

## Part B Individual Treatment Plant

### Questionnaire for 8 target states and 2 Union Territories in India

#### Face sheet

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Maharashtra
2	Name of city/town	Ghatkopar
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

#### I Summary of sewage treatment plant

1 <b>Basic data related to facilities</b>				
1.1	Are there calculations for basic design and capacity of treatment plant facilities?	Yes	<input type="radio"/> No, <input type="radio"/> Others :	
1.2	Is there a layout plan showing earthwork, machinery, and electrical equipment?	Yes	<input type="radio"/> No, <input type="radio"/> Others :	
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings.	Yes	<input type="radio"/> No, <input type="radio"/> Others :	
1.4	Is there a flow chart for instrumentation?	Yes	<input type="radio"/> No, <input type="radio"/> Others :	
1.5	Are there single-line diagrams (electrical)?	Yes	<input type="radio"/> No, <input type="radio"/> Others :	
1.6	Sewage treatment process used (Example: Conventional activated sludge process)	AL		
1.7	Sludge treatment process used (Example: Sludge drying after thickening)	N/A		
1.8	Which is the effluent discharge point?	<input type="radio"/> River, <input type="radio"/> Lakes and marshes, <input type="radio"/> Sea area, <input type="radio"/> Others : Use for agriculture		
1.9	Layout of plant (please attach the drawing, if you have)	<input type="radio"/> Yes, <input type="radio"/> No		
2 <b>History</b>				
2.1	Is the history of failure, repair, or reconstruction recorded?	Yes	<input type="radio"/> No, <input type="radio"/> Others :	
2.2	Are there any requests or complaints from surrounding residents?	Yes	<input type="radio"/> No, <input type="radio"/> Others :	
3 <b>Design capacity and actual loading</b>				
3.1	Design wastewater flow	400	MLD	
3.2	Average daily flow	125	MLD	
3.3	Maximum daily flow	250	MLD	
3.4	Dry weather flow	125	MLD	
3.5	Design wet weather flow	400	MLD	
3.6	Wet weather flow	250	MLD	
3.7	Design wastewater influent quality	N/A		
3.8	Average wastewater influent quality	BOD 32 mg/l, COD 59 mg/l, SS 40 mg/l		
3.9	Design effluent quality	N/A		
3.10	Average effluent quality	BOD 10 mg/l, COD 26 mg/l, SS 20 mg/l		
3.11	Solids capture rate	N/A	%	
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)?	N/A		
3.13	Frequency of drawing out sludge	N/A	times/day	times/month
3.14	Frequency of sludge carried outside STP	Once in 10 years		times/month,
3.15	Design sludge generation volume and water content	N/A	MLD,	ML/year, %
3.16	Average sludge generation volume, and water content	N/A	MLD,	ML/year, %
3.17	Percentage of volatile solids in generated sludge	mean: %,	max: %,	N/A
3.18	Methods of effective sludge or waste utilization	Fertilizer, Waste		N/A
3.19	Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge?	t/year, %		N/A
3.2	Are there operation records for pumps, equipment, blowers, etc.?	Daily report: <input type="radio"/> Yes, <input type="radio"/> No, Monthly report: <input type="radio"/> Yes, <input type="radio"/> No		
3.2.1	Is the water quality measured regularly?	<input type="radio"/> Yes, <input type="radio"/> No		
3.2.2	Are water quality measurement records maintained?	Daily report: <input type="radio"/> Yes, <input type="radio"/> No, Annual report: <input type="radio"/> Yes, <input type="radio"/> No		
3.2.3	Is record of concentration of toxic substances in sludge maintained?	Yes	<input type="radio"/> No, <input type="radio"/> Others :	

3.2.4	Has the water quality of the final effluent exceeded the effluent standards anytime?	Yes	<input checked="" type="radio"/> No
3.2.5	If Yes, what are the cause for exceeding the effluent standard?	No	
<b>4 Corrosion of facilities and damage status</b>			
4.1	Is there corrosion of buildings or structures?	<input checked="" type="radio"/> Yes	No name of part :
4.2	Was there any damage to the building frame part of facilities?	<input checked="" type="radio"/> Yes	No, name of part :
4.3	Is there corrosion in equipment?	<input checked="" type="radio"/> Yes	No, name of part :
4.4	Is there damage to equipment?	<input checked="" type="radio"/> Yes	No, name of part :
4.5	Are there records of corrosion and damage to facilities?	Yes	<input checked="" type="radio"/> No
4.6	Is there foul smell most of the time?	Yes	<input checked="" type="radio"/> No
4.7	Is scum generated?	A large amount	<input checked="" type="radio"/> Small amount, No
<b>5 Management of planned facilities</b>			
5.1	Is there an operation schedule for machinery and equipment	Yes "manufacturer compilation, Others	<input checked="" type="radio"/> No
5.2	Is there an operation manual?	Yes	<input checked="" type="radio"/> No
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	<input checked="" type="radio"/> Yes	No
	Is there a wastewater examination method?	Yes: Name of the method:	N/A
		No:	
5.4	Are there the education and training manuals for the staff?	Yes	No
<b>6 Inspection of facility and equipment</b>			
6.1	Are there check records for equipment?	Daily report: <input checked="" type="radio"/> Yes	No, Monthly report: Yes
		Annual report: Yes	No
6.2	Is there an inspection manual?	Yes	<input checked="" type="radio"/> No
6.3	Is there an inspection schedule?	Yes	<input checked="" type="radio"/> No
6.4	Details of inspection procedure	Visual/audible/TV camera, others :	N/A
6.5	How has the result of the inspection been used?	N/A	
6.6	How are inspection results maintained?	Electronic data, Hard copy, Others :	N/A
<b>7 Repair, Rehabilitation, Reconstruction</b>			
7.1	Is there a manual for repair, rehabilitation and reconstruction of facility and equipment?	Yes	<input checked="" type="radio"/> No
7.2	If Yes, is it being used?	Yes	<input checked="" type="radio"/> No
7.3	Are there repair, rehabilitation and reconstruction plans for facility and equipment ?	Yes	<input checked="" type="radio"/> No
7.4	Have repairs, rehabilitation and reconstruction been implemented?	Yes	<input checked="" type="radio"/> No
7.5	Are there repair, rehabilitation and reconstruction	Electronic data, Hard copy, Others :	N/A
<b>8 Work implementation</b>			
8.1	Staffing or Manpower at Plant	Executive engineer : 1 person Asst : 1 person Sub : 6 persons Foremen (1per shift + 2reliever) : 4+1 persons	
8.2	Engineers	Laborers : 12 persons Electricians : 4 persons Welder : 1 person, Carpenter : 1 person, Mason : 1person Painter : 1person	
8.3	Working time	N/A Regular working time From : to : to : Shifts	
8.4	Work mode	N/A Permanent worker Subcontractor	
8.5	Contents of work	Operation, Maintenance, Repair	N/A
8.6	Others (Are there the special measures taken at the time of accidents or disasters)	Yes	No N/A
<b>9 Procurement of utility and materials</b>			
9.1	Is the procurement of the chemicals easy?	Yes	No N/A
9.2	Is there a procurement plan of chemicals?	Yes	No N/A
9.3	Amount of electric power used each day/month, and of one year	15850kWH/day, 482131kWH/month, 5785580kWH/year	
9.4	Quantity of industrial chemicals used "Chlorine, Coagulant, etc."	No ; kg/d, kg/year	
		No ; kg/d, kg/year	
9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	Yes	<input checked="" type="radio"/> No
9.6	Frequency of power failure during year, total number of hours of power failure	N/A	times/year hours/year
9.7	Are there standby power generators?	N/A	
9.8	How many times a year and how many hours a year is the standby power generator used?	N/A	times/year hours/year

<b>10 Efficiency improvement and remedial measures and maintenance management of</b>			
10.1	Is there a centralized control system?	Yes	<input type="radio"/> No
	Is there a data logger system?	Yes	<input type="radio"/> No
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No Maintenance
<b>11 Safety management</b>			
11.1	Is there a safety and hygiene organization?	Yes	<input type="radio"/> No
11.2	Is there a safety operation manual?	Yes	<input type="radio"/> No
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input type="radio"/> No
11.6	Is education and training implemented for health and safety?	Yes	<input type="radio"/> No
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	Yes	No

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

<b>1 Machinery system</b>			
<b>1.1 Type of screens</b>			
1.1.1	Is there a coarse screen?	Yes	<input type="radio"/> No
1.1.2	Is screen type mechanical?	Yes	<input type="radio"/> No
1.1.3	Is there a fine screen?	<input checked="" type="radio"/> Yes	No
1.1.4	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
<b>1.1.5 Grit chamber</b>			
1.1.6	Is there a crushing device?	Yes	<input type="radio"/> No
1.1.7	Is there a conveyor?	Yes	<input type="radio"/> No
<b>1.1.8 How is the grid chamber cleaned?</b>			
	Mechanically?	<input checked="" type="radio"/> Yes	No
	Bucket elevator?	<input checked="" type="radio"/> Yes	No
	Jet pump?	Yes	<input type="radio"/> No
	Screw?	Yes	<input type="radio"/> No
	Air lift?	Yes	<input type="radio"/> No
	Manually?	<input checked="" type="radio"/> Yes	No
	Aeration?	<input checked="" type="radio"/> Yes	No
<b>1.2 Pumps</b>			
1.2.1	What is the rated voltage of main pump?	6600 V	
1.2.2	Is there any speed controlled pump?	Yes	<input type="radio"/> No
1.2.3	If Yes, what is the type of pump?	Yes	<input type="radio"/> No
1.2.4	If Yes, what is the method of speed control?	Yes	<input type="radio"/> No
1.3	What type of aeration facilities used?	Surface aeration	
1.3.1	What type of air diffuser is used?	No	
<b>1.4 Disinfection equipment</b>			
1.4.1 What type of disinfection method for effluent is			
	Chlorination?	Yes	<input type="radio"/> No
	Ultra violet ray?	Yes	<input type="radio"/> No
	Ozonizer?	Yes	<input type="radio"/> No
<b>1.5 Sludge thickening equipment</b>			
1.5.1 What type of sludge thickening equipment is used			
	Gravity thickening?	No	
	Air flotation?	No	
	Centrifugal thickening?	No	
	Belt type?	No	
<b>1.6 Sludge dehydration equipment</b>			
1.6.1 What type of sludge dehydration method is adopted			
	Mechanical?	No	
	Filter press?	Yes	<input type="radio"/> No
	Centrifugal dehydration	Yes	<input type="radio"/> No
	Vacuum filtration?	Yes	<input type="radio"/> No
	Others?	No	
1.6.2	Where does the dewatered sludge go to?	N/A	
1.7.1	Sludge digestion facility (Anaerobic)?	Yes	<input type="radio"/> No
1.7.2	Is digester gas used?	Yes (for )	<input type="radio"/> No
<b>2 Electrical system</b>			
<b>2.1 Substation facility</b>			
2.1.1	What is the substation voltage?	N/A	V
<b>2.3 Uninterrupted power supply (UPS)</b>			
2.3.1	Is there uninterrupted power supply?	Yes	No N/A
2.3.2	If Yes, is it DC supply or AC supply?	AC	DC N/A
2.3.3	What are the applications of this power supply?	N/A	
<b>2.5 Measuring instruments</b>			
2.5.1 What type of flow meter is used and where?			
	Electro-magnetic?	Yes ( )	<input type="radio"/> No
	Ultrasonic?	Yes ( )	<input type="radio"/> No
	Orifice plate?	Yes ( )	<input type="radio"/> No
	Venturi?	Yes ( )	<input type="radio"/> No
	Weir?	Yes ( )	<input type="radio"/> No
	Partial flume?	Yes ( )	<input type="radio"/> No

2.5.2	<b>What type of level gauge is adopted and where?</b>		
	Float-type?	Yes ( )	No ( )
	Pressure-type?	Yes ( )	No ( )
	Ultrasonic?	Yes ( )	No ( )
	Radio wave ?	Yes ( )	No ( )
2.5.3	<b>Is a water quality meter used?</b>		
	PH?	Yes ( )	No ( )
	DO?	Yes ( )	No ( )
	MLSS?	Yes ( )	No ( )
	ORP?	Yes ( )	No ( )
	Turbidity?	Yes ( )	No ( )
	Nitrogen?	Yes ( )	No ( )
	Phosphorus?	Yes ( )	No ( )
2.5.4	<b>Is sludge measurement performed?</b>		
	Sludge concentration?	Yes ( )	No ( )
2.5.5	<b>Is any meteorological instrument used for the following?</b>		
	Temperature?	Yes ( )	No ( )
	Atmospheric pressure?	Yes ( )	No ( )
	Rain?	Yes ( )	No ( )
	Wind velocity (Anemometer)?	Yes ( )	No ( )
2.5	<b>Monitoring control system</b>		
2.5.1	<b>Does a lookout post exist at the following</b>		
	Grit chamber		
	Dry well		
	Sewage treatment facility		
	Sludge thickening equipment		- Manual Control Room at Old Ghatkopar PS.
	Sludge dehydration equipment		
	Anaerobic digestion tank		
	Pumping station		
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	Yes ( )	No ( )

**Part B Individual Treatment Plant**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Face sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Maharashtra
2	Name of city/town	Navi Mumbai
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

**I Summary of sewage treatment plant**

<b>1 Basic data related to facilities</b>	
1.1	Are there calculations for basic design and capacity of treatment plant facilities? <input checked="" type="radio"/> Yes No, Others :
1.2	Is there a layout plan showing earthwork, machinery, and electrical equipment? <input checked="" type="radio"/> Yes No, Others :
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings, <input checked="" type="radio"/> Yes No, Others :
1.4	Is there a flow chart for instrumentation? <input checked="" type="radio"/> Yes No, Others :
1.5	Are there single-line diagrams (electrical)? <input checked="" type="radio"/> Yes With contractor No, Others :
1.6	Sewage treatment process used (Example: Conventional activated sludge process) SBR
1.7	Sludge treatment process used (Example: Sludge drying after thickening) Centrifugal dehydrator
1.8	Which is the effluent discharge point? Horticulture
1.9	Layout of plant (please attach the drawing, if you have one) Yes
<b>2 History</b>	
2.1	Is the history of failure, repair, or reconstruction recorded? Yes <input checked="" type="radio"/> No Others :
2.2	Are there any requests or complaints from surrounding residents? Yes <input checked="" type="radio"/> No
<b>3 Design capacity and actual loading</b>	
3.1	Design wastewater flow 100 MLD
3.2	Average daily flow 36.2 MLD
3.3	Maximum daily flow 225 MLD
3.4	Dry weather flow None MLD
3.5	Design wet weather flow None MLD
3.6	Wet weather flow None MLD
3.7	Design wastewater influent quality BOD Max250 Min100 Avg175mg/l, COD 400 mg/l, SS 200 mg/l
3.8	Average wastewater influent quality BOD 199 mg/l, COD 308 mg/l, SS 170 mg/l
3.9	Design effluent quality BOD <5 mg/l, COD <100 mg/l, SS <10 mg/l
3.10	Average effluent quality BOD 5 mg/l, COD 28 mg/l, SS 10 mg/l
3.11	Solids capture rate None %
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Pump
3.13	Frequency of drawing out sludge Cotinuously 16hours/day times/day times/month
3.14	Frequency of sludge carried outside STP None times/month, times/year
3.15	Design sludge generation volume and water content Generated: 13475kg/day Excess sludge: 1680 m <sup>3</sup> /day MLD, ML/year, %
3.16	Average sludge generation volume, and water content None MLD, ML/year, %
3.17	Percentage of volatile solids in generated sludge None mean: %, max: %, min: %
3.18	Methods of effective sludge or waste utilization agriculture
3.19	Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? t/year, 80 % (Design) After calculation
3.2	Are there operation records for pumps, equipment, blowers, etc.? Daily report: <input checked="" type="radio"/> Yes No, Monthly report: <input checked="" type="radio"/> No, Annual report: <input checked="" type="radio"/> Yes With client

3.2.1	Is the water quality measured regularly?	<input checked="" type="radio"/> Yes <input type="radio"/> No
3.2.2	Are water quality measurement records maintained?	Daily report: <input checked="" type="radio"/> Yes <input type="radio"/> No, Annual report: <input checked="" type="radio"/> Yes <input type="radio"/> No.
3.2.3	Is record of concentration of toxic substances in sludge maintained?	Yes <input checked="" type="radio"/> No
3.2.4	Has the water quality of the final effluent exceeded the effluent standards anytime?	Yes <input checked="" type="radio"/> No
3.2.5	If Yes, what are the cause for exceeding the effluent standard?	No
<b>4 Corrosion of facilities and damage status</b>		
4.1	Is there corrosion of buildings or structures?	Yes <input checked="" type="radio"/> No, name of part :
4.2	Was there any damage to the building frame part of facilities?	Yes <input checked="" type="radio"/> No, name of part :
4.3	Is there corrosion in equipment?	<input checked="" type="radio"/> Yes <input type="radio"/> No, name of part : Sludge pipes
4.4	Is there damage to equipment?	Yes <input checked="" type="radio"/> No, name of part :
4.5	Are there records of corrosion and damage to facilities?	Yes <input checked="" type="radio"/> No
4.6	Is there foul smell most of the time?	Yes <input checked="" type="radio"/> No
4.7	Is scum generated?	A large amount <input checked="" type="radio"/> Small amount <input type="radio"/> No
<b>5 Management of planned facilities</b>		
5.1	Is there an operation schedule for machinery and equipment	<input checked="" type="radio"/> Yes "manufacturer compilation, Others" <input type="radio"/> No
5.2	Is there an operation manual?	<input checked="" type="radio"/> Yes <input type="radio"/> No
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	<input checked="" type="radio"/> Yes <input type="radio"/> No
	Is there a wastewater examination method?	<input checked="" type="radio"/> Yes <input type="radio"/> No Name of the method: Stadarnd method (EPA)
5.4	Are there the education and training manuals for the staff?	<input checked="" type="radio"/> Yes <input type="radio"/> No
<b>6 Inspection of facility and equipment</b>		
6.1	Are there check records for equipment?	Daily report: <input checked="" type="radio"/> Yes <input type="radio"/> No, Monthly report: <input checked="" type="radio"/> No, Annual report: <input checked="" type="radio"/> Yes <input type="radio"/> No (NMMC)
6.2	Is there an inspection manual?	<input checked="" type="radio"/> Yes <input type="radio"/> No
6.3	Is there an inspection schedule?	<input checked="" type="radio"/> Yes <input type="radio"/> No SGS(Agency)
6.4	Details of inspection procedure	Visual/audible/TV camera, others : N/A
6.5	How has the result of the inspection been used?	No
6.6	How are inspection results maintained?	No
<b>7 Repair, Rehabilitation, Reconstruction</b>		
7.1	Is there a manual for repair, rehabilitation and reconstruction of facility and equipment?	Yes <input checked="" type="radio"/> No
7.2	If Yes, is it being used?	Yes <input checked="" type="radio"/> No
7.3	Are there repair, rehabilitation and reconstruction plans for facility and equipment ?	Yes <input checked="" type="radio"/> No
7.4	Have repairs, rehabilitation and reconstruction been implemented?	Yes <input checked="" type="radio"/> No
7.5	Are there repair, rehabilitation and reconstruction records?	No
<b>8 Work implementation</b>		
8.1	Staffing or Manpower at Plant	On paper : 3 shift Actually : 2shift Operators : 4 persons, Fitter : 5 persons, Electrician : 6 persons,
8.2	Engineers	Helpers : 7 persons,
8.3	Working time	N/A Regular working time From : to : to : Shifts
8.4	Work mode	Permanent worker <input checked="" type="radio"/> Subcontractor
8.5	Contents of work	<input checked="" type="radio"/> Operation <input checked="" type="radio"/> Maintenance <input checked="" type="radio"/> Repair Subcontr
8.6	Others (Are there the special measures taken at the time of accidents or disasters)	Yes <input checked="" type="radio"/> No
<b>9 Procurement of utility and materials</b>		
9.1	Is the procurement of the chemicals easy?	<input checked="" type="radio"/> Yes <input type="radio"/> No
9.2	Is there a procurement plan of chemicals?	<input checked="" type="radio"/> Yes <input type="radio"/> No Chlorine / Polymer
9.3	Amount of electric power used each day/month, and of one year	6425.5 kWh in a day/month, 2345307.5 kWh in a year

9.4	Quantity of industrial chemicals used "Chlorine, Coagulant, etc."	Chlorine : 3mg/l	kg/d	kg/year
		Polymer : 2kg/ton(ss)		kg/year
9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	Yes	<input checked="" type="radio"/> No	
9.6	Frequency of power failure during year, total number of hours of power failure	None	times/year	hours/year
9.7	Are there standby power generators?	No	times/year	hours/year
9.8	How many times a year and how many hours a year is the standby power generator used?	No	times/year	hours/year
10	<b>Efficiency improvement and remedial measures and maintenance management of</b>			
10.1	Is there a centralized control system?	<input checked="" type="radio"/> Yes	No	
	Is there a data logger system?	<input checked="" type="radio"/> Yes	No	
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No	
11	<b>Safety management</b>			
11.1	Is there a safety and hygiene organization?	<input checked="" type="radio"/> Yes	No	
11.2	Is there a safety operation manual ?	<input checked="" type="radio"/> Yes	No	With contractor (NMMC) PDF f
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No	
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No	
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input checked="" type="radio"/> No	
11.6	Is education and training implemented for health and safety ?	<input checked="" type="radio"/> Yes	No	
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	Yes	<input checked="" type="radio"/> No	

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

1	<b>Machinery system</b>			
1.1	<b>Type of screens</b>			
1.1.1	Is there a coarse screen?	<input checked="" type="radio"/> Yes	No	
1.1.2	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No	
1.1.3	Is there a fine screen?	<input checked="" type="radio"/> Yes	No	
1.1.4	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No	
1.1.5	<b>Grit chamber</b>			
1.1.6	Is there a crushing device?	Yes	<input checked="" type="radio"/> No	
1.1.7	Is there a conveyor?	<input checked="" type="radio"/> Yes	No	
1.1.8	<b>How is the grid chamber cleaned?</b>			
	Mechanically?	<input checked="" type="radio"/> Yes	No	
	Bucket elevator?	Yes	<input checked="" type="radio"/> No	
	Jet pump?	Yes	<input checked="" type="radio"/> No	
	Screw?	<input checked="" type="radio"/> Yes	No	
	Air lift?	Yes	<input checked="" type="radio"/> No	
	Manually?	Yes	<input checked="" type="radio"/> No	
	Aeration?	Yes	<input checked="" type="radio"/> No	
1.2	<b>Pumps</b>			
1.2.1	What is the rated voltage of main pump?	415 V		
1.2.2	Is there any speed controlled pump?	Yes	<input checked="" type="radio"/> No	
1.2.3	If Yes, what is the type of pump?	Yes	<input checked="" type="radio"/> No	
1.2.4	If Yes, what is the method of speed control?	No		
1.3	What type of aeration facilities used?	Roots blowers		
1.3.1	What type of air diffuser is used?	Fixed Polyurethane Membrane (tubular)		
1.4	<b>Disinfection equipment</b>			
1.4.1	<b>What type of disinfection method for effluent is</b>			
	Chlorination?	<input checked="" type="radio"/> Yes	No	
	Ultra violet ray?	Yes	<input checked="" type="radio"/> No	
	Ozonizer?	Yes	<input checked="" type="radio"/> No	
1.5	<b>Sludge thickening equipment</b>			
1.5.1	<b>What type of sludge thickening equipment is</b>			
	Gravity thickening?	None		
	Air flotation?	None		
	Centrifugal thickening?	None		
	Belt type?	None		
1.6	<b>Sludge dehydration equipment</b>			
1.6.1	<b>What type of sludge dehydration method is</b>			
	<b>Mechanical?</b>			
	Filter press?	Yes	<input checked="" type="radio"/> No	
	Centrifugal dehydration	<input checked="" type="radio"/> Yes	No	
	Vacuum filtration?	Yes	<input checked="" type="radio"/> No	
	Others?			
1.6.2	Where does the dewatered sludge go to?	Landfill		
1.7.1	Sludge digestion facility (Anaerobic)?	Yes	<input checked="" type="radio"/> No	
1.7.2	Is digester gas used?	Yes (for	<input checked="" type="radio"/> No	

2	<b>Electrical system</b>		
2.1	<b>Substation facility</b>		
2.1.1	What is the substation voltage?	N/A	V
2.3	<b>Uninterrupted power supply (UPS)</b>		
2.3.1	Is there uninterrupted power supply?	<input checked="" type="radio"/> Yes	No
2.3.2	If Yes, is it DC supply or AC supply?	<input checked="" type="radio"/> AC	DC
2.3.3	What are the applications of this power supply?		
2.5	<b>Measuring instruments</b>		
2.5.1	What type of flow meter is used and where?	Pump room	
	Electro-magnetic?	Yes ( )	<input checked="" type="radio"/> No
	Ultrasonic?	<input checked="" type="radio"/> Yes ( )	No
	Orifice plate?	Yes ( )	<input checked="" type="radio"/> No
	Venturi?	Yes ( )	<input checked="" type="radio"/> No
	Weir?	Yes ( )	<input checked="" type="radio"/> No
	Partial flume?	Yes ( )	<input checked="" type="radio"/> No
2.5.2	What type of level gauge is adopted and where?	Coarse screen, Wet well, Fine screen, Reactor, Sludge sump	
	Float-type?	Yes ( )	<input checked="" type="radio"/> No
	Pressure-type?	Yes ( )	<input checked="" type="radio"/> No
	Ultrasonic?	<input checked="" type="radio"/> Yes ( )	No
	Radio wave ?	Yes ( )	<input checked="" type="radio"/> No
2.5.3	<b>Is a water quality meter used?</b>		
	PH?	<input checked="" type="radio"/> Yes	No
	DO?	<input checked="" type="radio"/> Yes	No
	MLSS?	Yes	<input checked="" type="radio"/> No
	ORP?	Yes	<input checked="" type="radio"/> No
	Turbidity?	<input checked="" type="radio"/> Yes	No
	Nitrogen?	Yes	<input checked="" type="radio"/> No
	Phosphorus?	Yes	<input checked="" type="radio"/> No
2.5.4	<b>Is sludge measurement performed?</b>		
	Sludge concentration?	Yes	<input checked="" type="radio"/> No
2.5.5	<b>Is any meteorological instrument used for the following?</b>		
	Temperature?	Yes	<input checked="" type="radio"/> No
	Atmospheric pressure?	Yes	<input checked="" type="radio"/> No
	Rain?	Yes	<input checked="" type="radio"/> No
	Wind velocity (Anemometer)?	Yes	<input checked="" type="radio"/> No
2.5	<b>Monitoring control system</b>		
2.5.1	Does a lookout post exist at the following	Yes	
	Grit chamber	} Central control room	
	Dry well		
	Sewage treatment facility		
	Sludge thickening equipment		
	Sludge dehydration equipment		
	Anaerobic digestion tank		
	Pumping station		
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	<input checked="" type="radio"/> Yes	No



**Part B Individual Treatment Plant**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Face sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Maharashtra
2	Name of city/town	Pune
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

**I Summary of sewage treatment plant**

<b>1 Basic data related to facilities</b>	
1.1	Are there calculations for basic design and capacity of treatment plant facilities? <input checked="" type="radio"/> Yes, No, Others :
1.2	Is there a layout plan showing earthwork, machinery, and electrical equipment? <input checked="" type="radio"/> Yes, No, Others :
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings. <input checked="" type="radio"/> Yes, No, Others :
1.4	Is there a flow chart for instrumentation? <input checked="" type="radio"/> Yes, No, Others :
1.5	Are there single-line diagrams (electrical)? <input checked="" type="radio"/> Yes, No, Others :
1.6	Sewage treatment process used (Example: Conventional activated sludge process) TF, ASP
1.7	Sludge treatment process used (Example: Sludge drying after thickening) Centrifugal dehydration
1.8	Which is the effluent discharge point? River MULA
1.9	Layout of plant (please attach the drawing, if you Yes
<b>2 History</b>	
2.1	Is the history of failure, repair, or reconstruction <input checked="" type="radio"/> Yes No Others :
2.2	Are there any requests or complaints from surrounding residents? <input checked="" type="radio"/> Yes sometimes
<b>3 Design capacity and actual loading</b>	
3.1	Design wastewater flow 17.5 MLD
3.2	Average daily flow 17.62 MLD
3.3	Maximum daily flow 18.41 MLD
3.4	Dry weather flow N/A
3.5	Design wet weather flow N/A
3.6	Wet weather flow N/A
3.7	Design wastewater influent quality BOD 250 mg/l, COD 350 mg/l, SS 300mg/l
3.8	Average wastewater influent quality BOD 120 mg/l, COD 260 mg/l, SS 140mg/l
3.9	Design effluent quality BOD <20mg/l, COD <30 mg/l, SS <30mg/l
3.10	Average effluent quality BOD 16mg/l, COD 52 mg/l, SS 20 mg/l
3.11	Solids capture rate 80% (percentage reduction of SS)
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Sludge decanter
3.13	Frequency of drawing out sludge N/A
3.14	Frequency of sludge carried outside STP N/A
3.15	Design sludge generation volume and water 6m <sup>3</sup> /hr 2nos
3.16	Average sludge generation volume, and water content 5m <sup>3</sup> /hr 12hour 1nos total: 60m <sup>3</sup> /day
3.17	Percentage of volatile solids in generated sludge N/A
3.18	Methods of effective sludge or waste utilization Landfill
3.19	Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? N/A
3.2	Are there operation records for pumps, equipment, blowers, etc.? Daily report: <input checked="" type="radio"/> Yes No, Monthly report: Yes No, Annual report: Yes No
3.2.1	Is the water quality measured regularly? <input checked="" type="radio"/> Yes No
3.2.2	Are water quality measurement records maintained? Daily report: <input checked="" type="radio"/> Yes No, Annual report: Yes No
3.2.3	Is record of concentration of toxic substances in sludge maintained? Yes <input checked="" type="radio"/> No

3.2.4	Has the water quality of the final effluent exceeded the effluent standards anytime?	Yes	No
3.2.5	If Yes, what are the cause for exceeding the effluent standard?	N/A	
<b>4 Corrosion of facilities and damage status</b>			
4.1	Is there corrosion of buildings or structures?	<input checked="" type="radio"/> Yes	No, name of part :
4.2	Was there any damage to the building frame part of facilities?	Yes	<input checked="" type="radio"/> No, name of part :
4.3	Is there corrosion in equipment?	Yes	<input checked="" type="radio"/> No, name of part :
4.4	Is there damage to equipment?	Yes	<input checked="" type="radio"/> No, name of part :
4.5	Are there records of corrosion and damage to facilities?	<input checked="" type="radio"/> Yes	No
4.6	Is there foul smell most of the time?	<input checked="" type="radio"/> Yes	No
4.7	Is scum generated?	<input checked="" type="radio"/> Small amount	sometimes
<b>5 Management of planned facilities</b>			
5.1	Is there an operation schedule for machinery and equipment	<input checked="" type="radio"/> Yes	"manufacturer compilation, Others" No
5.2	Is there an operation manual?	<input checked="" type="radio"/> Yes	No
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	<input checked="" type="radio"/> Yes	No
	Is there a wastewater examination method?	<input checked="" type="radio"/> Yes	Name of the method: AFHA
5.4	Are there the education and training manuals for the staff?	Yes	<input checked="" type="radio"/> No
<b>6 Inspection of facility and equipment</b>			
6.1	Are there check records for equipment?	Daily report: Yes	Monthly report: Yes No,
		Annual report: Yes	No
6.2	Is there an inspection manual?	<input checked="" type="radio"/> Yes	No
6.3	Is there an inspection schedule?	Yes	No
6.4	Details of inspection procedure	<input checked="" type="radio"/> Visual / audible / TV camera, others :	
6.5	How has the result of the inspection been used?	N/A	
6.6	How are inspection results maintained?	<input checked="" type="radio"/> Electronic data,	Hard copy,
		Others :	
<b>7 Repair, Rehabilitation, Reconstruction</b>			
7.1	Is there a manual for repair, rehabilitation and reconstruction of facility and equipment?	Yes	<input checked="" type="radio"/> No
7.2	If Yes, is it being used?	N/A	
7.3	Are there repair, rehabilitation and reconstruction plans for facility and equipment ?	Yes	<input checked="" type="radio"/> No
7.4	Have repairs, rehabilitation and reconstruction been implemented?	Yes	<input checked="" type="radio"/> No
7.5	Are there repair, rehabilitation and reconstruction records?	N/A	
<b>8 Work implementation</b>			
8.1	Staffing or Manpower at Plant	1)Chief Engineers(WW,STP,RW,City) 2)Add. C. E. 3)S.E. 4)Exec. Eng. 5)Dep. Eng. 6)Sec. Eng. 7)Jr. Eng. 8)Jr. Eng.supervisor	
8.2	Engineers		
8.3	Working time	Regular working time From 8 :30 to 17 : 30 3shift 8to16, 16to24,	
8.4	Work mode	Permanent worker	<input checked="" type="radio"/> Subcontractor
8.5	Contents of work	<input checked="" type="radio"/> Operation ,	<input checked="" type="radio"/> Maintenance, Repair
8.6	Others (Are there the special measures taken at the time of accidents or disasters)	Yes	<input checked="" type="radio"/> No
<b>9 Procurement of utility and materials</b>			
9.1	Is the procurement of the chemicals easy?	<input checked="" type="radio"/> Yes	No
9.2	Is there a procurement plan of chemicals?	<input checked="" type="radio"/> Yes	No
9.3	Amount of electric power used each day/month, and of one year	3,500kWh /day,	95,000kWh /month,
9.4	Quantity of industrial chemicals used "Chlorine, Coagulant, etc."	Chlorine : 60.kg/d, not in use presently Polyelectrolyte : 4.8kg/d	
9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	Yes	No
9.6	Frequency of power failure during year, total number of hours of power failure	once a week	
9.7	Are there standby power generators?	No	
9.8	How many times a year and how many hours a year is the standby power generator used?	No	
<b>10 Efficiency improvement and remedial measures and maintenance management of</b>			

10.1	Is there a centralized control system?	Yes	<input type="radio"/> No
	Is there a data logger system?	Yes	<input type="radio"/> No
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No
<b>11 Safety management</b>			
11.1	Is there a safety and hygiene organization?	Yes	No
11.2	Is there a safety operation manual ?	Yes	<input type="radio"/> No
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input type="radio"/> No Minor
11.6	Is education and training implemented for health and safety ?	<input checked="" type="radio"/> Yes	No O&M
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	Yes	No

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

<b>1 Machinery system</b>			
<b>1.1 Type of screens</b>			
1.1.1	Is there a coarse screen?	<input checked="" type="radio"/> Yes	No
1.1.2	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
1.1.3	Is there a fine screen?	<input checked="" type="radio"/> Yes	No
1.1.4	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
<b>1.1.5 Grit chamber</b>			
1.1.6	Is there a crushing device?	Yes	<input type="radio"/> No
1.1.7	Is there a conveyor?	<input checked="" type="radio"/> Yes	No
1.1.8	<b>How is the grid chamber cleaned?</b>		
	Mechanically?	<input checked="" type="radio"/> Yes	No
	Bucket elevator?	Yes	<input type="radio"/> No
	Jet pump?	Yes	<input type="radio"/> No
	Screw?	Yes	<input type="radio"/> No
	Air lift?	Yes	<input type="radio"/> No
	Manually?	Yes	<input type="radio"/> No
	Aeration?	Yes	<input type="radio"/> No
<b>1.2 Pumps</b>			
1.2.1	What is the rated voltage of main pump?	420 V	
1.2.2	Is there any speed controlled pump?	Yes	<input type="radio"/> No
1.2.3	If Yes, what is the type of pump?	Yes	<input type="radio"/> No
1.2.4	If Yes, what is the method of speed control?	No	
<b>1.3 What type of aeration facilities used?</b>			
1.3.1	What type of air diffuser is used?	N/A	
<b>1.4 Disinfection equipment</b>			
1.4.1	What type of disinfection method for effluent is		
	Chlorination?	<input checked="" type="radio"/> Yes	No not in use presently
	Ultra violet ray?	Yes	<input type="radio"/> No
	Ozonizer?	Yes	<input type="radio"/> No
<b>1.5 Sludge thickening equipment</b>			
1.5.1	What type of sludge thickening equipment is used		
	Gravity thickening?	<input checked="" type="radio"/> Yes	
	Air flotation?	No	
	Centrifugal thickening?	No	
	Belt type?	No	
<b>1.6 Sludge dehydration equipment</b>			
1.6.1	What type of sludge dehydration method is adopted?		
	Mechanical?		
	Filter press?	Yes	<input type="radio"/> No
	Centrifugal dehydration	<input checked="" type="radio"/> Yes	No
	Vacuum filtration?	Yes	<input type="radio"/> No
	Others?	No	
1.6.2	Where does the dewatered sludge go to?	Landfill	
1.7.1	Sludge digestion facility (Anaerobic)?	Yes	<input type="radio"/> No
1.7.2	Is digester gas used?	Yes (for )	<input type="radio"/> No
<b>2 Electrical system</b>			
<b>2.1 Substation facility</b>			
2.1.1	What is the substation voltage?	11kV	
<b>2.3 Uninterrupted power supply (UPS)</b>			
2.3.1	Is there uninterrupted power supply?	Yes	<input type="radio"/> No
2.3.2	If Yes, is it DC supply or AC supply?	No	
2.3.3	What are the applications of this power supply?	No	
<b>2.5 Measuring instruments</b>			
2.5.1	<b>What type of flow meter is used and where?</b>		
	Electro-magnetic?	Yes ( )	<input type="radio"/> No
	Ultrasonic?	Yes ( )	<input type="radio"/> No
	Orifice plate?	<input checked="" type="radio"/> Yes ( )	No
	Venturi?	Yes ( )	<input type="radio"/> No
	Weir?	Yes ( )	<input type="radio"/> No
	Partial flume?	<input checked="" type="radio"/> Yes ( )	No

2.5.2	<b>What type of level gauge is adopted and where?</b>		
	Float-type?	Yes ( )	No ( )
	Pressure-type?	Yes ( )	No ( )
	Ultrasonic?	Yes ( )	No ( )
	Radio wave ?	Yes ( )	No ( )
2.5.3	<b>Is a water quality meter used?</b>		
	PH?	Yes ( )	No ( )
	DO?	Yes ( )	No ( )
	MLSS?	Yes ( )	No ( )
	ORP?	Yes ( )	No ( )
	Turbidity?	Yes ( )	No ( )
	Nitrogen?	Yes ( )	No ( )
	Phosphorus?	Yes ( )	No ( )
2.5.4	<b>Is sludge measurement performed?</b>		
	Sludge concentration?	Yes ( )	No ( )
2.5.5	<b>Is any meteorological instrument used for the following?</b>		
	Temperature?	Yes ( )	No ( )
	Atmospheric pressure?	Yes ( )	No ( )
	Rain?	Yes ( )	No ( )
	Wind velocity (Anemometer)?	Yes ( )	No ( )
2.5	<b>Monitoring control system</b>		
2.5.1	<b>Does a lookout post exist at the following</b>		
	Grit chamber	Yes ( )	No ( )
	Dry well	Yes ( )	No ( )
	Sewage treatment facility	Yes ( )	No ( )
	Sludge thickening equipment	Yes ( )	No ( )
	Sludge dehydration equipment	Yes ( )	No ( )
	Anaerobic digestion tank	Yes ( )	No ( )
	Pumping station	Yes ( )	No ( )
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	Yes ( )	No ( )

## Questionnaire for 8 target states and 2 Union Territories in India

### Face sheet

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Uttar Pradesh
2	Name of city/town	Kanpur
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

### I Summary of sewage treatment plant

<b>1 Basic data related to facilities</b>	
1.1	Are there calculations for basic design and capacity of treatment plant facilities? <input checked="" type="radio"/> Yes No, Others :
1.2	Is there a layout plan showing earthwork, machinery, and electrical equipment? <input checked="" type="radio"/> Yes No, Others :
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings, <input checked="" type="radio"/> Yes No, Others :
1.4	Is there a flow chart for instrumentation? Yes, <input checked="" type="radio"/> No Others :
1.5	Are there single-line diagrams (electrical)? Yes, <input checked="" type="radio"/> No Others :
1.6	Sewage treatment process used (Example: Conventional activated sludge process) UASB
1.7	Sludge treatment process used (Example: Sludge drying after thickening) Sludge drying beds
1.8	Which is the effluent discharge point? River Ganga
1.9	Layout of plant (please attach the drawing, if you Yes
<b>2 History</b>	
2.1	Is the history of failure, repair, or reconstruction recorded? Yes <input checked="" type="radio"/> No Others :
2.2	Are there any requests or complaints from surrounding residents? Yes <input checked="" type="radio"/> No Others :
<b>3 Design capacity and actual loading</b>	
3.1	Design wastewater flow 36 MLD
3.2	Average daily flow 36 MLD
3.3	Maximum daily flow 36 MLD
3.4	Dry weather flow N/A
3.5	Design wet weather flow N/A
3.6	Wet weather flow N/A
3.7	Design wastewater influent quality BOD 500 mg/l, COD - mg/l, SS 1200mg/l
3.8	Average wastewater influent quality BOD 450-650 mg/l, COD 1000-1850 mg/l, SS 800-1600mg/l
3.9	Design effluent quality BOD 175 mg/l, COD - mg/l, SS 200mg/l
3.10	Average effluent quality BOD 170-275mg/l, COD 400-750 mg/l, SS 200-275 mg/l
3.11	Solids capture rate N/A %
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? No only valve from UASB
3.13	Frequency of drawing out sludge 1 times/day
3.14	Frequency of sludge carried outside STP daily
3.15	Design sludge generation volume and water content 480m <sup>3</sup> /day 92%
3.16	Average sludge generation volume, and water content 180m <sup>3</sup> /day 97-98%
3.17	Percentage of volatile solids in generated sludge mean:52%, max: 70%, min:37%
3.18	Methods of effective sludge or waste utilization No use (Landfill )
3.19	Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? No, Sludge contains toxic.
3.2	Are there operation records for pumps, equipment, blowers, etc.? Daily report: <input checked="" type="radio"/> Yes Monthly report: Yes No, Annual report: Yes No
3.2.1	Is the water quality measured regularly? <input checked="" type="radio"/> Yes No
3.2.2	Are water quality measurement records maintained? Daily report: <input checked="" type="radio"/> Yes No, Annual report: Yes No,
3.2.3	Is record of concentration of toxic substances in sludge maintained? <input checked="" type="radio"/> Yes No
3.2.4	Has the water quality of the final effluent exceeded the effluent standards anytime? <input checked="" type="radio"/> Yes No

3.2.5	If Yes, what are the cause for exceeding the effluent standard?	Quality of influent and toxicity
<b>4 Corrosion of facilities and damage status</b>		
4.1	Is there corrosion of buildings or structures?	<input checked="" type="radio"/> Yes No, name of part : Blower room It not use
4.2	Was there any damage to the building frame part of facilities?	<input checked="" type="radio"/> Yes No, name of part : Blower room It not use
4.3	Is there corrosion in equipment?	<input checked="" type="radio"/> Yes No, name of part : screen, pump
4.4	Is there damage to equipment?	<input checked="" type="radio"/> Yes No, name of part : screen, pump
4.5	Are there records of corrosion and damage to facilities?	<input checked="" type="radio"/> Yes No
4.6	Is there foul smell most of the time?	<input checked="" type="radio"/> Yes No
4.7	Is scum generated?	<input checked="" type="radio"/> Small amount
<b>5 Management of planned facilities</b>		
5.1	Is there an operation schedule for machinery and equipment	<input checked="" type="radio"/> Yes "manufacturer compilation, Others" No
5.2	Is there an operation manual?	<input checked="" type="radio"/> Yes No
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	<input checked="" type="radio"/> Yes No
	Is there a wastewater examination method?	<input checked="" type="radio"/> Yes: Name of the method: Standard Method(APHA)
5.4	Are there the education and training manuals for the staff?	Yes <input checked="" type="radio"/> No
<b>6 Inspection of facility and equipment</b>		
6.1	Are there check records for equipment?	Daily report: <input checked="" type="radio"/> No Monthly report: <input checked="" type="radio"/> Yes Annual report: Yes <input checked="" type="radio"/> No
6.2	Is there an inspection manual?	<input checked="" type="radio"/> Yes No
6.3	Is there an inspection schedule?	<input checked="" type="radio"/> Yes No
6.4	Details of inspection procedure	<input checked="" type="radio"/> Visual / audible / TV camera, others :
6.5	How has the result of the inspection been used?	for preventive maintenance
6.6	How are inspection results maintained?	Electronic data, <input checked="" type="radio"/> Hard copy, Others :
<b>7 Repair, Rehabilitation, Reconstruction</b>		
7.1	Is there a manual for repair, rehabilitation and reconstruction of facility and equipment?	<input checked="" type="radio"/> Yes No
7.2	If Yes, is it being used?	<input checked="" type="radio"/> Yes No
7.3	Are there repair, rehabilitation and reconstruction plans for facility and equipment ?	<input checked="" type="radio"/> Yes No
7.4	Have repairs, rehabilitation and reconstruction been implemented?	<input checked="" type="radio"/> Yes No
7.5	Are there repair, rehabilitation and reconstruction records?	Electronic data, <input checked="" type="radio"/> Hard copy, Others :
<b>8 Work implementation</b>		
8.1	Staffing or Manpower at Plant	Engineers : 4 persons Maintenance: 36 persons Shift-in-charge: 3 persons Analyses of water quality: 1 persons Office workers:3 persons Total staff:
8.2	Engineers	Project Engineers : 1 persons, Assistant Engineers : 3 persons,
8.3	Working time	Regular working time From 0:00 to 24 : 00 3 shift
8.4	Work mode	Permanent worker <input checked="" type="radio"/> Subcontractor
8.5	Contents of work	<input checked="" type="radio"/> Operation <input checked="" type="radio"/> Maintenance <input checked="" type="radio"/> Repair
8.6	Others (Are there the special measures taken at the time of accidents or disasters)	Yes <input checked="" type="radio"/> No
<b>9 Procurement of utility and materials</b>		
9.1	Is the procurement of the chemicals easy?	Yes <input checked="" type="radio"/> No
9.2	Is there a procurement plan of chemicals?	Yes <input checked="" type="radio"/> No
9.3	Amount of electric power used each day/month, and of one year	5,423,573 kWh in a year
9.4	Quantity of industrial chemicals used "Chlorine, Coagulant, etc."	Chlorine : Not use Polyelectrolyte ; Not use
9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	Yes <input checked="" type="radio"/> No
9.6	Frequency of power failure during year, total number of hours of power failure	30 minutes / day
9.7	Are there standby power generators?	Yes, but it's not using
9.8	How many times a year and how many hours a year is the standby power generator used?	It's not using
<b>10 Efficiency improvement and remedial measures and maintenance management of</b>		
10.1	Is there a centralized control system?	Yes <input checked="" type="radio"/> No
	Is there a data logger system?	Yes <input checked="" type="radio"/> No

10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
<b>11 Safety management</b>			
11.1	Is there a safety and hygiene organization?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
11.2	Is there a safety operation manual ?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
11.4	Are there warning signs for dangerous parts of the facilities?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
11.5	Have there been instances of accidents/disasters in the past?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
11.6	Is education and training implemented for health and safety ?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	<input type="radio"/> Yes	<input checked="" type="radio"/> No

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

<b>1 Machinery system</b>			
<b>1.1 Type of screens</b>			
1.1.1	Is there a coarse screen?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
1.1.2	Is screen type mechanical?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
1.1.3	Is there a fine screen?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
1.1.4	Is screen type mechanical?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
<b>1.1.5 Grit chamber</b>			
1.1.6	Is there a crushing device?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
1.1.7	Is there a conveyor?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
<b>1.1.8 How is the grid chamber cleaned?</b>			
	Mechanically?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Bucket elevator?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Jet pump?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Screw?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Air lift?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Manually?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Aeration?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
<b>1.2 Pumps</b>			
1.2.1	What is the rated voltage of main pump?	400 v	
1.2.2	Is there any speed controlled pump?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
1.2.3	If Yes, what is the type of pump?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
1.2.4	If Yes, what is the method of speed control?	N/A	
<b>1.3 What type of aeration facilities used?</b>			
1.3.1	What type of air diffuser is used?	No	
<b>1.4 Disinfection equipment</b>			
<b>1.4.1 What type of disinfection method for effluent is</b>			
	Chlorination?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Ultra violet ray?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Ozonizer?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
<b>1.5 Sludge thickening equipment</b>			
<b>1.5.1 What type of sludge thickening equipment is</b>			
	Gravity thickening?	<input checked="" type="radio"/> Yes	(not in use presently)
	Air flotation?	<input type="radio"/> No	
	Centrifugal thickening?	<input type="radio"/> No	
	Belt type?	<input type="radio"/> No	
<b>1.6 Sludge dehydration equipment</b>			
<b>1.6.1 What type of sludge dehydration method is</b>			
<b>Mechanical?</b>			
	Filter press?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Centrifugal dehydration	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Vacuum filtration?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Others?	No	
1.6.2	Where does the dewatered sludge go to?	Landfill	
1.7.1	Sludge digestion facility (Anaerobic)?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
1.7.2	Is digester gas used?	<input type="radio"/> Yes (for )	<input checked="" type="radio"/> No
<b>2 Electrical system</b>			
<b>2.1 Substation facility</b>			
2.1.1	What is the substation voltage?	33kv	
<b>2.3 Uninterrupted power supply (UPS)</b>			
2.3.1	Is there uninterrupted power supply?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
2.3.2	If Yes, is it DC supply or AC supply?	N/A	
2.3.3	What are the applications of this power supply?	N/A	
<b>2.5 Measuring instruments</b>			
<b>2.5.1 What type of flow meter is used and where?</b>			
	Electro-magnetic?	<input checked="" type="radio"/> Yes ( )	<input type="radio"/> No It's not using.
	Ultrasonic?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Orifice plate?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Venturi?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Weir?	<input checked="" type="radio"/> Yes ( )	<input type="radio"/> No
	Partial flume?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No

2.5.2	<b>What type of level gauge is adopted and where?</b>		
	Float-type?	Yes (	<input type="radio"/> No
	Pressure-type?	Yes (	<input type="radio"/> No
	Ultrasonic?	Yes (	<input type="radio"/> No
	Radio wave?	Yes (	<input type="radio"/> No
2.5.3	<b>Is a water quality meter used?</b>		
	PH?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	DO?	Yes	<input type="radio"/> No
	MLSS?	Yes	<input type="radio"/> No
	ORP?	Yes	<input type="radio"/> No
	Turbidity?	Yes	<input type="radio"/> No
	Nitrogen?	Yes	<input type="radio"/> No
	Phosphorus?	Yes	<input type="radio"/> No
2.5.4	<b>Is sludge measurement performed?</b>		
	Sludge concentration?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
2.5.5	<b>Is any meteorological instrument used for the following?</b>		
	Temperature?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	Atmospheric pressure?	Yes	<input type="radio"/> No
	Rain?	Yes	<input type="radio"/> No
	Wind velocity (Anemometer)?	Yes	<input type="radio"/> No
2.5	<b>Monitoring control system</b>		
2.5.1	<b>Does a lookout post exist at the following</b>	No	
	Grit chamber	Yes	<input type="radio"/> No
	Dry well	Yes	<input type="radio"/> No
	Sewage treatment facility	Yes	<input type="radio"/> No
	Sludge thickening equipment	Yes	<input type="radio"/> No
	Sludge dehydration equipment	Yes	<input type="radio"/> No
	Anaerobic digestion tank	Yes	<input type="radio"/> No
	Pumping station	Yes	<input type="radio"/> No
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	Yes	<input type="radio"/> No



**Part B Individual Treatment Plant**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Cover sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Utter Pradesh
2	Name of city/town	Allahabad
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

**I Summary of sewage treatment plant**

<b>1 Basic data related to STP components</b>	
1.1	Are there calculations for basic design and capacity of treatment plant components? Yes, No, Others N/A
1.2	Is there a layout plan showing earthwork, machinery, and electric equipment? Yes, No, Others N/A
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings, and so on? Yes, No Others : N/A
	Yes, No Others : N/A
	Yes, No Others : N/A
1.4	Is there a flow chart for instrumentation? Yes, No Others : N/A
1.5	Are there single-line diagrams (electrical)? Yes, No Others : N/A
1.6	Sewage treatment process used (Example: Conventional activated sludge process) ASP
1.7	Sludge treatment process used (Example: Sludge drying after thickening) Gravity thickening , Anaerobic digestion ,Sludge drying bed
1.8	Which is the effluent discharge point? Through irrigation Channel & surplus to river
1.9	Layout of plant (please attach the drawing, if you <input checked="" type="radio"/> Yes <input type="radio"/> No
<b>2 History</b>	
2.1	Is the history of failure, repair, or reconstruction recorded? <input checked="" type="radio"/> Yes <input type="radio"/> No Log book
2.2	Are there any requests or complaints from surrounding residents? Yes <input checked="" type="radio"/> No
<b>3 Design capacity and actual loading</b>	
3.1	Design wastewater flow 60 MLD
3.2	Average daily flow 60 MLD
3.3	Maximum daily flow 65 MLD
3.4	Dry weather flow 65 MLD
3.5	Design wet weather flow 65 MLD
3.6	Wet weather flow No record MLD
3.7	Design wastewater influent quality BOD N/A mg/l COD N/A mg/l SS N/A mg/l
3.8	Average wastewater influent quality BOD 115.8 mg/l COD N/A mg/l SS 379 mg/l
3.9	Design effluent quality BOD 30 mg/l COD N/A mg/l SS 50 mg/l
3.10	Average effluent quality BOD 25.65 mg/l COD N/A mg/l SS 44.68 mg/l
3.11	Solids capture rate N/A %
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? N/A
3.13	Frequency of drawing out sludge N/A times/day 22days-1bed times/month
3.14	Frequency of sludge carried outside STP N/A times/month times/year
3.15	Design sludge generation volume and water content 180 KLD ML/year %
3.16	Average sludge generation volume, and water content 160 KLD ML/year %
3.17	Percentage of volatile solids in generated sludge mean: % max: % N/A min: %
3.18	Methods of effective sludge utilization Manure , landfill ,flowering
3.19	What is the amount of sludge disposed and water content in sludge? N/A t/year N/A %
3.2	Are there operation records for pumps, equipment, blowers, etc.? Daily report: <input checked="" type="radio"/> Yes <input type="radio"/> No Monthly report: Yes No
3.2.1	Annual report: Yes No
3.2.1	Is the water quality measured regularly? <input checked="" type="radio"/> Yes <input type="radio"/> No

3.2.2	Are water quality measurement records maintained?	Daily report: <input checked="" type="radio"/> Yes <input type="radio"/> No Annual report: <input type="radio"/> Yes <input type="radio"/> No
3.2.3	Is record of concentration of toxic substances in sludge maintained?	Yes <input checked="" type="radio"/> No
3.2.4	Has the water quality of the final effluent exceeded your target effluent standards anytime?	Yes <input type="radio"/> No <input type="radio"/> Rarely
3.2.5	If Yes, what are the causes for exceeding the effluent standard?	<input checked="" type="radio"/> Yes <input type="radio"/> No In case of breakdown in plant
<b>4 Corrosion of facilities and damage status</b>		
4.1	Is there corrosion of buildings or structures?	Yes <input checked="" type="radio"/> No, name of part :
4.2	Was there any damage to the building frame part of facilities?	Yes <input checked="" type="radio"/> No, name of part :
4.3	Is there corrosion in equipment?	<input checked="" type="radio"/> Yes <input type="radio"/> No, name of part : Blower impeller
4.4	Is there damage to equipment?	Yes <input checked="" type="radio"/> No, name of part :
4.5	Are there records of corrosion and damage to equipment?	Yes <input type="radio"/> No <input type="radio"/> N/A
4.6	Is there foul smell most of the time?	<input checked="" type="radio"/> Yes <input type="radio"/> No At intake
4.7	Is scum generated?	A large amount, <input type="radio"/> Small amount, <input type="radio"/> No <input type="radio"/> N/A
<b>5 Management of facilities</b>		
5.1	Is there a schedule for operating machinery and equipment	Yes <input type="radio"/> "manufacturer compilation, Others" <input checked="" type="radio"/> No
5.2	Is there an operation manual for the complete facility?	Yes <input type="radio"/> No <input type="radio"/> N/A
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	Yes <input checked="" type="radio"/> No
5.4	Is there a wastewater examination method?	Yes: <input type="radio"/> Name of the method: <input type="radio"/> No <input type="radio"/> N/A
5.4	Are there the education and training manuals for the staff of the STP?	Yes <input type="radio"/> No <input type="radio"/> N/A
<b>6 Inspection of equipment in the STP</b>		
6.1	Are there check records for equipment?	Daily report: <input type="radio"/> Yes <input type="radio"/> No Monthly report: <input type="radio"/> Yes <input type="radio"/> No Annual report: <input type="radio"/> Yes <input type="radio"/> No N/A
6.2	Is there an inspection manual?	Yes <input type="radio"/> No <input type="radio"/> N/A
6.3	Is there an inspection schedule?	Yes <input type="radio"/> No <input type="radio"/> N/A
6.4	Details of inspection procedure	Visual <input type="radio"/> audible/ <input type="radio"/> /TV camera, <input type="radio"/> others : <input type="radio"/> N/A
6.5	How has the result of the inspection been used?	N/A
6.6	How are inspection results maintained?	Electronic data, <input type="radio"/> Hard copy, <input type="radio"/> Others : <input type="radio"/> N/A
<b>7 Repair, Rehabilitation, Reconstruction</b>		
7.1	Is there a manual for repair, rehabilitation and reconstruction of the STP?	Yes <input type="radio"/> No <input type="radio"/> N/A
7.2	If Yes, is it being used?	Yes <input type="radio"/> No <input type="radio"/> N/A
7.3	Are there repair, rehabilitation and reconstruction plans for the STP?	Yes <input type="radio"/> No <input type="radio"/> N/A
7.4	Have repairs, rehabilitation and reconstruction been implemented?	Yes <input type="radio"/> No
7.5	Are there repair, rehabilitation and reconstruction records?	Electronic data, <input type="radio"/> Hard copy, <input type="radio"/> Others : <input type="radio"/> N/A
<b>8 Work implementation</b>		
Organization for entire plants + pumping stations in jurisdiction.		
8.1	Staffing or Manpower at Plant	Project Manager: 1 person, Asst.Engineer: 3 persons Asst.Proj.Engineer: 6 persons, Junior Engineer: 3 persons Operator: 12 persons, Total staff: persons
8.2	Engineers	persons, persons, persons,
8.3	Working time	Regular working tin From to Shifts; to N/A
8.4	Work mode	Permanent worker <input type="radio"/> Subcontractor <input type="radio"/> N/A
8.5	Contents of work	Operation, <input type="radio"/> Maintenance, <input type="radio"/> Repair <input type="radio"/> N/A
8.6	Others (Are there the special measures taken at the time of accidents or disasters?)	Yes <input type="radio"/> No <input type="radio"/> N/A
<b>9 Procurement of utilities and materials</b>		
9.1	Is the procurement of the chemicals easy?	Yes <input type="radio"/> No <input type="radio"/> N/A
9.2	Is there a procurement plan for chemicals?	Yes <input type="radio"/> No <input type="radio"/> N/A
9.3	Amount of electric power used	8338 kWh in a day/month, kWh in a year
9.4	Quantity of industrial chemicals used such as chlorine, coagulant, etc.	N/A kg/d, kg/year N/A kg/d, kg/year
9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	Yes <input checked="" type="radio"/> No

9.6	Frequency of power failure during year, total number of hours of power failure		48	times/year
			42	hours/year
9.7	Are there standby power generators?	<input checked="" type="radio"/> Yes	No	
9.8	How many times a year and how many hours a year is the standby power generator used?		48	times/year
			42	hours/year
10	<b>Efficiency improvement and remedial measures and maintenance management of sewerage facilities</b>			
10.1	Is there a centralized control system?	Yes	<input checked="" type="radio"/> No	
	Is there a data logger system?	Yes	<input checked="" type="radio"/> No	
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No	
11	<b>Safety management</b>			
11.1	Is there a safety and hygiene organization?	Yes	<input checked="" type="radio"/> No	
11.2	Is there a safety operation manual?	Yes	<input checked="" type="radio"/> No	
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No	
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No	
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input checked="" type="radio"/> No	No accidents
11.6	Is education and training implemented for health and safety ?	Yes	<input checked="" type="radio"/> No	
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	Yes	<input checked="" type="radio"/> No	

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

1	<b>Machinery system</b>			
1.1	<b>Type of screens</b>			
1.1.1	Is there a coarse screen?	<input checked="" type="radio"/> Yes	No	
1.1.2	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No	
1.1.3	Is there a fine screen?	<input checked="" type="radio"/> Yes	No	
1.1.4	Is screen type mechanical?	Yes	<input checked="" type="radio"/> No	
1.1.5	<b>Grit chamber</b>			
1.1.6	Is there a crushing device?	Yes	<input checked="" type="radio"/> No	
1.1.7	Is there a conveyor?	<input checked="" type="radio"/> Yes	No	
1.1.8	<b>How is the grid chamber cleaned?</b>			
	Mechanically?	<input checked="" type="radio"/> Yes	No	
	Bucket elevator?	Yes	<input checked="" type="radio"/> No	
	Jet pump?	Yes	<input checked="" type="radio"/> No	
	Screw?	Yes	<input checked="" type="radio"/> No	
	Air lift?	Yes	<input checked="" type="radio"/> No	
	Manually?	<input checked="" type="radio"/> Yes	No	
	Aeration?	Yes	<input checked="" type="radio"/> No	
1.2	<b>Pumps</b>			
1.2.1	What is the rated voltage of main pump?		415	V
1.2.2	Is there any speed controlled pump?	Yes	No	N/A
1.2.3	If Yes, what is the type of pump?	Yes	No	N/A
1.2.4	If Yes, what is the method of speed control?	N/A		
1.3	<b>What type of aeration facilities used?</b>			
1.3.1	What type of air diffuser is used?	No		
1.4	<b>Disinfection equipment</b>			
1.4.1	What type of disinfection method for effluent is used?			
	Chlorination?	Yes	No	N/A
	Ultra violet ray?	Yes	No	N/A
	Ozonizer?	Yes	No	N/A
1.5	<b>Sludge thickening equipment</b>			
1.5.1	What type of sludge thickening equipment is used ?			
	Gravity thickening?	Yes	No	N/A
	Air flotation?	Yes	No	N/A
	Centrifugal thickening?	Yes	No	N/A
	Belt type?	Yes	No	N/A
1.6	<b>Sludge dehydration equipment</b>			
1.6.1	Type of sludge dehydration method used:			
	<b>Mechanical?</b>			
	Filter press?	Yes	No	N/A
	Centrifugal dehydration	Yes	No	N/A
	Vacuum filtration?	Yes	No	N/A
	Others?	N/A		
1.6.2	Where does the dewatered sludge go to?	N/A		
1.7.1	Sludge digestion facility (Anaerobic)?	<input checked="" type="radio"/> Yes	No	
1.7.2	Is digester gas used?	<input checked="" type="radio"/> Yes	No	for Dual fuel generator

2	<b>Electrical system</b>			
2.1	<b>Substation facility</b>			
2.1.1	What is the substation voltage?		33	kV
2.3	<b>Uninterrupted power supply (UPS)</b>			
2.3.1	Is there uninterrupted power supply?	Yes	No	N/A
2.3.2	If Yes, is it DC supply or AC supply?	AC	DC	N/A
2.3.3	What are the applications of this power supply?	N/A		
2.5	<b>Measuring instruments</b>			
2.5.1	<b>What type of flow meter is used and where?</b>			
	Electro-magnetic?	Yes ( )	No ( <input checked="" type="radio"/> )	
	Ultrasonic?	Yes ( )	No ( <input checked="" type="radio"/> )	
	Orifice plate?	Yes ( )	No ( <input checked="" type="radio"/> )	
	Venturi?	Yes ( )	No ( <input checked="" type="radio"/> )	
	Weir?	Yes ( )	No ( <input checked="" type="radio"/> )	
	Partial flume?	<input checked="" type="radio"/> Yes ( 1 )	No	Before PST
2.5.2	<b>What type of level gauge is adopted and where?</b>			
	Float-type?	Yes ( )	No ( <input checked="" type="radio"/> )	
	Pressure-type?	Yes ( )	No ( <input checked="" type="radio"/> )	
	Ultrasonic?	Yes ( )	No ( <input checked="" type="radio"/> )	
	Radio wave ?	Yes ( )	No ( <input checked="" type="radio"/> )	
2.5.3	<b>Is a water quality meter used?</b>			
	PH?	Yes	No ( <input checked="" type="radio"/> )	
	DO?	Yes	No ( <input checked="" type="radio"/> )	
	MLSS?	Yes	No ( <input checked="" type="radio"/> )	
	ORP?	Yes	No ( <input checked="" type="radio"/> )	
	Turbidity?	Yes	No ( <input checked="" type="radio"/> )	
	Nitrogen?	Yes	No ( <input checked="" type="radio"/> )	
	Phosphorus?	Yes	No ( <input checked="" type="radio"/> )	
2.5.4	<b>Is sludge measurement performed?</b>			
	Sludge concentration?	Yes	No ( <input checked="" type="radio"/> )	
2.5.5	<b>Meteorological instruments used for:</b>			
	Temperature?	<input checked="" type="radio"/> Yes	No ( <input checked="" type="radio"/> )	
	Atmospheric pressure?	Yes	No ( <input checked="" type="radio"/> )	
	Rain?	Yes	No ( <input checked="" type="radio"/> )	
	Wind velocity (Anemometer)?	Yes	No ( <input checked="" type="radio"/> )	
2.5	<b>Monitoring control system</b>			
2.5.1	<b>Does a lookout post exist at the following locations?</b>			
	Grit chamber	Yes	No ( <input checked="" type="radio"/> )	
	Dry well	Yes	No ( <input checked="" type="radio"/> )	
	Sewage treatment facility	Yes	No ( <input checked="" type="radio"/> )	
	Sludge thickening equipment	Yes	No ( <input checked="" type="radio"/> )	
	Sludge dehydration equipment	Yes	No ( <input checked="" type="radio"/> )	
	Anaerobic digestion tank	Yes	No ( <input checked="" type="radio"/> )	
	Pumping station	Yes	No ( <input checked="" type="radio"/> )	
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	Yes	No ( <input checked="" type="radio"/> )	

**Part B Individual Treatment Plant**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Cover sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Utter Pradesh
2	Name of city/town	Allahabad
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

**I Summary of sewage treatment plant**

<b>1 Basic data related to STP components</b>							
1.1	Are there calculations for basic design and capacity of treatment plant components?	<input checked="" type="radio"/> Yes	No,	Others			
1.2	Is there a layout plan showing earthwork, machinery, and electric equipment?	<input checked="" type="radio"/> Yes	No,	Others			
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings, and so on?	<input checked="" type="radio"/> Yes	No	Others :			
		<input checked="" type="radio"/> Yes	<input checked="" type="radio"/> No	Others :			
		<input checked="" type="radio"/> Yes	No	Others :			
1.4	Is there a flow chart for instrumentation?	Yes	<input checked="" type="radio"/> No	Others :			
1.5	Are there single-line diagrams (electrical)?	<input checked="" type="radio"/> Yes	No	Others :			
1.6	Sewage treatment process used (Example: Conventional activated sludge process)	MBBR					
1.7	Sludge treatment process used (Example: Sludge drying after thickening)	Thickening + Sludge drying bed					
1.8	Which is the effluent discharge point?	River through nala					
1.9	Layout of plant (please attach the drawing, if you have one)	<input checked="" type="radio"/> Yes	No				
<b>2 History</b>							
2.1	Is the history of failure, repair, or reconstruction recorded?	<input checked="" type="radio"/> Yes	Log book				
2.2	Are there any requests or complaints from surrounding residents?	Yes	<input checked="" type="radio"/> No				
<b>3 Design capacity and actual loading</b>							
3.1	Design wastewater flow	29	MLD				
3.2	Average daily flow	29	MLD				
3.3	Maximum daily flow	31	MLD				
3.4	Dry weather flow	34	MLD				
3.5	Design wet weather flow	34	MLD				
3.6	Wet weather flow	No record	MLD				
3.7	Design wastewater influent quality	BOD	N/A mg/l	COD	N/A mg/l	SS	N/A mg/l
3.8	Average wastewater influent quality	BOD	114.1 mg/l	COD	N/A mg/l	SS	375.6 mg/l
3.9	Design effluent quality	BOD	30 mg/l	COD	N/A mg/l	SS	50 mg/l
3.10	Average effluent quality	BOD	26.32 mg/l	COD	N/A mg/l	SS	47.25 mg/l
3.11	Solids capture rate	N/A %					
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)?	N/A					
3.13	Frequency of drawing out sludge	N/A	times/day			times/month	
3.14	Frequency of sludge carried outside STP	N/A	times/month			times/year	
3.15	Design sludge generation volume and water content	N/A	kLD	—	ML/year	—	%
3.16	Average sludge generation volume, and water content	N/A	kLD	—	ML/year	—	%
3.17	Percentage of volatile solids in generated sludge	mean: —	%	max:	%	N/A	
		min: —	%	N/A			
3.18	Methods of effective sludge utilization	Land applications such as manure, landscaping, <input checked="" type="radio"/> flowering plants, etc. Other methods : <input checked="" type="radio"/> Landfill					
3.19	What is the amount of sludge disposed and water content in sludge?	N/A	t/year				
		N/A	%				

3.2	Are there operation records for pumps, equipment, blowers, etc.?	Daily report: <input checked="" type="radio"/> Yes <input type="radio"/> No	Monthly report: <input checked="" type="radio"/> Yes <input type="radio"/> No
		Annual report: Yes No	
3.2.1	Is the water quality measured regularly?	Yes No N/A	
3.2.2	Are water quality measurement records maintained?	Daily report: Yes No N/A	
		Annual report: Yes No	
3.2.3	Is record of concentration of toxic substances in sludge maintained?	Yes <input checked="" type="radio"/> No N/A	
3.2.4	Has the water quality of the final effluent exceeded your target effluent standards anytime?	<input checked="" type="radio"/> Yes <input type="radio"/> No Rarely	
3.2.5	If Yes, what are the causes for exceeding the effluent standard?	Yes <input checked="" type="radio"/> No N/A	
4	<b>Corrosion of facilities and damage status</b>		
4.1	Is there corrosion of buildings or structures?	Yes <input checked="" type="radio"/> No name of part :	
4.2	Was there any damage to the building frame part of facilities?	Yes <input checked="" type="radio"/> No name of part :	
4.3	Is there corrosion in equipment?	<input checked="" type="radio"/> Yes <input type="radio"/> No name of part : Blower impeller	
4.4	Is there damage to equipment?	Yes <input checked="" type="radio"/> No name of part :	
4.5	Are there records of corrosion and damage to equipment?	Yes <input checked="" type="radio"/> No	
4.6	Is there foul smell most of the time?	<input checked="" type="radio"/> Yes <input type="radio"/> No At intake	
4.7	Is scum generated?	A large amount, Small amount, No N/A	
5	<b>Management of facilities</b>		
5.1	Is there a schedule for operating machinery and equipment	Yes "manufacturer compilation, Others" <input checked="" type="radio"/> No	
5.2	Is there an operation manual for the complete facility?	Yes No N/A	
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	Yes <input checked="" type="radio"/> No	
	Is there a wastewater examination method?	Yes: Name of the method: No N/A	
5.4	Are there the education and training manuals for the staff of the STP?	Yes No N/A	
6	<b>Inspection of equipment in the STP</b>		
6.1	Are there check records for equipment?	Daily report: Yes No Monthly report: Yes No	
		Annual report: Yes No N/A	
6.2	Is there an inspection manual?	Yes No N/A	
6.3	Is there an inspection schedule?	Yes No N/A	
6.4	Details of inspection procedure	Visual audible/ /TV camera, others : N/A	
6.5	How has the result of the inspection been used?	N/A	
6.6	How are inspection results maintained?	Electronic data, Hard copy, Others : N/A	
7	<b>Repair, Rehabilitation, Reconstruction</b>		
7.1	Is there a manual for repair, rehabilitation and reconstruction of the STP?	Yes No N/A	
7.2	If Yes, is it being used?	Yes No N/A	
7.3	Are there repair, rehabilitation and reconstruction plans for the STP?	Yes No N/A	
7.4	Have repairs, rehabilitation and reconstruction been implemented?	Yes No N/A	
7.5	Are there repair, rehabilitation and reconstruction records?	Electronic data, Hard copy, Others : N/A	
8	<b>Work implementation</b>		
8.1	Staffing or Manpower at Plant	Organization for entire plants + pumping stations in jurisdiction.	
		Project Manager: 1 person,	Asst.Engineer: 3 persons
		Asst.Proj.Engineer: 6 persons,	Junior Engineer: 3 persons
		Operator: 12 persons,	Total staff: persons
8.2	Engineers	persons,	persons,
8.3	Working time	Regular working tin From to	Shifts: to N/A
8.4	Work mode	Permanent worker	Subcontracto N/A
8.5	Contents of work	Operation , Maintenance, Repair	N/A
8.6	Others (Are there the special measures taken at the time of accidents or disasters?)	Yes No N/A	

<b>9 Procurement of utilities and materials</b>			
9.1	Is the procurement of the chemicals easy?	<input checked="" type="radio"/> Yes	No
9.2	Is there a procurement plan for chemicals?	<input checked="" type="radio"/> Yes	No
9.3	Amount of electric power used	1920	kWh in a day/month, STP
		2000	kWh in a day/month, P.S
9.4	Quantity of industrial chemicals used such as chlorine, coagulant, etc.	Chlorine ; 30kg/day, 900kg/month, 10800kg/year	
9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	Yes	<input checked="" type="radio"/> No
9.6	Frequency of power failure during year, total number of hours of power failure	216 times/year	
		88 hours/year	
9.7	Are there standby power generators?	<input checked="" type="radio"/> Yes	No
9.8	How many times a year and how many hours a year is the standby power generator used?	84	times/year
		42	hours/year
<b>10 Efficiency improvement and remedial measures and maintenance management of sewerage facilities</b>			
10.1	Is there a centralized control system? Is there a data logger system?	Yes	<input checked="" type="radio"/> No
		Yes	<input checked="" type="radio"/> No
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No
<b>11 Safety management</b>			
11.1	Is there a safety and hygiene organization?	Yes	<input checked="" type="radio"/> No
11.2	Is there a safety operation manual?	<input checked="" type="radio"/> Yes	No
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input checked="" type="radio"/> No No accidents
11.6	Is education and training implemented for health and safety ?	Yes	<input checked="" type="radio"/> No
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	Yes	<input checked="" type="radio"/> No

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

<b>1 Machinery system</b>			
<b>1.1 Type of screens</b>			
1.1.1	Is there a coarse screen?	<input checked="" type="radio"/> Yes	No at channel
1.1.2	Is screen type mechanical?	Yes	No N/A
1.1.3	Is there a fine screen?	<input checked="" type="radio"/> Yes	No rack
1.1.4	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
1.1.5 Grit chamber			
1.1.6	Is there a crushing device?	Yes	<input checked="" type="radio"/> No
1.1.7	Is there a conveyor?	<input checked="" type="radio"/> Yes	No
1.1.8	How is the grid chamber cleaned?		
	Mechanically?	<input checked="" type="radio"/> Yes	No
	Bucket elevator?	Yes	<input checked="" type="radio"/> No
	Jet pump?	Yes	<input checked="" type="radio"/> No
	Screw?	Yes	<input checked="" type="radio"/> No
	Air lift?	Yes	<input checked="" type="radio"/> No
	Manually?	<input checked="" type="radio"/> Yes	No
	Aeration?	Yes	<input checked="" type="radio"/> No
<b>1.2 Pumps</b>			
1.2.1	What is the rated voltage of main pump?	415	V
1.2.2	Is there any speed controlled pump?	Yes	<input checked="" type="radio"/> No
1.2.3	If Yes, what is the type of pump?	Yes	<input checked="" type="radio"/> No
1.2.4	If Yes, what is the method of speed control?	No	
1.3	What type of aeration facilities used?	Twin blower	
1.3.1	What type of air diffuser is used?	N/A	
<b>1.4 Disinfection equipment</b>			
<b>1.4.1 What type of disinfection method for effluent is used?</b>			
	Chlorination?	<input checked="" type="radio"/> Yes	No
	Ultra violet ray?	Yes	<input checked="" type="radio"/> No
	Ozonizer?	Yes	<input checked="" type="radio"/> No
<b>1.5 Sludge thickening equipment</b>			
<b>1.5.1 What type of sludge thickening equipment is used ?</b>			
	Gravity thickening?	<input checked="" type="radio"/> Yes	No
	Air flotation?	Yes	<input checked="" type="radio"/> No
	Centrifugal thickening?	Yes	<input checked="" type="radio"/> No
	Belt type?	Yes	<input checked="" type="radio"/> No

1.6	<b>Sludge dehydration equipment</b>			
1.6.1	<b>Type of sludge dehydration method used:</b>			
	Mechanical?			
	Filter press?	Yes	<input type="radio"/> No	
	Centrifugal dehydration	Yes	<input type="radio"/> No	
	Vacuum filtration?	Yes	<input type="radio"/> No	
	Others?	Sludge drying beds		
1.6.2	Where does the dewatered sludge go to?	N/A		
1.7.1	Sludge digestion facility (Anaerobic)?	Yes	<input type="radio"/> No	
1.7.2	Is digester gas used?	Yes	<input type="radio"/> No	for
2	<b>Electrical system</b>			
2.1	<b>Substation facility</b>			
2.1.1	What is the substation voltage?	11 kV		
2.3	<b>Uninterrupted power supply (UPS)</b>			
2.3.1	Is there uninterrupted power supply?	Yes	No	N/A
2.3.2	If Yes, is it DC supply or AC supply?	AC	DC	N/A
2.3.3	What are the applications of this power supply?	STP+MPS		
2.5	<b>Measuring instruments</b>			
2.5.1	<b>What type of flow meter is used and where?</b>			
	Electro-magnetic?	Yes ( )	<input type="radio"/> No	
	Ultrasonic?	<input checked="" type="radio"/> Yes ( )	<input type="radio"/> No	Chamber after grid
	Orifice plate?	Yes ( )	<input type="radio"/> No	
	Venturi?	Yes ( )	<input type="radio"/> No	
	Weir?	Yes ( )	<input type="radio"/> No	
	Partial flume?	Yes ( )	<input type="radio"/> No	
2.5.2	<b>What type of level gauge is adopted and where?</b>			
	Float-type?	Yes ( )	<input type="radio"/> No	
	Pressure-type?	Yes ( )	<input type="radio"/> No	
	Ultrasonic?	Yes ( )	<input type="radio"/> No	
	Radio wave ?	Yes ( )	<input type="radio"/> No	
2.5.3	<b>Is a water quality meter used?</b>			
	PH?	Yes	<input type="radio"/> No	
	DO?	Yes	<input type="radio"/> No	
	MLSS?	Yes	<input type="radio"/> No	
	ORP?	Yes	<input type="radio"/> No	
	Turbidity?	Yes	<input type="radio"/> No	
	Nitrogen?	Yes	<input type="radio"/> No	
	Phosphorus?	Yes	<input type="radio"/> No	
2.5.4	<b>Is sludge measurement performed?</b>			
	Sludge concentration?	Yes	<input type="radio"/> No	
2.5.5	<b>Meteorological instruments used for:</b>			
	Temperature?	<input checked="" type="radio"/> Yes	No	
	Atmospheric pressure?	Yes	<input type="radio"/> No	
	Rain?	Yes	<input type="radio"/> No	
	Wind velocity (Anemometer)?	Yes	<input type="radio"/> No	
2.5	<b>Monitoring control system</b>			
2.5.1	<b>Does a lookout post exist at the following locations?</b>			
	Grit chamber	Yes	<input type="radio"/> No	
	Dry well	Yes	<input type="radio"/> No	
	Sewage treatment facility	Yes	<input type="radio"/> No	
	Sludge thickening equipment	Yes	<input type="radio"/> No	
	Sludge dehydration equipment	Yes	<input type="radio"/> No	
	Anaerobic digestion tank	Yes	<input type="radio"/> No	
	Pumping station	Yes	<input type="radio"/> No	
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	Yes	<input type="radio"/> No	



**Part B Individual Treatment Plant**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Cover sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Karnataka
2	Name of city/town	Bengaluru
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

**I Summary of sewage treatment plant**

<b>1 Basic data related to STP components</b>						
1.1	Are there calculations for basic design and capacity of treatment plant components?	<input checked="" type="radio"/> Yes	No,	Others		
1.2	Is there a layout plan showing earthwork, machinery, and electric equipment?	<input checked="" type="radio"/> Yes	No,	Others		
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings, and so on?	<input checked="" type="radio"/> Yes, Yes, Yes,	No <input checked="" type="radio"/> No <input checked="" type="radio"/> No	Others : Others : Others :		
1.4	Is there a flow chart for instrumentation?	<input checked="" type="radio"/> Yes	No	Others :		
1.5	Are there single-line diagrams (electrical)?	<input checked="" type="radio"/> Yes	No	Others :		
1.6	Sewage treatment process used (Example: Conventional activated sludge process)	ASP				
1.7	Sludge treatment process used (Example: Sludge drying after thickening)	Gravity thickening , Sludge drying bed , Centrifuge				
1.8	Which is the effluent discharge point?	River Vrishavavati Valley				
1.9	Layout of plant (please attach the drawing, if you have one)	<input checked="" type="radio"/> Yes	No			
<b>2 History</b>						
2.1	Is the history of failure, repair, or reconstruction recorded?	Yes	<input checked="" type="radio"/> No	Others :		
2.2	Are there any requests or complaints from surrounding residents?	Yes	<input checked="" type="radio"/> No			
<b>3 Design capacity and actual loading</b>						
3.1	Design wastewater flow	75	MLD			
3.2	Average daily flow	30	MLD			
3.3	Maximum daily flow	36	MLD			
3.4	Dry weather flow	75	MLD			
3.5	Design wet weather flow	80	MLD			
3.6	Wet weather flow	36	MLD			
3.7	Design wastewater influent quality	BOD	284-388 mg/l	COD	457-730 mg/l	SS 636-1356 mg/l
3.8	Average wastewater influent quality	BOD	167 mg/l	COD	352 mg/l	SS 1043 mg/l
3.9	Design effluent quality	BOD	<20 mg/l	COD	<250 mg/l	SS <30 mg/l
3.10	Average effluent quality	BOD	6.82 mg/l	COD	70.17 mg/l	SS 664 mg/l
3.11	Solids capture rate	N/A %				
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)?	Secondary clarifier				
3.13	Frequency of drawing out sludge	1hour-1	time/day		times/month	
3.14	Frequency of sludge carried outside STP	1bed	times/month		times/year	
3.15	Design sludge generation volume and water content	3000	m <sup>3</sup> /day	ML/year	0.7	%
3.16	Average sludge generation volume, and water content	5-10	m <sup>3</sup> /day	ML/year		%
3.17	Percentage of volatile solids in generated sludge	mean:	%	max:	%	N/A
		min:	%	N/A		
3.18	Methods of effective sludge utilization	Manure				
3.19	What is the amount of sludge disposed and water content in sludge?	120	t/year			
		N/A	%			
3.2	Are there operation records for pumps, equipment, blowers, etc.?	Daily report:	<input checked="" type="radio"/> Yes	No	Monthly report:	Yes No
		Annual report:	Yes	No		
3.2.1	Is the water quality measured regularly?	<input checked="" type="radio"/> Yes	No			
3.2.2	Are water quality measurement records maintained?	Daily report:	<input checked="" type="radio"/> Yes	No		
		Annual report:	<input checked="" type="radio"/> Yes	No		

3.2.3	Is record of concentration of toxic substances in sludge maintained?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	once in a year
3.2.4	Has the water quality of the final effluent exceeded your target effluent standards anytime?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
3.2.5	If Yes, what are the causes for exceeding the effluent standard?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
<b>4 Corrosion of facilities and damage status</b>				
4.1	Is there corrosion of buildings or structures?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	name of part :
4.2	Was there any damage to the building frame part of facilities?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	name of part :
4.3	Is there corrosion in equipment?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	name of part : Blower impeller
4.4	Is there damage to equipment?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	name of part :
4.5	Are there records of corrosion and damage to equipment?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
4.6	Is there foul smell most of the time?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
4.7	Is scum generated?	<input type="radio"/> A large amount, <input checked="" type="radio"/> Small amount,		<input type="radio"/> No
<b>5 Management of facilities</b>				
5.1	Is there a schedule for operating machinery and equipment	<input checked="" type="radio"/> Yes	"manufacturer compilation, Others" <input type="radio"/> No	
5.2	Is there an operation manual for the complete facility?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
	Is there a wastewater examination method?	<input checked="" type="radio"/> Yes	Name of the method: <input type="radio"/> No	
5.4	Are there the education and training manuals for the staff of the STP?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
<b>6 Inspection of equipment in the STP</b>				
6.1	Are there check records for equipment?	Daily report: <input checked="" type="radio"/> Yes <input type="radio"/> No	Monthly report: <input type="radio"/> Yes <input type="radio"/> No	
		Annual report: <input type="radio"/> Yes <input type="radio"/> No		
6.2	Is there an inspection manual?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
6.3	Is there an inspection schedule?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
6.4	Details of inspection procedure	<input checked="" type="radio"/> Visual	<input type="radio"/> audible/	<input type="radio"/> /TV camera, others :
6.5	How has the result of the inspection been used?	Action taken if any fault.		
6.6	How are inspection results maintained?	Electronic data, <input checked="" type="radio"/> Hard copy,	Others :	
<b>7 Repair, Rehabilitation, Reconstruction</b>				
7.1	Is there a manual for repair, rehabilitation and reconstruction of the STP?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
7.2	If Yes, is it being used?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
7.3	Are there repair, rehabilitation and reconstruction plans for the STP?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
7.4	Have repairs, rehabilitation and reconstruction been implemented?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
7.5	Are there repair, rehabilitation and reconstruction records?	Electronic data, <input type="radio"/> Hard copy,	Others : N/A	
<b>8 Work implementation</b>				
Organization for entire plants + pumping stations in jurisdiction.				
8.1	Staffing or Manpower at Plant	Plant Process Manager: 1person	Gardeners: 6 persons	
		Instrumentation Engineer: 1person	Sludge Handling: 2 persons	
		Lab Analyst: 1 person	Office Attendant: 1 person	
		Lab Assisat: 1 person	Security Staff: 7 persons	
8.2	Engineers	Electricians: 3 persons, 3-shift		
		Fitters: 2 persons, 2-shift		
		Operators: 12 persons, G-shift(4person) + 3-shift(8person)		
		Helpers: 17 persons, G-shift(7person) + 3-shift(10person)		
8.3	Working time	Regular working tin From 8:30 to 17:30	Shifts: to	
8.4	Work mode	Permanent worker office	Subcontracto(O&M)	
8.5	Contents of work	<input checked="" type="radio"/> Operation	<input checked="" type="radio"/> Maintenance	<input checked="" type="radio"/> Repair
8.6	Others (Are there the special measures taken at the time of accidents or disasters?)	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
<b>9 Procurement of utilities and materials</b>				
9.1	Is the procurement of the chemicals easy?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
9.2	Is there a procurement plan for chemicals?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
9.3	Amount of electric power used	332000 kWh/month,	kWh in a year	
9.4	Quantity of industrial chemicals used such as chlorine, coagulant, etc.	not used	kg/d,	kg/year
		not used	kg/d,	kg/year

9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	Yes	<input type="radio"/> No
9.6	Frequency of power failure during year, total number of hours of power failure		times/year 10 hours/month average
9.7	Are there standby power generators?	<input checked="" type="radio"/> Yes	No
9.8	How many times a year and how many hours a year is the standby power generator used?		times/year hours/year used when interruption is more than 10 minutes
10	<b>Efficiency improvement and remedial measures and maintenance management of sewerage facilities</b>		
10.1	Is there a centralized control system?	Yes	<input type="radio"/> No
	Is there a data logger system?	Yes	<input type="radio"/> No
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No
11	<b>Safety management</b>		
11.1	Is there a safety and hygiene organization?	<input checked="" type="radio"/> Yes	No
11.2	Is there a safety operation manual?	<input checked="" type="radio"/> Yes	No
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input type="radio"/> No No accidents
11.6	Is education and training implemented for health and safety ?	<input checked="" type="radio"/> Yes	No
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	<input checked="" type="radio"/> Yes	No

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

1	<b>Machinery system</b>		
1.1	<b>Type of screens</b>		
1.1.1	Is there a coarse screen?	<input checked="" type="radio"/> Yes	No
1.1.2	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
1.1.3	Is there a fine screen?	<input checked="" type="radio"/> Yes	No
1.1.4	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
1.1.5	<b>Grit chamber</b>		
1.1.6	Is there a crushing device?	Yes	<input type="radio"/> No
1.1.7	Is there a conveyor?	<input checked="" type="radio"/> Yes	No
1.1.8	<b>How is the grid chamber cleaned?</b>		
	Mechanically?	<input checked="" type="radio"/> Yes	No
	Bucket elevator?	Yes	<input type="radio"/> No
	Jet pump?	Yes	<input type="radio"/> No
	Screw?	Yes	<input type="radio"/> No
	Air lift?	Yes	<input type="radio"/> No
	Manually?	Yes	<input type="radio"/> No
	Aeration?	Yes	<input type="radio"/> No
1.2	<b>Pumps</b>		
1.2.1	What is the rated voltage of main pump?	415	V
1.2.2	Is there any speed controlled pump?	Yes	<input type="radio"/> No
1.2.3	If Yes, what is the type of pump?	Yes	<input type="radio"/> No
1.2.4	If Yes, what is the method of speed control?	No	
1.3	What type of aeration facilities used?	Surface aerator	
1.3.1	What type of air diffuser is used?	N/A	
1.4	<b>Disinfection equipment</b>		
1.4.1	<b>What type of disinfection method for effluent is used?</b>		
	Chlorination?	Yes	<input type="radio"/> No
	Ultra violet ray?	Yes	<input type="radio"/> No
	Ozonizer?	Yes	<input type="radio"/> No
1.5	<b>Sludge thickening equipment</b>		
1.5.1	<b>What type of sludge thickening equipment is used ?</b>		
	Gravity thickening?	<input checked="" type="radio"/> Yes	No
	Air flotation?	Yes	<input type="radio"/> No
	Centrifugal thickening?	Yes	<input type="radio"/> No
	Belt type?	Yes	<input type="radio"/> No
1.6	<b>Sludge dehydration equipment</b>		
1.6.1	<b>Type of sludge dehydration method used:</b>		
	<b>Mechanical?</b>		
	Filter press?	Yes	<input type="radio"/> No
	Centrifugal dehydration	<input checked="" type="radio"/> Yes	No but not used
	Vacuum filtration?	Yes	<input type="radio"/> No
	Others?	Sludge drying beds	
1.6.2	<b>Where does the dewatered sludge go to?</b>		
1.7.1	Sludge digestion facility (Anaerobic)?	Yes	<input type="radio"/> No
1.7.2	Is digester gas used?	Yes	<input type="radio"/> No for

2	<b>Electrical system</b>		
2.1	<b>Substation facility</b>		
2.1.1	What is the substation voltage?	11	kVA
2.3	<b>Uninterrupted power supply (UPS)</b>		
2.3.1	Is there uninterrupted power supply?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
2.3.2	If Yes, is it DC supply or AC supply?	AC	<input checked="" type="radio"/> DC
2.3.3	What are the applications of this power supply?	Only for offices	
2.5	<b>Measuring instruments</b>		
2.5.1	<b>What type of flow meter is used and where?</b>		
	Electro-magnetic?	<input checked="" type="radio"/> Yes ( 1 )	<input type="radio"/> No
	Ultrasonic?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Orifice plate?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Venturi?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Weir?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Partial flume?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
2.5.2	<b>What type of level gauge is adopted and where?</b>		
	Float-type?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Pressure-type?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Ultrasonic?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Radio wave?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
2.5.3	<b>Is a water quality meter used?</b>		
	PH?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	DO?	<input checked="" type="radio"/> Yes	<input type="radio"/> No Not working
	MLSS?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	ORP?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Turbidity?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Nitrogen?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Phosphorus?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
2.5.4	<b>Is sludge measurement performed?</b>		
	Sludge concentration?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
2.5.5	<b>Meteorological instruments used for:</b>		
	Temperature?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	Atmospheric pressure?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Rain?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	Wind velocity (Anemometer)?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
2.5	<b>Monitoring control system</b>		
2.5.1	<b>Does a lookout post exist at the following locations?</b>		
	Grit chamber	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Dry well	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Sewage treatment facility	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Sludge thickening equipment	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Sludge dehydration equipment	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Anaerobic digestion tank	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Pumping station	<input type="radio"/> Yes	<input checked="" type="radio"/> No
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	<input type="radio"/> Yes	<input checked="" type="radio"/> No

**Part B Individual Treatment Plant**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Cover sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Karnataka
2	Name of city/town	Bengaluru
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

**I Summary of sewage treatment plant**

<b>1 Basic data related to STP components</b>				
1.1	Are there calculations for basic design and capacity of treatment plant components?	<input checked="" type="radio"/> Yes	No,	Others
1.2	Is there a layout plan showing earthwork, machinery,	<input checked="" type="radio"/> Yes	No,	Others
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings, and so on?	<input checked="" type="radio"/> Yes <input checked="" type="radio"/> Yes <input checked="" type="radio"/> Yes	No No No	Others : Others : Others :
1.4	Is there a flow chart for instrumentation?	<input checked="" type="radio"/> Yes	No	Others :
1.5	Are there single-line diagrams (electrical)?	<input checked="" type="radio"/> Yes	No	Others :
1.6	Sewage treatment process used (Example: Conventional activated sludge process)	MBR		
1.7	Sludge treatment process used (Example: Sludge drying after thickening)	Sludge drying bed , Centrifuge		
1.8	Which is the effluent discharge point?	Tank in cubbon park for water sprinkling		
1.9	Layout of plant (please attach the drawing, if you have one)	<input checked="" type="radio"/> Yes	No	
<b>2 History</b>				
2.1	Is the history of failure, repair, or reconstruction recorded?	<input checked="" type="radio"/> Yes	No	Others :
2.2	Are there any requests or complaints from surrounding residents?	Yes	<input checked="" type="radio"/> No	
<b>3 Design capacity and actual loading</b>				
3.1	Design wastewater flow	1.5	MLD	
3.2	Average daily flow	1-1.5	MLD	
3.3	Maximum daily flow	1.5	MLD	
3.4	Dry weather flow	1.5	MLD	
3.5	Design wet weather flow	1-1.5	MLD	
3.6	Wet weather flow	1-1.5	MLD	
3.7	Design wastewater influent quality	BOD 330 mg/l	COD 660 mg/l	SS 450 mg/l
3.8	Average wastewater influent quality	BOD 188 mg/l	COD 402 mg/l	SS 173 mg/l
3.9	Design effluent quality	BOD < 4 mg/l	COD N/A mg/l	SS < 3 mg/l
3.10	Average effluent quality	BOD 1.5 mg/l	COD 7 mg/l	SS 0.1 mg/l
3.11	Solids capture rate	N/A %		
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)?	Aeration tank to centrifuge.		
3.13	Frequency of drawing out sludge	According to MLSS	time/day	times/month
3.14	Frequency of sludge carried outside STP	2-3	times/month	times/year
3.15	Design sludge generation volume and water content	1-2	t/month	ML/year %
3.16	Average sludge generation volume, and water content	1-2	t/month	ML/year %
3.17	Percentage of volatile solids in generated sludge	mean:	%	max: % N/A
		min:	%	N/A
3.18	Methods of effective sludge utilization	Manure, landscaping		
3.19	What is the amount of sludge disposed and water content in sludge?	1-2	t/month	
		N/A	%	
3.2	Are there operation records for pumps, equipment, blowers, etc.?	Daily report: <input checked="" type="radio"/> Yes	No	Monthly report: <input checked="" type="radio"/> Yes No
		Annual report: Yes	No	
3.2.1	Is the water quality measured regularly?	<input checked="" type="radio"/> Yes	No	
3.2.2	Are water quality measurement records maintained?	Daily report: <input checked="" type="radio"/> Yes	No	Annual report: <input checked="" type="radio"/> Yes No
		Annual report: <input checked="" type="radio"/> Yes	No	

3.2.3	Is record of concentration of toxic substances in sludge maintained?	Yes	No	2 times a year
3.2.4	Has the water quality of the final effluent exceeded your target effluent standards anytime?	Yes	<input checked="" type="radio"/> No	
3.2.5	If Yes, what are the causes for exceeding the effluent standard?	Yes	<input checked="" type="radio"/> No	
<b>4 Corrosion of facilities and damage status</b>				
4.1	Is there corrosion of buildings or structures?	Yes	<input checked="" type="radio"/> No	name of part :
4.2	Was there any damage to the building frame part of facilities?	Yes	<input checked="" type="radio"/> No	name of part :
4.3	Is there corrosion in equipment?	Yes	<input checked="" type="radio"/> No	name of part :
4.4	Is there damage to equipment?	<input checked="" type="radio"/> Yes	No	name of part : Blower impeller
4.5	Are there records of corrosion and damage to equipment?	<input checked="" type="radio"/> Yes	No	
4.6	Is there foul smell most of the time?	Yes	<input checked="" type="radio"/> No	
4.7	Is scum generated?	A large amount,	Small amount,	<input checked="" type="radio"/> No
<b>5 Management of facilities</b>				
5.1	Is there a schedule for operating machinery and equipment	<input checked="" type="radio"/> Yes	"manufacturer compilation, Others"	No
5.2	Is there an operation manual for the complete facility?	<input checked="" type="radio"/> Yes	No	
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	<input checked="" type="radio"/> Yes	No	
	Is there a wastewater examination method?	<input checked="" type="radio"/> Yes	Name of the method: APHA	No
5.4	Are there the education and training manuals for the staff of the STP?	<input checked="" type="radio"/> Yes	No	
<b>6 Inspection of equipment in the STP</b>				
6.1	Are there check records for equipment?	Daily report: <input checked="" type="radio"/> Yes	No	Monthly report: Yes No
		Annual report: Yes	No	
6.2	Is there an inspection manual?	<input checked="" type="radio"/> Yes	No	
6.3	Is there an inspection schedule?	<input checked="" type="radio"/> Yes	No	
6.4	Details of inspection procedure	<input checked="" type="radio"/> Visual	audible/	/TV camera, others :
6.5	How has the result of the inspection been used?	Take immediate action.		
6.6	How are inspection results maintained?	Electronic data,	<input checked="" type="radio"/> Hard copy,	Others :
<b>7 Repair, Rehabilitation, Reconstruction</b>				
7.1	Is there a manual for repair, rehabilitation and reconstruction of the STP?	Yes	<input checked="" type="radio"/> No	
7.2	If Yes, is it being used?	Yes	<input checked="" type="radio"/> No	
7.3	Are there repair, rehabilitation and reconstruction plans for the STP?	Yes	<input checked="" type="radio"/> No	
7.4	Have repairs, rehabilitation and reconstruction been implemented?	<input checked="" type="radio"/> Yes	No	
7.5	Are there repair, rehabilitation and reconstruction records?	Electronic data,	<input checked="" type="radio"/> Hard copy,	Others :
<b>8 Work implementation</b>				
Organization for entire plants + pumping stations in jurisdiction.				
8.1	Staffing or Manpower at Plant	Regional Manager: (Safty Officer)	1 person,	Electrician: 3 persons Fitter: 2 persons
		Plant Manager: (Process incharge)	1 person,	Helper: 6 persons Total staff: persons
8.2	Engineers	(Mechanical Engineer)		
		Security Guard:	3 persons,	
		Chemist/supervisor:	1 person,	
		Gardener:	2 persons,	
8.3	Working time	Regular working tin	From 9:00 to 18:00	Shifts: to
8.4	Work mode	Permanent worker	Subcontracto all	
8.5	Contents of work	<input checked="" type="radio"/> Operation	<input checked="" type="radio"/> Maintenance,	<input checked="" type="radio"/> Repair
8.6	Others (Are there the special measures taken at the time of accidents or disasters?)	<input checked="" type="radio"/> Yes	No	
<b>9 Procurement of utilities and materials</b>				
9.1	Is the procurement of the chemicals easy?	<input checked="" type="radio"/> Yes	No	
9.2	Is there a procurement plan for chemicals?	<input checked="" type="radio"/> Yes	No	
9.3	Amount of electric power used	1000	kWhn in a day	kWh in a year
9.4	Quantity of industrial chemicals used such as chlorine, coagulant, etc.	NaClO	2.5mg/day	kg/year
		not used	kg/d,	kg/year

9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	<input checked="" type="radio"/> Yes	No
9.6	Frequency of power failure during year, total number of hours of power failure		times/year 15-20 hours/month average
9.7	Are there standby power generators?	<input checked="" type="radio"/> Yes	No
9.8	How many times a year and how many hours a year is the standby power generator used?		times/year hours/year used when interruption is more than 10minutes
10	<b>Efficiency improvement and remedial measures and maintenance management of sewerage facilities</b>		
10.1	Is there a centralized control system?	<input checked="" type="radio"/> Yes	No
	Is there a data logger system?	<input checked="" type="radio"/> Yes	No
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No
11	<b>Safety management</b>		
11.1	Is there a safety and hygiene organization?	<input checked="" type="radio"/> Yes	No
11.2	Is there a safety operation manual?	<input checked="" type="radio"/> Yes	No
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input checked="" type="radio"/> No Fire drills, National Safety week
11.6	Is education and training implemented for health and safety ?	<input checked="" type="radio"/> Yes	No
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	<input checked="" type="radio"/> Yes	No

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

1	<b>Machinery system</b>		
1.1	<b>Type of screens</b>		
1.1.1	Is there a coarse screen?	<input checked="" type="radio"/> Yes	No
1.1.2	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
1.1.3	Is there a fine screen?	<input checked="" type="radio"/> Yes	No
1.1.4	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
1.1.5	<b>Grit chamber</b>		
1.1.6	Is there a crushing device?	Yes	<input checked="" type="radio"/> No
1.1.7	Is there a conveyor?	Yes	<input checked="" type="radio"/> No
1.1.8	<b>How is the grid chamber cleaned?</b>		
	Mechanically?	Yes	<input checked="" type="radio"/> No
	Bucket elevator?	Yes	<input checked="" type="radio"/> No
	Jet pump?	Yes	<input checked="" type="radio"/> No
	Screw?	Yes	<input checked="" type="radio"/> No
	Air lift?	Yes	<input checked="" type="radio"/> No
	Manually?	<input checked="" type="radio"/> Yes	No
	Aeration?	Yes	<input checked="" type="radio"/> No
1.2	<b>Pumps</b>		
1.2.1	What is the rated voltage of main pump?		415 V
1.2.2	Is there any speed controlled pump?	Yes	<input checked="" type="radio"/> No
1.2.3	If Yes, what is the type of pump?	Yes	<input checked="" type="radio"/> No
1.2.4	If Yes, what is the method of speed control?	No	
1.3	<b>What type of aeration facilities used?</b>		
			Roots blower
1.3.1	What type of air diffuser is used?		N/A
1.4	<b>Disinfection equipment</b>		
1.4.1	<b>What type of disinfection method for effluent is used?</b>		
	Chlorination?	<input checked="" type="radio"/> Yes	No
	Ultra violet ray?	Yes	<input checked="" type="radio"/> No
	Ozonizer?	Yes	<input checked="" type="radio"/> No
1.5	<b>Sludge thickening equipment</b>		
1.5.1	<b>What type of sludge thickening equipment is used ?</b>		
	Gravity thickening?	Yes	<input checked="" type="radio"/> No
	Air flotation?	Yes	<input checked="" type="radio"/> No
	Centrifugal thickening?	Yes	<input checked="" type="radio"/> No
	Belt type?	Yes	<input checked="" type="radio"/> No
1.6	<b>Sludge dehydration equipment</b>		
1.6.1	<b>Type of sludge dehydration method used:</b>		
	Mechanical?		
	Filter press?	Yes	<input checked="" type="radio"/> No
	Centrifugal dehydration	<input checked="" type="radio"/> Yes	No
	Vacuum filtration?	Yes	<input checked="" type="radio"/> No
	Others?		Sludge drying beds
1.6.2	Where does the dewatered sludge go to?		N/A
1.7.1	Sludge digestion facility (Anaerobic)?	Yes	<input checked="" type="radio"/> No
1.7.2	Is digester gas used?	Yes	<input checked="" type="radio"/> No for

2	<b>Electrical system</b>		
2.1	<b>Substation facility</b>		
2.1.1	What is the substation voltage?	11	kV
2.3	<b>Uninterrupted power supply (UPS)</b>		
2.3.1	Is there uninterrupted power supply?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
2.3.2	If Yes, is it DC supply or AC supply?	<input checked="" type="radio"/> AC	<input type="radio"/> DC
2.3.3	What are the applications of this power supply?	PLC only	
2.5	<b>Measuring instruments</b>		
2.5.1	<b>What type of flow meter is used and where?</b>		
	Electro-magnetic?	<input checked="" type="radio"/> Yes ( 1 )	<input type="radio"/> No Inlet before screen
	Ultrasonic?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Orifice plate?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Venturi?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Weir?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Partial flume?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
2.5.2	<b>What type of level gauge is adopted and where?</b>		
	Float-type?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Pressure-type?	<input checked="" type="radio"/> Yes ( 4 )	<input type="radio"/> No Aeration tanks, etc
	Ultrasonic?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
	Radio wave ?	<input type="radio"/> Yes ( )	<input checked="" type="radio"/> No
2.5.3	<b>Is a water quality meter used?</b>		
	PH?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	DO?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	MLSS?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	ORP?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Turbidity?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	Nitrogen?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Phosphorus?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
2.5.4	<b>Is sludge measurement performed?</b>		
	Sludge concentration?	<input checked="" type="radio"/> Yes	<input type="radio"/> No Twice a day - MLSS
2.5.5	<b>Meteorological instruments used for:</b>		
	Temperature?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
	Atmospheric pressure?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Rain?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Wind velocity (Anemometer)?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
2.5	<b>Monitoring control system</b>		
	<b>Does a lookout post exist at the following locations?</b>		
	Grit chamber	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Dry well	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Sewage treatment facility	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Sludge thickening equipment	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Sludge dehydration equipment	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Anaerobic digestion tank	<input type="radio"/> Yes	<input checked="" type="radio"/> No
	Pumping station	<input type="radio"/> Yes	<input checked="" type="radio"/> No
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	<input checked="" type="radio"/> Yes	<input type="radio"/> No



**Part B Individual Treatment Plant**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Cover sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Tamilnadu
2	Name of city/town	Chennai
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

**I Summary of sewage treatment plant**

<b>1 Basic data related to STP components</b>			
1.1	Are there calculations for basic design and capacity of treatment plant components?	<input checked="" type="radio"/> Yes	No, Others
1.2	Is there a layout plan showing earthwork, machinery, and electric equipment?	<input checked="" type="radio"/> Yes	No, Others
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings, and so on?	<input checked="" type="radio"/> Yes <input checked="" type="radio"/> Yes <input checked="" type="radio"/> Yes	No No No Others : Others : Others :
1.4	Is there a flow chart for instrumentation?	<input checked="" type="radio"/> Yes	No Others :
1.5	Are there single-line diagrams (electrical)?	<input checked="" type="radio"/> Yes	No Others :
1.6	Sewage treatment process used (Example: Conventional activated sludge process)	ASP	
1.7	Sludge treatment process used (Example: Sludge drying after thickening)	Centrifugal sludge dehydration after thickening	
1.8	Which is the effluent discharge point?	Sea area through Buckingham canal	
1.9	Layout of plant (please attach the drawing, if you have one)	<input checked="" type="radio"/> Yes	No
<b>2 History</b>			
2.1	Is the history of failure, repair, or reconstruction recorded?	<input checked="" type="radio"/> Yes	No Others :
2.2	Are there any requests or complaints from surrounding residents?	<input checked="" type="radio"/> Yes	No Yes, the residents filed cases in the High Court of Madras for shifting of the STP (which is in existence well before their settlement) along with the adjoining Solid waste dumping yard of Corporation of Chennai.
<b>3 Design capacity and actual loading</b>			
3.1	Design wastewater flow	54 MLD	
3.2	Average daily flow	60 MLD	
3.3	Maximum daily flow	65 MLD	
3.4	Dry weather flow	54 MLD	
3.5	Design wet weather flow	135 MLD	
3.6	Wet weather flow	70 MLD	
3.7	Design wastewater influent quality	BOD 460 mg/l COD 1570 mg/l SS 690 mg/l	
3.8	Average wastewater influent quality	BOD 306 mg/l COD 822 mg/l SS 414 mg/l	
3.9	Design effluent quality	BOD <20 mg/l COD <100 mg/l SS <30 mg/l	
3.10	Average effluent quality	BOD <17 mg/l COD <70 mg/l SS <24 mg/l	
3.11	Solids capture rate	93 %	
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)?	Primary sludge drawing :-Pumping / Gravity, Secondary sludge drawing :- Pumping , Digester sludge drawing :-Pumping	
3.13	Frequency of drawing out sludge	24	720
		time/day	times/month
3.14	Frequency of sludge carried outside STP	180	2160
		times/month	times/year
3.15	Design sludge generation volume and water content	0.03 MLD	10.95 ML/year 75 %
3.16	Average sludge generation volume, and water content	0.02 MLD	7.3 ML/year 80 %
3.17	Percentage of volatile solids in generated sludge	mean: 57 % max: 60 % min: 54 %	
3.18	Methods of effective sludge utilization	Land applications such as manure, landscaping, flowering plants, etc. Other methods : Filling up in low lying area inside STP.	
3.19	What is the amount of sludge disposed and water content in sludge?	t/month	All the sludge is disposed for filling up low lying areas.
		%	
3.2	Are there operation records for pumps, equipment, blowers, etc.?	Daily report: <input checked="" type="radio"/> Yes No	Monthly report: Yes No
		Annual report: Yes No	

3.2.1	Is the water quality measured regularly?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
3.2.2	Are water quality measurement records maintained?	Daily report: <input checked="" type="radio"/> Yes	<input type="radio"/> No	
		Annual report: <input type="radio"/> Yes	<input type="radio"/> No	
3.2.3	Is record of concentration of toxic substances in sludge maintained?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
3.2.4	Has the water quality of the final effluent exceeded your target effluent standards anytime?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
3.2.5	If Yes, what are the causes for exceeding the effluent standard?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> NA
4	<b>Corrosion of facilities and damage status</b>			
4.1	Is there corrosion of buildings or structures?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	name of part :
4.2	Was there any damage to the building frame part of facilities?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	name of part :
4.3	Is there corrosion in equipment?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	All MS components of the pumps are affected by corrosion and prevented by Epoxy painting frequently.
4.4	Is there damage to equipment?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	name of part :
4.5	Are there records of corrosion and damage to equipment?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
4.6	Is there foul smell most of the time?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
4.7	Is scum generated?	A large amount,	<input checked="" type="radio"/> Small amount,	<input type="radio"/> No
5	<b>Management of facilities</b>			
5.1	Is there a schedule for operating machinery and equipment	<input checked="" type="radio"/> Yes	"manufacturer compilation, Others"	<input type="radio"/> No
5.2	Is there an operation manual for the complete facility?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
	Is there a wastewater examination method?	<input checked="" type="radio"/> Yes	Name of the method: APHA standard 21st Edition.	<input type="radio"/> No
5.4	Are there the education and training manuals for the staff of the STP?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
6	<b>Inspection of equipment in the STP</b>			
6.1	Are there check records for equipment?	Daily report: <input type="radio"/> Yes	<input type="radio"/> No	Monthly report: <input checked="" type="radio"/> Yes
		Annual report: <input type="radio"/> Yes	<input type="radio"/> No	
6.2	Is there an inspection manual?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
6.3	Is there an inspection schedule?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
6.4	Details of inspection procedure	<input checked="" type="radio"/> Visual	audible/	/TV camera, others :
6.5	How has the result of the inspection been used?	For updating Preventive maintenance schedule the results are used.		
6.6	How are inspection results maintained?	Electronic data,	<input checked="" type="radio"/> Hard copy,	Others :
7	<b>Repair, Rehabilitation, Reconstruction</b>			
7.1	Is there a manual for repair, rehabilitation and reconstruction of the STP?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
7.2	If Yes, is it being used?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
7.3	Are there repair, rehabilitation and reconstruction plans for the STP?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
7.4	Have repairs, rehabilitation and reconstruction been implemented?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
7.5	Are there repair, rehabilitation and reconstruction records?	Electronic data,	<input checked="" type="radio"/> Hard copy,	Others :
8	<b>Work implementation</b>			
8.1	Staffing or Manpower at Plant	Engineers: 3 persons,	Foreman: 2 persons	
		Maintenance: 7 persons,	Shift in charge: 3 persons	
		Lab Analyst: 2 persons,		
		Office workers: 27 persons,	Total staff: 44 persons	
8.2	Engineers	Mechanical Engineer: 1 person,		
		Electrical Engineer: 1 person,		
		Process Engineer: 1 person,		
8.3	Working time	Regular working tin From 9:00 to 18:00	Shifts: to	
8.4	Work mode	<input checked="" type="radio"/> Permanent worker	<input checked="" type="radio"/> Subcontracto	
8.5	Contents of work	<input checked="" type="radio"/> Operation	<input checked="" type="radio"/> Maintenance	<input checked="" type="radio"/> Repair
8.6	Others (Are there the special measures taken at the time of accidents or disasters?)	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
9	<b>Procurement of utilities and materials</b>			
9.1	Is the procurement of the chemicals easy?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
9.2	Is there a procurement plan for chemicals?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
9.3	Amount of electric power used	9952 kWh in a day	3632480 kWh in a year	
9.4	Quantity of industrial chemicals used such as chlorine, coagulant, etc.	Coagulant : Poly electrolyte	10 kg/d, 3650 kg/year	
		Scrubber NaOH Caustic soda:	20 kg/d, 7200 kg/year	
9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
9.6	Frequency of power failure during year, total number of hours of power failure	150 times/year	403.10 hours/month	

9.7	Are there standby power generators?	<input checked="" type="radio"/> Yes	No
9.8	How many times a year and how many hours a year is the standby power generator used?	150 times/year	403.10 hours/year
10	<b>Efficiency improvement and remedial measures and maintenance management of sewerage facilities</b>		
10.1	Is there a centralized control system?	Yes	<input checked="" type="radio"/> No
	Is there a data logger system?	Yes	<input checked="" type="radio"/> No
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No
11	<b>Safety management</b>		
11.1	Is there a safety and hygiene organization?	<input checked="" type="radio"/> Yes	No
11.2	Is there a safety operation manual?	<input checked="" type="radio"/> Yes	No
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input checked="" type="radio"/> No
11.6	Is education and training implemented for health and safety ?	<input checked="" type="radio"/> Yes	No
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	<input checked="" type="radio"/> Yes	No

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

1	<b>Machinery system</b>		
1.1	<b>Type of screens</b>		
1.1.1	Is there a coarse screen?	<input checked="" type="radio"/> Yes	No
1.1.2	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
1.1.3	Is there a fine screen?	Yes	<input checked="" type="radio"/> No
1.1.4	Is screen type mechanical?	Yes	<input checked="" type="radio"/> No
1.1.5	<b>Grit chamber</b>		
1.1.6	Is there a crushing device?	Yes	<input checked="" type="radio"/> No
1.1.7	Is there a conveyor?	<input checked="" type="radio"/> Yes	No
1.1.8	<b>How is the grid chamber cleaned?</b>		
	Mechanically?	<input checked="" type="radio"/> Yes	No
	Bucket elevator?	Yes	<input checked="" type="radio"/> No
	Jet pump?	Yes	<input checked="" type="radio"/> No
	Screw?	Yes	<input checked="" type="radio"/> No
	Air lift?	Yes	<input checked="" type="radio"/> No
	Manually?	Yes	<input checked="" type="radio"/> No
	Aeration?	Yes	<input checked="" type="radio"/> No
1.2	<b>Pumps</b>		
1.2.1	What is the rated voltage of main pump?	415	V
1.2.2	Is there any speed controlled pump?	<input checked="" type="radio"/> Yes	No
1.2.3	If Yes, what is the type of pump?	Positive displacement blower for Biogas scrubber air blower and Biogas feed blower.	
1.2.4	If Yes, what is the method of speed control?	VFD-Variable frequency Drive.	
1.3	<b>What type of aeration facilities used?</b>		
		Surface aerator	
1.3.1	What type of air diffuser is used?	N/A	
1.4	<b>Disinfection equipment</b>		
1.4.1	<b>What type of disinfection method for effluent is used?</b>		
		Maturation pond of 2 days detention period is provided.	
	Chlorination?	Yes	<input checked="" type="radio"/> No
	Ultra violet ray?	Yes	<input checked="" type="radio"/> No
	Ozonizer?	Yes	<input checked="" type="radio"/> No
1.5	<b>Sludge thickening equipment</b>		
1.5.1	<b>What type of sludge thickening equipment is used ?</b>		
	Gravity thickening?	<input checked="" type="radio"/> Yes	No
	Air flotation?	Yes	<input checked="" type="radio"/> No
	Centrifugal thickening?	Yes	<input checked="" type="radio"/> No
	Belt type?	Yes	<input checked="" type="radio"/> No
1.6	<b>Sludge dehydration equipment</b>		
1.6.1	<b>Type of sludge dehydration method used:</b>		
	<b>Mechanical?</b>		
	Filter press?	Yes	<input checked="" type="radio"/> No
	Centrifugal dehydration	<input checked="" type="radio"/> Yes	No
	Vacuum filtration?	Yes	<input checked="" type="radio"/> No
	Others?	Yes	<input checked="" type="radio"/> No
1.6.2	Where does the dewatered sludge go to?	For land filling / filling up low lying areas inside the plant.	
1.7.1	Sludge digestion facility (Anaerobic)?	<input checked="" type="radio"/> Yes	No
1.7.2	Is digester gas used?	<input checked="" type="radio"/> Yes	No for captive power generation
2	<b>Electrical system</b>		
2.1	<b>Substation facility</b>		
2.1.1	What is the substation voltage?	11	kV
2.3	<b>Uninterrupted power supply (UPS)</b>		
2.3.1	Is there uninterrupted power supply?	<input checked="" type="radio"/> Yes	No
2.3.2	If Yes, is it DC supply or AC supply?	<input checked="" type="radio"/> AC	DC
2.3.3	What are the applications of this power supply?	Instruments.	

2.5	<b>Measuring instruments</b>		
2.5.1	<b>What type of flow meter is used and where?</b>		
	Electro-magnetic?	<input checked="" type="radio"/> Yes ( 1 )	No for sludge flow.
	Ultrasonic?	<input checked="" type="radio"/> Yes ( )	No for influent and effluent flow.
	Orifice plate?	Yes ( )	<input checked="" type="radio"/> No
	Venturi?	Yes ( )	<input checked="" type="radio"/> No
	Weir?	Yes ( )	<input checked="" type="radio"/> No
	Partial flume?	<input checked="" type="radio"/> Yes ( )	No for influent and effluent flow.
2.5.2	<b>What type of level gauge is adopted and where?</b>		
	Float-type?	Yes ( )	<input checked="" type="radio"/> No
	Pressure-type?	Yes ( )	<input checked="" type="radio"/> No
	Ultrasonic?	<input checked="" type="radio"/> Yes ( )	No for influent and effluent flow.
	Radio wave ?	Yes ( )	<input checked="" type="radio"/> No
2.5.3	<b>Is a water quality meter used?</b>		
	PH?	Yes	<input checked="" type="radio"/> No
	DO?	Yes	<input checked="" type="radio"/> No
	MLSS?	Yes	<input checked="" type="radio"/> No
	ORP?	Yes	<input checked="" type="radio"/> No
	Turbidity?	Yes	<input checked="" type="radio"/> No
	Nitrogen?	Yes	<input checked="" type="radio"/> No
	Phosphorus?	Yes	<input checked="" type="radio"/> No
2.5.4	<b>Is sludge measurement performed?</b>		
	Sludge concentration?	<input checked="" type="radio"/> Yes	No
2.5.5	<b>Meteorological instruments used for:</b>		
	Temperature?	<input checked="" type="radio"/> Yes	No
	Atmospheric pressure?	Yes	<input checked="" type="radio"/> No
	Rain?	Yes	<input checked="" type="radio"/> No
	Wind velocity (Anemometer)?	Yes	<input checked="" type="radio"/> No
2.5	<b>Monitoring control system</b>		
2.5.1	<b>Does a lookout post exist at the following locations?</b>		
	Grit chamber	Yes	<input checked="" type="radio"/> No
	Dry well	Yes	<input checked="" type="radio"/> No
	Sewage treatment facility	Yes	<input checked="" type="radio"/> No
	Sludge thickening equipment	Yes	<input checked="" type="radio"/> No
	Sludge dehydration equipment	Yes	<input checked="" type="radio"/> No
	Anaerobic digestion tank	Yes	<input checked="" type="radio"/> No
	Pumping station	Yes	<input checked="" type="radio"/> No
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	Yes	<input checked="" type="radio"/> No

## Part B Individual Treatment Plant

### Questionnaire for 8 target states and 2 Union Territories in India

#### Cover sheet

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Tamilnadu
2	Name of city/town	Chennai
3	Name of respondent	
4	STP Name	
5	Contact information	
6	Address	
7	Phone number	
8	E-mail address	

#### I Summary of sewage treatment plant

<b>1 Basic data related to STP components</b>			
1.1	Are there calculations for basic design and capacity of treatment plant components?	<input checked="" type="radio"/> Yes	No, Others
1.2	Is there a layout plan showing earthwork, machinery, and electric equipment?	<input checked="" type="radio"/> Yes	No, Others
1.3	Are there detailed specifications of all facilities and equipment fitted in the plant? Are there as-fitted drawings of all sewers? Are there structural drawings of tanks, digesters, reactors, buildings, and so on?	<input checked="" type="radio"/> Yes <input checked="" type="radio"/> Yes <input checked="" type="radio"/> Yes	No No No Others : Others : Others :
1.4	Is there a flow chart for instrumentation?	<input checked="" type="radio"/> Yes	No Others :
1.5	Are there single-line diagrams (electrical)?	<input checked="" type="radio"/> Yes	No Others :
1.6	Sewage treatment process used (Example: Conventional activated sludge process)	ASP	
1.7	Sludge treatment process used (Example: Sludge drying after thickening)	Centrifugal sludge dehydration after thickening	
1.8	Which is the effluent discharge point?	Sea area through Adayar River	
1.9	Layout of plant (please attach the drawing, if you have one)	<input checked="" type="radio"/> Yes	No
<b>2 History</b>			
2.1	Is the history of failure, repair, or reconstruction recorded?	<input checked="" type="radio"/> Yes	No Others :
2.2	Are there any requests or complaints from surrounding residents?	Yes	<input checked="" type="radio"/> No
<b>3 Design capacity and actual loading</b>			
3.1	Design wastewater flow	40	MLD
3.2	Average daily flow	40	MLD
3.3	Maximum daily flow	43	MLD
3.4	Dry weather flow	36	MLD
3.5	Design wet weather flow	90	MLD
3.6	Wet weather flow	49	MLD
3.7	Design wastewater influent quality	BOD 350 mg/l	COD 600 mg/l SS 400 mg/l
3.8	Average wastewater influent quality	BOD 320 mg/l	COD 700 mg/l SS 450 mg/l
3.9	Design effluent quality	BOD <20 mg/l	COD <100 mg/l SS <30 mg/l
3.10	Average effluent quality	BOD <18 mg/l	COD <60 mg/l SS <25 mg/l
3.11	Solids capture rate	95 %	
3.12	What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)?	By pumping	
3.13	Frequency of drawing out sludge	6	time/day 180 times/month
3.14	Frequency of sludge carried outside STP	Sludge disposed within low lying areas of the STP	
3.15	Design sludge generation volume and water content	0.0222	MLD 8.1 ML/year 75 %
3.16	Average sludge generation volume, and water content	0.0122	MLD 4.45 ML/year 74 %
3.17	Percentage of volatile solids in generated sludge	mean: 68 % min: 62 %	max: 70 %
3.18	Methods of effective sludge utilization	Land applications such as manure, landscaping, flowering plants, etc. Other methods : Filling up in low lying area inside STP.	
3.19	What is the amount of sludge disposed and water content in sludge?	t/month %	All the sludge is disposed for filling up low lying areas.
3.2	Are there operation records for pumps, equipment, blowers, etc.?	Daily report: <input checked="" type="radio"/> Yes No Annual report: Yes No	Monthly report: Yes No
3.2.1	Is the water quality measured regularly?	<input checked="" type="radio"/> Yes	No
3.2.2	Are water quality measurement records maintained?	Daily report: <input checked="" type="radio"/> Yes No Annual report: Yes No	

3.2.3	Is record of concentration of toxic substances in sludge maintained?	Yes	<input type="radio"/> No	
3.2.4	Has the water quality of the final effluent exceeded your target effluent standards anytime?	Yes	<input type="radio"/> No	
3.2.5	If Yes, what are the causes for exceeding the effluent standard?	Yes	No	NA
<b>4 Corrosion of facilities and damage status</b>				
4.1	Is there corrosion of buildings or structures?	Yes	<input type="radio"/> No	name of part :
4.2	Was there any damage to the building frame part of facilities?	Yes	<input type="radio"/> No	name of part :
4.3	Is there corrosion in equipment?	<input checked="" type="radio"/> Yes	No	All MS components of the pumps are affected by corrosion and prevented by Epoxy painting frequently. name of part :
4.4	Is there damage to equipment?	Yes	<input type="radio"/> No	name of part :
4.5	Are there records of corrosion and damage to equipment?	<input checked="" type="radio"/> Yes	No	
4.6	Is there foul smell most of the time?	Yes	<input type="radio"/> No	
4.7	Is scum generated?	A large amount,	<input checked="" type="radio"/> Small amount	No
<b>5 Management of facilities</b>				
5.1	Is there a schedule for operating machinery and equipment	<input checked="" type="radio"/> Yes	"manufacturer compilation, Others"	No
5.2	Is there an operation manual for the complete facility?	<input checked="" type="radio"/> Yes	No	
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	<input checked="" type="radio"/> Yes	No	
	Is there a wastewater examination method?	<input checked="" type="radio"/> Yes	Name of the method: APHA standard 22st Edition.	No
5.4	Are there the education and training manuals for the staff of the STP?	<input checked="" type="radio"/> Yes	No	
<b>6 Inspection of equipment in the STP</b>				
6.1	Are there check records for equipment?	Daily report: <input checked="" type="radio"/> Yes <input type="radio"/> No	Monthly report: <input checked="" type="radio"/> Yes <input type="radio"/> No	
		Annual report: <input checked="" type="radio"/> Yes <input type="radio"/> No		
6.2	Is there an inspection manual?	Yes	<input type="radio"/> No	
6.3	Is there an inspection schedule?	Yes	<input type="radio"/> No	
6.4	Details of inspection procedure	<input checked="" type="radio"/> Visual	audible/ /TV camera,	others :
6.5	How has the result of the inspection been used?	N/A		
6.6	How are inspection results maintained?	Electronic data,	<input checked="" type="radio"/> Hard copy,	Others :
<b>7 Repair, Rehabilitation, Reconstruction</b>				
7.1	Is there a manual for repair, rehabilitation and reconstruction of the STP?	<input checked="" type="radio"/> Yes	No	
7.2	If Yes, is it being used?	<input checked="" type="radio"/> Yes	No	
7.3	Are there repair, rehabilitation and reconstruction plans for the STP?	<input checked="" type="radio"/> Yes	No	
7.4	Have repairs, rehabilitation and reconstruction been implemented?	<input checked="" type="radio"/> Yes	No	
7.5	Are there repair, rehabilitation and reconstruction records?	Electronic data,	<input checked="" type="radio"/> Hard copy,	Others :
<b>8 Work implementation</b>				
8.1	Staffing or Manpower at Plant	Engineers: 9 persons,	Foreman: 1 person	
		Maintenance: 17 persons,	Shift in charge: 10 persons	
		Lab Analyst: 2 persons,		
		Office workers: 0 person,	Total staff: 38 persons	
8.2	Engineers	Mechanical Engineer: 4 persons,		
		Electrical Engineer: 4 persons,		
		Process Engineer: 1 person,		
8.3	Working time	Regular working tin From 8:00 to 18:00	Shifts: to	
8.4	Work mode	<input checked="" type="radio"/> Permanent worker	<input checked="" type="radio"/> Subcontracto	<input type="radio"/> Shift
8.5	Contents of work	<input checked="" type="radio"/> Operation	<input checked="" type="radio"/> Maintenance	<input checked="" type="radio"/> Repair
8.6	Others (Are there the special measures taken at the time of accidents or disasters?)	<input checked="" type="radio"/> Yes	No	
<b>9 Procurement of utilities and materials</b>				
9.1	Is the procurement of the chemicals easy?	<input checked="" type="radio"/> Yes	No	
9.2	Is there a procurement plan for chemicals?	<input checked="" type="radio"/> Yes	No	
9.3	Amount of electric power used	7000 kWh in a day	2044000 kWh in a year	
9.4	Quantity of industrial chemicals used such as chlorine, coagulant, etc.	Chlorine: 200 kg/d,	73000 kg/year	
		Poly Electolyte: 7 kg/d,	2555 kg/year	
		Scrubber NaOH Caustic soda: 3 kg/d,	1095 kg/year	

9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	<input checked="" type="radio"/> Yes	No
9.6	Frequency of power failure during year, total number of hours of power failure	as grid power from Tamilnadu Electricity Board was not obtained	
9.7	Are there standby power generators?	<input checked="" type="radio"/> Yes	No
9.8	How many times a year and how many hours a year is the standby power generator used?	91 times/year 6370 hours/year	
10	<b>Efficiency improvement and remedial measures and maintenance management of sewerage facilities</b>		
10.1	Is there a centralized control system?	Yes	<input checked="" type="radio"/> No
	Is there a data logger system?	Yes	<input checked="" type="radio"/> No
10.2	Has the operation and maintenance service been subcontracted to a private company?	<input checked="" type="radio"/> Yes	No
11	<b>Safety management</b>		
11.1	Is there a safety and hygiene organization?	<input checked="" type="radio"/> Yes	No
11.2	Is there a safety operation manual?	<input checked="" type="radio"/> Yes	No
11.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
11.4	Are there warning signs for dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
11.5	Have there been instances of accidents/disasters in the past?	Yes	<input checked="" type="radio"/> No
11.6	Is education and training implemented for health and safety ?	<input checked="" type="radio"/> Yes	No
11.7	Is there a risk management manual (for floods, cyclones, earthquakes, and other natural disasters)?	<input checked="" type="radio"/> Yes	No

## II Check list of sewerage systems, machinery and electrical systems

Please reply as indicated on the right side.

1	<b>Machinery system</b>		
1.1	<b>Type of screens</b>		
1.1.1	Is there a coarse screen?	<input checked="" type="radio"/> Yes	No
1.1.2	Is screen type mechanical?	<input checked="" type="radio"/> Yes	No
1.1.3	Is there a fine screen?	Yes	<input checked="" type="radio"/> No
1.1.4	Is screen type mechanical?	Yes	<input checked="" type="radio"/> No
1.1.5	<b>Grit chamber</b>		
1.1.6	Is there a crushing device?	Yes	<input checked="" type="radio"/> No
1.1.7	Is there a conveyor?	<input checked="" type="radio"/> Yes	No
1.1.8	<b>How is the grid chamber cleaned?</b>		
	Mechanically?	<input checked="" type="radio"/> Yes	No
	Bucket elevator?	Yes	<input checked="" type="radio"/> No
	Jet pump?	Yes	<input checked="" type="radio"/> No
	Screw?	Yes	<input checked="" type="radio"/> No
	Air lift?	Yes	<input checked="" type="radio"/> No
	Manually?	Yes	<input checked="" type="radio"/> No
	Aeration?	Yes	<input checked="" type="radio"/> No
1.2	<b>Pumps</b>		
1.2.1	What is the rated voltage of main pump?	415	V
1.2.2	Is there any speed controlled pump?	Yes	<input checked="" type="radio"/> No
1.2.3	If Yes, what is the type of pump?	No	
1.2.4	If Yes, what is the method of speed control?	No	
1.3	<b>What type of aeration facilities used?</b>		
1.3.1	What type of air diffuser is used?	Fixed low speed surface Aerators.	
1.4	<b>Disinfection equipment</b>		
1.4.1	<b>What type of disinfection method for effluent is used?</b>		
	Chlorination?	<input checked="" type="radio"/> Yes	No
	Ultra violet ray?	Yes	<input checked="" type="radio"/> No
	Ozonizer?	Yes	<input checked="" type="radio"/> No
1.5	<b>Sludge thickening equipment</b>		
1.5.1	<b>What type of sludge thickening equipment is used ?</b>		
	Gravity thickening?	<input checked="" type="radio"/> Yes	No
	Air flotation?	Yes	<input checked="" type="radio"/> No
	Centrifugal thickening?	Yes	<input checked="" type="radio"/> No
	Belt type?	Yes	<input checked="" type="radio"/> No
1.6	<b>Sludge dehydration equipment</b>		
1.6.1	<b>Type of sludge dehydration method used:</b>		
	Mechanical?	Yes	No
	Filter press?	Yes	<input checked="" type="radio"/> No
	Centrifugal dehydration	<input checked="" type="radio"/> Yes	No
	Vacuum filtration?	Yes	<input checked="" type="radio"/> No
	Others?	Yes	<input checked="" type="radio"/> No
1.6.2	Where does the dewatered sludge go to?	For land filling / filling up low lying areas inside the plant.	
1.7.1	Sludge digestion facility (Anaerobic)?	<input checked="" type="radio"/> Yes	No
1.7.2	Is digester gas used?	<input checked="" type="radio"/> Yes	No for captive power generation

2	<b>Electrical system</b>			
2.1	<b>Substation facility</b>			
2.1.1	What is the substation voltage?		11	kV
2.3	<b>Uninterrupted power supply (UPS)</b>			
2.3.1	Is there uninterrupted power supply?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
2.3.2	If Yes, is it DC supply or AC supply?	AC	<input type="radio"/>	DC <input type="radio"/> No
2.3.3	What are the applications of this power supply?	No		
2.5	<b>Measuring instruments</b>			
2.5.1	<b>What type of flow meter is used and where?</b>			
	Electro-magnetic?	Yes ( <input type="radio"/> )	<input checked="" type="radio"/>	No
	Ultrasonic?	<input checked="" type="radio"/>	( <input type="radio"/> )	No For influent and effluent flow.
	Orifice plate?	Yes ( <input type="radio"/> )	<input checked="" type="radio"/>	No
	Venturi?	Yes ( <input type="radio"/> )	<input checked="" type="radio"/>	No
	Weir?	Yes ( <input type="radio"/> )	<input checked="" type="radio"/>	No
	Partial flume?	<input checked="" type="radio"/>	( <input type="radio"/> )	No For influent and effluent flow.
2.5.2	<b>What type of level gauge is adopted and where?</b>			
	Float-type?	Yes ( <input type="radio"/> )	<input checked="" type="radio"/>	No
	Pressure-type?	<input checked="" type="radio"/>	( <input type="radio"/> )	No
	Ultrasonic?	Yes ( <input type="radio"/> )	<input checked="" type="radio"/>	No
	Radio wave ?	Yes ( <input type="radio"/> )	<input checked="" type="radio"/>	No
2.5.3	<b>Is a water quality meter used?</b>			
	PH?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	DO?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	MLSS?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	ORP?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Turbidity?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Nitrogen?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Phosphorus?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
2.5.4	<b>Is sludge measurement performed?</b>			
	Sludge concentration?	<input checked="" type="radio"/>	Yes	No
2.5.5	<b>Meteorological instruments used for:</b>			
	Temperature?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Atmospheric pressure?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Rain?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Wind velocity (Anemometer)?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
2.5	<b>Monitoring control system</b>			
2.5.1	<b>Does a lookout post exist at the following locations?</b>			
	Grit chamber	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Dry well	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Sewage treatment facility	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Sludge thickening equipment	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Sludge dehydration equipment	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Anaerobic digestion tank	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
	Pumping station	Yes	<input type="radio"/>	<input checked="" type="radio"/> No
2.5.3	Is SCADA (Supervisory Control And Data Acquisition) system used?	Yes	<input type="radio"/>	<input checked="" type="radio"/> No



***APPENDIX – A3-2***

***Questionnaires on Operation and  
Maintenance of Pumping Stations and Sewers***



**Questionnaire for 8 target states and 2 Union Territories in India (below )**

**Face sheet**

For your answer, please fill in the fields below so Study Team may want to check later.

1	Name of state	Delhi
2	Name of city/town	Delhi
3	Name of respondent	
4	Department	
5	Name of Plant	
6	Contact information	
7	-Address	
8	-Phone number	
9	-Fax number	
10	-E-mail address	

**Status of Sewerage facilities and O&M**

Mark the appropriate answer for the following questions related to their operation and maintenance of sewerage facilities, or indicate the quantity and content, please.

1	<b>Summary of sewer and channels</b>	
1.1	<b>Collection system</b>	
1.1.1	Type of collection system	Normally separate system; mixed with rainwater during rainy season
1.2	<b>History of sewer use</b>	
1.2.1	Sewer ledger	N/A
1.2.2	Tenure of use of The pipes	N/A
	Materials of Pipes and channels	N/A
1.2.3	Manhole kind and number set up	N/A
	Size of sewer and channels	N/A
1.3	<b>Investigation of sewer net</b>	
1.3.1	Is there a manual for sewer net investigation?	N/A
1.3.2	Is there a plan for sewer net investigation?	N/A
1.3.3	Search procedure	N/A
1.3.4	How has the result of the survey been used?	N/A
1.3.5	Are there the check records for sewer and	N/A
1.3.6	How are the results of the investigation kept?	N/A
1.3.7	Is there a plan for pipe cleaning ?	N/A
1.3.8	Are there records of pipe cleaning ?	N/A
1.3.9	About the organization which carries out business	N/A
1.4	<b>Repair, Rehabilitation, Reconstruction</b>	
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	N/A
1.4.2	Is it used?	N/A
1.4.3	Are there the plan of sewer net repair, rehabilitation and reconstruction?	N/A
1.4.4	Were repairs, regeneration and rebuilding	N/A
1.4.5	Are there records of repair, rehabilitation and reconstruction?	N/A
1.4.6	How are the results of the investigation kept?	N/A
1.5	<b>Safety management</b>	
1.5.1	Is there the safety hygiene organization?	N/A
1.5.2	Is there a safety operation manual ?	N/A
1.5.3	Is a safety protection tool arranged?	N/A
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	N/A
1.5.5	Has a disaster occurred in the past?	N/A
1.5.6	Is education and training being given for health	N/A
1.5.7	Is there a crisis-management manual?	N/A
1.6	<b>About the organization which carries out work</b>	
1.6.1	Management organization	N/A
1.6.2	Working time	N/A
1.6.3	Work content	N/A
1.6.4	About the organization which carries out business	N/A

2	<b>Summary of relay pumping station</b>	
2.1	<b>Basic data concerning facilities</b>	
2.1.1	Are there specifications for basic design and facilities	N/A
2.1.2	Is there any completed chart or documents about the earthwork, machines, and installation, construction of electric equipment about the pumping station.	N/A
2.1.3	Is there an Equipment Ledger?	N/A
2.2	<b>Inspection of facility and equipment</b>	
2.2.1	Are there check records for equipment?	N/A
2.3	<b>About the matter relevant to the history</b>	
2.3.1	Is there any record of the breakdown , repair, and reconstruction of facilities?	N/A
2.3.2	Are there records of requests and complaints from surrounding residents?	N/A
2.4	<b>Management of premeditated facilities</b>	
2.4.1	Is there a plan for operating equipment of the plant?	Yes ( manufacturer compilation, Others )
2.4.2	Is there an operation manual?	N/A
2.4.3	Are there plans for repair, rehabilitation and	N/A
2.4.4	Are there education and training plans for the staff	N/A
2.5	<b>Safety management</b>	
2.5.1	Is there a safety and hygiene organization?	N/A
2.5.2	Is there a safety operation manual ?	N/A
2.5.3	Are tools for safety and protection properly	N/A
2.5.4	Is there indication or warning about dangerous parts of the facilities?	N/A
2.5.5	Is there an example of a disaster in the past?	N/A
2.5.6	Are education and training in health and safety	N/A
2.5.7	Is there a crisis-management manual?	N/A
2.6	<b>About the organization which carries out work</b>	
2.6.1	Implementing system	N/A
2.6.2	Working time	N/A
2.6.3	Work content	N/A
2.6.4	About the organization which carries out work	N/A

**Part A Sewer Networks, Pumping Stations and STP under Urban Local Body  
Questionnaire for 8 target states and 2 Union Territories in India**

**Face sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Haryana
2	Name of city/town	Gurgaon
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

**I Status of Sewerage facilities and O&M**

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

1	<b>Summary of sewers and channels</b>			
1.1	<b>Collection system</b>			
1.1.1	Type of collection system	<input checked="" type="radio"/> Separate system	Combined system ,	A part is combined system
1.2	<b>History of sewer use</b>			
1.2.1	Sewer record book or log book	<input checked="" type="radio"/> Yes	No	Drawing available
		<input checked="" type="radio"/> Drawings	Others :	
1.2.2	Life of oldest sewer pipe	years to	years	(25years) (Circular brick drains)
	Materials of Pipes and channels	<input checked="" type="radio"/> Hume concrete pipe		Others : NP4 , now
1.2.3	Type, number and arrangement of manholes	concrete / brick kinds, Number set up: rectangular-corner-100km/30		
	Size of sewers and channels	Diameter: 200 mm to 1800 mm, mm (1800 being replaced by2400		
1.3	<b>Sewer network</b>			
1.3.1	Is there a manual for sewer network inspection?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.3.2	Is there a plan for sewer network?	<input checked="" type="radio"/> Yes	No	
1.3.3	Inspection procedure	<input checked="" type="radio"/> Visually	by TV camera	
		Others :		
1.3.4	How has the result of the inspection been used?	N/A		
1.3.5	Are there check records for sewer and manhole?	Yes	<input type="radio"/> No	
1.3.6	How are the results of the records kept?	Electronic data, Hard copy, N/A		
		Others :		
1.3.7	Is there a plan for pipe cleaning ?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.3.8	Are there records for pipe cleaning ?	Yes	<input type="radio"/> No	
1.3.9	About direct work and subcontracted work	Direct work	<input checked="" type="radio"/> Subcontracted work	
1.4	<b>Repair, Rehabilitation, Reconstruction</b>			
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	Yes	<input type="radio"/> No	Being prepared
1.4.2	If Yes, is it used?	Yes	No	N/A
1.4.3	Are there plans of sewer network repair, rehabilitation and reconstruction?	Yes	<input type="radio"/> No	Being prepared
1.4.4	Have repairs, rehabilitation and rebuilding been implemented?	Yes	<input type="radio"/> No	
1.4.5	Are there records of repair, rehabilitation and reconstruction?	Yes	<input type="radio"/> No	
1.4.6	How are the results of the investigation kept?	Electronic data, Hard copy, N/A		
		Others :		
1.5	<b>Safety management</b>			
1.5.1	Is there a safety and hygiene organization?	Yes	<input type="radio"/> No	
1.5.2	Is there a safety operation manual ?	Yes	<input type="radio"/> No	
1.5.3	Are safety protection tools used?	<input checked="" type="radio"/> Yes	No	Gas masks
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No	
1.5.5	Is education and training being given for health	Yes	<input type="radio"/> No	
1.5.6	Is there a crisis-management manual?	Yes	<input type="radio"/> No	
1.6	<b>About the organization which carries out work</b>			
1.6.1	Management organization	Manager: persons,	Worker: persons	N/A
1.6.2	Working time	From to	N/A	
1.6.3	Work content	Maintenance , rehabilitation and rebuild N/A		
1.6.4	About work mode	Through permanent workers	<input checked="" type="radio"/> Subcontract	

<b>2 Summary of relay pumping station</b>	
<b>2.1 Basic data of facilities</b>	
2.1.1 Is there a general layout plan showing all equipment and machinery?	<input checked="" type="radio"/> Yes    No    Others :
2.1.2 Is there a log book for equipment?	<input checked="" type="radio"/> Yes    No    Others :
<b>2.2 Inspection of facility and equipment</b>	
2.2.1 Are there check records for equipment?	Daily report : Yes <input checked="" type="radio"/> No,    Monthly report:    Yes    No, Annual report:    Yes    No    Only when problem occurs,logged
<b>2.3 History</b>	
2.3.1 Is there any record of breakdown , repair, and reconstruction of facilities?	Yes <input checked="" type="radio"/> No    Others :
<b>2.4 Management of planned facilities</b>	
2.4.1 Is there a schedule for operating equipment of the plant?	Yes ( manufacturer compilation, Others ), <input checked="" type="radio"/> No
2.4.2 Is there an operation manual?	Yes <input checked="" type="radio"/> No
2.4.3 Are there plans for repair, rehabilitation and	Yes <input checked="" type="radio"/> No
2.4.4 Are there education and training plans for the staff	Yes <input checked="" type="radio"/> No
<b>2.5 Safety management</b>	
2.5.1 Is there a safety and hygiene organization?	Yes <input checked="" type="radio"/> No
2.5.2 Is there a safety operation manual?	Yes <input checked="" type="radio"/> No
2.5.3 Are there safety protection tools?	<input checked="" type="radio"/> Yes    No
2.5.4 Is there indication or warning on dangerous parts of the facilities?	<input checked="" type="radio"/> Yes    No
2.5.5 Are education and training in health and safety implemented?	Yes <input checked="" type="radio"/> No
2.5.6 Is there a crisis-management manual?	Yes <input checked="" type="radio"/> No
<b>2.6 About the organization which carries out work</b>	
2.6.1 Implementing system	Manager:    persons,    Worker:    persons    N/A
2.6.2 Working time	From    to    N/A
2.6.3 Work content	Investigation,    Maintenance "repair, rehabilitation and reconstruction"
2.6.4 About direct work and subcontracted work	Direct work    Subcontracted work    N/A

**Part A Sewer Networks, Pumping Stations**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Face sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Uttar Pradesh
2	Name of city/town	Ghaziabad
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

**I Status of Sewerage facilities and O&M**

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary. Only STP

1	<b>Summary of sewers and channels</b>			
1.1	<b>Collection system</b>			
1.1.1	Type of collection system	<input checked="" type="radio"/> Separate system, <input type="radio"/> Combined system, <input checked="" type="radio"/> A part is combined system    (when it rains)		
1.2	<b>History of sewer use</b>			
1.2.1	Sewer record book or log book	<input checked="" type="radio"/> Yes	<input type="radio"/> No	Others :
1.2.2	Life of oldest sewer pipe	N/A <input checked="" type="radio"/> Drawings    Others :		
1.2.3	Materials of Pipes and channels	Hume concrete pipes    Others :		
1.2.3	Type, number and arrangement of manholes	Duct Type Straigh kinds,    Number set up:    N/A		
1.2.3	Size of sewers and channels	Diameter: 250 mm to 2800 mm, mm× mm to mm× mm		
1.3	<b>Sewer network</b>			
1.3.1	Is there a manual for sewer network?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.3.2	Is there a plan for sewer network?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.3.3	Assessment procedure	<input checked="" type="radio"/> Visually,    by TV camera Others :		
1.3.4	How has the result of the assessment been used?	N/A		
1.3.5	Are there check records for sewer and manhole?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.3.6	How are the results of the records kept?	Electronic data, <input checked="" type="radio"/> Hard copy, Others :    N/A		
1.3.7	Is there a plan for pipe cleaning ?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.3.8	Are there records for pipe cleaning ?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.3.9	About direct work and subcontracted work	<input type="radio"/> Direct work	<input type="radio"/> Subcontracted work	<input type="radio"/> N/A
1.4	<b>Repair, Rehabilitation, Reconstruction</b>			
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.4.2	If Yes, is it used?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.4.3	Are there plans of sewer network repair, rehabilitation and reconstruction?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.4.4	Have repairs, rehabilitation and rebuilding been implemented?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.4.5	Are there records of repair, rehabilitation and reconstruction?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.4.6	How are the results of the investigation kept?	Electronic data, <input checked="" type="radio"/> Hard copy, Others :    N/A		
1.5	<b>Safety management</b>			
1.5.1	Is there a safety and hygiene organization?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.5.2	Is there a safety operation manual ?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.5.3	Are safety protection tools used?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.5.5	Is education and training being given for health and safety ?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.5.6	Is there a crisis-management manual?	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
1.6	<b>About the organization which carries out work</b>			
1.6.1	Management organization	Manager:    persons,    Worker:    persons    N/A		
1.6.2	Working time	From    to    N/A		
1.6.3	Work content	Maintenance , rehabilitation and rebuild    N/A		
1.6.4	About work mode	<input type="radio"/> Through permanent workers	<input type="radio"/> Subcontract	<input type="radio"/> N/A

<b>2 Summary of relay pumping station</b>				
<b>2.1 Basic data of facilities</b>				
2.1.1	Is there a general layout plan showing all equipment and machinery?	Yes	No	Others : N/A
2.1.2	Is there a log book for equipment?	Yes	No	Others : N/A
<b>2.2 Inspection of facility and equipment</b>				
2.2.1	Are there check records for equipment?	Daily report : Yes No, Monthly report: Yes No		N/A
<b>2.3 History</b>				
2.3.1	Is there any record of breakdown , repair, and reconstruction of facilities?	Yes	No	Others : N/A
<b>2.4 Management of planned facilities</b>				
2.4.1	Is there a schedule for operating equipment of the plant?	Yes ( manufacturer compilation, Others ), No N/A		
2.4.2	Is there an operation manual?	Yes	No	N/A
2.4.3	Are there plans for repair, rehabilitation and reconstruction?	Yes	No	N/A
2.4.4	Are there education and training plans for the staff ?	Yes	No	N/A
<b>2.5 Safety management</b>				
2.5.1	Is there a safety and hygiene organization?	Yes	No	N/A
2.5.2	Is there a safety operation manual ?	Yes	No	N/A
2.5.3	Are there safety protection tools?	Yes	No	N/A
2.5.4	Is there indication or warning on dangerous parts of the facilities?	Yes	No	N/A
2.5.5	Are education and training in health and safety implemented?	Yes	No	N/A
2.5.6	Is there a crisis-management manual?	Yes	No	N/A
<b>2.6 About the organization which carries out work</b>				
2.6.1	Implementing system	Manager: persons, Worker: persons		N/A
2.6.2	Working time	From to N/A		
2.6.3	Work content	Investigation, Maintenance "repair, rehabilitation and reconstruction"		
2.6.4	About direct work and subcontracted work	Direct work	Subcontracted work	N/A



**Part A Sewer Networks, Pumping Stations**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Face sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Uttar Pradesh
2	Name of city/town	Noida
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

**I Status of Sewerage facilities and O&M**

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

1	<b>Summary of sewers and channels</b>		
1.1	<b>Collection system</b>		
1.1.1	Type of collection system	Separate system , Combined system , A part is combined system	
1.2	<b>History of sewer use</b>		
1.2.1	Sewer record book or log book	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
		Drawings	Others :
1.2.2	Life of oldest sewer pipe	10 years	
	Materials of Pipes and channels	Hume concrete pipes Others : N/A	
1.2.3	Type, number and arrangement of manholes	kinds, Number set up: N/A	
	Size of sewers and channels	Diameter: 250 mm to 1000 mm, mm× mm to mm× mm	
1.3	<b>Sewer network</b>		
1.3.1	Is there a manual for sewer network?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.3.2	Is there a plan for sewer network?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.3.3	Assessment procedure	Visually, by TV camera	N/A
		Others :	
1.3.4	How has the result of the assessment been used?	N/A	
1.3.5	Are there check records for sewer and manhole?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.3.6	How are the results of the records kept?	Electronic data, Hard copy,	N/A
		Others :	
1.3.7	Is there a plan for pipe cleaning ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.3.8	Are there records for pipe cleaning ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.3.9	About direct work and subcontracted work	Direct work	Subcontracted work N/A
1.4	<b>Repair, Rehabilitation, Reconstruction</b>		
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.4.2	If Yes, is it used?	Yes <input type="checkbox"/> No <input type="checkbox"/>	N/A
1.4.3	Are there plans of sewer network repair, rehabilitation and reconstruction?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.4.4	Have repairs, rehabilitation and rebuilding been implemented?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.4.5	Are there records of repair, rehabilitation and reconstruction?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.4.6	How are the results of the investigation kept?	Electronic data, Hard copy,	N/A
		Others :	
1.5	<b>Safety management</b>		
1.5.1	Is there a safety and hygiene organization?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.5.2	Is there a safety operation manual ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.5.3	Are safety protection tools used?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.5.5	Is education and training being given for health and safety ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.5.6	Is there a crisis-management manual?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1.6	<b>About the organization which carries out work</b>		
1.6.1	Management organization	Manager: persons, Worker: persons	Outsourcing
1.6.2	Working time	From to	N/A
1.6.3	Work content	Maintenance , rehabilitation and rebuild	N/A
1.6.4	About work mode	Through permanent workers	Subcontract N/A

<b>2 Summary of relay pumping station</b>	
<b>2.1 Basic data of facilities</b>	
2.1.1 Is there a general layout plan showing all equipment and machinery?	Yes <input type="radio"/> <input checked="" type="radio"/> No Others :
2.1.2 Is there a log book for equipment?	<input checked="" type="radio"/> Yes <input type="radio"/> Only for pumps at MPS
<b>2.2 Inspection of facility and equipment</b>	
2.2.1 Are there check records for equipment?	Daily report: Yes <input type="radio"/> <input checked="" type="radio"/> No, Monthly report: Yes <input type="radio"/> <input checked="" type="radio"/> No, Annual report: Yes <input type="radio"/> <input checked="" type="radio"/> No
<b>2.3 History</b>	
2.3.1 Is there any record of breakdown , repair, and reconstruction of facilities?	Yes <input type="radio"/> <input checked="" type="radio"/> No Others :
<b>2.4 Management of planned facilities</b>	
2.4.1 Is there a schedule for operating equipment of the plant?	<input checked="" type="radio"/> Yes ( manufacturer compilation, Others ), <input type="radio"/> No
2.4.2 Is there an operation manual?	Yes <input type="radio"/> <input checked="" type="radio"/> No
2.4.3 Are there plans for repair, rehabilitation and reconstruction?	Yes <input type="radio"/> <input checked="" type="radio"/> No
2.4.4 Are there education and training plans for the staff ?	Yes <input type="radio"/> <input checked="" type="radio"/> No
<b>2.5 Safety management</b>	
2.5.1 Is there a safety and hygiene organization?	Yes <input type="radio"/> <input checked="" type="radio"/> No
2.5.2 Is there a safety operation manual ?	Yes <input type="radio"/> <input checked="" type="radio"/> No
2.5.3 Are there safety protection tools?	<input checked="" type="radio"/> Yes <input type="radio"/> No
2.5.4 Is there indication or warning on dangerous parts of the facilities?	<input checked="" type="radio"/> Yes <input type="radio"/> No
2.5.5 Are education and training in health and safety implemented?	Yes <input type="radio"/> <input checked="" type="radio"/> No
2.5.6 Is there a crisis-management manual?	Yes <input type="radio"/> <input checked="" type="radio"/> No
<b>2.6 About the organization which carries out work</b>	
2.6.1 Implementing system	Manager : persons, Worker : persons
2.6.2 Working time	From to
2.6.3 Work content	Investigation, Maintenance "repair, rehabilitation and reconstruction"
2.6.4 About direct work and subcontracted work	Direct work Subcontracted work

## Part A Sewer Networks, Pumping Stations

### Questionnaire for 8 target states and 2 Union Territories in India

#### Face sheet

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Uttar Pradesh
2	Name of city/town	Agra
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

#### I Status of Sewerage facilities and O&M

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

1	<b>Summary of sewers and channels</b>	
1.1	Collection system	Sewer network & Nala Tapping
1.1.1	Type of collection system	Combined system
1.2	<b>History of sewer use</b>	
1.2.1	Sewer record book or log book	Yes
1.2.2	Life of oldest sewer pipe	Drawings 25 years
	Materials of Pipes and channels	Concrete pipes
1.2.3	Type, number and arrangement of manholes	Brick Masonry type Kinds, Approx - 3000
	Size of sewers and channels	Diameter: 150 mm to 1400 mm
1.3	<b>Sewer network</b>	
1.3.1	Is there a manual for sewer network?	Yes
1.3.2	Is there a plan for sewer network?	Yes
1.3.3	Assessment procedure	Visually Others:
1.3.4	How has the result of the assessment been used?	For improvement of treatment of sewer
1.3.5	Are there check records for sewer and manhole?	Yes
1.3.6	How are the results of the records kept?	Electronic data, Hard copy, N/A
1.3.7	Is there a plan for pipe cleaning ?	Yes
1.3.8	Are there records for pipe cleaning ?	Yes
1.3.9	About direct work and subcontracted work	Subcontracted work
1.4	<b>Repair, Rehabilitation, Reconstruction</b>	
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	No
1.4.2	If Yes, is it used?	N/A
1.4.3	Are there plans of sewer network repair, rehabilitation and reconstruction?	Yes
1.4.4	Have repairs, rehabilitation and rebuilding been implemented?	No
1.4.5	Are there records of repair, rehabilitation and reconstruction?	N/A
1.4.6	How are the results of the investigation kept?	Hard copy
1.5	<b>Safety management</b>	
1.5.1	Is there a safety and hygiene organization?	No
1.5.2	Is there a safety operation manual ?	Yes
1.5.3	Are safety protection tools used?	Yes
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	Yes
1.5.5	Is education and training being given for health and safety ?	Yes
1.5.6	Is there a crisis-management manual?	No
1.6	<b>About the organization which carries out work</b>	
1.6.1	Management organization	Project Manager and his staff
1.6.2	Working time	Usually day time
1.6.3	Work content	Maintenance, rehabilitation and rebuild
1.6.4	About work mode	Subcontract

2	<b>Summary of relay pumping station</b>	
2.1	Basic data of facilities	
2.1.1	Is there a general layout plan showing all equipment and machinery?	Yes
2.1.2	Is there a log book for equipment?	Yes
2.2	<b>Inspection of facility and equipment</b>	
2.2.1	Are there check records for equipment?	Daily report : Yes , Monthly report : Yes Annual report : Yes
2.3	<b>History</b>	
2.3.1	Is there any record of breakdown , repair, and reconstruction of facilities?	Yes
2.4	<b>Management of planned facilities</b>	
2.4.1	Is there a schedule for operating equipment of the plant?	No
2.4.2	Is there an operation manual?	Yes
2.4.3	Are there plans for repair, rehabilitation and reconstruction?	Yes
2.4.4	Are there education and training plans for the staff ?	No
2.5	<b>Safety management</b>	
2.5.1	Is there a safety and hygiene organization?	No
2.5.2	Is there a safety operation manual ?	Yes
2.5.3	Are there safety protection tools?	Yes
2.5.4	Is there indication or warning on dangerous parts of the facilities?	Yes
2.5.5	Are education and training in health and safety implemented?	Yes
2.5.6	Is there a crisis-management manual?	No
2.6	<b>About the organization which carries out work</b>	
2.6.1	Implementing system	Project Manager & his staff
2.6.2	Working time	Round the clock
2.6.3	Work content	Investigation, Maintenance "repair, rehabilitation and reconstruction"
2.6.4	About direct work and subcontracted work	Subcontracted work

**Part A Sewer Networks, Pumping Stations**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Face sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Maharashtra
2	Name of city/town	Bandra
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

**I Status of Sewerage facilities and O&M**

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

1	<b>Summary of sewers and channels</b>			
1.1	Collection system			
1.1.1	Type of collection system	<input checked="" type="radio"/> Separate system	<input type="radio"/> Combined system	<input checked="" type="radio"/> A part is combined system
1.2	<b>History of sewer use</b>			
1.2.1	Sewer record book or log book	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
		Drawings	Others :	
1.2.2	Life of oldest sewer pipe	15 years to	years	About so years
	Materials of Pipes and channels	Hume concrete pipes	Others :	N/A
1.2.3	Type, number and arrangement of manholes	N/A	kinds, Number set up:	
	Size of sewers and channels	Diameter: N/A	mm to mm,	mm× mm to mm×
1.3	<b>Sewer network</b>			
1.3.1	Is there a manual for sewer network inspection?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	(there is no manual present as such for the department.)
1.3.2	Is there a plan for sewer network?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.3.3	Inspection procedure	Visually,	by TV camera	
		Others :	N/A	
1.3.4	How has the result of the inspection been used?	N/A		
1.3.5	Are there check records for sewer and manhole?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.3.6	How are the results of the records kept?	Electronic data, Hard copy,		
		Others :	N/A	
1.3.7	Is there a plan for pipe cleaning ?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.3.8	Are there records for pipe cleaning ?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.3.9	About direct work and subcontracted work	Direct work	Subcontracted work	N/A
1.4	<b>Repair, Rehabilitation, Reconstruction</b>			
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.4.2	If Yes, is it used?	<input type="radio"/> Yes	<input type="radio"/> No	N/A
1.4.3	Are there plans of sewer network repair, rehabilitation and reconstruction?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.4.4	Have repairs, rehabilitation and rebuilding been implemented?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.4.5	Are there records of repair, rehabilitation and reconstruction?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.4.6	How are the results of the investigation(Health inspection) kept?	Electronic data, Hard copy,	<input checked="" type="radio"/> Others :	Part electronic
1.5	<b>Safety management</b>			
1.5.1	Is there a safety and hygiene organization?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	Safety week
1.5.2	Is there a safety operation manual ?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.5.3	Are safety protection tools used?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.5.5	Is education and training being given for health	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
1.5.6	Is there a risk management manual?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
1.6	<b>About the organization which carries out work</b>			
1.6.1	Management organization	Manager: persons,	Worker: persons	N/A
1.6.2	Working time	From	to	N/A
1.6.3	Work content	Maintenance , rehabilitation and rebuild		N/A
1.6.4	About work mode	Through permanent workers	Subcontract	N/A

<b>2 Summary of relay pumping station</b>			
<b>2.1 Basic data of facilities</b>			
2.1.1	Is there a general layout plan showing all equipment and machinery?	Yes	<input checked="" type="radio"/> No Others :
2.1.2	Is there a log book for equipment?	Yes	No Others :
<b>2.2 Inspection of facility and equipment</b>			
2.2.1	Are there check records for equipment?	Daily report : <input checked="" type="radio"/> Yes <input type="radio"/> No, Monthly report: Yes <input checked="" type="radio"/> No, Annual report: Yes <input checked="" type="radio"/> No	
<b>2.3 History</b>			
2.3.1	Is there any record of breakdown , repair, and reconstruction of facilities?	<input checked="" type="radio"/> Yes	No Others :
<b>2.4 Management of planned facilities</b>			
2.4.1	Is there a schedule for operating equipment of the plant?	Yes ( manufacturer compilation, Others ), No	
2.4.2	Is there an operation manual?	Yes	<input checked="" type="radio"/> No
2.4.3	Are there plans for repair, rehabilitation and reconstruction?	Yes	<input checked="" type="radio"/> No
2.4.4	Are there education and training plans for the staff ?	Yes	<input checked="" type="radio"/> No
<b>2.5 Safety management</b>			
2.5.1	Is there a safety and hygiene organization?	<input checked="" type="radio"/> Yes	No
2.5.2	Is there a safety operation manual ?	<input checked="" type="radio"/> Yes	No
2.5.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
2.5.4	Is there indication or warning on dangerous parts of the facilities?	Yes	No N/A
2.5.5	Are education and training in health and safety implemented?	Yes	<input checked="" type="radio"/> No
2.5.6	Is there a risk management manual?	Yes	<input checked="" type="radio"/> No
<b>2.6 About the organization which carries out work</b>			
2.6.1	Implementing system	Manager: persons, Worker: persons	N/A
2.6.2	Working time	From 9 to 5:30	3shift
2.6.3	Work content	Investigation <input checked="" type="radio"/> Maintenance	"repair, rehabilitation and
2.6.4	About direct work and subcontracted work	Direct work	Subcontracted work N/A

## Part A Sewer Networks, Pumping Stations

### Questionnaire for 8 target states and 2 Union Territories in India

#### Face sheet

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Maharashtra
2	Name of city/town	Navi Mumbai
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

#### I Status of Sewerage facilities and O&M

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

1	<b>Summary of sewers and channels</b>		
1.1	<b>Collection system</b>		
1.1.1	Type of collection system	Separate system, Combined system, A part is combined system	
1.2	<b>History of sewer use</b>		
1.2.1	Sewer record book or log book	Yes <input type="radio"/> No <input checked="" type="radio"/>	Drawings Others :
1.2.2	Life of oldest sewer pipe	N/A years to years (Navi Mumbai Municipal Corp have their data.)	
	Materials of Pipes and channels	N/A Hume concrete pipes Others :	
1.2.3	Type, number and arrangement of manholes	N/A kinds, Number set up: (Navi Mumbai Municipal Corp have their data.)	
	Size of sewers and channels	N/A Diameter: mm to mm, mm× mm to mm× mm	
1.3	<b>Sewer network</b>		
1.3.1	Is there a manual for sewer network inspection?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.2	Is there a plan for sewer network?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.3	Inspection procedure	Visually, by TV camera Others : N/A	
1.3.4	How has the result of the inspection been used?	N/A	
1.3.5	Are there check records for sewer and manhole?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.6	How are the results of the records kept?	Electronic data, Hard copy, Others : N/A	
1.3.7	Is there a plan for pipe cleaning ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.8	Are there records for pipe cleaning ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.9	About direct work and subcontracted work	Direct work	Subcontracted work N/A
1.4	<b>Repair, Rehabilitation, Reconstruction</b>		
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.2	If Yes, is it used?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.3	Are there plans of sewer network repair, rehabilitation and reconstruction?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.4	Have repairs, rehabilitation and rebuilding been implemented?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.5	Are there records of repair, rehabilitation and reconstruction?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.6	How are the results of the investigation kept?	Electronic data, Hard copy, Others : N/A	
1.5	<b>Safety management</b>		
1.5.1	Is there a safety and hygiene organization?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.5.2	Is there a safety operation manual ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.5.3	Are safety protection tools used?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.5.5	Is education and training being given for health and safety ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.5.6	Is there a risk management manual?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.6	<b>About the organization which carries out work</b>		
1.6.1	Management organization	Manager: persons, Worker: persons	N/A
1.6.2	Working time	From to	N/A
1.6.3	Work content	Maintenance, rehabilitation and rebuild	N/A
1.6.4	About work mode	Through permanent workers	Subcontract N/A

<b>2 Summary of relay pumping station</b>	
<b>2.1 Basic data of facilities</b>	
2.1.1 Is there a general layout plan showing all equipment and machinery?	Yes <input type="radio"/> No <input checked="" type="radio"/> Others :
2.1.2 Is there a log book for equipment?	Yes <input type="radio"/> No <input type="radio"/> Others :
<b>2.2 Inspection of facility and equipment</b>	
2.2.1 Are there check records for equipment?	Daily report: Yes <input type="radio"/> No <input checked="" type="radio"/> Monthly report: <input checked="" type="radio"/> No <input type="radio"/> Annual report: Yes <input type="radio"/> No <input checked="" type="radio"/>
<b>2.3 History</b>	
2.3.1 Is there any record of breakdown , repair, and reconstruction of facilities?	Yes <input type="radio"/> No <input checked="" type="radio"/> Others :
<b>2.4 Management of planned facilities</b>	
2.4.1 Is there a schedule for operating equipment of the plant?	Yes ( manufacturer compilation, Others ), <input checked="" type="radio"/> No <input type="radio"/>
2.4.2 Is there an operation manual?	Yes <input type="radio"/> No <input checked="" type="radio"/>
2.4.3 Are there plans for repair, rehabilitation and reconstruction?	Yes <input type="radio"/> No <input checked="" type="radio"/>
2.4.4 Are there education and training plans for the staff ?	Yes <input type="radio"/> No <input checked="" type="radio"/>
<b>2.5 Safety management</b>	
2.5.1 Is there a safety and hygiene organization?	Yes <input type="radio"/> No <input checked="" type="radio"/>
2.5.2 Is there a safety operation manual ?	Yes <input type="radio"/> No <input checked="" type="radio"/>
2.5.3 Are there safety protection tools?	Yes <input type="radio"/> No <input checked="" type="radio"/>
2.5.4 Is there indication or warning on dangerous parts of the facilities?	Yes <input type="radio"/> No <input checked="" type="radio"/>
2.5.5 Are education and training in health and safety implemented?	Yes <input type="radio"/> No <input checked="" type="radio"/>
2.5.6 Is there a risk management manual?	Yes <input type="radio"/> No <input checked="" type="radio"/>
<b>2.6 About the organization which carries out work</b>	
2.6.1 Implementing system	Manager: persons, Worker: persons N/A
2.6.2 Working time	From to N/A
2.6.3 Work content	Investigation, Maintenance "repair, rehabilitation and reconstruction"
2.6.4 About direct work and subcontracted work	Direct work <input checked="" type="radio"/> Subcontracted work <input type="radio"/>



**Part A Sewer Networks, Pumping Stations**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Face sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Maharashtra
2	Name of city/town	Pune
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

**I Status of Sewerage facilities and O&M**

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

1	<b>Summary of sewers and channels</b>	
1.1	<b>Collection system</b>	
1.1.1	Type of collection system	<input checked="" type="radio"/> Separate system <input type="radio"/> Combined system, <input type="radio"/> A part is combined system
1.2	<b>History of sewer use</b>	
1.2.1	Sewer record book or log book	<input checked="" type="radio"/> Yes <input type="radio"/> No We get picture of Layout Drawings Others :
1.2.2	Life of oldest sewer pipe	1928 year
	Materials of Pipes and channels	<input checked="" type="radio"/> Hume concrete pipe <input type="radio"/> Others : NP2 & NP3 Collection & Conveyance
1.2.3	Type, number and arrangement of manholes	N/A kinds, Number set up: N/A
	Size of sewers and channels	Diameter: 250 mm to 1,800 mm
1.3	<b>Sewer network</b>	
1.3.1	Is there a manual for sewer network inspection?	<input type="radio"/> Yes <input checked="" type="radio"/> No
1.3.2	Is there a plan for sewer network?	<input type="radio"/> Yes <input checked="" type="radio"/> No
1.3.3	Inspection procedure	N/A
1.3.4	How has the result of the inspection been used?	N/A
1.3.5	Are there check records for sewer and manhole?	<input type="radio"/> Yes <input checked="" type="radio"/> No
1.3.6	How are the results of the records kept?	N/A
1.3.7	Is there a plan for pipe cleaning ?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.3.8	Are there records for pipe cleaning ?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.3.9	About direct work and subcontracted work	<input checked="" type="radio"/> Direct work + <input checked="" type="radio"/> Subcontracted work
1.4	<b>Repair, Rehabilitation, Reconstruction</b>	
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	<input type="radio"/> Yes <input checked="" type="radio"/> No
1.4.2	If Yes, is it used?	<input type="radio"/> Yes <input checked="" type="radio"/> No
1.4.3	Are there plans of sewer network repair, rehabilitation and reconstruction?	<input type="radio"/> Yes <input checked="" type="radio"/> No They repair, when a problem occurs.
1.4.4	Have repairs, rehabilitation and rebuilding been implemented?	<input type="radio"/> Yes <input checked="" type="radio"/> No
1.4.5	Are there records of repair, rehabilitation and reconstruction?	<input type="radio"/> Yes <input checked="" type="radio"/> No
1.4.6	How are the results of the investigation kept?	N/A
1.5	<b>Safety management</b>	
1.5.1	Is there a safety and hygiene organization?	<input checked="" type="radio"/> Yes <input type="radio"/> No ward office
1.5.2	Is there a safety operation manual ?	N/A
1.5.3	Are safety protection tools used?	<input checked="" type="radio"/> Yes <input type="radio"/> No there is no gas masks.
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.5.5	Is education and training being given for health and safety ?	<input checked="" type="radio"/> Yes <input type="radio"/> No every 4 months ward office level
1.5.6	Is there a risk management manual?	N/A
1.6	<b>About the organization which carries out work</b>	
1.6.1	Management organization	N/A
1.6.2	Working time	From 8:30 to 13:00 , From 15:00 to 17:30
1.6.3	Work content	<input checked="" type="radio"/> Maintenance <input type="radio"/> rehabilitation and rebuild
1.6.4	About work mode	N/A

<b>2 Summary of relay pumping station</b>	
<b>2.1 Basic data of facilities</b>	
2.1.1 Is there a general layout plan showing all equipment and machinery?	<input checked="" type="radio"/> Yes    No    Others :
2.1.2 Is there a log book for equipment?	<input checked="" type="radio"/> Yes    No    Others :
<b>2.2 Inspection of facility and equipment</b>	
2.2.1 Are there check records for equipment?	Daily report: <input checked="" type="radio"/> Yes    Monthly report:    Yes    No. Annual report:    Yes    No
<b>2.3 History</b>	
2.3.1 Is there any record of breakdown , repair, and reconstruction of facilities?	Yes <input checked="" type="radio"/> No    Others :
<b>2.4 Management of planned facilities</b>	
2.4.1 Is there a schedule for operating equipment of the plant?	<input checked="" type="radio"/> Yes    They have a schedule for screen cleaning.
2.4.2 Is there an operation manual?	Yes <input checked="" type="radio"/> No
2.4.3 Are there plans for repair, rehabilitation and reconstruction?	Yes <input checked="" type="radio"/> No
2.4.4 Are there education and training plans for the staff ?	Yes <input checked="" type="radio"/> No
<b>2.5 Safety management</b>	
2.5.1 Is there a safety and hygiene organization?	Yes <input checked="" type="radio"/> No
2.5.2 Is there a safety operation manual ?	N/A
2.5.3 Are there safety protection tools?	<input checked="" type="radio"/> Yes    No
2.5.4 Is there indication or warning on dangerous parts of the facilities?	<input checked="" type="radio"/> Yes    Partly
2.5.5 Are education and training in health and safety implemented?	<input checked="" type="radio"/> Yes    No
2.5.6 Is there a risk management manual?	N/A
<b>2.6 About the organization which carries out work</b>	
2.6.1 Implementing system	It is the same as the organization of STP
2.6.2 Working time	N/A
2.6.3 Work content	N/A
2.6.4 About direct work and subcontracted work	N/A

## Part A Sewer Networks, Pumping Stations

### Questionnaire for 8 target states and 2 Union Territories in India

#### Face sheet

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Uttar Pradesh
2	Name of city/town	Kanpur
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

#### I Status of Sewerage facilities and O&M

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

1	<b>Summary of sewers and channels</b>		
1.1	<b>Collection system</b>		
1.1.1	Type of collection system	<input checked="" type="radio"/> Separate system	Combined system, A part is combined system
1.2	<b>History of sewer use</b>		
1.2.1	Sewer record book or log book	Yes <input type="radio"/> No <input checked="" type="radio"/>	Drawings Others :
1.2.2	Life of oldest sewer pipe	1904 years to	years
	Materials of Pipes and channels	Hume concrete pipes	Others : Brick sewer
1.2.3	Type, number and arrangement of manholes	N/A	kinds, Number set up: N/A
	Size of sewers and channels	Diameter: 150 mm to 90 inch(2286mm) mm× mm to mm×	
1.3	<b>Sewer network</b>		
1.3.1	Is there a manual for sewer network inspection?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.2	Is there a plan for sewer network?	Yes <input checked="" type="radio"/> No <input type="radio"/>	
1.3.3	Inspection procedure	<input checked="" type="radio"/> Visually	by TV camera Others :
1.3.4	How has the result of the inspection been used?	N/A	
1.3.5	Are there check records for sewer and manhole?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.6	How are the results of the records kept?	Electronic data, Hard copy,	N/A Others :
1.3.7	Is there a plan for pipe cleaning ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.8	Are there records for pipe cleaning ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.9	About direct work and subcontracted work	Direct work	<input checked="" type="radio"/> Subcontracted work
1.4	<b>Repair, Rehabilitation, Reconstruction</b>		
1.4.1	Is there a manual for repair, rehabilitation, reconstruction?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.2	If Yes, is it used?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.3	Are there plans of sewer network repair, rehabilitation and reconstruction?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.4	Have repairs, rehabilitation and rebuilding been implemented?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.5	Are there records of repair, rehabilitation and reconstruction?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.6	How are the results of the investigation kept?	Electronic data, Hard copy,	Others : N/A
1.5	<b>Safety management</b>		
1.5.1	Is there a safety and hygiene organization?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.5.2	Is there a safety operation manual ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.5.3	Are safety protection tools used?	Yes <input type="radio"/> No <input type="radio"/>	N/A
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
1.5.5	Is education and training being given for health and safety ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.5.6	Is there a risk management manual?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.6	<b>About the organization which carries out work</b>		
1.6.1	Management organization	Manager: 4 persons, Worker: 43 persons	
1.6.2	Working time	From to	N/A
1.6.3	Work content	Maintenance, rehabilitation and rebuild N/A	
1.6.4	About work mode	Through permanent workers	<input checked="" type="radio"/> Subcontract

<b>2 Summary of relay pumping station</b>	
<b>2.1 Basic data of facilities</b>	
2.1.1 Is there a general layout plan showing all equipment and machinery?	<input checked="" type="radio"/> Yes    No    Others :
2.1.2 Is there a log book for equipment?	<input checked="" type="radio"/> Yes    No    Others :
<b>2.2 Inspection of facility and equipment</b>	
2.2.1 Are there check records for equipment?	Daily report: Yes <input checked="" type="radio"/> No    Monthly report: Yes    No, Annual report: Yes    No
<b>2.3 History</b>	
2.3.1 Is there any record of breakdown , repair, and reconstruction of facilities?	Yes <input checked="" type="radio"/> No    Others :
<b>2.4 Management of planned facilities</b>	
2.4.1 Is there a schedule for operating equipment of the plant?	<input checked="" type="radio"/> Yes (manufacturer compilation)    Others ), No
2.4.2 Is there an operation manual?	<input checked="" type="radio"/> Yes    Manufacturer manual    No
2.4.3 Are there plans for repair, rehabilitation and reconstruction?	Yes <input checked="" type="radio"/> No
2.4.4 Are there education and training plans for the staff ?	Yes <input checked="" type="radio"/> No
<b>2.5 Safety management</b>	
2.5.1 Is there a safety and hygiene organization?	Yes <input checked="" type="radio"/> No
2.5.2 Is there a safety operation manual ?	Yes <input checked="" type="radio"/> No
2.5.3 Are there safety protection tools?	<input checked="" type="radio"/> Yes    No
2.5.4 Is there indication or warning on dangerous parts of the facilities?	<input checked="" type="radio"/> Yes    No
2.5.5 Are education and training in health and safety implemented?	Yes <input checked="" type="radio"/> No
2.5.6 Is there a risk management manual?	Yes <input checked="" type="radio"/> No
<b>2.6 About the organization which carries out work</b>	
2.6.1 Implementing system	Manager: 4 persons, Worker: 43 persons
2.6.2 Working time	From    to    N/A
2.6.3 Work content	Investigation, Maintenance "repair, rehabilitation and reconstruction"
2.6.4 About direct work and subcontracted work	Direct work <input checked="" type="radio"/> Subcontracted work

**Part A Sewer Networks, Pumping Stations**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Cover sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Uttar Pradesh
2	Name of city/town	Allahabad
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

**I Status of Sewerage facilities and O&M**

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

<b>1 Summary of sewers and channels</b>			
<b>1.1 Collection system</b>			
1.1.1	Type of collection system	Separate system ,	Combined system <u>A part is combined system</u>
<b>1.2 History of sewer use</b>			
1.2.1	Sewer record book or log book	<u>Yes</u> No	Others
		<u>Drawings</u>	
1.2.2	Life of oldest sewer pipe	100 years	
	Materials of pipes	Hume concrete pipes	Others
1.2.3	Type, number and arrangement of manholes	kinds: Brick RCC+Steel	Number set up: N/A
	Size of sewers and channels	Diameter: 150 inch to	62.93 inch,
		— mm×	— mm to
		— mm×	— mm
<b>1.3 Sewer network</b>			
1.3.1	Is there a manual for sewer network inspection?	Yes <u>No</u>	
1.3.2	Are there drawings of existing sewer network ?	<u>Yes</u> No	
1.3.3	Inspection procedure	Visually, —	by TV camera
		Others : N/A	
1.3.4	How has the result of the inspection been used?	N/A	
1.3.5	Are there check records for sewer and manhole?	Yes No	Check with GM Jalkal Vibag
1.3.6	How are the results of the records kept?	Electronic data,	Hard copy,
		Others : N/A	
1.3.7	Is there a pipe cleaning plan?	Yes No	N/A
1.3.8	Are there records for pipe cleaning ?	Yes No	N/A
1.3.9	About direct work and subcontracted work	Direct work	Subcontracted work N/A
<b>1.4 Repair, Rehabilitation, Reconstruction</b>			
1.4.1	Is there a manual for repair, rehabilitation, reconstruction of sewers and channels?	Yes No	N/A
1.4.2	If Yes, is it used?	Yes No	N/A
1.4.3	Are there plans for repair, rehabilitation and reconstruction of existing sewer network?	Yes No	N/A
1.4.4	Have repairs, rehabilitation and reconstruction been implemented?	Yes No	N/A
1.4.5	Are there records of repair, rehabilitation and reconstruction?	Yes No	N/A
1.4.6	How are the results of the inspection kept?	Electronic data,	Hard copy,
		Others : N/A	
<b>1.5 Safety management</b>			
1.5.1	Is there a safety and health system?	Yes No	N/A
1.5.2	Is there a safety operation manual?	Yes No	N/A
1.5.3	Are safety protection tools used?	Yes No	N/A
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	Yes No	N/A
1.5.5	Is education and training being given for health and safety ?	Yes No	N/A
1.5.6	Is there a risk management manual?	Yes No	N/A
<b>1.6 Organization</b>			
1.6.1	Management organization	N/A	Manager: persons Worker: persons
1.6.2	Working time	N/A	From to
1.6.3	Work content	N/A	Maintenance , rehabilitation and reconstruction
1.6.4	About work mode	Through permanent workers	Subcontract N/A

<b>2 Relay pumping station</b>			
<b>2.1 Basic data of facilities</b>			
2.1.1	Is there a general layout plan showing all equipment and machinery?	<input checked="" type="radio"/> Yes	No Others :
2.1.2	Is there a log book for equipment?	<input checked="" type="radio"/> Yes	No Others :
<b>2.2 Inspection of units such as grit chamber, screen and other related equipment</b>			
2.2.1	Are there check records for equipment?	Daily report <input checked="" type="radio"/> Yes No, Annual report <input checked="" type="radio"/> Yes No,	Monthly report: <input checked="" type="radio"/> Yes No,
<b>2.3 History</b>			
2.3.1	Is there any record of breakdown , repair, and reconstruction of pumping facilities?	<input checked="" type="radio"/> Yes	No Others :
<b>2.4 Plans for facilities</b>			
2.4.1	Is there a schedule for operating equipment of the pumping station?	Yes ( manufacturer compilation, Others ), <input checked="" type="radio"/> No	
2.4.2	Is there an operation manual?	<input checked="" type="radio"/> Yes	No
2.4.3	Are there plans for repair, rehabilitation and reconstruction?	<input checked="" type="radio"/> Yes	No
2.4.4	Are there education and training plans for the staff ?	Yes	<input checked="" type="radio"/> No
<b>2.5 Safety management</b>			
2.5.1	Is there a safety and hygiene department?	Yes	<input checked="" type="radio"/> No
2.5.2	Is there a safety operation manual ?	<input checked="" type="radio"/> Yes	No
2.5.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
2.5.4	Is there indication or warning on dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
2.5.5	Are education and training in health and safety implemented?	Yes	<input checked="" type="radio"/> No
2.5.6	Is there a risk management manual?	Yes	<input checked="" type="radio"/> No
<b>2.6 About the organization which carries out work</b>			
2.6.1	Implementing system	Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 person, Asst.Engineer: 3 persons Asst.Proj.Engineer: 6 persons, Junior Engineer: 3 persons Operator: 12 persons,	
2.6.2	Working time	From to 3 Shift	
2.6.3	Work content	Investigation, Maintenance <input checked="" type="radio"/> repair, <input checked="" type="radio"/> rehabilitation and	
2.6.4	About direct work and subcontracted work	Direct work <input checked="" type="radio"/> Subcontracted work	

**Part A Sewer Networks, Pumping Stations**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Cover sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Karnataka
2	Name of city/town	Bengaluru
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

**I Status of Sewerage facilities and O&M**

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

<b>1 Summary of sewers and channels</b>			
<b>1.1 Collection system</b>			
1.1.1	Type of collection system	<input checked="" type="radio"/> Separate system	<input type="radio"/> Combined system A part is combined system
<b>1.2 History of sewer use</b>			
1.2.1	Sewer record book or log book	Yes <input type="radio"/> No <input checked="" type="radio"/>	Others
1.2.2	Life of oldest sewer pipe	<input checked="" type="radio"/> Drawings	6 years (Mailasandra STP) 8-10 years (Cubbon Park STP)
	Materials of pipes	<input checked="" type="radio"/> Hume concrete pipes	Others
1.2.3	Type, number and arrangement of manholes	Kinds: 1 type (Circular)	Number set up: N/A
	Size of sewers and channels	Diameter: 225mm to 1200mm (Mailasandra STP) Diameter: 225mm to 450mm (Cubbon Park STP)	mm× mm
<b>1.3 Sewer network</b>			
1.3.1	Is there a manual for sewer network inspection?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.2	Are there drawings of existing sewer network ?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
1.3.3	Inspection procedure	<input checked="" type="radio"/> Visually	by TV camera
		Others :	
1.3.4	How has the result of the inspection been used?	Repairing and cleaning	
1.3.5	Are there check records for sewer and manhole?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.6	How are the results of the records kept?	Electronic data, <input type="radio"/> Hard copy, <input type="radio"/>	N/A
		Others :	
1.3.7	Is there a pipe cleaning plan?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.8	Are there records for pipe cleaning ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.3.9	About direct work and subcontracted work	Direct work <input type="radio"/> Subcontracted work <input type="radio"/>	N/A
<b>1.4 Repair, Rehabilitation, Reconstruction</b>			
1.4.1	Is there a manual for repair, rehabilitation, reconstruction of sewers and channels?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.2	If Yes, is it used?	Yes <input type="radio"/> No <input type="radio"/>	N/A
1.4.3	Are there plans for repair, rehabilitation and reconstruction of existing sewer network?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
1.4.4	Have repairs, rehabilitation and reconstruction been implemented?	Yes <input type="radio"/> No <input type="radio"/>	N/A
1.4.5	Are there records of repair, rehabilitation and reconstruction?	Yes <input type="radio"/> No <input type="radio"/>	N/A
1.4.6	How are the results of the inspection kept?	Electronic data, <input type="radio"/> Hard copy, <input type="radio"/>	N/A
		Others :	
<b>1.5 Safety management</b>			
1.5.1	Is there a safety and health system?	Yes <input type="radio"/> No <input type="radio"/>	Only some guidelines are provided
1.5.2	Is there a safety operation manual?	Yes <input type="radio"/> No <input type="radio"/>	Only some guidelines are provided
1.5.3	Are safety protection tools used?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
1.5.5	Is education and training being given for health and safety ?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Only contractor provides training to its staff
1.5.6	Is there a risk management manual?	Yes <input type="radio"/> No <input checked="" type="radio"/>	
<b>1.6 Organization</b>			
1.6.1	Management organization	Manager(Only from Board): 5persons Worker: 6persons (Mailasandra STP) Manager(Only from Board): 2persons Worker: 3persons (Cubbon Park STP)	
1.6.2	Working time	From 9AM to 6PM (24 hours emergency services) 3 shifts: 6AM-2PM; 2PM-8PM; 8PM-6AM	
1.6.3	Work content	Maintenance, rehabilitation and reconstruction	
1.6.4	About work mode	Through permanent workers <input checked="" type="radio"/> Subcontract <input type="radio"/>	

2	<b>Relay pumping station</b>	1 Intermediate pumping station (6 years old)	(Mailasandra STP)
		No intermediate pumping station, only terminal PS	(Cubbon Park STP)
2.1	<b>Basic data of facilities</b>		
2.1.1	Is there a general layout plan showing all	<input checked="" type="radio"/> Yes No Others :	
2.1.2	Is there a log book for equipment?	<input checked="" type="radio"/> Yes No Others :	
2.2	<b>Inspection of units such as grit chamber, screen and other related equipment</b>		
2.2.1	Are there check records for equipment?	Daily report: <input checked="" type="radio"/> Yes No, Annual report: Yes No, Monthly report: <input checked="" type="radio"/> Yes No, (Power consumption, oil&grease, etc.)	
2.3	<b>History</b>		
2.3.1	Is there any record of breakdown , repair, and reconstruction of pumping facilities?	<input checked="" type="radio"/> Yes No Others :	
2.4	<b>Plans for facilities</b>		
2.4.1	Is there a schedule for operating equipment of the pumping station?	<input checked="" type="radio"/> Yes ( manufacturer compilation, Others ), No	
2.4.2	Is there an operation manual?	<input checked="" type="radio"/> Yes No Manual for equipment (pump, motor, valves) supplied by manufacturer	
2.4.3	Are there plans for repair, rehabilitation and reconstruction?	Yes <input checked="" type="radio"/> No	
2.4.4	Are there education and training plans for the staff ?	Yes <input checked="" type="radio"/> No	
2.5	<b>Safety management</b>		
2.5.1	Is there a safety and hygiene department?	<input checked="" type="radio"/> Yes No	
2.5.2	Is there a safety operation manual ?	<input checked="" type="radio"/> Yes No	
2.5.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes No	
2.5.4	Is there indication or warning on dangerous parts of the facilities?	<input checked="" type="radio"/> Yes No	
2.5.5	Are education and training in health and safety implemented?	<input checked="" type="radio"/> Yes No Contractor Provides	
2.5.6	Is there a risk management manual?	Yes <input checked="" type="radio"/> No	
2.6	<b>About the organization which carries out work</b>		
2.6.1	Implementing system	Manager: 1person Worker: 6-7persons (Excluding contractors staff)	(Mailasandra STP)
		Taken care by STP staff members (Excluding contractors staff)	(Cubbon Park STP)
2.6.2	Working time	From to 3 shifts	
2.6.3	Work content	<input checked="" type="radio"/> Investigation, Maintenance "repair, rehabilitation and reconstruction"	
2.6.4	About direct work and subcontracted work	Direct work	<input checked="" type="radio"/> Subcontracted work



**Part A Sewer Networks, Pumping Stations**

**Questionnaire for 8 target states and 2 Union Territories in India**

**Cover sheet**

Please fill in the fields below. Attach additional sheets if necessary.

1	Name of state	Tamilnadu
2	Name of city/town	Chennai
3	Name of respondent	
4	Department	
5	Name of plant	
6	Contact information	
7	Address	
8	Phone number	
9	E-mail address	

**I Status of Sewerage facilities and O&M**

Answer as indicated on the right side, related to their operation and maintenance of sewerage facilities. Attach additional sheets if necessary.

<b>1 Summary of sewers and channels</b>		
<b>1.1 Collection system</b>		
1.1.1	Type of collection system	<input checked="" type="radio"/> Separate system <input type="radio"/> Combined system A part is combined system
<b>1.2 History of sewer use</b>		
1.2.1	Sewer record book or log book	Yes <input type="radio"/> No <input checked="" type="radio"/> Drawings <input type="radio"/> Others <input type="radio"/>
1.2.2	Life of oldest sewer pipe	From 1914
	Materials of pipes	Hume concrete pipes <input type="radio"/> Others Stoneware pipe and C.I.pipes <input type="radio"/>
1.2.3	Type, number and arrangement of manholes	Kinds: Rectangular, Circular Type <input type="radio"/> Number set up: 79737
	Size of sewers and channels	Diameter: 150 mm to 600 mm, Gravity <input type="radio"/> pumping 1200 mm <input type="radio"/> mm× mm
<b>1.3 Sewer network</b>		
1.3.1	Is there a manual for sewer network inspection?	Yes <input type="radio"/> No <input checked="" type="radio"/>
1.3.2	Are there drawings of existing sewer network ?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.3.3	Inspection procedure	<input checked="" type="radio"/> Visually <input type="radio"/> by TV camera Others : Periodical maintenance
1.3.4	How has the result of the inspection been used?	Proper maintenance of sewer system
1.3.5	Are there check records for sewer and manhole?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.3.6	How are the results of the records kept?	Electronic data <input type="radio"/> <input checked="" type="radio"/> Hard copy
1.3.7	Is there a pipe cleaning plan?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.3.8	Are there records for pipe cleaning ?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.3.9	About direct work and subcontracted work	Direct work <input type="radio"/> <input checked="" type="radio"/> Subcontracted work
<b>1.4 Repair, Rehabilitation, Reconstruction</b>		
1.4.1	Is there a manual for repair, rehabilitation, reconstruction of sewers and channels?	<input checked="" type="radio"/> Yes <input type="radio"/> No Based on CPHEEO manual
1.4.2	If Yes, is it used?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.4.3	Are there plans for repair, rehabilitation and reconstruction of existing sewer network?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.4.4	Have repairs, rehabilitation and reconstruction been implemented?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.4.5	Are there records of repair, rehabilitation and reconstruction?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.4.6	How are the results of the inspection kept?	Electronic data, <input checked="" type="radio"/> Hard copy, <input type="radio"/> Others :
<b>1.5 Safety management</b>		
1.5.1	Is there a safety and health system?	Yes <input type="radio"/> No <input checked="" type="radio"/>
1.5.2	Is there a safety operation manual?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.5.3	Are safety protection tools used?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.5.4	Are warnings displayed on the dangerous parts of the facilities?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.5.5	Is education and training being given for health and safety ?	<input checked="" type="radio"/> Yes <input type="radio"/> No
1.5.6	Is there a risk management manual?	<input checked="" type="radio"/> Yes <input type="radio"/> No For floods
<b>1.6 Organization</b>		
1.6.1	Management organization	Manager: _____ persons Worker: _____ persons
1.6.2	Working time	From 8:30 to 16:30 3 shift
1.6.3	Work content	<input checked="" type="radio"/> Maintenance <input checked="" type="radio"/> rehabilitation and <input type="radio"/> reconstruction
1.6.4	About work mode	<input checked="" type="radio"/> Through permanent workers <input checked="" type="radio"/> Subcontract

<b>2 Relay pumping station</b>			
<b>2.1 Basic data of facilities</b>			
2.1.1	Is there a general layout plan showing all equipment and machinery?	<input checked="" type="radio"/> Yes	No Others :
2.1.2	Is there a log book for equipment?	<input checked="" type="radio"/> Yes	No Others :
<b>2.2 Inspection of units such as grit chamber, screen and other related equipment</b>			
2.2.1	Are there check records for equipment?	Daily report: <input checked="" type="radio"/> Yes No, Annual report: <input checked="" type="radio"/> Yes No,	Monthly report: <input checked="" type="radio"/> Yes No,
<b>2.3 History</b>			
2.3.1	Is there any record of breakdown , repair, and reconstruction of pumping facilities?	<input checked="" type="radio"/> Yes	No Others :
<b>2.4 Plans for facilities</b>			
2.4.1	Is there a schedule for operating equipment of the pumping station?	<input checked="" type="radio"/> Yes ( manufacturer compilation, Others ),	No
2.4.2	Is there an operation manual?	<input checked="" type="radio"/> Yes	No
2.4.3	Are there plans for repair, rehabilitation and reconstruction?	<input checked="" type="radio"/> Yes	No
2.4.4	Are there education and training plans for the staff ?	<input checked="" type="radio"/> Yes	No
<b>2.5 Safety management</b>			
2.5.1	Is there a safety and hygiene department?	<input checked="" type="radio"/> Yes	No
2.5.2	Is there a safety operation manual ?	<input checked="" type="radio"/> Yes	No
2.5.3	Are there safety protection tools?	<input checked="" type="radio"/> Yes	No
2.5.4	Is there indication or warning on dangerous parts of the facilities?	<input checked="" type="radio"/> Yes	No
2.5.5	Are education and training in health and safety implemented?	<input checked="" type="radio"/> Yes	No
2.5.6	Is there a risk management manual?	<input checked="" type="radio"/> Yes	No
2.6	<b>About the organization which carries out work</b>	H.T.Relay,Pumping Station Purasawalkam	
2.6.1	Implementing system	Incharge engineer: 1 person,	Operator: 4 persons
		Electrician: 1 person,	Driver: 1 person
		Field worker: 6 persons,	
2.6.2	Working time	From to on shift basis	
2.6.3	Work content	<input checked="" type="radio"/> Investigation, Maintenance "repair, rehabilitation and reconstruction"	
2.6.4	About direct work and subcontracted work	<input checked="" type="radio"/> Direct work	<input checked="" type="radio"/> Subcontracted work