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ENVIRONMENT & SOCIAL IMPACT ASSESSMENT & MANAGEMENT PLAN FOR KHUNTI WATER SUPPLY PROJECT

REVISED VERSION , AUGUST 2018

Jharkhand Urban Infrastructure Development Company Limited (JUIDCO)

Jharkhand Municipal Development Project (JMDP)

Table of Contents

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

AAQ	Ambient Air Quality
BIS	Bureau of Indian Standard
BMTPC	Building Materials & Technology Promotion Council
CGWA	Central Ground Water Authority
CGWB	Central Ground Water Board+C26
CTE	Consent to Establish
DEM	Digital Elevation Model
DG	Diesel Generator
EHS	Environmental Health Safety
EPC	Engineering Procurement Construction
ESMP	Environmental Social Management Plan
HSSE	Health Safety Social Environment
IFC	International Finance Corporation
JSEB	Jharkhand State Electricity Board
JSPCB	Jharkhand State Pollution Control Board
JUIDCO	Jharkhand Urban Infrastructure Development Company Limited
KII	Key Informants Interview
KNP	Khunti Nagar Panchayat
NH	National Highway
OF	Out Fall
OP	Operating Procedure
PM	Particulate Matter
PVC	Polyvinyl Chloride
RCC	Reinforced Cement Concrete
RoW	Right of Way
UDHD	Urban Development and Housing Department
ULB	Urban Local Body
JMDP	Jharkhand Municipal Development Project
JUIDCO	Jharkhand Urban Infrastructure Development Company Ltd.
WB	World Bank
ESMF	Environmental and Social Management Framework
ESIA	Environment and Social Impact Assessments
GoJ	Government of Jharkhand
ToR	Terms of Reference
ESR	Elevated Storage Reservoir
WTP	Water Treatment Plant
EMP	Environment Management Plant
WSS	Water Supply Scheme
SES	Socio-Economic Survey
PIA	Project Impact Area
CoI	Corridor of Impact
PAPs	Project Affected Persons
RAP	Resettlement Action Plan
SIA	Social Impact Assessment
JSEB	Jharkhand State Electricity Board
GRC	Grievance and Redressal Committee

EXECUTIVE SUMMARY

Introduction

The Urban Development and Housing Department (UDHD), Government of Jharkhand has designed the Jharkhand Municipal Development Project (JMDP) with an objective to improve urban service delivery and urban management capacities in selected Urban Local Bodies (ULBs). JMDP entails planning and implementation of multiple sub-projects across districts in Jharkhand. The Government of Jharkhand has identified the Jharkhand Urban Infrastructure Development Company Ltd. (JUIDCO Ltd.) as the primary implementing agency for executing the JMDP. The Government of Jharkhand is seeking financial support from the World Bank towards the cost of the JMDP.

An Environmental and Social Management Framework (ESMF) has been prepared by JUIDCO for the JMDP with the following objectives: to assess and manage the potential environmental and social risks and impacts that may come up during implementation and throughout the project cycle; to ensure the social and environmental sustainability of investments; and to ensure compliance with national environmental and social legislation and World Bank safeguard policies. As required by the ESMF, screening, and categorisation, an Environment and Social Impact Assessments (ESIA) and management plan has been conducted for the Khunti Water Supply sub-project by consultants independent of DPR consultants, following the requirements of Bank OP 4.01 Category A project. WBG EHS Guidelines, and Industry Sector Guidelines for Water and Sanitation have been used to identify impacts and recommend suitable mitigation measures.

About the Khunti Water Supply Sub-Project

The Khunti Water Supply Scheme in Khunti Nagar Panchyat is one of the sub-projects for implementation under JMDP and this document is the ESIA and ESMP of this sub-project. The current Water Supply Scheme supplies 0.9 MLD of water and covers partially 30 percent of the urban area. It was first constructed in the year 1982 with a 3m weir, distribution network, an intake well, and one ESR. A pumping facility from the intake well and WTP were upgraded later in the year 2006 after which regular piped water supply system was commissioned. The proposed sub- project will augment the existing system by expanding to 13.54 MLD of water till the ultimate design year i.e. 2048.

The existing intake well, on Tajna River will serve as source of water for the project. For this purpose, the Water Resources Department, Government of Jharkhand has issued a no objection certificate for drawing of the increased amount of water from the intake, based on a water balance calculation conducted as part of the DPR, and the departments own investigations. The current raw water main pipeline connecting the intake and proposed new WTP will be replaced with a new 500mm dia and 1650m length. The existing WTP will be decommissioned and a new 16 MLD capacity WTP will be developed, and connected with 4 ESRs (3 New & 1 refurbished) and about 8.7 kms of rising mains; and 122 km new distribution lines will be laid under this project to supply 100 percent household (8350) connections with automated meters. The entire project is divided into 4 zones, distribution consists of new DI pipes replacing old PVC, HDPE and CI pipes. Operations and Maintenance will be supported for 5 years' post implementation of the project

Applicable Environmental and Social Policies

The key environment and social laws and legislation applicable for Khunti water supply project, are Water (Prevention And Control of Pollution) Act, 1974; The Water (Prevention And Control of Pollution) Act, 2012; Air (Prevention and Control of Pollution) Act 1981, The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; Construction and Demolition Waste Management Rules, 2016, The Noise Pollution (Regulation and Control) Rules, 2000 Country Labour laws[1] and Street Vendors (Protection of Livelihood and Regulation of Steet Vending) Act, 2014.

In addition, a set of operational policies laid down by the World Bank will also be applicable to the project, which are OP 4.01 Environmental Assessment; OP 4.36 Forests; OP 4.12 Involuntary Resettlement; OP 4.10 Indigenous People; and World Bank Policy on Access to Information and Disclosure. The project shall also follow WBG EHS Guidelines, and WBG Industry Sector Guidelines on Water and Sanitation.

Public and Stakeholder Consultations

As a part of environmental and social impact assessment, two rounds of public/stakeholder consultations were organized in Khunti to seek inputs into the project design and

[1] Contract labour (Regulation and Abolition) Act 1970; Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013; Employees P.F and Miscellaneous Provision Act, 1952; Child labour (Prohibition and Regulation) Act 1986; Inter-State Migrant Workmen's (Regulation of employment and Conditions of service) Act, 1979; The Building and Other Construction Works (Regulation of Employment and Conditions of Service) Act 1996; Minimum Wages Act 1948; Equal Remuneration Act 1976; Weekly Holidays Act 1942; Employer's Liability Act 1938; Bonded Labour System (Abolition) Act 1976 etc.

development of the ESIA in January 2017, and on an advanced draft of the ESIA in October 2017. Furthermore, information pertaining to the sub-project including work schedule, procedures involved, finalization of project components with identification of impacts, entitled persons, mitigation measures and grievance redressal mechanisms was discussed and disseminated. Stakeholders such as the public, the ULB, the Land Revenue Department, National Highway Authority of India (NHAI), Water Resources Department etc. were also involved in the consultations. The suggestions arising from the consultations were incorporated, as appropriate, in the designs and mitigation plans.

The summary of public consultation inputs, undertaken as part of ESIA is detailed below:

i. One private land parcel will be acquired for the proposed project and owner has already given the consent for the acquisition but there is no permanent impact to structures.
ii. Impacts are limited to non-title holders. The structure of only 2 non-title holder will be affected due to the project. There will be temporary loss of income of 35 PAPs for approximate 20 days during the actual construction process. There is only one Schedule Tribe household to be affected.
iii. Assistance will be provided for the temporary impacts. The relevant provisions of the Entitlement Matrix were made known to the public and a Hindi version of the same would be distributed before mobilization of the contractor. Locals were also informed of skill development training.
iv. People have raised the issue of noise and air pollution that would be generated during the construction phase and have requested for implementation of suitable mitigation measures.
v. Water pipelines should be separated from the roadside drainage to avoid any possible contamination.
vi. Free water points for public use need to be considered.
vii. As informed by people, the contractor should keep a provision for employment of local persons (mainly women), in the project.

Screening, Categorisation and Assessment of Impacts

Screening of the subproject was carried out in line with the checklist attached in Annexure I. Khunti Urban Water Supply Project is categorized under environment as E-1. As per the ESMF guidance, all project involving sensitive environmental areas, including forests would qualify for E1 categorisation. The proposed sub- project will involve replacement of 233 m of pipeline within protected forest area.

The key positive impacts due to the sub-project are (a) improved water quality and quantity; (b) increase in employment opportunities for locals; (c) reduction in groundwater abstraction (d) improved living standards and hygiene within the project area; and (e) improved institutional capacity of the ULB to manage the sustainability of the water supply infrastructure.

This ESIA identifies the environmental and social impacts that may occur because of the implementation of the sub-project in all its phases; design, construction and operation. The sub -project will be implemented on similar alignments as the old water supply scheme and all infrastructure components proposed under the subproject are located within the town and its surroundings. The expected environmental impacts during construction phase include (a) waste and construction debris generation from decommissioning of the old water supply scheme [old WTP, and ESR, and disposal of old distribution lines] (b) excavation activities causing impacts on soil erosion, vegetation and increased risks of accident and injury (c) increase in dust, air, noise pollution and with the town and disruptions in traffic/ pedestrian movement flow (especially where pipelines cross major roads). Impacts will be site specific, and in most cases mitigatory measures are standard. The ULB has designated a landfill site which has the requisite capacity to accommodate for debris and waste, in addition a site for setting up the contractors labour camp has been designated over 1 acre near the existing WTP where 50-60 migrant workers will be accommodated. The project will not affect any physical cultural resources adversely, and there are no historic and archaeological significant sites in the town of Khunti.

One private land parcel will be acquired for the proposed project. Land for three ESRs and intake well is already in possession. Around 1650 m of pipeline will be upgraded and 130.758 km will be newly laid, The newly laid pipe will be within the RoW and there is no change in the character of land. The project involves loss of two structures of two non-titleholders within the road Right of Way (RoW). Also at the time of laying of pipes is likely to cause loss of income for 35 street vendors temporarily. As per ESMF categorisation criteria, Khunti Water Supply Project is categorised as S-2. A separate ARAP is prepared to meet the requirement of country legislations and World Bank's Operational Policy 4.12 on Involuntary Resettlement.

The existing Raw Water pipeline of 300mm, would need to be replaced by 500mm pipeline. The current alignment of 233 m of raw water pipeline is located on forest land (for which 0.02 Ha area would be utilized) also a Scheduled V area. A clearance for this has been granted by the Divisional Forest Officer, Khunti, under section 3 (2) of The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. As this is a

government legally designated protected forest, the ESMP will follow all recommendations given in the clearance, no trees will be cut and consent of the forest dwelling community in the Gram Sabha has been taken as per the procedure of clearance under the applicable Act. An Scheduled Tribe Participation Plan (STPP) has also been prepared to ensure community participation throughout the sub project cycle to fulfil the requirement of World Bank's policy 4.10 on Indigenous Peoples and OP 4.36 on Forests. The ESMP also specifies all precautionary measures not to damage / disturb the sensitive areas, and to avoid any impacts.

Operation phase impacts are minor, the ESIA has put in place effective mechanisms and mitigation for occupational health and safety risks for the WTP operators and adequate treatment and disposal of sludge from the WTP during operation phase. Since back water is recovered and re-circulated in the WTP, no wastewater will be generated from water treatment process. A sewerage scheme is being planned for Khunti Nagar Panchayat (KNP) area, and will be fully operational in the next 4-5 years.

Environment and Social Management Plan

An Environment and Social Management Plan (ESMP), which elaborate on the identified mitigation measures, and the means of their implementation, the monitoring plan and the costs involved have been prepared along with ESIA. The ESMP has a budgetary requirement of INR. 29.22 lakhs for the construction phase, and INR 25.4 lakhs for O&M phase comprising of 5 years.

The cost for the ESH training, mitigation, waste disposal and labour camp have been included in the Project cost. The costs for environmental quality monitoring, personal protective equipment for labour have been provided. The Management Plan also covers operation and maintenance phase has also been prepared with special emphasis on water quality monitoring and sludge management.

Abbreviated Resettlement Action Plan (ARAP) proposes a budget of INR 7.74 lakhs. However, no separate budget has been provisioned under Scheduled Tribe Participation Plan (STPP) as the implementation arrangements for ensuring participation of the forest dwellers remains the same as ESMP and ARAP. This has been included in the overall sub-project costs.

Grievance Redressal mechanism

A GRC will be set up at the state and ULB level. The objective is to receive and resolve the affected communities concerns, queries, complaints and grievances about the environmental and social aspects of the Project that could be encountered during implementation as well as to address other social issues pertaining to social cohesion and integration once the sub-projects implemented. Some means of communicating information on JUIDCO's GRM includes the following:

- Distribution of leaflets to the public places
- Notice boards
- JUIDCO's website
- Telecommunication Tools

The Deputy Project Director (JUIDCO, PMU) will be responsible for ensuring that each sub-project establishes an effective multi-level GRM to handle all grievances related to sub-project activities. The GRM will function at 2 levels: at the community level, where every effort will be made to resolve the issue; and at the sub-project level where,a GRC will be established and as an appeal mechanism at state level. the sub-project level GRC shall be constituted with five persons including a female member.

- One from the ULB/executing agency
- Any one elected representative (local project area; preferably female)
- Representative of a community-based group of women such as Mahila Samakhya/Mahila Mandal
- A person who is publicly known and accepted by the locals (in the project area) to speak on their behalf (to be identified by the elected representatives of the ULB)
- Community development officer from PIU
- Medical officer
- Officer from concerned department such as police, transport and labour
- ULB-level community organiser or Chief Municipal Officer's representative

The PAP will have to clarify the area of grievance. The GRC will entertain only grievances related to construction activities affecting the livelihood or loss of property/utility or restriction of access, labour community conflict, construction site management and quality of service during the O&M period. Grievances related to corruption will only be dealt under the anti-corruption laws of the Jharkhand.

The PAP (or his/her representative) may submit his/her complaint in by either written letter, phone, or email to the GRC or, alternatively, raise his/her voice in a public or individual meeting with project staff. A very simple grievance form in local language will also be available at each project site to be filled in by the complainant. Also complaint boxes shall be placed at ULB office, PIU office and Contractors campsite/office. One person in PIU and Khunti contractor office will be designated as complaint officer responsible for reciving all the grievances (oral or written) and maintaining the log of such complaints and action taken. This complaint officer shall facilitate filling the grievance form in case of illiterate complainants. NGO engaged for ARAP implementation shall act as facilitator in ensuring that all the complaints/suggestions reach the attention of PIU head especially of the PAPs and local community. The effectiveness of the GRM shall be tracked through progress report of Construction Supervision and Quality Consultants (CSQC) and NGO facilitating ARAP implementation.

The contact details of the registering complaints/suggestions at state level is given below:

Grievance Redressal Cell
Jharkhand infrastructure Development Company Limited
3rd Floor,Pragati Sadan, Kutchery Chowk
Ranchi-834001, Jharkhand
Phone No: 651 2243203
Email: grc.jmdp.juidco@gmail.com

The GRC will meet to try and resolve the matter at community level and make a recommendation usually within 7-10 working days from receipt of complaint. If there is no decision after 10 days, the PAP or any other aggrieved person can refer the complaint to the Deputy Project Director (JUIDCO, World Bank PMU). The Deputy Project Director (JUIDCO, World Bank PMU) will chair an Appeals Committee, which will then examine and address the complaint within 20 days. It is recognised that some complaints may take longer to resolve due to their complexity, for example, those related to land disputes. In such cases, the greived party shall be communicated the possibility of delays with reasons and next actions within 20 days, All submitted complaints and grievances will be registered at the sub-project level and added to a database of JUIDCO-JMDP PIU, which will be monitored regularly by designated JUIDCO-JMDP staff.In addition to the mechanism explained above, PAPs have the right to approach the judiciary of the country.

Gender Issues, Action Plan and Monitoring Indicators

The main gender issues in the project are inequality in accessibility to urban infrastructure and services, safety and security of the women, inequality in participation of women workforce and awareness of women about their rights.

The project will ensure easy accessibility to improved urban infrastructure and services through 24x7 domestic water supply for households and better roads. Proper street lighting will increase the safety and security of women. There will also be a provision for the contractor to employ local people, preferably women. The implementing consultant/NGO would increase the awareness among the women regarding their rights and opportunities available from the project.

The monitoring indicators are the number of connections of water supply points to the vulnerable population particularly women headed households in the sub-project area, contractor's progress report shall include number of women employed and their wages and monthly status of the grievance redressal mechanism(GRM).

Institutional and Implementation arrangement for ESMP Supervision

The State PMU in Ranchi at JUIDCO will be overall responsible for addressing environmental and social safeguard measures. An environmental and social specialist is already in place in the PMU. The PMU will be supported by a Project Implementation Unit (PIU) at Khunti, responsible for day-to-day implementation of ESMP, ARAP and STPP. The PMU specialists will also train and strengthen the capacities of specialists in the PIUs and other implementing entities. The project shall hire qualified civil society organisations/NGOs for the implementation of ARAP and other social mobilisation/IEC activities under the Khunti Water Supply Project.

Construction Supervision and Quality Control Consultants are also in the process of being hired, and will contain a dedicated Environment, Social, Health and Safety Officer to verify compliance with ESMP, labour management, occupational health and safety requirements, and waste management procedures.

The Project Management Consultants (PMC) shall provide additional support of Social and environment specialists to the PMU and PIU to coordinate, review, support and monitor all respective safeguards aspects of the Khunti Water Supply Project.

The compliance of the ESMP, labour management and OHS management by the contractor shall be monitored and assessed during construction by the PIU and CSQC consultant, and formal inspections by the PMU staff. There will also be a safeguard audit of the works which shall be carried out by an independent consultant.

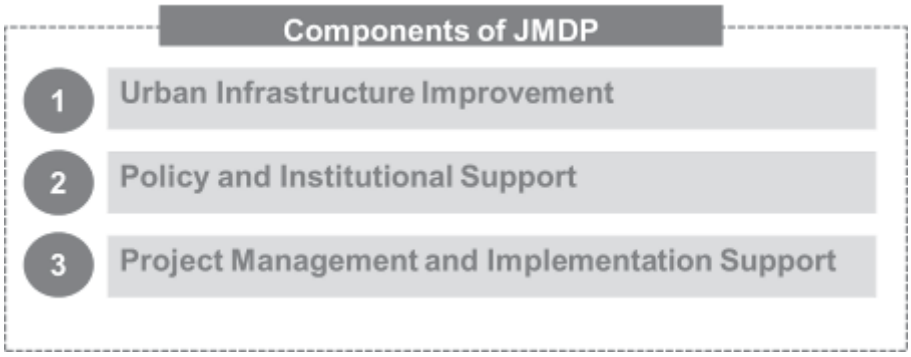
1 INTRODUCTION

1. The Urban Development and Housing Department (UDHD), Government of Jharkhand (GoJ), has created the Jharkhand Municipal Development Project (JMDP) with an objective to improve urban service delivery and urban management capacities in selected Urban Local Bodies (ULBs). The Government of Jharkhand (GoJ) has sought financial support from the World Bank (WB) towards the cost of the JMDP. Jharkhand Urban Infrastructure Development Company Ltd. (JUIDCO Ltd.) has been identified as the primary implementing agency for the JMDP.

"JUIDCO" is a company created under the administrative control of Urban Development Department, Government of Jharkhand for formulation, implementation and monitoring of various central/state sponsored urban infrastructure development schemes in the state of Jharkhand. JUIDCO has been undertaking implementation of water supply projects in the urban areas across the State of Jharkhand, besides

2. The JMDP encompasses upgradation of municipal infrastructure (expansion of coverage, and construction and rehabilitation of basic infrastructure systems, such as, water supply, roads, municipal buildings, *etc.*) and associated operation and maintenance support. The JMDP primarily has three components, as shown in Figure-1 below.

Figure 1: Components of JMDP



3. These components entail planning and design of multiple sub-projects, across different districts in Jharkhand. The priority sub-projects have been identified by the Government of Jharkhand based on technical, environmental, social and financial sustainability of the investments.

4. An Environmental and Social Management Framework (ESMF) has been prepared by JUIDCO for the JMDP with the following objectives: to assess and manage the potential

environmental and social risks and impacts that may come up during implementation and throughout the project cycle; to ensure the social and environmental sustainability of investments; and to ensure compliance with national environmental and social legislation.

As per World Bank policy 4.01, an ESMF is an instrument that examines the issues and associated impacts when a project consists of a program and/or series of sub-projects, and the impacts cannot be determined until the program or sub-project details have been identified. The ESMF sets out the principles, rules, guidelines and procedures to assess the environmental and social impacts. It contains measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive impacts, besides provisions for estimating and budgeting the costs of such measures, and information on the agency or agencies responsible for addressing project impacts.

5. As required by the ESMF, Environment and Social Impact Assessments (ESIAs) are being conducted for the selected priority sub-projects.

1.1 Brief Description of Project

6. The Khunti Nagar Panchayat (KNP), an urban area in the state of Jharkhand, is partially receiving water from the existing water supply scheme commissioned in year 1982 and upgraded in 2006. At present, only 14% of the total households of Khunti Nagar Panchayat, spread across 10 wards out of the 16 wards, have water connections. The remaining areas depend entirely on ground water for meeting their daily needs. The proposed sub-project, called the Khunti Urban Water Supply Scheme (Khunti-UWSS), is aimed at 100% coverage of piped potable water supply on 24x7 basis in KNP. The proposed source for the Khunti-UWSS is the Tajna River - a left bank tributary of the Swarnrekha river in Swarnrekha basin in the Khunti district. The following activities are to be taken up under the proposed sub-project: the existing 300 mm of pipeline from intake well will be replaced by 500 mm DI pipe; a new 16 MLD WTP will be developed; three ESRs will be constructed; one existing ESR will also be rehabilitated and used; 100% household connections with automated meters will be provided.

1.2 Objective of the ESIA Study

7. The objectives of the ESIA is

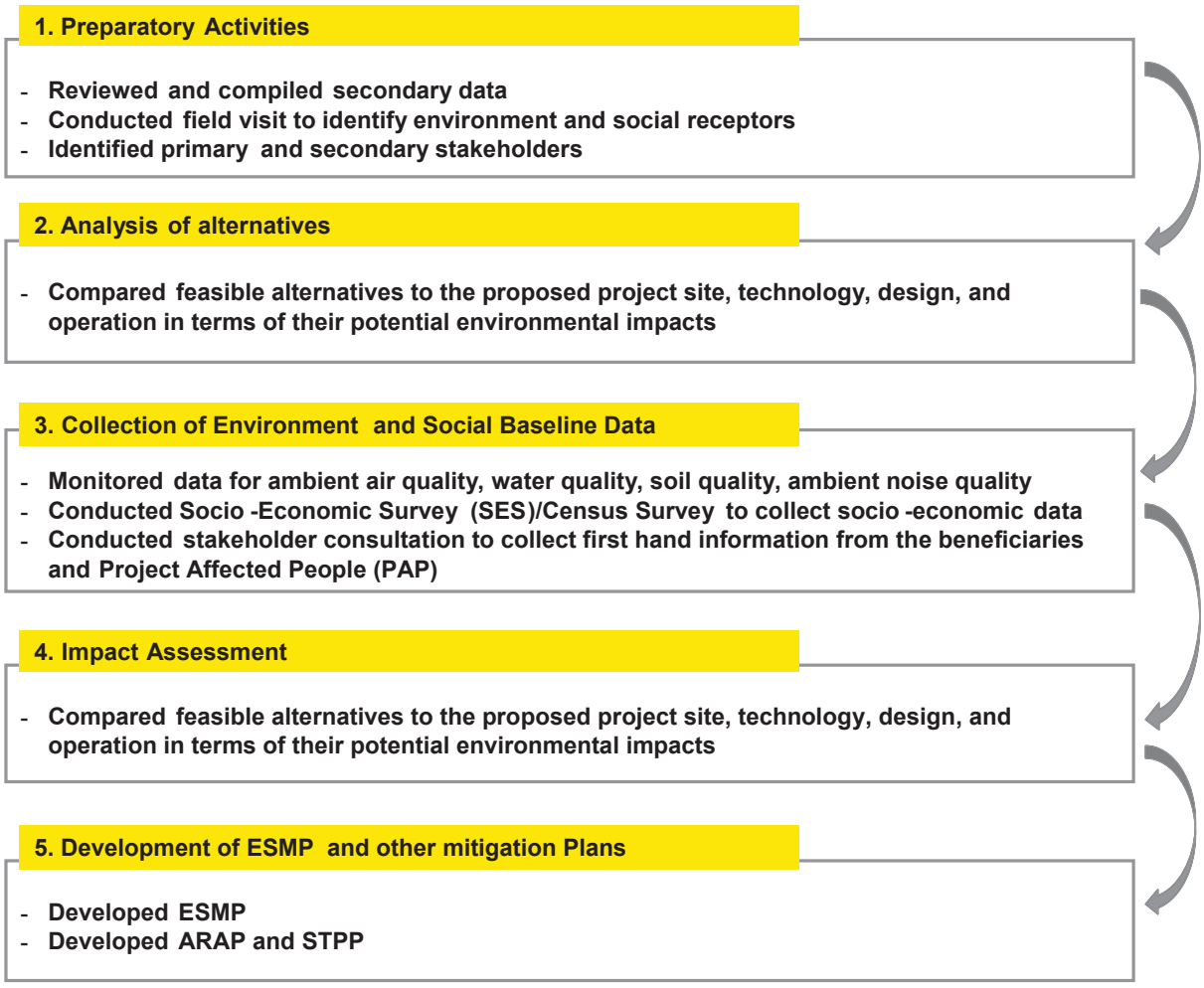
a) Identification of the project activities
b) Description of existing environment and social conditions of the area
c) Assessment of potential impacts associated with the project activities

d) Mitigation and monitoring measures proposed for impacts identified and
e) Incorproation of stakeholder suggestions and feedback
f) Preparation of an environment and social management plan which includes implmementation arrnagements for supervision.

1.3 Approach and Methodology

8. This section of the report details the step by step approach followed for conducting the ESIA of Khunti-UWSS with respect to the proposed sub-project as illustrated in the Figure-2 below.

Figure 2: Overview of methodology followed for conducting the ESIA



(a). Preparatory Activities

9. Preparatory activities included team mobilisation and compilation of existing secondary information pertaining to the project area. Field visits were planned and conducted during February 2017 with the following objectives:

- Assessing existing environmental conditions
- Identifying potential environmental and social impacts
- Identifying potential mitigation measure
- Identifying interested and affected individuals or parties
- Preparation of a strategy for the Process Public Participation (PPP)

(b). Analysis of Alternatives

10. The feasible alternatives to the proposed project site, technology, design, and operation were analysed in terms of their potential environmental and social impacts.

(c). Collection of Environmental and Social Baseline Data

11. This section details the methodology adopted for establishing the environmental and social baseline.

A. Environmental Baseline

12. The baseline environmental status is important to understand the existing physical and biological characteristics along with cultural and social status of residing community. The data presented in this section is based on field surveys, monitoring, stakeholders consultations and secondary data collection (drainage, topography, climate, flora and fauna). The information on the baseline environmental conditions (Water/Air/Noise quality and Soil monitoring), forms the basis to analyse the probable impacts of the proposed project vis-à-vis the present background environmental quality of the core study area. In case of environmental baseline, sampling of air quality, water quality (surface and ground), soil quality, and noise levels was undertaken in the first week of March, 2017. The sampling locations for monitoring of air, water, soil, and noise quality were identified based on the following:

- Existing topography
- Sensitive environmental areas and receptors
- Location of water bodies
- Wind direction and location of village/towns/sensitive areas
- Accessibility, power availability and security of monitoring equipment

13. The details of the parameters monitored have been presented below:

- **Ambient Air Quality**: Ambient air quality was monitored at four locations for parameters including Particulate Matter (PM<10 micron, PM<2.5 micron), SO_x and NO_x.
- **Water Quality**: Information on water quality was generated by collecting and analysing samples from three surface water bodies and five ground water locations.
- **Soil Quality**: Soil quality was assessed by collecting six soil samples from four locations. Further, the collected soil samples were analysed for the physical and chemical parameters.
- **Ambient Noise Quality**: Ambient noise quality was monitored for 24 hour at four locations within the study area.
- **Land Environment**: Information regarding topography, geology, seismicity, ecology and land use pattern was collected through various field visits, secondary research and information available with the project proponent.

B. Social Baseline

14. As the first step, data from the secondary documents such as Census, ULB records *etc.* was reviewed for collecting basic socio-economic information.

As the next step, a census survey was conducted with an objective of gathering first-hand information on the following:

- Inventory of affected assets
- Categorization and measurements of potential loss
- Physical measurements of the affected assets/structures
- Identification of trees and crops
- Household characteristics, including social, economic and demographic profile
- Identification of non-titleholders
- Assessment of potential economic impact, including temporary loss

15. The census survey covered 100% structures affected within the proposed Right of Way (ROW) as per the Corridor of Impact (CoI) of the DPR and drawings provided. Structures considered are permanent (pukka), semi-permanent (semi-pukka) and temporary (kutcha).

In addition to census survey, a series of public consultations were conducted during January, March and June 2017 after finalisation of the methodology, protocol and communication strategy by JUIDCO. The stakeholder consultations were conducted through focus group discussions, individual interviews and formal as well as informal meetings. The vulnerable sections of Project Affected Persons (PAPs) were also included in the

consultation process in the ward level meetings. The public consultation helped in ensuring people participation in the planning and implementation phase and further facilitated in disclosure of the project details to the would be PAPs and beneficiaries. In conformance to the World Bank principles of consultation and disclosure, the project activity was disclosed across the selected locations with the following key objectives:

- Understand the community concerns and issues
- Disclose environmental issues that may arise due to the project and discuss suggestions for mitigation measures
- Assess the present-day project site's characteristics and definitive social, livelihood, and environmental impacts
- Consult with affected communities and/or entities on the proposed project alternatives in order to minimize adverse impacts and enhance beneficial ones
- Obtain a consensus on the proposed activity, potential impacts and suggested mitigation measures

(d). Impact Assessment and Management Plan

16. Primary and secondary data collected for establishing the baseline, were analysed for identification of potential environmental and social impacts that may occur during different phases of the project. For each of the identified impacts, measures to avoid and/or mitigate these have been recommended in the Environment and Social Management Plan (ESMP) and Abbreviated Resettlement Action Plan (ARAP) and Scheduled Tribe Participation Plan (STPP). A relevant monitoring plan has been proposed to ensure effectiveness of the management measures.

17. The sub-steps followed for conducting impact assessment and developing management plan are given below:

- Reviewed literature related to the project
- Conducted field visits to the project area
- Conducted stakeholders consultations with PAPs, ULB and other local community members about the project
- Established environmental and social baseline of the project area
- Identified potential environmental and social impacts, considering the characteristics of the project and the biophysical and socioeconomic characteristics of the area
- Developed recommendations on mitigation measures to be implemented to mitigate the negative environmental and social impacts due to the project activity

1.4 Layout of the Report

18. The ESIA report has been organized into the following sections:

- **Section 1: Introduction** - This section provides a brief introduction to the project, scope of the ESIA and methodology followed for developing the ESIA.
- **Section 2: Project Description**- The project details in terms of location and components have been presented in this section.
- **Section 3: Legal and Regulatory Framework**-This section details out the acts, policies and regulations rolled out by the Government of India at central and state level, which are applicable to the proposed project. Further, this section also reviews the applicability of World Bank's safeguard policies to the project activities.
- **Section 4: Analysis of Alternatives**- This section presents two scenarios, 'with project' scenario and 'no project' scenario.
- **Section 5: Environmental Baseline Profile**- The findings of baseline studies conducted and secondary information collated have been presented in this section.
- **Section 6: Social Profile of the State/District and PIA -** The socio-economic profile of the state, district and the PIA have been presented in this section.
- **Section 7: Public Consultations and Disclosure -** This section presents the summary of the public consultations including key informant interviews and in-depth interviews with primary and secondary stakeholders.
- **Section 8: Environmental Impact Assessment -** This section presents the environmental impact assessment and environmental impacts identified during various phases of the project. The mitigation measures for the impacts have also been presented.
- **Section 9: Social Impact Assessment (SIA) and Mitigation Plans** - This section presents the social impacts that may occur due to the project activity and summary of relevant mitigation Plans prepared**.**
- **Section 10: Environmental And Social Management Plan**- The measures to avoid and mitigate environmental and social impacts across different phases of the project cycle with allocation of responsibilities and monitoring plan for reviewing effectiveness of the measures have been presented in this section. The cost of implementation of EMP has also been presented here.

2 PROJECT DESCRIPTION

2.1 General

19. The Khunti Nagar Panchayat (KNP) receives water from the existing water supply scheme which was commissioned in the year 1982 and upgraded in 2006.. At present, a total of 1001 numbers of water connections are in place i.e. is only 14% of the total HHs in KNP. 30% geographically covered (partially in ten wards out of 15). The remaining area depends on ground water for meeting their daily needs. The quantity being supplied in Khunti is 65 lpcd approximately. The final per capita supply is calculated after deducting 20% of non-revenue water. Average water losses during the transmission and distribution are about 20 % in Khunti.The proposed sub-project is aimed at 100% coverage of piped potable water supply on 24x7 basis in KNP.

2.2 Proposed Project

2.2.1 Site Setting

20. The proposed sub-project is situated in Khunti town, located in Khunti district which is the newest district of Jharkhand situated at 611 meters above sea level and located along National Highway 23 at latitude 23.08º North and longitude 85.28º East located in south central part of the state.

21. Khunti is surrounded by Ranchi and Gumla districts in the north, Chaibasa and Seraikela districts in the south, Ranchi and Seraikela districts in the east, Gumla and Simdega districts in the west. The proposed source for Khunti Urban Water Supply Scheme is Tajna River - a left bank tributary of Swarnrekha River in Swarnrekha basin in the Khunti district. River Tajna/Karkari (Perennial River) is the only surface water supply source for Khunti flowing through the north-eastern boundary of Khunti town.

2.2.2 Current Scenario

22. The existing surface water supply scheme includes an intake well, a 3-m weir (located downstream of the intake), a WTP, 1 ESR and the distribution network. The details of the existing water supply scheme are tabulated below.

Table 1: Details of Existing Water Supply of KNP

S.No	Component	Details
1	Total Water Supply	0.9 MLD
2	Name of Source	Tajna/Karkari River with existing weir
3	Type of Source	Perennial River[2]
4	HFL	606.72
5	DBL	602.84
6	Present Water Level(m)	604.94
7	Weir	Stone Masonry, 2m
87	Location of Intake	Near Mukti Dham adjoining NH23
8	Intake Well Dia & Depth	Diameter: 6 m & Depth :6 m
9	Intake Capacity	>12.37 MLD
10	Gangway Length & Width	Length: 20m & Width:3m
11	Pumps available at Intake	30 HP & 30 HP (Stand by)
12	Head	35 m
13	Pipe Material	DI
14	Dia & Length of pipe material	Diameter:300 mm; Length :1350m

Source: DPR

Pumping machinery at intake

23. The current pumping machinery at the intake wells have been presented in Table 2.

Table 2: Pumping Machinery at Intake

S.No	Project Component	Details
1	Pumps available at Intake	1. 30 HP 2. 30 HP (Stand By)
2	Head	35 m
3	Discharge	2400 lpm
4	Transformer	200Kva
5	HT Line Availability	Yes (Through Village Feeder)
6	Pumping Hours	10-12 hours a day
7	Power Supply	10 Hours (Poor & Intermittent)
8	Age (Year of Installation)	2006 (9 Years Old)

Source: DPR provided by JUIDCO

Raw Water from Intake to WTP

24. The current raw water from intake to WTP has been presented in **Table 3**.

Table 3: Raw Water from intake to WTP

S.No	Project Component	Details
1	Pipe material	DI
2	Diameter	300 mm
3	Length	1350 m
4	Age	2006

Source: DPR

[2] A Hydrological test/monitoring conducted by the Water Resource Department, GoJ in regular interval, accordingly perennial river is decided.

Clear Water Main from WTP to Sump at ESR

25. The details of the current clear water main from WTP to sump at ESR is presented in **Table 4**.

Table 4: Clear Water Main from WTP to Sump at ESR

S.No	Project Component	Details
1	Pipe material	DI
2	Diameter	250 mm
3	Length	34000 m
4	Age	2006

Source: DPR

WTP

26. Currently, the raw water is treated through a conventional process at the existing treatment plant.

Table 5: WTP plant details

S. No.	Component	Details
1	Capacity	2.25 MLD
2	Working Hours	10-12 Hours/Day
3	Type	Conventional
4	Age (Year of Installation)	1982
5	Clear Water Sump	337500 Litres
6	Transformer	200 KVA

Source: DPR

27. The following units are present in the current WTP:

- Aeration fountain
- Flash Mixer
- Flocculator
- Clarifier
- Rapid Sand Filter
- Chlorination Arrangement

Elevated Storage Resavoir (ESR)

28. The details of the current ESR under the WSS has been provided in Table 6.

Table 6: Current ESR

S.No.	Component	Details
1	Location	Behind Police campus
2	Age (Year of Installation)	2007
3	Condition	Structurally Safe
4	Total Capacity	450000 Litres
5	Staircase	Iron Ladder with railings

Source: DPR

Distribution and House Connections

29. The details of current distribution and house connections in Table 7

Table 7: Current Distribution and House Connection

S.No	Component	Details
1	Type of Pipe	DI, PVC, HDPE
2	Diameter	DI K7 300 - 1100m Di k7 250 - 112m DI K7 200 - 600m PVC 175 - 400m PVC 150 - 5966m PVC 125 - 6000m DI K7 100 - 15960 HDPE 80 – 678
3	Age (Year of Installation)	DI is 9 years Old
4	Coverage	30% (~30.81 KM)
5	Connections	1002

Source: DPR

2.2.3 Proposed Scheme

30. The existing intake well will serve as source of water for the project. The capacity of water withdrawal will be increased by replacing the current 300 mm pipe with 500 mm pipe. The distance from the intake well to the proposed WTP is 1650 m. The proposed WTP will be of 16 MLD capacity and will be connected with 4 ESRs. (3 New & 1 existing which will be refurbished)

31. Considering the topology, the entire project has been divided into 4 zones. Wards falling under the four zones have been provided in Table 8.

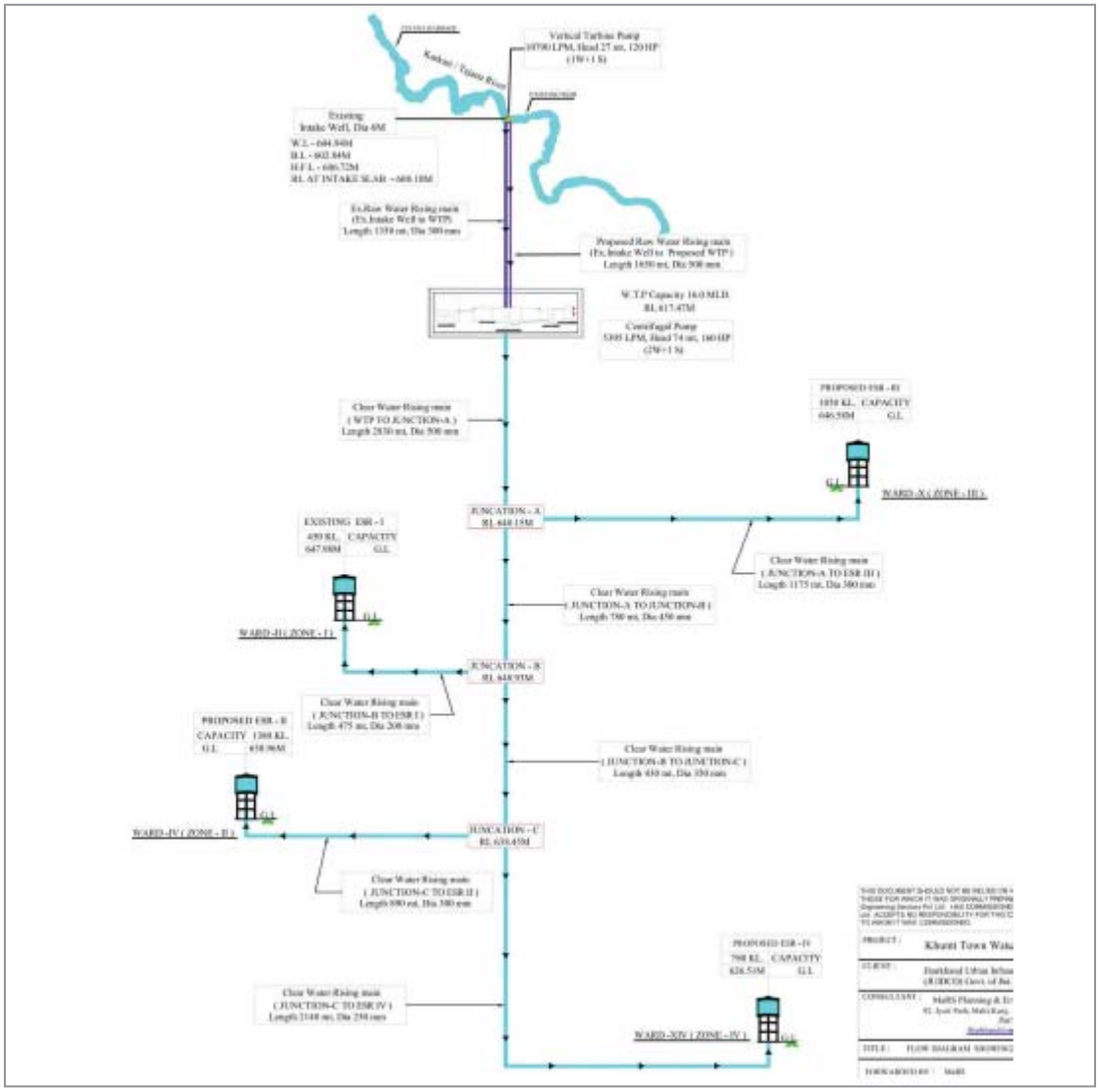
Table 8: Zone details

S. No	Zones	Ward Number
1	Zone - 1	Ward no. 1 & 2
2	Zone - 2	Ward no. 3,4,5,6,7 & 8
3	Zone - 3	Ward no. 9,10,11,12 & 13
4	Zone - 4	Ward no. 14,15 & 16

Source: DPR

32. Three (3) ESRs and reuse of one existing ESR is proposed under the project. Currently there is one abandon ESR in existing Zone –III, which will be demolished and new ESR of 1050 Kl will be constructed. The project proposed 100% household connection with automated meters. Line diagram of the proposed scheme has been presented in Figure 3.

Figure 3: Line Diagram of the Proposed Scheme



Source: DPR

Land Requirement for the Project

33. The total land required under the proposed scheme is 8.33 acre. The land break up details of the different components have been provided in **Table 9.**

Table 9: Land Details

S. No.	Name of structure	Location of Land	Required Area	Type of Land
1.	Replacement of pumps and rising mains	Existing Intake structure	Existing Intake	Under WRD
2.	Pipeline Raw Water pumping main of 500 mm dia. DI for a length of 3.81 Km. from intake to WTP	Forest land and RoW of roads	0.0235 Ha	Forest land ,Govt Land & Private Land
3.	WTP	Near Existing WTP.	4.88 Acre	Govt. Land
4.	ESR-1	(Ward No-2) Near Khunti Thana	Existing ESR	Govt. Land
5.	ESR-2	Kadama (Ward No-4)	1.30 Acre	Govt. Land
6.	ESR-3	Dahugutu (Ward No-10)	2.05 Acre	Govt. Land
7.	ESR-4	(Ward No-14) Near Bus Stand	0.10 Acre	Govt. Land
8.	Clear Water Transmission System (~8.5 Km)	In ROW of roads and government land in which ESR will be constructed.	2.0 acre	Govt.Land

Source: DPR

Demand Projection

34. Proposed water supply system has been designed based on the design criteria and demand projections. The demand projection worked out as the design criteria for the project horizon has been indicated below **Table 10.**

Table 10: Demand Projection

S. No	Description	2018	2033	2048
1.	Population	42353	56546	74921
2.	Rate of Water Supply (in lpcd)	155.25	155.25	155.25
3.	Water Demand in Litres	65,75,303	87,78,767	116,31,485
4.	Water Demand in KLD	6,575.30	8,778.77	11,631.49
5.	Water Demand including firefighting and floating population in MLD	7.435	9.772	12.774
6.	Total Water Demand including Institutional demand (6%) in MLD	7.881	10.358	13.540
7.	Rate of Water Supply (including	186.075	183.184	180.728

	Firefighting, floating & Institutional Demand) (in lpcd)			

Source: DPR

Source of water

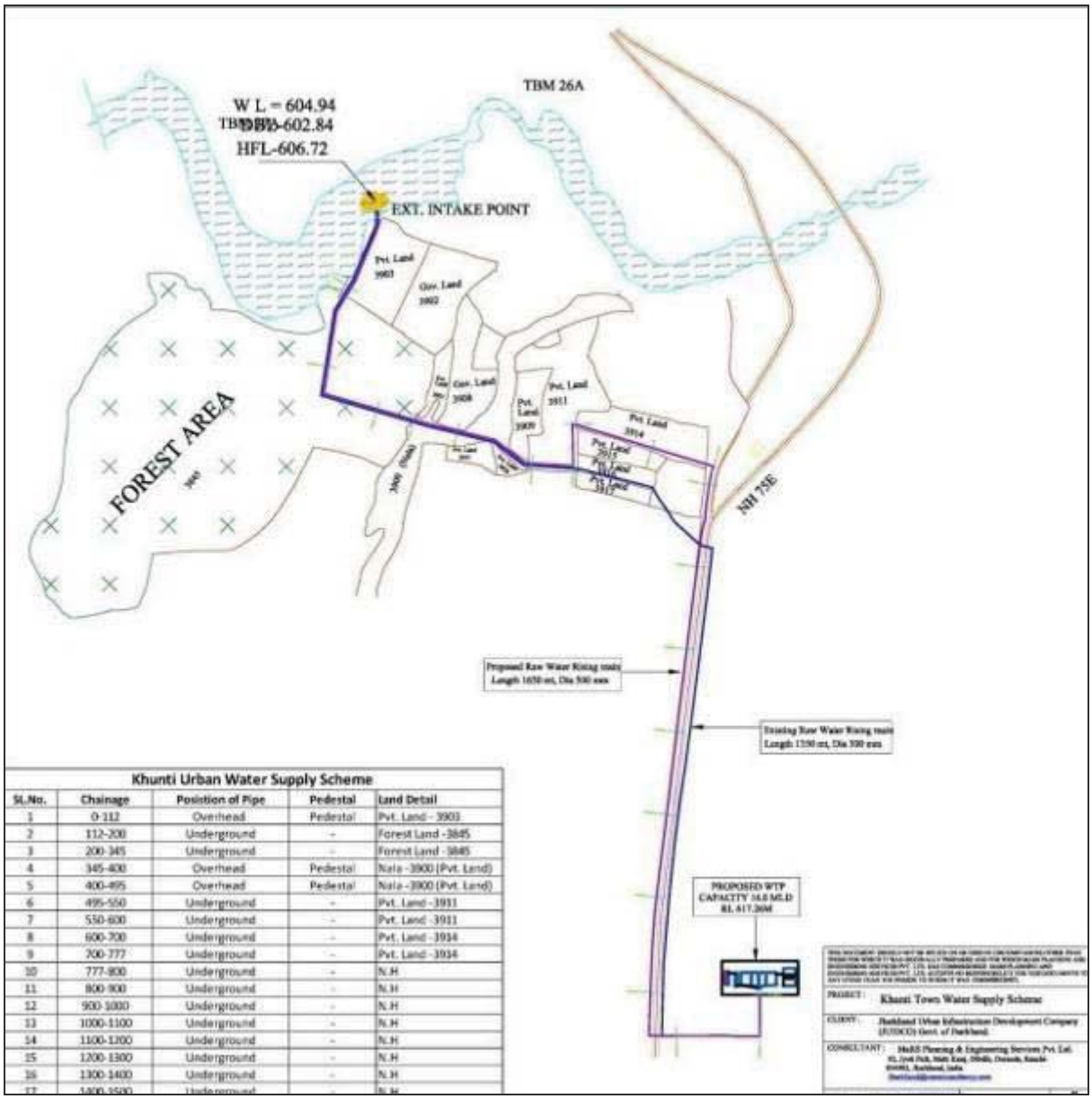
35. River Tajna/Karkari (a perennial river) flowing through the north-eastern boundary of Khunti is its only surface water supply source. As per the DPR prepared for the sub-project; the water balance analysis conducted by JUIDCO; in consultations with the Water Resources Department (WRD) and ULB; and sustainability certificate received from the WRD, it is estimated that the source will be sufficient to cater the required demand of 13.54 MLD water till the ultimate design year i.e. 2048. The capacity calculation of existing weir and barrage has been provided in **Table: 11Error! Reference source not found.**. A schematic diagram of the proposed project has been presented in **Figure 4.**

Table 11:Capacity calculation of existing weir & barrage for Khunti WSS

	Water Demand in Base Year	7.881 MLD
	7.881 X 1000	7880 cum /day
	In intermediate year	10.358 MLD
	10.385 X 1000	10358 cum/day
	In Ultimate Year	13.540 MLD
	13.540X1000	13540 cum/day
	Quantity of water at weir site	325584 cu m
	Quantity of water at Barrage site	484227 cu m
	Total	**809811 cu m**
	Hence storage water will feed	
(a)	In base year	
	809811 cu m /7880 cum	**103 days**
(b)	In intermediate year	
	809811 cu m/ 10358 cu m	**78 days**
(c)	In Ultimate Year	
	809811 cu m/1350 cu m	**60 days**
1	Calculation for Quantity of water at weir site	
	Length of submergence	**912 m**
	Width at the top	**280 m**
	Height of Water (3+0)/2	**1.5 m**
	Hence Quantity	

	918 x 280 x 1.5	**383040 cum**
(A)	Assume 85 % in current shape	**325584 cu m**
2	Quantity of water at barrage site	
	Length	**1415 m**
	Width	**330 m**
	Height of Water (2.44+0)/2	**1.22 m**
	Hence Quantity	
	1415 x330 x 1.22	**569679 cu m**
(B)	Assume 85 % in current shape	**484227 cu m**
	Total Quantity (A+B)	**809811 cu m**

Figure 4: Schematic diagram of proposed project



Khunti Urban Water Supply Scheme

Sl.No.	Chainage	Position of Pipe	Pedestal	Land Detail
1	0-112	Overhead	Pedestal	Pvt. Land - 3903
2	112-200	Underground	-	Forest Land -3885
3	200-345	Underground	-	Forest Land -3885
4	345-400	Overhead	Pedestal	Nala -3900 (Pvt. Land)
5	400-495	Overhead	Pedestal	Nala -3900 (Pvt. Land)
6	495-550	Underground	-	Pvt. Land -3911
7	550-600	Underground	-	Pvt. Land -3911
8	600-700	Underground	-	Pvt. Land -3914
9	700-777	Underground	-	Pvt. Land -3914
10	777-800	Underground	-	N.H
11	800-900	Underground	-	N.H
12	900-1000	Underground	-	N.H
13	1000-1100	Underground	-	N.H
14	1100-1200	Underground	-	N.H
15	1200-1300	Underground	-	N.H
16	1300-1400	Underground	-	N.H
17	1400-1500	Underground	-	N.H

Source: DPR

Proposed Water Treatment Plant

36. The proposed WTP will be of 16 MLD. The proposed treatment is Rapid Sand Filtration (RSF) and chlorination. The WTP will consist of a chlorination unit, aeration fountain, venturi flume, flash mixer, flocculator, clarifier, rapid sand filter with filter house, chemical storage house, pure water sump and pump house, pure water sump, pump house and post chlorination unit. Land for new WTP has been identified near the existing WTP.

Table 12: Proposed WTP Details

Sl. No	Parameters	Details
1	Aeration fountain	Plan area not less than 0.625 square meter per MLD
2	Venturi Flume	Simple mechanical indicator (pedestal type gauge)
3	Flash Mixer	Rapid mixing device, detention time 60 seconds to give velocity gradient 300 to 400 sec-1 , vane mixer type confirming to IS 7090of 1985
4	Flocculator	Confirming to IS 7208 of 1974 (type-c) with detention period of 30 minutes
5	Clarifier	▶ Horizontal flow circular tank, detention period 2-5 hr. ▶ Over flow rate 30 cum per square meter per day. ▶ Weir loading not more than 300 cum/m/day with mechanical sludge scraper confirming to IS no 10313-1982 with necessary inlet arrangement
6	Rapid sand filter with filter house:	▶ Filter designed for filtration rate of 5000 Lt/square meter/hour. ▶ Filters to be located in filter house with roof slab, pipe Gallery and platform minimum 5.5 meter in width with constant rate filtration or declining rate filtration.
7	Chemical House in two Storeys	▶ Ground floor to accommodation 7 days' alum requirement and sundry storage (Minimum 4 m height) ▶ First floor to accommodate alum and lime tanks chain pulley block etc.(min. 5m height) ▶ Solution Tank: Minimum 3 Tanks (One for preparation, second for dosing and third as standby), each tank capable of giving 8 hours maximum dose without interruption, minimum free board 0.30 M, trays for dissolving level indicator, mechanical agitation devices (constant head device, strength of solution up to 10% only) conforming to IS 9222 part-1/1979.
8	Pure water Sump and Pump House	▶ Capacity of sump: One hour of designed flow ▶ Pump House: Pump house of required size over the sump or by the side
9	Store House	▶ Alum storage of three month and 7 days' temporary storage (daily use) ▶ 7 days TCL (bleaching powder) requirement ▶ 20% extra capacity for other sundry articles
10	Vacuum feed type chlorinators	▶ Confirming to I.S. 10533-A part –II 1983. ▶ Chlorinator equipment container room: to confirm to I.S.10553 Part-I 1983

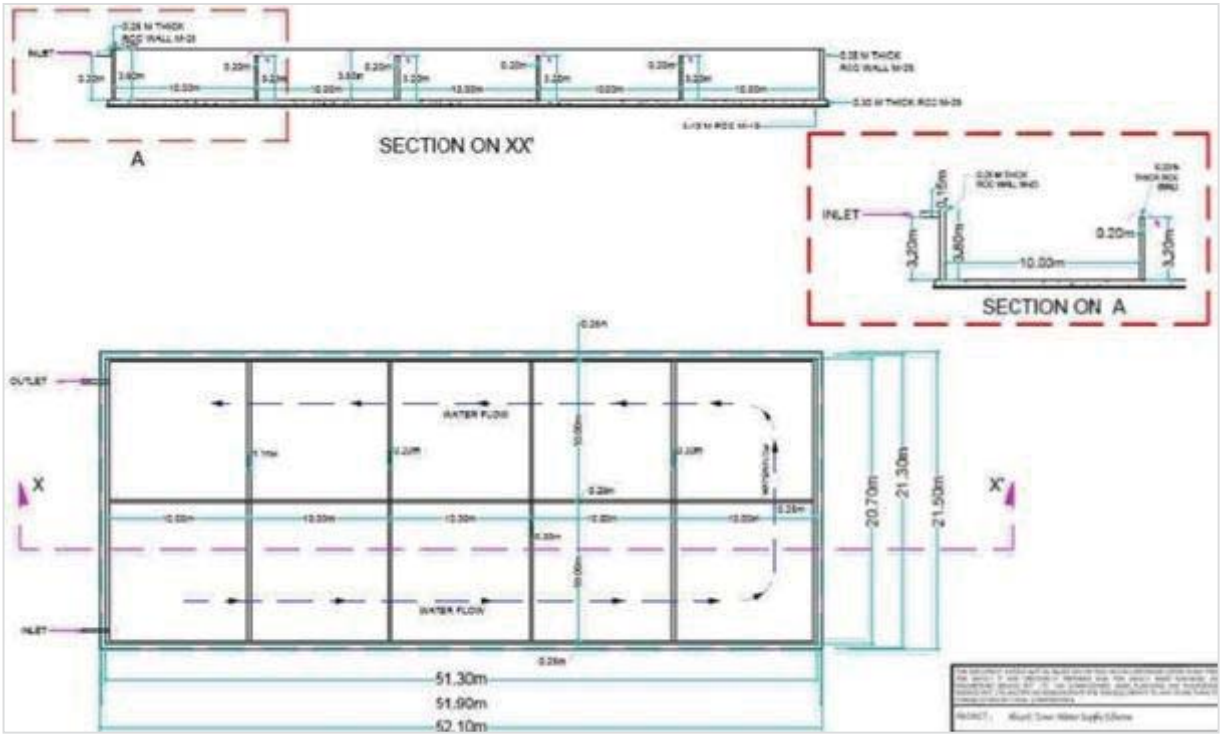
Source: DPR provided by JUIDCO

Proposed system for waste water and sludge disposal:

37. **System for recycling of wastewater**: It is estimated that the backwash water will be about 5% of the daily production (i.e. about 0.52 MLD considering a production of at least 10.38 MLD up to the year 2033). The proposed system of recycling this water will be using a series of RCC sedimentation tanks that will allow sufficient time for the sludge and particles to settle down and the remaining clarified water will be reused by directing it to the channel of raw water inlet to flash mixer via a small pump. This arrangement will avoid pollution and minimize wastage of water.

38. The size of the tanks has been designed considering 5% of the disposal of the daily production (i.e. about 0.52 MLD considering a production of at least 10.38 MLD up to the year 2033). Figure below presents the design of the tanks.

Figure 5: Design of WTP Tank



Source: DPR

System for disposal of sludge:

39. An estimated 6 MT[3] of sludge (0.8 MT – from chlorine preparation and 5.2 MT from WTP) will be produced per day when total water demand will be 10.36 MLD (Intermediate Year).

40. The sludge will be collected from the tanks mechanically and will be allowed to dry in sludge drying bed for 24 hours, then stabilised and then will be disposed to the designated municipal landfill site at Belahatti. The sludge is not suitable to be re-used. The proposed landfill site is a new landfill proposed for Khunti Solid Waste Management project and the ULB has provided its NOC for the use of land for sludge disposal.

Rising Main Details - Clear Water

41. The details of the proposed clear water piping details have been provided in Table 13.

Table 13: Rising Main Details Clear Water

Sl. No	Diameter	Length (in meters)
1	500 mm (WTP to JN. A)	2830
2	400 mm (Jn. A to Jn. B)	780
3	350 mm (Jn. B to Jn. C)	430
4	300 mm (Jn. A to ESR 3 - 1175 m & Jn. C to ESR	2065
5	250 mm (Jn. C to ESR 4)	2140
6	200 mm (Jn. B to Ex. ESR 4)	475

Source: DPR

Storage Capacity

42. About 40%-50% of the daily requirements of water, is proposed to be stored at various locations in the system to cater to the fluctuating needs of the system. About 35%-40% of the demand requirements are proposed to be stored in the service reservoirs. The balance 10% -15% is proposed to be stored in ground level tanks near the treatment plant areas. Three new ESR's s are being proposed to be built under this project. One existing ESR of 450 Kl will be re-used for storing water. Details of all the ESR under the project have been provided in the Table 14.

Table 14: Details of ESR

Sl.No.	Details of ESR	ESR-1 (existing)	ESR-2	ESR-3	ESR-4
1.	Capacity of the ESR in KL	450	1380	1050	780
2.	Staging of the ESR in m	18	24	21	22
3.	RL of GL at ESR in m	648.24	638.96	646.58	625.96

Source: DPR

[3] Approx. quantity of sludge from WTP for water demand of 7.88 MLD will be approx. 3.9 MT and with water demand of 13.54 (ultimate year) MLD will be approx. 7 MT

Clear Water Transmission System

43. The entire project area has been further divided into 4 different zones and different command area of the treatment plant based on the topography, physical boundaries, and reuse of existing ESR 1. The existing clear water transmission main was laid about 6 years back and the supply pattern is not uniform and pipes are found to be inadequate size with many tapings, hence existing transmission main is discarded completely.

Local Distribution Scheme

44. The distribution system network is divided into 4 zones for the equitable distribution of water. The command of the existing ESR and its pressure at the tail end points were analysed, accordingly the requirement of additional reservoirs was designed. 4 zones have been formed for the equitable distribution of water. Each zone is proposed to be fed with a service reservoir. The summary of the distribution pipe network is provided in **Table 15.**

Table 15: Statement of Distribution for the proposed scheme

S.No	Diameter	Length (in meters)
1	100 mm	80081
2	150 mm	11893
3	200 mm	13596
4	250 mm	42
5	300 mm	13178
6	400 mm	2424
7	500 mm	482
8	600 mm	342

Source: DPR provided by JUIDCO

Design period

45. As per Central Public Health and Environmental Engineering Organisation (CPHEEO) Manual on water supply, following design periods have been adopted for different components of water supply system:

- Water Treatment Plant - 15 years
- Infiltration works (Intake) - 30 yearsRaw and Clear Water main pipelines - 30 years
- Distribution system - 30 years
- Clear water ground/over - head tanks 15 years
- Pump house buildings - 30 years
- Pumping equipment (E&M) - 15 years

2.2.1 Labour accommodation

46. The construction phase of the proposed project is expected to continue for 18 months and approximate skilled and unskilled labour required for the project is projected to be 350. About 15% (approx 55 nos.) of skilled and unskilled labour may come from outside the

Khunti district. Labour camp for 55 workers will be set up near proposed WTP and the remaining will be employed from nearby villages. The construction cum labour camps will be set up on an area of approximately 1 acre. Approximately 10-15 toilets are proposed to be provided at the labour camp[4], the final number will depend on the number of labour residing within the camps. The toilets will be connected to septic tanks as per BIS 2470-1 (1985). Guidelines that will be followed for the siting, setting up of facilities required in the labour camp would be provided as per the specifications in Annexure VII. In addition, mobile toilets, hand washing facilities and drinking water tanks would be set up at site specific locations where labour would be working during the day.

2.2.2 Water Requirement

47. As per the detailed project report, average water requirement during construction phase for the project will be approximately 5000 kl. Water required for construction will be sourced through water tankers from government approved sources.

2.2.2 Power Requirement

48. The power requirement during the construction phase will be met through temporary electric connection from Jharkhand State Electricity Board (JSEB), and further supplemented with DG sets for back up will be used during power outage.

49. The construction phase will require a maximum of 30,000 litres of diesel. On-site fuel requirement will be met from nearby fuel stations. On-site diesel is proposed to be stored in 100 litres drums and will be kept in a designated storage area with all safety precautions.

2.2.3 Raw Material Requirement

50. For the construction of the entire project complex, raw materials like steel, sand, stone and cement will be required which will be met through government licenced quarries. No new quarries will be eatblished for the sub project. The approximate estimated quantities for the raw materials, their source and mode of transport are provided in **Table 16.**

Table 16: Estimation of raw material for construction

List of Construction materials	Average Quantity	Source of Material	Mode of transportation and storage site
Cement	782.76 MT	Government Authorized agency/ suppliers	Truck
Gravel	110 cu m	Govt. Approved local quarry/suppliers	Truck
Steel	221.59 MT	Government Authorized suppliers	Truck
Sand	1,253.55 cu.m.	Govt. Approved local quarry/suppliers	Truck
Good Earth	200 cu m	Govt. Approved local quarry/suppliers/nearby under construction site	Truck

[4]As per Worker's accommodation standard guidance note by IFC and EBRD

Bricks	222,077.60 nos.	Government approved Brick Klin	Truck
Ready Mixed M-25 grade concrete	1.385 CUM	Mini mobile batching plant	Truck/Tractor (transportation to construction area)

Source: DPR

2.2.4 Wastewater Disposal from labour camps

51. The sewage generated at the construction site will be collected in septic tanks. 1septic tanks catering to 55 users will be provided at the labour camp as per specifications given in BIS 2470 1985 Part I. Septic tank and soak pits will be provided (as per specifications given in IS 2470 1995 Part I and Part II) onsite and at labour camp

2.2.5 Waste Generation

52. The solid waste generated by the project will consist of labour camp waste, garbage waste, metal scrap, and construction debris. The main types of waste that will be generated and sources during construction phase are detailed in **Table 17.**

Table 17: Details of Waste generated during construction phase

Sl.No	Waste Type	Source	Estimated Quantity	Method of Disposal
Non-hazardous waste				
1.	Domestic solid waste	Labour activities	75 kg per day	Waste will be segregated onsite and disposed through municipal corporation to Belahatti landfill site. NOC has been provided in Annex IV
2.	Construction Debris and earth	Excavation work	3-5 tonnes per day	Excavated materials to be used for backfilling and levelling
3.	Packaging waste containing wood, cardboard and other recyclables	Packing material and accessories	20 tonnes per year	Sold to recyclers
4.	Concrete	ESR and old WTP	126.945 CUM	To be used as back filling and levelling.
Hazardous waste				
1.	Waste oil and oil contaminated rags	DG set ,construction machinery	0.5-1 ton per annum	Collected and disposed through CPCB/JSPCB approved recyclers
	Bituminous Waste	From road cutting	190.4175 CUM	Re-use as back filling and levelling

Source: DPR

2.2.6 Implementation (Construction and O&M) Schedule

53. The implementation schedule of the sub-project after the tender process is presented in **Figure 6**.

Figure 6: Work Execution Schedule

Work Execution Programme (Bar Chart)) for Re-Organization of KHUNTI Urban Water Supply Scheme (After Tender)																			
Sl.No	Description of work / Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Soil testing , Details Design and Drawing of Different RCC component of Scheme.																		
2	Construction of RCC Intake Well With Pump House & RCC Gangway.																		
3	Construction of 16 MLD Water Treatment plant.																		
4	Construction of 1380KL capacity RCC Elevated Service Reservior																		
5	Construction of 1050KL capacity RCC Elevated Service Reservior																		
6	Construction of 780KL capacity RCC Elevated Service Reservior																		
7	Construction of Twin type Staff Quarter & Boundary																		
8	Supplying & Laying of Rising & Distribution Pipelines.																		
9	Supplying ,Installion of Raw & Clear Water Pumping Machinery and Electrical Equipments.																		
10	Testing of all works																		

Source: DPR

3 ADMINISTRATIVE, REGULATORY FRAMEWORK & PROJECT CATEGORIZATION

54. This chapter details out the policy, legal and institutional framework under the ambit of which the ESIA was undertaken. It reviews the national and state laws of Jharkhand relevant to the scope of activities under the sub-project, and, discusses the implications for the sub-project design and implementation

3.1 Applicable National & State Laws and Regulations

55. An overview of the applicable environmental laws and regulations relevant to this sub-project is provided in **Table 18**.

Table 18: Applicable Environmental Regulations of GoI and GoJ

S.No	Act/Rules	Purpose	Applicable Yes/ No	Remarks on Applicability/ Non-Applicability	Regulatory Authority
	Environmental Regulations				
1.	Environment Protection Act-1986 The Environment (Protection) Rules, 1986	To protect and improve the overall environment.	Yes	As most environmental notifications, rules and schedules in India are issued under this Act, an Environmental Statement needs to be submitted annually by the entity to whom.	JSPCB, Government of Jharkhand
2.	Air (Prevention and Control of Pollution) Act, 1981 and Air (Prevention and Control of Pollution) Rules, 1982	To control air pollution by controlling emission of air pollutants, as per the prescribed Standards.	Yes	It must be ensured that emissions during construction (e.g., dust emissions) and operation (e.g., DG set at WTP) are within the prescribed standards. Consent to Establish (CoE) and Consent to Operate (CoO) needs to be taken by the Contractor from the Jharkhand State Pollution Control Board (JSPCB) for establishment and operation of . An Environmental Statement needs to be submitted annually to the JSPCB by the Contractor to whom CoE and CoO is granted	JSPCB, Government of Jharkhand
3.	Water Prevention and Control of Pollution) Act, 1974 and Water (Prevention and Control of Pollution) Rules, 1975	To control water pollution by controlling discharge of pollutants as per the prescribed Standards.	Yes	It must be ensured that effluents during construction and operation (e.g., backwash water and sludge from WTP) are within the prescribed standards.	JSPCB, Government of Jharkhand
4.	The Forest	To check deforestation by	No	There is no diversion of forest	Forest Department, State

S.No	Act/Rules	Purpose	Applicable Yes/ No	Remarks on Applicability/ Non-Applicability	Regulatory Authority
	(Conservation) Act,1980	restricting conversion of forested areas into non-forested areas.		land invloved. However, the raw water Pipe will be replaced in 0.0235 ha of forest land. As forest land involved is less than 1 Ha so no permission is needed under FCA Act. However, usage rights is settled in the name of few ST families of Birhu Thana village. Since FRA frees the forest rights of all encumberences and procedural requirement of the 1980 Act in terms of section 4(7), required NOC has been obtained (under section 3(2) of FRA Act 2006.	Government of Jharkhand and MoEF&CC, Government of India, Divisional Forest Officer.
5.	Wild Life (Protection) Act, 1972	To protect and conserve wildlife.	No	The sub-project is not located in a protected area.	Forest Department, Government of Jharkhand and MoEF&CC, Government of India
6.	Environmental Impact Assessment (EIA) Notification 2006 Amendment S.O. 3999(E) dated December 2016	Sets out the procedure of obtaining Environmental Clearance and conducting EIA for projects and activities covered under the Notification.	No	Water Supply Projects do not require prior Environmental Clearance under this regulation.	MoEF&CC, Government of India
7.	Solid Waste (Handling and Management) Rules, 2016	Lays down the methods of handling Municipal Solid Waste (MSW) and its scientific disposal.	Yes	All solid waste generated during construction (e.g., at labour camp) and operation (e.g., disposal of dry sludge from WTP) of the sub-project has to be	JSPCB, Government of Jharkhand

S.No	Act/Rules	Purpose	Applicable Yes/ No	Remarks on Applicability/ Non-Applicability	Regulatory Authority
				handled and disposed as per the prescribed rules.	
8.	Construction and Demolition Waste Management Rules, 2016	Every waste generator is responsible for collection, segregation, storage of construction and demolition waste. The waste has to be deposited at the collection centre or handed over to authorised processing facilities.	Yes	Construction waste will be generated during the construction phase of the sub-project. Emphasis on the roles and accountability for waste management, segregation, recovery, reuse, recycle at source, should be addressed in the management of construction and demolition waste.	JSPCB, Government of Jharkhand
9.	Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.	Stipulates the method of segregating, storing, managing, and disposing hazardous and other wastes regulated under the Rules.	Yes	Applicable to the hazardous waste (waste oil from diesel generator sets, oil soaked cotton, used oil filters) generated during construction and operation phases.	JSPCB, Government of Jharkhand
10.	The Noise Pollution (Regulation and Control) Rules, 2000	The standards for noise for day and night have been promulgated for various areas/zones.	Yes	Applicable to all noise generating construction activities and construction equipment deployed at worksite. Also applicable for all noise generating activities during operation of sub-project (e.g., WTP operation).	JSPCB, Government of Jharkhand
	Occupational Health & Safety				
11.	Building and Other Construction Workers (Regulation of Employment and Conditions of	It regulates the employment and conditions of service for building and other construction workers and also provides for their safety, health and welfare.	Yes	This is applicable as the construction works will employ 10 or more workers.	District Labour Commissioner and Buildings Inspector, Government of Jharkhand

S.No	Act/Rules	Purpose	Applicable Yes/ No	Remarks on Applicability/ Non-Applicability	Regulatory Authority
	Service) Act, 1996				
12.	Central Motor Vehicles Rules, 1989	To check vehicular air and noise pollution.	Yes	This rule is applicable for vehicles deployed in construction activities.	Department of Transport, Government of Jharkhand
13.	Explosives Rules Act, 1983	Safe transportation, storage and use of explosive materials.	Yes	Applicable as the construction activity may require blasting using explosives.	Chief Controller of Explosives, Government of India
	Labour Welfare				
14.	Workmen Compensation Act, 1923	It provides regulation for payment of compensation by employers to their employees for injury by accident i.e. personal injury or occupational disease.	Yes	Construction workers will be involved in the project.	District Labour Commissioner, Government of Jharkhand
15.	Inter-state Migrant Workers Act, 1979	It protects workers whose services are requisitioned outside their native states in India Contractor who employs or who employed five or more Inter-State migrant workmen is required to obtain registration under this act	Yes	Interstate migrant workers may be involved in the projects.	District Labour Commissioner
16.	The Child Labour (Prohibition & Regulation) Amendment Act, 2016	It prohibits employment of children in certain specified hazardous occupations, processes and regulates the working conditions in others.	Yes	Construction workers will be involved in the project.	District Labour Commissioner
17.	Minimum Wages Act, 1948	Payment of minimum rate of wages as fixed and periodically revised by the State Government.	Yes	Construction/daily wage workers will be involved in the projects.	District Labour Commissioner
18.	Building and Other	An Act to provide for the levy	Yes	Construction workers will be	District Labour

S.No	Act/Rules	Purpose	Applicable Yes/ No	Remarks on Applicability/ Non-Applicability	Regulatory Authority
	Construction Workers Welfare Cess Act, 1996	and collection of Cess on the cost of construction incurred by employers.		involved in the project.	Commissioner
	Resettlement and Rehabilitation				
19.	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act -2013 and Jharkhand Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules-2015	Fair compensation for acquisition of: (i) Land and other immovable assets; (ii) Resettlement of displaced population due to LA and (iii) Economic rehabilitation of all those who are affected due to land acquisition. The Act also covers the Lease Holders, Share Croppers and Tenant.	No	No land acquisition will be undertaken for the project.	Revenue Department of respective under the District Collector.
20.	The Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	Grants legal recognition to the rights of traditional forest dwelling communities. For diversion of forest land for "drinking water supply and water pipelines" managed by the Government which involve	Yes	No need for compulsory land acquisition is identified. However, replacement of the existing raw water main of 300mm with 500mm would involve working within the forest area in Birhu Thana village under Khunti Nagar Panchayat. There will be no change in the character of land and does not affect the rights and wefare of the forest rights holders. The project needs to ensure that	Ministry of Tribal Affaires, GoI and Department of Tribal Welfare of various State Government and Panchayati Raj. District Commissioner, Khunti. Divisional Forest Officer – Khunti

S.No	Act/Rules	Purpose	Applicable Yes/ No	Remarks on Applicability/ Non-Applicability	Regulatory Authority
		felling of trees not exceeding 75 trees per ha and diversion of forest area <1 Ha (UNDER SECTION 3(2))		the forest rights holders along the raw water pipe alignment support the project and and their interests are protected. NOC already obtained vide letter no. 1110 dated 03/07/2017 from the office of District Forest Officer – Khunti has been obtained for relaying of pipeline in 0.0235 Ha of forest area	
21.	Panchayats (Extension to Scheduled Areas) Act, 1996	Ensuring self-governance through traditional Gram Sabha for people living in the scheduled areas of India.	No	No land acquisition will be undertaken for the project. Around 1650 m of pipeline will be upgraded and 130.758 km will be newly laid, The newly laid pipe will be within the RoW and there is no change in the character of land.	State Government through Gram Sabhas
22.	The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014.Jharkhand street vendor (Protection of livelihood and regulation of street vending), Rules 2014.	The Act aims to protect the rights of urban street vendors and to regulate street vending activities. It provides for Survey of street vendors and protection from eviction or relocation; issuance of certificate for vending; provides for rights and obligations of street vendors; development of street vending plans; organizing capacity building programmes to enable the street vendors to exercise	Yes	There is temporary loss of livelihood of 35 street vendors and physical displacement of 2 vendors.	ULBs and State Government.

S.No	Act/Rules	Purpose	Applicable Yes/ No	Remarks on Applicability/ Non-Applicability	Regulatory Authority
		the rights contemplated under this Act;			
23.	Chota Nagpur Tenancy Act, 1908.	The Act provides for rights of tribal communities/indigenous people in the State of Chota Nagpur plateau area. The basic objective of the Act was to restrict the transfer of tribal land to non-tribal. But in case of development project, Section 46 allows for transfer of land only with permission of District Commissioner.	No	One private Land parcel will be acquired for the Khunti water supply prject.	Land Revenue Department, District Commissioner

3.2 World Bank Safeguard Policies

56. The objective of the World Bank's environmental and social safeguard policies is to prevent and mitigate undue harm to people and their environment during the development process. These policies provide guidelines for bank and borrower staff in identification, preparation, and implementation of programs and projects. Safeguard policies provides a platform for participation of stakeholders in project design, and are an important instrument for building ownership among local populations (World Bank, 2006). The triggered safeguard policies are presented in **Table 19**.

Table 19: Applicability of WB Safeguard Policies for the Project

WB Safe Guard Policy	Key Features	Applicability
OP 4.01 - Environmental Assessment	▶ Potential environmental consequences of projects are identified early in the project cycle. ▶ Environment Assessment (EAs) and mitigation plans required for projects with significant environmental impacts or involuntary resettlement. ▶ EAs to include analysis of alternative designs and sites, or consideration of "no option". ▶ Requires public participation and information disclosure before Board approval.	Applicable According to OP 4.01 environmental issues have been identified in the integrated Environmental and Social Impact assessment (ESIA) and Environmental Management Plan (ESMP) is prepared. Separate Abbreviated Resettlement Action Plan(ARAP) and Scheduled Tribe Participation Plan(STPP) is also prepared.
OP 4.36 - Forests	▶ Requires all relevant types of projects to avoid causing significant, unmitigated harm to natural forests or other natural habitats. ▶ Prohibits support for projects that would involve the significant conversion or degradation of critical forests or other types of critical natural habitats ▶ Requires recognition of and respect for any legally documented or customary land tenure and use rights aswell as the rights of indigenous peoples and workers. Also the rights and welfare of people affected by project should be assessed and addressed.	Applicable All necessary mitigations and practices for replacement of 233 m of pipeline in forest area have been addressed in the ESIA, ESMP and STPP. There will be no change in the character of land, no trees will be cut, and the activity does not affect the rights and wefare of the forest rights holders. The project needs to ensure that the forest rights holders along the raw water pipe alignment support the project and and their interests are protected.

WB Safe Guard Policy	Key Features	Applicability
OP 4.10 Indigenous People	Its purpose is to ensure indigenous peoples benefit from Bank-financed development and to avoid or mitigate adverse effects on indigenous peoples. It applies to projects that might adversely affect indigenous peoples or when they are part of project beneficiaries. it requires the participation of indigenous peoples in design and delivery of unban infrastructure and services.	Applicable presence of STs are identified in the project influence area of the Project. A separate STPP has been prepared. And consultation is has been carried out to ensure community's support.
OP 4.12 - Involuntary Resettlement	► Implemented in projects which displaces people. ► Requires public participation in resettlement planning as part of Social Assessment (SA) for project. ► Identification of "those who have formal legal rights to land (including customary and traditional rights recognized under the laws of the country. ► Intended to restore or improve income earning capacity of displaced populations in addition to their resettlement. ► Intended to provide compensation for lost assets and other resettlement assistance to "those who have no recognizable legal right or claim to the land they are occupying". ► Some project interventions are likely to trigger issues such as those related to land acquisition, loss of assets and impact on livelihood sources. Identification of any potential impacts and mitigation measures to address likely impacts is proposed. ► Transfer of Government land under different tenure systems could trigger adverse impacts such as loss of access to natural resources – firewood, fodder, water etc. and loss of sources of income/ livelihood/ shelter/ homestead.	Applicable. There will be impact on the Squatters and Encroachers (Non-Title Holders) mostly commercial entities.

3.3 IFC EHS Guideline

57. Table 20 presents the IFC EHS guideline applicable for the project

Table 20: IFC EHS guideline applicable to project

Safeguard Policies	Objective	Applicability	Safeguard
IFC: General EHS Guidelines	The (EHS) guidelines contain performance level and measures on environmental, occupational health and safety for construction, community health and safety to be followed during the construction, operation and decommissioning phases.	Applicable, as the sub-projects will involve construction, operational and de-commissioning activities.	The sub-project will adhere to the performance level and measures provided in the IFC general EHS guidelines,in Annexure V Mitigation measures proposed including OHS management plan (Annex IX) has been prepred using the EHS gudelines, and to provide the contractor with the guidance in implementing the required measures.
IFC Industry Sector Guidelines for Water and Sanitation	This industry sector EHS guideline is to be used together with the general EHS guidelines document, which provides guidance on EHS issues potentially applicable to Water and sanitation. Recommendations for the management of EHS issues associated with construction activities as would typically apply to these types of civil works are provided in the general EHS guidelines	The guidelines for water and sanitation include information relevant to the O&M of (i) potable water treatment and distribution systems, and (ii) collection of sewage in centralised systems (such as piped sewer collection networks) or decentralized systems (such as septic tanks subsequently serviced by pump trucks) and treatment of collected sewage at centralized facilities.	The sub-project had made use of these industry specific guidelines for reccomendin mititgation and management measures in O&M phase of he water supply project.
IFC Industry Sector Guidelines for Waste	The guideline document provides a summary of the	The guidelines for waste management will	The sub-project had made use

Management Facilities	most significant EHS issues associated with waste Management, which occur during the operational and decommissioning phases, along with recommendations for mitigating these impacts.	cover facilities or projects dedicated to municipal sewage management.	of these industry specific guidelines as applicable.
IFC Workers' Accommodation: Processes and Standards: Guidance Note	This Guidance Note addresses the processes and standards that should be applied to the provision of workers' accommodation	Applicable, as the sub-projects will involve setting up of labour camp during construction phase.	The plan to be followed for setting up of the labour camp has been provided in Annexure VII. This plan is prepared in reference to the Workers accommodation : processes and standards (A guidance note by IFC and EBRD). The objective of this plan in Annex VII is to provide guidance to the contractor or other agency involved in setting up of the construction and labour camp for keeping the health & Safety of workers and impacts of setting up such camps on the local community in consideration while developing and establishing such camp.

Project Categorization

58. As per the preliminary screening conducted in Annex 1, the Khunti Urban Water Supply Project is categorized as E-1 and S-2 (shown in table 21). AS per ESMF catgeorisation, category E-1 corresponds to Bank Category A project. Hence the requirements of Catgeory A project as per OP 4.01 have been followed under the ESIA for Khunti water Supply, including OP 4.01 Annex B Contents of ESIA for Category A project.

Table 21: Environmental Categorization of Khunti Water supply as per the ESMF

Category	Description	Type	Action
Environmental			
E-1	Significant adverse environmental impacts over the lifetime of the project; likely need for significant mitigation.	▶ Significant adverse impacts that are sensitive, diverse, or unprecedented, or that affect an area broader than the sites or facilities subject to physical works. ▶ Projects impacting sensitive environmental components[5]. ▶ Projects involving STPs and dam safety due diligence measures. ▶ Projects requiring environmental clearance as per EIA notification of MoEF&CC	The proposed sub- project will involve replacement of 233 m within 235 sq.m. of protected forest land. Though, there is need for compulsory land acquisition for the project or diversion of forest land However, replacement of the existing raw water main of 300mm with 500mm would involve working within the forest area in Birhu Thana village under Khunti Nagar Panchayat. There will be no change in the character of land, no trees will be cut, and the necessary precautions in the construction activity have been integrated in the ESMP. The activity does not affect the rights and wefare of the forest rights holders. The project needs to ensure that the forest rights holders along the raw water pipe alignment support the project and and their interests are protected. All impacts, environmental and social concerns associated with proposed water supply project have been addressed in the ESIA, and the appropriate mitigation and monitoring measures have been provided in ESMP, ARAP and STPP. JUIDCO has engaged an independent agency different from DPR consultant

[5]*Projects impacting sensitive environmental components include protected areas, forest areas.*

Category	Description	Type	Action
			to carry out a full comprehensive ESIA for Khunti Water Supply project, to meet the requirements of OP 4.01 Category A project. The development of the ESIA involved two rounds of stakeholder and public consultantations. The first, seeking inputs into the development of the ESIA and understanding the social and environmetnal issues of the project area, and the second on the advanced draft of the ESIA and ESMP.
Social			
S-2	Moderate with minimised social impacts	► If impacts are of minor nature or less than 200 persons or about 50 households are affected.	The project activity will also lead to permanent impact of loss of livelihood for 2 PAPs and temporary impact of loss of livelihood for 35 PAPs, all of whom are non-title holders. JUIDCO has prepared an Abbreviated Resettlement Action Plan (ARAP) by a separate consultant. The draft ARAP will be disclosed after approval from World Bank

E & S permissions required

59. Planning Stage

- NOC from WRD for withdrawal of water for water supply scheme *(obtained and presented in Annex-XVII).*

60. Pre-construction stage

- NOC from the Forest Department for replacement of 233 m of pipelines in forest land under Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 *(obtained- see annex- XIV)*
- NOC/ Consent from Urban Local body for designated site at Belahatti for disposal of construction waste (obtained- see annex IV)
- NOC for WTP sludge disposal at Belahatti from urban local body .*(obtained- see annex IV)*
- NOC from urban local body for establishment of labour camp near WTP .*(obtained- see annex IV)*

61.

62. Construction stage

- CTE & CTO from JSPCB for batching (concrete mix) plant and DG set (greater than 15 kVA).
- Labour license from Department of Labour.
- Contractor who employs or who employed five or more Inter-State migrant workmen need to obtain registration of interstate workmen migrant license from labour commissioner.
- Approval from ULB for withdrawal of water for construction purpose from surface water source
- PUC for construction vehicles from Department of Transport, Government of Jharkhand.

4 ANALYSIS OF ALTERNATIVES

4.1 No Project scenario

63. River Tajna/Karkari (Perennial River) is the only surface water supply source for Khunti Nagar Panchayat (KNP) flowing through the north-eastern boundary of the town.

The present surface water supply scheme includes a WTP and intake well that were constructed in the year 1982. Water pumping facility from the intake well and WTP were upgraded in late 2006 after which regular piped water supply system was commissioned.

64. With the current scheme, 1001 water connections have been provided, which account for 14% of the total HHs in KNP. At present, 65 lpcd of water is being supplied through intermittent water supply adding up to a total duration of about 1.5 hours per day. The population is forecasted to increase to 74921 by 2048 from the present population of 36390 and the water demand is expected to be around 13.540 MLD.

65. The key issues with the current water supply are:

- Incomplete coverage (reaching only 14% of the households)
- Inadequate supply (at 65 lpcd)
- No metering of the water supply resulting in huge wastage by consumers
- Low water pressure
- Poor water quality (as the WTP is more than 25 years old and in a dilapidated condition)
- Poor Maintaince of current WTP which has resulted in dilapidated condition

66. The sub-project will lead to the following benefits:

- 100% coverage of the households in KNP
- Reduction in water wastage due to 100% household connections and metering
- Improved water quality supplied to consumers thereby reducing the burden of water borne disease.
- Reduction in drudgery, and savings in time for women who travel long distances to collect water from a dediated point.
- General hygiene in the served area could improve through use of acceptable water quality and enhanced availability (from 65 lpcd to 155 lpcd).

67. The no-project scenario will lead to the following negative and long term impacts:

- Increased exposure to health risks/ water borne diseases due to consumption of water with little or no treatment.
- Loss of time and energy, especially for women and girl children, due to fetching water from public water points.
- Groundwater depletion due to over extraction through tube wells.

Table 22: Option Analysis

Options	Scenario	Remarks
Option-I	Proposed raw water main from existing intake well to WTP site through a mix of Forest, Government, Private and National Highway lands. Use of only 1 existing ESR out of 2 existing ESRs Use of Rapid Sand Filter	▶ The increase water supply can be achieved by changing the existing 300 mm pipeline from intake to WTP with a 500 mm pipeline. ▶ Around 233 m length of the existing 300 mm pipeline passes through forest land. NOC has been obtained from the Forest Department for replacement of the pipeline. ▶ ESR of Zone –I will continue to be in operation.
Option-II	A new existing intake well at the upstream of Tajna Barrage connecting to the proposed WTP through the Toyatoli Village, crossing the Canal, River and then along the NH up to WTP.	▶ Construction of a new intake well will disturb the riverine environment and the fresh construction activity may lead to river pollution. ▶ The alignment of the pipeline from intake point to the WTP is being proposed in government land as well as one Private land parcel, which is currently under cultivation. Laying of pipelines will lead to

	Use of all (2) existing ESRs Use of Slow Sand Filter	livelihood loss. ▶ There are boulders present along this alignment, which have to be removed through use of explosives that entail safety risks. ▶ Two structures will be permanently impacted because of the alignment of pipeline from intake well to WTP. ▶ There is community resistance to this alignment. ▶ The ESR in zone – 3 is defunct for long period of time and the current structure has been observed to be structurally not safe. ▶ Use of slow sand filter will require 50 times more area than rapid sand filter

68. As per the table presented above, Option–I has been considered in the proposed sub-project to ensure the following:

- Avoid impacts on river Tajna
- Minimise loss of livelihood
- Avoid water quality and reduced noise and vibration impacts of establishing new intake structures
- Minimise permanent impact on properties
- Avoid resistance of community

69. The Environment and Social Impact Assessment (ESIA) has been conducted based on the sub-project components considered in Option-I.

5 ENVIRONMENTAL BASELINE

5.1 Introduction

70. This section presents the existing environmental baseline status of the study area, covering an area of 500 m radius from the sub-project site.

5.2 Land Environment

5.2.1 Land use

71. The land use pattern for the Khunti Nagar Panchayat is provided in **Table 23**.

Table 23: Land Use Pattern for the Khunti Nagar Panchayat

Land use	Area (Ha)	Percentage Coverage
Residential	478.33	4.941%
Commercial	6.43	0.066%
Industrial & Manufacturing	46.09	0.476%
Public & Semi Public	61.76	0.638%
Traffic & Transportation	95.88	0.990%
Recreational	6.19	0.064%
Agriculture	7722.97	79.778%
Water Body	201.39	2.080%
Vacant land	1061.27	10.963%
Protected Forest [6]	0.235	0.002%
Total	**9680.545**	

Source: Master plan, Khunti

5.2.2 Topography

72. The Tajna (Karkari) river is the major water body flowing through northern part of the town forming its north-eastern boundary (ward number 9). River Karkari is the tributary of River Subarnarekha. The highest elevation point is 633 m along the Ranchi-Chibasa road (NH 75). General slope is towards southern side of the town. The city is highly undulating with a difference of 15-20m.

5.2.3 Geomorphology

73. The northernmost and southernmost parts of the district are covered with hillocks and forests. Altitude of the area varies from 500 m to 700 m above mean sea level in general. There are many hillocks throughout the district having an altitude of 700 m above mean sea level. The district is the part of Chota Nagpur plateau.

5.2.4 Geology

74. The major landforms of the area are granite gneiss. Undulating erosional surface with interrupting dykes, ridges and inselbergs are prominent features. These are developed over granite gneiss. It consists of boulders, cobbles, pebbles, gravels, sandy silt and clays.

[6] Pipe will be upgraded in this patch, overall forest area in KNP is 9 Ha.

5.2.5 Hydrogeology

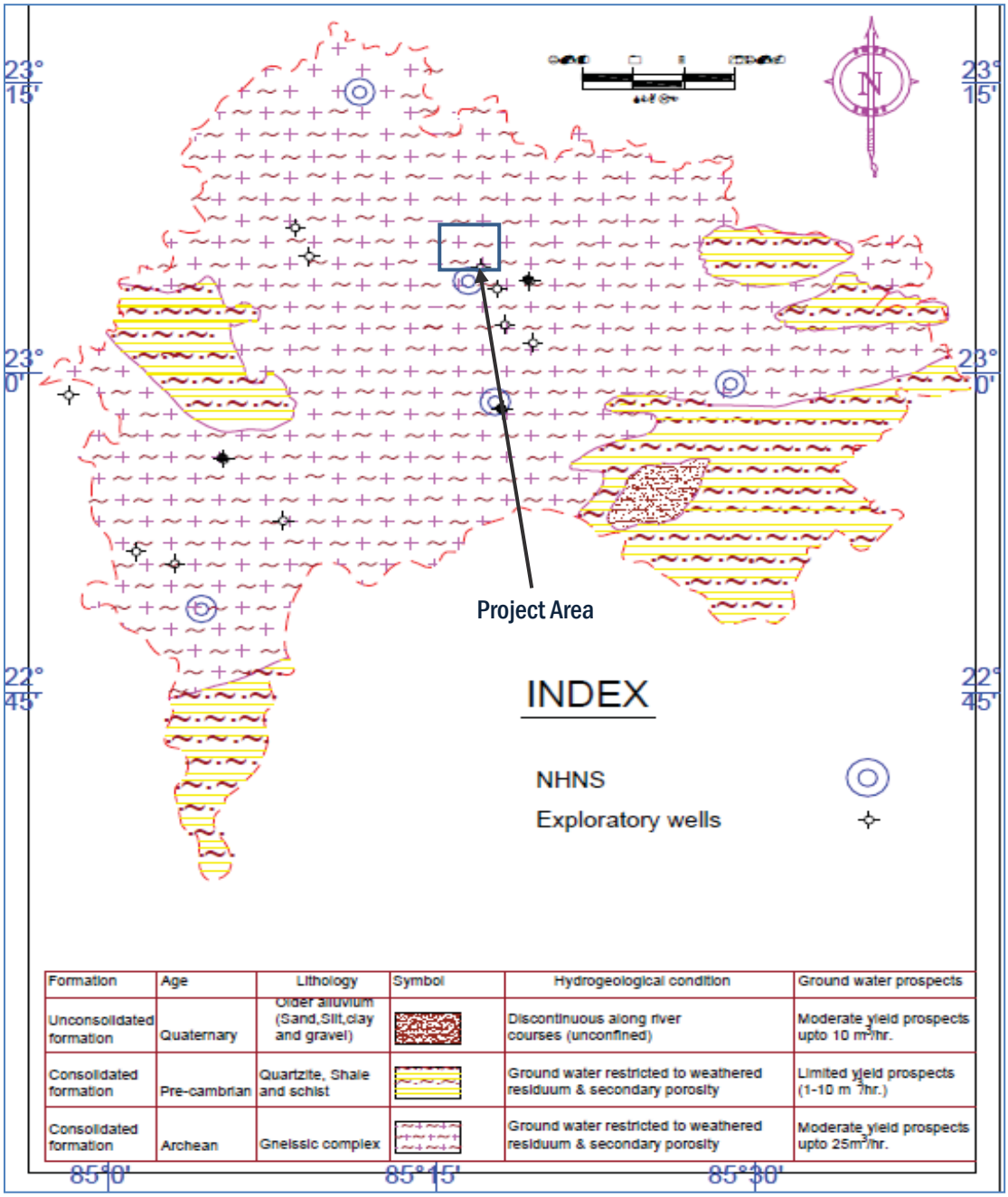
75. The Khunti district has varied hydrogeological characteristics due to which the ground water potential differs from one region to another. It is underlain by Chota Nagpur granite gneiss of pre-Cambrian age in three-fourths of its area.

76. Aquifer system: Two types of aquifers are found. Weathered aquifer and fractured aquifers. Thickness of weathered aquifers varies from 10-25 m in granite terrain and 30-60 m in lateritic terrain. In weathered aquifer ground water occurs in unconfined condition, while in fractured aquifer ground water occurs in semi confined to confined condition.

- Shallow Aquifer: The shallow aquifers are being tapped through dug wells, dug cum bore wells and hand pumps. The thickness of weathered mantle varies from 5 to 20 mbgl. In lateritic terrain, many dug wells dry up during summer months. Hand pumps generally tap first fracture zones, with a depth of 30-40 mbgl.
- Deeper Aquifer: In granite gneiss terrain area first fracture occurs between 50-70 m and second fracture is found between 100-120 m depth.

The hydrogeological map of Khunti district is available, showing the project area which has been presented in **Figure 7.**

Figure 7: Hydrogeological Map of Khunti District



Formation	Age	Lithology	Symbol	Hydrogeological condition	Ground water prospects
Unconsolidated formation	Quaternary	Older alluvium (Sand,Silt,clay and gravel)		Discontinuous along river courses (unconfined)	Moderate yield prospects upto 10 m^3/hr.
Consolidated formation	Pre-cambrian	Quartzite, Shale and schist		Ground water restricted to weathered residuum & secondary porosity	Limited yield prospects (1-10 m^3/hr.)
Consolidated formation	Archean	Gneissic complex		Ground water restricted to weathered residuum & secondary porosity	Moderate yield prospects upto 25m^3/hr.

Source: CGWB

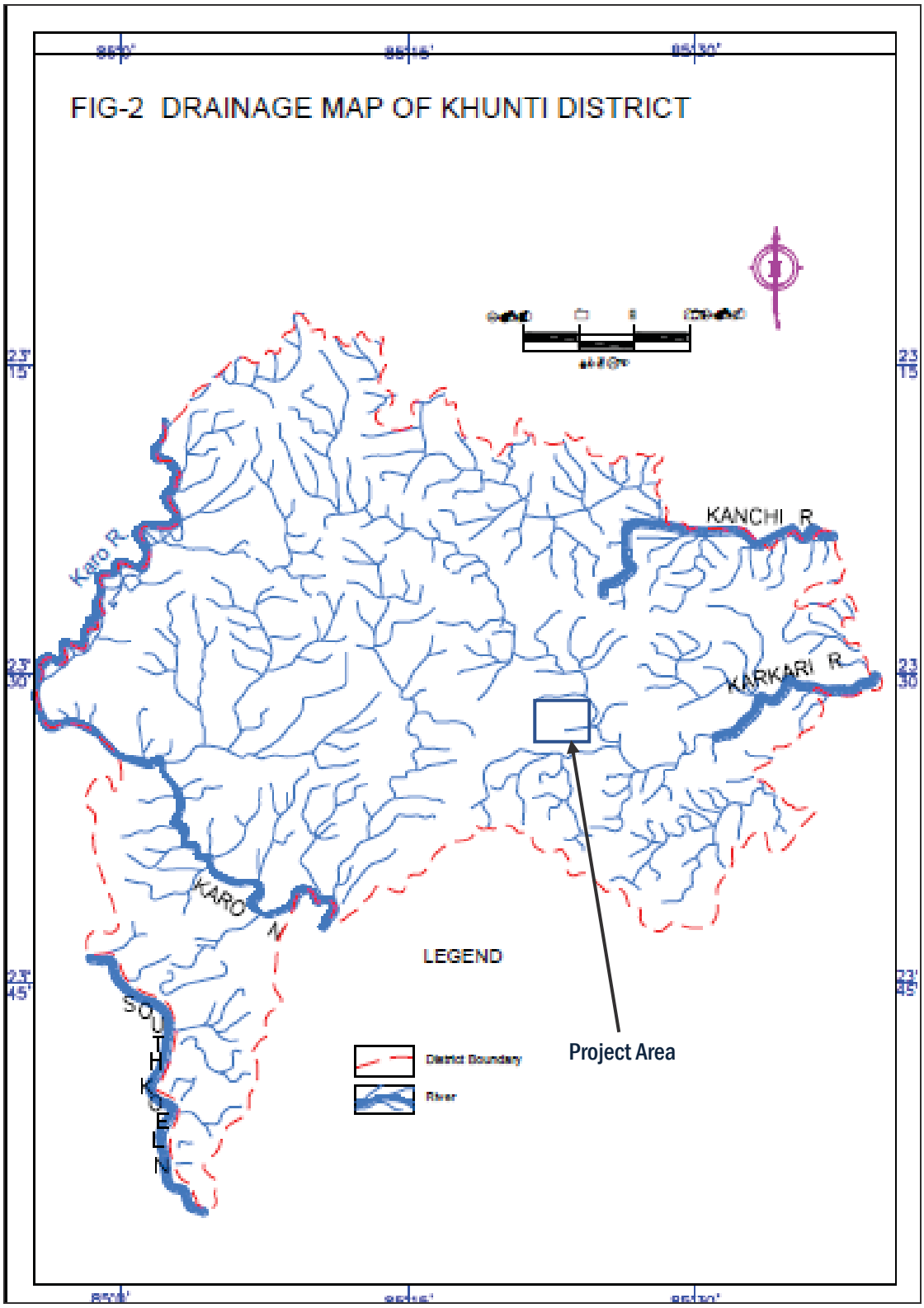
5.2.6 Ground Water Status

77. The overall stage of ground water development in Khunti district is 28.26 percent indicating sufficient scope of development. All the blocks in Khunti are classified as falling in the ‘safe zone’. However, the long-term water level trend (2003-2012) was observed to be declining by about 0.41 m/year in Khunti block. In terms of the water quality, the water in the phreatic aquifers is alkaline in nature.

5.2.7 Surface Water Status

78. The major rivers draining the Khunti district are Tajna , Banai, Chata and Karo The Tajna river is a left bank tributary of Swarnrekha river in Swarnrekha basin and is the major water body flowing throughout the northern part of KNP forming its north eastern boundary.The drainage map of Khunti district showing the project area has been presented in **Figure 8.**

Figure 8: Drainage Map of Khunti District



Source: CGWB

5.2.8 Soil

79. Soil samples were collected from study area at six locations during February 2017. The details of the soil sampling locations are described in **Table 24** and presented in **Figure 9.**

Table 24: Soil Sampling Locations

S.No.	Sampling Locations	Location Code	Geographical Coordinates	Remarks
1	Kadma	S-1	23.05783 N, 85.28803 E	Presents soil quality near proposed pipeline
2	Dahuphuttu	S-2	23.0852 N, 85.285867 E	Presents soil quality near proposed pipeline
3	Ward No. 4	S-3	23.07281 N, 85.274244 E	Presents soil quality near proposed ESR-2
4	WTP	S-4	23.105667 N, 85.278883 E	Presents soil quality near existing WTP
5	Proposed Labour camp	S-5	23.10699 N, 85.27961 E	Presents soil quality near proposed labour camp
6	Subhas chowk – sensitive area,	S-6	23.07603 N, 85.27887 E	Presents soil quality near proposed pipeline

Note: The soil samples at each location were collected from different depths of 0 to 15 cm (D-1), 15 to 30 cm (D-2), 30 to 60-cm (D-3) and 60 to 100cm (D-4) at each location.

80. Soil sampling locations were chosen based on a reconnaissance survey of the area and prevailing activities within 100 m study area. Samples were collected by hand driven sampling augers from the surface and different depths.

81. The samples were packed in dependable, waterproof containers and analysed as per ASTM, USEPA IS: 2720, M.L. Jackson (Soil Chemical Analysis).

Figure 9: Soil Sampling Locations

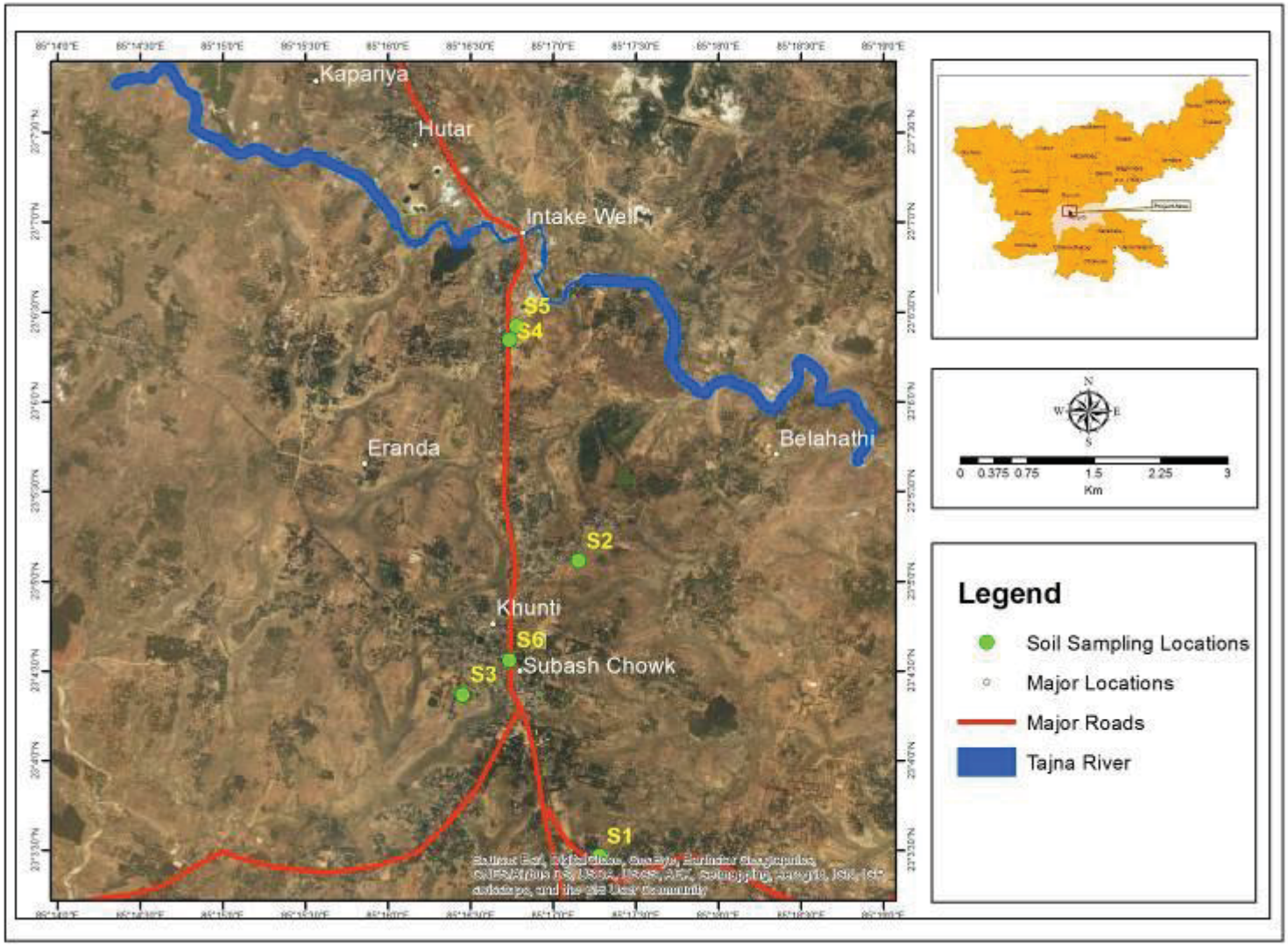


Table 25: Physio-Chemical Characteristics of Soil

Sl. No.	Parameter & Unit		Method	Unit	Sampling Location					
					S 1	S 2	S 3	S 4	S 5	S 6
1.	Texture	Coarse	International pipette method	%	58.3	49.2	17.5	65.4	51.5	24.4
		Gravels		%	30.1	21.8	14.3	17.3	19.7	23.2
		Fine		%	9.3	10.6	19.7	8.7	8.3	15.8
		Clay + Silt		%	2.3	18.4	48.5	8.6	20.5	36.6
2.	Porosity		Stochastics method	%	27.5	30.2	29.6	30.5	28.6	30.2
3.	Bulk Density		Weighing bottle method	g/cm^3	2.5	2.14	2.49	2.61	1.57	1.84
4.	Water holding capacity		Saturation moisture percentage	%	97.5	92.6	64.5	78.9	85.8	57.0
5.	pH		Electrometric method	--	6.68	6.04	4.95	5.55	5.67	7.03
6.	Conductivity		Electrometric method	mho/cm	28	50	38	37	86	222
7.	Magnesium		Titrimetric method	meq/100gm	5.6	6.8	7.9	3.5	4.6	7.9
8.	Calcium		Titrimetric method	mq/100gm	3.2	2.5	5.7	8.9	3.5	4.8
9.	Alkalinity		Titrimetric method	%	12	4	4	8	4	8
10.	Chloride		Mohr's titration method	mg/l	9.78	19.57	2.0	2.0	2.0	7.83
11.	Sodium		Direct air acetylene flame method	ppm	39.4	45.7	42.1	63.4	32.8	32.6
12.	Potassium		Direct air acetylene flame method	ppm	2.9	3.8	4.1	5.8	3.1	3.8
13.	Organic carbon		Walkely & black method	%	0.25	0.56	0.37	0.28	0.74	0.28
14.	SAR		Specific absorption rate	mq/l	8.63	8.92	6.11	9.37	8.03	4.98
15.	Nitrogen		Alkaline permanganate method	Kg/ha	275	289	158	313	271	195
16.	Salinity		Electrometric method	Kg/ha	57.3	83.5	39.1	75.3	21.5	29.6

82. Soil in the study corridor was found to be mostly clayey. The pH of the soil ranged between 4.95 - 7.03 and hence was mostly acidic in nature. Electrical conductivity (EC) was low, generally varying between 23-222 μmhos/cm. Sodium level (32.6 – 63.4 ppm) in the soil samples was also found low and therefore making the soil good for agricultural purpose. In

comparison to sodium, potassium level (2.9 – 5.8ppm) was found to be high. Nitrogen level (158 - 313 kg/ha) was found to be moderate. Organic matter content (organic carbon 0.25 – 0.74%) was high indicating good vegetative potential of the soil.

5.3 Natural Hazards

5.3.1 Seismicity

83. As per the earthquake hazard map of India provided in the Vulnerability Atlas prepared by Building Materials and Technology Promotion Council (BMTPC), the Khunti district lies in Zone II which is the 'Low Damage Risk Zone' and is vulnerable to earthquakes of intensity MSK VI or less.

5.3.2 Wind Hazard

84. According to Wind Hazard Map of Jharkhand prepared by BMTPC, the sub-project area falls in Moderate Damage Risk Zone – B (V_b=39m/s).

The seismicity, and wind hazard of the study area has been presented below in **Figure 10** & **Figure 11** respectively.

Figure 10: Project area marked on Earthquake Hazard Map

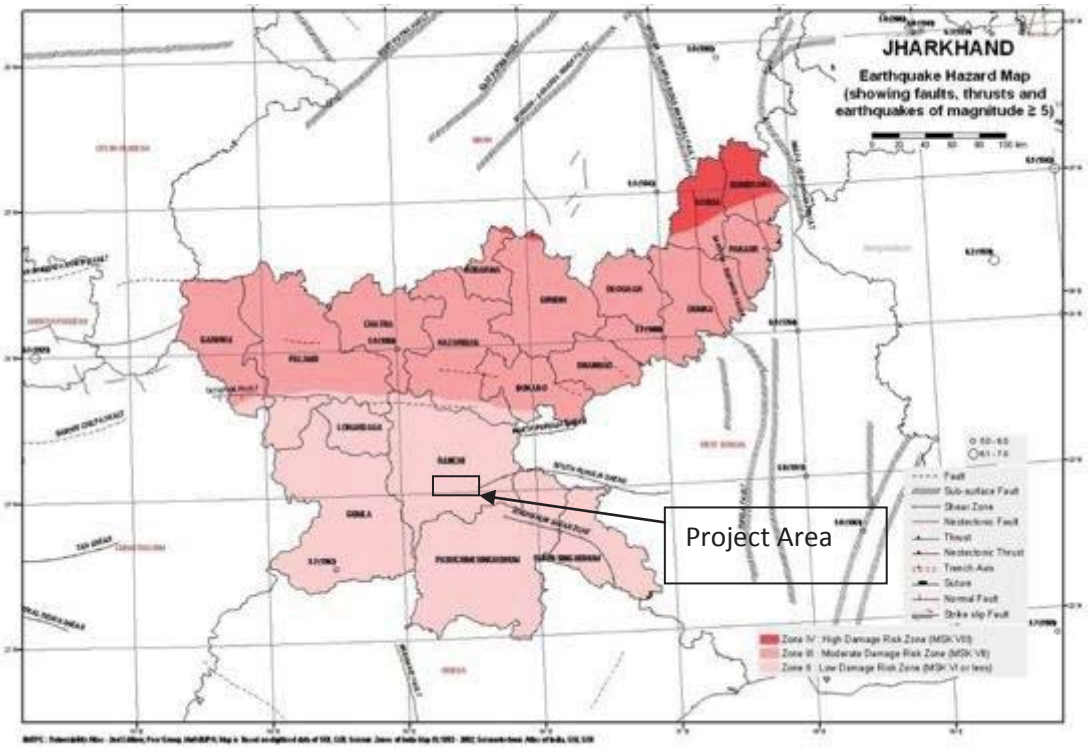


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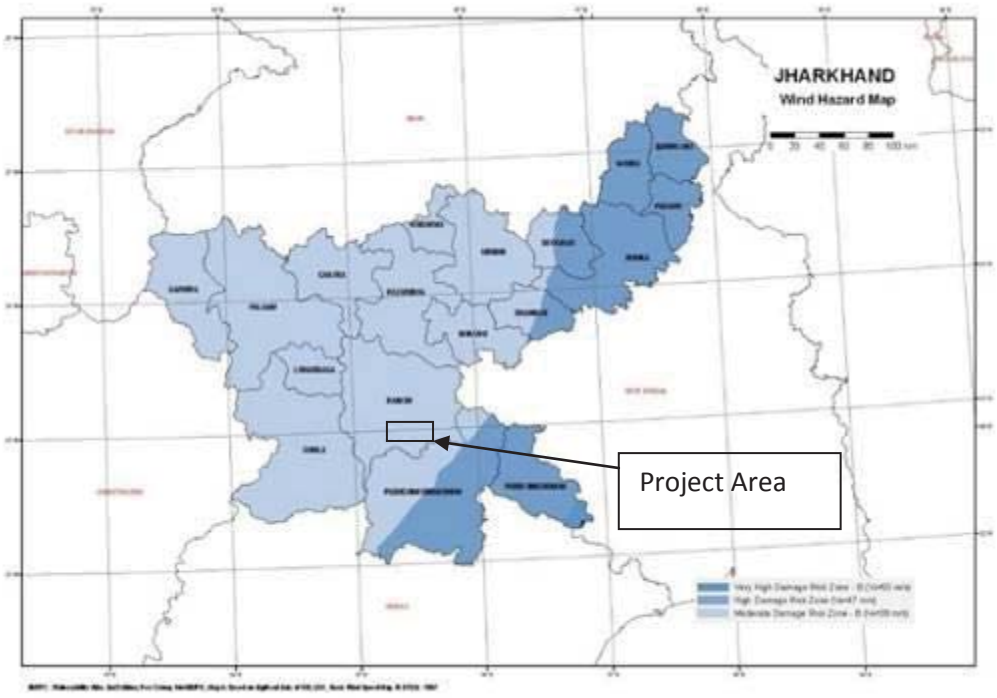
Figure 11: Project area marked on Wind Hazard Map



5.3.3 Floods

85. As per the Flood Hazard Map of India by Building Materials & Technology Promotion Council (BMTPC), the sub-project site does not fall under area liable to floods.

5.4 Air Environment

5.4.1 Climate and Micro-meteorology of the study area

86. The climate of the study area is classified as tropical monsoon climate with following four main seasons:

- Winter season: January and February
- Pre-monsoon season: March to May
- Monsoon season: June to September
- Post monsoon Season: October to December

a) IMD Meteorological Data

87. The secondary data on ambient temperature, atmospheric pressure, relative humidity and wind speed has been analysed based on Indian Meteorological Department (IMD) data from Ranchi (A)[7] observatory. The same has been summarised in **Table 26.** The rainfall data for Ranchi (A) has been summarised in **Table 27.**

[7] The nearest IMD observatory is at Ranchi which is 50 km from Khunti

Table 26: Ambient Air Temperature, Relative Humidity, Vapour Pressure and Wind Speed

Month	Temperature (Mean daily in °C)				Relative Humidity in %		Vapour Pressure (hPa)		Wind Speed
	Highest	Max Daily	Min Daily	Lowest	8:30 hrs	17:30 hrs	8:30 hrs	17:30 hrs	In km/hr
Jan	22.7	26.7	10	5.9	62	42	10.4	9.8	7.2
Feb	25.4	30.5	12.4	7.6	55	36	11.0	10.1	8.3
Mar	31.1	35.6	16.9	12.2	41	27	11.4	10.0	9.1
April	35.4	39.1	21.3	16.9	40	27	14.7	12.3	9.5
May	36.8	41.1	23.3	18.6	50	36	19.8	16.1	10
June	33.3	39.3	23.5	20.0	71	62	25.5	24	10.8
July	29.2	32.6	22.5	21.0	87	82	27.8	28.0	10.6
Aug	28.5	31.1	22.2	20.9	88	83	27.4	27.8	10.7
Sept	28.8	31.3	21.6	19.7	83	78	26.2	26.0	9.9
Oct	28.3	30.9	18.6	15.1	70	61	20.5	19.5	7.6
Nov	25.7	28.7	14.1	10.5	60	51	14.2	13.7	7.3
Dec	22.9	26.1	10.1	6.4	62	47	11.1	10.7	7.1
Avg.	29.0	41.3	18.0	5.6	64	53	18.3	17.3	9

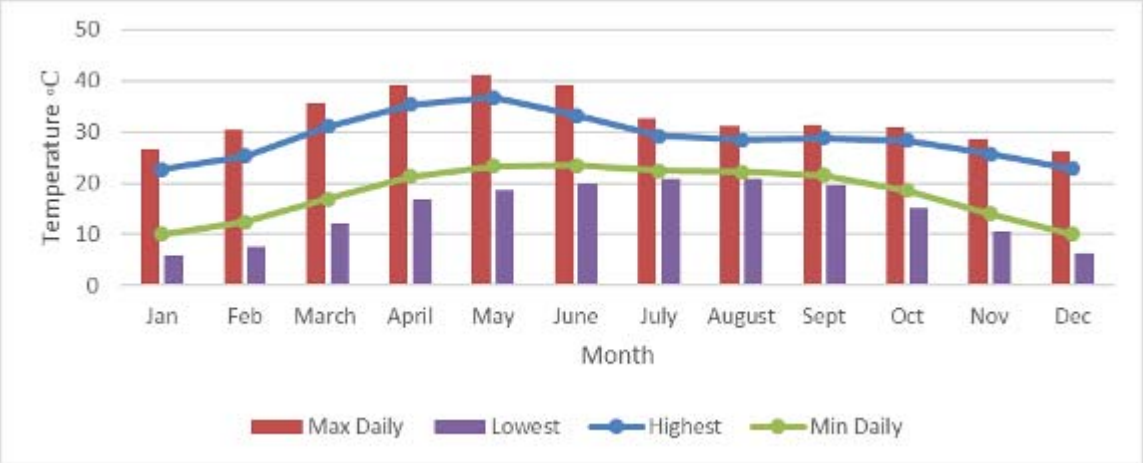
Table 27: Rainfall, Cloud amount and Weather Table

Month	Rainfall (mm)			Cloud Amount (Okta)		Weather Phenomena					
	Monthly Mean	Max -24 hourly	Avg. No. of rainy days	All Clouds		Average Number of days					
				8:30 hrs	17:30 hrs	PPT(0.33 mm or more)	Hail	Thunder	Fog	Dust Storm	Squall
Jan	20.8	84	1.6	1.6	2.1	2.9	0.0	0.8	4.2	0.0	0.0
Feb	27.8	47	2.4	1.7	2.2	4.0	0.1	2.7	1.9	0.0	0.3
Mar	19.8	44.7	2.1	1.7	2.4	3.7	0.0	3.6	1.4	0.0	0.4
April	30.7	73.3	2.4	1.6	3.2	4.3	0.1	5.0	0.3	0.2	1.1
May	58.7	54.6	4.6	2.0	3.2	7.3	0.2	9.0	0.4	0.1	1.6
June	215.6	172	10.6	5.0	6.0	13.2	0.0	12.1	0.1	0.2	1.0
July	353.2	178.8	18.4	6.6	6.7	22.5	0.0	11.4	0.1	0.0	0.2
Aug	335.0	120	16.8	6.7	6.7	21.1	0.0	11.7	0.1	0.0	0.0
Sept	258.0	141.4	12.7	5.2	6.1	15.5	0.0	9.0	0.5	0.0	0.0
Oct	77.5	175.8	4.3	2.7	3.4	6.0	0.0	3.0	1.9	0.0	0.0
Nov	11.7	49.4	1.0	1.7	2.2	1.2	0.0	0.2	1.7	0.0	0.0
Dec	9.6	39.0	0.9	1.5	1.9	1.2	0.0	0.2	2.8	0.0	0.0
Avg				3.2	3.9						
Total	1418.4	77.8				102.9	0.4	68.7	15.4	0.5	4.6

5.4.2 Temperature

88. The monthly temperature variation is shown in Figure 12. As per the data recorded at meteorological station, Ranchi, the temperature begins to increase from March till May. April and May are the hottest months with highest temperature of 36.8°C, recorded in the month of May. The lowest temperature of 5.9°C was recorded in month of January. The daily mean minimum temperature varies from 10.1°C in December to 23.5°C in June, whereas the daily mean maximum temperature varies from 26.1 °C in December to 41.1°C in May.

Figure 12: Monthly Temperature Variation



5.4.3 Relative Humidity

89. The mean relative humidity in different months during 1961-1990 is shown in Figure 13. The relative humidity is generally high in monsoon from June to October. It is about 64% during morning hours and 53% during evening hours. The minimum humidity is observed in April and maximum relative humidity is observed in August. Figure 14 presents the average monthly rainfall observed in Ranchi. The annual average rainfall in the region is about 1418.4 mm spreading over 77.8 days. Maximum rainfall occurs during month of July (353.2 mm) and minimum during the month of December (9.6 mm).

Figure 13: Relative Humidity

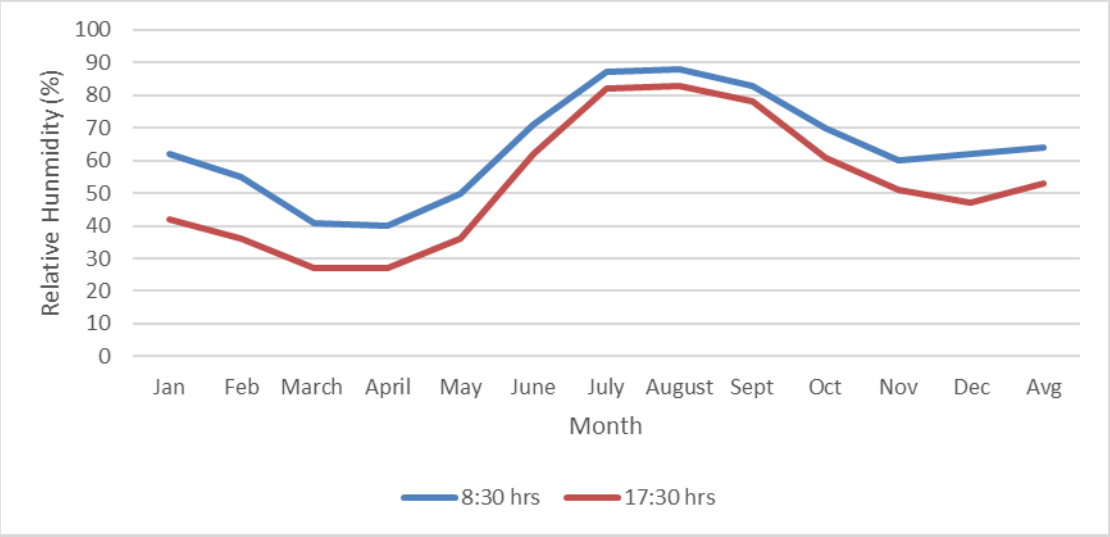
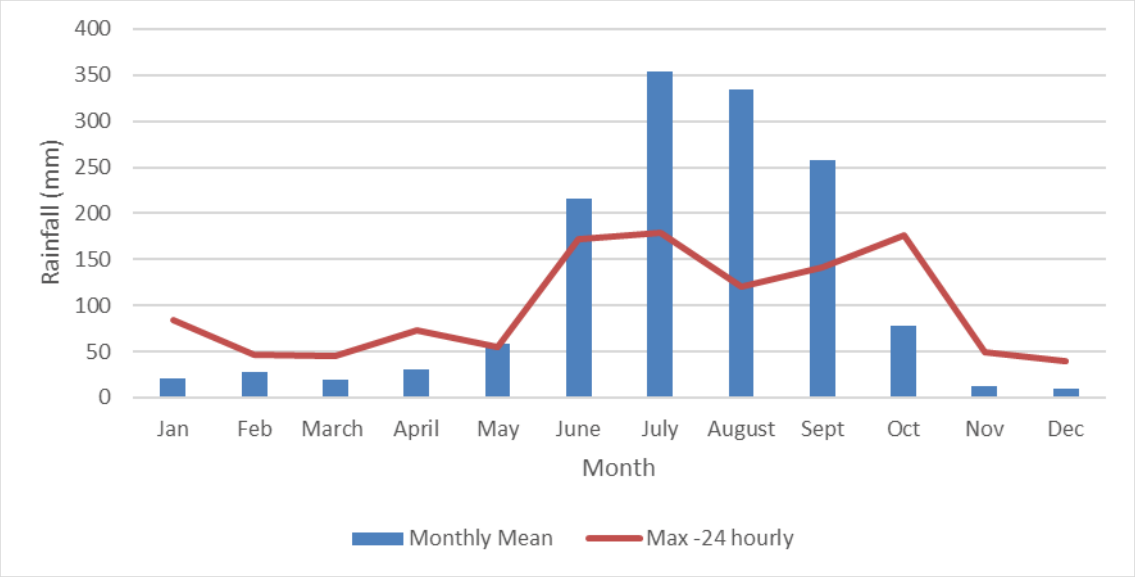


Figure 14: Rainfall Details



5.4.4 Cloud Cover

90. The highest cloud cover of 6.7 okta is recorded during the month of August.

5.4.5 Wind Speed/Direction

91. The mean wind speed is recorded to be highest in the month of June at 10.8 kmph and lowest in the month of December at 7.1 kmph. The predominant wind direction is observed from East and West during the summer season (March-May), West during the monsoon season (June – September), East. during the other seasons wind direction details as recorded at Ranchi meteorological station is presented in Table 28.

Table 28: Wind Direction of Ranchi

Month	Morning Time Predominant Wind			Evening Time Predominant Wind		
	I	II	III	I	II	III
January	East	Calm	North East	Calm	East	West
February	East	Calm	West	Calm	East	West
March	East	West	Calm	East	Calm	West
April	East	West	Calm	East	Calm	West
May	East	West	Calm	East	Calm	West
June	East	West	Calm	East	West	Calm
July	East	West	Calm	West	Calm	East
August	East	West	Calm	East	Calm	West
September	East	West	Calm	Calm	East	West
October	East	Calm	North West	Calm	East	West
November	East	Calm	North East	Calm	East	North East
December	East	Calm	North East	Calm	East	North East

5.4.6 Ambient Air Quality

92. A total of ambient air quality four (4) monitoring locations representing residential, industrial, high traffic zone and commercial setup were selected to determine air quality levels within the study area. The locations of the monitoring stations were based on preliminary analysis of the meteorological conditions. Logistical considerations such as accessibility, security, and availability of reliable power supply etc. were also considered while finalizing the locations of AAQM stations. Details of the AAQM stations are summarized in **Table 29.**

Table 29: Description of Ambient Air Quality Monitoring Stations

Sl.No.	Station Code	Coordinates	Location Description	Remarks
1	AAQ1	23 06 25.18N, 85 16 46.59E	Proposed labour camp site near proposed WTP	Represents air quality near Proposed Construction Camp
2	AAQ2	23 04 33.71N, 85 16 43.93E	Subhash chowk	Represents air quality near proposed pipeline
3	AAQ3	23 03 27.51N, 85 17 17.22E	Proposed ESR camp area, Kadma	Represents air quality near proposed ESR camp area
4	AAQ4	23 06 20.99N, 85 16 42.61E	Existing WTP area	Represents air quality near existing WTP

93. The ambient air quality monitoring (AAQM) was conducted from 26th February 2017 to 28th February 2017 for each of the locations on a 24-hour schedule. The equipment was kept

in open space, away from vegetation and the height of samplers monitoring was kept in range of 3 – 5 m. Monitoring was done as per the Guidelines for Ambient Air Quality Monitoring, National Ambient Air Quality Series NAAQMS/25/2003-04 for the following parameters:

- Respirable Suspended Particulate Matter (RSPM/ PM_{10})
- Fine particulate Matter (FPM/ $PM_{2.5}$)
- Sulphur Dioxide (SO_2)
- Nitrogen Dioxide (NO_2)

94. For the collection of samples for PM_{10}, SO_2 and NO_2, Respirable Dust Samplers (RDS – APM 460 BL, Envirotech) along with gaseous sampling impingers were used. For the collection of $PM_{2.5}$, Fine Particulate Sampler (Model APM 151, Envirotech) was used. Sulphur Dioxide (SO_2) was collected by drawing air through absorbing solution of sodium tetrachloromercurate (EPA modified West & Gaeke Method) and NO_2 was collected by drawing air through the mixture of absorbing solutions of sodium hydroxide and sodium arsenite (Na-Arsenite modified Jacobs & Hochheiser Method). The measurement for both SO_2 and NO_2 was done colorimetrically.

95. Results of AAQM are presented in **Table 30.**

Table 30: Ambient Air Quality Monitoring Results

Parameters	Monitoring Station & Category				NAAQS Guideline	IFC Guideline
	Construction camp site	Subhash chowk	ESR camp area, Kadma	Existing WTP area		
PM_{10}	70.30	133.69	142.31	180.61	100	50
$PM_{2.5}$	30.83	75.00	56.58	87.07	60	25
SO_x	5.42	12.63	7.30	9.21	80	20
NO_x	17.19	21.42	18.47	18.29	80	200 (1 hour)

Results:

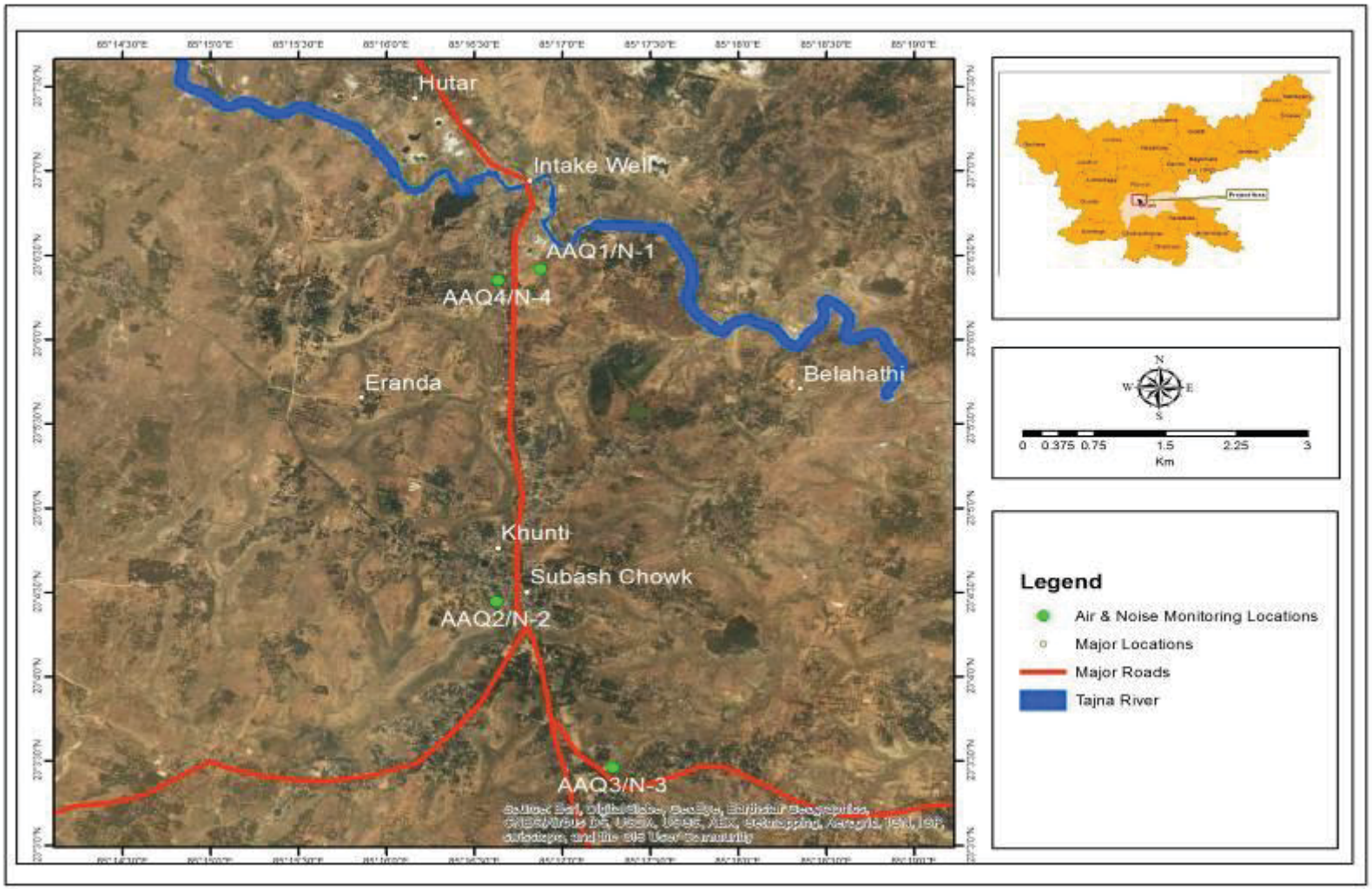
I. The value of PM_{10} was observed to be higher than the norms of CPCB (100 µg/m^3) at existing WTP area (180.61 µg/m^3) due to the presence of a crusher unit, stone mining/quarrying and industry about 500 meters from the existing WTP.

II. High value of PM_{10} was observed at ESR camp area at Kadma. This is due to congestion at Khunti bus stand and presence of brick industries nearby.

III. Subhash Chowk is the centre of the city with high population and dense traffic, which is one of the contributing factors for the high air pollution level.

96. The findings indicate the importance of dust control and emission control measures during the construction activity.

Figure 15: Air & Noise Monitoring Locations



5.5 Noise Environment

97. To assess the background noise levels in the study area, ambient noise monitoring was conducted. Total 4 locations within the study corridor (as indicated in **Table 31**) were selected for measurement of present status of ambient noise levels.

Table 31: Details of Noise Monitoring Stations

S.No.	Location Code	Coordinates	Location Description	Remarks
1	N 1	23 03 29.16N, 85 17 17.22E	ESR near Kadma area	Represents noise levels near to Proposed ESR -2
2	N 2	23 06 22.90N, 85 16 46.50E	Existing WTP	Represents noise levels near proposed pipeline
3	N 3	23 06 25.00N, 85 16 47.32E	Proposed labour camp area	Represents noise levels near proposed labour camp area
4	N 4	23 04 35.10N, 85 16 43.60E	Subhash Chowk	Represents noise levels near to existing WTP

98. The summarized noise level data, as recorded, is presented in **Table 32.**

Table 32: Ambient Noise Quality Monitoring Results

Location Code	Area Cat.	Average Leq (dBA)		Day Time (dBA)		Night Time (dBA)		Noise Standard – Day (IFC & CPCB) db(A)- l	Noise Standard – Night (IFC & CPCB) db(A)- l
		Day	Night	Max.	Min.	Max.	Min.		
N 1	ESR near Kadma area	54.9	51.2	59.1	53.1	53.0	49.7	55	45
N 2	Existing WTP	63.8	54.5	67.2	59.1	58.1	51.2	55	45
N 3	Proposed Labour camp area	58.7	52.6	62.3	52.2	56.7	50.4	55	45
N 4	Subhash chowk	68.9	57.2	76.4	62.2	61.1	53.2	65	55

99. The day time equivalent noise level reckoned from 0600 to 2200 hours (Leq day) varied from 54.9 to 68.9 dB(A) while night time equivalent noise level reckoned from 2200 to 0600 hours varied from 51.2 to 57.2 dB(A). The day time equivalent noise levels (Leq Day) and night time equivalent noise levels (Leq Night) monitored at all the locations were found to be higher at N-1, N-2 & N-3 than the prescribed norms of CPCB [Day time 06:00-22:00 – 55 dB(A) and Night time 22:00-06:00 – 45 Db(A)].

5.6 Water Environment

100. The water quality assessment was undertaken to understand the baseline water quality (both groundwater and surface water) in the study area. The sampled locations have been presented in Table 33.

Table 33: Details of Water Sampling Locations

Sl.No.	Location Code	Sampling Locations	Geographical Coordinates	Type of Sample	Remarks
1	GW 1	Shubhash Chowk – sensitive area	23.0760 N, 85.2789 E	Ground Water	Bore well used by local community near proposed pipeline
2	GW 2	WTP Hand pump	23.1061N, 85.2786 E	Ground Water	Hand pump used by local community near to existing WTP
3	GW 3	Kadma	23.0576 N, 85.2881 E	Ground Water	Bore well used by local community near proposed ESR
4	GW 4	Ward no. – 4	23.0731 N, 85.2739 E	Ground Water	Bore well used by local community near proposed ESR
5	GW 5	Dahuphuttu ward no. 10	23.0857 N, 85.2848 E	Ground Water	Bore well used by local community near proposed ESR
6	SW 1	Near Barrage	23.1155 N ,85.2748 E	Surface Water	Surface Water near Barrage
7	SW 2	Intake Well	23.1156 N, 85.2803 E	Surface Water	Surface Water near existing intake well
8	SW 3	WTP raw water	23.1058 N, 85.2785 E	WTP raw water	WTP raw water

The monitoring results of groundwater and surface water have been provided in

Table 34 **& Table 36**.

Figure 16: Water Sampling Locations

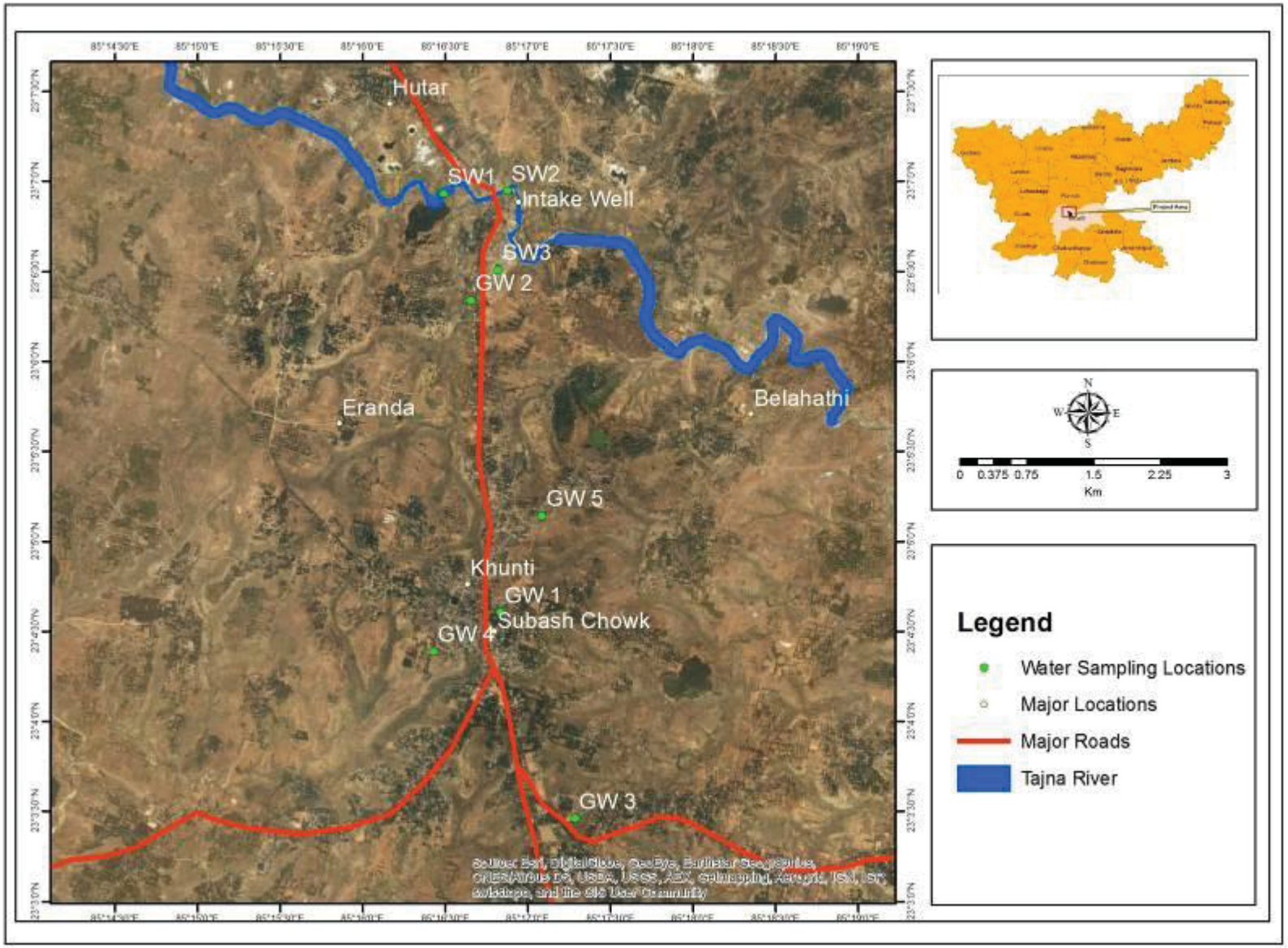


Table 34: Ground Water Quality Monitoring Results[8]

Sl. No.	Parameters	Unit	Method	Monitoring Location					IS: 10500, 2012 Acceptable Limit	IS: 10500, 2012, Permissible Limit
				GW 1	GW 2	GW 3	GW 4	GW 5		
1	pH value	--	APHA 4500 H+ B	7.07	6.47	6.99	6.85	6.38	6.5-8.5	No relaxation
2	Temperature	°C	APHA 2550 B	26.6	26.6	26.6	26.7	26.7		
3	Conductivity	µs/cm	APHA 2510 B	4780	288	390	908	514		
4	Total Dissolved solid	mg/l	APHA 2540 C	3142	238	266	604	308	500	2000
6	Alkalinity	mg/l	IS 3025 (P-23)	528	42	100	126	100	200	600
7	Hardness	mg/l	IS 3025 (21)	1430	88	136	332	120	200	600
8	DO	mg/l	IS 3025 (38)	1.2	1.6	0.8	1.2	0.6		
9	COD	mg/l	IS 3025 (58)	134.4	3.4	20.2	43.7	20.2		
10	Calcium	mg/l	IS 3025 (P-40)	144	26.4	31.2	85.6	29.6	75	200
11	Magnesium	mg/l	APHA 3500 Mg B	26	5.3	14.1	28.7	4.6	30	100
12	Chloride	mg/l	IS 3025 (P-32)	1046	15.7	72.4	110.6	64.6	250	1000
13	Sulphate	mg/l	IS 3025 (P-24)	55.5	52.5	7.8	8.6	40.5	200	400
14	Nitrate	mg/l	APHA 4500 NO3-B	4.6	18.1	6.5	2.9	17.9	45	No relaxation
15	Fluoride	mg/l	APHA 4500 F (C)	0.7	0.04	0.6	0.08	0.00	1	1.5

[8] February 2017

Sl.	Parameters	Unit	Method	Monitoring Location					IS: 10500,	IS: 10500,
17	Copper[9]	mg/l	APHA 3111 B	ND	ND	ND	ND	ND	0.05	1.5
18	Iron	mg/l	APHA 3111 B	0.88	0.17	0.00	0.67	0.21	0.3	No relaxation
19	Manganese	mg/l	APHA 3111 B	ND	ND	ND	ND	ND	0.1	0.3
20	Phenols	mg/l	IS 3025 (P-43)	ND	ND	ND	ND	ND	0.001	0.002
21	Mercury	mg/l	APHA 3114 B	ND	ND	ND	ND	ND	0.001	No relaxation
22	Cadmium	mg/l	APHA 3111 B	ND	ND	ND	ND	ND	0.003	No relaxation
23	Selenium	mg/l	APHA 3111 B	ND	ND	ND	ND	ND	0.01	No relaxation
24	Arsenic	mg/l	APHA 3112 B	ND	ND	ND	ND	ND	0.01	0.05
25	Lead	mg/l	APHA 3111 B	ND	ND	ND	ND	ND	0.01	No relaxation
26	Zinc	mg/l	APHA 3111 B	0.31	0.56	0.18	0.71	0.43	5	15
27	Total coliform	Cfu/100ml	APHA 9221 B	23	< 1.8	< 1.8	< 1.8	< 1.8	Shall not be detectable in any 100 ml sample	

[9] Detection Limits- Cu- 0.1 mg/l, Mn- 0.1 mg/l, Phenolic compound-0.001 mg/l, Mercury-0.002 mg/l, Cd-0.01 mg/l,As-0.003 mg/l, Pb-0.01 mg/l

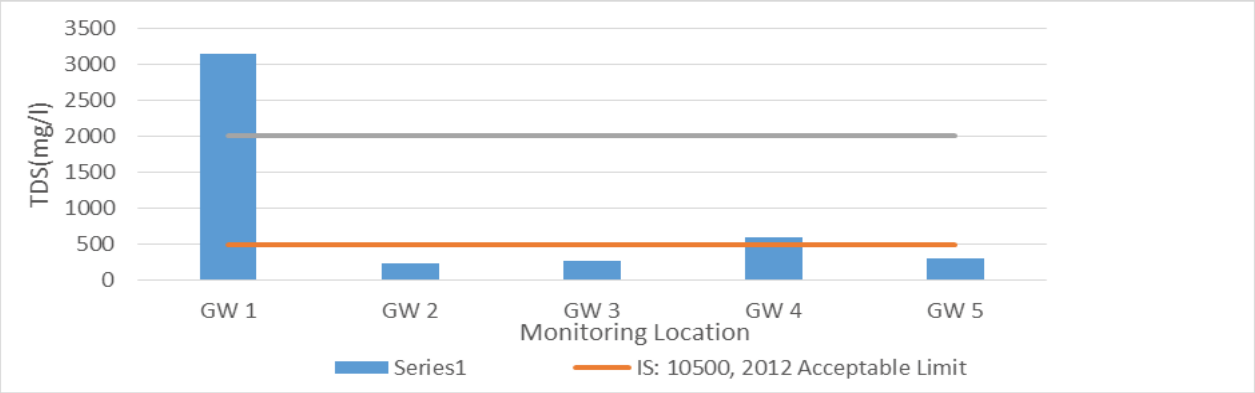
5.6.1 Groundwater Quality

The pH for all the groundwater samples was found within the drinking water limits (6.5 to 8.5) as promulgated by Bureau of Indian Standards (IS: 10500) as observed from

Table 34.

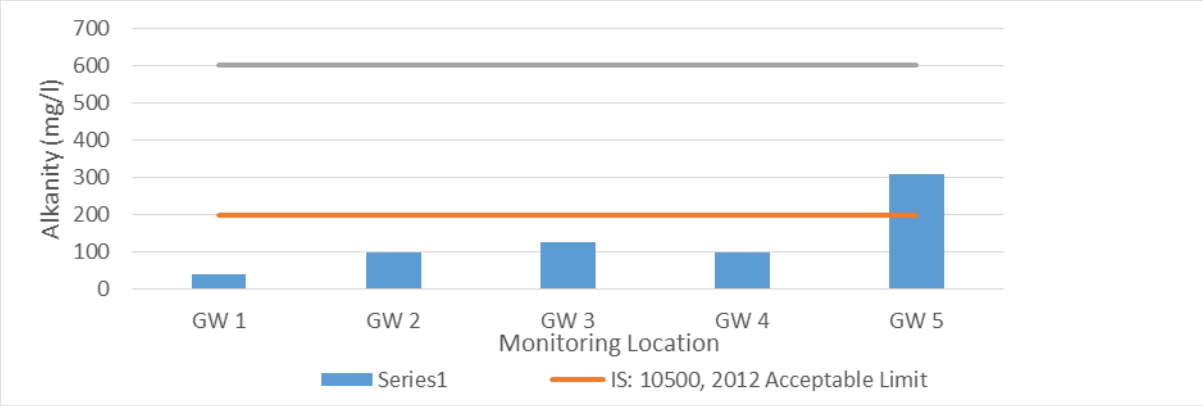
101. Total Dissolve Solid (TDS) was normal at all the sampling locations except GW-1. This may be because of longer contact time with the underlying rocks and sediments. The TDS observed at different sampling locations have been presented in **Figure 17.**

Figure 17: TDS of sampling locations



102. Total Alkalinity ranged between 34 mg/l (DW-1) to 126 mg/l (at GW-4). Total alkalinity at GW-1 was observed to be above the acceptable limit, but, it was within the permissible limit at GW-1 (528 mg/l).

Figure 18: Alkanity of sampling locations



103. Total hardness at GW-1 was observed to be above the permissible limit which may be attributed to presence of calcium and magnesium, but were observed to be within acceptable limit at all other monitoring locations.

104. Iron has been observed to be more in GW-1 & GW-5 than the permissible limit.

5.6.2 Surface water Quality

105. Parameters for analysis of surface water quality was selected based on the utility of the particular source of water as per MoEFCC guidelines. The quality of surface water was compared with IS: 10500-2012 for drinking purposes and also against water quality criteria as per CPCB guidelines for aquatic resources (Table 35). The surface water quality analysis of the samples in the study area is given below Table 36.

Table 35: Primary Water Quality Criteria for Designated-Best-Use-Classes

Designated-Best-Use	Class	Criteria
Drinking Water Source without conventional treatment, but after disinfection.	A	▶ Total Coliforms Organism MPN/100ml shall be 50 or less. ▶ pH between 6.5 and 8.5 ▶ Dissolved Oxygen 6mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 2mg/l or less.
Outdoor bathing (Organized)	B	▶ Total Coliforms Organism MPN/100ml shall be 500 or less. ▶ pH between 6.5 and 8.5 ▶ Dissolved Oxygen 5mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 3mg/l or less.
Drinking water source after conventional treatment and disinfection	C	▶ Total Coliforms Organism MPN/100ml shall be 5000 or less. ▶ pH between 6 to 9 ▶ Dissolved Oxygen 4mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 3mg/l or less.
Propagation of Wild life and Fisheries	D	▶ pH between 6.5 to 8.5 ▶ Dissolved Oxygen 4mg/l or more ▶ Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	▶ pH between 6.0 to 8.5 ▶ Electrical Conductivity at 25oC micro mhos/cm Max.2250. ▶ Sodium absorption Ratio Max. 26 ▶ Boron Max. 2mg/l
	Below-E	▶ Not Meeting A, B, C, D & E Criteria

Source: Central Pollution Control Board

Table 36: Surface Water Quality Monitoring Results[10]

Sl. No.	Parameters	Unit	Method	Monitoring Location			IS: 10500, 2012 Acceptable Limit	IS: 10500, 2012, Permissible Limit
				SW 1 (Near barrage upstream)	SW 2 (Near intake well)	SW 3 (WTP raw water)		
1	pH value	-	APHA 4500 H+ B	7.92	8.2	8.15	6.5-8.5	No relaxation
2	Temperature	°C	APHA 2550 B	26.6	26.6	26.6		
3	Conductivity	µs/cm	APHA 2510 B	106	106	112		
4	Total Suspended solid	mg/l	IS 3025 (P-17)	46	44	30	500	2000
5	Alkalinity	mg/l	IS 3025 (P-23)	50	50	50	200	600
6	Hardness	mg/l	IS 3025 (21)	32	32	34	200	600
7	DO	mg/l	IS 3025 (38)	9.2	10.4	10.4		
8	BOD	mg/l	IS 3025 (44)	0.28	6.7	6.7		
9	COD	mg/l	IS 3025 (58)	3.4	74.0	73.9		
10	Nitrate	mg/l	APHA 4500 NO^3-B	1.2	1.3	1.3	45	No relaxation
12	Chloride	mg/l	IS 3025 (P-32)	4.9	5.8	5.9	250	1000
13	Sulphate	mg/l	IS 3025 (P-24)	6.0	4.9	5.6	200	400

[10] February 2017

Sl.	Parameters	Unit	Method	Monitoring Location			IS: 10500,	IS: 10500,
16	Calcium	mg/l	IS 3025 (P-40)	10.4	10.4	10.4	75	200
17	Magnesium	mg/l	APHA 3500 Mg B	1.5	1.8	2.0	30	100
20	Phenolic compound	mg/l	IS 3025 (P-43)	ND11	ND	ND	0.01	0.02
22	Lead	mg/l	APHA 3111 B	ND	ND	ND	0.01	No relaxation
23	Boron	mg/l	APHA 3111 B	ND	ND	ND	0.5	1.0
24	Arsenic	mg/l	APHA 3112 B	ND	ND	ND	0.01	0.05
25	Mercury	mg/l	APHA 3114 B	ND	ND	ND	0.001	No relaxation
26	Cadmium	mg/l	APHA 3111 B	ND	ND	ND	0.003	No relaxation
29	Copper	mg/l	APHA 3111 B	ND	ND	ND	0.05	1.5
30	Zinc	mg/l	APHA 3111 B	0.28	0.41	0.67	5	15
31	Iron	mg/l	APHA 3111 B	0.6	0.42	0.85	0.3	No relaxation
32	Total coliform	MPN100ml	APHA 9221 B	2	> 1600	220	Shall not be detectable in any 100 ml sample	

[11] *Detection Limits- Cu- 0.1 mg/l, Mn- 0.1 mg/l, Phenolic compound-0.001 mg/l, Mercury-0.002 mg/l, Cd-0.01 mg/l,As-0.003 mg/l, Pb-0.01 mg/l*

106. pH for all the surface water samples was found within the drinking water limits (6.5 to 8.5) as promulgated by Bureau of Indian Standards (IS: 10500) as observed from **Table 36.**

107. BOD was observed to be less than 0.2 in SW-1 & SW-2. Faecal coliform and total coliform was present in all the water samples indicating the risk of other more harmful pathogens and the presence of human or animal faecal contamination in the surface water, so adequate disinfection has been proposed in the current project in WTP.

5.7 Ecology Baseline

5.7.1 Forest

108. The existing 300 mm pipeline (233 m) is passing through Birhu forest. Birhu forest is a protected medium dense forest of approximately 9.6 Ha under Khunti division and is predominantly covered by *Shorea Robusta (*Sal) trees. Around 235 sq. m of area of Birhu forest is required for upgrading the existing pipeline. Sal tree has been planted by the forest department in this land and communities dwelling nearby to the forest collect fuel wood (dry leaves and bushes) from the forest. During the application filed for NOC, the divisional forest officer mentioned that no major or endangered species were found in this forest area. The proposed alignment will not involve felling of any trees.

5.7.2 Terrestrial Ecology

109. In KNP are, the vegetation contains herb, shrub, tree, climber and grass. The dominant category is trees which covers 59 species. *Butea monosperma,* is the most dominant species in KNP, followed by *Ziziphus mauritiana* (Ber). Major fauna reported in KNP area are *Macaca mulatta* (monkeys), *Presbytia entellus* (grey langur), *Pteropus ginganteus* (Indian flying fox) and *Vulpesbengalensis* (fox). As per forest department, no endangered species have been reported in KNP.

5.7.3 Aquatic Ecology Baseline

110. The aquatic ecology in Tajna River near intake wells mainly comprises of Diatoms, followed by Chlorophyceae and blue- greens. Desmids and Dinophyceae. Zooplankton present is represented by 12 genera of rotifers, 6 of protozoa, 5 cladocerans and 2 of copepods. Major fish species reported in the river are Rohu, Catla, Mirka, etc.

6 SOCIAL PROFILE

111. This section outlines the social profile of the project impact area in terms of demography, livelihood, health and infrastructure.

6.1 Project Impact Area

112. The entire Project Impact Area (PIA) is within the KNP area. The Khunti Nagar Panchayat (KNP) is divided into 16 wards with the total of 7,245 houses. KNP is responsible for establishment and operation and maintenance of all basic amenities like water supply, sanitation, sewerage, and solid waste disposal. Khunti Nagar Panchayat is also responsible for holding public meeting, function, fairs, public awareness programs and implementation of all government schemes.

113. The socio-economic profile of PIA (Project Impact Area) is based on data from the secondary documents such as Census 2011, ULB records, and other pulished report and studies with an objective to understand the socio-economic background of the project area.

114. In addition, a census survey was carried out during the above mentioned period with an objective of gathering first-hand information on the following:

- Household characteristics, including social, economic and demographic profile
- Identification of non-titleholders
- Categorization and measurements of potential loss
- Inventory of affected assets
- Physical measurements of the affected assets/structures
- Assessment of potential economic impact, including temporary loss.

115. The census survey covered 100% structures affected within the proposed Right of Way (ROW) as per the Corridor of Impact (CoI) of the DPR and drawings provided.

6.2 Socio Economic Profile

116. Khunti is a class III town and district headquarters of Khunti District, located at the central part of Jharkhand. Part of the South Chotanapur Commissionary, Khunti district was established on 12th September 2007, with 6 Blocks, and is 45 Km south of the state capital, Ranchi. The district is historically known as the center of activity of the Birsa movement. The town is spread over an area of 25.0 sq. km with total population of 36,390 as per Census of India 2011. National Highway 23 and SH 3 is major road crossing the town connecting link to other urban areas. Khunti is agriculture and forest product based town.

Population

117. As per the data available from Census 2011, total population of the town is 36,390 in the year 2011 with average household size of five persons. The population of Khunti town is unevenly distributed 16 wards. Ward number 12 Hutubdug located in the east central part of

the town has lowest population share in the town with 3.4% of population; whereas ward number 5 Khunti, located in west central side of the town has maximum population in the town i.e. 9.2 % of total.

Table 37: Population, Area and Population Density of Khunti Town

Year	Area in sq. km	Population	Density –persons per sq. km
1971		11,743	455
1981		18,787	728
1991		24,183	937
2001	25.8	29,282	113
2011	25.8	36,390	1410

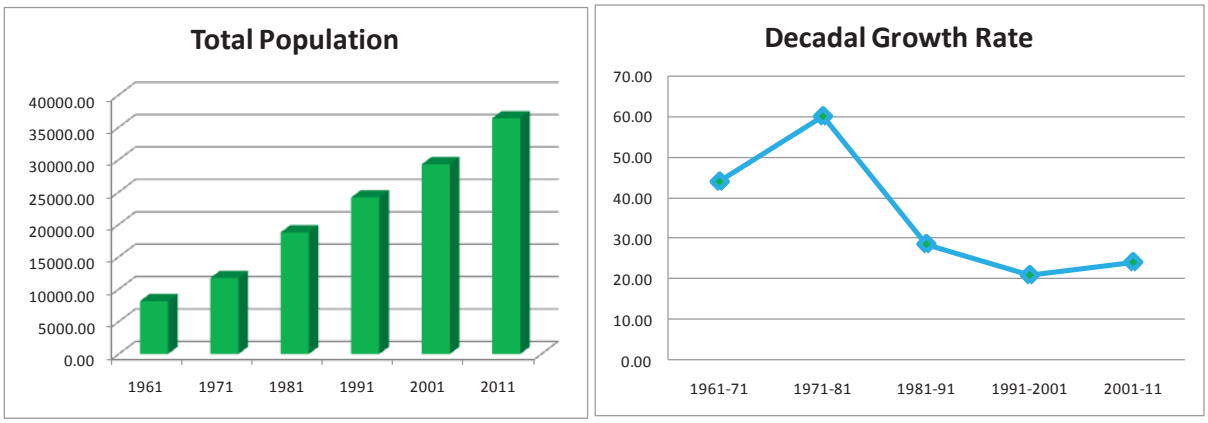
Source: Census of India 2011, KNP,

118. The total population of Khunti District is 5.3 Lakk as per Census 2011, whereas, the population of the Khunti Nagar Parishad is 36,390. Whereas, Khunti Nagar Parishad has total administration over 7,245 houses to which it supplies basic amenities like water and sewerage.

Population Growth Rate

119. The average population growth rate of the Khunti Nagar Parishad has been 24.27% as per Census 2011.

Figure 19: Population Growth Rate



Schedule Caste and Schedule Tribe Population

120. The Khunti Nagar Parishad has a sizable Scheduled caste and tribal population. As per Census 2011, Schedule Caste (SC) constitutes 4% while Schedule Tribe (ST) is 5% of total population in KNP. 29% of the total population falls under Minorities.

Sex Ratio

121. In Khunti Nagar Parishad, sex ratio is of 960 against state average of 948 (i.e. 49% of females against the 51% of males to the total population). Moreover, Child Sex Ratio in Khunti Nagar Parishad is around 924 compared to Jharkhand state average of 948. Population of Children with age of 0-6 is 4,763 which is 13% of total population of Khunti (Nagar Parishad).

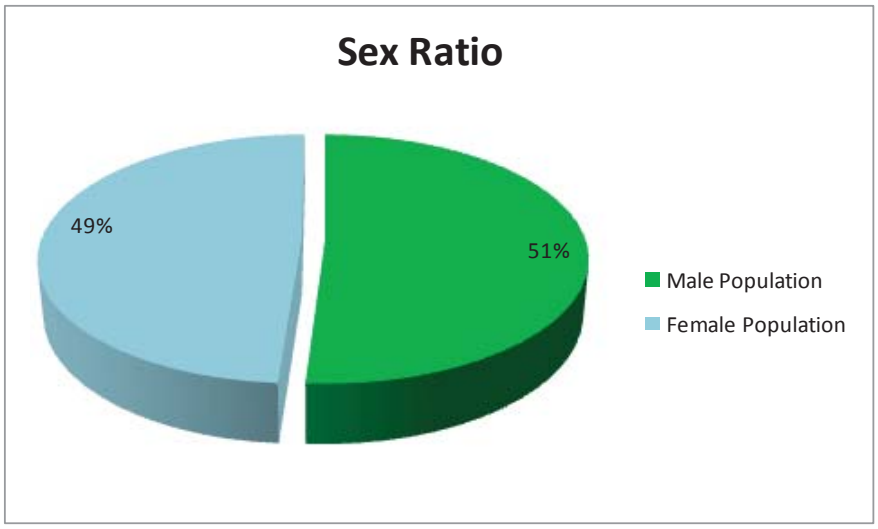
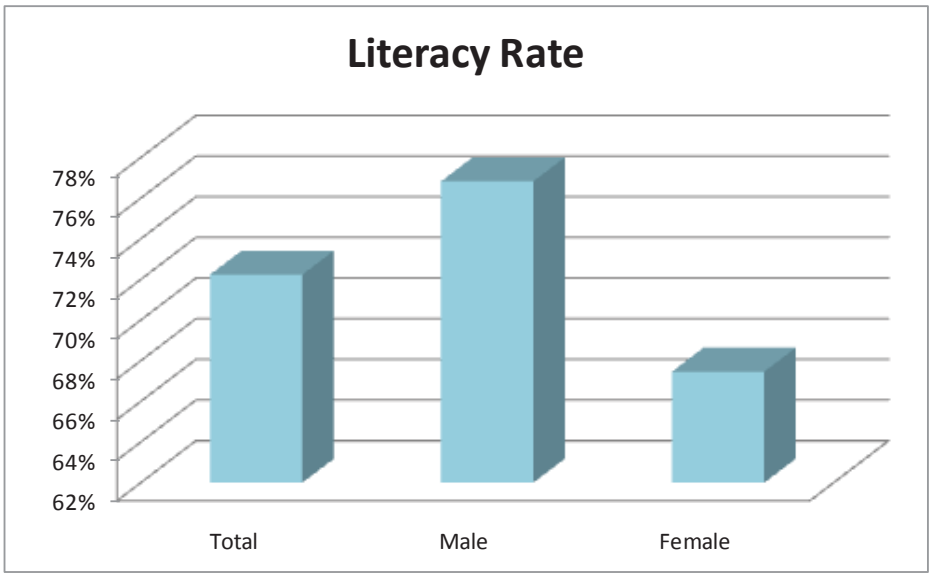


Figure 20: Gender Ratio

Literacy Rate

122. Literacy rate of Khunti city was observed around 72% as per Census 2011 indicating an overall increase as compared to 2001. Of the total literate population, about 54% comprised male population while the rest 46% comprised female population as per Census 2011. The literacy rate in female population is 67% much lower than the literacy rates in males which is 77%.

Figure 21: Literacy Rate in Khunti Nagar Panchayat



Workforce Participate Rate

As per Census 2011, the total worker population was around 30% while the rest 70% comprised non worker population.

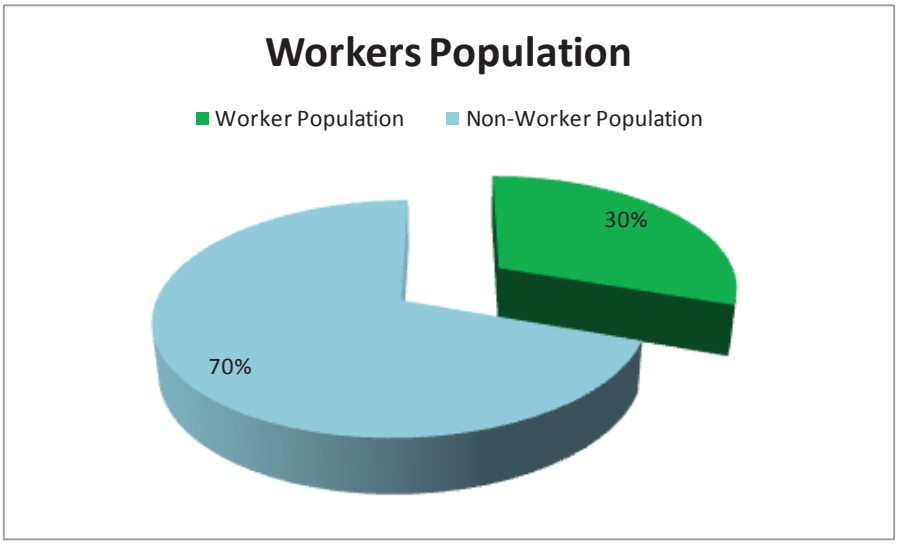


Figure 22: Workforce Participation in Khunti Nagar Parishad

123. In 2011, out of the total population, about 11,052 persons were engaged in work or business activity. Of this 8,243 were males while 2,809 were females. In census survey, worker is defined as person who does business, job, service, and cultivator and labor activity. Of total 11,052 working population, 79% were engaged in Main Work while 21% of total workers were engaged in Marginal Work in 2011.

Occupation Structure

124. In Khunti Nagar Parishad, majority (79%) of the total workers were involved in other activites, which involve government servants, municipal employees, teachers, factory workers, plantation workers, those engaged in trade, commerce, business, transport banking, mining, construction, political or social work, priests, entertainment artists, etc. Though in case of Khunti town, in this category the other workers are involved in the processing of primary activities only. The second highest is household industry workers which is 17%.

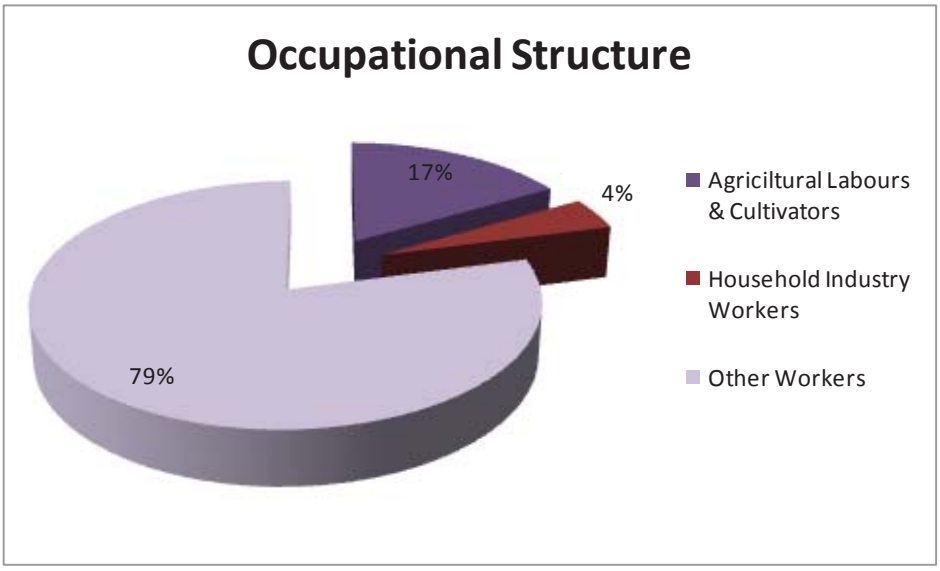


Figure 23: Occupation Distribution of Total Workers in Khunti NP, Census 2011

Economic Profile of the Study Area

125. Khunti is famous as the lac producer of the Jharkhand region. A large share of India's total lac is produced in this place. Lac is a natural polymer (resin) that is produced by a tiny insect called Kerria lacca (Kerr). This insect is specially grown on the shoots of several species of trees such as palas, kusum and ber. This agricultural profession of lac cultivation is a secondary source of income for many tribal in the Khunti region. And it is with the Government assistance and many other voluntary and NGO's that this cultivation has taken a new form and a new lease of life.

Agriculture

126. The main crop grown in the district are paddy, maize black gram and Mustard. The district has also been identified as Agri-export Zone by Government of India, keeping in view the production of large quantities of green vegetables in the district. The climate of the district remains cool throughout the year with an average rainfall of 1050 mm to 1500 mm which is conducive for production of vegetables. However, there is urgent need for increasing the irrigation coverage in the district so that mono cropping at present may be transformed to multi cropping system in future. Peas, cauliflower, brinjal, tomato and french

beans are supplied to other towns in Jharkhand and neighbouring States of Orissa, Chattisgarh and West Bengal.

Basic infrastructure service

127. As per Census, 2011, there are 2 government allopathic hospitals run in the area with a strength of 30 beds and has very basic amenities and people are usually referred to nearby cities like Ranchi or Patna for better care. Other than that, there are 7 dispensaries, 1 T.B. Hospital and 1 Alternative hospital medicine centers in the town.

128. Although several public and private health facilities are available in the state, overall infrastructure for dispensing health related services require improvements. The incidence of malaria, typhoid and gastroenteritis disorders are common in the area.

Education Facilities

129. There are 12 primary schools, 10 middle schools, 6 secondary schools, 6 senior secondary schools and 1 Arts, Science and Commerce College in Khunti Nagar Parishad (Source: census of India, 2011).

Sanitation and Civic amenities

130. Throughout the PIA sanitation facility is poor to say the least. People however, have made own arrangement of individual toilet which is not hygienic. People of the clusters defecate in the open. In urban/ semi urban centres sanitation system is old and many households still use kuchcha or unsanitary latrines.

Water Supply

131. Tube wells are the main source of drinking water in Khunti. The piped water supply system of Khunti is facing several problems at present. A low level of service in terms of low per capita water supply rate, short hours of supply, insufficient terminal pressure in the outlying areas, and non-uniform spatial supply rate are few examples of these problems. Most of the colonies do not receive municipal piped water supply.

132. Distribution network do not cover the entire town. Thus about 85 % area is not covered under the existing scheme. Ground water is the only alternative left. The quality of this water is also a cause of concern. Thus, quantity as well as quality of drinking water is the major issue obstructing the development and growth of the town. To supply adequate and safe drinking water, the proposed project is essential.

6.3 Town Management

133. Khunti town administration is structurally divided into two wings i.e. elective wing headed by chairperson and administrative wing headed by executive officer. In addition to

nagar panchayat there are other parastatal bodies (e.g. Ward Office) working for sanitation related aspects.

134. The elective body is headed by Chairperson supported by vice-chairperson and 16 councilors, one for each of the16 wards. Chairperson and vise-chairperson in KNP are selected by councilors. The tenure of the elected body of KNP is for five years.. The elective body is responsible for making policy decisions at town level for implementation of various town / citizen services including sanitation, and oversees the implementation process for successful execution of such schemes. As per Jharkhand Municipal Act, 2011, the Standing Committee shall consist of the Chairperson; the Vice- Chairperson, and three elected councilors to be elected by the Council.

135. Khunti Nagar Panchayat19 (KNP)'s administrative body was constituted in the year 2008. It consists of 20 nos. of ward having total area of 25.8 Sq. Km. KNP is responsible to provide basic infrastructure including roads, drainage and sewerage, water supply, street lighting and services covering education, housing, poverty alleviation, slum improvement, urban forestry, environmental protection and conservation, primary health etc. KNP is headed by one executive officer and is responsible for operational planning and management of nagar panchayat. Other officials in the KNP such as municipal engineer, health officer, accounts officer etc. directly report to executive officer.

7 PUBLIC CONSULTATIONS AND DISCLOSURE

7.1 Identification of Stakeholders and Methods for Consultation

136. Consultation during project preparation as an integral part of the environment and social assessment process not only minimizes the risks but involves the public as stakeholders in project preparation process, promotes public understanding of the project leads to timely completion of the project. The ESMP prepared also incorporates the views of the project beneficiaries and Project Affected Persons (PAPs) in the design of the mitigation measures and a management plan.

137. The specific aims of the consultation process are to:

- Provide clear and accurate information about the project to the beneficiary community;
- Obtain the main concerns and perceptions of the public and their representatives regarding the project
- Obtain opinions and suggestions directly from the impacted communities on their preferred mitigation measures; and
- Identify local leaders with whom further dialogue can be continued in subsequent stages of the project.
- Improve project design and, thereby, minimize conflicts and delays in implementation
- Increase long term project sustainability and ownership

138. The primary stakeholders that were identified for the Khunti water supply project are the Khunti nagar Panchayat officials, representative of forest, water resource department and other relevant departments, PAPs and the direct beneficiaries. The secondary stakeholders include other individuals and groups, *viz.*, the ULBs, other Governmental/Quasi-governmental departments, *etc.* The stakeholders identified, the social survey methods followed for collecting primary data and disclosure of the project are presented in the table below.[12]

[12] Given the socio-economic background of PAPs, most of them are engaged in their livelihood activities during the day. Therefore, despite repeated efforts to involve them in consultation process, only few attended.

Table 38 Stakeholders identified and methods used

Category of stakeholder	Type of Stakeholder	Method of consultation
Primary		
Citizens	Citizens' consultation in each Ward	Focus Group Discussion (FGDs) - gender disaggregated as far as possible
Government and other stakeholders	▶ Jharkhand Urban Infrastructure Development Company Ltd (JUIDCO) ▶ Principal Secretary, Urban Development & Housing Department, Government of Jharkhand ▶ Director, State Urban Development Agency (SUDA) ▶ Ministry of Railways ▶ The World Bank ▶ Khunti Nagar Panchayat ▶ Land Revenue Department ▶ State Electricity Department, Khunti ▶ Health Department. (District Hospital, Khunti) ▶ Public Health Engineering Department (PHED), Khunti ▶ Public Works Department (PWD) ▶ Jharkhand State Pollution Control Board ▶ Water supply, Khunti Nagar Panchayat ▶ Drinking water and sanitation department, Khunti Nagar Panchayat ▶ Sewerage Department, Khunti Nagar Panchayat ▶ Forest Department, Khunti ▶ Police Department, Khunti ▶ Irrigation Department, Khunti	Meetings / FGDs/ Interviews
Private and community stakeholders	▶ Members of Vendor Committee Khunti ▶ Educational Institutions of Khunti	Meetings / FGDs/ Depth Interviews

Category of stakeholder	Type of Stakeholder	Method of consultation
	► Local clubs, Other offices ► Eateries and small artisans ► Social Organization	
Potential project affected persons	100% of households which are likely to be directly affected physically and/or economically due to construction works under the project	Census data

Process of Consultation

139. Consultation during the E&S Assessments: As a part of environmental and social impact assessment, public/stakeholder consultations were organized in Khunti. Furthermore, information pertaining to the sub-project including work schedule, procedures involved, finalization of project components with identification of impacts, entitled persons, mitigation measures and grievance redressal mechanisms was disseminated. Other stakeholders such as Forest, Water resource Department, PHED, the Land Revenue Department, National Highway Authority of India (NHAI) etc. were also contacted for face to face discussions (Refer Table no. 43). The outcomes of the initial consultations held during the month of January & February were incorporated, as appropriate, in the designs and mitigation plans.

140. Consultation on the draft ESIA, ESMP, STPP and ARAP: **The** draft ESIA was presented and explained to local community, stake holders, PAP and ULB members on 9th October 2017.The impacts arising due to the project, the mitigation measures and ESMP was discussed in detail.

7.2 Findings of Public Consultation (Phase 1)

Table 39: Findings of Community Consultation

Date / Place / No. of Participants	Summary of Discussion	Consensus	Mitigation Measures - Input to technical design
Place: Khunti Nagar panchayat **24.02.2017** **11.30 am**	A detailed public consultation was organized with the potential PAPs, people's representatives, shopkeepers, businessmen, and others regarding the benefits versus costs. While the benefits of the proposed sub-project were acknowledged, the community members stressed that the Executing Agency needs to declare the possible price of the water point connection and the subsidy/benefits available to the poor. A focus group discussion with all women participants was undertaken in the same area. The women were apprehensive about the quality of the water supplied and the maintenance of the pipelines. They also pointed out that it was dangerous to have the water pipelines just above sewage drains.	The local community members are of the view of the proposed water supply sub-project was desirable. However, they are apprehensive about the price of metered water and the billing system. People were appraised about the payments which will have to be made for water connections in the discussion held on 30/05/2017. MoM of the consulations can be seen in Annexure III "Minutes of the Consultation held on 30th of May 2017 with Self Help Group of the Khunti Nagar Panchayat to discuss the Water Supply Scheme proposed for World Bank funding"	The DPR Consultant was advised to incorporate the Corridor of Impact (COI) line in the design drawings. Initiation on behalf of the Vendor Committee for identifying the temporarily affected PAPs.
Place: Ward No.4 Khunti **Date: 15.02.2017** **11.30 pm**	Most of the people impacted temporarily are vendors. As per Mr Sanjoy Singh, Ward Parshad and other PAPs water supply is available but the quality	The water supply project is well within the available Right of Way (RoW) and there will be no land acquisition. The squatters mainly vendors and other commercial	The DPR Consultant was asked to include COI and property line in the design drawings to understand and undertake the

	of water is very poor. Also, the supply timings need to be improved. A focus group discussion with all women participants was undertaken in the same area. The women were apprehensive about the quality and quantity of water. All participants were concerned about the billing system. They suggested that there should be a concession on billing of water for poor families.	entities would be provided compensation for temporary impacts. The billing system should be disclosed to all PAPs.	Census Survey. Provisions for skill development for PAF are being considered. EMP would be a part of the bid document.
Place: Ward No. 3 Khunti Date: 15.02.2017 2.30 pm	The community members are of the opinion that with improved water supply facilities, there would be enhancement in the quality of life. The decision on the billing system should be taken considering all financial categories of people. The community members stressed that the period of construction needs to be reduced to avoid nuisance due to prolonged construction period.	The community members stressed that proper mitigation measures should be identified and implemented to reduce environmental impacts during the construction phase.	The water supply is expected to commence within two years. The EMP has been designed to mitigate environmental impacts from the construction activity. The EMP will be incorporated into the bid document for implementation by the contractor.
Place: Ward No. 7 Khunti Date: 16.02.2017 12.30 pm	There was apprehension that there could be less number of household connections due to inadequate quality and quantity of water. The women community members shared details on the difficulty they experience in fetching water in summer. They felt that properly	The community members stressed that proper mitigation measures should be identified and implemented to reduce environmental impacts during the construction phase.	The water supply is expected to commence within two years. The EMP has been designed to mitigate environmental impacts due to the construction activity and will be incorporated in the bid document for implementation by the contractor.

	implemented water supply connections will be very helpful to women.		
In addition to the above specific public consultations and FGDs, the stakeholders were also consulted during SES and Census Survey.			

Table 40: Findings of consultation with elected representatives

Date / Place / No. of Participants	Summary of Discussion	Consensus	Mitigation Measures - Input to technical design
Ward Councillors and various departments of Khunti Nagar Panchayat, Khunti	The metered water supply system was accepted. The people are apprehensive that the price would be prohibitive. Provisions of water supply in community toilets/urinals should be kept. Stress on proper identification and compensation for the PAPs. Since all households will be connected, the temporary impacts of construction will be felt all over Khunti. The vendors will be affected during the period of laying of the main pipe from the source to the Water Treatment Plant (WTP). Further, it was also suggested that the construction work should be done in night, if possible to avoid problems to road users.	The price of each water point is yet to be decided. As per provision of ESMP trees should be planted. No scope of Land Acquisition and the construction will be within the available RoW. Safety measures would be a part of EMP and Bid Document Temporary impacts will be a part of ARAP which would be disclosed on websites and other media.	Vendor Committee would help in temporary impacts on potential PAPs. The DPR Consultants were asked to include COI in their drawings. The EMP needs to be reviewed to accommodate all aspects of Environment and Safety.
Ward Councillors and various departments of Khunti Nagar Panchayat, Khunti	Key activities and methodologies that will be carried out while conducting the ESIA studies. Relevance of soil, water and air testing for the water supply	It was revealed that the pricing of water was not finalized but it would be around Rs.120 for 150 Litres per Capita per Day (LPCD) All the statutory testing is part of	There would be a census survey to identify the project affected. The ESMP is to be reviewed to accommodate all aspects of environment and safety. The

	project. Discussion on the project structures and which wards will be the beneficiaries. If new wards are developed, whether they will be included as beneficiaries or not.	the ESIA preparation. All the ward members will act as facilitators to complete the ESIA activities.	ESMP would be a part of the bid document.

Table 41: Findings of Consultation with Government Officials

Date / Place / No. of Participants	Summary of Discussion	Consensus	Mitigation Measures - Input to technical design
State Level			
Mr. Ajay Rastogi, Special Secretary, Department of Environment and Forests 18.01.2017	▶ Discussions were held on the Jharkhand Municipal Development Project (JMDP) and proposed sub-project in water supply and suggestions were sought on environmental and social issues to be addressed in Environmental and Social Management Plan. ▶ For the water supply project, the Special Secretary suggested alignment of projects so as to minimize tree cutting. ▶ The team was informed about Order No: 3503/2014 passed by Jharkhand High Court that contains guidelines on tree cutting. He informed that an application needs to be submitted to High Power Committee headed by the Chief Conservator of Forests, Ranchi. ▶ He told that environmental parameters monitored in municipal areas can be collected from JSPCB. ▶ He also stressed on the necessary mitigation measures that need to be adopted to minimize air emissions from construction sites and transportation of construction material.	▶ ESIA would be shared with the Department of Environment and Forests. ▶ All statutory guidelines and orders to be followed. ▶ Environmental parameters in municipal areas can be collected where required. ▶ Environment Management Plan (EMP) would be shared with the Department Environment and Forests.	▶ Minimizing Environmental Impacts in consultation with the Detailed Project Report (DPR) Consultant. ▶ EMP would be a part of the bid documents.
Sanjay Kumar (IFS), Member Secretary, Jharkhand State Pollution Control Board 18.01.2017	Team apprised the Member Secretary of JMDP and the proposed sub-projects in water supply sector, and. sought suggestions on environmental and social issues to be addressed in the Impact Assessments.	Consent to Establish (CTE) and Consent to Operate (CTO) is not required for water supply projects, but is required for batching plant, hot mix plant and DG set.	EMP to be added in the Bid Documents.

Date / Place / No. of Participants	Summary of Discussion	Consensus	Mitigation Measures - Input to technical design
Smt. Himani Pandey (IAS), Secretary, Welfare Department 14.01.2017	Meeting team apprised the Secretary of JMDP and the proposed sub-project in water supply sector and sought her suggestions on the environmental and social issues to be addressed in Environmental and Social Management Plan. For the water supply project, she suggested validation of the Right of Way (ROW) and stressed that vendor compensation should be carried out as per national /state laws.	ESIA would be shared with the Department. The ARAP and ESMP would be displayed in the Welfare Office Notice Board. The Grievance and Redressal Committee (GRC) committee contact details would be displayed.	DPR Consultant was asked to review the RoW details. Initiation for formation of GRC.
Praveen Kumar Toppo (IAS), Labor Commissioner and Prabhat Kumar, Joint Labor Commissioner(JAS) 23.01.2017	The meeting team apprised Labour Commissioner and Joint Labour Commissioner of JMDP and the proposed sub-project in water supply. The team sought suggestions on environmental and social issues. The team was informed about the licenses required and the facilities to be provided to the workers.	ESIA would be shared with the Department. The ESMP would be available in public domain.	ESMP to be added in the Bid Document. All the labor rules would also be part of the Bid Document. Labour management Plan are to be incorporated in the ESMP and the contractor has to provide facilities in accordance with the specifications.

Date / Place / No. of Participants	Summary of Discussion	Consensus	Mitigation Measures - Input to technical design
Amarinder Pratap Singh(IAS), Principal Secretary, Department of Drinking Water and Sanitation 23.01.2017	The meeting team apprised Principal Secretary of JMDP and the proposed sub-project in water supply and sought suggestions on environmental and social issues to be addressed in Environmental and Social Management Plan. He recommended that adequate water and sanitation facilities be provided to the labourers in labour camps. He also stressed that proper mitigation measures should be incorporated to avoid water pollution during the construction phase.	ESIA would be shared with the Department. The ESMP would be available in public domain.	Necessary permits for water withdrawal to be obtained for construction purpose.
Ashok Kumar (Chief Engineer) Yogender Sharma, Member, Monitoring Cell - Water Resources Department 25.01.2017	The meeting team apprised the Chief Engineer and his team on JMDP and the proposed sub-projects in water supply, storm water drainage and water supply sectors and sought their suggestions on the environmental and social issues to be addressed under the project. Regarding the water supply project, the Chief Engineer stressed that as Khunti is a water stressed location, proper measures should be implemented to mitigate any severe impacts on water availability due to the project.	ESIA would be shared with the Department. The ESMP would be available in public domain.	A detailed water balance exercise was consucted by the DPR consultant and WRD to ensure that their was dedicated water storage to meet the demand so that there is no additional pressure of water withdrwal from river Tajna.

To know the concerns and to take the consent from the actual beneficiaries/forest rights holders along the Raw water main alignment, an **AAM SABHA** was organized under chairmanship of vice chairman Nagar Panchayat on **03.06.2017 and 13.06.2017**.

Aam Sabha Proceedings and NoC from forest Department is annexed.

All the actual beneficiaries were contacted and called for the AAM Sabha meeting, their views were taken and all the beneficiaries have given their consent for laying the pipeline. Even though the alotted land parcels are not being currently utilised, they had only one concern that pipe should be laid underground so that in future, they could do the farming.

Keeping this in mind, decision has been taken that the entire Raw water main pipeline will be laid underground and the designs have been modified accordingly. Implementation stage consultation will be conducted before the start of construction activities so that concerned people are informed about the start and completion date of the project, benefits and grievance system of the project.

Consultation meetings should also be organised by PIU social expert at regular intervals during construction phase to acquaint the concerned Birhu Villagers of the following:

a) Timeline and progress of the project

b) Information on benefits / adverse impacts; compensation and entitlements

c) Construction Schedule

7.3 Summary of Public Consultation (Phase II)

Observations

141. JUIDCo undertook a second phase of public consultation based on the advanced draft of the ESIA to seek inputs and acceptance of the proposed measures. The consultation was conducted at the District Collector Office, Khunti, the District Commissioner, ULB members, WRD , PAPs , Women Self Help Group were present. The summary of public consultation undertaken as part of ESIA is detailed below:

- One private land parcel wiil be acquired for the khunti water supply project.
- Impacts are limited to non-title holders. The structure of only 2 non-title holders will be affected due to the project. There will be temporary loss of livelihood of 35 PAPs for approximate 20 days during the actual construction process. There is only one Schedule Tribe household to be affected.
- Assistance will be provided for the temporary impacts. The relevant provisions of the Entitlement Matrix (shown in section 12. 5 “Entitlement Matrix”) were made known to the public and a Hindi version of the same would be distributed before mobilization of the contractor. Locals were also informed of skill development training.
- Khunti Nagar Panchayat is in the process of developing a plan to relocate the vendors during construction.
- People have raised the issue of noise and air pollution that would be generated during the construction phase and have requested for implementation of suitable mitigation measures.
- The participants stressed that majority of the labours to be employed during the construction and operation phase should be locals
- The participants suggested that the approved ESIA should be provided at ULB level.
- Water pipelines should be separated from the drainage lines to avoid any possible contamination.
- Free water points need to be considered.
- As informed by people, the contractor should keep a provision for employment of local persons (mainly women), in the project.

Table 42: Key issues raised during consultation and response provided

S.No	Key Concerns	Response provided
Environmental		
1	Community insisted on sharing the possible price of the water point connection and the subsidy/benefits	Community was informed by the PMU that the water tariff is still under consideration and ULBs will decide on water charges.

	available to the poor.	
2	People have raised the issue of noise and air pollution that would be generated during the construction phase	Adequate safe measures to mitigate environmental impact have been assessed and made part of ESMP. ESMP will be made part of bid documents, so that the contractor is aware beforehand the mitigation measures to be implemented at site .Additional regular monitoring will be undertaken to oversee that all mitigation measures are properly implemented by contractor. Grievance cell will be created at ULB level as well as JUIDCO level, so that public can raise issues on any environmental concern that may arise due to construction activity.
3	People were concern regarding water quality during operation phase.	All the present stakeholders were informed that water quality will be maintained as per the Indian standard. Monthly water quality test will be conducted to maintain the quality of water.
Social		
3	The community members stressed on proper identification and compensation for the PAPs.	Survey has been conducted to identify the PAPs. Further, the ARAP implementation NGOs will conduct detailed verification of PAPs at implementation stage. The compensation will be provided as per the Entitlement Matrix and the community has been informed about the compensation.
4	The women were apprehensive about the quality of the water supplied and the maintenance of the pipelines. They suggested that the water pipelines should be separated from the drainage lines to avoid any possible contamination.	It was explained to the community members that the daily water quality testing will be done to ensure compliance to IS: 10500:2012 at the WTP through a fully functional govt. approved laboratory.
5	Communities raised concern on increase in traffic problems that may occur during the construction phase	Traffic management plan will be made in consultation with local authority and will be implemented by contractor to reduce the traffic impacts and local inconvenience
6	The participants stressed that majority of the labours to be employed during the construction and operation phase should be locals approved ESIA should be	Necessary directives will be given to Contractor for hiring the local work force. However, in case of unavailability of required labor force and associated goods and services locally for the construction of civil works, because of a number of reasons such as worker unavailability and lack of technical skills and

	provided at ULB level	capacity, the labour force (total or partial) may be brought in from outside the project area from nearby municipal towns and villages and sometimes from outside the state

Disclosure of Project Information

142. The impacts of the project were disclosed to the local people who will be affected. Both positive and negative impacts of the project were disclosed. During public consultation sessions, the local people accepted that they were aware of the project as it was disclosed from time to time through local newspaper.

143. It was made known to the people that a resettlement information leaflet containing information on compensation, entitlement and resettlement management adopted for the project will be made available in the local language (Hindi) before mobilization of the contractor. The detailed information would also be available on the website of JUIDCO and the World Bank after approval of the World Bank.

Grievance Redressal Mechanism

144. The Grievance Redressal Committee (GRC) at the state level has already been constituted. Consultation for the formation of GRC for this project at district/city level is being undertaken. Before the start of the process of civil contractor appointment, the GRC at project level will be formed in consultation with the PAPs and beneficiaries so that the grievances are resolved at the project site itself.

Provision of further Consultations at Implementation Stage

145. The effectiveness of the implementation of an Environmental and Social Management Plan (ESMP) is directly related to the degree of continuing involvement of the people affected by the sub-project. Several additional rounds of consultation with the PAPs and local community will be undertaken during the sub-project implementation. A NGO responsible for ARAP implementation is entrusted with the task of conducting these consultations during implementation phase. This could involve agreements on assistance options, entitlement package and income restoration measures, accessibility and padestraian movement for the sub-project and inconvenience to the local community with respect to dust, noise safety, labour etc.. The consultation will continue throughout the sub-

project implementation stage. The following set of activities will be undertaken for effective implementation of the plan:

- In case of any change in engineering alignment planning, the PAPs and other stakeholders will be consulted in selection of alternative alignment for minimization of resettlement impacts, development of mitigation measures, *etc.*
- During Implmentation an active feedback loop for citizen complaints on air, noise, dust pollution, and safety issues will be maintained and adequately addressed by the contractor and PIU.
- INcase of any changes to implmentation/ work schedules, closure of roads, interruption in utilities, the PIU and ULB will inform the affected people prior.
- Together with the NGO, the Project Implementation Unit (PIU) will conduct information dissemination sessions in the project area and will invite feedback from the PAPs in order to strengthen the Environmental and Social Management Plan implementation.
- During the implementation of ARAP, the NGO will organize public meetings and will inform the communities about the progress of the implementation of sub-project works, including awareness regarding health and sanitation issues related to water supply.
- Consultation and focus group discussions will be conducted with vulnerable groups like women, SCs, STs, and people living below poverty line to understand their specific needs that should be incorporated in ESMP/RAP/STPP.
- Women will be specially consulted during implementation stage.

8 ENVIRONMENTAL IMPACT ASSESSMENT

146. This chapter assesses key potential environmental impacts that are expected to occur during the project duration. The significance of the impacts has been assessed based on the methodology defined in Annexure XIII. The expected impacts have been categorized into the following two phases:

- **Construction phase**
- **Operation phase**

8.1 Project Area of Influence

147. In the proposed sub-project, direct and/or indirect impacts are generated which are rather short-term. It is expected that most of the impacts are temporary in nature and will cease once the construction is completed. *Table* 43 shows the influence area of the proposed sub-project components.

Table 43: Details of influence area of the proposed sub-project components

S. No.	Components	Sub-components	Description of construction activity	Description of operation & maintenance activity	Influence Area	List of sensitive receptors identified within influence area
1	Intake well (existing)	Repairs to existing intake well	Dismantling old plaster Plastering and painting	Annual Maintenance of Plaster and Paint on the wall of well	10 m upstream and 10 m downstream of the intake well	Aquatic life
		Repair and reinstallation of inlet pipe at existing intake well	Non-corrosive painting for the inlet pipes	Non-corrosive painting for the inlet pipes	15 m upstream and 15 m downstream of 25 m of pipeline to be laid in the river bed;	Aquatic Life
		Installation of new pumps	Replacement of old pumps and installation of new pumps along with non-corrosive painting	Oiling & Greasing, Non-corrosive painting	River bed	Aquatic life
2	Raw water rising main (replacement)	Construction of Coffer Dam and replacement of rising main	Dewatering, construction of coffer dam and demolition of coffer dam, replacement of existing 300 m pipeline with 500 mm pipeline	No operation and Maintenance required	15 m upstream and 15 m downstream of 25 m of pipeline to be laid in the river bed 50 m on either side of 1392 m of pipeline to be laid in non-forest land 1m along the pipeline of the 233 m of pipeline to be replaced in forest	River Bed, Forest area. There is no fishing or any water related activity in this area.

S. No.	Components	Sub-components	Description of construction activity	Description of operation & maintenance activity	Influence Area	List of sensitive receptors identified within influence area
					area;	
3	WTP	Decommissioning of existing WTP, and Construction of new WTP	Excavation, foundation, civil, structural, mechanical, electrical and pavement work Construction of boundary wall of 824.90 meters	Operating Pumps, electric panels, disinfection dosing Maintaining Valves, Screens, Pumps, Chambers, Filters, Aeration Pipe pores, Dosing	10 m periphery of the WTP site	Labours / workmen
4	Clear water rising main (replacement)	replacement of Pipeline	Excavation of foundation and Laying of 8.72 km of pipeline	Intermediate Connections pipelines	2 m along the pipe line laying	Workmen
5	ESRs	Dismantling of old existing ESR in zone III	Demolition of existing ESR	NA	20 m periphery of the ESR in Zone III	ESR Workmen
		Use of existing ESR-I 450 KL	None	Tank Cleaning, maintenance of EST Walls, Ladder including painting	30 m x 30 m around the ESR site	ESR Workmen
		New ESR-II 1380 KL	Construction of ESR & boundary wall of 115.90 meters	Tank Cleaning, maintenance of EST Walls, Ladder including painting	30 m x 30 m around the ESR site	ESR Workmen

S. No.	Components	Sub-components	Description of construction activity	Description of operation & maintenance activity	Influence Area	List of sensitive receptors identified within influence area
		New ESR-III of 1050 kl	Construction of ESR & boundary wall of 115.90 meters	Tank Cleaning, maintenance of EST Walls, Ladder including painting	30 m x 30 m around the ESR site	ESR Workmen
		New ESR-IV of 780 kl	Construction of ESR & boundary wall of 115.90 meters, excavation ,	Tank Cleaning, maintenance of EST Walls, Ladder including painting	30 m x 30 m around the ESR site	ESR Workmen
6	Distribution system	Laying of pipeline of 122.038 km.	Linear excavation for laying pipes along the roads, placing pipes in the trench and refilling with the excavated soil. The trenches will be of maximum 1 m wide and 1.5 m depth. Restoration	Monitoring for Unaccounted Water Loss by leakage/ seepage/ pipe breaks	2 m along the pipe line	Land and habitation
7	Labour camp		Construction of Labour Camp within WTP Area, Labour huts, Drinking water & sanitation facility to labours, crèche, first aid medical room , dismantling of labour camp	None	WTP Site area (1 acre land)	Labour and contractors staff.

8.2 Impacts due to project activity

8.2.1 Positive Impacts

Construction Phase

148. The positive impacts of the project during construction phase are:

- ***Employment opportunities:*** With the construction of the proposed Project, there will be employment opportunities for both skilled and unskilled workers from Khunti. This will be beneficial both from the economic and social point of view. Economically, it means abundant unskilled labour will be used in production. Several workers including casual labourers, plumbers and engineers are expected to work on the site for a period of time. Semi-skilled, unskilled and formal employees are expected to obtain gainful employment during the period of construction. With labour intensive construction technologies, the project will provide employment for youths and provide support to the GoJ initiatives on creation of jobs.

- ***Creation of a market for construction***: The Project will require materials, some of which will be sourced locally and some internationally. These include plant (pump sets, switch gear, instrumentation) pipes, valves, cement, sand and chemicals. This will provide a ready market for suppliers in and outside the project area

Operation Phase

- **Improved water quality** will in turn reduce exposure to water borne diseases to the consumers.

- General hygiene in the served area could improve through use of acceptable water quality and enhanced availability (from 65 lpcd to 155 lpcd).

- Savings in time and effort: Piped water availability through household connections will save time and effort spent earlier in fetching water, especially for women.

- Household water connections and metering will help to reduce water wastage – currently estimated at 20 percent.

- Use of SCADA will reduce water wastage due to overflows at the ESRs, enhance equity and timeliness in water supply.

- Availability of potable drinking water will contribute to improved living standards within the sub-project area.

- Discontinuation of groundwater use and creating a new water supply system based on nearest surface water sources

- Recovering backwash water from treatment process

- Improve water use efficiency and reduce water wastage at household level by recording and monitoring the water usage, and charging the consumers as per usage. Minimize unaccounted for water (UFW) losses using leak detection, and identifying unauthorized connections
- Using low-noise and energy efficient pumping systems

8.2.2 Negative Impacts

149. The precise environmental impacts and risks, and required mitigation measures under OP/BP 4.01; and OP 4.36 are described in the following sections of this ESIA. In particular, the Environmental and Social Management Plan (ESMP) will detail mitigation measure and also provides the institutional arrangement for their implementation including monitoring arrangements.

150. The impacts and subsequent mitigations presented here draw on a detailed field study carried out in Khunti. Information has been collected on a wide variety of variables required to anticipate and manage project impacts, including sensitive environmental receptors in the impacted area, expected effects of air and noise, impact of construction (e.g. on traffic and public safety). During operation of water supply system, the overall impact is expected to be positive, however to safeguard public health, it is imperative that regular monitoring of raw and treated water at the treatment plants, and in the distribution network be implemented to ensure that drinking water limits are not exceeded. The main impacts have been presented in Table 44.

Table 44: Environmental Impact due to construction and operation phase

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
Pre- Construction Phase			
Impact on utilities, traffic movement	Minor	▸ The proposed interventions will necessitate road cuttings, excavations of trenches, and in some cases the relocation of existing public utilities resulting in the interruption of the services for a period of time. ▸ The construction activities may necessitate partial traffic interruption, and temporary road cuts and vehicle and pedestrian traffic deviations. These could result in traffic congestion and increase risk of accidents. ▸ Also, the materials supply and disposal will generate circulation of trucks increasing the traffic load on the various roads/ National highway. ▸ Accidental damages to existing services (cables) might occur during excavation.	▸ Consult with the utility departments to demarcate the locations and alignments of electrical cables, water mains and communication cables. ▸ Prepare a detailed planning and construction phasing schedule, and coordinate service interruption with public utilities and public administrations. (Works phasing shall be established in a way to reduce the disruption time). ▸ Advise citizens in advance concerning programmed interruptions in water, and other services.
Loss of Vegetation	Negligible	▸ Land clearance for laying pipeline in forest land will not lead to felling of trees. Around 233 m length of the current alignment (300mm) passes through forest land (Birhu Forest).and will be re-laid by 500 mm pipeline which will be submerged. For relaying pipeline in forest area, there will be no felling of trees and as per condition of NOC received from the Divisional Forest Officer, no tree felling will be permitted. (Annex XIV and XV) ▸ Within the urban area, construction activities may involve clearing of shrubs, grasses and other vegetation during excavation activities. ▸ Cutting of trees is unlikely, and will be avoided but cannot be ruled out especially at the WTP	▸ Non-mechanical construction to be undertaken in the forest area. Heavy construction equipment will be completely avoided in forest area as per the conditions of the Forest NOC, to prevent any damage to existing trees, and ground vegetation. ▸ No trees will be cut or damaged within the forest area as per the conditions of the NOC. ▸ Any maintainence on the 233m pipeline (underground) in the forest area will be carried out in coorindation with the forest department, such that all equipment, and methodlogy of repair/maintainence is compliant with the Divisional Forest Officer. ▸ In order to avoid loss of ground vegetation urban area close supervision of earthworks will be

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
		site for clearance.	observed in order to confine land clearance within the RoW of the pipeline ▸ Removal of vegetation (bushes) will be limited to the extent possible within the urban area ▸ The contractor will stockpile topsoil for reinstating flora along the road or in the areas which have been cleared vegetation. The contractor will not fell/cut trees without a written consent from the competent authority and permission obtained from the respective officer for cutting of trees, along with a justification on the need for tree cutting.
Construction Phase			
Traffic interruption and vehicle, pedestrian traffic deviations		▸ Traffic congestion and temporary road closures (for sections where pipeline is crossing key arterial roads) ▸ Increased movement of trucks for materials supply and disposal will generate traffic congestion and risk of accidents. ▸ Traffic flow may also be impacted by temporary road cuts.	▸ The contractor will prepare and implement Traffic Management Plan and traffic arrangements in consultations with the ULB, PIU staff and the traffic police. ▸ Trucks carrying materials should be restricted to hours for delivery of material and pick up of waste material. (delivery hours must be set a part of planning) ▸ Provide citizens advanced warning about partial/temporary road closures and rerouting of vehicle and pedestrian traffic, especially where schools/ colleges concerned. ▸ Phasing of open work fronts should be scheduled so that multiple sites are not affected at the same time ▸ At night time, all barriers and signs will remain at sites, with lighting and / or fluorescent signs placed as required to warn both vehicular and pedestrian traffic, especially where trenches are left open. ▸ The Contractor shall restore the project sites to the

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
			state to which it was or better, prior to construction.
Impact on accessibility to buildings (houses, businesses and schools)		► Excavations to replace old pipelines and place transmission lines may create temporary difficulties of access to the adjacent buildings and some disturbance of the neighbouring residents and users. ► Minor, temporary disruptions mostly related to temporary disruption of entrances.	► Prior Information and consultation with hospitals, schools, institutions and local authorities wherever any sensitive receptor is concerned, such that access should not be disturbed or affected. ► Where areas are excavated, temporary fencing, bridges, and access routes should be provided ► Signage should clearly mark the dedicated pedestrian route, to facilitate access and avoid accidental falls into these areas
Land Contamination	Minor	► There is a risk of water and soil contamination in case of spills or leaks of oil, grease and hazardous substances ► Cross-contamination of previously non-contaminated soils from any pollutants/grease or sediments from contaminated soils ► Increased fire risk and the resulting mobilization of hazardous smoke or air borne materials ► Poor or improper management of the stored materials and wastes can result in dispersion of materials in the nearby canals, streets and adjacent properties. ► The estimated amount of waste is as follows: i. Construction waste:3-5 tons per day ii. Domestic waste (labour camp):75 kg per day iii. Hazardous waste:2-3 tons per annum iv. Other wastes:20 tons per annum (packaging waste) v. Concrete waste – 126.945 cu m vi. Waste oil and oil contaminated rags-0.5-1 tons per annum	► All wastes/debris will be disposed as per the construction debris and waste management plan in Annex VIII ► All storage containers containing fuel, oil, lubricant should be adequately sealed and labelled. ► The contractor will utilize KNP official landfill at belahatti for waste generated on the construction site which has been approved by the ULB. ► All waste and wastewater generated from the labour camp will be managed as per the specifications in VII such that there is no significant impact on camp residents, the biophysical environment or surrounding communities. ► The contractor shall maintain Maintain the MSDS Sheets incase of any hazardous materials on site. ► Adopt the provisions in the Emergency Response Plan in case of any leakage or hazardous material spill. ► Construction contractor will ensure daily collection, a designated storage area, segregation and periodic (monthly) disposal of construction waste generated as per the ULB and JSPCB regulations. ► Littering and burning of waste at the labour camp

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
		vii. Bituminous Waste-190.4175 cu m Domestic waste generated from labour camp can cause contamination of land. ► A small proportion of waste generated will include used oil, hydraulic fluids, waste fuel, and grease and waste oil soaked rags.	will be strictly prohibited. ► Segregated Domestic waste generated at the labour camp will be stored onsite and handed over to ULB for proper disposal by contractor ► Construction contractor will ensure that there is no unauthorized dumping of used oil and other hazardous wastes. Such wastes will be stored safely onsite and disposed periodically through JSPCB/CPCB approved recyclers and records of the same will be maintained. ► Transport vehicles and equipment will undergo regular maintenance to avoid any oil leakages. ► Unloading and loading protocols will be prepared for diesel, oil and used oil respectively and workers will be trained to prevent/contain spills and leaks.
Soil Erosion	Minor	► Excavation and allied construction activities will make the top soil susceptible to erosion.	► Top soil will be managed as per the guidelines in Annex VI ► Construction activities (especially excavation work) will be undertaken in the dry season. ► The contractor shall contain excavated materials in the vicinity of the worksite to prevent dispersion and sedimentation of drains, creeks, streets and adjacent properties ► Stripping of topsoil shall not be conducted earlier than required to prevent the erosion (wind and water) of soil. Excess topsoil will be used for landscaping purposes. ► The disturbed areas and soil stock piles will be kept moist to avoid wind erosion of soil. ► Topography will be restored and re-vegetated for slope stabilization immediately after the completion of construction at each location. ► In case of areas in the proximity of water bodies,

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
			small bunds will be created and silt traps will be provided to prevent washing of the soil into these water bodies. ► JUIDCo will ensure a 'Muck Disposal Management Plan' will be prepared in consultation with the Forest Department and will include measures for soil erosion control in the forest area.
Impact on Water Availability	Moderate	► Around 5000 kl of water will be required for civil works during the construction process, sprinkling for dust supression and for consumption and use by workers. ► The duration of the impact is assessed to be short-term, *i.e.* during construction and will be fluctuating with peak and low phases. ► Extraction of water from nearby surface water sourced, will lead to local shortage of water that may cause hardship to nearby communities. ► Replacement of the rising main will involve construction of cofferdam near the intake using temporary barriers. Water will be pumped out to make the area dry for construction. During the replacement of rising main pipeline, there will be no supply of water, which will create temporary disruption/shortage.	► The contractor will ensure sourcing of water through tanks will be done after proper verification of the source of water ► Construction labour will be sensitized about water conservation. ► Optimum use of water will be done during sprinkling on roads for dust settlement, washing of vehicles, etc. ► Wastewater generated from the washing/cleaning area in camp site, after passing through oil & grease trap and curing area can be re-used for water sprinkling and wheel washing. ► Total 2-3 days will be required for replacing the rising main line. Adequate communication regarding this will be made to local communities through print media and notices minimum 7 days prior to construction activity. The existing ESR will be filled up before the replacement of pipeline , to minimize water scarcity and in addition ,alternate supply of water through tankers will be undertaken during this period.
Impact on Water Quality	Moderate	► Pumping and discharging of storm water off-site from the excavated trenches ► Chances of contamination of surface and groundwater resources may occur due to improper management of wastewater	► Wastewater from construction site should not be allowed to accumulate at site as standing water may lead to breeding of mosquitoes. Septic tanks/soak pits should be provided for its disposal (as per specifications given in IS 2470 1995 Part I and Part

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
		(sewage, grey water) at project labour camp or other accidental spills/leaks at the storage areas. ► Surface runoff carrying the excavated loose top soil will lead to increased sedimentation in the receiving water bodies. ► Replacement of the rising main/pumps would lead to an impaxct water quality due to increase in turbidity and chemical contamination from paints in the construction work. Increase in silt content and water turbidity. ► The Contractor may need to extract storm waters from the trenches and other construction works to ensure effective working conditions; the discharge of the pumped water can impact surface waters and drainage systems and cause erosion. Replacement of the rising main will involve construction of cofferdam at the selected site using temporary barriers. Water would be pumped out to make the area dry for construction. Removal of temporary barriers once the work is over, may damage the foundation soils adjacent to the structure and may have temporary impacts.	II) onsite and at labour camp. ► Proper cover and stacking of loose construction material and excavated loose soil will be ensured to prevent surface runoff and contamination of receiving water bodies. ► Dumping of debris in or nearby water bodies will be strictly avoided. All the waste generated (construction waste, labour camp waste) will be collected, segregated, stored and disposed in an environmentally suitable manner. ► Silt curtain will be deployed to completely enclose the cofferdam installation and removal works. ► Sheet piling will be cut off at elevations approved in advance by JUIDCO –Engineer in order to minimize damage to foundation soils adjacent to the structures , and the cut off portions will be removed from the site
Impact on Air Quality	Moderate	► Air quality in and around the project site would be impacted to some extent due to construction and construction related activities. The main impacts will be from site levelling, earthworks, excavation, construction material handling, dismantling of existing structures, wind-generated dust from exposed	► The batching plant will conform to CPCB general emission and noise standards for noise. The contractor will obtain a consent from Pollutin control board before the plant is operational. ► The emissions from diesel generators (meant for emergency power requirement) will be controlled to minimise impacts of air emissions by optimised

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
		areas of soil and mounds of stored soil and use of DG sets, etc. ▸ A batching plant would be set up at WTP site would have air quality impacs ▸ Dust generated from vehicle movements emissions from construction traffic and onsite machinery ▸ Dust and air pollutants emitted could affect the community residing in the nearby areas[13] depending upon prevailing wind directions and speed, causing minor respiratory impacts on site workers, nearby residents and pedestrians.	operations, orientation at the site and providing stack height as per stack height criteria of Central Pollution Control Board) from ground level for wider dispersion of gaseous emissions. Proper maintenance of engines and use of vehicles with 'Pollution under Control Certificate' will be ensured. ▸ Fugitive dust emissions will be suppressed by spraying water and wetting of the stockpiles. ▸ Proper location of material stockpiles will be ensured (especially sand and soil). All such loose material will be provided with temporary bunds and screens to prevent erosion and generation of fugitive dust. When not in use, all stockpiles of the loose construction material will be covered with tarpaulin sheets. ▸ Trucks transporting soil and material will be covered with tarpaulin sheets. ▸ Dust masks and eye protection against dust, splinters, debris etc. should be provided to construction workers where required. (according to OHS management in Annex IX.
Noise Environment	Moderate	▸ The major sources of noise will be use of heavy machinery, vehicles, and operation of DG sets, batching plant, and demolition of existing structures such as the existing WTP and ESR ▸ Construction activities will increase noise levels and impact nearby communities, especially the sensitive receptors (hospitals, schools, etc.).	▸ All vehicles and machinery will conform to Central Motor and Vehicle Act 1988, EP Act 1986 Noise Rules 2002 ▸ Hammering and vibration compaction will be minimised when in close proximity to structures, buildings or property boundary where applicable, residential class mufflers and engine shrouds (acoustic lining) will be used on all equipment. ▸ Normal working hours of the contractor will be between 06:00 and 18:00 hours. Contractor should

[13] nearest resident located approximately 30m from proposed site

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
			ensure that the ambient noise level near the project site is within the day time noise standard (refer Annexure V for applicable standards). ► Only well-maintained equipment will be operated on-site, and, regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components will be conducted. ► Machinery and equipment that may be in intermittent use will be shut down or throttled down during non-work periods. ► Low noise equipment will be used as far as practicable, and the number of equipment operating simultaneously will be reduced as far as practicable. ► Equipment known to emit noise strongly in one direction will be oriented so that the noise is directed away from nearby sensitive receptors as far as practicable. ► Earplugs should be provided to workers involved in unloading operations ► Timely maintenance and servicing of transportation vehicles and the machinery/pumps to be used during construction phase to reduce the noise generation due to friction and abrasion ► In cases where contractor will perform night time work, prior notice and consent will be taken from nearby residents. ► DG sets shall be provided with acoustic enclosure and comply with CPCB norms ► Monitoring of Noise levels shall be carried out on monthly basis to check the level of pollutants and effectiveness of the proposed ESMP ► Minimal use of vehicle horns in the project area will

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
			be encouraged. ► Equipment noise will be 85 dB(A) at 1 m from the source in line with WB EHS guidelines
Increased generation of waste from Construction materials		► The construction activities will necessitate temporary on-site storage of construction materials and excavated materials; poor management of the stored materials and wastes can result in dispersion of materials in the nearby drainage systems, streets and adjacent properties. Appropriate disposal of construction wastes could minimize similar issues at the final disposal site ► Wastes would be generated from discarded construction materials, cement bags, wood, steel, oils, fuels and other similar items. ► Domestic solid wastes may also be generated from the workers' camp. Improper waste management could cause odour and rodent problem.	► The contractor shall handle construction materials and waste in accordance with approved procedures in Annex VIII and Annex VII. ► Sites for temporary piles should be agreed with PIU and local authorities. ► The community should be made aware of constraints imposed on the contractor for waste collection, storage and disposal ► In case of accidental waste dispersion, CSQC/PIU shall be informed and restoration measures shall be applied. ► Waste materials are to be disposed at Belahatti landfill as per the consent given by the ULB provided in Annex III. ► Waste concrete will be reused and recycled to the extent possible to help in pollution prevention and conservation of natural resources.
Occupational Health & Safety Risk	Moderate	► Construction site personnel (including workers) will be exposed to risk of accidents from handling of heavy equipment, working at heights in ESRs, working in excavated pits, electrical work, etc. ► Increased air pollution and noise levels will directly impact construction workers and site personnel. ► The excavation trenches for placement of pipelines and foundations (WTP) are potential risks to vehicles and workers; long pipe alignments can create health and safety risks for both workers and pedestrians.	► The contractor will follow the provisions for OHS management plan in Annex VIII. In addition, all Workers will be trained on Environment Health and Safety with an aim of improving awareness.this cludes use of PPE, HIV prevention, maintainence of campsite hygiene. ► Provision of all workers with requisite personal protective equipment. ► Provision of onsite drinking water and sanitation facilities. ► Provision of signage's at all construction sites, enforcing/ reminding use of PPE and safety practices.

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
		▸	▸ Safety conditions in the trenches during construction phase shall be ensured using appropriate shoring systems and dewatering mechanisms. ▸ ▸ Safe access and thoroughfare must be provided on construction site always. Dangerous areas shall be clearly identified with appropriate signs, lights and flagmen. ▸ Excavated areas shall be clearly marked to avoid accidental falls into these areas, and clearly lit at night. ▸ Regular monitoring by supervising engineers of contractors' compliance with safety procedures. ▸ Use of de-watering, side-walls support, and slope ▸ gradient adjustments that eliminate or minimize the risk of collapse, entrapment, or drowning in excavated areas ▸ Providing safe means of access and egress from ▸ excavations, such as graded slopes, graded access route, or stairs and ladders ▸ Job rotations should be practised for people, working in high noise level areas ▸ Risk of free fall of materials should be minimized by installing telescoping arm loaders and conveyors ▸ Firefighting facility should be provided at the camp site and trained personnel should be available at site who can operate the fire extinguishers and other fire-fighting equipment.
Community	Major	▸ During peak time of construction,	▸ Contractor to hire workers through recruitment

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
Health & Safety Risk		approximately 350 labours would be required, of which 55 would be migrant labour (skilled and unskilled). Labour requirements will also be met from local populations, but approximately 15 % would need to be sourced from outside Khunti district to meet the requirement. ► Arriving migrant workers will require housing, food supply, merchandize, transport, health care, entertainment, social interaction, etc. ► If not managed appropriately this influx of workers (and followers) can lead to adverse social and environmental impacts on local communities. ► Laying of pipes may necessitate the re-routing of vehicular and pedestrian traffic and introduce traffic delays, thereby increasing travel time, cost, and risk of accidents to pedestrians, and young students, especially at areas which are excavated, and access to important buildings, campuses may be affected. ► Access to construction sites by unauthorized persons (including children) may cause accidents.	offices and avoid hiring “at the gate” to discourage spontaneous influx of job seekers. ► Vaccinating workers against common and locally prevalent diseases; and establishment of health centres at camp and construction site for routine health screening. ► Mandatory and regular training for workers on required code of conduct and and consequences for failure to comply with law ► Measures described earlier for controlling impact on air quality, noise levels and improper wastewater discharges will also help to mitigate the community impacts. ► A traffic management plan will be prepared by the contractor, approved by the ULB, and implemented throughout the construction period, to ensure smooth traffic flow and minimize disruption. ► Public information notices with work start and completion dates, contact details of ULB officials, traffic diversion details, etc., will be put up in local newspapers and distributed as pamphlets (including in the local language). ► The contractor will follow the specifications in the labour camp plan Annex VII ► JUIDCO will issue the directives to Contractor and Contractor will accordingly prepare code of conduct for all labour and staff. ► Necessary directives will be given to Contractor for hiring the local work force. ► Details of project will be displayed at prominent places such as ULB's office and Deputy Commissioner's office ► Responsibilities for managing these impacts will be

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
			reflected as a contractual obligation, with appropriate mechanisms for addressing non-compliance. ► Caution boards, barricades, etc., will be used to warn the public about unauthorized access and danger. Additional monitoring on these aspects will be undertaken at locations close to sensitive receptors such as schools and playgrounds. ► Deploy temporary security guards in critical areas such as labour camp, construction camp, to prevent unauthorized access. ► Install lighting devices and safety signal devices in the temporary access areas and construction sites. ► A transportation plan of materials will be prepared by the contractor, approved by the ULB, and implemented to avoid their delivery at peak traffic hours. ► Warning signs and other protective barriers shall be erected to prevent accidents to citizens due to open ditches, heavy machinery and construction vehicles etc.
Operation Phase			
Impacts on Air Quality	Minor	► Gaseous pollutants will be generated may be from accidental release of chlorine gas in WTP. ► Emissions from diesel fuel combustion in diesel generators[14] at WTP, and from operation of transportation vehicles. ►	► BIS guidelines for safety in chlorination plants (IS 10553 – Part 1) will be followed (see Annexure XII). ► Emergency scrubbing arrangement will be provided in the WTP to prevent accidental emission of chlorine gas. ► Diesel generators will be operated only for emergency power backup. The emission source of diesel generators will have adequate stack height

[14] The use of D.G. sets is anticipated only during power failure and use of transport vehicles (e.g., for conveyance of sludge to landfill site) will be limited.

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
			will conform to the set norms of CPCB. Also regular maintenance of diesel engines will be ensured. ► Only vehicles holding valid Pollution under Control Certificates will be used for transportation. ► There will be peripheral plantation of trees around the WTP to filter any dust emissions and reduce impacts n surrounding areas.
Impacts on Noise Environment	Moderate	► The major noise generating equipment during operational phase are the pump sets at the intake well, and, air blowers, ventilation fans, water pumps and DG Sets at the WTP. ► All these are expected to result in increase in existing noise levels at the intake well and WTP premises. ► Settlements presents within 100 m of the WTP, can be affected during the operation phase.	► The DG sets will have inbuilt acoustic enclosure, silencers, air release valve, essential hoods, etc., and will meet the CPCB noise standards of 75 dB (A) at 1 meter from the enclosure surface. The motors and pumps within enclosed chamber ► Ear plugs and ear muffs will be provided for the workers near noise generating sources at the intake and WTP. Thick canopied trees will be planted around the WTP site to attenuate noise, if any, arising from the WTP in line with the guidelines of CPCB for green belt development[15].
Waste Generation	Moderate	► The water treatment process will generate waste from rinsing and back washing of filter media containing debris, chemical precipitates, straining of organic debris and plankton. It is estimated that the backwash water will be about 5% of the WTP capacity. ► The water treatment process will generate sludge from sedimentation of particulate matter in raw water, flocculated and precipitated material resulting from chemical coagulation, residuals of excess chemical	► RCC sedimentation tanks will allow the flow of waste water to accumulate in the waste water tanks so as to allow sufficient time for the sludge to settle down Backwash water will be reused by directing it to the channel of raw water to flash mixer via a small pump ► Any excess waste water that needs to be disposed will be first tested for ensuring compliance with the CPCB's 'general standards for discharge of environmental pollutants' and disposed at a location authorized by JSPCB.

[15] http://cpcbenvis.nic.in/scanned%20reports/PROBES-75%20Guidelines%20For%20Developing%20Greenbelts.pdf

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
		dosage, plankton etc. It is estimated that 0.52 MLD of sludge will be generated. ► Improper disposal of sludge at any site may result in contamination of soil.	► Accumulated sludge from clari-flocculators, filter backwash, etc., will be channelled to the sludge drying beds for natural drying. The KNP has identified Belahatti as the landfill site for disposal of the sludge. A NOC has been obtained from KNP for disposal of sludge in the Belahatii land fill. ► Hazardous waste like spent oil from generators and used oils generated from maintenance activity will be sent to authorised vendor of JSPCB/CPCB.
Reduced Downstream Flows	Minor	► The downstream flow is likely to be affected in case of abstraction over the permissible withdrawal limit as prescribed by Water Resources Department The prescribed limits as per NOC received from WRD for water withdrawal are 7.88 MLD in 2018 , 10.35 MLD in 2035- & 14 MLD in 2048.	► The sub-project will adhere to the limits in the water use permit issued by the WRD; ► The Proponent shall monitor the hydrology to determine whether there is reduced downstream flow that may affect community residing downstream of the river
Increased Waste water in KNP area	Moderate	► As a result of the increase of water supply, it is expected that wastewater will increase proportionally with the implementation of the sub-project, the net wastewater generation is estimated to be 7.82 MLD[16] by 2033 and is expected to rise to 10.2 MLD by 2048.As 66% of KNP has no drainage system at present, and no sanitary sewerage network this additional generation of waste water (sullage) is likely to flow into open drains and natural drainage system.	The ULB and JUIDCO will develop and implement a long-term plan for sewerage management in KNP. The ULB, with the support of ongoing state and national programmes, will implement sewerage network and treatment infrastructure system in the next 3-5 years.
Occupational Health & Safety	Moderate	► The WTP plant operation requires use of various chemicals in different stages of the process. ► The following chemicals used during the	► Handrails and guards will be installed around tanks, trenches, pits, stairwells, and other accident-prone areas. ► Flooring at the plant will be of non-skid type.

[16] *Assuming 80 % of water generated will be released as waste water*

Impacts	Impact Significance	Explanation of impact	Mitigation Measures
		operation phase might be hazardous in case of improper storage or handling: Chlorine, and diesel.	▶ Storage and handling of chemicals will be as per the applicable code of safety (SDS –Safety Data Sheet) issued for the chemicals. ▶ Adherence to safety procedures for chlorination detailed in IS 10553 will be ensured through training for personnel and monitoring for compliance. ▶ A plan for emergency response to accidental releases will be prepared and implemented as required. ▶ Provision will be made for the necessary PPE and first-aid kit. ▶ Periodic training on EHS aspects will be provided to the personnel by the operator.
Public Health	Moderate	▶ Improper treatment, disinfection dosage and chlorination will result in public health impacts.	Daily water quality testing to ensure compliance to IS: 10500:2012 will be undertaken at the WTP through a fully functional govt. approved laboratory. ▶ Monthly water quality monitoring at end user points will be conducted to ensure that water being circulated through distribution lines is meeting the necessary standard.
		▶	

9 SOCIAL IMPACT ASSESSMENT (SIA)

9.1 SIA Methodology

151. The chapter deals with the approach and methodology adopted for collection of material and non-material socio-economic and cultural data and its analysis for understanding the various types of impact the project would bring about in the local social, cultural and economic fabric of the society. It also discusses the methods, tools and techniques used for screening and identifying the areas of concern for preparation of Resettlement Action Plan (RAP). With a view to comply with the applicable national and state laws, acts and guidelines and the World Bank OP 4.12, a conjunctive approach integrating the social, environmental and design aspects as well as intensive stakeholder consultations was adopted.

152. The project thus involves an integrated approach towards planning and design, incorporating close cooperation of the engineering, environment and social sector teams. The social assessment for impact analysis of the project was carried out through a series of complementary processes. Data for SIA was collected through various primary and secondary sources.

153. Primary data was collected through intensive survey to comprehend the broad baseline status and socio-economic profile of the local community and to establish the legal entitlement of the project affected families/people. Secondary data/information was collected from various agencies so as to ascertain/verify the ground realities and bring out the socio-economic characteristics, physical features and cultural set-up of the project area. Other secondary data was obtained from documents collected from JUIDCO, published articles and census publications.

9.2 Findings of Social Impact Assessment

9.2.1 Scope of Land Acquisition

154. According to JUIDCO raw water pipeline will cross from the government as well as one private land parcel so there will be land acquisition under the land acquisition act and for this process has already been initiated. AAM sabha has allready been conducted on 26th May 2018 by the district land acquisition department of the district and land owner has given their consent for the aquisition.

first notice under section-11 of the land acquisition act has issued 0n 10th of August 2018 by the district administration and process of the land acquisition will be completed before the award of the contract.

155. From the analysis of impacts, it is noted that only 2 private structures will be permanently affected due to the project work. In addition, there will be temporary impact on income for maximum 20 days of 35 vendors during the laying of Pipes.. The details of project impacts are discussed in the following section and the summary project impacts are presented in table below:

Table 45: Summary Project Impacts

Sl. No.	Impacts	Number
1	Total land acquisition requirements (in Ha)	0.031
2	Total private land acquisition requirements (in Ha)	0.031
3	Total Govt. land acquisition requirements (in Ha)	Nil
4	Total Number of land units/plots affected	01
5	Total Number of private land units/plots affected	01
6	Total Number of private Residential structures of TH	Nil
7	Total Number of private Commercial structures of TH	Nil
8	Total Number of private structures of NTH affected within the RoW	2
9	Total Number of Affected Families	2
10	Total Number of Vulnerable households affected	1
11	Total Number of Mobile vendors affected Temporarily	35
12	Total Number of CPRs affected (Community and Religious)	Nil

Source: Census Survey, March, 2017

156. Thus, the sub-project is categorized as Category S2.

9.2.2 Influence on Society

157. Upgrading the Water supply and other urban infrastructure of the ULBs will have immense positive impact on the life of the under privileged in the urban areas. The development of the same would increase the well-being of the people in PIA.

(a). Positive Impacts

158. The positive impacts on the population would be the followings:

- Improvement in overall water supply and sanitation services for Khunti Nagar Panchayat.
- Reduced incidence of water borne diseases and reduction in child mortality rate.
- Time savings for women.
- Surge in improved health, standard of living; personal hygiene.
- Improved services delivered by commercial establishments (restaurants), hospitals, businesses etc. due to availability of clean drinking water.

(b). Adverse Impact

159. The adverse impacts to the population would be the followings:

- The structure of only 2 non-title holder with 9 PAPs will be affected due to the project.
- There will be temporary loss of livelihood of 35 vendors for approximate 20 days during the actual construction process.
- There is only one Schedule Tribe household to be affected.

9.3 Social Impact Mitigation Measures

160. One private land parcel will be acquired for the proposed projec. Around 1650 m of pipeline will be upgraded and 130.758 km will be newly laid, The newly laid pipe will be within the RoW and there is no change in the character of land. The project involves loss of two structures of two non titleholders within the road Right of Way (RoW). Also at the time of laying of pipes is likely to cause loss of income for 35 street vendors temporarily. As per ESMF categorisation criteria Khunti Water Supply Project is categorised as S-2 and a separate Abbreviated Resettlement Action Plan (ARAP) is prepared.

161. One private land parcel will be acquired for the proposed project because the construction of the raw water main would involve working within the forest area in Birhu Thana village under Khunti Nagar Panchayat. In order to ensure that the forest rights holders support the project and and their interests are protected throughout the project cycle, this Scheduled Tribe Participation Plan (STPP) has been prepared to meet the requirement of World Bank's Operation Policy on Indigenous People as well as Forest Rights Acts 2006 of India.

162. The Abbreviated Resettlement Action Plan and a Scheduled Tribe Participation Plan has been prepared as separate reports and will be disclosed along with this ESIA and ESMP. Abbreviated Resettlement Action Plan (ARAP) proposes a budget of INR 7.74 lakhs. However, no separate budget has been provisioned under Scheduled Tribe Participation Plan (STPP) as the implementation arrangements for ensuring participation of the forest dwellers remains the same as ESMP and ARAP. This has been included in the overall sub-project costs.

9.4 Gender issues and Action Plan

163. The Gender Development Index (GDI) value for India is very low and the socio-economic profile of the project area shows much lower socio-economic standing for women. The details have been discussed in table below:

Table 46: Gender Data of Jharkhand and India

Items	Jharkhand	India
Gender Related Development Index (GDI)	0.558	0.590
GDI rank (out of 35)	29	122
Gender Empowerment Measure (GEM)	0.435	0.497
GEM rank (out of 35)	26	Not Applicable

Source: Jharkhand Factsheet

164. Further, the random interviews conducted for 200 households under the Khunti water supply sub-project indicated the following:

a) Women play a major role in domestic water management and are typically responsible for collecting and storing water. The table below shows that in case of 84.36% households, women are responsible for managing household water requirements.

Table 47: Present Accessibility in Khunti of Water for the Households

For households without water supply			
Responsibility of managing water requirements	Women 84.36%	Men 12.80%	Both 2.84%
Source of water	Within house 20.85%	<0.5km 38.86%	>0.5km to <1km 40.28%
Time spent on fetching water	<=15 Mins 44.55%	>15 to <=25 mins 37.44%	>25 mins 18.01%

Source: Survey from Jan to June, 2017

b) Women participation in decision-making regarding financial matters, education of child, healthcare of child, purchase of assets, day to day household activities, social function and marriages and land property was observed to be significantly low. The table below provides details of women involvement in various activities.

Table 48:Women Participation in Khunti on Decision Making

Decision making and participation at household level							
	Financial matter	Education of child	Healthcare of child	Purchase of assets	Day-to-day household activities	Social function and marriages	Land property
Men	85.3%	9.8%	9.8%	60.8%	11.3%	60.8%	71.1%
Women	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%
Both	10.3%	85.8%	85.8%	34.8%	84.3%	34.8%	24.5%

Source: Survey from Jan to June, 2017

c) The benefits of the project as envisaged by the women population are:

i. Increased accessibility and better quality of the water
ii. Reduced time spent on accessing the water.
iii. Decreased cost of living leading to a better quality of life

iv. Increased security of the women with infrastructural development of the urban areas, mainly house connections.

v. Improvement in water quality leading to improvement in health and hygiene.

165. The project can improve the situation and create opportunities for them to equally access the project benefits by ensuring the following:

i. Good quality of water supply will decrease the incidences of water borne diseases and will increase hygiene and sanitation.

ii. Time saved by the women folk can be utilised for other productive activities that can help in generation of additional income.

d) Women are largely involved in domestic work and have very low economic participation rate (i.e., productive or gainful employment). In the project, women are affected in a variety of ways. For example, they face hardship and stress due to scarcity of urban infrastructure and services such as water supply, drains and drainage, etc.

e) In order to assess women's issues in connection with urban infrastructural project women were interviewed separately. The present scenario of the Khunti Nagar Panchayat as per the women FGD. (Annexure III: MINUTES OF THE CONSULTATION HELD ON 30TH OF MAY 2017 WITH SELF HELP GROUP OF THE KHUNTI NAGAR PANCHAYAT TO DISCUSS THE WATER SUPPLY SCHEME PROPOSED FOR WORLD BANK FUNDING)

Gender Action Plan

Actions	Indicators	Responsibility	Timeframe
Output 1. Water supply infrastructure			
1.1 Provide metered water pipe connections in project towns	► In the water supply projects, free water connection will be given to women headed households and the project will monitor the number of free connections provided to this category.	PIU/ULBs (support from PMC/PMU)	Construction to operation
1.2 Provide access to Water supply system	► Provision of clean and encumbrance free access to house connctions.		
Output 2. Capacity of JUIDCO, ULBs andconsumers community in project town			
2.1 Prepare and implement gender-sensitive behavior change communication (BCC) plan for project towns	► A gender-sensitive BCC plan will be developed and implemented in all project towns focusing on water conservation, water use efficiency, hygiene behavior and road safety awareness. Minimum 50% women participants will be ensured.	PMU/PIU/ULBs (support from PMC/PMU)	Pre-Construction Stage
2.2 Conduct awareness generation programs in project towns	► Awarenessgenerationprograms on water conservation, environment protection, and hygiene will be conducted in each project town, ensuring, 50% womenparticipants.	ULBs (support from PMC/ PMU)	Construction to operation
2.3 Constitute Grievance Redressal Committees (GRCs)in each sub-project	► GRCswill be constituted in each project location with at least one women member.	PIU/ULBs (support from PMC/PMU)	
2.4 Designate a gender focal point in JUIDCO.	► Designated social expert will function as Gender Focal Point for all women related grievances.	JUIDCO/PMU	Pre Construction stage to operation
2.5 Develop gender-sensitive training/learning material for ULBs	► Training/learning material will be prepared for ULBs staff on gender sensitive O&M services andurban servicemanagement ► Learning material on community based participatory planning,monitoring and evaluation	PMU (support from PMC)	Pre Construction stage to operation

Actions to be Taken

166. The Vishakha Guidelines are a set of procedural guidelines for use in India in cases of sexual harassment. They are promulgated by the Indian Supreme Court in 1997 and was superseded in 2013 by 'The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013'. The Jharkhand High Court in the Writ Petion (PIL) 5497 of 2011 had ordered the State of Jharkhand to strictly enforce the directions of the Honourable Supreme Court and also advised to enact legislation in tune Tamil Nadu Prohibition of Eve Teasing Act, 1998 and Delhi Prohibition of Eve Teasing Act, 1998.

167. As per the information of Jharkhand State Commission for Women (JSCW), around 10 Government organisations have confirmed the functioning of Anti sexual harassment cells till the December of 2016. The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act 2013 under Vishaka Guidelines mentions an employer to set up an Internal Complaints Committee (ICC) at each office or branch with more than 10 employees of any gender. Inability to form such a cell can charge a sum of Rs 50,000 from the employer. JSCW had written letter to the chief secretary for prompt formation and functioning of such cells in all private as well as government departments for the sake of women employees. Involvement of an NGO member and a woman employee is mandatory in the cell also referred as ICC. But the formation of such cells in all the government and private offices is in process.

9.5 Labour Influx Management and Child Labour

168. The construction of civil works for which the required labor force and associated goods and services cannot be fully supplied locally for a number of reasons such as worker unavailability and lack of technical skills and capacity. In such cases, the labor force (total or partial) would need to be brought in from outside the project area from nearby municipal towns and villages and sometimes outside the state. This rapid migration of labor to the project area may affect the project area negatively in the terms of additional burden on public infrastructure such as local social and health services, utilities such as water and electricity, housing and social dynamics and thus impact on local communities. Other related issues could be increased risk of spread of communicable diseases, and increased rates of illicit behavior and crime. Some of the adverse environmental impacts are illegal waste disposal sites, inappropriate Wasterwater discharges, camp related noise, access roads and land use issues. Such adverse impacts may get amplified by local-level low capacity to manage and

absorb the incoming labor force, and specifically when civil works are carried out in, or near, vulnerable communities and in other high-risk situations.

169. According to estimates, the labour demand (350 workers) for the project will be met through local labour, and a small fraction of 50-60 workers will be migrant. However these numbers are only indicative given the context of labour requriements in Jharkhand. The contactor, once on board would require to set up construction and labour camp for keeping the health and safety of workers and impacts of setting up such camps on the local community in consideration

170. As majority of labour under the project will consist of local population with only 15% labour/technicians coming from outside; therefore,chances of conflict between immigrant labour force and local community are rare. In this regard, directives will be issued to the contractor to manage the migrant labour. In addition to the above, there may be issues relating to child labour and safety and security of women.. A committee will be set up in each sub project district to look after the issues pertaining to child labour and ensure that children below 14 years are not employed in any of the sub-projects. While the sub project ESIAs would require to assess such potential issues linked to temporary project induced labour influx, the specific impacts can only be assessed once the contractor is appointed and decides to outsource labour.

171. Some of the risk factors identified are (i) weak institutional capacity of the implementing agency; (ii) many contractors without strong worker management and health and safety policies; (iv) pre-existing social conflicts or tensions; (v) weak local law enforcement, and (vi) prevalence of gender-based violence and social norms towards it in the community (vii) local prevalence of child and forced labor. (Viii) perception of insecurity by the local community due to illicit behavior or crimes including theft, physical assaults, substance abuse, human trafficking etc and (ix) limited availability of affordable accommodation and rents within Municipal area.

172. There are multiple and comprehensive Acts and Rules at both state and national level (Chapter 3) that set out the provisions for appropriate working conditions and for good labour management. However, multiplicity of laws and rules sometimes cause confusion in its applicability in a specific context. Further in case of contracted workers and Primary labor suppliers the enforcement weakens.

173. Hence, the contractor would require to develop sub project specific labour management procedures and mitigation measures in the C-ESMP before the start of works and monitor and update the labour management Plan as necessary during the course of the project. JUIDCO would develop a separate training module with the help of technical partner

to build the capacity of JUIDCO, Supervision Consultants and Contractors in preparation and execution of this labour management Plan.

174. This Labor Management Plan would address specific activities that will be undertaken to minimize the impact on the local community, including elements such as

- Communication and awareness plan on national labour and women harassment laws and its penal implications, leave provisions and other allowances for workers benefit,
- Worker codes of conduct with respect to manual scavenging, engagement with local residents, child labor, nondiscrimination, harassment of coworkers including women and those belonging to SC and STs and other minority social groups.
- Training programs on HIV/AIDS and other communicable diseases, etc.
- Workers' Camp Management Plan addressing specific aspects of the establishment and operation of workers' camps provided the ULB is unable to cater to the demand for affordable housing for this additional workforce in terms of rentals, hostels, apartments etc.
- Compliant handling Mechanism at the sub project level

175. The responsibilities for managing these adverse impacts is being clearly reflected as a contractual obligations of the Civil Works Contractor and Supervision Consultant, with appropriate mechanisms for addressing non-compliance.

10 ENVIRONMENT & SOCIAL MANAGEMENT PLAN

176. This section describes the management plan to be implemented to avoid or mitigate the anticipated negative environmental impacts and enhance the positive impacts of the sub-project activities.

10.1 Objectives of the ESMP

177. The objectives of the Environment and Social Management Plan (ESMP) are to:

- Provide a comprehensive listing of the various mitigation and monitoring measures that are to be implemented to avoid or reduce negative impacts and enhance postive impacts.
- Ensure compliance with the applicable National, and State Environment and Social laws and regulations as well as the World Bank's safeguard policies.
- Institutional arrangements that are and will be put in place by JMDP for the environmental and social compliance.
- Detail the plan for periodic monitoring of the effectiveness of the mitigation measures and residual impacts.
- Outline the capacity building plan for enhancing the capacities of the key stakeholders on environmental and social management.
- Detail the budget requirements for implementation of the ESMP.

10.2 Institutional Arrangement for ESMP Implementation

178. The key institutional arrangements and capacity for the implementation of the ESMP, their roles and responsibilities are outlined in this section.

Table 49: Key institutions for EMP implementation

Level	Implementing institutions	External institutions servicing the sub-project	
State	**JUIDCO – Project Management Unit (PMU)** [already in place] ▸ Environmental Specialist ▸ Social Specialist	**JUIDCO's Project Management Consultant (PMC)** ▸ Environmental Specialist ▸ Social Specialist	
Khunti ULB level	**JUIDCO – Project Implementation Unit (PIU)** ▸ Environmental Specialist ▸ Social Specialist	**Contractor** ▸ Environmental Health and Safety Specialist ▸ Social Specialist	**JUIDCO's Construction Supervision and Quality Control Consultant (CSQC Consultant)** ▸ Environment, Social Health and Safety

			Specialist

179. JUIDCO-PMU: JUIDCO is the primary implementing agency for the JMDP under which the Khunti-WSS sub-project is being implemented. JUIDCO has established a Project Management Unit (PMU) for JMDP, which has a dedicated environment and social specialist. The JUIDCO-PMU will have ultimate responsibility and obligation to ensure ESMP implmentation and compliance. This role will include on-going identification and management of environmental impacts, monitoring social and environmental performance, ensuring availability of committed human resources and budget for ESMP implementation, periodic monitoring and reporting on ESMP performance. JUIDCO PMU will also carry out regular training on ESHS aspects especially for construction stage, orientation and experience sharing programs to enhance the knowledge and capacity of the project staff.

The PMU will also put in place training programmes as per the ESMF for contractors staff on environment and social impacts in construction stage which include OHS management, maintainence of labour camp code of conduct and hygene,use of PPE, HIV prevention, gender, and maintaining hazard free work spaces JUIDCO-PMU will coordinate with Project Implementing Unit (PIU) at ULB level and Project Management Consultant (PMC) for effective monitoring of the ESMP. The JUIDCO PMU will draw support from safeguards specialists from the project management consultant's team if needed.

180. JUIDCO-PIU: The PIU located at the ULB level, this will be established and have a dedicated environment and social specialist to supervise and monitor the contractor's performance in implementing the ESMP. The PIU will assume direct responsibility for day-to-day project management, coordination and implementation of the sub project. The PIU will also supervise implementation of ESMP, and submit monthly progress reports to the PMU; and, will monitor the financial and physical progress of ESMP, adequacy of public consultation and compliant handling, and grievance redressal. It will also facilitate smooth coordination between the contractor, CSQC and the relevant government departments (ultilities, forest, traffic management etc.) for ESMP implementation. The PIU will also form the formal link between he ULB and JUIDCo, obtaining various clearances and approvals required and essential for project implementation, and reporting ESMP non compliance to the PMU.

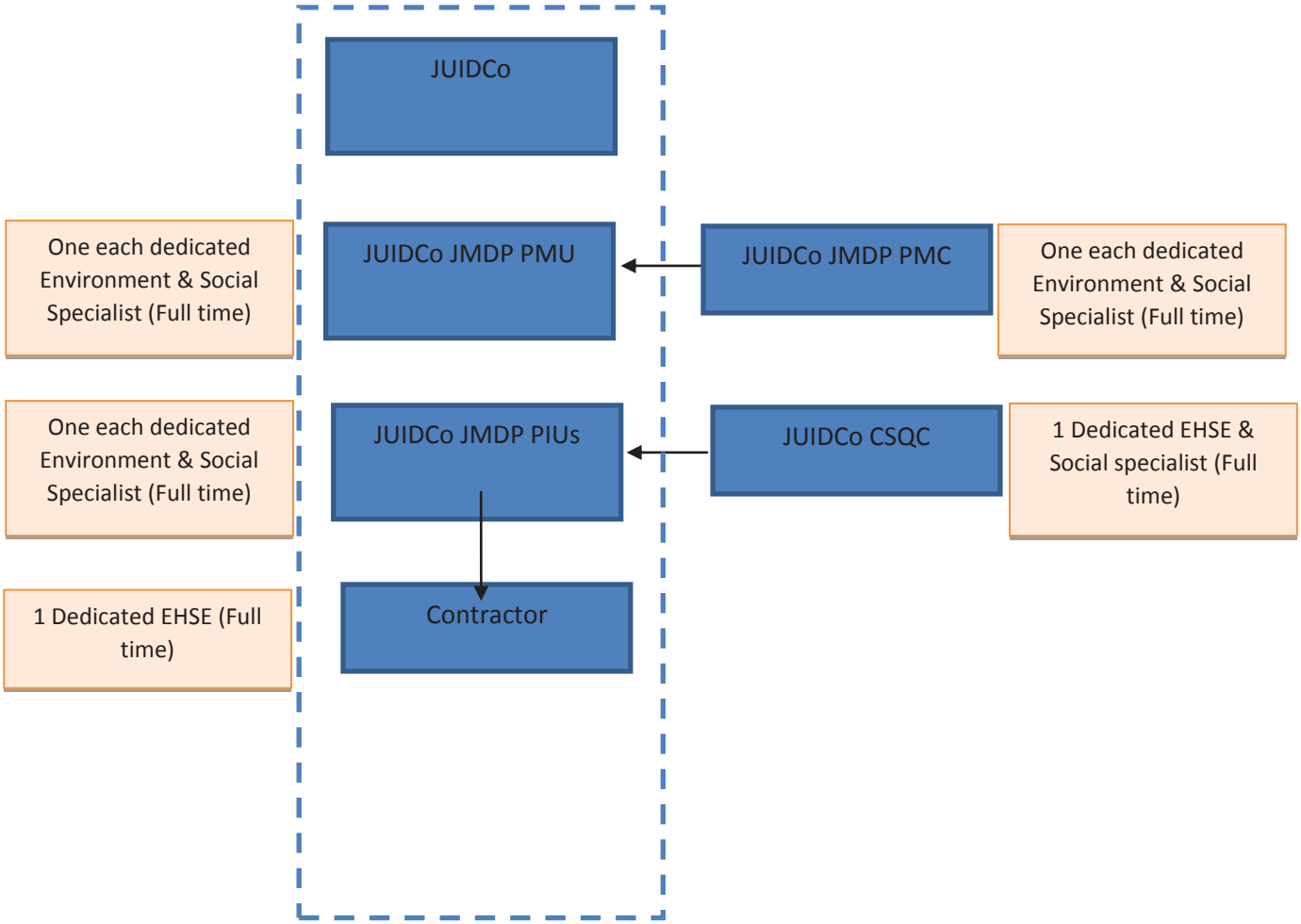
181. CSQC Consultant: The CSQC Consultant ESHS specialist will undertake day to day supervision of the implementation of the ESMP, labour management, OHS and waste management provisions, including all mitigation, management and monitoring measures by the Contractor, will provide required on-site guidance for safeguards compliance, and, will report on safeguards compliance and non-compliance to the PIU**.** The scope of work for the CSQC ESHS specialist is attached in Annex XVIII

182. Contractor: The contractor will be responsible for implementation and adherence to all the mitigation measures, monitoring and inspection arrangements outlined in this ESMP associated with their respective activities. The contractor will be required to comply with the mitigation provisions, specifications, and drawings of the ESMP and with any related codes of conduct required by JUIDCO. The contractor selection process will include consideration of the capacities of the entities to ensure compliance to legal environmental and social requirements as well as adherence to the ESMP. The contract conditions will emphasize the obligations of the contractor on both these aspects. The contractor will put in place experienced specialist in the roles of Environmental Health and Safety; and Social as a part of the implementation team**.**

State Pollution Control Board The state pollution control board (JSPCB) will provide Approvals for the WTP before start of Operation and Maintenance and conduct Monitoring of the effluent quality and ensure that it is according to the Standards laid down by CPCB/ CPHEEO.

Khunti ULB: The ULB officers, engineers will form an integral part of the PIU. However, the ULB will also support the sub project implmentation in conducting information education and communication activities, addressing compliants, assistance in obtaining necessary government approvals for waste management, water withdrawal, and raw material requirements.

183. The organogram of the project is presented in **Error! Reference source not found.**



184. The human resources in each of these institutions for EMP implementation will be as follows:

Level	Institution	Human Resources
State	JUIDCO PMU	Full time dedicated 1 each Environment & Social Specialist
State + Regional	JUIDCO PMC	Full time dedicated 1 each Environment & Social Specialist
Regional/ ULB	JUIDCO PIU	1 dedicated Environment & Social Specialist
Regional/ ULB	CSQC Consultant	Full time Environment Social Health and Safety Specialist
Project Site	Contractor	Full time Environment Health and Safety Engineer

10.3 Project Commitments

185. As a part of the EMP, JUIDCO will commit to recognizing the environmental issues, social and livelihood impacts on the local communities at the individual sub-project sites. Overall, JUIDCO/PMC/the Contractor will not restrict or curtail the rights of local communities

during the development of the sub-project other than for interventions that are necessary from the perspective of community health & safety.

10.4 Revisions to the ESMP

186. In case of any future changes in the sub-project design the ESMP will need to be updated to reflect the new scope of the activities. The environmental specialist in CSQC firm, and JUIDCO- PIU will identify any safeguard issues relating to the new design elements, and mitigation measures for the same. In case of substantial revisions, this will be finalised in consultation with the PMU.

10.5 Environmental and Social Management Plan

187. The ESMP presents a listing of the mitigation measures to be taken for each potential impact along with details on the responsible person, means of verification, timing and frequency of monitoring, supervision responsibility and reporting requirements. Before the start of construction work, the Project Engineer, contractor's team will carry out joint field verification of the EMP. The efficacy of the mitigation measures suggested in the EMP will be checked and if required, the Engineer will modify the EMP and BoQs associated with the mitigation measures. Additionally, JUIDCO shall organize orientation sessions for all contractor staff of and field level implementation staff of Contractor and all consultants on environment and social management

The EMP is presented in Table 50.

Table 50: Environmental and Social Management Plan for Khunti Water Supply Scheme

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
1	Pre-Construction Phase				
1.1	Site clearing, leading erosion, sedimentation and vegetation loss	► Vegetation clearance should be limited to only areas where construction is meant to be carried out, and restored/revegetated after construction works ► Sediment control measures should put in place before clearing vegetation in areas where the potential for sedimentation exist. ► Non-mechanical construction to be undertaken in the forest area. Heavy construction equipment will be completely avoided in forest area as per the conditions of the NOC, to prevent any damage to existing trees, and ground vegetation. ► No trees will be cut or damaged within the forest area as per the conditions of the NOC. ► In order to avoid loss of ground vegetation urban area close supervision of earthworks will be observed in order to confine land clearance within the RoW of the pipeline ► Removal of vegetation (bushes) will be limited to the extent possible within the urban area ► The contractor will stockpile topsoil for reinstating flora along the road or in the areas which have been cleared vegetation. ► The contractor will not fell/cut trees without a written consent from the competent authority and permission obtained from the respective officer	Site inspection by PIU	Contractor, (Primary responsibility) CSQC / PIU/PMU (secondary responsibility)	During mobilization, site preparation and construction Activities.

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		for cutting of trees, along with a justification on the need for tree cutting.			
1.2	Interference with existing utilities	A work plan with clear responsibilities for each party should be developed to ensure smooth execution of the construction. ► Consult with the utility departments to demarcate the locations and alignments of electrical cables, water mains and communication cables. ► Prepare a detailed planning and construction phasing schedule, and coordinate service interruption with public utilities and public administrations. (Works phasing shall be established in a way to reduce the disruption time) ► Advise citizens in advance concerning programmed interruptions in water, and other services.			Daily monitoring by Contractor, CSQC and PIU and traffic police.
2	Construction phase				
2.1	Traffic Management	► Trucks carrying materials should be restricted to hours for delivery of material and pick up of waste material. (delivery hours must be set a part of planning) ► Provide citizens advanced warning about partial/temporary road closures and rerouting of vehicle and pedestrian traffic, especially where schools/ colleges concerned.	► On site inspection monitoring of agreed mitigation measures	Contractor, (Primary responsibility) CSQC / PIU/PMU (secondary responsibility),	Daily monitoring by Contractor, CSQC and PIU. Quarterly monitoring by PMU

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		► Phasing of open work fronts should be scheduled so that multiple sites are not affected at the same time ► At night time, all barriers and signs will remain at sites, with lighting and / or fluorescent signs placed as required to warn both vehicular and pedestrian traffic, especially where trenches are left open. ► The Contractor shall restore the project sites to the state to which it was or better, prior to construction.			
2.2	Accessibility to properties	► Prior nformation and consultation with hospitals, Schools, institutions and local authorities wherever any sensitive receptor is concerned, and access should not be disturbed or affected. ► Where areas are excavated, temporary fencing, bridges, and access routes should be provided. ► Signage should clearly mark the dedicated pedestrian route, to facilitate access and avoid accidental falls into these areas ► Prior consultation and notification to the impacted and interested.	► Daily inspection on all open work fronts ► Consultations with public and ULB ► GRM mechanism	Contractor, (Primary responsibility) CSQC / PIU/PMU (secondary responsibility.	Daily monitoring by Contractor, CSQC and PIU. Quarterly monitoring by PMU
2.3	Land Contamination due to improper disposal of hazardous and	► The contractor shall handle construction materials and waste in accordance with approved procedures in Annex VIII and Annex VII. ► Sites for temporary piles should be agreed with	► Periodic inspection of 'construction waste management register' including details on	Contractor, (Primary responsibility) CSQC / PIU/PMU	Daily monitoring by Contractor, CSQC and PIU. Quarterly

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
	construction wastes	PIU and local authorities. ► The community should be made aware of constraints imposed on the contractor for waste collection, storage and disposal ► In case of accidental waste dispersion, CSQC/PIU shall be informed and restoration measures shall be applied. ► Waste materials are to be disposed at Belahatti landfill as per the consent given by the ULB provided in Annex III. ► Waste concrete will be reused and recycled to the extent possible to help in pollution prevention and conservation of natural resources. ► All storage containers containing fuel, oil, lubricant should be adequately sealed and labelled. ► The contractor will utilize KNP official landfill at Belahatti for waste generated on the construction site which has been approved by the ULB. ► All waste and wastewater generated from the labour camp will be managed as per the specifications in VII such that there is no significant impact on camp residents, the biophysical environment or surrounding communities. ► The contractor shall maintain Maintain the MSDS Sheets incase of any hazardous materials on	generation and disposal of any 'hazardous waste'. ► Periodic observation of labour camp for waste management issues. ► Memorandum of Understanding with approved recycler of JSPCB/CPCB for disposal of hazardous waste, if generated.	(secondary responsibility.	monitoring by PMU.

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		site. ► Adopt the provisions in the Emergency Response Plan in case of any leakage or hazardous material spill. ► Construction contractor will ensure daily collection, a designated storage area, segregation and periodic (monthly) disposal of construction waste generated as per the ULB and JSPCB regulations. ► Littering and burning of waste at the labour camp will be strictly prohibited. ► Segregated Domestic waste generated at the labour camp will be stored onsite and handed over to ULB for proper disposal by contractor ► Construction contractor will ensure that there is no unauthorized dumping of used oil and other hazardous wastes. Such wastes will be stored safely onsite and disposed periodically through JSPCB/CPCB approved recyclers and records of the same will be maintained. ► Transport vehicles and equipment will undergo regular maintenance to avoid any oil leakages. ► Unloading and loading protocols will be prepared for diesel, oil and used oil respectively and workers will be trained to prevent/contain spills and leaks.			
	Land	► Littering and burning of waste at the labour camp	►		Daily monitoring

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
	Contamination due to improper disposal of waste at labour camp	will be strictly prohibited. ► Domestic waste generated at the labour camp will be segregated onsite and collected by the ULB for management. ► Concrete flooring and oil interceptors should be provided for workshops, vehicle washing and fuel handling area. ► Used lead batteries, if any, should be disposed as per the Batteries (Management and Handling) Rules 2001. ► Water separated and collected from oil interceptor should be reused for dust suppression. ► All arrangements for transportation during dismantling and clearing debris, considered incidental to the work, will be implemented by contractor in a planned manner as approved and directed by JUIDCO. ► Discarded plastic bags, paper and paper products, bottles, packaging material, gunny bags, hessian, metal containers, strips and scraps of metal, PVC pipes, rubber and poly urethane foam, auto mobile spares, tubes, tires, belts, filters, waste oil, drums and other such materials shall be either reused or will be sold /given out for recycling. ► Septic tank must be provided for toilets and the			by Contractor, CSQC and PIU. Quarterly monitoring by PMU

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		sludge should be cleared by municipal exhausters. ► The municipal waste from the labour camp will only be routed through proper collection and handover to local municipal body for further disposal.			
3.4	Soil Erosion	► Top soil will be managed as per the guidelines in Annex VI ► Construction activities (especially excavation work) will be undertaken in the dry season. ► The contractor shall contain excavated materials in the vicinity of the worksite to prevent dispersion and sedimentation of drains, creeks, streets and adjacent properties ► Stripping of topsoil shall not be conducted earlier than required to prevent the erosion (wind and water) of soil. Excess topsoil will be used for landscaping purposes. ► The disturbed areas and soil stock piles will be kept moist to avoid wind erosion of soil. ► Topography will be restored and re-vegetated for slope stabilization immediately after the completion of construction at each location. ► In case of areas in the proximity of water bodies, small bunds will be created and silt traps will be provided to prevent washing of the soil into these	Review of Contractor's work plan. Periodic inspection of worksites. Review of implementation of the 'Muck Disposal/ Management Plan' for forest area.	Contractor,(Primary responsibility) CSQC / PIU/PMU (secondary responsibility	Daily monitoring by Contractor, CSQC and PIU. Quarterly monitoring by PMU

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		water bodies. ► JUIDCo will ensure a 'Muck Disposal Management Plan' will be prepared in consultation with the Forest Department and will include measures for soil erosion control in the forest area.			
3.5	Impact on Water availability	► The contractor will ensure sourcing of water through tanks will be done after proper verification of the source of water ► Construction labour will be sensitized about water conservation. ► Optimum use of water will be done during sprinkling on roads for dust settlement, washing of vehicles, etc. ► Wastewater generated from the washing/cleaning area in camp site, after passing through oil & grease trap and curing area can be re-used for water sprinkling and wheel washing. ► Total 2-3 days will be required for replacing the rising main line. Adequate communication regarding this will be made to local communities through print media and notices minimum 7 days prior to construction activity. The existing ESR will be filled up before the replacement of pipeline , to minimize water scarcity and in addition ,alternate supply of water through tankers will be undertaken during this period.	Proper legal permit for sourcing of water Periodic inspection of worksites Communications undertaken to local communities for non-availability of water Supply of tanker water to all wards	Contractor,(Primary responsibility) CSQC / PIU/PMU (secondary responsibility	Daily monitoring by Contractor, CSQC and PIU. Quarterly monitoring by PMU.

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
3.6	Impact on Water Quality	▸ Wastewater from construction site should not be allowed to accumulate at site as standing water may lead to breeding of mosquitoes. Septic tanks/soak pits should be provided for its disposal (as per specifications given in IS 2470 1995 Part I and Part II) onsite and at labour camp. ▸ Proper cover and stacking of loose construction material and excavated loose soil will be ensured to prevent surface runoff and contamination of receiving water bodies. ▸ Dumping of debris in or nearby water bodies will be strictly avoided. All the waste generated (construction waste, labour camp waste) will be collected, segregated, stored and disposed in an environmentally suitable manner. ▸ The contractor will ensure that the activities undertaken at the intake does not degrade the river and/or bank and no silts get into the river – using techniques to control the movement and deposition of silt, e.g., silt curtains or barriers to completely enclose the cofferdam installation. ▸ Sheet piling will be cut off at elevations approved in advance by JUIDCO –Engineer in order to minimize damage to foundation soils adjacent to the structures , and the cut off portions will be removed from the site	Periodic inspection of worksites. Review of implementation of the 'Muck Disposal/ Management Plan' for forest area.	Contractor, (Primary responsibility) CSQC / PIU/PMU (secondary responsibility	Daily monitoring by Contractor, CSQC and PIU. Quarterly monitoring by PMU.

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
3.7	Air Pollution	▸ The batching plant will conform to CPCB general emission and noise standards for noise. The contractor will obtain a consent from Pollutin control board before the plant is operational. ▸ The emissions from diesel generators (meant for emergency power requirement) will be controlled to minimise impacts of air emissions by optimised operations, orientation at the site and providing stack height as per stack height criteria of Central Pollution Control Board) from ground level for wider dispersion of gaseous emissions. Proper maintenance of engines and use of vehicles with 'Pollution under Control Certificate' will be ensured. ▸ Fugitive dust emissions will be suppressed by spraying water and wetting of the stockpiles. ▸ Proper location of material stockpiles will be ensured (especially sand and soil). All such loose material will be provided with temporary bunds and screens to prevent erosion and generation of fugitive dust. When not in use, all stockpiles of the loose construction material will be covered with tarpaulin sheets. ▸ Trucks transporting soil and material will be covered with tarpaulin sheets. Dust masks and eye protection against dust, splinters, debris etc. should be provided to	Periodic inspection of worksites. Air Quality Monitoring by NABL/MoEF&CC accredited laboratory. Monthly statement of Ambient Air Quality Monitoring to be submitted to JUIDCO	Contractor,(Primary responsibility) CSQC / PIU/PMU (secondary responsibility),	Daily monitoring by Contractor, CSQC and PIU. Quarterly monitoring by PMU.

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		construction workers where required. (according to OHS management in Annex IX.			
3.8	Noise Pollution	▸ All vehicles and machinery will conform to Central Motor and Vehicle Act 1988, EP Act 1986 Noise Rules 2002 ▸ Hammering and vibration compaction will be minimised when in close proximity to structures, buildings or property boundary where applicable, residential class mufflers and engine shrouds (acoustic lining) will be used on all equipment. ▸ Normal working hours of the contractor will be between 06:00 and 18:00 hours. Contractor should ensure that the ambient noise level near the project site is within the day time noise standard (refer Annexure V for applicable standards). ▸ Only well-maintained equipment will be operated on-site, and, regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components will be conducted. ▸ Machinery and equipment that may be in intermittent use will be shut down or throttled down during non-work periods. ▸ Low noise equipment will be used as far as practicable, and the number of equipment operating simultaneously will be reduced as far	Periodic inspection of worksites. Noise Monitoring by NABL/MoEF&CC accredited laboratory. Monthly statement of Noise Monitoring to be submitted to JUIDCO	Contractor,(Primary responsibility) CSQC / PIU/PMU (secondary responsibility),	Daily monitoring by Contractor, CSQC and PIU. Quarterly monitoring by PMU.

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		as practicable. ► Equipment known to emit noise strongly in one direction will be oriented so that the noise is directed away from nearby sensitive receptors as far as practicable. ► Earplugs should be provided to workers involved in unloading operations ► Timely maintenance and servicing of transportation vehicles and the machinery/pumps to be used during construction phase to reduce the noise generation due to friction and abrasion ► In cases where contractor will perform night time work, prior notice and consent will be taken from nearby residents. ► DG sets shall be provided with acoustic enclosure and comply with CPCB norms ► Monitoring of Noise levels shall be carried out on monthly basis to check the level of pollutants and effectiveness of proposed EMP ► Minimal use of vehicle horns in the project area will be encouraged. ► Equipment noise will be 85 dB(A) at 1 m from the source in line with WB EHS guidelines			
3.9	Occupational Health & Safety Risk	► The contractor will follow the provisions for OHS management plan in Annex VIII. In addition, all Workers will be trained on Environment Health and Safety with an aim of improving awareness.	► Periodic checking of Accident Register (for record of accidents at intake,	Contractor,(Primary responsibility) CSQC /	Daily monitoring by Contractor, CSQC and PIU.

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		this includes use of PPE, HIV prevention, maintainence of campsite hygiene. ► IFC EHS guidelines should be refered and used by the implementing agency JUIDCo ► Provision for all workers with requisite personal protective equipment. ► Provision of onsite drinking water and sanitation facilities. ► Provision of signage's at all construction sites, enforcing/ reminding use of PPE and safety practices. ► Safety conditions in the trenches during construction phase shall be ensured using appropriate shoring systems and dewatering mechanisms. ► Safe access and thoroughfare must be provided on construction site always. Dangerous areas shall be clearly identified with appropriate signs, lights and flagmen. ► Excavated areas shall be clearly marked to avoid accidental falls into these areas, and clearly lit at night. ► Regular monitoring by supervising engineers of contractors' compliance with safety procedures. ► Use of de-watering, side-walls support, and slope gradient adjustments that eliminate or minimize the risk of collapse, entrapment, or	WTP, ESRs). ► Review of bid documents for use of any ACM. ► Periodic visual assessment of risk at accident-prone areas. ► Inspection of PPE use by workers, first-aid kit. ► Periodic checking of records on training/awareness programs organized for workers on EHS aspects.	PIU/PMU (secondary responsibility	Quarterly monitoring by PMU

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		drowning in excavated areas ► Providing safe means of access and egress from excavations, such as graded slopes, graded access route, or stairs and ladders ► Job rotations should be practised for people, working in high noise level areas ► Risk of free fall of materials should be minimized by installing telescoping arm loaders and conveyors ► Firefighting facility should be provided at the camp site and trained personnel should be available at site who can operate the fire extinguishers and other fire-fighting equipment.			
310	Community Health and Safety Risk	► Contractor to hire workers through recruitment offices and avoid hiring "at the gate" to discourage spontaneous influx of job seekers. ► Vaccinating workers against common and locally prevalent diseases; and establishment of health centres at camp and construction site for routine health screening. ► Mandatory and regular training for workers on required code of conduct and and consequences for failure to comply with law ► Measures described earlier for controlling impact on air quality, noise levels and improper wastewater discharges will also help to mitigate	► Periodic checking of Accident Register. ► Periodic visual assessment of risk at accident-prone areas.	Contractor, (Primary responsibility) CSQC / PIU/PMU (secondary responsibility),	Daily monitoring by Contractor, CSQC and PIU. Quarterly monitoring by PMU

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		the community impacts. ▸ A traffic management plan will be prepared by the contractor, approved by the ULB, and implemented throughout the construction period, to ensure smooth traffic flow and minimize disruption. ▸ Public information notices with work start and completion dates, contact details of ULB officials, traffic diversion details, etc., will be put up in local newspapers and distributed as pamphlets (including in the local language). ▸ The contractor will follow the specifications in the labour camp plan Annex VII ▸ JUIDCO will issue the directives to Contractor and Contractor will accordingly prepare code of conduct for all labour and staff. ▸ Necessary directives will be given to Contractor for hiring the local work force. ▸ Details of project will be displayed at prominent places such as ULB's office and Deputy Commissioner's office ▸ Responsibilities for managing these impacts will be reflected as a contractual obligation, with appropriate mechanisms for addressing non-compliance. ▸ Caution boards, barricades, etc., will be used to warn the public about unauthorized access and			

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		danger. Additional monitoring on these aspects will be undertaken at locations close to sensitive receptors such as schools and playgrounds. ▸ Deploy temporary security guards in critical areas such as labour camp, construction camp, to prevent unauthorized access. ▸ Install lighting devices and safety signal devices in the temporary access areas and construction sites. ▸ A transportation plan of materials will be prepared by the contractor, approved by the ULB, and implemented to avoid their delivery at peak traffic hours. ▸ Warning signs and other protective barriers shall be erected to prevent accidents to citizens due to open ditches, heavy machinery and construction ▸ vehicles etc.			
3.11	Site restoration	▸ On completion of the works, all temporary structures and construction equipment will be removed, all waste cleared, waste disposal pits/trenches filled in and effectively sealed off and the site left clean and tidy. ▸ All waste will be disposed in accordance with the Construction Waste Management Rules, 2016 in consultation with the ULB and JSPCB.	Site inspection.	Contractor,(Primary responsibility) CSQC / PIU/PMU (secondary responsibility),	Prior to handing over of work site by Contractor.- by CSQC and PIU. Quarterly monitoring by PMU

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		▸ The site will be properly levelled and re-vegetated.			
4.0	Operation Phase				
4.1	Air Pollution	▸ BIS guidelines for safety in chlorination plants (IS 10553 – Part 1) will be followed (see Annexure XII). ▸ Emergency scrubbing arrangement will be provided in the WTP to prevent accidental emission of chlorine gas. ▸ Diesel generators will be operated only for emergency power backup. The emission source of diesel generators will have adequate stack height will conform to the set norms of CPCB. Also regular maintenance of diesel engines will be ensured. ▸ Only vehicles holding valid Pollution under Control Certificates will be used for transportation. ▸ There will be peripheral plantation of trees around the WTP to filter any dust emissions and reduce impacts n surrounding areas.	Periodic observation and document check (e.g., maintenance record of DG set, PUC of vehicles, etc.) Air Quality Monitoring by NABL/MoEF&CC accredited laboratory. Quarterly statement of Ambient Air Quality Monitoring to be submitted to JUIDCO.	Operator, ULB	Periodic monitoring by Operator and ULB
4.2	Noise Pollution	▸ The DG sets will have inbuilt acoustic enclosure, silencers, air release valve, essential hoods, etc., and will meet the CPCB noise standards of 75 dB (A) at 1 meter from the enclosure surface. ▸ The motors and pumps to be procured will be	Periodic observation (noise levels, use of protective gear by workers, survival of tree plantation in premises)	Operator, ULB	Periodic monitoring by Operator and ULB

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		selected in such a way that the noise levels will be in the range of 40 – 55 dB ▶ Ear plugs and ear muffs will be provided for the workers near noise generating sources at the intake and WTP. ▶ Thick canopied trees will be planted to attenuate noise, if any, arising from the WTP in line with the guidelines of CPCB.	Document check (e.g., specifications of DG sets, motors and pumps; tree plantation record). Noise Monitoring by NABL/MoEF&CC accredited laboratory. Quarterly statement of Noise Monitoring to be submitted to JUIDCO.		
4.3	Impact due to waste generation	▶ Backwash from filter beds will be sent to a storage tank, and after allowing adequate time for settlement of solids, clarified water will be pumped to WTP inlet ▶ Any excess waste water that needs to be disposed will be first tested for ensuring compliance with the CPCB's 'general standards for discharge of environmental pollutants' and disposed at a location authorized by JSPCB. ▶ Accumulated sludge from clari-flocculators, filter backwash, etc., will be channelled to the sludge drying beds for natural drying. ▶ Dried sludge will be disposed at the designated Belahatti landfill site only.	Periodic inspection of working of backwash recirculation facility and sludge drying beds. Periodic checking of waste water quality testing results and their conformity to CPCB standards for disposal. Periodic checking of sludge transport and disposal register.	Operator, ULB	Periodic monitoring by Operator and ULB
4.4	Reduced downstream flow	▶ The sub-project will adhere to the limits in the water use permit issued by the WRD;	Periodic inspection of the records at the	Operator, ULB	Periodic monitoring by

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		▸ Periodic monitoring of the downstream flow will be undertaken by the WRD.	intake and WTP on water intake and supply Monitoring of downstream flow		Operator and ULB
4.5	Increased Waste water in KNP area	The ULB and JUIDCO will develop and implement a long-term plan for sewerage management in KNP. The ULB, with the support of ongoing state and national programmes, will implement sewerage network and treatment infrastructure system in the next 3-5 years..	Periodic observation of any water stagnation, inspection of soak-pits	Operator, ULB	Periodic monitoring by Operator and ULB
4.6	Occupational Health & Safety Risk	▸ Handrails and guards will be installed around tanks, trenches, pits, stairwells, and other accident-prone areas. ▸ Flooring will be of non-skid type. ▸ Storage and handling of chemicals will be as per the applicable code of safety (MSDS – Material Safety Data Sheet) issued for the chemicals. ▸ Adherence to safety procedures for chlorination detailed in IS 10553 will be ensured through training for personnel and monitoring for compliance. ▸ A plan for emergency response to accidental releases will be prepared and implemented as required. ▸ Provision will be made for the necessary PPE and first-aid kit. ▸ Periodic training on EHS aspects will be provided	Periodic checking of Accident Register (for record of accidents at intake, WTP, ESRs) Periodic visual assessment of risk at accident-prone areas Inspection of PPE use by workers, first-aid kit Periodic checking of records on training/awareness programs organized for workers on EHS aspects.	Operator, ULB	Periodic monitoring by Operator and ULB

S. No	Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Monitoring/ Reporting
		to the personnel by the operator.			
4.7	Public Health	▸ Daily water quality testing to ensure compliance to IS 10500:2012 will be undertaken at the WTP through a fully functional approved govt. laboratory. ▸ Checking water System leaks and loss of Pressure (Water system leaks does not only reduce the pressure of the water, it also compromises the quality of the water by allowing contaminated water to leak into the system) Monthly water quality monitoring at end user points will be conducted to ensure that water being circulated through distribution lines is meeting the necessary standard.	Periodic checking of Water Quality Testing register.	Operator, ULB	Periodic monitoring by Operator and ULB

10.6 Environmental Monitoring

188. Monitoring will be required to ensure effectiveness of implementation of suggested mitigation measures by assessing the changes in environmental conditions. The monitoring scheduled for the construction and operation phases of the sub-project are presented in **Table 51** and

Table 51: Monitoring schedule during construction phase

	Type of Monitoring	Parameters for Monitoring	Frequency	Method	Responsibility & Verification	Monitoring Locations
1	Tree Cutting	If tree cutting is required, then tree felling can be undertaken after necessary approval from regulatory authority.	Before construction	Visual / Site Inspection Maintaining log book of all inspection checklists	R: Site In-charge/ Contractor V: CSQC and PIU	At respective project Sites
2	Debris/ Construction materials disposal	According to Construction debris and waste management plan- annex VII Re-use of Concrete and bituminous wastes	During construction – at least once a week	Visual / Site Inspection Maintaining log book of all inspection checklists	R: Site In-charge/ Contractor V: CSQC and PIU	i. WTP construction site. ii. ESR construction sites iii. Distribution network where sensitive area comes like Hospital /school iv. Intake well
3	Ambient air quality monitoring	PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, HC	Quarterly	Fine Particulate Samplers for PM2.5 Respirable Dust Sampler for PM10 fitted with Gaseous sampling arrangements for SO2 and NOx, CO analyser	R: Site In-charge/ Contractor with approved agency for environmental quality testing V: CSQC and PIU	i. WTP construction site/ AAQ 1 ii. Near Batching Plant iii. Baseline Monitoring locations /sensitive receptors (minimum 3 samples)
4	Dust Control	No. of tankers for water sprinkling, Timing of sprinkling, covering of all stored materials	Weekly	Visual / Site Inspection Maintaining log book of all inspection checklists	R: Site In-charge/ Contractor	i. WTP construction site ii. Near Batching Plant iii. All Open work fronts iv. Construction camp

					V: CSQC and PIU	
5	Noise	Day time and night time noise level (max, min & Leq levels)	Once a month	Noise meter	R: Site In-charge/ Contractor V: CSQC and PIU	i. At WTP site/ Construction labour camp, construction site. ii. All 4 ESR construction sites iii. Baseline Monitoring locations /sensitive receptors (minimum 3 samples)
6	Surface Water Quality	Relevant physical, chemical and biological parameters	Once a month	Grab sampling and analysis by using standard methods	R: Site In-charge/ Contractor V: CSQC and PIU	i. At source (existing intake well) ii. At existing WTP (treated water)
7	Drinking Water Quality at labour camp and all worker sites	Drinking water quality (as per IS:10500-2012)	Once a month	Grab sampling and analysis by using standard methods	R: Site In-charge/ Contractor V: CSQC and PIU	Sources of drinking water at labour camp and mobile water tanks if established.
8	Material and fuel storage areas	Storage and Handling practices of oils, paints, lubricants and fuels Condition of storage facilities Spillage and drainage conditions	Weekly	Inspections, Observations		Contractor's yard/camp sites

9	Waste Management at labour camp and all worker sites	Record of waste generation, handling and disposal methods (including construction waste and domestic waste from labour camp).	Weekly	Visual / Site Inspection Maintaining log book of all inspection checklists	R: Site In-charge/ Contractor V: CSQC and PIU	iv. Labour camp v. Construction sites
10	Soil Erosion	Extent and degree of erosion	Throughout construction	Survey and observation	R: Site In-charge/ Contractor V: CSQC and PIU	River bank near intake, and Structures for controlling soil erosion
11	Occupational health and safety	Record of accidents, injuries, Disabilities and fatalities and action taken.	Throughout construction	Visual / Site Inspection Maintaining log book of all inspection checklists	R: Site In-charge/ Contractor V: CSQC and PIU	At all construction sites
12	Site restoration	Clearance and restoration of site, removal of all temporary structures, closing of any septic waste pits etc. disposal of all debris	Post construction	Visual inspection of all locations	R: Site In-charge/ Contractor V: CSQC and PIU	Labour camp WTP site Construction camp site ESR sites Intake well site

NOx – Oxides of Nitrogen, SO_x – Sulphur Dioxide, PM – Particulate Matter

Table 52: Environment monitoring schedule in operation phase

Type of Monitoring	Parameters for Monitoring	Frequency	Responsibility	Monitoring Locations
Water Quality supplied to consumers	pH, Nitrite, Nitrate, Turbidity, Total Alkalinity, Fluoride, Iron, Total coliform and Faecal coliform etc. (IS:10500-2012)	Daily Sampling -Residual Chlorine at WTP when system begins, at least forthnightly under normal operating conditions. Should be done daily over next 10 days if the dose of chlorine is altered in the system Monthly one water samples at end user points	WTP operator Verfification to be undertaken by ULB	Residual Chlorine at WTP End user points at randomly chosen end-user points)
Water Quality (at Source)	pH,Cl,F,NO3,TC,FC, Hardness, Turbidity BOD,COD,DO,Total Alkalinity heavy metals & pesticides	Monthly	WTP operator	At intake, well
Waste and sludge management	Record of waste generation, and disposal methods, sludge treatment and disposal and any wastewater that cannot be recirculated; quality to meet CPCB general standards.	Weekly	DBO Contractor Verfification to be undertaken by ULB	WTP

Worker Health	Biological Monitoring, audiometric testing, fitness-to-work examinations, and general worker well- being.	Regular check up for workers as per Factories Act.	WTP operator	WTP/ Staff quarters
Worker Safety	Record of accidents, injuries, disabilities and response ; availability of First Aid Kit and PPE for all workers.	Continous monitoring and maintainence of records.	WTP operator	Intake and WTP
Green Belt Development around WTP	No. of plants, survival status as per CPCB Guidelines for green belts. [17]	Six-monthly	WTP operator	Within WTP premises
Leak Detection; maintenance and repair	Checking water System leaks and loss of pressure Acting on any complaints by consumers on loss in pressure, localised flooding due to leakage.	Regular field visits	DBO Contractor, jointly with ULBOperator, and JUIDCOPIU staff	Throughout distribution network

[17] http://cpcbenvis.nic.in/scanned%20reports/PROBES-75%20Guidelines%20For%20Developing%20Greenbelts.pdf

Documentation and Record Keeping

189. Documentation and record keeping of requirements specified in ESMP will include the following databases and registers:

i. Project level Management Information System (MIS) will be updated by JUIDCO's Environmental and Social Specialist pertaining to ESMP implmetation of Khunti Water Supply Project
ii. Quarterly ESMP comlpaince, monitoring and verification report by PMU specialists and submitted to the World Bank.
iii. End of Project report submitted by PMU to the World Bank which contains all aspects of ESMP compliance, and findings and addressal of all safeguard audit issues.
iv. Monthly ESMP progress report submitted by CSQC consultant team to PMU and PIU.
v. Monthly monitoring ESMP checklist/ verification report maintained by JUIDCO PIU and submitted to PMU (according to format in Annex XII)
vi. The ULB will submit quarterly compliance reports to PMU during the O&M phase according to the provisions listed in table 55 and 56 during the lifetime of the JMD project.

In addition, the PIU will maintain a file comprising of the following documents:

i. Legal register to track details of all NOCs, licenses and permits pertaining to the sub project
ii. Database of all project impacted entities to be compensated as per the proposed entitlement framework as well as grievance records.
iii. Labour camp monitoring checklist and accident/injury, compliance wih OHS arrangements
iv. Record of all labour licences, registration of workers and labour camp establishment permit.
v. Training register for contractor's team, and project staff
vi. Environmental Quality (Air, Water, Soil, Ambient Noise) monitoring register
vii. Waste management plan monitoring register
viii. Tree plantation register
ix. Environment and social audit findings and compliance reports

JUIDCO-PMU is the primary agency responsible for ESMP implmentation and reporting to the World Bank. Hence the PMU shall coordinate all inputs from PIU, CSQC and submit the following environmental reporting documentation to World Bank pertaining to Khunti Water supply project:

(a) Environmental & Social Monitoring Reports:

190. During Project Implementation, quarterly environmental monitoring reports will be submitted by PMU to the Bank for environmental and social progress of Khunti Water Supply during construction and operation phase of the project (JMDP will finance 5 years O&M). The report will provide the following information:

- Background/context of the monitoring report (adequate information on the project, including physical progress of project activities, scope of monitoring report, reporting period, and the monitoring requirements including frequency of submission as agreed upon);
- Changes in project scope and adjusted safeguard measures, if applicable;
- Qualitative and quantitative environment and social monitoring.
- Monitoring parameters/indicators and methods based on the monitoring plan/program in the EMP;
- Monitoring EHS compliance with WBG EHS Guidelines, and WBG, EBRD Worker accomodaton standards.
- Results of ambient environmental sampling (e.g., air quality and noise) and subsequent ambient sampling to be undertaken by contractors as specified in the EMP (results to be compared to applicable standards);
- Monitoring of all mitigation measures listed in table 55
- If noncompliance or any major gaps identified, include a corrective action plan;
- Records on disclosure of monitoring information to affected communities;
- Identification of key issues, or complaints from affected people, or recommendations for improvement;
- Monitoring adjustment measures recommended based on monitoring experience/trends and stakeholders suggestions.
- Information about actual institutional arrangement for implementing the monitoring program/plan provided or adjusted, as may be required;
- Information on occupational health and safety, injury, and accidents reported on site.
- Monitoring of all waste and debris management
- Proposed items of focus for the next report and due date.

(b) *Monthly Progress Report of Water Supply Khunti*

191. The CSQC consultant shall, by no later than 10th of the following month, submit a brief progress report summarizing the physical and financial progress of the construction contract and the activities undertaken by the supervision team for the preceding month including progress made on ESMP as per the scope in Annex XVIII. The reports shall include the minutes of the monthly site coordination/stakeholder meetings and compliants handled and all verification of environment quality monitoring of water, air, noise and soil.

(c) *Sub-Project Completion Report:*

192. The PMU will submit a sub-project Completion Report to World Bank after completion of construction phase i.e. by the end of 18 months. This will also include performance evaluation on the Contractor's implmentation of the ESMP and compliance with audit findings and any non-compliance issues raised.

10.7 Capacity Building and Training

193. The implementation of the ESMP will require a robust environmental, health and safety training plan which will ensure that the job specific training will be provided to the PIU and the ULB to encourage the implementation of environmentally sound practices and adherence to regulatory compliance requirements. This will help in minimising adverse environmental impacts and achieving performance beyond compliance. The same level of awareness and commitment will be imparted to the contractors and sub-contractors prior to the commencement of the project. The table below gives a brief overview of the capacity building and training plan.

Table 53: Capacity Building and Training Plan

Training program	Key stakeholders participating	Frequency of training	Methodology of training
Training program on ESMP, ARAP ans STPP compliance for PIU and ULB officers	PIU and ULB representatives, Environment and Social specialist PIU, Supervising Enginner ULB	Annual	Workshop, face to face training. provided by JUIDCO PMU safeguards staff
Training on ESMP, ARAP, STPP, Labour influx management, OHS, use of PPE, and emergency response measures for Contractor staff/labour	Contractor staff	During contractor mobilization phase, prior to commencement of work.	Orientation Session & During the construction phase progress as required. On-site awareness program at

			construction site and at labour camp Provided by JUIDCO PMU safeguards staff, supported by CSQC and CSQC,
Awareness program on Environment Health and Safety management and implmentation of ESMP for WTP, ESRs, Pipeline laying workers	Workers operating and maintaining WTP, intake, ESRs and pipelines.	Prior to commencement of operations; During the operations phase progress as required.	On-site awareness program at WTP provided by JUIDCO PMU safeguards staff

Stakeholder Engagement

194. The Project will establish a Community Disclosure and Grievance Redressal (CDGR) system to facilitate stakeholder engagement to be implemented during the execution of project. It is suggested that the system will be implemented by JUIDCO-PMU & PIU from support from appointed CSQC and RAP implementation support agency. The grievance mechanism should capture community grievance as well as worker's grievance. The CDGR must have various stakeholders and must meet regularly with PAPs to resolve the grievances.

195. The system will comprise of the following:

- ***An accessible and simple grievance redressal procedure:*** The grievance redressal procedure will outline the process and steps to be taken by the contractor, CSQC and PIU, the key people responsible, and the upper limit to the time taken to resolve a conflict to the satisfaction of the complainant. In case there are grievances that have reached a stalemate, a third party mediation may be considered. The entire GR process will be disclosed to the community at individual project sites, and it should be JUIDCO's and its CSQC 's endeavour to get all complaints recorded in the grievances log, and be addressed in a consistent manner.
- Apart from this a **Grievance redressal committee** shall be constituted at the ULB level with representatives from PIU, other deparments and prominent citizens. Grievances could also be recorded by the aggrieved party with Deputy Project Director JUIDCO.
- ***A public consultation plan:*** This plan will detail out the range of awareness and communication initiatives that will be implemented by JUIDCO in order to transparently and proactively address stakeholder concerns during the implementation of project activity.

196. The Environmental and Social specialists of PIU will coordinate with the various government agencies, and ULBs to meet the EMP's commitments to stakeholder engagement as follows:

- Interface between JUIDCO, ULB, contractors, sub-contractors, relevant line departments (forest, utilities, traffic police) and the local community.
- Disclosure of sub-project specific information including the ESIA and ESMP on ULB website and district library.
- Establish a mechanism to obtain, report and monitor all grievances from the local community.
- Regular engagement with all relevant local stakeholder groups identified in this report.

10.8 ESMP Budget

197. The indicative split up of capital and recurring cost for the environmental management for the project is presented in Table 54. It is important to mention that recurring cost for personnel to be hired for environmental management has not been reflected in the budget as it is considered as part of the project operations.

Table 54: Indicative Budgetary allocation for ESMP implementation

Sl. No.	Particular	Mitigation /monitoring component	Capital Cost (INR in Lakhs)
A)	Construction Phase		
	(i) *Environmental Mitigation Measures*		
1	Environment, Health and Safety Awareness and Trainings	i. Trainings to be provided to contractors staff/workers with information pertaining to minimizing solid waste, camp site hygiene, usage of designated toilets; HIV prevention, gender, and occupational health and safety including usage of PPE, and maintaining Workplace EHS signage. ii. Training to WTP workers on EHS aspects and ESMP implementation	Covered part of ESMF training cost
2	Tree cutting/ vegetation loss	iii. Care will be taken to minimize the destruction or damage of trees. iv. Re- planting of destroyed/ cut trees and shrubs in cleared areas where works are complete.	Covered part of Project cost

Sl. No.	Particular	Mitigation /monitoring component	Capital Cost (INR in Lakhs)
		v. LPG provision shall be made available in labour camp so that no tree cutting is involved for fuel wood.	
3	Interference with any utilities	work plan with clear responsibilities for each department/ implementing agency should be developed by JUIDCo to ensure smooth execution of any utility relocation.	Covered part of Project cost
4	Drainage management	i. Provision of adequate drainage and bunds/ diversion dykes, water sprinkling etc. to prevent soil/ raw material escape.	Covered part of Project cost
5	Maintaining Accessibility	i. Proper barricading should be provided at trenches and work sites close to buildings, schools and residential areas; ii. Provide walkways and metal sheets where required to maintain access across for people and vehicles; iii. Location for material piling and waste in areas where there is low potential for traffic congestion.	Covered part of Project cost
6	Dust Control	i. Water sprinkling scour checks on slopes or when working in loose soils ii. Wet all active construction areas as and when necessary to reduce dust. iii. Use tarpaulin sheets to cover sand and other loose material when transported by trucks	Covered part of Project cost
7	Emission control	Fit all heavy equipment and machinery with air pollution control devices to meet criteria of CPCB. Ensure all vehicles meet PUC requirements.	Covered as part of Project cost
8	Noise Pollution control	i. Minimize noise from construction equipment by using vehicle silencers, fitting jack hammers with noise- reducing mufflers, and portable street barriers the sound impact to surrounding	Covered part of Project cost

Sl. No.	Particular	Mitigation /monitoring component	Capital Cost (INR in Lakhs)
		sensitive receptors. ii. Maintain maximum sound levels not exceeding 80 decibels (dB) when measured at a distance of 10 m or more from the vehicle/s. iii. Development of vegetation and landscaping around WTP	
9	Construction debris, and solid waste management	i. Re-use of excavated materials in the works as far as feasible to reduce waste in landfill ii. Properly dispose of the spoil in the identified landfill approved by the ULB iii. Reuse of bituminous waste from road cutting and concrete waste from demolition of ESR for a back filling and leveling iv. Vehicles for transport of solid waste management and dumper bins wherever required v. Construction Waste from the Project is disposed at suitable sites and verification that disposal has been done in accordance with the waste management plan in Annex	Covered part of Project cost
10	Establishment of Labour camp and ancillary facilities	As per specifications listed in Annex VII.	Covered part of Project cost
11	Labour welfare and hygiene on construction site s	i. At every workplace (construction camps, on site construction areas etc.) good and sufficient water supply shall be maintained to avoid waterborne / water related / water-based diseases to ensure the health and hygiene of workers. ii. Adequate mobile toilets shall be provided at workplace for men and women iii. Medical and emergency care on site shall be provided to workers.	Covered part of Project cost

Sl. No.	Particular	Mitigation /monitoring component	Capital Cost (INR in Lakhs)
12	Labour Health and Safety	i. Treatment of local and migrant workers which will control the movement of disease vectors (through contaminated water, mosquitoes and between people); ii. Provision of personal hygiene facilities in good condition with adequate water supply at all construction sites. iii. Ensure awareness raising on proper sanitation and personal hygiene to promote proper health. iv. HIV testing for labour and workers v. Workers should be provided with suitable personal protective equipment (PPE); vi. Provision of adequate sanitary facilities to workers. vii. Safety signage installation, and barricading along the work areas	10
13	Green Belt Plantation at WTP	2-3 rows of plantation in the periphery of WTP as per CPCB guidance of green belt development	To be covered Part of Project cost
14	Miscellaneous expenses for construction phase EMP implementation.		2.7
Sub-Total			12.7
(ii) ***Environmental Quality Monitoring***			
1	Air Quality monitoring[18]	PM10 µg /m3, PM2.5 µg/m3, SO2, NOX, CO	5.12
2	Water Quality	Physical, chemical and biological	4.8

[18]*Air Monitoring: Rs 8000 per sample, Continuous 24 months monitoring at proposed WTP & Labour Camp. 2 monitoring each during construction period at zone-1,2,3 &4 ,3 ESR locations and Inlet pump to WTP*

Sl. No.	Particular	Mitigation /monitoring component	Capital Cost (INR in Lakhs)
	monitoring[19]		
3	Noise Monitoring (Occupational & Ambient)[20]	Equivalent Day & Night Time Noise Levels	-4.2
4	Drinking Water Quality at Labour camp, construction camps and onsite	Grab sampling and analysis by using standard methods	*2.4*
	Sub-Total		**16.52**
	(Construction Phase) Total (i+ ii)		**12.7+16.52= 29.22**
B)	Operation Phase		
	(i) Environmental Quality Monitoring		
1	Air monitoring (2 location per 4 times a year)	PM10 µg /m3, PM2.5 µg/m3, SO2, NOX, CO	0.64 per annum
2	Water quality monitoring (source and WTP (Both locations, quarterly)	pH, Cl, F,NO_3,TC,FC, Hardness,Turbidity BOD,COD,DO, Alkalnity, heavy metals and pesticides.	2.4 per annum
3	Water Quality Supplied to consumers (follow IS:10500-2012)	pH, Nitrite, Nitrate, Turbidity, Total Alkalnity, Fluoride, Iron, Total coliform and Fecal coliform etc.	1.2 per annum

[19] *Water Monitoring: Rs 10000 per sample ; continuous drinking water monitoring at labour camp for 24 months , 2 monitoring at Tajna river near intake point during construction phase*

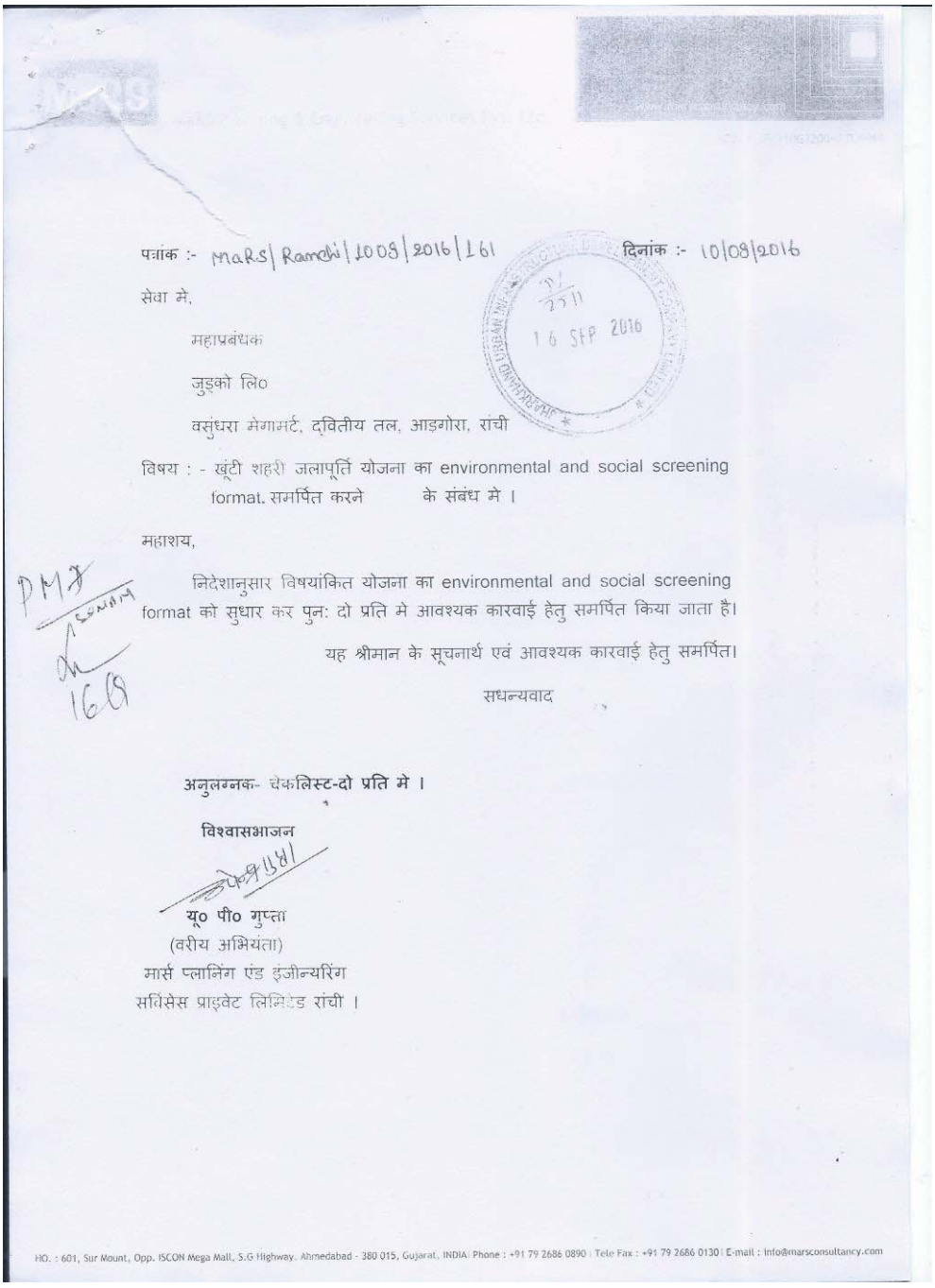
[20] *Noise Monitoring: Rs 7000 per sample Continuous 24 months monitoring at proposed WTP & Labour Camp. 2 monitoring each during construction period at zone-1,2,3 &4 ,3 ESR locations and Inlet pump to WTP*

Sl. No.	Particular	Mitigation /monitoring component	Capital Cost (INR in Lakhs)
	Monthly, one water sample(each zone to be covered three times per annum)		
4	Noise monitoring (3 locations, 4 times a year)	Equivalent Day & Night Time Noise Levels	0.84 per annum
Sub-Total			5.08 lakhs/year 25.4lakhs(5years)
	(iii) ***Environmental Mitigation***		
1	Environment, Health and Safety Awareness and Trainings	Trainings for WTP operator staff Develop in-house guidelines on environment, health and safety management	Covered part of ESMF training cost
2	Sludge management	Sludge from WTP will be dried, stabilized and transported to disposal site in Belahatti which is 6 km away from KNP, approximately 5.2 MT of dry sludge.	*Covered under O&M cost*[21]
3	Health, Safety and Hygiene for workers	i. Implementation of an emergency response plan (EPR) ii. Installation of fire hydrants/extinguishers within the proposed WTP and ancillary facilities and train workers on how use. iii. The design shall propose noise and vibration proofed systems installation. These shall be monitored during operation and if the values go above ambient or specifications, the necessary measures shall be undertaken which may include:	*Covered under O&M cost*

[21] O&M cost budget of the Project = 10.04 Crore

Sl. No.	Particular	Mitigation /monitoring component	Capital Cost (INR in Lakhs)
		iv. Personal protective equipment shall be provided	
4	Storage and handling of Chlorine	i. Proper ventilation, lighting, entry and exit facilities ii. Facility for isolation in the event of major chlorine leakage iii. Personal protection and safety equipment for the operators in the chlorine plant iv. Provide training to the staff in safe handling and application of chlorine; this shall be included in the contract of Chlorinator supplier	*Covered under O&M cost*
2	Waste Management	Waste Management arrangement in staff quarters and at WTP.	*Covered under O&M cost*
3	Noise and Vibration management	Ensure regular servicing of all machinery to prevent excess noise and vibration	
4.	Greenbelt maintenance	Maintaince of green belt developed as per CPCB guideline of Green belt plantation	*Covered under O&M cost*
5	Environment, health and safety training and EMP evaluation		*Covered under O&M cost*
6	Housekeeping	Housekeeping and record keeping of all ESMP provisions	*Covered under O&M cost*
(Operation phase) Sub-Total = 25.4 lakhs (5 years)			

ANNEXURE I: ENVIRONMENTAL AND SOCIAL SCREENING CHECKLIST



पत्रांक :- MaRS/Ranchi/1009/2016/161 दिनांक :- 10/08/2016

सेवा मे,

महाप्रबंधक

जुइको लि०

वसुंधरा मेगामर्ट, द्वितीय तल, आड़गोरा, रांची

विषय : - खूंटी शहरी जलापूर्ति योजना का environmental and social screening format. समर्पित करने के संबंध मे ।

महाशय,

निदेशानुसार विषयांकित योजना का environmental and social screening format को सुधार कर पुन: दो प्रति मे आवश्यक कारवाई हेतु समर्पित किया जाता है।

यह श्रीमान के सूचनार्थ एवं आवश्यक कारवाई हेतु समर्पित।

सधन्यवाद

अनुलग्नक- चेकलिस्ट-दो प्रति मे ।

विश्वासभाजन

यू० पी० गुप्ता

(वरीय अभियंता)

मार्स प्लानिंग एंड इंजीन्यरिंग

सर्विसेस प्राइवेट लिमिटेड रांची ।

HO. : 601, Sur Mount, Opp. ISCON Mega Mall, S.G Highway, Ahmedabad - 380 015, Gujarat, INDIA. Phone : +91 79 2686 0890 | Tele Fax : +91 79 2686 0130 | E-mail : info@marsconsultancy.com

Jharkhand Municipal Development Project
Environmental and Social Screening Format

Part A

Name of the Department: Jharkhand Urban Infrastructure Development Company Ltd.

Name of the City/Municipality: Khunti

Names & Designation of the Officers responsible:

1	JUIDCo	Environment Specialist Dr. Ram Vijay Singh. 19.9.2016 Social Specialist RAMASHIS RATAK
2	ULB	City Engineer DILIP OHDAR City Manager VIJAY KUMAR
3	Consultant	MaRS Planning and Engineering Services Pvt. Ltd.

Name of the proposed sub project:	Khunti Town Water Supply Scheme
Name of the proposed site:	Intake well, WTP, 3 ESR
Proposed sub component/functions at the site: e.g. Intake point/STP/WTP/Rising main/Distribution main/distribution line etc.	Intake point, Water Treatment Plant, Elevated Service Reservoir
Current land use of the proposed site:	Government Land

Part B

(Please tick mark ✓in the appropriate column and provide relevant information)

Sl. No	Social Screening Questions	Probable social Impacts		
		Yes	No	Comments/Remarks
1	Is land in the possession of Municipality? What is the area?	√		Area: 1. WTP: 4.88 Acre 2. ESR 2: 1.30 Acre 3. ESR 3: 2.05 Acre 4. ESR 4: 0.10 Acre
2	Is the current ownership status of the proposed site clear? Who is the current owner?	√		NOC Received from concerned authority of Jharkhand Govt. Jharkhand Govt. is the current owner.
3	Is there any land transfer formalities to be completed before using the site for		√	

6/9/16 JE

Vijay Kumar 6.9.16

19/9/16
Executive Officer
Nagar Panchayat Khunti

MaRS Planning Engineering Services Pvt. Ltd.

Sl. No	Social Screening Questions	Probable social Impacts		
		Yes	No	Comments/Remarks
	proposed function?			
4	Will there be loss perennial crops (yielding and/or fruit bearing and other trees?		√	
5	Will the project displace residential structures (Houses)?		√	
6	Will the project displace commercial structures (shops workshops, factory and other establishments)?		√	
7	Will there be loss of structures other than buildings? (Compound wall/gate/water tanks/ slabs/ wells/ septic tanks, etc.		√	
8	Are any cultural properties (place of worship, religious structure, memorial, monument, cemetery, etc.) affected or displaced?		√	
9	Are any community properties (hand pump, well, tap, chabutra, community hall etc.) affected or displaced?		√	
10	Are any tenants running enterprises or operating from the structures that would be displaced?		√	
11	Are there any tenants residing in the structures that would be displaced?		√	
12	Are there residential squatters within the proposed site boundary?		√	
13	Are there commercial squatters/vendors/Hawkers within the proposed site boundary?		√	
14	Will there be loss of incomes and livelihoods of employees of affected establishments/ structures?		√	
15	Will people lose access to common facilities, services, or natural resources?		√	
16	Will there be loss of existing access to private properties and services?		√	
17	Is there any Tribal community members residing in group/cluster in close proximity to the site?	✓ 1NO	√ 3NO	Among 4 Nos site in one no site Revenue vill-Kadma ward no 10, Tribal house hold exists within one km Radius
18	Is there possibility of any conflict/Grievances by the surrounding		√	

6/9/16
J.E.

Vijay Kumar
6.9.16

6/9/16
Executive Officer
Nagar Panchayat Khunti

MaRS Planning Engineering Services Pvt. Ltd.

Sl. No	Social Screening Questions	Probable social Impacts		
		Yes	No	Comments/Remarks
	land users due to proposed activities on the site?			

Sl. No	Environmental Aspect	Possible Impacts			
		Yes	No	Possible	Comments/ Remarks
19	Is the sub project in an eco-sensitive area or adjoining an eco-sensitive area? If Yes, which is the area? Elaborate accordingly.		√		
20	Are there any cultural heritage sites; known heritage sites in the project area, or broader area of influence?		√		
21	Are there any sensitive human receptorswithin close proximity of the site? E.g. school or hospital		√		
22	Will the project involve significant removal of vegetative cover/tree cutting?		√		
23	Will the activities proposed at the site impact water quality and water resource availability and use ?	√	√		
24	Does the project have the potential to pollute the environment, or contravene any environmental laws and regulations ?	√		During execution of project due to Earth work excavation and other activities certain pollution level may increase.	This impact is temporary. This can be minimize by adopting Green building concept rule. Regular sprinicling water & other safety measure can minimize the impact.

6/9/16
JE.

Vijay Kumar
6.9.16

6/9/16
Executive Officer
Nagar Panchayat Khunti

MARS Planning Engineering Services Pvt. Ltd.

Sl. No	Environmental Aspect	Possible Impacts			
		Yes	No	Possible	Comments/ Remarks
25	Will the project cause increased disruption to traffic movements and/or possible conflicts with and/or disruption to local community within the urban area ?	√		During pipe laying road cutting work may increase some disruption to traffic movement or disruption to local communities for short time.	
26	Will the project require prior environmental clearance either from the MoEF or from a relevant State Government Department E.g. SPCB for establishment of STP/ State Forest Department for either the conversion of forest land or for tree-cutting.	√	√		Site does not come under forest land. Water supply system will be installed. No STP will be constructed

Date : 6.9.16

Signature and Name of the Officer responsible
MaRS Planning & Engineering Services Pvt. Ltd.

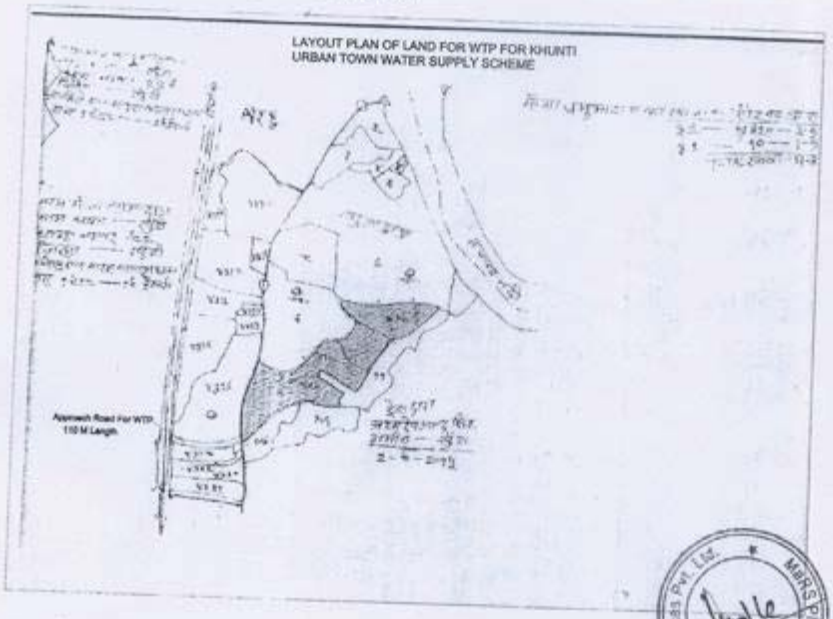
6/9/16
J.E.

Vijay Kumar
6.9.16

19/9/16
Executive Officer
Nagar Panchayat Khunti

Location Map and Photographs of site :

WTP, ESR 2 , ESR 3 and ESR4



6/9/16
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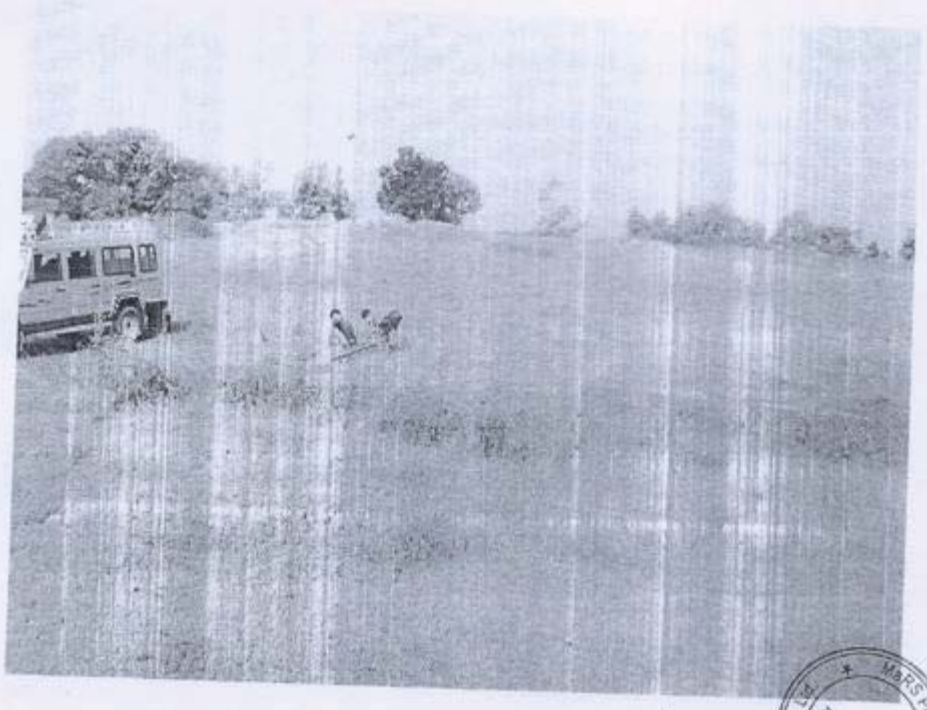
Vijay Kumar
6.9.16

Executive Officer
Nagar Panchayat Khunti



6/9/16
J.E.

Vijay Kumar
6/9/16

7/9/16
Executive Officer
Nagar Panchayat Khunti

MARS Planning Engineering Services Pvt. Ltd.

LAYOUT PLAN OF LAND FOR ESR-II
FOR KHUNTI URBAN TOWN WATER SUPPLY SCHEME

MaRS planning & Engineering Pvt. Ltd.

6/9/11
JE

Vijay Barman
6.9.11

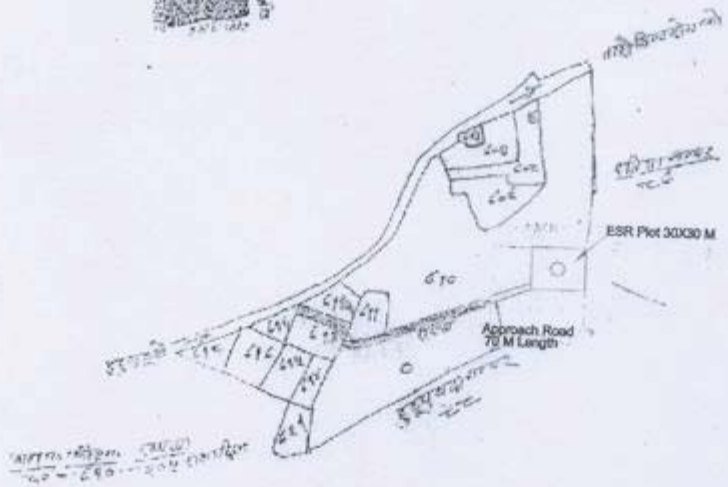
6/9/11
Executive Officer
Nagar Panchayat Khunti

6/9/16
J.E.

Vijay Kumar
6.9.16

6/9/16
Executive Officer
Nagar Panchayat Khunti

LAYOUT PLAN OF LAND FOR ESR-III
FOR KHUNTI URBAN TOWN WATER SUPPLY
SCHEME



Vijay Kumar
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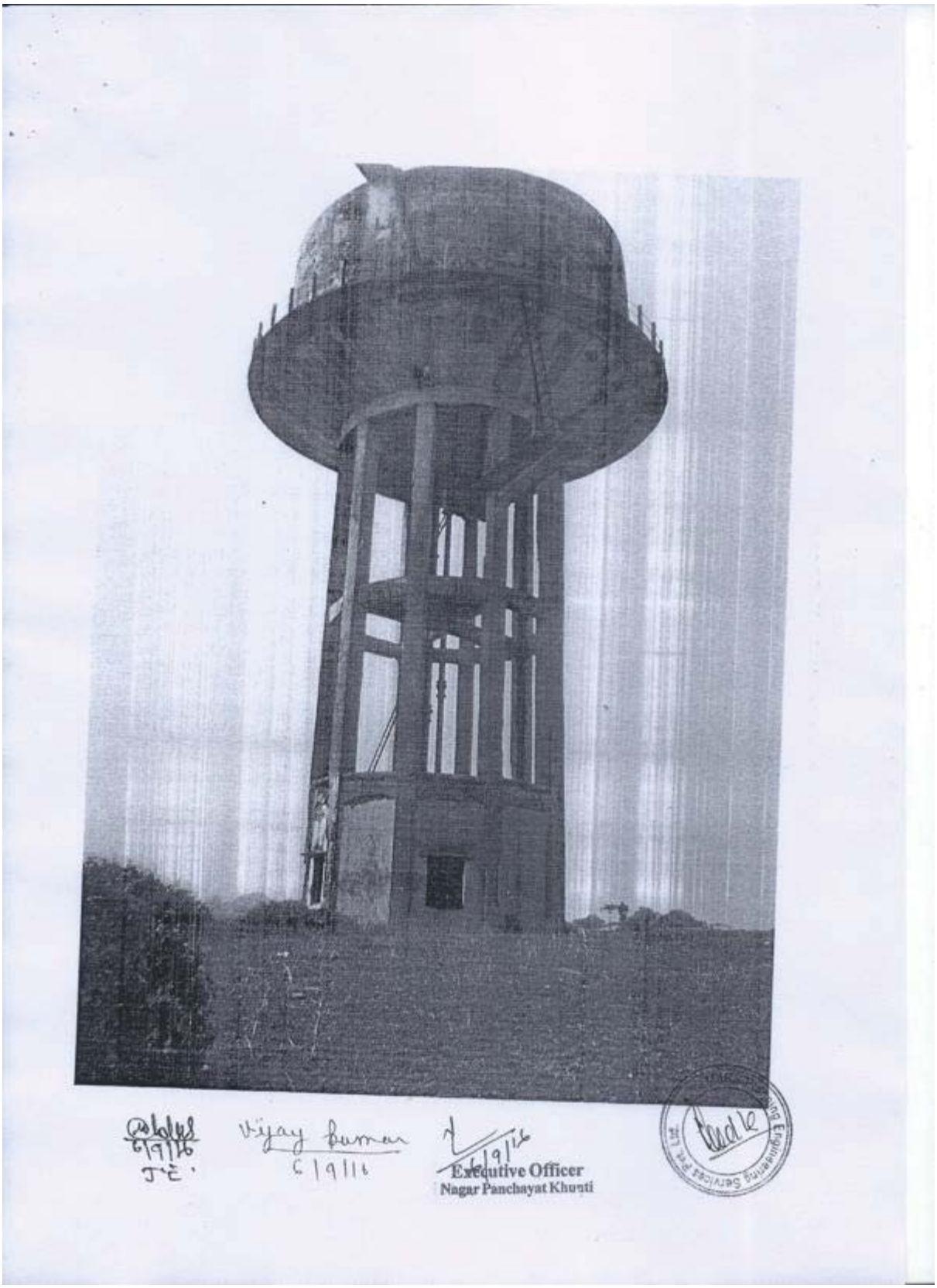
Executive Officer
Nagar Panchayat Khunti


Vijay Kumar
Executive Officer
Nagar Panchayat Khunti

6/9/16
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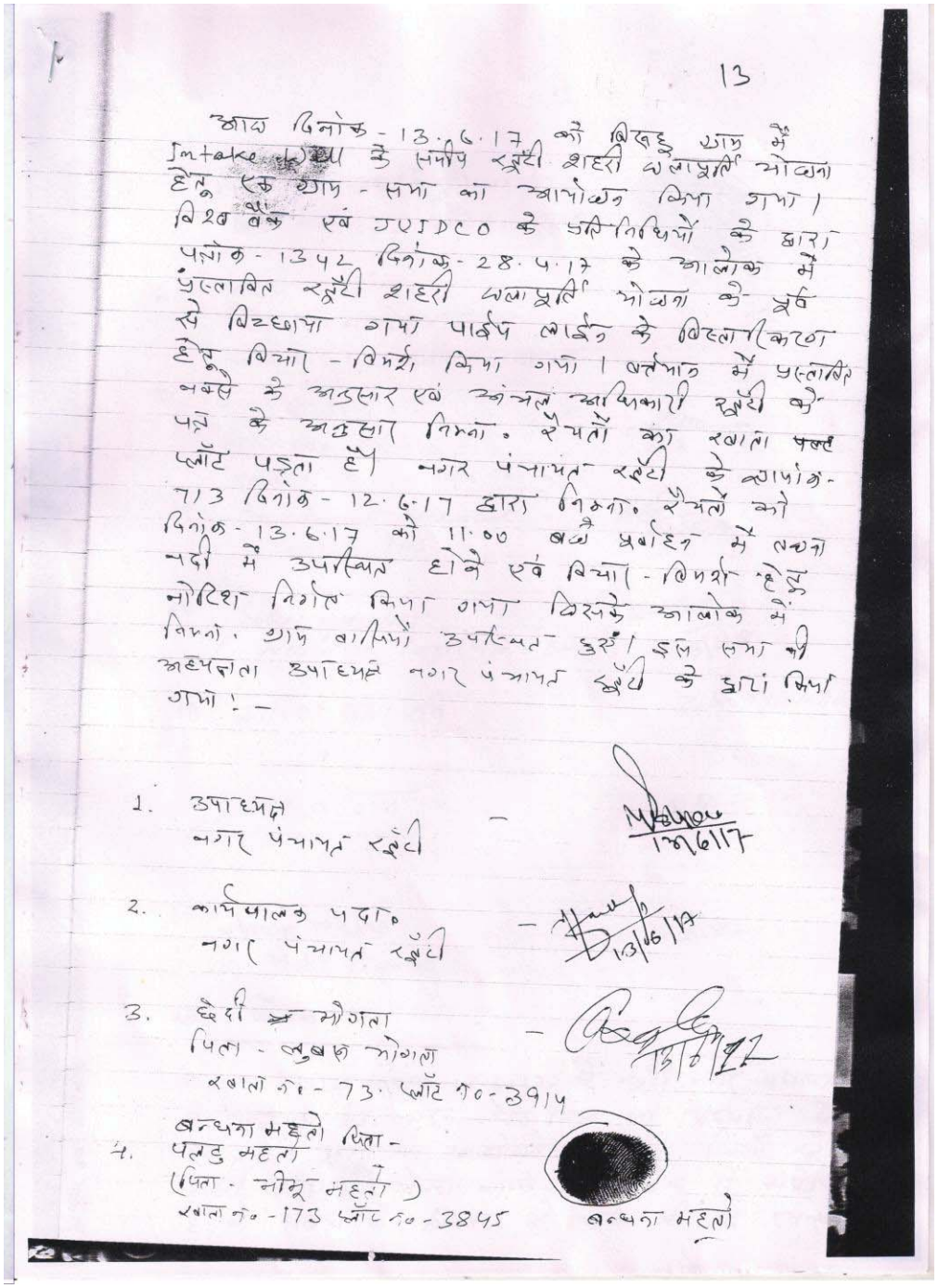
Vijay kumar
6.9.16

Executive Officer
Nagar Panchayat Khunti

ANNEXURE II: AAM SABHA PROCEEDINGS (BIRUHU VILLAGE)



13

आज दिनांक - 13.6.17 को बिरुहु ग्राम में Intake चौक के समीप रूबी शहरी जलापूर्ति योजना हेतु एक ग्राम - सभा का आयोजन किया गया। विश्व बैंक एवं JUIDCO के प्रतिनिधियों के द्वारा पत्रांक - 1342 दिनांक - 28.4.17 के आलोक में प्रस्तावित रूबी शहरी जलापूर्ति योजना के तहत से विच्छापा गया पाईप लाईन के विस्तारीकरण हेतु विचार - विमर्श किया गया। वर्तमान में प्रस्तावित वर्क्स के अनुसार एवं अंचल अधिकारी रूबी के पत्र के अनुसार निगम० रैयतों का रजाना पक्का प्लॉट पड़ता है। नगर पंचायत रूबी के कार्यांक - 713 दिनांक - 12.6.17 द्वारा निगम० रैयतों को दिनांक - 13.6.17 को 11:00 बजे प्रभावित में लगना नदी में उपस्थित होने एवं विचार - विमर्श हेतु नोटिश निर्गत किया गया जिसके आलोक में निगम० ग्राम वासियों उपस्थित हुई। इस सभा की अध्यक्षता उपाधक्ष नगर पंचायत रूबी के द्वारा किया गया :-

1. उपाधक्ष
नगर पंचायत रूबी — 13/6/17

2. कार्यपालक पदा०
नगर पंचायत रूबी — 13/6/17

3. हेदी ~~मोगता~~ मोगता
पिता - लुबुक मोगाल
रजानो नं० - 73. प्लॉट नं० - 3914 — 13/6/17

4. बन्धना महतो पिता -
पलटु महतो
(पिता - नीमू महतो)
रजाना नं० - 173 प्लॉट नं० - 3845

बन्धना महतो

ANNEXURE III: MINUTES OF THE CONSULTATION HELD ON 30TH OF MAY 2017 WITH SELF HELP GROUP OF THE KHUNTI NAGAR PANCHAYAT TO DISCUSS THE WATER SUPPLY SCHEME PROPOSED FOR WORLD BANK FUNDING

Attendance

Smt. Meghna Ruby Kachhap, Executive Officer, Khunti
Shri. Utakarsh Mishra, Deputy Project Director, PMU, JUIDCO Ltd
Shri. Ramashis Rajak, Social Specialist, PMU, JUIDCO Ltd
Shri. Kumar Mrinal, Senior Municipal Engineer, PMU, JUIDCO Ltd.
Shri. Aman Mishra , Engineer, Mars Planning.
Shri Animesh, City Mission Manager, Khunti.
Members of the Various SHG of ULB, Khunti.

Meeting started with welcome note by Executive officer of Khunti Nagar Panchayat Smt. Meghna Ruby Kachhap. She explained the objective of the meeting and also presented the overview of the urban Water supply scheme proposed under Jharkhand Municipal Development Project funded by the World Bank.
After the welcome Speech of Smt. Megna Ruby Kacchap, Ramashis Rajak, Social Specialist of JUIDCO Ltd discussed the importance of the project and how urban Water Supply scheme will change the day to day life of the women because urban water supply scheme directly affect the women and children because most of the time women has to travel long distance to bring the water for her family due to this women do not get ample time to take care her children and other family members.

When Social Specialist asked the SHG group members that they know about the urban Water Supply scheme of Khunti or not 60% SHG Members said that they do not know about the Water supply scheme for Khunti which is funded by the World Bank, But SHG members said that they will extend all kind of support required by the Urban Local body to make scheme successful.

SHG members said that if services will be provided in efficient and responsible manner then they do not have any problem to pay the charges.

All the SHG members accepted that due to scarcity of potable water most them have to walk long distance and bring water for the family and due to unavailability of the clean potable water and collecting and drinking water from various sources, children suffer from various complications and diseases.

After explaining the benefit of the project to women from various SHG, Women were asked to put their views on the existing water supply and for proposed water supply scheme.

When asked by the specialist of JUIDCO that how this scheme will help them because there is existing water supply in the Khunti then lots of the women shown dissatisfaction on existing Water supply scheme and said that *pani samay par nahi aata hai* (Water does not Supplied on time)

Malti Choudhary *kabhi-kabhi to mahino pani nahi aata hai (sometime water donot come during the whole month).*

First of all **Sunita Srivastava** put her views and said that due to scarcity of water we donot invite our daughter in summer vacation because if they come, due to water scarcity they face any problem then it become the issue for us (pani ke kami hone ke karan humlog apni betiyo ko garmi chhuti me bhi nahi bula pate hai kyunki pani ki kami karan ye ek samsya ban jat hai.)

Mina Devi informed in the meeting that existing pipeline is unable to cater demand of the area so sometime, she does not get water one week or two week so I have to walk more than one kilometre to fetch the water for the family.

Saroj Bhengra said that new water supply scheme proposed for the 24*7 water supply so it will make the life easier for women like us.

Ravika Devi said that current water supply scheme most of the time provide the dirty water which is only used for the cleaning of cloths and washing of the dishes it cannot be used for the drinking purpose.

Ranti Devi said that present water supply do not cover the 100% household so everybody not getting water form this supply scheme due to that we have to invest lots of time to bring the water.

Anisha Parvin(Ward No.05)from last three month we are not getting water in our ward and we have to bring water from the hand-pump and that is use for cleaning and bathing, for drinking purpose we have to buy water bottle of Twenty litres which cost us Rs.30/bottle. She also said that my niece and other relative says aunty give us food but she does not give us the water (*bua khana to deti hai lekin pani nahi deti hai*)

Jamoda (Ward No.9) There is water connection in her house but she not getting water (*pani ka connection to hai lekin pani nahi aata hai*)

Sarita Devi (Ward No11) she has to walk one kilometre to bring water.

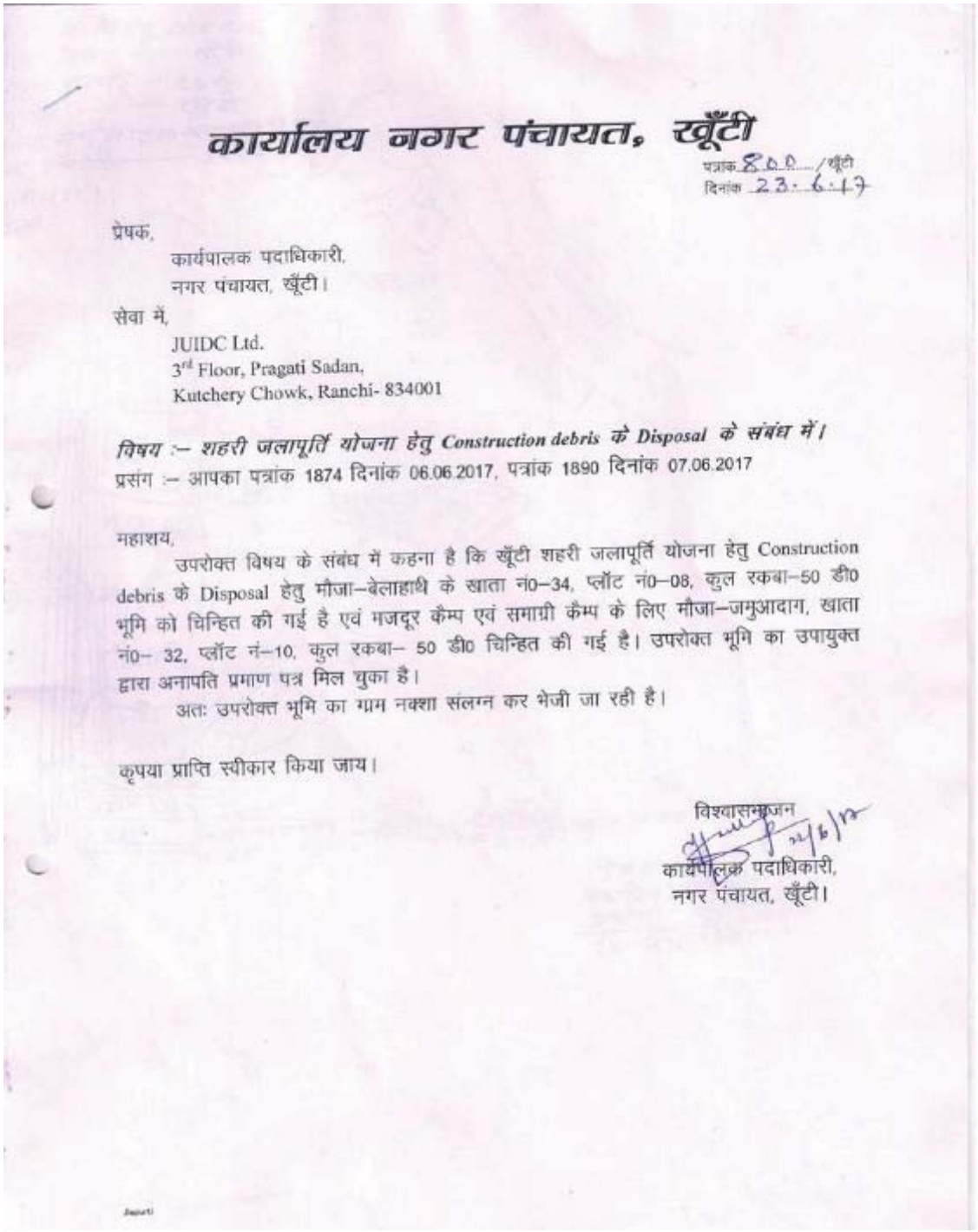
Nusrat Anjum (Ward No.5) Water Supply scheme should be built as soon as possible. So that nobody will suffer due to water scarcity.

Malti Devi (Ward No 4) Water pipeline has been laid but water don’t come.

All the SHG were agreed that water supply scheme should be built as soon as possible so that people of Khunti Nagar Panchayat will 24*7 water supply and because of this life will become easier and they can spent their time in productive work, which can enhance their living standard.

ANNEXURE IV: NOC ISSUED BY KHUNTI NAGAR PANCHAYAT FOR

1. DESIGNATED DISPOSAL SITE FOR CONSTRUCTION WASTE AND SLUDGE AT BELAHATTI
2. LAND FOR LABOUR/CONSTRUCTION CAMPS AT WTP



कार्यालय नगर पंचायत, खूँटी

पत्रांक 800 /खूँटी
दिनांक 23.6.17

प्रेषक,
कार्यपालक पदाधिकारी,
नगर पंचायत, खूँटी।

सेवा में,
JUIDC Ltd.
3rd Floor, Pragati Sadan,
Kutchery Chowk, Ranchi- 834001

विषय :– शहरी जलापूर्ति योजना हेतु Construction debris के Disposal के संबंध में।
प्रसंग :– आपका पत्रांक 1874 दिनांक 06.06.2017, पत्रांक 1890 दिनांक 07.06.2017

महाशय,
उपरोक्त विषय के संबंध में कहना है कि खूँटी शहरी जलापूर्ति योजना हेतु Construction debris के Disposal हेतु मौजा–बेलाहाथी के खाता नं0–34, प्लॉट नं0–08, कुल रकबा–50 डी0 भूमि को चिन्हित की गई है एवं मजदूर कैम्प एवं समाग्री कैम्प के लिए मौजा–जमुआदाग, खाता नं0– 32, प्लॉट नं–10, कुल रकबा– 50 डी0 चिन्हित की गई है। उपरोक्त भूमि का उपायुक्त द्वारा अनापति प्रमाण पत्र मिल चुका है।
अतः उपरोक्त भूमि का ग्राम नक्शा संलग्न कर भेजी जा रही है।

कृपया प्राप्ति स्वीकार किया जाय।

विश्वासभाजन
22/6/17
कार्यपालक पदाधिकारी,
नगर पंचायत, खूँटी।

ANNEXURE V: APPLICABLE ENVIRONMENTAL STANDARDS

Applicable Standards – CPCB

I. Drinking Water Standard

Drinking water guideline as per IS 10500, 2012 has been presented in table below;

S.No	Characteristic	Acceptable Limit	Permissible Limit
General Parameters			
1	Colour, Hazen units, *Max*	5	15
2	Odour	Agreeable	Agreeable
3	*p*H value	6.5-8.5	No Relaxation
4	Turbidity, NTU, *Max*	1	5
5	Total dissolved solids, mg/l	500	2000
6	Aluminium (as Al), mg/l, *Max*	0.03	0.2
7	Ammonia (as total ammonia-N)mg/l, *Max*	0.5	No relaxation
8	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0
9	Barium (as Ba), mg/l, *Max*	0.7	No relaxation
10	Boron (as B), mg/l, *Max*	0.5	1
11	Calcium (as Ca), mg/l, *Max*	75	200
12	Chloramines (as Cl2), mg/l, *Max*	4	No relaxation
13	Chloride (as Cl), mg/l, *Max*	250	1000
14	Copper (as Cu), mg/l, *Max*	0.5	1.5
15	Fluoride (as F) mg/l, *Max*	1.0	1.5
16	Free residual chlorine, mg/l, *Min*	0.2	1
17	Iron (as Fe), mg/l, *Max*	0.3	No relaxation
18	Magnesium (as Mg), mg/l, *Max*	30	100
19	Manganese (as Mn), mg/l, *Max*	0.1	0.3
20	Mineral oil, mg/l, *Max*	0.5	No relaxation
21	Nitrate (as NO3), mg/l, *Max*	45	No relaxation
22	Phenolic compounds (as C6H5OH), mg/l, *Max*	0.001	0.002
23	Selenium (as Se), mg/l, *Max*	0.01	No relaxation
24	Silver (as Ag), mg/l, *Max*	0.1	No relaxation
25	Sulphate (as SO4) mg/l, *Max*	200	400
26	Sulphide (as H2S), mg/l, *Max*	0.05	No relaxation
27	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600
28	Total hardness (as CaCO3), mg/l, *Max*	200	600
29	Zinc (as Zn), mg/l, *Max*	5	15
Concerning Toxic Substances			
30	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation
31	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation
32	Lead (as Pb), mg/l, *Max*	0.01	No relaxation
33	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation
34	Molybdenum (as Mo), mg/l, *Max*	0.07	
35	Nickel (as Ni), mg/l, *Max*	0.02	
36	Polychlorinated biphenyls, mg/l, * *Max*	0.0005	No relaxation
37	Polynuclear aromatic hydro carbons (as PAH), mg/l, *Max*	- 0.000 1	No relaxation
38	Total arsenic (as As), mg/l, *Max*	0.01	0.05

S.No	Characteristic	Acceptable Limit	Permissible Limit
39	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation
40	Bromoform, mg/l, *Max*	0.1	No relaxation
41	Dibromochloromethane, — mg/l, *Max*	0.1	No relaxation
42	Bromodichloromethane, — mg/l, *Max*	0.06	No relaxation
43	Chloroform, mg/l, *Max*	0.2	No relaxation
Concerning Radioactive Substances			
44	Alpha emitters Bq/l, *Max*	0.1	No relaxation
45	Beta emitters Bq/l, *Max*	1.0	No relaxation
Bacteriological Quality of Drinking Water1)			
46	*All water intended for drinking*: a) *E. coli* or thermotolerant coliform bacteria2),	Shall not be detectable in any 100-ml sample	
47	*Treated water entering the distribution system*: a) *E. coli* or thermotolerant coliform bacteria2) Shall not be detectable in any 100 ml sample b) Total coliform bacteria		
48	*Treated water in the distribution system*: a) *E. coli* or thermotolerant coliform bacteria Shall not be detectable in any 100 ml sample b) Total coliform bacteria		

II. Surface Water

Surface Water Quality criteria as per CPCB guidelines has been presented in table below

Designated-Best-Use	Class	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	▶ Total Coliforms Organism MPN/100ml shall be 50 or less ▶ pH between 6.5 and 8.5 ▶ Dissolved Oxygen 6mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	▶ Total Coliforms Organism MPN/100ml shall be 500 or less ▶ pH between 6.5 and 8.5 ▶ Dissolved Oxygen 5mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	▶ Total Coliforms Organism MPN/100ml shall be 5000 or less ▶ pH between 6 to 9 ▶ Dissolved Oxygen 4mg/l or more ▶ Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wildlife and Fisheries	D	▶ pH between 6.5 to 8.5 ▶ Dissolved Oxygen 4mg/l or more ▶ Free Ammonia (as N) 1.2 mg/l or less

Designated-Best-Use	Class	Criteria
Irrigation, Industrial cooling, Controlled waste disposal	E	▶ pH between 6.0 to 8.5 ▶ Electrical Conductivity at 25°C micro mhos/cm Max.2250 ▶ Sodium absorption Ratio Max. 26 ▶ Boron Max. 2mg/l
	Below-E	Not Meeting A, B, C, D & E Criteria

Source: Central Pollution Control Board

III. DG Set Emission Standards

Emission limits for new diesel engine up to 800 kW for generator set (Gen-set) application has been presented in table below:

Power Category	Emission Limits (g/kW-hr)			Smoke Limit (light absorption coefficient, m-1)
	NOx +HC	CO	PM	
Upto 19 KW	≤ 7.5	≤ 3.5	≤ 0.3	≤ 0.7
More than 19 KW upto 75 KW	≤ 4.7	≤ 3.5	≤ 0.3	≤ 0.7
More than 75 KW upto 800 KW	≤ 4.0	≤ 3.5	≤ 0.2	≤ 0.7

IV. Noise Levels

The ambient noise quality standard as prescribed by CPCB in the Noise Rules 2000 has been provided in table below:

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

Environmental Quality Standards – IFC EHS Guidelines

V. Air Quality

The ambient air quality guideline as provided in World Bank Group's General EHS Guidelines 2007 has been presented in table below:

Parameter	Averaging Period	Guideline value in µg/m^3
Sulfur dioxide (SO2)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline
Nitrogen dioxide (NO2)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM10	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM2.5	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

VI. Wastewater

Sanitary wastewater from facilities may include effluents from domestic sewage, food service, and laundry facilities serving site employees. Miscellaneous wastewater from laboratories, medical infirmaries, water softening etc. may also be discharged to the sanitary wastewater treatment system. World Bank Group's General EHS Guidelines 2007 for sanitary wastewater quality has been presented in table below:

Pollutants	Pollutants	Guideline Value
pH	pH	6-9
BOD	mg/l	30
COD	mg/l	125
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Oil and grease	mg/l	10
Total suspended solids	Mg/l	50
Total coliform bacteria	MPN / 100 ml	400

VII. Noise Level Guideline

As per World Bank Group's General EHS Guidelines 2007, noise impacts should not exceed the levels presented in table or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Receptor	One Hour LAeq (dBA)	
	Daytime 07:00 - 22:00	Night time 22:00 - 07:00
Residential; institutional; educational	*55*	*45*
Industrial; commercial	*70*	*70*

ANNEXURE VI: TOP SOIL MANAGEMENT

Loss of topsoil is a long-term impact due to the following reasons: (i) site clearance (ii) temporary construction activities such as construction camps, material storage locations, diversion routes etc. The environmental measures for both these activities during all stages of construction activity are discussed in the subsequent sections.

The top soil from all sites shall be stripped to a specified depth of 15 cm and stored in stock piles for reuse. A portion of temporarily acquired area and/or RoW edges will be earmarked for storing top soil. The locations for stacking will be pre-identified in consultation and with approval of JUIDCO. The following precautionary measures will be taken by the Contractor to preserve the stock piles till they are re-used:

- Stockpiles will be such that the slope doesn't exceed 1:2 (vertical to horizontal), and height is restricted to 2 m
- To retain soil and allow percolation of water, the edges of pile will be protected by silt fencing
- Multiple handling kept to a minimum to ensure that no compaction occurs ·
- Stockpiles shall be covered with empty gunny bags or will be planted with grasses to prevent the loss during rains
- Such stockpiled topsoil will be utilized for:
    - Covering reclamation sites or other disturbed areas
    - Top dressing and raising turfs
    - Filling up of tree pits
    - For developing compensatory plantation ·
    - In the agricultural fields of farmers, acquired temporarily that needs to be restored
    - Residual top soil, if there is any, shall be utilized for the plantations works the utilization as far as possible shall be in the same area from where top soil was removed. The stripping, preservation and reuse shall be carefully inspected, closely supervised and properly recorded by JUIDCO

Annexure VII: Labour Camp Site Management Plan

Introduction

The scope of this plan pertains to the siting, development, management and restoration of construction and labour camps to avoid or mitigate impacts on the environment. According to estimates, the labour demand (350 workers) for the project will be met through local labour, and a small fraction of 50-60 workers will be migrant. Howver these numbers are only indicative given the context of labour requriements in Jharkhand. The contactor, once on board would require to set up construction and labour camp for keeping the health and safety of workers and impacts of setting up such camps on the local community in consideration accoding to the specifications in this plan. This plan is prepared in reference to the guidance provided in the ESMF on Labour camp siting and management, and the Workers accommodation: processes and standards (A guidance note by IFC and EBRD).

The land for the labour camp accommodation and facilities has been made available by the consent of the ULB (Annex III) and will be located across 1 acre (0.4 Ha) at the WTP site. Most impacts ariding from operation of the camps would be managed by the contractor as they concern his staff. Responsibilities for managing these impacts have been clearly reflected as a contractual obligation, with appropriate mechanisms for addressing non-compliance.

The contractor would also be requirde to develop specific labour management procedures and mitigation measures before the start of works and monitor and update the labour management plan as necessary during the project. JUIDCO would develop a separate training module with the help of technical partner to build the capacity of JUIDCO, Supervision Consultants and Contractors in preparation and execution of this labour management plan. This would address specific activities that will be undertaken to minimize the impact on the local community, including elements such as

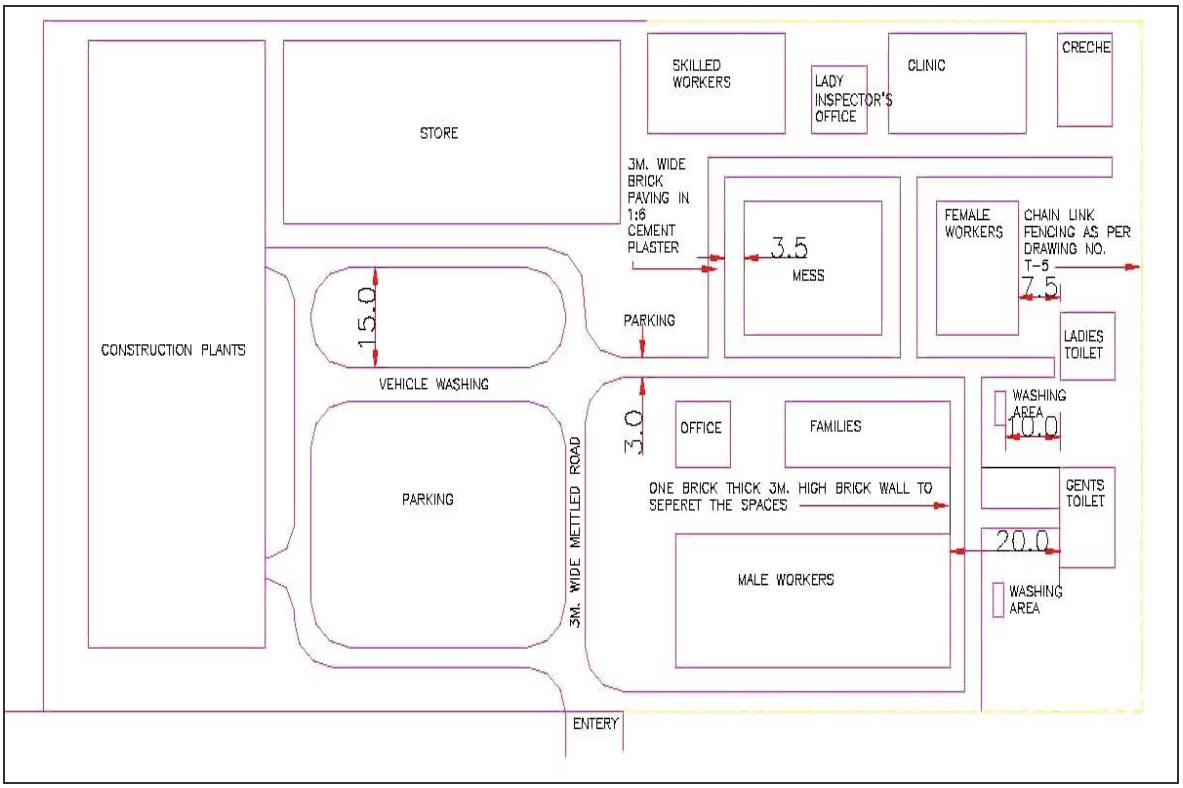
i. Communication and awareness plan on national labour and women harassment laws and its penal implications, leave provisions and other allowances for workers benefit,
ii. Worker codes of conduct with respect to manual scavenging, engagement with residents, child labor, nondiscrimination, harassment of coworkers including women and those belonging to SC and STs and other minority social groups.
iii. Training programs on HIV/AIDS and other communicable diseases, etc.
iv. Compliant handling Mechanism at the sub project level

Pre-Construction Stage

1. Siting: The contractor will work out arrangements for setting up his facilities during the duration of construction with the ULB and JUIDCo PIU. These arrangements shall be in the form of written agreement between the contractor and the ULB that would specify:

a. Photograph of the proposed camp site in original condition;
b. List the activities to be carried out in the site
c. Environmental mitigation measures to be undertaken to prevent land, air, water and noise pollution
d. Detailed layout plan for development of the construction and labour camp that shall indicate the various structures to be constructed in the camp including temporary, drainage and other facilities (as shown in figure below) gives a generic layout plan for a construction camp); and Restoration plan of camp site to previous camp conditions
e. The arrangements will be verified by the JUIDCO PIU to enable redressal of grievances at a later stage of the project.

Figure: Suggestive Layout Plan for Construction and Labour Camp Areas



1. Setting up of labour and construction camps

During the construction stage of the project, the construction contractor will construct and maintain necessary living accommodation, rest areas and ancillary facilities for labour such

that the requirements of food, healthcare, merchandise, transport, and recreation can be ensured. Contractor shall follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp. The labour camp will be set up on an area of _approximately 1 acre near the current WTP site. The camp site and has been determined keeping in mind the site would not be located within or close to dense forest areas. The camp site and its associated facilities such as access roads do not involve forest clearance and do not negatively affect local wildlife.

The Supervisor of the camp should take the attendance of the employee at each camp twice in a day (morning and evening) and should maintain the record. Further work hours of the workers should be maintained in accordance to the labour law and as mentioned in the labour licence. All workers should be provided with ID card and entry to the site should be through ID card only and should be ensured by security guard.

Living accommodation and ancillary facilities should be provided to all the migrant workers employed for the complete duration of construction/maintenance period. The rooms of labour shall be well lighted and ventilated. Transportation to the labour from the camp to the working site should also be provided, along with the facilities and provisions to be provided for the labour are described below:

a) Site barricading
b) Clean Water Facility
c) Clean kitchen area with provision of clean fuel like LPG
d) Clean Living Facilities for Workers
e) Sanitation Facilities
f) Waste Management Facilities
g) Rest and emergency area for workers at construction site
h) Safe access road is required at camps
i) Health Care Facilities
j) Crèche Facility & Play School
k) Fire-fighting Facility

a) Site Barricading and Safety

Site should be completely barricaded from all the sides to prevent entry of outsiders and animals into the site with adequate marking, flags, reflectors etc. for safety of general traffic movement and pedestrians. Entry gate should be provided at the site and labour and construction camp which should be guarded by security guard. All workers should be issued ID cards and entry of outsiders shall be maintained in the register at the gate. Board should

be displayed at the site and the labour camp, the name of project, capacity of project, authority carrying our projects, restriction of entry without authorization, no smoking zone and associated risks. Plant and machinery operation shall be restricted to 6:00 Am to 10:00 PM.

b) Clean Water/ Drinking Water

Towards the provision and storage of drinking water at the construction camp, the contractor shall ensure the following provisions

- Potable water shall be provided for construction labour for drinking & cooking purpose. Clean water shall be provided for bathing, cleaning and washing purpose. Water quality testing for drinking water provided for workers shall be carried out on monthly basis. Water dispensers should be cleaned on monthly basis. Adequate water per person should be provided at site for drinking, cooking, bathing, cleaning and other use purpose
- Every water supply or storage shall be at a distance of not less than 15m from any wastewater / sewage drain or other source of pollution. Water sources within 15m proximity of toilet, drain or any source of pollution will not be used as a source of drinking water in the project.
- If bore well used as drinking water source, it shall be covered, the door shall be kept locked and opened only for cleaning or inspection, which shall be done at least once a month. There shall be a motor installed for extraction of water from well.
- In every site, adequate and suitable facilities for washing clothes and utensils shall be provided and maintained for the use of contract labour employed therein. Separate and adequate bathing shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic conditions.

c) Kitchen Area

Provision of clean kitchen area for cooking and storage of eatables shall be provided. Clean fuels like LPG shall be provided for cooking purpose. Burning of firewood, garbage, paper and any other material for cooking or any other purpose shall strictly be prohibited at the site. Separate utensil washing area should be provided with proper drainage system. Kitchen waste should be daily cleaned and disposed of. Water storage facility at kitchen should be covered and cleaned on monthly basis. Kitchen area should be away from washing, toilets and bathing area. Wall surfaces adjacent to cooking areas are made of fire-resistant materials. Food preparation tables are also equipped with a smooth durable washable surface.

d) Living Facility for the Workers

Workers should be provided with proper bedding facility. Single bed should be provided to each worker and each bed should be at least 1 m apart from another. Double deck bedding should be avoided, in case provided, adequate fire-fighting facility should be provided.

Bed linen should be washed regularly and should be applied with repellent and disinfectants so as to manage the diseases caused due to pests. Use of Long Lasting Impregnated Nets or use of Pyrethroids (in WHO class III – especially formulated for public health) for mosquito and vector control.

Facilities for storage of personal belongings for workers should be provided in form of locker, shelf or cupboard. A separate storage area for the tools, boots, PPE should be provided. Proper ventilation through mechanical systems and lighting system should be ensured in construction camps.

e) Sanitation and Toilet Facilities

Sanitary arrangements, latrines and urinals shall be provided in every work place separately for male and female workers. The arrangements shall include:

- A latrine for every 15 females or part thereof (where female workers are employed). A latrine for every 10 males.
- Every latrine shall be under cover and so partitioned as to secure privacy, and shall have a proper door and fastenings.
- The latrines and urinals shall be adequately lighted and shall be maintained in a clean sanitary condition at all times and should have a proper drainage system;
- Water shall be provided in or near the latrines and urinals by storage in suitable containers.
- Hygiene in the camps should be maintained by providing good sanitation and cleaning facilities. Soak Pits can be provided only if labour camp is located away from river.
- Wastewater generated from these facilities should be disposed off through septic tanks and soak pit

f) Waste and Wastewater Management in Labour Camp

- Kitchen waste water shall be disposed into soak pits located preferably at least 30 meters from any water body/ drinking water source. The capacity should be at least 1.3 times the maximum volume of wastewater discharged per day. The bottom of the pit should be filled with coarse gravel and the sides shored up with board, etc. to prevent erosion and collapse of the pit.

- Municipal waste will be generated from labour camp, and the contractor will comply with the Wastew management specifications in Annex VIII.
- Dustbins for recyclable and non-recyclable waste shall be provided in labour camp area. Recyclable waste shall be sold to authorized vendors and non-recyclable shall be disposed through authorized agency in area responsible for waste collection and management. The rejected waste should be disposed in a secured manner at the designated landfill site in belahatti.
- No dumping of waste/wastewater will take place on the surface/ ground. Hazardous waste or wastewater shall not be stored in unlined ponds.
- Wastewater generated from the washing/cleaning area after passing through oil & grease trap and curing area shall be re-used for water sprinkling and wheel washing.
- Wastewater from construction site should not be allowed to accumulate at site as standing water may lead to breeding of mosquitoes.
- Wastewater generated from labour camp will not be directed into river but should be treated and disposed off through septic tank (designed following Indian standard code of practice for installation of septic tanks IS: 2470) and soak pit/leach pit to meet the CPCB standards of class E.
- Wherever septic tanks are not provided mobile toilets with anaerobic digestion facility shall be provided and no domestic waste shall be discharged to any water body.
- Temporary storm water drainage system should also be provided at camp site and construction site to drain the storm water and prevent accumulation of storm water at site and thus breeding of mosquitoes/flies
- Solid wastes generated in the kitchen shall be reused if recyclable or disposed in land fill sites per waste management plan in Annex VIII
- All used oils, lubricants and machine oils will be stored in leak proof containers, and shall be placed on paved surface and disposed as per waste management plan in Annex VII. Authorised vendors from Jharkhand Pollution control board will collect the waste oils, lubricants.
- As the project is located within the urban area of Khunti, and is a short distance from a large city such as Ranchi, the contractor will have access to healthcare facilities and clinics. Any bio- medical waste generated at the labour camp is likely to be minor, likely to be generated at first aid centre, and shall be disposed of following the Bio Medical Waste Disposal Rules, 2016[22].

Provision of Rest and Emergency Assembly areas

The work place shall provide four suitable sheds, two for meals and two for rest (separately for men and women). The height of the shelter shall not be less than 3.0m from the floor level to the lowest part of the roof. These shall be kept clean. Emergency Assembly Area shall be demarcated as emergency collection area near the gate where all can assemble in case of fire, earthquake or calamity at the site.

g) Safe Access Road

Temporary paved surface shall be constructed to approach the labour camp from the site. If camps are located close to residential and commercial areas, the roads should be watered sufficiently. Trucks carrying construction material to be adequately covered to avoid the dust pollution and to avoid the material spillage. Movement shall not be hampered during monsoon season due to water logging.

h) Medical and First Aid Facilities

- Medical facilities shall be provided to the labour at the construction camp. Visits of doctor shall be arranged twice a month wherein routine check-ups would be conducted for women and children. A separate room for medical check-ups and keeping of first aid facilities should be built. The site medical room should display awareness posters on safety facilitation hygiene and HIV/AIDS awareness.
- Ambulance/ 4-wheeler motorized vehicle shall be available at the site for carrying injured to the nearby hospital. Tie-ups should be made with nearby hospital to handle emergency, if any. Nos. of ambulance, doctors and nearby hospital shall be displayed in first-aid room, site office & labour camps. List of contact nos. of emergency personnel, hospitals, fire brigade and other emergency contact should be displayed at camp site, guard's room and first aid room.
- First Aid Box will be provided at every construction campsite and under the charge of a responsible person who shall always be readily available during working hours. He/she shall be adequately trained in administering first aid-treatment. Formal arrangement shall be prescribed to carry injured person or person suddenly taken ill to the nearest hospital. The first aid box shall contain the following.

- 6 small sterilized dressings

- medium size sterilized dressings
- large size sterilized dressings
- large sterilized burns dressings
- 1 (30 ml) bottle containing 2 % alcoholic solution of iodine
- 1 (30 ml) bottle containing salvolatile
- 1 snakebite lancet
- 1 (30 gms) bottle of potassium permanganate crystals
- 1 pair scissors
- Ointment for burns
- A bottle of suitable surgical antiseptic solution
- In case, the number of labour exceeds 50, double quantity should be provided.

i) Crèches

In case 20 or more women workers are employed, there shall be a room of reasonable size for use of children under the age of six years. The room should have adequate light and ventilation. A caretaker is to be appointed to look after the children. The use of the room shall be restricted to children, their mothers and the caretaker.

j) Storage of Construction Material in Construction Camps

- Adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids.
- Impervious/paved surfaces should be used for refueling areas and other fluid transfer areas to avoid soil and water contamination due to spillage.
- Training workers on the correct transfer and handling of fuels and chemicals and the response to spills
- Provide portable spill containment and cleanup equipment on site and training in the equipment deployment
- All materials shall be stored in a barricaded area. In case of electrical equipment, danger signs shall be posted.
- The batch mix plant is to be located away from the residential area and not in the wind direction. Separate parking areas for vehicles and also workshop areas need to be provided.

k) Firefighting arrangement

The following precautions need to be taken:

- Demarcation of area susceptible to fires with cautionary signage;
- Portable fire extinguishers and/or sand baskets shall be provided at easily accessible locations in the event of fire
- Contractor shall educate the workers on usage of this equipment.

During Construction Activities

Construction camps shall be maintained free from litter/ garbage and in hygienic condition. It should be kept free from spillage of oil, grease or bitumen. Any spillage should be cleaned immediately to avoid pollution of soil, water stored or adjacent water bodies. The following precautions need to be taken in construction camps.

- Measures to ensure that no leaching of oil and grease into water bodies or underground water takes place.
- Wastewater should not be disposed into water bodies.
- Regular collection of solid wastes should be undertaken and should be disposed safely.
- All consumables as the first aid equipment, cleaning equipment for maintaining hygiene and sanitation should be recouped immediately.
- The debris/scrap generated during construction should be kept in a designated and barricaded area.
- The PIU will monitor the cleanliness of construction campsites and ensure that the sites are properly maintained throughout the period of the contract.

A. Grievance Redressal System

A complaint register and a complaint box should be provided at the site so any person from local community can register their complaint, if any due of the camp, workers and other facilities. The system shall be communicated to local communities through consultations. Open house meetings should be conducted with workers on monthly basis to identify their problems and issues if any related to health, hygiene, safety, comfort and other issues. Activities prohibited at site

B. Activities which should be strictly prohibited at site shall include

- Open burning of wood, garbage and any other material at sit for cooking or any other purpose
- Disturbance to the local community.
- Adoption of any unfair means or getting indulgence in any criminal activity
- Non-compliance of the safety guidelines as communicated be safety officials and during the trainings
- Adoption and proper usage of PPEs all the time as required
- Operation of the plant and machinery between 10 pm to 6 am unless approved by team leader

- No animal (wild or domestic or bird) shall be harmed by any construction worker in any condition at site and nearby areas
- Cutting of tree without permission of team leader/authorized person
- No indigenous population shall be hurt or teased

C. Post Construction/Decommissioning Stage

After the completion of construction, all construction camp facilities, labour camps shall be dismantled and removed from the site. The site shall be restored to a condition in no way inferior to the condition prior to commencement of the works.

Various activities to be carried out for site rehabilitation include:

- All temporary structures should be cleared
- Debris (rejected material), building debris, garbage, night soils and POL waste should be disposed suitably per the construction debris and waste management plan.
- All disposal pits or trenches should be filled in, disinfected and effectively sealed off.
- All the areas within the camp site should be levelled and spread over with stored top soil. Residual topsoil, if any will be distributed or spread evenly in plantation sites, on adjoining/near-by barren land or affected agricultural land adjacent to the RoW that has been impacted because any accidental spillage.
- Oil and fuel contaminated soil shall be removed and transported and buried in waste disposal areas.
- Underground water tank in a barren/non-agricultural land can be covered. However, in an agricultural land, the tank shall be removed.
- If the construction camp site is on an agricultural land, top soil can be spread so as to aid faster rejuvenation.
- Entire camp area should be left clean and tidy, in a manner keeping the adjacent lands neat and clear, to the entire satisfaction of landowner and JUIDCO.
- Proper documentation of rehabilitation site is necessary. This shall include the following:
  a) Photograph of rehabilitated site;
  b) Land owner consent letter for satisfaction in measures taken for rehabilitation of site;
  c) Undertaking from contractor; and
  d) Certification from Engineer in-charge of the PIU.

ANNEXURE VIII: CONSTRUCTION DEBRIS AND WASTE MANAGEMENT PLAN

I. Potential Sources of Waste Generation

The expected solid waste as per JUIDCO to be generated during construction phase and their disposal method is provided in the table below:

Table 55: Solid and Hazardous Waste- Construction Phase

S. No	Type of Waste	Estimated Quantity	Disposal
Non-Hazardous waste			
1.	Construction Debris and earth material, rocks,	3-5 tonnes per day	This will be used to level low lying areas at approved site for fling purpose, construction of approach roads. If any extra material is remained, then that should be disposed of to the approved debris disposal site
2	Concrete Waste from ESR and old WTP	126.945 CUM	Bituminous waste, concrete will be Re-use as back filling and levelling for other roads Non-recyclable waste shall be disposed at approved debris site in covered vehicles
3	Used Oil from diesel generators and construction machinery	Approx. 5 tonnes per annum	To be disposed to JSPCB and CPCB authorised vendors
4	Packing waste containing cardboard, wood etc.	20 tonnes per year	Recyclable waste shall be sold to authorized vendors and non-recyclable shall be disposed through authorized agency in area responsible for waste collection and management.
Hazardous waste			
1	Waste and oil contaminated rags	0.5-1 ton per annum	Collected and disposed through CPCB/JSPCB approved recyclers
2	Bituminous Waste	190.4175 CUM	Re-use as back filling and leveling

- Indicates Hazardous waste

* - The quantity will be for the entire construction period

II. Design of Comprehensive Waste Management Plan

The contractor should follow the specifications listed below:

- Categorization of waste into degradable, biodegradable and hazardous categories and list of different types of waste that falls in each of these categories.
- Estimates about the quantity of waste generated in each category and type of storage units required.
- Detail the provisions for storage and handling of waste until disposed.
- A plan of the respective camps / areas like construction camp, labour camp etc. to be submitted indicating in it the space allocated for storage and handling of wastes.
- Detail the precautions to be taken while storing, handling and disposing each type of waste, trainings to be imparted to workers to create awareness about waste management.
- Details of Debris disposal site at Belatti as defined in **Annexure III: Allocation Letter for disposal of construction waste & land for labour/construction camps:**
- The contractor will submit a copy of approved site identification report along with location plan on a village map showing the debris disposal sites, site, its survey no., access road, project stretch, distance from the project stretch, surrounding features and land use like residences, agricultural land, water bodies etc., photograph of the site showing the topography and other existing features.

III. Precautions to be adopted during disposal of debris/waste material

The contractor shall take the following precautions during transportation and disposal of debris/waste material:

- A register should be kept for recording the details of the waste generated and their disposal.
- The contractor will take full care to ensure that public or private properties are not damaged/ affected during the site clearance for disposal of debris and the traffic is not interrupted.
- All arrangements for transportation during dismantling and clearing debris, considered incidental to the work, will be implemented by contractor in a planned manner as approved and directed by JUIDCO.
- In the event of any accidental spill or spread of wastes onto adjacent parcels of land, the contractor will immediately remove all such waste material/s and restore the affected area to its original state to the satisfaction of JUIDCO.
- Contractor should ensure that any spoils/materials unsuitable shall not be disposed off near any water course; water body; agricultural land; natural habitats like grass

lands, wet lands, flood plains, forests etc. pasture; eroded slopes; and in ditches, which may pollute the surrounding including water sources.

- Contractor should ensure effective water sprinkling during the handling and transportation of materials where dust is likely to be created.
- Contractor Materials having the potential to produce dust will not be loaded beyond the side and tail board level and will be covered with a tarpaulin in good condition. •
- Any diversion required for traffic during disposal of debris shall be provided with traffic control signals and barriers after discussion with the local body and as approved by JUIDCO.
- During the debris disposal, Contractor will take care of surrounding features and avoid any damage to trees and properties
- No hazardous and contagious waste material shall be disposed at such locations.

IV. Waste Disposal from Construction and Labour Camp

- Concrete flooring and oil interceptors should be provided for workshops, vehicle washing and fuel handling area.
- Petroleum, oil and lubricants waste shall be stored safely in separate containers and should be disposed off by transfer only to recycler/ re-refiners possessing valid authorization from the Jharkhand State Pollution Control Board.
- Used lead batteries, if any, should be disposed as per the Batteries (Management and Handling) Rules 2001.
- Water separated and collected from oil interceptor should be reused for dust suppression.
- There should be a register to record the details of the oil wastes generated at the workshops and oil storage areas.
- The municipal waste from the labour camp will only be routed through proper collection and handover to local municipal body for further disposal.
- No incineration or burning of wastes shall be carried out.
- Discarded plastic bags, paper and paper products, bottles, packaging material, gunny bags, hessian, metal containers, strips and scraps of metal, PVC pipes, rubber and poly urethane foam, auto mobile spares, tubes, tires, belts, filters, waste oil, drums and other such materials shall be either reused or will be sold /given out for recycling.
- Wastewater will be treated through Septic tank and soak pit and the sludge should be cleared by municipal exhausters.

V. Disposal of bituminous waste

- At locations identified for disposal of residual bituminous wastes, the disposal will be carried out over a 60 mm thick layer of rammed clay so as to eliminate the possibility of leaching of wastes into the ground water.
- The Contractor will suitably dispose off unutilized non-toxic debris at pre-designated disposal sites, subject to the approval of JUIDCO.
- Debris generated from construction activities along the rivers and streams drainage channels shall be carefully disposed in such a manner that it does not flow into the surface water bodies or form puddles in the area.

VI. Disposal of non-bituminous waste

- Non-bituminous wastes may be dumped in in barren lands, only after approval of JUIDCO/ULB
- Local tree species suitable for such re-habitation work shall be selected in consultation with local community.

VII. Criteria for land selection for disposal of construction of Debris

For disposal of debris, dumping sites need to be selected. The criteria for selection of dumping sites include:

- No residential areas are located downwind side of these locations
- Dumping sites are located at least 1000 m away from sensitive locations;
- Dumping sites do not contaminate any water sources, rivers etc.; and
- Dumping sites have adequate capacity equal to the amount of debris generated;
- Permission from the Village Panchayat and other regulatory authority are to be obtained for the dumping site selected.
- Sites should be chosen so that it can be suitably rehabilitated
- Productive lands are to be avoided; and
- Available waste lands shall be given preference

VIII. Documentation and Bookkeeping

- The designated disposal site approved by ULB only can be used as disposal site.
- The contractor should keep record of type and quantity of material disposed daily and capacity of disposal site.
- Stringent action & penalties should be imposed off on contractor for dumping of materials in locations other than the pre-identified locations. Grievance Redressal mechanism should be in place for taking note and action on such complaints.

ANNEXURE IX: OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PLAN

Assessment and Control of Occupational Health Risks

The Contractor shall carry out a Health Risk Assessment (HRA) of all construction activities for all chemical, physical, biological, ergonomic, emergency situations and psychological health hazards associated with work at the construction site having risks assessed as medium or high on the Risk Assessment Matrix based on which control measures should be selected, implemented and documented. On site and off site emergency management plan shall be developed to effectively handle them.

i. The environmental and occupational health and safety aspects and related emergency preparedness response can include incidence such as collapse of structure, trench, explosion, and other occupational accidents.
ii. The selection of controls should take account of the control hierarchy, i.e. Elimination, Substitution, Engineering, Procedural and lastly Personal Protective Equipment.
iii. Contractor shall develop the onsite emergency plan considering the potential environmental, occupational health and safety emergency at site and activities involved, and submit a copy of this plan to PIU and CSQC consultant before the start of the work. (this is also applicable for the operational phase of the water treatment plant)
iv. Construction staff shall be trained in the nature of the occupational risk, hazards and the specified controls and responses.
v. All records of emergency preparedness plan with emergency contact numbers, mock drills and corrective preventive action record after emergency is occurred
vi. The accident and incident records and emergency preparedness drill reports shall form part of quarterly report to the PMU
vii. Contractor shall be responsible to handle emergency condition and shall be liable to compensate the damage against accident, if any occurs at site.

I. Chemical Hazards

The Contractor shall identify, assess and control all hazardous chemicals involved in the construction, including building materials, proprietary chemical products, fumes, dusts and gases emitted because of cutting and welding and sanding/grinding.

II. Physical Hazards

The Contractor shall assess the risks associated with physical hazards and eliminate them or control them to as low as reasonably practicable, applying the principles outlined below:

1. Noise

For operations under noisy conditions, the Contractor shall establish procedures in compliance with the Noise Guideline provided in "The Noise Pollution (Regulation And Control) Rules, 2000". The Contractor shall reduce noise from construction equipment by measures such as:

- Selecting machinery that has inherent noise reduction features;
- Periodic monitoring of sound levels and regular maintenance of equipment;
- Contractor shall conduct periodic monitoring of sound pressure at least once each quarter.

2. Vibration

Where exposure to vibration may affect part or all of the body, for example in the use of pneumatic drills, the Contractor shall ensure that exposures are assessed and eliminated or controlled.

3. Climatic Stress

For operations under extreme climatic conditions, the Contractor shall establish procedures in compliance with the relevant standards.

III. Biological Hazards

Where insects, mites and animals, moulds, yeasts, fungi, bacteria and viruses are present in the working environment, exposures to pathogenic biological agents shall be controlled such that diseases and ill health effects are prevented.

1. Malaria

When construction takes place in areas where malaria occurs, a comprehensive risk based malaria control program shall be in place encompassing all aspects of malaria prevention programs. Use of malaria prophylaxis is a must, comparable with wearing safety shoes and hard hats. The four components of malaria prophylaxis are:

- Awareness
  - Be aware of the risk of malaria in the work locations or sites visited;
  - Be aware of the signs and symptoms and know how long it takes to develop the illness after being bitten.
- Bite Prevention - Avoid being bitten by mosquitoes by:
  - Wearing long sleeved shirts and trousers when outdoors;
  - Using insect repellent (preferably containing the active ingredient DEET) and;
  - Using air conditioning whenever available or mosquito nets at bedtime in the absence of air-conditioning.
- Chemoprophylaxis - comply when advised by a competent health professional:
  - Take anti-malarial drugs (chemoprophylaxis) when appropriate, to prevent infection from developing into clinical disease. Although highly effective, note that anti-malarial drugs do not guarantee 100% protection;
  - Medications are safe to use if taken according to medical advice.
- Diagnosis and Treatment
  - Early diagnosis and treatment can prevent fatalities. Seek immediate diagnosis and treatment if a fever and/or flu-like symptoms develop one week or more after entering and up to 3 months after departure from a risk area;
  - Inform your doctor of recent travel to a malaria risk area;
  - Owner should closely monitor performance of these Malaria control programs.

2. Legionella bacteria

Water systems may support the growth of legionella bacteria. These bacteria can enter the human body when contaminated water is inhaled as a spray, and may cause infection in the form of Pontiac Fever or Legionnaires 'disease. Known sources of legionella-contaminated water on construction sites, which may lead to infection, include:

- Domestic water storage tanks;
- Pipe work including dead legs and intermittently used water services;
- Personal and safety showers, pipe work and heads;
- Fire water and other water storage tanks;
- Water supplies used for suppressing road dust etc.;
- Water cooling systems for air conditioners;
- Water jetting equipment

The Contractor shall appoint a competent person to assess the risk of legionella and to implement the control measures.

3. Pest and Insect Control

Typical pests are flies, mosquitoes, rats and snakes. Effective cleaning and good housekeeping of worksite and worker's camps is the basis of any pest control programme. In addition to providing Long Lasting Impregnated Nets. The Contractor shall employ a specialist subcontractor to provide a pest control service for the worksite and workers camp, to the Contractor's specification.

IV. Ergonomic Hazards

The use of good manual handling and lifting techniques for construction materials minimises back and other related injuries. The Contractor shall therefore instruct workers in correct posture and lifting techniques.

V. Psychological Hazards

1. Work Plan and Organisation

The Contractor needs to be assured that all relevant and appropriate good working practices are being followed. To plan the work so as to maximise efficiency and so as to optimise human efforts the following shall be considered:

- Work cycles/shift work, taking account of local legislation
- Circadian (daily) rhythms of the working population

2. Working Hours and Working Cycles

Regular long working hours and shift work can promote fatigue. Fatigue can lead to reduced mental function and vigilance. As a result there will be an increased likelihood of accidents and ill health. Most construction activities carry a safety risk and this shall not be aggravated by serious fatigue because of excessive overtime. As a minimum the Contractor shall follow local legislation and ILO/UN recommendations on maximum working hours. The Contractor shall assess all the risks associated with the extended working hours and shift cycles and shall agree with the Owner the working hours and working cycles to be applied on the specific project.

The Contractor shall set up a system to monitor that Subcontractors are also following the agreed working cycles.

VI. Monitoring of Health Performance and Incident Reporting & Investigation

The Contractor shall have health monitoring systems in place. A medical file shall be kept for each employee. This file should include details of the pre-employment fitness to work assessment, details of any subsequent first aid treatments or clinic visits, and details of any medical surveillance that may be undertaken. The Contractor shall monitor:

- Occupational illness cases and frequency;
- First aid treatment cases;
- Number of individuals' undergoing medical surveillance;
- Number of health audits;
- Number of health-related training courses;
- There may be a requirement to monitor and report specific illnesses, if required by the specific health management plan.

Contractors shall investigate health incidents and non-accidental deaths, involving their staff in the same way as they are expected to investigate and report safety incidents.

VII. Fitness to Work

The Contractor shall identify all worker groups whose specific work or working conditions require a minimum fitness for duty standard.

VIII. Local Health Facilities and Medical Emergency Response

The Contractor shall provide access to suitably equipped and staffed hospitals. The Contractor shall provide medical centre and first aid arrangements that comply with the Medical Emergency Guidelines. Particular attention shall be paid to ensuring that the required first aid response times are achieved and should be verified by drills.

The Contractor shall develop a site-specific plan based on the health risk assessment, which describes the response to various medical emergency scenarios and medical evacuation procedures. The Contractor shall arrange for regular drills to practice and learn from the various emergency scenarios.

IX. General Health and Safety

1. Drinking Water

Drinking water standards should meet those in the latest edition of Guidelines for Drinking Water Quality - WHO. The Contractor shall provide sufficient potable water calculated at 30 litres per person per day, plus at least five days' emergency supply.

2. Garbage Collection

- The Contractor shall provide a suitable system for garbage collection and disposal. Spillage of refuse should be prevented. Arrangement shall be made for a daily collection of food wastes for collection of refuse from living quarters and work sites not less than twice weekly.
- A sufficient number of fly-proof and rodent proof bins or containers shall be supplied to all food establishments, and to camp areas and work sites to maintain cleanliness. Bins shall be cleaned immediately after being emptied.
- Disposal of garbage shall meet local legislative requirements and public health standards.

X. Emergency preparedness and response planning

The 'On-site emergency plan' to be prepared by contractor and shall include minimum the following information:

- Site Locations
- Name, Designation & Contact Numbers of the organization, nearby hospitals, fire agencies etc. and key personnel including their assigned responsibilities in case of an emergency.
- Site Layout Diagram showing location of fire extinguishers, emergency collection area and fire alarm
- Identification of Potential Emergencies Situations/ preventive measures / control & response measures
- Medical services / first aid
- List of emergency equipment including fire extinguishers, fire suits etc.

ANNEXURE X: GENERAL GUIDELINES FOR CHLORINATION PLANTS INCLUDING, HANDLING STORAGE AND SAFETY OF CHLORINE CYLINDERS AND DRUMS

- This Indian Standard (Part 1) was adopted by the Indian Standards Institution on 31 May 1983, after the draft finalized by the Public Health Engineering Equipment Sectional Committee had been approved by the Civil Engineering Division Council.
- Chlorine cylinders and drums with liquid chlorine can rapture at temperatures of over 70°C due to building up of internal pressure. Chlorine gas damages the lungs and attacks the mucous membranes. Therefore, special precautions are required to be observed when working with chlorine gas apparatus and chlorine containers.
- In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.
- For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant plates retained in the round of value should be the same as that of the specified value in this standard.

INSTALLATION

Chlorination Equipment and Container Room

- Chlorine gas units and cylinders shall be housed in separate rooms, easily accessible, close to the point of application and convenient for truck loading and safe container handling. The floor shall be flat and at least 150 mm above the surrounding ground and drainage shall be adequate. The height of the container room should be at least 4'0 m. Under no circumstances such units shall be housed in basement or below ground level since the chlorine gas is heavy and settles into depressions.
- The exits shall lead directly out in the open and the doors shall open outward. The hinges of the doors should be of parliamentary type. At least two exits shall be provided in each such rooms.
- Adequate arrangements for air circulation and cross ventilation shall be made in the rooms. Air entry shall be from above and air exit shall be from below. Exhaust fans shall be provided at floor level.
- Natural ventilation and means of cross ventilation that allows change in approximate 10 minutes is desirable. For small installation, provision of ventilator openings 'at the bottom, one opposite the other is adequate.

- Separate and reasonably gas tight enclosers openings to the outdoor shall be provided for housing the chlorine feeding equipment in large installations (where tonne containers are used). These enclosers shall be vented to the upper atmosphere and equipped with positive means of exhaust (near the floor level, at the centre of the room or opposite to the entrance) capable of a complete air change within 2 to 4 minutes in an emergency. A satisfactory ventilation scheme involves a combination of fresh air and exhaust system, consisting of fans that force the fresh air into the enclose through openings near the ceiling with exhaust fans to clear away any chlorine contaminated air near the floor level. The design of exhaust system shall not include the natural ventilation that may be available.
- Rooms for chlorine containers in which more than 200 kg chlorine is stored shall be separated from the chlorine gas apparatus room and shall be accessible., only from outside:
- Containers shall rest securely on cradles or on a level rack equipped with adequate safety block to prevent rolling and be slightly elevated from the floor to keep them dry.
- The temperature in the installation room shall be within the range of +4 to + 40°C. The chlorine gas containers and chlorine gas pipes shall not be exposed to direct heat radiations and shall be protected from sun rays.
- Electrical installations inside the chlorine gas rooms shall be limited to the absolute minimum required. While laying electrical wiring and fixtures adequate safety precautions shall be observed during their installation of ensuring safe use of electricity (see IS : 732-1963* and IS : 5216-1969t).
- The following information shall be indicated prominantly on the outside entry door: - "Chlorine gas dosing apparatus room" "Smoking and handling naked flame prohibited "Admission restricted".

HANDLING

- Ordinarily a plant labourer can handle up to 100-kg cylinder when aided by small hand cart. Heavy containers shall be handled with the aim of mechanical contrivance, such as trucks, monorails, cranes or other such equipment.
- Chlorine gas containers shall not be bumped, dropped or rolled on the ground and no object shall be allowed to strike them with force.
- Use of mechanical lifting devices is recommended. For lifting one tonne container, the capacity of the mechanical device should be about 2 tonne~.

STORAGE

- All plants, particularly small· ones, should keep on hand at all times sufficient supply of chlorine cylinders or drums.
- Special consideration shall be given to requirements of monsoon seasons.
- Cylinders shall conform to IS: 7681-1975* and the provisions of IS: 8198 (Part 6)-1979t for filling, inspection, testing, maintenance. And use ·of containers for storage and transportation of liquefied chlorine in cylinders shall be observed.
- Cylinders shall be stored vertically so that a leaking container, if found, Can be removed with the least possible handling of others. Tonne containers shall be stored on the sides all the time horizontally with suitable rollers or saddles.
- Tonne containers are equipped with two values each with an internal eduction pipe. A removable hood is provided to protect the valves from inj4ry during shipment and handling. In placing tonne containers in position for use, the two valves shall be in vertical alignment. The eduction pipes then permit the upper valve to discharge gas and the lower valve liquid chlorine.
- No other objects except chlorine gas storing containers shall be kept in the room.

SAFETY

- All operating and storing rooms for chlorine gas appliances and containers shall be fire proof.
- Chlorine storage rooms should preferably be provided with chlorine gas alarm device which gives out an acoustic or an optical signal when the chlorine gas concentration is reached, the set value for which is 1'0 mg chlorine per cubic metre of air in case of a person working in the room and 20 mg chlorine per cubic metre of air when no human being is inside the room.
- The sensor for alarm device shall be placed not higher than 300 mm above the floors of the room.
- A bottle of ammonia is essential to detect leaks, etc, in case alarm device is not provided.
- Cylinder as well as chlorine shall be tested at every shift period for leaks, first by trying to detect the sharp irritating smell of chlorine, then by passing over each cylinder and around each valve and pipe connections, a rod with a small cotton-wool swab tied on the end, dipped in an aqueous solution of ammonia. If chlorine is, present in the air, the swab will appear to smoke due to formation of white cloud of ammonium chlorine. If the leak appears to be heavy, all persons not directly concerned should leave the area and the operator should put on his mask and make a thorough search of the leak.

  NOTE - In tracing a leak, always work down-stream that is start at the cylinder and work down along the Jirie of flow until the leak is found.

- Safety equipment, like gas masks, rubber gloves, aprons shall be housed in easily accessible (unlocked) cupboard placed outside the chlorination room.

  NOTE - Faulty gas mask is' worse than none at all. Hence these shall be tested frequently and canisters shall be changed at proper intervals.

- First aid box and eye wash fountain shall be provided outside chlorinator room.
- The provisions shall be made for emergency disposal of chlorine from leaking containers. The proportions of alkali and water recommended for this purpose are given in Table 1.

TABLE 1 RECOMMENDED ALKALINE SOLUTIONS FOR ABSORBING CHLORINE

Container Capacity	Caustic Soda		Soda Ash		Hydrated Lime	
	100%	Water	kg	Water	kg	Water
kg	kg	l				l
45	57	180	136	450	57	570
67	85	275	204	680	85	850
1 000	115	3 640	2 272	9 090	115	1 150

NOTE — When chlorine is to be absorbed in hydrated lime, the solution should be continuously and vigorously agitated.

- Water shall never be applied to the chlorine leak to stop it, as it will only make it worse.
- When a chlorine leak occurs, the ventilation system should be operated immediately before any person enters the chlorination room.

  NOTE - Ventilation system should be controlled from outside.

- The exhaust pipe of the apparatus shall lead to the open through the shortest path and the outlet of this exhaust pipe shall not be readily accessible.
- In case of fire: the cylinders and drums containing' chlorine shall be protected by spraying with water since the containers' can burst at temperatures of over 70°C. Source of pressurized water shall be provided adjacent to the chlorination room.
- Fusible plug, a safety device, shall be provided over all cylinders' and containers designed to melt or soften between 70 to 75°C to preclude a build-up of hydrostatic pressure resulting from thermal expansion due to fire and other hazardous conditions.
- Before disconnecting the flexible leads from containers to gas headers, the cylinder valves should be closed first and then the gas under pressure should be drawn from the header and flexible leads before the header valve is closed.

- Solvents, such as petroleum, hydrocarbons or alcohols should not be used for cleaning parts which come in contact with chlorine. The safe solvents are chloroform or carbon tetrachloride. Grease should never be used where it comes in contact with chlorine.23
- No direct flame should 'be applied to the chlorine cylinder when heating becomes necessary.
- The protective hood over the valve should always be kept in place except when the cylinders are in use
- In addition to this, the relevant provisions of IS:4263-1967 shall also be observed as far as possible.

[23] Code for safety for chlorine

ANNEXURE XI: ESMP MONITORING REPORT BY PIU

Name of Sub-Project:

Name of ULB:

The components taken up for _____ town are detailed in the following Table.

Package	Particulars	Status	Date of Award	Date of Completion

The status of Environmental and Social Management Plan (ESMP) for the month _____ year _____are presented in the following sections

PERMISSIONS/CONSENTS/CLEARANCES/APPROVALS:

S.no	Particulars	Competent Authority	Status (applied/obtained)
1.	Forest		
2	Railways		
3	National Highway		
4	Irrigation Department		
5	NOC for water abreaction from source		
6	CTO (batching plant)		
7	CTE (batching plant)		
8	Ground water extraction for construction activity		
9	Establishment of DG-set (as per Air Act, 1981.)		
10	PUC certificates		
11	Labour License (as per Labour Act 1970)		
12	Labour Registration (as per BOC Act -1996)		
13	Certificate of Employing Labour (as per BOC Act -1996)		

I. FIELD VISITS & TRAINING CONDUCTED

	Date	Sites Visited	Persons Met	Remarks
Field Visit/ Training				

II. COMPLIANCE TO EMP[24]

Particulars	Complied	Compliance to EMP
Pre-Construction Phase	□	
Construction Phase	□	
Monitoring Requirements & Specifications	□	

III. REDRESS OF GRIEVANCES/ COMPLIANT HANDLING

Sub Project	Registers Maintained	No. of Grievances received in the month	Action Taken

IV. LABOUR REGISTRATION AND RECORDS

Sub Project	Labour license obtained (no. of labour)	Total labor registered/working on the project on the date of inspection	M/F	Local/Migrant

V. ACCIDENTS ON SITE

Project Site	Total accidents in project site/camps etc. this months	Fatal/serious injury/Disability	FIR available	Action taken

[24]Insert Construction Stage EMP table here and provide compliance status, and Recommendations for each EMP measures and environment monitoring reports

VI. TEMPORARY IMPACTS ON STRUCTURES AND LIVELIHOODS

Sr. No	Total affected identified so far.	PAH identified this month	ARAP/RAP/SMP approved so far	Received entitlement so far.

VII. DESIGN CHANGES

Design Parameter	New scope of work	Environmental Impacts/Risks	Mitigation measures	Cost of mitigation (if Applicable)

VIII. ENVIRONMENTAL MONITORING VERIFICATION

(A) Air Quality Monitoring Ambient Air Monitoring

Time-period of Monitoring:

S.No	Location of sampling	Observed Value	NAAQS Standard	Compliance	Mitigation

(B) Water Quality Monitoring

Time-period of Monitoring:

S.No	Location of sampling	Observed Value	IS:10500 Values	Compliance	Mitigation

(C) Ambient Noise Monitoring

Time-period of Monitoring:

S.No	Location of sampling	Observed Value	CPCB Values	Compliance	Mitigation

IX. WASTE MANAGEMENT PLAN VERIFICATION

S. No	Waste Type	Quantity	Disposal Method/ Reuse site
1	Excavated Soil		
2	Domestic Solid Waste		
3	Construction debris		
4	Hazardous Waste		
5	Labour Camp Waste		

X. TREE PLANTED

S.No	Location	Species Panted	Quantity	Survival (%)

XI. SUMMARY AND CONCLUSIONS

EMP monitoring being done daily on the critical issues and following improvements/ positive developments are observed.

S. No	Issues/Deviations	Compliance status last visit	Corrective actions to be taken	Compliance status during this visit
1				
2				
3				
4.				
5				
6.				
7				
8				

ANNEXURE XII: ENVIRONMENT IMPACT ASSESSMENT METHODOLOGY

Impact Description

An impact is any change to a resource or receptor brought about by the presence of a project component or by the execution of a project related activity. The impacts have been characterized into the following

- Adverse or beneficial;
- Direct or indirect;
- Short, medium, or long-term in duration; and permanent or temporary;
- Affecting a local, regional or global scale; including trans-boundary;

Table A: Impact Characteristics

S.No.	Impact Characteristics	Definition
1	Adverse	Causes adverse change from the baseline, or introduces a new undesirable factor.
2	Beneficial	Causes improvement on the baseline or introduces a positive change.
3	Direct Impact	Impacts that result from a direct interaction between a proposed project activity and the receiving environment/receptors
4	Indirect Impact	Impacts that result from other activities that are encouraged to happen as a consequence of the proposed project

Impact Severity

Impact severity is a function of the extent, duration, and, sensitivity of the receptor. The definition of extent, duration and sensitivity to consider for determining impact severity has been presented in B

Table B: Parameters to consider for impact severity

S.No	Classification	Description
1	Extent	Evaluation of the area of occurrence/influence of environmental impact; Extent can be defined as limited (within 2 km radius of the site); local (within 5 km radius of the site); regionally (district wide, nationally or internationally).

2	Duration	Defines the time which a receptor will be affected. Temporary (<1 year); short term (1 – 5 years); medium term (5 – 10 years); long term (>10); or permanent.
3	Sensitivity of receptor	*High sensitivity*: Entire community affected (more than 100 households affected), presence of world heritage and important cultural sites, presence of water body used by community within 50 m of project footprint, presence of ecologically sensitive area, national park or wild life sanctuary within 2 km of project site. *Medium sensitivity:* More than 50 and less than 100 houses affected, presence of forest area within 5 km, presence of water body used by community within 50-100 m of project footprint. *Low sensitivity:* No displacements, no potential for stakeholder conflict, less than 50 household affected, water body used by community present within 500 m of project footprint, no livelihood impact.

Based on the above table, impact severity is calculated as presented below:

- Very low: Environmental changes are within the existing limits of natural variations.
- Low: Environmental changes exceed the existing limits of natural variations. Natural environment is completely self-recoverable.
- Medium: Environmental changes exceed the existing limits of natural variations and results in damage to specific environmental components. Natural environment remains self-recoverable.
- High: Environmental changes result in significant disturbance to specific environmental components and ecosystems. Certain environmental components lose self-recovering ability.

Probability of occurrence

- The probability of occurrence of an impact is described below:
- Unlikely - The impact is unlikely to occur.
- Likely - The impact is likely to occur under most conditions.
- Definite - The impact will occur.

Impact Significance

Impact significance is determined from an impact significance matrix (**Table**) which compares severity of the impact with probability of its occurrence.

Table C: Impact significance

		Probability of occurrence		
		Unlikely	Likely	Definite
Severity	Very low	Negligible	Negligible	Minor
	Low	Negligible	Minor	Minor
	Medium	Minor	Moderate	Moderate
	High	Minor	Major	Major

Impact significance criteria are as follows:

- Major: These denote that the impact is unacceptable and further mitigation measures must be implemented to reduce the significance.
- Moderate: Impacts in this region are considered tolerable but efforts must be made to reduce the impact to levels that are as low as reasonably practical.
- Minor: Impacts in this region are considered acceptable.
- Negligible: Impacts in this region are almost not felt.

ANNEXURE XIV: FOREST NOC APPLICATION AND MAP OF PIPELINE

परिशिष्ट

अनुसूचित जनजाति एवं अन्य परम्परागत वन निवासी (वन अधिकारों की मान्यता) अधिनियम 2006 की धारा ...3 (2) के तहत् सरकार द्वारा प्रबंधित सुविधाओं हेतु वन भूमि को गैर–वन अद्देश्यों हेतु विपथन के लिए पूर्व अनुमोदन प्राप्त करने हेतु :–

प्रपत्र 'क'

(पैरा 2.2 (1) देखें)

(यूजर एजेंसी द्वारा भरा जाएगा)

1. परियोजना विवरण :– खूँटी शहरी जलापूर्ति योजना

(1) प्रस्तावित परियोजना/योजना, जिसके लिए वन भूमि वंछित है के विषय में

लघु कथन :– इन्टेक वेल से जलशोधन संस्थान तक पाईप लेे जाने हेतु जमीन

(2) वांछित वन भूमि का विवरण (2 विकल्पों उल्लेख करें)

(क) स्थान – सर्वे संख्या/कम्पार्टमेंट संख्या :– मौजा - बिरदू थाना नं० - 239 खाता नं० प्लॉट नं० - 3845

(ख) क्षेत्र का विस्तार (हेक्टेयर में) :– 0.0235 हेक्टेयर

(ग) वन मंडल :– खूँटी वन प्रमंडल

(घ) 1:50.000 के स्केल मैप पर निकटवर्ती वन सीमा तथा वंछित वन भूमि का नक्शा पर दिखायें :–

(3) प्रस्तावित वन भूमि में परियोजना लगाने की औचित्यता :– खूँटी शहरी क्षेत्र को पानी देने हेतु

(4) प्रत्येक हे0 में काटे जाने वाले परियोजना लगाने रखे जाने वाले वृक्षों की संख्या :– कोई वृक्ष नहीं प्रभावित होगा *

2 प्रस्ताव भवन/गतिविधि क्षेत्र मैप के साथ वांछित कुल वन भुमि का उद्देश्यवार अलग–अलग विवरण:–

3 इस आश्य की पुष्टि कि यूजर एजेंसी काटे जाने वाले वृक्षों की संख्या की दो गुनी सुख्या में उस परियाजना के निकटवर्ती क्षेत्र में वृक्ष लगायेगा तथा कम से कम 5 वर्षों तक उन वृक्षों की सुरक्षा तथा अनुरक्षण हेतु वार्षिक उपलब्ध करायेगी (विवरण संलग्न करें)। *

4 ग्राम सभा की संस्तुति – स्वीकृत/अस्वीकृति :– स्वीकृत

(जैसा भी मामला हो, (✓) का निशान लगाए)। (ग्राम सभा के संकल्प की प्रति संलग्न करें)

मेधना रुबी कच्छप

यूजर एजेंसी हेतु प्राधिकृत व्यक्ति का हस्ताक्षर

(बड़े अक्षरों में नाम) कार्यपालक पदाधिकारी, कार्यपालक खूँटी

पता :– .....

प्रस्ताव की क्रम संख्या :– .....

तिथि .....

स्थान .....

(रेंज वन अधिकारी का हस्ताक्षर)

प्रपत्र 'ख'

(पैरा 2.2 (4) देखें)

(संबंधित रेंज वन अधिकारी के द्वारा भरा जाएगा)

प्रस्ताव की क्रम संख्या.....

1. प्ररियोजना/योजना का नाम :– रहूँटी शहरी जलापूर्ति योजना
   (1) राज्य/संघ राज्य क्षेत्र :– झारखण्ड
   (2) जिला :– रहूँटी
   (3) वन विभाग :– रहूँटी प्रमंडल
   (4) प्रस्तावित वन भूमि (2 विकल्प उल्लेख करने हैं) मौजा - बिरहु आना ग०- 239 खाँट ग०- 38.39
   क. स्थान–सर्वे संख्या/कम्पार्टमेंट संख्या :–
   ख. क्षेत्र का विस्तार (हैक्टेयर में) :– 0.0235 हेक्टेयर

   (5) क्या यह जैविक रिजर्व, बाघ रिजर्व, हाथी कोरिडोर इत्यादि का भाग है।

2 प्रस्ताव की स्वीकृति (दो विकल्पों के लिए अगल–अलग) पर उचित विचार के साथ निरीक्षण दौरा किए जाने की तिथि का उल्लेख करते हुए स्थल निरीक्षण रिर्पोट संलग्न करें।

3 प्रस्ताव की स्वीकृति अथवा अन्य बातों हेतु रेंज वन अधिकारी की विनिर्दिष्ट संस्तुति तथा बेहतर विचार।

रेंज वन अधिकारी का हस्ताक्षर

नाम .....

कार्यालय मुहर .....

तिथि.....

स्थान .....

कारण का उल्लेख करते हुए स्वीकृत/अस्वीकृत

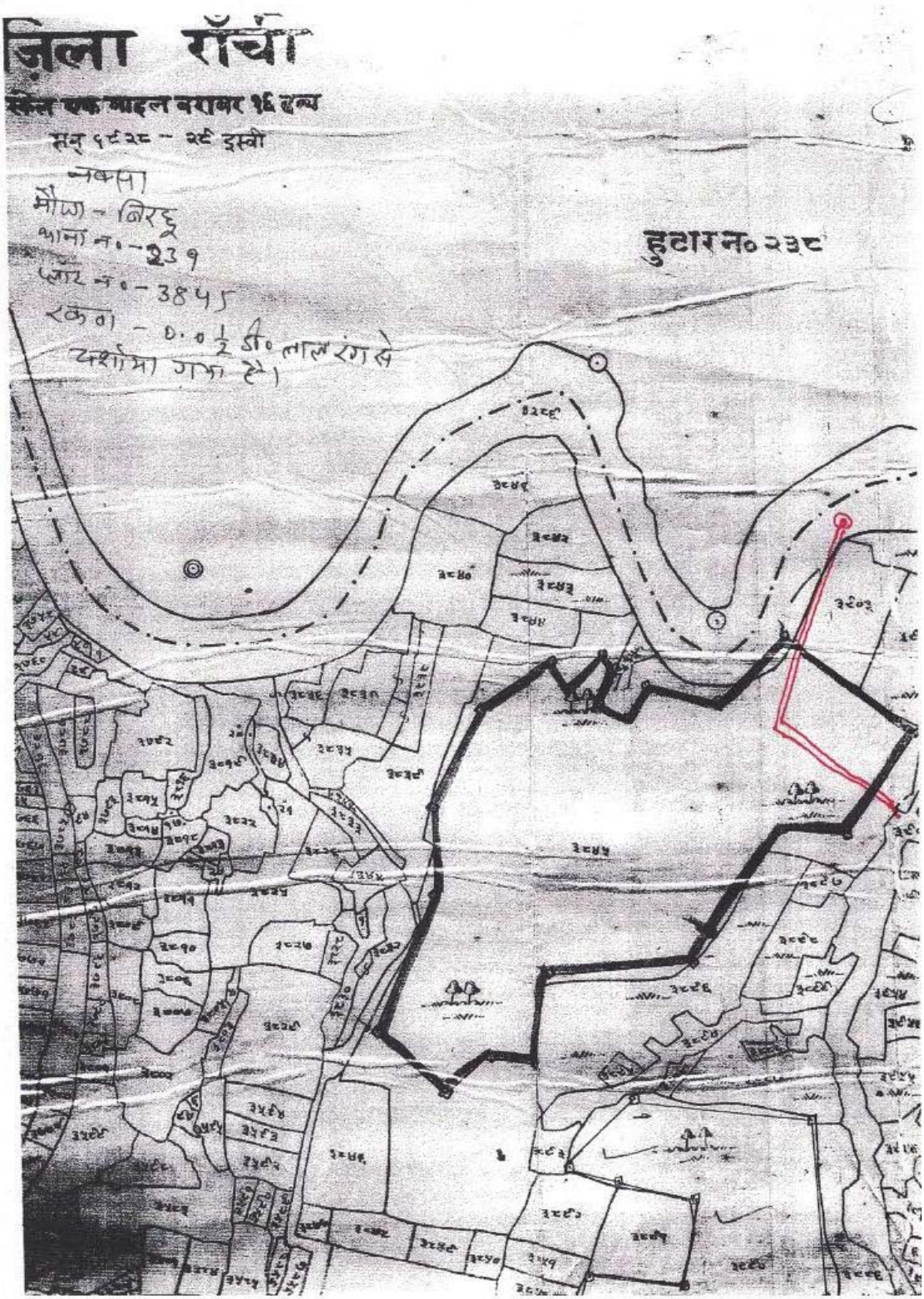
वन प्रमण्डल पदाधिकारी के हस्ताक्षर

नाम.....

कार्यालय मुहर.....

तिथि .....

दिनांक .....


ज़िला राँची
स्केल एक माइल बराबर १६ इन्च
सन् १९२८ – २९ इस्वी
नक्सा
मौजा - जिरदू
प्लाट नं० - 239
खेवट नं० - 3845
रकबा - ०.०½ डी० लाल रंग से
दर्शाया गया है।
हुटार नं० २३८

11 ANNEXURE XV: NOC ISSUED UNDER FRA, 2006, SECTION 3 (2) (FOR REPLACEMENT OF PIPELINE IN 0.0235 HA OF FOREST LAND)

कार्यालय : वन प्रमंडल पदाधिकारी, खूँटी वन प्रमंडल, खूँटी।

E-mail :.dfokhunti@gmail.com

झारखण्ड सरकार

पत्रांक :– 1110 /दिनांक :– 03/07/17

सेवा में,

कार्यपालक पदाधिकारी
नगर पंचायत, खूँटी।

विषय – **खूँटी शहरी जलापूर्ति योजना अंर्तगत पाईप बिछाने हेतु 0.235 हे0 वन भूमि के अपयोजन के स्वीकृति के संबंध में।**

प्रसंग – आपका पत्रांक– 740 दिनांक– 07.06.17 तथा खूँटी का पत्रांक–192 दिनांक–28.06.17

महाशय,

उपर्युक्त विषयाधीन खूँटी शहरी जलापूर्ति योजना अन्तर्गत इन्टेक वेल से जलशोध संस्थान तक पाईप ले जाने हेतु अनुसुचित जनजाति एंव अन्य परॅम्परागत वन निवासी (वन अधिकारों की मान्यता) अधिनियम 2006 की धारा 3 (2) के तहत समर्पित प्रस्ताव, वन क्षेत्र पदाधिकारी खूँटी के प्रसंगाधीन पत्र द्वारा समर्पित जाँच प्रतिवेदन तथा की गई अनुशंसा के आलोक में मौजा–बिरहु, थाना–खूँटी–239 के प्लॉट नं0–3845 में पड़ने वाले वन भूमि का कुल रकवा–0.0235 हे0 भूमि के अपयोजन की स्वीकृति अनुसूचित जन जाति एंव अन्य परम्परागत वन निवासी (वन अधिकारों की मान्यता) अधिनियम–2006 की धारा 3 (2) के अन्तर्गत निम्न शर्तों के साथ दी जाती है।

1) पाईप बिछाने हेंतु वन भूमि की एरिया में कोई वृद्धि नही किया जायेगा, वृद्धि किये जाने की स्थिति में वन संरक्षण अधिनियम 1980 के प्रावधान लागु होगा।

2) प्रस्ताव के साथ समर्पित नक्शे में बोर्ड परिवर्तन नही किया जायेगा।

3) किसी भी वृक्ष का पातन/क्षति नही किया जायेगा।

4) किसी वन्य प्राणी की कोई क्षति नही की जायेगी।

5) वन क्षेत्र सीमा के अंदर मिटटी कटाई/पत्थर तोड़ाई नही की जायेगी।

6) विपथन (Divertion) किये गये वन भूमि का उपयोग किसी की परिस्थिति में प्रस्तावीत कार्य के अतिरिक्त किसी अन्य प्रयोजन हेतु नही किया जायेगा।

आपका विश्वासी,

3.7.17

वन प्रमण्डल पदाधिकारी,
खूँटी वन प्रमण्डल, खूँटी।

1.7.17

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12 ANNEXURE XVI: JUSTIFICATION OF POINT NO. 5 OF FOREST NOC

NOC was provided by District Forest Officer(DFO) on 3.7.2017. Point number 5 of the NOC stated that no excavation work can be undertaken inside forest land.As the project required excavation activity inside forest for laying of pipeline, JUIDCO requested for clarification of the same from the DFO. DFO, Khunti on letter dated 28.07.2017 clarified that excavation activity can be undertaken 235 sqm of forest land for laying of pipeline

कार्यालय : वन प्रमंडल पदाधिकारी, खूँटी वन प्रमंडल, खूँटी।
E-mail :.dfokhunti@gmail.com

पत्रांक :– 1247 /दिनांक :– 28/07/17/

सेवा में,

कार्यपालक पदाधिकारी,
नगर पंचायत, खूँटी।

विषय :– शहरी जलापूर्ति योजना हेतु अनापत्ति पत्र निर्गत करने के संबंध में।

प्रसंग – इस कार्यालय का पत्रांक– 1110 दिनांक– 03.07.17 तथा आपका पत्रांक– 1007 दिनांक– 26.07.17

महाशय,

उपर्युक्त विषयक आपके प्रसंगाधीन पत्र के क्रम में सूचित करना है कि इस कार्यालय पत्रांक– 1110 दिनांक– 03.07.17 द्वारा विषयाधीन योजना हेतु वन अधिकार अधिनियम, 2006 के तहत आपके द्वारा समर्पित प्रस्ताव के आलोक में मौजा– बिरहू, थाना– खूँटी– 259 के प्लॉट नं0– 3845 में पड़ने वाले वन भूमि 0.0235 हे0 अपयोजन की सर्शत स्वीकृति प्रदान की गई है।

अतः अनुरोध है कि 0.0235 हे0 वन भूमि पर ही मिट्टी खोदाई कर पाईप लाईन बिछाने का कार्य करेंगे।

आपका विश्वासी,

28.07.17
वन प्रमण्डल पदाधिकारी,
खूँटी वन प्रमण्डल, खूँटी।

ANNEXURE XVII: NO OBJECTION FROM WATER RESOURCES DEPARTMENT FOR WATER WITHDRAWAL FROM EXISTING INTAKE POINT

256

झारखण्ड सरकार
जल संसाधन विभाग

पत्रांक– 2/PMC/विविध–425/2016– 487 /राँची, दिनांक 15/6/2016

प्रेषक,

श्री मुक्तिसाधन चौरसिया
उप सचिव (अभियंत्रण)

सेवा में,

FAX
e-mail

प्रधान सचिव
नगर विकास एवं आवास विभाग,
झारखण्ड, राँची।

विषय :– खूँटी शहरी जलापूर्त्ति योजना हेतु तजना सिंचाई (वीयर) योजना से पानी उपलब्ध कराने हेतु अनापत्ति के संबंध में।

प्रसंग :– नगर विकास एवं आवास विभाग, झारखण्ड सरकार, राँची का पत्रांक– JUDCO Ltd./Khunti/WS/204/2015-282 दिनांक 27.02.2016

महाशय,

उपर्युक्त विषयक आपके प्रासंगिक पत्र से प्राप्त प्रस्ताव के आलोक में खूँटी शहरी जलापूर्त्ति योजना हेतु जल पथ प्रमण्डल, खूँटी के अधीन तजना सिंचाई (वीयर) योजना से वर्ष 2018 से 7.88 MLD, वर्ष 2035 से 10.35 MLD एवं वर्ष 2048 से 14 MLD जल निकासी हेतु इन्टेक वेल के माध्यम से जल निकासी हेतु विभागीय अनापत्ति प्रदान की जाती है।

जल निकासी के लिए इन्टेक वेल के निर्माण करने से पूर्व इसकी जानकारी कार्यपालक अभियंता, जल पथ प्रमण्डल, खूँटी को दी जाय।

विश्वासभाजन,

15/6/2016

(मुक्तिसाधन चौरसिया)
उप सचिव (अभियंत्रण)

ANNEXURE XVIII: SCOPE OF WORK FOR SAFEGUARDS SUPERVISION

1. The CSQC team will include a suitably qualified Environment Social Health and safety Specialist (ESHS) to undertake the day-to-day supervision of contractors in all matters concerning compliance with the ESMP, and the occupational health, safety (OHS), Waste Management, Labour Camp Management and Labour influx and child labour etc...

2. The PIU's safeguards officers will provide independent oversight and inputs to the CSQC Consultant with regard to all aspects of environmental and social compliance, for the CSQC Consultant to have addressed on the project through their role.

3. The JMDP PMU will undertake at least quarterly inspections of the construction sites, accompanied by the CSQC safeguard specialists. The Environment and Social Specialist shall prepare a joint quarterly report to be agreed by all parties clearly identifying actions to be taken to improve safeguards compliance.

4. Prior to any contractor commencing civil works the CSQC ESHS specialist shall in consultation with the PMU:

    - Review and Clear the Contractor's ESMP to ensure that it meets that it meets the requirements of: (i) the respective ESMPs; (ii) fully complies with relevant national laws, including any conditions of consent; (iii) meets the World Bank's Environmental, Health and Safety (EHS), and applicable IFC industry Sector Guidelines and environmental and social safeguards policies of WBG

    - Review and Clear the Contractor's OHS Plan. This shall be consistent with the projects ESMP OHS requirements, as well as the World Bank's EHS guidelines, and applicable IFC industry Sector Guidelines.

5. The environmental and social specialist of PIU shall report to the PMU environemal and social specialists if any changes to project design or construction methods which would trigger an update to the Project ESMP, RAP and STPP. Changes to works or methods should be assessed against the existing Project Area of Influence (PAI), Corridor of direct impact (CoI) and whether there is a likely public interest aspect to the changes. If either the PAI (geographically, socially or environmentally) has changed or CoI has changed substantially or if there is a public interest element to the changes then the safeguard instruments shall be updated.

6. CSQC shall regularly update JUIDCO PIU and PMU on progress with the contractor's applications for permits or consents as relevant under local laws or regulations.

7. CSQC shall Supervisethe management of the Contractors labour in all matters concerning occupational health, safety and care of the works and workers, including HIV/AIDS prevention, gender based violence (GBV).

8. CSQC shall ensure that the contractor is adhering to the day-to-day requirements of the ESMP, the environmental and social safeguard requirements under GoI laws (including conditions of consent), and the World Bank's occupational health, environmental and social safeguards policies.

9. CSQC shall ensure that any workers camps are established and managed in accordance with the recommendations of the ESMP and the guidance contained in the IFC Guidance Note on Worker's Accommodation.

10. CSQC shall issue instructions to the Contractor to address any ESMP non-compliance issues.

11. CSQC shall submit monthly progress report and support PIU in preparation of quarterly safeguard progress reports in an agreed format covering all aspects of the project supervision, including project progress, testing results, occupational health and safety, ESMP compliance, incidents, near misses, summary of grievances / complaints and actions taken, upcoming or potential issues to be any consultation undertaken, relevant training, and compliance with permits and consents.

12. CSQC shall provide support to contractor, PIU to consult with the communities and stakeholders in accordance with the consultation plan in the ESMP