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IN THIS EDITION

REGULARS

- 04 Editorial Stream
- 06 National Water News
- 24 Global Water News
- 17 Subscription Card- EverythingAboutWater
- 70 The Ozone Page – Column

In Depth:

- 38 **Redefining Waste: New Era of Water Reuse**
Tariq Siddiqui
- 42 **Technological Advancements for Quality Monitoring of Recycled Waste Waters**
Dr Mayur J. Kapadia
- 46 **Advance Oxidation Ditch in India**
Mrs. Dharni Lahewala
- 48 **Innovative Wastewater Treatment Technologies**
Gaurang Shetty

Case Study:

- 52 **KSB Develops Customized Pump for Atwater Montréal Pumping Station Refurbishment**
KSB SE & Co. KGaA
- 54 **Amagua C.E.M. Designs Solar-Powered Water Treatment and Distribution Network for Ecuador's Samborondón District**
Neda Simeonova

Tech 2.0:

- 56 **Toshiba Shaping the Sustainable with its Next-Gen Technologies**
Mr. Shuichi Ito
- 58 **Overcoming Chemical Dosing Challenges in Wastewater Treatment**
Adeel Hassan

IN DISCUSSION WITH INDUSTRY EXPERTS

- 60 **Jyoti Bhasin**
Managing Director, APAC, NSF

SPECIAL FEATURE

- 62 **Respect Water**
Dr. Sarvesh Kumar Shahi
Assistant Professor, KIIT School of Law

INSIGHTS ON UNION BUDGET 2024 (64 - 69)

- Anil Sethi**
Chairman, Pump Academy Pvt. Ltd.
- Mohammed Abdul Rahman**
Director, AACP India
- Syamal Kumar Sarkar**
- Prof. Parmendra Kumar Bajpai**
Vice Chancellor, Jai Prakash Vishwavidyala (University)
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- Mr. Amit Sharma**
Executive Director, Aquatech Systems (Asia) Pvt. Ltd.
- Dr Mayur J. Kapadia**
Trainer, Writer, Editor & Former AGM, Quality Control Dept, GNFC Ltd.
- 71 **UNWIND**
- 74 **Event Calendar**
- 76 **Baywatch**
- 72 **Tender News**
- 78 **Advertiser's Index**



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All the images and news articles have been taken from leading online sources through secondary research.

NAVIGATING WASTEWATER CHALLENGES AMIDST CHANGING CONDITIONS

Dear Readers,

Welcome to the July edition of EverythingAboutWater Magazine, where we turn our focus to the pressing challenges and innovative solutions in wastewater management. As global environmental conditions shift, the necessity for adaptable and resilient wastewater treatment strategies has never been more urgent.

In this issue, we delve into the evolving landscape of wastewater management, exploring how changing weather patterns, urban expansion, and industrial growth are impacting our ability to effectively treat and manage wastewater. With the stakes higher than ever, this edition highlights the technologies and strategies that are helping communities and industries navigate these challenges.

Our feature articles cover a range of critical topics, from advanced treatment processes and decentralised wastewater systems to the integration of data analytics and real-time monitoring tools. We also examine the role of policy and regulation in driving innovation and ensuring that wastewater management practices can keep pace with changing conditions.

Through insightful case studies and expert opinions, we showcase how cities, industries, and utility providers are adapting their wastewater infrastructure to meet the demands of a rapidly changing world. Learn how innovative projects are tackling issues such as water scarcity, pollution control, and resource recovery, ensuring that wastewater is not only treated effectively but also turned into a valuable resource.

This issue serves as an essential guide for water professionals, environmental engineers, policymakers, and anyone interested in the future of wastewater management. As you explore the cutting-edge solutions and thought leadership presented, we hope to inspire you to rethink traditional approaches and embrace the innovations that are driving the industry forward.

Thank you for joining us on this journey through the latest advancements in wastewater management. Together, let's work towards a future where our wastewater systems are resilient, sustainable, and equipped to meet the challenges of tomorrow.

Thanks & Regards,

Simran Arora

Associate Editor

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Miraliving launches a range of contemporary home decor accessories

Miraliving endeavors to be the one stop décor solution provider for futuristic & novel art objects which will make homes warm and fashionable. The range of décor art objects & furnishings by Miraliving evoke beauty, harmony, and functionality, characterized by opulent materials, intricate embroidery, and the brand's signature Vases & Table Lamps. From velvet cushions adorned with jewelled embellishments to lavish tabletop décor settings, Miraliving offers to be the epitome of glamour for Indian Living Spaces.

The brand's collection features a wide array of decorative items that are perfect for adding a touch of sophistication and glamour to your space. Speaking of the collection Jatin Kapoor, Founder Miraliving says, "The Idea was to infuse fresh perspectives and innovation into everything and the sole aim is to create and curate the now of luxury without compromising on quality and craft".

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About Miraliving:

Miraliving, a brand born from the esteemed parent company Mantra One, epitomizes luxury and sophistication in home décor. Founded by Jatin Kapoor, who has helmed Mantra One—a renowned furniture and interior design company—since 2012, Miraliving was created to extend the legacy of exceptional design and craftsmanship into the realm of decorative items. Specializing in luxurious home décor, Miraliving offers a diverse range of products including table lamps, embroidered cushion covers, candle stands, sculptures, wall art, and accent furniture. Each piece is meticulously crafted to elevate your living space, combining opulence with functionality. Miraliving stands out not only for its exquisite products but also for its comprehensive interior styling services. Our expert team provides personalized design solutions, ensuring that every item you choose fits seamlessly into your home, creating a harmonious and elegant aesthetic. Jatin Kapoor's passion for creating dream homes is the driving force behind Miraliving. With a decade of experience, Jatin Kapoor's vision is to bring innovative and sophisticated décor to discerning communities who seek the best in luxury living. At Miraliving, we believe that home is a reflection of one's identity, and we are dedicated to helping you curate a space that is both beautiful and personal.



7 Villages to get Treated Water for Irrigation Soon

Farmers of seven villages in the district will soon start receiving treated water from the sewage treatment plant established in Basti Peer Dad for irrigation of their agricultural land. Deputy Commissioner Himanshu Aggarwal said the work on this project, which cost Rs. 7.10 crore, is progressing rapidly. "Once completed, it will provide irrigation facilities to about 550 hectares of agricultural land in these villages", he added.

Aggarwal said the project was being implemented under the Jalandhar Smart City project by the Soil and Water Conservation Department. He stated that the project involved laying a total of 20 km of underground pipeline, of which 17 km had already been completed. The Deputy Commissioner said the treated water from the sewage treatment plant in Basti Peer Dad would be supplied to the fields through underground pipes and pump sets with a discharge capacity of 72 litres per second.

He said 80 percent of the work on the project had been completed and would be finished by the end of October, benefiting the farmers of Basti Peer Dad, Gill, Chamiara, Sangal Sohla, Safipur, Gakhla and Katlupur villages. The Deputy Commissioner said the project would not only save groundwater but also benefit farmers by reducing their expenses on diesel to run tubewells. He said such alternative irrigation sources could significantly help prevent the groundwater level from further depletion.

Lupinder Kumar, Sub-Divisional Soil Conservation Officer of the Soil and Water Conservation Department Punjab, stated that to ensure the treated water remained within the safe standards for irrigation, this system would be equipped with monitoring devices. The project will save 30 to 40 percent of groundwater in the area, reducing farmers' reliance on it as treated water from the plant will be available through the year for irrigation.

WABAG secures repeat order of INR 415 Crores towards 7 years Operation & Maintenance Contract of 110 MLD SWRO Nemmeli Desalination Plant, Chennai

VA TECH WABAG ("WABAG"), a leading pure-play water technology Indian Multinational

ATER NEWS

Group, has secured a repeat order worth about INR 415 Crores from the Chennai Metropolitan Water Supply and Sewage Board (CMWSSB) towards Operation & Maintenance of 110 MLD SWRO Desalination Plant at Nemmeli in Chennai for a period of 7 years. Wabag's initial Operation & Maintenance contract was completed in 2021, after which the contract was extended by the customer and Wabag continued to Operate & Maintain the Plant. CMWSSB floated a public tender for the Operation & Maintenance of the Plant, and Wabag secured this repeat order for Operating & Maintaining the Plant for another seven years.

The Nemmeli Desalination Plant was inaugurated by the Honourable Chief Minister of Tamilnadu in 2013. This Plant is the first Municipal Desalination Plant built in India on Design, Build, Operate (DBO) basis for drinking water purposes. The Nemmeli Desalination Plant is equipped with the most advanced Sea Water Reverse Osmosis (SWRO) technology, ensuring the production of high-quality desalinated water for domestic consumption, coupled with a process that optimizes power consumption. The water produced from this Plant is being supplied to South Chennai, benefitting millions of residents.

Commenting on this order, Mr. Shailesh Kumar, CEO – India Cluster said, “We are extremely proud to secure this repeat order for the Operation & Maintenance of the 110 MLD Nemmeli Desalination Plant. In line with our Growth Strategy, this new order further strengthens our O&M order book, providing annuity income, improving cash flows, and revenue predictability. This award underscores the continued trust and confidence our client CMWSSB has in our expertise and consistent performance, for which we are extremely thankful. We look forward to continuing our partnership and ensuring the plant operates at peak efficiency, serving the community by providing safe and reliable water supply.”

Krishna Water Revives Major Irrigation Projects in YSR District

Recent heavy rains in upstream areas of Maharashtra and Karnataka have resulted in increased inflows into the Srisailem project, which subsequently supplies water to the Owk and Velugodu reservoirs. KADAPA: The Krishna river is reviving two major irrigation projects in Kadapa district, with water from upstream reservoirs now flowing into the Telugu Ganga and Gandikota canals. This development comes as a much-needed relief to the local farmers following a difficult year marked by drought. According to officials, 2,500 cusecs of water are currently being channelled into the Telugu Ganga project, while 11,500 cusecs are flowing from the Owk reservoir to the Gandikota project.

On Saturday, Kadapa district Collector Siva Sankar Lotheti and Mydukur MLA Putta Sudhakar Yadav officially released water from Subsidiary Reservoir-1 (SR-1) to SR-2 within the Telugu Ganga project. The water had travelled from Velugodu in Kurnool district to SR-1, and is expected to significantly improve irrigation across the catchment area. Meanwhile, at the Owk reservoir, Jammalamadugu MLA Adinarayana Reddy, YSR district Joint Collector Aditi Singh, former MLC B.Tech Ravi, and local leader Bhupesh Reddy oversaw the release of 11,500 cusecs of water towards the Gandikota project. This water is expected to reach the Gandikota reservoir by Sunday evening or night.

DROPLETS

Orbis Signs US Distribution Partnership with Core & Main

Orbis Intelligent Systems, a leader in water technology, is announcing a national distribution partnership with Core & Main, a trusted name in water infrastructure solutions. This collaboration combines Orbis' innovative SmartCap technology with Core & Main's extensive industry leadership and expertise, marking a significant milestone in the water industry.

Orbis and Core & Main are partnering to enhance water network performance and efficiency through the SmartCap technology. This acoustic fixed-base pipe monitoring system, housed in a fire hydrant cap, uses real-time data to detect leaks and reduce non-revenue water loss, providing a crucial role in modern water management.

Orbis, with its focus on cutting-edge infrastructure monitoring technologies, stands out as a key partner for water utilities and municipalities. Now, Orbis' SmartCap solution will be accessible nationwide through Core & Main's expansive distribution network.

To explore how Orbis' SmartCap technology can benefit your water operations, visit Orbis Intelligent Systems, or contact your local Core & Main CORE+ product specialist.

FluxGen collaborates with Microsoft to accelerate water replenishment in India

FluxGen Sustainable Technologies and Microsoft have developed a water replenishment project at two hospitals in Bangalore. By identifying and arresting leaks, wastage, and excessive usage through sensor fusion, AI, and IOT, the partners expect to reduce water use at each hospital by 50 percent. The technology can be scaled nationwide (and globally) and used to solve one of India's key developmental issues. By 2030, water demand will be twice the available supply, affecting major cities like Bengaluru, Chennai, and Delhi. Microsoft is committed to becoming water neutral by 2030 and is working closely with FluxGen to test and scale up ways to achieve this goal.



Recent heavy rains in upstream areas of Maharashtra and Karnataka have resulted in increased inflows into the Srisaillam project, which subsequently supplies water to the Owk and Velugodu reservoirs. Officials are optimistic about filling the Brahma Sagar reservoir, a critical part of the Telugu Ganga project, to its full capacity of 17 TMC (thousand million cubic feet) within the next 60 days. This would potentially benefit 96,000 acres of land under the Telugu Ganga project in the district. The Gandikota reservoir, part of the Galeru-Nagari project, currently holds only 1.44 TMC, despite its capacity exceeding 27 TMC. Officials expect it to crucially fill up over the next five weeks.

Jaishankar Inaugurates India-Funded Water, Sanitation Project in Maldives



Maldives's endeavours in reaching its Sustainable Development Goals by establishing climate-resilient and cost-effective water and sewerage systems. I am sure that this will go a long way in improving the lives of the women on these islands who bear the primary burden of fetching clean water," S. Jaishankar said.

India-Maldives development cooperation embodies the motto of our partnership – 'Imagined by Maldives, Delivered by India'. It will be our endeavour to harness this defining feature of our relationship and scale greater heights. And I hope President with your guidance and encouragement, our joint efforts, our joint activities and our shared vision will form an important milestone in the journey of our two nations together," he added.

Earlier in the day, S. Jaishankar called on Maldivian President Mohamed Muizzu on Saturday, reaffirming New Delhi's commitment to strengthening India-Maldives relations for the benefit of both nations and the wider region. Maldives President Muizzu thanked Prime Minister Narendra Modi and the government of India for always supporting the island nation.

He further said that the "enduring partnership" between New Delhi and Male continues to bring the two nations closer through cooperation in security, development, and cultural exchange. EAM S. Jaishankar's visit marks his first visit to the island nation after his re-appointment for the second term.

His visit follows the recent visit of Maldivian President Mohamed Muizzu, to India for the swearing ceremony of the new Cabinet and Council of Ministers.

Effectively Utilising Mine Water Addresses the Ecological Impacts of Mining for Positive Change: Shri G. Kishan Reddy

Minister of Coal and Mines, Shri G. Kishan Reddy, has released comprehensive guidelines for the rejuvenation of traditional water bodies in coal and lignite mining regions. The release event took place in the presence of Shri Satish Chandra Dubey, Minister of State for Coal and Mines, and Shri Amrit Lal Meena, Secretary, Ministry of Coal. Speaking on the occasion, Shri G. Kishan Reddy highlighted the importance of water as a priceless natural resource. He emphasised that effectively utilising mine water addresses the ecological impacts of mining by transforming a potential challenge into an opportunity for positive change. This innovative approach includes various strategies, such as empowering self-help groups (SHGs) to operate floating restaurants on water-filled mine-pits. These floating restaurants provide new economic opportunities for local communities while enhancing local tourism.

He further noted that mine water is repurposed for diverse uses, including industrial purposes, groundwater recharge, high-tech cultivation, and fish farming. Initiatives like mine tourism and floating restaurants showcase the versatility of mine water as a valuable resource. He added that this comprehensive strategy not only mitigates environmental impacts by creating water bodies at rehabilitation sites but also plays a crucial role in enhancing community resilience. By restoring these water resources, Coal and Lignite CPSUs, guided by the Ministry of Coal, aim to improve local livelihoods and support sustainable development.

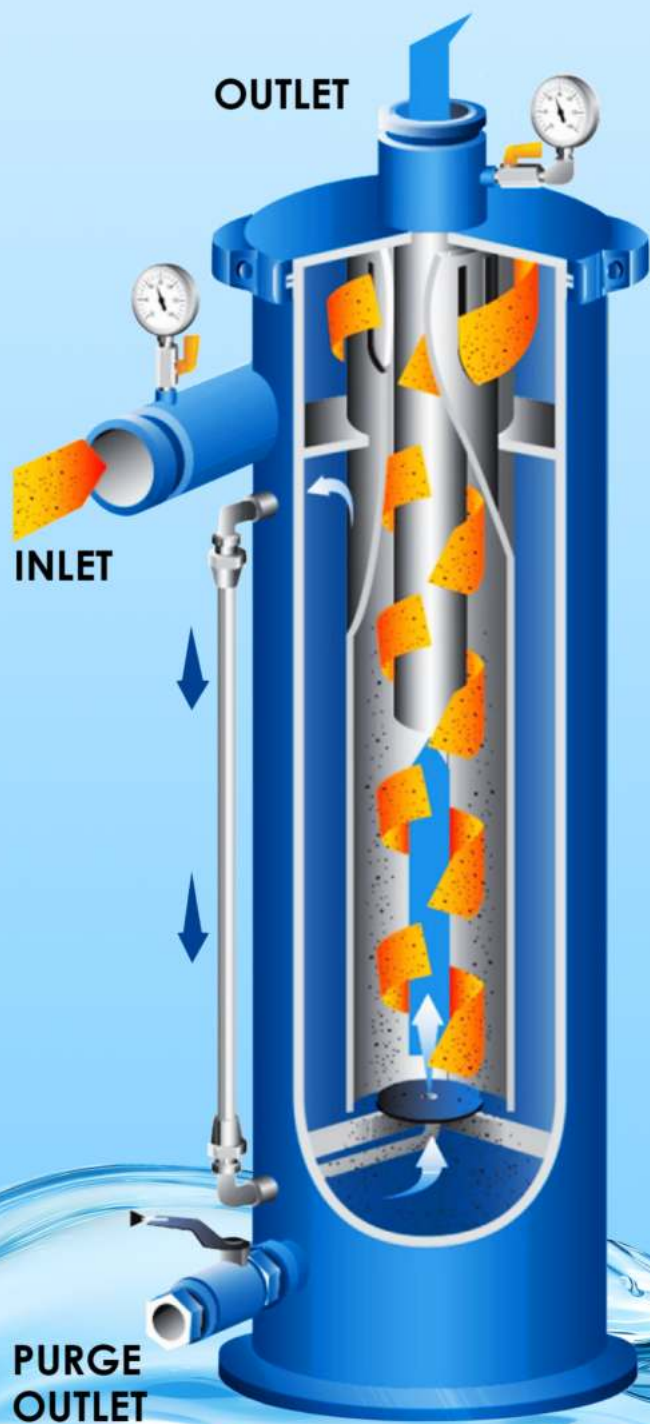




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In his address, Minister of State for Coal and Mines, Shri Satish Chandra Dubey emphasised the pivotal role of innovative water management in addressing the challenges of coal mining. He highlighted that repurposing mine water for various uses, including community development and environmental preservation, reflects a progressive approach to resource management. By supporting initiatives that transform mine water into valuable assets, such as recreational areas and local enterprise projects, the government aims to balance economic benefits with ecological stewardship.

Shri Amrit Lal Meena, Secretary of the Ministry of Coal, remarked that this initiative focuses on repurposing mine water for purposes such as drinking, irrigation, fishing, water sports, and mine tourism in the vicinity of coal mining areas. Additionally, these efforts contribute to maintaining biodiversity and ecological balance. By transforming a byproduct into a multifaceted resource, the Ministry of Coal is demonstrating its commitment to sustainable development and community well-being, setting a benchmark for responsible resource management.

Recognising the critical role of water bodies in maintaining ecological balance, the Ministry of Coal, in collaboration with Coal/Lignite Central Public Sector Undertakings (CPSUs), district administrations, and gram panchayats, has launched the project titled “Rejuvenation of Traditional Water Bodies in Coal/Lignite Mining Regions.” This initiative aligns with the guidelines of Mission Amrit Sarovar (2022) from the Department of Rural Development, Government of India, and will serve as a CSR initiative by Coal/Lignite CPSUs, including Coal India Limited (CIL) and NLC India Limited (NLCIL).

The project aims to rejuvenate and establish at least 500 water bodies in and around coal and lignite mining areas over the next five years (FY 2024-25 to FY 2028-29). CPSUs will manage water bodies within leasehold areas, while District Collectors will handle the water bodies outside the leasehold area. Each new water body will have a pondage area of at least 0.4 hectares and a capacity of around 10,000 cubic meters. Additionally, the project will leverage mine water from active and abandoned mines, aligning with the Government of India’s Jal Shakti Abhiyan. In FY24, approximately 4,892 LKL of treated mine water was offered to 981 villages in coal/lignite-bearing states. Over the past five years, 18,513 LKL of mine water has been made available for community use, including irrigation and drinking purposes.

The release of the guidelines signifies a pivotal moment in advancing sustainable mining practices. By providing clear directives for the rejuvenation of traditional water bodies, the Ministry of Coal is setting

a precedent for effective environmental stewardship and community engagement. These guidelines will ensure a structured and impactful approach to restoring vital water resources, ultimately contributing to ecological balance and enhanced quality of life in mining regions.

Gurgaon Water Treatment Plant Upgrades: New Motor Pumps to Boost Water Supply in City



Two new motor pumps were set to be installed at the Chandu Budhera Water Treatment Plant to improve the raw water supply to the Basai plant, addressing an ongoing shortage. The pumps would boost 25 MLD each, while one would be kept on standby for GURGAON.

Two new motor pumps will be installed at the Chandu Budhera Water Treatment Plant (WTP) to boost the raw water supply to the Basai treatment plant. The move is aimed at addressing the shortage of raw water supply at the Basai WTP, an official said. Earlier this year, the authority had laid a pipeline to supply raw water from Chandu Budhera to Basai plants.

“Presently, the machinery deployed has insufficient head to pump water effectively to the Basai plant, necessitating the upgrade. We will be installing two motors which will have the capacity to boost 25 MLD water each, while one machinery will be kept on standby in case of an emergency. We have prepared the estimate for the installation of the motor pump. We will soon float the tender for the same once we get the approval from the authority,” a senior official of GMDA said. The project is estimated to cost GMDA Rs. 1.6 crore.

Currently, 270 MLD of water is being supplied in the city from the Basai plant. Higher head values indicate that a pump can move water to greater heights, which is essential for transferring water between different elevations in a water supply system, the official said.

Check Dams Help in Water Conservation in Rural Nashik

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construction of weirs at 261 locations in 69 parched villages, will help transform the lives of their inhabitants. The works in the remaining 64 villages are being planned and will be implemented soon. The series of check dams – Kolhapur-type weirs and cement nallah bandh (CNB weirs) – that have been constructed in the villages through the MGNREGA scheme will facilitate groundwater storage in the parched villages, thus reducing their dependency on water tankers to meet their drinking water needs during summer.



“The objective is to arrest running water and make it stop to ensure that it percolates into the soil. The work on 261 structures has been completed. The works were carried out during the dry season. This year, if there are normal rains, many of these villages may not require tankers for drinking water supply during the summer season,” said Nashik ZP CEO, Ashima Mittal. “Villages under drought prone area plan (DPAP) requiring tankers to meet drinking water needs, were part of the programme. For visible results it was decided to construct multiple structures in a village,” another officer said.

Funds of Rs. 100 crores were utilised for the structures through MGNREGA, ensuring that locals got the work in their own villages. The construction of these structures will help in percolation of water, which will aid in availability of water to the villagers for drinking and agricultural purposes. The structure at Manjre village in Malegaon has water stored to the brim. These structures are expected to be filled to the brim at least thrice during rainy season, which means that much water will be percolating into the ground. This will have a very positive effect on the population of the village – ranging from 1,000 to 5,000, said the officer. SKOCH, a non-profit organisation that works for the development of the ecosystem, has acknowledged the achievements of Nashik ZP and honoured it for its water conservation initiatives.

Mumbai Lakes Supplying Drinking Water to City at 72 Percent Capacity, says BMC

After heavy rainfall in the last few days, it was a dry day for the catchment area of seven Mumbai lakes which supply water to the city.

In Mumbai, the collective lake levels in the seven reservoirs that supply drinking water to the city is now at 72 per cent, as per the BMC data. According to the Brihanmumbai Municipal Corporation (BMC) data, on Wednesday, the collective lake levels or water stock in Mumbai lakes is now at 10,56,157 million litres of water or 72.97 percent. Mumbai draws water from Tulsi, Tansa, Vihar, Bhatsa, Modak Sagar, Upper Vaitarna, and Middle Vaitarna. As per the data shared by the civic body, the water level in Tansa is at 99.10 percent. At ModakSagar, 100 percent of water stock is available. In Middle Vaitarna 73.97 percent, Upper Vaitarna 43.10 percent, Bhatsa 70.67 percent, Vihar 100 percent and Tulsi 100 percent of useful water level is available.

Lakes Vihar and Modak Sagar started to flood on Thursday as a result of persistently high rains. Around 4 pm on Wednesday, Tansa lake began to overflow, increasing the amount of water stored in all seven reservoirs by 17 days in a single day. Approximately 400 million gallons of water are supplied to Mumbai by Tansa Lake, which is situated in the Shahpur region of Thane. On July 26, 2024, it overflowed. One of the two lakes that directly feed water to the BMC, Tulsi Lake, started to overflow on July 20 at around 8:30 am, mimicking the event that occurred on the same day last year at 1:28 pm, according to a statement from the civic organisation. Meanwhile, the India Meteorological Department (IMD), in its latest Mumbai weather update, has predicted moderate to heavy rainfall in Mumbai on Sunday.



The weather department, in its latest Mumbai weather update, has predicted “moderate rain in city and its suburbs with possibility of heavy rainfall at isolated places. Occasional gusty winds reaching 40-50 kmph very likely” in the next 24 hours. The Regional Meteorological Centre (RMC) in Mumbai has issued a yellow alert for heavy rainfall in the city. The maximum temperature in the city is likely to settle at 30 degrees Celsius and the minimum temperature will be recorded at 25 degrees Celsius.

A high tide of about 3.85 metres is expected to hit Mumbai at 4.56 pm today, stated Brihanmumbai Municipal Corporation (BMC). The civic body also said that a low tide of about 1.14 metres is expected at 11.30 pm today. The island city recorded 11 mm of rainfall, eastern Mumbai 8 mm and western Mumbai 5 mm of rainfall in the 24-hour period ending at 8 am.



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District Collector Announces Water Management Initiatives for Mayiladuthurai

Mayiladuthurai District Collector A. P. Mahabharathi announced several key initiatives aimed at improving water management in the district. Mr. Mahabharathi outlined plans to fill Perunthottam Lake, Thiruvai Lake, and 2,000 ponds in rural areas at a meeting with the district collectors and Chief Minister M.K.Stalin. The initiative aims to utilise water efficiently for the benefit of Kuruvai paddy fields, ensuring sustainable water use. Additionally, the release of water is expected to raise groundwater levels in the district, benefitting agricultural activities and rural water resources. The collector assured that steps would be taken to replenish the ponds in rural regions.

Alert Sounded

Later in a press statement, Mr. Mahabharathi said as the Mettur dam is expected to reach its full level, surplus water will be released from the dam. Therefore, residents living along the banks of the Kollidam River and those in the riverbed area are advised to move to safe locations. The collector urged the public to avoid activities such as bathing, allowing children to enter the river, fishing, taking selfies, and driving livestock through the water when high water levels are released in the Kollidam. He requested cooperation from the public to ensure safety and efficient water management during this period.

One of the Country's Largest Sewage Treatment Plants Ready in Telangana



One of the country's largest Sewage Treatment Plants (STP), located in Nagole with a capacity of 320 MLD, is ready for commissioning. Trial runs for the plant commenced on Monday and the inauguration is expected by month-end. As part of a master plan to curb sewage pollution in the Musi River, which flows through Hyderabad, the Hyderabad Metropolitan Water Supply and Sewerage Board (HMWSSB) has initiated the construction of 31 new STPs with a combined capacity of 1,259.50 MLD.

These projects, costing an estimated Rs. 3,866.41 crores, will make Hyderabad the first city in South Asia to treat 100% of its daily sewage. The Nagole STP, one of the new facilities, uses the Sequential Batch Reactor (SBR) technology, which is more cost-efficient and consumes less power than other wastewater treatment methods. Hyderabad STPs Limited, a subsidiary of Ramky Infrastructure, is responsible for building and operating five STPs under Package-II along the Musi River's south bank. These include facilities at Nagole, two in Attapur, Kokapet and Mir Alam Tank. Of the total Rs. 1,297-crore project value, Rs. 908 crores is allocated for construction, and Rs. 389 crores for operation and maintenance over the next 15 years. The five STPs collectively have a capacity of 480.50 MLD.

As of March, the STPs at Kokapet and Mir Alam Tank are operational, treating 15 MLD and 41.50 MLD of wastewater daily, respectively. The two Attapur STPs are expected to be completed by October. The Nagole STP, constructed on a 15-acre site, includes a pump house, primary treatment unit, SBR basins, and a chlorine contact tank. It will serve Saidabad, Malakpet, LB Nagar, Yakutpura and several other areas. Key benefits of the Nagole STP include the prevention of sewage flow into the catchment areas, 100% treatment of sewage generated in the project area and the reuse of treated water for agricultural purposes.

Sujalam-II Rewrites the Narrative Around Wastewater; Reframing it as Reclaimed Water, a Valuable Resource

The Sujalam-II summit on reclaimed water, themed "Clear Solutions: Resource Recovery from Reclaimed Water," was organised by Water Digest and supported by the Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti. VA TECH WABAG Limited, South Eastern Coalfield Limited, NBCC (India) Limited, NHPC Limited, NJS Engineers Private Limited, Andritz and Pure N Safe Private Limited were key partners for the event. The summit, which was the sequel to the Jal Sujalam summit in 2023, successfully brought together stakeholders, experts and decision-makers from both the government and private sectors for a full day of insightful discussions and presentations. Attendees braved the sudden downpour to be present at the conference, which is a testament to the importance of the theme. The conference was organised to address the pressing issues of wastewater treatment, recycling, and resource recovery. With a focus on innovative technologies and sustainable practices, Sujalam-II provided a platform for sharing knowledge and exploring new strategies to optimise water reuse and resource recovery. The conference consisted of an Inaugural session and two additional sessions focused on solutions, implementations, policy and technologies.



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The inaugural session started with welcoming the dignitaries on stage and a ceremonial lamp lighting ceremony by all the dignitaries, post which Ms. Anupama Madhok Sud, Director and Editor, Water Digest, officially launched the event with her Welcome Address. She laid out the objectives of the event, commenting that this year would build on the achievements from the first iteration of the conference, forging the pathway to reframing the narrative around wastewater and changing the perspective to look at it as a resource, starting with renaming it to Reclaimed Water. This was followed by the addresses of the Guests of Honour on the dais. Mr. A. B. Pandya, Secretary General, International Commission on Irrigation and Drainage and Editor-in-Chief, Water Digest made the Opening Address, while Special Addresses were given by Ms. Archana Varma (IAS), Addl. Secretary, Mission Director, National Water Mission, Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Mr. Rajeev Kumar Mital (IAS), Director General, National Mission for Clean Ganga, Ms. Laura Sustersic, Project Director, Support to Ganga Rejuvenation III, Mr. Rajiv Ranjan Mishra (IAS), Chief Advisor NIUA, Former DG National Mission for Clean Ganga and Mr. G. Asok Kumar (IAS), Former Director General, National Mission for Clean Ganga, who joined virtually.

Following the inaugural session, the first session commenced on the subject of 'Wastewater Treatment, Recycle and Reuse: Smart Technologies & Sustainable Plants'. The session was highly educational with addresses by Mr. Anshuman, Director, Water Resources Division, TERI, Ms. Noa Amsalem, Water Attaché, Embassy of Israel in India, Mr. Sanjay Thute, General Manager – Global BD, VA TECH WABAG Limited and Dr. Sumit Kumar Gautam, Technical Expert to Ganga Rejuvenation III, (GIZ) GmbH. The session delved into the latest advancements in wastewater treatment, recycling and resource recovery technologies. Speakers highlighted smart technologies that are revolutionising the field, showcasing sustainable plant designs that maximise efficiency and minimise environmental impact.

The summit then broke for lunch, post which the second session started, focused on 'Resource Recovery from Effluent and Sludge, Biosolids Management and Circular Economy'. Mr. R. S. Tyagi, Expert Advisor – National Institute of Urban Affairs (NIUA), and Ex-Member – Delhi Jal Board (DJB), Dr. Pravin Kumar, Director, NMCG, who also chaired the session, Dr. Indra N. Mitra, Director – Technical and Project Development, Cambi India, Mr. R. K. Singh, Scientist D, Central Pollution Control Board and Mr. Anshuman, Director, Water Resources Division, TERI had an insightful discussion with questions and active participation by the audience. The session focused on the critical area of resource recovery from effluent and sludge.

Experts discussed innovative methods for biosolids management and the integration of circular economy principles into wastewater treatment processes.



Ms. Archana Varma (IAS), Addl. Secretary, Mission Director, National Water Mission, Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti commented that “Any framework for reuse of used water would have to change the psyche in people and bring back the respect for water which traditionally as a country we had. Our mental makeup towards water has to change. We already have a framework of reused water which was inaugurated in 2022. We are trying to work towards developing a national agency.”

Highlighting the government's work on the matter, Mr. Rajeev Kumar Mital (IAS), Director General, National Mission for Clean Ganga commented, “There is a dedicated Centre of Excellence on the reuse of treated water, which is doing various kinds of research, mapping and advocacy on various initiatives taken by state governments and taking the idea forward.” Building on the general sentiments of the summit, Mr. Rajiv Ranjan Mishra (IAS), Chief Advisor NIUA, Former DG National Mission for Clean Ganga commented, “Developing treatment capacity becomes our first goal. And you have to do it fast because this is your source; once you have that available, only then can you reuse it.”

Speaking on the success of the event, Ms. Anupama Madhok Sud, Director and Editor, Water Digest stated “We are thrilled with the outcomes of Sujalam-II. The summit provided a unique opportunity for stakeholders to come together and share their expertise, paving the way for future advancements in water management and resource recovery.”

Sujalam-II concluded with a strong sense of accomplishment and optimism for the future of water resource management. The day's discussions and presentations provided a comprehensive overview of current challenges and innovative solutions in the field. Participants left with a renewed commitment to advancing sustainable practices and fostering collaborative efforts. The conference not only highlighted the importance of viewing wastewater as a valuable resource but also set the stage for future initiatives and partnerships aimed at ensuring water security and environmental sustainability.



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Major steps taken by Government for Water Conservation and Rainwater Harvesting to reduce Water Stress in the country

Water conservation through rainwater harvesting is one of the foremost priorities of the Government, stated Union Minister of State for Jal Shakti, Shri Rajbhushan Choudhary, while giving a written reply to a question in Rajya Sabha today. Major steps taken by the Government for water conservation and rainwater harvesting to reduce water stress in the country are as follows:

Government of India has been implementing a scheme namely Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) which inter-alia includes water conservation and water harvesting structures. Financial assistance is given to various States under 15th Finance Commission tied grants which can be inter-alia utilized for rainwater harvesting. The Ministry of Jal Shakti has been implementing Jal Shakti Abhiyan (JSA) since 2019 on an annual basis. In the current year, Ministry of Jal Shakti is implementing Jal Shakti Abhiyan: Catch the Rain (JSA: CTR) 2024, 5th in the series of JSAs, in all the districts (rural as well as urban) of the country. JSA: CTR is a convergence of various Central Government schemes and funds like MGNREGS, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Per Drop More Crop, Repair, Renovation and Restoration Components under the Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Compensatory Afforestation Fund Management and Planning Authority (CAMPA), Finance Commission grants, State Government schemes, Corporate Social Responsibility (CSR) funds etc.

One of the major interventions undertaken under the campaign includes constructions and repair of rainwater harvesting structures including rooftop and water harvesting structures. Atal Mission for Rejuvenation and Urban Transformation (AMRUT) 2.0 has provisions for harvesting the rainwater through storm water drains into water body (which is not receiving sewage/effluent). Through preparation of 'Aquifer Management Plan' cities target to strategize groundwater recharge augmentation by developing a roadmap for improving rain water harvesting within city limits. Through IEC campaign, awareness is created about practices for water conservation like rainwater harvesting. Ministry of Housing & Urban Affairs has formulated guidelines for the States to adopt measures suitable to local conditions, such as Unified Building Bye Laws (UBBL) of Delhi, 2016, Model Building Bye Laws (MBBL), 2016 and Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines, 2014 with adequate focus on requirement of rainwater harvesting and water conservation measures. Government of India is implementing Atal Bhujal Yojana, in 8,213 water stressed Gram Panchayats (GPs) in 80 districts of 7 States, viz., Haryana, Gujarat,

Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The scheme marks a paradigm shift from groundwater development to groundwater management.

Government of India has been implementing "Pradhan Mantri Krishi Sinchai Yojana (PMKSY)" with an aim to enhance physical access of water on farm and expand cultivable area under assured irrigation, improve on farm water use efficiency, introduce sustainable water conservation practices etc. PMKSY has three components/ schemes namely Har Khet Ko Pani (HKKP), Repair, Renovation & Restoration (RRR) Scheme of Water Bodies and Surface Minor irrigation (SMI) Scheme. The Ministry of Jal Shakti has set up the Bureau of Water Use Efficiency (BWUE) under the National Water Mission on 20.10.2022, to act as a facilitator for promotion of improving water use efficiency across various sectors namely irrigation, drinking water supply, power generation, industries, etc. in the country. Mission Amrit Sarovar was implemented in the recent times with provisions for creation/rejuvenation of at least 75 Amrit Sarovars in every district of the country with the purpose to harvest and conserve water. Central Ground Water Board (CGWB) has completed the National Aquifer Mapping (NAQUIM) Project in the entire mappable area of about 25 lakh sq. km. which has been shared with the respective State agencies for implementation.

The management plans include various water conservation measures through recharge structures. CGWB has also prepared a Master Plan for Artificial Recharge to Groundwater- 2020 in consultation with States/UTs which is a macro level plan indicating various structures for the different terrain conditions of the country including estimated cost. The Master Plan has provisions for construction of about 1.42 crore Rain water harvesting and artificial recharge structures in the country to harness 185 Billion Cubic Metre (BCM) of monsoon rainfall. CGWB, under Ground Water Management and Regulation Scheme, has also implemented several successful artificial recharge projects in the country for demonstrative purpose which enable the State Governments to replicate the same in suitable hydro-geological conditions. National Water Policy (2012) has been formulated by Department of Water Resources, RD & GR, which inter-alia advocates rainwater harvesting and conservation of water and also highlights the need for augmenting the availability of water through direct use of rainfall. Department of Land Resources (DoLR) implements Watershed Development Component of Pradhan Mantri Krishi Sinchai Yojana (WDC-PMKSY) for the development of rainfed and degraded lands in the country.

The activities undertaken, inter-alia, include ridge area treatment, drainage line treatment, soil and moisture conservation, rainwater



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harvesting, nursery raising, pasture development, livelihoods for asset-less persons etc. WDC-PMKSY, through these interventions, seeks to ensure sustainable development through improved natural resource management and better resilience of farmers to climate change. Water is a State subject and the Central Government supplements the efforts of the States through technical and financial support, the Minister added.

Delhi Jal Board and Partner NGOs' "Yamuna Jan-Jagran Abhiyan" Program Garner Great Public Support in The National Capital



The Delhi Jal Board, in collaboration with partner NGOs under the Yamuna Action Plan- III (YAP-III), is running two crucial public awareness programs that are making significant strides. These initiatives are focused on the cleaning, conservation, and rejuvenation of the Yamuna River in Delhi, relying heavily on active public participation.

The much-talked program, "Yamuna Jan Jagran Abhiyan," is a public awareness campaign targeting diverse demographics across the city. The campaign has achieved unprecedented success, engaging 2,94,982 participants to date. This initiative aims to educate the public about the importance of the Yamuna River and encourage collective efforts to restore its health and beauty. In June alone, approximately 10,900 individuals enthusiastically joined the "Yamuna Jan Jagran Abhiyan," showcasing a strong commitment towards the river's restoration. Altogether, lacs of people have participated in both awareness campaigns, reflecting the growing community support for YAP-III. These programs aim to heighten awareness among Delhi's citizens and students regarding the cleanliness and conservation of the Yamuna River. Various activities are conducted across the city to achieve this objective:

Art and Performances: Messages about keeping the Yamuna clean are conveyed through street plays, poetry recitations, and songs, engaging the public creatively. **Community Participation:** Cleanliness drives and community meetings are organized to motivate residents to clean the Yamuna banks and maintain cleanliness in their surroundings. **Door-to-Door Awareness Campaigns:** Delhi Jal Board workers and partner NGO representatives visit households to educate people about the causes of Yamuna pollution and preventive measures.

Education and Empowerment: Seminars, workshops, and training programs teach methods of Yamuna conservation and waste management. Women are encouraged to participate in these activities, fostering community involvement. **Students' Enthusiasm:** Painting and essay competitions in schools promote creative expression and motivate students to take part in cleaning the Yamuna.

Cleaning and rejuvenating the Yamuna is crucial for Delhi due to its significant environmental, health, and cultural impacts. The river is a vital water source, supporting millions with drinking water, agriculture, and industry. Pollution in the Yamuna leads to severe health issues and disrupts ecosystems. Reviving the river can enhance biodiversity and promote sustainable urban development. Moreover, the Yamuna holds deep cultural and spiritual importance, making its restoration a matter of heritage preservation. The Delhi Jal Board's continuous efforts aim to cleanse and purify the Yamuna River through these public awareness programs. With the robust public support garnered from these initiatives, there is hope not only for a cleaner Yamuna but also for an improved environment around the river.

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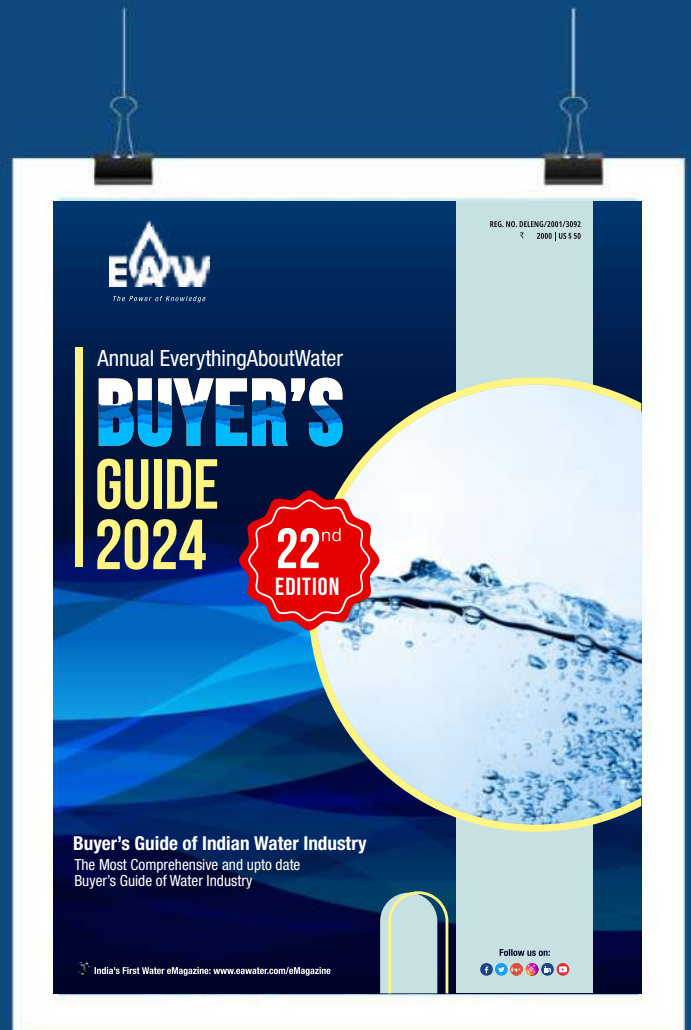
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PRSI EXPO 2024 TO CELEBRATE PIONEERS IN INDIAN PLASTICS RECYCLING

- Plastics Recycling Awards will be presented across various categories, including Recycled Plastic Product, Recycled Plastic Packaging Product, Plastics Recycling Company, Plastics Recycling Ambassador, Best Community Effort for Recycling, and Technology and Innovation.
- To honor outstanding achievements in the Indian plastics recycling industry, recognizing innovation, sustainability, and advancements in recycling technologies and practices.

Mumbai 08th August 2024: The Plastics Recycling Awards India are set to recognize and celebrate outstanding achievements across the Indian plastics recycling industry at the upcoming PRSI Expo 2024. The awards ceremony, slated to be held on **5th December 2024 at the Bombay Exhibition Centre (BEC) in Mumbai during the globally renowned Plastics Recycling Show 2024**, promises to highlight the most innovative and impactful developments in recycled material usage, product design, and manufacturing.

This prestigious event offers an exclusive platform to showcase the latest advancements in the plastics recycling industry. Finalists will be prominently featured in a dedicated area at the Plastics Recycling Show India, with winners in various categories announced during the ceremony. This occasion promises unparalleled recognition for leaders and pioneers driving innovation and sustainability in the plastics recycling sector.

Mr. Taher Patrawala, Managing Director, Media Fusion, said “The first Plastics Recycling Show India (PRSI) awards are designed to honor the outstanding contributions of individuals and organizations in the plastics recycling sector. The Indian plastics industry is particularly noteworthy for its steadfast commitment to sustainability and environmental

stewardship. Significant advancements in sustainable packaging materials, recycling technologies, and biodegradable polymers are driving positive change within the industry. This focus on sustainability not only aligns with global environmental goals but also presents a golden opportunity for young entrepreneurs and startups to innovate with eco-friendly solutions. Receiving an award not only sets a benchmark for excellence but also offers invaluable recognition. Companies that utilize awards to assess and enhance their performance often outpace their competitors, gaining a substantial advantage from the prestige that comes with winning.”

The categories for this year's awards include **Recycled Plastic Product, Recycled Plastic Packaging Product, Plastics Recycling Company, Plastics Recycling Ambassador, Best Community Effort for Recycling, and Technology and Innovation**. Each category is designed to highlight specific aspects of the industry, from product innovation to community initiatives. For instance, the Recycled Plastic Product category awards products designed for commercial or domestic use that exhibit innovation, sustainability, and environmental impact. The Recycled Plastic Packaging Product category is dedicated to packaging products incorporating recycled content, focusing on design innovation, resource consciousness, reusability, and end-of-life solutions.

The Plastics Recycling Company category recognizes companies demonstrating outstanding operation, innovation, and management in recycling practices and sustainable growth, encouraging participation from all types and sizes of plastic recycling facilities. **The Plastics Recycling Ambassador** award celebrates individuals who have made significant contributions to the Indian plastics recycling industry, including professionals, politicians,

civil servants, NGO activists, and dedicated citizens.

The Best Community Effort for Recycling category acknowledges local community initiatives that have successfully implemented projects or introduced new recycling systems, resulting in significant advancements in plastics recycling. **The Technology and Innovation** category honors companies that have introduced, developed, or applied innovative technologies in recycling, focusing on the tangible benefits gained through these technological advancements and their impact on the industry. Each category has specific criteria, ensuring that the best practices and innovations are recognized and celebrated.

The key deadlines for entries and nominations are set for September 20, 2024.

The Indian Plastics Recycling Industry, with a market size of 9.9 million tons in 2023 and expected to reach 23.7 million tons in 2032, is a growing segment. With constant developments in recycling technologies and policies, it is an industry that is rapidly influencing the country's sustainability goals. The PRSI Expo 2024 will be a vital platform for discussing the future of this dynamic industry, showcasing cutting-edge technologies, and fostering collaborations that drive sustainable development.



BENTLEY SYSTEMS TO HOST 'BENTLEY ILLUMINATE 2024' IN NEW DELHI

New Delhi, 12th August, 2024, – Bentley Systems, Incorporated (Nasdaq: BSY), the infrastructure engineering software company is set to host its prestigious marquee event, 'Bentley Illuminate' at Pullman Hotel, New Delhi on September 10th. At the event, Bentley Systems will showcase its transportation, water infrastructure, electric utilities, and airport solutions, as they light the path to a more efficient, resilient, and sustainable future for India's economy. This initiative aligns with the government's Viksit Bharat 2047 roadmap to turn India into a USD 30-trillion developed economy in about two decades for a projected 1.65 billion population.

'Bentley Illuminate' will bring together industry leaders, experts, and stakeholders to discuss and explore innovative strategies and technologies to build a resilient and sustainable future for India's infrastructure. The event will feature insightful plenary keynotes, addressing the opportunities and challenges for Indian infrastructure, industry solutions to support Viksit Bharat 2047, and strategies for advancing sustainable civil infrastructure.

'Bentley Illuminate' will include a demo of digital twin projects by the company and a series of parallel industry tracks focused on transportation, water infrastructure, electric utilities, and transportation showcasing Bentley's innovations in each of these sectors. Bentley calls out to all industry leaders to join them at the event, network and work towards new strategies in infrastructure planning and delivery to better serve our communities and businesses. More details about 'Bentley Illuminate 2024' can be found

here
<https://events.bentley.com/bentleyilluminateindia/partnerrefMedia>

About Bentley Systems

Bentley Systems (Nasdaq: BSY) is the infrastructure

engineering software company. We provide innovative software to advance the world's infrastructure – sustaining both the global economy and environment. Our industry-leading software solutions are used by professionals, and organizations of every size, for the design, construction, and operations of roads and bridges, rail and transit, water and wastewater, public works and utilities, buildings and campuses, mining, and industrial facilities. Our offerings, powered by the iTwin Platform for infrastructure digital twins, include MicroStation and Bentley Open applications for modeling and simulation, Seequent's software for geoprofessionals, and Bentley Infrastructure Cloud encompassing ProjectWise for project delivery, SYNCHRO for construction management, and AssetWise for asset operations. Bentley Systems' 5,200 colleagues generate annual revenues of more than \$1 billion in 194 countries.

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BASF India Limited announces Q1 FY2024-2025 results

BASF India Limited (BSE code: 500042) registered sales of Rs. 39,669.0 million for the first quarter of financial year 2024-25, as compared to Rs. 33,746.5 million in the same quarter of previous year, representing an 18% year-on-year growth.

Profit before tax (before exceptional items) stood at Rs. 2,828.7 million for the quarter ended June 30, 2024 compared to Profit before tax (before exceptional items) of Rs. 1,518.7 million, an improvement of 86% for the corresponding period of the previous year. The Company ascribed the growth to strong volume growth and better margins.

“BASF India has delivered the best financial performance ever in this quarter. The Company continues to participate well in the robust growth momentum in India. All business segments have contributed to strong results, especially Agricultural Solutions, Materials and Industrial Solutions Segments. I commend the BASF teams for their stellar efforts.” said Alexander Gerding, Managing Director, BASF India Limited & Head - BASF Group Companies in India.

NX Filtration receives orders from Thermax for various nanofiltration and ultrafiltration water projects in India

With over 40 years of history, Thermax is amongst the prime Indian companies focusing on water and wastewater treatment, with more than 20,000 water and wastewater treatment installations across various municipal, industrial and commercial applications.

After extensive successful piloting with NX Filtration's hollow fiber nanofiltration technology, Thermax will now be scaling up to full-scale water projects. Thermax initial order involves hollow fiber nanofiltration modules with an aggregate total capacity of approximately 5 million liters per day, and ultrafiltration modules with a total capacity of approximately 25 million liters per day, and will be used for various of its existing and new water treatment installations across India.

Arun Nair, regional sales director at NX Filtration, comments: “We are very pleased with our new partnership with Thermax. We are glad to have successfully converted a pilot into a first full-scale hollow fiber nanofiltration project for Thermax, and also to supply Thermax with our high-quality ultrafiltration modules. We are looking forward to further develop our relationship and apply our technology across more projects and applications with Thermax in the future.



Faster wide-scale leak detection now within reach

Mass deployment of connected leak loggers is being made possible by the latest technology, writes Tony Gwynne, global leakage solutions director, Ovarro. Water companies in England and Wales are expected to embrace opportunities offered by smart technology to improve leakage performance in the 2025-2030 asset management plan (AMP8) period, according to the regulator, Ofwat. An ongoing focus on cost efficiency means the sector is seeking products to help improve performance while delivering better long-term value for customers. This continuing need for utilities to achieve more for less is driving development of managed digital solutions that make processes faster and more efficient. Rapidly advancing technology in the field of leakage means smart systems are now more intuitive and can connect to one another, reducing the steps required to find a leak, by completing much of the upfront data analysis for users.

Ovarro's latest addition to the market is EnigmaREACH, a lift-and-shift correlating hub for rapid non-revenue water (NRW) reduction. It combines either 32 or 64 loggers, a tablet, a single app for logger deployment, retrieval and follow-up, and access to Ovarro's LeakInsight analytics platform. EnigmaREACH offers mass logger deployment and expanded network coverage compared to that of traditional lift-and-shift kits. The companion app guides technicians through the logger installation, retrieval and follow-up processes. EnigmaREACH was developed following conversations with Ovarro clients who wanted to see the high-accuracy results synonymous with the Enigma range on a much wider scale, without the added challenges of recruiting additional skilled leakage technicians. The solution means leak detection teams – including contractors incentivised to find leaks quickly - can work through a district metered area (DMA) faster and find more leaks in a single day.

Typically, a team taking a lift-and-shift approach – deploying loggers in a specific location and retrieving them usually the next day - will use between 80 and 100 loggers, positioned around 75m apart, for approximately 6km of network coverage. One EnigmaREACH kit comprising 64 loggers can monitor up to 16km of pipe network, depending on how far apart they are positioned – more than double the distance with fewer loggers – and perform 256 overnight correlations.

ATER NEWS

Traditionally, once the loggers are retrieved, skilled analysts use a laptop to assess the data themselves to identify an area of interest, and to review or assign any points of interest (Pols) to be followed-up. A follow-up technician would then deploy additional correlating kits to pinpoint the leak and place the blue mark on the ground.

In developing EnigmaREACH, Ovarro's data scientists explored how the analytics process could be enhanced, to allow the system to perform the correlations automatically and use the technology to assign Pols to follow-up technicians, reducing the reliance on analysts to manually generate them. The pinpointing accuracy of the EnigmaREACH kit also means that the leak verification can be promptly carried out using a ground mic, reducing time investigating leaks. The system achieves this when the loggers are retrieved by the technician and placed in their associated box, which will automatically upload the data to the LeakInsight analytics platform via a mobile phone or tablet. LeakInsight will automatically complete the correlation and generate the POIs for the user to view when they login to the system. The Pols can then be assigned to technicians directly through the app.

Having a system that automatically generates Pols, as well as having a simple-to-use app to guide technicians through their tasks on the ground, frees-up skilled analysts and technicians. This means they can spend more time validating - another benefit, given the current recruitment and retention challenges in the leakage field. UK water companies have committed to triple the rate of leakage reduction by 2030 and halve leakage by 2050. Great progress has been made, but reaching these levels remains a mighty task – and annual targets can be thrown off course by extreme weather, such as freeze-thaw events.

In such a scenario, when increased numbers of bursts cause a leakage breakout, EnigmaREACH could be deployed over a large area to pinpoint bursts quickly, cut water loss and reduce customer impact. The same could apply in a drought, when leakage can occur due to ground movement, and there is an urgent need for leaks to be identified quickly to preserve water supplies.

Mozambique, Malawi and Tanzania sign MoU for the Joint Management of the Ruvuma/Rovuma River Basin

The Rovuma River Basin countries – Malawi, Mozambique and Tanzania – on 31 July signed a Memorandum of Understanding in Dar es Salaam in pursuit of stronger cooperation in water management. The MoU will be the reference point for further discussions on basin management cooperation efforts in general, the crafting of a basin treaty and the establishment of River Basin Organisation in particular. The riparian states are receiving support from the SADC, working with the GIZ-TWM, IUCN, GWPSA and Water Net. The governments of Mozambique, Malawi and Tanzania intend to maximise their contributions to the mutual management of the resources of the Rovuma River Basin. The memorandum, signed on Wednesday in Dares Salaam, foresees the strengthening of cooperation in matters of use, development, protection, conservation and sustainable management of the Rovuma River Basin, a press release issued by the Mozambican Ministry of Public Works, Housing and Water Resources reads.

DROPLETS

Broad range of Acrylics, Alcohols, Glycol Ethers and Acetates from BASF now also available with different sustainability attributes

Singapore-based Memsift Innovations and Korea's Angstroms Co Ltd Partner to Revolutionize Lithium Recovery: In a pioneering partnership, Singapore's innovative membrane solution provider Memsift Innovations Pte Ltd and Korea's Angstroms Co Ltd have executed a cooperation agreement aimed at recovering lithium from Korea's secondary cell industrial liquid-wastes, including effluents from lithium-ion battery recycling facilities.

Innovative Technology for Sustainable Resource Recovery: Memsift's state-of-the-art membrane distillation process and proprietary membranes, based on patented technologies, offer distinct advantages over conventional brine treatment and zero liquid discharge solutions. The TS-30™ system employs a unique thermodynamic principle for thermal separation, significantly reducing industrial effluent treatment costs. Additionally, the advanced GOSEPT™ nanofiltration membranes excel in separating monovalent ions like lithium chloride from multivalent ions, even in highly acidic conditions.

Strengthening a Successful Partnership: Since establishing their partnership in early 2021, Memsift and Angstroms have collaborated closely for the past three years. This new agreement marks the next phase, empowering Angstroms to recover energy transition metals from unconventional sources in Korea through multiple projects.



Shared by the three countries, the Rovuma River Basin extends for 760 km, 650 km of which serves as the border between Mozambique and Tanzania. It is rich in aquatic and terrestrial biodiversity, in particular the 42,400 square kilometre Niassa National Reserve, which covers parts of the provinces of Cabo Delgado and Niassa, whose development is likely to be boosted by the implementation of the Integrated Transboundary Water Resources Management.

The agreement was signed during the meeting of the Council of Ministers for the Rovuma Basin by Carlos Mesquita, Minister of Public Works, Housing and Water Resources; Jumaa Hamido Aweso, Minister of Water of Tanzania; and Abida Sidik Mia, Minister of Water and Sanitation of Malawi. The agreement serves as a platform for cooperation partners, the Southern African Development Community (SADC) and member states to assess the progress of the basin roadmap and discuss the implementation of the subsequent project, financed by the Global Environment Facility (GEF).



At the ceremony, the Mozambican government was represented by the Minister of Public Works, Housing and Water Resources, Carlos Mesquita, who said that the agreement would bring numerous advantages to the three countries, namely the openness of member states to the development of regional projects, as well as the possibility of mobilising financing for their implementation, resulting in economic and social benefits for the communities living along the Rovuma Basin.

Minister Mesquita further highlighted that the Rovuma River basin was almost unparalleled in the SADC region as being among the few shared basins that are still in their natural conditions, that is, without storage infrastructure (dams). "This river basin is rich in aquatic and terrestrial biodiversity, and a large part of it is still intact, especially in Mozambique, where the Rovuma flows through the provinces of Niassa and Cabo Delgado," Minister Mesquita said.

"In this sense, Mozambique considers that there are many challenges for its management, with emphasis on the sustainable use and guarantee of water supply to the main water-using sectors, the vulnerability associated with water (floods and droughts), water quality and health of the aquatic ecosystem, as well as good water governance and implementation of Integrated Water Resources Management, from the perspective of transboundary water management," he added.

These challenges "increase the need to adopt structural and non-structural measures, which require cooperative actions between the riparian states. In the current context of climate change, in which our region was hit by El Niño, we hope that the ongoing initiative will help to create and promote integrated and sustainable resource management through the implementation of measures to guarantee water safety in the Rovuma river basin, in order to mitigate the occurrence of water-borne diseases, such as COVID-19 and diarrhoeal diseases, and mitigate the impacts resulting from water scarcity".

Cooperation between the three countries also extends to the Zambezi River basin, with the creation of the Zambezi Watercourse Commission (ZAMCOM) in 2024. Malawi has however not yet ratified the agreement establishing the commission.

bNovate Technologies and MattenPlant sign groundbreaking distribution agreement to enhance water safety across Asia

In a landmark move set to revolutionise water safety across Asia, Switzerland's bNovate Technologies SA, which provides rapid monitoring and analysis of water, sealed its very first partnership in Asia, appointing Singapore's MattenPlant as its official Asian distributor.



JULY 2024

GLOBAL WATER NEWS

This significant collaboration was cemented during the Singapore International Water Week. bNovate CEO Serge Gander and MattenPlant CEO Victor Lim joined forces to bring cutting-edge, automated solutions for industrial microbiology to new markets, especially in the food and beverage sectors in the Philippines and Vietnam.

“We are thrilled to partner with MattenPlant,” said Serge Gander, CEO of bNovate. “Their expertise in integrating water technologies and their strong presence in Asia align perfectly with our global ambition of making water safer with our automated and digital monitoring solutions. This agreement marks a significant milestone for bNovate, enabling us to reach new markets and better serve our customers.”

Using state-of-the-art flow cytometry technology, bNovate's BactoSense instrument measures cell concentrations in just 20 minutes, proactively addressing abnormalities and deviations from baseline microbial profiles. This technology ensures swift, accurate, waterborne microbe detection, safeguarding public health and industry standards.

Victor Lim, CEO of MattenPlant, shared his enthusiasm: “We are very impressed with what bNovate brings to the market in their range of monitoring equipment. This is an exciting opportunity for our companies to work together and bring highly effective water safety solutions to our customers, particularly in the food and beverage industry. We will leverage our local presence to provide training, service and pilot testing. This is to enhance customer's engagement and experience of BactoSense”

Asia faces significant water challenges in many regions, including contamination from industrial and agricultural activities, rapid urbanisation and inadequate water infrastructure. The partnership with MattenPlant addresses these critical issues by introducing advanced Swiss water monitoring technologies that provide real-time, precise data, enabling proactive management and remediation. By leveraging bNovate's innovative solutions, communities and industries across Asia can achieve safer, cleaner water, ultimately enhancing public health and supporting sustainable development. This collaboration represents a pivotal step in transforming regional water safety standards, ensuring that every drop meets the highest quality standard.

RSK Welcomes Strategic Investment from Searchlight Capital Partners and Ares Management

RSK Group Limited (“RSK” or the “Company”), a global leader in the delivery of sustainable solutions, today announced it has entered into an agreement to receive a £500 million preferred equity investment from a consortium led by Searchlight Capital Partners, L.P. (“Searchlight”), and Ares Management Corporation funds (“Ares”). In addition, Ares has committed an incremental £300 million debt facility to further support RSK's growth plans, bringing total available debt facilities provided by Ares to £1.4 billion.



Founded in 1989 by its CEO Alan Ryder, RSK and its 15,000 employees provide end-to-end, bespoke environmental consulting and engineering solutions to a vast array of clients across the Water, Energy, Construction and Infrastructure sectors. The additional capital is expected to support the ambitions articulated in RSK's 2030 Global Strategy, including organic growth initiatives and the continued execution of the Company's acquisition strategy.

“RSK is very pleased to welcome a new group of investors and further strengthen our relationship with Ares,” said Dr Alan Ryder, Founder and CEO. “This strategic partnership marks a pivotal moment for RSK as we take another step towards our long-term vision of becoming the world's largest and most trusted provider of sustainable solutions. Searchlight and Ares' expertise in our industry, combined with their track record of supporting growth initiatives, will be instrumental as we execute on our M&A strategy and expand our service offerings. After three decades, RSK remains committed to delivering environmental and engineering services to help government and business clients around the world achieve a more sustainable future. The opportunities for RSK increase at pace.”

James Redmayne, Partner at Searchlight said, “We are delighted to be partnering with Alan and the RSK management team, as they embark on the next phase of their journey to becoming the leading global provider of sustainability solutions for their customers. The unique employee-ownership culture of the business provides the perfect

GLOBAL WATER NEWS

JULY 2024

platform for RSK to continue its stated mission of striving to address the current and future impacts of climate change.”

Giles Marshall, Partner at Searchlight, added, “The evolving regulatory landscape, accelerating global energy transition and goal of providing clean water and sanitation for all, present increasing challenges and opportunities for RSK’s customers, which the business is uniquely positioned to execute on. We look forward to partnering with the management team to support their continued growth and industry-leading service.”

Michael Dennis, Co-Head of European Credit at Ares, added, “Since our initial investment in 2018, we have seen firsthand RSK’s commitment to helping advance the energy transition through differentiated client solutions. We are excited to increase our financial commitment alongside Searchlight and further support the Company’s focus on identifying new investment opportunities and developing innovative capabilities that can drive more sustainable business outcomes and long-term growth for RSK.”

Schneider Electric collaborates with Water Resources Department, Maharashtra for Efficient Water Management



Schneider Electric, the leader in the digital transformation of energy management and automation, recently announced its collaboration with Water Resources Department, Maharashtra to sensitize officials on modernizing water and wastewater (WWW) management using the latest digital technologies. This partnership is a continuation to Schneider Electric’s support to the Ministry of Jal Shakti’s efforts to accelerate the technology adoption for sustainable water management in India.

India, a country grappling with a staggering ~40% water loss due to leaks, is confronting significant strain on its water table, posing a threat to its economic advancement. In response to this pressing

challenge, Schneider Electric has made its mission to confront the complexities of water management and address the urgent need for fostering sustainability, efficiency, and resilience in the water sector.

With this strategic partnership with the Government of Maharashtra, Schneider Electric has reaffirmed its commitment to championing responsible water management. As part of this collaboration, the company aims to drive awareness among stakeholders, encouraging the adoption of innovative digital technologies to elevate efficiency, productivity, and sustainability in water management processes. Schneider Electric’s end-to-end IoT platform, EcoStruxure, offers real-time data, analytics, and professional services to increase water consumption efficiency, decrease leaks, and optimize water distribution. EcoStruxure also offers advanced diagnostics and seamless IT/OT integration to future-proof operations.

The event was attended by key dignitaries including Sanjay Khandare, IAS, Principal Secretary, Water Supply & Sanitation Department, Government of Maharashtra, Sanjay Belsare, Secretary, Project Coordination, Water Resources Department, Government of Maharashtra and Aman Mittal, IAS, Deputy Secretary, Water Supply & Sanitation Department, Government of Maharashtra. These dignitaries gathered to discuss the pressing need to embrace digital technologies in the facilitation of a more sustainable water network.

“Integrating digital solutions into water management practices can lead to more efficient, resilient, and sustainable use of water as well as energy resources, thereby addressing the growing challenges posed by factors such as population growth, urbanization, and climate change”, said Sanjay Belsare, IAS, Secretary- CAD, Water Resources Department, Government of Maharashtra.

Emphasizing the significance of digital solutions for effective water management during a keynote address Aman Mittal, IAS, Deputy Secretary, Water Supply & Sanitation Department, Government of Maharashtra suggests a creation of mass awareness about the true potential of digital technologies, that is critical to address issues related to water resources. Digital solutions encompass various technologies such as data analytics, IoT (Internet of Things) sensors, remote monitoring systems, and predictive modelling algorithms. AI and machine learning algorithms can analyse water-related data to improve water distribution, predict droughts or floods, and make better water management decisions. Drone images and remote sensing could help map traditional water bodies, assess their health, and identify replenishment or restoration needs. Also, Chatbots and solutions built around them could serve as virtual water conservation aides, offering personalised advice and raising awareness about the

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judicious use of water and resources.

Addressing the gathering on the occasion, Mr. Arvind Kakru, Vice President – Industrial Automation, Greater India at Schneider Electric, said, “At Schneider Electric, we strongly believe that India’s journey toward water conservation and innovation is crucial for realizing its developmental aspirations. The significance of water in our progress cannot be overstated, and the impact of leakage on our water resources and energy usage cannot be ignored. Water conservation directly translates to energy conservation and secures our future. Through our collaboration with Water Resources Department, Maharashtra, Schneider Electric is committed to engaging stakeholders in breaking the cycle of waste and establishing a circular system for efficient energy and water management. Together, we are dedicated to maximizing the value of every drop, driving innovation to combat energy and water wastage, and paving the way for a more sustainable future.”

Schneider Electric has also collaborated with the Ministry of Jal Shakti to prepare a skill development program that empowers eco-warriors to become proficient in using next-gen technology. The curriculum focuses on technologies in water governance, efficient operations, management of water and wastewater treatment plants, sustainable water management, technology for water conservation, and efficient desalination processes using digital technologies.

UNICEF and Partners Advancing Sustainable Water Systems in Colombia



Estefany starts each day by brushing her teeth alongside her two children, 5-month-old Matias and 2-year-old Jeisson. Then she heads out to check the solar panels on her community’s water system, preparing for her day’s work — turning salt water into fresh water. A member of the Wayúu, the largest indigenous group in northern Colombia, Estefany lives in the Guarerapo community in the country’s La Guajira department. With an arid desert climate and an economy

that relies on destabilising mineral resource extraction, fresh water is scarce in La Guajira. Natural disasters and weather emergencies compound the lack of safe drinking water.

Unsafe water, sanitation and hygiene (WASH) environments jeopardise children’s health and human rights in Colombia and around the world. In 2023 alone, 136 children in La Guajira died due to preventable diseases related to poor WASH conditions, according to Colombia’s National Institute of Health. Globally, over 1,000 children under 5 die every day from diseases linked to inadequate WASH services, which kill 1.4 million people every year.

UNICEF USA, UNICEF Colombia and the Baxter International Foundation recognise the urgent need for resilient and adaptive solutions, and have partnered since 2021 on programming to improve access to safe WASH services for thousands of children, adolescents, families and communities in Colombia. The Baxter International Foundation recently extended its support through 2027 to reach thousands more children and families in the region. The additional funding will help UNICEF rehabilitate water systems, promote basic sanitation using community-based solutions, monitor water quality and distribute hygiene kits and other supplies to Colombia’s most vulnerable children.

Solar-powered water plants improve the lives of women and girls

Estefany, 23, is the plumber for her local solar-powered water plant, which serves more than 2,500 people in her community, including over 600 students from the Isidro Ibarra Education Institution. The system converts contaminated, untreated groundwater into clean water that can be stored and used for multiple purposes. “Here, we all drink water from the plant because it comes out fresh. We use it for everything. We cook with it. We wash ourselves and our clothes,” Estefany explains.

Before the water treatment plant’s installation, members of Estefany’s community collected rainwater from contaminated sources like lakes and streams, sharing these unsanitary resources with livestock. “That is not life,” she says. “Salt water is not drinkable. Maybe for animals, but not for people.”

Where no local water system exists, women and girls must collect water from untreated reservoirs, traversing rough terrain and risking gender-based violence. Many girls miss out on a comprehensive, quality education because of this arduous daily task, limiting their chances at employment and economic opportunity.



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Expanding WASH services to build a healthier future for all

With UNICEF training, Estefany and the other members of her local water committee learned how to operate and maintain their new water system. Mastering these valuable technical skills and knowing that she can help her community build longterm resiliency inspired Estefany to continue her education, “so that I can work and so that my children have a better future.”

The expanded program aims to enhance access to quality, climate-resilient WASH services to directly benefit 12,000 children and families, and their broader communities, in Colombia’s La Guajira and Chocó departments. Estefany describes how the water plant has changed her community. “When we did not have this system here, we used to buy water by tank truck, which cost between 320,000 and 350,000 pesos (\$80 – 90) for 1,320 gallons of water. Imagine those in the community that don’t have the means to pay 320,000 pesos. It is important to maintain the system longterm to continue enjoying the clean water we have here.”

Safe, sustainable WASH services safeguard children’s health, well-being and education. Supported by UNICEF social behavior change training, more than 2,100 people, including over 850 children and adolescents, no longer practice open defecation. Self-built latrines and water points in homes and schools have led to more dignified environments and better public health outcomes.

Modifying behaviours and norms is essential to maintaining improved sanitation practices once UNICEF and its partners have completed their work. The extended partnership will support 70 communities — 45 in La Guajira and 25 in Chocó — in eliminating fecal contamination and open defecation. Thirty of these communities will also receive support to improve hygiene practices and increase access to climate-resilient WASH services in six schools.

One project, many interlocking goals

Adopted by United Nations Member States in 2015, the 2030 Agenda for Sustainable Development, set forth 17 interconnected UN Sustainable Development Goals (SDGs), illustrating how the global community can work together to tackle poverty, improve lives and protect the environment. Every SDG affects children’s ability to reach their full potential. The collaboration between UNICEF and the Baxter International Foundation demonstrates how one partnership can address multiple targets. In implementing new WASH infrastructure and sustainable, climate-resilient systems that are managed by

community members, the project touches on SDGs pertaining to WASH, infrastructure, climate action, gender equality, and sustainable cities and communities. For her own children, Estefany hopes that “They have a way to study and that the water system is not temporary, but permanent because we all benefit from it, children and adults.”

EU continues its engagement in global water cooperation at the 10th World Water Forum



It is a priority for the EU to accelerate global action to address the water crisis, driven by overdemand, mismanagement and the impacts of climate change, biodiversity loss and pollution. Water resilience is also key to prevent and address the current and future health, food and energy crises. At EU Green Week, the European Commission will launch an awareness-raising campaign on the need to transform the way water is managed, used and valued. This #WaterWiseEU campaign will encourage people to “See Water Differently” and explore solutions to the various water challenges we are facing today.

At the World Water Forum, the EU will announce joining the Freshwater Challenge, launched at last year’s UN Water Conference. It aims to accelerate the restoration of 300,000 km of degraded rivers and 350 million hectares of degraded wetlands by 2030. By joining this challenge, the EU is showing its commitment to nature-based solutions for ensuring a sustainable water supply. The EU will also support water cooperation at global level, by launching a new initiative with the International Network of Basin Organisations supporting peer-learning between Lake and River Basin Organisations. Based on EU experience, this action will strengthen institutional frameworks, human capacities, means for planning and implementation among basin organisations all over the globe.

EU research and innovation will also be showcased at the Forum,



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through the co-funded EU partnership Water4All in a dedicated pavilion, and through the Horizon Europe Restore our Ocean & Waters Mission.

The EU pavilion will host a one-day event to present EU Research and Innovation on water, the partnerships, the Mission and promoting their various actions. Different international actions with external partners like UNESCO, the International Network of Basin Organisations (INBO) or UNEP will also be presented.

The EU's participation in the Forum emphasizes its commitment to achieving the United Nations Sustainable Development Goals, notably SDG 6 - ensuring the availability and sustainable management of water and sanitation for all by 2030. The EU aims to keep water high on the global political agenda and to maintain the momentum from the UN 2023 Water Conference, where world leaders committed to accelerate actions for clean water and sanitation for all by 2030.

The EU will join high-level discussions on the Water Action Agenda (WAA), Hydro-diplomacy and Peace, Water Governance, One Health approach and Water Information Systems. It will advocate for full implementation of the commitments made to the WAA and for enhancing water cooperation as a tool for security, stability, prosperity and peace. The EU will also showcase its support for the development of water information systems as fundamental tools for providing more comprehensive and valuable information for water resource management and decision-making

On the Forum

The World Water Forum is held every three years, and brings the international water sector together, including Heads of State, multilateral institutions, academia, civil society and the private sector. At the Forum, as part of the thematic process, the European Commission will coordinate the topic "Sound water supply and demand" under the sub-theme "Water Security and Prosperity". A Ministerial Declaration will be adopted on 20 May.

On the global water crisis

It is estimated that almost half of the world's population will suffer acute water stress by 2030. Worldwide, 2.2 billion people still lack access to safe drinking water and more than half of the global population does not have access to safe sanitation.

This threatens the health of millions of individuals, especially the most

vulnerable groups. Increasing water stress impacts food and energy security and ecosystem health and hampers socio-economic and human development. Increased competition for dwindling freshwater resources threatens stability among and within nations through conflicts, displacement or migration.

On EU-funded Research and Innovation on water

Water4All is a joint initiative from the European Commission, the EU Member States and non-EU partnering countries which aims to bring partners together to work towards the sustainable use of water resources in Europe and beyond. Water4All is a co-funded partnership under Cluster 6 of Horizon Europe, the EU research and innovation programme. The partnership's overall budget is estimated to €400-450 million including an estimated European Union contribution of €126 million over the 10 years duration.

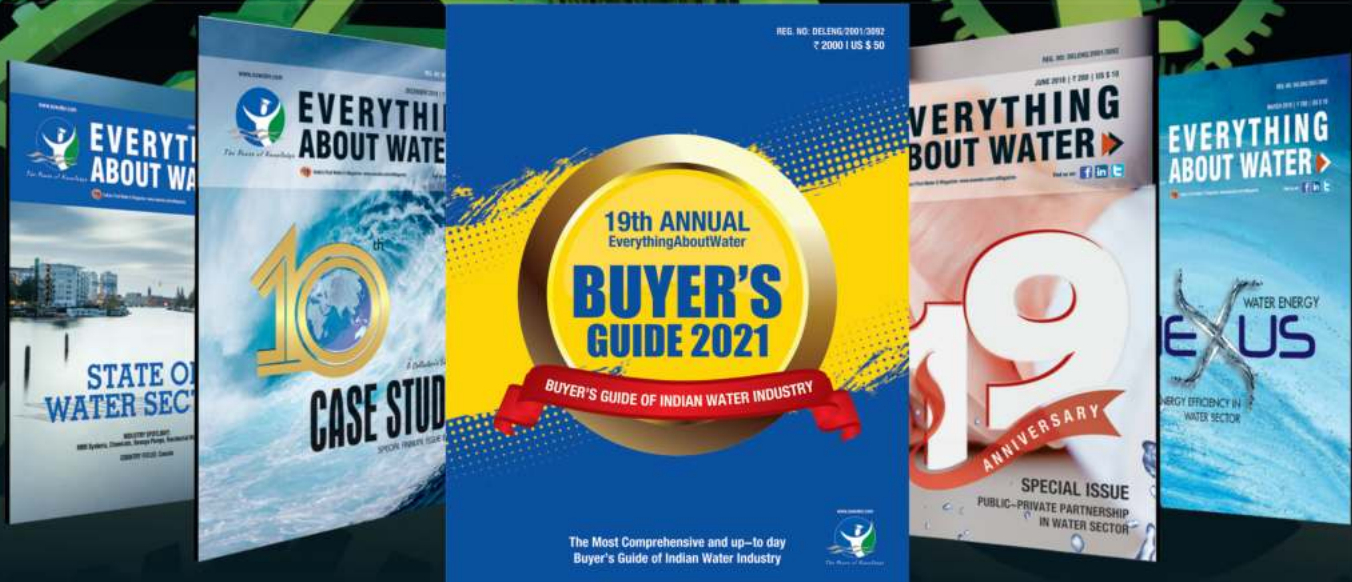
It addresses the wider global water emergency crisis, related to water scarcity, water pollution, especially emerging contaminants, like micro-pollutants and micro-plastics, extreme hydro-meteorological events, ecosystems and biodiversity decline. Its vision is to boost the systemic transformation and changes across the entire research – water innovation pipeline, fostering the matchmaking between problem owners and solution providers to ensure water security for all in the long term.

Five EU Missions have been launched under Horizon Europe programme. They aim to deliver concrete solutions to big societal challenges by putting research and innovation into a new role, combined with new forms of governance and collaboration, as well as by engaging citizens.

The Horizon Europe Mission "Restore our Ocean and Waters" is restoring the health of one of our most precious shared resources: our ocean and waters. This means protecting and restoring marine and freshwater biodiversity and ecosystems, eliminating pollution, and making the blue economy carbon-neutral and circular. The Mission will look at the whole water system from rivers to the seas and ocean. To support the Mission objectives and its related lighthouses, two cross-cutting enablers will be enhanced: the digital ocean and water knowledge system and broad public mobilisation and engagement.



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RED LION® LAUNCHES TWO NEW PROGRAMMABLE RTUS FOR RUGGED AUTOMATION ENVIRONMENTS, THE VTMIPM-138-D AND VT-MIPM-248-D

Red Lion, a manufacturer of innovative technologies that empower industrial organizations to access, connect and visualize their data, is pleased to announce the launch of two new programmable Remote Terminal Units (RTUs), VT-MIPM-138-D and VT-MIPM-248-D.



Equipped with onboard I/O and designed for uncompromising performance in extreme environments, the industrial controllers are ideal for a wide range of rugged, process-oriented applications in water and wastewater processing, oil and gas production and other advanced automation settings.

The new RTUs deliver maximum standalone control over today's toughest industrial processes. Automatic datalogging and timestamping, as well as logging of trends, alarms and sequences of events, give operators full visibility on their applications. A robust IEC 61131 programming and configuration environment in Red Lion Workbench provides extensive programming and troubleshooting capability. The unit also supports ISaGRAF for backward compatibility and has a true open system design, with Ethernet TCP, Modbus, Linux® and more.

An ideal platform for water, wastewater and oil and gas processing facilities, the VT RTUs come pre-

certified, letting operators add applications as desired, program and configure as needed and scale up easily, from 1 to 1000+ stations. Multi-user connectivity is enabled via 10/100 Ethernet ports, RS232 and RS485 and up to 4 communications ports. Onboard I/O is a mixture of DI, DO, AI and AO. Advanced communication capabilities include report on exception, store and forward and peer-to-peer networking.

"The VT-MIPM-138-D and VT-MIPM-248-D units represent the ultimate RTU upgrade for extreme industrial settings," said Jacob Colegrove, Product Manager. "For operators moving from an existing Sixnet series, it's the obvious choice. They share the same footprint, has equivalent I/O count, offer comprehensive data logging and networking functionality, plus programmable features for full flexibility."

Suitable for hazardous areas and extreme temperatures, the controllers are rated for operating temperatures of -40°C to 70°C and have UL Class I, Division 2, CE, and ABS Type certifications.

To learn more about the VT-MIPM-138-D and VT-MIPM-248-D RTUs, visit Datalogging and Control | Sixnet Industrial RTUs | Red Lion or contact a Red Lion sales representative.

For more information about Red Lion, visit www.redlion.net

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HER MAJESTY QUEEN MÁXIMA OPENS INNOVATIVE WATER TRANSITION FACTORY NX FILTRATION

Hengelo, the Netherlands, 24 July 2024

NX Filtration is extremely honored to announce that Her Majesty Queen Máxima, together with the company's founder, Prof. Dr. Ir. Erik Roesink, will officiate the opening of our new water filtration technology factory. This festive event will take place on 11 September 2024 in Hengelo, in the presence of Hengelo's mayor, Sander Schelberg.

The opening of our large-scale and state-of-the-art factory marks a milestone in our mission to make innovative water filtration solutions accessible worldwide. NX Filtration's technology, based on hollow fiber nanofiltration membranes, enables our customers to filter water in a highly sustainable manner. Polluted water from rivers, or even wastewater, can be upgraded to drinking water quality through a simple yet robust process.

This method consumes significantly less energy than traditional methods and avoids the use of chemicals. The opening of our factory in Hengelo by Her Majesty Queen Máxima signifies an important milestone for our company. The event symbolizes our technological advancements and acknowledges the dedication and hard work of our committed employees and partners. What makes our factory unique is our commitment to sustainability and self-sufficiency. In addition to over 1,350 solar panels on the roof and extensive heat recovery systems, this plant is the first in the Netherlands to use heat exchange with a neighboring data center.

Prof. Dr. Ir. Erik Roesink, founder and Chief Technology Officer of NX Filtration: "We believe that the opening of our plant is not only a milestone for our company but also for the broader community and industry, which will increasingly rely on advanced purification

technologies for their water supply. We are proud of the continuous innovation power of the Netherlands and that we can contribute to accelerating the water transition and our international reputation as a leader in sustainable technologies."

About NX Filtration

NX Filtration is a provider of direct nanofiltration membrane technology for producing pure and affordable water to improve the quality of life. The direct nanofiltration technology removes micropollutants (including pharmaceuticals, medicines, PFAS, and insecticides), color, and selective salts, as well as bacteria, viruses, and nanoplastics from water, while offering significant sustainability benefits. For more information about NX Filtration, please visit www.nxfiltration.com.

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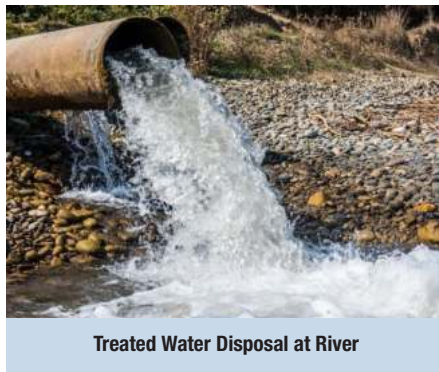
REDEFINING WASTE: NEW ERA OF WATER REUSE

The freshwater supply on Earth is extremely limited, constituting only about 1% of the total water resources. In India, which holds approximately 4% of the world's freshwater resources, this scarcity is further exacerbated by the fact that the country supports about 18% of the global population. As a result, many regions in India experience significant water stress. If we see the consumption pattern, the agriculture sector is the primary consumer of water, utilizing nearly 85% of extracted surface and groundwater. Domestic use accounts for 7%, while industrial and commercial activities consume the remaining 8%.

Despite progress, there are still challenges in providing universal access to clean drinking water. Currently, around 75% of rural households have access to drinking water facilities due to mission mode efforts put forward under the JJM projects. But a substantial number still lack tap water connections in rural India. Urban areas, too, face challenges in ensuring continuous, high-quality water supply with equitable distribution.

Rapid urbanization and industrialization have significantly increased the generation of wastewater. Indian cities now produce over 72 billion litres of sewage daily, in addition to the effluents discharged by industries. Unfortunately, only less than 40% of municipal wastewater is treated before being released into the environment, with industrial wastewater treatment rates also falling short.

To address this critical issue, the government has launched several initiatives, including the National Mission for Clean Ganga and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT). These programs, supported by private sector investments, aim to develop and expand wastewater treatment infrastructure and sewerage networks across the country. By accelerating the implementation of these projects, India seeks to significantly enhance its wastewater collection and treatment capacity over the coming decade, thereby contributing to sustainable water management and



Treated Water Disposal at River

improved public health outcomes.

MUNICIPAL INITIATIVES FOR SUSTAINABILITY

The increasing demand for water in urban areas has placed significant pressure on water utilities and urban local bodies. With ever increasing demands and declining supply, these bodies are adopting more sustainable methods for long-term water management. In November 2022, the Ministry of Jal Shakti, in collaboration with the European Union, formulated the National Framework on Safe Reuse of Treated Water. This framework sets ambitious targets for all states:

- 100% collection of used water
- 100% treatment of collected water
- 50% safe reuse of treated water by 2025
- 100% safe reuse of treated water by 2030 (where STPs are operational and collection and treatment capacity exists)

Several Indian cities faced with daunting task of making water provision for the residents are implementing remedial initiatives to augment their water resources. Some of the example could be found in Chennai, which is developing projects to ensure an optimal supply of recycled drinking water designed to bridge the gap in the city's water requirements. In Delhi, the Delhi Jal Board (DJB) is focusing on water reuse, developing a plant with 2 million gallons per day recycling capacity at its Bawana water treatment

plant. This project, aims to meet the city's future water demands and ease the stress people face especially during summers.

The Aurangabad Municipal Corporation in Maharashtra has prepared a detailed project report for reusing treated water from their three STPs at Kanchanwadi (161 MLD), JhaltaPhata (35 MLD), and Padegaon (10 MLD) to augment city's water supply. The Aurangabad Smart City Development Corporation Limited is also promoting the reuse of 90% of water from STPs.

The state government in Goa has developed a plan to reuse treated water from STPs to reduce the burden on existing water sources. The necessary infrastructure and facilities are expected to be developed at the Vasco STP to provide 2 to 3 MLD of treated water to the Mormugao Port Authority and Zuari Industrial Estate, in addition to the domestic use.

These initiatives demonstrate a growing commitment across various municipal bodies to implement sustainable water management practices. By focusing on the collection, treatment, and reuse of wastewater, cities are working towards reducing their reliance on freshwater sources and improving overall water security.

Water reuse projects have the potential to significantly alleviate the stress on existing resources. By treating and recycling wastewater for various non-potable uses, such as irrigation, industrial processes, and even groundwater recharge, these projects can reduce the demand for fresh water

The success of water reuse projects depends on various critical factors:

- Effective implementation and maintenance of treatment facilities
- Public awareness and acceptance of treated water reuse

- Continuous monitoring and rigorous quality control measures
- Integration of these initiatives with broader urban water management strategies
- Regulatory support and clear guidelines for water reuse applications
- Financial viability and cost-effectiveness of treatment technologies
- Adequate infrastructure for distribution of reclaimed water
- Ongoing research and development to improve treatment processes
- Skilled workforce in water treatment and reuse technologies
- Collaboration between government agencies, utilities, and stakeholders
- Environmental impact assessments and mitigation strategies
- Energy efficiency in treatment processes to ensure sustainability
- Risk management protocols for potential system failures
- Public-private partnerships to facilitate project implementation
- Long-term planning to accommodate future water demand and climate change impacts

As more cities adopt similar approaches, there is potential for significant improvements in urban water sustainability across India.

INDUSTRIAL INITIATIVES FOR SUSTAINABILITY

The volume of water used in industrial processes varies significantly across different sectors and plant operations due to several factors, including input raw materials, manufacturing processes, equipment and technology variations, and the age of the facility. In India, major water-intensive industries include thermal power plants, heavy engineering, textile, pulp and paper, steel, sugar, and fertilizer production. Although water consumption in these industries varies based on their individual processes and water use practices, it is notably higher in thermal power plants, which account for over 80% of industrial water usage, far exceeding other industrial sectors.

The demand for water in industrial use and power generation is increasing rapidly, with the World Bank reporting a growth rate of 42% per annum. With water stress continue to inflict the production facilities, industries such as thermal power, steel, mining, and cement are increasingly turning to recycled water.

Zero-liquid discharge (ZLD) has become a focal point for organizations aiming to reuse water in their

manufacturing processes or within their premises. Industries are installing ZLD plants that employ advanced wastewater treatment methods; including ultrafiltration, reverse osmosis, crystallization, and fractional electro-deionization.



Wastewater Treatment Facility

Among the pioneering project utilizing ZLD technology is the Sipat Super Thermal Power Station of the National Thermal Power Corporation (NTPC) in Chhattisgarh. This large-scale, coal-fired power project, with a capacity of 2,980 MW, has implemented ash water recirculation systems that typically recover 70% of ash pond water for reuse. The installation of sewage treatment plants (STPs) and effluent treatment plants (ETPs) has further enhanced the power station's water management capabilities.

Adani Power has also made significant strides in reducing water consumption and achieving ZLD across its plants. By establishing ETPs, implementing water demineralization processes, and harvesting rainwater, the company has achieved noteworthy results. Water consumption at Adani Power's plants in Maithon, Haldia, and Jojobera decreased from 3.5 m³/MWh to 2.5 m³/MWh.

In urban India, where rapid growth and industrialization have strained water supplies, water reuse projects can contribute to more sustainable urban development by ensuring that water resources are used more efficiently and responsibly.

The steel industry has also embraced ZLD initiatives. The Steel Authority of India's (SAIL) has implemented ZLD at its Bhilai plant using recycled wastewater to clean the plant's filters. Similarly, Tata Steel Mining Limited has developed a 108 million litre per day

(MLD) common effluent treatment plant (CETP) at the Sukinda Chromite Mine, which treats 100% of generated effluent and allows for 90-95% reclamation of recycled treated water.

As these initiatives gain momentum across industries, there is a growing need for robust operations and maintenance (O&M) contractual frameworks to ensure long-term viability and quality assurance. These efforts collectively represent a significant shift towards more sustainable water use in industrial sectors, addressing the pressing issue of water scarcity while promoting environmental responsibility.

WAY FORWARD

Urban water management faces significant challenges due to depleting and degrading water sources. The adoption of a circular economy model promoting high-quality treated water reuse is becoming essential. Initiatives like the National Mission for Clean Ganga aim to monetize treated water by selling it to industries.

The government's Water Vision 2047 is expected to contribute significantly to efficient wastewater recycling and reuse. Decentralized wastewater treatment systems offer high potential for accelerating water reuse. For instance, the DJB aims to reach a sewage treatment capacity of 922 MGD by December 2024 and 964.5 MGD by March 2025, according to the latest monthly progress report submitted to the Jal Shakti Ministry.

A modular STP decentralized treatment project, estimated at Rs. 410 crore is sanctioned under the Namami Gange Programme. The partnership with Japan introduces the Johkasou technology, a decentralized wastewater treatment system that treats human waste from flush toilets and domestic wastewater from kitchens, baths, and others, for efficient domestic wastewater management and reuse.



Wastewater Treatment Plant

The Government of India, through its National Water Mission (NWM), is committed to conserving water, minimizing wastage, and ensuring more equitable distribution both across and within states. The mission emphasizes integrated water resources development and management as a key strategy for achieving these goals. A central objective of the NWM is to enhance water use efficiency by 20%, a target that requires the active participation of various sectors, including the industrial sector.

Achieving this ambitious goal necessitates a concerted effort from industries to optimize and improve their water use efficiency. By adopting advanced technologies, implementing best practices in water management, and investing in wastewater treatment and recycling, industries can significantly contribute to reducing water consumption. Moreover, public-private partnerships and regulatory frameworks encouraging sustainable water practices are essential for driving the necessary changes across all sectors.

The success of these initiatives will not only help in addressing India's water scarcity challenges but also promote sustainable development, ensuring that the country's water resources are managed responsibly for future generations.

ABOUT THE AUTHOR



With a doctorate in media and over 28 years of professional experience, he has been deeply involved in the water sector, advising several leading water companies across India. As the Chief Strategist at TS Advisory Services, he plays a pivotal role in developing, evaluating, and defining business strategies and implementation plans for various industries.

Tariq Siddiqui
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TECHNOLOGICAL ADVANCEMENTS FOR QUALITY MONITORING OF RECYCLED WASTE WATERS

INTRODUCTION

Recycled waste water is a valuable resource in a world facing water scarcity. Reusing treated wastewater offers a sustainable solution by reducing pressure on freshwater sources. However, wastewaters are often complicated as they might contain a wide range of inorganic and organic pollutants. Also, these waters harbour a varied microbial community, in addition to having various physicochemical features. To ensure safe and effective reuse, a thorough analysis of the recycled water is crucial as various issues resulting out of insufficient removals of pollutants have been reported. Basic methods used to determine mere organic content of wastewater, like total organic carbon (TOC), chemical oxygen demand (COD), and biological oxygen demand (BOD), are insufficient to rely solely upon them. It is essential to evaluate the characteristics of treated wastewater with respect to parameters specific to each case. Hence, it is necessary to follow alternative approaches for wastewater characterization. At the same time, it is also essential that these approaches are more suitable and practical.



TYPES OF WATER REUSE & QUALITY MONITORING

There are several types of wastewater applications, categorized based on the source of the water. The quality monitoring necessary for each application is also different. The application-wise monitoring essential for reuse is broadly covered in below table.

TYPE OF REUSE	APPLICATION	QUALITY MONITORING
Agricultural	Irrigating crops, orchards, and landscapes	Salinity, Nutrients (nitrogen, phosphorus), Microbiological quality (absence of harmful microbes)
Onsite	Gray water for toilet flushing, laundry, or irrigation within a building or complex	Absence of pathogenic microbes, other basic parameters like turbidity, pH etc.
Industrial	Cooling water, boiler feed, cleaning	Depending on nature of industry, type of wastewater and intended reuse. May include specific contaminants, heavy metals, organic compounds, dissolved oxygen, etc
Potable	Highly treated wastewater for replenishing drinking water supplies	Detailed analysis prescribed by medical councils of the state/ country
Stormwater	Rainwater runoff for irrigation, toilet flushing, or other non-potable purposes	Absence of pathogenic microbes, other basic parameters like turbidity, pH etc.

REGULATIONS AND STANDARDS

The countries have their own established criteria, regulations and standards for allowing reuse of treated waste water. The 'National Framework on safe reuse of wastewater in India' provides guidelines for reuse in India. It categorizes reuse on the basis of water quality and outlines minimum treatment requirements. It also emphasizes adoption of local regulations based on specific water needs and environmental conditions.

This framework divides treated water quality into two broad categories: (1) Highest quality, suitable for irrigation of edible crops after minimal disinfection (e.g., greens, fruits), (2) Lowest quality, restricted to industrial applications having minimal human contact (e.g., toilet flushing, cooling, boiler). The framework promotes adoption of advanced treatment technologies for higher quality reuse applications.

WASTE WATER QUALITY MONITORING

(A) Mandatory Requirements:

Commonly, following parameters are monitored for recycled water mandatorily.

Physical Characteristics:

- **Turbidity:** Measures cloudiness caused by suspended particles.
- **Conductivity:** Indicates dissolved salts and overall water salinity.
- **pH:** Shows acidity or alkalinity of the water.

Chemical Composition:

- **Heavy Metals:** Tests for presence of lead, mercury, and other potentially toxic metals.

- **Organic Compounds:** Identifies residual organic pollutants like pesticides or pharmaceuticals.
- **Nutrients:** Evaluates levels of nitrogen and phosphorus, which can be beneficial for irrigation but harmful in excess.
- **Chlorine Residual:** Specifies the level of disinfection.

Microbiological Analysis:

- **Microbial Contaminants:** Bacteria, viruses, and parasites, crucial for assessing the risk of waterborne diseases and ensuring public health safety. Common tests include Total Coliform Bacteria, E. coli and Fecal Coliform Bacteria.

(B) Optional Requirements :

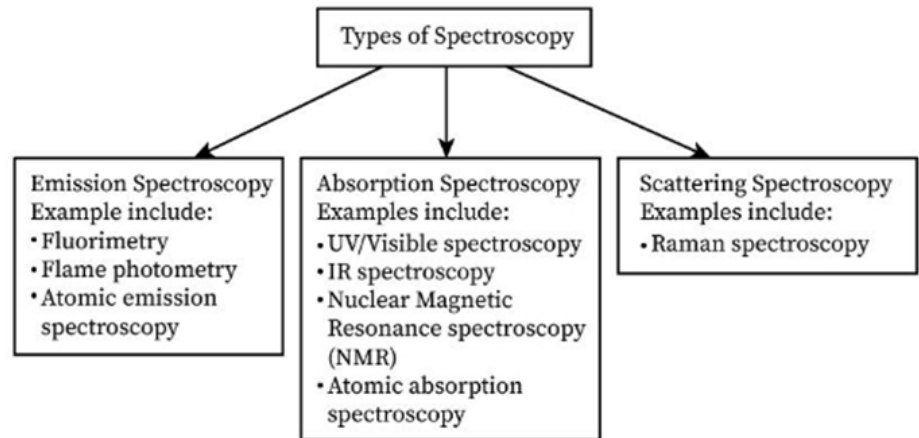
- **Metals:** Depending on the source of wastewater and potential industrial contamination, testing for specific metals like lead, cadmium, arsenic, mercury, nickel, vanadium, copper, or chromium might be necessary.
- **Emerging Contaminants:** These include pharmaceuticals, personal care products, and endocrine-disrupting chemicals. Testing for these may be required in specific situations or for research purposes.
- **Organic Compounds:** Analysis for specific organic compounds may be needed if there is a concern about industrial or agricultural runoff in the wastewater source.
- **Toxicity Tests:** These tests assess the overall impact of the treated water on living organisms, particularly for reuse in sensitive environments like aquaculture.

ADVANCES IN WASTE WATER QUALITY MONITORING TECHNIQUES:

For safety and reliability of water analysis, several technologies deploying the latest developments have come into place. These advancements help to single out potential threats, discover and detect contaminants, and ensure high standard of safety compliance. Additionally, they present robust ways to address any water-related issues quickly, implement the required solutions, and even take proactive steps to prevent water-related problems.

Advanced Spectroscopy: Spectroscopy is a broad field that comprises several different sub-disciplines and a wide array of techniques, each of which uses highly specialized equipment.

Apart from UV-Vis Spectroscopy, which helps in monitoring many important parameters of water, below mentioned spectroscopies have found their ways in monitoring recycled waste waters.



- **Atomic Absorption Spectroscopy:** Atomic Absorption Spectroscopy is very useful to detect the metal ion concentration present in drinking water samples.
- **Infrared (IR) Spectroscopy:** IR spectroscopy typically measures the relative absorption of different frequencies in the IR region by a sample and thereby identifies the types of molecular bonds present in the sample, indicating the type of molecular structures present in a water sample.
- **Fourier Transform Infrared (FTIR) Spectroscopy:** FTIR spectrometers are exceptionally useful for identifying unknown chemicals of a variety of colours. It will not generate energy during the sampling process, which makes it an ideal tool for verifying substances.
- **Near-Infrared (NIR) Spectroscopy:** It can be used for both quantitative and qualitative analysis. Water has two strong absorption bands in the NIR making it an excellent candidate for making low level measurements. The bands related to water occur at 1400 nm and 1900 nm, the latter being the most intense. The choice of which band to use is determined by the background solvent and water concentration. By measuring the NIR spectra of a series of samples of known water concentration, a quantitative model can be developed which will allow the measurement of water in future samples based only on their NIR spectrum.

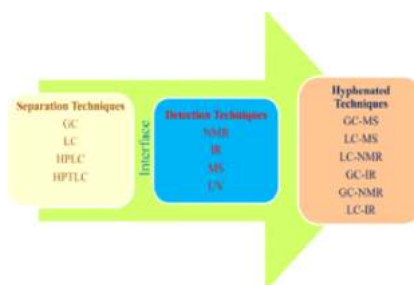
- **Fluorescence Spectroscopy :** This is a sensitive and non-destructive method widely used for the analysis of complex samples. Regarding water treatment applications,

- fluorescence spectroscopy has been mostly applied at drinking water and wastewater treatment plants to characterize and monitor the different types of dissolved organic matter. For instance, in the food industry wastewater, fluorescence can be very useful towards qualitative and quantitative analysis of amino acids, vitamins, nucleic acids or polyphenols.
- **Nuclear Magnetic Resonance (NMR) Spectroscopy:** NMR spectroscopy provides detailed information about the structure and reaction state of molecules. It is hence a powerful tool for deducing the exact nature of monomolecular organic compounds present in treated wastewater.
- **Inductively Coupled Plasma - Optical Emission Spectroscopy (ICP-OES):** Because of its multielement determination capability, high dynamic linear range and sensitivity, this spectroscopy is used widely for the analysis of drinking water. Its application has also made its way in several standard procedures prescribed under US-EPA, ISO etc.
- **Raman spectroscopy:** It offers an effective tool for qualitative analysis and quantitative detection of contaminants in a water environment. It can be applied for detecting many pollutants of organic, inorganic and biological nature.

HYPHENATED METHODS:

Hyphenated techniques couple two (or more) methods to solve more complex analytical problems.

More specifically, it refers to the combination of a separation technique with spectroscopic detection technology. Separation techniques include gas chromatography (GC), liquid chromatography (LC), high-performance liquid chromatography (HPLC) and capillary electrophoresis (CE). On the other hand, spectroscopic detection technology is used to analyse molecular structure. In turn, that enables quantification of each component within a sample to get a better idea of its composition. The choice of spectroscopic detection methods includes one or more among mass spectrometry (MS), nuclear magnetic resonance (NMR) spectroscopy, Fourier-transform infrared (FTIR or simply IR), and fluorescence emission. Combination of high information spectroscopic detectors with gas chromatography provides useful means to identify and quantify unknown compounds in a mixture.



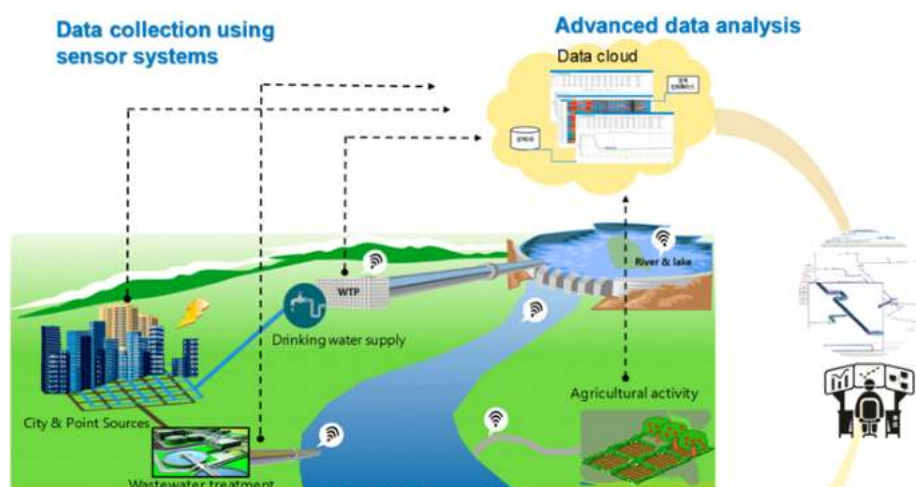
The result of such combination is a range of commonly used hyphenated techniques for waste water analysis, like:

- **GC-MS, LC-MS:** These are powerful techniques for the separation and determination of volatile and semi-volatile compounds. It is useful for investigative monitoring of spot samples of water for unknown (non-target) organic chemical pollutants.
- **High-resolution mass spectrometry (HRMS):** It is a powerful tool in the analysis of dissolved organic matter in waste waters. This technique has improved the understanding of complex environmental mixtures.
- **LC-IR, GC-IR, GC-FTIR:** The separation power of GC or LC is coupled with infrared spectroscopy to analyse different frequencies absorbed by molecules to deduce their structures. They allow it to characterise functional groups with a view to identifying compounds – particularly useful for distinguishing between structural isomers.
- **GC-NMR:** GC coupled with Nuclear magnetic resonance spectroscopy (NMR spectroscopy) is a very powerful analytical method providing

valuable information on the structure of molecules. This technique exploits the magnetic properties of certain atomic nuclei to determine the structure of compounds in which they reside.

SENSOR TECHNOLOGY:

The field of water testing has seen tremendous improvement with the advent of real-time sensors which are portable as well. These devices can provide information and data on various parameters. This translates into getting instantaneous solutions and responses to water quality issues.



REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEMS:

They help in extensive tracking and analysis of large water bodies. Crucial factors like sources of pollution and changes in the water bodies over time can be thoroughly analyzed with the combination of these cutting-edge technologies.

MICROBE IDENTIFICATION BY 'BIOLOG' INSTRUMENTATION:

Working on a patented technology, 'Biolog' instrumentation, test panels, and critical software provide easy phenotype characterization of microbial organisms as well as microbial identification enabling identification of nearly 3000 species of bacteria, yeast, and fungi. The beauty lies in the quickness and simplicity of operation. Some bacterial species can be identified in as little as 1 hour. One has to simply prepare a cell suspension and inoculate the appropriate microplate for identification.

GENOMIC SURVEILLANCE:

and monitoring of the specific pathogenic variants circulating in a community. It has potential for recovery of complete virus genomes from wastewater. It can also identify novel mutations and lineages in wastewater before appearance in clinical samples.

METAGENOMICS:

It is the study of genomic and genetic data inferred from environmental and clinical samples. Wastewater's microbial diversity, distribution of

pathogenic microbial contaminants, antibiotic resistance genes, and the overall quality of treated wastewater can be determined by examining the metagenome. For microbial diversity, metagenomic databases are useful sources for identifying new microbes in different environments.

NEXT GENERATION SEQUENCING (NGS):

The emergence of NGS is revolutionizing the potential to address complex microbiological challenges in the water industry. NGS technologies can provide holistic insight into microbial communities and their functional capacities, taxonomic classification, catabolic gene characterization, bacterial toxicity, cyanobacteria and harmful algal blooms, and characterization of viruses in water and wastewater systems, thus eliminating the need to develop a new assay for each target organism or gene. NGS methods have been widely adopted for water research and are being translated to various applications in the water industry.

DATA ANALYTICS AND AI:

These are well used in water quality testing to process extensive quantities of data. These algorithms can identify patterns, predict potential contamination threats, and even optimize the strategies used to monitor the water bodies.

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KNOW?**

Antarctica holds about 60% of the world's fresh water in the form of ice. If all the ice were to melt, global sea levels would rise significantly.

CONCLUSION

The quality of recycled water directly affects our well-being and therefore we must take proper steps to ensure that it is contaminant-free and safe for use. Water quality testing and analysis is a component that will help achieve this goal. The safety and reliability of our treated water supplies hinges on a robust water analysis, where latest technological advents have large and crucial role to play. Adoption of appropriate, right, accurate, suitable and practical quality monitoring techniques for recycled wastewaters is the correct approach for promoting safe and responsible reuse of wastewaters, contributing to a more sustainable water management approach.

ABOUT THE AUTHOR



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Dr Mayur J. Kapadia, MSc, PhD, is an Educator, Trainer, Editor and Technical Content Creator. He served M/s GNFC Ltd in capacity of Add Gen Mgr & Lab Head for its Bharuch & Dahej (Gujarat) locations. He possesses professional industrial experience of 40 years in the fields of Quality Control of Chemicals / Fertilizers / FMCG products, New Laboratory Set up, Cooling Water Management, ISI certification, and many other areas. He has to his credit technical suggestion awards, nearly 30 publications in journals / magazines and >20 presentations in conferences. He has been conducting full day training programs on Quality Control, NABL, Instrumental Analysis, ISI certification, Cooling Water Management, etc for industry professionals.

He is an active member in technical committee of Bureau of Indian Standards (BIS), which has conferred upon him a 'Certification of Appreciation' for his immense contribution towards establishing and improving various Indian Standards. He also has been rendering technical services to various organizations for quality improvement, process trouble-shooting and analytical aspects.

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ADVANCE OXIDATION DITCH IN INDIA

INTRODUCTION TO DITCHES

Oxidation ditches are the advanced and modified version of Activated Sludge Process. It is a complete mix process which tends to operate in an extended aeration mode. Oxidation ditches are operated at long hydraulic and solid retention times to get good removal of carbon and nutrients. The two processes, namely, Nitrification and denitrification, occur in the two different zones of the Ovivo's advanced oxidation ditch. The process of Nitrification occurs with the help of the Autotrophic bacteria in the aerobic zone of the Oxidation Ditch which helps in converting the ammonia-nitrogen to nitrate-nitrogen. The nitrate-nitrogen then gets converted to the nitrogen gas in the anoxic zone of the Oxidation Ditch basin with the help of facultative bacteria. This process of converting Nitrates to Nitrogen gas is called denitrification process. The ditches are equipped with primary treatment upstreams and secondary clarifiers at the downstream side for complete removal of BOD and TSS.



Fig.1 Ovivo's Advanced Oxidation Ditch
Google Earth Image



Fig.2 Ovivo's Advanced Oxidation Ditch Site Image

ADVANTAGES OF OVIVO'S ADVANCED OXIDATION DITCHES OVER OTHER BNR OPTIONS

Ovivo's advanced Oxidation Ditch treatment is very successful and proven Secondary Wastewater treatment technology. Once the ditch is commissioned and working as shown in Figure.1 and 2, it requires minimum manpower to operate it (an unmanned operation). The Ovivo's Advanced Oxidation ditches can handle varied flow ranges and it has proven to be a very effective technology for those areas generating low flow conditions as well as for any isolated regions where labor availability is also less. Oxidation ditches require more land area as compared to the area required to construct SBR and MBR or other treatment plants. On comparison with the other treatment technologies, it has been found out that the ditches generally utilize less energy as compared to other technologies and so are energy efficient and the treatment objectives can be achieved with low capital and maintenance costs.

Ovivo's Advanced Oxidation ditches are equipped with mechanical surface aerators. These are vertical shaft aerators with an upper impeller and a lower turbine. The upper impeller helps in maintaining the effective velocity of the wastewater throughout the basin and helps to transfer oxygen from the atmosphere to the wastewater whereas the lower turbine prevents sludge settling and also helps in maintaining the floor velocity.

There are two different types of mechanical aerators installed in the basin. One of its types is known as the LSC aerator with Draft Tube as shown in Figure 3. It has the upper impeller known as Hubert impeller. The impeller and the draft tube has certain inches of clearance in between. The draft tube is mounted on the floor and is the non-rotating part of the aerator which is fixed horizontally with the partition wall within the basin. The draft tube aerators are used when the depth of the basin is more than it is specified, depending on the diameter of the aerator impellers. For 215 HP aerators, the standard allowable max depth is around 19ft. The depth of the

Ovivo's Advanced Oxidation Ditch plant is 22 ft, so the draft tube aerator has been installed at one end of the basin.



Fig.3-LSC Aerator w/Draft Tube

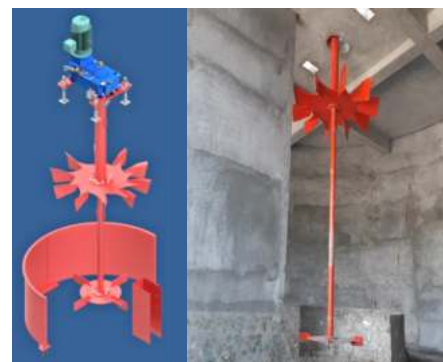


Fig.4- Excell® Aerator II

The other type of aerator installed in the ditch is known as the Excell® aerator II with dual Impeller which is shown in Figure 4. Its upper impeller is known as the Astrumaer impeller, and it has the lower turbine for mixing. It is located at the far end of the basin. The lower turbine helps in dewatering the basin, if the basin is required to go under maintenance, to a depth of three feet above the basin floor.

Ovivo's advanced oxidation ditches are monitored and

controlled by the Oculus™ control System. It helps in monitoring and controlling the BNR operations occurring in the basin and in optimizing the power usage of the plant. The DO probes, ORP probes and NO₃ probes in the basin work in co-ordination with each other to maintain the anaerobic, anoxic and aerobic conditions in the basin. The level sensors help in maintaining the effluent weir level in the basin. The Oculus system receives signals from all the installed probes in the basin which helps in controlling the power input to the aerators and also helps in better functioning of the EliminatIR gate. The EliminatIR gate helps in maintaining the NO₃ levels in the Anoxic zone with the help of the readings obtained through the ORP probe.

STP DESIGN BASIS

There was sufficient land area available at the Sewage Treatment Plant site for the construction of Ovivo's advanced Oxidation Ditch treatment process. As per the incoming flow and the influent parameters available, four oxidation ditches were constructed on the site. Each oxidation ditch is constructed to treat the incoming flow of 25.65 MLD. The total occupied footprint including all the four ditches is 338 ft X 273 ft with 22 ft of SWD. Ovivo India Private Limited Provided the key equipments for the construction of the STP including surface aerators, mechanical gates and controls with a detailed process design. The plant was commissioned in 2020.

Each oxidation ditch is equipped with two (2) nos. of 215 HP aerators. These aerators are VFD controlled. The Excell aerator II in the basins are operated completely with the electricity generated through the gas driven turbines. The LSC Aerator with the draft tube is operated partially with electricity generated through the gas driven turbines. The gas is produced by the anaerobic digesters installed on the site.

Nitrification/Denitrification in Ovivo's Advanced Oxidation Ditch

The process of Nitrification occurs in the oxidation ditch where there is sufficient oxygen available. The nitrogen enters the wastewater treatment plant in the form of ammonia. As ammonia is very harmful and toxic, it is required to be removed from the wastewater before it enters the water bodies. Ammonia (NH₃-N) entering the plant gets converted to Nitrates (NO₃-N) with the help of the DO available in the basin. This process of converting the ammonia to nitrates is facilitated by a specific type of bacteria called Nitrosomonas and Nitrobacter in a two-stage process. These NO₃ generated enters the anoxic basin where the process of denitrification occurs with the help of facultative bacteria. These NO₃ generated gets converted to N₂ gas which is released into the atmosphere. The facultative bacteria also require oxygen to carry out the process. These bacteria can utilize the oxygen from the NO₃ generated in the basin to oxidize the organic substrate coming into the plant.

This helps in decreasing the overall power requirement of the plant.

BIOWIN SIMULATION

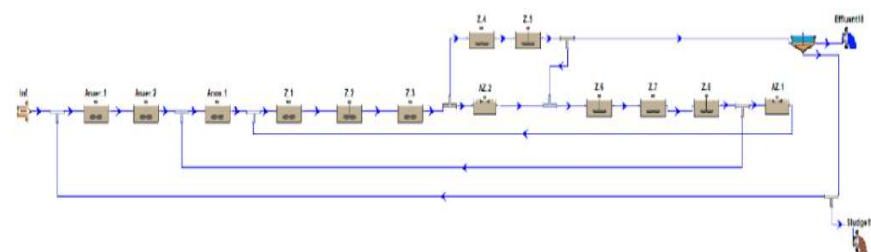
BIOWIN is a very well-known and trusted software in the wastewater industry which is used to validate the traditional design methods of wastewater treatment plant designing. Ovivo India has used this simulation tool to simulate the Ovivo's three-stage advanced oxidation Ditch process and to confirm the results guaranteed by the design sheets. BIOWIN can be used to simulate the simple Oxidation Ditches to complex 5 Stage Oxidation Ditches. The Ovivo's advanced Oxidation Ditch is modelled by dividing the basin into specific zones as shown in the figure below. The influent values, wastewater temperature, SRT value, DO, MLSS and the aerator HP value are required to run the model. The below image shows the Ovivo's Oxidation Ditch fragmented into various zones and the influent values used in the model along with the effluent results obtained after simulation.

ABOUT THE AUTHOR



Mrs. Dharni Lahewala
Manager, OVIVO India Pvt Ltd

Mrs. Dharni Lahewala, Manager – Process Aeration Group has been working with OVIVO India Pvt Ltd since past 10 years. She is B.E. (Civil) and has completed her post-graduation in M. Tech (Env.). At present she leads the Process Aeration Group for USA business support which works on designing of Advanced Oxidation Ditch plants in USA. Ovivo is a global provider of equipment, technology and systems producing among the purest water and treating some of the most challenging wastewater in the industry.



INFLUENT DETAILS

	Flow	6.70 mgd
	COD - Total	458.80 mg/L
	N - Total Kjeldahl Nitrogen	35.00 mgN/L
	P - Total P	6.00 mgP/L
	ISS Total	75.00 mg/L
	S - Total S	10.00 mg/L
	Volatile suspended solids	225.00 mg/L
	Total suspended solids	300.00 mg/L
	BOD - Total Carbonaceous	225.00 mg/L
	pH	7.30

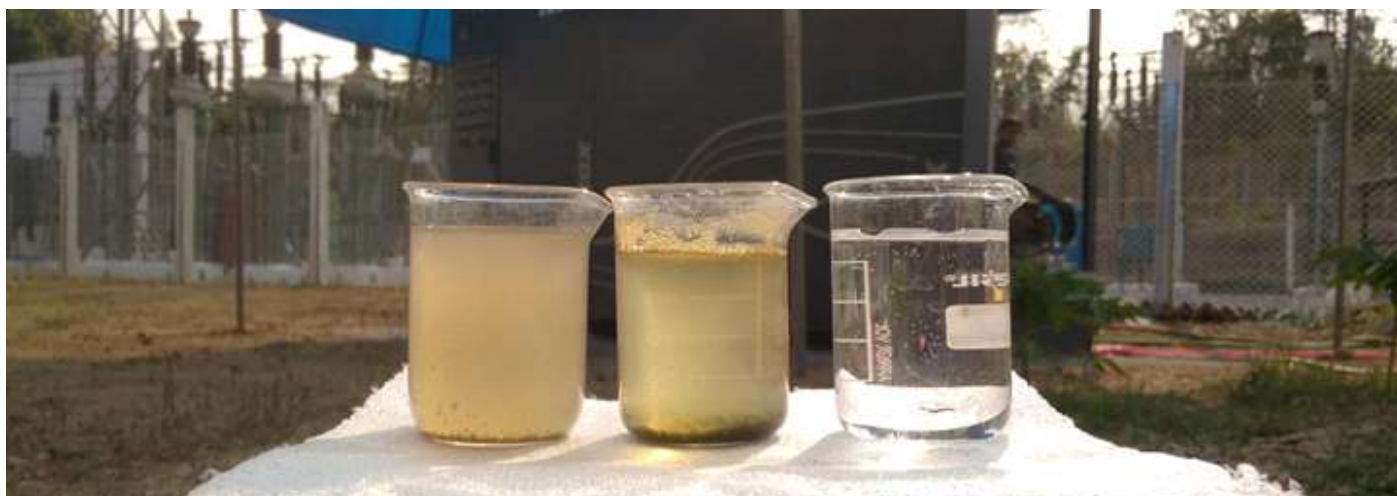
EFFLUENT DETAILS

	Flow	6.51 mgd
	N - Ammonia	0.62 mgN/L
	N - Nitrate	2.40 mgN/L
	N - Nitrite	0.17 mgN/L
	N - Filtered TKN	1.79 mgN/L
	N - Total N	4.95 mgN/L
	P - Soluble phosphate	0.45 mgP/L
	P - Total P	0.74 mgP/L
	Total suspended solids	11.78 mg/L
	COD - Total	35.47 mg/L
	BOD - Total Carbonaceous	3.79 mg/L
	pH	7.45

SUMMARY

The Ovivo's advanced oxidation ditches costs significantly lower in operation and maintenance cost, as compared to the other treatment technologies. The oxidation ditches are very robust in operation and a very reliable solution to handle shock loads. The STP plant is running successfully generating the required permissible effluent limits from 2020.

INNOVATIVE WASTEWATER TREATMENT TECHNOLOGIES



Transforming wastewater into clean water | Source: INDRA

India, a dynamic hub of industry and technology, is experiencing a transformative shift in its approach to wastewater treatment under the leadership of the Prime Minister, with various efforts underway to boost innovation and entrepreneurship. As the nation contends with the dual challenges of industrialization and environmental sustainability, innovative solutions are emerging that are set to revolutionize the wastewater treatment landscape in India. Before exploring these innovations, it's essential to grasp the challenges India faces in wastewater treatment.

The water treatment market is predicted to grow significantly in the coming years due to factors such as population growth, urbanization, the increasing need for new water resources, strict regulations on water quality and public health, and expanding industrial applications. It is essential to explore some of the latest advancements in wastewater treatment technologies from a global perspective, with a particular focus on India's initiatives and the role of startups in driving this transformation.

Conventional wastewater treatment begins with the

removal of large solids and debris, a crucial initial step in managing the inflow of wastewater. Following this preliminary stage, the focus shifts to a biological process aimed at addressing the dissolved organic matter that the primary treatment does not capture. Sewage Treatment Plants (STPs), which are specifically designed to treat sewage from residential, institutional, commercial, and industrial sources, play a central role in this process. However, operating these facilities presents significant challenges, including high energy consumption and the need for sludge disposal. Furthermore, STPs often require upgrades to handle emerging contaminants such as pharmaceuticals and personal care products. These complexities pose substantial difficulties for smaller or economically constrained communities in establishing and maintaining these critical facilities. Environmental regulations are becoming more stringent, requiring higher standards for wastewater discharge and treatment.

Innovation in wastewater treatment is essential for several such reasons, which are increasingly critical as the global population grows and environmental

challenges intensify. Achieving sustainable development goals, particularly those related to clean water and sanitation (SDG 6), requires the implementation of advanced and sustainable wastewater treatment technologies.

I believe water filtration plants play a crucial role in removing impurities from wastewater. By integrating machine learning and artificial intelligence, these systems can optimize filtration processes in real-time, adapting to changing water compositions and ensuring a higher degree of purity in the treated water. Ultrafiltration plants, for instance, use fine membranes to eliminate particles, bacteria, and even viruses from water, ensuring a high level of purity.

Another key aspect is distillation plants, which continue to lead in providing pure water solutions with advanced techniques. Beyond their traditional role in desalination, modern distillation plants are now also effective in removing various contaminants and pollutants. This makes them a versatile solution for addressing the challenges posed by diverse wastewater compositions.

Biotechnological advancements are also playing a crucial role in transforming wastewater treatment. Techniques such as bioaugmentation, where specific microorganisms are introduced to degrade pollutants, and bioremediation, which uses natural organisms to treat contaminated water, are proving effective. These methods are environmentally friendly and often more cost-effective than traditional chemical treatments.

Sustainability is becoming a core principle in the design and operation of water treatment facilities. Many new plants are now being built with a focus on reducing carbon footprints and enhancing energy efficiency. For example, some modern water treatment plants incorporate solar energy to power operations, significantly reducing their reliance on fossil fuels. Energy efficiency is another critical focus area in the design of modern wastewater treatment plants. Advanced technologies enable these facilities to optimize energy use, reducing the overall environmental impact while maintaining high standards of water quality.

Water technology has historically progressed at a slow pace, where the adage "move fast and break things" doesn't quite fit. Instead, the industry is characterized by lengthy sales cycles, risk-averse customers, and financially constrained water utilities. Despite this, the demand for innovation coupled with a supply of robust, scalable solutions from talented entrepreneurs is higher than ever—creating an increasingly favorable environment for both founders and investors.

Climate change fundamentally impacts water resources; it is the primary medium through which we experience the effects of global warming. This reality presents both significant challenges and opportunities to address critical issues related to water scarcity and governance.

Developing such an ecosystem would promote dialogue and co-creation of new policies and financing models, while also engaging the public in a meaningful and transparent manner.

Challenges such as slow adoption, regulatory hurdles, and the conservative nature of the water industry make it a challenging space for venture capital investments. Nevertheless, I remain very optimistic about the future, as water technologies are crucial for global sustainability, and exciting companies are making incredible progress in the space. Another major challenge is the scale-up readiness of new water treatment technologies. While a technology might work effectively in a controlled, small-scale environment, replicating that success on a larger scale can present unforeseen challenges. Scaling up involves not only technological adjustments but also increased capital, operational expertise, and robust supply chains that can handle larger production volumes.

Particularly in developing countries, the financial resources available for upgrading water treatment systems are often limited. Public sector water utilities may face budget constraints that restrict their ability

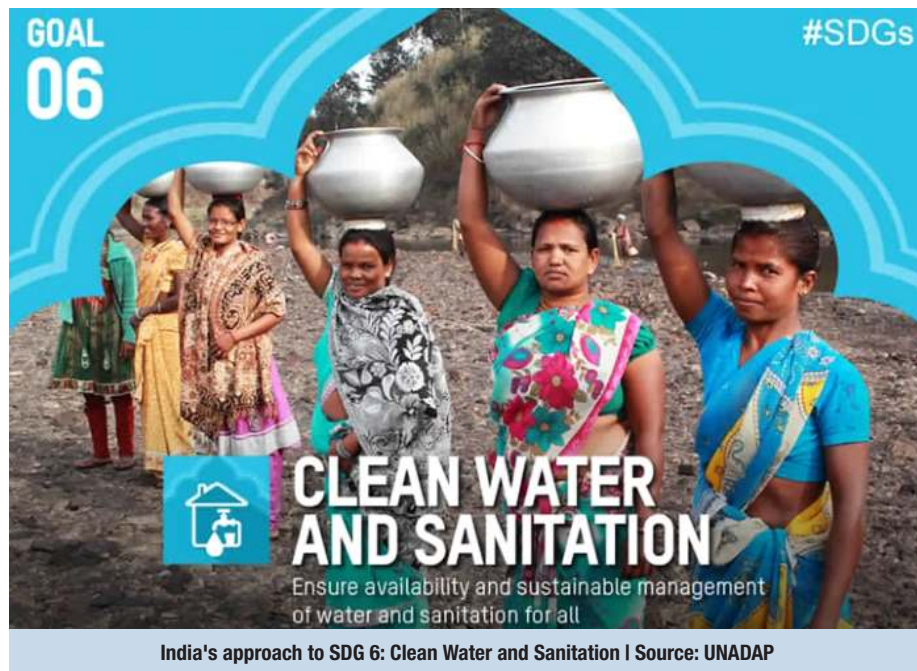
to invest in new technologies, regardless of the long-term savings or benefits they might offer. Emerging technologies must also navigate complex environmental and social landscapes. For instance, water treatment processes that produce hazardous byproducts or require excessive energy can face opposition from environmental groups. Similarly, technologies that promise to significantly alter labor dynamics in the sector might encounter resistance from workers' unions and communities dependent on existing water management practices.

Startups are becoming increasingly instrumental in transforming India's wastewater treatment sector by introducing innovative technologies and new approaches to address long-standing challenges. Their agility, fresh perspectives, and capacity to rapidly integrate modern scientific advancements are reshaping the landscape of water management in the country.

Traditionally, large corporations and government entities have dominated this sector, often relying on established, time-tested technologies that, while effective, can be slow to evolve. In contrast, startups thrive on innovation and speed, driven by a need to differentiate and make an impact. This dynamism is crucial in a field like wastewater treatment, where evolving challenges such as increasing urbanization, industrialization, and stringent environmental regulations demand more efficient, cost-effective, and sustainable solutions.

One of the major contributions of startups in this sector is their role in accelerating the adoption of cutting-edge technologies such as artificial intelligence, IoT, and advanced biotechnological processes. These technologies offer significant improvements over traditional methods, including enhanced efficiency, reduced costs, and minimized environmental impact. For instance, startups are developing AI-driven platforms that optimize treatment processes in real time, adjusting to fluctuations in wastewater composition and flow to maximize treatment efficiency and minimize energy use.

Moreover, startups often adopt a more holistic approach to water management, emphasizing not only the technical aspects of treatment but also the integration of systems into smarter city frameworks and industrial practices. This includes implementing solutions for real-time water quality monitoring, smart metering, and advanced data analytics to predict system failures and optimize maintenance schedules. Such integrations can significantly improve the



responsiveness and adaptability of water infrastructure, essential qualities in today's rapidly changing environmental and regulatory landscape.

The water tech sector is emerging, with only a few companies and limited funding. A notable example is INDRA, which recently raised \$4 million in their Series A funding round. This round was led by Emerald Technology Ventures and Mela Ventures, along with Peak Sustainability Ventures and The Climate Angels, aimed at impacting over 500,000 lives and counting. Based in Mumbai, INDRA addresses water treatment challenges in the industrial and sewage segments with its patented electro-chemical oxidation and coagulation process. They have developed a proprietary water treatment solution—a plug-and-play system that requires 90% less space compared to existing solutions while recovering up to 99% of treated water.

The Indian market for water treatment is estimated to be worth \$12 billion at the moment, and by 2030, it is projected to grow to \$20 billion. The Indian government has been actively supporting startups in the wastewater treatment sector through various initiatives and schemes, including those from the Department of Science & Technology and the Department of Biotechnology (BIRAC). At the state level, initiatives like the Maharashtra State Innovation Society promote a culture of innovation and entrepreneurship.

The provision of government-aligned work orders is another significant form of support. These orders serve as both a validation of the technology and a steady initial revenue stream. For a startup in the water treatment industry, securing a government contract can be a game-changer, offering the credibility needed to attract further investment and partnerships.

Data analytics and monitoring play a critical role in the realm of sustainable wastewater management. Traditionally, most data analytics companies have concentrated on mapping water quantity due to the relative ease of measuring and tracking water flow and usage.

However, as the complexity of water management challenges increases, the focus is shifting toward a more comprehensive approach that includes the quality of water alongside its quantity. This shift is driven by the urgent need to ensure not only the adequacy of water supply but also its safety and suitability for various uses.

A standout example of innovation in this field is Boon (formerly known as Swajal). This company leverages advanced technologies, including artificial intelligence, to enhance the efficiency and reliability of water purification systems. Boon's patented approach to predictive filter maintenance is particularly revolutionary. By using AI, the system can predict when a filter will need maintenance or replacement, long before it becomes a critical issue. This predictive capability not only prevents downtime but also optimizes the performance of the water purification system, ensuring that it operates at peak efficiency. The Waterloo system tracks everything from basic water quality metrics to more detailed analyses, such as the presence of specific contaminants. Each drop of water is monitored for its compliance with health and safety standards, and adjustments can be made instantaneously if any discrepancies are detected.

Innovations in transforming industrial wastewater from a costly burden into a valuable resource are cutting costs and carbon footprints while propelling companies towards sustainability and leadership in their sectors. Manufacturers in the food industry often discharge high-organic process wastewater to publicly-owned treatment works after onsite pretreatment. In some cases, these manufacturers may benefit from exploring alternative pathways for disposing of wastewater characterized by high organic loads.

Community involvement and education are also playing key roles in water sustainability efforts. More and more, individuals and communities are being educated about the importance of water conservation and are being encouraged to adopt sustainable practices such as using water-efficient appliances, fixing leaks, and managing water use in their homes and gardens.



INDRA's wastewater treatment plant | Source: INDRA



INDRA: Wastewater treatment plant | Source: Maker Mela at Somaia Vidyavihar

This support ecosystem is crucial for nurturing early-stage innovations and bringing them to market. By providing a supportive environment for entrepreneurship, these initiatives help drive technological advancement and address critical challenges in sectors such as wastewater management. As India continues to invest in wastewater treatment technologies and support startups, the country is well-positioned to tackle its water challenges and set an example for sustainable water management globally. Through a combination of technological innovation, community engagement, and government support, India is charting a path towards a cleaner, healthier, and more sustainable future.

This community-level action is crucial in reducing overall water consumption and helping to preserve this vital resource.

Governments and regulatory bodies are also stepping up their efforts by enforcing stricter regulations on water quality and industrial water usage. These regulations are pushing companies to adopt more sustainable practices and are holding them accountable for their water use and waste. Additionally, many governments are investing in infrastructure to improve water supply and treatment facilities, ensuring that clean, safe water is accessible to all their citizens.

The Smart Cities Mission is another pivotal initiative by the Indian government aimed at modernizing urban infrastructure, which includes the development of smart water management systems. These systems use technology such as IoT sensors and smart meters to monitor and manage water distribution, reduce wastage, and predict maintenance needs. This initiative is vital for ensuring sustainable water management in urban areas, where the demand for water is continuously increasing.

2024 marks a pivotal year where innovation and sustainability continue to merge to protect our vital resource — water. With a growing number of innovative startups performing well in this domain, the coming years are set to attract more investment and instill greater confidence among investors and the government alike.



ABOUT THE AUTHOR



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Bio: Gaurang is the Chief Innovation Catalyst at riidl Somaiya Vidyavihar. He was identified as the 50 Most Inspiring CEOs - 2017, Silicon India. His efforts at riidl (startup incubator) was recognised by DST with a National Award for emerging incubator 2020. META (Facebook) has awarded him for his resilient & continued leadership at Meta Developer Circles Mumbai in 2021. He volunteered as the Chairman for startup's committee at Indian Merchant Chamber (2023-2024).




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KSB DEVELOPS CUSTOMIZED PUMP FOR ATWATER MONTRÉAL PUMPING STATION REFURBISHMENT

KSB SE & Co. KGaA

INTRODUCTION

Delivering potable water to the residents, commerce and industrial infrastructure of Montréal is a massive task for the City's Water Department. The Department operates six water treatment plants, the largest of which are Atwater and Charles-J.-Des Baillets. The water feeding these two plants is extracted from the St Lawrence River and is purified by a combination of filtration, ozonisation, ultraviolet (UV) water treatment and finally chlorination at the Charles-J.-Des Baillets. From there it is diverted to the Atwater plant for distribution through the City's network of pipes.

Should it be necessary to shut down either the Charles-J.-Des Baillets plant or the Atwater plant, water can be diverted to and from either plant. This ensures that water levels in all seven reservoirs around the metropolitan area of Montréal are maintained at optimum capacity. Both production plants are interconnected via sizeable piping, so that in the unlikely event of one plant going down, water can still be supplied to the reservoirs.

HISTORY

The Atwater drinking water treatment plant site represents an important part of Montréal's heritage, this being attributable to its historical, scientific/technical, architectural and artistic, as well as landscape values. Originally constructed in 1868 the Atwater plant has undergone many changes since then, the first being the construction of the central pumping station in 1923 (Fig.1) and the replacement of the original steam pumps with electric pumps. Over the past 100 years, the plant has played a critical role in the development of the city, through its



contribution to public safety and health. Considerable investments have been made by the City of Montréal in order to increase production capacity and improve overall operating efficiency. The most recent investment has been to refurbish and expand the pumping facilities through the replacement of aging pumps with purpose-designed units manufactured by KSB which have brought output up to 700,000m³ per day of drinking water for a large area of Montréal Island.

PROJECT

As part of the project involving the refurbishment of equipment at potable water production plants, pumping stations and reservoirs (REQU 1), the City of Montréal launched a public tender for the pre-purchase of six (6) new motor-pump sets (MPS) and their components in 2018. This would include medium voltage synchronous electrical motors with

exciters, switch gear cabinets, all to replace the aging high-pressure pumps in the Atwater potable water pumping station. The very nature of the project, it being a complete replacement of the pumps in an existing pumping hall, threw up a range of challenges for KSB's engineers to address, not least of these being the design of the pump specified by the client. In the terms of the contract, the pump manufacturer would be responsible for the supply of the pumps and all related electrical components, as well as assisting in the installation of the units, their commissioning, testing and post-commission personnel training. Key to the project was that the pumps had to be centrifugal single-stage horizontal split-case, double-suction, double-volute pumps with bottom entry suction and discharge on the horizontal side. The requirement for bottom suction entry and side discharge was dictated by the existing piping infrastructure within the pump house.



Being an existing pump station, it was critical to ensure that the dimensions of the equipment to be supplied complied with all the dimensions and clearances (Fig.2) so that the equipment could be installed in the available space while taking into account the existing structures, including the location of the water intake and discharge pipes. Any modification to this old configuration would have had a huge impact (in engineering and cost) on the piping arrangement and construction at site.

KSB TAKES ON THE CHALLENGE

KSB's working relationship with the City of Montréal goes back over 40 years, when in the late 1970's it supplied five of its type ME 5,500HP 4200 l/s pumps to the Charles-J.-Des Bailleurs water treatment plant. In 2015 a further KSB ME pump was installed, this coming on stream in 2018, which enabled the plant to operate to its optimum design capability. It was in the spring of 2018 that KSB was invited to tender for the supply pumps for the Atwater plant, eventually being awarded the contract at the end of that year. The contract award would take into account not only the acquisition cost, but also the operating cost of electrical energy over 25 years. This meant that the pump sets had to deliver high levels of operating efficiency.

In order to meet the contract criteria KSB's engineers in Halle, Germany had to manufacture a bottom entry suction pump, a design which is not a common standard design, and meet 29 essential hydraulic and mechanical criteria. As a result the pump was custom-made to this design and subjected to full factory testing with the specific project motor and the specific project switch gear at the factory in Germany.

EQUIPMENT SUPPLIED

The pumps designed and supplied were six single-stage horizontal split case double suction pumps, each fitted with 948mm double-entry radial impellers (Fig.3). Each pump comes with a 2500HP synchronous motor with brushless exciter. The pumps are rated to operate at 1580l/s at a head of 73m. Included in the package are an excitation control panel and electrical integration services.



A further issue was the need to keep the plant operational at all times during the refurbishment work. This was achieved by extending the installation of the equipment over an extended period, whereby the existing pumps would be taken out sequentially and replaced by the new pumps. In order for this to be fulfilled, all the units were fabricated by KSB at the same time then stored at a nearby site for the duration of the refurbishment program, this being two years. Concerns were raised with regard to any possible delay in the delivery of the new equipment. This was because the obsolescence of existing pumps would worsen as spare parts were no longer available. In addition, the plant would have to deal with two separate electrical power systems, which is not recommended. In fact, the new pumps were to be connected to the 25 KV power system while the existing pumps would continue to be powered by the existing 12 KV power system, which was reaching the end of its useful life. This situation was identified as creating additional costs in the maintenance and management of the operation.

All six pumps were fabricated and ready for factory testing in early 2020, right at the beginning of the COVID pandemic. The Halle factory maintained the testing schedule despite personnel shortages. Due to global sanitary restrictions, the client was not able to witness the tests at the factory in Germany in person. This difficulty was resolved by allowing remote participation via video conference to the factory test bench. All tests were successful and even improved the theoretical efficiency.

SUMMARY

KSB shipped all equipment from Germany to a storage site in Montréal area where periodic (monthly) maintenance was performed on the units during storage. The first two pumps were installed and commissioned in 2022, with the four remaining units being installed and commissioned in August 2023.

The contractor installed all the pumps and electrical equipment and completed the inter connection wirings between the switchgear, motor control and excitation panels (Fig.4). KSB inspected the pumps and motor mechanical installation. Also KSB's subcontractor (electrical integrator) checked all the wirings from/to all the above mentioned equipment, these being sensors, motors, switchgear, motor control and excitation control panels. KSB was also present during the pump SAT.

All pumps were retested onsite and achieved all required performance, followed by personnel training for pumps, motors and switchgears undertaken in September/October 2023.

**DID YOU
KNOW?**

The water industry is increasingly using innovative technologies like desalination to convert seawater into freshwater, addressing water scarcity challenges in coastal regions.

AMAGUA C.E.M. DESIGNS SOLAR-POWERED WATER TREATMENT AND DISTRIBUTION NETWORK FOR ECUADOR'S SAMBORONDÓN DISTRICT

Using Bentley Technology Saved USD 1.2 Million in Costs and Helped Eliminate 6,905 Tons of Carbon Emissions

ADOPTING SOLAR ENERGY FOR A NEW INTEGRATED WATER SYSTEM

Amagua C.E.M. provides drinking water and wastewater management for the La Puntilla Parish in the Samborondón district of Ecuador. Committed to offering a quality, efficient water supply and sewerage service, they also provide complementary preventive system management, as well as consulting for network design, construction, and maintenance of residential facilities. To streamline operations and ensure a reliable water supply, Amagua decided to build an integrated water capture, transportation, and treatment system. "To have operational autonomy, we determined the need for an integrated collection, conduction, and treatment system that allows it to supply [...] a complete flow of 880 liters per second (l/s)," said Leonidas Dávila, engineer and project director at Amagua.

The project was divided into two phases, providing a flow of 440 l/s in the first phase and an additional 440 l/s during the second phase. It involved designing a catchment, distribution line, and treatment plant.

To make the project self-sustainable and reduce its carbon footprint as much as possible, Amagua contemplated using solar panels to power the network and pump the water to the distribution tanks. The solar energy captured by the panels would power surface pumps that draw water from a river or well and pump it to the raw water tank and distribution system, reducing and potentially eliminating the network's reliance on conventional energy sources, such as grid electricity or fossil fuels.

ADDRESSING UNDULATING TERRAIN AND PIPELINE TRANSIENTS

While solar panels are advantageous to reducing environmental impact and supporting a more sustainable and economical water supply, Amagua needed to consider several factors to optimize pump and network operations. "It is important to consider the appropriate capacity and size of solar panels, as well as the efficiency and capacity of storing energy in batteries, for optimal operation of the pump system," said Leonidas Dávila. In addition to the panel specifications and energy considerations, Amagua also had to address semi-undulating terrain and irregular topography, as well as avoid problems with transients in the 4.2-kilometer-long pipeline in the high elevation area.

To identify and mitigate potential problems that could affect the pressure and flow and compromise operations, as well as ensure that the solar panels could generate the necessary power to deliver a reliable water supply, Amagua had to perform various modeling scenarios. They needed an integrated 3D design and hydraulic modeling and analysis solution to optimize optioneering, determine the most effective network arrangement, and validate the use of solar energy.

LEVERAGING BENTLEY'S 3D DESIGN AND HYDRAULIC MODELING AND ANALYSIS APPLICATIONS

"It was proposed that MicroStation and OpenFlows Water be used to optimize the execution of the project," said Leonidas Dávila. Amagua selected MicroStation to design the entire architecture of the system in 2D and 3D, as well as OpenFlows Water to model and analyze the pipeline arrangement of the network and estimate energy consumption costs, based on both electricity and renewable energy.

The advanced algorithms and 3D visualization features of Bentley's applications allowed Amagua to perform digital simulations of numerous scenarios, verifying the optimization of both the existing and

future distribution networks, and validating the use of solar panels as the most efficient source of renewable energy. “Thanks to the usefulness of OpenFlows Water’s energy cost module, we were able to model energy costs when using fossil fuels and when using solar panels, as well as their contribution to the carbon footprint,” said Leonidas Dávila. The digital models will also be used throughout the construction and operations phases of the project.

DIGITAL SIMULATION REAPS SAVINGS AND SUPPORTS SUSTAINABILITY

Using Bentley’s advanced 3D design and hydraulic modeling and analysis applications, Amagua reduced modeling time by 80%. Working in a connected digital platform improved efficiencies in data federation and data exchange processes by 75% and 80%, respectively. Through accurate modeling and simulation, Amagua shortened the planning stage by 15 days, identifying and eliminating 3,530 collisions during the design phase that was equivalent to a potential savings of USD 50,000. The integrated technology solution shaved 97 days off the construction schedule to save USD 1.2 million while achieving an optimal design that saved 40,000 tons of concrete.

In addition to time, cost, and material savings, the digital simulations supported the use of solar panels, delivering significant environmental and sustainability benefits by reducing energy consumption and the carbon footprint of the project. The solar panels reduced dependency on fossil fuels, eliminating 6,905 metric tons of carbon emissions. “As a result, we were able to achieve a 95% reduction in fossil fuel energy used per year,” said Leonidas Dávila. Compared to conventional pumping systems, the solar-powered pumps are easier to maintain and are especially useful in rural or remote areas where electrical infrastructure may be limited, providing autonomous and reliable access to drinking water, improving the quality of life for communities. “The use of water pumping systems with solar panels offers significant environmental, economic, and social benefits,” said Leonidas Dávila.

Project Summary

Organization: Amagua C.E.M.

Solution: Water and Wastewater

Location: Samborondón, Guayas, Ecuador

Project Objectives:

- To deliver an integrated water capture, transportation, and treatment system.

- To achieve a more sustainable, economic water supply.

Project Playbook: MicroStation, OpenFlows Water



Amagua’s project involved designing a self-sustainable, energy-efficient plant, using all solar panels to power the pumps.

Fast Facts

- Amagua provides drinking water and wastewater management for La Puntilla Parish.
- They determined a need for an integrated water capture, transportation, and treatment network.
- The project involved designing a self-sustainable, energy-efficient plant, using solar panels to power the pumps.



Using MicroStation and OpenFlows Water optimized design, shortening the construction period by 97 days.

ROI

- Using MicroStation and OpenFlows Water optimized design, shortening the construction period by 97 days.
- Bentley’s applications reduced Amagua’s modeling time by 80% and saved on material costs.

Callout Quote:

“By harnessing solar energy, the environmental impact is reduced, and a more sustainable and economical water supply is achieved over the long term.” – Leonidas Dávila Viera, Engineer and Project Director, Amagua C.E.M.



Bentley’s applications reduced Amagua’s modeling time by 80% and saved material costs.

ABOUT THE AUTHOR



Neda Simeonova

senior product marketing manager,
Water Infrastructure, at Bentley Systems

Neda Simeonova is a senior product marketing manager, Water Infrastructure, at Bentley Systems. Neda has been involved in the water, wastewater, and stormwater infrastructure industry for over 18 years, including as the former editorial director of Water & Wastes Digest, Storm Water Solutions and Water Quality Products magazines where she focused on industry trends, technology advancements, and water policies.

TOSHIBA SHAPING THE SUSTAINABLE WITH ITS NEXT-GEN TECHNOLOGIES

COP27 set the stage for COP28 to continue the push towards a low-carbon future, particularly in the realm of transitioning from fossil fuel. The research increasingly indicates that we will have to not only lower emissions as much and as fast as possible but also remove excess carbon that will continue to be emitted into the atmosphere from hard-to-abate sectors. Technological solutions will also be central to decarbonization through initiatives such as the digital transformation can act as an enabler to decarbonisation, or technologies for carbon capture and sequestration.

Toshiba has the tools and the technology needed to accelerate the global energy transition and reduce carbon emissions as much as possible. As such, Toshiba Group formulated the Environmental Future Vision 2050 to address carbon neutrality, the circular economy, and a society in harmony with nature. Toshiba will promote the implementation of initiatives in three areas: “response to climate change”, “response to the circular economy” and “consideration of ecosystems” so as to realize the ideal situation by 2050. In November 2021, we revised the vision “response to climate change” from 50% reduction across the Group's value chain by FY2030 to “Achievement of carbon neutrality throughout the entire value chain (70% reduction of GHG emissions by FY2030)”.

Toshiba recognizes the importance of maintaining a management foundations with integrity and transparency to support our business activities, and, to that end, has set out the following as material issues to be addressed by Toshiba Group so as to increase our corporate value.

TOSHIBA'S SUSTAINABLE GROWTH AGENDA: FORGING A GREENER FUTURE

Since its founding in 1875, Toshiba has combined innovation and expertise to tackle social issues. Toshiba's goal is to achieve carbon neutrality and a circular economy by building infrastructure that everyone can enjoy and a connected data society. In this process, we will continually create value by maximizing the power of data, and draw on the product expertise, technologies, and customer relationships we have cultivated over the years to support social infrastructure, including the energy, water treatment, transportation and devices businesses.

Toshiba group in India is making good progress in business expansion. In FY22, consolidated revenue of all Indian Toshiba Group companies grew almost by 50%. Toshiba can provide comprehensive solution to generate, transfer and store and smart use of energy, we are also experts in water management and a reliable partner of the government in its “Clean Ganga” initiative. Toshiba's SCiB™, a rechargeable lithium-ion battery ideal for hybrid vehicles, is receiving encouraging response from the industry and we are partnering up with major car company to support Indian Green mobility initiative.

We need to achieve growth along with protecting environment. By integrating sustainability into our business goals, we will solve several problems caused by social challenges. Toshiba's management philosophy is “Committed to People, Committed to the Future.” We believe we will contribute to a new better world.

TOSHIBA INDIA'S SUSTAINABILITY REPORT: A BUSINESS UPDATE ON ENVIRONMENTAL RESPONSIBILITY

With the government's strategy for accelerating the pace of sustainable economic development, India is

primed for ‘Green Growth’. With a rich heritage of almost 150 years of continuous innovation and technological excellence, Toshiba is in a unique position to support India in realizing its goals for sustainable growth.

Toshiba has been a reliable partner in India's quest for sustainable energy security and can provide comprehensive solution to generate, transfer and store and smart use of energy. Toshiba can supply solutions and services in power plants by offering Cyber Physical Systems and IoT as a service like EtaPRO™ to improve the efficiency and reliability of power generating assets. In addition, our Carbon Dioxide Capture Utilization and Storage (CCUS) solution helps to separate and capture CO2 from thermal power plants, resulting in transition towards a carbon neutral society.

For energy Transmission & Distribution (T&D), Toshiba is a world leader in the supply of integrated solutions for both conventional and renewable energy sources. To support the transition towards renewable energy and combat climate change, we have been supplying our clients with a wide range of high-quality, reliable and efficient transmission and distribution equipment, including GIS.

We are also experts in water management and a reliable partner of the government in its “Clean Ganga” initiative. Toshiba also contributes to the Clean Ganga initiative and so far Toshiba has constructed a total of 10 sewage treatment plants across 3 states (Uttar Pradesh, Bihar & Jharkhand), with a total installed capacity of 181 million litres per day (MLD).

Toshiba has been spearheading this transformation through its technologically advanced SCiB™ rechargeable lithium-ion batteries that present many

industries an unprecedented opportunity to decarbonize their energy consumption. With its wide industrial and infrastructure applications, Toshiba's SCiB™ rechargeable lithium-ion batteries can minimize environmental impact, create economic value and contribute to carbon neutrality.

Toshiba supports India's ambitious Green Mobility initiatives through its automotive lithium-ion battery – SCiB™ rechargeable battery, contributing to improved fuel consumption efficiency and reduced CO2 emissions. For example, if CO2 emission reductions up to Scope 3*1 are required, converting employee shuttle buses to EVs can be a countermeasure. With Toshiba's SCiB™ that offer a high level of safety rapid charging and long service life, the number of EV buses and the amount of rechargeable batteries required for operation can also be greatly reduced. In 2022, Toshiba signed an agreement with EVage to supply its SCiB™ cells for 10,000 EVage electric commercial vehicles.

LOOKING TO THE FUTURE: NEW TECHNOLOGIES FOR A NEW WORLD

In a rapidly evolving landscape, Toshiba pioneers the path forward, embracing cutting-edge technologies to shape a bold future for our changing world. Toshiba Group showcased energy solutions that play a crucial role in achieving carbon neutrality across the energy lifecycle at the Japan Pavilion at COP28, organized by Ministry of the Environment, Government of Japan ("MOE").

The Toshiba technologies the MOE has selected to showcase include SCiB™, AEROXIA™ and P2C (power to chemicals)—that are contributing to the global goal of achieving carbon neutrality.

SCiB™ FOR ENERGY STORAGE AND SMART-USE

SCiB™ helps reduce fuel consumption and CO₂/NO_x emissions and life cycle costs, improves operating rates and enables the construction of highly safe and reliable battery systems. Applying SCiB™ to EV buses as an example, the required number of buses and battery capacity can be reduced, thereby reducing lifecycle costs and resource consumption. As batteries play an increasingly important role, SCiB™ contributes to tackle social issues.

ENERGY TRANSMISSION: AEROXIA™ REPLACES SF6 IN POWER FACILITIES WITH ECO-FRIENDLY GAS

Toshiba's ground-breaking technology, AEROXIA™ is set to transform the world of energy transmission by replacing SF6 gas, commonly used in high-voltage electrical equipment, with an eco-friendly alternative derived from natural sources. The environmental impact of using SF6 is staggering—over 20,000 times the global warming potential of CO2 when released into the atmosphere. Toshiba's AEROXIA™ offers eco-friendly, low-maintenance, and highly efficient solutions for electrical power using natural-origin gas alternatives.

P2C (Power to Chemicals) that Transforms CO2 into Green Resources with Renewable Energy

P2C is the bridge between carbon capture and utilization in the CCU supply chain, and Toshiba has developed an advanced electrolysis catalyst that delivers the world's highest CO2 conversion rate. The process uses renewable energy, and acts on CO2 in a gaseous state, not dissolved in water, converting it into carbon monoxide, an important raw material for chemical synthesis.

ABOUT THE AUTHOR



Mr. Shuichi Ito
Managing Director, Toshiba India Pvt Ltd

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OVERCOMING CHEMICAL DOSING CHALLENGES IN WASTEWATER TREATMENT

Around 359 billion cubic meters of wastewater is produced globally each year. As well as municipal wastewater, a broad range of industrial processes produce wastewater, such as chemical manufacturing, food processing and powerplants.

If the effluent water is going to be discharged back into the environment, it must be treated to comply with regulatory requirements and prevent damage to ecosystems and human health. Alternatively, many industrial companies want to reuse their wastewater to minimise their environmental impact, reduce costs and overcome water shortages. For this purpose, the wastewater must be treated so that it is suitable for its new purpose, such as industrial cooling water.

Wastewater treatment providers are facing the challenge of effectively handling a variety of treatment chemicals, as well as external factors such as increasing demand and the drive for sustainability. Here Adeel Hassan, product manager at Watson-Marlow Fluid Technology Solutions, shares his insight into how wastewater treatment providers can overcome different process challenges by upgrading their pumping technology.

DISINFECTION AND NEUTRALISATION

Chemical disinfection involves the use of oxidising chemicals, such as sodium hypochlorite. However, oxidising chemicals off-gas, causing gas to be present in the fluid. This gas can block a diaphragm pump by preventing correct operation of the ball valves. Wastewater treatment providers can overcome this by selecting peristaltic pumps, which push any gas present in the fluid through the pump without causing any maintenance issues.

Sustainability is driving the use of higher concentration chemicals to minimise transport costs and emissions, as well as reduce the size of dosing

systems. However, high concentration chemicals, such as sulfuric acid used in neutralisation, can be hazardous if not contained after a pump failure. Therefore, it is important that plant managers select a pump that is compatible with high concentration chemicals and prevents chemical exposure to the operator.

High concentration chemicals require a very accurate and repeatable pump to maintain process capability. Peristaltic pumps with low pulsation and no ball valves result in parts per million (ppm) concentrations with very low standard deviations, minimising chemical usage and maximising process quality.

COAGULANTS AND FLOCCULANTS

Regulations around preventing eutrophication are driving the removal of phosphates from wastewater. Ferric chloride, commonly used in this process, reacts aggressively with metal pumps. By selecting a pump with a plastic case, wastewater treatment providers can ensure their equipment is compatible with ferric chloride systems.

Furthermore, in diaphragm pumps, ferric chloride can pose a threat of solid content becoming stuck under the ball valves that are keeping the pump open. If both valves become stuck, then the pump can start to siphon, and the fluid will travel in the opposite direction as it can flow out of the pump. This creates inaccuracy as the fluid is leaking out. By selecting a peristaltic pump that does not require any valves, these challenges can be avoided completely.

Polymers are commonly used for dewatering of sludge and solids removal from water. Solids removal helps to clean the water for reuse, while dewatering sludge minimises bulk, which can reduce costs associated with storage and disposal by up to 75 per cent. Efficient polymer activation is essential in

increasing the efficacy of the polymer and minimising usage. The creation and integrity of polymer chains requires a constant stream of polymer into the dissolution stage, which can be achieved by using a low pulsation pump.

If condensation gets into the source tank, then polymers can agglomerate together and block the valves of some pumps, such as diaphragm pumps. This plugs the discharge of the pump and can cause it to breakdown. This can be avoided completely with peristaltic pumps, which require no valves to operate.

URBANISATION

As well as the variety of different chemicals in wastewater treatment providing dosing challenges, the wastewater industry must contend with external factors. Urbanisation means more people are living closer together in towns and cities, increasing the amount of municipal wastewater in one area. The resultant wastewater means bigger wastewater treatment works with larger processing systems are needed.

Therefore, wastewater treatment providers require more powerful pumps with high flow rates and low pulsation to increase efficiency and meet demand. While diaphragm pumps meet the capacity requirements, they can only offer low pulsation when operated at low flow rates. Instead, plant managers should opt for a peristaltic pump that offers low pulsation even at high flow rates.

RISING TO THE CHALLENGE

After calls from plant managers for more powerful and adaptable pumping equipment that enables accurate, flexible and high capacity dosing, the Qdos H-FLO was designed. The pump is capable of flow rates up to 600 litres per hour and can handle pressures up to 7 bar



via a range of interchangeable pump heads. The different pumpheads enable the pump to be used in a wide range of wastewater applications and allow plant managers to respond quickly as treatment processing requirements change.

The Qdos H-FLO has a pressure sensor that detects leaks and blockages. The pump stops before the system becomes damaged and alerts the operator with diagnostic feedback. In addition, all of the chemicals are safely contained within the pumphead,

preventing operator exposure. If there is a problem, the pumphead can just be changed. The twin-tube technology provides extremely low pulsation, with an offset rotor design protecting pipework integrity and providing consistent chemical supply compared with diaphragm pumps delivering similar flow rates. Unlike diaphragm pumps, the Qdos H-FLO has no valves, eliminating the issue of valves becoming stuck or blocked. In addition, the pump has a high accuracy of $\pm 1\%$, which prevents chemical waste and saves costs.

Wastewater treatment providers face a variety of operating challenges, including handling a wide range of chemicals, meeting high demand, and becoming more sustainable. However, with the correct pumping technology, wastewater plant managers can ensure their operations run efficiently, accurately and safely.

ABOUT THE AUTHOR



As Product Manager for Watson-Marlow Fluid Technology Solutions, Adeel Hassan oversees the Qdos range of chemical metering pumps, widely used in water treatment plants globally. He is actively involved in understanding the challenges faced by customers and leads product development initiatives to drive efficiencies across the sector. In addition to extensive product management experience for several leading manufacturers, Adeel has spent time in the Middle East working on automation projects for the water treatment industry. He holds an MSc in Technology and Innovation Management from the University of Sussex, UK.

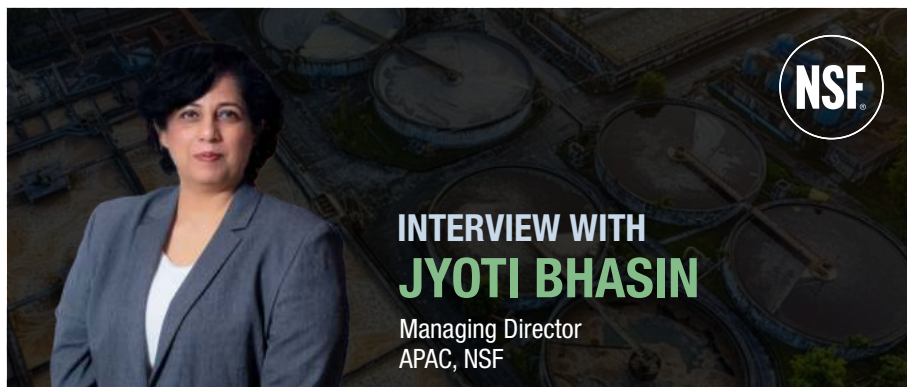
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Q: Can you share your company's vision and mission regarding water management and sustainability? How does your company differentiate itself in the competitive landscape of the water industry?

A: NSF is an independent, global services organization dedicated to improving human and planet health for more than 80 years by developing public health standards and providing world-class testing, inspection, certification, advisory services and digital solutions to the food, nutrition, water, life sciences and consumer goods industries. NSF operates in 180 countries and is a World Health Organization (WHO) Collaborating Center on Food Safety, Water Quality and Medical Device Safety.



NSF's expertise is reflected in our 160 published standards and protocols, and is the largest certification body for water products in the world. We also work with agencies and associations in global markets to develop new standards. NSF's scientific expertise and ability to drive consensus standards in areas of public health led to NSF being recognised in 1996 as a WHO Collaborating Centre on Drinking Water Safety and Treatment.

In 2014, NSF was designated as a Pan American Health Organization/WHO Collaborating Centre on Food

Safety, Water Quality, and Indoor Environment. Over the last two decades, NSF has provided secondees to WHO to work on priority projects that include airline water safety, safety plans for small, centralised water utilities, and home water treatment system verification. In India, we are committed to addressing local water challenges through our globally recognised standards and innovative solutions.

Q: What are the current trends and major innovations in the water industry? How do you see the future of the water industry evolving over the next 5-10 years?

A: India is facing significant water stress due to limited water resources. Prioritising water conservation and efficient management practices are crucial. Current trends include the increased use of water treatment and purification technologies, which allow for the reuse of wastewater, rainwater harvesting and desalination of seawater.

Over the next 5-10 years, sustainable water reuse and recycling technologies will be key to meeting the increasing demand for clean water while reducing environmental impact. With the Indian government's investment of US\$270 billion in water infrastructure, collaboration between the government, businesses, and standards and conformity assessment businesses will be essential to address water challenges and ensure long-term water security.

Q: In your view, where are the best investment opportunities in India's water sector? Which areas do you think have the highest potential for growth and development?

A: Investment in desalination technology, wastewater

management, and water treatment and recycling holds significant promise due to the increasing demand for clean water and the government's focus on improving water infrastructure. These sectors will present great opportunities for growth and advancement.

Additionally, future adoption of international water standards such as NSF/ANSI/CAN 60 and NSF/ANSI/CAN 61 would ensure water safety. NSF/ANSI/CAN 60 addresses the health effects implications of treatment chemicals and related impurities while NSF/ANSI/CAN 61 addresses crucial aspects of drinking water system components such as whether contaminants that leach or migrate from the product/material into the drinking water are above acceptable levels in finished waters.

Q: What are some key technologies and innovations that are helping to improve efficiency and sustainability in water management?

A: Reverse osmosis and ultraviolet (UV) disinfection are two examples of advanced water treatment techniques that have proved crucial in making water safe. Furthermore, the use of water recycling and reuse systems has made a substantial contribution to water conservation. Moreover, desalination technology makes it possible to turn brackish and saltwater into drinkable water, thereby revolutionizing the management of limited water resources and improving water security and sustainability.

Q: How can the water industry in India benefit from digitalization and data-driven strategies to enhance management practices and decision-making?

A: Due to climate change, the demand for water resources has increased. Digital water, utilizing IoT sensors and data analytics, is crucial for efficient water management. NSF also provides cybersecurity tools and collaborates with water utilities, technology providers, the public sector, and industry associations to promote change in digital water management.

Furthermore, external evaluations from a third party, such as risk assessments and gap analyses, are valuable for identifying security vulnerabilities. For comprehensive support, obtaining ISO 27001: Information Security Management certification can help identify vulnerabilities and guide the implementation of industry best practices.

Q: What lessons can India learn from other countries that have successfully addressed water issues? How can these be adapted to the Indian context?

A: India can learn from other countries in addressing water challenges.

Importance of certification: Certification according to industry standards like NSF/ANSI for water systems provides a competitive advantage by assuring customers of product compliance and independent verification. This improves water piping and fittings quality to minimize wastage.

Water conservation and reuse technologies: Some countries have advanced water technologies for wastewater treatment and desalination of seawater. India can invest in comparable technology, particularly in areas with limited water supplies, and encourage businesses and individuals to switch to water-efficient systems and practices.

Digitalisation and smart water networks: Sensors, IoT, and big data analytics can optimise water distribution and quickly identify leaks. Implementing this technology in India would increase the effectiveness of the water supply, decrease waste, and improve responsiveness to water-related emergencies.

Q: Looking ahead, what do you expect for the future of the water industry in India over the next five to ten years, particularly in terms of technological advancements, policy changes, and overall growth?

A: Due to the increasing water scarcity, there will be a greater focus on developing water recycling and reuse technologies and desalination. The government of India is promoting wastewater reuse, increasing water use efficiency, and providing potable water to every household in the country.

For NSF, this presents an opportunity to bring our global experience in water conservation technologies and products to the Indian market, ensuring water quality and safety standards throughout India.

Q: Can you talk about any notable projects or initiatives you've been involved in that address water-related challenges in India? What were the outcomes and key takeaways from these experiences?

A: To enhance the calibre of Indian plumbing items and the abilities of Indian plumbers, NSF and Water Management & Plumbing Skill Council, previously known as the Indian Plumbing Skills Council (IPSC), initiated an agreement in 2017. This agreement gives the Indian plumbing industry local access to NSF certification, enhancing the quality of Indian plumbing products and creating opportunities to export Indian plumbing products.

Furthermore, we have certified our first clients in India to NSF standards. For example, in 2023, we certified Indofil as the first client in India to NSF Guideline 533. This certification will help the manufacturer gain recognition among drinking water product manufacturers worldwide.

Q: As an international service organization, can you share some insights on how India's water business is gaining success in the global market?

A: A company's capacity to succeed in international markets is mostly determined by the quality, reliability and brand reputation of its products. The purpose of NSF's water testing and certification services is to help manufacturers in meeting water quality standards across various markets. For nearly 60 years, NSF has offered water product, material testing and certification services, and our knowledge in this field is unmatched.

NSF offers testing and certification services and provides training and education to help businesses and communities comprehend water quality regulations and best practices. We also work closely with regulatory agencies and industry associations to develop and revise standards that pertain to the water sector, providing valuable guidance to businesses and communities.

Q: What role do you see for innovation and entrepreneurship in driving positive changes in India's water industry? Are there any promising startups or initiatives that have caught your attention?

A: Innovation and entrepreneurship are vital for driving positive changes in India's water industry, addressing challenges like scarcity, contamination, and inefficient distribution.

At NSF, we are very proud of the entrepreneurial spirit of Indian businesses. We recognize the importance of global collaboration and knowledge sharing in advancing water

conservation efforts. Our global experience in water technologies and products can be a valuable asset for Indian startups and businesses, providing them access to best practices, market insights, and potential partnerships to accelerate their growth and impact.

Q: What piece of advice would you offer to the team at EverythingAboutWater?

A: Continuously monitor and analyse the latest trends, technologies, and regulations impacting the water industry. Collaborate with leading experts, researchers, and influencers in the water sector to maintain and attract a larger audience.

Q: Lastly, how can our audience stay informed about your company's latest developments and initiatives?

A: To stay informed about our company's latest developments and initiatives, you can visit our website www.nsf.org. Additionally, you can follow us on social media platforms such as LinkedIn and Instagram to get real-time updates and news about our company.

ABOUT THE INTERVIEWEE

Jyoti has a rich professional experience of working in different corporate sectors for more than two and half decades – a strategic leader, Jyoti has successfully led teams to deliver high growth in the service, retail, and education sectors.

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RESPECT WATER

Dr. Sarvesh Kumar Shahi

Assistant Professor,
KIIT School of Law, Bhubaneswar



The whole world, inclusive of India, is facing a water crisis. Every now and then, there is news flashing on the internet that due to water scarcity and water pollution, many people have lost their lives. Not only these, but, in several states, protests regarding water shortages have been rising.

We have been taught since our childhood that “water is life” but have we respected water enough as life? Recently, the news has been flooding about the water crisis in Bengaluru. Who do you think is responsible and answerable for this crisis? Do we have to be dependent on the laws and regulations every now and again for proper water management and distribution of this resource or is it high time for ‘We the People of India’ to act and be aware to fight against this scarcity and be well versed with the management of this resource.

People need to get educated about the significance of water. They need to learn different techniques of water management and need to be sensitized about the various water related issues that exist in our country.

Taking into consideration the current situation of Gaya district of the state of Bihar, it has been brought into news that the ground water level has gone down dangerously, which has created a panic situation for domestic households. The government has assured the supply of treated waste-water to the water users, but the citizens may object to the use of treated water due to certain religious issues. The objection may be raised to its use, highlighting the negative impact of it on the health and hygiene of citizens. But several scientific research studies have shown that it is perfectly fine to use treated water. Today, the whole battle is of sewage water versus drinking water. But, in the future, when there will be no water left to consume, then the only way would be to use waste-water by converting it to portable water.

My personal view is that the water treatment plants that would be set up for the supply of treated water need to be maintained and taken care of by the government. If not maintained and looked upon, the heavy metals contained in waste-water might have a negative impact on the health of the consumers.

The 2nd big issue faced by India is the severe decrease in the number of wetlands. We need to rejuvenate them. But the ones that have gone dry, can we revive them with treated wastewater? We need scientific opinion on this. In such a case, there would be another controversy on artificial lake versus natural lake. Another question that arises is, are artificial lakes as effective as natural lakes? Can water treated wastewater from artificial lakes be used for irrigation and farming purposes? The only answer to these relevant questions is “wait and watch”. The functioning can be properly judged on its implementation by the state-level water management authorities, like the water management board/water supply board, and water sewage board to ensure better and timely supply of treated water to schools, households and irrigation fields.

Looking at the worst situation of water shortage in approaching summer, several other questions are coming to my mind, such as, are we ready to face extreme weather conditions in the future? Had the government conducted any survey which evaluates the current water capacity that our remaining wetlands have? Will it be able to sustain our needs for the future? In my opinion, the government needs to look upon such data to act upon this issue in a positive way.

From now onwards, we need to focus on small steps to properly manage the water resources. A mandatory regulatory mechanism has to be set up for institutions' waste water due to overflow of tanks. They should be directed to fix water overflow alarm to

reduce the risk of wastage of water. Restaurants and hotels can use the concept of “serving food on leaves”, which suggests the use of banyan leaves while eating. Use of eco-friendly disposable cutlery is suggested to avoid water wastage while washing permanent utensils. The issue of water leakage from taps and pipes should be looked upon in public places, institutions and houses. Building infrastructure laws need to be reformed to mandate rainwater harvesting systems and prevent leaked pipe water wastage.

We focus on tech cities, but in the long run, we have witnessed that these tech cities have been converted into tanker cities due to water crisis in households, which has further given birth to water tanker mafias charging high rates for water supply, in absence of any concrete administrative guidelines.

Thus, water must be understood within the context of the urban ecosystem. It is high time for the government to create a “water vulnerability index” which may highlight the district and village based water scarcity survey in order to help the administrative officials to act upon the possible threat of water shortage every year and take suitable measures to deal with it. More research studies should be promoted by the government in higher educational institutes focussing upon on the adaptation of the best conservation techniques by water scarce countries. Political leaders may play a key role in reaching out to people of their constituency, educating the best possible techniques of water management for the use of farming and households. Overall, the focus should be on RRR i.e. Recycle, Reuse and Respect water.



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INSIGHTS ON UNION BUDGET 2024



Anil Sethi
Chairman
Pump Academy Pvt. Ltd.

While presenting the Union Budget 2024-25, Finance Minister Mrs. Nirmala Sitharaman announced a significant thrust towards research and development of new technologies across various sectors. This announcement marks a pivotal shift in India's approach to technological innovation and its role in driving economic growth.

The budget's focus on research and development aligns with global trends where technological advancements are increasingly seen as key drivers of economic growth and societal progress. India has seen substantial government investment in digital infrastructure and innovations, with the private sector enhancing access for all citizens, particularly the common people. For the water sector, this emphasis on new technologies could herald a new era of innovation and efficiency. The energy audit and energy efficiency measures for micro and small industries are a welcome announcement. Providing financial support to shift to cleaner energy forms and moving industries from 'energy efficiency' targets to 'emission targets' is essential given India's commitment to achieving 'Net-Zero' emissions by 2070. The government's plan to promulgate appropriate regulations for the transition of industries from the current 'Perform, Achieve and Trade' mode to the 'Indian Carbon Market' mode will be beneficial.

For companies like Pump Academy Private Limited, the Union Budget 2024-25 presents exciting opportunities. The focus on energy efficiency and carbon emission reduction aligns perfectly with Pump Academy's core business of optimizing water pumping stations. With the budget's emphasis on sustainable practices and technological advancement in infrastructure projects, Pump Academy's expertise in cutting-edge technologies for water management is now more relevant than ever. By leveraging its expertise in modern pump technology, Pump Academy is well-positioned to contribute to projects that improve water distribution efficiency while significantly reducing energy consumption and carbon footprint. This alignment with the budget's goals of enhancing infrastructure and promoting sustainability opens up new avenues for the company.

The Union Budget 2024-25's emphasis on technology, energy efficiency, and carbon emission reduction presents a significant opportunity. The coming years may see an acceleration in the implementation of energy-efficient water management solutions, innovative approaches to infrastructure development, and a renewed focus on sustainable practices in the water sector.



Mohammed Abdul Rahman
Director
AACP India

The Union Budget 2024-25, presented by India's Finance Minister Smt. Nirmala Sitharaman, underscores the government's commitment to infrastructure development as a key driver of economic growth. A substantial allocation of Rs. 11.11 lakh crore for infrastructure marks an 11.1% increase from the previous year, representing 3.4% of GDP. This investment reflects a strategic focus on developing robust infrastructure across various sectors, including railways, roads, airports, urban development, and water and sanitation.

In the crucial area of water supply and sanitation, the budget allocates Rs. 77,390.68 crores for the financial year 2024-2025. While this represents a modest 0.5% increase from the revised estimate of Rs. 77,032.65 crore in 2023-2024, it demonstrates the government's continued commitment to this essential sector.

A significant portion of this allocation, Rs. 69,926.65 crore, is earmarked for the Jal Jeevan Mission (JJM). This flagship program aims to provide every rural household with a functional tap connection by 2024, ensuring consistent and sufficient

water supply. The slight increase in funding from the previous year's revised estimate of Rs. 69,846.31 crore indicates the government's ongoing support for this critical initiative.

The Jal Jeevan Mission has made substantial progress since its launch in 2019. According to the official JJM Dashboard, over 15 crore rural households have been provided with tap water connections. This achievement was highlighted by Jal Shakti Minister C.R. Paatil, who stated, "This golden milestone has not only given a gift of pure water to countrymen but also uniquely improved their quality of life."

The government's focus on water infrastructure aligns with broader global sustainability goals, particularly UN Sustainable Development Goal 6, which aims to ensure availability and sustainable management of water and sanitation for all by 2030. The continued investment in water supply infrastructure is crucial for public health, economic development, and environmental sustainability.

For companies in the water treatment sector, such as AACP India, this budget allocation presents significant opportunities. As a leading water treatment solution provider in the country, AACP India is well-positioned to contribute to the implementation of the Jal Jeevan Mission and other water-related initiatives. The company can leverage its expertise in water purification, distribution systems, and sustainable water management to support government efforts in delivering clean water to millions of households as well as to diverse industries helping them with enhanced production capabilities.

Moreover, the focus on infrastructure development opens up possibilities for innovative water technologies, such as smart water management systems, efficient water treatment plants, and sustainable wastewater solutions. Companies in this sector may find increased demand for their products and services as both government agencies and private entities work towards improving water infrastructure across the country.

As India continues to prioritize water security and sanitation, the role of private sector companies in complementing government efforts becomes increasingly important. This budget not only reflects the government's commitment to these crucial areas but also signals potential growth opportunities for businesses operating in the water treatment and water supply and management sectors.



Syamal Kumar Sarkar

The FM indicated 9 budget priorities, of which 4 priorities are linked to water resources. These are: 1) Inclusive HRD and social justice, (Priority 3), 2) Urban development, (Priority 5) 3) Infrastructure (Priority 7), 4) Next generation reforms (Priority 9).

Priority 3: there is AP Reorganisation Act by which Telangana and AP were created. The GOI will finance Polavaram water project in AP, being the lifeline of farmers and funds will be given for essential infrastructure projects in AP.

Priority 5: Govt will promote in cooperation with states and multilateral banks water supply, sewage treatment, and services for 100 large cities through bankable projects. The projects will use treated waste water for irrigation and filling up of tanks.

Priority 7: for irrigation and flood management measures, funds will be provided to Bihar, Assam, HP, Uttarakhand and Sikkim. In Bihar, Govt through Accelerated Irrigation Benefit program will provide financial support for projects with estimated costs of Rs 11500 crore such as Koshi Mechi intra state river link and 20 other ongoing and new schemes including barrages, river pollution abatement, survey and investigation of Koshi Irrigation project etc.

Priority 9: On taxonomy for climate change, Govt will develop a taxonomy for climate finance for enhancing the availability of capital for climate adaptation and mitigation. This will meet country's climate commitment and green transition.

On Data and Services, for improving data governance, collection, processing and governance, and management of data and statistics, different sectoral data bases will be utilised.

The central Government recognised the need for completion of water projects for enhancing the water storage and its consequent positive impact on food security. The urban population is increasing day by day, which will have adverse impact of water demand. As per Niti Aayog report (2019), by 2050, the water demand in India is expected to be twice the water supply. From where the extra water will come, as Rainfall is temporary and India stores about 10 percent of rainfall. Thus "Sponge City" concept in India should be introduced. The Government attempt in this direction is timely. In India, irrigation is the highest water consuming sector, and water use efficiency is less than 40 percent.

Using treated waste water in irrigation will save water in that sector, which could be reallocated to other sectors such as industry, domestic sectors. Secondly, water should not be wasted, but should be treated and reused. The Union Budget recognised that concept which is timely. The Union Budget 2024-25 allocated Rs 70,192 crore for Water access under Jal Jeevan Mission program, and Rs 7192 crore for SBM program. Universal access to all households is one of the objectives of SDG Goals. India took big initiatives in this direction. However, the budget allocation under JJM this year is almost same as last year.

The inter state or Intra state river linking is a growing concept in India, otherwise the surplus water in a river gets wasted. Government recognised this concept and proposed funding for intra state river link project in Bihar. The inter state river link in other states, should also be examined.

On taxonomy for climate, financing for adaptation and mitigation should also be considered in water sector. Water is an engine of climate resilience. The immediate impacts of climate change due to global warming are occurrence of flood, drought, sea level rise, heat wave impact, etc, and water resources are adversely impacted. Similarly, water in certain forms, also increases mitigation, wetlands act as sinks for carbon mitigation. These aspects were omitted in the budget speech.

On data related reference, data governance, collection, processing and management of data and statistics were indicated in the budget. These aspects are very weak in water sector and adequate attention should be given by states and central government.

Finally, technology for water resource management should be incentivised: for example, Air Water Generator is a technology for water manufacturing from atmospheric air, which helps in water availability in remote areas where conventional water access is difficult. There is a need for use of, AWG, AI, IOT for water resources management for which governments should provide incentives.



Prof. Parmendra Kumar Bajpai
Vice Chancellor, Jai Prakash
Vishwavidyalaya (University)
Chapra, Bihar

One of the standout features of the budget is the substantial increase in allocation to the education sector. With a proposed budget of ₹1.48 lakh crore, this marks a noteworthy elevation from previous years. It connotes the government's recognition of education as a key driver of economic growth and social progress.

Moreover, the introduction of initiatives aimed at promoting research and innovation within higher education institutions is a significant leap towards positioning India as a global hub of research. The allocation of grants for universities, particularly in science and technology fields, will stimulate intellectual growth and innovation.

Recognizing the importance of technology in education, the budget has allocated funds specifically for the expansion of digital learning. Initiatives aimed at bridging the digital divide, particularly in rural and underserved areas, include the development of online learning platforms and the provision of devices to students. It will ensure that all students have access to quality educational resources, irrespective of geographic barriers.

Another highlight of the 2024 budget is the emphasis on skill development and vocational training. By investing heavily in skill development programs aligned with industry needs will certainly enable students to gain practical experience and improve their overall employability.



Mr Ravichandran Purushothaman
President
Danfoss India

We welcome the forward-looking and growth-oriented Union Budget 2024, presented by the Finance Minister. As part of India's new blueprint for holistic growth, the increased focus on urban development, infrastructure, innovation, and next-generation reforms will have a multiplier effect on the economy. With a strong emphasis on energy security, industrial development, and MSME support, India is poised for sustainable growth and development.

Agriculture and Allied Sectors: The Government's substantial allocation of ₹1.52 lakh crore towards agriculture and allied sectors is to be lauded. Initiatives such as natural farming, pulses, and oilseeds missions, along with the development of digital public infrastructure, are crucial for enhancing productivity and sustainability.

Enhanced focus on food security, irradiation, and safety testing labs will revolutionize India's food landscape, ensuring quality and accessibility.

Urban Development and Infrastructure: The budget's emphasis on urban development and infrastructure growth is a significant step towards driving economic expansion. The focus on smart cities and industrial development presents ample opportunities for our energy-efficient solutions.

Energy Security and Industrial Development: We welcome the government's prioritization of energy security and industrial development, which aligns perfectly with our expertise. Danfoss India is poised to play a vital role in India's green transition through our innovative energy-efficient technologies. We are committed to supporting industrial growth while ensuring that it is sustainable and environmentally friendly. Climate

Resilience: The government's commitment to climate resilience and sustainable growth is commendable and the focus on climate-resilient agriculture and flood mitigation measures underscores the government's dedication to environmental sustainability.

Leveraging our nine plus decades of expertise, we are committed to driving sustainable development and innovation in India's green transition. We are eager to actively participate in these transformative initiatives, deploying our energy-efficient technologies to create a more sustainable future.



Mohammed Naser Azeez
Managing Director
Aquality Intelligent Solutions Pvt. Ltd.

Finance Minister Smt. Nirmala Sitharaman's presentation of the Union Budget 2024-25 has placed a strong emphasis on infrastructure development as a cornerstone of India's economic growth strategy. The substantial allocation of INR 11.11 lakh crore towards infrastructure underscores the government's commitment to leveraging this sector as a primary catalyst in achieving the ambitious \$5 trillion GDP target.

A notable feature of this year's budget is the heightened focus on the water sector, recognizing its critical role across all social and economic areas. The allocation of INR 77,390.68 crores for water supply and sanitation in the 2024-2025 fiscal year demonstrates the government's dedication to this vital resource. Within this allocation, the Jal Jeevan Mission (JJM) receives the majority share of INR 69,926.65 crore, highlighting its significance in the national water management strategy.

The JJM, a flagship program launched in August 2019, aims to provide functional tap water connections to every household in India by the end of 2024. This ambitious initiative seeks to ensure universal access to clean and safe drinking water. The program has already made significant strides, connecting over 15 crore rural households with piped water since its inception.

In a move towards sustainable development, the government has announced support for energy transition by expanding the list of exempted capital goods used in the manufacture of solar cells and panels within the country. This decision is expected to boost domestic production of renewable energy components and potentially reduce the cost of solar-powered water treatment systems. Consequently, this could lead to wider adoption of such systems, contributing to a reduction in carbon emissions from water and wastewater treatment processes.

The budget's provisions are particularly favourable for private companies operating in sectors such as water treatment, air quality improvement, renewable energy, and related ancillary industries. These measures will certainly create conducive environment for growth and innovation in these crucial areas.

Aquality Intelligent Solutions Pvt. Ltd., along with other companies in the environmental and sustainability sectors, views the budget positively. The firm anticipates significant growth opportunities arising from the implementation of these budgetary measures. The focus on infrastructure, water management, and renewable energy aligns well with the objectives of companies working towards sustainable development and environmental protection.

Moreover, the budget's emphasis on these sectors is expected to stimulate job creation, encourage technological advancements, and attract both domestic and foreign investments. This could lead to the development of a robust ecosystem for companies specializing in water management, renewable energy, and related technologies.

As India continues its journey towards becoming a \$5 trillion economy, the strategic focus on infrastructure and sustainability in the 2024-25 budget sets a strong foundation for inclusive and environmentally conscious growth. Companies like Aquality Intelligent Solutions Pvt. Ltd. are well-positioned to contribute to and benefit from this national vision, playing a crucial role in India's sustainable development narrative.



Mr. Amit Sharma
Executive Director
Aquatech Systems (Asia) Pvt. Ltd.

The first Union Budget of Modi 3.0 addresses a wide range of Indian sectors, including MSMEs, employment, skilling, youth, and the middle class.

The budget announcement on the enhancement of water supply, solid waste management and sewage treatment in 100 cities is a positive step forward, and reflects the government's proactive measures to create sustainable and liveable urban environments. The Rs 2.66 lakh crore for rural development could help balance outgrowth between cities and rural areas.

The Department of Drinking Water and Sanitation has received a budgetary allocation of Rs 77,390.68 crores for the fiscal year 2024-2025. The budget also includes significant funding for water supply and sanitation at Rs 64,302.85 crore, an increase from the previous year's Rs 64,138.41 crore.

Encouraging private investment through funding and new financing options is a wise decision. This might bring more private money into infrastructure projects, resulting in fresh ideas and better efficiency.

By prioritizing project completion, encouraging private sector participation, and emphasizing sustainable development, these strategic moves are set to propel economic growth and elevate the quality of life.

Additionally, the introduction of internship opportunities in 500 top companies is an excellent initiative to integrate young talent into mainstream businesses.

Apart from direct policy initiatives, other announcements such as the government's to develop cities as Growth Hubs", develop urban areas, including town planning schemes, and transit-oriented development plans for 14 large cities of above 30 lakh population augur well for companies in the water sector.

Appreciate the government's decision to establish the Critical Mineral Mission for domestic production, recycling of essential minerals, and abroad acquisition of critical mineral assets. It will undoubtedly help to speed the penetration of EVs and self-sustainability in lithium.



Dr Mayur J. Kapadia
Trainer, Writer, Editor & Former AGM,
Quality Control Dept, GNFC Ltd,
Bharuch, Gujarat.

WATER RESOURCE MANAGEMENT- ONE OF THE 9 PRIORITY AREAS OF UNION BUDGET 2024

While promising government support for farmers, young, women and poor in the interim budget presented before the general elections; the finance minister - Nirmala Sitharaman - intended to continue on the path of fiscal consolidation with continued capital expenditure and other social welfare services to pave way towards turning the dream of Viksit Bharat into a reality by 2047. In the record setting 7th budget presentation on 23rd July, the FM presented a 'fabulous' Union Budget that has made people at large happier. The fiscal deficit has already come down to 4.9% and the budget indicates prospects for further bringing it down to 4.5% level. With the macro scene being magnificent, the FM has managed to combine high Capex and satisfy the political allies without providing any great freebies to the general public.

The commending part of the Union Budget 2024 is its strong focus on water management. This budget categorized 9 priority areas and 'water resources' is one of those 9 priority areas. Budget approaches water recovery and storage through innovative use of treated municipal waste water for irrigation and tank filling in nearby areas, which is extremely essential and a remarkable initiative. This approach will help conserve water and support agricultural activities.

Budget also emphasizes water supply, sewage treatment, and solid waste management projects for 100 large cities for improving urban water infrastructure. Such a step is backed by the collaboration of the state governments with multilateral development banks to create bankable projects. This means that the projects will be designed in a way that makes them financially viable and attractive to investors. This will attract funding and ensure successful implementation of these initiatives. The Centre will also work closely with state governments to align local needs with the overall goals of the project. The success of this initiative will enhance the availability and quality of water in these cities, handle wastes more effectively, reduce pollution, improve sanitation, and improve solid waste collection, segregation, and disposal processes. All these efforts will make these cities cleaner and more liveable.

Addressing water in agriculture is also a key to driving water security as efficient water use in farming can reduce pressure on freshwater resources and ensure their availability for drinking purposes. Government's commitment in releasing climate-resilient crop varieties highlights its move not only to boost agricultural productivity but also improve water use efficiency in farming. Budgetary provision like this will support India's mission to secure long-term water sustainability ensuring that every community has access to safe and reliable water resources.

Overall, the budget has taken certain initiatives in improving water resources management. However, the exact timeline for the implementation of various projects has not been specified. NITI Aayog in 2019 reported that water demand in various sectors is expected to be twice the water resources supply, which calls for use of technology for atmospheric water generation. Incentives for such initiatives were expected to have been included in the budget. The government's emphasis and commitment for starting the work soon on various projects covered under budget and provide updates on progress is a welcome step for professionals and technologists working for the success of this extremely important area of work.



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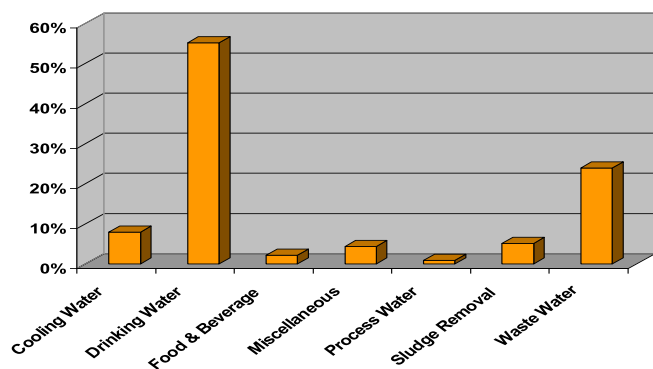


OZONE APPLICATION OVERVIEW IN INDIA

It is almost two decades that ozone is being used in India. Beginning with its use in drinking water ozone has now found a wide range of application in India. Summary of ozone use in India has been given below. In the next decade India could be the largest ozone market in the world. It already has the distinction of the Worlds largest single ozone system (200 kg per hour) under operation

Drinking water Treatment: Contributes to approximately 60% of the ozone applications in India. This could be due to its acceptance as a replacement of commonly used disinfectants that have been proven to cause cancer producing by products. However, ozone use has not found users in Municipal drinking water, which is by far the largest application of ozone across the world. Reasons could be many, but authorities have now begun to look into this. This could be one of the largest application segment in the future.

Waste water Treatment: This is the next biggest segment in India. The applications are mostly industry centric, being used for oxidation for reduction of COD/BOD and Color. Ozone is an ideal substitute as it is Eco friendly and provides solutions to the toughest applications. Reduction of sludge, lesser useage of chemicals are some of the major advantages of ozone. In STP, ozone is being preferred in IT parks and Hospitality industry for providing an effective reuse solution. It provides an opportunity for zero discharge plants being most preferred for reuse in irrigation, golf course, landscaping etc.. Textile industries in South have started adopting ozone technology as the most dependable Technology for color reduction



Ozone Market in India

Cooling Tower water treatment: Progressive State electricity Boards such as Mahagenco and Gujarat State Electricity Corporation Limited have taken conscious decisions to replace chlorination with ozone. Power plants at Paras, Parli, Khaperkeda have incorporated ozone and others such as Dhuvaran, Wanakbori are following suit. Use of ozone in power plants have enormous advantages including cost savings.

Ultra pure water: Ozone is used as a disinfectant of choice for ultra-pure water in pharma industry electronic industry and for process water. Leaving for harmful by-products, quick action, reliability of results make ozone the favorite in these areas.

Miscellaneous applications: Ozone finds applications in process industry for varied other industrial processes. Use of ozone in process such as double bond cleavage (Ozonolysis) in Phrama Industry, Surface treatment in packaging industry, are very common. The use of ozone to produce faded jeans, stone wash jeans are becoming popular. Ozone is now being used in Sugar bleaching in one of the large sugar company in South. Ozone use for pulp bleaching is a well known application.

Ozone In medicine: Though there are more than 18 countries that have approved ozone as a alternate therapy, India still lags behind. However ozone is being unofficially used in Indian medical practices by doctors who have taken such training in countries like Germany. There are more than 100 doctors today who practice using ozone. Consumer products such as ozonated oils for various skin applications, burns, are available in the US and in Europe. The efficacy has been well documented and safety proven.

DO YOU KNOW ?

- Ozone is a blue liquid at very low temperatures below minus 200 degrees cel
- Liquid ozone is explosive and not of use commercially.
- Ozone gas is produced wherever there is high voltage and air – lightening, X-ray machines, photocopiers, televisions
- The half life of ozone in water is just 20 minutes but the same in Air can be as long as 24 hours !!!

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UNVEILING THE VEIL: LAKE NYOS' SILENT MENACE



Nestled within the verdant highlands of Cameroon, Lake Nyos lies shrouded in an eerie calm that belies the devastating power lurking beneath its placid surface. This seemingly serene body of water, encircled by lush green hills, has become a symbol of nature's unpredictable wrath—a quiet sentinel to a deadly force that once unleashed, claimed countless lives in an instant.

As the first rays of dawn break through the mist that hovers above the lake, the scene appears tranquil, almost idyllic. Yet, beneath this deceptive calm, the lake holds a dark secret—a pocket of deadly carbon dioxide, silently accumulating within its depths, waiting for the moment when it will erupt with catastrophic force.

The night of August 21, 1986, marked the moment when this hidden menace revealed itself. Without warning, a massive cloud of carbon dioxide surged from the lake, rolling down the hills and asphyxiating over 1,700 people and thousands of animals in the surrounding villages. The invisible cloud swept through the landscape, leaving behind a trail of death and devastation in what is now remembered as one of the most chilling natural disasters in history.

The cause of this tragedy—a limnic eruption—remains a subject of intense scientific study and speculation. The event at Lake Nyos was a stark reminder of the hidden dangers that can lie dormant within Earth's most serene landscapes, capable of unleashing untold horror in the blink of an eye.

Today, Lake Nyos is a place of both fear and fascination. Efforts to prevent a recurrence of the deadly gas release have led to the installation of degassing systems, but the memory of that fateful night lingers, casting a shadow over the lake's tranquil waters.

As the sun sets, casting a blood-red glow across the lake's surface, one can't help but feel a chill in the air—a reminder of the silent threat that once lay beneath. The story of Lake Nyos serves as a haunting testament to the power of nature's hidden forces, urging us to respect and understand the mysteries that lie within our world, lest they strike again without warning.



T E N D E R

Installation Of Arsenic Free Water Treatment Plant At Nowdapara Under Bagdah Gp Of Bagdah Block.			
Category	AMC, Repair, Maintenance, Installation Tenders		
Location	West Bengal, Kholapota		
Bid Open Date	26 August 2024	Tender Value	4.99 Lac
Doc Collection Date	26 August 2024	FTID	24081448470
1 Hp Solar Water Treatment Plant At Near Ghushighata Bazar Karma Tirtha Sansad No Xi. Activity Id 96797521 Under Kulti Gram Panchayat. Haroa Development Block. Under 15 Th Cfc Fund.			
Category	Scientific Equipment Tender		
Location	West Bengal, Bhargar		
Bid Open Date	26 August 2024	Tender Value	3.50 Cr
Doc Collection Date	27 August 2024	FTID	240814415110
Repairing with replacement alum tank b agitator gear box with motor at watgunge water treatment plant			
Category	Transportation, Courier, Cargo Services Tenders		
Location	West Bengal, Kolkata		
Bid Open Date	25 August 2024	Tender Value	1.5 Lac
Doc Collection Date	24 August 2024	FTID	24071644880
Reverse Osmosis Based Point Of Use Water Treatment system For Drinking Purposes (V2) As Per Is 16240			
Category	Miscellaneous Tenders		
Location	Madhya Pradesh, Chhatarpur		
Bid Open Date	5 August 2024	Tender Value	11.50 Lac
Doc Collection Date	5 August 2024	FTID	240716421770
Annual operation and maintenance of 40 mgd water treatment plant hww padmapukur.			
Category	AMC, Repair, Maintenance, Installation Tenders		
Location	West Bengal, Bally Jagachha		
Bid Open Date	3 September 2024	Tender Value	81.78 Lac
Doc Collection Date	31 August 2024	FTID	240814432260
Construction Of 1.00 Mld Sewage Treatment Plant Cum 1.00 Kld Fecal Sludge Treatment Plant Under Sbm 2.0 At T.Kallupatti Town Panchayat, Madurai District			
Category	Miscellaneous Tenders		
Location	Maharashtra, Osmanaba		
Bid Open Date	21 August 2024	Tender Value	18.90 Lac
Doc Collection Date	23 August 2024	FTID	2406114158430

T E N D E R

Supply, Laying, Testing And Commissioning Of Rwpm, Pumpset, Transformer And Design, Construction And Commissioning Of 15 Mld Water Treatment Plant At Nathankuni Meppadi Gp-General Civil Work

Category	Construction, Infrastructure, Civil Work Tenders		
Location	Kerala, Vythiri		
Bid Open Date	30 August 2024	Tender Value	17.79 Cr
Doc Collection Date	29 August 2024	FTID	240814439010
Instalation Of Water Treatment Plant/Atm Near Vidyasagar Ssk At Sahid Bandhu Nagar, Sansad No.- Xxiv, Mouza- Talbanda, Jl. No.- 28 Under Bilkanda I Gram Panchayat Of Barrackpore -li Dev. Block, North			
Category	Agro, Marine, Food Products Tenders		
Location	West Bengal, Habra		
Bid Open Date	24 August 2024	Tender Value	4.50 Lac
Doc Collection Date	24 August 2024	FTID	240814445180



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EVENT CALENDAR



July 2024

European Wastewater Management Conference & Exhibition

02-03 July 2024

The Point at Emirates Old Trafford, Manchester, UK/Online
ewwmconference.com/

Thai Water Expo 2024

03 - 05 Jul 2024

Queen Sirikit National Convention Center, Bangkok, Thailand
www.thai-water.com

12th Annual International Forum on Water

15-18 July 2024

Athens, Greece
www.atiner.gr/water

Water and Aqueous Solutions Gordon Research Conference

20 - 21 Jul 2024

Holderness School, Holderness, USA
<https://www.grc.org/water-and-aqueous-solutions-conference/2024/>

August 2024

The Water Expo 2024

20 - 22 Aug 2024

Miami Airport Convention Center, Miami, USA
www.thewaterexpo.com/

AgriTech India 2024

22 - 24 Aug 2024

BIEC Bengaluru International Exhibition Centre, Bengaluru, India
agritechindia.com

September 2024

19th EverythingAboutWater Expo 2024

10-12 September 2024

Yashobhoomi, IICC, Dwarka, New Delhi
www.eawaterexpo.com

EcwaTech 2024

10 - 12 Sep 2024

Crocus Expo, Moscow, Russia
en.ecwatech.ru

CamWater 2024

11 - 13 Sep 2024

Diamond Island Convention and Exhibition Center, Phnom Penh, Cambodia

www.camwaterexpo.com

Taiwan International Water Week 2024

11 - 13 Sep 2024

Taipei World Trade Center, Taipei, Taiwan
www.taiwanintwaterweek.com

Water & Wastewater Management Expo 2024

11 - 12 Sep 2024

The Emergency Services Show, Birmingham, UK
www.ess-expo.co.uk

Indo Water Expo & Forum 2024

18 - 20 September 2024

Grand City Mall & Convex Surabaya, Surabaya, Indonesia
indowater.com/

Water and Wastewater Fair 2024

24 - 26 Sep 2024

Elmia, Jönköping, Sweden
www.elmia.se/en/va-massan/

October 2024

Aqua Ukraine

15-17 Oct 2024

Ukraine, Kyiv | International Exhibition Centre
www.iec-expo.com.ua/en/aquaen-2024

WWEM - Water, Wastewater and Environmental Monitoring Conference

09-10 Oct 2024

NEC, Birmingham, UK
www.ilmexhibitions.com/wwem/

WETEX 2024

01-03 Oct 2024

Dubai World Trade Centre (DWTC)
www.wetex.ae

IFAT India

16-18 Oct 2024

Bombay Exhibition Centre, NESCO, Mumbai
www.ifat-india.com

Cairo Water Week 2024

13 - 17 Oct 2024

The Nile Ritz-Carlton Cairo, Cairo, Egypt
www.cairowaterweek.eg

November 2024

Produced Water Management, Treatment & Reinjection 2024

28 Oct - 01 Nov 2024

Dubai, UAE

10times.com/e1x5-z5p1-f9sp

Deepwater Operations Conference & Exhibition 2024

05 - 07 Nov 2024

Moody Gardens Hotel Spa and Convention Center, Galveston, USA
www.offshore-event.com/2024home/home

Vietwater 2024

06 - 08 Nov 2024

Saigon Exhibition and Convention Center, Ho Chi Minh, Vietnam
vietwater.com

SADC Groundwater Conference 2024

13 - 15 Nov 2024

Maseru, Lesotho
www.sadc.int

Annual WMAO Conference 2024

19 - 20 Nov 2024

Crowne Plaza Columbus North - Worthington, Columbus, USA
wmao.org

Clean India Show 2024

21 - 23 Nov 2024

Bombay Exhibition Centre (BEC), Mumbai, India
ctwindia.com/clean-india-show/

Floodex 2024

27 - 28 Nov 2024

ExCeL London, London, UK
floodex.co.uk

National Drainage Show 2024

27 - 28 Nov 2024

ExCeL London, London, UK
drainageshow.com

December 2024

GeoSmart India (GSI)

02 - 05 December 2024

Hyderabad, India
geosmartindia.net/2024/

Pak Water & Energy Expo 2024

03 - 05 Dec 2024

Karachi Expo Center, Karachi, Pakistan
www.pakwaterexpo.com

Exhibition on Water / Water Forum

04 - 06 December 2024

Belgrade Fair - Hall 3 / Belgrade / Serbia
www.sajamvoda.rs

EVENT CALENDAR



Aquatech China 2024

11 - 13 Dec 2024

Shanghai New International Expo Centre (SNIEC), Shanghai, China
www.aquatechtrade.com/shanghai

January 2025

Water Exhibition & Conference

14 - 16 Jan 2025

ADNEC Centre Abu Dhabi, Abu Dhabi, UAE
www.worldfutureenergysummit.com

NEWEA Annual Technical Exhibition & Conference

26 - 29 Jan 2025

Boston Marriott Copley Place, Boston, USA
annualconference.newea.org

InterAqua

29 - 31 Jan 2025

Tokyo Big Sight, Koto, Japan
en.www.interaqua.jp

Michigan Onsite Wastewater Conference

07 - 08 Jan 2025

Kellogg Hotel and Conference Center, Lansing, USA
events.anr.msu.edu/event

February 2025

Indomach

06 - 08 Feb 2025

Adityapur Auto Cluster, Jamshedpur, India
indomach.in

World Ag Expo

11 - 13 Feb 2025

International Agri-Center, Tulare County, USA
www.worldagexpo.com

Mountain States Ground Water Expo

13 - 14 Feb 2025

Aquarius Casino Resort, Laughlin, USA
mountainstatesgroundwater.com

Water and Waste Expo

20 - 22 Feb 2025 Pragati Maidan, New Delhi, India
waterwastesolidwaste.in

World Water Tech Innovation Summit

25 - 26 Feb 2025

Park Plaza London Riverbank, London, UK
worldwatertechinnovation.com

Membrane Technology Conference & Exposition

24 - 27 Feb 2025

Long Beach, USA

www.amtaorg.com/awwaamta-membrane-technology-conference-exposition

Water Today's Water Expo

26 - 28 Feb 2025

Chennai Trade Centre, Chennai, India
www.waterexpo.biz

March 2025

International Conference on Advances in Water Treatment and Management

1 - 2 March 2025

Gandhinagar, Gujarat, India
www.pdeu-h2o.com

Sioux Empire Water Festival

4 - 5 March 2025

Sioux Falls, USA
sewf.org

Hot Water & Hot Air

4 - 6 March 2025

Portland, USA
www.aceee.org/2025-hot-water-hot-air-forums

International Conference on Water Management Modeling

5 - 7 March 2025

Toronto, Canada
www.icwmm.org

Oman Sustainability Week

11 - 15 May 2025

Muscat, Oman
www.omansustainabilityweek.com

ISH - World's leading trade fair HVAC + Water

17 - 21 March 2025

Frankfurt, Germany
ish.messefrankfurt.com/frankfurt/en.html

Aqua Netherlands

18 - 20 March 2025

Evenementenhal Gorinchem, Netherlands
www.aquanederland.nl/en

Water & Clean Tech India Expo

19 - 21 March 2025

Pragati Maidan, New Delhi
www.smartcitiesindia.com

Water Philippines Expo & Conference

19 - 21 March 2025

SMX Convention Center, Manila, Philippines

www.waterphilippinesexpo.com

April 2025

China Clean Expo Shanghai

31 Mar - 03 Apr 2025

Shanghai New International Expo Centre (SNIEC), Shanghai, China
www.chinacleanexpo.com/en

American Worlds Water Association Annual Conference

07 - 10 Apr 2025

Anaheim, USA

www.inawwa.org/event/2025-annual-conference-april-21-25th/

Baku Water Week

08 - 10 Apr 2025

Baku Expo Center
bakuwaterweek.az/en/

Water Environment Association of Ontario Annual Conference

13 - 15 Apr 2025

London Convention Centre, London, Canada
weao.org/about/

Smart Water Systems

14 - 15 April 2025

London, United Kingdom
www.smgconferences.com

MiningWorld Russia

23 - 25 Apr 2025

Crocus Expo International Exhibition Center, Krasnogorsk, Russia
miningworld.ru/en/

Our Ocean Conference KOREA

28 - 30 Apr 2025

Centum City Industrial Complex, Busan, South Korea
ourocean2025.kr

2025 Water for Food Global Conference

28 Apr - 02 May 2025 University of Nebraska
waterforfood.nebraska.edu

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The Water Expo 2024 (13th edition) in Miami, Florida, comes as an in-person physical tradeshow to serve your needs, in the proper place, at the proper time.

Equipment, technologies, products, and education will be presented for the WASTEWATER, SEWER INFRASTRUCTURE, SEPTIC & PORTABLE SANITATION,

Date: 21-22 Aug 2024

Venue: MACC Convention Center, Miami, USA

Website: www.thewaterexpo.com

ENVIRONMENTAL SERVICES, WATER QUALITY, HIGH PRESSURE & STORMWATER industries.

It is the only tradeshow & conference in the western hemisphere serving United States PLUS Latin American / Caribbean markets (comprised by more of 45 countries). It works as the Effective Commercial Hub to CONNECT Manufacturers & Distributors with Buyers, Professionals, Dealers, Municipalities, Contractors, and Potential Reps. from the served markets.



 **MATECIA**
BUILDING MATERIAL EXHIBITION

MATECIA is a business exhibition in India that connects Exhibitors & Sponsors with Architects, Interior Retailers, Designers, Distributors, Agents, Builders, Government agencies, Project Consultants, Channel Partners and Dealers in the Building Material and Interior Products industry.

It is from the 22-year-old reputed media house of SURFACES REPORTER®, PLY

Date: 22-25 August 2024

Venue: Yashobhoomi (IICC), Dwarka, New Delhi

Website: matecia.com

REPORTER and FURNITURE DESIGN & TECHNOLOGY.

MATECIA EXHIBITION 2023 saw 45000+ visitors from 500+ towns & cities of India and 20+ other countries. It is one of the undisputed high performing exhibition for Building Material brands in India.

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19th EVERYTHING ABOUT
WATER EXPO
SOUTH ASIA'S LARGEST WATER
EXHIBITION AND CONFERENCE **2024**

10-12 | Hall No. 2C, Yashobhoomi,
Sep 2024 | IICC, Dwarka, New Delhi, IN

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Where the Water Community Comes Together

The 19th EverythingAboutWater Expo 2024 stands as a remarkable and all-encompassing annual event in India, spotlighting cutting-edge technologies and solutions within the water sector. This event serves as an exceptional gateway for stakeholders worldwide to immerse themselves in the expansive and dynamic realm of the Indian Water management Industry, facilitating the exchange of business opportunities, networking, and the exploration of innovative Water solutions.

Date: 10 - 12 September 2024

Venue: IICC, New Delhi

Website: www.eawaterexpo.com

India is currently on a trajectory towards severe water stress, with projections indicating a critical situation by 2025. The rapid pace of Industrialization and the burgeoning population have significantly widened the gap between water supply and demand, a matter of deep concern for both the Central and State Governments. Within the framework of the 19th Everything About Water Expo 2024, unparalleled business prospects will emerge for both domestic and international players in the Water Industry. Attendees will have the opportunity to gain valuable insights, discover future trends, and navigate the evolving landscape of the Indian Water market.

15th Edition
**Agri Tech
India 2024**



The agriculture sector in India expected to generate better momentum in the next few years due to increased investments in agricultural infrastructure such as irrigation facilities, warehousing and cold storage. Furthermore, the growing use of farm mechanization and new varieties, the likely improve the yield for Indian farmers. India expected to be self-sufficient in pulses, oilseed, maize and other crops in the coming few years.

Date: 22-24 August 2024

Venue: BIEC, Bangalore, India

Website: agritechindia.com

In consonance with the efforts of Indian Government, Media Today Group is organizing AGRITECH INDIA 2024- 15th International Exhibition on Agriculture, Farm Machinery, Dairy, & Agri Processing Technology in BIEC, Bangalore, India, from 22-23-24 August, 2024. The event will pump in more value additions to the existing technology from all over the world. This event has been a proven platform for Indian growers, agri entrepreneurs, startups, importers, exporters and all other stakeholders for expanding and diversifying their business activities. It will be an opportunities for agri business enterprises to display and launch their latest products range, mechanization & technological innovations for farmers.

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FAST TRACK YOUR GROWTH

CONFERENCE

The conference program will include internationally renowned keynote speakers encompassing experiences, challenges and solutions from around the world. The conference is structured into 4 sessions and 2 days training programs, spread over two days, focusing on specific theme, besides the inaugural and valedictory session.

- **GLOBAL FORUM: BEST PRACTICES**
- **INDUSTRIAL WATER FORUM**
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EverythingAboutWater training program equips participants with the special expertise, technical knowledge and skills they need to tackle complex Waste Water Treatment & Recycling challenges, these trainings has been attended by over 25,000 + delegates.

- **INTRODUCTION OF WASTEWATER TREATMENT**
- **WATER RECYCLING**
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and many more...

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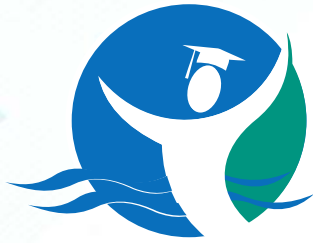


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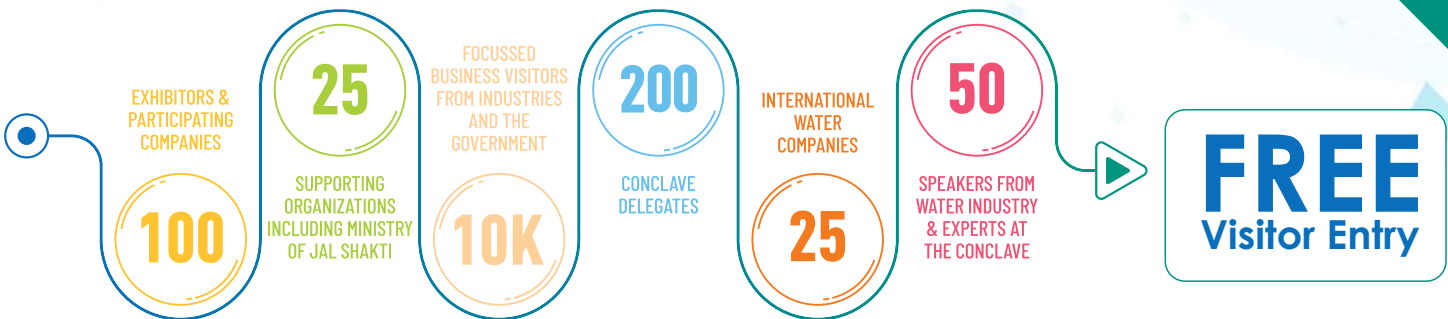
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Don't miss the tide of opportunities!

Join us at the 19th EverythingAboutWater Expo 2024 - where ideas flow, and solutions ripple for a water-secure tomorrow!



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