

# Year Round, Clarified Surface Water for Thrissur City

from PEECHI HEP (1x2.5MW)



Thrissur the third largest urban agglomeration in Kerala & the 21<sup>st</sup> largest in India. It was once the Capital of the Kingdom of Cochin & a point of contact for the Assyrians, Greeks, Persians, Arabs, Romans, Portuguese, Dutch & English. Also known as the Cultural Capital of Kerala, it has historically been a centre of Hindu scholarship, and Christianity, Islam and Judaism are believed to have entered the



Indian subcontinent through Thrissur.

Asia's tallest church, the Our Lady of Dolours Syro-Malabar Catholic Basilica (*Puthan Pally*) & is home to India's 1st Mosque - Cheraman Juma Masjid constructed in 629 CE.

Thrissur has functioned as a **municipality since 1921.**

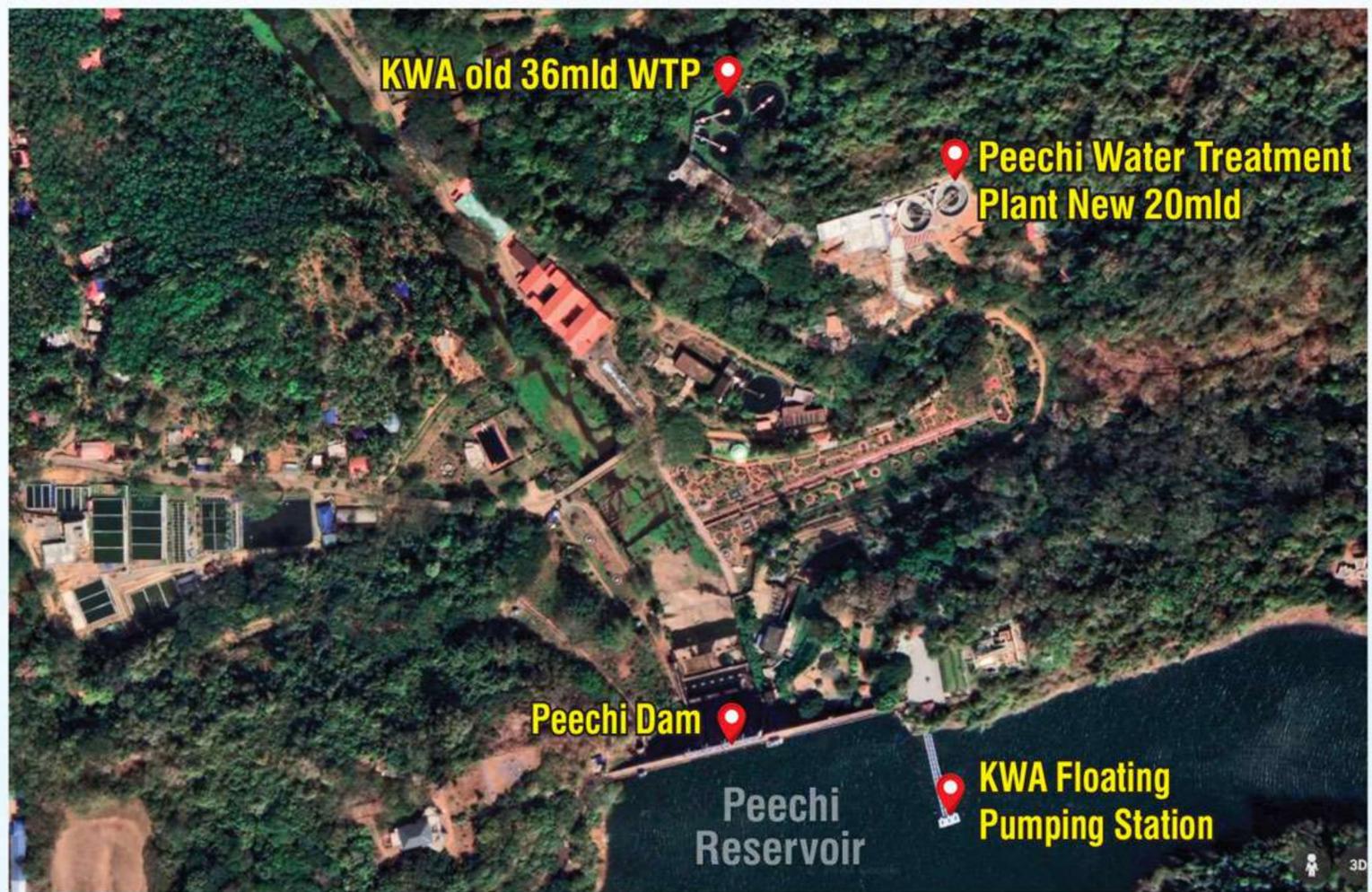


**Peechi Dam** is a Hydro Electricity Project (1x2.5mw) situated 22km outside Thrissur city is built across the **Manali River**, the dam has a catchment area of nearly 3,200 acres.



**Situation:**

For ages, to tackle high water level fluctuations, raw water was tapped through a Sluice in the **Bottom** of the dam through **Pen Stock** of HEP.



Unfortunately this Bottom Water had huge amount of **mud, high NTU & harmfully high content of Iron-** hence despite extensive filtration techniques treating this raw water was a WTP Engineer's Nightmare.

**Solution :**

In 2016, Pauly Peter found that the **water on the top surface of the dam was much more clear** than that at the lower sluices - to make it drinking worthy, he only had to filter & sanitize it..!

Accordingly, Pauly developed a simple floating intake system that would help draw water from the surface. **First testing** of this system happened at the **Chiminni dam**.

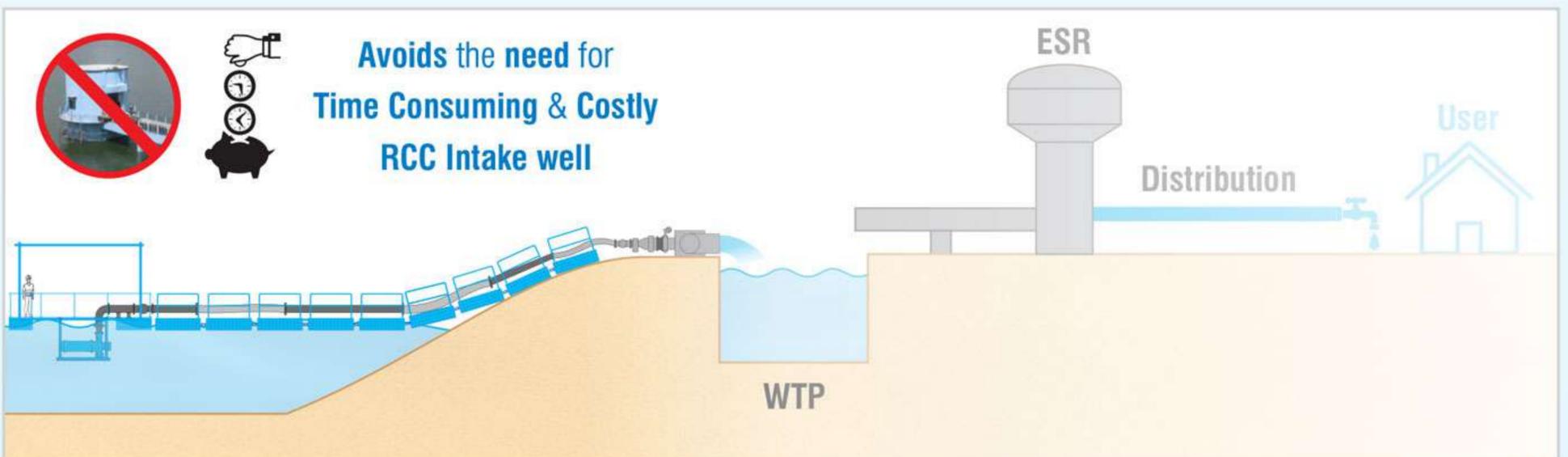
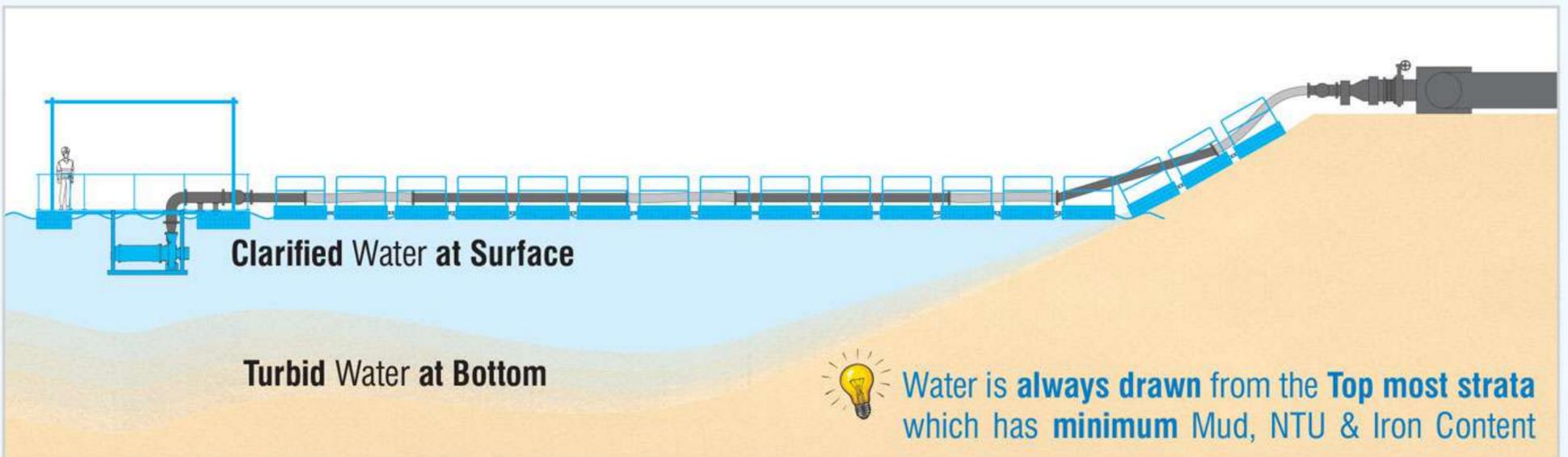
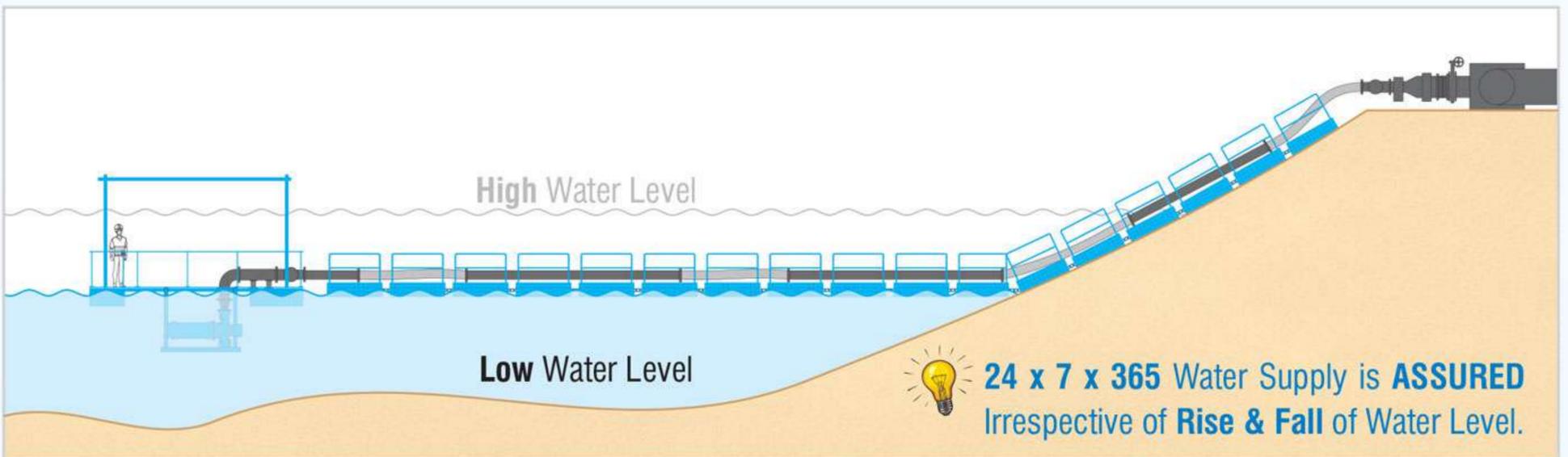
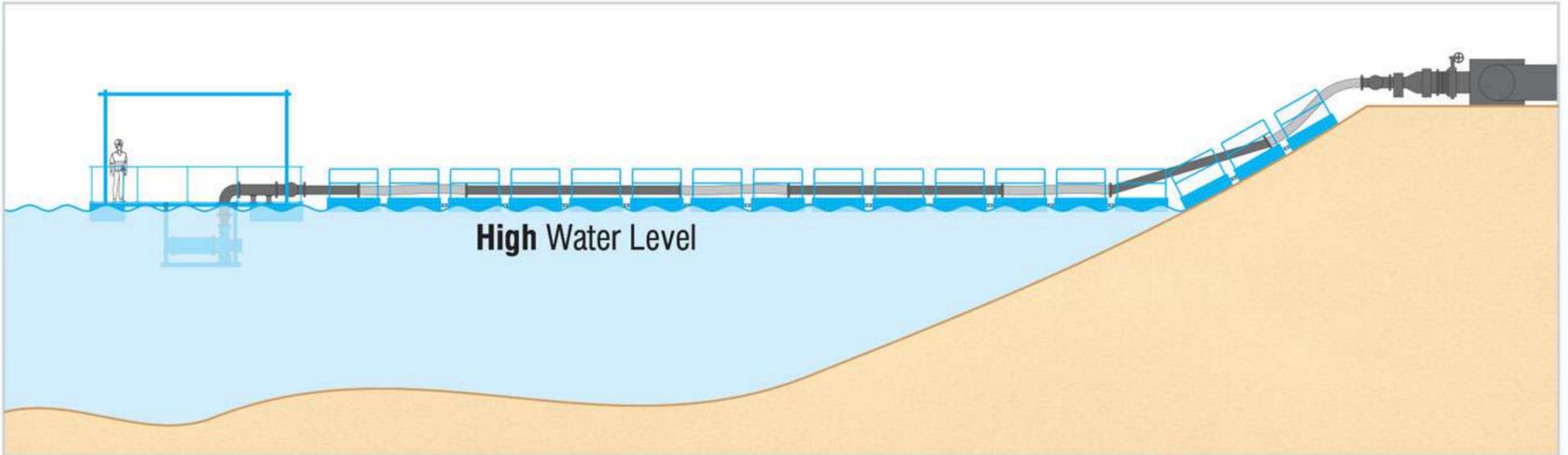


Instead of a Intake Well dependent VT pump, whose Suction Water Level is fixed as per Summer Low WL - i.e. Lower level with higher Silt, NTU & Iron content, in the Tender itself, m/s. KWA opted for Versatile Submerged pumpsets mounted on Floating Pontoon which also avoids the need for Time Consuming & Costly RCC Intake well.

24 x 7 x 365, Clarified Surface Water Supply is ASSURED Irrespective of Rise & Fall of Water Level.

This success consequently prompted him to bring in m/s Aqua Machineries to complete the project on a full scale.

**Aqua's Solution :**



The Pumpsets & pontoon are installed **deep in the dam** on the opposite side of the gates of the dam.



Aqua Submerged CF Pumpsets @ Peechi Dam		
	<b>End Client:</b> <b>Kerala Water Authority</b>	<b>Site :</b> <b>Peechi Reservoir</b>
		<b>Model :</b> <b>ARS_H_PS_2052_MM_215</b>
<b>Rating:</b> <b>833m<sup>3</sup>/hr @ 45m</b>	<b>Motor Rating:</b> <b>215hp</b>	<b>Qty.:</b> <b>3 nos.</b>

### Pros & Cons of Various Pontoon mounted Pumps

	VT Pump	Horizontal Pump	Submerged Pumpset
<b>Risk of Motor Burnout due to Rains, Storms &amp; Water Sprays / Splashing</b>	<b>Very High Risk</b> 		<b>No Risk,</b> as the Motor is IP68 rated 
<b>Center of Gravity (CG)</b>			
<b>Stability against Waves, Storms etc.</b>	<b>Highly Unstable</b> ...leading to Chances of Toppling & Oscillating	<b>Mildly Unstable</b> ...having Some Chances of Toppling	<b>Very Stable...</b> ...no Chances of Toppling
<b>Risk of Toppling &amp; Lateral Stability due to Lower Center of Gravity (CG) &amp; Low Roll Center (LRC)</b>	<b>Much Above the Deck</b> ...leads to pendulum like high amplitude oscillations 	<b>Above the Deck</b> ...leads to mild oscillations 	<b>Below Deck</b> ...so no oscillations 
<b>Direction of Pump's Inlet Suction Flow</b>	<b>Vertical Bottom Facing</b> ...leads to Undesirable Suction of Silt 	<b>Vertical Bottom Facing</b> ...leads to Undesirable Suction of Silt 	<b>Horizontal Side Facing</b> ...leads to Suction of Fairly Clear Water from Upper Strata. 

<p><b>Lubrication of Pumpsets</b></p>	<p>Forced Water Lubrication is <b>Continuously required.</b> <i>...is Very Costly &amp; Very Complex to Operate &amp; Maintain</i></p>	<p><b>Periodic Oiling &amp;/or Greasing is required.</b> <i>...is Costly &amp; Tedious to Operate &amp; Maintain</i></p>	<p><b>Not required.</b></p>
<p>Installation &amp; Operating <b>Manpower: Skill level</b> required &amp; <b>Quantity</b></p>	<p>Ultra Highly Skilled</p>	<p>Highly Skilled</p>	<p>Medium Skilled</p>
<p>Conducive to <b>Remote Operation</b></p>	<p>No</p>	<p>No</p>	<p>Yes</p>
<p><b>Need for Operator to go to Pontoon Frequently</b> <i>...for Priming, Alignment of Shaft/Coupling; Gland Packing Replacement / Tightening; Valve Opening / Closing; Forced Water Lubrication; Re-Oiling, Re-Greasing; Sleeve Replacement; etc.</i></p>	<p>Yes</p>	<p>Yes</p>	<p>Not Required.</p>

**Aqua's SubCF Benefits:**

Single, Robust & oversized Shaft is **Common** between the motor & pump - made from **Stainless Steel** & designed without Any Sleeves (*below the Mechanical Seals*) it **eliminates the need of spare parts.**

**Saves (upto 75%) Spare Parts & Consumables\***

**Saves (upto 66%) O&M Staff\***



**No need for Frequent Periodic....**

**Shafts &/or Coupling**      **Gland Packing**

**Eliminates Suction Lift Problems like Priming, NPSH & Cavitation**

**No need of Valve Opening / Closing during pump Start/Stop**

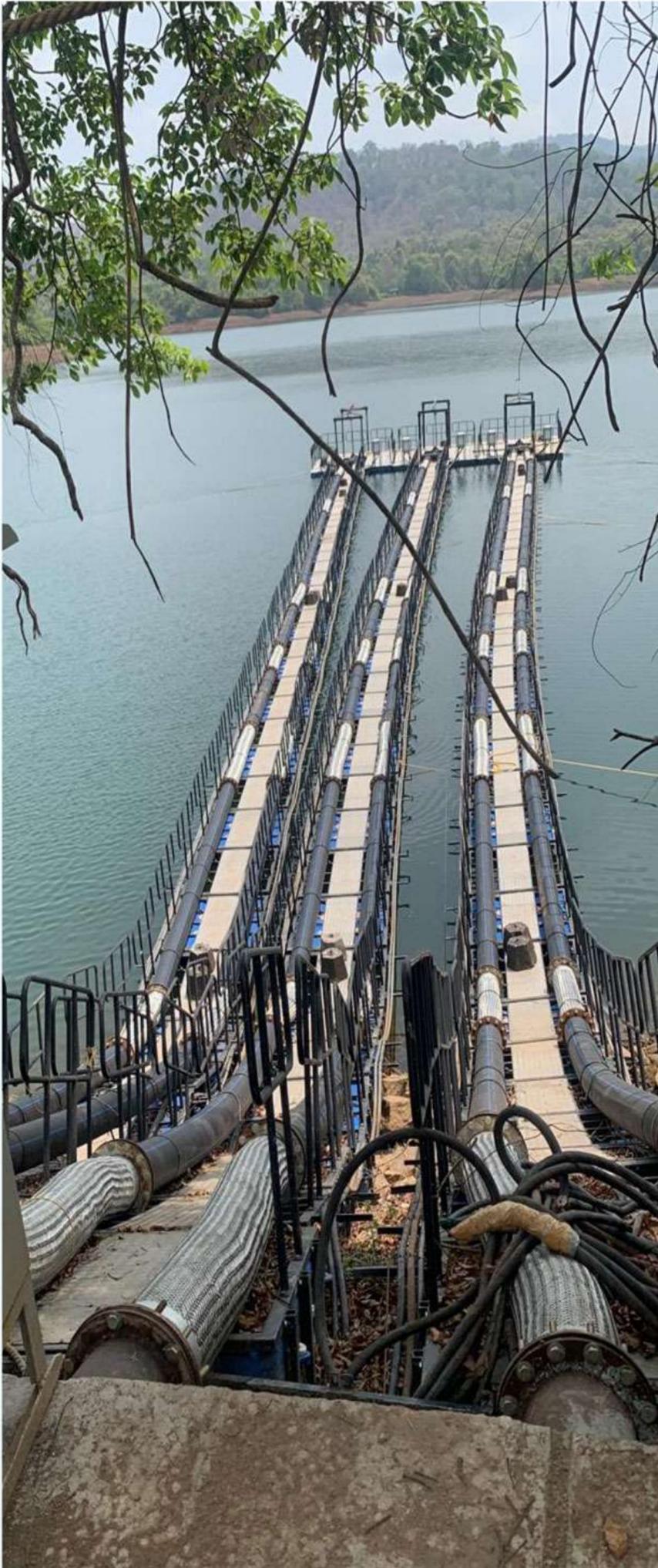
**Oil &/or Grease**

Site:

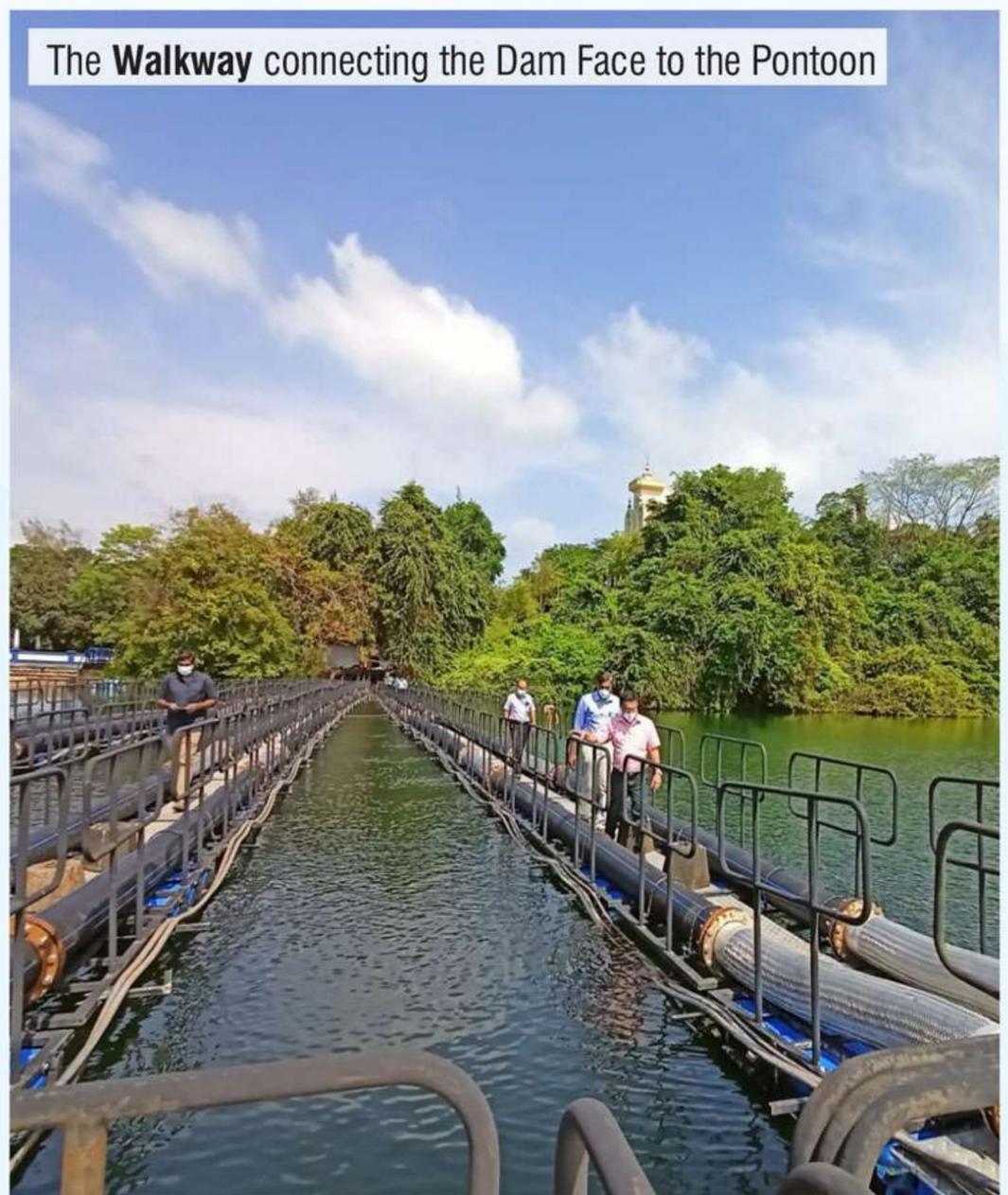


Motor Junction Box,  
Valves & Manifold are located  
on Dam Face

Site:



Motor **Starters** are installed in a Brick Masonry Electrical Room **outside the Reservoir**



The **Walkway** connecting the Dam Face to the Pontoon



**Well Synchronized Pump, Pontoon & Walkway Design for Optimal System Performance.**



Email: eekwatsr@gmail.com  
Phone No. 0487 - 2333070  
Pin: 680 020

## KERALA WATER AUTHORITY

No.A8-4820/2017 -17 Vol.II

Office of the Executive Engineer  
PH Division, Thrissur  
Dated: 03.11.2023

### TO WHOM SO EVER IT MAY CONCERN

This is to certify that M/S Aqua Machineries Pvt Limited - Ahmedabad designed and proposed complete system floating system at Peechi Reservoir for KWA including supply of Submerged Centrifugal Pump-sets suitable on Pontoon was supplied through M/S Aswathy Agencies, Vokkaom Thiurvanathapuram District for the work under AMURT. The Pump-set details are as under.

Make	:	"AQUA"
Mounting	:	Horizontal Portable suitable for Pontoon.
Head	:	45 mts
Discharge	:	833 M3/Hr (
Pump Model	:	ARS_H-PS_1 <sup>st</sup> _Vog_2052_MQ_M_2015_00415_NJ
Motor Details	:	215 HP-415 V- 1500 RPM (Syn)
Quantity	:	3 No's

The pump-sets were commissioned during June 2022 and continuously in operation, performance is satisfactory to the requirements.

This certificate issued on the request of manufacturer M/s Aqua Machineries Pvt Limited incumbent to participate in tender.

*H. Prasad*  
Executive Engineer  
KERALA WATER AUTHORITY  
PH DIVISION, THRISSUR



Worthy IAS (Mr. Alex Verghese) Mission Director; AMRUT Govt of Kerala; praising the Aqua Submerged pumps based Water Intake project stating **key benefits** of :

*"... Sufficient water in All Seasons from Top of the Reservoir & Easy for Maintenance"*

at AWWA Presentation in Jaipur  
on 7<sup>th</sup> October, 2023.

*"Previously a part of the discharge from the Peechi Dam pen stock pipe of KSEB generation system was used in the WTP of Kerala Water Authority. As this water contained heavy iron, alternative sources were planned and the final solution was to use the surface water with the help of floating pontoon intake structure with submerged pump set.*

*The beneficiaries will get clean & clear water with less time to treat it - unlike earlier times when the water was slightly Greenish & required more time for treatment."*

- Hon. Minister, Minor Irrigation; (Sri Rosy Augustine) (during Inauguration)

# Aqua Machineries Private Limited

[www.aquapumps.com](http://www.aquapumps.com)

Registered Office & Manufacturing Plant

Survey No. 504/1-2, 442/2, Near Haridarshan Estate, Near Express Highway, Ramol, Ahmedabad-382 445. Gujarat, India.

[marketing@aquapumps.com](mailto:marketing@aquapumps.com)