Questionnaire for 8 target states and 2 Union Territories in India

Face sheet

	Please fill in the fields below. Attach additional she	ets 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	
Č		
7	Phone number	
8	E-mail address	

I Summary of sewage treatment plant

1	Dasic data related to facilities					
1.1	Are there calculations for basic design and capacity	Yes No	Of	hers ·		
	of treatment plant facilities?	103, 10,	01	ners .		
1.2	Is there a layout plan showing earthwork,	Yes No	Of	hers ·		
	machinery, and electrical equipment?	100,				
1.3	Are there detailed specifications of all facilities and					
	equipment fitted in the plant? Are there as-fitted	Yes No	0	thers ·		
	drawings of all sewers? Are there structural	143, 110,	0	uleis.		
	drawings of tanks, digesters, reactors, buildings,					
1.4	Is there a flow chart for instrumentation?	Yes , No,)	Ot	hers :		
1.5	Are there single-line diagrams (electrical)?	Yes, <u>No</u> ,	Ot	hers :		
1.6	Sewage treatment process used (Example:	AL.				
	Conventional activated sludge process)					
1.7	Sludge treatment process used (Example: Sludge	N/A				
	drving after thickening)					
1.8	Which is the effluent discharge point?	River, La	ikes and m	arshes, Sea	area, Others: Us	se for
		agriculture				
19	I ayout of plant (please attach the drawing if you	(Yes)		£		
2	History					
2.1	Is the history of failure, repair, or reconstruction	Yes 🤇	No>			
-	recorded?	Others :				
2.2	Are there any requests or complaints from	V.	N			
	surrounding residents?	res C	NO			
3	Design capacity and actual loading					
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/	1
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 %	6			
3.12	What equipment is used for drawing out sludge					
	from primary/secondary sedimentation tank or	N/A				
	digester (pump/gravity, etc.)?					
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	s		times/month,	
3.15	Design sludge generation volume	N/A	MID		MI /vear	%
	and water content	11/A	MLD	,	will/year,	70
3.16	Average sludge generation volume,	N/A	MID		MI /vear	0/2
	and water content	14/21	MLD	,	will'year,	70
3.17	Percentage of volatile solids	mean:	%,	max:	%,	
	in generated sludge	min:	%			N/A
3.18	Methods of effective sludge or waste utilization	Fertilizer, Was	te			
		Other methods :			N/A	
3.19	Is sludge used for agricultural purpose or some					
	other purpose? What is the amount of sludge	*/	0/		NI/A	
	disposed and water content in sludge?	t/year,	%		IN/A	
3.2	Are there operation records for pumps, equipment,	Daily report:	Yes	No, Mont	hly report: Ye	s No,
	blowers, etc.?	Annual report:	Yes	No	·····	
3.2.1	Is the water quality measured regularly?		, ,	No		
		res		NU		
3.2.2	Are water quality measurement records	Daily report.	Yes	No,		
	maintained?	Annual report:	Yes	No,		
3.2.3	Is record of concentration of toxic substances in		<u></u>			
	sludge maintained?	Yes	\Box	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	No		
	effluent standard?			
4 4.1	Is there corrosion of buildings or structures?	Yes	No name of part :	
4.0			N	
4.2	part of facilities?	<u></u>	No, name of part	
4.3	Is there corrosion in equipment?	Yes	No, name of part	:
4.4 4 5	Is there damage to equipment? Are there records of corrosion and	Yes	No, name of part	
	damage to facilities?	Yes	No	
4.6	Is there foul smell most of the time?	Yes	No Small amount	No
4.7	Management of planned facilities	A large amou	it, <u>Sinan amount</u> ,	
5.1	Is there an operation schedule for machinery and	Yes "manufa	acturer compilation, Ot	hers No
5.2	Is there an operation manual?	Yes	No	
5.2				
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	Yes	> No	
	Is there a wastewater examination method?	Yes: Name	e of the method:	N/A
54	Are there the education and training manuals for	No		
2.1	the staff?	Yes	No	
61	Inspection of facility and equipment	Daily raports	Vas	No Monthly reports V
0.1	Are there check records for equipment?	Annual report:	Yes No	No, Monuniy report: Yes
6.2	Is there an inspection manual?	Yes	No	
6.3	Is there an inspection schedule?	Yes	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 I	Hard conv	
		Others :	lard copy,	N/A
7	Repair, Rehabilitation, Reconstruction			
/.1	reconstruction of facility and equipment?	Yes	No	
7.2	If Yes, is it being used?	Yes		
1.5	plans for facility and equipment ?	Yes	<u>No</u>	
7.4	Have repairs, rehabilitation and reconstruction	Yes	No	
7.5	Are there repair, rehabilitation and reconstruction	Electronic data,	Hard copy, Others :	N/A
8	Work implementation			
8.1	Staffing or Manpower at Plant	Executive engine Asst	er	: 1 person : 1 person
		Sub		: 6 persons
82	Engineers	Foremen (1per sh Laborers	ift + 2reliever)	: 4+1 persons : 12 persons
0.2	2.1.5.1.0010	Electricians	-	: 4 persons
		Welder : 1 per Painter : 1 per	son, Carpenter : son	1 person, Mason : 1 person
8.3	Working time	N/A Regular wo	rking time From :	to : to : Shifts
8.4	Work mode	: to : N/A Permanent	worker Subco	ontractor
8.5	Contents of work	Operation,	Maintenance, Repa	iir N/A
8.6	Others (Are there the special measures taken at the time of accidents or disasters)	Yes	No	N/A
9	Procurement of utility and materials			
9.1	Is the procurement of the chemicals easy?	Yes Ves	No	N/A N/A
9.3	Amount of electric power used each day/month,	15850kWH/day_4	182131kWH/month 57	285580kWH/year
0.4	and of one year	No	. 1 _{re/4}	Lakaan
9.4	"Chlorine, Coagulant, etc."	No	; kg/d,	kg/year
9.5	Is there a list of vendors for chemicals, consumable materials, and machine parts?	Yes	No	
	materiais, and materiane parts :	100	<u> </u>	
9.6	Frequency of power failure during year, total number of hours of power failure	N/A	times/year	
97	Are there standby power generators?	X 7/4	nours/year	
2.7		N/A		
9.8	now many times a year and how many hours a	N/A	times/year	hours/year

10	Efficiency improvement and remedial			
10	monocurron and maintanance management of			
	measures and maintenance management of	\$7		
10.1	Is there a centralized control system?	Yes		
	Is there a data logger system?	Yes		
10.2	Has the operation and maintenance service	Yes	> No	Maintenance
	been subcontracted to a private company?			
11	Safety management			
11.1	Is there a safety and hygiene organization?	Yes	$\underline{N_0}$	
11.2	Is there a safety operation manual?	Yes		
11.3	Are there safety protection tools?	$\langle Yes \rangle$	> No	
11.4	Are there warning signs for dangerous parts of the	Vac		
	facilities?	Tes		
11.5	Have there been instances of accidents/disasters in	¥7		
	the nast?	res	NO	
11.6	Is education and training implemented for health	3.7		
	and safety ?	Yes	NO	
117	Is there a risk management manual (for floods			
11.7	avalones parthquakes and other natural disasters)?	Yes	No	
	cyclolles, earthquakes, and other natural disasters)?			
π	Check list of some rege systems machine	w and alactrica	lavetome	
ш	Check list of sewerage systems, machiner	y and electrica	ii systems	
	Please reply as indicated on the right side.			
1	Machinery system			
1.1	Type of screens			
1.1.1	Is there a coarse screen?	Yes		
1.1.2	Is screen type mechanical?	Yes		
1.1.3	Is there a fine screen?	Yes 🔿	No	
1.1.4	Is screen type mechanical?	Yes 🔿	No	
1.1.5	Grit chamber			
1.1.6	Is there a crushing device?	Yes		
117	Is there a conveyor?	Yes		
1.1./	How is the grid chember cleaned?	100		
1.1.0	Machanically?	Ves	No	
	Delate least 2	Var	No	
	Bucket elevator?	res		
	Jet pump?	Yes	NO	
	Screw?	Yes		
	Air lift?	Yes		
	Manually?	Yes	No	
	Aeration?	Yes	No	
1.2	Pumps			
1.2.1	What is the rated voltage of main pump?	6600 V		
1.2.2	Is there any speed controlled pump?	Yes		
1.2.3	If Yes, what is the type of pump?	Yes		
1.2.4	If Yes, what is the method of speed control?	Yes		
1.3	What type of aeration facilities used?	Surface aeration		
1.3.1	What type of air diffuser is used?	No		
1.4	Disinfection equipment			
1.4.1	What type of disinfection method for effluent is			
	Chlorination?	Yes		
	Ultra violet rav?	Yes		
	Ozonizer?	Ves		
15	Sludge thickening equipment	105		
1.5	What type of sludge thickening equipment is used			
1.5.1	Creative this loss is a 2	No		
	All floor and a second se	No		
	Air flotation?	INU N		
	Delta and	INU Na		
	Den type ?	110		
1.6	Sluage dehydration equipment			
1.6.1	what type of sludge dehydration method is adopted	N T		
	Mechanical?	INO	<u> </u>	
	Filter press?	Yes	$\underline{N_0}$	
	Centrifugal dehydration	Yes	$\underline{N_0}$	
	Vacuum filtration?	Yes	\underline{No}	
	Others?			
1.6.2	Where does the dewatered sludge go to?	N/A		
1.7.1	Sludge digestion facility (Anaerobic)?	Yes		
1.7.2	Is digester gas used?	Yes (for) No	
2	Electrical system			
2.1	Substation facility			
2.1.1	What is the substation voltage?	N/A	V	
23	Uninterrupted power supply (UPS)	•••••••••••••••••••••••••••••••••••••••	·····	
2.3.1	Is there uninterrupted power supply?	Yes	No	N/A
232	If Yes is it DC supply or AC supply?	AC	DC	N/A
2.3.2	What are the applications of this power supply?	N/A		1.7.1.1
2.3.3	Measuring instruments			
2.5	What type of flow mater is used and where?			
2.3.1	Flectro-magnetic ⁹	Vac (
	Literaprie?	Vas (
		ies (
		ies (
		ies (
	weir?	res (<u> <u>No</u></u>	
	Partial flume?	Yes () No	

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

Questionnaire for 8 target states and 2 Union Territories in India

Face sheet

	Please fill in the fields below. Attach additional shee	ets 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	Dhona numbar	
1		
8	E-mail address	

I Summary of sewage treatment plant 1 Basic data related to facilities

-	Summary of Sewage treatment plant						
1	Basic data related to facilities	·····					
1.1	Are there calculations for basic design and capacity	Yes	No	Others ·			
	of treatment plant facilities?		110,	oulors.			
1.2	Is there a layout plan showing earthwork,						
	machinery, and electrical equipment?	Yes	No,	Others :			
		\smile					
13	Δ re there detailed specifications of all facilities and						
1.5	equipment fitted in the plant? Are there as fitted						
	drawings of all sewers? Are there structural	Yes,	No,	Others :			
	drawings of tanks digesters reactors buildings						
	drawings of tanks, digesters, reactors, buildings,						
1.4	Is there a flow chart for instrumentation?	Yes	No,	Others :			
1.5	Are there single-line diagrams (electrical)?	(Yes) V	Vith cont	tractor	No, Ot	hers :	
1.6	Sewage treatment process used (Example:	SBR					
	Conventional activated sludge process)						
1.7	Sludge treatment process used (Example: Sludge	Centrifugal	dehvdrat	or			
	drying after thickening)						
1.8	Which is the effluent discharge point?	Horticulture					
		Tiorneunture					
1.9	Layout of plant (please attach the drawing, if you	·····					
	have one)	Yes					
2	History	<u>.</u>					
21	Is the history of failure, repair, or reconstruction	Vas	No	<u> </u>			
2.1	recorded?	i es					
	recorded ?	Others :					
2.2	Are there any requests or complaints from	Yes	< No	$\overline{}$			
	surrounding residents?		\sim	_			
3	Design capacity and actual loading						
3.1	Design wastewater flow				100 MI	D	
3.2	Average daily flow				36.2 MI	LD	
3.3	Maximum daily flow				225 MI	LD	
3.4	Dry weather flow	None			M	LD	
3.5	Design wet weather flow	None			M	LD	
3.6	Wet weather flow	None			M	LD	~~ ~ ~ ~ ~ ~ ~ ~
3.7	Design wastewater influent quality	BOD Max2	250 Min1	100 Avg1	75mg/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 m	g/l
3.9	Design effluent quality	BOD <5	mg/l,	COD	< 100 mg	$\frac{g}{l}$, SS <1	<u>0 mg/l</u>
3.10	Average effluent quality	BOD 2	mg/1,	COD	28 mg	/1, <u>SS 10</u>	mg/l
3.11	Solids capture rate	None	%				
3.12	what equipment is used for drawing out sludge	D					
	from primary/secondary sedimentation tank or	Pump					
	digester (pump/gravity, etc.)?						
3.13	Frequency of drawing out sludge	Cotinuously	16hours	s/day		times/day	times/mon
3.14	Frequency of sludge carried outside STP	None		time	s/month.	times/v	ear
3.15	Design sludge generation volume	Generated:	13475kg/	/day E	xcess sludg	ge: 1680 m ³ /day	MLD,
	and water content	ML/year,	%				
3.16	Average sludge generation volume,						
	and water content	None		MLD,		ML/year,	%
3.17	Percentage of volatile solids	Nono	maan		0/_	mov	0/_
	in generated sludge	min	0/		/0,	max.	/0,
		111111.	/0)			
3.18	Methods of effective sludge or waste utilization	agricult	ure				
3 19	Is sludge used for agricultural nurpose or some	0					
	other purpose? What is the amount of sludge		00				
	disposed and water content in sludge?	t/year,	80 % (l	Design)	1	After calculation	
	asposed and water content in studge:						
3.2	Are there operation records for pumps, equipment.	Daily report	Yes) N	o, Monthly	/ report:	No,
	blowers, etc.?	Annual repo	ort: C	Yes >	With cli	ent	
	L						

3.2.1	Is the water quality measured regularly?	Yes No
3.2.2	Are water quality measurement records maintained?	Daily report Yes No, Annual report: Yes No,
3.2.3	Is record of concentration of toxic substances in sludge maintained?	Yes 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?	No
4	Corrosion of facilities and damage status	
4.1	Is there corrosion of buildings or structures?	Yes No, name of part :
	6	Δ
4.2	Was there any damage to the building frame part of facilities?	Yes No. name of part :
4.3	Is there corrosion in equipment?	Yes No, name of part : Sludge pipes
4.4	Is there damage to equipment?	Yes No, name of part :
4.5	Are there records of corrosion and	Yes No
	damage to facilities?	
4.6	Is there foul smell most of the time?	Yes No
4.7	Is scum generated?	A large amount Small amount No
5	Management of planned facilities	
5.1	Is there an operation schedule for machinery and	Yes "manufacturer compilation, Others" No
	equipment	
5.2	Is there an operation manual?	Yes No
	*	
5.3	Is there a schedule for wastewater examination	Vac No
	for influent, effluent and others?	10
	Is there a wastewater examination method?	Yes: No Name of the method: Stadard method (EPA)
54	Are there the education and training manuals for	
5	the staff?	Yes No
6	Inspection of facility and equipment	
6.1	Are there check records for equipment?	Daily report Yes No, Monthly report No,
		Annual report: Yes No (NMMC)
6.2	Is there an inspection manual?	Yes No
6.3	Is there an inspection schedule?	Yes 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
7	Repair, Rehabilitation, Reconstruction	
7.1	Is there a manual for repair, rehabilitation and	
	reconstruction of facility and equipment?	Yes No
7.2	If Yes, is it being used?	Yes No
7.3	Are there repair, rehabilitation and reconstruction	
	plans for facility and equipment ?	Yes No
7.4	Have repairs, rehabilitation and reconstruction been implemented?	Yes <u>No</u>
7.5	Are there repair, rehabilitation and reconstruction records?	No
8	Work implementation	
8.1	Staffing or Manpower at Plant	On paper : 3 shift Actually : 2 shift Operators : 4 persons,
		Fitter : 5 persons,
		Electrician : 6 persons,
8.2	Engineers	Helpers : / persons,
8.3	Working time	N/A Regular working time From : to : to : Shifts
8.4	Work mode	Permanent worker Subcontractor
8.5	Contents of work	Operation Maintenance, Repair Subcontr
8.6	Others (Are there the special measures taken at the	Yes No
	time of accidents or disasters)	
9	Procurement of utility and materials	
9.1	1. (1	
	is the procurement of the chemicals easy?	Yes No
9.2	Is there a procurement of the chemicals easy? Is there a procurement plan of chemicals?	Yes No Chlorine / Polymer
9.2 9.3	Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one user	Yes No Chlorine / Polymer 6425.5 kWh in a day/month, 2345307.5 kWh in a year

9.4	Quantity of industrial chemicals used	Chlorine	; 3mg/l	kg/d	, kg	g/year
	"Chlorine, Coagulant, etc."	Polymer ;	2kg/ton(ss)	kş	g/year
9.5	Is there a list of vendors for chemicals, consumable					
	materials, and machine parts?		Yes			
9.6	Frequency of power failure during year, total	None		times/vear		
	number of hours of power failure			hours/year		
9.7	Are there standby power generators?	No	ti	imes/year	hours/year	
9.8	How many times a year and how many hours a	No	times/s	loor.	hours/year	
	year is the standby power generator used?	110	unics/ y	car	nours/year	
10	Efficiency improvement and remedial					
	measures and maintenance management of					
10.1	Is there a centralized control system?	\langle	Yes	No		
	Is there a data logger system?	\sim	Yes >	No		
10.2	Has the operation and maintenance service		Var	N		
	been subcontracted to a private company?		res	INO		
11	Safety management					
11.1	Is there a safety and hygiene organization?	\leq	Yes >	No		
11.2	Is there a safety operation manual ?	\leq	Yes 🗲	No	With contractor	(NMMC) PDF f
11.3	Are there safety protection tools?	\leq	Yes	No		
11.4	Are there warning signs for dangerous parts of the	\sim	Ves	No		
	facilities?	<u> </u>	103	110		
11.5	Have there been instances of accidents/disasters in					
	the past?		Yes			
11.6	Is education and training implemented for health	~				
	and safety ?	\leq	Yes	No		
11.7	Is there a risk management manual (for floods,					
	cyclones, earthquakes, and other natural disasters)?		Yes	$\sim N_0$		

II Check list of sewerage systems, machinery and electrical systems

	Please reply as indicated on the right side.			
1	Machinery system			
1.1	Type of screens			
1.1.1	Is there a coarse screen?	<u>(Yes</u>)	No	
1.1.2	Is screen type mechanical?	(Yes)	No	
1.1.3	Is there a fine screen?	(Yes)	No	
1.1.4	Is screen type mechanical?	(Yes)	No	
1.1.5	Grit chamber			
1.1.6	Is there a crushing device?	Yes	<u>No</u>	\geq
1.1.7	Is there a conveyor?	(Yes)	No	
1.1.8	How is the grid chamber cleaned?			
	Mechanically?	(Yes)	No	
	Bucket elevator?	Yes	No	>
	Jet pump?	Yes	No	>
	Screw?	Yes	No	
	Air lift?	Yes	No	\geq
	Manually?	Yes	No	>
	Aeration?	Yes	No	\supset
1.2	Pumps			
1.2.1	What is the rated voltage of main pump?	415 V		
1.2.2	Is there any speed controlled pump?	Yes	< <u>No</u>	\geq
1.2.3	If Yes, what is the type of pump?	Yes	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 1.3.1	What type of aeration facilities used? What type of air diffuser is used?	Roots blowers Fixed Polyurethar	e Membran	e (tubular)
1.3 1.3.1 1.4	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment	Roots blowers Fixed Polyurethar	e Membran	e (tubular)
1.3 1.3.1 1.4 1.4.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i	Roots blowers Fixed Polyurethan	e Membran	e (tubular)
1.3 1.3.1 1.4 1.4.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination?	Roots blowers Fixed Polyurethar	e Membran No	e (tubular)
1.3 1.3.1 1.4 1.4.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray?	Roots blowers Fixed Polyurethar	e Membran No No	e (tubular)
1.3 1.3.1 1.4 1.4.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer?	Roots blowers Fixed Polyurethar yes Yes Yes	e Membran No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment	Roots blowers Fixed Polyurethan Yes Yes Yes	e Membran No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is	Roots blowers Fixed Polyurethar (Yes) Yes Yes	e Membran No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening?	Roots blowers Fixed Polyurethar Yes Yes Yes None	e Membran No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation?	Roots blowers Fixed Polyurethar s Yes Yes Yes None None	e Membran No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening?	Roots blowers Fixed Polyurethar s Yes Yes Yes Yes None None None	No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type?	Roots blowers Fixed Polyurethar s Yes Yes Yes None None None None	e Membran No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment	Roots blowers Fixed Polyurethar s Yes Yes Yes None None None None	e Membran No No No	e (tubular)
$1.3 \\ 1.3.1 \\ 1.4 \\ 1.4.1 \\ 1.5 \\ 1.5.1 \\ 1.6 \\ 1.6.1 \\ 1.6.1 \\ 1.6$	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment What type of sludge dehydration method is	Roots blowers Fixed Polyurethar S Yes Yes Yes None None None None	e Membran No No No	e (tubular)
$ \begin{array}{c} 1.3\\ 1.3.1\\ 1.4\\ 1.4.1\\ 1.5\\ 1.5.1\\ 1.6\\ 1.6.1\\ \end{array} $	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment What type of sludge dehydration method is Mechanical?	Roots blowers Fixed Polyurethar	e Membran No No	e (tubular)
$ \begin{array}{c} 1.3\\ 1.3.1\\ 1.4\\ 1.4.1\\ 1.5\\ 1.5.1\\ 1.6\\ 1.6.1\\ \end{array} $	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment What type of sludge dehydration method is Mechanical? Filter press?	Roots blowers Fixed Polyurethar is Yes Yes None None None None None None Yes	e Membran No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1 1.6 1.6.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment What type of sludge dehydration method is Mechanical? Filter press? Centrifugal dehydration	Roots blowers Fixed Polyurethar Yes Yes Yes None None None None None Yes Yes	e Membran No No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1 1.6 1.6.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent is Chorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment What type of sludge dehydration method is Mechanical? Filter press? Centrifugal dehydration Vacuum filtration?	Roots blowers Fixed Polyurethar S Yes Yes Yes None None None None None None Yes Yes Yes	No No No No No No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1 1.6.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment What type of sludge dehydration method is Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Ochters?	Roots blowers Fixed Polyurethar is Yes Yes Yes None None None None Yes Yes Yes Yes Yes Yes Yes Yes Yes	No No No No No No No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1 1.6.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment What type of sludge dehydration method is Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to?	Roots blowers Fixed Polyurethar S Yes Yes Yes None None None None None Yes Yes Yes	No No No No No No	e (tubular)
1.3 1.3.1 1.4 1.4.1 1.5 1.5.1 1.6.1 1.6.2 1.7.1	What type of aeration facilities used? What type of air diffuser is used? Disinfection equipment What type of disinfection method for effluent i Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment What type of sludge dehydration method is Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility (Anaerobic)?	Roots blowers Fixed Polyurethar S Yes Yes Yes None None None None None Yes Yes Yes Yes Landfill Yes	No No No No No No	e (tubular)

2 Electrical system	
2.1 Substation facility	
2.1.1 What is the substation voltage? N/A V	
2.3 Uninterrupted power supply (UPS)	
2.3.1 Is there uninterrupted power supply? Yes No	
2.3.2 If Yes, is it DC supply or AC supply? AC DC	
2.3.3 What are the applications of this power supply?	
2.5 Measuring instruments	
2.5.1 What type of flow meter is used and where? Pump room	
Electro-magnetic? Yes () No	
Ultrasonic? (Yes) <u>No</u>	
Orifice plate? Yes () No	
Venturi? Yes () No	
Weir? Yes () No	
Partial flume? Yes () No	
2.5.2 What type of level gauge is adopted and where? Coarse screen, Wet well, Fine screen, Reactor, St	udge sump
Float-type? Yes () No	
Pressure-type? Yes () No	
Ultrasonic? (Yes) No	
Radio wave ? Yes () No	
2.5.3 Is a water quality meter used?	
PH? Yes No	
DO? <u>Yes</u> No	
MLSS? Yes No	
ORP? Yes No	
Turbidity? Yes No	
Nitrogen? Yes No	
Phosphorus? Yes No	
2.5.4 Is sludge measurement performed?	
Sludge concentration? Yes No	
2.5.5 Is any meteorological instrument used for the	
following?	
Temperature? Yes No	
Atmospheric pressure ?	
Rain? Yes No	
wind velocity (Anemometer)?	
2.5 Nonitoring control system	
2.5.1 Does a lookout post exist at the following res	
Diy wen	
Sewage treatment facility	
Shudge unckenning equipment	
Anarchic direction tank	
Pumping station	
Pumping station	

Questionnaire for 8 target states and 2 Union Territories in India

Face sheet

Please fill in the fields below. Attach additional she	ets 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	
o runcis	
7 Phone number	
8 E-mail address	

I Summary of sewage treatment plant 1 Basic data related to facilities

1	Dasic uata related to facilities	
1.1	Are there calculations for basic design and capacity	
	of treatment plant facilities?	(res.) No, Others:
12	Is there a layout plan showing earthwork	
1.2	machinery and electrical equipment?	Yes, No, Others:
	machinery, and electrical equipment?	
1.3	Are there detailed specifications of all facilities and	
	equipment fitted in the plant? Are there as-fitted	(Yes) No. Others
	drawings of all sewers? Are there structural	
	drawings of tanks, digesters, reactors, buildings,	
1.4	Is there a flow chart for instrumentation?	(Yes) No, Others:
1.5	Are there single-line diagrams (electrical)?	(Yes.) No. Others:
1.6	Sewage treatment process used (Example:	
1.0	Conventional activated sludge process)	TF, ASP
17	Conventional activated studge process)	
1./	Sludge treatment process used (Example: Sludge	Centrifugal dehydration
	drying after thickening)	
1.8	Which is the effluent discharge point?	River MIII A
19	I ayout of plant (please attach the drawing, if you	Vas
1.7	Layout of plant (please attach the drawing, if you	105
2	History	
2.1	Is the history of failure, repair, or reconstruction	Yes No Others :
2.2	Are there any requests or complaints from	(Yes) sometimes
	surrounding residents?	Just sometimes
3	Design capacity and actual loading	
3.1	Design wastewater flow	17.5 MLD
3.2	Average daily flow	17.62 MLD
3.2	Maximum daily flow	18.41 MLD
2.1	Dry weather flow	N/Λ
2.5	Dagign wet weether flow	1V/A N/A
3.5	Wet weather flow	N/A N/A
3.0	wet weather now	
3.7	Design wastewater influent quality	BOD 250 mg/l , COD 350 mg/l , SS 300mg/l
3.8	Average wastewater influent quality	BOD120 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	Sludge decanter
	digester (pump/gravity, etc.)?	
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	$6m^3/hr$ $2ncs$
2.16		
3.16	Average sludge generation volume,	5m ³ /hr 12hour 1nos total: 60m ³ /day
	and water content	
3.17	Percentage of volatile solids	N/A
	in generated sludge	1.071
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	N/A
	disposed and water content in sludge?	
3.2	Are there operation records for pumps, equipment,	Daily report: Yes No, Monthly report: Yes No,
	blowers, etc.?	Annual report: Yes No
3.2.1	Is the water quality measured regularly?	
	1	Yes No
3 7 7		
3.4.4	Are water quality measurement records	Daily report (Yes) No
	Are water quality measurement records	Daily report: Yes No,
	Are water quality measurement records maintained?	Daily report: Yes No, Annual report: Yes No
3.2.3	Are water quality measurement records maintained? Is record of concentration of toxic substances in	Daily report: Yes No, Annual report: Yes No

.2.5 1	Has the water quality of the final effluent exceeded the effluent standards anytime?	Yes	No
	If Yes, what are the cause for exceeding the effluent standard?	N/A	
4	Corrosion of facilities and damage status	······	
4.1	Is there corrosion of buildings or structures?	Yes No,	name of part :
4.2	Was there any damage to the building frame part of facilities?	Yes No.	name of part :
4.3 J	Is there corrosion in equipment?	Yes No,	name of part :
4.4	Is there damage to equipment?	Yes <u>No</u> ,	name of part :
4.5	Are there records of corrosion and damage to facilities?	Yes N	No
4.6] 4.7]	Is there foul smell most of the time? Is scum generated?	Small amount, so	No ometimes
5]	Management of planned facilities		
5.1 I	Is there an operation schedule for machinery and equipment	Yes "manuf	facturer compilation, Others" No
5.2	Is there an operation manual?	Yes N	No
5.3	Is there a schedule for wastewater examination		_
f	for influent, effluent and others?	Yes 1	No
]	Is there a wastewater examination method?	Yes: Name of	of the method: AFHA
5.4	Are there the education and training manuals for the staff?	Yes n	No
6]	Inspection of facility and equipment		
6.1	Are there check records for equipment?	Daily report: Yes	, Monthly report: Yes No
	1 I.	Annual report: Yes	No
6.2 1	Is there an inspection manual?	Yes	No
6.3 1	Is there an inspection schedule?	Yes N	No
6.4 J	Details of inspection procedure	Visual / audible /	TV camera, others :
6.5 1	How has the result of the inspection been used?	N/A	
6.6 I	How are inspection results maintained?	Electronic data, I	Hard copy,
-		oulois.	
71	Repair, Rehabilitation, Reconstruction		
/.1	reconstruction of facility and equipment?	Yes	No
7.2	If Yes, is it being used?	N/A	
7.3 µ	Are there repair, rehabilitation and reconstruction plans for facility and equipment ?	Yes	No
7.4 I 1	Have repairs, rehabilitation and reconstruction been implemented?	Yes 🔿	No
7.5	Are there repair, rehabilitation and reconstruction records?	N/A	
8	Work implementation		
L	Staffing or Manpower at Plant	1)Chief Engineers(WW,ST 3)S.E, 4)Exec. Eng., 5)Dep	P,RW,City) 2)Add. C. E. b. Eng., 6)Sec. Eng., 7)Jr. Eng.
8.1		8) Ir Eng supervisior	
8.1	Engineers	8)Jr. Eng.supervisior	
8.1 8.2 8.3	Engineers Working time	8)Jr. Eng.supervisior Regular working time Fron	n 8:30 to 17:30 3shift 8to16, 16to
8.1 \$ 8.2 8.3 8.4	Engineers Working time Work mode	8)Jr. Eng.supervisior Regular working time Fron Permanent worker	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor
8.1 1 8.2 1 8.3 1 8.4 1 8.5 0	Engineers Working time Work mode Contents of work	8)Jr. Eng supervisior Regular working time Fron Permanent worker Operation _ M	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair
8.1 5 8.2 1 8.3 7 8.4 7 8.5 0 8.6 0	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters)	8)Jr. Eng supervisior Regular working time Fron Permanent worker Operation M Yes 1	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair
8.1 8.2 8.3 8.4 8.5 8.6 1 8.6 1 9	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials	8)Jr. Eng supervisior Regular working time Fron Permanent worker Operation Yes I	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair
8.1 1 8.2 1 8.3 1 8.3 1 8.4 1 8.5 0 1 8.6 0 1 9 1 9.1 1 9.2 1	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals?	8)Jr. Eng supervisior Regular working time Fron Permanent worker Operation Yes I Yes I Yes I Yes I Yes I	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor> aintenance, Repair No
8.1 1 8.2 1 8.3 1 8.4 1 8.5 0 1 9 1 9.1 1 9.2 1 9.3 1	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one year	8)Jr. Eng. supervisior Regular working time Fron Permanent worker Operation M Yes 1 Yes 1 Yes 1 3,500kWh/day, 95,00	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair No No No D0kWh /month,
8.1 8.2 1 8.2 1 8.3 8.4 1 8.5 0 9 1 9.1 1 9.2 1 9.3 4 9.3 4 9.4 0	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one year Quantity of industrial chemicals used	8)Jr. Eng. supervisior Regular working time From Permanent worker Operation M Yes I Yes I 3,500kWh /day, 95,00 Chlorine : 60 kg/d. not in	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair No No No No No No No No No No
8.1 \$ 8.2] 8.3 ¥ 8.4 ¥ 8.5 6 6 1 1 9 1 9 1 9 1 9 .2] 9 .2] 9 .3 4 9 .4 6	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one year Quantity of industrial chemicals used "Chlorine, Coagulant, etc."	8)Jr. Eng. supervisior Regular working time From Permanent worker Operation M Yes I Yes I 3,500kWh /day, 95,00 Chlorine : 60 kg/d. not in Polyelectrolyte ; 4.8kg/d	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair No No No No No No No No No No
8.1 (8.2 1) 8.3 (8.4 1) 8.5 (9 1) 9.1 1) 9.1 1) 9.2 1) 9.3 4 (9.3 4) 9.4 (9.5 1) 1	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one year Quantity of industrial chemicals used "Chlorine, Coagulant, etc." Is there a list of vendors for chemicals, consumable materials, and machine parts?	8)Jr. Eng. supervisior Regular working time From Permanent worker Operation M Yes I Yes I 3,500kWh /day, 95,00 Chlorine : 60 kg/d. not in Polyelectrolyte ; 4.8kg/d Yes I	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair No No No No No No No No No No
8.1 (8.2]] 8.3 (8.4) 8.5 (9]] 9.1]] 9.1]] 9.2] 9.3 (9.2]] 9.3 (9.5]] 1]] 9.5]]	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one year Quantity of industrial chemicals used "Chlorine, Coagulant, etc." Is there a list of vendors for chemicals, consumable materials, and machine parts? Frequency of power failure during year, total	8)Jr. Eng. supervisior Regular working time Fron Permanent worker Operation M Yes 1 Yes 1 3,500kWh /day, 95,00 Chlorine : 60 kg/d. not in Polyelectrolyte : 4.8kg/d Yes 1 once a	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair No No No No No No No No No No
8.1 (8.2 1) 8.3 (8.3 (8.4) 9 (9 (9 (9 (9 (9 (9 (9 (9 (9 (Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one year Quantity of industrial chemicals used "Chlorine, Coagulant, etc." Is there a list of vendors for chemicals, consumable materials, and machine parts? Frequency of power failure during year, total number of hours of nower failure	8)Jr. Eng. supervisior Regular working time Fron Permanent worker Operation M Yes 1 Yes 1 3,500kWh /day, 95,00 Chlorine : 60 kg/d. not in Polyelectrolyte : 4.8kg/d Yes 1 once a	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair No No No No No No No No No No
8.1 8.2 8.3 8.4 9 9 9.1 9 9.1 9 9.2 1 9 9.2 1 9 9.3 4 6 1 1 9 9.5 1 1 9 9.5 1 1 9 9.5 1 1 9 9.3 4 6 9 9 9.3 4 9 9 9.3 4 9 9.3 4 9 9.3 1 8.4 9 9 9.3 1 8.4 1 9 9 9.3 1 8.4 1 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one year Quantity of industrial chemicals used "Chlorine, Coagulant, etc." Is there a list of vendors for chemicals, consumable materials, and machine parts? Frequency of power failure during year, total umber of hours of nower failure Are there standby power generators? How many times a year and how many hours a	8)Jr. Eng. supervisior Regular working time Fron Permanent worker Operation M Yes 1 Yes 1 3,500kWh /day, 95,00 Chlorine : 60 kg/d. not in Polyelectrolyte : 4.8kg/d Yes 1 once a No	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair No No No No No No No No No No
8.1 8.2 8.3 8.4 9 9.1 9.1 9.2 9 9.4 9 9.5 1 9 9.5 1 9 9.5 1 9 9.7 4 1 9 9.4 1 1 1 1 1 1 1 1 1 1 1 1 1	Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters) Procurement of utility and materials Is the procurement of the chemicals easy? Is there a procurement plan of chemicals? Amount of electric power used each day/month, and of one year Quantity of industrial chemicals used "Chlorine, Coagulant, etc." Is there a list of vendors for chemicals, consumable materials, and machine parts? Frequency of power failure during year, total quamber of hours of nower failure. Are there standby power generators? How many times a year and how many hours a year is the standby power generator used?	8)Jr. Eng. supervisior Regular working time Fron Permanent worker Operation M Yes Yes Yes 3,500kWh /day, 95,00 Chlorine : 60 kg/d. not in Polyelectrolyte ; 4.8kg/d Yes No No No	n 8:30 to 17:30 3shift 8to16, 16to Subcontractor aintenance, Repair No No No No No No No No No No

10.1	Is there a centralized control system?	Yes)	
	Is there a data logger system?	Yes	< No $>$)	
10.2	Has the operation and maintenance service	Vas	No		
	been subcontracted to a private company?		INU		
11	Safety management				
11.1	Is there a safety and hygiene organization?	Yes	No		
11.2	Is there a safety operation manual ?	Yes	(No))	
11.3	Are there safety protection tools?	Yes	No		
11.4	Are there warning signs for dangerous parts of the	Vac	No		
	facilities?	Tes	INO		
11.5	Have there been instances of accidents/disasters in	¥7			
	the past?	res	NO	Minor	
11.6	Is education and training implemented for health	~~~~	27	0.014	
	and safety?	Yes	No	0&M	
11.7	Is there a risk management manual (for floods.				
	cyclones earthquakes and other natural disasters)?	Yes	No		
	ejerenes, curuquares, and other natural disusters).				

II Check list of sewerage systems, machinery and electrical systems

	Please reply as indicated on the right side.			
1	Machinery system			
1.1	Type of screens			
111	Is there a coarse screen?	Yes		No
112	Is screen type mechanical?	Yes		No
113	Is there a fine screen?	Yes		No
1114	Is screen type mechanical?	Yes		No
1 1 5	Grit chamber			
1.1.5	Is there a crushing device?	Ves	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	No
1.1.0	Is there a conveyor?	Ves		No
1.1.7	How is the grid chamber cleaned?	105		110
1.1.0	Mechanically?	Vac		No
	Pucket elevator?	Vec		No
	Lot nump?	Voc	~~~>	No
	Serow?	Vec	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	No
	Air lift?	Ves	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	No
	Manually?	Vec	~~~>	No
	Aeration?	Ves	~~~>	No
1.2	Pumps	103		
1.2	What is the rotad valtage of main nump?	420 V		
1.2.1	What is the fated voltage of main pump?	Vos		No
1.2.2	If Veg, what is the type of pump?	Vos	~~>	No
1.2.3	If Yes, what is the type of pullip?	No		110
1.2.4	What type of corpetion facilities used?	110		
1.5	What type of aeration facilities used:	NI/A		
1.3.1	Disinfection a submer of the second	IN/A		
1.4	Disinfection equipment			
1.4.1	What type of disinfection method for effluent is	Var		No. ant in second la
	Chlorination?	Var		No not in use presently
	Outra violet ray?	I es	~~>	N
1.5	Ozonizer?	Yes	\sim	NO
1.5	Sludge thickening equipment			
1.5.1	What type of sludge thickening equipment is used	V		
	Gravity thickening?	Na		
	Air flotation?	No No		
	Centrifugal thickening?	No		
1.6	Shadee debudeetien equipment	INO		
1.0	Sludge denydration equipment			
1.6.1	What type of sludge dehydration method is adopted			
	Mechanical?	Vaa		N
	Filter press?	Yes	\sim	No
	Centrifugal denydration	Vas		No
	vacuum filtration?	No		
1 6 2	Where does the devictored shides as to?	INU Londfill		
1.0.2	Shades dispeties facility (Assesship)?	Vas	~~~~~~	No
1.7.1	Sindge digestion facinity (Anaerodic)?	Vos (for	\sim	No
1.7.2	Is digester gas used?	1 cs (101		110
2	Calenter for station			
2.1	Substation facility			
2.1.1	What is the substation voltage?	llkV		
2.3	Uninterrupted power supply (UPS)	37		N
2.3.1	Is there uninterrupted power supply?	Yes	\sim	
2.3.2	II Tes, is it DC supply or AC supply?	INU No		
2.3.3	what are the applications of this power supply?	110		
2.5	ivieasuring instruments			
2.5.1	what type of flow meter is used and where?		<u> </u>	
	Electro-magnetic?	Yes ($\frac{1}{2}$	No
	Ultrasonic?	Yes ($\underline{)} \subseteq$	No
	Orifice plate?	Yes)	No
	Venturi?	Yes (\sim	NO
	Weir?	Yes ($\frac{1}{2}$	No
	Partial flume?	rest)	NO

2.5.2 What type of level gauge is adopted and y	whore?		
2.5.2 What type of level gauge is adopted and v	VIICIC:		
Float-type?	Yes (
Pressure-type?	Yes (
Ultrasonic?	Ves) <u>No</u>	
Radio wave ?	Yes () <u>No</u>	
2.5.3 Is a water quality meter used?			
PH?	(Yes)	No	
DO?	Yes	No	
MLSS?	Yes	No	
ORP?	Yes	No	
Turbidity?	Yes	No	
Nitrogen?	Yes	No	
Phosphorus?	Yes	No	
2.5.4 Is sludge measurement performed?			
Sludge concentration?	Yes	(No)	
2.5.5 Is any meteorological instrument used for	r the	<u> </u>	
following?			
Temperature?	(Yes)	No	
Atmospheric pressure?	Yes	(No)	
Rain?	Yes	No	
Wind velocity (Anemometer)?	Ves		
2.5 Monitoring control system	105		
2.5 1 Deep a lackant next exist at the following			
2.5.1 Does a lookout post exist at the following	\$7		
Grit chamber	Yes	NO	
Dry well	Yes	No	
Sewage treatment facility	Yes	No	
Sludge thickening equipment	Yes	<u>No</u>	
Sludge dehydration equipment	Yes		
Anaerobic digestion tank	Yes		
Pumping station	Yes		
2.5.3 Is SCADA (Supervisory Control And Data	Voc	No	
Acquisition) system used?	1 55	110	

Questionnaire for 8 target states and 2 Union Territories in India

Face sheet

	Please fill in the fields below. Attach additional shee	ets 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

1	Basic data related to facilities	
1.1	Are there calculations for basic design and capacity	No. Others
	of treatment plant facilities?	(Yes) No, Others:
1.2	Is there a layout plan showing earthwork.	
	machinery, and electrical equipment?	(Yes) No, Others:
13	Are there detailed specifications of all facilities and	
	equipment fitted in the plant? Are there as-fitted	
	drawings of all sewers? Are there structural	(Yes) No, Others:
	drawings of tanks digesters reactors buildings	
14	Is there a flow chart for instrumentation?	Yes. No.) Others:
1.5	Are there single-line diagrams (electrical)?	Yes, No. Others:
1.6	Sewage treatment process used (Example:	I.I.A GD
	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
1.0		
1.9	Layout of plant (please attach the drawing, if you	Yes
2	History	
2.1	Is the history of failure, repair, or reconstruction	Yes No
	recorded?	Others :
2.2	Are there any requests or complaints from	Yes No
	surrounding residents?	Others :
3	Design capacity and actual loading	
3.1	Design wastewater flow	36 MLD
3.2	Average daily flow	36 MLD
3.3	Maximum daily flow	50 MLD
3.4	Dry weather flow	N/A N/A
3.5	Wet weather flow	N/A
5.0	Design westewater influent quality	DOD 500 m = // COD m = // SS 1200 m = //
37	Design wastewater numeri (maniy	SO(1) SO(1) MO/1 CO(1) - MO/1 SS(1/00)MO/1
3.7 3.8	Average wastewater influent quality	BOD 500 mg/l, COD - mg/l, SS 1200mg/l BOD 450-650 mg/l, COD 1000-1850 mg/l, SS 800-1600mg/l
3.7 3.8 3.9	Average wastewater influent quality Design effluent quality	BOD 300 mg/1, COD - mg/1, SS 1200mg/1 BOD 450-650 mg/1, COD 1000-1850 mg/1, SS 800-1600mg/1 BOD 175 mg/1, COD - mg/1, SS 200mg/1
3.7 3.8 3.9 3.10	Average wastewater influent quality Design effluent quality Average effluent quality	BOD 500 mg/1 COD - mg/1 SS 1200mg/1 BOD 450-650 mg/1 COD 1000-1850 mg/1 SS 800-1600mg/1 BOD 175 mg/1 COD - mg/1 SS 200mg/1 BOD 170-275mg/1 COD 400-750 mg/1 SS 200-275 mg/1
3.7 3.8 3.9 3.10 3.11	Average wastewater influent quality Design effluent quality Average effluent quality Solids capture rate	BOD 500 mg/l COD - mg/l SS 1200mg/l BOD 450-650 mg/l COD 1000-1850 mg/l SS 800-1600mg/l BOD 175 mg/l COD - mg/l SS 200mg/l BOD 170-275mg/l COD 400-750 mg/l SS 200-275 mg/l N/A % %
3.7 3.8 3.9 3.10 3.11 3.12	Average wastewater influent quality Average wastewater influent quality Average effluent quality Average effluent quality Solids capture rate What equipment is used for drawing out sludge	BOD 500 mg/l COD - mg/l SS 1200mg/l BOD 450-650 mg/l COD 1000-1850 mg/l SS 200mg/l BOD 175 mg/l COD - mg/l SS 200mg/l BOD 170-275mg/l COD 400-750 mg/l SS 200-275 mg/l N/A %
3.7 3.8 3.9 3.10 3.11 3.12	Average wastewater influent quality Average wastewater influent quality Design effluent quality Average effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or	BOD 500 mg/l COD - mg/l SS 1200mg/l BOD 450-650 mg/l COD 1000-1850 mg/l SS 200mg/l BOD 175 mg/l COD - mg/l SS 200mg/l BOD 170-275mg/l COD 400-750 mg/l SS 200-275 mg/l N/A %
3.7 3.8 3.9 3.10 3.11 3.12	Average wastewater influent quality Average wastewater influent quality Design effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)?	BOD 500 mg/l COD - mg/l SS 1200mg/l BOD 450-650 mg/l COD 1000-1850 mg/l SS 200mg/l BOD 175 mg/l COD - mg/l SS 200mg/l BOD 170-275mg/l COD 400-750 mg/l SS 200-275 mg/l N/A %
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3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14	Average wastewater influent quality Average wastewater influent quality Design effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP	BOD 500 mg/l COD - mg/l SS 1200mg/l BOD 450-650 mg/l COD 1000-1850 mg/l SS 200mg/l BOD 175 mg/l COD - mg/l SS 200mg/l BOD 170-275mg/l COD 400-750 mg/l SS 200-275 mg/l N/A % No only valve from UASB 1 times/day daily
3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15	Average wastewater influent quality Average wastewater influent quality Design effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume	BOD 500 mg/l COD - mg/l SS 1200mg/l BOD 450-650 mg/l COD 1000-1850 mg/l SS 200mg/l BOD 175 mg/l COD - mg/l SS 200mg/l BOD 170-275mg/l COD 400-750 mg/l SS 200-275 mg/l N/A % No only valve from UASB 1 times/day daily
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3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18	Design Wastewater influent quality Design emastewater influent quality Design effluent quality Average effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge or waste utilization	BOD 500 mg/1, COD - mg/1, SS 1200mg/1 BOD 450-650 mg/1, COD 1000-1850 mg/1, SS 800-1600mg/1 BOD 175 mg/1, COD - mg/1, SS 200mg/1 BOD 170-275 mg/1, COD 400-750 mg/1, SS 200-275 mg/1 NA % No only valve from UASB 1 times/day 480m³/day 92% 180m³/day 97-98% mean:52%, max: 70%, min:37% No use (Landfill)
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3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19	Design wastewater influent quality Design emission of the second	BOD 500 mg/1, COD - mg/1, SS 1200mg/1 BOD 450-650 mg/1, COD 1000-1850 mg/1, SS 200-1600mg/1 BOD 175 mg/1, COD - mg/1, SS 200-275 mg/1 BOD 170-275mg/1, COD 400-750 mg/1, SS 200-275 mg/1 No only valve from UASB 1 times/day 480m³/day 92% 180m³/day 97-98% mean:52%, max: 70%, min:37% No use (Landfill)
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3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19	Design vastewater influent quality Average wastewater influent quality Design effluent quality Average effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge or waste utilization Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge?	BOD 500 mg/1, COD - mg/1, SS 1200mg/1 BOD 450-650 mg/1, COD 1000-1850 mg/1, SS 200mg/1 BOD 175 mg/1, COD - mg/1, SS 200mg/1 BOD 170-275 mg/1, COD 400-750 mg/1, SS 200-275 mg/1 NA % No only valve from UASB 1 times/day 480m³/day 92% 180m³/day 97-98% mean:52%, max: 70%, min:37% No use (Landfill) No, Sludge contains toxic. No
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3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.2	Design vastewater influent quality Average wastewater influent quality Design effluent quality Average effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge or waste utilization Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? Are there operation records for pumps, equipment, blowers, etc.?	BOD 500 mg/1, COD - mg/1, SS 1200mg/1 BOD 450-650 mg/1, COD 1000-1850 mg/1, SS 200mg/1 BOD 175 mg/1, COD - mg/1, SS 200mg/1 BOD 170-275 mg/1, COD 400-750 mg/1, SS 200-275 mg/1 N/A % No only valve from UASB 1 times/day 480m³/day 92% 180m³/day 97-98% mean:52%, max: 70%, min:37% No use (Landfill) No, Sludge contains toxic. Daily report: Yes Daily report: Yes No
3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.2 3.2.1	Design wastewater influent quality Average wastewater influent quality Design effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge or waste utilization Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? Are there operation records for pumps, equipment, blowers, etc.? Is the water quality measured regularly?	BOD 300 mg/1, COD - mg/1, SS 1200mg/1 BOD 450-650 mg/1, COD 1000-1850 mg/1, SS 200mg/1 BOD 175 mg/1, COD - mg/1, SS 200mg/1 BOD 170-275 mg/1, COD 400-750 mg/1, SS 200-275 mg/1 N/A % No only valve from UASB 1 times/day daily 480m ³ /day 92% 180m ³ /day 92% 180m ³ /day 97-98% mean:52%, max: 70%, min:37% No use (Landfill) No, Sludge contains toxic. Daily report: Yes No Annual report: Yes No
3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.2 3.2.1 3.2.2	Design wastewater influent quality Average wastewater influent quality Design effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge or waste utilization Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? Are there operation records for pumps, equipment, blowers, etc.? Is the water quality measured regularly?	BOD 300 mg/1, COD - mg/1, SS 1200mg/1 BOD 450-650 mg/1, COD 1000-1850 mg/1, SS 200mg/1 BOD 175 mg/1, COD - mg/1, SS 200mg/1 BOD 170-275 mg/1, COD 400-750 mg/1, SS 200-275 mg/1 N/A % No only valve from UASB 1 times/day daily 480m ³ /day 92% 180m ³ /day 92% 180m ³ /day 97-98% mean:52%, max: 70%, min:37% No use (Landfill) No, Sludge contains toxic. Daily report: Yes No Yes No Daily report: Yes No,
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3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.2 3.2.1 3.2.2 3.2.3	Design wastewater influent quality Average wastewater influent quality Design effluent quality Average effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge or waste utilization Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? Are there operation records for pumps, equipment, blowers, etc.? Is the water quality measurement records maintained? Is record of concentration of toxic substances in sludge	BOD 450-650 mg/l, COD - mg/l, SS 1200mg/l BOD 450-650 mg/l, COD 1000-1850 mg/l, SS 200-275 mg/l BOD 170-275 mg/l, COD 400-750 mg/l, SS 200-275 mg/l N/A % No only valve from UASB 1 times/day daily 480m ³ /day 92% 180m ³ /day 97-98% mean:52%, max: 70%, min:37% No use (Landfill) No, Sludge contains toxic. Daily report: Yes No Annual report: Yes No, Annual report: Yes No, Annual report: Yes No, Annual report: Yes No,
3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.2 3.2.1 3.2.2 3.2.3 3.2.4	Average wastewater influent quality Average wastewater influent quality Design effluent quality Average effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge or waste utilization Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? Are there operation records for pumps, equipment, blowers, etc.? Is the water quality measurement records maintained? Is record of concentration of toxic substances in sludge maintained?	BOD 450-650 mg/l, COD - mg/l, SS 1200mg/l BOD 175 mg/l, COD - mg/l, SS 200mg/l BOD 175 mg/l, COD 400-750 mg/l, SS 200-275 mg/l N/A % No only valve from UASB 1 times/day daily 480m ³ /day 92% 180m ³ /day 97-98% mean:52%, max: 70%, min:37% No use (Landfill) No, Sludge contains toxic. Daily report: Yes No Annual report: Yes No, Annual report: Yes No, Annual report: Yes No, Annual report: Yes No,
3.7 3.8 3.9 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.2 3.2.1 3.2.2 3.2.3 3.2.4	Design wastewater influent quality Average wastewater influent quality Design effluent quality Solids capture rate What equipment is used for drawing out sludge from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Percentage of volatile solids in generated sludge Methods of effective sludge or waste utilization Is sludge used for agricultural purpose or some other purpose? What is the amount of sludge disposed and water content in sludge? Are there operation records for pumps, equipment, blowers, etc.? Is the water quality measurement records maintained? I	BOD 450-650 mg/l, COD - mg/l, SS 1200mg/l BOD 175 mg/l, COD - mg/l, SS 200mg/l BOD 175 mg/l, COD 400-750 mg/l, SS 200-275 mg/l N/A % No only valve from UASB 1 times/day daily 480m ³ /day 92% 180m ³ /day 97-98% mean:52%, max: 70%, min:37% No use (Landfill) No, Sludge contains toxic. Daily report: Yes Mo Annual report: Yes No, Annual report: Yes No,

.2.5	If Yes, what are the cause for exceeding the effluent standard?	Quality of influent and toxicity
4	Corrosion of facilities and damage status	······································
4.1	Is there corrosion of buildings or structures?	Yes No, name of part : Blower room It not use
4.2	Was there any damage to the building frame part of facilities?	Yes No, name of part : Blower room It not use
4.3	Is there corrosion in equipment?	Yes No, name of part : screen, pump
4.4	Is there damage to equipment?	Yes No, name of part : screen, pump
4.5	Are there records of corrosion and damage to facilities?	Yes No
4.6	Is there foul smell most of the time?	Yes No
4.7	Is scum generated?	Small amount
5	Management of planned facilities	
5.1	Is there an operation schedule for machinery and equipment	Yes "manufacturer compilation, Others" No
5.2	Is there an operation manual?	Yes No
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	Yes No
	Is there a wastewater examination method?	Yes: Name of the method: Standard Method(APHA)
5.4	Are there the education and training manuals for the staff?	Yes No
6	Inspection of facility and aquinment	<u>1</u>
6.1	Are there check records for equipment?	Daily report: No Monthly report Yes
6.2	Is there an inspection manual?	Yes No
6.3	Is there an inspection schedule?	Yes No
6.4	Details of inspection procedure	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, Hard copy, Others :
7	Repair, Rehabilitation, Reconstruction	
7.1	Is there a manual for repair, rehabilitation and reconstruction of facility and equipment?	Yes No
7.2	If Yes, is it being used?	(Yes) No
7.3	Are there repair, rehabilitation and reconstruction	
7.4	plans for facility and equipment ? Have repairs, rehabilitation and reconstruction	
75	been implemented? Are there repair rehabilitation, and reconstruction	Yes No Electronic data Hard conv
	records? Work implementation	Others :
81	Staffing or Manpower at Plant	Engineers: 4 persons
0.1	builting of thanpower at Faut	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 Subcontractor
8.5	Others (Are there the applied applied applied to the set of the	Operation, Maintenance, Repair
8.0 0	Conters (Are there the special measures taken at the time of accidents or disasters)	Yes No
91	Is the procurement of the chemicals easy?	Yes No
9.2	Is there a procurement plan of chemicals?	Yes No
9.3	Amount of electric power used each day/month, and of one year	5,423,573 kWh in a year
91	Quantity of industrial chemicals used	Chlorine : Notuse
).+ 0.5	"Chlorine, Coagulant, etc."	Polyelectrolyte ; Not use
7.J	materials, and machine parts?	Yes <u>No</u>
9.0 0.7	number of hours of power failure	30 minutes / day
9./	Are mere standby power generators?	r es,out 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
10	Efficiency improvement and remedial	
ļ	measures and maintenance management of	
0.1	Is there a centralized control system?	Yes No
	Is there a data logger system?	Yes No

10.2	Has the operation and maintenance service	Yes	No	
	been subcontracted to a private company?	\sim		
11	Safety management			
11.1	Is there a safety and hygiene organization?	Yes	$\underline{N0}$	
11.2	Is there a safety operation manual ?	Yes	$\langle No \rangle$	
11.3	Are there safety protection tools?	Yes	No	
11.4	Are there warning signs for dangerous parts of the	Ves	No	
	facilities?	105	110	
11.5	Have there been instances of accidents/disasters in	Vec	No	
	the past?	105		
11.6	Is education and training implemented for health	Ves	No	
	and safety ?	105		
11.7	Is there a risk management manual (for floods,	Ves	No	
	cyclones earthquakes and other natural disasters)?	103	110	

I Check list of sewerage systems, machinery and electrical systems Please reply as indicated on the right side.

1	Machinery system		
1 1	Type of sereens		
1.1		Vac	
1.1.1		Ver	No
1.1.2	is screen type mechanical?	Tes Var	No
1.1.5	Is there a fine screen?	V	
1.1.4	Is screen type mechanical?	Yes	
1.1.5	Grit chamber		
1.1.6	Is there a crushing device?	Yes	
1.1.7	Is there a conveyor?	Yes	
1.1.8	How is the grid chamber cleaned?		
	Mechanically?	Yes	No
	Bucket elevator?	Yes	No
	Jet pump?	Yes	No
	Screw?	Yes	(No)
	Air lift?	Yes	No
	Manually?	Yes	No
	Aeration?	Yes	No
12	Pumps	105	
1.2	What is the set of a stress of the income of	400	
1.2.1	what is the rated voltage of main pump?	400 V	
1.2.2	Is there any speed controlled pump?	res	
1.2.3	If Yes, what is the type of pump?	Yes	
1.2.4	If Yes, what is the method of speed control?	N/A	
1.3	What type of aeration facilities used?	N/A	
1.3.1	What type of air diffuser is used?	No	
1.4	Disinfection equipment		
1.4.1	What type of disinfection method for effluent is		
	Chlorination?	Yes	(No)
	Ultra violet rav?	Yes	(No)
	Ozonizer?	Yes	(No)
15	Sludge thickening equipment	,	
151	What type of cludge thickening equipment is		
1.5.1	what type of sludge thickening equipment is	(verting and the second	
	Gravity thickening?	(not in use pr	esenuy)
	Air flotation ?	INO NU	
	Centrifugal thickening?	INO N	
	Belt type?	NO	
1.6	Sludge dehydration equipment		
1.6.1	What type of sludge dehydration method is		
	Mechanical?		
	Filter press?	Yes	No
	Centrifugal dehydration	Yes	No
	Vacuum filtration?	Yes	
	Others?	No	
1.6.2	Where does the dewatered sludge go to?	Landfill	
171	Sludge digestion facility (Anaerobic)?	Yes	(N0)
172	Is digester gas used?	Yes (for)	(N_0)
2	Flectrical system	100 (101)	
21	Substation facility		
2.1	Substation facility	221	
2.1.1	what is the substation voltage?	33KV	
2.3	Uninterrupted power supply (UPS)	No	~~~
2.3.1	Is there uninterrupted power supply?	Yes	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	
2.5	Measuring instruments		
2.5.1	What type of flow meter is used and where?		
	Electro-magnetic?	Yes?) No It's not using.
	Ultrasonic?	Yes (
	Orifice plate?	Yes (<u>No</u>
	Venturi?	Yes (
	Weir?	Yes) No
	Partial flume?	Yes (No

2.5.2	What type of level gauge is adopted and where?	·	
	Float-type?	Yes (
	Pressure-type?	Yes (
	Ultrasonic?	Yes ($\mathbb{N}_{\mathbb{N}}$
	Radio wave?	Yes (
2.5.3	Is a water quality meter used?		
	PH?	Yes	No
	DO?	Yes	
	MLSS?	Yes	
	ORP?	Yes	No
	Turbidity?	Yes	
	Nitrogen?	Yes	
	Phosphorus?	Yes	No
2.5.4	Is sludge measurement performed?		
	Sludge concentration?	Yes	No
2.5.5	Is any meteorological instrument used for the		
	following?		
	Temperature?	Yes	No
	Atmospheric pressure?	Yes	No
	Rain?	Yes	No
	Wind velocity (Anemometer)?	Yes	No
2.5	Monitoring control system		
2.5.1	Does a lookout post exist at the following	No	
	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	Vac	No
	Acquisition) system used?	105	IND

Questionnaire for 8 target states and 2 Union Territories in India

Cover sheet

Name of state	Utter Pradesh				
Name of city/town	Allahabad				
Name of respondent					
STP Name					
Contact information					
Address					
Phone number					
E-mail address					
Summary of sewage treatment plant					
Basic data related to STP components					
Are there calculations for basic design and cap	acity	N	Others	NT/ A	
of treatment plant components?	Yes,	No,	Others	N/A	
Is there a layout plan showing earthwork.					
machinery, and electric equipment?	Yes,	No,	Others	N/A	
Are there detailed specifications of all facilities	s				
and equipment fitted in the plant? Are there	, Vaa	Ne	Others :	NI/A	
and equipment futer if the plant? Are there	I eS,	INO No	Others :	IN/A	
as-inted drawings of all sewers? Are there	res,	INO	Others :	IN/A	
structural drawings of tanks, digesters, reactors	s, Yes,	No	Others :	IN/A	
buildings, and so on?					
Is there a flow chart for instrumentation?	Yes,	No	Others :	N/A	
Are there single-line diagrams (electrical)?	Yes,	No	Others :	N/A	
Sewage treatment process used (Example:	1.05				
Conventional activated sludge process)	ASP				
Sludge treatment process used (Example: Slu	dge Gravity thicken	ing, Anaerobic d	igestion ,Sludge drvin	g bed	
drying after thickening) Which is the effluent discharge point?	Through irright	ion Channel & gu	urplus to river		
The first of the officient discharge point:		ion channel & su	17103 10 11VO		
Layout of plant (please attach the drawing, if y	ou <u>Yes</u> N	0			
History					
Is the history of failure, repair, or reconstruction recorded?	n Yes Log bo	ook			
Are there any requests or complaints from	Yes N	\sim			
surrounding residents?		_			
Design capacity and actual loading					
Design wastewater flow	60) MLD			
Average daily flow	6() MLD			
Maximum daily flow	65	6 MLD			
Dry weather flow	65	5 MLD			
Design wet weather flow	6.	5 MLD			
Wet weather flow	No record	I MLD			
Design wastewater influent quality	F	OD N/A mg/l	COD N/A mg/l	SS	N/A mg/
Average wastewater influent quality	F	OD 115.8 mg/l	COD N/A mg/l	SS	379 mg/
Design effluent quality	F	OD 30 mg/l	COD N/A mg/l	SS	50 mg/
Average effluent quality	F	OD 25.65 mg/l	COD N/A mg/l	SS	44.68 mg/
Solids canture rate	L	N/A %	1,711 mg/1	~~	
What equipment is used for drawing out sluds	TA	1,711 /0			
a string equipment is used for drawing out sludg	,• N/A				
from primory/occar domy and in the training of	IN/A				
from primary/secondary sedimentation tank or					
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)?					month
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge	N/A	times/day	22days-1bed	times/	monui
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP	N/A N/A	times/day times/month	22days-1bed	times/	year
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content	<u>N/A</u> N/A 180	a times/day a times/month) KLD	22days-1bed ML/year	times/	year %
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content	<u>N/A</u> N/A 18(times/day times/month KLD	22days-1bed ML/year	times/	year %
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume,	N/A N/A 180	times/day times/month KLD KLD	22days-1bed ML/year ML/year	times/	year %
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content	N/A N/A 180	times/day times/month KLD KLD	22days-1bed ML/year ML/year	times/ times/y	year %
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids	N/A N/A 180 160 m	times/day times/month KLD KLD ean: %	22days-1bed ML/year ML/year max:	times/ times/y	year % % N/A
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge	N/A N/A 18(16(m	A times/day A times/month D KLD D KLD ean: % nin: %	22days-1bed ML/year ML/year max: N/A	times/ times/y	year % % N/A
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge utilization	N/A N/A 180 160 m 1 Manure , landfi	A times/day A times/month A KLD A KL	22days-1bed ML/year ML/year max: N/A	times/y	year % % N/A
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge utilization	N/4 N/4 180 160 Manure , landfi	A times/day A times/month A KLD A KLD A KLD A KLD A t/year	22days-1bed ML/year ML/year max: N/A	times/y	year % % N/A
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge utilization What is the amount of sludge disposed and wa	N/4 N/4 180 160 Manure , landfi ter N/A	A times/day A times/month A KLD A KLD A KLD ean: % min: % Il ,flowering A t/year	22days-1bed ML/year ML/year max: N/A	times/y	year % % N/A
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge utilization What is the amount of sludge disposed and wa content in sludge?	N/4 N/4 180 160 Manure , landfi ter N/4 N/4	A times/day A times/month A times/month A KLD A KLD A KLD A KLD A t/year A t/year A t/year	22days-1bed ML/year ML/year max: N/A	times/y	year % % N/A
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge utilization What is the amount of sludge disposed and wa content in sludge? Are there operation records for pumps, equipm	N/A N/A 180 160 Manure , landfi ter N/A N/A nent, Daily report:	A times/day A times/month A times/month A KLD A KLD A KLD A KLD A KLD A Vyear A % Yes No	22days-1bed ML/year ML/year max: N/A Monthly report:	times/y times/y % Yes	year % N/A N/A
from primary/secondary sedimentation tank or digester (pump/gravity, etc.)? Frequency of drawing out sludge Frequency of sludge carried outside STP Design sludge generation volume and water content Average sludge generation volume, and water content Percentage of volatile solids in generated sludge Methods of effective sludge utilization What is the amount of sludge disposed and wa content in sludge? Are there operation records for pumps, equipm blowers, etc.?	N/A N/A 18(16(m 16(m 16(m 1 16(m 1 16(m 1 16(Manure , landfi ter N/A N/A Manure , landfi ter N/A	A times/day A times/month A KLD A KLD A KLD A KLD A L/year A Vyear A % Yes No Yes No	22days-1bed ML/year ML/year max: N/A Monthly report:	times/ times/y % Yes	year % % N/A N/A

3.2.2	Are water quality measurement records	Daily rep	oort: 🔿	les 🔿	No				
	maintained?	Annual r	eport:	les	No				
3.2.3	Is record of concentration of toxic substances in								
	sludge maintained?	Yes							
324	Has the water quality of the final effluent exceeded								
0.2.	your target effluent standards anytime?	Yes	No	Rarely					
325	If Yes, what are the causes for exceeding the								
5.2.5	effluent standard?	Yes	No	In case	of break	down in p	olant		
4	Corresion of facilities and damage status								
4	Le there correction of buildings or structures?								
4.1	is there corrosion or bundlings or structures?	Yes	(No.)	name o	f part :				
42	Was there any damage to the building frame		\sim						
	part of facilities?	Yes	(N_0)	name o	f part :				
4.3	Is there corrosion in equipment?	(Yes)	No.	name o	f part :]	Blower in	peller		
4.4	Is there damage to equipment?	Yes	(No)	name o	f part :		.^		
4.5	Are there records of corrosion and damage to	Vac	No	N/A					
	equipment?	105	INU	IN/A					
4.6	Is there foul smell most of the time?	Yes	No	At intal	ke				
4.7	Is scum generated?	A large a	umount,	Small a	mount,		No	N/A	
5	Management of facilities								
5.1	Is there a schedule for operating machinery and	Yes	"manufac	turer co	mpilatio	n, Others"	No	>	
	equipment								
5.2	Is there an operation manual for the complete	Yes	No	N/A					
	facility?	100	110						
5.3	Is there a schedule for wastewater examination	Yes	No						
	for influent, effluent and others?	37	<u> </u>	6.4					NT/A
~ .	Is there a wastewater examination method?	Y es:	Name o	of the me	ethod:			No	N/A
5.4	Are there the education and training manuals for	Yes	No	N/A					
	the staff of the STP?								
6	Inspection of equipment in the STP	N 11		······		N 41		**	
6.1	Are there check records for equipment?	Daily rep	port: Y	es	No J	Monthly r	eport:	Yes	No
		Annual r	eport:	í es	No	N/A			
6.2	Is there an inspection manual?	Yes	No	N/A					
63	Is there an inspection schedule?								
0.5	is there an inspection schedule.	Yes	No	N/A					
6.4	Details of inspection procedure	Visual		audible	:/ /	TV came	ra,	others :	N/A
6.5	How has the result of the inspection been used?	NT/A							
	*	N/A							
6.6	How are inspection results maintained?	Electroni	ic data.	Hard co	opv.	Other	s : N/A		
_					.12,				
7	Repair, Rehabilitation, Reconstruction								
/.1	is there a manual for repair, renabilitation and	Yes	No	N/A					
7 2	If Vac. is it being used?	Vaa	Ne	N/A					
7.2	If ites, is it being used?	res	INO	IN/A					
1.5	plans for the STP?	Yes	No	N/A					
74	Have repairs rehabilitation and reconstruction								
/	been implemented?	Yes	No						
7.5	Are there repair, rehabilitation and reconstruction	T-1 (·			0.1	NT/ A		
	records?	Electron	ic data,	Hard co	ору,	Other	s: N/A		
8	Work implementation	Organizat	tion for enti	re plants	+ pumpi	ng stations	in jurisdi	ction.	
8.1	Staffing or Manpower at Plant	Project	t Manager:	1	person,	T. T	Asst.En	gineer:	3 persons
		Asst.Proj	j.Engineer:	6	persons	, J	unior En	gineer:	3 persons
			Operator:	12	persons	,			
					persons	,	Tota	l staff:	persons
8.2	Engineers				persons	,			
					persons.	,			
83	Working time	Regular	working ti	From	persons	to	Shifts	· to	N/A
8.5	Work mode	Democra	working th	Subcon	tractor	N/A	Shint	, ц	
0.4		Permane	nt worker	Subcon	itractor	IN/A		NT/A	
8.5	Contents of work	Operatio	n ,	Mainte	nance,	кер	air	N/A	
8.6	Others (Are there the special measures taken at the	Yes	No	N/A					
0	Time of accidents of disasters?)								
9	Procurement of utilities and materials	Vac	No	N/A					
9.1	Is the procurement of the chemicals easy?	Ves	No	N/A					
9.3	Amount of electric power used	1 00	110						
			8338	kWh in	a day/m	onth,		kWh in	a year
9.4	Quantity of industrial chemicals used such as		N/A]	kg/d,		kg/year	
	chlorine, coagulant, etc.		N/A]	kg/d,		kg/year	
9.5	Is there a list of vendors for chemicals, consumable								
	materials, and machine parts?	Yes	No						
	-								

	p			
9.6	Frequency of power failure during year, total		48	times/year
	number of hours of power failure		42	hours/year
9.7	Are there standby power generators?	Yes	No	
9.8	How many times a year and how many hours a		48	times/year
	year is the standby power generator used?		42	hours/year
10	Efficiency improvement and remedial measures	and mainte	nance	
	management of sewerage facilities			
10.1	Is there a centralized control system?	Yes	(No)	
	Is there a data logger system?	Yes	(No)	
10.2	Has the operation and maintenance service	Vac	No	
	been subcontracted to a private company?	165	INU	
11	Safety management			
11.1	Is there a safety and hygiene organization?	Yes	No	
11.2	Is there a safety operation manual?	Yes	(N_0)	
11.3	Are there safety protection tools?	<u>Yes</u>	No	
11.4	Are there warning signs for dangerous parts of the	Ves	No	
	facilities?	103	140	
11.5	Have there been instances of accidents/disasters in	Vec	No	No accidents
	the past?	103		No accidents
11.6	Is education and training implemented for health	Vac	No	
	and safety ?	105		
11.7	Is there a risk management manual			
	(for floods, cyclones, earthquakes,	Yes	No	
	and other natural disasters)?			

${\rm I\!I}\,$ Check list of sewerage systems, machinery and electrical systems

	Please reply as indicated on the right side.				
1	Machinery system				
1.1	Type of screens				
1.1.1	Is there a coarse screen?	Yes		No	
1.1.2	Is screen type mechanical?	Yes		No	
1.1.3	Is there a fine screen?	Yes		No	
1.1.4	Is screen type mechanical?	Yes	\subset	No⊃	
1.1.5	Grit chamber				
1.1.6	Is there a crushing device?	Yes	\sim	No	
1.1.7	Is there a conveyor?	Yes		No	
1.1.8	How is the grid chamber cleaned?				
	Mechanically?	(Yes)		No	
	Bucket elevator?	Yes	\sim	No >	
	Jet pump?	Yes	2	No>	
	Screw?	Yes	2	No	
	Air lift?	Yes	~ ~	No	
	Manually?	(Yes)	······	No	
	Aeration?	Yes	\sim	No >	
1.2	Pumps				
121	What is the rated voltage of main nump?		415 V		
122	Is there any speed controlled nump?	Yes		No	N/A
123	If Yes, what is the type of pump?	Yes		No	N/A
12.3	If Yes, what is the method of speed control?	N/A			
1.2.1	What type of aeration facilities used?	Surface aera	ator		
131	What type of air diffuser is used?	No			
1.4	Disinfection equipment				
141	What type of disinfection method for effluent is use				
1	Chlorination?	Yes		No	N/A
	Ultra violet rav?	Yes		No	N/A
	Ozonizer?	Yes		No	N/A
1.5	Sludge thickening equipment				
151	What type of sludge thickening equipment is use	d ?			
1.5.1	Gravity thickening?	u. Yes		No	N/A
	Air flotation?	Yes		No	N/A
	Centrifugel thickening?	Yes		No	N/A
	Relt type?	Yes		No	N/A
16	Sludge dehydration equipment	105		110	
161	Type of sludge dehydration method used:				
1.0.1	Type of sludge denyuration method used.				
		Vac		No	NI/A
	Contribuced debudgetion	Vac		No	N/A
	Venum filmetion	I US Vec		No	N/A
	v acuum filtration?			110	IV/A
160	Where does the downtored sludge as to?	IN/A N/A			
1.0.2	Sludge digestion facility (Ansarchic)?	(Vec)		No	
1.7.1	Sudge digestion facility (Anaerobic)?	Ves		No	for Dual fuel generator
1./.2	is uigester gas used?			140	IOI Duai fuel generator

2 Electrical system			
2.1 Substation facility			
2.1.1 What is the substation voltage?		33 kV	
2.3 Uninterrupted power supply (UPS)			
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 Measuring instruments			
2.5.1 What type of flow meter is used and where?			
Electro-magnetic?	Yes ($) \subset N_0 \supset$	
Ultrasonic?	Yes ($) \subset N_0 >$	
Orifice plate?	Yes () No)	
Venturi?	Yes () No	
Weir?	Yes () No)	
Partial flume?	(Yes)(1)) No Before PST	
2.5.2 What type of level gauge is adopted and wher	e?		
Float-type?	Yes () (No)	
Pressure-type?	Yes () No	
Ultrasonic?	Yes () <u>No</u>	
Radio wave ?	Yes () <u>No</u>	
2.5.3 Is a water quality meter used?			
PH?	Yes		
DO?	Yes	No	
MLSS?	Yes	(No)	
ORP?	Yes	No	
Turbidity?	Yes	No	
Nitrogen?	Yes	No	
Phosphorus?	Yes	No	
2.5.4 Is sludge measurement performed?			
Sludge concentration?	Yes	No	
2.5.5 Meteorological instruments used for:	_		
Temperature?	Yes	No	
Atmospheric pressure?	Yes	No	
Rain?	Yes	No	
Wind velocity (Anemometer)?	Yes	No	
2.5 Monitoring control system			
2.5.1 Does a lookout post exist at the following locat	tions?		
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		
2.5.3 Is SCADA (Supervisory Control And Data	Vec	No	
Acquisition) system used?	1 05	110	

Questionnaire for 8 target states and 2 Union Territories in India

Cover sheet

	Please fill in the fields below. Attach additional she	if necessary	
1	Name of state	ter Pradesh	
2	Name of city/town	lahabad	
3	Name of respondent		
4	STP Name		
5	Contact information		
6	Address		
0	Address		
8	E-mail address		
Ι	Summary of sewage treatment plant		
1	Basic data related to STP components		
1.1	Are there calculations for basic design and capacity		0.1
	of treatment plant components?	Yes No,	Others
1.2	Is there a layout plan showing earthwork,		
	machinery, and electric equipment?	Yes No,	Others
13	Are there detailed specifications of all facilities		
1.5	and equipment fitted in the plant? Are there	Ves No	Others :
	as-fitted drawings of all sewers? Are there	Yes No	Others :
	structural drawings of tanks digesters reactors	Yes. No	Others :
	buildings and so on?		
14	Is there a flow chart for instrumentation?	Yes No	Others :
1.4	Are there single-line diagrams (electrical)?	Yes. No	Others :
1.5	Sewage treatment process used (Example:		0.0000
	Conventional activated sludge process)	MBBR	
1.7	Sludge treatment process used (Example: Sludge	Thickening + Sludge drying bed	
1 0	drying after thickening) Which is the offluent discharge point?	Piver through pale	
1.0	L avout of plant (planse attach the drawing	Kiver unough hala	
1.9	if you have one)	Yes No	
2	History		
21	Is the history of failure, repair, or reconstruction		
2.1	recorded?	Yes Log book	
2.2	Are there any requests or complaints from	V. OV	
-	surrounding residents?	Yes No	
3	Design capacity and actual loading		
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 C	COD N/A mg/l SS N/A mg/l
3.8	Average wastewater influent quality	BOD 114.1 mg/l C	COD N/A mg/l SS 375.6 mg/l
3.9	Design effluent quality	BOD 30 mg/l C	COD N/A mg/l SS 50 mg/l
3.10	Average effluent quality	BOD 26.32 mg/l C	COD N/A mg/l SS 47.25 mg/l
3.11	Solids capture rate	<u>N/A %</u>	
5.12	w nat equipment is used for drawing out sludge	NT/A	
	from primary/secondary sedimentation tank or	IN/A	
0.10	aigester (pump/gravity, etc.)?	NT/A /1	
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	N/A אס –	- MI/vear — %
	and water content		///
3.16	Average sludge generation volume,	N/A kLD —	- ML/year — %
3.17	Percentage of volatile solids	mean: — % m	ax: % N/A
2 10	m generated studge	<u>min: — %</u>	N/A
3.18	wemous or effective sludge utilization	Land applications such as manure, la	nascaping, <u>flowering plants</u> etc.
		Other methods : Landfill	
3.19	What is the amount of sludge disposed and water	N/A t/year	
	content in sludge?	N/A 0/	
		IN/A %	

3.2	Are there operation records for pumps, equipment.	Daily report: Yes No Monthly report: Yes No
	blowers etc?	Annual report: Ves No
321	Is the water quality measured regularly?	
5.2.1	is the water quality measured regularly?	Yes No N/A
3.2.2	Are water quality measurement records	Daily report: Yes No N/A
	maintained?	Annual report: Yes No
323	Is record of concentration of toxic substances in	
5.2.5	sludge maintained?	Yes No N/A
324	Has the water quality of the final effluent exceeded	
5.2.4	vour target effluent standards anytime?	Yes No Rarely
3.2.5	If Yes, what are the causes for exceeding the	Yes No N/A
4	Corrosion of facilities and damage status	
4.1	Is there corrosion of buildings or structures?	Yes No, name of part :
10	We do a serie do a serie do do a la 11 dia o forma	
4.2	was there any damage to the building frame	Yes No name of part :
	part of facilities?	
4.3	Is there corrosion in equipment?	Yes No, name of part : Biower Impener
4.4	Are there records of corresion and damage to	Tes No name of part.
4.5	auinment?	Yes No
16	Is there foul small most of the time?	Vec No At intele
4.0	Is soun generated?	A large amount Small amount No N/A
, 5	Management of facilities	A lage anount, Sinan anount, 10
51	Is there a schedule for operating machinery and	Yes "manufacturer compilation Others" No
0.1	equipment	
52	Is there an operation manual for the complete	
0.2	facility?	Yes No N/A
5.3	Is there a schedule for wastewater examination	
	for influent, effluent and others?	Yes <u>No</u>
	Is there a westewater examination method?	Vas: Name of the method: No. N/A
5 /	Are there the education and training menuals for	res. Name of the method. NO IVA
5.4	the staff of the STP?	Yes No N/A
ć	Increation of acquinment in the CTD	
6 1	Are there shock records for emigment?	Daily and an Monthly apports - Vac - No
0.1	Are there check records for equipment?	Arrysol accept. Yes No Monthly report. Tes No
60	Is there are increastion manual?	Annual report: 1 es No N/A
0.2	is there an inspection manual?	Yes No N/A
6.3	Is there an inspection schedule?	V N NI/A
	*	res 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	NI/A
	been used?	IV/A
6.6	How are inspection results maintained?	
		Electronic data, Hard copy, Others : N/A
7		
71	Renair Rehabilitation Reconstruction	
/.1	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and	
	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP?	Yes No N/A
	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP?	Yes No N/A
7.2	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used?	Yes No N/A Yes No N/A
7.2 7.3	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction	Yes No N/A Yes No N/A
7.2 7.3	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP?	Yes No N/A Yes No N/A Yes No N/A
7.2 7.3 7.4	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction	Yes No N/A Yes No N/A Yes No N/A
7.2 7.3 7.4	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented?	YesNoN/AYesNoN/AYesNoN/A
7.2 7.3 7.4	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, machibilitation and reconstruction	YesNoN/AYesNoN/AYesNoN/AYesNoN/A
7.2 7.3 7.4 7.5	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction place for the strp?	Yes No N/A Yes No N/A Yes No N/A Yes No N/A Electronic data, Hard copy, Others : N/A
7.2 7.3 7.4 7.5	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records?	Yes No N/A Yes No N/A Yes No N/A Yes No N/A Electronic data, Hard copy, Others : N/A
7.2 7.3 7.4 7.5 8	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant	Yes No N/A Yes No N/A Yes No N/A Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Aest Engineer: 3 percons
7.2 7.3 7.4 7.5 8 8.1	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant	Yes No N/A Yes No N/A Yes No N/A Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 person, Asst.Engineer: 3 persons Asst.Proj.Enjineer: 6 persons, Junior Engineer: 3 persons
7.2 7.3 7.4 7.5 8 8.1	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant	Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 person, Asst.Engineer: 3 persons Asst.Proj.Enigneer: 6 persons, Junior Engineer: 3 persons Operator: 12 persons, 12 persons, 14 persons
7.2 7.3 7.4 7.5 8 8.1	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant	Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 persons, Asst.Proj.Enigneer: 6 persons, Junior Engineer: 3 persons Operator: 12 persons, Total staff: persons
7.2 7.3 7.4 7.5 8.1 8.2	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant	Yes No N/A Yes No N/A Yes No N/A Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 persons, Asst.Proj.Enigneer: 6 persons, Junior Engineer: 3 persons Operator: 12 persons, Total staff: persons persons, Total staff: persons
 7.2 7.3 7.4 7.5 8 8.1 8.2 	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant	Yes No N/A Yes No N/A Yes No N/A Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 persons, Asst.Proj.Enigneer: 6 persons, Junior Engineer: 3 persons Operator: 12 persons, Total staff: persons, persons, persons, persons,
7.2 7.3 7.4 7.5 8 8.1 8.2 8.3	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time	Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 persons, Project Manager: 1 persons, Junior Engineer: 3 persons Operator: 12 persons, Total staff: persons, persons, persons, Total staff: persons, Regular working tin From to Shifts; to N/A
7.2 7.3 7.4 7.5 8.1 8.2 8.3 8.4	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode	Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 persons, Project Manager: 1 persons, Junior Engineer: 3 persons Operator: 12 persons, Total staff: persons persons, persons, Total staff: persons Regular working tin From to Shifts; to N/A
7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work	Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 persons, Project Manager: 1 persons, Junior Engineer: 3 persons Operator: 12 persons, Total staff: persons persons, persons, Total staff: persons Regular working tin From to Shifts; to N/A Permanent worker Subcontracto N/A N/A
7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Work mode Contents of work Others (Are there the special measures taken at the view of the view	Yes No N/A Electronic data, Hard copy, Others : N/A Organization for entire plants + pumping stations in jurisdiction. Project Manager: 1 person, Asst.Proj.Enigneer: 6 persons, Junior Engineer: 3 persons Operator: 12 persons, Total staff: persons persons, persons, persons, Permanent worker Subcontracto N/A Yes No N/A N/A N/A N/A

9	Procurement of utilities and materials				
9.1	Is the procurement of the chemicals easy?	Yes	No		
9.2	Is there a procurement plan for chemicals?	Yes	No		
9.3	Amount of electric power used		1920	kWh in a day/month, STP	
			2000	kWh in a day/month, P.S	Wh in a year
9.4	Quantity of industrial chemicals used such as chlorine, coagulant, etc.	C	Chlorine ;	30kg/day, 900kg/month, 10800k	g/year
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		216	times/year	
	number of hours of power failure		88	hours/year	
07		\sim		nouis, jour	
9.7	Are there standby power generators?	res	NO		
9.8	How many times a year and how many hours a		84	times/year	
	year is the standby power generator used?		42	hours/year	
10	Efficiency improvement and remedial measures	and mainte	nance		
	management of sewerage facilities				
10.1	Is there a centralized control system?	Yes			
	Is there a data logger system?	Yes			
10.2	Has the operation and maintenance service		N		
	been subcontracted to a private company?	res	No		
11	Safety management				
11.1	Is there a safety and hygiene organization?	Yes	No		
11.2	Is there a safety operation manual?	Yes	No		
11.3	Are there safety protection tools?	Yes	No		
11.4	Are there warning signs for dangerous parts of the facilities?	Yes	No		
11.5	Have there been instances of accidents/disasters in the past?	Yes	No	No accidents	
11.6	Is education and training implemented for health and safety ?	Yes	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.			
1 Machinery system			
1.1 Type of screens			
1.1.1 Is there a coarse screen?	Yes	No at channel	
1.1.2 Is screen type mechanical?	Yes	No N/A	
1.1.3 Is there a fine screen?	(Yes)	No rack	
1.1.4 Is screen type mechanical?	(Yes)	No	
1.1.5 Grit chamber			
1.1.6 Is there a crushing device?	Yes		
1.1.7 Is there a conveyor?	Yes	No	
1.1.8 How is the grid chamber cleaned?			
Mechanically?	(Yes)	No	
Bucket elevator?	Yes		
Jet pump?	Yes		
Screw?	Yes		
Air lift?	Yes		
Manually?	Yes	No	
Aeration?	Yes		
1.2 Pumps			
1.2.1 What is the rated voltage of main pump?	4	115 V	
1.2.2 Is there any speed controlled pump?	Yes		
1.2.3 If Yes, what is the type of pump?	Yes		
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		
1.4 Disinfection equipment			
1.4.1 What type of disinfection method for efflu	uent is used?		
Chlorination?	Yes	No	
Ultra violet ray?	Yes		
Ozonizer?	Yes		
1.5 Sludge thickening equipment			
1.5.1 What type of sludge thickening equipmen	t is used ?		
Gravity thickening?	(Yes)	No	
Air flotation?	Yes	(N_0)	
Centrifugal thickening?	Yes		
Belt type?	Yes	(N_0)	

.6.1	Type of sludge dehydration method used:			
	Mechanical?			
	Filter press?	Yes	No	
	Centrifugal dehydration	Yes	No	
	Vacuum filtration?	Yes	NO	
	Others?	Sludge dryir	ng beds	
.6.2	Where does the dewatered sludge go to?	N/A		
.7.1	Sludge digestion facility (Anaerobic)?	Yes	NO	
.7.2	Is digester gas used?	Yes	No for	
2	Electrical system			
2.1	Substation facility			
1 1	What is the substation voltage?	1	11 kV	
23	Uninterrunted nower supply (UPS)			
2.5	Is there uninterrupted nerves supply (CIS)	Vec	No N/A	
2.2	Is there uninterrupted power supply?		DC N/A	
.3.2	What are the applications of this network supply?		DC IVA	
.3.3 25	what are the applications of this power supply?			
2.5	Measuring instruments			
.5.1	What type of flow meter is used and where?	N 7 /		
	Electro-magnetic?	Yes (
	Ultrasonic?	<u>Yes</u> () No Chamber after grid	
	Orifice plate?	Yes (
	Venturi?	Yes (
	Weir?	Yes (
	Partial flume?	Yes ($)$ N_0	
.5.2	What type of level gauge is adopted and where	?		
	Float-type?	Yes () <u>No</u>	
	Pressure-type?	Yes () <u>No</u>	
	Ultrasonic?	Yes () No	
	Radio wave ?	Yes () No	
.5.3	Is a water quality meter used?			
	PH?	Yes	No	
	DO?	Yes	N_0	
	MLSS?	Yes	<u>No</u>	
	ORP?	Yes	<u>No</u>	
	Turbidity?	Yes	No	
	Nitrogen?	Yes	<u>No</u>	
	Phosphorus?	Yes	No	
.5.4	Is sludge measurement performed?			
	Sludge concentration?	Yes	No	
.5.5	Meteorological instruments used for:			
	Temperature?	(Yes)	No	
	Atmospheric pressure?	Yes		
	Rain?	Yes	(No)	
	Wind velocity (Anemometer)?	Yes		
2.5	Monitoring control system			
51	Does a lookout nost exist at the following locati	ons?		
	Grit chamber	Yes	No	
	Dry well	Yes		
	Sewage treatment facility	Yes		
	Studge thickening equipment	Ves		
	Shudge dabydration againment	Ves		
	Anagrabic digestion tank	Yes		
	Pumping station	Ves		
5 2	Is SCADA (Supervisory Control And Date	105		
	is SCADA (Supervisory Control And Data	Vec		

Questionnaire for 8 target states and 2 Union Territories in India

Cover sheet

. 1	Please fill in the fields below. Attach additional she	ets if necessa	ıry.					
1	Name of state	Karnataka						
2	Name of respondent	Deligaturu						
4	STP Name							
5	Contact information							
6	Address							
7	Phone number							
8	E-mail address							
T	Summary of sewage treatment plant							
1	Basic data related to STP components							
1.1	Are there calculations for basic design and capacity	Vas		Na	Others			
	of treatment plant components?	res		INO,	Others			
1.2	Is there a layout plan showing earthwork,	Vas		No	Others			
	machinery, and electric equipment?			Ν0,	Others			
1.3	Are there detailed specifications of all facilities							
	and equipment fitted in the plant? Are there	Yes.		No	Others :			
	as-fitted drawings of all sewers? Are there	Yes,			Others :			
	structural drawings of tanks, digesters, reactors,	r es,			Others :			
14	Is there a flow chart for instrumentation?	Ves		No	Others :			
1.4	Are there single-line diagrams (electrical)?	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	g bed , Centrifuge			
1.8	Which is the effluent discharge point?	River Vı	ishavavati	Valley				
1.9	Layout of plant (please attach the drawing,	Vac	No					
	if you have one)	res	INO					
2	History							
2.1	Is the history of failure, repair, or reconstruction recorded?	Yes	No	Others :				
2.2	Are there any requests or complaints from surrounding residents?	Yes	No					
3	Design capacity and actual loading							
3.1	Design wastewater flow		75	MLD				
3.2	Average daily flow		30	MLD				
5.5 3.4	Maximum daily now		<u> </u>	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 (536-1356	mg/l
3.8	Average wastewater influent quality		BOD	167 mg/l	$\frac{\text{COD}}{\text{COD}} = \frac{352 \text{ mg/l}}{250 \text{ mg/l}}$	55	1043	mg/l
5.9 10	Average effluent quality		BOL	6.82 mg/l	COD 70 17 mg/l	SS	664	mg/l
.11	Solids capture rate		200	N/A %				
.12	What equipment is used for drawing out sludge							
	from primary/secondary sedimentation tank or	Seconda	ry clarifier					
1.0	digester (pump/gravity, etc.)?		11 1	6				
.13	Frequency of drawing out sludge		1hour-1	times/month		times/	month	
.14	Prequency of studge carried outside STP		1 Ded	umes/month		umes/y	/cal	
.13	and water content		3000	m ³ /day	ML/year		0.7	%
.16	Average sludge generation volume, and water content		5-10	m ³ /day	ML/year			%
.17	Percentage of volatile solids		mean	: %	max:	%	N/A	ł
	in generated sludge		min	: %	N/A			
.18	Methods of effective sludge utilization	Manure						
.19	What is the amount of sludge disposed and water		120	t/year				
	content in sludge?		N/A	%				
3.2	Are there operation records for pumps, equipment,	Daily rep	oort: 🔿	Yes > No	Monthly report:	Yes		No
	blowers, etc.?	Annual r	eport:	Yes No				
2.1	Is the water quality measured regularly?	Yes	No					
2.2	Are water quality measurement records maintained?	Daily rep Annual r	oort: C	Yes No Yes No				

3.2.3	Is record of concentration of toxic substances in sludge maintained?	Yes	No	once in a year		
3.2.4	Has the water quality of the final effluent exceeded your target effluent standards anytime?	Yes	No			
3.2.5	If Yes, what are the causes for exceeding the effluent standard?	Yes	No			
4	Corrosion of facilities and damage status					
4.1	Is there corrosion of buildings or structures?	Yes	No	name of part :		
4.2	Was there any damage to the building frame	Yes	No	name of part :		
4.3	Is there corrosion in equipment?	Yes	No	name of part : Blo	wer impeller	
4.4 4.5	Is there damage to equipment? Are there records of corrosion and damage to	Yes Ves		name of part :		
4.6	equipment? Is there foul smell most of the time?	Yes	No			
4.7	Is scum generated?	A large a	amount, <	Small amount,	No	
5	Management of facilities					
5.1	Is there a schedule for operating machinery and equipment	Yes	"manufac	turer compilation, C	Others" No	
5.2	Is there an operation manual for the complete facility?	Yes	No			
5.3	Is there a schedule for wastewater examination for influent, effluent and others?	Yes	No			
	Is there a wastewater examination method?	Yes:	Name o	f the method:		No
5.4	Are there the education and training manuals for the staff of the STP?	Yes	No			
6	Inspection of equipment in the STP					
6.1	Are there check records for equipment?	Daily rep Annual r	port: Y report: Y	<u>Yes No Mor</u> Yes No	nthly report:	Yes No
6.2	Is there an inspection manual?	Yes	No			
6.3	Is there an inspection schedule?	Yes	No			
6.4	Details of inspection procedure	VisuaD		audible/ /TV	camera,	others :
6.5	How has the result of the inspection been used?	Action ta	aken if any	fault.		
6.6	How are inspection results maintained?	Electron	ic data, 🔇	Hard copy	Others :	
7 7.1	Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP?	Yes	No			
7.2	If Yes, is it being used?	Yes	(No)			
7.3	Are there repair, rehabilitation and reconstruction	37	\sim			
74	plans for the STP?	res	NO			
	been implemented?	Yes	No			
1.5	Are there repair, rehabilitation and reconstruction records?	Electron	ic data,	Hard copy,	Others : N/A	ion
۲ و 1	work implementation Staffing or Mannower at Plant	Diganiza Plant Dev	Con IOI entil	c plants + pumping s ger: 1 person	Gord	eners: 6 persons
0.1	Starring of Manpower at Frant	Instrume Instrume I	entation England Lab Analyst: Lab Assistat:	gineer: 1person 1 person 1 person	Sludge Han Office Atter Security	dling: 2 persons adant: 1 person Staff: 7 persons
8.2	Engineers	E	lectricians: Fitters: Operators:	3 persons, 2 persons, 12 persons,	3-shift 2-shift G-shift(4perso	n) + 3-shift(8person)
83	Working time	Regular	melpers:	From 8:30 to	17.30 Shifter	to
8.4	Work mode	Permane	ent worker	office Subcontrac	to(O&M)	
8.5	Contents of work	Operatio	$\bar{\mathbb{D}}, \subset$	Maintenance <	Repair	
8.6	Others (Are there the special measures taken at the time of accidents or disasters?)	Yes	No			
9	Procurement of utilities and materials					
9.1	Is the procurement of the chemicals easy?	Yes	No			
9.2 9.3	Is there a procurement plan for chemicals? Amount of electric power used	<u>r es</u>	<u>No</u> 332000	kWh/month.		kWh in a vear
9.4	Quantity of industrial chemicals used such as		not used	<u>kg</u> /c	1,	kg/year
	chlorine, coagulant, etc.		not used	kg/c	1,	kg/year

9.5	Is there a list of vendors for chemicals, consumable		\sim		
	materials, and machine parts?	Yes			
9.6	Frequency of power failure during year, total			times/year	
	number of hours of power failure		10	hours/month	average
9.7	Are there standby power generators?	Yes	No		
9.8	How many times a year and how many hours a			times/year	used when interruption is more than 10
	year is the standby power generator used?			hours/year	minutes
10	Efficiency improvement and remedial measures	and mainte	nance		
	management of sewerage facilities				
10.1	Is there a centralized control system?	Yes	No		
	Is there a data logger system?	Yes	NO		
10.2	Has the operation and maintenance service	Yes	No		
	been subcontracted to a private company?		110		
11	Safety management				
11.1	Is there a safety and hygiene organization?	Yes	No		
11.2	Is there a safety operation manual?	<u>Yes</u>	No		
11.3	Are there safety protection tools?	<u>Yes</u>	No		
11.4	Are there warning signs for dangerous parts of	Ves	No		
	the facilities?		110		
11.5	Have there been instances of accidents/disasters	Vec	No	No accidents	
	in the past?	103		No accidents	
11.6	Is education and training implemented for health	Ves	No		
	and safety ?		140		
11.7	Is there a risk management manual				
	(for floods, cyclones, earthquakes,	Yes	No		
	and other natural disasters)?				

${}^{\rm I\!I}$ Check list of sewerage systems, machinery and electrical systems

	Please reply as indicated on the right side.					
1	Machinery system					
1.1	Type of screens					
1.1.1	Is there a coarse screen?	\leq	Yes		No	
1.1.2	Is screen type mechanical?	\leq	Yes		No	
1.1.3	Is there a fine screen?	\leq	Yes)		No	
1.1.4	Is screen type mechanical?	\leq	Yes		No	
1.1.5	Grit chamber					
1.1.6	Is there a crushing device?		Yes	\subset	No	
1.1.7	Is there a conveyor?	\langle	Yes		No	
1.1.8	How is the grid chamber cleaned?		_			
	Mechanically?	\sim	Yes		No	
	Bucket elevator?		Yes	\sim	No	
	Jet pump?		Yes	\sim	No	
	Screw?		Yes	\langle	No	
	Air lift?		Yes	\leq	No	
	Manually?		Yes	\leq	No	
	Aeration?		Yes	\leq	No	
1.2	Pumps					
1.2.1	What is the rated voltage of main pump?			415 V		
1.2.2	Is there any speed controlled pump?		Yes	\leq	No	
1.2.3	If Yes, what is the type of pump?		Yes	\leq	No	
1.2.4	If Yes, what is the method of speed control?		No			
1.3	What type of aeration facilities used?		Surface ae	rator		
1.3.1	What type of air diffuser is used?		N/A			
1.4	Disinfection equipment					
1.4.1	What type of disinfection method for effluent is	use	d?			
	Chlorination?		Yes	\leq	No	
	Ultra violet ray?	. j	Yes	\leq	No	
	Ozonizer?		Yes	\leq	No	
1.5	Sludge thickening equipment					
1.5.1	What type of sludge thickening equipment is us	ed?				
	Gravity thickening?	\leq	Yes		No	
	Air flotation?		Yes	\leq	No	
	Centrifugal thickening?		Yes	\leq	No	
	Belt type?		Yes	\subseteq	<u>No</u>	
1.6	Sludge dehydration equipment					
1.6.1	Type of sludge dehydration method used:					
	Mechanical?					
	Filter press?		Yes	\leq	No	
	Centrifugal dehydration	\leq	Yes)		No	but not used
	Vacuum filtration?		Yes	\leq	No)	
	Others?		Sludge dry	ring beds		
1.6.2	Where does the dewatered sludge go to?					
1.7.1	Sludge digestion facility (Anaerobic)?		Yes	\leq	No	
1.7.2	Is digester gas used?	1	Yes	<	No)	for

2	Electrical system			
2.1	Substation facility			
2.1.1	What is the substation voltage?	11	kVA	
2.3	Uninterrupted power supply (UPS)	.		
2.3.1	Is there uninterrupted power supply?	(Yes)	No	
2.3.2	If Yes, is it DC supply or AC supply?	AC	C DC D	
2.3.3	What are the applications of this power supply?	Only for offices		
2.5	Measuring instruments	····		
2.5.1	What type of flow meter is used and where?			
	Electro-magnetic?	Yes (1) <u>No</u>	
	Ultrasonic?	Yes () <u>No</u>	
	Orifice plate?	Yes () No	
	Venturi?	Yes () <u>No</u>	
	Weir?	Yes () No	
	Partial flume?	Yes () <u>No</u>	
2.5.2	What type of level gauge is adopted and where?)		
	Float-type?	Yes () No	
	Pressure-type?	Yes () No	
	Ultrasonic?	Yes () No	
	Radio wave ?	Yes () No	
2.5.3	Is a water quality meter used?			
	PH?	Yes		
	DO?	(Yes)	No Not we	orking
	MLSS?	Yes	$\underline{N_0}$	
	ORP?	Yes		
	Turbidity?	Yes		
	Nitrogen?	Yes		
	Phosphorus?	Yes		
2.5.4	Is sludge measurement performed?	**	\sim	
	Sludge concentration?	Yes	NO	
2.5.5	Meteorological instruments used for:	· ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
	Temperature?	<u>Yes</u>	No	
	Atmospheric pressure?	Yes	No	
	Rain?	Ves	No	
25	Wind velocity (Anemometer)?	res		
2.5	Monitoring control system	0		
2.5.1	Does a lookout post exist at the following location	ons?	~~~	
	Grit chamber	Yes	No	
	Dry well	r es Vec		
	Sewage treatment facility	I US Vac		
	Sludge unckening equipment	Ves	No	
	Anaerobic direction tark	Yes	No	
	Anaerooic digestion	Yes	No	
253	I unpling station	100		
2.3.3	Acquisition) system used?	Yes	No	

Questionnaire for 8 target states and 2 Union Territories in India

Cover sheet

	Please fill in the fields below. Attach additional she	ets 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 Basic data related to STP components Are there calculations for basic design and capacity 1.1 Yes. No, Others of treatment plant components? 1.2 Is there a layout plan showing earthwork, Yes No, Others machinery, Are there detailed specifications of all facilities 1.3 and equipment fitted in the plant? Are there Yes, No Others as-fitted drawings of all sewers? Are there Yes No Others Yes, structural drawings of tanks, digesters, reactors, No Others buildings, and so on? 1.4 Is there a flow chart for instrumentation? Yes, No Others No 15 Are there single-line diagrams (electrical)? Yes Others 1.6 Sewage treatment process used (Example: MBR Conventional activated sludge process) 1.7 Sludge treatment process used (Example: Sludge Sludge drying bed , Centrifuge drying after thickening) 18 Which is the effluent discharge point? Tank in cubbon park for water sprikling 1.9 Layout of plant (please attach the drawing, (Yes) No if you have one) History 2.1 Is the history of failure, repair, or reconstruction (Yes) No Others : recorded? 2.2 Are there any requests or complaints from Yes (No) surrounding residents? Design capacity and actual loading 3 3.1 Design wastewater flow MLD Average daily flow MLD 3.2 15 3.3 1.5 MLD Maximum daily flow 1.5 MLD 34 Dry weather flow 3.5 Design wet weather flow 1-1.5 MLD 3.6 -1.5 MLD Wet weather flow 330 mg/l 660 mg/l 450 mg/l BOD COD SS 3.7 Design wastewater influent quality COD COD 402 mg/l BOD 3.8 Average wastewater influent quality 188 mg/l SS173 mg/l 3.9 Design effluent quality BOD <4 mg/l 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 N/A Solids capture rate % 3.12 What equipment is used for drawing out sludge from primary/secondary sedimentation tank or Aeration tank to centrifuge. digester (pump/gravity, etc.)? Frequency of drawing out sludge According to MLSS time/day 3.13 times/month 3.14 Frequency of sludge carried outside STP 2-3times/month times/year 3.15 Design sludge generation volume 1-2 ML/year % t/month and water content 3.16 Average sludge generation volume, 1 - 2t/month ML/year % and water content Percentage of volatile solids mean: max: % N/A 3.17 % in generated sludge min: % N/A 3.18 Methods of effective sludge utilization Manure, landscaping 3.19 What is the amount of sludge disposed and water 1-2 t/month content in sludge? N/A % Monthly report: Are there operation records for pumps, equipment, Daily report: < Yes 3.2 No Yes plowers, etc.? Annual report: Yes No 3.2.1Is the water quality measured regularly? Yes No

Daily report: <

Annual reports

Yes

Yes

No

No

3.2.2 Are water quality measurement records

maintained?

7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9.1 9.2 9.3	Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials Is the procurement of the chemicals easy? Is there a procurement plan for chemicals? Amount of electric power used	Chemist/supervision Plant M (Safty Plant M (Process in (Mechanical E Security Chemist/supervision Operation Yes Yes Yes	data, data, n for enti Manager: Officer) Manager: ncharge) Engineer) y Guard: pervisor: ardener: orking tin worker No No No No 1000	re plants 1 1 3 1 1 2 From Mainte	py + pump person person person person 9:00 Subco nance in a day	Ot ing stati- s, s, to ntracto a	hers : ons in jur I I I I I I I I I I I I I	risdiction. Electricia Fitte Helpe Total stal	n: er: er: ff: to	3 persons 2 persons 6 persons persons
7.4 7.5 8.1 8.2 8.3 8.4 8.5 8.6 9 9.1 9.2	Work implementation Engineers Working time Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials Is the procurement of the chemicals easy? Is there a procurement plan for chemicals?	Electronic of Organizatio Regional M (Safty Plant M (Process in (Mechanical E Securit Chemist/su G Regular wo Permanent Operation Yes Yes	data, data, find for entiin danager: Officer) Officer) danager: ncharge) Engineer) y Guard: pervisor: dardener: orking tiin worker No No No No No No	re plants 1 1 3 1 From Mainte	+ pump person person person person 9:00 Subcon nance	Ot ing stations s, s, to tracto a	hers : ons in jun I I I I Repair	risdiction. Electricia Fitte Helpe Total stat	n: r: r: ff: to	3 persons 2 persons 6 persons persons
7.5 8 8.1 8.2 8.3 8.4 8.5 8.6	Work implementation Engineers Working time Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials	Electronic of Organizatio Regional M (Safty Plant M (Process ii (Mechanical E Securit Chemist/sup G Regular wo Permanent Operation	data,	re plants 1 1 3 1 2 1 From Mainte	py + pump person person person person person 9:00 Subcon nance	Ot ing stati , s, s, to thracto a	hers : ons in jur I I I I I I I I I I I I I	risdiction. Electricia Fitte Helpe Total stal	n: er: er: ff: to	3 persons 2 persons 6 persons persons
7.5 8 8.1 8.2 8.3 8.4 8.5 8.6	Work implementation Engineers Working time Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?)	Chemist/su Organization Regional M (Safty Plant M (Process in (Mechanical E Security Chemist/su Chemist/su Og Regular wo Permanent Operation	data,	re plants 1 1 3 1 2 From Mainte	+ pump person person person person person 9:00 Subcon nance	Ot ing stations s, s, to tracto a	hers : ons in jur I I I I I I I I I I I I I	risdiction. Electricia Fitte Helpe Total stat	n: er: er: ff: to	3 persons 2 persons 6 persons persons
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7.5 8.1 8.2 8.3 8.4 8.5	Working time Work mode Contents of work	Electronic of Organizatio Regional M (Safty Plant M (Process in (Mechanical E Securit Chemist/suj G Regular wo Permanent Operation	data,	re plants 1 1 3 1 2 From Mainte	+ pump person person person person 9:00 Subcon nance	Ot ing stations s, s, to tracto a	hers : ons in jun I I I Repair	risdiction. Electricia Fitte Helpe Total stal	n: er: er: ff: to	3 persons 2 persons 6 persons persons
7.5 8 3.1 3.2 3.3	Working time Work mode	Electronic of Organizatio Regional M (Safty Plant M (Process in (Mechanical E Securit Chemist/suj G Regular wo Permanent	data, n for enti Manager: Officer) Manager: ncharge) Engineer) y Guard: pervisor: Gardener: bardener: brking tin worker	re plants 1 1 3 1 2 1 From	opy + pump person person person person 9:00 Subcoi	Ot ing stations s, s, to ntracto a	hers : ons in jui 1 1 18:00 S 11	risdiction. Electricia Fitte Helpe Total stal	n: er: er: ff: to	3 persons 2 persons 6 persons persons
7.5 8 3.1 3.2 3.3	Working time	Electronic of Organizatio Regional M (Safty Plant M (Process ii (Mechanical E Securit Chemist/suj G Regular wc	data, n for enti Manager: Officer) Manager: ncharge) Engineer) y Guard: pervisor: Gardener: bardener:	re plants 1 1 3 1 2 1 From	opy + pump person person person person person 9:00	Ot ing stations s, s, to	ihers : ons in juu I I 18:00 iSl	risdiction. Electricia Fitte Helpe Total stat	n: er: er: ff: to	3 persons 2 persons 6 persons persons
7.5 8 3.1 3.2	Work implementation Staffing or Manpower at Plant Engineers	Chemist/su	data, n for enti Manager: Officer) Manager: ncharge) Engineer) y Guard: pervisor: Bardener	Hard c re plants 1 1 3 1 2	opy + pump person person person person person	Ot ing station , s,	hers : ons in jun I	risdiction. Electricia Fitte Helpe Total stat	n: er: er: ff:	3 persons 2 persons 6 persons persons
8.2 8.2	Work implementation Staffing or Manpower at Plant Engineers	Organizatio Organizatio Regional M (Safty Plant M (Process in (Mechanical E Securit	data, n for enti Manager: Officer) Manager: ncharge) Engineer) y Guard:	Hard c re plants 1 1 3	+ pump person person	Ot ing station	hers : ons in jui I	risdiction. Electricia Fitte Helpe Total stat	n: er: er: ff:	3 persons 2 persons 6 persons persons
8 8 8.1	Work implementation Staffing or Manpower at Plant Engineers	Organization Regional M (Safty Plant M (Process in (Mechanical E	data, n for entiManager:Officer)Manager:ncharge)Ingineer	Hard c re plants 1	+ pump person person	Ot ing statio	hers : ons in jui I	risdiction. Electricia Fitte Helpe Total stat	n: er: er: ff:	3 persons 2 persons 6 persons persons
.4 8.1	Work implementation Staffing or Manpower at Plant	Organizatio Regional M (Safty Plant M	data, n for entiManager:Officer)Manager:nabores	Hard c re plants 1	+ pump person person	Ot ing statio	hers : ons in jui	risdiction. Electricia Fitte Helpe	n: er: er:	3 persons 2 persons 6 persons
.4 .5 .1	Work implementation Staffing or Manpower at Plant	Organization Regional M (Safty	data, n for entiManager:Officer)	Hard c re plants	+ pump person	Ot ing statio	hers : ons in jui I	risdiction. Electricia Fitte	n: er:	3 persons 2 persons
.4 .5 8	Work implementation Staffing or Manpower at Plant	Organization Regional N	data, < n for enti Manager:	Hard c re plants	+ pump person	Ot ing statio	hers : ons in jui I	risdiction. Electricia	n:	3 persons
.4 .5 8	records? Work implementation	Organizatio	data, <	Hard c	opy, + pump	Ot ing stati	hers : ons in jui	risdiction.		
.4	records?	Electronic	data, <	Hard c	opy,>	Ot	hers :			
.4							-			
.4	Are there repair, rehabilitation, and reconstruction									
4	Have repairs, rehabilitation and reconstruction	Yes	No							
.3	Are there repair, rehabilitation and reconstruction plans for the STP?	Yes 🤇	No							
.2	If Yes, is it being used?	Yes 🤇	No							
	reconstruction of the STP?	Yes 🤇	No							
.1	Is there a manual for repair, rehabilitation and									
7	Repair. Rehabilitation. Reconstruction									
.6	How are inspection results maintained?	Electronic	data, <	Hard c	opy,	Ot	hers :			
	used?	Take imme	ediate act	tion.						
.+ .5	How has the result of the inspection been			aaaion				oui		
: A	Details of inspection presedure	Vienel		audible	a/	/TV co	mera	oth	ers ·	
.3	Is there an inspection schedule?	Yes	No							
.2	Is there an inspection manual?	Yes	No							
		Annual rep	ort: Y	les	No			1		- 10
.1	Are there check records for equipment?	Daily repor	rt: 🔨	(es)	No	Month	ly report	: Y	es	No
6	Inspection of equipment in the STP									
.4	the staff of the STP?	Yes	No							
⊿	Is there a wastewater examination method?		iname o	n the m	emod:	APHA				NO
	for influent, effluent and others?	Van	Nome	of the	othod	A DLI A				Na
.3	Is there a schedule for wastewater examination	Yes	No							
.2	Is there an operation manual for the complete facility?	Yes	No							
.1	equipment		111111111111111111111111111111111111111	aurer co	mpnaul	m, Othe	.15 T	10		
5	Management of facilities	Vac "	monufo	turor	mpilet	on 041	are" N	Jo		
.7	Is scum generated?	A large am	ount,	Small	amount,		$\subseteq \mathbb{N}$	\sim		
.6	Is there foul smell most of the time?	Yes 🤇	NO							
	equipment?	(Yes)	No							
.4 .5	Are there records of corrosion and damage to		110,	name (n part :	Diowel	mpene	4		
.3 4	Is there corrosion in equipment?	Yes (<u>No</u>	name (of part :	Blower	impelle	r		
	part of facilities?	Yes 🤇	No	name o	of part :					
.2	Was there any damage to the building frame	105		name	n part :					
4 .1	Is there corrosion of buildings or structures?	Yes (No	name c	of part .					
	effluent standard?	105 (
2.5	If Yes, what are the causes for exceeding the	Vac	No							
	your target effluent standards anytime?	Yes 🤇	No							
4	Has the water quality of the final offluent averaged				-					
2.4		100	NO	2 times	s a vear					

9.5	Is there a list of vendors for chemicals, consumable	Yes	No			
	materials, and machine parts?	103	110			
9.6	Frequency of power failure during year, total			times/year		
	number of hours of power failure		15-20	hours/month	average	
9.7	Are there standby power generators?	Yes	No			
9.8	How many times a year and how many hours a			times/year	used when interruption is more than	
	year is the standby power generator used?			hours/year	10minutes	
10	Efficiency improvement and remedial measures	and mainte	nance			
	management of sewerage facilities					
10.1	Is there a centralized control system?	Yes	No			
	Is there a data logger system?	Yes	No			
10.2	Has the operation and maintenance service	Yes	No			
	been subcontracted to a private company?		110			
11	Safety management					
11.1	Is there a safety and hygiene organization?	<u>Yes</u>	No			
11.2	Is there a safety operation manual?	<u>Yes</u>	No			
11.3	Are there safety protection tools?	(Yes)	No			
11.4	Are there warning signs for dangerous parts of the	Ves	No			
	facilities?		110			
11.5	Have there been instances of accidents/disasters	Vac	No	Fire drille No	tional Safaty week	
	in the past?	105		The units, Iva	Holiai Salety week	
11.6	Is education and training implemented for health	Vac	No			
	and safety ?		NU			
11.7	Is there a risk management manual (for floods,					
	cyclones, earthquakes, and other natural	Yes	No			
	disasters)?					

II Check list of sewerage systems, machinery and electrical systems

	Please reply as indicated on the right side.			
1	Machinery system			
1.1	Type of screens			
1.1.1	Is there a coarse screen?	<u>Yes</u>	No	
1.1.2	Is screen type mechanical?	<u>Yes</u>	No	
1.1.3	Is there a fine screen?	(Yes)	No	
1.1.4	Is screen type mechanical?	(Yes)	No	
1.1.5	Grit chamber			
1.1.6	Is there a crushing device?	Yes		
1.1.7	Is there a conveyor?	Yes	No	
1.1.8	How is the grid chamber cleaned?			
	Mechanically?	Yes		
	Bucket elevator?	Yes		
	Jet pump?	Yes	No	
	Screw?	Yes	No	
	Air lift?	Yes	No	
	Manually?	Yes	No	
	Aeration?	Yes	<u>No</u>	
1.2	Pumps			
1.2.1	What is the rated voltage of main pump?	4	415 V	
1.2.2	Is there any speed controlled pump?	Yes		
1.2.3	If Yes, what is the type of pump?	Yes		
1.2.4	If Yes, what is the method of speed control?	No		
1.3	What type of aeration facilities used?	Roots blowe	r	
1.3.1	What type of air diffuser is used?	N/A		
1.4	Disinfection equipment			
1.4.1	What type of disinfection method for effluent is	s used?		
	Chlorination?	Yes	No	
	Ultra violet ray?	Yes	No	
	Ozonizer?	Yes	No	
1.5	Sludge thickening equipment			
1.5.1	What type of sludge thickening equipment is us	sed ?		
	Gravity thickening?	Yes	(No)	
	Air flotation?	Yes	No	
	Centrifugal thickening?	Yes	No	
	Belt type?	Yes	(No)	
1.6	Sludge dehydration equipment			
1.6.1	Type of sludge dehydration method used:			
	Mechanical?			
	Filter press?	Yes	(No)	
	Centrifugal dehydration	Yes	No	
	Vacuum filtration?	Yes	(No)	
	Others?	Sludge dryin	g beds	
1.6.2	Where does the dewatered sludge go to?	N/A		
1.7.1	Sludge digestion facility (Anaerobic)?	Yes	No	
1.7.2	Is digester gas used?	Yes	No for	

2	Electrical system			
21	Substation facility			
211	What is the substation voltage?	11	kV	
2.1.1	Uninterrunted nower supply (UPS)			
231	Is there uninterrupted power supply (013)	(Yes)	No	
2.3.1	If Ves, is it DC supply or AC supply?	AC)
2.3.2	What are the applications of this power supply?	PLC only		
2.5.5	Magaining instruments	120 011		
251	What type of flow meter is used and where?			
2.0.1	Flectro-magnetic?	$\overline{\mathrm{Yes}}$ (1) No	Inlet before screen
	Litrasonic?	Yes ()
	Orifice plate?	Yes () No)
	Venturi?	Yes () No)
	Weir?	Yes () No)
	Partial flume?	Yes ($) \leq N_0$)
2.5.2	What type of level gauge is adopted and where?			
	Float-type?	Yes () No))
	Pressure-type?	Yes (4) No	Aeration tanks, etc
	Ultrasonic?	Yes () No)
	Radio wave ?	Yes () No)
2.5.3	Is a water quality meter used?	.,,		
	PH?	Yes	(No))
	DO?	(Yes)	No	
	MLSS?	Yes	< No)
	ORP?	Yes	< No)
	Turbidity?	Yes	No	
	Nitrogen?	Yes	< No)
	Phosphorus?	Yes	< No)
2.5.4	Is sludge measurement performed?			
	Sludge concentration?	Yes	No	Twice a day - MLSS
2.5.5	Meteorological instruments used for:			
	Temperature?	Yes	No	
	Atmospheric pressure?	Yes	No)
	Rain?	Yes	< No)
	Wind velocity (Anemometer)?	Yes	(No))
2.5	Monitoring control system			
	Does a lookout post exist at the following locatio	ns?	\sim	
	Grit chamber	Yes	(No)
	Dry well	Yes	< No)
	Sewage treatment facility	Yes	(No))
	Sludge thickening equipment	Yes	$\langle No \rangle$)
	Sludge dehydration equipment	Yes	(N_0))
	Anaerobic digestion tank	Yes	(N_0))
	Pumping station	Yes	<u> </u>)
2.5.3	Is SCADA (Supervisory Control And Data	Yes	No	
	Acquisition) system used?	100	110	

Questionnaire for 8 target states and 2 Union Territories in India

	Cover sneet							
	Please fill in the fields below. Attach additional she	ets if necessar	ry.					
1	Name of state	Tamilnadu						
2	Name of city/town	Chennaı						
3	Name of respondent							
4	STP Name							
5	Contact information							
6	Address							
7	Phone number							
8	E-mail address	<u> </u>						
I	Summary of sewage treatment plant							
1	Basic data related to STP components							
1.1	Are there calculations for basic design and capacity	V Tran		N.T.		•		
I	of treatment plant components?	(Yes)		No,	U	thers		
1.2	Is there a layout plan showing earthwork,	Vac		No	0			
ł	machinery, and electric equipment?	Its		10,	0	iners		
1.3	Are there detailed specifications of all facilities							
I	and equipment fitted in the plant? Are there	CYes.		No	0	thers :		
ľ	as-fitted drawings of all sewers? Are there	(Yes)		No	0	thers :	····	
ľ	structural drawings of tanks, digesters, reactors,	(Yes.)		No	0	thers :		
ľ	buildings, and so on?					·····		
1.4	Is there a flow chart for instrumentation?	Yes,		No	0	thers :	······	
1.5	Are there single-line diagrams (electrical)?	Yes,		No	0	thers :		
1.6	Sewage treatment process used (Example:	ASP						
	Conventional activated sludge process)	1 800 1						
1.7	Sludge treatment process used (Example: Sludge	Centrifu	and sludge (dehvdration aft	er thicker	ning		
1	drying after thickening)		,ai onaco	Icityuru	21 tilie.	IIIIg		
1.8	Which is the effluent discharge point?	Sea area t	through Bu	ackingham cana	al			
1.9	Layout of plant (please attach the drawing,	Ves	No					
ľ	if you have one)	100	110					
2	History	·····						
2.1	Is the history of failure, repair, or reconstruction	Vac	No	Others .				
I	recorded?	res	INO	Others .				
2.2	Are there any requests or complaints from	4		Yes, the reside	ents filed	cases in the	e High (Court of Madr
ľ	surrounding residents?		- •	for shifting of	the STP	(which is ir	n exister	nce well befor
ľ		Yes	No	their settlemer	nt) along	with the ad	lioining	Solid waste
I				dumping yard	of Corpe	oration of C	hennai.	00111
3	Design capacity and actual loading	.j						
3.1	Design wastewater flow	1	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
3.91	Design effluent quality		BOD	$\leq 20 \text{ mg/l}$	COD	≤100 mg/1	SS	$\leq 30 \text{ mg/l}$
< 10 [*]	Average effluent quality		BOD	$\sim <17 \text{ mg/I}$	COD	0 mg/1</td <td>SS</td> <td><24 mg/I</td>	SS	<24 mg/I

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 time/day 720 times/month
3.14	Frequency of sludge carried outside STP	180 times/month 2160 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	mean: 57 % max: 60 %
	in generated sludge	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	t/month All the sludge is disposed for filling up
	content in sludge?	% low lying areas.
3.2	Are there operation records for pumps, equipment,	Daily report: Yes No Monthly report: Yes No
	blowers, etc.?	Annual report: Yes No

3.2.1	Is the water quality measured regularly?	Yes No
3.2.2	Are water quality measurement records	Daily report: Yes No
3 7 3	Is record of concentration of toxic substances in	Annual report: Yes No
5.2.5	sludge maintained?	Yes No
3.2.4	Has the water quality of the final effluent exceeded your target effluent standards anytime?	¹ Yes No
3.2.5	If Yes, what are the causes for exceeding the effluent standard?	Yes No NA
4	Corrosion of facilities and damage status	
4.1	Is there corrosion of buildings or structures?	Yes No name of part :
4.2	Was there any damage to the building frame	Yes No name of part :
4.2	part of facilities?	
4.3	is there corrosion in equipment?	All MS components of the pumps are Yes No, name of part : affected by corrosion and prevented by Epoxy painting frequently.
4.4	Is there damage to equipment?	Yes No name of part :
4.5	Are there records of corrosion and damage to	Vas No
	equipment?	
4.6	Is there foul smell most of the time?	Yes No
4.7	Is scum generated?	A large amount, Small amount, No
5	Management of facilities	
5.1	Is there a schedule for operating machinery and equipment	Yes "manufacturer compilation, Others" No
5.2	Is there an operation manual for the complete facility?	Yes No
5.3	Is there a schedule for wastewater examination	Yes No
	for influent, effluent and others?	
	Is there a wastewater examination method?	Yes: Name of the method: APHA standard 21st Edition. No
5.4	Are there the education and training manuals for	Yes No
	the staff of the STP?	
6	Inspection of equipment in the STP	
6.1	Are there check records for equipment?	Daily report: Yes No Monthly report: Yes No
6.0		Annual report: Yes No
6.2	Is there an inspection manual?	Yes No
0.5	Details of inspection schedule?	Visual audible/ /TV camara others :
6.4 6.5	How has the result of the inspection	Visual audible/ / I v callela, ollels.
0.5	been used?	For updating Preventive maintenance schedule the results are used.
6.6	How are inspection results maintained?	Electronic data, Hard copy, Others :
7	Repair, Rehabilitation, Reconstruction	
7.1	Is there a manual for repair, rehabilitation and	Ves No
	reconstruction of the STP?	
7.2	If Yes, is it being used?	<u>Yes</u> No
7.3	Are there repair, rehabilitation and reconstruction	Yes No
74	Plans for the STP?	
/.4	been implemented?	Yes No
75	Are there repair rehabilitation and reconstruction	
	records?	Electronic data, Hard copy. Others :
8	Work implementation	
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,
02	Working time	Process Eligineer: 1 person, Pogular working tin From 0:00 to 18:00 (Shifts) to
0.5 8.4	Work mode	Permanent worker Subcontracto
8.5	Contents of work	Operation Maintenance (Repair)
8.6	Others (Are there the special measures taken	Var No
	at the time of accidents or disasters?)	100
9	Procurement of utilities and materials	
9.1	Is the procurement of the chemicals easy?	Ves No
9.2	Is there a procurement plan for chemicals?	Yes 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	Coagulant : Poly electrolyte 10 kg/d, 3650 kg/year
	chlorine, coagulant, etc.	Scrubber NaOH Caustic soda: 20 kg/d, 7200 kg/year
9.5	Is there a list of vendors for chemicals, consumable	e Yes No
	materials, and machine parts?	
9.6	Frequency of power failure during year, total	150 times/year
	number of hours of power failure	403.10 hours/month

9.7	Are there standby power generators?	Yes	No	
9.8	How many times a year and how many hours a		150 times/year	
	year is the standby power generator used?	ļ	403.10 hours/year	
10	Efficiency improvement and remedial measures	and mainte	enance	
	management of sewerage facilities			
10.1	Is there a centralized control system?	Yes		
	Is there a data logger system?	Yes		
10.2	Has the operation and maintenance service	Yes	No	
	been subcontracted to a private company?	<u> </u>	110	
11	Safety management			
11.1	Is there a safety and hygiene organization?	Yes	No	
11.2	Is there a safety operation manual?	Yes	No	
11.3	Are there safety protection tools?	(Yes)	No	
11.4	Are there warning signs for dangerous parts of	Yes	No	
	the facilities?	\sim		
11.5	Have there been instances of accidents/disasters	Yes	No	
	in the past?			
11.6	Is education and training implemented for health	Yes	No	
	and safety ?	<u> </u>	110	
11.7	Is there a risk management manual (for floods,			
	cyclones, earthquakes, and other natural	Yes	No	
	disasters)?			

II Check list of sewerage systems, machinery and electrical systems

	Please reply as indicated on the right side.				
1	Machinery system				
1.1	Type of screens				
1.1.1	Is there a coarse screen?	Yes	No		
1.1.2	Is screen type mechanical?	Yes	No		
1.1.3	Is there a fine screen?	Yes	No		
1.1.4	Is screen type mechanical?	Yes	No		
1.1.5	Grit chamber		~~~~		
116	Is there a crushing device?	Yes	No >		
117	Is there a conveyor?	Yes	No		
118	How is the grid chamber cleaned?				
	Mechanically?	(Yes)	No		
	Bucket elevator?	Yes			
	Let nump?	Yes			
	Scraw?	Yes			
	Air lift?	Yes			
	Manually?	Yes			
	Agreetion?	Yes			
1.2	Pumps	105			
1.2	What is the metadown loss of main mount?	414	z v		
1.2.1	what is the rated voltage of main pump?	41. Vac	v v		
1.2.2	Is there any speed controlled pump?	<u> </u>	INO	for Discourse the second blocks	
1.2.3	If Yes, what is the type of pump?	Positive displac	ement blower	for Biogas scrubber air blower	
		and Biogas feed	l blower.		
1.2.4	If Yes, what is the method of speed control?	VFD-Variable 1	requency Drive	е.	
1.3	What type of aeration facilities used?	Surface aerator			
1.3.1	What type of air diffuser is used?	N/A			
1.4	Disinfection equipment				
141	What turns of disinfection mothod for offluent is	10 17		1 1 4 2 1 1 1 1	
*****	what type of disinfection method for enfuent is	used? Matura	tion pond of 2	days detention period is provided.	
	Chlorination?	Yes Matura	tion pond of 2 No	days detention period is provided.	
	Chlorination? Ultra violet ray?	Yes Yes	tion pond of 2 No No	days detention period is provided.	
	Chlorination? Ultra violet ray? Ozonizer?	Yes Yes Yes Yes	tion pond of 2 No No No	days detention period is provided.	
1.5	Vina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment	<u>used? Matura</u> Yes Yes Yes	tion pond of 2 No No No	days detention period is provided.	
1.5 1.5.1	Vina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use	Yes Yes Yes Yes	tion pond of 2 No No No	davs detention period is provided.	
1.5 1.5.1	Vina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening?	Used ? Matura Yes Yes Yes	tion pond of 2 No No No	davs detention period is provided.	
1.5 1.5.1	Vina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation?	used? Matura Yes Yes Yes d? Yes Yes	tion pond of 2. No No No No	davs detention period is provided.	
1.5 1.5.1	Vinat type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening?	used? Matura Yes Yes Yes d? Yes Yes Yes		davs detention period is provided.	
1.5 1.5.1	Vinat type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type?	$\begin{array}{c} used? \qquad Matura \\ Yes \\ Yes \\ Yes \\ \hline Yes \\ \hline Yes \\ Yes \\ Yes \\ Yes \\ Yes \\ Yes \end{array}$	tion pond of 2 No No No No No No No	davs detention period is provided.	
1.5 1.5.1	Vinat type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehvdration equipment	used? Matura Yes Yes Yes ed? Yes Yes Yes Yes	tion pond of 2 No No No No No No	davs detention period is provided.	
1.5 1.5.1 1.6	Vinat type of distinction method for entitlent is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used:	used? Matura Yes Yes Yes ed? Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No	davs detention period is provided.	
1.5 1.5.1 1.6 1.6.1	Vina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Machanical?	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No	davs detention period is provided.	
1.5 1.5.1 1.6 1.6.1	Vina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press?	used? Matura Yes Yes Yes d? Yes Yes Yes Yes		davs detention period is provided.	
1.5 1.5.1 1.6 1.6.1	wina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No No No No	davs detention period is provided.	
1.5 1.5.1 1.6 1.6.1	wina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration?	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No No No No	davs detention period is provided.	
1.5 1.5.1 1.6 1.6.1	wina type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others?	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No No No No	davs detention period is provided.	
1.5 1.5.1 1.6 1.6.1	What type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others?	yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	tion pond of 2 No No No No No No No No No No	days detention period is provided.	
1.5 1.5.1 1.6 1.6.1	What type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge direction facility (Amerobic)?	yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	tion pond of 2 No No No No No No No No No No No No No	days detention period is provided.	
1.5 1.5.1 1.6 1.6.1 1.6.2 1.7.1	What type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is used Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility (Anaerobic)? Lis digester gas used?	yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	tion pond of 2 No No No No No No No No No No No No No	days detention period is provided.	
1.5 1.5.1 1.6 1.6.1 1.6.2 1.7.1 1.7.2	what type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is used Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility (Anaerobic)? Is digester gas used? Fleetrical system	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No No No No No No No	/ lying areas inside the plant.	
1.5 1.5.1 1.6.1 1.6.2 1.7.1 1.7.2 2	what type of distinction method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility (Anaerobic)? Is digester gas used? Electrical system Euchristic facility	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No No No No No No No	davs detention period is provided.	
1.5 1.5.1 1.6.1 1.6.2 1.7.1 1.7.2 2.1	what type of distinct of method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility (Anaerobic)? Is digester gas used? Electrical system Substation facility Where does the device the operation	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No No No No No No No	davs detention period is provided.	
1.5 1.5.1 1.6.1 1.6.2 1.7.1 1.7.2 2.1 2.11	what type of distinct tool include for entitlent is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility (Anaerobic)? Is digester gas used? Electrical system Substation facility What is the substation voltage?	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No No No No No No No	days detention period is provided.	
1.5 1.5.1 1.6.1 1.6.2 1.7.1 1.7.2 2.1 2.1.1 2.3	what type of distinct tion method for entitient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is use Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility (Anaerobic)? Is digester gas used? Electrical system Substation facility What is the substation voltage? Uninterrupted power supply (UPS)	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes For land filling Yes Yes	tion pond of 2 No No No No No No No No Vfilling up low No No No	days detention period is provided.	
1.5 1.5.1 1.6.1 1.6.2 1.7.1 1.7.2 2.1.1 2.3.1 2.3.1	what type of distinct of method for efficient is Chlorination? Ultra violet ray? Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is us Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility (Anaerobic)? Is digester gas used? Electrical system Substation facility What is the substation voltage? Uninterrupted power supply (UPS) Is there uninterrupted power supply?	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No A Vo No No No Vo No No No No No No No No No No No No No	/ lying areas inside the plant.	
1.5 1.5.1 1.6.1 1.6.2 1.7.1 1.7.2 2.1 1.2.1.1 2.3.1 2.3.2	what type of distinction include for enhances Ozonizer? Sludge thickening equipment What type of sludge thickening equipment is used Gravity thickening? Air flotation? Centrifugal thickening? Belt type? Sludge dehydration equipment Type of sludge dehydration method used: Mechanical? Filter press? Centrifugal dehydration Vacuum filtration? Others? Where does the dewatered sludge go to? Sludge digestion facility What is the substation voltage? Uninterrupted power supply (UPS) Is there uninterrupted power supply? If Yes, is it DC supply or AC supply?	used? Matura Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	tion pond of 2 No No No No No No No A filling up low No No No No No No No No No No No No No	/ lying areas inside the plant. for captive power generation	

2.5	Measuring instruments			
2.5.1	What type of flow meter is used and where?			
	Electro-magnetic?	Yes (1) No	for sludge flow.
	Ultrasonic?	Yes () No	for influent and effluent flow.
	Orifice plate?	Yes () No	
	Venturi?	Yes () <u>No</u>	
	Weir?	Yes () <u>No</u>	
	Partial flume?	Yes () No	for influent and effluent flow.
2.5.2	What type of level gauge is adopted and where?		_	
	Float-type?	Yes () No	
	Pressure-type?	Yes () No	
	Ultrasonic?	Yes () No	for influent and effluent flow.
	Radio wave ?	Yes () No	
2.5.3	Is a water quality meter used?			
	PH?	Yes	No	
	DO?	Yes	No	
	MLSS?	Yes	No	
	ORP?	Yes	No	
	Turbidity?	Yes		
	Nitrogen?	Yes	No	
	Phosphorus?	Yes	(N_0)	
2.5.4	Is sludge measurement performed?			
	Sludge concentration?	Yes	No	
2.5.5	Meteorological instruments used for:			
	Temperature?	Yes	No	
	Atmospheric pressure?	Yes	(No)	
	Rain?	Yes	No	
	Wind velocity (Anemometer)?	Yes	No	
2.5	Monitoring control system			
2.5.1	Does a lookout post exist at the following locatio	ns?		
	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	Vac	No	
	Acquisition) system used?	1 05	NO	

Questionnaire for 8 target states and 2 Union Territories in India

1	Please fill in the fields below. Attach additional shee	ets if necessary	у.					
1	Name of state	Tamilnadu						
2	Name of city/town	Chennai						
3	Name of respondent							
1	STP Name							
i	Contact information							
5	Address							
7	Phone number							
;	E-mail address							
	Contraction of the state of the							
1	Summary of sewage treatment plant							
	Are there calculations for basic design and canacity							
	of treatment plant components?	Yes		No,		Others		
,	Is there a layout plan showing earthwork							
1	machinery, and electric equipment?	(Yes)		No,		Others		
3	Are there detailed specifications of all facilities							
1	and equipment fitted in the plant? Are there	Ves		No		Others ·		
	as-fitted drawings of all sewers? Are there	Yes		No		Others :		
	structural drawings of tanks digastars reactors	Yes		No		Others ·		
	buildings and so on?	\sim		110				
	The design of the set	(Vac)		No		Oth and i		
	Is there a flow chart for instrumentation?	Vac		No		Others :		
)	Are there single-line diagrams (electrical)?	<u>tes</u> ,		INO		Others :		
)	Sewage treatment process used (Example:	ASP						
	Conventional activated sludge process)							
/	Sludge treatment process used (Example: Sludge	Centrifuga	al sludge o	hehydration af	ter thick	ening		
	drying after thickening)					-		
5	Which is the effluent discharge point?	Sea area th	nrough A	layar River				
)	Layout of plant (please attach the drawing,	Ves	No					
	if you have one)		140					
2	History							
l	Is the history of failure, repair, or reconstruction							
	recorded?	Yes	No	Others :				
,	Are there any requests or complaints from							
-	Are more any requests or complaints from	Yes	No					
,	Surrounding residents :							
	Design capacity and actual loading		40	MID				
	Design wastewater flow		40					
	Average daily flow		40					
2	Maximum dany now		43	MID				
+	Dry weather flow		00	MID				
;	Wat waather flow			MID				
7	Met wedtiel 100W		49 RUD	350 mg/l	COD	600 mg/l	22	400 mg/
	Average wastewater influent quality		BOD	320 mg/l		700 mg/l	22	450 mg/
)	Design effluent quality		RUD	<20 mg/l	COD	<100 mg/l	22	<30 mg/
ĺ	Average offluent quality		BOD	<18 mg/l	COD	<60 mg/l	55	<25 mg/
1	Solids canture rate		500	95 %	200	<u>\00 mg/1</u>	55	<u>~23 mg/</u>
,	What equipment is used for drawing out sludge			<i>,</i> ,				
1	from primary/secondary sedimentation tank or	By numpi	nσ					
ļ	digaster (pump/grouity_ate)?	by pumpi	-5					
,	Engine and forming out the let		ć	time/darr		190	time -	month
)	Frequency of drawing out sludge	<u> </u>	0	ume/day		100	umes	monu
	CLEONENCY OF STROOP CALLED OUTSIDE NTE	 Sindge dis 	noced w	min low lying	areas of	THE NEP		

3.15	Design sludge generation volume	0.0222 MLD 8.1 ML/year 75 %
	and water content	
3.16	Average sludge generation volume,	0.0122 MLD 4.45 ML/year 74 %
	and water content	•••• ··· ····· /•
3.17	Percentage of volatile solids	mean: 68 % max: 70 %
	in generated sludge	min: 62 %
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	t/month All the sludge is disposed for filling up
	content in sludge?	% low lying areas.
3.2	Are there operation records for pumps, equipment,	Daily report: Yes No Monthly report: Yes No
	blowers, etc.?	Annual report: Yes No
3.2.1	Is the water quality measured regularly?	Yes No
3.2.2	Are water quality measurement records	Daily report: Yes No
	maintained?	Annual report: Yes No

323	Is record of concentration of toxic substances in	
5.2.5	sludge maintained?	Yes No
3.2.4	Has the water quality of the final effluent exceeded	
	your target effluent standards anytime?	Yes No
3.2.5	If Yes, what are the causes for exceeding the	Yes No NA
	effluent standard?	105 110 111
4	Corrosion of facilities and damage status	
	Le there are a set in a file it is a set of the set of	
4.1	is there corrosion of bundlings of structures?	Yes No name of part :
4.2	Was there any damage to the building frame	Yes No name of part ·
	part of facilities?	res (10) mane or part.
4.3	Is there corrosion in equipment?	All MS components of the pumps are
	1 1	All Mis components of the pumps are
		Yes No, name of part: affected by corrosion and prevented by
		Epoxy painting frequently.
44	Is there damage to equipment?	Yes No name of part :
4 5	Are there records of corrosion and damage to	\sim
т.5	againment?	(Yes) No
4.6	Is there foul smell most of the time?	Yes No
4.7	Is scum generated?	A large amount, Small amount No
5	Management of facilities	
5.1	Is there a schedule for operating machinery and	Yes "manufacturer compilation, Others" No
	equipment	
52	Is there an operation manual for the complete	
5.2	fooility?	Yes No
5.3	Is there a schedule for wastewater examination	(Yes) No
	for influent, effluent and others?	
	Is there a wastewater examination method?	Ves: Name of the method: APHA standard 22st Edition No.
5 1	Are there the advection and training menuals for	
5.4	Are there the education and training manuals for	Yes No
	the staff of the STP?	
6	Inspection of equipment in the STP	
6.1	Are there check records for equipment?	Daily report: Yes No Monthly report: Yes No
		Annual reports Yes No
60	Is there on increation manual?	
0.2	is there an inspection manual?	Yes No
<i>c</i> 2	Le there are increased and early dealers	
0.3	is there an inspection schedule?	Yes No
		Will audible/ TV compare others i
6.4	Details of inspection procedure	Visual audible/ /1 v camera, others :
6.5	How has the result of the inspection	N/A
	been used?	19/74
6.6	How are inspection results maintained?	
6.6	How are inspection results maintained?	Electronic data, Hard copy. Others :
6.6	How are inspection results maintained?	Electronic data, Hard copy. Others :
6.6 7	How are inspection results maintained? Repair. Rehabilitation. Reconstruction	Electronic data, Hard copy. Others :
6.6 7 7 1	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for renair, rehabilitation and	Electronic data, Hard copy. Others :
6.6 7 7.1	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and manual for setup STP2	Electronic data, Hard copy. Others :
6.6 7 7.1	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP?	Electronic data, Hard copy. Others :
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6.6 7 7.1 7.2 7.3 7.4 7.5 8	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation	Electronic data, Hard copy. Others : Yes No Yes No Yes No Yes No Electronic data, Hard copy. Others :
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6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.2 8.3 8.4	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode	Electronic data, Hard copy. Others : Yes No Yes No Yes No Yes No Yes No Electronic data, Hard copy. Others : Engineers: 9 persons, Foreman: 1 person Maintenance: 17 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Total staff: 38 persons Mechanical Engineer: 4 persons, Total staff: 38 persons Mechanical Engineer: 4 persons, Electrical Engineer: 4 persons, Electrical Engineer: 1 person, Total staff: 38 persons Mechanical Engineer: 1 person, Total staff: 38 persons Mechanical Engineer: 1 person, Electrical Engineer: 3 persons, Electrical Engineer: 3 persons, Electrical Engineer: 4 persons, Electrical Engineer: 5 person, Electric
6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.2 8.3 8.4 8.5	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work	Electronic data, Hard copy Others : Yes No Electronic data, Hard copy Others : Electronic data, Hard copy Others : 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 Mechanical Engineer: 4 persons, Electrical Engineer: 1 person, Process Engineer: 1 person, Process Engineer: 1 person, Regular working tin From 8:00 to 18:00 Shifts; to Permanent worker Subcontracto Shift Operation
6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken	Electronic data, Hard copy Others : Yes No Electronic data, Hard copy Others : Electronic data, Hard copy Others : 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 Electrical Engineer: 4 persons, Process Engineer: 1 person, Regular working tin From 8:00 to No Subcontracto Shift Operation Maintenance
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 6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?)	Electronic data, Hard copy Others : Yes No Electronic data, Hard copy Others : Electronic data, Hard copy Others : Engineers: 9 persons, Foreman: 1 person Maintenance: 17 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Office workers: 0 persons, Belectrical Engineer: 4 persons, Process Engineer: 1 person, Process Engineer: 1 person, Permanent worker Subcontracto Shift Operation Maintenance, Repair No
 6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?)	Electronic data, Hard copy Others : Yes No Electronic data, Hard copy Others : Electronic data, Hard copy Others : 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 Mechanical Engineer: 4 persons, Process Engineer: 1 person, Regular working tin From 8:00 to Operation Maintenance Waintenance Repair
6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials	Electronic data, Hard copy Others : Yes No Electronic data, Hard copy Others : Electronic data, Hard copy Others : 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 Mechanical Engineer: 4 persons, Electrical Engineer: 1 person, Regular working tin From 8:00 to Operation Maintenance Repair No
6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9 9.1	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode. Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials Is the procurement of the chemicals easy?	Electronic data, Hard copy Others : Yes No Yes No Yes No Yes No Electronic data, Hard copy Others : Engineers: 9 persons, Foreman: 1 person Maintenance: 17 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Foreman: 1 person Maintenance: 17 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Total staff: 38 persons Mechanical Engineer: 4 persons, Electrical Engineer: 4 persons, Process Engineer: 1 person, Regular working tin From 8:00 to 18:00 Shifts; to Permanent worker Subcontracto Shift Operation Maintenance Repair Yes No
6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9 9.1 9.2	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials Is the procurement of the chemicals easy? Is there a procurement plan for chemicals?	Electronic data, Hard copy. Others : Yes No Yes No Yes No Yes No Electronic data, Hard copy. Others : Engineers: 9 persons, Foreman: 1 person Maintenance: 17 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Total staff: 38 persons Mechanical Engineer: 4 persons, Electrical Engineer: 1 person, Regular working tin From 8:00 to 18:00 (Shifts; to Permanent worker Subcontracto Shift Operation Maintenance Repair Yes No
 6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9 9.1 9.2 9.3 	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials Is the procurement of the chemicals easy? Is there a procurement plan for chemicals? Amount of electric power used	Electronic data, Hard copy Others : Yes No Yes No Yes No Yes No Electronic data, Hard copy Others : Engineers: 9 persons, Foreman: 1 person Maintenance: 17 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Shift in charge: 10 persons Electrical Engineer: 4 persons, Total staff: 38 persons Mechanical Engineer: 4 persons, Electrical Engineer: 1 person, Regular working tin From 8:00 to 18:00 Shifts; to Permanent worker Subcontracto Shift Operation Maintenance Repair Yes No Yes No
 6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9 9.1 9.2 9.3 	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of the chemicals easy? Is there a procurement plan for chemicals? Amount of electric power used	Electronic data, Hard copy Others : Yes No Yes No Yes No Yes No Electronic data, Hard copy Others : Others : 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 Electrical Engineer: 4 persons, Process Engineer: 1 person, Permanent worker Subcontracto Shift Operation Maintenance Yes No
6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9 9.1 9.2 9.3	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials Is the procurement of the chemicals easy? Is there a procurement plan for chemicals? Amount of electric power used	Electronic data, Hard copy Others : Yes No Yes No Yes No Yes No Yes No Electronic data, Hard copy Others : Electronic data, Hard copy Others : Electronic data, Hard copy Others : Image: persons Engineers: 9 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Office workers: 0 persons, Electrical Engineer: 4 persons, Electrical Engineer: 4 persons, Process Engineer: 1 person, Regular working tin From 8:00 to Operation Maintenance, Repair Yes No Yes Yes No Yes
 6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9 9.1 9.2 9.3 9.4 	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials Is the procurement of the chemicals easy? Is there a procurement plan for chemicals? Amount of electric power used Quantity of industrial chemicals used such as	Electronic data, Hard copy Others : Yes No Yes No Yes No Yes No Yes No Electronic data, Hard copy Others : Others : Engineers: 9 persons, Foreman: 1 person Maintenance: 17 persons, Shift in charge: 10 persons Lab Analyst: 2 persons, Office workers: 0 persons, Total staff: 38 persons Electrical Engineer: 4 persons, Process Engineer: 1 person, Regular working tin From 8:00 to Waintenance Repair Operation Maintenance Yes No Total kap 2044000 kWh in a
 6.6 7 7.1 7.2 7.3 7.4 7.5 8 8.1 8.2 8.3 8.4 8.5 8.6 9 9.1 9.2 9.3 9.4 	How are inspection results maintained? Repair, Rehabilitation, Reconstruction Is there a manual for repair, rehabilitation and reconstruction of the STP? If Yes, is it being used? Are there repair, rehabilitation and reconstruction plans for the STP? Have repairs, rehabilitation and reconstruction been implemented? Are there repair, rehabilitation and reconstruction records? Work implementation Staffing or Manpower at Plant Engineers Working time Work mode Contents of work Others (Are there the special measures taken at the time of accidents or disasters?) Procurement of utilities and materials Is the procurement of the chemicals easy? Is there a procurement plan for chemicals? Amount of electric power used Quantity of industrial chemicals used such as chlorine, coagulant, etc.	Electronic data, Hard copy Others : Yes No Yes No Yes No Yes No Yes No Electronic data, Hard copy Others : Electronic data, Hard copy Others : 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 Percess Engineer: 4 persons, Process Engineer: 1 person, Regular working tin From 8:00 to Permanent worker Subcontracto Shift Operation Maintenance Yes No Yes

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	as grid p	ower from Tamilnadu Electricity Board was not obtained
9.7	Are there standby power generators?	Yes	No
9.8	How many times a year and how many hours a		91 times/year
	year is the standby power generator used?		6370 hours/year
10	Efficiency improvement and remedial measures	and mainte	nance
	management of sewerage facilities		
10.1	Is there a centralized control system?	Yes	No
	Is there a data logger system?	Yes	
10.2	Has the operation and maintenance service	Vac	No
	been subcontracted to a private company?	Tes	140
11	Safety management		
11.1	Is there a safety and hygiene organization?	Yes	No
11.2	Is there a safety operation manual?	<u>Yes</u>	No
11.3	Are there safety protection tools?	(Yes)	No
11.4	Are there warning signs for dangerous parts of the	Yes	No
	facilities?		10
11.5	Have there been instances of accidents/disasters	Vec	No
	in the past?	1 55	NO
11.6	Is education and training implemented for health	Vac	No
	and safety ?		110
11.7	Is there a risk management manual (for floods,		
	cyclones, earthquakes, and other natural	Yes	No
	disasters)?		

II Check list of sewerage systems, machinery and electrical systems

	Please reply as indicated on the right side.			
1	Machinery system			
1.1	Type of screens			
1.1.1	Is there a coarse screen?	(Yes)	N	ło
1.1.2	Is screen type mechanical?	(Yes)	N	lo
1.1.3	Is there a fine screen?	Yes		
1.1.4	Is screen type mechanical?	Yes		
1.1.5	Grit chamber			
1.1.6	Is there a crushing device?	Yes		
1.1.7	Is there a conveyor?	(Yes)	N	lo
1.1.8	How is the grid chamber cleaned?			
	Mechanically?	Yes	N	lo
	Bucket elevator?	Yes		
	Jet pump?	Yes		
	Screw?	Yes		
	Air lift?	Yes		
	Manually?	Yes		
	Aeration?	Yes		
1.2	Pumps			
1.2.1	What is the rated voltage of main pump?		415 V	
1.2.2	Is there any speed controlled pump?	Yes		0
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	What type of aeration facilities used?	Fixed low	speed surface A	Aerators.
1.3.1	What type of air diffuser is used?	N/A		
1.4	Disinfection equipment			
1.4.1	What type of disinfection method for effluent is	used?		
	Chlorination?	Yes	N	lo
	Ultra violet ray?	Yes		
	Ozonizer?	Yes		
1.5	Sludge thickening equipment			
1.5.1	What type of sludge thickening equipment is use	ed ?		
	Gravity thickening?	(Yes)	N	lo
	Air flotation?	Yes		No)
	Centrifugal thickening?	Yes	C N	No >
	Belt type?	Yes		No)
1.6	Sludge dehydration equipment			
1.6.1	Type of sludge dehydration method used:			
	Mechanical?	Yes	N	Jo
	Filter press?	Yes		lo D
	Centrifugal dehydration	(Yes)	N	Jo
	Vacuum filtration?	Yes		10)
	Others?	Yes		No)
162	Where does the dewatered sludge go to?	For land f	illing / filling un	p low lying areas inside the plant.
171	Sludge digestion facility (Anaerobic)?	(Yes)	Notes and the second se	ι
172	Is digester gas used?	Yes	N	Io for captive power generation
1.7.2	is algebra has used.			1 1 0

2	Electrical system			
2.1	Substation facility			
2.1.1	What is the substation voltage?		11 kV	
2.3	Uninterrupted power supply (UPS)			
2.3.1	Is there uninterrupted power supply?	Yes	(No)	
2.3.2	If Yes, is it DC supply or AC supply?	AC	DC	No
2.3.3	What are the applications of this power supply?	No		
2.5	Measuring instruments	····		
2.5.1	What type of flow meter is used and where?			
	Electro-magnetic?	Yes () No >	
	Ultrasonic?	Yes () <u>N</u> o	For influent and effluent flow.
	Orifice plate?	Yes () No	
	Venturi?	Yes () (No)	
	Weir?	Yes () No	
	Partial flume?	Yes () No	For influent and effluent flow.
2.5.2	What type of level gauge is adopted and where?			
	Float-type?	Yes () No	
	Pressure-type?	Yes () <u>No</u>	
	Ultrasonic?	Yes () <u>No</u>	
	Radio wave ?	Yes () No	
2.5.3	Is a water quality meter used?			
	PH?	Yes	(No)	
	DO?	Yes	No	
	MLSS?	Yes	No	
	ORP?	Yes	No)	
	Turbidity?	Yes	(No)	
	Nitrogen?	Yes	(No)	
	Phosphorus?	Yes	(No)	
2.5.4	Is sludge measurement performed?		_	
	Sludge concentration?	Yes	No	
2.5.5	Meteorological instruments used for:			
	Temperature?	Yes	No	
	Atmospheric pressure?	Yes	No	
	Rain?	Yes	<u>No</u>	
	Wind velocity (Anemometer)?	Yes		
2.5	Monitoring control system			
2.5.1	Does a lookout post exist at the following locatio	ons?		
	Grit chamber	Yes	No	
	Dry well	Yes	No	
	Sewage treatment facility	Yes		
	Sludge thickening equipment	Yes		
	Sludge dehydration equipment	Yes		
	Anaerobic digestion tank	Yes		
	Pumping station	Yes		
2.5.3	Is SCADA (Supervisory Control And Data	Yes	No	
	Acquisition) system used?	100	110	

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	Summary of sewer and channels	
1.1	Collection system	
1.1.1	Type of collection system	Normally separate system; mixed with rainwater during rainy season
1.2	History of sewer use	
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	Investigation of sewer net	
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	Repair, Rehabilitation, Reconstruction	
1.4.1	Is there a manual for repair, rehabilitation,	N/A
	reconstruction?	
1.4.2	Is it used?	N/A
1.4.3	Are there the plan of sewer net repair,	NI/A
	rehabilitation and reconstruction?	
1.4.4	Were repairs, regeneration and rebuilding	N/A
1.4.5	Are there records of repair, rehabilitation and	NT/ A
	reconstruction?	N/A
1.4.6	How are the results of the investigation kept?	N/A
1.5	Safety management	
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	About the organization which carries out work	
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	Summary of relay pumping station	
2.1	Basic data concerning facilities	
2.1.1	Are there specifications for basic design and	N/ A
	facilities	IV/A
2.1.2	Is there any completed chart or documents about	
	the earthwork, machines, and installation,	NI/A
	construction of electric equipment about the	174
	numping station	
2.1.3	Is there an Equipment Ledger?	N/A
2.2	Inspection of facility and equipment	
2.2.1	Are there check records for equipment?	N/A
2.3	About the matter relevant to the history	
2.3.1	Is there any record of the breakdown, repair,	N/Δ
	and reconstruction of facilities?	
2.3.2	Are there records of requests and complaints	N/A
	from surrounding residents?	
2.4	Management of premeditated facilities	
2.4.1	Is there a plan for operating equipment	Yes (manufacturer compilation Others)
	of the plant?	res (manufacturer complication, 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	Safety management	1
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	N/A
	parts of the facilities?	
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	About the organization which carries out work	3.7 / A
2.6.1	Implementing system	N/A
2.6.2	Working time	N/A
2.6.3	Work content	N/A
	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

1	Summary of sewers and channels	
1.1	Collection system	
1.1.1	Type of collection system	Separate system? Combined system, A part is combined system
1.2	History of sewer use	
1.2.1	Sewer record book or log book	Yes No Drawing available
		Drawing Others :
1.2.2	Life of oldest sewer pipe	years to years (25years) (Circular brick drains)
	Materials of Pipes and channels	Hume concrete pipes 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 by 2400
1.3	Sewer network	
1.3.1	Is there a manual for sewer network inspection?	Yes No
1.3.2	Is there a plan for sewer network?	Yes No
1.3.3	Inspection procedure	Visually by TV camera
	T. T	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 No
136	How are the results of the records kept?	Electronic data, Hard copy, N/A
1.0.0	ite are the results of the records heper	Others :
137	Is there a plan for pipe cleaning?	(Yes) No
138	Are there records for pipe cleaning?	Yes No
139	About direct work and subcontracted work	Direct work Subcontracted work
1.3.9	Repair, Rehabilitation, Reconstruction	
141	Is there a manual for repair rehabilitation	\frown
1	reconstruction?	Yes No Being prepared
142	If Ves is it used?	Yes No N/A
1.4.2	Are there plans of sewer network repair	
1.4.5	rebabilitation and reconstruction?	Yes No Being prepared
1 1 1	Have repairs, rehabilitation and rebuilding been	
1.4.4	Have repairs, renabilitation and rebuilding been	Yes No
1 1 5	implemented?	
1.4.3	Are there records of repair, renabilitation and	Yes (No)
140	reconstruction?	Electropia data Hard conv
1.4.0	How are the results of the investigation kept?	Others : N/A
15	C -	Oulers. N/A
1.5	Safety management	
1.5.1	Is there a safety and hygiene organization?	Yes No
1.5.2	Is there a safety operation manual?	Yes No
1.5.3	Are safety protection tools used?	Yes No Gas masks
1.5.4	Are warnings displayed on the dangerous parts of	
	the facilities?	Yes No
155	Is education and training being given for health	Yes No
156	Is there a crisis-management manual?	Ves No
1.5.0	A hand the supervise tion and the source of the	100 110
1.0	About the organization which carries out work	Managari parang Warker: rangara N/A
1.0.1	Wanagement organization	Interview Persons, Worker: persons IN/A
1.0.2	Working unle	FIOIII IU IV/A
1.0.3	work content	Through memory and reduild N/A
1.0.4	About work mode	subcontract

2	Summary of relay pumping station	
2.1	Basic data of facilities	
2.1.1	Is there a general layout plan showing all equipment and machinery?	Yes No Others :
2.1.2	Is there a log book for equipment?	Yes No Others :
2.2	Inspection of facility and equipment	
2.2.1	Are there check records for equipment?	Daily report : Yes <u>No</u> Monthly report: Yes No, Annual report: Yes No Only when problem occurs logged
2.3	History	
2.3.1	Is there any record of breakdown , repair,	Yes No Others :
2.4	Management of planned facilities	
2.4.1	Is there a schedule for operating equipment	Yes (manufacturer compilation, Others),
	of the plant?	
2.4.2	Is there an operation manual?	Yes No
2.4.3	Are there plans for repair, rehabilitation and	Yes No
2.4.4	Are there education and training plans for the staff	Yes No
2.5	Safety management	
2.5.1	Is there a safety and hygiene organization?	Yes <u>No</u>
2.5.2	Is there a safety operation manual?	Yes No
2.5.3	Are there safety protection tools?	Yes No
2.5.4	Is there indication or warning on dangerous parts of the facilities?	Yes No
2.5.5	Are education and training in health and safety implemented?	Yes No
2.5.6	Is there a crisis-management manual?	Yes No
2.6	About the organization which carries out work	
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

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

1	Summary of sewers and channels	
1.1	Collection system	
1.1.1	Type of collection system	Separate system Combined system
		A part is combined system (when it rains)
		(when it fails)
1.2	History of sewer use	
1.2.1	Sewer record book or log book	Yes No
		Drawings Others :
1.2.2	Life of oldest sewer pipe	N/A years to years
	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
	Size of sewers and channels	Diameter: 250 mm to 2800 mm
		mmx mm to mmx mm
1.3	Sewer network	
1.3.1	Is there a manual for sewer network?	Yes No N/A
1.3.2	Is there a plan for sewer network?	Yes No N/A
1.3.3	Assessment procedure	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?	Yes No N/A
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 No
1.3.8	Are there records for pipe cleaning ?	Yes No
1.3.9	About direct work and subcontracted work	Direct work Subcontracted work N/A
1.4	Repair, Rehabilitation, Reconstruction	
1.4.1	Is there a manual for repair, rehabilitation,	Vac No
	reconstruction?	res <u>NO</u>
142	If Ves is it used?	$V_{es} = N_0 = N/\Delta$
1.4.2	Are there plans of sewer network repair	
1.4.5	rehabilitation and reconstruction?	Yes No
	renabilitation and reconstruction?	
1.4.4	Have repairs, rehabilitation and rebuilding been	Yes No
	implemented?	
1.4.5	Are there records of repair, rehabilitation and	Yes No
	reconstruction?	
1.4.6	How are the results of the investigation kept?	Electronic data, Hard copy,
		Others : N/A
1.5	Safety management	
1.5.1	Is there a safety and hygiene organization?	Yes No N/A
152	Is there a safety operation manual?	
1.5.2	Are sofety protection to als used?	
1.5.5	Are safety protection tools used?	Tes INO IN/A
1.5.4	Are warnings displayed on the dangerous parts of	Yes No N/A
	the facilities?	
1.5.5	is education and training being given for health	Yes No N/A
	and safety ?	N7. N7.
1.5.6	Is there a crisis-management manual?	res No N/A
1.6	About the organization which carries out work	
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	Inrough permanent workers Subcontract N/A

2	Summary of relay pumping station						
2.1	Basic data of facilities						
2.1.1	Is there a general layout plan showing all						
	equipment and machinery?	Yes	No	Others :	N/A	A	
2.1.2	Is there a log book for equipment?	Yes	No	Others :	N/	А	
2.2	Inspection of facility and equipment	D 11	N 7				
2.2.1	Are there check records for equipment?	Daily report	: Yes	No, Monthly	report: Y	es No	N/A
	Uiotowy	Annual report	Yes	NO			
2.3	La there environment of breekdown renoin						
2.3.1	is there any record of breakdown, repair,	Yes	No	Others :	N/A		
	and reconstruction of facilities?						
2.4	Management of planned facilities						
2.4.1	Is there a schedule for operating equipment	Yes (man	ufacture	er compilation,	Others),		
	of the plant?	No				N/A	
242	Is there an operation manual?	* 7			NT/ 4		
2.1.2		Yes		No	N/A		
2.4.3	Are there plans for repair, rehabilitation and	Vac		No	NI/A		
	reconstruction?	105		NO	IN/A		
2.4.4	Are there education and training plans for the staff	Yes		No	N/A		
	2						
2.5	Safety management	V		N.	NT/A		
2.5.1	Is there a safety and hygiene organization?	Yes		No	N/A N/A		
2.5.2	Is there a safety operation manual?	Ies		No	IN/A N/A		
2.5.5	Are there safety protection tools?	ies		INO	IN/A		
2.3.4	is there indication or warning on dangerous parts	Yes		No	N/A		
	of the facilities?						
2.5.5	Are education and training in health and safety	Yes		No	N/A		
256	implemented?	V		N.	NT/A		
2.5.6	Is there a crisis-management manual?	res		NO	N/A		
2.0	About the organization which carries out work	Managan		Worker		NT/A	
2.0.1	Working time	From to	persons	s, worker:	persons	IN/A N/A	
2.0.2	Work content	Investigation	Maint	ananca "renoi	r rehabilitati	and reas	metruction"
2.0.3	About direct work and subcontracted work	Direct work	wainte	Subcontracted	l work		A
2.0.4	ADOUT UNCET WOLK AND SUDCONTRACTED WOLK	DIRECT WORK		Subconnacted	IWOIK	1N/F	1

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

1	Summary of sewers and channels	
1.1	Collection system	
1.1.1	Type of collection system	Separate system, Oombined system, A part is combined system
1.2	History of sewer use	
1.2.1	Sewer record book or log book	Yes No
	C C	Drawings Others :
1.2.2	Life of oldest sewer pipe	10 years
	Materials of Pipes and channels	Hume concrete pipes Others : N/A
123	Type, number and arrangement of manholes	kinds. Number set up: N/A
1.2.0	Size of sewers and channels	
		Diameter: 250 mm to 1000 mm,
		$mm \times mm$ to $mm \times mm$
13	Sewer network	
131	Is there a manual for sever network?	Ves No
132	Is there a plan for sewer network?	Ves No
13.2	Assessment procedure	Visually by TV camera N/Δ
1.5.5	Assessment procedure	Others ·
124	How has the result of the assessment been used?	N/A
1.3.4	Are there shock records for sever and morphole?	
1.5.5	Are there check records for sewer and manhole?	Yes No
136	How are the results of the records kent?	Electronic data Hard conv N/A
1.5.0	now are the results of the records kept.	Others ·
127	Is there a plan for pine cleaning 2	Vec No
1.3.7	Are there records for pipe cleaning ?	Vas No
1.3.0	About direct work and subcontracted work	Direct work Subcontracted work N/A
1.5.9	About direct work and subcontracted work	Direct work Subcontracted work IV/A
1.4	Kepair, Kenabilitation, Reconstruction	1
1.4.1	is there a manual for repair, renabilitation,	Yes No
	reconstruction?	
142	If Yes is it used?	Yes No N/A
1 4 3	Are there plans of sewer network repair	
1.4.5	rehabilitation and reconstruction?	Yes No
1.4.4	Have repairs, rehabilitation and rebuilding been	Yes No
	implemented?	
1.4.5	Are there records of repair, rehabilitation and	Yes No
	reconstruction?	
1.4.6	How are the results of the investigation kept?	Electronic data, Hard copy, N/A
		Others :
1.5	Safety management	
151	Is there a safety and hygiene organization?	Yes No
152	Is there a safety operation manual?	Vac
1.5.2		
1.5.3	Are safety protection tools used?	Yes No
1.5.4	Are warnings displayed on the dangerous parts of	Yes No
	the facilities?	
1.5.5	Is education and training being given for health	Ves No
	and safety ?	
1.5.6	Is there a crisis-management manual?	Yes No
16	About the organization which carries out work	Outsourcing
161	Management organization	Manager: persons Worker: persons Outsourcing
162	Working time	From to N/A
1.0.2	Work content	Maintenance rehabilitation and rehuild N/A
1.0.3	About work mode	Through permanent workers Subcontract N/A
1.0.4	1 HOUL WOLK HIOLE	i inough permanent workers Subcontract IN/A

2	Summary of relay pumping station	
2.1	Basic data of facilities	
2.1.1	Is there a general layout plan showing all	
	equipment and machinery?	Ves No Others
2.1.2	Is there a log book for equipment?	Yes Only for pumps at MPS)
2.2	Inspection of facility and equipment	
2.2.1	Are there check records for equipment?	Daily report: Yes No, Monthly report: Yes No,
	· ·	Annual report: Yes No
2.3	History	
2.3.1	Is there any record of breakdown , repair,	Var Others
	and reconstruction of facilities?	Yes No Others:
2.4	Management of planned facilities	
2.4.1	Is there a schedule for operating equipment	Yes (manufacturer compilation, Others).
	of the plant?	NO
242	Is there are execution menually	\sim
2.4.2	is there an operation manual?	Yes No
2.4.3	Are there plans for repair rehabilitation and	
	reconstruction?	Yes No
2.4.4	Are there education and training plans for the staff	V
	?	Tes No
2.5	Safety management	
2.5.1	Is there a safety and hygiene organization?	Yes No
2.5.2	Is there a safety operation manual?	Yes No
2.5.3	Are there safety protection tools?	(Yes) No
2.5.4	Is there indication or warning on dangerous parts	Ves No
	of the facilities?	
2.5.5	Are education and training in health and safety	Vac No
	implemented?	
2.5.6	Is there a crisis-management manual?	Yes No
2.6	About the organization which carries out work	
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

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

1	Summary of sewers and channels	
1.1	Collection system	Sewer network & Nala Tapping
1.1.1	Type of collection system	Combined system
1.2	History of sewer use	
1.2.1	Sewer record book or log book	Yes
		Drawings
1.2.2	Life of oldest sewer pipe	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	Sewer network	
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	Repair, Rehabilitation, Reconstruction	
1.4.1	Is there a manual for repair, rehabilitation,	No
	reconstruction?	
1.4.0	1017	N1/A
1.4.2	If Yes, is it used?	N/A
1.4.3	Are there plans of sewer network repair,	res
	rehabilitation and reconstruction?	
1.4.4	Have repairs, rehabilitation and rebuilding been	No
	implemented?	110
1.4.5	Are there records of repair, rehabilitation and	NI/A
	reconstruction?	N/A
1.4.6	How are the results of the investigation kept?	Hard copy
-		
1.5	Safety management	
1.5.1	Is there a safety and hygiene organization?	No
152	Is there a safety operation manual?	Yes
1 5 2	Are sofety protection tools used?	Vac
1.3.3	Are warmings diaplayed on the damagenesis sector f	155
1.3.4	the facilities?	Yes
1 ~ ~	In e fraction and training here in the first state	
1.5.5	is education and training being given for health	Yes
	and safety ?	
1.5.6	Is there a crisis-management manual?	No
1.6	About the organization which carries out work	
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	Summary of relay pumping station	
2.1	Basic data of facilities	
2.1.1	Is there a general layout plan showing all	
	equipment and machinery?	Vaa
		Tes
2.1.2	Is there a log book for equipment?	Yes
2.2	Inspection of facility and assument	
2.2	Inspection of facility and equipment	Doily report Vac Monthly report Vac
2.2.1	Are there check records for equipment?	Annual report : Ves
23	History	Annual report . Tes
2.5	Is there any record of breakdown repair	
2.5.1	and reconstruction of facilities?	Yes
2.4	Management of planned facilities	
2.4		
2.4.1	is there a schedule for operating equipment	No
	of the plant?	
2.4.2	Is there an operation manual?	Ves
		105
2.4.3	Are there plans for repair, rehabilitation and	Yes
	reconstruction?	
2.4.4	Are there education and training plans for the staff	No
	?	
2.5	Safety management	
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	Yes
	of the facilities?	
2.5.5	Are education and training in health and safety	Ves
	implemented?	
2.5.6	Is there a crisis-management manual?	No
2.6	About the organization which carries out work	
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

Face sheet

	Please fill in the fields below. Attach additional shee	ts 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

1	Summary of sewers and channels						
1.1	Collection system						
1.1.1	Type of collection system	Separate system,	Combined sy	vstem	A part is co	ombined sy	ystem
1.2	History of sewer use						
1.2.1	Sewer record book or log book	Yes					
		Drawings	Other	s:			
1.2.2	Life of oldest sewer pipe	15 years to	years	Abo	ut so years		
	Materials of Pipes and channels	Hume concrete p	pipes Other	s :	N/A		
1.2.3	Type, number and arrangement of manholes	N/A kinds	s, Number s	et up:			
	Size of sewers and channels	Diameter: N/A	mm to	mm,	mm×	mm to	mm×
1.3	Sewer network						
1.3.1	Is there a manual for sewer network inspection?	Yes N_0	(there is no 1	nanual pres	sent as such t	for the depa	artment.)
1.3.2	Is there a plan for sewer network?	Yes No					
1.3.3	Inspection procedure	Visually, by TV ca	umera				
		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?	Ves	No				
		105					
1.3.6	How are the results of the records kept?	Electronic data, Ha	rd copy,				
		Others :		N/A			
1.3.7	Is there a plan for pipe cleaning ?	<u>Yes</u>	No				
1.3.8	Are there records for pipe cleaning ?	<u>Yes</u>	No				
1.3.9	About direct work and subcontracted work	Direct work	Su	bcontracte	d work	N	/A
1.4	Repair, Rehabilitation, Reconstruction						
1.4.1	Is there a manual for repair, rehabilitation,	Vac	No				
	reconstruction?	105	NO				
1.4.2	If Yes, is it used?	Yes	No]	N/A		
1.4.3	Are there plans of sewer network repair,	3.7	\sim				
	rehabilitation and reconstruction?	Yes	NO				
1 1 1	Have repairs, rehabilitation and rebuilding been		\sim				
1.4.4	implemented?	Yes	$\sim N_0$				
1 / 5	Are there records of repair, rehabilitation and						
1.4.5	reconstruction?	Yes	No				
		Electronic dete II-					
1.4.6	How are the results of the investigation(Health	Electronic data, Ha	ra copy,				
	inspection) kept?	Others: Part elec	ctronic				
1.5	Safety management						
1.5.1	Is there a safety and hygiene organization?	Yes	No		Safety	week	
1.5.2	Is there a safety operation manual?	Yes	No				
1.5.3	Are safety protection tools used?	Yes	No				
1.5.4	Are warnings displayed on the dangerous parts of						
	the facilities?	Yes	No				
155	Is education and training being given for health	(Yes)	No				
1.5.6	Is there a risk management manual?	Yes					
1.6	About the organization which carries out work		<u> </u>				
1.6.1	Management organization	Manager: perso	ons. Worker	: perso	ns	N/A	
1.6.2	Working time	From to		F-100		N/A	
1.6.3	Work content	Maintenance . reh	abilitation an	d rebuild		N/A	
1.6.4	About work mode	Through permane	nt workers	Su	bcontract	N	/A

2	Summary of relay pumping station	
21	Basic data of facilities	
211	Is there a general layout plan showing all	
2.1.1	as there a general rayout plan showing an	
	equipment and machinery?	Yes No Others :
		\sim
2.1.2	Is there a log book for equipment?	Yes No Others :
2.2	Inspection of facility and equipment	
2.2.1	Are there check records for equipment?	Daily report : Yes No, Monthly report: Yes No,
	TT	Annual report: Yes <u>No</u>
2.3	History	
2.3.1	Is there any record of breakdown, repair,	(Ves No Others :
	and reconstruction of facilities?	Concession of the second secon
2.4	Management of planned facilities	
2.4.1	Is there a schedule for operating equipment	Yes (manufacturer compilation Others)
	of the plant?	No
2.4.2	is there an operation manual?	Yes No
213	Are there plans for repair rehabilitation and	
2.4.5	reconstruction?	Yes No
244	Are there, education and training plans for the staff	
2.4.4	Are there education and training plans for the start	Yes No
2.5	Safety management	N N
2.5.1	Is there a safety and hygiene organization?	Yes No
2.5.2	Is there a safety operation manual?	Yes No
2.5.3	Are there safety protection tools?	Yes No
2.5.4	Is there indication or warning on dangerous parts	Yes No N/A
	of the facilities?	
2.5.5	Are education and training in health and safety	Yes
	implemented?	
2.5.6	Is there a risk management manual?	Yes <u>No</u>
2.6	About the organization which carries out work	
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 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 shee	ts 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

1	Summary of sewers and channels					
1.1	Collection system					
1.1.1	Type of collection system	Separate system, Combined system, A part is combined system				
1.2	History of sewer use					
1.2.1	Sewer record book or log book	Yes <u>No</u>				
		Drawings Others :				
1.2.2	Life of oldest sewer pipe	N/A years to years (Navi Munbai 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 Munbai Municipal Corp have their data.)				
	Size of sewers and channels	N/A Diameter: mm to mm, mm× mm to mm× mm				
1.3	Sewer network					
1.3.1	Is there a manual for sewer network inspection?	Yes No				
1.3.2	Is there a plan for sewer network?	Yes No				
1.3.3	Inspection procedure	Visually, by TV camera				
	X X	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?	Voc No				
		Tes				
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 No				
1.3.8	Are there records for pipe cleaning ?	Yes No				
1.3.9	About direct work and subcontracted work	Direct work Subcontracted work N/A				
1.4	Repair, Rehabilitation, Reconstruction					
1.4.1	Is there a manual for repair, rehabilitation,	V N				
	reconstruction?	Yes No				
142	If Yes, is it used?	Yes No				
1.4.3	Are there plans of sewer network repair.					
	rehabilitation and reconstruction?	Yes No				
1 4 4						
1.4.4	Have repairs, renabilitation and rebuilding been	Yes No				
1 4 5	Implemented?					
1.4.5	Are there records of repair, rehabilitation and	Yes No				
	reconstruction?					
1.4.6	How are the results of the investigation kept?	Electronic data, Hard copy,				
		Others : N/A				
1.5	Safety management					
1.5.1	Is there a safety and hygiene organization?	Yes No				
1.5.2	Is there a safety operation manual?	Yes No				
153	Are safety protection tools used?	Yes No				
1.5.5	Are warnings displayed on the dangerous parts of					
1.5.4	the facilities?	Yes No				
155	In education and training being given for boolth					
1.3.3	is education and training being given for health	Yes No				
	and safety ?					
1.5.6	Is there a risk management manual?	Yes No				
1.6	About the organization which carries out work					
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				

2	Summary of relay pumping station		
2.1	Basic data of facilities		
2.1.1	is there a general layout plan showing all		
	equipment and machinery?	Yes No Others :	
2.1.2	Is there a log book for equipment?	Yes No Others :	
2.2	Inspection of facility and equipment		
2.2.1	Are there check records for equipment?	Daily report: Yes No, Monthly report: No,	\geq
	· ·	Annual report: Yes No	
2.3	History		
2.3.1	Is there any record of breakdown, repair,		
	and reconstruction of facilities?	res <u>No</u> Others :	
2.4	Management of planned facilities	l	
2.4.1	Is there a schedule for operating equipment	Yes (manufacturer compilation Others)	
	of the plant?	No	
2 4 2			
2.4.2	is there an operation manual?	Yes No	
243	Are there plans for repair rehabilitation and		
2	reconstruction?	Yes No	
2.4.4	Are there education and training plans for the staff		
	?	Yes No	
2.5	Safety management	i	
2.5.1	Is there a safety and hygiene organization?	Yes No	
2.5.2	Is there a safety operation manual?	Yes No	
2.5.3	Are there safety protection tools?	Yes No	
2.5.4	Is there indication or warning on dangerous parts	N _e	
	of the facilities?	res	
2.5.5	Are education and training in health and safety	V	
	implemented?	res No	
2.5.6	Is there a risk management manual?	Yes No	
2.6	About the organization which carries out work		
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	ı"
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 shee	ets 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

1	Summary of sewers and channels	
1.1	Collection system	
1.1.1	Type of collection system	Separate system Combined system, A part is combined system
1.2	History of sewer use	
1.2.1	Sewer record book or log book	Yes We get picture of Layout
		Drawings Others :
1.2.2	Life of oldest sewer pipe	1928 year
	Materials of Pipes and channels	Hume concrete pipes 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	Sewer network	
1.3.1	Is there a manual for sewer network inspection?	Yes No
1.3.2	Is there a plan for sewer network?	Yes 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?	Yes
1.3.6	How are the results of the records kept?	N/A
1 2 7	Le de ser en alem franciae elección e a	(Vac) Na
1.3./	Ano there a plan for pipe cleaning?	
1.3.0	About direct work and subcontracted work	Direct work + Subcontracted work
1.5.9	Papair Pababilitation Pacanstruction	
1.4	Le there a manual for renain rehabilitation	
1.4.1	is there a manual for repair, renabilitation,	Yes No
1 4 0		Vac Na
1.4.2	If Yes, is it used?	
1.4.5	Are there plans of sewer network repair,	Yes No They repair, when a problem occurs.
1.4.4	Have repairs, rehabilitation and rebuilding been	Yes No
	implemented?	
1.4.5	Are there records of repair, rehabilitation and	Yes No
	reconstruction?	
1.4.6	How are the results of the investigation kept?	N/A
1.5	Safety management	
1.5.1	Is there a safety and hygiene organization?	Yes No ward office
1.5.2	Is there a safety operation manual?	N/A
1.5.3	Are safety protection tools used?	Yes there is no gas masks.
1.5.4	Are warnings displayed on the dangerous parts of	Voc No
	the facilities?	Tes No
1.5.5	Is education and training being given for health	
	and safety ?	res every 4 months ward office level
1.5.6	Is there a risk management manual?	N/A
1.6	About the organization which carries out work	
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	Maintenance rehabilitation and rebuild
1.6.4	About work mode	N/A

2	Summary of relay pumping station	
2.1	Basic data of facilities	
2.1.1	Is there a general layout plan showing all	
	equipment and machinery?	
		Yes No Others :
2.1.2	Is there a log book for equipment?	Yes No Others :
2.2	Inspection of facility and equipment	
2.2.1	Are there check records for equipment?	Daily report Yes Monthly report: Yes No,
		Annual report: Yes No
2.3	History	
2.3.1	Is there any record of breakdown, repair,	Vac No Others
	and reconstruction of facilities?	Tes No Others.
2.4	Management of planned facilities	
2.4.1	Is there a schedule for operating equipment	
	of the plant?	Yes They have a schedule for screen cleaning.
2.4.2	Is there an operation manual?	V
		Yes No
2.4.3	Are there plans for repair, rehabilitation and	Yes No
	reconstruction?	
2.4.4	Are there education and training plans for the staff	Yes No
	?	
2.5	Safety management	
2.5.1	Is there a safety and hygiene organization?	Yes No
2.5.2	Is there a safety operation manual?	N/A
2.5.3	Are there safety protection tools?	Yes No
2.3.4	as there indication or warning on dangerous parts	Yes Partly
255	Are advantion and training in health and safety	
2.5.5	implemented?	Yes No
256	Is there a risk management manual?	N/Δ
2.5.0	About the organization which carries out work	
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

Face sheet

	Please fill in the fields below. Attach additional shee	ts 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

1	Summary of sewers and channels					
1.1	Collection system					
1.1.1	Type of collection system	Separate system Combined system, A part is combined system				
1.2	History of sewer use					
1.2.1	Sewer record book or log book	Yes No Drawings Others :				
1.2.2	Life of oldest sewer pipe	1904 years to vears				
	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	Sewer network					
1.3.1	Is there a manual for sewer network inspection?	Yes No				
1.3.2	Is there a plan for sewer network?	(Yes) No				
1.3.3	Inspection procedure <	Visually by TV camera				
	I I I I I I I I I I I I I I I I I I I	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 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 ?	Yes No				
1.3.8	Are there records for pipe cleaning ?	Yes No				
1.3.9	About direct work and subcontracted work	Direct work Subcontracted work				
1.4	Repair, Rehabilitation, Reconstruction					
1.4.1	Is there a manual for repair, rehabilitation,	N ₁				
	reconstruction?	res <u>No</u>				
1.4.2	If Yes, is it used?	Yes No				
1.4.3	Are there plans of sewer network repair,					
	rehabilitation and reconstruction?	Yes No				
1.4.4	Have repairs, rehabilitation and rebuilding been	Vac No				
	implemented?					
1.4.5	Are there records of repair, rehabilitation and	Vac No				
	reconstruction?	103				
1.4.6	How are the results of the investigation kept?	Electronic data, Hard copy, Others : N/A				
1.5	Safety management					
1.5.1	Is there a safety and hygiene organization?	Yes No				
1.5.2	Is there a safety operation manual?	Yes No				
1.5.3	Are safety protection tools used?	Yes No N/A				
1.5.4	Are warnings displayed on the dangerous parts of	Vac No				
	the facilities?	ies No				
1.5.5	Is education and training being given for health	N				
	and safety ?	ies <u>No</u>				
1.5.6	Is there a risk management manual?	Yes No				
1.6	About the organization which carries out work					
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 Subcontract				

2	Summary of relay pumping station	
2.1	Basic data of facilities	
2.1.1	Is there a general layout plan showing all	
	equipment and machinery?	Yes No Others :
2.1.2	Is there a log book for equipment?	Yes No Others :
2.2	Inspection of facility and equipment	
2.2.1	Are there check records for equipment?	Daily report: Yes No. Monthly report: Yes No. Annual report: Yes No
2.3	History	
2.3.1	Is there any record of breakdown , repair, and reconstruction of facilities?	Yes No Others :
2.4	Management of planned facilities	
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 Manufacturer manual No
2.4.3	Are there plans for repair, rehabilitation and reconstruction?	Yes No
2.4.4	Are there education and training plans for the staff ?	Yes No
2.5	Safety management	
2.5.1	Is there a safety and hygiene organization?	Yes No
2.5.2	Is there a safety operation manual?	Yes No
2.5.3	Are there safety protection tools?	Yes No
2.5.4	Is there indication or warning on dangerous parts of the facilities?	Ves No
2.5.5	Are education and training in health and safety implemented?	Yes No
2.5.6	Is there a risk management manual?	Yes No
2.6	About the organization which carries out work	
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 Subcontracted work

	Cover sheet						
	Please fill in the fields below. Attach additional she	ets if necessary.					
1	Name of state	Utter Pradesh					
2	Name of city/town	Allahabad					
3	Name of respondent						
4	Department						
5	Name of plant						
07	Address						
0	Audress Dhona number						
9	F-mail address						
Т	Status of Sewerage facilities and O&M						
-	Answer as indicated on the right side related to the	ir operation and m	aintenance				
	of severage facilities. Attach additional sheets if ne	n operation and m	annenance				
1	Summary of sewers and channels	cessary.					
11	Collection system						
1 1 1	Type of collection system	Separate system	n	Combined	system	A part is co	mbined system
1.1.1	History of sower use	Separate system	<u>,</u>	Comonica	system	Apartiseo	momed system
1.2	Server record book or log book	Vac	No				
1.2.1	Sewer record book or log book	Drawings	INO		Others		
122	Life of oldest sewer pipe	Diawings	100	vears	otilers		
1.2.2	Materials of pipes	Hume concrete	nines	years	Others		
123	Type, number and arrangement of manholes	kinds: Brick	RCC+Stee	1	others	Number	set up: N/A
1.2.3	Size of sewers and channels		Diameter:	150	inch to	62.93	inch
	Size of sewers and chamiers		Diameter.	- 150	mm×	02.95	- mm to
				—	mm×	—	- mm
1.3	Sewer network	<u>.</u>					
1.3.1	Is there a manual for sewer network inspection?	Yes 🤇	No>				
1.3.2	Are there drawings of existing sewer network?	Yes	No				
1.3.3	Inspection procedure		Visually,	—		by TV camera	a
	1 1		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	Chech with	h GM Ia	lkal Vihao	
		103	110	Cheen with	1 0101 34	ikui vibug	
1.3.6	How are the results of the records kept?	Electronic data	l,		I	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	C l		NT/A
1.3.9	About direct work and subcontracted work	Direct work			Subconti	racted work	IN/A
1.4	Repair, Rehabilitation, Reconstruction						
1.4.1	Is there a manual for repair, rehabilitation,	Yes	No	N/A			
	reconstruction of sewers and channels?						
1.4.2	If Yes, is it used?	Yes	No	N/A			
1.4.3	Are there plans for repair, rehabilitation and	Yes	No	N/A			
	reconstruction of existing sewer network?	105	110	1011			
1.4.4	Have repairs, rehabilitation and reconstruction	Vac	No	N/A			
	been implemented?	105	NO	11/74			
1.4.5	Are there records of repair, rehabilitation and	Vac	No	NI/A			
	reconstruction?	105	INO	IN/A			
1.4.6	How are the results of the inspection kept?		Η	Electronic d	ata, I	Hard copy,	
	x x	Others :		N/A			
1.5	Safety management						
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			
153	Are safety protection tools used?	Yes	No	N/A			
1.5.5	Are warnings displayed on the dangerous parts of	105	110				
1.5.1	the facilities?	Yes	No	N/A			
155	Is advention and training being given for health						
1.3.3	and conferry 2	Yes	No	N/A			
1 ~ ~		Va-	No	N/A			
1.5.6	Is there a risk management manual?	res	INO	1 N /A			
1.6	Urganization	N 7/4				***	
1.6.1	Management organization	N/A	Manager:		persons	Worker	persons
1.0.2	working time	IN/A N/A Maint	FIOM	rohekili	otion	and	raconstruction
1.0.5	About work mode	IN/A Mainte	mance,	renabilit	Subcont	anu	N/A
1.0.4	AUOUL WOLK HIDUE	1 mougn perm	anent work	515	JUOCOIIII	uvt	1 V/ Г 1

2	Relay numping station					
21	Basic data of facilities					
211	Is there a general layout plan showing all	İ				
2.1.1	equipment and machinery?					
	equipment and machinery.	Yes	No	Others :		
212	Is there a log healt for a minmont?					
2.1.2	is there a log book for equipment?	Yes	No	Others :		
22	Inspection of units such as grit chamber, screen	<u>.</u>				
2.2	and other related equipment					
2.2.1	Are there check records for equipment?	Daily rep	ort Yes	No.	Monthly report: Yes	> No.
2.2.1	The more encourceords for equipment.	Annual re	eport Yes	No,		
2.3	History	<u>.</u>				
2.3.1	Is there any record of breakdown, repair, and					
	reconstruction of pumping facilities?	<u>Yes</u>	No	Others :		
24	Plans for facilities	L				
2.4	Is there a schedule for operating equipment of the	[
2.4.1	numping station?	Yes (mar	nufacturer comp	ilation, Oth	ers),	No
	pumping station:					
2.4.2	Is there an operation manual?	Yes	No			
2 4 2	And there also for a second match illusting and					
2.4.3	Are there plans for repair, renabilitation and	Yes	No			
244	Are there, education and training plans for the					
2.4.4	staff 2	Yes	No			
25	Stall :	<u>.</u>				
2.5	Safety management	Vac				
2.3.1	Is there a safety operation manual?	Ves	No			
2.5.2	Are there safety protection tools?	Yes	No			
2.5.4	Is there indication or warning on dangerous parts					
	of the facilities?	Yes	No			
255	Are education and training in health and safety		<u> </u>			
2.0.0	implemented?	Yes	No			
2.5.6	Is there a risk management manual?	Yes	<pre>No</pre>			
2.6	About the organization which carries out work	Organizat	tion for entire pl	ants + pum	ping stations in jurisdictio	n.
2.6.1	Implementing system	P	roject Manager:	1	person, Asst.Engineer:	3 persons
		Ass	t.Proj.Engineer:	6	persons unior Engineer:	3 persons
			Operator	: 12	persons,	
2.6.2	Working time		From		to 3 Shift	
2.6.3	Work content	Investigation	, Maintenance	C "rep	air, <u>rehabilitatio</u>	n and
2.6.4	About direct work and subcontracted work	Direct wo	ork	<	Subcontracted work	>

Cover sheet Please fill in the fields below. Attach additional sheets if necessary. Karnataka Bengaluru 1 Name of state 2 Name of city/town 3 Name of respondent 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	1 Summary of sewers and channels					
1.1	Collection system					
1.1.1	Type of collection system	Separate system Combined system A part is combined system				
1.2	History of sewer use	4				
121	Sewer record book or log book	Yes No				
1.2.1	Sewer record book of log book	Drawings Others				
122	I ife of oldest sewer nine	6 years (Mailasandra STP)				
1.2.2	Elle of oldest sewer pipe	(Vialiasalula 511)				
		8-10 years (Cubbon Park STP)				
	Materials of pipes	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				
1.3	Sewer network	4 000				
131	Is there a manual for sewer network inspection?	Yes No				
132	Are there drawings of existing sewer network?	Yes No				
133	Inspection procedure	(Visually) by TV camera				
1.0.0	inspection procedure	Others ·				
134	How has the result of the inspection been used?	Repairing and cleaning				
13.4	Are there check records for sewer and manhole?					
1.5.5		Yes No				
136	How are the results of the records kent?	Electronic data Hard conv				
1.5.0	now are the results of the records kept?	Others : N/A				
1 2 7		Unlers. IVA				
1.3.7	Is there a pipe cleaning plan?	Yes No				
1.3.8	Are there records for pipe cleaning ?	Yes No				
1.3.9	About direct work and subcontracted work	Direct work Subcontracted work N/A				
1.4	Repair, Rehabilitation, Reconstruction					
1.4.1	Is there a manual for repair, rehabilitation,	V V				
	reconstruction of sewers and channels?	Yes No				
142	If Yes, is it used?	Yes No N/A				
143	Are there plans for repair, rehabilitation and					
1.1.5	reconstruction of existing sewer network?	Yes No				
	reconstruction of existing sewer network:					
1.4.4	Have repairs, rehabilitation and reconstruction	Yes No N/A				
	been implemented?					
1.4.5	Are there records of repair, rehabilitation and	Yes No N/A				
	reconstruction?					
1.4.6	How are the results of the inspection kept?	Electronic data, Hard copy,				
		Others : N/A				
1.5	Safety management					
151	Is there a safety and health system?	Yes No Only some guidelines are provided				
152	Is there a safety operation manual?	Vac No Only some guidelines are provided				
1.5.2	is there a safety operation manual:	Tes No only some guidennes are provided				
1.5.3	Are safety protection tools used?	<u>les</u> No				
1.5.4	Are warnings displayed on the dangerous parts of	Yes No				
	the facilities?	\smile				
1.5.5	Is education and training being given for health	Ves No Only contractor provides training to its staff				
	and safety ?	Tes Only contractor provides training to its start				
1.5.6	Is there a risk management manual?	Yes No				
1.6	Organization					
1.6.1	Management organization	Manager(Only from Board): 5persons (Mailanna der CTD)				
	• • • • • • • • • • • •	Worker: 6persons (Mailasandra STP)				
		Manager(Only from Board): 2persons (Caller Data COD)				
		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 Subcontract				

2	Relay pumping station	1 Intermediate pumping station (6 years old)	(Mailasandra STP)			
		No intermediate pumping station, only terminal PS	(Cubbon Park STP)			
2.1	Basic data of facilities					
2.1.1	Is there a general layout plan showing all	Yes No Others :				
2.1.2	Is there a log book for equipment?	Yes No Others :				
2.2	Inspection of units such as grit chamber, screen	******				
	and other related equipment					
2.2.1	Are there check records for equipment?	Daily report Yes No, Monthl	y report: \underbrace{Yes} No,			
		Annual report: Yes No, (Power	consumption, oil&grease, etc.)			
2.3	History	·				
2.3.1	Is there any record of breakdown, repair, and	Yes No Others:				
	reconstruction of pumping facilities?					
2.4	Plans for facilities	,				
2.4.1	Is there a schedule for operating equipment of the	V. (manufacture consilition Others)				
	pumping station?	(manufacturer compliation, Others),	impliation, Others), No			
2.4.2	Is there an operation manual?	Vec No Manual for equipn	oment (pump, motor, valves)			
		supplied by manuf	acturer			
2.4.3	Are there plans for repair, rehabilitation and	Yes No				
	reconstruction?					
2.4.4	Are there education and training plans	Yes No				
	for the staff ?					
2.5	Safety management	·				
2.5.1	Is there a safety and hygiene department?	Yes No				
2.5.2	Is there a safety operation manual?	Yes No				
2.5.3	Are there safety protection tools?	<u>Yes</u> No				
2.5.4	Is there indication or warning on dangerous parts	Yes No				
	of the facilities?					
2.5.5	Are education and training in health and safety	Yes No Contractor Provide	es			
250		Vac No				
2.5.0	Is there a risk management manual?	Tes <u>No</u>				
2.0	About the organization which carries out work	Managar Inerson				
2.0.1	implementing system	Worker 6-7persons	(Mailasandra STP)			
		(Excluding contractors staff)	(Wallasalura 511)			
		Taken care by STP staff members				
		(Excluding contractors staff)	(Cubbon Park STP)			
262	Working time	Ecom to 2 shifts				
2.6.3	Work content	Investigation Maintenance "repair rehabilita	tion and reconstruction"			
2.5.5	About direct work and subcontracted work	Direct work Subcont	racted work			

Cover sheet

	Please fill in the fields below. Attach additional shee	ets 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.					
1	Summary of sewers and channels					
1.1	Collection system					
1.1.1	Type of collection system	Separate system Combined system A part is combined system				
1.2	History of sewer use					
1.2.1	Sewer record book or log book	Yes No				
	Ũ	Drawings Others				
1.2.2	Life of oldest sewer pipe	From 1914				
	Materials of pipes	Hume concrete pipes Others Stoneware pipe and C.I.pipes				
1.2.3	Type, number and arrangement of manholes	kinds:Rectangular, Circular Type Number set up: 79737				
	Size of sewers and channels	Diameter: 150 mm to 600 mm, Gravity				
		pumping 1200 mm mm				
		mm× mm				
1.3	Sewer network					
1.3.1	Is there a manual for sewer network inspection?	Yes No				
1.3.2	Are there drawings of existing sewer network?	Yes No				
1.3.3	Inspection procedure	Visually by TV camera				
	I I I I I I I I I I I I I I I I I I I	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?					
		Yes No				
1.3.6	How are the results of the records kept?	Electronic data.				
1.0.0		Others :				
137	Is there a pipe cleaning plan?	Yes No				
138	Are there records for pipe cleaning?	Yes No				
139	About direct work and subcontracted work	Direct work				
1.5.7	Repair Rehabilitation Reconstruction					
1/1	Is there a manual for repair, rehabilitation					
1.4.1	is there a manual for repair, renaomination,	Yes No Based on CPHEEO manual				
	reconstruction of sewers and channels?					
1.4.2	If Yes, is it used?	Yes No				
1.4.3	Are there plans for repair, rehabilitation and	Ves No				
	reconstruction of existing sewer network?					
1.4.4	Have repairs, rehabilitation and reconstruction					
	been implemented?	Yes No				
145	Are there records of repair, rehabilitation and	\frown				
11110	reconstruction?	Yes No				
116	How are the results of the inspection kent?	Electronic data Hard conv				
1.4.0	flow are the results of the hispection kept?	Others :				
15	Safaty managamant	Ouers.				
1.5	Is there a sofety and health system?	V N-				
1.5.1	is there a safety and health system?	res No				
1.5.2	Is there a safety operation manual?	Yes No				
1.5.3	Are safety protection tools used?	<u>Yes</u> No				
1.5.4	Are warnings displayed on the dangerous parts of	Vec				
	the facilities?					
1.5.5	Is education and training being given for health					
	and safety ?	Yes No				
156	Is there a risk management manual?	Ves No For floods				
1.5.0	Organization					
161	Management organization	Manager: persons Worker: persons				
1.0.1	Working time	$\frac{1}{1}$				
1.0.2	Work content	I TOTIL 0.30 10 10.30 5 SIIII				
1.0.5	About work mode	Through permanent workers Cubcontract				
1.0.4	AUUUL WUIK IIIUUL					

2	Relay numping station						
21	Basic data of facilities						
211	Is there a general layout plan showing all	T					
2.1.1	equipment and machinery?						
	equipment and machinery.	Yes	No	Others :			
212	Is there a loop heads for a minmant?						
2.1.2	is there a log book for equipment?	Yes	No	Others :			
22	Inspection of units such as grit chamber, screen	<u>i</u>					
2.2	and other related equipment						
221	Are there check records for equipment?	Daily re	mort Yes	No	Monthly rep	ort Ves	No
2.2.1	The more check records for equipment.	Annual	report: Yes	No.	wionuny rep	ort. <u>103</u>	110,
2.3	History	, / IIIIdui	100011. 105	,			
231	Is there any record of breakdown repair and						
2.0.1	reconstruction of pumping facilities?	Yes	No	Others :			
24	Plans for facilities	i					
2.4	Is there a schedule for operating againment of the	1					
2.4.1	numping station?	Yes	(manufacturer co	ompilation,	Others),	No	C
				-			
2.4.2	Is there an operation manual?	Yes	No				
		\smile					
2.4.3	Are there plans for repair, rehabilitation and	Yes	No				
2 4 4	reconstruction?						
2.4.4	Are there education and training plans	Yes	No				
2.5	for the staff ?						
2.5	Safety management	\sim	N				
2.5.1	Is there a safety and hygiene department?	Ves	NO				
2.5.2	Are there a safety operation manual ?	Vac	No				
2.3.5	Are there indication or warning on dangerous parts		INU				
2.3.4	of the facilities?	Yes	No				
255	Are advantion and training in health and safety						
2.5.5	implemented?	Yes	No				
256	Infinitemented :	Vec	No				
2.5.0	About the organization which carries out work	H T Re	lav Pumping Stati	ion Purasay	valkam		
261	Implementing system	In In	charge engineer:	1	person	Operator:	4 persons
2.0.1	inplementing system		Electrician:	1	person.	Driver:	1 person
		• •••••••	Field worker:	6	persons,	211101	
2.6.2	Working time	<u>.</u>	From		to on sh	ift basis	
2.6.3	Work content	Investigatio	on, Maintenance	"repair, r	ehabilitation	and reconstr	nction >>
2.6.4	About direct work and subcontracted work	Direct worl	\triangleright	<	Subcontracte	d work	