一诺环境
INNOVATION ENVIRONMENT

INNO-CLEAN

Water purification equipment and safe water supply services at water plants

Provide full-process technical guidance, equipment installation and operation
Protect the 24-hour water supply safety "lifeline"

LIAONING INNOVATION ENVIRONMENT GROUP CORP., LTD

www.yinuohuanjing.com

400-082-9898

INNOVATION Environmental Industrial Park, Beipiao Economic Development Zone, Chaoyang City, Liaoning Province

Focus on water purification business for 20 years

LIAONING INNOVATION ENVIRONMENT GROUP CORP., LTD

辽宁一诺环境产业集团有限公司
Liaoning Innovation Environment Group Corp., Ltd

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GROUP INTRODUCTION

Liaoning Innovation Environment Group Co., Ltd. is located in the "Innovation Environmental Industrial Park" in Beipiao City, Liaoning Province, the hometown of the dragon. It covers a total area of 270 mu and a planned construction area of 140,000 square meters. Innovation Environment is a national high-tech enterprise, a "Little Giant" enterprise specializing in refined, sophisticated and innovative technologies, and a provincial-level technical center. It has general contracting qualifications for municipal public works, professional contracting qualifications for environmental protection projects, and construction electromechanical installation engineering qualifications.

There are more than 700 employees, among whom more than 150 professional and technical engineers in the Beijing R&D Center, Jinan Environmental Design Institute and Shenyang Technical Center are involved in the R&D and technical implementation of water purification, membrane-related products, sodium hypochlorite disinfection products and safe drinking water. It is a comprehensive environmental service enterprise integrating consultation, R&D, design, manufacturing, system integration, engineering construction and operation and maintenance services.

Innovation Environment has various advanced production equipment and a complete service system, including cloud platform control center, numerical control processing center, large equipment machining center, water quality testing center, electrical production and processing center, 2000T hydraulic equipment, automatic welding platform, rubber lining vulcanization production line, plastic lining production line, passivation cleaning equipment, painting line, electrostatic spraying production line, electrical testing platform, etc. With the help of professional technology and production and processing capabilities, it provides customers with good pre-sales, in-sales and after-sales services.

Innovation Environment's water purification equipment has 21 national patents and software copyrights, and more than 30 health permit approvals. It is divided into 3 major technical service centers and 1 network cloud service platform across the country by regions, serving customers closely, creating a technology and product service platform for customers, adhering to the development concept of win-win, so that the company's products meet the water purification equipment and safe water supply services of waterworks, ensure green and energy -saving, and take the road of high-quality development.

Process Design | Equipment Customization | Installation and Commissioning | Operation and Maintenance Services

Guarantee of Three Major Technical Centers

Beijing R&D Center: Integrates domestic and international achievements, focusing on underlying process development, product research, development and design, as well as the introduction of new technologies and products. Jinan Environmental Engineering Design Institute: Focuses on the feasibility schemes of customers' projects, detailed design of engineering projects, and on-site engineering support. Shenyang Technical Center: Focuses on product information technology and cloud platform development, technical support in the production process, and provision of customer solutions.

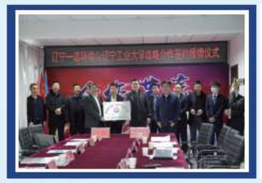
Beijing R&D Center

Jinan Environmental Engineering Design Institute

Shenyang Technical Center

School-Enterprise Cooperation/International Cooperation

Innovation Environment Group has established close school-enterprise R&D cooperation with the Chinese Academy of Sciences , Tsinghua University, China Agricultural University, University of Science and Technology Beijing, etc., and set up a technology industrialization promotion base. It has established a Township Environmental Industry Technology Research Institute and a postgraduate training base in the Innovation Environmental Industrial Park. At the same time, it is a strategic partner of DuPont of the United States and Toray of Japan in China, jointly integrating the application and implementation of internationally leading environmental governance technologies.



School-enterprise cooperation

International Cooperation

Toray China Strategic Partner

DuPont China Strategic Partner

In-House Testing Center

To support product development and customer service, Innovation Environment has established its own testing center. Equipped with over 80 sets of advanced testing equipment, it can perform over 100 tests for various water quality and environmental indicators, providing free services to customers.

General Physical and Chemical Indicator Laboratory

Conventional Ion Testing Laboratory

Metal Indicator Testing Laboratory

Microbial Indicator Testing Laboratory

INDUSTRY ANALYSIS

Pain Points in the Waterworks Industry

- With the increasing types of pollutants in water sources, the difficulty and complexity of water treatment have been greatly increased, and the processes and equipment types used are increasingly diversified.
- Design units, construction units, equipment manufacturers and operation units act independently with disjointed functions, lacking effective integration and coordination among various links.
- The phenomenon of "emphasizing construction over management and equipment over operation" is widespread, making it difficult for waterworks to meet all indicators. There is a need for specialized companies to coordinate resources and manage centrally.
- The water treatment process is becoming increasingly complex. The promulgation and implementation of the latest national standard *Standards for Drinking Water Quality* (GB5749-2022) (effective from April 1, 2023) puts forward higher and more systematic requirements for the joint scheduling and automatic control of various workshops and treatment units in waterworks.

Our Advantages

Full-process Process Design

Proficient in full-process process design for water treatment and master various advanced water treatment technologies.

Independent R&D & Production

One of the largest-scale and most technologically comprehensive environmental equipment processing bases in northern China, with the capability of independently processing and manufacturing all process equipment, complete sets of electrical equipment, and automatic control equipment, effectively ensuring construction periods and equipment quality.

4 Advantages

20 Years of Waterworks Construction Experience

With nearly 20 years of waterworks construction experience and dozens of water supply project achievements.

Rich Waterworks Operation and Management Experience

Responsible for the domestic water supply for 500,000 people in Beipiao City, Liaoning Province all year round, with very rich project operation, management experience and emergency management capabilities.

Innovation Environment — A one-stop partner that best understands the pain points of waterworks construction and operation.

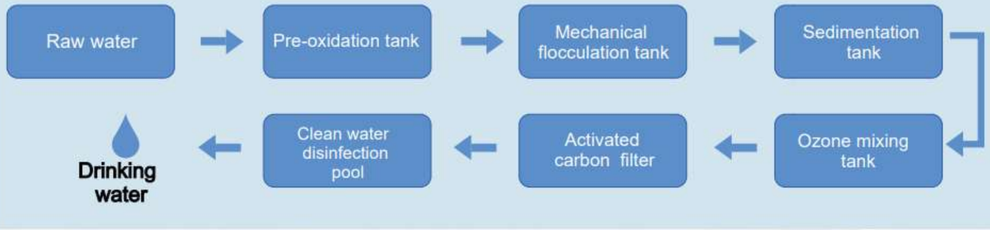
TYPICAL WATERWORKS PROCESS FLOW

General water source purification process

Applicable conditions: The raw water quality meets the "Surface Water Environmental Quality Standard" (GB3838-2002) Class III or above standards. The inlet turbidity is no more than 2000-3000NTU and can reach 5000-10000NTU in a short time.

Water Purification Process for Water Sources Contaminated with Trace Organic Matter

Applicable Conditions: Except for organic matter, other indicators of raw water meet or exceed Class III standards of * Environmental Quality Standards for Surface Water* (GB3838-2002). The water purification effect of the advanced treatment scheme for water quality standards has been verified by tests and demonstrations.

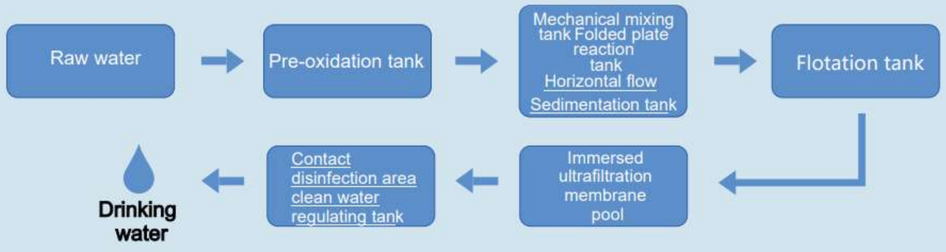


Water Purification Process for Water Sources Containing Iron and Manganese

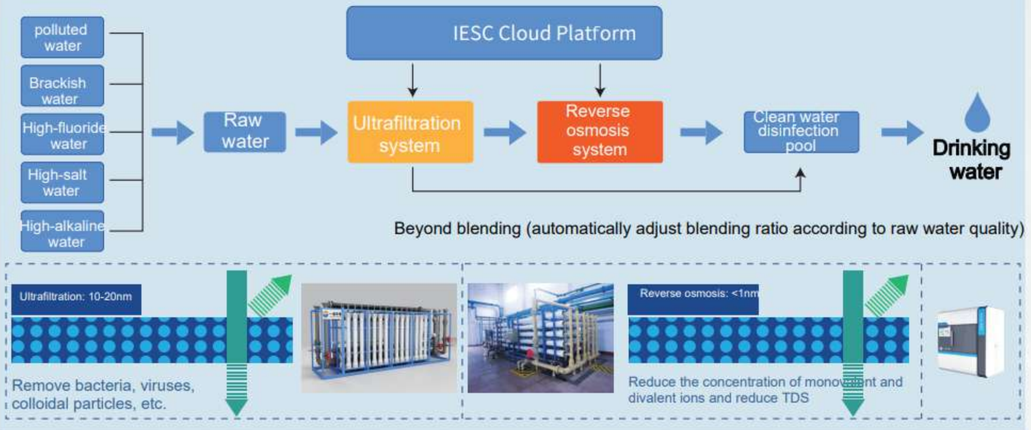
Applicable Conditions: The iron and manganese contents in raw water exceed the provisions of the current *Standards for Drinking Water Quality* (GB5749-2022), and raw water shall be subjected to iron and manganese removal treatment.

Membrane water purification process for treating organic polluted water sources

Applicable conditions: Water quality is affected by temperature and rainfall, with large fluctuations, serious wat er pollution, and is prone to the growth of algae and microorganisms. Membrane treatment technology is reco mmended.



Double membrane method for treating excessive ion in water purification plant



Typical treatment processes for municipal drinking water

Process	Applicable Water Quality	Water production standards
Coagulation + Sedimentation + Filtration + Disinfection	Excessive Algae, Turbidity, Color	GB5749-2022
Ozone + Activated Carbon Combined Technology	Excessive Organic Matter, Disinfection By-products	GB5749-2022
Conventional Process + Submerged Ultrafiltration (or Cartridge Type)	Excessive Algae, Turbidity, Bacteria	GB5749-2022
Pretreatment + Ultrafiltration + Reverse Osmosis (Blending)	Excessive Algae, Turbidity, Bacteria, Cations, Anions	GB5749-2022
Pretreatment + Nanofiltration (Blending)	Excessive Hardness, Cations, Anions, Salinity	GB5749-2022
Manganese Sand Filter	Excessive Iron, Manganese	GB5749-2022
Activated Alumina, Molecular Sieve Media Filtration	Excessive Fluoride	GB5749-2022

WATER SUPPLY TREATMENT ENGINEERING

1. Concrete

Chemical preparation and dosing

PAM three-tank integrated dosing machine

PAC dissolving and dosing system

Mixed facilities

Pipeline mixer

Grid mixing tank

Mechanically agitated mixing tank

Flocculation tank

Grid flocculation tank

Small-pore grid

Folded plate flocculation tank

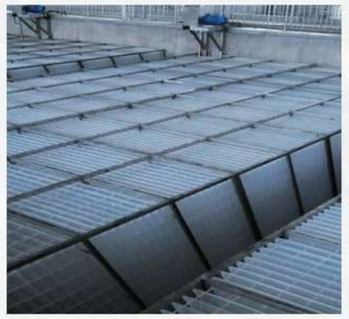
2.Sedimentation and clarification

Horizontal flow sedimentation tank

Inclined tube sedimentation tank

Clarifier

PP inclined tube



PP inclined plate

Stainless steel sump

3. Filter

V-type filter

integrated water purifier

Integrally cast filter plate

Adjustable water filter cap

Immersed ultrafiltration tank

Immersed ultrafiltration

Water pump room

Ozone, activated carbon, membrane separation system

Ozone catalytic oxidation device

Activated carbon adsorption tank

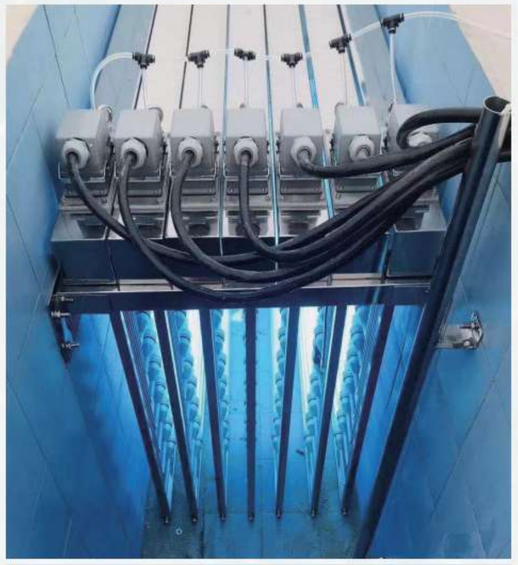
Ultrafiltration device

Reverse osmosis device

4. Disinfection

Sodium hypochlorite disinfection equipment

Ozone disinfection equipment



UV disinfection equipment

5. Sludge treatment

Sludge equipment

Reciprocating scraper

Gantry type scraper

sludge pool

sludge pump

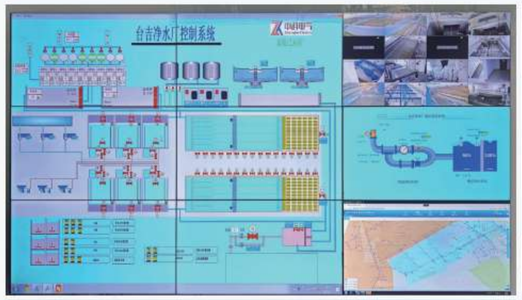
Sludge dewatering machine

Screw-type sludge dewatering machine

Centrifugal sludge dewatering machine

Plate and frame filter press

6. Electrical and automatic control



control system

PLC/DCS control system

Powertrain system

Local operation box

7. Ancillary Facilities

Water treatment consumables

- Strategic partnership with well-known im ported brands such as 3M (USA) and Pal l.
- The only authorized agent of Acedean (U SA) in China, with high cost performance.

- Special chemicals for water-related products

- High-quality quartz sand, anthracite, fruit shell & coconut shell activ ated carbon.
- High quality and low price, sufficient supply.

- Ultrafiltration membrane replacement
- Nanofiltration membrane replacement
- Reverse osmosis membrane replacement

Measuring and testing instruments

Tap water testing instrument

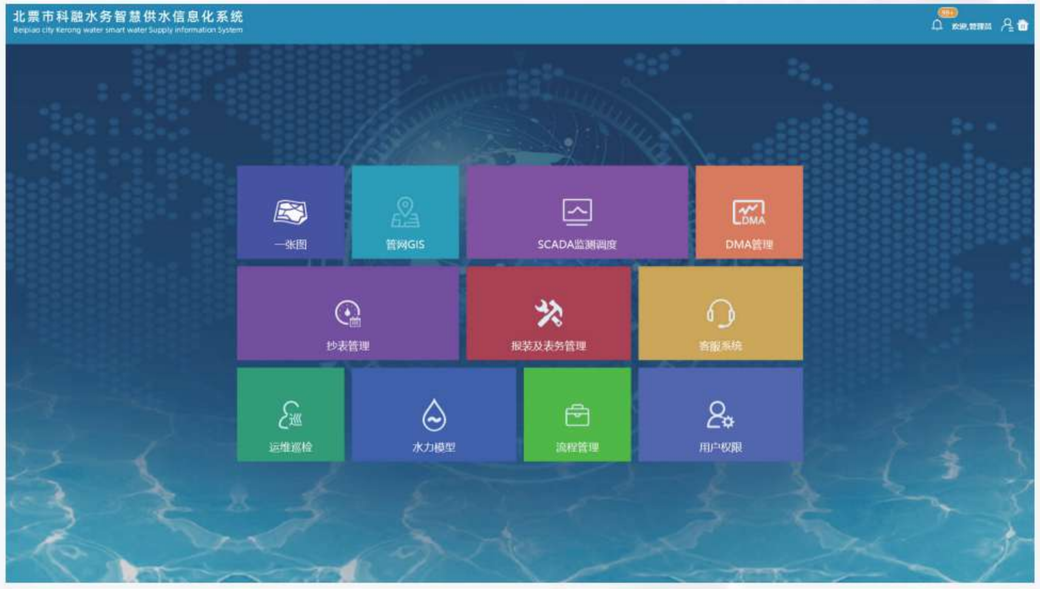
Household smart water meter

Turbidity detection instrument

Residual chlorine detection instrument

Flow Meters

SMART WATER



Liaoning Innovation Environment Group Co., Ltd. is committed to providing water utilities with comprehensive digital information technology application solutions, truly realizing the human-machine interconnection of water and water conservancy enterprises, helping enterprises achieve "efficiency improvement through labor saving, water saving, electricity saving, and management optimization", and enhancing the market competitiveness of water and water conservancy enterprises. It realizes functions such as comprehensive data collection, interactive perception and visualization, system integration and interconnection, precise management matching, intelligent and efficient operation, and controllable prediction and early warning.
Map Display — It is convenient for users to realize all asset management and personnel dispatching from the water source to the tap (water plant, pipe network booster pump station, secondary water supply booster pump station, water meter).
Leadership Cockpit — Leaders can understand the asset operation (production water volume, sales water volume) and personnel dispatching situation they care about from modules such as production indicators, pipe network operation and maintenance, asset management, engineering construction, and operation summary.

Subsystem Directory

One Map	Water Supply GIS System	Monitoring and Dispatching SCADA System	Pipe Network DMA District Water-saving System
Hydraulic Model	Meter Reading System	Application for Installation and Meter Management	Customer Service System
Integrated APP	Operation and Maintenance Patrol	Technical Support	Digital Twin Visualization

Implementation Plan

Business Process:

Project field research → Submit system proposal → Complete the contract process

Project implementation process:

Submit construction plan → Data center construction → Dispatching center construction → Pipeline network data census → Pipeline network monitoring

Positioning → Instrument well construction → Instrument installation and data IoT → Software Development → Project acceptance and handover

FOUR ADVANTAGES

AFTER-SALE SERVICE

- Northeast Region
- East China Region
- North China Region
- Southwest Region
- Beijing Region
- Urban and Rural Water Supply Division
- Xiong'an Region
- Sodium Hypochlorite Division
- Shandong Region
- Membrane Treatment and Tank Division

Explanation of Innovation After-sales Service

Improved After-sales Service System

Upon receiving the user's notification, Innovation Company will immediately respond by phone, arrive at the site promptly, and complete the repair within 12 hours. If the repair cannot be completed within the specified time, spare parts or alternative services that can be put into use will be provided.

Proactive Service

A strict regular free inspection system is implemented to assist customers in regularly inspecti ng and maintaining equipment.

Service Beyond Warranty Period

After the warranty period expires, Innovation Company will continue to provide product repair services for customers, only charging material fees for spare parts and wearing parts, and providing the required technical services quickly.

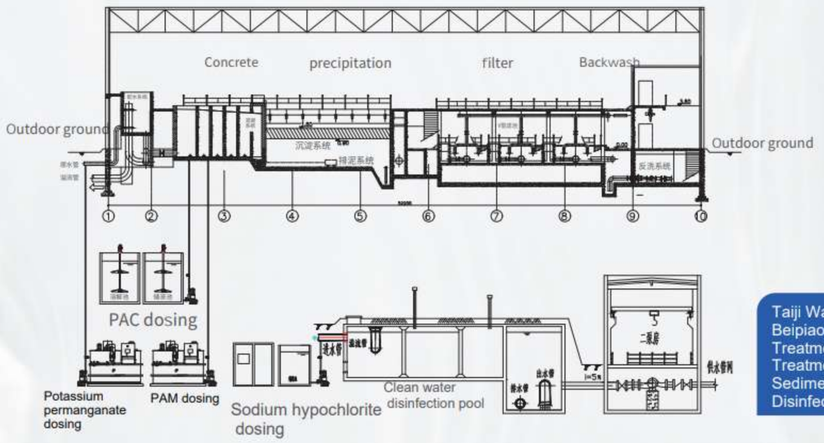
Smart Water

Innovation Company has established a smart water With the user's permission, the operating parameters of users are uploaded to the cloud platform in real
time through Internet of Things technology. The company will provide dedicated personnel on duty to offer users considerate protection and services!

TYPICAL CASES AND PROJECTS

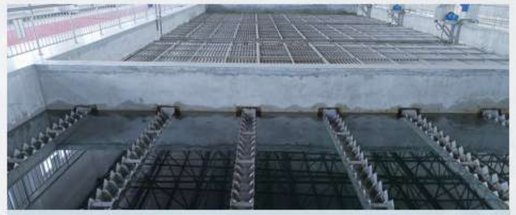
The treatment capacity of Taiji Water Purification Plant is 90,000 m³ /d, and the water source is taken from Yunfeng Reservoir. The main buildings (structures) include the flow regulation and pressure regulating room, steady pressure and water distribution room, water purification workshop, clear water tank, secondary booster pump house, chemical dosing room, chlorine dosing room, recovery water tank and sludge conditioning tank, sludge treatment room, comprehensive building, machine repair room and warehouse, auxiliary houses, etc. The treatment process mainly includes mixing, flocculation, sedimentation, filtration, disinfection and other processes. The main purpose of water purification treatment in the plant is to remove suspended substances, colloidal substances, bacteria, viruses, etc. in the raw water. The operating unit has adopted a smart water system, realizing multiple service contents such as automatic operation of equipment, automatic metering and charging of the revenue system, and automatic report management.

Process Flow Chart of Taiji Water Purification Plant



Taiji Water Purification Plant, Beipiao City
Treatment Capacity: 90,000 m³ /d
Treatment Process: Coagulation + Sedimentation + Filtration + Disinfection

Phase II Project of Rongcheng Surface Water Plant in Xiong'an
Treatment Capacity: 25,000 m³ /d
Main Process: Baffle Reaction Tank + Horizontal Sedimentation Tank + Air Flotation Tank + Submerged Ultrafiltration Membrane Tank + Disinfection



Dongchengfang Surface Water Plant in Zhuozhou, Hebei
Treatment Capacity: 150,000 m³ /d
Main Process: Coagulation + Sedimentation + Filtration + Disinfection

Chaoyang Zhonglao Water Treatment Plant
Treatment Capacity: 100,000 m³ /d
Main Process: Coagulation + Sedimentation + Filtration + Disinfection

Xilinhot Water Plant, Inner Mongolia
Treatment Capacity: 33,600 m³ /d
Main Process: Self-cleaning + Nanofiltration

Yantai Economic and Technological Development Zone Water Supply Co., Ltd., Woniushan Water Plant
Treatment Capacity: 67,000 m³ /d
Main Process: Ultrafiltration + Reverse Osmosis Dual Membrane

Ningdong Base Nanhu Water Plant
Treatment Capacity: 38,400 m³ /d
Main Process: Ozone Oxidation + Chemical Softening and Sedimentation + V-Type Filter + Ultrafiltration + Reverse Osmosis

Qiqihar Gannan Town Water Treatment Plant Process Upgrade and Reconstruction
Treatment Capacity: 15,000 m³ /d
Main Process: Procurement and Installation of Reverse Osmosis Membrane Treatment Room Equipment + Electrical and Automation Systems

Chaoyang Koubei Water Plant
Treatment Capacity: 20,000 m³ /d Main process: coagulation + sedimentation + filtration + membrane filtration + disinfection