

**DRAFT POLICY
FOR RE-USE OF TREATED WASTE WATER**

Government of Haryana

1 PREFACE

Water is by far the most important natural resource on Earth to sustain all forms of life. The availability of water is undoubtedly of paramount importance to sustain all types of economic activities in a State. However, water is a limited resource and needs to be used judiciously.

Haryana State has a total geographical area of 44,212 Sq Km and occupies 1.3 % of the total geographical area of the country. Brackish water is the bane of the State and nearly 60% of the ground water in Haryana is brackish and unfit for human consumption. Besides, there is an imbalance in distribution of water across the State with the Northern part having access to water in plentiful whereas the situation is quite precarious in the Southern part of the State. Water supply in Haryana is made available through a network of canal system and from ground water. The WJC supplies water to the districts of Panipat, Sonapat, Rewari, Rohtak, Bhiwani, Dadri, Jind and Jhajjar whereas the Bhakra Main Line canal feeds the districts of Hisar and Sirsa. The districts of Haryana covered under the Sub-regional plan have no perennial river. The ground water levels in Haryana range from 4 – 16.3 m bgl and the decline in ground water levels ranges between 1 – 0.6 m/annum. However, some districts have also shown a rise in ground water levels with the maximum rise being 0.5 m/annum. The declining ground water tables lie in Gurgaon, Panipat and Faridabad, while Rewari has shown increase in ground water levels even though its ground water table is deepest in the state.

The water resources, in particular, are constrained in the districts of Mohindergarh, Rewari, Mewat and Gurgaon . The problem is further accentuated with the deterioration in the quality of water due to the incidence of high fluorides as well as presence of Total Dissolved Solids in some parts of district Faridabad, Gurgaon, Mewat, Palwal, Sonipat and Mohindergarh.

The State is therefore, witnessing the presence of a large portion of water stressed and water parched areas, particularly in the Southern part of the State.

There are 83 notified towns in the State of Haryana with a population of 54,40,172 persons as per 2011 Census population. At present, 132 STPs have been installed by PHED/HSVP/ULBs having a collective capacity of 1642 MLD. The treated unused water from these STPs is being discharged into the nearby drains/canals and other water bodies. It is a travesty of circumstances that on the one hand the surface and ground water resources are highly stressed and depleting fast whereas on the other hand the treated unused water is being allowed to go waste without any purposeful application. It is therefore imperative that a meaningful and tangible

action plan is formulated to harness and channelize the treated unused water so as to bridge the gap between demand and supply, to the maximum possible extent.

2 NECESSITY FOR POLICY ON REUSE OF TREATED USED WATER

Keeping in view the limited availability of water resources in the State and also issues relating to quality of water, it is imperative to lay emphasis on management of water resources. The ground water is also highly stressed on account of indiscriminate tapping of the ground water aquifers by multifarious agencies whereas the recharge in contrast is insignificant. The State is making best possible efforts to optimize the utilization of the water resources and a number of measures are perpetually being taken to provide rain water harvesting structures and ground water recharging techniques. However, notwithstanding the efforts of the Government, the portents are ominous and in case a tangible perspective action plan is not drawn to conserve the water resources, the position would further exacerbate.

The need of the hour is therefore to consider the fast increasing municipal treated unused water as a potential water resource which can suitably be put to effective use particularly for non-potable purposes. This will go a long way in de-stressing the ground and surface water resources and would, to some extent, result in attenuation of the existing water imbalances.

At present, the existing untreated or partially treated or treated water finds its way into streams, ponds, drains or other depressions resulting in pollution of the water bodies and resultantly endangering the environmental safety and ambience. Besides, this unused water also percolates into the sub-soil strata causing contamination of the ground water regime and thus resulting in a potential threat to the health of the public.

Though the concept of recycling of waste water was introduced years back but this practice is being followed/adopted in isolation and is rather insignificant. The acceptability levels of this concept are abysmally low and people are still hesitant and apprehensive to adopt the concept of treated unused water as a water resource even for non-potable applications. As a result of the poor response, the performance of the existing STPs has become tardy as the operators or local bodies /implementing agencies have no incentive and moreover in the absence of no buyer of the treated unused water, the accountability of the operators has severely diminished. It is in this context that the promotion of treated unused water assumes paramount importance and immediate measures are required to be taken for roping in user groups with large stakes.

Besides relieving the pressure on the dwindling water resources, the reuse of TUV would help in generating significantly high revenues which could partly meet with the operation and maintenance costs of the STPs and eventually bring about a perceptible improvement in their functioning and performance. The pricing of TUV therefore needs to be based on a well-established fundamental of cost recovery to the maximum possible extent.

3 STATUTORY AND POLICY FRAMEWORK

The reducing trends of the water resources have caught the attention of the Planners, Engineers and Policy makers, over the years and the concept of waste water recycling and reuse has unanimously been found to be the most plausible and feasible solution to partly arrest the shrinkage of the precious resource. Thus, this concept forms an integral part of all water supply and Waste Management programmes and is recognized by almost all policy frameworks in the country. This policy has therefore been framed keeping in view the provisions in the Constitution of India and related State and Central statutes and policies which find mention in Annexure-1.

4 VISION

“The policy envisages maximizing the collection of sewage and its treatment and reusing the treated unused water increasingly for non-potable applications thereby reducing the dependency on the limited ground and surface water resources: and to eventually promote treated unused water as an economic resource to meet with part capital as well as operation and maintenance cost of sewage treatment for

enhanced performance.”

5 OBJECTIVES

The policy lays down the following objectives:

- i) To attain a minimum coverage of 80% of the area with sewerage facilities and collection of sewage in all the 83 towns in the State.
- ii) To attain a level of 100% treatment of collected sewage as per prescribed standards so that treated effluent has BOD and TSS level below 10 mg/l.
- iii) To reuse at least 25% of the treated unused water by every Municipality within the time frame set under the policy by every municipal body.
 - To reuse 60% of TUW by 2025
 - To reuse 100% TUW by 2033
 - To reuse 50% TUW generated in the rural areas under the Maha Gram scheme by 2033.

6 IMPLEMENTING TIMELINES

At present, the stage of development of infrastructure for collection and treatment of sewage varies from town to town and accordingly the timeframe for achieving the envisaged goals in the policy cannot be uniform but would have to be staggered so as to have a realistic and pragmatic approach. Accordingly, the time frame for various Municipalities and villages to be covered under the Maha Gram scheme can be categorized as under:

Sn	Existing status of development in the town	Target	Maximum duration for implementation of reuse of treated unused water
1	Sewerage system and STP exists	Minimum of 25% of treated unused water for reuse or Present treated outflow from functional STP	1 Year
2	Sewerage system but STP is not available	Minimum of 25% of treated unused water for reuse or Treatment capacity of proposed STP(s)	9 months from the date of start of the operation of STP
3	No Sewerage system and no STP	Minimum of 25% of treated unused water for reuse or	4 years

		Treatment capacity of proposed STP(s)	
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Sn	Existing status of development in the Village under Maha Gram	Target	Maximum duration for implementation of reuse of treated unused water
1	No Sewerage system and no STP	Minimum of 25% of treated unused water for reuse or Treatment capacity of proposed STP(s)	4 years

Concomitant to the implementation of the policy, the additional infrastructure for collection and treatment of sewage in the towns will continue to be developed in the towns/villages as per requirement by the different implementing agencies and depending on the availability of financial resources.

The infrastructure to be constructed/ strengthened in the future shall inter-alia cover the following:

- a) Extend/strengthen the sewerage network, in a phased manner.
- b) Increase the existing capacity of the STPs and construct new STPs which at present do not have sewage treatment facilities. Besides, existing STPs, wherever required, maybe up graded suitably with the addition of functional components so that the characteristics of treated effluent fall within the latest prescribed norms laid down by HSPCB.

7 POLICY CONSIDERATIONS

The policy is conceived on the following premises:

7.1 Ownership of TUW

The prime responsibility for treatment, reuse and recycling of treated unused water will lie with Public Health Engineering Department (PHED). Accordingly, planning and creation of infrastructure, of adequate capacity, for collection and treatment of municipal wastewater as well as infrastructure for reuse of treated unused water would be the responsibility of PHED, depending on availability of funds. However, the State Government will seek to augment the available financial resources by tapping various avenues, through persistent efforts.

HSVP/ULBs will also utilize their financial resources for up gradation of the existing infrastructure and construct Sewage Treatment Plants in the uncovered towns/areas. However, PHED shall coordinate and consolidate/collate the entire data of the State.

The economic rights on the TUW shall reside with the respective local body. The economic rights include any economic activity generated downstream due to supply of TUW in water bodies such as streams, rivers, canals, lakes, etc. However, the guidelines under this policy will be followed by all local bodies wherever the financial assistance from state/central government is extended to local body for the purpose.

7.2 Prevention of contamination of other sources of water

TUW shall meet all the statutory quality standards. Stringent quality standards will be adopted such that it does not contaminate other sources of water-surface as well as ground water. This drastically impacts the cost of treatment of fresh water.

The policy for regulation of use of treated unused water, if considered expedient, divide the state into multiple zones according to geographical and hydrological characteristics and forecast of the different uses in wastewater, with each sub-region subject to different reuse standards.

Treated wastewater quantity and quality are interlinked and need to be managed in an integrated manner, consistent with overall catchment area management and ecological sustainability of the receiving water body.

7.3 Consider TUW as an additional source of water

TUW adhering to prescribed water quality norms shall be used for meeting the demand for non-potable uses, as an additional source of water. Both industry and agriculture can use treated unused wastewater. Guidelines shall clearly mention the standards of treated wastewater quality and there shall be no compromise in the quality of treated unused water to be supplied for non-potable purposes.

7.4 Promote TUW as an economic resource

TUW shall be considered as an economic commodity and used to generate additional resources which shall be expended primarily for creation of new infrastructure or strengthening existing infrastructure required for sewage collection, treatment and distribution for reuse, besides paying for fresh water resources.

7.5 Develop Sewage Treatment Projects on a financially sustainable basis

The pricing mechanism of TUV shall be based, as far as possible, on the principle of recovery of costs incurred for collection and treatment of municipal sewage and distribution of TUV for reuse, in order to ensure sustainability of the projects. Corporatization of services providers and the establishment of a strong state level regulator responsible for the whole TUV chain and setting tariffs across the whole spectrum of water users can enable substantial cost recovery through tariffs for most of the water infrastructure and services.

7.6 Reuse of domestic wastewater of Industrial units

Industrial establishments shall treat domestic wastewater generated within their premises and reuse it for appropriate non-potable applications. However, the industrial effluent shall be collected and treated separately and disposed as per prevailing standards prescribed by CPCB/HSPCB.

8 MANDATE OF USE OF TUV

This policy has been designed with the primary principle of utilizing TUV to substitute fresh water. However, suitability of TUV shall be considered prior to its allocation for substituting the fresh water supply for any application. While substituting fresh water with TUV, necessary care shall be taken that TUV is not mixed with or used with potable water.

TUV shall be mandated for use for different class of users depending on its availability. It shall be the State's endeavor to use the available TUV to the maximum, but not less than the milestones prescribed in Implementation Timeline. With the subsequent increase in sewage collection, efficiency and treatment capacity, the available TUV shall be utilized using the same principles.

8.1 Non Potable Use

8.1.1 Mandatory Use

8.1.1.1 *Thermal Power Plants*

It shall be mandatory for all Thermal Power Plants within a 50 km radius of the STP or city limits to use TUV.

8.1.1.2 *Industrial Units*

It shall be mandatory for all Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) estates, all Industrial units in Special Investment Region (SIR) Industrial Parks and large industrial units consuming more than 100 KLD of fresh water for non-potable purposes, and which are situated within a 50 km radius of the STP or city limits to use TUV. However, it shall not be mandatory to use TUV wherever there

is threat for direct exposure to humans or the water is used in processes resulting in products for human consumption.

8.1.2 Mandatory on fulfilling certain conditions

8.1.2.1 Construction activities

The concerned local body/implementing agency shall

- a. Provide facility of supplying TUV to construction sites through tankers/lorries against a fixed, pre-determined charge. Locations for setting up filling stations for TUV in tankers/lorries shall be developed after assessment of the demand at local level.
- b. Lay special supply lines for TUV in developing areas/new localities, if found feasible
- c. Stop supply of fresh water, once the above infrastructure is functional and found satisfactory by the user.
- d. However, it shall be ensured by the Local Bodies or PHED, in case the STP has been constructed to treat village waste water, that the treated unused water meets the norms prescribed by HSPCB, for reuse of recycled water, at all times. In case the standards of treated unused water are found to deviate from the prescribed norms or are found to be suspect, the supply of such treated unused water shall be stopped immediately and till such time that the deficiency is removed/rectified.

8.1.2.2 Dual water supply system in Houses/Offices/Business Establishments

Dual water supply shall be provided, with two separate distribution systems, independent of each other, one for potable water supply and the other for supplying treated unused water. The recycled water shall be utilized for flushing and watering the lawns/gardens.

Every home /office/Business Establishment shall have access to two water pipelines. However, since the laying of reclaimed water transmission and distribution lines and dual plumbing by existing users/retro-fitting of a developed urban area will be expensive and disruptive, it is therefore, important that only new townships and new Planned Developments should be covered under the dual system. Area where dual system is proposed in future shall be notified.

It shall be the responsibility of the State Government/Colonizer/Developer to supply adequate quantity of treated unused water for flushing in areas where dual system has been notified. In case of any deficiency in the availability of treated unused water or proper quality of treated unused

water is not maintained as per prescribed norms for any reason, whatsoever or the availability in terms or quantity or quality is restricted temporarily, potable water shall be supplied to make up the deficit till such time that the matter is resolved fully.

However, irrespective of immediate availability or non-availability of treated unused water, every owner of a house/apartment of a flat, Group Housing Society, Commercial Complexes and Institutional buildings in area/areas notified for dual plumbing system, shall follow the dual plumbing system so as to receive treated unused water separately from a different piping system. The prospective user shall make the necessary arrangements for storage and pumping of the treated unused water for the purpose of flushing etc.

The following precautions shall have to be taken for use of treated unused water in dual plumbing system:

- Re-cycle water pipes, fittings, appurtenances, valves, taps, meters, hydrants shall be of red colour or painted red.
- Signs and symbols signifying and clearly indicating “treated unused water not fit for drinking” will be stamped/fixed on the outlets, hydrants, valves, both surface and sub-surface, covers and at all conspicuous places of re-cycled distribution system.
- Detectable marker tapes of red colour bearing the words “re-cycled water” shall be fixed at suitable intervals on pipes.
- Octagonal covers, red in colour or painted red with the words “ Re-cycled- not fit for drinking” embossed on them shall be used for re-cycled water.
- All connections from the re-cycled system shall be distinguishable from connections of potable water supply pipelines.
- No cross-connections shall be made or allowed to be made between the re-cycled water and potable water supply system.
- In case re-cycled water supply is required to be supplemented with potable water, this arrangement shall be made at the boosting station of a sector/area.

8.1.2.3 Large commercial or institutional users

Local body/PHED shall make an endeavor to create conveyance network for supplying TUV to institutional areas, business districts or areas having large number of such users to cater to their need. If TUV is made available, such users do not require constructing their own

STPs. In such a situation, it shall be mandatory for such users to use TUV for toilet flushing, gardening, fire hydrant system, etc.

8.1.2.4 Municipal uses

It shall be mandatory for Municipal Corporations/Municipalities/Wards/Gram Panchayats to use TUV for the following applications, once the infrastructure for supplying TUV is functional in their administrative boundaries.

- Maintenance of parks, gardens and developing landscaping
- Rejuvenation of ponds, lakes, stream and rivers.

It should be noted that the quality parameters for TUV shall be designed in consultation with experts as a preventive measure against risk of harm to aquatic ecosystem as well as ground water contamination.

- Water supply for emergency purposes like fire brigade, etc.

8.1.2.5 Other non-potable uses

Local bodies/PHED/Irrigation & Water Resources/HSIIDC shall identify other potential users, who can use TUV in some or all of their applications. Use of TUV shall be made mandatory for these users and supply of fresh water shall be restricted only for potable purposes.

8.1.3 Agriculture/Irrigation

TUV shall be used for agriculture/irrigation purposes provided surplus quantity is available after meeting the demands of the above mentioned uses. The Irrigation & Water Resources shall develop a suitable water grid for distribution of the treated unused water from the STP located in the vicinity for irrigation of the fields. However, prior to allocation of TUV for agriculture/irrigation purposes in any area, soil hydraulic tests for those areas, water requirement for the crops/vegetation in the respective areas and water quality of irrigation water to be used in those respective areas, according to these tests should be computed. This water quality shall be considered as a baseline for using TUV for agriculture/irrigation in these areas. In any case, the Total Dissolved Solids (TDS) concentration in the TUV shall not exceed 1800 mg/l and Sodium Adsorption Ratio (SAR) values shall be maintained at least between 10 – 18 and never exceed 26 in any case, as prescribed by CPCB. Similarly, Boron concentration should not exceed 2 mg/l. Regular water quality monitoring will have to be carried out if TUV is used for irrigation/agriculture. Disinfection for ensuring complete control of coliforms shall be undertaken.

8.2 POTABLE USE

Considering social sensitivities and public perception towards treated unused water, presently it shall not be used for potable purposes and uses which involve direct human contact. However, in future, with increase in water demand, advancements in treatment technology, competitive rates and change in public perception, T UW may be used for potable purposes.

9 ALLOCATION OF WATER

9.1 Availability of T UW

The Local Body shall declare availability of T UW within 3 months of the notification of the policy and thereafter on the 1st January and 1st July of every year. This information shall be accompanied by details of both quantity and quality of treated unused water besides location of STPs where T UW is available.

PHED/HSVP/HSI IDC shall provide the complete data relating to their respective Departments to the ULB by 15th December and 15th June so as to enable ULB to consolidate the information for the entire State.

Similarly, the PHED, at the appropriate time, after significant infrastructure for sewage treatment has been constructed in the Maha Gram villages shall commence to declare availability of T UW on the 1st January and 1st July of every year. This information shall also be accompanied by details of both quantity and quality of treated unused water besides location of STPs where T UW is available.

9.2 Application by user

All the prospective water users who are consuming more than 100 KLD of water including industrial clusters shall apply on a central portal indicating their water requirement of water. All new applicants shall also follow similar procedure.

9.3 Allocation of water

Keeping in view the availability of T UW, the SLHPC shall allocate T UW in the following manner:

9.3.1 *Where availability of T UW is more than the demand*

In case the availability of T UW is more than demand, then all the mandatory users will be provided with the required quantity of T UW. After the demand of these mandatory users has been met with, the other users or other

mandatory users outside the supply zone (50 Km distance) can be allocated the remaining treated unused water. This balance TUV shall however be decided by the SLHPC.

9.3.2 *Where availability of TUV is less than the demand*

In case the availability of TUV is less than the demand, the TUV shall be provided to the users proportionally or in such a way as maybe decided by the State Government.

9.3.3 *Where there is no availability of TUV*

The State Government will make efforts to create new/additional infrastructure for collection and treatment of sewage so as to generate treated unused water. Fresh water shall continue to be supplied to the users till such time treated unused water can be made available.

9.4 Discontinuation of existing fresh water supply

The existing fresh water supply shall be discontinued within a period of one year of TUV supply. However, before the fresh water supply is discontinued, it shall be ensured by the Local Bodies/PHED that the arrangements for supply of TUV to the users are satisfactory and the quality of the treated unused water meet the existing norms prescribed by CPCB/HSPCB or amendments issued from time to time.

9.5 Enforcement for use

Enforcement for use shall be enforced by Irrigation & Water Resources/PHED which gives permission or supply of fresh water to users. Besides, the mandatory users shall not be given allotment of fresh water/reservation of fresh water except as per provisions in the policy. Further, the existing allotment/reservation of fresh water shall stand cancelled within one year from the date of TUV being made available after ensuring that the arrangement of supply of TUV to the user(s) is satisfactory.

10 ENVIRONMENTAL ASPECTS

The development of projects would take into account all environmental aspects, while selecting method of treatment, storage of wastewater and sludge management. Effective procedures will be put in place to adequately factor in environmental and social opportunities and concerns during all stages of reuse of TUV projects. A robust monitoring system shall be developed for analysis of wastewater quality on a regular basis, with check points in place to identify any deviations from compliance and remedial actions for the same.

10.1 Quality Standards and treatment norms

The treatment system for municipal wastewater shall be designed so as to achieve the norms of water quality prescribed by CPCB or HSPCB, whichever are stringent, as per the latest amendments and notifications. However, the Government shall have the prerogative to make more stringent norms for ensuring a better effluent water quality, should it choose to do so.

The concentration of BOD₅ and Total Suspended Solids (TSS) shall be less than 10 mg/l for supply of TUV to users except for water used for rejuvenation of water bodies or used in agriculture/irrigation. Bio-assay test should ensure 90% survival of fish after 96 hours in 100% treated effluent. If the TUV is being used for rejuvenation of water bodies, especially lakes or ponds, then Dissolved Oxygen levels of TUV should at least be above 6 mg/l. Further, phosphate and nitrate concentrations should be regularly checked so as to eliminate the risk of eutrophication or dense growth of plant life in water bodies due to excessive richness of nutrients.

If a user requires TUV of a better quality, the treatment for achieving the same shall be done by the respective user at his end. The decision to upgrade the wastewater treatment system, to produce better quality TUV lies with the Government, should it deem so useful, owing to higher demand centres for TUV of better quality. In such circumstances, the costs incurred as capital investment as well as charges for operation and maintenance for the upgraded treatment units shall be added to the TUV cost and shall be borne entirely by the users.

10.2 Technology options

A critical area in the planning process of a wastewater treatment system is the identification of an appropriate treatment technology (set of unit processes) which is not only techno-economically feasible, but also robust and simple to operate and maintain at a comparatively lower cost. The treatment system should be able to provide treated water adhering to the prescribed norms throughout its life with Standard Operation Procedures (SOPs) in place for Preventive Maintenance and evaluation of treatment efficiency.

Technologies for wastewater recycling can be categorized based on wastewater characteristics, anticipated flow rates, effluent discharge standards/norms, areas of use for recycled water, location of the plant, etc. Chapter 7 of Part A of Manual on Sewerage and Sewage Treatment systems (2013), CPHEEO discusses in detail the different type of treatment technologies suitable under different conditions. The manual also provides details on the design considerations and operating requirements for a variety of technologies which will be suitable to produce treated water appropriate for specific uses. The selected technology shall treat water to the extent of not only meeting the policy/norms, but also make

it suitable for direct utilization by the users mentioned in the policy, as far as possible.

The policy while suggesting use of conventional treatment technologies, does not restrict the exploration of innovative technologies developed by IITs/NEERI or any other credible organization having experience in the domain of water and wastewater management. However, when designing the tertiary treatment system for treating municipal wastewater, technologies, like MBBR, MBR, SBR, etc. which are effective, successful and robust need to be explored. The policy further suggests that the preponderant criteria for selection of appropriate wastewater treatment technology shall include lower land/space footprint, be less energy intensive and have higher efficiency.

11 PREPARATION OF TREATED UNUSED WATER PROJECTS

11.1 Identification and Preparation of projects

11.1.1 Preliminary Information

Information regarding existing infrastructure for sewage collection and treatment shall be collected by local authorities. It would include layout and extent of existing underground sewerage/drainage system, areas not connected to collection system, existing number of treatment plants (STPs) with their locations, treatment technology, capacity and operational efficiency. Also, the local authorities shall make a database of potential users, their locations and quantum of water demand which can be met through TUW.

11.1.2 Identification of viable project

The basis for identification of a project would be the availability of TUW location of potential users, water demands to be met by TUW. Such projects shall be prepared by the TUW Cell and technical approval will be given to the suitable and technically viable projects by the SLTC. The projects which have been technically cleared shall be accorded approval in principle by the SLHPC. Further, the SLHPC shall recommend such project(s) to the State Government for according administrative approval.

11.1.3 Identification of the project with the hydrological unit

Hydrological unit stands for Watershed of the area/ catchment of the water body earlier receiving treated/untreated wastewater, etc. The new projects should effectively reveal the improvement in quality and health of watershed and ecosystem of water bodies.

11.1.4 Preparation of Detailed Project Report (DPR)

If the project is found to be technically feasible and financially viable, then DPR will be prepared. DPR shall include, but not limited to the following:

1. Profile of local body: Location and capacities of existing STPs, treatment technologies and operational framework of STPs, quantity of sewage generated, coverage of collection system, quantity of treated sewage available, quality of treated sewage, etc.
2. Profile of users (within the threshold radius): Type of usage, water quality required, quantity required by each user along with their respective distances from proposed project site.
3. Hydrological Profile of the water body: Watershed delineation, existing quality of the water body (river, stream, pond, lake, groundwater), load assessment, change in water quality due to changes in discharge of treated sewage due to projects. Improvement in quality of the water body should be clearly demonstrated.
4. Plan & Layout of proposed Distribution System: Route to be adopted for laying distribution pipelines for treated unused water, capacity of main distribution header, laying of a water grid for irrigation, sub mains, branch headers, approvals required for right of way, etc.
5. Approximate cost of project.
6. Funding source.
7. Suggestions on implementing agency which can be a Local Body /PHED/Irrigation & Water Resources Department/HSIIDC/HSVP or any other Government agency or an agency on PPP mode.
8. Level and nature of private sector involvement.

A similar methodology as described above shall be adopted for framing DPRs relating to supply of treated unused water from the STPs constructed to treat village waste.

11.2 Approval by SHPC

Based on recommendations of the State Level Technical Committee, the Special Committee shall give in-principle approval for the project and decide the following:

1. Allocation of TUW to different users.
2. Implementing Agency for the project.
3. Financial and management structure of the project.
4. Pricing of TUW

12 PRICING PRINCIPLES

The TUV shall be considered as an economic commodity while determining the price of TUV. The price of TUV shall be determined keeping in view a host of factors such as investment made on developing infrastructure for sewage collection and treatment, quality of treated water supplied, requirement of distribution infrastructure and other social, cultural and business factors.

12.1 Price of fresh water

The price of TUV shall be kept lower than the price of fresh water as notified by the Government from time to time.

12.2 Factors for consideration

While deciding the price of TUV, the SLHPC shall consider the following factors:

- 1 Recovery of part capital and operation & maintenance cost incurred on the distribution network and allied structures for providing TUV.
- 2 Recovery of part operation & maintenance cost of STP.
- 3 Recovery of part capital as well as operation & maintenance cost of providing tertiary treatment, if any at the STP.
- 4 Recovery of part operation & maintenance cost of sewage collection system may also be considered.

12.3 Variation and escalation

The price fixed for TUV shall be for the first year and a suitable price escalation clause shall be incorporated in the agreement to be executed with the users. The price of TUV can be reviewed again after every five years by SLHPC.

12.4 Recovery and Billing

Implementing Agency shall develop and have in place automated systems of measurements, billings and recovery of water charges. Facility of on-line payments shall also be provided for the benefit of the users.

12.5 Opening of Accounts

An escrow account or otherwise shall be maintained by the Local Body for the amount received by it which shall exclusively be utilized for carrying out works relating to strengthening of the infrastructure as well as operation and maintenance so as to ensure sustainability of the treated unused water projects. Similarly, for the infrastructure to be provided for collection of wastewater and treatment in the rural areas under the Maha Gram scheme, the PHED shall also open and maintain a separate account for the amount received by it which shall exclusively be utilized for carrying out works relating to strengthening of the

infrastructure as well as operation and maintenance so as to ensure sustainability of the treated unused water projects.

12.6 Purchase Agreements

A purchase agreement shall be executed between the implementing agency and the user. The agreement shall be comprehensive and should not contain any ambiguity. It should vividly indicate the terms and conditions of the water purchase and shall include in-built provisions for settlement of disputes, arbitration etc.

13 PRIVATE/EXTERNAL SECTOR PARTICIPATION

Keeping in view the shrinking water resources, the use of TUW assumes a high order of priority. It is therefore, imperative to plan, identify, formulate and execute technically viable as well as cost effective projects for supplying TUW to the prospective users.

13.1 Financial Resource Mobilization

Since the State resources are limited, additional funds shall have to be mobilized either through Central Government, Institutional Financing or funds from any External Agency.

13.2 Option of PPP

All efforts shall be made to get the projects implemented with the involvement of private players by adopting any of the procurement models based on Public-Private-Partnership (PPP).

The suggested models could be any one or a combination of the following:

- 1 DBO
- 2 DFBOT -Annuity
- 3 (BOT-User Charges
- 4 BOT- End User
- 5 HAM

The PPP model shall be finalized after a holistic assessment and evaluation of different variants.. The SLTC shall after due diligence recommend the most appropriate and suitable model for private participation and a final decision in the matter shall be taken by SLHPC.

14 STAKEHOLDERS ROLE AND RESPONSIBILITY

14.1 Stake Holders

The development of infrastructure and sewage treatment in the towns has been created by PHED/HSVP and HSIIDC. These Departments are also responsible for strengthening/up gradation of the existing infrastructure, if required to implement the policy for supplying treated unused water to the users.

The economic rights on the TUV shall reside with the respective Local Body and with PHED for such schemes where the infrastructure for collection of sewage and its treatment is to be created under the Maha Gram scheme.

14.2 Implementing Agency

The Implementing Agency for carrying out works for the supply of treated unused water to the users shall be appointed by the SLHPC who shall plan, execute, operate and maintain the TUV projects.

14.3 Users

A user of TUV shall apply for permission to take TUV as per the terms and conditions of this policy.

14.4 Regulatory Agencies

The Regulatory Agencies shall assist in finalizing the legal frame work and quality standards/treated unused water norms for using TUV for various purposes.

15 GOVERNANCE

For successful implementation of the projects and for effective management of the policy, the following Committees will be formed:

- (1) State Level High Powered Committee
- (2) State Level Technical Committee

15.1 State Level High Powered Committee(SLHPC)

State Level High Powered Committee shall be the Apex body to take decisions on various issues related with the successful implementation of the policy. The broad terms of reference of this Committee shall be as under:

- a) According in principle Administrative Approvals to the projects for conveyance of TUV, creation of storage capacities, construction of grids for the purpose of irrigation etc.
- b) Pricing of TUV
- c) Allocation of TUV to the eligible users
- d) Selection of agencies for the implementation of the projects
- e) Monitoring the progress of execution of works
- f) Taking policy decisions on connected issues
- g) Monitor the progress of sewerage schemes for uncovered areas in the State being executed by the concerned Departments
- h) Monitor the progress of works related to construction of STPs by various Departments

- i) Monitor periodically the performance of the functional STPs across the State
- j) Explore the possibility of mustering additional resources for construction of STPs in balance towns and in villages being covered under Maha Gram
- k) Formulate an action Plan for achieving the timelines envisaged under this policy
- l) Any other issue of importance where a final call is to be taken by the Apex body

The composition of the State Level High Powered Committee shall be as under:

SN	Designation	
1	Chief Secretary	Chairperson
2	Administrative Secretary, Irrigation & Water Resources Department	Member
3	Administrative Secretary, Urban Local Bodies Department	Member
4	Administrative Secretary, Power Department	Member
5	Administrative Secretary, Town & Country Planning Department	Member
6	Administrative Secretary, Industries Department	Member
7	Administrative Secretary, Agriculture Department	Member
8	Administrative Secretary, Health Department	Special Invitee
9	Administrative Secretary, Public Health Engineering Department	Member-Secretary

The SLHPC shall meet at least once in 3 months.

15.2 State Level Technical Committee(SLTC)

For successful and timely execution of the projects and in order to ensure that the projects are technically viable and cost effective, a State Level Technical Committee shall be constituted. The broad functions of the Committee shall be as under:

- a) Accord technical Approval to the projects related to conveyance of TUW, creation of storage capacities, construction of grids for the purpose of irrigation etc.
- b) Conceive and finalize formats for project agreements, formats of agreement between implementing agency and users, incorporating all the relevant clauses including provision for settling disputes, arbitration etc.
- c) Monitor the progress of implementation of projects with focus on quality of construction.
- d) Formulate guidelines for operation and maintenance of the implemented projects.
- e) Perform the functions of Technical Adviser to the SLHPC for all matters of technical nature.
- f) Monitor and evaluate the progress of sewerage schemes for uncovered areas being executed by various Departments
- g) Monitor the progress of works related to construction of STPs by various Departments
- h) Monitor the performance of the functional STPs across the State
- i) Monitor the various construction milestones to achieve the timelines set up under the policy
- j) Overview the functioning of the Technical Cell created under the policy
- k) Perform other tasks as assigned by the SLHPC or as decided by the Government.

The composition of the State Level Technical Committee shall be as under:

SN	Designation	
1	Engineer-in-Chief, Public Health Engineering Department	Chairman
2	Concerned Chief Engineer (Rural)	Member
3	Concerned Chief Engineer (Urban)	Member
4	Concerned Chief Engineer (IB & WR)	Member
4	Concerned Chief Engineer (HSVP)	Member
5	Chief Engineer (ULB)	Member
6	Concerned Chief Engineer (UHVPNL)	Member
7	Chief Engineer (DHBVNL)	Member
8	General Manager (IA), HSIIDC	Member
9	Chief Engineer, TUW cell	Member-Secretary

The SLHPC shall meet at least once in 2 months or earlier, depending on the quantum of business to be conducted.

The State Government will have the discretion to change/alter the constitution of the Committees, at any time, through a Government notification.

15.3 Treated Unused Water Cell

In order to carry out the day to day activities and to coordinate the smooth and timely implementation of the projects, a separate Cell shall be established which shall be headed by an independent Officer of the rank of Chief Engineer.

The functions of the Cell shall be as under:

15.3.1 *Preparation of DPRs*

Collection, collation and evaluation of the primary information received from the project area.

The TUW Cell would be responsible for project formulation in consultation with the line Departments, as the case maybe.

15.3.2 *Provide secretarial assistance to the SLTC/SLHPC.*

As and when required, this Cell will provide secretarial services to the SLTC/SLHPC in proper discharging of their functions.

15.3.3 *Management Information System*

The Cell will develop a Data Management and Information System to have a regular real time data with regard to waste water generation, technology adopted for

treatment, characteristics of the treated effluent, technology adopted for reuse, operating cost of the infrastructure developed, revenue generated, etc. Complete details of the revenue generated from individual user and as a class of users shall be maintained.

In addition, the Cell shall also maintain a data base regarding progress of sewerage works being implemented by various Departments across the State in uncovered areas along with the progress of STPs under construction. In this regard, the concerned Departments shall update their monthly progress report and forward it to the TUW Cell by the 4th of each month. The formats for monitoring shall be developed by the TUW Cell and communicated to the concerned Departments. This will enable the TUW to develop a central data bank which shall serve as a powerful tool in future decision making.

15.3.4 Research & Development

Capacity Building of the personnel of the implementing agencies in the field of treated unused water and its optimum utilization is required to be carried out periodically. This can be achieved through Research and Development activities, development of state-of-art technologies and development of innovative practices for effective and optimum utilization of the water resources.

The projects conceptualized using innovative technologies shall be brought to attention of various international organizations, research and training centres, etc. to form several bilateral development cooperation partners. Initiation of these development cooperation programmes and research projects in the wastewater sector and/or subsector (reuse sludge management, etc.) has adequate potential for capacity building, planning technical visits and trip studies, etc. as well as for strengthening the institutional, legal and organizational structures in the waste water sector.

Additionally, it shall open the doors for active and intensive donor coordination and contributions along with prospects for implementation of pilot projects, thereby enabling execution of the approved projects with an additional external financial support.

The Research & Development facilities available at HIRMI, Kurukshetra can be utilized for preparing cost effective and technically viable projects for development of water grids required for irrigation with treated unused water. Similarly, HIPA, Gurgaon is adequately equipped to impart training to various categories of personnel in diverse fields and the available infrastructure can be optimally utilized for imparting in-service training necessary for capacity building.

15.3.5 Public Awareness

The concept of reuse of treated unused water is likely to face stiff opposition, in the initial stages keeping in view the traditional values of the people and taboo on certain acts and practices. Public awareness therefore assumes great importance and is the key to change the mindset of the public, albeit slowly. Intensive I.E.C activities will have to be carried out in the State to overcome the public apprehensions regarding reuse of treated unused water and issues relating to health and water quality.

The I.E.C activities shall have to be conceived systematically, carefully identifying the target groups and develop a strategy which would bring about a transition in the mind set of the prospective users. The tools for conducting I.E.C activities could be Mass Media, Electronic media, Print Media, Workshops, Community awareness programmes etc. The ultimate objective is to address the following issues before implementation of the policy and ensuring the success of the projects.

- a) Educate the public on treated unused water while stressing on the importance of water as a limited resource.
- b) Emphasis on the present status of the availability of water resource and the alarming rate at which the ground water reservoir is shrinking.
- c) Propagate the need for carrying out water harvesting and recharging techniques.
- d) Conservation of water by preventing wastage, mis-use of water and recycling of waste water for flushing, gardening and washing.
- e) Rope in celebrities to take up this cause and educate/motivate public on the reuse of treated unused water. The public generally has a propensity to identify with celebrities and icons.
- f) Bring about a behavioral change for the success of the projects.

15.5.6 The structure of the TUW Cell shall be as follows:

SN	Designation	No.
1	Chief Engineer	1
2	Executive Engineer (PHED)	1
4	Executive Engineer (IB & WR)	1
5	Head Draftsman	2
6	Tracer	1
7	Assistants	2
6	Clerks (Contractual)	1
8	PA to CE	1
9	Computer Programmer (Contractual)	1
10	Computer Operators (Contractual)	1
11	Peons (Contractual)	3

The services of Executive Engineer (IB & WR) shall be requisitioned from the IB & WR Department.

16 MISCELLANEOUS

The State Governments may issue directions and guidelines as it deems fit and considers expedient for the purpose of achieving the objectives and as envisaged in the policy, from time to time. In addition, the SLHPC shall be empowered to taken any decision for the successful implementation of the projects and achieving the ultimate goals.

ANNEXURES

ANNEXURE-1

STATUTORY AND POLICY: Government of India

The concept of wastewater recycling is recognized by most policy frameworks and institutions in India. Some significant legislations and documents are as follows:

Constitutional provisions:

1. Constitution of India, part IV, lays down directive principles of State policy. Article 48A states “The State shall endeavour to protect and improve the environment and to safeguard the forests and Wild Life of the country.”
2. Fundamental duties of every citizen in India in Article 51A states that “It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living creatures.”
3. Role of self-Government (73rd and 74th Constitutional Amendments)-
These amendments make it obligatory on the State Governments to constitute Urban Local Bodies and transfer responsibility of water supply and sanitation services to them.

As such, there is constitutional mandate to preserve, protect and promote natural resources and water constitutes the most important ingredient amongst all.

Central statutes and policies:

- 1 The Environment Protection Act, 1986;
- 2 Policy statement for Abatement of Pollution, 1992;
- 3 The National Water Policy, 2012;
- 4 The National Sanitation Policy, 2008;
- 5 Manual on Sewerage and Sewage Treatment Systems, by Central Public Health and Environmental Engineering Organization (CPHEEO), Ministry of Urban Development, Government of India, 2013, to name a few such references.

CHALLENGES

With the present pace of development and industrialization, the water demand in the urban and rural areas is likely to increase considerably. It is expected that by the turn of the next decade there is going to be a burgeoning water demand keeping in view the current development trends.

The indiscriminate tapping of the ground water reservoir, heavy pollution of the water resources, especially due to indiscriminate discharge into the water bodies is severely affecting the availability of safe ,potable water besides impacting the environment and consequently resulting in potential health hazards. As a result, the availability of fresh water is likely to reduce in the coming years, particularly for drinking, agricultural and industrial purposes.

It is apprehended that in the times to come, the ground and surface water resources are likely to be highly stressed notwithstanding the fact that ground water recharging techniques are being applied, where feasible. In view of this predicament, it is imperative that local and traditional sources are rejuvenated for supplementing the conventional drinking water sources and ensuring water security..

DRINKING WATER SYSTEM

Haryana is one of the States which is providing only piped water supply facilities in the rural and urban areas. About 60 % of the groundwater is brackish and unfit for human consumption. In areas where the ground water is saline, piped drinking water supply schemes are based on surface sources. In the sweet belt areas which constitute about 40% of the area of the State, the drinking water supply schemes are based on ground water sources or tubewells.

Drinking water in the urban areas is being made available at a norm of 135 litres per capita per day (LPCD) plus 15% "Unaccounted for Water." In the rural areas, the water supply schemes are based @ 70 lpcd in the Desert districts of Hisar, Sirsa, Fatehabad, Rohtak, Jhajjar, Bhiwani, Dadri, Mohindergarh and Rewari whereas in the non-desert districts of the State, the water supply schemes are implemented @ 55 lpcd. However, drinking water supply projects financed by NABARD are executed at a norm of 70 lpcd.

The State Government has recently launched the Maha Gram scheme in the rural areas which envisages the provision of sewerage facilities in villages along with treatment facilities. Keeping in view the enormity of the problem, the scheme is being taken in hand in a phased manner. In the villages selected under this programme, the existing drinking water infrastructure will be upgraded to supply water at the rate of 135 lpcd plus 15% "Unaccounted for Water". This is an ambitious programme and will go a long way in improving the sanitary conditions in the villages and bring about a perceptible change

in the environment besides arresting the large scale exodus of people to the cities/towns.

UNDERGROUND SEWERAGE/DRAINAGE SYSTEM (COLLECTION AND TREATMENT)

There are 83 notified towns in the State of Haryana and sewerage facilities exist in --- towns with a coverage area varying from ---- to ----%. The collected sewage is treated in the STPs which have been constructed for this purpose. In Haryana State, STPs are being constructed by PHED/HSVP/ULBs. In addition, HSIIDC has also constructed CETPs in various industrial areas for treatment of the heterogeneous industrial waste which is being discharged by different type of industries.

The status of STPs across the State is as follows:

1 Number of STPs constructed

SN	Name of Department	No. of STPs constructed	Capacity in MLD
1	PHED	112	1046
2	HSVP	16	492
3	ULB	3	95
4	M.E.S	1	9
	Total	132	1642

2 Number of STPs under construction

SN	Name of Department	No. of STPs under construction	Proposed Capacity in MLD
1	PHED	14	126
2	HSVP	6	40.8
	Total	20	166.8

3 Number of STPs under planning

SN	Name of Department	No. of STPs being planned	Proposed Capacity in MLD
1	PHED	3	17
2	HSVP	23	366.5
3	ULB	22	207
4	Panchayats	1	6
	Total	49	596.5

Besides, the status of CETPs being constructed by HSIIDC for catering to the industrial discharge in various industrial areas is as follows:

1 Number of CETPs constructed

No. of CETPs	16
Total Capacity	158.85 MLD

2 Number of CETPs under construction

No. of CETPs	4
Proposed Total Capacity	39 MLD

3 Number of CETPs under planning

No. of CETPs	5
Proposed Total Capacity	14 MLD

From the above it can be seen that at present, 132 STPs are in existence in the urban areas having a total treatment capacity of 1642 MLD, based on projected population. This does not include the CETPs constructed by HSIIDC. Further, 20 STPs are under construction which will generate an additional treatment capacity of 166.8 MLD.

Besides, 49 STPs are in the planning stage having an envisaged capacity of 596.5 MLD.

Thus, it is expected that in the next 2-3 years, the total designed treatment capacity of the STPs shall be around 2405 MLD in the urban areas. It would be pertinent to mention at this juncture that the Maha Gram scheme in the rural areas is gaining great importance and in case the pace of implementation under this programme is steadily maintained in the near future, another 100 odd STPs are likely to come up in the next 3-4 years. This offers a tremendous opportunity to use treated unused water and augment the depleting water resources effectively.

ABBREVIATIONS

AMRUT	Atal Mission for Rejuvenation And Urban Transformation	TUW	Treated Unused Water
BCM	Billion cubic metre	TUW Cell	Treated Unused Water Cell
BOD	Bio-Oxygen Demand	ULB	Urban Local Body
BOT	Build, Operate, Transfer	WJC	Western Jamuna Canal
CETP	Common Effluent Treatment Plant		
CPCB	Central Pollution Control Board		
CPHEEO	Central Public Health and Environmental Engineering Organization		
DBO	Design, Build, Operate		
DFBOT	Design, Finance, Build, Operate, Transfer		
DPR	Detailed Project Report		
HAM	Hybrid Annuity Model		
HIPA	Haryana Institute of Public Public Administration		
HIRMI	Haryana Irrigation Research And Management Institute		

HSPCB	Haryana State Pollution Control Board
HSIIDC	Haryana State Infrastructure & Industrial Development Corporation
HSVP	Haryana Shehri Vikas Pradhikaran
IEC	Information, Education and Communication Cell
IIT	Indian Institute of Technology
KL:	Kilo Litre
LPCD	Litres Per Capita Per Day
MBBR	Moving Bed Bio-film Reactor
MBR	Membrane Bio Reactor
Mg/L	Milligram per Litre
MLD	Million Litres per Day
NEERI	National Environmental Engineering Research Institute
PHED	Public Health Engineering Department
PPP	Public Private Participation
SBR	Sequential Batch Reactor
SIR	Special Investment Region
SLHPC	State Level High Powered Committee
SLTC	State Level Technical Committee
SOP	Standard Operating Procedure
STP	Sewage Treatment Plant
TSS	Total Suspended Solids