

# EXECUTIVE SUMMARY

*Of*

## ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

*For*

# EXPANSION OF EXISTING PROJECT FOR MANUFACTURE OF MINING EXPLOSIVES AND PROPOSED HIGH ENERGY DEFENCE PRODUCTS

(ToR Letter No. F.No.IA-J-11011/166/2018-IA.II(I), dated 21 June, 2018), MoEF&CC , New Delhi

Monitoring Period: March to May 2018 (Pre monsoon season 2018)

## Project Proponent



**CDET EXPLOSIVE INDUSTRIES PVT. LTD.**

**Village Mouza - Talegaon (S.P), Tal-Ashti, Dist- Wardha,  
Pin Code – 442204 Maharashtra.**

## *Environmental Consultant*



QCI-NABET Accredited EIA Consultant for Synthetic Organic Industries (Sector 21),  
MoEF&CC (GOI) and NABL Recognized Laboratory  
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Report No. ANqr /PD/20A/2018/111

[CATEGORY: A, 5 (F) AND 6(b)]

**April 2019**

## 1.0 INTRODUCTION

CDET Explosive Industries Pvt. Ltd. (CDET) was established in the year 1998 and commenced production in January 2005. The company manufactures explosive initiating devices & mining explosives and is classified as Hazardous Industry. The company and its top management are committed to implement effective safety, operations and work environment parameters to ensure a safe working environment.

The company is already in the business of manufacturing explosive initiating devices mining explosives, and proposes the expansion for backward integration and into products of primarily defence applications. Considering the strategic location of Nagpur/Wardha, the Government of India (GOI) has decided to develop as Defence production hub in the area and considering this business opportunity, the management of CDET has decided to expand the range of products to include products required for Defence applications. CDET shall obtain the required licenses from the Department of Industrial Policy and Promotion, GOI. CDET is one of the leading manufacturers of explosive initiating devices / high energy products in India and has adequate experience in the line of the proposed business.

### 1.1 PURPOSE OF THE REPORT

In order to fulfill statutory requirement for the expansion of existing project for manufacture of mining explosives and proposed high energy defence products to obtain environmental clearance, Form-1, Pre-feasibility report along with proposed draft TOR were submitted to MoEF&CC. A standard TOR was issued by the Expert Appraisal Committee (EAC- Industry 2) New Delhi. The committee approved the Terms of Reference, vide letter F.No.IA-J-11011/166/2018-IA.II(I), dated 21 June, 2018 Ministry of Environment, Forest and Climate Change, EAC, New Delhi (Annexure-I).

CDET has retained M/s Anacon Laboratories Pvt. Ltd., Nagpur to undertake Environmental Impact Assessment (EIA) studies as per the Terms of Reference (TOR) approved by MoEF&CC, EAC, New Delhi

### 1.2 IDENTIFICATION OF PROJECT

The existing products are mining explosives, and proposed products have primarily defence applications and will be supplied to Defence Organizations of GOI. These products play a vital role in national safety & security. Therefore, special consideration may be granted to mask certain sensitive information for security reasons due to the explosive nature of products and in the interest of national safety and security. Since EIA is a public document, the mass balance may kindly be exempted from EIA. In consideration to the sensitive nature of the information, it should be kept restricted to the extent possible.

#### 1.2.1 Nature of the Project

The existing products before proposed expansion do not fall under the purview of the EIA Notification, 2006 and subsequent amendments. CDET has obtained valid consents (CTE/CTO-Annexure II) required from MPCB for the existing products. Hence, earlier compliance before expansion is fulfilled.

The project is not located in notified industrial zone so it is categorized as Category-A project. The proposed expansion will be within existing land area of 128.57 Acres (no additional land acquisition). The project is falling under schedule 5(f) and 6(b) of EIA Notification, 2006 and prior Environment Clearance needs to be obtained from MoEF&CC, GOI.

#### 1.2.2 Size of the Project

The details of existing and proposed expansion production/generation capacity are shown in **Table 1**.

**TABLE 1  
EXISTING AND PROPOSED EXPANSION PRODUCTION DETAILS**

<b>A: EXISTING PRODUCTS NOT COVERED IN EIA NOTIFICATION</b>			
<b>Product Name</b>	<b>Existing (CTO)</b>	<b>Proposed addition (Apply for CTE )</b>	<b>Total</b>
Shock tube (Mtrs/A)	16,000,000	184,000,000	200,000,000
Delay Elements (Nos./A)	12,000,000	28,000,000	40,000,000
Detonators (Nos./A)	60,000,000	140,000,000	200,000,000

<b>B: PROPOSED PRODUCTS NOT COVERED IN EIA NOTIFICATION</b>	
<b>Product Name</b>	<b>Proposed (Apply for CTE )</b>
Cast Booster (MT/A)	300
Cartridge Explosives (MT/A)	60,000
Bulk Explosives (MT/A)	60,000
Detonating Fuse (Mtrs/A)	60,000,000

<b>C: PROPOSED PRODUCTS REQUIRING EC (MINING EXPLOSIVES AND HIGH ENERGY DEFENCE PRODUCTS)</b>			
<b>Sl. No.</b>	<b>Product<sup>(2)</sup></b>	<b>5(f) Maximum Quantity</b>	<b>6(b) Maximum Quantity<sup>(1)</sup></b>
1	PETN	1,500 MTPA	-
2	Styphnic acid	6.0 MTPA	-
3	Lead Styphnate	7.2 MTPA	-
4	Lead Azide	-	0.4 MT(at any given time)   Max. Annual qty handled 30 MTPA
5	Emulsifier	6,000 MTPA	-
6	SMO	10,000 MTPA	-
7	HMX	100 MTPA	-
8	RDX	500 MTPA	-
9	DNT/TNT	1,500 MTPA	-
10	Ammonium nitrate	-	2,000 MT (at any given time)   Max. Annual qty handled 100,000 MTPA
11	CL 20	10 MTPA	-
12	HNS	12 MTPA	-
13	Bonding agent/Binder/Plasticizer for explosive	10 MTPA	-
14	Taggants for explosives	10 MTPA	-

<sup>(1)</sup>Refer schedule II & III of MSIHC Rules 1989 amended 2000

<sup>(2)</sup>As is or in form of compounded products-hetero-mixed stabilized formulations (physical mixing as per explosive standard)

### 1.2.3 Location of the Project

The proposed project area located within the existing plant at Village Mouza - Talegaon (S.P), Survey No. 270, 271, 272, 273, 309, 321/1, 322/1, 323, 325, 326, 327, 328, 330, 333, 334, 335, 336, 337, 340, 395, Taluka - Ashti, Dist- Wardha, Pin Code – 442 204 Maharashtra. The project site lies

at the 21°6'35.06"N- 21° 7'10.67"N latitude and 78°12'55.57"E - 78°13'25.07"E longitude on the Topo sheet No. 55 K/4 and 55 K/8 (**Annexure III & IV**).

#### 1.2.4 Regulatory Framework

According to the EIA Notification, 2006 and its subsequent amendments, the proposed project comes under the project activity of **5(f)**, Synthetic Organic Chemicals Industry and **6(b)** isolated storage under **Category A** and is located at Village- at Mouza - Talegaon (S.P), Taluka - Ashti, District - Wardha, Pin Code - 442 204, Maharashtra and requires environmental clearance from MoEF&CC (EAC Industry -2). Accordingly, CDET has therefore initiated the process of Environmental Clearance. Project status is as follows:

Description of Process	Date
ToR Application submitted at MoEF&CC	10 <sup>th</sup> May 2018
Essential information submitted to MOEF&CC	19 <sup>th</sup> May 2018
Standard TOR issued by EAC,MOEF & CC New Delhi	21 <sup>st</sup> June 2018

The EIA report for the expansion of existing manufacturing of mining explosive and proposed high energy defence products is prepared based on the approved and standard ToR by EAC, MOEF & CC, New Delhi, and will be submitted for grant a prior environmental clearance.

#### 1.2.5 Cost of the Project

Total cost for the proposed project expansion is estimated to be Rs. 98.36 Crores.

## 2 PROJECT DESCRIPTION

### 2.1 TYPE OF PROJECT AND CAPACITY

CDET has now planned to undertake proposed project expansion and has initiated steps for identifying of technologies and critical equipment from indigenous and overseas sources. It is an expansion of existing project for manufacture of mining explosives and proposed high energy defence products. CDET have applied for total 14 products which attract Environment Clearance. 12 products attract Environment Clearance under 5(f) and 2 products attract Environment Clearance under 6(b).

### 2.2 NEED FOR THE PROJECT

CDET has setup manufacturing facilities for production of various types of explosives. The Ministry of Defence, GOI under Make in India policy has issued Policy 2013 amendments to produce indigenous products. Based upon its past performance and indigenous capability, CDET has applied for licenses to manufacture Defence products and items of backward integration.

### 2.3 PROCESS DESCRIPTION OF PROPOSED PRODUCT

The process for manufacturing know how about explosives manufacturing are available with the company as given in EIA report Chapter 2.

### 2.4 DETAILS ABOUT RESOURCES

#### 2.4.1 Raw Materials

**Source:** All the raw materials are available from indigenous sources. Proposed raw materials will also be received by road transport from adjoining destinations of Maharashtra, Gujarat, Rajasthan, Chhattisgarh, MP etc.

## 2.4.2 Source of Water Supply, Requirement and wastewater generation

The water requirement will be met through ground water. The daily water requirement for the existing Explosive Industrial Unit is 477 KLD. CDET obtained NOC from CGWBA for 327.40 KLD for ground water extraction. Water is being sourced from existing dug wells (**Annexure VII**). The proposed expansion is requires about 322 KLD of water. Total water requirement after expansion will be 799 KLD.

### Wastewater generation

The existing waste water generation is 166 KLD. The wastewater generation for proposed expansion will be about 148 KLD. Total waste water generation after expansion will be 314 KLD.

### Sewage Treatment Plant (STP)

The sewage water drain from administrative building, plant toilets, canteen is connected to the equalization cum collection tank of STP of capacity 48 KLD.

Zero liquid discharge (ZLD) is maintained by plant.

## 2.4.3 Land Requirement

The core zone includes Industrial area of 128.57 Acres land of CDET and 10 km radius from CDET Explosives Industrial Unit (**Annexure III & IV**). The total land identified for the proposed project is **1.4 acres**. The project is located in industrially backward district classified as Group D+ by the Government of Maharashtra.

The proposed project activities located within the existing plant at Village Mouza - Talegaon (S.P), Taluka - Ashti, Dist- Wardha, Pin Code – 442 204 Maharashtra.

## 2.4.4 Power Requirement and Supply

The industry has been obtained contract demand for 750 KVA by MSEDCL (Load sanction Letter- **Annexure IX**). Existing power requirement is 750 KVA, Proposed additional power requirement will be 750 KVA. Total power requirement after expansion will be 1500 KVA.

DG sets with capacity(KVA)		
Existing	Proposed addition	Total after expansion
2x200 + 1x125	2x500	1525

The DG sets as a standby arrangement.

### Fuel

The fuel HSD is sufficiently available domestically. The Company's process steam generation boilers would require Coal / Agro-waste, which is proposed to be procured from the coal mining areas of WCL and nearby areas.

## 2.4.5 Manpower Requirement

At CDET the present strength of persons employed of various categories such as managers, officers, supervisors and all types of workers and van drivers is 431. The additional manpower requirement for the proposed project is 131 persons. Total manpower after expansion will be 562.

## 3 DESCRIPTION OF ENVIRONMENT

This chapter of the report provides an overview of the environmental baseline conditions within the study area of 10 km radius. An environmental baseline monitoring was carried out as a part of EIA studies for proposed expansion of CDET Explosive Industries Pvt. Ltd. during **pre-monsoon season (March-May 2018)** along with secondary data.

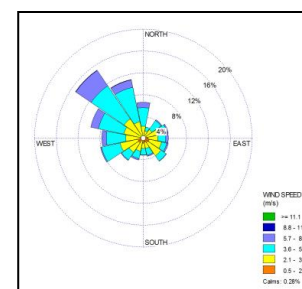
### 3.1 AIR ENVIRONMENT

#### 3.1.1 Meteorology

##### Summary of the Meteorological Data Generated At Site (March-May 2018)

Month	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
March 2018	25	41	4	50	0.3
April 2018	29	44	4	34	8.9
May 2018	34	45	7	34	0.0
<b>Range</b>	<b>25-45</b>		<b>4-50</b>		<b>Total=9.2</b>

Details	Wind Direction
First Predominant Wind Direction	NW (15%)
Second Predominant Wind Direction	NNW (10%)
Avg. wind speed (m/s)	3.76
Calm conditions (%)	0.25



Wind-Roses (Premonsoon-2018)

#### 3.1.2 Baseline Data

Ambient air monitoring was carried out at 08 locations. The locations were identified keeping in view predominant wind directions prevailing during study period, sensitive receptors and human settlements. The levels of PM<sub>10</sub>, PM<sub>2.5</sub>, Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>), Carbon monoxide (CO), Volatile Organic Compound (VOC), were monitored as per MOEF&CC/CPCB guideline moreover the selection of parameters are based on the process emission likely to be emitted and its impact on air matrix. The details methodology given in **Annexure V**. The results of monitoring carried out are presented in **Annexure X(a)**.

The details of Ambient Air Quality Monitoring Results are summarized and given in **Table 2**.

**TABLE 2**  
**SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS**

Sr. No.	Location		PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sub>3</sub>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
1.	Project Site	Min	72.3	25.3	12.0	21.7	0.371	8.2	8.2
		Max	91.1	35.1	24.5	33.4	0.394	11.1	9.9
		Avg	83.3	30.1	17.3	26.8	0.383	9.7	9.1
		98 th	90.6	35.1	24.0	32.8	0.394	11.1	9.9
2.	Kakaddara	Min	67.2	22.5	12.4	24.1	0.344	8.7	7.3
		Max	80.1	33.2	22.5	35.1	0.535	10.7	9.8
		Avg	72.1	26.4	17.2	28.5	0.362	9.7	8.6
		98 th	78.4	32.7	22.3	34.9	0.457	10.7	9.7
3.	Devgaon	Min	58.9	18.9	10.4	18.6	0.328	8.1	7.4
		Max	75.5	31.9	22.1	27.1	0.354	10.6	9.6
		Avg	68.2	27.1	16.7	24.0	0.345	9.5	8.4
		98 th	75.2	31.8	21.8	26.9	0.354	10.6	9.6
4.	Sirkuthi	Min	48.5	17.1	11.1	19.3	0.301	7.3	7.1
		Max	62.3	28.5	20.5	30.1	0.327	10.9	10.2

Sr. No.	Location		PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sub>3</sub>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
		Avg	56.5	21.5	14.8	24.1	0.313	9.3	8.7
		98 th	61.0	27.2	19.1	28.8	0.325	10.9	10.1
5.	Jamnera	Min	56.8	17.8	10.5	19.3	0.319	8.8	7.2
		Max	70.2	28.5	19.8	31.1	0.338	10.8	9.7
		Avg	63.6	23.5	16.2	26.6	0.328	9.7	8.6
		98 th	70.0	28.5	19.7	30.7	0.338	10.8	9.7
6.	Malegaon	Min	48.5	18.9	10.2	17.8	0.310	9.1	7.6
		Max	62.5	28.9	19.2	29.1	0.331	10.9	9.7
		Avg	58.3	23.6	15.0	24.2	0.322	10.1	8.6
		98 th	62.3	28.6	18.9	29.0	0.331	10.9	9.6
7.	Mandla	Min	50.4	17.8	10.1	18.9	0.333	9	7.8
		Max	66.8	27.5	18.3	29.7	0.365	10.8	9.6
		Avg	58.6	21.5	13.5	24.1	0.343	9.9	8.7
		98 th	65.1	25.9	17.5	28.5	0.359	10.8	9.6
8.	Indramari	Min	48.5	16.9	9.8	19.8	0.308	9.3	8.4
		Max	66.2	24.1	19.3	30.1	0.331	10.9	9.9
		Avg	60.6	21.3	15.3	24.3	0.321	10.1	9.1
		98 th	66.0	24.0	19.1	28.6	0.330	10.9	9.9
CPCB Standards			100 (24hr)	60 (24hr)	80 (24hr)	80 (24hr)	2 (8hr)	100 (8hr)	400 (24hr )

TABLE 3

CONCENTRATION OF HEAVY METALS & VOCs IN AMBIENT AIR

Location	Pb (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	Hg (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Total VOCs (µg/m <sup>3</sup> )
Project site	BDL	BDL	BDL	BDL	1.12	BDL	1.63
Kakaddara	BDL	BDL	BDL	BDL	0.92	BDL	1.16
Devgaon	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Sirkuthi	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Jamnera	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Malegaon	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mandla	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Indramari	BDL	BDL	BDL	BDL	0.62	BDL	0.89
<b>Ambient Air Quality CPCB Standard</b>	<b>01 (24 hrs)</b>	<b>06 (Annual)</b>	<b>20 (Annual)</b>	-	<b>5 (Annual)</b>	<b>1 (Annual)</b>	--

BDL: Below Detectable Limit

From the above results, it is observed that the ambient air quality at all the monitoring locations was within the permissible limits specified by CPCB.

### 3.2 NOISE ENVIRONMENT

Ambient noise level monitoring was carried out at the 08 locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 4**.

**TABLE 4  
SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS**

Sr. No.	Monitoring Locations	Category of Area/Zone	Equivalent Noise Level	
			Leq <sub>Day</sub>	Leq <sub>Night</sub>
1.	Project Site	Industrial Area	68.6	43.8
2.	Kakaddara	Commercial	53.2	39.6
3.	Devgaon	Commercial	51.7	38.2
4.	Sirkutni	Residential	50.8	38.7
5.	Jamnera	Residential	52.1	40.6
6.	Malegaon	Silence	51.2	39.7
7.	Mandla	Silence	47.6	37.2
8.	Indramari	Silence	48.9	37.6
<b>CPCB Standards dB(A)</b>				
1.	<b>Residential Area</b>		<b>55.0</b>	<b>45.0</b>
2.	<b>Commercial Area</b>		<b>65.0</b>	<b>55.0</b>
3.	<b>Industrial Area</b>		<b>75.0</b>	<b>70.0</b>
4.	<b>Silence Zone</b>		<b>50.0</b>	<b>40.0</b>

Source: Field monitoring and analysis by Anacon Laboratories Pvt. Ltd., Nagpur.

### 3.3 WATER ENVIRONMENT

#### 3.3.1 Geology and Hydrogeology

##### Regional Geology

Project area falls under Wardha District and 10 km study area is also part of Wardha district mainly cover the rocks of Deccan Trap Basalt of upper Cretaceous to Eocene Age. While Lameta Group of rocks of upper Cretaceous Age are also found.

##### Site specific Geology:

The study area is mostly cover by Deccan Trap Basalts which are hard and compact. In some parts basalts are weathered and jointed in nature. Some alluvium patches near the river banks are found.

##### Regional Hydrogeology:

The ground water occurrence and its distribution in space are highly influenced by the underlying geological formations and hydro-geological characteristic of the surroundings.

##### Site specific Hydrogeology:

The shallow aquifers of the study area occur within an average depth of 9-10m. The shallow aquifers of the area are mostly developed by way of dug wells in the area where depth varies from 9 to 22 m. In general the yield of dug wells ranges from 25 to 30 m<sup>3</sup>/day. The study area falls under "safe" category of ground water development as CGWB website. The depth of water levels in pre-monsoon period ranges from average 4.60 to 21.90 mbgl. The depth of water levels in post-monsoon period ranges from average 1.70 to 20.10 mbgl.

##### Drainage Pattern:

Dendritic to semi-dendritic type of drainage pattern is observed in study area which follows the regional slope.



## Geomorphology

Geomorphological the study area is undulating and sloping topography with characterized Deccan basalt rock. The maximum elevation of the area is 363m and minimum level of 331m above mean sea level. The north-eastern part of the study area is on higher elevation and south-west part of study area is on lower elevation.

### 3.3.2 Surface and Ground Water Quality

11 water samples were collected from various sampling locations, eight (8) from groundwater and three (3) surface water sources.

#### Surface water quality

The physico-chemical characteristics of the surface water samples collected and analysed are presented in **Annexure X(b)** and are compared with the IS-10500 standards. The analysis results indicate that the pH ranged between 8.14-8.25 which are well within the specified standard of 6.5 to 8.5. The TDS was observed to be 278-302 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 185.39-196.45 mg/l as CaCO<sub>3</sub> which is also within the permissible limit of 600 mg/l. The nitrate was found to be in the range of 10.21-12.63 mg/l. The levels of chloride and sulphate were found to be in the range of 50.39 – 51.93 mg/l and 15.39-21.66 mg/l respectively.

#### Groundwater quality

The physico-chemical characteristics of groundwater are presented in **Annexure X(b)** and compared with the IS-10500 standards. The analysis results indicate that the pH ranged between 7.83-8.62.

The TDS was ranging from 264-556 mg/l. Total hardness was found to be in the range of 167.2-404.8 mg/l. The fluoride concentrations were varied between 0.19-0.62 mg/l which is within the acceptable limit of 1 mg/l. The nitrate and sulphate were found in the range of 2.63-11.32 mg/l and 5.21-17.89 mg/l respectively.

#### Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. Water samples were analysed for total coliform as per standards. Bacteriological quality of surface and groundwater in Pre monsoon season is presented in **Annexure X(b)**.

## 3.4 LAND ENVIRONMENT

### 3.4.1 Land use / Land cover of Study Area

The land-use & land cover map of the 10 km radial study area from the periphery of project site has been prepared using Resource SAT-1 (IRS-P6), sensor- LISS-3 having 23.5 m spatial resolution and date of pass 26 Feb 2016 satellite image with reference to Google Earth data. In order to strengthen the baseline information on existing land use pattern, the following data covering approx. N 21°01'16.26" to N 21°11'50.71" latitude and E 78°07'25.28" to E 78°18'49.72" longitude and elevation 175-240 meter are used as per the project site confined within that area.

**TABLE 5  
LU/LC AND ITS COVERAGE WITHIN 10 KM RADIUS**

S.No.	Level-I	Level-II	Area (Sq.Km)	Percentage (%)
1	Built-up land	Settlement	8.58	2.73
		Industrial Settlement	1.54	0.49
		Road Infrastructure	2.15	0.68

S.No.	Level-I	Level-II	Area (Sq.Km)	Percentage (%)
		Brick Kline	0.24	0.08
2	Agricultural Land	Cropland	211.42	67.33
3	Forest	Forest/Reserve Forest	70.44	22.43
4	Scrubs/Wastelands	Barren Land	3.68	1.17
		Open Scrub	8.42	2.68
5	Waterbodies	Canal	1.04	0.33
		River/Pond/Tank	3.11	0.99
		Drainage	2.36	0.75
6	others	Mining/Stone Quarry	1.02	0.32
	Total		314	100

### 3.4.2 Soil Characteristics

Eight soil samples were collected from different locations of the study area. The monitoring was carried out once in the study period during pre-monsoon season 2018 and analyzed for significant parameters. The results indicated the following:

#### ➤ Interpretation and Overall Characteristics of Soil

The bulk density of the soil in the study area ranged between **1.40-1.61** g/cc which indicates favourable physical condition for plant growth. pH is found to be acidic to moderately alkaline **6.44-7.16** in reaction. The nutrient status in terms of NPK value is found to be in the range of **108.6-183.4** kg/ha, **11.38-18.92** kg/ha and **148-329.6** kg/ha respectively. This indicates that soil is moderately fertile. The soil is non-toxic with reference to heavy metals.

### 3.5 BIOLOGICAL ENVIRONMENT

The baseline study for existing biological environment was carried out in May - 2018. Study of flora and fauna carried out as per prescribed method addressed in SOP. A participatory and consultative approach was also followed. Field visits were under taken for survey of the vegetation and animals in the study area. The study area is divided into two parts as core zone and buffer zone. Project area i.e. 128.57 acres considered as core area and the buffer area as the 10 km radius from the periphery of project site

#### • Floral Biodiversity of the Study Area

- Trees:** Total 63 species were found in the study area
- Shrubs (small trees):** Total 25 species were enumerated from the study area.
- Herbs:** In the study area 16 species were observed.
- Bamboo & Grasses:** 8 species were enlisted from the study area
- Climbers and Twiners:** Total 13 species of climbers/ twiners were recorded in the study area.

#### • Fauna in the study area

The 10 km radius study area was found to be a home to several species of mammals, reptiles, aves and other lower invertebrates. As described earlier, the part of study area is covered with forest. Big wild animals like Wild boar, Sambhar, Nilgai, Barking deer, spotted deer as well as small sized fauna like Jackal, Monkey, etc. were found in the connected Reserve Forest area within study area.

Birds were observed throughout the study area mostly near the forest area and water bodies. Reptiles and amphibians were also observed in the study area. The details of Fauna observed/reported provided in **Annexure XI**.

- **Interpretation & Recommendations pertaining to the Biological environment study**

The overall biological environment studies revealed that, the proposed expansion of project will not cause any destruction of wildlife habitat. The aforesaid activities will be carried out within the existing plant premises and no tree cutting is involved in the project. Impact of the project would be minimum or significantly low and therefore net loss of biodiversity or long-term degradation of the receiving environment is not envisaged. However, the existing greenbelt (in terms of density) within plant premises was observed to low. Thus, it is recommended for extensive plantations as per greenbelt plan provided in Ch. 10 along with other mitigation measures provided in Ch.4 are needed to be strictly implemented.

### **3.6 SOCIO-ECONOMIC ENVIRONMENT**

Socio-economic survey was carried out to know the infrastructural activities amenities available within 10 km radius from Project Site. The information regarding facilities available and the opinion of the people was sought by floating questionnaires and interaction with the people. This is done for observing the impact due to the project wrt social aspects so that proper actions / measures could be taken up for the benefit of the people (economically and wrt quality of life) and the project.

The project shall generate additional direct/indirect employment and indirect service sector enhancement in the region and would help in the Social Status upliftment of the state as well as the local area.

Additional capital investments will contribute to State/National level exchequer. Thus the project would be beneficial for the society at large and the additional revenue generated will help enrich regional growth/State and vital FOREX will be value addition.

## **4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **4.1 IMPACTS DURING OPERATION PHASE**

#### **4.1.1 Land Environment**

There may be some pollution, which may affect the soil adjacent to the plant area, if proper care is not taken.

Proper mitigative measures like use of efficient pollution control systems, proper stack height and use of top soil in plantation results in no significant impact on soil of the project site. There will be no impact on soil of the study area located beyond the working area of the project.

Soil samples will be collected and tested at regular intervals from the nearby areas. This will help in mitigation of any harmful impact on soil due to the project activity, if any.

#### **Solid/Hazardous Waste**

The solid waste generated from the primary and secondary operations of ETP in the form of ETP sludge. This sludge is isolated and dried in sludge drying beds. Dried sludge is sent to CHWTSDF for disposal and same procedure will be followed for proposed expansion.

#### **4.1.2 Air Environment**

- **Details of air dispersion model**

Assessment of air pollution was carried out for stack attached to boilers, D.G. sets etc. The ISCST-3 (Industrial Source Complex – short term-3) from Lakes Environment is an hour-by-hour steady state Gaussian Plume Model. This model is widely recognized as predictive tool in impact assessment for air environment. The ISCST-3 model was applied with the consideration of elevated + flat terrain, gradual plume rise and buoyancy induced dispersion options in the present study.

• **Stack details**

The stack details viz, height, diameter, temperature, velocity, volumetric flow and emission rates are presented in **Table 4.3**. Total 5 existing and after expansion 7 stacks were considered, which is attached to the respective equipment through which the emissions are likely come out.

**TABLE 6  
RESULTANT CONCENTRATIONS DUE TO PROJECT**

Scenario	Pollutant	Maximum Baseline Concentration ( $\mu\text{g}/\text{m}^3$ )	Predicted conc. due to project activities ( $\mu\text{g}/\text{m}^3$ )		Incremental Conc. ( $\mu\text{g}/\text{m}^3$ )	Resultant Conc. ( $\mu\text{g}/\text{m}^3$ )	Limits (Industrial/ Residential, Rural) Concentration ( $\mu\text{g}/\text{m}^3$ )
			Existing	After Expansion			
After expansion	Particulate Matter	91.1	1.5	2.1	0.6	91.7	100
	SO <sub>2</sub>	24.5	(a)13.5 (100% coal)	(a)14.5 (100% coal)	1	25.5	80
			(b)9.5 (100% agro-waste)	(b)0.65 (100% agro-waste)	8.85 (reduced)	15.65	
			(c)10.5 (70% agro-waste+30% coal)	(c)4.8 (70% agro-waste+30% coal)	5.7 (reduced)	18.8	
NO <sub>2</sub>	35.1	5.2	15.5	10.3	45.4	80	

**Important Note:** No changes in resultant concentration as predicted concentration for existing project is already included in current baseline concentration and after expansion, slight increase is observed but no significant incremental concentration. After expansion the concentration levels are well within the NAAQS levels prescribed by CPCB, in all the three fuel combination scenarios (a, b, c) mentioned above.

• **Impact Study Due to Proposed Traffic Density**

All the major raw materials are transported by road ways. A road network already exists up to the project site. All the tippers/ trucks will be covered by tarpaulin. Hence there is not much fugitive dust generation during transportation of raw materials during construction phase. Pucca road exists up to the site. The existing road is capable of absorbing this additional truck movement. The total raw material required for proposed new products is estimated to be 45000 MTT/Annum max and the traffic density will be ~10trips max per day. Hence, the increase in traffic load will be very less. So there will be insignificant effect on the nearby surrounding. The receptor villages are far away from project site so there will not be any adverse impact due to vehicular traffic.

• **Vehicular Emission**

The national highway (NH-6) is passing from the 10 km radius of the project location and it is shown in **Figure 4.5**. Heavy traffic was observed on the national highway. It was observed that during peak period, 960 vehicles per hour were plying on NH-6.

**Odour control measures**

- Released of exhaust gases through stack of appropriate height
- Installation of scrubber to adsorb odour emitting gases

- Proper ventilation system to remediate the odour problem
- Installation of activated carbon filters to adsorb odour emitting compounds from treated water.
- Fullfledged green belt development.
- Use of best quality valves at transfer points of organic solvents / liquids to prevent fugitive organic emissions.
- The exhaust emissions of HMX plant (acetic acid, acetic anhydride) are passed through scrubbers and vented through stacks.

#### **4.1.3 Noise Environment**

DG sets are likely to be used during power failure. Predictions have been made taking into account even DG set in operation and thus reflecting the worst case scenario. The maximum predicted noise level within the plant boundary (0.1 km radius) is 57.0-67.0 dB (A). Noise level at a distance of 0.5 km radius of the plant is predicted to be less than 55 dB (A) which is well within the standards.

#### **4.1.4 Water Environment**

##### **Source of Water Supply and Requirement**

The water requirement will be met through ground water. The daily water requirement for the existing Explosive Industrial Unit is 477 KLD. CDET obtained NOC from CGWBA for 327.40 KLD for ground water extraction. Water is being sourced from existing dug wells (**Annexure VII**). The proposed expansion is requires about 322 KLD of water. Total water requirement after expansion will be 799 KLD.

##### **Wastewater generation**

The existing waste water generation is 166 KLD. The waste water generation for proposed expansion will be about 148 KLD. Total waste water generation after expansion will be 314 KLD.

- Drinking and industrial water requirement of the factory is fulfilled by dug wells located within the factory. Well water is treated via softener, RO and DM plants as per process requirements or otherwise fed directly to the process tanks. Water purification units and water coolers are provided for drinking water in respective process buildings.
- In all of the process plants effluent collection tanks have been provided to collect and recycle the effluent within the plant. The Softener's and DM plant regeneration wastewater and RO reject water is recycled fully in the plants.

##### **Wastewater Treatment Plant**

- The capacity of existing ETP =39 KLD and additional ETP capacity =100 KLD
- Total capacity of ETP after expansion =139 KLD

##### **Sewage Treatment Plant (STP)**

The sewage water drain from administrative building, plant toilets, canteen is connected to the equalization cum collection tank of STP of capacity 48 KLD.

Zero liquid discharge (ZLD) is maintained by plant.

#### **4.1.5 Biological Environment**

##### **Impact due to Air Pollution**

- The impact on the surrounding ecology during the operation of the project will be mainly occur from the deposition of air pollutants.

- Air pollution affects the biotic and abiotic components of the ecosystem individually and in synergy with other pollutants. Chronic and acute effects on plants and animals may be induced when the concentration of air pollutants exceeds threshold limits.
- The incremental emissions of air pollutants during proposed expansion project will not likely to induce any significant changes in the ecology because the ambient air quality will remain within the standard limits. However deposition of small amount of pollutants may also affect the surrounding ecosystem. The project is therefore planned to implement most efficient air pollution control systems for achieving emission levels in effective manner.

#### **Identification of impact on sensitive areas**

There is no National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger Reserve, within the study area. The nearest wildlife sanctuary was Bor Wildlife Sanctuary about ~40.00 km in SE direction from project site. No forest land involved in the project activities.

#### **Identification of impact on Schedule – I Species**

No rare or endangered flora/fauna were recorded in the study area except common peafowl (*Pavo cristatus*) which is schedule I species as per WPA 1972 whereas least concern species as per IUCN reported in Buffer Zone. There will not be any direct impact on common peafowl envisaged. However, in order to improve habitat in surrounding areas a budgetary provision of Rs. 5.00 Lakhs towards conservation common peafowl are allocated.

#### **Greenbelt/Plantation details in plant premises**

The plantation along with green belt covered land is 42.428 acres, which is 33% of total project area of 128.57 acres. At present green belt with native plant species is developed within plant premises. Around 3762 nos. of tree already grow within existing plant premises whereas 12000 saplings are proposed to be planted in subsequent years. The plantation will comprise of fruit bearing trees, soil improving and air pollution abatement trees. These positive steps will serve to develop an ecological layout which will provide nesting, breeding and perching ground for native birds in the area

#### **4.1.6 Socio-Economic Environment**

M/s CDET Explosive Industries Pvt. Ltd. has proposed expansion plan, located in Talegaon, district Wardha Maharashtra. The proposed expansion will generate direct & indirect employment indicative on the basis of skilled, semi-skilled and labour work. Due to employment generation and additional amenities quality of life of the study area will improve in future. Overall study area needs developments in infrastructure facilities.

### **5.0 ANALYSIS OF ALTERNATIVES (SITE AND TECHNOLOGY)**

#### **5.1 Study of Analysis of Alternatives Related to Site**

The proposed project area located within the existing plant at Village Mouza - Talegaon (S.P), Survey No. 270, 271, 272, 273, 309, 321/1, 322/1, 323, 325, 326, 327, 328, 330, 333, 334, 335, 336, 337, 340, 395, Taluka - Ashti, Dist- Wardha, Pin Code – 442 204 Maharashtra.

CDET has adequate land area for proposed expansion and hence expansion is proposed within existing land area. No additional land is required.

#### **5.2 Analysis of Alternatives Related to Technology**

The company is in the process of reviewing and shortlisting the different alternative technology and technology suppliers of various defence products. The exact route and technology in respect of these products can only be firmed up once necessary LOI and clearances are obtained from the GOI. In respect of the other products the Company has the necessary know-how and do-how to manufacture

these products. The company has also identified the routes they intend to take for manufacturing of the defence products.

## 6.0 ENVIRONMENTAL MONITORING PROGRAMME

The environmental monitoring program is presented in **Table 6.1**. The equipment, laboratory setup and budget required to carry out the environmental monitoring is given in **Table 7**.

The project will be based on state of the art technology which will help in reducing the pollution from the plant. The project is also equipped with pollution monitoring systems to help the plant operators. These measures will help in minimizing the adverse impact on the environment during the operational phase.

### 6.1 Budget for Implementation of Environmental Monitoring Plan

An effective environmental monitoring plan is proposed during the construction and operational phases of the project to conserve the environment at site. The capital expenditure will be incurred for implementing the environmental monitoring plan.

**TABLE 7**

**BUDGETARY PROVISIONS FOR ENVIRONMENTAL MONITORING PROGRAMME (Rs. in lakhs)**

Sr. No.	Environmental Component	Recurring Cost
1	Air Environment including boilers and DG sets	6.00
2	Noise Environment	0.50
3	Water Environment (water & wastewater)	3.00
4	Land Environment (Soil monitoring / reclamation)	0.50
5	EC compliance and due diligence	1.00
6	ETP/WTP	2.00
<b>Total</b>		<b>13.00</b>

## 7.0 ADDITIONAL STUDIES

### 7.1 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

#### Risk Analysis

Accidental risk involves the occurrence or potential occurrence of some accident consisting of an event or sequence of events resulting into fire, explosion or toxic hazards to human health and environment risk assessment (RA) provides a numerical measure of the risk that a particular facility poses to the public. It begins with the identification of probable potential hazardous events at an industry and categorization as per the predetermined criteria. The consequences of major credible events are calculated for different combinations of weather conditions to simulate worst possible scenario. These consequence predictions are combined to provide numerical measures of the risk for the entire facility.

#### Hazard Identification

- Identification of hazards is an important step in risk assessment as it leads to the generation of accidental scenarios. The merits of including the hazard for further investigation are subsequently determined by its significance, normally using a cut-off or threshold quantity.

### 7.2 REHABILITATION & RESETTLEMENT ACTION PLAN

There are also no oustees or project affected persons or home oustees, thus R & R plan is not required for this project.

### 7.3 SOCIAL IMPACT ASSESSMENT

The project proponent will provide welfare activities, recreational facilities in the surrounding villages once the plant commences production. The management will conduct regular health checkups in the surrounding villages. There will be enhancement of educational standards of people in the study area. There will be positive and beneficial impacts by way of economic improvements, transportation, aesthetic environment and business generation. There will be an overall upliftment of socio-economic status of people in the area.

### 7.4 BIODIVERSITY CONSERVATION

Peacock or Indian peafowl reported within the study area falls under the schedule-I category. The rest of the fauna reported from the study area, falls under either in schedule-II, Schedule-III or Schedule-IV of the Wild Life Protection Act 1972 and as amended. The conservation plan is prepared for *Pavo cristatus* (Peacock).

### 7.5 PUBLIC CONSULTATION

After the completion the public consultation process, the issues raised by the public, their compliances and commitments made by the Project proponent during the public hearing will be incorporated in the final EIA/EMP report and the final EIA/EMP report will be submitted for environmental clearance of the proposed expansion of the project.

### 8.0 PROJECT BENEFITS

The project manufacturing unit has made improvement in infrastructure as well as overall socio-economic development in the area. The people residing in the nearby areas are being benefited directly and indirectly as well. The project is providing benefits for the locals during operational phase of the activity.

#### OTHER TANGIBLE BENEFITS

Existing mining explosives manufacturing unit going for addition of new high energy defence products including HMX, RDX, DNT/TNT and supplying to Defense organizations (GOI). These products plays vital role for national safety & security.

The company is also involved with brownfield projects of mining explosive manufacture across the country. The company exports its products to many markets in Asia, Middle East, Europe and South America, and is earning valuable Foreign Exchange for the country. In addition, the Company is also planning for overseas expansions to manufacture similar range of products in near future.

This will help to increase the economy of the region, state and thereby the country itself. There are other intangible benefits apart from the tangible benefits which will help to improve the economic status of the state and the country.

### 8.0 ENVIRONMENTAL COST BENEFIT ANALYSIS

CDET has decided to expand the range of products to include products required for Defence applications. CDET shall obtain the required licences from the Department of Industrial Policy and Promotion, GOI. The project is not located in notified industrial zone so it is categorized as Category-A project. The proposed expansion will be within existing land area of 128.57 Acres (no additional land acquisition).



## 9.1 ENVIRONMENTAL VALUE ENHANCEMENT (BIODIVERSITY, CROP PRODUCTIVITY, ECO-TOURISM)

The project site for proposed expansion is well connected to railways, roadways and airways. The proposed expansion project falls within existing project area, therefore, it will not involve loss of vegetation and biodiversity. The vegetation is similar in the whole area with no sensitive ecosystem or rare and endangered flora or fauna, hence no environmental loss will be there in terms of net productive value.

The total project cost is estimated to be **Rs. 98.36 Crores** and expenditure on implementation of the Environmental Management Plan (EMP) is presented in **Chapter 10** of this report. The developmental activities due to project will increase economy of country and also help to increase the economy of the state through products transportation, taxes, supporting economy for nation's growth.

## 10.0 ENVIRONMENTAL MANAGEMENT PLAN

The main objectives in formulating this environmental management plan are:

- To limit / reduce the degree, extent, magnitude or duration of adverse impacts.
- To treat all the pollutants i.e. liquid effluent, air emissions and hazardous waste with adoption of adequate and efficient technology.
- To comply with all the norms and standards stipulated by Maharashtra Pollution Control Board / Central Pollution Control Board.
- To reduce any risk hazards and design the disaster management plan.

Continuous development and search for innovative technologies for a cleaner and better environment

## 10.1 BUDGETARY PROVISIONS FOR EMP

Adequate budgetary provision is made by the management of CDET for executing the environmental management plant as delineated above. The details about the capital and recurring investment to be earmarked for implementation of various activities are presented in **Table 8**, below.

**TABLE 8  
BUDGETARY PROVISIONS FOR EMP COST**

Sr. No.	Description	Estimated cost (Rs. lakhs)	
		Capital cost	Recurring cost
1.	Pollution Control (air and noise)	100.00	10.50
2.	Waste Water treatment	80.00	10.00
3.	Solid and Hazardous waste management	05.00	01.00
4.	Incinerator	15.00	02.00
5.	Green belt and landscaping	05.00	07.50
6.	Rain water harvesting	25.00	05.00
7.	Environmental monitoring	--	13.00
8.	Occupational health and safety	02.00	11.75
<b>Total</b>		<b>232.00</b>	<b>60.75</b>

## 11.0 SUMMARY AND CONCLUSIONS

Considering the silent features of the project as described in EIA report. Summary of the project in terms of environmental, technical aspects and economic feasibility the details are as under;

All activities are confined to private industrial land and minimum possible emission is allowed to enter in to the environment due to proposed expansion project. Thus environment will not be adversely affected in any way.

- The wastewater generated will be treated and recycled/reused in the process. Zero discharge condition is followed by plant.
- Wastewater is treated in full-fledged effluent treatment plant. The treated wastewater will be reused in the process.
- The domestic waste water collected from the plant via concealed pipelines to the STP collection tank and treated water is further send to boiler for utilization as process feed water and also used for plantation purposes.
- The development of green belt and plantation will help to attenuate the noise levels and restrict air pollution and will increase the aesthetics.
- The product waste generated is recycled, reused. Additional solid waste will be incinerated within plant and ash will be sent to TSDF.
- Overall socio economic benefits of the region is going to enrich.
- Apart from this, the environmental management plan delineated may help to reduce pollution by implementation.
- The enterprise social commitment policy (formerly CSR) will work further to bring out the development of the surrounding villages and thus area and quality of life of people will be improved.
- The cost of environmental control and monitoring measures are computed and provision for capital & recurring is made by the management.
- At CDET the present strength of persons employed of various categories such as managers, officers, supervisors and all types of workers and van drivers is 431. The additional manpower requirement for the proposed project is 131 persons. Total manpower after expansion will be 562.
- Employees, company and region will be directly / indirectly benefited.
- The project would be beneficial for the society at large and the additional revenue generated will help enrich regional growth/State and vital FOREX will be value addition.
- Additional revenue generated will add to regional growth. Hence the project is beneficial for Region as well as State and Nation at large

### **Concluding Remarks:**

Thus it can be concluded on a positive note that after the implementation of the mitigation measures, Environmental Management and Monitoring Plans as enumerated above, the normal operation of **M/s CDET** will have no significant impact on environment after expansion and the project will be benefitted to local people to some extent with an economic growth in state/ country level.

### **12.0 DISCLOSURE OF CONSULTANTS**

The Environmental studies for proposed expansion project of **M/s CDET Explosive Industries Pvt. Ltd.** are carried out by **M/s Anacon Laboratories Pvt. Ltd.**, Nagpur (**M/s ALPL**). Anacon established in 1993 as an analytical testing laboratory and now a leading Environmental Consultancy firm backed by testing lab for environment and food in Central India region. **M/s ALPL** is a group of experienced former Scientists from the Government Institutions and excellent young scientist of brilliant career with subject expertise. It is recognized by Ministry of Environment & Forests, New Delhi for carrying out environmental Studies & accredited by Quality Council of India (QCI) for conducting Environmental studies as per QCI-NABET RA – 132<sup>nd</sup> AC Meeting, dtd. May 30<sup>th</sup>, 2017 as Category 'A' consultant for 5 (f) & 6 (b) sectors.