ANNEXURE I

Technical Quality Audit Parameters: Drinking Water Supply Schemes

Pre-implementation Stage

S.No.	Parameter	Benchmark	Reference	Indicator	Sub indicators	Max. marks	Marks Obtained	Weightage
1	Planning & Design	Technical Framework in comprehensive Planning	DPR	1.1) survey & investigation	1.1.1) Topographic Survey	4		25 %
					1.1.2) Land Acquisition, Forest clearance etc.	4		
					1.1.3) NOC from Railways, Electricity Board, Water Resources, Roads, Panchayat	4		
				1.2) Demand and Resource assessment	1.2.1) Population growth, Industrial Development & seasonal variation.	4		
					1.2.2) Available water sources & their lean period discharge	2		
					1.2.3) Discharge depletion studies	2		
					1.2.4) Assessment of existing water supply infrastructures and their uses.	2		
				1.3) Selection of technology for network design	1.3.1) Use of latest software for Pipe Network and Economic Design of Pumping Mains along with drawings	10		
				1.4) Selection of appropriate Technology for treatment of water & Sewage and Innovation	1.4.1) Optimum design of WTP with advanced treatment technologies.	10		
					1.4.2) Provision of water sources sustainability measures	5		
					1.4.3) Assessment of other uses of selected source and raw water testing	1		
					1.4.4) Use of modern mechanized/digital equipments such as:i) Remote Monitoring, ii) SCADA, iii) Automated Meter Reading (AMR), iv) Leak Detection, v) GIS (Geographic Information	10		

					System), vi) Smart Pumping Systems vii) Online Water Quality Analyzers, vii) automated chlorination viii) Mobile Applications ix) Customer Portals x) Drone Photography etc.			
				1.5) Cost Analysis, Budget planning and timeline estimates	1.5.1) Financial implication with cost index upto implementation period.	2		
					1.5.2) Identification of funding agency with annual budget allocation	3		
					1.5.3) Period for DPR approval, call of tenders, award of work & its implementation etc.	5		
				1.6) Framing specification	1.6.1) Identification of suitable materials proposed to be used	5		
					1.6.2) Framing specifications for above materials	10		
				1.7) Long term Planning	1.7.1) Future requirement projections such as vacant space for expansion and modular design of WTP and storage tanks	1		
					1.7.2) Future development of the area such as industrial growth, education hub etc.	1		
					1.7.3) Horticulture Planning for aesthetics of pump-house, storage, and WTP	1		
				1.8) Reducing O&M cost	1.8.1) Provision of solar energy	1		
					1.82.) Provision of energy efficient machinery such as BEE certified/star rated	1		
					1.8.3) Provision of automation	1		
					1.8.4) Life cycle cost analysis of pumping machinery	1		
				1.9) Tube Well Design	1.9.1) Site Selection and tubewell design as per the project requirements	10		
					Total	**100**		**25%**

IMPLEMENTATION STAGE

Sr. no.	Parameter	Benchmark	Reference	Indicator	Sub Indicators	Max. marks	Marks obtained	Weightage
2	Execution, Inspection and testing	Technical Methodology for implementation and inspection & testing	Contract Agreement and test reports	2.1) Use of all construction materials	2.1.1) Materials such as aggregates, sand etc. from approved source	2		40%
					2.1.2) Use of design mix and weigh mix	2		
					2.1.3) Procurement of piped of approved make and manufacturer	2		
					2.1.4) Carrying out tests at manufacture's premises before dispatch	2		
				2.2) Pumping system efficiency enhancement	2.2.1) Use high efficiency pumps & motors specifically designed for site requirements	3		
					2.2.2) Use of designed size of rising main/Suction pipe to minimize frictional losses	3		
					2.2.3) Provision of positive suction head	3		
				2.3) supervision by skilled manpower/TPIA	2.3.1) Deployment of appropriately qualified personal	2		
					2.3.2) Manpower deployment as per requirement	2		
				2.4) Use of modern facilities for construction and treatment	2.4.1) Advance water treatment such as Arsenic, Iron, Fluoride membrane filtration, UV disinfection etc.	4		
					2.4.2) Automated operation of Pumps/WTP	4		
					2.4.3) Smart metering and leakages detection	4		
					2.4.4) GIS mapping of sources, network and all other infrastructures	2		
				2.5) Conformity to relevant standards	2.5.1) Work executed as per approved bid document	10		

				2.6) Making good the dismantled surfaces	2.6.1) Dismantled roads and streets are repaired properly and dismantled material disposal.	5		
				2.7) Pre & Post Inspections of all materials	2.7.1) Physical inspection of pipes at site before laying	2		
					2.7.2) Ensure requires frequency of tests during implementation	2		
					2.7.3) Water sample testing after treatment	4		
					2.7.4) Non-Destructive testing of concrete structures, where applicable	2		
				2.8) setting up of testing laboratory	2.8.1) Setting up water testing laboratories at site of WTP	4		
					2.8.2) Setting up of water testing laboratories at district and state level	4		
					2.8.3) Ensuring NABL accreditation of water testing laboratories at district/state level	4		
				2.9) Functionality & testing of pipes, discharge measurement of Pumps	2.9.1) Flow testing in pipes after laying at site	2		
					2.92) Testing of pumping machinery to meet with the required discharge	4		
					2.9.3) Availability of electric/ Solar energy as per requirements	4		
				2.10) Documentation and Reporting	2.10.1) Preparation of site inspection and quality control registers	2		
					2.10.2) Checking of test results by Engineer in Charge	2		
					2.10.3) Rectification of defects	2		
					2.10.4) Submission of reports and keeping the record	2		
				2.11) Tubewell Drilling and Development	2.11.1 Drilling Process	4		
					2.11.2) Development of the Tube Well	3		
					2.11.3) Completion and Maintenance	3		

Total	**100**		**40%**

COMMISSIONING

Sr. no.	Parameter	Benchmark	Reference	Indicators	Sub Indicator	Max. marks	Marks obtained	Weightage
3	Commissioning and Hand over	Guidelines for commissioning and handover	Completion report	3.1) Testing the functionality	3.1.1) 100% HH water connections	20		15%
					3.1.2) System flushing and disinfection	5		
					3.1.2) Specified Quantity, quality and regularity of water	20		
				3.2) Testing and Functionality of WTP	3.2.1) Cleaning & disinfection of WTP	5		
					3.2.2) Specified quality and quantity of potable water from WTP	10		
					3.2.3) Proper operation of SCADA and online analyzer	10		
				3.3) Submission of Assets management Plan and completion certificate	3.3.1) Submission of Assets completion Plan and completion report by Agency and certificate by Department	5		
					3.3.2) Preparation of Manual on Standard Operating Methods and Procedure for WTP	5		
					3.3.3) Emergency response mechanism	5		
				3.4) Guarantee of works	3.4.1) Post commissioning Monitoring and support	10		
					3.4.2) Withhold of security amount	5		
					Total	**100**		**15%**

SAFETY AND SECURITY

Sr. no.	Parameter	Benchmark	Reference	Indicator	Sub Indicator	Max. marks	Marks obtained	Weightage
4	Safety and Security	Guidelines for Safety and Security		4.1) Adherence to safety standards	4.1.1) Providing of safety measures such as first aid & firefighting equipments, safety uniforms etc.	3		5%
					4.1.2) Monitoring and Surveillance	2		
				4.2) Safety measures for workers and users	4.2.1) Access control	1		
					4.2.2) Detection, alert and remedial measures in case of chlorine gas leakage if applicable	2		
				4.3) Security measures	4.3.1) Physical Security measure	1		
					4.3.2) Incident response and reporting	1		
					Total	**10**		**5%**

OPERATION & MAINTENACE

S.No.	Parameter	Benchmark	Reference document	Indicator	Sub Indicator	Max. marks	Marks obtained	Weightage
5	Operation and maintenance	Procedure for effective maintenance	Assets management plan and manual on SOMP	5.1) Compliance to prescribed deliverable	5.1.1) Supply of Specified Quantity and regularity of water upto tail end.	20		100 %
					5.1.2) Supply of specified Quality of potable water from WTP and upto tail end	20		
				5.2) Effective running of Machinery /WTP/STP	5.2.1) Deployment of skilled staff for operation and maintenance	5		
					5.2.2) Deployment of required number of staff for operation and maintenance	5		
					5.2.3) Running as per operation manuals on Standard Operating Methods and Procedure	5		
				5.3) Timely rectification of defects	5.3.1) Grievance redressal and record keeping	10		
					5.3.2) Maintenance schedule development and its compliance	10		
					5.3.3) Availability of spare parts/stand by machinery	10		
					5.3.4) Training and Capacity building	5		
					5.3.5) Regular disinfection	5		
					5.3.6) No panelty of electric bill for non-installation of capacitor, overload, delayed payments etc.	5		
					Total	**100**		**100%**

Sr. No.	Parameter	Marking Criteria	Weightage (%)	Marks obtained
1	Design and Planning		25*	
2	Execution, Inspection and Testing		40*	
3	Commissioning and Handing over		15*	
4	Safety Measures		5*	
5	Project Management	Adherence to project timelines and Cost Projections	5	
6	Environmental Measures	Consideration of environmental factors like sustainability, eco-friendly construction practices	5	
7	User Feedback	Feedback from beneficiaries, stakeholders to assess their satisfaction levels	5	
		TOTAL	**100**	
1	**Operations and Maintenance**		100*****	
		TOTAL	**100**	

*The breakup of the weightage is given in the detailed framework for these parameters

* Parameters that are not applicable to a specific project will not be considered in the audit scoring. The weightage will be adjusted accordingly