

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR 500kV TRANSMISSION LINE FROM SUKI KINARI – MAIRA SWITCHING STATION LOT-2

Environmental Monitoring and Laboratory Testing

The proposed Transmission Line (T/L) from Suki Kinari to Maira Switching Station starts near Paras, Kaghan Valley in Khyber Pakhtunkhwa (KP) province where the proposed Suki Kinari Hydro Power Project (HPP) is under construction and ends at proposed 500kV Switching Station Maira, District Rawalpindi in Punjab Province. The T/L transverses through hilly to semi hilly area of Abbottabad and Rawalpindi Districts.

The said T/L has been divided into two (02) LOTS, LOT-1 traverses through KP province whereas LOT-2 traverses through KP and Punjab provinces. Below Terms of Reference (ToR) specifically deals in LOT-2.

1. ToR for Drinking Water and Surface Water Sampling/Monitoring

This ToR provides the objectives and the scope of work for the environmental monitoring laboratory that will be hired to undertake drinking water and surface water baseline monitoring in the subject Project Area. The main objective of drinking water and surface water baseline monitoring is to evaluate the existing quality of drinking water and surface water.

1.1. Scope of Work:

The scope of work consists of but not limited to the following activities/requirements:

- a) Internationally accepted code of practices will be used for drinking water and surface water sampling (collection method, precautions/instructions for sampler, sample preservation before delivered to laboratory for analysis etc.).
- b) Integrated composite sampling will be carried out for obtaining drinking water and surface water samples from the following locations:

Location	Sampling Area	Type of Sample	No. of Samples
1	Abbotabad and Rawalpindi Districts	Surface Water	08
		Drinking Water	07
Total samples			15

- c) The Bidder/Contractor will undertake the required testing for the following parameters:

Type of Sample	Parameters
Drinking Water	Color, pH, Turbidity, Total Hardness, Total Dissolved Solid (TDS), Aluminum (Al), Antimony (Sb), Barium (Ba), Boron (B), Cadmium (Cd), Chloride (Cl ⁻), Chromium (Cr), Copper (Cu), Cyanide (CN), Fluoride (F), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), Nitrate (NO ₃ ⁻), Nitrite (NO ₂ ⁻), Selenium (Se), Residual Chlorine, Odor, Taste, Arsenic (As), Zinc (Zn ²⁺),

	Pesticides, Phenols (Total Phenolic Compounds), Total Coli forms, Fecal Coli forms (E.Coli).
Surface Water	Temperature, pH, COD, BOD ₅ , Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Chloride Fluoride (F-), Oil & grease, Phenols (Total Phenolic Compounds), Cyanide (CN-), Anionic Detergents as MBAS, Sulfate (SO ₄ ⁻²), Sulfide (S), Ammonia NH ₃ , Cadmium (Cd), Chromium (Cr) as Hexavalent & Trivalent, Copper (Cu), Lead (Pb), Nickel (Ni), Zinc (Zn), Iron (Fe), Manganese (Mn), Selenium (Se), Silver (Ag), Arsenic (As), Barium (Ba), Boron (B), Mercury (Hg), Chlorine (Cl), Total Toxic Metals, Turbidity, Dissolved Oxygen, Pesticides.

- d) Sampling methodology shall be as per National Environmental Quality Standards (NEQS). NESPAK's engineers/scientist shall supervise the sampling process at site.
- e) Analytical procedures shall be according to USEPA methods. Results of analysis will be compared with NEQS limits. However, where these standards do not provide limits for certain parameters, other appropriate international standards will be used for comparison.
- f) The Contractor will provide comprehensive report on drinking water and surface water, which will include, but not limited to the following:
 - I. General
 - II. Sampling methodology and locations
 - III. Analysis of results with remarks / comments
 - IV. CV's and designations of personnel responsible for sampling, monitoring and report writing.
- g) The security arrangements for sampling shall be bidder/contractor's responsibility.
- h) The report must be submitted within fifteen (15) days after mobilization.

2. Program for Air Quality and Background Noise Levels Baseline Monitoring

2.1. Introduction

Air quality and background noise levels baseline monitoring is required to be performed in the same Project Area. The objective of monitoring would be to analyze the existing ambient air quality and background noise levels at each site of the subject project and to analyze the existing emission sources.

2.2. Monitoring Locations

Eighteen (18) locations have been identified for baseline ambient air quality (09 Points) and background noise monitoring (09 Points), which are given below:

Sr. No.	Location	Type of Monitoring/Sampling	No. of Samples
1	Abbotabad and Rawalpindi Districts	Ambient Air	09
		Noise Level	09
Total sampling points			18

The exact locations will be finalized by NESPAK Environment Specialist, who will also supervise the activities of the lab in the field.

2.3. Methodology for Ambient Air Quality and Background Noise Level Baseline Monitoring

The monitoring methodology for each of the air quality parameter will be in accordance with the requirements of NEQS, Statutory Regulatory Order (SRO) 1062 (I)/2010 for ambient air and 1064(I)/2010 for Noise levels. Sampling methodology will be approved by NESPAK before mobilization to site and monitoring works will be top supervised by NESPAK's representative (s).

2.4. Monitoring Protocol

The details of the testing parameters and averaging period as per NEQS are given below:

Type of Sample	Number of Samples	Testing Parameters
Ambient Air Monitoring	09	SO ₂ (Averaging Period: 24 hours)
		NO (Averaging Period: 24 hours)
		NO ₂ (Averaging Period: 24 hours)
		CO (Averaging Period: 1 hour & 8 hours)
		Suspended Particulate Matter (Averaging Period: 24 hours)
		PM ₁₀ (Averaging Period: 24 hours)
		PM 2.5 (Averaging Period: 1 hour & 24 hours)
		Ozone (Averaging Period: 1 hour)
		Volatile Organic Compounds (VOC)
		CO ₂
Noise Level Monitoring	09	dB(A)

2.5. Monitoring Report

After completion of monitoring and testing, results will be compared with NEQS and a comprehensive report on baseline air quality and noise levels monitoring will be prepared and submitted by the monitoring laboratory within fifteen (15) days after mobilization. Report will

cover the introductory part, sampling methodology, monitoring and sampling locations with coordinates, analysis of results/remarks, comparison with applicable national and international standards and pictorial representation.

2.6. Transportation and Security

The cost for collection, preservation and transportation of samples to the laboratory and other logistics such as transport, accommodation etc. is to be borne by the Laboratory. Cost must be inclusive of all taxes. Considering the topography of the area, the cost of hiring local jeeps for the movement of equipment's (if required) shall be borne by the bidder. The bidders shall also take care of security arrangements (if required) for themselves during field work.