



Environmental Monitoring Report

Project Number: 38255-02
April 2008

IND: Uttarakhand State Road Investment Program (Subproject 1)

Prepared by

Project Management Unit, Public Works Department, Government of Uttarakhand

For

Executing Agency

Public Works Department, Government of Uttarakhand, Uttarakhand

This report has been submitted to ADB by the PMU (ADB (Transport)/Public Works Department), Dehradun, Uttarakhand and is made publicly available in accordance with ADB's public communications policy (2005). It does not necessarily reflect the views of ADB.

Asian Development Bank

GOVERNMENT OF UTTARAKHAND

**UTTARAKHAND STATE ROAD INVESTMENT PROGRAM
(PHASE - I)**



ADB LOAN NO.: 2308- IND

**1st ENVIRONMENTAL MONITORING REPORT FOR
ENVIRONMENT IMPLEMENTATION OF PROJECT - 1**

April, 2008

Project Management Unit
(Asian Development Bank/Public Works Department)

CONTENTS

ABBREVIATIONS 1

1. INTRODUCTION 2

 1.1 Objectives, Scope, and Methodology 2

 1.2 Project Description 2

2. CONSIDERATION OF ENVIRONMENTAL SAFEGUARDS DURING PROJECT PREPARATION..... 6

 2.1 Preparation of DPR and Environmental Assessment Report 7

 2.2 Preparation of Bid Documents..... 8

 2.3 Environmental Statutory Clearances 8

3. IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARDS DURING CONSTRUCTION..... 11

 3.1 Setting up Site Offices and Construction Camps..... 11

 3.2 Mobilization of Resources..... 11

 3.3 Site Clearing 11

 3.4 Cut and Fill for Preparation of Embankment..... 12

4. IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARDS DURING CONSTRUCTION ON CATEGORY ‘A’ ROADS 15

5. MONITORING OF ENVIRONMENTAL QUALITY 28

6. INSTITUTIONAL CAPACITY AND ARRANGEMENT 28

7. CONCLUSION AND RECOMMENDATIONS 30

ABBREVIATIONS

ADB	:	Asian Development Bank
BOQ	:	Bill of Quantity
DFO	:	Divisional Forest Officer
DPR	:	Detailed Project Report
EAG	:	Environmental Assessment Guidelines
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plan
EMR	:	Environmental Monitoring Report
EPA	:	Environmental Protection Act (1986)
FCA	:	Forest Conservation Act
GOI	:	Govt. of India
GOU	:	Government of Uttarakhand
IEE	:	Initial Environmental Examination
LVRs	:	Light Vehicle Roads
MDRs	:	Major District Roads
NGO	:	Non-Governmental Organization
NHs	:	National Highways
NOC	:	No Objection Certificate
ODRs	:	Other District Roads
PIU	:	Project Implementation Unit
PMU	:	Project Management Unit
PPR	:	Preliminary Project Report
ROW	:	Right-of-Way
SEIA	:	Summary of Environmental Impact Assessment
SHs	:	State Highways
SPCB	:	State Pollution Control Board
USRIP	:	Uttarakhand State Road Improvement Program

1. INTRODUCTION

1. The Uttarakhand is a newly segregated state from Uttar Pradesh. It came in to existence on 9 November, 2000. The Public Works Department (PWD) of Government of Uttarakhand has initiated Uttarakhand State Road Investment Program (USRIP) to implement the upgradation and improvement work of various identified road stretches in the state of Uttarakhand for capacity augmentation for safe and efficient movement of traffic through a soft loan taken from Asian Development Bank (ADB).

2. The ADB Loan was provided by using Multitranches Financing Facility (MFF). The first project or Phase I of the MFF was approved on 2 January 2007. The first project is classified as an "A" project because 2 roads (Almora – Bageshwar) and (Barechhina – Sheraghat) passing through the Binsar Wildlife Sanctuary, and the other roads are classified as "B" project. Therefore, the environmental monitoring for the 2 roads needs to be submitted semi annually to ADB, and the environmental monitoring for other roads needs to be submitted annually to ADB.

1.1 Objectives, Scope, and Methodology

3. This 'Environmental Monitoring Report of Phase I of 'USRIP' Project has been prepared in the month of April 2008. This is the first environmental monitoring report (EMP) under the Project covered all the project roads including 2 roads that passing through the Binsar Wildlife Sanctuary. The report aims to provide information on the progress of implementing the Environmental Management Plan (EMP) and to evaluate the implementation of EMP for necessary improvement if needed.

4. The purpose of environmental monitoring report is to satisfy the environmental safeguard requirements of the Government of India and the Asian Development Bank as well as to fulfill the requirements written in the loan document for USRIP.

5. The findings are based on the review of monthly progress report submitted by supervision consultant on the monitoring of environmental impacts and findings obtained during the field monitoring in the month of March and April 2008 and overall monitoring cover the period September 2007 to April 2008.

1.2 Project Description

6. Out of thirteen districts of Uttarakhand, the Phase I of 'USRIP' Project is located in eleven districts (except two districts i.e. Tehri and Haridwar). There are a total of 23 road sections that have been taken under Phase I of 'USRIP' Project. The road sections considered in Phase I has been grouped in two packages. Out of 23 roads, 9 roads are grouped in the Package I (Garhwal Zone) while 14 roads are taken in Package II (Kumaon Zone). Detailed of these roads is given in **Table 1**. A total of 573 km length of roads is to be improved out of which one road (i.e. Pauri- Khirsu- Srinagar road) has no longer funded by the Phase 1 Project, because this section has already been improved by the State Government under other scheme. Out of the remaining 8 road sections of Package I, 7 roads has a category of other district roads (ODRs) and 1 (i.e. Kalsi - Chakrata) has a category of major district road (MDR).

7. In Package II, 14 road sections are spread over six districts of the State namely Almora, Bageshwar, Champawat, Nainital, Pithoragarh and Udham Singh Nagar. Out of the 14 road sections, three roads pass through fertile plains of Himalayan foothills in Udham Singh Nagar district, which covers 49.6 km length. Out of these 14 road sections, three roads has a category of State Highway (137.2 km length), two roads are MDRs (length 75.90 km), four roads are

ODRs (length 66.20 km) and the remaining five roads has the category of village roads (length 62.30 km). All of the roads are bituminous road except a non-bituminous stretch of road length of 16.70 km of Betalghat - Bhatrojkhana. Finally, the total length to be improved in the Phase I remains about 556 km. All the identified project road sections are located in the State of Uttarakhand, except a two km section of Dhakia- Gulabo- Mukundpur- Paiga (Udham Singh Nagar) road which passes through the adjoining Moradabad district of the Uttar Pradesh State. The maintenance work of this particular section is also carried out by the Public Works Department of Uttarakhand.

8. Most of the project roads of Package I and Package II, except Contract VII (Almora – Bageshwar) and Contract VIII (Barechhina – Sheraghat) of Package II, were categorized as a 'B' project under ADB's environmental categorization and therefore, it will require Environmental Monitoring Report (EMR) annually. While for the Package II, the road connecting Almora - Bageshwar under Contract VII and Barechhina - Sheraghat under the Contract VIII were categorized as an 'A' project under ADB's environmental categorization (Table 3) and therefore, biannual Environmental Monitoring Report (EMR) will be submitted to ADB. Since most of the construction activities for Phase I project are still at the inception stage, one environmental monitoring report has been prepared for all the roads in Phase I. The next Environmental Monitoring Reports (EMRs) for two roads having category 'A' (i.e. Almora - Bageshwar and Barechhina - Sheraghat) will be submitted to ADB at the end of October **2008**.

9. Construction contract for all the road sections included in Phase I have been awarded. The Package wise date of signing on each contract and firms responsible for civil work construction is presented in **Table 2**.

Table 1: Project Background and Progress of Phase I roads under 'USRIP' Project

Sl. No.	Contract(s)	District(s)	Road		Category	Length (Km)	Physical Progress (up to the EMR)
			From	To			
Package I (Garhwal Zone)							
1	Contract I	Dehradun	Kalsi	Chakrata	MDR	41.565	Mobilization of resources, site clearances, establishment of construction camps and site offices.
2	Contract IA	Uttarkashi	Kuwa	Kafnol	ODR	47.546	Agreement signed on 02/02/2008
3			Naugaon	Purola	ODR	17.89	
4	Contract II	Pauri	Fatehpur	Lansdowne	ODR	21.807	Mobilization of resources, established construction camps, site clearances, removal of vegetation in Fatehpur- Lansdown, transportation of stones & other materials at stone crashing site and other part of the project. Construction of cross drainages and retention walls.
5			Pathrakhal	Gethicheda	ODR	17.985	
6			Pauri- Khirsu	Srinagar	Deleted		
7	Contract III	Rudraprayag & Chamoli	Jakholi	Guptkashi	ODR	14.375	Mobilization of resources, site clearances, est. of construction camps and site office.
8			Rudraprayag	Pokhri-Karanprayag	ODR	14.512	
9			Nandprayag	Ghat	ODR	18.493	
Sub-total						194.173	
Package II (Kumaon Zone)							
10	Contract V	Udhamsingh Nagar	Jaitpur	Dhanori	ODR	10.80	Mobilization of resources, site clearances, est. of construction camps, site office, labeling of road surface, cross drainage, water supply, operation of machines in some part of the project
11			Dhakia-Gulabo	Paiga-Mukundpur	ODR	25.00	
12			Zafarpur	Gularbhoj	ODR	13.80	
13	Contract VI	Almora & Nainital	Ranikhet	Mohan	MDR	70.20	Mobilization of resources, site clearances, establishment of
14			Betalghat	Bhatrojkhana	ODR	16.70	

Sl. No.	Contract(s)	District(s)	Road		Category	Length (Km)	Physical Progress (up to the EMR)
			From	To			
15			Nathuakhan	Suyalbadi	VR	29.00	construction camps and site office.
16	Contract VII	Almora	Almora	Bageshwar	SH	72.90	Mobilization of resources, site clearances, establishment of construction camps and site office.
17	Contract VIII	Almora , Bageshwar & Pithoragarh	Barechhina	Sheraghat	SH	42.30	Mobilization of resources, site clearances, establishment of construction camps and site office.
18			Udiyari bend	Kanda	MDR	25.70	
19			Udiyari bend	Thal	SH	22.00	
20	Contract IX	Champawat	Pulla-Chamdeol	Shilling	VR	6.50	Mobilization of resources, site clearances, establishment of construction camps and site office.
21			Lohaghat	Chaumel	VR	7.50	
22			Thuligarh	Bhairav mandir	VR	6.30	
23			Kakrali	Thuligarh	VR	13.00	
			Sub-total			361.70	
		11 Districts	23 Roads (1 Deleted)		Grand Total	555.873	

Table 2: Date of Signing and Name of Firms for Civil Works Construction

Contract(s)	District(s)	Date of Signing	Name of the Firm(s)
Package I (Garhwal Zone)			
Contract I	Dehradun	27/12/2007	Wood Hill Infrastructure Ltd., 112 1 st Floor, Navyug Market, Ghaziabad, UP
Contract IA	Uttarkashi	02/02/2008	Gagotri Enterprises Ltd., B 158, Sector A - Mahanagar, Lucknow, UP
Contract II	Pauri	24/09/2007	R. G. Build Well Engineering Limited, R-15/84, Rajnagar, Ghaziabad, UP
Contract III	Rudraprayag & Chamoli	06/11/2007	R. G. Build Well Engineering Limited, R-15/84, Rajnagar, Ghaziabad, UP
Package II (Kumaon Zone)			
Contract V	Udham Singh Nagar	21/09/2007	Wood Hill Infrastructure Ltd., 112 1 st Floor, Navyug Market, Ghaziabad, UP
Contract VI	Nainital & Almora	27/09/2007	Gagotri Enterprises Ltd., B 158, Sector A - Mahanagar, Lucknow, UP
Contract VII	Almora	14/09/2007	N.K.G. Infrastructure Ltd., C-28, Rajnagar, Ghaziabad, UP
Contract VIII	Almora, Bageshwar & Pithoragarh	24/09/2007	Gagotri Enterprises Ltd., B 158, Sector A - Mahanagar, Lucknow, UP
Contract IX	Champawat	03/10/2007	Dwarika - N.K.G. (JV), B-7, Sector 37, NOIDA, UP

2. CONSIDERATION OF ENVIRONMENTAL SAFEGUARDS DURING PROJECT PREPARATION

10. At the time of project preparation, DPR consultants were deputed for the survey and preparation of Detailed Project Reports (DPRs) for Phase I roads. The term Package I and Package II were used for the Garhwal and Kumaon Zones respectively. As part of detailed project preparation, environmental impact assessment reports (IEE/EIA) were prepared by environmental consultant engaged by the PWD.

11. Aside from the environmental consultant under the DPR work, the Project Management Unit (PMU) office has engaged also an environmental consultant to guide and review environmental assessment report for the future sub-projects submitted by DPR consultants; assist in procurement process to ensure that the environmental assessment report and its EMP is included or attached in the bidding document of the ongoing project; to ensure that contractors selected have capability to implement EMP especially implementing mitigation measures associated with construction works; work closely with supervision consultant to monitor the implementation of EMP by contractors; and ensure that the EMP is implemented throughout project implementation. In addition, the environment specialist under the PMU is also responsible to monitor the overall implementation of EMP and prepare Environmental Monitoring Report (EMR).

12. A list of the project roads along with the type of environmental assessment studies undertaken for Phase I roads is presented in **Table 3**.

Table 3: Type of Environmental Assessment Studies Undertaken for Project Roads under Phase I of 'USRIP' Project

Sl. No.	Contract(s)	District(s)	Road		Reports	Category
			From	To		
Package I (Garhwal Zone)						
1	Contract I	Dehradun	Kalsi	Chakrata	IEE	'B' Project
2	Contract IA	Uttarkashi	Kuwa	Kafnol	IEE	'B' Project
3			Naugaon	Purola	IEE	'B' Project
4	Contract II	Pauri	Fatehpur	Lansdowne	IEE	'B' Project
5			Pathrakhal	Gethichheda	IEE	'B' Project
6			Pauri- Khirsu	Srinagar	IEE	'B' Project
7	Contract III	Rudraprayag	Jakholi	Guptkashi	IEE	'B' Project
8		Chamoli	Rudraprayag	Pokhri-Karanprayag	IEE	'B' Project
9			Nandprayag	Ghat	IEE	'B' Project
Package II (Kumaon Zone)						
10	Contract V	Udhamsingh Nagar	Jaitpur	Dhanori	IEE	'B' Project
11			Dhakia-Gulabo	Mukundpur-Paiga	IEE	'B' Project
12			Zafarpur	Gularbhoj	IEE	'B' Project
13	Contract VI	Almora & Nainital	Ranikhet	Mohan	IEE	'B' Project
14			Betalghat	Bhatrojkhan	IEE	'B' Project
15			Nathuakhan	Suyalbadi	IEE	'B' Project
16	Contract VII	Almora	Almora	Bageshwar	EIA	'A' Project
17	Contract VIII	Almora, Bageshwar & Pithoragarh	Barechhina	Sheraghat	EIA	'A' Project
18			UdiyariBend	Kanda	IEE	'B' Project
19			Udiyari Bend	Thal	IEE	'B' Project
20	Contract IX	Champawat	Pulla-Chamdeol	Shilling	IEE	'B' Project
21			Lohaghat	Chaumel	IEE	'B' Project
22			Thuligarh	Bhairav mandir	IEE	'B' Project
23			Kakrali	Thuligarh	IEE	'B' Project

Note: IEE: Initial Environmental Examination and EIA: Environmental Impact Assessment

2.1 Preparation of DPR and Environmental Assessment Report

13. The environmental assessment study was prepared to identify potential environmental impacts of the each project road and how to mitigate the impacts. The environmental assessment report provides recommendations on how the potential environmental impacts could be mitigated.

The environmental assessment report which include the environmental management plan provide a set of guidance on what, how, when and where the mitigation measures has to be implemented. It includes also who has to implement and monitor the implementation of mitigation measures. .

14. There were 21 Initial Environmental Examination (IEE) and 2 Environmental Impact Assessment (EIA) reports (i.e. Almora – Bageshshwar and Barechhina – Sheraghat roads) prepared under the Phase I. The environmental assessment reports both in the form of IEE and EIA are helpful in following ways:

- i. It provides the basic information about the environmental conditions of the project areas and what will be the potential environmental impacts.
- ii. It provides the recommendations to mitigate potential environmental impacts and describe on how to implement in the environmental management plan.
- iii. It provides guidance on how the environmental monitoring has to be carried out, and
- iv. It indicates what kind of environmental statutory clearance will need to be obtained.

2.2 Preparation of Bid Documents

15. The Environmental Management Plan (EMP) covers the information of potential environmental impacts and the proposed mitigation measure for each road has been provided in the bidding documents. In addition to the EMP that was provided to the contractors, the Appendix 1A of the bidding document includes also some detailed instructions on subject that highlight in the EMP and environmental monitoring plan on the followings:

- i. Precaution to be adopted during disposal of debris of solid wastes including disposal of organic debris generated during road construction.
- ii. Precaution to be adopted at sanitation and housekeeping at the labor construction camp like toilets, hygiene, water supply, waste disposal, first aid and maintenance etc.
- iii. To measure and maintain the air quality standard.
- iv. To measure and maintain the noise quality standard.
- v. To check the primary water quality standard including physical and chemical properties of drinking water.

16. The contractors' response on the instruction to include works for environmental impacts associated with the construction activities is satisfactory. Necessary budget has been allocated particular for Category 'A' projects to handle environmental problems. Also the contractors' budget includes items of implementation of environmental management and monitoring plan included in the contract document.

17. The contract document for the contractor (Clause 9 of special condition of contract) includes details terms and conditions regarding the safeguard issues and implementation of the Environmental Management and Monitoring Plans that has to be adhered and implement by the Contractors.

2.3 Environmental Statutory Clearances

18. As stated in the loan document, prior to commencing a civil work all the required statutory clearances have to be obtained with regard to the Phase I roads, there is no road project required environmental clearance from MOEF, although 2 road projects classified by ADB as 'A' project. The environmental statutory clearances for Phase I are related with removal of trees that should be obtained from the State Forest Department (SFD) and clearances for some construction activities that need to be obtained from the State Pollution Control Board (SPCB).

19. **Removal of trees along the ROW:** Trees will have to be removed within the existing ROW in some places to allow for widening of the carriageway, construction of shoulders or to meet current road safety standards. It should be noted that trees within the ROW are considered to be within the purview of the State Forest Department (SFD).

20. **NOCs from Forest Department and SPCB:** The SPCB generally establishes a review panel and circulates the application for public review and comment in each affected district. At least one public hearing is held in each affected district following not less than 30 days notice in local and regional newspapers. A state-level hearing is also required, taking all comments received from the districts into account. Assuming acceptability, the SPCB issues a NOC. The SPCB's NOC, as well as the Forest Department's clearance, is required before MOEF action on any required EIA can be considered complete.

21. In the areas where water is a scarcity and if proper water could not supply to the staff of contractors and for civil work construction like broadcasting etc. due to any region. The contractor can be use the ground water from adjoining tube wells, excavation of new water available sites and try to collect ground water from any other unused hand pumps etc. There are so far no permits required to use ground water. However, in future if required necessary permits should be obtained from GWB.

22. The Environmental Impact Assessment (EIA) reports prepared during project preparation have been utilized for preparation of documents to obtain the NOC and forest clearance from State Pollution Control Board (SPCB), and the State Forest Department respectively.

23. In the phase 1 project, the Forest Clearance was required as the project road is to be widened from single lane 3.75 m carriage way to intermediate lane 5.5 m carriage way for Jaitpur - Dhanori, Jafarpur - Gularbhoj and Dhakia – Mukundpur. The forest clearances for these road sections has been obtained and necessary compensation (amounting to INR 29,08,753/-) has been paid to office of the DFOs of Ramnagar and Haldwani. The sections of the roads for which compensation was paid for forest clearance is presented in Table 4.

Table 4: Compensation Paid for Forest Clearance under Phase I

Contract	District	Road		Length (Km)	Compensation Paid (Rs)
		From	To		
Contract V	Udham Singh Nagar	Jaitpur	Dhanori	10.80	92,753.00
		Dhakia-Gulabo	Mukundpur	25.00	27,30,000.00
		Zafarpur	Gularbhoj	13.80	86,000.00
Grand Total				49.60 Km	Rs. 29,08,753.00

24. The NOC were obtained from the State Pollution Control Board (SPCB) for Garhwal (for all road Contracts of Package I), and Kumaon (Contracts of Package II). The NOC was granted on 19th September, 2007. There are some conditions as part of the issuance of NOC aside paying the administration fee (Rs. 300000/=) paid to directly to SPCB. The conditions as part of issuance of the NOC are:

- Obtaining separate NOCs for establishment and operations of stone crushers and hot mix plants under the projects.
- This NOC is applicable for improvement of existing roads only.
- Compensatory afforestation @ 10 trees for each tree felling.
- Proper arrangement for treatment and disposal of wastewater generated from construction / labor camps to prevent impact on rivers, streams and other water resources.

- In case project road exist on forest land, necessary clearance from Forest Department should be obtained.
- DG sets should be attached with stake of adequate height as well as acoustic enclosures.
- Proper safety measures are established for project execution.

25. The details of the administration fee paid to the concerned department i.e. Uttarakhand State Pollution Control Board to process the NOC is presented in Table 5.

Table 5: Amount paid for administration fee to process the NOC (Pollution clearance) to SPCB under Phase I

Sl. No.	Contract(s)	District(s)	Road		Amount Paid (Rs)
			From	To	
Package I (Garhwal Zone)					
1	Contract I	Dehradun	Kalsi	Chakrata	1,50,000/=
2	Contract IA	Uttarkashi	Kuwa	Kafnol	
3			Naugaon	Purola	
4	Contract II	Pauri	Fatehpur	Lansdowne	
5			Patharkhal	Gethichheda	
6			Pauri- Khirsu	Srinagar	
7	Contract III	Rudraprayag	Jakholi	Guptkashi	
8			Rudraprayag	Pokhri-Karanprayag	
9		Chamoli	Nandprayag	Ghat	
Package II (Kumaon Zone)					
10	Contract V	Udham Singh Nagar	Jaitpur	Dhanori	1,50,000/=
11			Dhakia-Gulabo	Paiga-Mukundpur	
12			Zafarpur	Gularbhoj	
13	Contract VI	Nainital	Ranikhet	Mohan	
14		Almora	Betalghat	Bhatrojkhan	
15			Nathuakhan	Suyalbadi	
16	Contract VII	Almora	Almora	Bageshwar	
17	Contract VIII	Almora & Bageshwar	Barechhina	Sheraghat	
18		Pithoragarh	UdiyariBend	Kanda	
19			Udiyari Bend	Thal	
20		Contract IX	Champawat	Pulla-Chamdeol	
21	Lohaghat			Chaumel	
22	Thuligarh			Bhairav mandir	
23	Kakrali			Thuligarh	
Total Amount Paid (Rs.)					3,00000/=

3. IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARDS DURING CONSTRUCTION

26. Most of the civil work contracts were granted in the last quarter of 2007. The initial civil work construction has recently started in 20 road sections in Garhwal and Kumaon Zones, except two roads of Contract IA (i.e. Kuwa - Kafnol and Nagaon - Purola) because of delay in signing agreement. At the time when this monitoring report is prepared, almost all the works are at the very early phase of setting up the site offices, initial mobilization of resources and equipments, and land clearing for the embankment.

3.1 Setting up Site Offices and Construction Camps

27. In total, 16 site offices, 14 construction camps have been established or being established and approximately 562 contractors' staff (Engineers, Supervisors, Operators, Drivers, Technicians, Semi/unskilled workers etc.) deputed for the implementation of civil works in 22 project roads of Phase I till to the submission of this first Environmental Monitoring Report (EMR). The contractors' site offices, storage facilities and construction camps are not located near by the water bodies (e.g. lakes, ponds, stream, river, etc.). The sites for the construction camps are selected in consultation with the PMU. All the sites of construction camps are located in private land and contractor has obtained necessary lease agreements with property owners. In most of the cases there is no separate workers camp. Workers are accommodated in temporary shelters constructed at construction camps and or in some cases contractor has arranged accommodation for workers by renting houses in the nearby villages. The Contractors are in the process of establishing adequate water supply and sanitation facilities at construction camps. The number and places of site offices and construction camps are described in **Table 6**.

3.2 Mobilization of Resources

28. In terms of human resources, preference has been given by contractor to hire local staff at project site itself. This is also described in special conditions of contract. However, few workers and technical staff come from outside project area as well. The experienced staff like site engineers, supervisors, operator, site manager are mostly hired from outside of the project location due to unavailability of well skilled staff at local level. **Table 6** gives the Package wise details of manpower mobilized by each contractor.

29. The mobilization of heavy equipments, and machineries have been done by most of the contractors at all project roads except Contract IA (i.e. Kuwa - Kafnol and Naugaon - Purola due to delayed agreement). The heavy equipments for land clearing were transported through existing road. So far, there is no destruction on existing road due to the movement of these heavy equipments. However, continue monitoring is being carried out to ensure that any destruction on existing road due to mobilization of the heavy equipment will be repaired immediately. The contractors' are also following measures given in EMP for any damage to the existing roads due to mobilization of heavy equipments.

3.3 Site Clearing

30. As it can be seen from the Table 6 that most of the contractor are at the stage of site clearing work mostly at location of CD work / embankment sites. The site clearance for all roads involves only clearing of local vegetation like shrubs and very less amount cut soils and stones. The marked big trees have already been cleared from the three project roads in fourth quarter of 2007 (Contract V). It was done by the concerned forest department. The compensation against tree felling, removal of log, litter from the project roads and plantation of suitable species is already paid to the concerned department. There are no blasting involve in site clearing activity.

31. Since the improvement work is limited to existing carriageway, site clearing activities involving tree cuttings are limited to selected (three) sub-projects only, these sections are Jaitpur - Dhanori, Jafarpur - Gularbhoj and Dhakia – Mukundpur of Contract V covering about 49.6 km length. The quantity of waste material / debris is negligible and contractor has no problem till date in disposing these wastes at disposal sites of local villages with prior permission from village panchayat heads. Waste generated from project roads will be disposed off in identified sites which contractor is presently identifying in consultation with local village panchayat heads. The contractors' are following EMP for managing waste material generated from the site clearing activities.

3.4 Cut and Fill for Preparation of Embankment

32. The scope of work under Phase I mostly involve strengthening of existing roads. Therefore amount of cut and fill is very limited. Wherever required the filling, the cut soils and other removed materials has been used to fill the road sections that need to be leveling of undulating road surface. There is no significant adverse effect on environment by using a balance cut and fill method of road improvement. The mitigation measures proposed in EMP are and will be followed by contractor to manage cut and fill material.

33. No specific unforeseen environmental impact was observed till the date when field monitoring was undertaken (March 2008 for preparing of first Environment Monitoring Report under USRIP Project). The progress of work is at initial stage only and proposed mitigation measures for activities at current construction stage have been implemented by contractor. There are no deviations from the proposed mitigation measures for handling the environmental impacts associated with construction activities at this initial stage.

34. However, minor change in alignment (for about 200m length) of Dhakia- Gulabo- Paiga- Mukundpur (Contract V) has been incorporated in project scope. No other environmental impacts generated from the changing in alignment. There are no additional mitigation measures needs to be adopted but all mitigation measures described in the EMP found to be adequate.

35. For all roads under the phase 1, there is no deviation from the proposed mitigation measures for handling the environmental impacts associated with construction activities at this initial stage. But in some roads the contractors have not fully mobilized. The contract wise status of activities under Phase I of project is presented in Table 6.

Table 6: Status of Staff Mobilization and Contractor Activities at Sites under Phase I Roads

Sl. No.	Road Sections		Mitigation measures										
	From	To	Site Clearance	Location of site for disposal	Site Offices		Construction Camps		Staff under Contract		Local Staff (Yes/No)	Budget for Env. Mitigation	Remark
					No.	Places	No.	Places	No.	Position			
1	Kalsi	Chakrata	Completed	Within 1Km distance from the cons. camps.	2	Sahiya, Vikasnagar	6	4 th Km. 11 th Km. 20 th Km. 25 th Km 40 Km	150	Engineers - 2, Supervisor -6, remaining workers etc.	Yes only unskilled staff	No separate budget for Env. Mitigation is provided in BOQ.	Budget for Env. Mitigation is already included in contract cost as per special condition of contract.
2	Kuwa	Kafnol	Contractor has not yet mobilized										
3	Naugaon	Purola											
4	Fatehpur	Lansdowne	Completed	Old borrow pits along road site.	1	Fatehpur	2	Fatehpur Daiyakhal	100	Engineer - 1, Jun. Eng. - 2, Superv. - 6, Operators - 4, Lab. Tech. -2, Drivers - 10, Accountant- 1 remaining workers etc.	Yes only semi/ unskilled staff	Do	Do
5	Pathrakhal	Gethicheda	Completed	Old borrow pits along road site.	1	On 9 th Km.	1	Kot					
6	Pauri-Khirsu	Srinagar	The road has already been improved under state Govt. scheme.										
7	Jakholi	Guptkashi	Completed	Old borrow pits along road site.	1	Jakholi	1	Dharkot	60	Mechanical Eng. - 1, Jun. Eng. - 1, Superv. - 2, Operators - 3, Drivers - 2, remaining workers etc.	Yes only semi/ unskilled staff	Do	Do
8	Rudraprayag	Pokhri-Karanprayag	Completed	Old borrow pits along road site.	1	Chhatikhali	1	Mohankhal	40	Jun. Eng. - 1, Superv. - 3, Operators - 3, Drivers - 2, remaining workers etc.	Yes only semi/ unskilled staff	Do	Do
9	Nandprayag	Ghat	Completed	Old borrow pits along road site.	1	Nandprayag	1	Nandprayag	60	Jun. Eng. - 1, Superv. - 2, Operators - 3, Drivers - 2,	Yes only semi/ unskilled staff	Do	Do

Sl. No.	Road Sections		Mitigation measures										
	From	To	Site Clearance	Location of site for disposal	Site Offices		Construction Camps		Staff under Contract		Local Staff (Yes/No)	Budget for Env. Mitigation	Remark
					No.	Places	No.	Places	No.	Position			
													remaining workers etc.
10	Jaitpur	Dhanori	Completed	Old borrow pits along road site.	2	Kashipur & Dineshpur	The sites for construction camps, number and position of staff under contract not defined till today.					Do	Do
11	Dhakia-Gulabo	Paiga-Mukundpur											
12	Zafarpur	Gularbhoj											
13	Ranikhet	Mohan	Contractor not fully mobilized.	-	1	Mohan	The sites for construction camps, number and position of staff under contract not defined till today.					Do	Do
14	Betalghat	Bhatrojkan	Not properly mobilized till to the submission of this Environmental Monitoring Report (EMR).										
15	Nathuakhan	Suyalbadi											
16	Almora	Bageshwar	Contractor not fully mobilized.	-	2	Almora & Takula	1	Takula	38	18 well skilled staff (Eng. 8, Sup. - 8, Lab Tech. 2) others - 20	Yes only semi/unskilled staff	Yes	Due to Category A project road.
17	Barechhina	Sheraghat	Contractor not fully mobilized.		2	Udyaribend & Chaukori	1	Chaukori	84	Engineers-3, Supervisor-5, Lab Tech.-1 Other skilled - 25 and Nonskilled-50.	Yes only semi/unskilled staff	Yes	Due to Category A project road.
18	Udiyari bend	Kanda	Not fully mobilized										
19	Udiyari bend	Thal											
20	Pulla-Chamdeol	Shilling	Completed	Within 0.5 Km.	1	Champawat	Sites not identified for construction camps		4	Operators - 2 Supervisors - 2	Yes only semi/unskilled staff	No separate budget for Env. Mitigation is provided in BOQ.	Budget for Env. Mitigation is already included in contract cost as per special condition of contract.
21	Lohaghat	Chaumel											
22	Thuligarh	Bhairav mandir	Completed	Within 3 Km. Old borrow pits along road site.	1	Kakrali	Do		26	Operator - 4, Driver - 3, Accountant - 1, Super. - 5 Others (Lab/Office/helper etc.) - 13	Yes only semi/unskilled staff	Do	Do
23	Kakrali	Thuligarh											
Total	23 Roads (1 Deleted)				16		14		562				

4. IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARDS DURING CONSTRUCTION ON CATEGORY 'A' ROADS

36. **The 'Almora-Bagehwar' and 'Barechhina-Sheraghat' Roads.** The road improvement works on these two roads was classified as an 'A' project, and therefore the environmental monitoring for these two roads has been done in more detail compare with the other roads. When this environmental monitoring report was prepared, the construction activities for these two road section were only at the stage of mobilization of resources, and establishment of site offices. Also the construction work on Almora-Bageshwar road is advanced with the rehabilitation of cross-drainage work which in the process at present. For Barechhina -Sheraghat sections contractor is still at the stage of establishing the site facilities and mobilization of resources. The status of work and progress in implementation of environmental mitigation measures in these two sections is described herewith.

37. **Establishment of Sites Offices.** The Contractor has established site offices in both the roads. There are two site offices (at Almora and Takula) and one construction camp (at Takula at chainage km 222.0) for **Contract VII: Almora - Bageshwar Road Section**). The construction camp is located about 700 m away from the project road and is connected with the existing paved village road. The land use around construction camp is mostly agricultural and nearby settlements are about 1 km away from the camp (Takula village – 800m and Choupla village – 1km). The Binsar Wildlife Sanctuary is about 45 km away from the Construction Camp. There are no separate worker camps in this section. Workers are being accommodated in construction camp itself and some of them have been provided rented accommodation in nearby villages. The site offices and construction camp were established with due considerations to environmental aspects as well as smooth functioning and easy access to entire project road length.

38. For **Contract VII: Barechhina – Sheraghat Road Section**, there are two offices (at Udiyaribend and Chaukori) and one construction camp (at Chaukori between chainage km 95.0 and 96.0). The construction camp is located on leased land from private party. It is about 600 m away from the project road and connected by existing village road (unpaved village road in forests). The land use around camp is mostly forested and camp of surrounded by dense pine forest. The boundary of the buffer zone of the Binsar Wildlife Sanctuary is only 500m away from the construction camp. There are no separate worker camps in this section. Workers are being accommodated in construction camp and some of them have been provided rented accommodation in nearby villages. The construction camp were established with due considerations to environmental aspects as well as smooth functioning and easy access to entire project road length. In absence of alternate site, the contractor has established construction camp near the forest area.

39. **Mobilization of Resources.** The Contractor has mobilized manpower as well as equipments to the site and initiated the work. In Almora-Bageshwar road section (Contract VII), presently about 38 staff including 18 skilled staff has been mobilized. Also the contractor has mobilized equipments and machineries (including hot mix plant) to the site. However, the operation of hot mix plant is yet to start. The contractor is in the process of getting the NOC from Pollution Control Board to operate the hot mix plant.

40. In Barechhina-Sheraghat road section (Contract VIII), presently about 84 staff including 34 skilled staff has been mobilized. Also the contractor has mobilized equipments and machineries (including hot mix plant) to the site. However, the operation of hot mix plant is yet to start. The contractor is also in the process of getting the NOC from Pollution Control Board to operate the hot mix plant.

41. **Land Clearing including Cut and Fill.** As the work in both the contract packages is at initial stage and also the scope of work is limited to the improvement of existing roads, the land clearing activities are limited to embankment sites and construction camp sites. At present in Almora – Bageshwar section work has been initiated with improvement of culverts and other cross-drainage structures only. Therefore amount of waste material /debris generated is negligible. Similarly in Barechhina - Sheraghat section, site clearing is limited to embankment sites and construction camp sites only and amount of debris/waste material generated is negligible. At present there are no activities taken place which require cut and fill activities. The Contractors' are in consultation with local authorities to identify suitable sites for construction waste/debris disposal.

42. **Monitoring of Dust / Particulate Emissions.** At present most of the activities are at initial stage and limited to establishing construction camps and storage of construction material i.e. aggregates etc. Therefore environmental monitoring has not been done at this stage. However, it is observed by visible inspection that at construction camp sites (mainly at Chaukori (between km 95 - 96) in Barechhina - Sheraghat Road) some level of dust/particulate emission is observed mainly due to movement of vehicles on unpaved access roads and handling on material at construction camps. The Contractors' are advised to control dust emissions by regular sprinkling of water on hauling roads and material handling sites as well as monitor the particulate concentration at camp sites.

43. The status of the implementation of mitigation measures and monitoring activities by Contractor against the provisions of the environmental management and monitoring plan is shown in the table 7 and table 8 respectively. Following pictures show the status of site activities at present in these two road sections.



Fig.1: Culvert under rehabilitation at km 196.5 on Almora-Bageshwar Road (Contract VII)

Fig.2: Consultation with Binsar Wildlife Sanctuary Officers on Almora-Bageshwar Road (Contract VII)





Fig.3: Typical Landslide at km 211 on on Almora-Bageshwar Road (Contract VII)

Fig.4: Location of Construction camp near Village Takula (km 2220 on Almora-Bageshwar Road (Contract VII)



Fig.5: Hot mix plant and workers facilities at construction camp on Almora-Bageshwar Road (Contract VII)

Fig.6: Water Supply through tankers at Construction Camp on Almora-Bageshwar Road (Contract VII)





Fig.7: Water sprinkling on unpaved roads at construction camp site on Barechhina-Sheraghat Road (Contract VIII)

Fig.8: Earth work at construction camp site on Barechhina-Sheraghat Road (Contract VIII)



Fig.9: Location of Construction camp at km 95 on Barechhina-Sheraghat Road (Contract VIII)

Fig.10: Site for storage of construction material at camp site on Barechhina-Sheraghat Road (Contract VIII)





Fig.11: Improvement work on access roads on Barechhina-Sheraghat Road (Contract VIII)

Fig.12: Take off point of access road to construction camp site from project road at km 95.5 on Barechhina-Sheraghat Road (Contract VIII)



Table 7: Status of EMP Implementation for Contract VII and Contract VIII (Category 'A' Roads) as on 31 March, 2008

Project Stage/Activity	Potentially Negative Impacts	Mitigation Measures	Location	Public Participation and Co-ordination	Responsible Party		Status of Implementation
					Implementation	Monitoring	
1. Location							
1.1 Location of construction camps and contractor facilities	Inappropriate location such as close to local community drinking water source, temple/shrines. Environmentally unsound use of community resources such as non-timber forestry products by workers.	Location of construction camps at least 500m away from community areas, and away from drinking water sources. Inclusion of information on activities not allowed by construction workers in contract documents.	Construction camp sites	Discussions with community group, local PWD staff.	PMU in PWD/ Consultants	PMU in PWD	Construction camps located at least 500 m away from sensitive locations (complied with)
1.2 Location of quarry sites	Location in unstable areas or areas not approved by Forest Department (DoF) and Geology and Mines Department (DoGM)	Only stable areas and existing or new government approved sites may be considered	Quarry sites (Haldwani, Lalkuan, Gola river, Tanakpur, Rampur, sand from river banks)	Approval from Forest /Geology and Mines Department. Co-ordination with PWD for use of existing quarry sites. If relevant, discussion with relevant Sanctuary officials.	PMU in PWD/ Consultants	PMU in PWD/ DoF, DoGM	No new quarry sites considered (complied with)
1.3 Location of borrow pits	Location in unstable areas or close to village	Location in area with stable soil and away from villages.	Borrow sites (Almora-Bageshwar: km 219+000, km 240+000; Barechhina-Seraghat: km 179+100, km 66+000, km 281+500, km 60+000)	Discussion with local PWD office	PMU in PWD / Consultants	PMU in PWD	No borrow pits opened so far (complied with)
1.4 Obtaining appropriate clearances/permits for sections of the road through forest areas, Sanctuary areas, location of quarry & blasting sites.	Delays in processing clearances causing delays in initiation of construction	Processing of clearances/permits on a timely basis and keeping in mind the time requirements for these clearances.	11.5 km section of Almora-Bageshwar section and 2.75 km section of Barechhina-Seraghat section located in vicinity of Binsar Wildlife Sanctuary)	Coordination with DoF, SPCB, DoGM, relevant local Administrations	PMU in PWD/ Consultants	ADB	NOC obtained from Forest Department and Pollution Control Board (complied with)
2. Planning/Project Design							

Project Stage/Activity	Potentially Negative Impacts	Mitigation Measures	Location	Public Participation and Co-ordination	Responsible Party		Status of Implementation
					Implementation	Monitoring	
2.1 Pavement	Water leakage/seepage through pavement and damage of road due to poor quality design. Excessive production of smoke or gaseous emissions due to heating bitumen using firewood or diesel fuelled asphalt mixing plants	Quality designs - layer thicknesses and material content Use of bitumen emulsion wherever possible.	All parts of project road		PMU in PWD/ Consultants	PMU in PWD, ADB	Incorporated in design (complied with)
2.2 Walls	Improper placement of gabion or masonry retaining breast/check/toe walls leading to unnecessarily continued issues of erosion, landslides and poor drainage.	Correct placement of gabion retaining breast/check/toe walls in wet, marshy and unstable areas and similar masonry walls in drier areas.	All parts of project road		PMU in PWD/ Consultants	PMU in PWD, ADB	Incorporated in design (complied with)
2.3 Determination of RoW width	Unnecessary widening leading to unnecessary geometric cuts, soil erosion and the destruction of plant and water resources.	Widths to be supported by traffic analyses and economic justification.	All parts of project road		PMU in PWD / Consultants	PMU in PWD, ADB	Incorporated in design (complied with)
2.4 Drainage structures	Poor drainage due to poorly designed/specified drainage structures, e.g., unlined drains. Damage to cross drainage structures due to inadequacy to support water flows and leading to damage to road. Unnecessarily increased sedimentation and waste.	Drains lined with cement mortar only. Drainage structures designed according with anticipated levels of water flows.	All parts of project road		PMU in PWD / Consultants	PMU in PWD, ADB	Incorporated in design (complied with)
2.5 Geometric cuts	Excessive excavation leading to unnecessarily large volumes of earthworks, and generation of excessive dust and sediments deposited in nearby water bodies.	Designs to be based wherever possible on "full cut" method – these requiring one-fourth the volume of material removal associated with "box-cut" methods.	Sharp curves where geometric adjustment required.		PMU in PWD / Consultants	PMU in PWD, ADB	Incorporated in design (complied with)
2.6 Road safety measures	Inadequate safety measures causing accidents in future.	In detail design provide site specific safety measures which also taken into cost and likely economic benefits.	All parts of project road		PMU in PWD/ Consultants	PMU in PWD, ADB	Incorporated in design (complied with)
2.7 Mechanisation	Poor quality construction because of lack of proper equipment and machinery causing early and untimely damage to the road surface and road furniture - leading to poor riding surfaces, poor drainage, unnecessary	During detailed design, specify mechanical construction methods. Select contractors based on their ability to supply/use machinery required for EFRC construction.	All parts of project road		PMU in PWD / Consultants	PMU in PWD, ADB	Incorporated in design (complied with)

Project Stage/Activity	Potentially Negative Impacts	Mitigation Measures	Location	Public Participation and Co-ordination	Responsible Party		Status of Implementation
					Implementation	Monitoring	
	erosion landslides, accidents, and sedimentation in water bodies.						
2.8 Bioengineering	Use of unsuitable bioengineering methods at various sites.	In detailed design specify various bioengineering options and follow the MoSRT&H code for road design and MoRD codes and specifications. Specify the need for monitoring of the implementation of bioengineering.	All parts of project road		PMU in PWD / Consultants	PMU in PWD, ADB	Incorporated in design (complied with)
3. Construction							
3.1 Establishment and shifting of construction camps	Deforestation and poaching by labourers. Improper waste disposal. Loss of aesthetic beauty. Negative impacts on public health. Disturbance to nearby settlements. Unfriendly use of community resources such as non-timber forestry products by construction workers. Leaving dirty and waste material after shifting from one camp site to another.	Provision of cooking gas to contractors' staff. References to the illegality of cutting trees, hunting and fishing and other prohibited activities in community areas to be included in contract documents. Provision of proper waste disposal facilities and health facilities. Health screening of imported workers. Prior information to nearby communities and Sanctuary warden posts of camp establishment. Ensure clean area left behind when shifting camp.	All parts of project road		Contractors, PWD	PIU in PWD	Construction camps not fully established. Contractor to follow, provide basic facilities to workers.
3.2 Removal of vegetation and uprooting of trees	Negative changes in micro level wildlife habitat/ environment. Soil erosion. Scarring of landscape.	Removal of only necessary vegetation. Suitable bioengineering and revegetation of the road shoulders. Compensatory tree plantation.	All parts of project road		Contractors, DoF	PIU in PWD, DoF	Not yet done.
3.3 Cutting of hill slope and earth removal from borrow areas	Soil erosion and landslides. Scarring of landscape because of improper disposal of debris. Dust pollution. Disruption of local drainage. Siltation in nearby water bodies and consequent negative effects on aquatic ecology. Noise and disturbance to wildlife and nearby communities.	Confine cutting activities to dry season. Use "full cut" method. Disposal of debris at proper sites or reuse material for construction. Use of appropriate bioengineering techniques immediately after cutting to maintain stability of slope above and below RoW.	Location of curves, cut & fill locations, landslide prone locations (km 202+200, km 205+100, km 207 to km 208, km 212+500,	Inform nearby community area before beginning cutting work.	Contractor	PIU in PWD	No cut and fill activities to date.

Project Stage/Activity	Potentially Negative Impacts	Mitigation Measures	Location	Public Participation and Co-ordination	Responsible Party		Status of Implementation
					Implementation	Monitoring	
		Proper restoration of borrow areas. Provision of appropriate drainage structures/facilities. Confine construction activities to day times.	km 212+800, km 217+300, km 219+300 of Almora-Bageshwar road				
3.4 Quarrying	Landslides (rockslides/falls), scarring of landscape. Disturbance to wildlife and nearby communities from blasting.	Use of controlled blasting and other environmental friendly techniques for quarrying. Inform nearby community areas before any blasting activities. Blasting only during the day time.	Quarry sites (Haldwani, Lalkuan, Gola river, Tanakpur, Rampur, sand from river banks)	Inform nearby community area before the blasting activities.	Contractors	PIU in PWD /DoGM	No direct quarrying involved.
3.5 Crushing of stone and transport of stone/ materials.	Dust pollution affecting construction labourers and local vegetation. Air pollution from machinery and vehicle exhausts. Noise pollution and disturbance to nearby wildlife and communities.	Water sprinkling of stone crushing site. Proper covers for vehicles transporting stone and materials. Regular maintenance of machinery and vehicles. Confine stone crushing and transportation activities to day times.	Stone crushing sites and all parts of project road		Contractors	PIU in PWD	No stone crushers established. Transportation of construction material is done in controlled manner (complies with)
3.6 Road surfacing activities	Air pollution from smoke and gaseous emissions affecting health of workers. Traffic delays.	Use of bitumen emulsion wherever possible, use diesel fuelled asphalt mixing plants when bitumen heating is required. Inform travellers of schedule of works via television, radio and local newspapers.	All parts of project road		Contractors	PIU in PWD	Not yet started.
3.7 Construction of line and cross drainage structures and bridges.	Inadequate capacity. Collapse of drainage structures due to poor quality construction. Disruption of local stream/river courses and aquatic hydrology. Increased sediments in rivers or streams.	Quality construction. Construction confined to dry season. Provision of appropriate drainage facilities and river/stream diversion structures.	All parts of project road		Contractors, PWD	PIU in PWD	Activities not yet started fully.
3.8 Construction of retention walls	Collapse of walls due to inappropriate quality of work, location and type of wall.	Quality construction and appropriate locations for each type of wall.	All parts of project road		Contractors, PWD	PIU in PWD	Not yet started.
3.9 Operation of machinery and equipment and general activities of labourers	Spillage/leakage of chemicals and oil and contamination of soil and water resources. Injury to workers/others. Respiratory problems from dust and machinery emissions. Hearing problems due	Proper storage and handling of chemicals and oil. Provision of workers with construction hats, face masks, ear plugs, gloves etc. Provision of well equipped first aid kits and health	All parts of project road		Contractors, PWD	PIU in PWD	Work not at fully started at construction plants. Safety provisions for labourers.

Project Stage/Activity	Potentially Negative Impacts	Mitigation Measures	Location	Public Participation and Co-ordination	Responsible Party		Status of Implementation
					Implementation	Monitoring	
	to high level of noise.	facilities.					
3.10 Water supply	Misuse of community water resources	Independent arrangements to be made for water requirements so that supplies to nearby communities remain unaffected	Construction camps	Discuss water resources suitable for construction and construction camp use with local communities and village groups.	Contractors, PWD field offices.	PIU in PWD	Not yet done.
4. Operation							
4.1 Movement of vehicles	Air pollution, noise, and vibrations from increased number of vehicles and disturbance to wildlife.	Planting of appropriate species surrounding the road to absorb air pollution and to block noise and disturbance during and immediately after construction.	All parts of project road		Contractors, PWD	PIU in PWD	Not yet started.
	Increased waste along highway from increased numbers of travellers.	Placing garbage bins and anti-waste signs at appropriate locations.	All parts of project road		Contractors, PWD	PIU in PWD,	Not yet started.
	Increased chances of illegal hunting, fishing and felling of trees in government forests and sanctuary.	Increased patrolling and monitoring by forestry and sanctuary officials.	All parts of project road		Local sanctuary and forestry officials.	sanctuary management and forestry departments	Not yet started.
	Increased accidents and injuries.	Installing crash-barriers at black-spots, road safety signs at other appropriate locations and speed breakers in community areas during construction.	All parts of project road		Contractors, PWD	PIU in PWD, Local traffic police	Not yet started.
General functioning of road	Damage to riding surface and structure of road - formation of potholes, water seepage, and poor drainage.	Quality construction and maintenance.	All parts of project road		Contractors, PWD	PIU in PWD	Not yet started.
	Excessive landslides, erosion due to improper maintenance of bioengineering works, wall construction.	Quality construction and maintenance.	All parts of project road		Contractors, PWD	PIU in PWD	Not yet started.
	Damage of drainage structures and consequent disruptions to traffic, failure to enable proper drainage, and increased sedimentation.	Quality construction and maintenance.	All parts of project road		Contractors, PWD	PIU in PWD	Not yet started.

Table 8: Status of Monitoring Plan for Contract VII and Contract VIII (Category 'A' Roads) as on 31 March, 2008

Environmental Features	Aspect to be Monitored	Time and Frequency of Monitoring	Location	Financial Requirements	Responsible party	Status of Implementation
1. Construction stage						
A. Physical Environment						
i) Air and Noise	Level of SPM, RSPM CO, SO ₂ and NO _x	Before starting of any construction activities	Seven Sensitive location along the project roads (Almora, Kaparchan, Basoli, Kalligair, Bageshwar, Dhaur Chinna, and Seraghat)	Environmental Monitoring cost - Refer table 6.1	PMU, PIU, PWD division office	Not yet started
	Noise levels on dB (A) scale	Once in every section while construction is ongoing				
		Once after completion of construction activities				
ii) Topography and Soil	Number and scale of soil erosion and landslide sites	Before starting of construction activities	Full length of project road where work will be undertaken	Costs for hiring consultant and/or Daily field allowances and vehicle charges for PWD staff	PMU, PIU, PWD division office	Not yet started
		Once a year during construction activities				
		Once after completion of construction activities and thereafter once per year for at least next 5 years depending on budget availability				
	Number of properly bioengineered sites	Once every summer during construction activities	Wherever bioengineering technique has been used	Daily field allowances for PWD staff	PMU, PIU, PWD division office	Not yet started
		Once after completion of construction activities and thereafter once per year for at least next 5 years depending on budget availability				
iii) Water Bodies	Concentration of sediments and presence of construction debris	Before starting of construction activities	Saryu river at Seraghat, Binsar Gad, and other perennial streams along the project roads	Environmental Monitoring cost - Refer table 6.1	PMU, PIU, PWD division office	Not yet started
		During construction activities in the vicinity of each water body				
		Once after completion of construction activities				
	pH, BOD, COD, DO, TDS, MM, NO ₃ , and Coliform	Before starting of construction activities				Not yet started
		During construction activities in the vicinity of each water body				
		Once after completion of construction activities				
	Length of line drainage structures constructed and strengthened	During construction activities in the vicinity of each water body	Full length of project road where work will be undertaken	Locations of line drainage structures are provided in design report. Location will be further confirmed during construction works. Additional costs only for field allowances for PWD staff.	PMU, PIU, PWD division office	Not yet started
	Length of damaged or missing line drains	Before starting of construction activities	Full length of project road where work will be undertaken			
	Total number, type and lengths of cross drainage structures including bridges	Before starting of construction activities	Full length of project road where work will be undertaken		PMU, PIU, PWD division office	Not yet started
		Once a year during construction activities				
		Once after completion of all construction				

Environmental Features	Aspect to be Monitored	Time and Frequency of Monitoring	Location	Financial Requirements	Responsible party	Status of Implementation
	constructed or strengthened	activities				
	Number of weak cross drainage structures	Before starting of construction activities After completion of construction activities	Full length of project road where work will be undertaken		PMU, PIU, PWD division office	Not yet started
iv) Geology and Seismology	Number of rock slides	Before starting of construction activities Once a year during construction activities After completion of construction activities	Full length of project road where work will be undertaken	Costs for consultant and /or field allowances and vehicle charges of PWD and Geology and Mines Department staff	PMU, PIU, PWD division office, Forest Department, Department of Geology and Mines	Not yet started
B. Ecological Resources						
i) Flora	Average tree density	Before starting of construction activities During construction (once a year per section) Once after completion of construction activities and thereafter once per year for at least 5 depending on budget availability.	Full length of project road where work will be undertaken		PMU, PIU, PWD division office, Forest Department, Binsar Wildlife Staff	Not yet started
	Number of cases of illegal tree felling	Once a year during construction activities Once after completion of all construction activities	Full length of project road where work will be undertaken	No costs, as it is part of the responsibilities of the local territorial forestry and sanctuary staff	PMU, PIU, PWD division office, Forest Department, Binsar Wildlife Staff	Not yet started
ii) Fauna						
Leopards	Approximate number of Leopard sightings, Number of sighting leopard troops. Date of sighting, time of sighting. Location of sighting	Before starting construction activities. During construction activities (throughout the year) Once after completion of construction activities and thereafter once every three years	Full length of project road Sections of project roads that pass through BWLS	Daily field allowances and vehicle for sanctuary, forestry and PWD staff	PMU, PIU, PWD division office, Forest Department, Binsar Wildlife Staff	Not yet started
Goral and Kakar	Approximate numbers seen or heard. Number of sightings. Date and time of sighting. Location of sighting	Before starting construction activities During construction activities (throughout the year) Once after completion of construction activities and thereafter once every three years	Full length of project road Sections of project roads that pass through BWLS		PMU, PIU, PWD division office, Forest Department, Binsar Wildlife Staff	Not yet started
Other Wildlife	Name of species seen.	Before starting construction activities	Full length of project		PMU, PIU, PWD	Not yet started

Environmental Features	Aspect to be Monitored	Time and Frequency of Monitoring	Location	Financial Requirements	Responsible party	Status of Implementation
(Langurs, Barking Deer etc.)	Frequency of sighting. Months and time of sighting. Location of sighting	During construction activities (throughout the year)	road. Sections of project roads that pass through BWLS		division office, Forest Department, Binsar Wildlife Staff	Not yet started
		Once after completion of construction activities and thereafter once every three years				
C. Social Environment						
i) Health	Number of accidents amongst construction workers	During construction activities	All construction sites along project road	Daily field allowances and vehicle charges of Local traffic police and PWD officials	PMU, PIU, Contractor, local health officials	Not yet started
	Number of accidents due to moving traffic among local community members	Before starting construction activities	All villages along project road		PMU, PIU, Contractor, local health officials, local traffic police	Not yet started
		Once a year during construction activities				
		Once every year after completion of construction activities				
ii) Travel time	Time taken to travel within each road section	Before starting construction activities	Full length of project road where work will be undertaken	Costs for hiring consultant or Daily field allowances and vehicle charges for Local traffic police and PWD officials.	PMU, PIU, Contractor, local traffic police	Not yet started
		After construction activities and thereafter once per year for at least next 5 years depending on budget availability				
	Number and extent of travel delays	During construction activities (throughout the year)	Full length of project road where work will be undertaken		PMU, PIU, Contractor, local traffic police	Not yet started

5. MONITORING OF ENVIRONMENTAL QUALITY

44. Since the construction activities are at initial stage, the monitoring environmental quality has not been carried. However, as the work progresses, environmental quality monitoring in terms of Air Quality, Water Quality, Noise Quality and erosion along with ecological aspects would be monitored. Aspects associated with environmental monitoring described in the environmental monitoring plan have been discussed with contractors and further conditions from NOC that is now being obtained from the SPCB will be included in the subsequent environmental monitoring reports.

45. Policies and Regulation of the Government of India through Ministry of Environment and Forests (MoEF) and Central Pollution Control Board (CPCB) will form the basis of the environmental quality monitoring.

46. Monitoring will be performed by using indicator described in the environmental monitoring plan and will be adjusted with the conditions or requirement of NOC. The monitoring locations will also be adjusted with the requirement of NOC. The result will be compared to the Indian environmental quality standards as explained in **Attachment A**.

6. INSTITUTIONAL CAPACITY AND ARRANGEMENT

47. There are several environmental experts have been engaged or implementing the Phase I project. The environmental expert at the PMU level with post graduate degree in environmental science was hired for undertaking the following responsibility:

- Ensure that the ADBs environmental safeguard policies/framework and Govt. of India notification/rules/regulation and various Acts enacted for the control and prevention of adverse impacts on environment are implemented in the whole the project cycle
- Guide and review the preparation of environmental assessment reports of each roads submitted by the DPR consultants.
- Prepare the Summary Environmental Assessments for the overall project and finalization in close co-ordination with the ADB.
- Ensure that the Environmental Management Plan is implemented in the whole cycle of the project from design to implementation of the Project.
- Co-ordinate the obtaining the requisite Environmental clearances for the project.
- Review and approve the Contractor's Implementation Plan with Supervision Consultant for the environmental measures, as per the EMP.
- Liaise with the various Central and State Government agencies on environmental and other regulatory matters.
- Continuously interact with the NGOs and Community groups to be involved in the Project (for the maintenance of additional plantations, if any, suggested for the Project).
- Assist the supervision consultant in establishing dialogue with the affected communities and ensure that the environmental concerns and suggestions are incorporated and implemented in the project.

- Review the environmental performance of the project through an assessment of the periodic environmental monitoring reports submitted by the Supervision Consultants.
- Provide support and assistance to the Government Agencies and the ADB to supervise the implementation of the EMP during the construction as well as operation stage of the project;
- Report to the Project Director on any environmental problem emerged from the Project that has not included in the EMP.
- In close coordination with PIU, and supervision consultant undertake the field monitoring to ensure that EMP implemented during the construction stage
- Prepare periodic (monthly, quarterly and annual) reports for dissemination with-in-the PWD for the Asian Development Bank etc.
- Hold periodic training for Project related staff on environmental issues.
- Undertake any other relevant work related with environmental aspect of the Project as and when required.

48. The environmental expert at the PMU has undertaken the following activities since his engagement:

- Taken lead role at PMU in coordination between ADB as well Supervision Consultant and Contractor;
- Liaisoning with statutory bodies in getting necessary permits;
- Ensured that environmental mitigation measures are included in the contract documents;
- Review of monthly progress report submitted by Supervision Consultant and preparing Environmental Monitoring Report
- Serving the need of PIU at field level in supervising the contractors' activities in implementing environmental management plans.

49. The supervision consultant is supported also by the environmental expert having a post graduate degree in environmental engineering. This expert were hired as part of supervision consultancy services and mobilized in the end of 2007. The Environmental expert of the Supervision consultant (SC) has the following main responsibilities: (i) to supervise the contractor to implement environmental mitigation measures, (ii) undertake day-to-day monitoring of the implementation of EMP. The result from this routine monitoring report is submitted to PIU in Monthly basis. The Supervision Consultant has submitted the monthly progress report to PMU for the month of March 2008. It includes progress of environmental aspects, key environmental issues identified, and work plan for upcoming activities.

50. At present contractor do not have any designated expert / person to look after implementation of the environmental mitigation measures. However, it has agreed that the accident prevention expert will take the responsibility to lead the contractors' responsibility on implementation of EMP.

51. For the preparation of project under the Phase II, all the DPR consultant have hired environmental expert to undertake environmental assessment study, and prepare the environmental assessment report.

7. CONCLUSION AND RECOMMENDATIONS

52. Under the Phase I of USRIP Project, it is envisaged during the environmental monitoring that:

- At the project preparation stage, the environmental assessment study was carried out for all road section. The bidding document was properly covered the environmental aspect by attaching the IEE, EIA, including its EMP. The contract for civil work has included the environmental requirement as special instruction for the contractor.
- There were no serious environmental problem identified at this early construction works especially on establishment of site offices, construction camps, mobilization of resources, and land clearing. Mitigation measures as stated in the EMP have been implemented without any difficulties. However, Contractors' are yet to obtain NOC from Pollution Control Board as well as NOC from Forest Departments (in case located near forest areas to operate the hot mix plants).
- For the Almora-Bageshwar and Barachhina-Sheraghat roads, there were no serious environmental problems. However, the contractors' has to obtain NOCs from Pollution Control Board as well as Binsar Wildlife Sanctuary for smooth functioning of construction camps as well as hot mix plants.

53. The next environmental monitor report for Almora – Bageshwar and Barechhina – Sheraghat will be submitted to ADB on October 2008, and overall environmental monitoring of the Project will be submitted May 2009.

Standards for Monitoring of Environmental Quality Parameters

A. Water Quality Monitoring. Water quality monitoring will be performed for pH, BOD, COD, TDS, NO₃, Oil and Grease and, Coliform. The water quality parameters should be analyzed in light of standards prescribed by CPCB (Table a) as well WHO.

Table a: CPCB Water Quality Standards

Designated Best Use	Class of Water	Criteria
Drinking water source (with conventional treatment)	A	Total Coliforms MPN/100ml shall be 50 or less pH between 6.5 to 8.5 Dissolved Oxygen 6 mg/1 or more Biochemical Oxygen Demand (BOD) 5 days 20°C 2 mg/1 or less
Outdoor bathing (organised)	B	Total Coliforms MPN/100ml shall be 500 or less pH between 6.5 to 8.5 Dissolved Oxygen 5 mg/1 or more Biochemical Oxygen Demand (BOD) 5 days 20°C 3 mg/1 or less
Drinking Water Source (without conventional treatment)	C	Total Coliforms MPN/100 ml shall be 5000 or less pH between 6.5 to 8.5 Dissolved Oxygen 4 mg/1 or more Biochemical Oxygen Demand (BOD) 5 days 20°C 3 mg/1 or less
Propagation of Wildlife	D	pH between 6.5 to 8.5 for Fisheries Dissolved Oxygen 4 mg/1 or more Free Ammonia (as N) 1.2 mg/1 or less
Irrigation, Industrial Cooling, Controlled Waste	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C Max 2250µ mhos/cm Sodium absorption ratio Max. 26 Boron, Max. 2 mg/1

B. Air Quality Monitoring. During the construction air quality should be monitoring at sensitive locations identified (near potential sources of air pollution in the area) in the monitoring plan and adjusted to follow the requirement of NOC for Level of Dust / SPM, RSPM, CO, SO₂ and NO_x. The quality should be standards prescribed by CPCB Table b).

Table b: National Ambient Air Quality Standards

Pollutant	Time weighted average	Sensitive area	Industrial area	Residential, rural & other areas	Method of measurement
Sulphur Dioxide (SO ₂)	Annual* 24 hours**	15 µg/m ³ 30 µg/m ³	80 µg/m ³ 120 µg/m ³	60 µg/m ³ 80 µg/m ³	Improved West and Gaeke Method Ultraviolet Fluorescence
Oxides of Nitrogen as NO _x	Annual* 24 hours**	15 µg/m ³ 30 µg/m ³	80 µg/m ³ 120 µg/m ³	60 µg/m ³ 80 µg/m ³	Jacob & Hochheiser Modified (Na-Arsenite) method Gas phase Chemiluminescence
Suspended Particulate Matter (SPM)	Annual* 24 hours**	70 µg/m ³ 100 µg/m ³	360 µg/m ³ 500 µg/m ³	140 µg/m ³ 200 µg/m ³	High Volume Sampler (Average flow rate not less than 1.1 m ³ /minute)

Pollutant	Time weighted average	Sensitive area	Industrial area	Residential, rural & other areas	Method of measurement
Restorable Particulate Matter (RPM) size less than 10 µm	Annual* 24 hours**	50 µg/m ³ 75 µg/m ³	120 µg/m ³ 150 µg/m ³	60 µg/m ³ 100 µg/m ³	Respirable Particulate Matter Sampler
Lead (Pb)	Annual* 24 hours**	0.5 µg/m ³ 0.75 µg/m ³	1.0µg/m ³ 1.5 µg/m ³	0.75 µg/m ³ 1.0 µg/m ³	AAS Method after sampling using EPM 2000 or equivalent filter paper
Carbon Monoxide (CO)	8 hours** 1 hour	1.0 mg/m ³ 2.0 mg/m ³	5.0 mg/m ³ 10 mg/m ³	2.0 mg/m ³ 4.0 mg/m ³	Non - dispersive infrared Spectroscopy

C. Noise Level Monitoring. Noise levels should be monitored as equivalent noise level measured on 'A' scale i.e. dB(A) during the construction period. This should be monitored on continuous basis as sensitive locations identified in the monitoring plan. Monitoring should be done for 1 day both day time and night time i.e. 6:00 to 22:00 daytime and 22:00 to 6:00 nighttime and at various sensitive zones. Table c gives the noise standards.

Table c: National Ambient Noise Standards

Area Code	Category of Zones	Limits of Leq in dB(A)	
		Day time*	Night time*
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence Zone **	50	40

* Day time is from 6 am to 9 pm whereas night time is from 9 pm to 6 am

** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicles horns, loud speakers and bursting of cracking are banned in these zones

D. Erosion. The number and scale of soil erosion and landslide sites should be monitored.