AQuA®

WATER TRANSPORTATION

Gujarat Water Grid

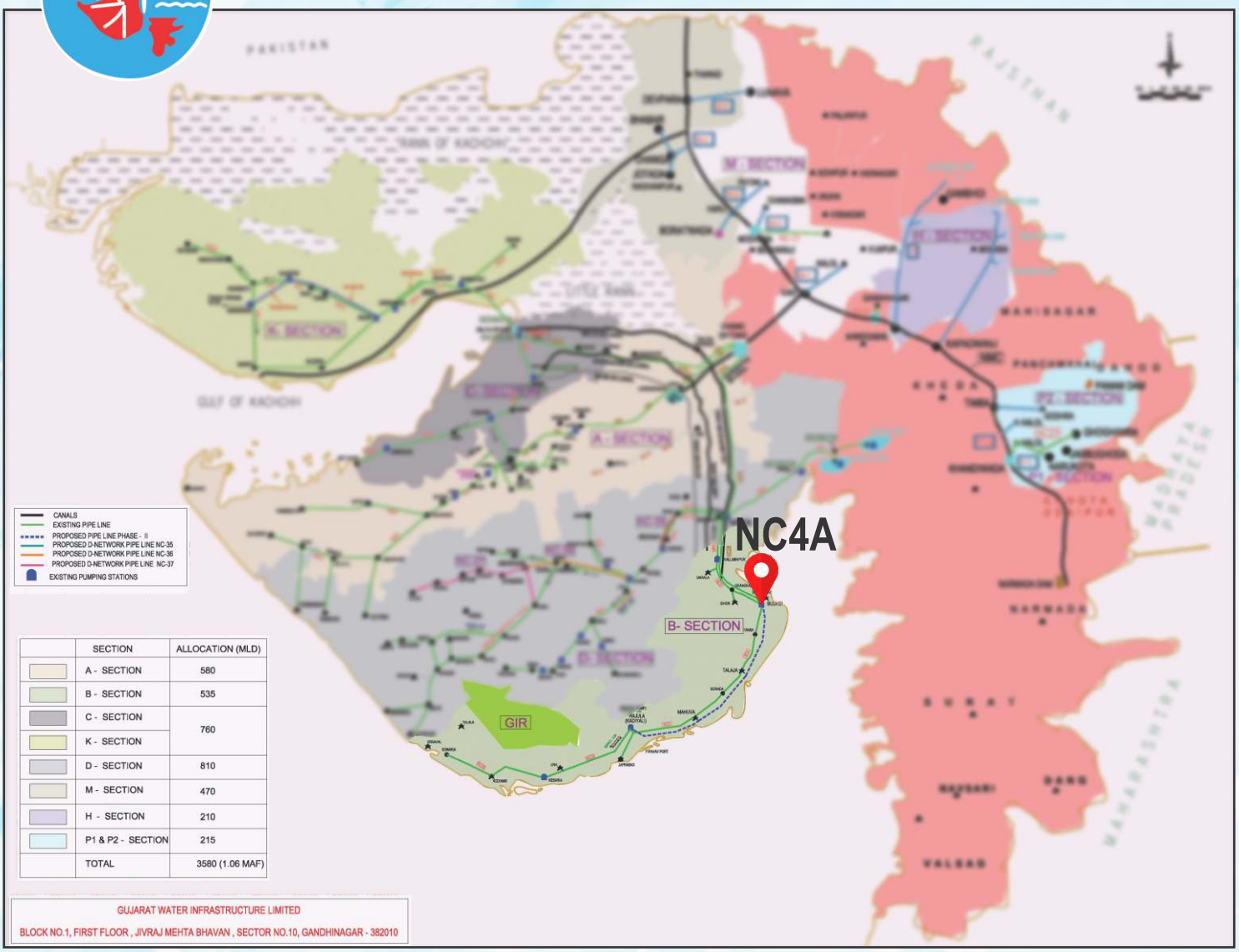
NC4A

Raw Water Transmission Pumping Station

Budhel to Borda

India's first comprehensive Water Supply Grid

WATER TRANSPORTATION



SECTION	ALLOCATION (MLD)
A - SECTION	580
B - SECTION	535
C - SECTION	760
K - SECTION	
D - SECTION	810
M - SECTION	470
H - SECTION	210
P1 & P2 - SECTION	215
TOTAL	3580 (1.06 MAF)

Project	:	**NC4A**
Section	:	**Budhel to Borda**
Package	:	**B**
Pumpset	:	10no Submerged Centrifugal Pump sets (6W+4S)
Flow	:	**1215** m3/hr
Head	:	**92** m.
Motor Capacity	:	**450** kW / **600** HP
Length of Pipeline	:	**64** km
Diameter of Pipes	:	**1400 / 1300** mm
Type of Pipe	:	MS Pipe with Inside Cement Mortar Lining and Outside gunniting

Gujarat faces scarcity of water in certain regions that are arid and receive less rainfall. Frequent droughts accentuate this scarcity of water in the state. The State had thus undertaken a sustainable measure to combat this problem by developing a 'State-wide Water Supply Grid'.

This grid was developed and extended over a decade to augment the local resources and to quench the thirst for water in the areas facing water scarcity.

With this grid, the government is able to supply water to far-off places through an inter-basin bulk water transfer.

This is an enormous project, with a spread of 1,20,769 km to serve 75% of Gujarat's population.

Situation :

The existing HSCF Pumps of **NC4** were having frequent failures *(related to bentonite soil swelling causing misalignment between motor & pumps).* Also the Open to sky Raw water sump was breeding Grass & Hyacinth which choked the Suction Strainers frequently demanding an unfortunate Dewatering of the Sump *(before the Suction Strainers could be approached for cleaning)* leading to huge downtime of pumping.

Solution :

So with the motto of uninterrupted pumping of drinking water transmission to various cities and villages of Package B; Gujarat Water Infrastructure Limited decided to upgrade to Auto-Coupling installed Submerged Centrifugal pumpsets for the next phase of its augmentation - i.e. **NC4A**.

The entire work of Supply, Installation, Testing & Commissioning of Pumping Machineries & Electro-Mechanical Accessories was executed by Aqua Machineries Pvt. Ltd. well within the time limit.

FORM NO. 3(A)

(Referred to in Rule No. 58(ii))

WORK WISE DETAILS OF WORK COMPLETED OR PROGRESS BY THE CONTRACTOR

1	Name of Contractor	:	Aqua Machineries Pvt. Ltd. Plot No. 3821, Phase-IV, G.I.D.C. Vatva, Ahmadabad
2	Work Order No. & Date	:	GWIL/LOA/BUDHEL AUG PROJECT/422/2013, dated 11.02.2013
3	Name of Work	:	Design, Engineering, Supply, Installation, Testing & Commissioning of SCF Pump With Associated Mechanical And Electrical Equipment, Instruments & Accessories With Comprehensive Operation And Maintenance For Five Years At Budhel Under NC-4 & 5, Augmentation project from Budhel- Borda-Kadiyari in District: Bhavanagar Above works consisting one of the followings; 1. 450 kW (600 HP) X 10 Nos. (SCF Pump sets)= Total kW 4500 2. 2500 KVA Transformer - 3 Nos. 3. 11kv HT VCB Panel 4. Construction of RCC Panel Room (25 Mtr x 6 Mtr x 4 Mre) i.e. 600m³
4	Estimated Cost of Work put to Tender	:	
5	Tender Amount	:	
6	Date of Starting the Work	:	11.02.2013
7	Stipulated Date of Completion of Work	:	12.05.2013 (for SITC)
8	Actual Date of Completion of work		15.05.2014 (for SITC)
9	Amount of Work done up to Date	:	

Signature of Contractor
(with Rubber Stamp)

10	State whether the details as above given by the contractor are correct, if not state as to what is correct information	:	Yes
11	State whether the contractor has Executed the work in progress satisfactorily as per specifications. If not give the correct position of the work.	:	SITC works of the project were completed on 15.05.2014. Operation & Maintenance work is being carried out by the agency from 01.06.2014.
12	Any other Remarks	:	–

Place: Barwala
Date: 3-12-2014

Senior Manager
GWIL, Barwala

No: 1173 Dt: 3/12/14

Gujarat Water Infrastructure Ltd. * Barwala *

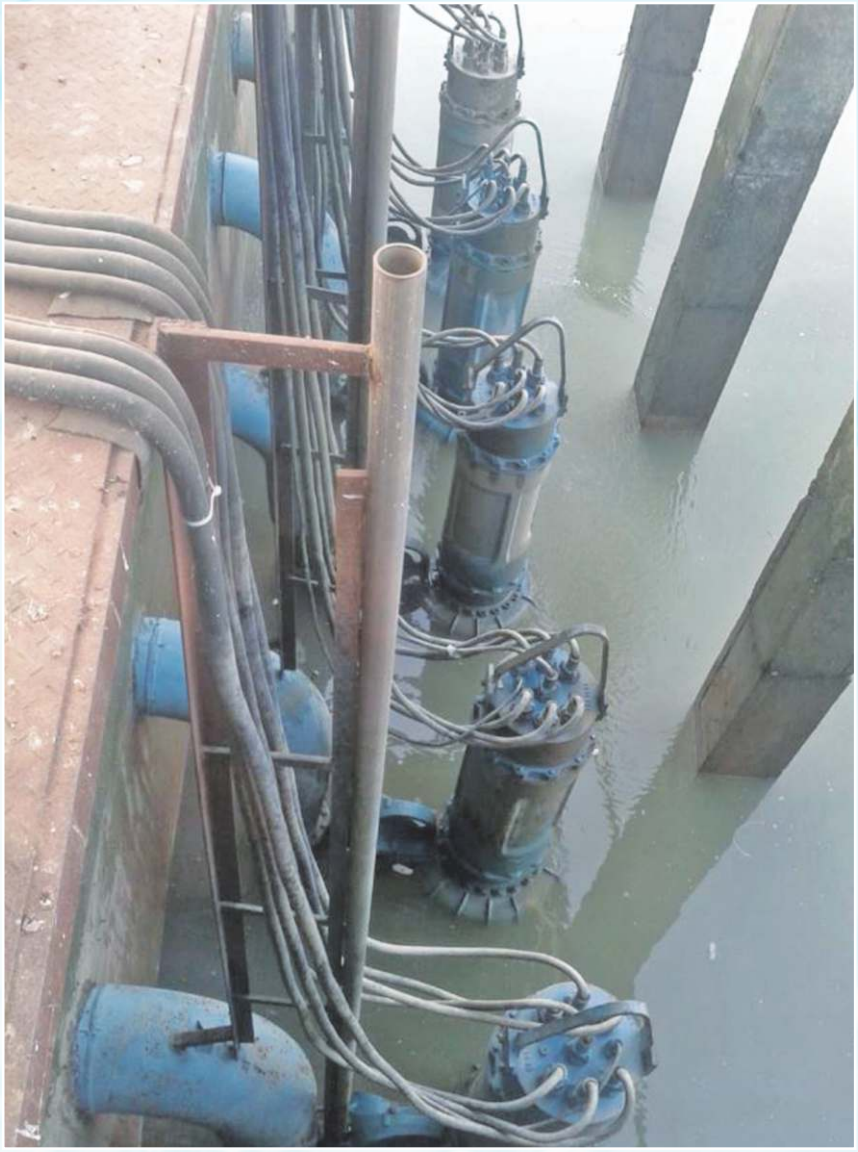
Abrasion Resistant & Maintenance free Reliable Shaft sealing

Two Independent, Bi-Directional Mechanical Shaft Seals *(EN 12756)* to ensure excellent isolation of pump end from motor.

Long Maintenance Free Bearing Life Heavy duty, Anti Friction, Thrust Ball cum Radial Bearings are designed for **L10H life** in excess of **1,00,000 hours.**

Factory filled with extremely Long Life, Synthetic Grease obviating the need of subsequent ReGreasing for atleast **50,000 hours &/or 5 years.**

Substantial Savings
Reduction in Pump House Space, Construction cost & Suction piping Manifold complexity.



Low Energy Cost
Due to Elimination of Suction Losses, Coupling Losses & Auxillaries; Wire to Water efficiency is slightly better than HSCF pumps.

Low Life Cycle Costs (LCC)
Zero Consumables,
Minimal maintenance &
good efficiency.

Robust & Reliable
No breakdown even in high silt levels.
Over-safe Design & Smart Protection Systems result in high Reliability.

Simple & Quick to Commission
Due to minimal civil structure requirement, projects can be commissioned much faster.

User Friendly
No risk of cavitations.
No damage due to Flood or Rains.
No Priming.
No Alignment.

Maintenance Free
Requires No Consumables or Routine maintenance *(like Priming, Oiling, Greasing, Gland Tightening, Shaft Alignment, Dewatering of Gland/ Leakage or Seepage into the Dry Pump room etc.)*

Minimal Noise, Vibration & Heat Emission

Gujarat Water Infrastructure Ltd.
(A Govt. of Gujarat Undertaking)
GWIL Office of the Senior Manager, Near Mamlatdar Office, State Highway No. 36, Barwala,
District: Ahmedabad – 382450. Phone : 99784 43953/51, Telefax (02711) 237076
e-mail : gwilbarwala@rediffmail.com ; gwilbarwala@gmail.com

Ref: PB/Mech/PC/Budhel GWIL/509 /2015

Date: 20/02/2015

TO WHOMS IT MAY CONCERN

Sub: Performance Certificate.

This is to certify that M/s. Aqua Machineries Pvt. Ltd. have supplied, erected & commissioned 10 Nos. of 600 HP / 450 kW with 1215 m3/hr X 95 meter Head Aqua make Submerged Centrifugal Pumps for Budhel Water pumping station. These pumps are most simple to operate & require almost no routine maintenance. The performance of the pump sets is satisfactory since May 2014 till today.

N.N. Patel
Senior Manager
GWIL, Barwala

GUJARAT WATER INFRASTRUCTURE LTD. UT. Govt. of Gujarat

Senior Manager
G.W.I.L., Barwala

SAKET PROJECTS LTD.

BUDHEL WATER PUMPING SYSTEM

PUBLICATIONS ■ ENERGY MANAGEMENT ■ EVENT MANAGEMENT ■ PHARMA MANUFACTURING

1.1 Installation Details:

Make	:	AQUA M/c Pvt Ltd
Type	:	SubCF
Model	:	ARS2563MM600
Head	:	92 m
Flow	:	1215 m3/hr
Motor kW	:	600 HP
Total nos.	:	10 (6W + 4S)

1.2 Site Measurements:

We have been carried out individual & parallel pump flow measurements at main header of Budhel Water Pumping station with the help of ultrasonic flow meter in the presence of GWIL officers.

Date of Inspection: 21st June 2014

During site visit, we had throttled the discharge valve of individual pump to maintain the discharge pressure near to rated head of the pump to maintain the duty point conditions. We had taken the discharge pressure with the existing pressure meter and frequency by main GEB frequency meter installed at site. The average flow readings with discharge valve throttling with corrected at 50 Hz frequency of various individual & parallel pumps are as under:

Singal Pump is Running

Pump No.	Frequency Hz	Friction head @ (m)	Suction Head (m)	Discharge Head (m)	Total Head (m)	Flow in m^3/hr	C. Head (m)	C. Flow (m3/hr)
3	49.4	3.5	1.00	86.11	88.61	1204	90.77	1218.62
4	49.5	3.5	1.00	87.12	89.62	1195	91.44	1207.07
8	49.4	3.5	1.00	87.12	89.62	1220	91.81	1234.82
9	49.4	3.5	1.00	88.13	90.63	1225	92.85	1239.88
10	49.4	3.5	1.00	87.12	89.62	1210	91.81	1224.70

Two Pumps are Running

Pump No.	Frequency Hz	Friction head @ (m)	Suction Head (m)	Discharge Head (m)	Total Head (m)	Flow in m^3/hr	C. Head (m)	C. Flow (m3/hr)
3 & 10	49.6	3.5	1.00	87.12	89.62	2470	91.07	2489.92

Three Pumps are Running

Pump No.	Frequency Hz	Friction head @ (m)	Suction Head (m)	Discharge Head (m)	Total Head (m)	Flow in m^3/hr	C. Head (m)	C. Flow (m3/hr)
3, 6 & 10	49.5	3.5	1.00	88.13	90.63	3630	92.47	3666.67

Four Pumps are Running

Pump No.	Frequency Hz	Friction head @ (m)	Suction Head (m)	Discharge Head (m)	Total Head (m)	Flow in m^3/hr	C. Head (m)	C. Flow (m3/hr)
3, 6, 7 & 10	49.6	3.5	0.50	88.13	91.13	4820	92.61	4858.87

Looking to the above measured parameters, pumps performances are matches with the design parameters.

SAKET HOUSE, 1, PANCHSHEEL, USMANPURA, AHMEDABAD 380 013. PHONES : +91-79-2755 1931/1817/287
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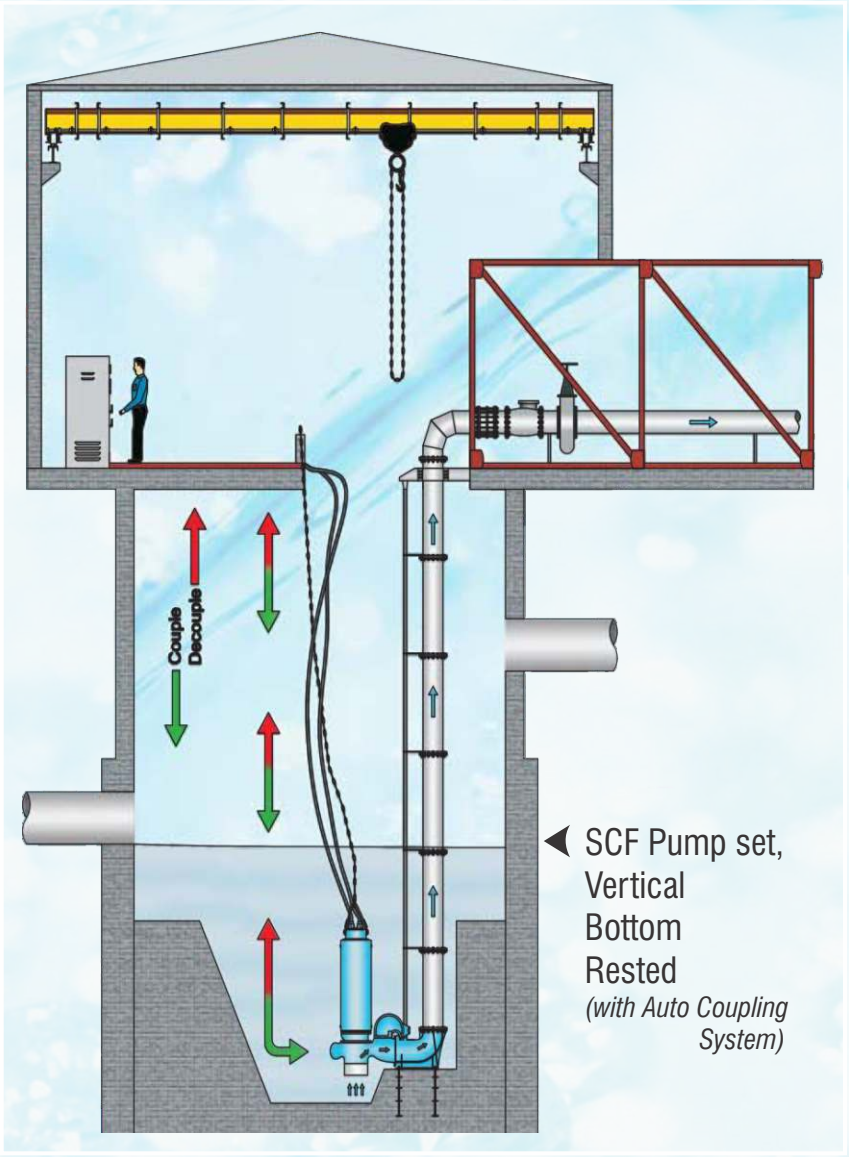

◀ SCF Pump set, Vertical Bottom Rested
(with Auto Coupling System)

"Having operated HSCF as well as Submerged CF pumpsets in raw water (24 x 7 x 365 days) Pumping Stations of GWIL; I feel that :

1) *Submerged CF pumpsets are very easy to operate & less prone to maintenance.*
2) *in Raw water Sumps, Suction Strainers get choked (with Grass, Algae growing in sump, Plastics, etc) & need to be cleaned frequently. In HSCF pumps, this calls for Emptying the entire Sump & inevitably leads to water transmission shutdown - but Submerged CF pumps can be pulled Up, it's Strainer be Cleaned & ReCommisioned without emptying the Sump (& balance Submerged CF pumps can still be run) so there is no disturbance to water transmission.*
3) *Also, the time required for entire cleaning excercise is Lower (than HSCF) & Much Lower if it is installed on AutoCoupling.*
4) *Pumping Station is free from Noise &Vibrations.*
5) *No Oiling, ReGreasing, Coupling Play setting or Alignment checking means peace of mind"*

- Mohobbatsinh Parmar (Dipl Mech)
Sr. Technician
NC33, NC4A, SPP3 & SPP4
Pumping Stations of GWIL

Aqua Machineries Private Limited
www.aquapumps.com

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