies were undertaken during February 2021 in the study area. Majority of the landscape in the Core Zone is characteristic of scrub forest with degraded natural landscape. The buffer zone has hilly terrain as well as plain areas. Due to low rainfall, the vegetation is rather open type and falls into distinct climatic formations – the southern tropical dry deciduous forest and is characterised by grassy undergrowth with short trees. The plain areas have of agricultural land (mostly irrigated from bore-wells), scrub-lands and settlements. The hilly areas are mostly forested (open forests & scrub forests), open cast iron ore mines and stretches of barren rocky areas and cliffs. No Rare, Endangered, Endemic and Threatened (REET) species found in the study area. There is no Biosphere Reserve, National Park, Tiger Reserve, Elephant Reserve, Wildlife sanctuary or

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bird sanctuary within the study area. Seven schedule -1 species found in the study area as per studies conducted and authentication list provided by Ballari Forest Division. The site-specific Wildlife Conservation Plan for Rs.200 lakhs has already been prepared and submitted to Forest (Wildlife) Department which is under consideration for approval. NMDC Ltd. will deposit the funds with State Forest Department for implementation of plan once it is approved by State Wildlife Department.

### 3.8 Social Environment

As per census 2011 data, the study area consists of about 58 villages in Sandur Tehsil, Ballari District and Molkalmuru of Chitradurga district. The study area consist of 1,08,187 population out which Male and Female population constitutes 51.20% and 48.80%. The scheduled castes (SC) are 16.06% and scheduled tribes (ST) are 25.38% to the total population. The overall literacy rate in the study area is 84.89%, out of which male literacy is 51.24% while female literacy is 48.76%. The area is having good infrastructure facilities due to the presence of many mining companies in the area.


### 4.1 ANTICIPATED ENVIRONMENTAL IMPACTS

Mining being site specific activity, excavation is bound to be done at a place where mineral actually exists. The KIOM is an operating mine, where other mines are also in operation over decades in the vicinity. The recommendations of Reclamation and Rehabilitation Studies (R&R) and Environment Management Plan Report prepared by Indian Council of Forestry Research and Education (ICFRE), Dehradun is under implementation. No increase in Mining Lease area is envisaged for proposed capacity expansion and the proposed production will be achieved by increasing net utilization of HEMM and Ore crushing plant etc.

The ore body occurs at the top of KIOM ranging between 850m and 1100 m above MSL. Currently, the mining operation is at an RL of 1078 m(highest) which will go down at an RL of 850 m(lowest) at the end of life of mine. The working area for mining and allied activities in the lease area is 477.49 Ha (324.70 Ha diverted forest land and 152.79 Ha revenue land). At the end of life of mine, land use under mining will increase from the present 99.87 Ha to 221 Ha and dumping area will increase from 11.51 Ha to 56.17 Ha.

Opencast mining operations with crushing and screening activities contribute towards air pollution in the form of particulate and gaseous pollutants. The KIOM has taken adequate mitigation measures to control air pollution. The impact due to proposed capacity expansion (3 MTPA Iron ore and 4.65 MTPA waste excavation) at KIOM has been predicted using AERMOD with digital elevation model option. The modelling results indicate that the maximum incremental Ground Level Concentrations (GLC) of PM<sub>10</sub> with controlled measures will be about 3.20 µg/m<sup>3</sup> within the KIOM mine lease area and at the boundary the predicted GLC's are observed to be about 1.00 µg/m<sup>3</sup>. Similarly, the maximum incremental PM<sub>2.5</sub> with controlled measures will be about 0.96 µg/m<sup>3</sup> within the KIOM lease area and at



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the boundary the predicted air emission levels are observed to be about 0.20  $\mu\text{g}/\text{m}^3$ . The incremental GLC's of  $\text{NO}_x$  is likely to be 2.18  $\mu\text{g}/\text{m}^3$ . The overall resultant concentrations (GLC's + baseline) were found to be well within the NAAQ 2009 standards.

Further, air dispersion modelling studies were conducted for additional 3 MTPA Iron ore movement by road using AERMOD Road Linear Source model with SRTM 30m resolution to predict the Ground Level Concentrations on dedicated transportation routes. The predicted GLCs were occurring within the 50m from the centre of the road. The Passenger Car Unit (PCU) recorded at the selected traffic locations are 8048.5 PCU. The existing transportation route is capable of handling additional 3 MTPA of iron ore as per IRC recommendations and traffic studies conducted in the area.

In the lease area, no water table/ aquifers were encountered up to the exploratory drilling level 820 mRL. The mine workings are limited up to 850 mRL. Hence, there is no intersection of ground water table with mine workings.

The in-house blasting studies are being carried out using NOMIS seismographs (Mini-Supergraph II) at the time of blasting. From the studies, it is inferred that no vibration was recorded beyond 1000 m.


No R&R issues are involved as the Kumaraswamy Iron Ore Mine (ML No: 1111) did not result in displacement of any human settlements and also not anticipated during capacity expansion.

#### **4.2 MITIGATIVE MEASURES**

The project is already carrying out Environmental Management Plan for all anticipated environmental impacts which are under control. There is no change in methodology of mining and processing of ore. The increase in pollution load due to proposed capacity expansion shall be very minimal due to existing and proposed pollution control measures.

Apart from existing air pollution control measures, additional measures such as Fixed Mist Cannons will be installed in dust prone areas, Dust suppressant PC compounds will be used regularly for adequate dust suppression and Quantity of water used for sprinkling will be increased from 600  $\text{m}^3/\text{day}$  to 1100  $\text{m}^3/\text{day}$ . Dry fog dust suppression system (DSS) has been installed at Primary Crusher and Secondary Crusher area and in Downhill conveyor system. Due to increased production, the additional water requirement of 30  $\text{m}^3/\text{day}$  is envisaged at dumper plat form and other areas thereby total water requirement increased to 500  $\text{m}^3/\text{day}$ .

Suitable trenches have been prepared along mine haul roads and benches, so that, water flows out to fixed area and ultimately to be held by check dams. The engineering measures works such as construction of loose boulder check dams, Gabion check dam, brush wood check dams, silt setting tanks as proposed in R&R

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plan prepared by ICFRE are being implemented to control surface water pollution. Following control measures are being taken for prevention of runoff from ROM mines and waste dump:

- Garland drains / Buttress walls have been constructed at toe of active waste dumps to arrest the silt material flowing with water during rainy season.
- Check dam and girdle wall are constructed below the active dump and de-silted regularly.
- Contour trenches are made in the first slope of the dumps and are terraced. Organic manure and fertilizers applied for healthy growth of plants.
- Agave bulbs are planted on the trenches with broadcasting of grass seeds on the dumps.
- Coir matting and afforestation being carried out at the dump slope.
- The rain water collection pond (80m X 35m X 3m) has been constructed in C block to collect the rain water for reuse and ground water recharge.


The total waste of 86.11 shall be dumped in AD-1 (C Block), AD-2 (B Block), Dump-3 and Dump-4 and dump stabilisation measures will be adopted once they become passive. The total area of waste dump will be 56.17 Ha. Retreating method of dumping will be followed for waste dumping.

Out of total lease area of 639.8 ha, active area of 363.12 ha being utilized for mining, waste dump, infrastructure etc. use shall be reclaimed and rehabilitated at the end of life of mine as per Progressive and Final Mine Closure Plan. Reclamation of the above areas will be undertaken by plantation of 11,50,250 trees. Afforestation is a continuous activity and project has already planted 2.47 lakh trees covering an area of 94.5 Ha over non-mineralized area of 114.37 Ha. The plantation activities will be undertaken in the balance area of 19.87 Ha by planting 38925 trees in consecutive years @ 5000-6000 saplings every year. An area of 162.31 Ha un-diverted forest land is kept intact. On the completed mining benches, shrubs like Agave and local shrubs will be planted. Recommended grasses will be grown on the slopes by hydro-mulching. Shrubs and native species of trees will be planted or seeds will be sown adding some soil. Once the slopes and terraces get stabilized natural growth of vegetation is automatically promoted by spreading soil with litters available in the adjoining areas. Water bodies will also be developed to attract terrestrial fauna and avifauna, wherever possible.

A "Mine Closure Obligation Scheme" has been started by NMDCL in the year 2009-10 voluntarily and presently, the company is contributing Rs.15.25 per ton of iron ore excavation and depositing the funds with LIC which shall be utilized for reclamation of mined out areas.

## **5.0 ENVIRONMENTAL MONITORING PROGRAM**

Regular Environmental Monitoring of Ambient air, Meteorology, Water, Soil, Noise and Vibrations, Land Use, Ecological Studies are being carried out by MoEF&CC/CPCB recognized laboratories. The seasons covered are Pre monsoon

 <p>एन एम डी सी N M D C</p>	<p><i>Environmental Impact Assessment for the proposed capacity expansion of Kumaraswamy Iron Ore Mine of M/s NMDCL Ltd. (ML No: 1111, working area 477.49 ha out of 639.80 ha) from total excavation of 8.6 MTPA to 16.25 MTPA (ROM Iron ore from 7 MTPA to 10 MTPA and Waste excavation from 1.6 to 6.25 MTPA) with 1800 TPH crushing and screening plant located at Deogiri village of Sandur Tehsil, Ballari District of Karnataka State</i></p>
<p><b>Executive Summary</b></p>	

(March to May), Monsoon (June to August), Post monsoon (September to November) and Winter season (December to February). The monitoring data is being submitted in Parivesh Portal of MoEF&CC and also to State Pollution Control Board etc. half yearly basis as a part of environmental compliance report. Continuous Ambient Air Quality Monitoring is being conducted at KIOM project Site and proposal for installation of 2 no. s of CAAQM stations is under process.

## **6.0 ADDITIONAL STUDIES**


Risk assessment has been carried out to quantify the extent of damage and suggest recommendations for safety improvement. The complete mining operations are being carried out under the management, control and directives of a qualified Mines Manager holding a First-Class Manager's Certificate of Competency granted by the Director General of Mines Safety (DGMS), Dhanbad. Moreover, mining supervisory staff is being imparted refresher, First aid and Frontline supervisory statutory trainings from time to time. Disaster Management Plan (DMP) is in place which will ensure the safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the DMP, it is widely circulated and personnel training through rehearsals/ mock drills are conducted. Training exercises are held to ensure that all personnel are familiar with their responsibilities and that communication links are functioning effectively.

The Occupational Health Centre is established at Project Hospital at Donimalai and annual budget is Rs.50 lakhs. The periodical and initial medical examination are being carried out as per the provisions laid down in Occupational Safety Health and working conditions code,2020.

## **7.0 PROJECT BENEFITS**

The operation of KIOM provide economic benefits to employees, local population nearby the project vicinity through Corporate Social Responsibility (CSR) and to Government in the form of royalty and taxes. The economic benefits rendered to Government includes Royalty, District Mineral Fund (DMF), National Mineral Exploration Trust (NMET), Other Cess etc. The 10% of the sale value of Iron Ore is retained by monitoring committee towards Special Purpose Vehicle (SPV) and 10% of sale value towards Environmental Management Plan cost for development of nearby areas.

Donimalai and Kumaraswamy Iron Ore Mining Complex has extended basic facilities like health care, educational facilities, potable water to the surrounding villages, construction & modification of existing roads, Cement Concrete Road construction, local transport, employment, sanitation etc. under CSR. The proposed expenditure towards CSR for FY 2021-22 is Rs. 1881.37 lakhs. Nine number of Government Middle Schools have been identified nearby seven villages for providing desktop computer with Wi-Fi connectivity. Each school shall be provided with 5 no. s of desktop computers and one internet connection. A budget of Rs 17.28 lakhs have been provided for the above purpose.

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## **8.0 ENVIRONMENT MANAGEMENT PLAN**

Environmental Management aspects of the KIOM are being looked after by the Environment Management Division of Donimalai – Kumaraswamy Iron ore Mining complex. The monitoring programme serve as an indicator for taking suitable mitigative measures in time to safeguard the environment. The EMP includes waste dump management, Engineering structures for surface water management, afforestation, haul road & transportation roads management, biological reclamation, etc. The recurring cost already incurred on annual basis is Rs. 1051 Lakhs based on last 5 years. The year-wise, activity wise and time bound budget both in capital and recurring is also earmarked under EMP till life of mine.

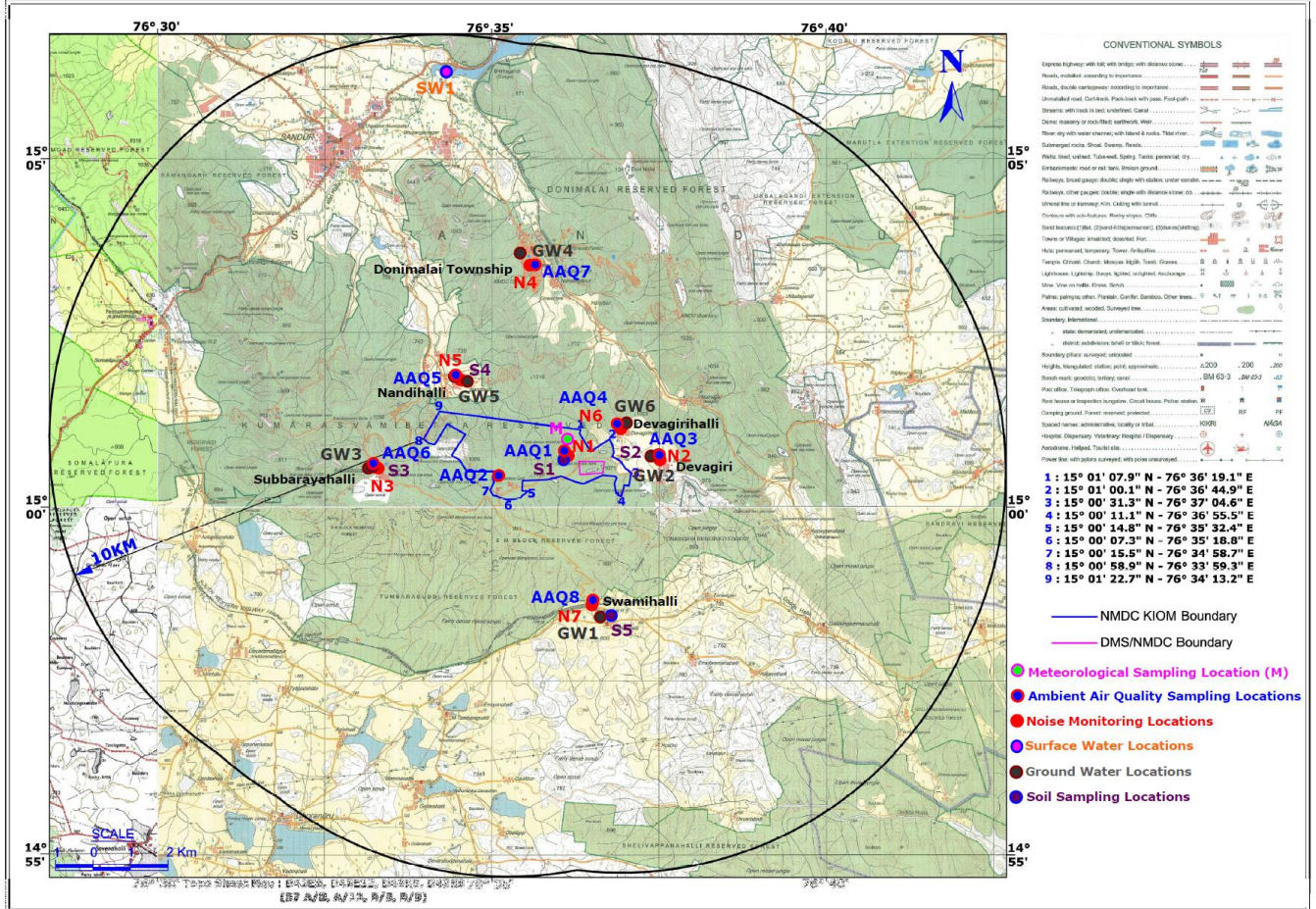
NMDC has formulated Environmental Policy at corporate level with commitment to protect the environment while operating mines. Further, the Iron Ore Mining Projects of Donimalai and Kumaraswamy of NMDC have got separate Integrated Management System (IMS) Policy comprising of ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 and SA 8000:2014.

## **9.0 CONCLUSIONS**

NMDC being India's largest iron ore producer has to take lead in ensuring high production to avoid iron ore imports leading to loss of precious foreign exchange. Further, KIOM being the largest iron ore producing mine in Karnataka and situated in one of the most intensive steel manufacturing zones in the country needs to ramp up its production capacity to meet the demand of iron ore in and around the state of Karnataka further to add in the national growth.

The proposed project would have adverse impacts on the environment. However, with proper and judicious implementation of the mitigation and environment management measures, the impacts can be further minimized and can be maintained well within the permissible limits specified by the regulatory authorities.

Thus, it can be concluded that with the strict implementation of the pollution control and mitigation measures, with proper environment management system in place this project will be beneficial to the society and will contribute to the economic development of the state in particular and the country in general.



**FIGURE-1**  
**SOI TOPOSHEET SHOWING THE ML AREA WITH BASELINE ENVIRONMENTAL MONITORING LOCATIONS IN 10KM RADIUS STUDY AREA**