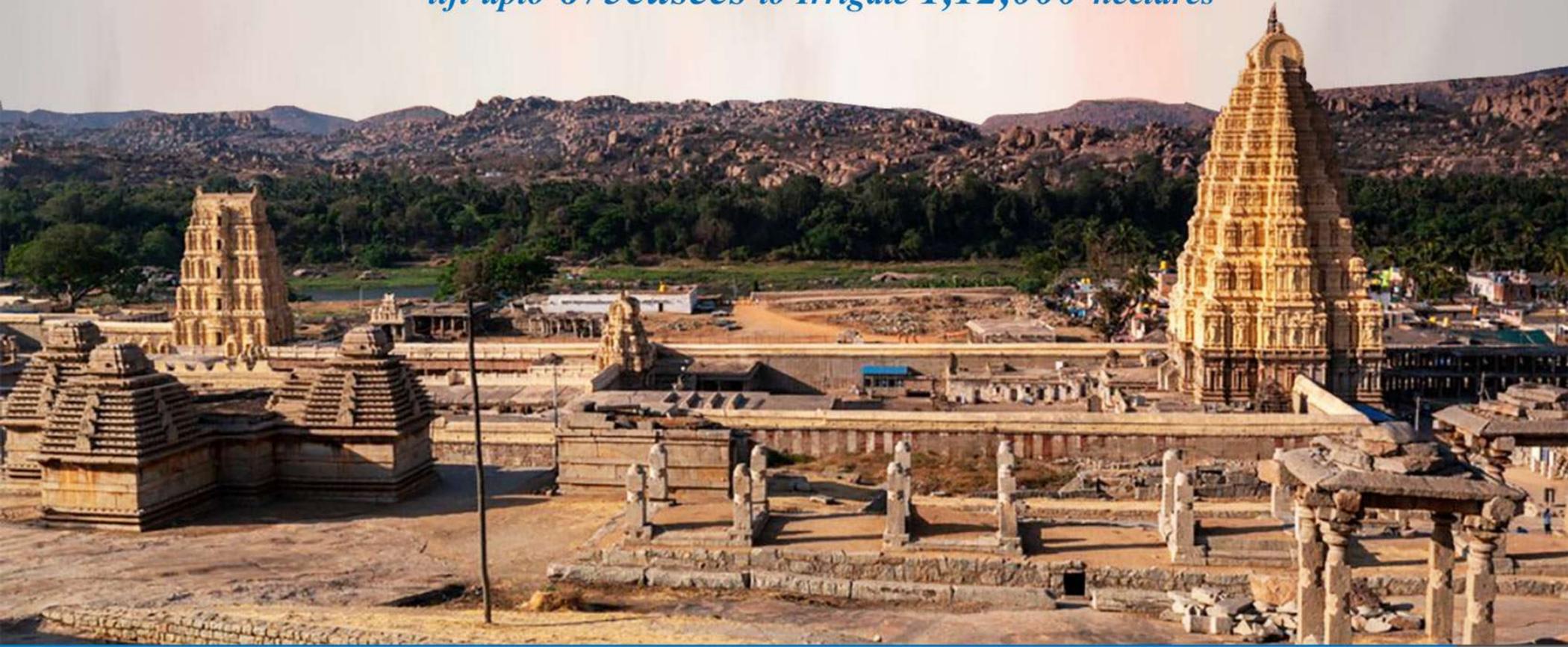


Karnataka

Krishna based Koppal LIS



33,786hp of Aqua's Submerged pumps (rated individually upto 3481m³/hr & upto 140 mwc) lift upto 675cusecs to Irrigate 1,12,000 hectares



Karnataka

covers an area of 1,90,498 Sq km with a population of 61 million is the eighth-largest state of India by population. Geologically, the state is covered by Archaeans, Proterozoic sediments, basalts of Deccan Trap Province & alluvium of Recent age. The Western Ghats, Karnataka Plateau and Coastal Landforms are the major geomorphic features of the state.

Koppal

Koppal district was carved out of Raichur is located in the northern part of the State. It was the capital of a branch of Shilaharas under the Chalukyas of Kalyani.

Koppal district is primarily agrarian in nature. Nearly 83% of district's population are settled in rural areas. Traditionally, the rural populations have engaged themselves in dairying & horticulture, while sericulture is added to their profession in the last decade. Major land use in the district is for cultivation and other allied activities.



Situation:

Despite seven river systems in Karnataka, 67% of the land falls under dry tracts; Karnataka is one of the most water-stressed states in India, with a large area of the State in the drought-prone region.

Koppal district experiences a **semi-arid type climate** characterized by hot summer & low rainfall. One of the most backward districts, it was irrigated solely by Rains. The districts of Belgaum, Vijayapur, Kalburgi Raichur, Koppal & through which the river flows are in **Rainfall Shadow areas** hence the rains are meager & unevenly distributed. The rainfall deficit in these districts is often more than 50%, which frequently affected the agriculture & drinking water supply.

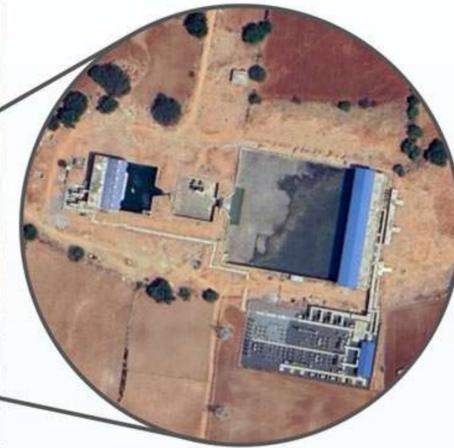


The farmers frequently faced crop losses & debt burdens, while the rural population often struggled to meet their basic needs. The district did not have a lift irrigation scheme.

However, as a redeeming feature; due to the high fertility of land, if water was made available by irrigation - the entire economic picture would turn around.

Hence Government of Karnataka entrusted m/s Krishna Bhagya Jala Nigam Ltd. KBJNL to implement a Lift Irrigation Scheme.

Macro Solution:



The **Koppal Lift Irrigation Scheme (KLIS)** was launched by m/s **Krishna Bhagya Jala Nigam Ltd. (KBJNL)**. KLIS involves lifting of **12.815 TMC** water from Right bank of back waters of **Narayanapur** Reservoir on Krishna River. It includes a 1st Head Works at **Marol** & 2nd Head Works at **Balkundi Tanda** – followed by Drip Irrigation of upto **1,12,000 hectares**.

Pumping Solution:

After extensive , Aqua's Submerged Centrifugal & Submerged VT pumps were selected (*over Conventional VT Pumps*) in the Tender; primarily due to benefits like:

- Simple, Compact & Cost Effective Civil Works
- Tolerance to Silty Raw Water
- No need of Highly Skilled Manpower - no need of Pre Start – Post Stop Ancillary / Auxiliary Systems (*Coolers, Forced Water Lubrication system, Dry Run Protection Watering, etc*)
- Competitive Pump Bowl & Motor Efficiencies

| Pumping Station | Pump type | Head (m) | Discharge (m ³ /hr) | Motor Rating (hp) | Qty. |
|---|---|----------|--------------------------------|-------------------|------|
| KYK Main to DC-4 | Submerged Centrifugal Pumpset (Double Suction) | 56.5 | 2772 | 770 | 8 |
| KYK Main to Tavarageri | Submerged Centrifugal Pumpset | 38 | 3481.2 | 650 | 4 |
| Hunagunda branch, Hulageri branch & Hanumasagar branch for filling of MI/ZP tank | Submerged Centrifugal Pumpset | 112 | 936 | 536 | 4 |
| | Submerged Vertical Turbine Pumpset | 140 | 900 | 650 | 20 |
| | Submerged Centrifugal Pumpset | 95 | 1134 | 536 | 3 |
| KYK to Yalaburga feeder, Yalaburga branch & Koppal branch for filling of MI/ZP tank | Submerged Centrifugal Pumpset (Double Suction) | 47.5 | 1908 | 450 | 4 |
| | | 80 | 1332 | 536 | 3 |
| | | 80 | 1404 | 550 | 3 |
| | | 80 | 1260 | 536 | 6 |

Project's Benefits:

- Total **78**nos. Tanks / Impounding Reservoir are filled by this Scheme.
- 5 Nos. of Minor Irrigation / Zilla Parishad Tanks under **Yelaburga Branch**; 7nos. Tanks under **Yelaburga Feeder** & 10 Nos. of Mirco Irrigation / Zilla Parishad Tanks under **Koppal Main Branch** Zilla.

Beneficiaries:

- **Koppal** Dist. : Koppal, Kustagi, Yelburga Taluk & Kankgiri of Gangavati
- **Bagalkot** Dist. : Hungund & Badami
- **Gadag** Dist. : Ron Taluk

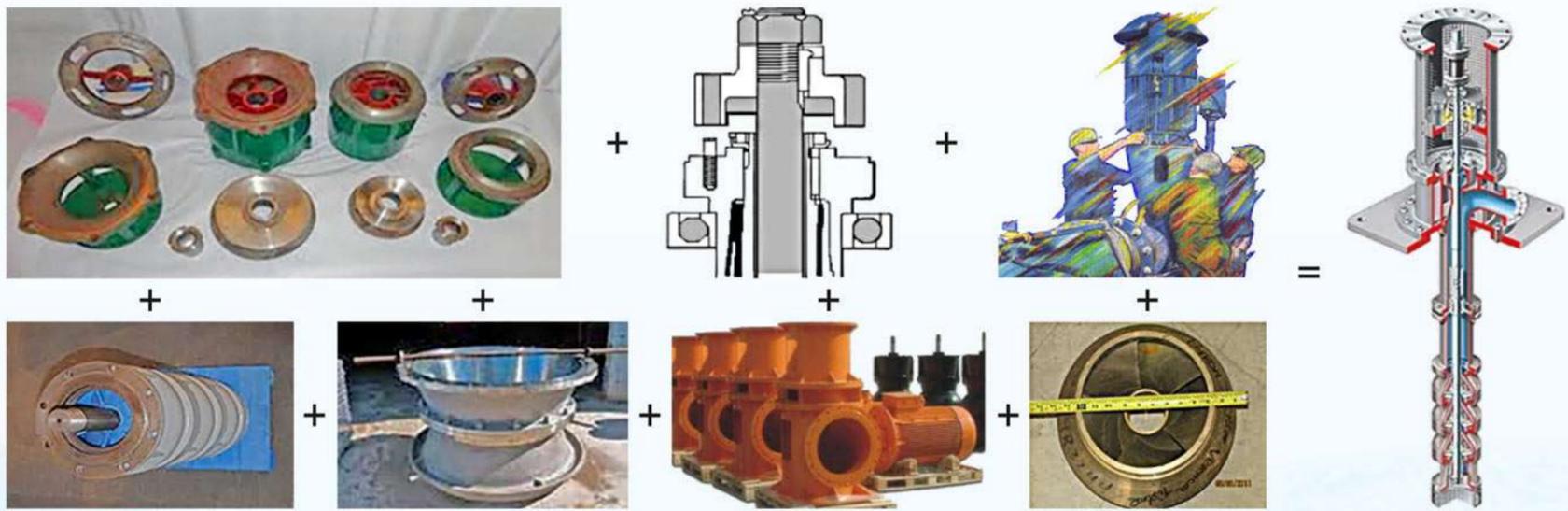
Aqua's Pump's: Additional Benefits:

Client Witness Pumpset Factory Acceptance Testing

Let us take the case of the **900m³/hr x 140m, 650hp, 1450rpm, 2 Stage Pumpset** to be installed at a depth of **10m** with **5nos. x 2m Long Column Pipes**

Conventional Vertical Turbine Pump + Motor

- It would have **5nos. Line Shafts, 5nos. Line Shaft Bearings, 5nos. Spiders & 5nos. Couplings** with **2nos. Impellers, 2nos. Bowls**, etc
- However, it may be offered for Factory Acceptance Testing in its partial form (*as allowed by IS 1710*) – for e.g. with a Smaller **90hp (& Lower Speed 960rpm) Laboratory Motor & Just 1 Bowl with Just 1 Impeller**; with **Just 1 Line Shaft, Just 1 Line Shaft Bearing, Just 1 Spider & Just 1 Coupling**. ⚠
- So the Resultant **Testbed Power** would be **Just 90hp**, Head may be **Just 31.1m** & the Flow would be **Just 600 m³/hr.!**
- Also, the Entire Pump Motor Set is **NEVER BUILT-UP** in Factory - so it is always a Question Mark for the Client; whether all the Sub Components when he assembles them at Site; will Run Harmoniously Mechanically Smoothly or not...!?



Aqua's Submerged VT Pumpsets:

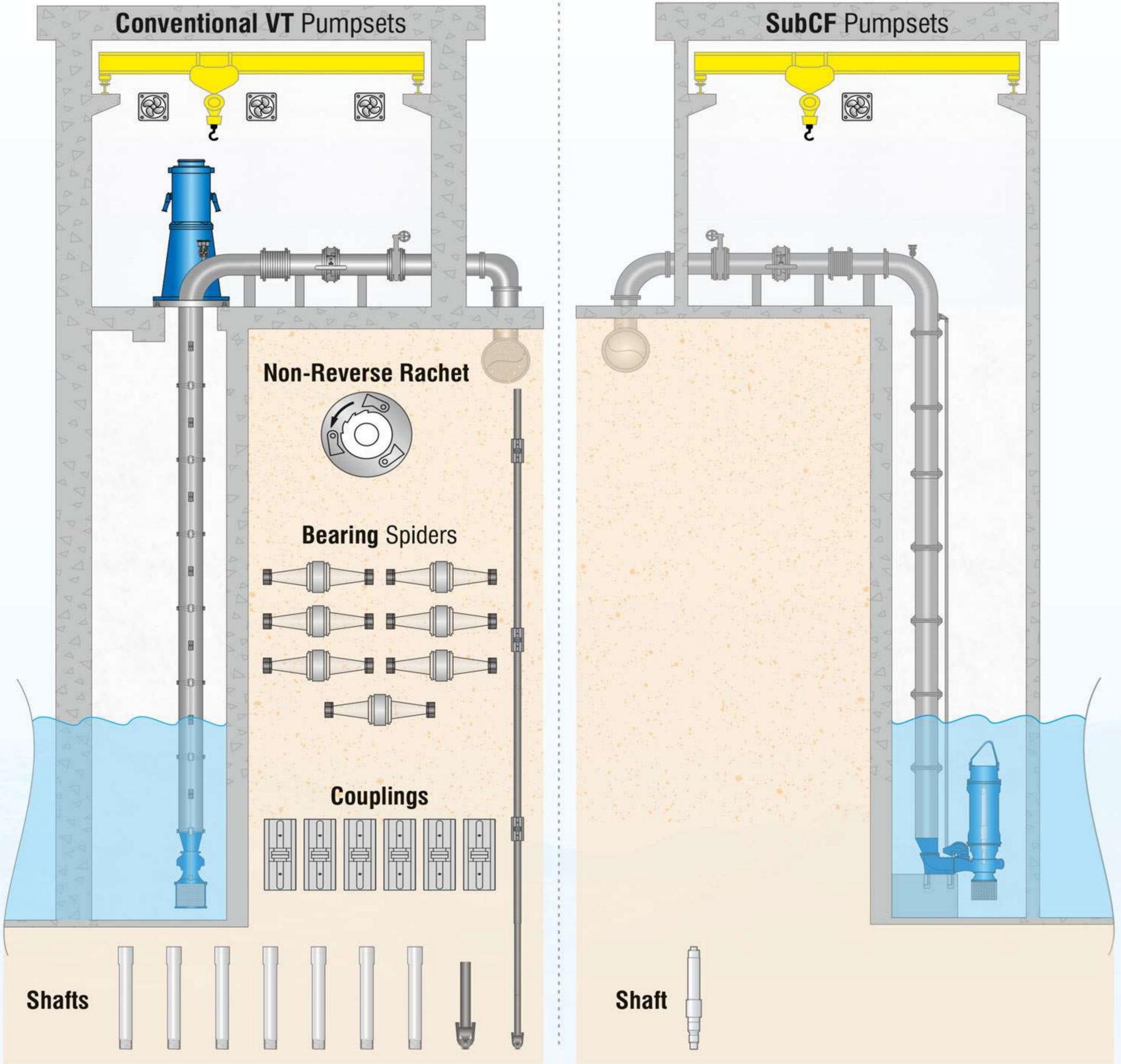
Accurate & Actual PumpSet Testing Methodology followed by Aqua

- the **ENTIRE Pump Motor** – i.e. **PUMPSET** (*including all the 2 stages, including all the bearings, shaft, etc*) along with the **650hp Job Motor** & its Cables; is built up as a **Single Mono Block Unit** & is Tested to deliver the **140m & 900 m³/hr.**
- **Hence**, the Client is not required to rely on Mathematical models to calculate predicted Electro Hydraulic performance & since the Entire PumpMotor Set is tested; its smooth Mechanical Performance is assured.



Aqua's Submerged pumps are tested as a Completely Built Up unit ensuring fully harmonious inter component performance & shipped as a "Plug & Play" unit ensuring Zero Assembly Errors at site. 💡

Aqua's Pump's: Additional Benefits:



Simple Civil Structures & Low Components / Spare Parts requirement was a key consideration for selection on Submerged pumps

Aqua's Pump's: Additional Benefits:

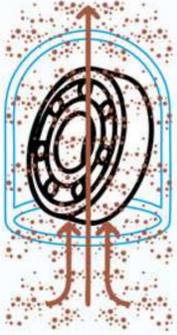
Apart from the main benefits (due to which Aqua's Submerged Centrifugal & Submerged VT pumps were selected in the 1st place); Clients are also pleased as the following Additional benefits, which surfaced during Execution/ O&M :

- Pump Efficiency found to be the Same as Bowl Efficiency... No Hidden Losses.
- Lower Auxiliary & Ancillary Losses.
- Lower Wire to Water, Pumping Station Energy Costs.
- Hugely Reduced requirement of Spare Parts & Consumables.
- No Consumables required.
- Tolerant to Months of Idling.

Aqua's Submerged Pumpset's: Benefits

Conventional VT Pumpset

(utilizes Water Lubricated Pump Bearings & Leakage Prone Rope Glands)

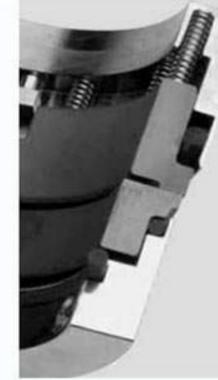
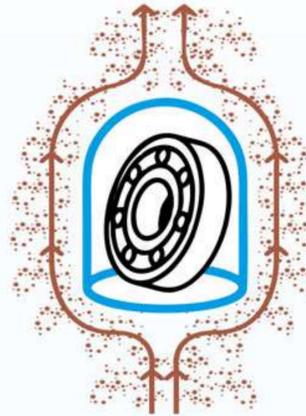


Rope Packing in Cast Iron Gland

Pump Bearings are exposed to **Silt Water** leading to their **Erosion** & possible **Premature Failures**.

Submerged Pumpset

(utilizes Two, Zero Leakage Mechanical Seals)



Mechanical Seal in Stainless Steel Gland

Bearings are located deep inside the motor & are **Totally Sealed** by **Two Mechanical Seals** thereby are totally **Protected** from Water, Silt, Rust & Galling



Low Energy Cost : Due to Elimination of many Ancillary & Auxiliaries; **Wire to Water Power Consumption** of SubCF based Pumping Station is **slightly Lower** (compared to Conventional Bare Shaft Pump - Motor Set based Pumping Stations).

Ultra Low ManPower Requirement



- **Requires No Special Pre – Post / Ancillary-Auxillary Operations** (like Valve Opening- Closing, starting-stopping-monitoring Forced Water Lubrication systems operation etc.)
- **Requires No Consumables** (like Oil, Grease, Gland Ropes, Bush, Pins, Couplings, Sleeves, etc)
- **Requires No Routine Maintenance** (like Gland Tightening, Gland Rope replacement, Shaft Alignment etc.)



Saves (upto 33%) Land Requirement*



Saves (upto 45%) Capital Cost of Entire Pumping Stations *



Saves (upto 75%) Spare Parts & Consumables*



Saves (upto 66%) O&M Staff*



Low Life Cycle Costs (LCC)*

*(refer marketing@aquapumps.com for additional white papers)



No need for Frequent Periodic...



Shafts / Sleeves &/or Coupling



Gland Packing



Oil &/or Grease



Minimal Noise, Vibration & Heat Emission; due to **elimination** of Auxiliary & Ancillary systems (like Forced Water Lubrication, Thrust Bearing Cooling system, Motor Heat Exchanger).

Site Photos:



Clean & Compact, Minimal Noise, Vibration & Heat on Pump House Operator Floor (due to elimination of Auxiliary & Ancillary systems (like Forced Water Lubrication, Thrust Bearing Cooling system, Motor Heat Exchanger)).



KRISHNA BHAGYA JALA NIGAMA LIMITED
(Govt of Karnataka Under taking)
O/o Assistant Executive Engineer,
KBJNL, Koppal Lift Irrigation Sub Division-02,
KUSHTAGI-583277,
Dt:Koppal

ಕೃಷ್ಣಾ ಭಾಗ್ಯ ಜಲ ನಿಗಮ ನಿಯಮಿತ
(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಅಧೀನ)
ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಇಂಜಿನಿಯರ್‌ರವರ ಕಛೇರಿ
ಕೃಷ್ಣಾಜನಿನಿ,ಕೊಪ್ಪಳ ವಿತ ನಿರಾಪರಿ ಉಪ ವಿಭಾಗ-02,
ಕುಷ್ಠಗಿ,- 583277
ಕೊಪ್ಪಳ ಜಿಲ್ಲೆ

TO WHOMSOEVER IT MAY CONCERN

These pumps manufactured by M/s Aqua Machinerie Pvt Ltd, Ahmedabad are erected and commissioned by M/s N D Waddar & Company for have supplied Project KYK Main to DC-4 (Koppal LIS).

Pumpset type :- Submerged Centrifugal pumpset with Integral motor (Double Suction).
Application :- Raw water handling.
Pump Model :- ARSDS_V_AC_1st_VoG_DS_4052_M_4P_770N_415_NJ.
Head :- 56.5 Mtr.
Discharge :- 2772 M3/hr.
No of Stages :- 1.
DN Size :- 400 MM.
Motor Rating :- 770 HP / 575 Kw.
Qty :- 8 Nos.(7W+1S)
Installation :- Auto coupling.

Voltage :- 415 V
Motor Type :- Submerged Squirrel cage induction - Dry Air filled Totally enclosed (IP 68) Self frame surface water cooled (TESWC) complying to IC4A1W0 of IS 6362

Qty :- 8 Nos.

These pumps were commissioned in the Month of May 2023 and are working satisfactorily till date.

Assistant Executive Engineer,
KBJNL, Koppal Lift Irrigation Sub Division-02,
KUSHTAGI-583277,
Dt:Koppal
21/Sep/2023

Assistant Executive Engineer,
KBJNL KUS Sub-Division. No.
KUSHTAGI-583277

KRISHNA BHAGYA JALA NIGAMA LIMITED
(Govt of Karnataka Under taking)
O/o Assistant Executive Engineer,
KBJNL, Koppal Lift Irrigation Sub Division-02,
KUSHTAGI-583277,
Dt:Koppal

ಕೃಷ್ಣಾ ಭಾಗ್ಯ ಜಲ ನಿಗಮ ನಿಯಮಿತ
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ಕುಷ್ಠಗಿ,- 583277
ಕೊಪ್ಪಳ ಜಿಲ್ಲೆ

TO WHOMSOEVER IT MAY CONCERN

These pumps manufactured by M/s Aqua Machinerie Pvt Ltd, Ahmedabad are erected and commissioned by M/s N D Waddar & Company for have supplied Project KYK Main to Tavarageri (Koppal LIS)

Pumpset type :- Submerged Centrifugal pumpset with Integral motor.
Application :- Raw water handling.
Pump Model :- ARSES_V_AC_1st_VoG_ES_5064_MQ_6P_650N_415_NJ.
Head :- 38 Mtr.
Discharge :- 3481.2 M3/hr.
No of Stages :- 1.
DN Size :- 500 MM.
Motor Rating :- 650 HP / 485 Kw.
Qty :- 4 Nos.(3W+1S)
Installation :- Auto coupling.

Voltage :- 415 V
Motor Type :- Submerged Squirrel cage induction - Dry Air filled Totally enclosed (IP 68) Self frame surface water cooled (TESWC) complying to IC4A1W0 of IS 6362

Qty :- 4 Nos.

These pumps were commissioned in the Month of July 2023 and are working satisfactorily till date.

Assistant Executive Engineer,
KBJNL, Koppal Lift Irrigation Sub Division-02,
KUSHTAGI-583277,
Dt:Koppal
21/Sep/2023

Assistant Executive Engineer,
KBJNL KUS Sub-Division No.
KUSHTAGI-583277

ಕೃಷ್ಣಾ ಭಾಗ್ಯ ಜಲ ನಿಗಮ ನಿಯಮಿತ
(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಅಧೀನ)

Office of the Executive Engineer,
KBJNL.NLBC Division, Rodalabanda-584127
Tq.Lingasugur Dist.Raichur
email:kbjnlNBC4@gmail.com

ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಧಿಯಂತರ ಕಛೇರಿ,
ಕೃಷ್ಣಾಜನಿನಿ ನಾವದಂತಾ ವಿಭಾಗ,
ರೋಡಲಬಂಡಾ-584127
ತಾ: ಲಿಂಗಸುಗುರು ಜಿ:ರಾಯಚೂರು.

No.KBJNL/NLBCD/PB-1/2023-24/1070 Date:- 03-11-2023

TO WHOMSOEVER IT MAY CONCERN

These pumps manufactured by M/s Aqua Machinerie Pvt Ltd, are erected and commissioned by M/s Shankaranarayana Construction Pvt. Ltd. for have supplied to M/s KBJNL for Project Hunagunda branch, Hulageri branch & Hanumasagar branch for filling of MI/ZP tanks under Koppal Lift Irrigation Scheme- Package 1

| Model | Head | Discharge | HP / KW | Qty | DN | Pumpset Type | Installation |
|---|---------|------------|---------|-----|--------|--|-------------------------|
| ARSES_V_Ac_1st_VoG_ES_2564_M_4P_536N_415_NJ | 112 Mtr | 936 M3/Hr | 536/400 | 4 | 250 MM | Submerged Centrifugal Pumpset with Intergral Motor. | Auto coupling Type |
| AVT_V_PS_2st_BO_ES_3052_M_4P_650N_415_NJ | 140 Mtr | 900 M3/Hr | 650/485 | 20 | 300 MM | Submerged Vertical Turbine Pumpset with Intergral Motor. | Vertical Bottom Rested. |
| ARSES_V_Ac_1st_VoG_ES_2564_M_4P_536N_415_NJ | 95 Mtr | 1134 M3/Hr | 536/400 | 3 | 250 MM | Submerged Centrifugal Pumpset with Intergral Motor. | Auto coupling Type |

Motor Type :- Submerged Squirrel cage induction - Dry Air Filled Totally Enclosed (IP 68) self frame surface water cooled (TESWC) complying to IC4A1W0 of IS 6362

These pumps were commissioned in the Month of Jan 2023 and are working satisfactorily till date.

EXECUTIVE ENGINEER
KBJNL. NLBC. Division
RODALABANDA

ಕೃಷ್ಣಾ ಭಾಗ್ಯ ಜಲ ನಿಗಮ ನಿಯಮಿತ
(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಅಧೀನ)

Office of the Executive Engineer,
KBJNL.NLBC Division, Rodalabanda-584127
Tq.Lingasugur Dist.Raichur
email:kbjnlNBC4@gmail.com

ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಧಿಯಂತರ ಕಛೇರಿ,
ಕೃಷ್ಣಾಜನಿನಿ ನಾವದಂತಾ ವಿಭಾಗ,
ರೋಡಲಬಂಡಾ-584127
ತಾ: ಲಿಂಗಸುಗುರು ಜಿ:ರಾಯಚೂರು.

No.KBJNL/NLBCD/PB-1/2023-24/1070 Date:- 03-11-2023

TO WHOMSOEVER IT MAY CONCERN

These pumps manufactured by M/s Aqua Machinerie Pvt Ltd, are erected and commissioned by M/s G Shankar, Class 1 contractor for have supplied to M/s KBJNL for Project KYK to Yalaburga feeder, Yalaburga branch & Koppal Branch for filling of MI/ZP tanks under Koppal lift irrigation scheme - Package 3

| Model | Head | Discharge | HP / KW | Qty | DN | Pumpset Type | Installation |
|---|----------|------------|-----------|-----|--------|---|--------------------|
| ARSDS_V_Ac_1st_VoG_DS_3052_M_4P_450N_415_NJ | 47.5 Mtr | 1908 M3/Hr | 450 / 335 | 4 | 300 MM | Submerged Centrifugal Pumpset with Intergral Motor (Double Suction) | Auto coupling Type |
| ARSDS_V_Ac_1st_VoG_DS_3052_M_4P_536N_415_NJ | 80 Mtr | 1332 M3/Hr | 536/400 | 3 | 300 MM | Submerged Centrifugal Pumpset with Intergral Motor (Double Suction) | Auto coupling Type |
| ARSDS_V_Ac_1st_VoG_DS_3052_M_4P_550N_415_NJ | 80 Mtr | 1404 M3/Hr | 550/410 | 3 | 300 MM | Submerged Centrifugal Pumpset with Intergral Motor (Double Suction) | Auto coupling Type |
| ARSDS_V_Ac_1st_VoG_DS_3052_M_4P_536N_415_NJ | 80 Mtr | 1260 M3/Hr | 536/400 | 6 | 300 MM | Submerged Centrifugal Pumpset with Intergral Motor (Double Suction) | Auto coupling Type |

Motor Type :- Submerged Squirrel cage induction - Dry Air Filled Totally Enclosed (IP 68) self frame surface water cooled (TESWC) complying to IC4A1W0 of IS 6362

These pumps were commissioned in the Month of Sept 2022 and are working satisfactorily till date.

EXECUTIVE ENGINEER
KBJNL. NLBC. Division
RODALABANDA

Aqua Machinerie Private Limited

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