



Making Wastewater Treatment Efficient & Affordable



UP-FLOW COMPACT CONSTRUCTED WETLAND based STP



CSIR-NEERI, Nagpur, 1.5 KLD



UCCW based GTP



GVAK, Deolapar, 3 KLD



CSIR-NEERI, Nagpur, 15 KLD



UCCW based STP



CSIR-CSIO, Chandigarh, 25 KLD

Upcoming UCCW based STPs

75 KLD at NEERI, Nagpur, 200 KLD (2 Nos) at MCET, Pollachi, Coimbatore, TN
100 KLD and 300 KLD at WCL, Majri, Chandrapur, MH



Technology Readiness Level - 8

Featured in CSIR Technology Transfer Commitments 2030 and Vision Viksit Bharat 2047



Swachh Bharat Mission



AMRUT



Sustainable Development Goals

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Current Scenario

- India generates approximately 72,000 MLD wastewater from Class I and Class II cities while only 26% gets treated (CPCB Report 2021).
- Increased sewage generation vis à vis, limited treatment capacity necessitates sustainable technologies that are cost effective with low O&M.
- Majority nature-based sewage treatment units are often associated with large foot print or inconsistent treatment efficiency.
- Lack of adequate centralised wastewater infrastructure necessitates decentralised, compact, and sustainable technologies that can be adapted for calibration from a single household to a small community.

Up-flow Compact Constructed Wetland (UCCW)

Up-flow Compact Constructed Wetland (UCCW) is a hybrid technology deployable for household and community-scales that provides efficient and affordable sewage treatment in a single system.

UCCW works on the principle of Up-flow Floating Surface Constructed Wetland (UFSCW) and Up-flow Sub Surface Constructed Wetland (USSCW) which ensuring maximum wastewater contact with media and wetland plants.



Circular Module

UCCW through up-flow manoeuvring provides preliminary, primary, secondary and tertiary treatment including disinfection, all in a compact modular system.

UCCW provides aerobic and anaerobic treatment facilitating suspended and attached growth simultaneously in a single system.

Reuse / recycle of treated water in gardening, floriculture, road washing, rejuvenation of waterbody etc. supporting circular economy.



Rectangular Module

Components of UCCW

- Screen cum Oil Removal
- Up-flow Floating Surface Constructed Wetland (UFSCW)
- Up-flow Sub Surface Constructed Wetland (USSCW)
- Up-flow Dual Media Filter (UDMF)
- Disinfection
- Treated Effluent Tank

Wetland Plant Species

- Canna Indica*
- Colocasia Esculenta*
- Cyperus Involucratus*

Treatment Performance

Parameters	Raw sewage	Treated Effluent
pH	6.5 – 7.5	6.5-8.5
TSS (mg/L)	120-210	< 5
BOD (mg/L)	200-250	<10
COD (mg/L)	300-350	< 50
Total Nitrogen (mg/L)	20-35	< 10
Total Phosphorus (mg/L)	5-10	< 1
Faecal Coliform (MPN/100mL)	$10^6 - 10^7$	< 230

Salient Features UCCW

- All treatment units in a single system
- Lowest O&M across technological spectrum
- Minimal energy footprint
- Compliant with Discharge Standards
- Compliance of Packaged STP norms
- Most silent STP
- Compact and easy to fabricate/construct

Treatment Stages



Inlet UFSCW USSCW UDMF

Reuse & Recycle



Recommended Material of Construction – FRP (upto 25 KLD) and RCC

Patent:

202111055046 (UCCW)
202311016818 (UFSCW)

Design Registration:

457124-001 (UCCW)
457300-001 (UFSCW)

Trade Mark:

6538708 (UCCW)
6759803 (UFSCW)
7053982 (USSCW)