



**HYDRAULIC-CHEMICAL WELL REHABILITATION with AIXTRACTOR 2.0 pH-neutral iron(III) remover & high performance gravel washer  
TENDER SPECIFICATIONS**

**Required well data:**

Well name:	
Well type:	
Year of construction:	
Depth (Commissioning):	
Depth (Actual):	
Diameter of borehole:	
Diameter of well:	
Casing material:	
Screen material:	
Screen length:	
Slot size:	
Screen position:	
Gravel pack:	
Well pump (type, capacity, depth):	
Rising main (diameter, type, lengths):	
Type of well shaft (shaft, cover/lid or pump room):	
Static water level:	
Present well performance and dynamic water level:	
Original well performance and dynamic water level:	
Power supply at site available:	
Potable water available at site:	
Storage area at site available:	
Truck access available:	

Pos.	Quantity / Unit	Description	Total price
<b><u>1. PREPARATIVE MEASURES</u></b>			
1.1	1	Mobilisation and demobilisation of all required equipment and manpower incl. construction of site.	.....
1.2	1	Job site installations for performing the work (time and scope) as per contract, incl. loading, warehousing and unloading, working and storing areas, machinery and equipment of all kinds, rehabilitation equipment, discharge pipes, sedimentation container, additional pumps and tools, installation of power and water supply.	.....
1.3	1	Job site clearing after accomplished contractual scope of work incl. restoration of the complete and access roads as per contractual scope of work in individually priced positions of these specifications.	.....
1.4	1	OPTIONAL: Covering job-site with sheeting, foil and/or fiber mat of sufficient size. Collection and disposal after finishing work.	.....
<b><u>2. INSTALLATION WORK</u></b>			
2.1	1	Disassembly, cleaning and assembly of well shaft incl. appropriate storage	.....
2.2	1	Removal, cleaning, warehousing and reinstallation of rising main, submersible pump and fittings incl. disassembly and professional reassembly of electrotechnical connections. Pump depth down to max. _____ m*	.....
2.3	1	Installation of flexible discharge pipe of max. length of ____ m* to designated discharge area incl. disassembly and transportation from site after completion of work.	.....
2.4	1	Transportation and erection of sediment container with volume of 10 m <sup>3</sup> for discharge of used rehabilitation agent incl. removal from site after completion of work.	.....



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<b>3. PRE AND FOLLOW-UP INSPECTIONS</b>			
3.1	2	Mobilisation and demobilisation of CCTV camera vehicle incl. manpower	.....
3.2	2	Execution of CCTV inspection in colour incl. axial and radial views before and after rehabilitation max. depth of ____ m*	.....
3.3	2	Recording the findings of CCTV inspection before and after rehabilitation, hand over of 3 copies (3 x written, 1 x Word) incl. photographs of conspicuities before and after rehabilitation (3 x in writing, 1 x jpg file)	.....
3.4	2	Documentation of CCTV inspection before and after rehabilitation incl. 3 copies (2 x CD, 1 x DVD)	.....
3.5		Expenses of standby time due to client during camera inspection incl. manpower	.....
3.6	1	OPTIONAL: Clear pumping due to turbidity before or during CCTV inspection	
3.7		Step drawdown pump test before rehabilitation for ____ *hours with mobile flowmeter to measure and record the actual performance incl. documentation	.....
3.8		Step drawdown pump test after rehabilitation s. 6.4.	
<b>4. MECHANICAL AND HYDRAULIC PRECLEANING</b>			
4.1a	1	Precleaning of well interior by brushes with variable diameter and screen slots by bristles with variable thickness incl. discharge of loosened particles	.....
4.1b	1	OPTIONAL: Precleaning of well interior by high pressure jetting incl. discharge of loosened particles. The rotating nozzle head is fixed to alignment duct. Nozzle diameter, interspace and pressure can be varied to match respective well lining materials and casing diameter.	.....
4.2		OPTIONAL: Precleaning of gravel pack by surging with packer pump in sections of ____ m	.....
4.3	1	Cleaning of well sump pipe down to base plate	.....

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<b>5. HYDRAULIC-CHEMICAL REHABILITATION</b>			
5.1	2	Erection and dismantling of multichamber equipment (gravel washer) incl. auxiliary devices	.....
5.2		Preparation of AIXTRACTOR 2.0® working solution	.....
5.3		Execution of gravel wash (prewash) in sections of ___ m with overlap of ___ m with circulation volume of rehabilitation agent to match the borehole diameter. Injection of chemical agent during treatment of screen section to prevent drifting in adjacent aquifer. Recommended dosage per m screen ___ kg. Reaction time 45 minutes.	.....
5.4		Intense surging of dissolved rehabilitation agent with packer pump until no verifiable remains to be found.	.....
5.5		Execution of gravel wash (main wash) analogous to pos. 5.3. Recommended dosage per meter screen ___ kg.	.....
5.6		Surging of chemical agent by means of packer pump until no verifiable remnants of agent in raw water to be found.	.....
5.7	1	Measuring of the following parameters every 15 minutes during clear pumping: discharge rate, water level, temperature, specific electrical conductivity	.....
5.8	1	Disposal of used rehabilitation agent: Discharge of the first gush of approx. 1 m <sup>3</sup> from each screen section in sediment container. Measuring and documentation of conductivity, sulphate and iron(II) concentrations every 15 minutes. Subsequent discharge of clear water portion complying with the FAO limit of 3000 µS/cm and sprinkling outside Water Protection Zone I & II or in sewage. Disposal of possible oxide sludge if any with other liquid waste from water works in agreement with client.	.....

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<b>6. DESANDING, DISINFECTION AND CLEAR PUMPING</b>			
6.1	1	Assembly and disassembly of desanding equipment, ..... desanding of well until technical sand-free standard of (0,1 g/m <sup>3</sup> ) in sections of ___ m* / overlap ___ m* has been reached. Pump capacity min. _____ m <sup>3</sup> /h*	
6.2	1	Cleaning of well sump pipe down to base plate. ....	
6.3	1	OPTIONAL: Disinfection of water well .....	
6.4		Step drawdown pumping test of min. ____* hrs until no chlorine traceable. ....	
<b>7. DOCUMENTATION</b>			
7.1	1	Delivery of documentation data incl. daily work reports, protocols and process control measurings (3 x in writing, 1 x Word-/Excel). All measurements and rehabilitation procedure to be documented as per DVGW technical standard W 130:  - Water level measurements - Water volumes - Amounts of rehabilitation agent per section - Measurements of all requested chemical and physi- cal parameters, test strip findings and observations - Discharge rates - Pumping tests as per DVGW-AB W 111 incl. water flow graphics before/after - Desanding as per DVGW W 119	
<b>8. UNFORESEEN EXPENDITURE AND KM-ALLOWANCE</b>			
8.1		Hourly rates and kilometer allowance	
		Foreman .....	
		Mechanic / Electrician .....	
		Skilled help .....	
		Rehabilitation equipment .....	
		Car .....	
		Truck .....	