BRIEF SUMMARY OF THE PROJECT

Environmental Impact Assessment/ Environment Management Plan for Obtaining Environment Clearance from Regulatory Authorities for Proposed Lower Penganga Inter State Irrigation Project, Adilabad District of Andhra Pradesh.

1.0 Aim of the Project and Description of the Works

The Lower Penganga project is a joint project between the states of Maharashtra and Andhra Pradesh on River Penganga. An understanding was reached between the states of Maharashtra and Andhra Pradesh on 6th October 1975 to take up Lower Penganga Project as an inter-state joint project. As per the agreement dated 7-8-1978 reached between the states of Maharashtra and Andhra Pradesh, the state of Maharashtra can use all the waters of River Penganga up to Lower Penganga project site near Chikal Wardha village subject to the condition that the Lower Penganga Project is taken up as a joint project. Joint meetings were held during 1978-84 to clear techno-economic issues and sharing of costs of common portion of works. Maharashtra Government prepared a Detailed Project Report for the joint project and submitted the same to Central Water Commission for clearance. The net annual 75% dependable flows at Lower Penganga dam are assessed as 1208 MCum (42.67 TMC) to be shared in the ratio of 88:12 between Maharashtra and Andhra Pradesh, which implies that the share of Maharashtra is 1063.2 MCum (37.55 TMC) and that of Andhra Pradesh is 145.0 MCum (5.12 TMC). The Andhra Pradesh share of water is proposed to be utilised for irrigation purpose in the backward tribal areas of Adilabad district. As per the DPR prepared by Maharashtra Government for the joint project, the project creates an irrigation potential of 199962 Ha(GCA) or 1,40,818 Ha(CCA) in Maharashtra and 29757 Ha (GCA) or 19232 Ha (CCA) in Adilabad district of Andhra Pradesh. The Maharashtra Government submitted the Detailed Project Report for the joint project including the portion of Andhra Pradesh to Central Water Commission for clearance.

2.0 Environmental Clearance Status for Maharashtra Portion of the Project

The proposal for the Maharashtra portion was considered by the Expert Appraisal Committee for River Valley & Hydro-electric projects in its meeting held on 21st February, 2007 and on 22nd March, 2007. Initially the project was accorded environmental clearance during 1984. At present the project for Maharashtra portion is under construction. The works of 35.63 m high earthen dam across River Penganga with central gated masonary spillway at about 2 Km upstream of Tadasoli village, Ghatanji Tehsil of Yavatmal district are in progerss. The project will irrigate 1,40,818 Ha in Maharashtra. The total land requirement for the project is 18,826 Ha, which includes 17,186 Ha of private land, 996 Ha of forest land and 644 Ha of Government land. The number of Project Affected villages is 46 out of which 32 villages will be fully affected & 14 villages will be partially affected and the number of project affected families is 8136 in Maharashtra State. The Maharashtra portion has got all relevant clearances from the competent authorities. The maximum and minimum distance of canal alignment from the boundary of Tipeshwar Wildlife Sanctuary is about 17.5 Kms. and 2.0 Kms respectively. **The Ministry of Environment & Forests (MoEF) has already accorded the Environmental Clearance for dam and command area portion of Maharashtra State and the project is under execution stage.**

As per the instructions of MoEF vide letter no. J.12011/68/2006-IA.1, dated: 17.05.2007, I & CADD, Government of Andhra Pradesh has to apply for Environmental Clearance for the command area of 19232 Ha of CCA in Andhra Pradesh portion. The Andhra Pradesh portion neither involves submergence nor the Project Affected Families (PAFs).

3.0 Objective:

The objective is to carry out the Environmental Impact Assessment (EIA) study to identify, predict and evaluate potential environmental, socio-economic effect, which may result from proposed “Lower Penganga Interstate Irrigation Project command area in Andhra Pradesh portion” and develop suitable Environment Management Plan (EMP) to mitigate the undesirable effects. The EIA is mandatory in the environmental clearance process of any developmental activities.

The study is aimed at:

a) Establishing the existing environmental conditions, identifying potential environment impacts and areas of significant environmental concerns due to the proposed project;

b) Prediction of impacts on Land, water, public health and socio-economic conditions etc. due to the proposed project

c) Preparation of Environment Management Plan (EMP); and

d) Development of post project environment monitoring programme

Since this is development of new ayacut and creates an irrigation potential of Gross Command Area under this canal will be 29757 Ha and CCA will be 19232 Ha. in Adilabad district. There is no submergence of forest or other land is involved. This project attracts Item 1(c) (ii), Category-A of the Schedule (As per new notification 14th September 2006.). Hence, the Terms of Reference (TOR) for carrying out (EIA) studies on the basis of the preliminary environment studies/analysis are developed for screening, scoping and ratification by Expert Appraisal Committee to complete the EIA studies and to proceed for environmental clearance process as per notification.

4.0 Project Description:

The Lower Penganga Project envisages construction of a dam across Penganga river with central gated concrete spillway from RD 870 to RD 1245 m with 25 nos of radial gates of size 12 m X 8 m and earth dam on both flanks of concrete dam across Penganga river and canals on left and right flanks. The total length of dam including spillway is 1988m.

The total catchment area up to the dam site is 17983 km ^{2}. The gross storage of the reservoir is 1045.37 Mcum at FRL of +261.5 m. The water spread area at FRL is about 162 km$^{2.}$

As per the DPR prepared by Maharashtra Government for the joint project, the project will irrigate 175760 Ha (CCA) of land as detailed below.

Description	GCA (ha)	CCA (ha)	ICA (ha)	Total (ha)
By gravity canal				
RBC upto 72km	56449	55159	41095	74546
LBC upto 96km	19531	15625	14219	
A.P upto 54km*	**24700**	**21017**	**19232**	
(* *The scope of A.P portion (Length of main canal and ayacut) is since changed as per the DPR now being prepared by A.P)*				
By Lift				
Parwa LIS	55013	44010	40050	85504
Kali LIS	54881	43905	39954	
Mukutban LIS	7555	6044	5500	
Total	218129	175760	160050	

The command is in Yavatmal district of Maharashtra through left bank canal and three lift irrigation schemes up to 96km. Further 41095 Ha of land will be irrigated in Chandrapur district through right bank canal off taking at tail end of LBC and crossing the river by an aqueduct. Another 19232 Ha. of land will be irrigated in Adilabad district of Andhra Pradesh.

The Andhra Pradesh link right bank canal takes off at CH.11.91 km of LBC. The Andhra Pradesh canal will be of 1925m length up to the left bank of river Penganga. An aqueduct will be constructed across Penganga River. Maharashtra Government will take up the Andhra link canal works upto the right bank of Penganga River including the aqueduct. The gravity canal of Andhra portion will be **89.09** km long from the off take point.

Salient features of the joint Lower Penganga Project as per the Detailed Project Report prepared by Maharashtra are given below.

Salient Features of Lower Penganga Project

	HEAD WORKS :	
A	**Location**	
	Latitude	19 ^{o} – 54` - 30" N
	Longitude	78 ^{o} – 12` - 30" E
	Toposheet No	56-I/1
	District	Yavatmal
	Tahsil	Ghatanji
	Village	Tadsaoli
B	**Watershed**	
	River	Penganga
	Catchment area upto Dam	17983 km^2
	Free catchment area	7843 km^2
	75% dependable gross yield at project including regeneration	1565.85Mm^3 or 55.33 TMC
	Net 75% dependable yield at dam site	1208.28Mm^3 or 42.67 TMC
C	**Dam**	
	Type	Earthen Dam
	Total Length including spillway	1998m
	Maximum height	35.63m
	Free board (a)above FRL and (b)above MWL	(a) 4.5m and (b) 2.5m
D	**Spillway**	
	Type	Ogee
	Length	405m (CH.855m to 1260m
	Max.height From foundation	27.630m
	Crest level	253.50m
	Design flood	25160.38 cumec
	No. and size of gates	27 radial gates of 12m x 8m
E	**Reservoir**	
	FRL	261.5m
	MWL	263.5m
	TBL	266.00m
	MDDL	252.00m

	Dead storage level	249.00m	
	River bed level	230.37m	
F	**Submergence**		
	Area under submergence at FRL + 0.50m	15951.1ha.	
	Private land (cultivable)	14657.49ha	
	Forest land	746.67ha	
	Govt.land	546.94ha	
	Total villages affected	46 nos	
	Fully affected	32 nos	
	Partially affectd	14 nos	
	Total population affected	36809 SC.....5764, ST.....11076 OBC.....7358, Others.12611.	
	Total Buildings / Houses affected	8136 SC:1274; ST: 2448; OBC: 2787; OC: 866; Others: 761	
G	**Storage at FRL**		
	Gross	1045.37Mm^3 (36.92 TMC)	
	Live	864.80Mm^3 (30.54 TMC)	
	Dead	180.57Mm^3 (6.38 TMC)	
H	**CANAL WORKS (Maharashtra portion)**	Left Bank	Right Bank
	Type of canal	Linked	Linked
	Bed Width	13.10 m	8.30 m
	FSD	5.30 m	4.10 m
	Free Board	1.00 m	1.00 m
	Discharge	125.07 m^3/sec	55.53 m^3/sec
	Length	96 Km	72 Km

As per the detailed surveys and investigation carried out now, the scope of Andhra Pradesh Portion of the joint project is finalized. The salient features are given below.

Salient Features of Lower Penganga Project.(*Andhra Pradesh Portion*)

	CANAL WORKS :	
A	**Canal**	
	Off take point	CH.11.91 Km of LBC
	Length	89.09Km
	Discharge at off take	18.15 cumec
	Bed width	5.2m / 2.75m
	Side slopes	1 ½ : 1
	Bed fall	1 in 10000 to 1 in 9000
	Off take level (CBL)	245.31
	FSL	247.91
	No. of reaches	5
	No of distributaries	26
	No. of structures	172
B	**Land Requirement**	Privater Land : 500.48 Ha, Forest Land : 8.780 Ha **Total : 509.261 Ha**
C	**R&R**	A strip of an average land width of 57.16m is required throughout the gravity canal length of 89.09 Km. No Project Affected Families (PAFs) are involved in the project.
D	**Command**	
	GCA	29757 ha
	CCA	19232 Ha.
	GIA	31733 ha
	Number of district(s) benefitted	01 (Adilabad, AP)
	Number of Mandals benefited	4 (Tamsi, Adilabad, Jainad & Bela)
	Number of Villages benefited	89
	Total population benefited	76000
E	**Water allotment**	
	Total annual allotment to AP	145.0 Mm^3 (5.12 TMC)
	For Irrigation	139.39 Mm^3 (4.923 TMC)
	For Drinking water supply	5.58 Mm^3 (0.197 TMC)
F	**Submergence**	No submergence is involved in Andhra Portion of the project

4.1 Location Of Project Area

The Lower Penganga Dam is located on Penganga River near Tadsaoli village in Ghatanji Tehsil of Yavatmal district in Maharashtra at the following coordinates.

Longitude : 78^{o} 12' 30" E

Latitude : 19^{o} 54' 30" N

The benefits from the project accrue in Yavatmal and Chandrapur districts of Maharashtra and Adilabad district in Andhra Pradesh.

The Andhra Pradesh Link canal takes off from chainage 11.91 Km of the Left Bank Main Canal of Lower Penganga Project to serve new command in Adilabad district of Andhra Pradesh.

4.2 List of Villages Benefitted

In Andhra Pradesh portion the command area completely lies in four Mandals of Adilabad district which covers the 89 villages and population of 76000 nos. The details of the villages proposed to be benefitted are given below:

List of Villages Proposed to be Benefitted Due to this Project

S.NO	VILLAGE NAME	POPULATION AS PER CENSUS 2001
TAMSI MANDAL		
1	GOMUTHRI	923
2	GUBIDI	390
3	ANTHERGAON	760
4	KARANJI-T	1488
5	ARLI-T	2392
6	WADOOR	1159
7	BHEEMPUR	1658
8	GUNJALA	781
9	DHANORA	974
10	TAMSI-K	899
11	GOLLAGHAT	238
12	BELA SRI RAMPUR	1050

S.NO	VILLAGE NAME	POPULATION AS PER CENSUS 2001
13	KAMATWADA	400
14	GONA	403
		13515
ADILABAD MANDAL		
1	JAMDAPUR	1245
2	CHANDA(T)	2760
3	LANDASANGVI	1568
		5573
JAINAD MANDAL		
1	HATHIGHAT	13
2	GUDA	1304
3	RAMPURTARAP	749
4	GIMMA BUZURG	0
5	KORTA	512
6	KEDARPUR	296
7	AKOLI	725
8	GIMMA (KHURD)	2154
9	SIRSONNA	677
10	MIRZAPUR	0
11	SHORAJ	958
12	FOUZPUR	165
13	POOSAI	585
14	SEKAPOOR	0
15	MONDAGADA	1265
16	KAMAI	429
17	DOLLARA	117
18	PENDALWADA	2123
19	KARANWADI	0
20	LEKARWADI	924
21	DADAPOOR	0
22	SANGVI(K)	1291
23	DEEPAGUDA	2197

S.NO	VILLAGE NAME	POPULATION AS PER CENSUS 2001
24	KOWTHA	1445
25	HARIYALI	0
26	BAHADURPUR	1237
27	KUTHOMPUT	0
28	KURA	1310
29	KODEKOTHA	0
30	KARANJI	1353
31	KHAPRI	895
32	UMRI	385
33	BELGAON	375
34	BALLORI	680
35	MAKODA	546
36	JAINAD	4349
		29059
BELA MANDAL		
1	NARAYANPUR	0
2	SANGIDI	2111
3	BHEDODA	1089
4	GUDA	548
5	KAMGARPUR	376
6	MANIYARPUR	502
7	KHOGDUR	1195
8	MANGROOL	894
9	KAPARJUN-D	0
10	KOBBAI	790
11	DATALPUR-D	0
12	DAHAGAON	1474
13	MOHABATPUR	246
14	KAPSI-B	637
15	SHAMSHABAD	383
16	AWALPUR	1083
17	SRISANNA	1607

S.NO	VILLAGE NAME	POPULATION AS PER CENSUS 2001
18	SINGAPUR-D	0
19	TAKLI	566
20	DHOPTALA	878
21	BELA	4359
22	BURANPUR-D	0
23	NAGRALA-D	0
24	PATAN	764
25	RAMKHAM	165
26	PONALA	700
27	CHANDPELLY	993
28	CHAPRALA	1672
29	WAROOR	357
30	JUNONI	674
31	KARONI-K	291
32	EKORI	564
33	MASALA-B	762
34	BHADI	1172
35	POHAR	380
36	KARONI-B	195
		27427
	TOTAL POPULATION	**75574**
	or say	**76000**

4.3 Cost of the Project

Head works & Canal (AP Share) :508.00 Cr (approximately)

Canal Works (Andhra Portion) : 603.00 Crores

Total cost of the Project : 1111.00 Cr

4.3 Site and Its Environs

The River Penganga originates near village Madha in Buldhana district at an altitude of 685.7 m. Penganga River is a major tributary of River Wardha in the Godavari Basin drains upto the dam site reaches cultivable and forest lands in Buldhana Parbani, Akola, Yavatmal and Nanded districts in Maharashtra. The total catchment area of the basin is 23854 Sq.Km among them the majority of the catchment area is falling under Maharashtra State 22300 Sq. Km and 1554 Sq. Km in Andhra Pradesh State. The river flows in the eastern direction upto the Lower Penganga dam site, beyond this point till its confluence with River Wardha it flows in southeastern direction.

i) General Climatic Conditions of the State and the Project Area in Particular

Three distinct seasons prevail over the Penganga sub-basin:

- Monsoon (Rainy) season from mid-June to mid-October,
- Winter from mid-October to February and
- Summer from March to mid-June.

The precipitation of the catchment area is mainly due to south-west monsoon and is from June to October. There are occasional post monsoon showers in December. There are frequent dry spells of a fortnight or more even during monsoon period. In early October, heavy showers are sometimes experienced. The average rainfall in the river valley is 1016 mm out of which 762 mm occurs in monsoon. The rainfall increases from west to east in the river valley. The climate of the area is dry with large temperature variations. The maximum and minimum temperature in the valley so far recorded are 44.4 ^{0} C and 15.6^{0} C respectively.

ii) Climate of Adilabad district (Project area)

The climate of the district is characterised by a hot summer and is generally dry except during the southwest monsoon season. The year may be divided into four seasons. The cold season from December to February; summer from March to May. The period from June to September constitutes the south-west monsoon season; while October and November form the post monsoon season.

iii) General Description of Topography, Physiography and Geology of the Area

The river flows mainly in south-eastern direction up to the upper Penganga dam site. From here it flows in southern direction for a short distance and again flows in south-eastern direction up to the Sahastrakunda fall from where it flows in a northern direction for some distance. From the point of confluence of its tributary Pus River, it flows in eastern direction up to Lower Penganga Dam site. The total length of river Penganga is 668.8km.

The Penganga catchment is feather shaped with length about twice the average width. Upper reaches of the basin lie on the plateau and is covered by forest in lower reaches.

The types of rocks that are found in the Penganga sub-basin are the Deccan trap, Gondwanas & Puranas. The ground water occurs in the soil cover, weathered mantle and in the highly jointed fractured zones of the hard rock. In the alluvium, the ground water is found in the basal portion containing gravel and coarse sand. The depth of ground water varies from 4.5m to 16.0m.

Topography Physiography and Geology of Adilabad district.

The Sahayadri parvat or Satnala range traverses the district from the north-west to the south-east for about 281km. In this range, the Mahbubghat is the highest peak. In the eastern portion of the district some hills and hillocks of minor importance are found.

In the geological history of the Peninsular India, the district of Adilabad has special significance in some of the areas. The Indian stratigraphy occurs in this district in addition to various types of geological formations. Important deposits of coal, limestone, iron ore and clays are also found besides several other minerals in the district.

iv) Population

Maharashtra

The entire submergence area of 15951 ha due to the reservoir is in Maharashtra. The area lies in Mahur and Kinwat taluks of Nanded district; and Mahagaon, Arni and Ghatanji taluks of Yavatmal district. A total of 46 villages are affected out of which 32 are fully affected 14 are partially affected. Total affected population is 36809 (2001 census).

Andhra Pradesh

About 5.12 TMC of water is proposed to be utilized for irrigation of 29757 Ha (GCA) of land and drinking water requirements of several villages en-route the WCS, in the district of Adilabad with a total population of 25 Lakhs (2001 census). Most of the population in the district is engaged in agriculture. Data on Mandal-wise, village-wise population of 4 mandals in the command area of the gravity canal are collected from the Mandal Revenue Officers concerned.

The canal runs through 4 mandals covering 89 villages. The total population of the villages is 76000 as per 2001 census.

v) Natural Resources

The present project is on Penganga River. Penganga is an inter-state river and is a tributary of river Wardha in Godavari river basin. Its catchment area lies mostly in Maharashtra (93.5%) and part in Andhra Pradesh (6.5%).

The catchment of river Penganga is feather shaped with length being about twice the width. Upper reaches of the basin lie on the plateau and the lower reaches are covered by forest. The types of rock found in the basin are Deccan trap, Gondwanas & Puranas. Ground water occurs in the soil cover, weathered mantle and in the highly jointed fractured zones of the hard rock. The depth of ground water varies from 4.5 m to 16 m.

Andhra Pradesh has drawn up sub-basin wise master plan for the use of Godavari water resources as per the GWDT tribunal award. The present planned utilisations are as per the agreement between Maharashtra and Andhra Pradesh in accordance with the GWDT award.

vi) Landuse / Land Cover Pattern

The total geographical area of the district is 1610500 Ha, out of which forest area is 43%, barren and uncultivated land is 3 %, land put to nonagricultural uses is 4%, Current fallows is 7 %, Permanent pastures and other grazing lands is 1%, Other fallow land is 4% , net area sown is 37% and land under miscellaneous tree crops & groves not included in net area sown is 1%.

vii) Sensitive Locations

In study area, the Tipeshwar Wildlife Sanctuary is situated in Yavatmal district of Maharashtra, which is situated at a distance of 2 Kms from the command area of the proposed project.

The Tipeshwar Wildlife Sanctuary is a “Green Oasis” in the southernmost part of the Maharashtra State and has a great significance from the point of wildlife and bio-diversity conservation. The Tipeshwar wildlife sanctuary derives its name from the ‘Goddess Tipai’located near the Tipeshwar village in the sanctuary area. It is situated in Patanbori and Parwa Ranges of the Pandarkawad Forest Division of Yavatmal District.

Tipeshwar Wildlife Sanctuary comprising of 148.63 sq.km. came into existence vide the Government of Maharashtra Notification No. WLP/1095-84/F-1-4, dated 24/01/1997 and 30/04/1997. It is situated in far southern corner of Maharashtra state, adjoining the Adilabad district of Andhra Pradesh. It constitutes a compact patch of dense forest cover, having immense value and potential for nature interpretation and bio-diversity conservation, in this region.

viii) Seismicity of the Project Area

As per the seismic hazard map of India updated in 2000 by the Bureau of Indian Standards (BIS), the project area lies in **Zones -II**. As classified in BIS map, Zone V indicates the most seismically active region, while zone -II is the least seismically active region.

ix) Socio-economic Aspects

Adilabad district is economically backward. The percentage of tribal population in the district is 16.74% of the total population and that of schedule castes is 18.54%. The rural population in the district is 73.47% consisting of mainly illiterate working class. The literacy rate of the district is 44.7%. The main occupation and source of livelihood of the people of Adilabad is agriculture. Even though the lands are fertile, the farmers depend on ill distributed and erratic rainfall with no dependable assured irrigation at all. Thus full benefit of the natural resources are not realised by the people so far.

3.0 Alternative Analysis:

In order to evaluate the techno-economically viable/ feasible and socio-economically acceptable, three alternatives have been considered given in Table -1 below. From the

Table -1, by considering all aspects of the project Alternative -1 is considered and selected for the project. The topography map showing the project area is given in Figure -1 and alternative analysis is given in Figure -2.

Table -1: Basic Criteria Considered for Evaluation of Alternatives

S.no.	Description of Parameter	Alternative -1	Alternative -2	Alternative -3
1	Route Description	• Route follows contour allowing gravity flow. • No drops throughout the length. • Canal passes through forest area from Km 24.825 to Km 26.200 (1375 m) • Canal runs along fringes of forest from Km. 26.200 to Km 27.750(1550 m)	• Route follows contour falling contour. • To keep up the command area as proposed drops has to be avoided. • Since drops has been avoided it results in heavy banking • Canal detours forest boundary from Km 23.1 for a length of 8200 m. • Detouring of forest makes the router longer by 3.30km relative to Alternative 1.	• Route follows contour falling contour. • To keep up the command area as proposed drops has to be avoided. • Canal detours forest boundary from Km 24.6 for a length of 7400 m. • Detouring of forest makes the router longer by 4.00km relative to Alternative 1.
2	Topography	• The canal passes through un-irrigated plain dry lands for most of the length. • Cut and cover is involved for about a kilo-metre with a maximum cutting of about 12m.	• The canal passes through un-irrigated plain dry lands for most of the length. • The canal passes through the low levels because of detouring which causes drop of about 10m of canal.	• The canal passes through un-irrigated plain dry lands for most of the length. • The canal passes through the low levels because of detouring which causes drop of about 10m of canal.
3	Length (km) Total route	89.09	92.93	93.09
	Forest Length, Km	2.93	Nil	Nil

S.no.	Description of Parameter	Alternative -1	Alternative -2	Alternative -3
4	Land use and Land Pattern	The land along the route is barren and rocky.	The land along the route is barren and rocky.	The land along the route is barren and rocky.
5	Land Requirement (ha) Total	509.26	532.15	534.05
	Forest land (ha)	8.78	Nil	Nil
6	Major Obstructions	• Satnala crossing involving aqueduct \ viaduct of 1500m	• Satnala crossing involving aqueduct \ via duct of 1500m • Wider stream crossings requiring major CD works as the route runs at lower levels than alternative -1. • This alternative is crossing the NH-7 two times. • Sudden falling of ground pattern may lead to breach of canal during flood situation and causes huge inundation. • The command area wil be lesser by 1000 Ha.	• Satnala crossing involving aqueduct \ via duct of 1500m • Wider stream crossings requiring major CD works as the route runs at lower levels than alternative 1 • Sudden falling of ground pattern may lead to breach of canal during flood situation and causes huge inundation. • The command area wil be lesser by 1000 Ha.
7	Major Advantages	• Follows contour covering maximum command by gravity. • Optimal cutting and	• Avoids passing through forest • No displacement of humans / Livestock.	• Avoids passing through forest • No displacement of humans / Livestock.

S.no.	Description of Parameter	Alternative -1	Alternative -2	Alternative -3
		embankment. • No major obstructions. • No displacement of humans / Livestock.		
8	Techno-economic Aspects	• The route follows gravity and avoids high embankments and deep cuttings. The construction will be easy. • This alignment is the least expensive. • The land to be acquired is 509.26ha	• The route follows gravity However due to detouring , the length of the canal increases by 8200 m • Also there will be a drop of 10m in the canal bed level which results in heavy banking and no. of drops. • The command will be lesser by 1000ha. • This alignment is relatively costlier than Alternative -1 due to increased length of canal and larger CD works. • The land to be acquired is 532.15ha	• The route follows gravity However due to detouring , the length of the canal increases by 7400 m • Also there will be a drop of 10m in the canal bed level which results in heavy banking and no. of drops. • The command will be lesser by 1000ha • This alignment is relatively costlier than Alternative -1 due to increased length of canal and larger CD works • The land to be acquired is 534.05ha
9	Environmental Issues	• The compensatory afforestation plan shall be made as per the Forest Conservation Act, 1980. • It is envisaged that there are few trees need to be cut in the alignment and	• It is envisaged that there are few trees need to be cut in the alignment and the same will be compensated as per WALT Act, 2002. • Flora and fauna will not be affected as the work	• It is envisaged that there are few trees need to be cut in the alignment and the same will be compensated as per WALT Act, 2002. • Flora and fauna will not be affected as the work

S.no.	Description of Parameter	Alternative -1	Alternative -2	Alternative -3
		the same will be compensated as per WALT Act, 2002. • Flora and fauna will be least affected as the work involved is digging of irrigation canal and concrete lining. Use of heavy machinery is not warranted. Impact on the environment will be negligible. • In fact, there will be positive impact on the environment because of the water supply for irrigation and the consequent development of the area vis-a-vis greenery and growth of plants and ground water recharging.	involved is digging of irrigation canal and concrete lining. Use of heavy machinery is not warranted. Impact on the environment will be negligible. • In fact, there will be positive impact on the environment because of the water supply for irrigation and the consequent development of the area vis-a-vis greenery and growth of plants and ground water recharging.	involved is digging of irrigation canal and concrete lining. Use of heavy machinery is not warranted. Impact on the environment will be negligible. • In fact there will be positive impact on the environment because of the water supply for irrigation and the consequent development of the area vis-a-vis greenery and growth of plants and ground water recharging.
10	Social Issues	• The route does not involve displacement of any humans / livestock and thus avoids rehabilitation issues. • The area will be developed	• The route does not involve displacement of any humans / livestock and thus avoids rehabilitation issues. • The area will be developed with agricultural growth and	• The route does not involve displacement of any humans / livestock and thus avoids rehabilitation issues. • The area will be developed with agricultural growth and

S.no.	Description of Parameter	Alternative -1	Alternative -2	Alternative -3
		with agricultural growth and employment generation. The living standards of the people in the region will increase to a considerable extent. The project will enhance the social harmony in the region because of the economic security due to the assured agricultural activity and increased production. • **It reduces agrarian distress prevailing in the project area i.e., Telangana for the last two decades.**	employment generation. The living standards of the people in the region will increase to a considerable extent. The project will enhance the social harmony in the region because of the economic security due to the assured agricultural activity and increased production.	employment generation. The living standards of the people in the region will increase to a considerable extent. The project will enhance the social harmony in the region because of the economic security due to the assured agricultural activity and increased production.
11	Conclusions	• Since it is running along the contour the route is the best of shortest covering maximum command area. • This is the most optimal route considering techno-economic viability and social & environmental acceptability.	• This is the lengthy route considering the Social, Techno-economic issues and covering less command area.	• This is the lengthy route considering the Social, Techno-economic issues and covering less command area.