EXECUTIVE SUMMARY

1.0 Introduction

The mandate for the planning, design, implementation of the irrigation projects rests with the I&CAD Department, Ministry of Irrigation, Government of Telangana. The Proponent for the proposed "Channaka-Korata barrage" on River Lower Penganga is "Irrigation & Command Area Development (I&CAD)" Department, Government of Telangana State. The main objective of I &CAD is creation and maintaining the irrigation potential of the State and the I&CAD shall make all efforts to plan, develop, conserve, utilize and manage the available water resources, in a judicious, equitable and sustainable manner. I&CAD has taken up the proposed Channaka-Korata barrage project is an interstate irrigation project to benefit the drought prone ayacut of uplands of the region in Adilabad District, Telangana State.

The proposed Channaka – Korata (Rudha) barrage is a joint project between the States of Maharashtra and Telangana state on River Penganga and it is independent of the joint Lower Penganga Project, envisages construction of a barrage across River Penganga on down stream of Lower Penganga Project to irrigate an ayacut of 6680.16 ha (5465.58 ha in Telangana and 1214.58 ha for Maharashtra).

Apart from the several project benefits, the Irrigation projects also effect adversely on the neighboring Environment of the proposed project. Hence these activities required to be well planned and should consider the environmental impacts. The Environmental Impact Assessment (EIA) is a technique which is necessary for identification, quantification and assessment of potential environmental impacts. Assessment of these impacts should commence early in the planning process of the project to enable full consideration of alternatives and to avoid later delays and complications in the proposed project. The present environment impact study was carried out as per the MoEF EIA Notification, 2006,subsequent guidelines thereof and approved ToR issuded by EAC, MoEFCC. The ToR issued by MoEF and their compliance is given in **Annexure -1.**

2.0 Project Description

2.1 Background

The Channaka-Korata (Rudha) barrage is located on Penganga River near Channaka village in Kelapur Tehsil of Yavatmal district in Maharashtra state and Korata village in Tamsi Mandal of Adilabad district of Telangana State. The proposed dam across Lower Penganga river at the following coordinates.

Longitude	:	78° 31′ 30″ E
Latitude	:	19° 49′ 19″ N

The benefits from the project accrue in Yavatmal district of Maharashtra and Adilabad district in Telangana. The free Catchment area for Barrage is 1338.1852 km2. The annual gross yield is assessed as 321.96 million m^3 (11.37 TMC) at 75% dependability (Approved by CE, Hydrology, I & CADD, Telangana). The storage capacity of the project is 23.474 million m^3 (0.829 TMC) and proposed to utilize 42.48 million m3 (1.5 TMC) in the ratio of 80:20 i.e. 33.98 million m^3 (1.2 TMC) for Telangana state and 8.5 million m^3 (0.3 TMC) for Maharashtra state. The Pump House, 23.025m x 9.80m, houses 4 Units of Vertical Turbine pumps/ motors.

2.2 Project Features

The major components of project are Barrage, Reservoir, Pump House, Pressure mains, Approach bund and Canal network. A Broad crested type Barrage is designed with a length of 287.5m having 20 vents/Gates. The Pump House is located at U/S of Barrage near Hattighat village, to lift 4.50 Cumecs of water from Barrage. An approach channel 120 m long connects the fore bay of the pump House to the river bed level. Vertical Turbine pumps (4 Nos) are proposed to lift the water through MS pressure mains. The power required for lifting the water will be 7.68 MW. The Salient features of the proposed Channaka-Korata barrage Project for Telangana portion are given

Table-1.

Table -1: Salient Features of Channaka-Korata barrage

	HEAD WORKS/BARRAGE	
A	**Location**	
	Latitude	19° 49’ 8.19” N
	Longitude	78° 31’ 7.30” E
	District	Adilabad
	Mandal	Tamsi
	Village	Korata
B	**Watershed**	
	River	Penganga
	Free catchment area	133804.2 Ha
C	**Barrage**	
	Type	Barrage with vertical lift gates
	Total Length	287.50 m
	Maximum height	6m
	(a)above FRL and (b)above MWL	+213.000m, +218.10m
E	Reservoir	
	FRL	+213.00m
	MWL	+218.10m
	Dead storage level	+203.00m
F	**Submergence**	
	Area under submergence	31.77 Acres
	Private land	31.77 Acres
	Forest land	NIL
	Govt.land	NIL
	Total villages affected	NIL
H	**Pump House:**	
	Location	U/S of Barrage at Hattighat village
	Peak demand	4.47cumecs
	No of vertical turbines	4nos

	HEAD WORKS/BARRAGE		
	Total Capacity of the pumps	4.5cumecs	
	Power required	7.68MW	
I	**COMMAND AREA/CANAL DISTRIBUTION**		
	Reach Ayacut	5,462.870 Ha (CCA) 10,442.913 Ha (GCA)	
	Water Requirement	4.50Cumecs	
	Designed for water	4.53cumecs	
	Length	3,360m	
J	Cost of the Project Cost of the EMP	Rs. 399.16 Crores RS. 7.105 Crores	

2.2.1 Project Benefits

- The Channaka- Korata Project is designed to serve command area and benefits drought prone upland areas and backward district of Adilabad in the state of Telangana.
- In Telangana portion the command area completely lies in three Mandals of Adilabad district which covers the 14 villages and population of 17340.
- Most of the command area belongs to un-irrigated dry lands. The Channka-Korata barrage project is targeted to Develop Culturable Command Area (CCA) of 5,465.870 Ha and Gross Command Are (GCA) of 5,967.55 Ha.
- The project costs would be reduced as the command area is to be developed following gravity system after pump house.
- The 4.5 cumecs of water for irrigation is proposed to be lifted from the barrage and delivered at elevated place and will be carried through gravity canals.
- There is no forest land requirement involved in the development of the project.
- The Benefit Cost (B.C) ratio for this joint project is 1.60.

3.0 Base Line Status of Project Site

The Baseline Data was collected for covering Post monsoon, Winter & Summer Seasons from October 2016 to June 2017. M/s. Vison Labs, Hyderabad (A laboratory Recognized by Ministry of Environment & Forests, Government of India, S.O. 1680 (E), Dated 02.07.2014 and also Accredited by NABL) was engaged for the baseline data generation. The environmental attributes covered for the study include ambient air quality, ground and surface water quality, noise levels, land environment including soil quality, land-use pattern, forest cover, biological environment, socio-economic and health status of the population, demography and quality of life. The primary and secondary data of the stated parameters were collected and analyzed.

The Team of Experts from M/s. Aarvee Associates, approved by Quality Council of India (QCI) - National Accreditation Board for Education and Training (NABET), visited the site during the month of the May, 2017.

After a preliminary reconnaissance of the study region and taking into account the meteorological (predominant wind directions, wind speed) & topographic conditions, traffic volume, major settlements in the study region, Six (6) stations are identified for carrying out Ambient Air Quality Monitoring (AAQM) in the study area spread along the project corridor of 4.0 Kms along the WCS

alignment. The criteria adopted for selecting the monitoring stations, sampling and analysis was carried out as recommended by IS: 5182 and CPCB

The Air Quality data for the study period was collected at each location on 24 hourly basis twice in a week for one season as per national guidelines. The parameters selected for analysing ambient air quality status were Sulphur dioxide (SO_2), Nitrogen Dioxide (NO2), Particulate Matter (PM_{10}), Particulate Matter (PM2.5) and Carbon Monoxide (CO). The data reveals the following findings as described below.

All the stations where AAQM was carried out falls under residential category. The recorded concentrations are compared with the latest National Ambient Air Quality (NAAQ) Standards as notified by CPCB. Monitoring was carried out for all the three seasons of the year. However, the following are the AAQ analytical results obtained during post monsoon period.

- The highest PM10 value of 30.7 µg/m3 was observed at Korata village and Lowest value of 16.2 µg/m3. was observed at Ghubadi village. It can be observed that both the values are well within the 24 hour average limit of 100 µg/m3 suggested by NAAQS. It can also be seen that the values are well within the annual limits too.
- The highest Sulphur Di-oxide value of 4.9 µg/m3 was recorded at both Pippalkhoti and Korata and Lowest value 4.0 µg/m3 was recorded at Korata,Ghubadi,Kodori and Akoli. The SO2 values observed at all the locations are below the 24 hours average standards suggested by NAAQS for residential and industrial areas which is 80 µg/m3.It can also be seen that the values are well within the annual limits too.
- The maximum Nitrogen Di-oxide (NO2) value observed was 15.2 µg/m3 which was recorded at Korata village and minimum value of 8.7 µg/m3 was recorded at both Kodori and Akoli villages. The NO2 values observed at all the locations are below the 24 hours average stipulated for residential category by NAAQS which is 80 µg/m3.It can also be seen that the values are well within the annual limits too.
- The CO concentrations at all the locations are less than 1 mg/m3 which is well within the NAAQS limit of 4 mg/m3.

The ambient air quality levels for all the parameters monitored are well within the CPCB standards. This may due to the fact that the land use pattern of the study area is residential with no major industrial or commercial activities.

3.2 Water Environment:

During the study period nine (9) Surface water samples were collected for assessing the water quality. Samples were identified considering proximity to the project site, their activities and depending upon its utility by the people in the region. Analysis was done for selected physico-chemical parameters along with bacteriological indicators of pollution have been used for describing the baseline status of water environment. Sampling was carried out for all the three seasons of the year. However, the following are the water quality results obtained during post monsoon period.

- The surface water samples collected from the various sources showed pH value ranging in between 7.62-8.42 during the post monsoon period. Some of water samples were observed to be slightly turbid. The analysis results show that the hardness values are in the range of 100 to 200 mg/l.
- The Fluoride values are observed to be less than the prescribed limit of 1.5 mg/l and are in the range of 0.2 to 0.3 mg/l which is also below the minimum requirement.
- The Dissolved Oxygen values are in the range of 2.3 to 7.5 mg/l. At three locations SW-3(River Lower Penganga near Proposed Barrage), SW-6(Lake near Pippalkhoti Village) and SW-7(Stream near Pendalwada Village), The dissolved oxygen levels were found to be less than the requirement which can affect aquatic life.
- The BOD values are showing higher values at locations SW-2(River Lower Penganga near Chanka Village; u/s of proposed barrage), SW-4(River Lower Penganga near Kodori

highway; d/s of Proposed Barrage), SW-6(Lake near Pippalkhoti Village) and SW-7(Stream near Pendalwada Village). Highest BOD value of 38mg/L was observed at SW-6(Lake near Pippalkhoti Village). COD values found to be varying between 12-126 mg/L. The highest COD was observed at the location SW-6(Lake near Pippalkhoti Village).

- The concentration of soluble salts in irrigation water is vital for type of crops to be grown, crop growth and health. Some category of plants have significant tolerance to these concentrations. These soluble salts concentrations can be expressed in terms of Electrical Conductivity (EC). The EC values are varying in the range 358 µS/cm to 496 µS/cm which is very low. The water with salinity in this range can be safely used for irrigation purpose.

Overall, the surface water quality is observed to be satisfactory and mostly matching with the IS:2296 Standards. The water can be utilised for irrigation purpose.

3.3. Ground Water Quality

Ground Water is one of the main sources of water in the project corridor for domestic, commercial and other irrigation use hence the rate of extraction of ground water is at a moderate scale. For assessing the ground water quality in the study area, seven (7) samples were collected from the identified bore wells/dug wells. Sampling was carried out for all the three seasons of the year. However, the following are the water quality results obtained during post monsoon period.

- The Ground water samples collected from the various sources showed pH value ranging in between 6.85 to 7.55 during the post monsoon season. Water quality analysis also shows the hardness values are in the range of 150 to 400 mg/l. The Fluoride values are in the range of 0.42 to 0.8 mg/l which is well with in the limits.
- The Chloride concentration in the samples collected varied between 25-165 mg/L which is well below the desirable limit a per Is 10500.
- The concentration of soluble salts in irrigation water is vital for type of crops to be grown, crop growth and health. These soluble salts concentrations can be expressed in terms of Electrical Conductivity (EC). The EC values are varying in the range 696 µs/cm to 1488 µs/cm which is a low value.
- The Total Dissolved Solids concentration are exceeding the Desired limits in all the samples collected except GW-7 (Rudha village). But all the values are well within the stipulated Permissible limits. Similarly the Total Hardness in all the samples is found to be within the Permissible limits, where as in GW-1 (Korata village) the observed hardness satisfy the desirable limit too.
- The Sodium concentrations in the analyzed samples are in the range 31.7 to 268.2 mg/l.
- The Alkalinity levels are in the range of 260 to 520 mg/l which are exceeded the desirable limits but within the permissible limits of Ground water quality.

As a whole, the ground water quality is complying with Regulatory norms in most of the cases. The water quality of the study area is suitable for usage in irrigation purpose.

3.4 Noise Environment

The noise levels were monitored at ten (10) locations. Precision integrating microcomputer controlled sound level meter having statistical unit with digital display was used for ambient noise level monitoring. The noise monitoring locations and levels recorded during post monsoon L_{eq} Max, L_{eq} (day) and L_{eq} (night) are given below:

It has been observed that all the values obtained during the study period are well within the CPCB standards prescribed for residential areas during day and night times except the location Hathighat pump house. At Hathighat pump house the day time and night time noise levels are well above the CPCB limit. The Leq day & Leq night values recorded are in the range of 40.6-64.1 dB(A) and 32.5-50.5 dB(A) respectively. The highest night time noise level value which was observed at Hathighat pump house was 50.5 dB(A).

3.5 Biological Environment

According to Champion and Seth classification of forests 1968, the forest type in study area falls in dry deciduous forests and the area falls in hot arid climatic zone. As per the vegetation analysis to determine the species density, abundance and dominance, the plant species *Tectona grandis* known to be dominating over other species with a Shannon wiener index of 2.4.

The main constraint in the project is the barrage site falls within 10 Kms from the Arli Reserved forest and Tippeshwar Wildlife Sanctuary. The details of the same are given below:

4.0. Impacts Identification and Prediction

This section summarizes the pollution potential of the proposed Channaka korata barrage Project and its possible impact on the surrounding environment during construction and operational phases.

4.1 Impact on Air Quality

The project is mainly envisaged for construction of barrage, pump house, WCS of length 3.36 km will involve earth excavation, back filling and concreting. Impacts on air during the construction phase could be due to construction activities such as earth excavation, back filling and transportation of construction materials etc. The usage of D.G sets for power backup will generate air emissions. These activities will lead to increase in the air pollutant levels. The construction material requirement of sub-grade, aggregate and concrete necessitates establishment of temporary stone crushers, new barrow areas and batch mixing plants. These activities will also cause air pollution discreetly. These impacts are temporary and spatially limited to construction area and its surroundings.

Mitigation Measures:

- Batch mix plants shall be located away from the inhabited areas, residential settlements and water bodies.
- Trucks and tippers carrying earth for filling, sand, gravel or stone will be duly covered with Tarpaulin sheets to avoid spilling.
- Dust level at the construction sites shall be controlled by sprinkling water on haulage roads twice in a day.
- Construction material, machinery and equipment will be maintained in a good working condition and shall be handled with due precaution and only by trained professionals.

4.2 Impact on Water Quality

As irrigation projects are built across river systems the impacts during construction stage would lead to low flow regime, sediment load, disturbance of aquatic ecology etc. The construction of project components barrage, reservoir, WCS may contaminate run-off water, natural drains by way of sediment load and other water pollutants leading to pollution in the downstream surface water bodies. WCS construction may necessitate disturbance of drainage pattern and local hydrology. The water requirement for the construction activities will be met from surface water sources i.e., River Penganga and other water bodies along the canal with prior approval from the concerned authorities. The abstraction from these resources will be temporary and will have marginal impact.

- The mitigation measures include proper disposal of water and other liquid wastes arising from construction.
- The streams and drains shall be kept free from dumping of muck / solid wastes and earth material at least 500m away from the steam.

4.3 Impact on Noise Quality

The impact of noise levels from the project on the neighboring communities anticipated with the construction activities. During construction, the major sources for noise pollution will be D.G sets, movement of vehicles transporting the construction materials to the construction yard and service

roads. Besides the noise generating activities at the yard such as blasting, construction equipment activity, stone crushers and batching plants are the other sources of noise generation. The noise generated during excavation, loading and transportation of material near the crushers, batching plants will affect the construction personnel and other nearby habitations in the area. However, these noise impacts are temporary, marginal and localized in nature. The Mitigation Measures:

- The required mitigation measures include location of construction equipment at least 250m away from inhabited areas. In addition construction workers will have to be provided with protection devices like earplugs.
- Other ancillary measures include maintenance of equipment in good condition, proper design of engine enclosures. Project activities shall coincide with periods when people would be least affected. Construction activities shall be strictly prohibited between 10pm and 6am in residential areas.

4.4 Impact on Soil quality

The project involves excavation of soil/ sand along the WCS. The excavated soil has to be disposed properly to avoid significant negative impacts. The loss of productive top soil is anticipated during construction. As the project is spread over 89.09 Km in discrete stretches the possibility of indiscriminate disposal of construction debris may lead to chocking of natural drains and contamination of soil. The mitigation measures are:

- It is estimated that the 15.28 Lakh Cum of soil (earth and rock) generation in the project.
- The solid waste generated in construction yards, labour camps may cause soil contamination if disposed in indiscriminate manner. Hence, the same shall be collected disposed in identified dump sites in hygienic manner.
- The construction activity will also generate hazardous waste like waste oils, used batteries, empty cans etc. These wastes should be collected, handled and disposed as per the Hazardous Waste (Management & Handling) Rules, 1989.

4.5 Impact on Biological Environment

i. Impact on Flora:

The construction of gravity canal, distributaries, sub-distributaries for a length of 30.0 Kms might require felling of about 300 nos. falling within the Right of Way of the Canal. These are all ubiquitous species. The impact due to felling of trees will be compensated in through the proposed avenue plantation programme. There are 8000 nos. of trees proposed to be replanted in the project along the canal distributaries and sub-distributaries. The mitigation measures suggested are:

- Plantation programme shall be promptly adopted to restore and further enrich the loss of vegetation.
- Plantation with an appropriate mix of indigenous and especially suited species shall be carried out along the corridor. The number of plants proposed to be planted is 8000 nos.
- Local plant varieties especially, soil bounding species will be planted near to the constructed aqueduct and also in the surroundings in order to hold the soil tightly.

ii. Impact on Fauna:

During the construction, no impact on the wildlife is anticipated as necessary precautionary measures will be taken up during the construction activity near the forest. The mitigation measures are:

- Awareness programmes shall be conducted in the command area as well as construction labours in the form of seminars/workshops/exhibitions.
- Define the construction boundary near Sanctuary peripheral area, and shall be provided with hoarding/notice boards/sign boards for the restriction of movement of construction labours/local

public.

- Construction camps shall be put 10 Kms away from the Tippeshwar Wildlife Sanctuary boundaries.
- The construction activity across the reserve forests shall be taken up during day time only.
- Project Authorities shall make periodic visits to meet Forest authorities to obtain their approval/suggestions during construction and operation of the project.
- Necessary noise mitigation measures as mentioned above shall be strictly implemented.
- Vehicles under PUC checkup only be used during construction activities to minimize air emissions.

4.6 Conclusions of Major Environmental Impacts

The proposed Channaka-Korata project would result in a number of positive permanent impacts on availability of irrigation water, drinking water, increasing in ground water table, and aesthetics and social-economic of the region. The adverse impacts anticipated are marginal, temporary and reversible mainly during Land acquisition and construction period. These adverse impacts can be mitigated by adopting suitable mitigation measures and allocation of the Budget for implementation.

5.0 Environmental Management Plan

The Environmental Management Plan (EMP) states the procedure in which the project proponent would carry out the implementation of the mitigation measures and ensures compliance with environmental regulations that are binding on the project. EMP is prepared based on assessment of adverse impacts due to the proposed activity. The EMP is also drawn after due consultation with the Project Proponent (I&CAD), Engineering Designers and other relevant authorities. The EMP team reviewed the best management practices adopted to mitigate environmental impacts in similar projects to opt the best options available.

This plan also specifies the organizational requirements and institutional strengthening necessary for sound environmental management of the project. The major components of the EMP are:

1. EMP implementing Agency,
2. Monitoring of the EMP implementation,
3. Training on Environmental management,
4. Budget for EMP implementation.
5. Disaster Management Plan

5.1 Monitoring of EMP implementation

For an effective implementation of EMP, it is proposed to have two level monitoring. The first is internally by the top management of Contracting Agency/Consulting Engineer and the Second one by I&CAD Department, Government of Telangana State. I&CAD shall supervise all activities and accordingly advise the Contracting Agency to improve on areas where any short comings are observed. I&CAD shall keep a record of all information and shall suggest suitable measures to be adopted by Contracting Agency if any aspect is found to be deviating from the anticipated values/ standards. Monitoring shall be carried out during construction and operation phases. This review by I&CAD and top management of contracting agency will make the EMP implementation more effective.

5.2 Environmental Management Cell

The Environmental Management Cell (EMC) will be set-up to look after all the environment-related activities in the site. This cell will be responsible for regular environmental quality monitoring and liaison with Regulatory bodies like TSPCB and MoEF. The cell should be headed by Project Officer / Manager along with supporting staff and workmen.

Functions of EMC:

- To monitor compliance with environmental regulations.
- Continual improvement in environmental performance.
- To ensure systematic and routine housekeeping to reduce generation of pollutants.
- To develop and maintain green belt.
- To keep up with regulatory requirements and arrange for the necessary certificates or consents viz., water and soil etc.,
- To conduct yearly environmental monitoring and submit the statement to TSPCB.
- Upto date monitoring should be maintained and performance / operational records be kept by the team.

5.3 Costs Towards Implementation of Environment Management Plan

The total budget for implementation of EMP works out to be Rs. 7.105 Crores which includes Corporate Social & Environmental Responsibilities (CERs). Tentative EMP budget is given in Table -2.
The main components are:

- Compensatory Afforestation.
- Dust suppression system.
- Tree plantation / Transplantation, if necessary.
- Environmental monitoring during construction and operation phase.
- Training during construction and operation phase.
- Corporate Social & Environmental Responsibilities (CERs).

Table -2: Tentative Budget for Implementation of EMP

S.No.	Item	Unit cost/ Lump sum cost (Rs.)	Total cost (Rs.)
I. Logistics cum Administrative costs			
1	Vehicle cost	@ Rs 40,000 per month for 20 vehicle months	8,00,000.00
2	Office administration (including man power costs) and logistics etc for Environment Management Cell (EMC)	For 24 months @ Rs.1,25,000/ month	30,00,000.00
II. Construction costs			
3	Sanitation- sulabh – sowchalaya 16.5 sq.m area (Included in project cost)		10,00,000.00
4	Dust suppression all along the stretch twice in a day for two years (300 days x 2 years x 4 tanks = 2400 x Rs. 400 = Rs.9.6 Lakh		9,60,000.00
5	Erosion control Retaining walls, slope pitching and turfing. (Included in project cost)		30,00,000.00
6	Labour camps, health & safety and other services (Included in project cost)		30,00,000.00
7	Solid waste management (Included in project cost)		10,00,000.00
8	Maintenance of Drainage Pattern in Command Area		50,00,000.00
9	Traffic Management		10,00,000.00
10	Identification and surveillance of Disaster Management Plan of Canal		25,00,000.00
III. Tree plantation and compensatory afforestation			

S.No.	Item	Unit cost/ Lump sum cost (Rs.)	Total cost (Rs.)
11	Compensatory Tree plantation along the service road of the canal having length of 30kms and administrative building area (8000nos of trees x Rs. 1000/- per tree including 5 years of maintenance)		96,00,000.00
IV. Monitoring costs : Construction Phase			
12	Air Quality Monitoring (06 Monitoring stations) once in a season during the construction period - (06 Stations x 3 Seasons x 2 Years)	Rs.6,000 per station	2,16,000.00
13	Noise level Monitoring (10 Monitoring stations) once in a season during the construction period - (10 Stations x 3 Seasons x 2 Years)	Rs.1500 per station	90,000.00
14	Water Quality sampling locations (16nos) once in a season during the construction period - (16 Stations x 3 Seasons x 2 Years)	Rs.6000 per sample	5,76,000.00
15	Soil Quality sampling locations (15 nos) once in a year during the construction period - (15 Stations x 3 Seasons x 2 Years)	Rs.6000 per sample	5,40,000.00
16	Awareness/ Training programmes (Lumpsum)	5,00,000	5,00,000.00
V. Monitoring costs: Operation Phase			
17	Air Quality Monitoring (06 Monitoring stations) twice in a year (other than monsoon season) -(06 Stations x 2 Seasons x 1 Year)	Rs.6,000 per station	72,000.00
18	Noise level Monitoring (10 Monitoring stations) twice in a year (other than monsoon season) -(10 Stations x 2 Seasons x 1 Year)	Rs.1500 per station	30,000.00
19	Water Quality sampling locations (16 nos) twice in a year (other than monsoon season) -(16 Stations x 2 Seasons x 1 Year)	Rs.6000 per sample	1,92,000.00
20	Soil Quality sampling locations (15 stations) once in a year (other than monsoon season) -(15 Stations x 2 Seasons x 1 Year)	Rs.6000 per sample	1,80,000.00
VI. Corporate Social & Environmental Responsibilities			
21	Upgradation of Schools in the project command area (20 schools x 3.0 lakhs)	LS	60,00,000.00
22	Upgradation of PHCs (10nos x 5.0 lakh/PHC)	LS	50,00,000.00
23	Community toilets and sanitary facilities (30nos x 1.5lakh/Toilet)	LS	45,00,000.00
24	Skill Development Centres	LS	50,00,000.00
25	Corporate Environmental Responsibility	LS	1,00,00,000.00
Sub Total			**6,02,16,000.00**
GST Tax @ 18.00 %			**1,08,38,880.00**
Grand Total			**7,10,54,880.00**

6.0 Summary and Conclusions

The EIA for the proposed Channaka-Korata Barrage Irrigation project has been prepared based on approved ToR issued by EAC, MoEFCC and EIA manual for Irrigation projects issued by MoEFCC. This project shows several positive impacts along with the few adverse impacts as described in the previous chapters. The identified and quantified significant project & environmental impacts/ issues are summarised and concluded below:

- Both the Governments of Telangana and Maharashtra have entered into an agreement to utilize the available water (42.67 TMC) on River Penganga and its applicable costs in 88:12 ratio respectively and the water share implies to 37.55 TMC to Maharashtra State and 5.12 TMC to the present Telangana State to irrigate an ayacut of 1,99,962 Ha in Maharashtra and 19,232 Ha in Telangana State. The Channaka-Korata Barrage is one of the project proposed on Lower Penganga river basin, among other projects proposed by Governments of Telangana and Maharashtra. It is an Inter-state Irrigation Project between Maharashtra and Telangana State.
- This project is enable to utilize allocated 33.98 Mcum (1.2 TMC) for Telangana portion and 8.495 Mcum (0.30 TMC) for Maharshtra portion. The proposed command area of the barrage is 5,465.870 ha of CCA for Telangana Portion and 1,214.575 ha of CCA for Maharashtra Portion. The project also provides 5,967.55 ha of GCA for Telangana portion 1,798.38 GCA ha for Maharashtra portion.
- There is limited area of submergence of 31.17 ha due to the proposed barrage. Overall land requirement for the project is 125.57 from the minimal project affected persons (PAPs) of 283 nos due to the proposed project. The Government of Telangana has already acquired the complete land with the estimated R&R budget Rs. 17.8 Crores.
- There is no forest land & Tippeshwar Wildlife sanctuary in the study area, is situated in Yavatmal district of Maharashtra, which is located at a distance of 2.39 Kms from the proposed barrage project in Telangana. Hence the project requires NOC from National Board of Wildlife (NABL), MoEFCC as the project activities barrage/pump house/ canal network falling within 10 Kms radius of the boundary of National Parks and Wildlife Sanctuary. (Ref: MoEFCC office memorandum on 2nd December 2009 indicating that Environmental clearances for all such projects that fall within 10kms boundary of the National parks and Wildlife sanctuaries).
- The command area development plan is designed in such a way that make up maximum culturable command area with minimal displacement of humans/livestock along the project corridor. Eventually, the project reduces agrarian distress prevailing in the project area i.e., Telangana for the last two decades.

- The ambient air quality levels for all the parameters monitored are well within the CPCB standards. This may due to no industrial/mining/commercial activities prevailed in the study area.
- As a whole, the Water and Soil Quality is complying with Regulatory norms in most of the cases. The water quality of the study area is suitable for usage in irrigation and the same waters can be used for drinking purposes after disinfection.
- The proposed Channaka- Korata barrage project would result in a number of positive permanent impacts on availability of irrigation water, drinking water, rising of ground water table, and aesthetics and social-economic status of the region. The adverse impacts anticipated are marginal, temporary and reversible mainly during Land acquisition and construction period. These adverse impacts can be mitigated by adopting suitable R&R package and suitable mitigation measures.
- There will be a positive impact on On Farm Development (OFD) works due to construction of distributory channels will serve the water till tale end of the command area and also the command area less than 40 ha will be served. An amount of 247.5 lakhs is included in the capital cost of the project towards OFD works.
- Irrigation concerned departments such as Agriculture, I&CAD, Soil conservation etc., shall consider the soil characteristics while preparing the management plan for crop rotation, optimization of water usage & agro chemicals etc., Gravity canals must be de-silted frequently as sedimentation is anticipated due to the run-off water.
- As the command area is having undulating topography, the most of the canals including Main, distributory & sub distributory were proposed on the ridge of the area. This layout reduces cost of canals and the cross drainage works. To fully utilize the allocated water share, the present Telengana Government is proposed to construct a gravity canal of 3,600 meters km long from the off take point. The allocated water is proposed to be utilized for irrigation purpose in the backward tribal areas of Adilabad district.
- Two level monitoring plans is proposed for an effective implementation of EMP. The first is internally by the top management of Contracting Agency/Consulting Engineer and the Second one by I&CAD Department. An amount of Rs. 7.105 Crore is allocated towards the implementation of EMP in the project, which includes Rs. 2.05 crores towards the Corporate Social Responsibility (CSR) and Rs. 1.00 Crores for Corporate Environmental Responsibility (CER).