



M/S. DEEPAK FERTILISERS AND PETROCHEMICALS CORP. LTD.

**Executive Summary of Draft EIA & EMP
Report for Environmental Clearance for
Expansion of Multiple Grades of NPK
Fertilizers Manufacturing at DFPCL complex,
Plot K1-K5, MIDC Industrial Area, Talaja,
Distt. Raigad, Maharashtra.**

DECEMBER, 2016



Kadam

Environmental Consultants
www.kadamenviro.com

Environment *for* Development

1 EXECUTIVE SUMMARY

This executive summary provides overall justification for implementation of the project, explains how adverse effects shall be mitigated. It summarizes the findings of the EIA study and is structured in accordance with the Appendix III A of EIA Notification, 2006 as amended till date.

1.1 PROJECT DESCRIPTION

The Deepak Group of Industries, having turnover of 4,000 Crore (2015-16) came in to existence during 1970's when Mr. C.K. Mehta set up Deepak Nitrite Ltd. In 1983, Deepak Fertilizers and Petrochemicals Corporation Limited (DFPCL) started commercial production of ammonia (in technical collaboration with Fish International Engineers (USA), using natural gas as feed stock. In July 1992, DFPCL commenced commercial production of Low Density Ammonium Nitrate (LDAN), Nitro Phosphate (NP) Dilute Nitric Acid (DNA), and Concentrated Nitric Acid (CNA).

The project is classified as Category "A" project. The proposed products falls under 5(a), *Chemical Fertilizers*, 'Project or Activities', as per Schedule in EIA Notification dated September' 14, 2006, as amended till date.

1.1.1 Proposed Project

The proposed project is expansion unit for manufacturing of multiple grades of NPK fertilizermaking overall capacity – 11.25 lakh MT per annum.

As per the EC issued dated 12.10.2015, DFPCL is constructing multiple grades NPK fertilizer (Granulation) plant with a capacity of 6 Lakh MTPA. DFPCL manufactures ANP Fertilizer (Prilling Unit) with capacity of 3.25 Lakhs MTPA in existing complex, which is in operation since 1989. In earlier EC approval phase DFPCL had proposed to discontinue existing ANP plant due to non-availability of required quality Phosphoric Acid. Now as DFCPL has the required sources of Phosphoric Acid and enhanced persistent demand of Prilled ANP in the local market DFPCL wish to continue with the manufacturing of ANP (Prilled) Fertilizer.

With existing ANP plant (Prilling Unit) capacity 3.25 Lakhs MTPA and proposed NPK (Granulation) capacity utilization up to 8 Lakhs MTPA, overall fertilizer production will be 11.25 Lakh MTPA. The total estimated capital investment for these products would be around INR 190 Crore.

List of proposed products is tabulated in **Table 1-1**.

Table 1-1: List of Proposed Products

S. No.	Name of Product	Production Capacity (MTPA) unless mentioned		
		Existing	Proposed	Total
	Proposed Expansion			
1.	NPK fertilizers	6.0 Lakh	3.25** +2 Lakh	11.25 Lakh
	Existing Products			
1	Liquid CO ₂	72,000	-	72,000
2	Ammonia	1,40,400	-	1,40,400

S. No.	Name of Product	Production Capacity (MTPA) unless mentioned		
		Existing	Proposed	Total
3	Methanol	99,996	-	99,996
4	Weak Nitric Acid	4,45,500	-	4,45,500
5	Concentrated Nitric Acid	1,29,600	-	1,29,600
6	** Ammonium Nitrate Phosphate	3,24,900	-	3,24,900
7	Low Density Ammonium Nitrate Plus Ammonium Nitrate Melt	1,44,000	-	1,44,000
8	Iso Propyl Alcohol (IPA)	70,200	-	70,200
9	Electric Power	9.4 MW	-	9.4 MW
10	Steam	1,056	-	1,056
11	Bentonite Sulphur Pastilles	25,000	-	25,000
12	Ammonium Nitrate Prills (Low Density)	2,00,000	-	2,00,000
13	Ammonium Nitrate Prills (High Density)	1,00,000	-	1,00,000
14	Iso Propyl Alcohol (For drum filling operation) – Packaging operation only	15,000	-	15,000
15	Di Iso Propyl Ether (DIPE) (For drum filling operation Packaging operation only)	15,000	-	15,000
16	Gas Based Power Generation (Excluding DG Sets)	17.9 MW	-	17.9 MW
	BY – PRODUCT			
1	Propane	33,000	-	33,000
2	Calcium Phosphate	210	-	210
3	Crude DIPE	1,440	-	1,440
4	Hydrogen Gas	960	-	960
5	Crude IPA/NPA Mixture	1,080	-	1,080

* EC for 6 Lakh MTPA multiple grades NPK fertilizer (granulation) received on 12.10.2015.

** Existing 3.25 Lakh MTPA ANP (Prilling) operating plant to be considered for continuous operation.

1.1.2 Process

NP/NPK grades as approved by FCO without affecting pollution norms and overall capacity will be manufactured in the proposed expansion.

Process Description

The neutralization of liquid Ammonia and Phosphoric acid takes place in a Pipe Reactor. The required N/P ratio is reached in the Granulator by injection of ammonia into the solids bed, through an Ammoniation System. NP/NPK production will involve following main steps:

- Solid Circuit;
- Granulation;
- Drying;
- Screening section;
- Cooling section (using a rotary cooler);

- Product Coating;
- Liquid Circuit.

1.1.3 UTILITIES

The estimated list of utilities required for the project is as given below:

S. No.	Utilities	Unit	Existing	Proposed	Total	Source
1.	Power	MW	314.65	1.15	315.8	Existing: MSDECL Proposed: MSDECL
2.	Fuel, NG	Sm ³ /day	-	5,000	7.5	Locally
3.	Water	KLD	21,093	250	21,343	MIDC Water supply
4.	Manpower, Construction phase only	Nos	-	200	200	Local Workers

1.1.4 Air Emissions & Control

- Point Source Emissions, i.e. SPM, SO₂ & NO_x from hot air generators and Ammonia from various process vents and prilling tower shall be controlled by Cyclone separators, scrubbers and by providing adequate stack height.
- Line Source Emissions, i.e. SPM emissions from movement of vehicles on paved roads & vehicular emissions like SPM, CO & HC's from exhaust of the vehicles is anticipated.
- Fugitive emissions of mainly NH₃, limited to plant area, from storage & handling of various hazardous chemicals used as either raw material or finished product.

1.1.5 Waste Water Treatment & Disposal

After proposed expansion of NPK plant, only utilities blow down from the cooling tower will be added. So total wastewater generation after the proposed expansion will be estimated about 2,876 KLD which will be treated in existing ETP. The capacity of existing ETP is sufficient to treat the proposed effluent load.

Recycling RO is already installed at site for capacity of 4,800 m³/day as a water conservation measures. Treated effluent from the ETP will be sent to RO and RO permeate will be reuse in plant while RO reject will be discharged into CETP.

1.1.6 Noise

- Noise generation sources are heavy machineries like crane, dumper, roller, bulldozers, and Operation of Hot air generator, Chiller, Compressor, Blower, Pumps, Cooling Tower and vehicle movement for transportation of raw material and finished goods.

1.1.7 Hazardous & Other Solid Waste

The following solid / hazardous wastes will be generated during operations:

- Hazardous Waste: Used/spent oil, waste /residue containing oil, contaminated hand gloves, discarded containers / barrels / bags /scraps, Drums and ETP Sludge.
- Domestic Waste: Sewage sludge, Waste paper and metal and kitchen waste;
- Other Solid Waste: Damaged HDPE bags

These will be managed as per the applicable Rules, mainly, Hazardous Waste (Management, Handling, Storage and Transboundary) Rules 2016, as amended till date.

1.2 DESCRIPTION OF THE ENVIRONMENT

1.2.1 Study Period, Area & Monitoring/Sampling Locations

Baseline monitoring study and surveys of the study area has been carried out for three months from 15th March to 14th June, 2016 within 10 km radius of the project site by MoEF approved laboratory of M/s. Green Circle Inc. M/s. Kadam Environmental Consultants has done primary survey related to landuse, socio-economic study and ecology & biodiversity.

Ambient Quality Monitoring was conducted at Eight (8) locations within the study area. Noise measurement was carried out at 7 locations, Surface water was collected from Seven (7) locations, which includes Three (3) river, One (1) Creek and Three (3) ponds water samples, Ground water from was collected from Eight (8) locations and soil samples from 8 locations were collected and analyzed.

1.2.2 Land Use and Land Cover

Draft land use of study area is classified as Buildup (~38.5%), Agricultural Land (20.1%), Shrub Land (~7.5%), Barren Land (~14.4%), Water Body (~8%) & Forest (~11.3%).

1.2.3 Meteorology

Based on the Indian Meteorological Department (IMD), Long Term Climatological Tables, 1981 – 2009, Mumbai - Colaba (Station ID: 43057). During the summer months of March to May, day temperatures remain between 24.8° – 31.4°C, in morning, humidity remains 76 – 78 % and in the evening, it remains between 63 – 68 %. Average wind speed was 1.6 m/sec., predominant wind direction was from NE to SW direction (28.5%).

Site-specific meteorological data shows the minimum and maximum temperature which were recorded as 20.0°C at 0000 Hrs, 2nd June & 38.0°C at 1500 Hrs, 23rd March respectively. Mean hourly relative humidity was 68.1 %. Average wind speed & Predominant wind direction were 3.5 m/sec & from W to E direction (30.0%) respectively. Calm wind contributes to about 7.52 % of all winds.

1.2.4 Ambient Air Quality

The broad findings of the ambient air quality monitoring are:

- Average concentration of PM₁₀ recorded ranged from minimum 80 µg/m³ (At Dhame Village) to maximum 139 µg/m³ (At Project Site);
- Average concentration of PM_{2.5} recorded ranged from minimum 36 µg/m³ (At Dhame) to maximum 61 µg/m³ (At Project Site);
- It is noted that the average PM₁₀ & PM_{2.5} results exceeds the permissible limits of 100 µg/m³ & 60 µg/m³ respectively for 24 Hrs. at Project Site which could be due to:
 - Construction of expansion unit of 6.0 Lac MTPA NPK Plant;
 - Operation of existing units;
 - Nearby industrial activities;
 - Vehicular movement on the MIDC internal road connecting site to main highway.

- The concentration of SO₂ (12 – 20 µg/m³), NO_x (23 – 49 µg/m³), NH₃ (20 – 54 µg/m³), CO (281 – 488 µg/m³) & THC (< 1.0 – 1.3mg/m³) are within permissible limits as prescribed by CPCB & Factories act;
- The concentration of NMHC – Non-Methane was below detectable limit.

1.2.5 Traffic Survey

Traffic survey was carried out at:

- MIDC Internal road, 0.48 Km NNW from project site on 22.06.2016. The road is 15 meters wide which is *2-Lane (One Way), Collector Road* and connects site to MIDC region;
- NH-4, at 4.33 Km WSW from project site on 21.06.2016. The road is 24 meters wide which is *3-Lane (One Way), Sub-arterial Road* and connects site to Mumbai & Pune highway.

1.2.6 Noise Level

Based on the noise monitoring results, it is observed that:

- Noise level during day time & night time, in Industrial area, were within the CPCB standards i.e. Industrial area (75 dBA (d) & 70 dBA (n)).
- Noise level during day & night time, at Navade Village, were slightly higher than the CPCB standards which is due to vehicular movements in nearby highways.

1.2.7 Water Quality

Quality of Surface water (River)

It is observed that:

- COD, BOD, TDS, Hardness, Nitrate and coliform values are high compared to river water standard in Kasardi River.
- Only BOD and coliform values are slightly high in Bava Malang River.
- The quality of River water can be compared with class C as per Classification of River Water standards.

Quality of Surface water (Creek)

It is observed that:

- The quality of Creek water is compared with class SW-I as per Classification for Coastal Water Marine standards.

Quality of Ground Water

It is observed that ground water quality, as per IS 10500:2012 standard limits for drinking water, does not deviates in any parameters and is fit for drinking.

1.2.8 Biological Environment

Project Site / Core Zone

Proposed project site comprises well developed green belt (with undergrowth of grasses, shrubs and herbs) and lawns in industry premises) with many floral species. Taxonomic details are detailed in EIA report. Among the faunal species, only three species of animals were observed at site.

Study Area / Buffer Zone

Overall 92 species were reported from buffer zone of the proposed site, out of which maximum species of trees (48) followed by Shrubs & Herbs (19 sp. each), climbers and grasses (03 sp each).

1.2.9 Socio-Economic Environment

The summary of the social survey for the study area is provided as below:

- Population and its distribution: There are 147 villages, with a total population of 2,36,218 persons and 54,848 households;
- Sex Ratio: 885 females per 1,000 males;
- Literacy Level: male literacy is 56 % and female literacy is 44 % of total population;
- Educational Facilities: The study area has adequate facilities for education. There are 175 primary schools, 21 secondary schools and 5 senior secondary schools within the study area.
- Drinking water: Public Works Department ensures potable water supply to the public for domestic, commercial, industrial and institutional purposes all over Maharashtra. It looks after maintenance and repairs of the public water supply network.
- The power supply in the Talaja MIDC area is being provided by Maharashtra State Electricity Distribution Company Ltd (MSEDCL). The Department does not have its own generation and purchases power from the Central Sector Power Stations of the National Thermal Power Corporation as per the allocation made by the Central Government.

1.3 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.3.1 Air Environment

Dispersion modeling (using "AERMOD" modelling software) was carried out for point and line sources. This indicates:

- Maximum 24 hourly average GLC's for PM₁₀ (7.01 µg/m³), SO₂ (0.007 µg/m³), NO_x (3.50 µg/m³) & NH₃ (7.01 µg/m³) are 200 to 500 meters from the project site;
- Incremental GLC's for all parameters remain within 500 meters from the project site;
- Air impact are not expected to cause any effect on vegetation and human settlements in the vicinity of the project site.

Mitigation Measures for Air Quality Impacts:

- Use of clean fuel, NG for dryers;
- Installing well-designed APCM like Cyclone separators, scrubbers having adequate stack height;
- Online sensors for NH₃ shall be provided;
- Effective water spraying will be done on the access roads to control re-entrained dust during dry season (if required);

- Regular Work place monitoring will be done.

1.3.2 Traffic

Approximately, 250 trucks per day carrying raw material and finished goods shall be using the national highway (NH 4) connecting Mumbai - Pune and JNPT.

From the proposed facility, approximately on daily basis, during peak hour, additional 93 PCU's will be merging into the existing traffic of MIDC Road and NH-4 respectively. The incremental traffic will lead to maximum PCU of 455 on MIDC Road & 3,335 on NH-4.

To ensure smooth traffic movement in the plant, proper in and out movement will be ensured. PUC certified vehicles, covered with tarpaulins, will be used.

1.3.3 Noise Environment

Using "SoundPlan" Modelling software, due to the proposed activities, Sound Pressure Levels (SPL), Noise level during day time & night time, in Industrial area, were within the CPCB standards i.e. Industrial area (75 dBA (d) & 70 dBA (n)).

The predicted cumulative incremental increase in Noise level shows that following:

- Incremental increase in core area of site shows incremental increases by only 0.2 dB(A) during day& night time.
- Beyond 100 m from the project area, increase in noise level is almost null.

1.3.4 Water Environment

By taking various recycling and reuse steps, surface water quality and quantity will not be affected by the proposed project. Only, during the heavy rainfall, there is a possibility of storm water to drain out from the factory premise which will meet the natural storm water drain. Hence, there will be minor impact on the surface water.

Following mitigation measures will be implemented to minimize the impact on the water environment:

- During construction phase, sewage will be disposed into soak pit and septic tank. Regular cleaning will be carried out.
- Zero Liquid Discharge shall be achieved by recycled and reuse of the treated waste water.
- Properly designed effluent drains with side barriers will be provided & inflow will be diverted to ETP followed by RO for necessary treatment.
- ETP sludge and RO salts will be disposed properly as per norms.
- Drip irrigation system will be proposed for greenbelt development to reduce fresh water demand.
- Process, chemical fuel storage and handling area will have proper bunds and dyke walls so that contaminated run-off cannot meet the storm-water line. In case of leakage, leaked fuel shall be immediately transferred to the spare tank;
- Use of PPE's during the collection, storage, handling and treatment of liquid waste.
- Rainwater harvesting from rooftop shall be done.

1.3.5 Land Environment

Expansion is proposed in the existing complex, which is in MIDC area. Hence, no change in land use is envisaged due to the proposed project.

- Soil contamination is envisaged in adjoining plots due to deposition of SPM, SO₂, NO_x & NH₃;
- Excess generation of hazardous and other solid wastes;
- Generation of scraps, used spares, cotton waste, hand gloves etc.;
- Soil Contamination due to Leakage of chemicals, fuel, raw material and waste water & sewage.

Following mitigation measures will be implemented to minimize the impact on the land environment:

Generated hazardous wastes during project operation will be transported to an authorized Treatment, Storage and Disposal Facility (TSDF) site and sent for incineration. Storage areas for hazardous waste, fuel & raw material are impervious and will be designed to prevent Leachate penetration. Consequently impacts on land / soil will be negligible.

1.3.6 Biological Environment

Greenbelt Development

Greenbelt will be maintained in 16% of the total plot area. Plantation will be carried out around periphery, near / around built-up areas and along internal roads of the project area every year.

1.3.7 Socio-Economic Environment

- The proposed activities shall generate indirect employment in the region due to the requirement of workers, supply of raw material, auxiliary and ancillary works, which would improve the economic status of the people.
- The activities would result in an increase in local skill levels through exposure to activities.
- As the existing loose / soft surface roads, may be upgraded to facilitate the movement of the heavy equipment required, the project in turn would lead to improvement in transport facilities.

DFPCCL will continue doing CSR activities in the field of Education, Medical & Health Facilities, Safe Drinking Water facilities, Infrastructure Facilities & Skill Development/ Training in nearby villages after consultation with collector and village panchayats.

1.4 ENVIRONMENTAL MONITORING PROGRAM

Various environmental parameters to be monitored are tabulated in **Table 1-2**.

Table 1-2: Environmental Monitoring Plan

S. No.	Environmental Component / Parameter	Frequency of monitoring	Location
1	CEMS Sensors (NH ₃).	Online	On stack attached with NPK Vents.
2	SPM, SO ₂ , NO _x & NH ₃ in stacks	Monthly	NPK Vents, ANP Prilling Tower, ANP Cyclone Separator, ANP Vacuum Pump.
4	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x & NH ₃ in ambient air.	Twice in a month at site & once in a season at Villages	1) 3 Locations in site 2) Valap Village 3) Devichipada Village
5	WPM for NH ₃ .	As per Factories Rules	At 5 locations within site and at Valap & Devichipada Village
6	Noise levels	Monthly	Main Plants and Utilities Area
7	Water consumed in various activities	Daily	Main intake, plant wise water supply

S. No.	Environmental Component / Parameter	Frequency of monitoring	Location
	and waste water generated from various areas of plants		line & effluent diversion line to ETPs.
8	Monitoring of wastewater inlet and outlet at ETP plants for the principal parameters (such as pH, SS, TDS, COD).	Daily	Stream wise inlet & outlet of ETPs
9	Surface water samples at nearby area. Parameters are essential parameters as per IS: 10500:2012.	Once in a Season	Valap Village Pond
10	Soil analysis for EC, pH, permeability and ESP	Pre & post monsoon / in the event of accidental spillage	At Site

Total cost of the project is ~ INR 190 Crore. Expenditure to be incurred by DFPCL on environmental monitoring and management shall include capital cost of ~ INR 1.975 Crore and ~ INR 0.19 Crore recurring cost (annually)

1.5 ADDITIONAL STUDIES

1.5.1 Risk & Hazards

In this study, toxic and flammable hazards are relevant. There is a possibility of failure associated with each mechanical component of the plant (vessels, pipes, pumps or compressors). These are generic failures and can be caused by such mechanisms as corrosion, vibration or external impact (mechanical or overpressure).

The range of possible releases for a given component covers a wide spectrum, from a pinhole leak up to a catastrophic rupture (of a vessel) or full bore rupture (of a pipe). For the purpose of QRA in an objective manner, representative failure cases are generated covering both the range of possible releases and their total frequency.

Accordingly, the following typical types of failures are considered:

- Minor Leak: 2 mm
- Medium Leak: 5 mm
- Major Leak: 10 mm

It can be concluded that due to 5 mm (medium) leak and 10 mm (major) leak in Ammonia storage Tank, toxic dispersion effect at IDLH concentration is going outside the plant boundary.

At Worst Case scenario of Ammonia Storage Tank Leak, maximum distance affected due to Toxic Dose effect goes far from the project site. However these areas will be manned every moment. Hence probability for occurrence of worst case scenarios will be negligible.

1.6 PROJECT BENEFITS

Due to establishment of the proposed project following benefits are envisaged for the locals and country:

- Benefit farmers for crop specific solutions as multiple grades (standard & fortified with micronutrients) can be manufactured;
- Reduce gap between demand and supply of fertilizers;
- Reduce the import quantity of NPK grade fertilizers, hence saving valuable foreign currency;
- Not require any additional land;
- No generation of waste water and air pollutants.
- Use existing infrastructure and utilities;
- Generate direct & indirect employment for local people.

1.7 ENVIRONMENT MANAGEMENT PLAN

Environmental Monitoring Plan for suggested mitigation measures and monitoring plan will include:

- Proper hazardous waste inventory accounting by HSE department;
- Monthly review by plant head in the production meeting;
- Monitoring for reduction in generation of hazardous waste quantity by director;
- Internal audit of hazardous waste storage area as per ISO system;
- Compliance of statutory conditions & reporting in environmental audit report;
- Reviewing time bound action plan for imparting training to drivers and availability of TREM cards.

An Environmental Management Cell with adequate professional expertise and resources shall be established to discharge responsibilities related to environmental management including statutory compliance, pollution prevention, environmental monitoring, etc.

1.8 CONCLUSION

Based on the EIA study conducted in Summer Season of 2016 (15th March, 2016 to 15th June, 2016), as per terms of reference given by EAC dated 21st September, 2016, the following highlight emerges:

- Project has various locational benefits like availability of raw material from nearby region;
- Site is well connected with ports, highway and railway;
- Strict adherence to all the applicable regulatory requirements will be complied with;
- Safety and environmental norms will be followed;
- Expansion project will have recycle & reuse schemes to reduce water consumption and achieve ZLD concept;
- Provision of air pollution control equipment, management of hazardous waste, will lead to minimum adverse environmental impacts;
- The project shall generate direct & indirect employment during construction & operation phase.

In view of this (above all points), the project may be considered for grant of Environmental Clearance.