

Shingu Chuo Sewage Treatment Plant

Aqua Shingu



Town of Shingu



Jiro-chan
Mascot of the Town of Shingu

Completion of Shingu Chuo Sewage Treatment Plant (Aqua Shingu)

With Mount Tachibana-yama to the east and Genkai-nada Sea to the west, the Town of Shingu is blessed with an abundant natural environment, which it continually strives to balance with the urban environment as part of its fundamental concept of building a community that coexists with the environment.

Public sewer system development was a major administrative issue in the Fourth Comprehensive Plan formulated in 2001. It is our great pleasure to hold a dedication for the completion of this facility in response to the plan.

We express our warm appreciation for the cooperation and guidance we received from many entities during the construction, including Kaminofu District, landowners of the Okita Land Readjustment Association, the governments of Japan, Fukuoka Prefecture and Fukuoka City and the Sewage Works Agency.

The public sewer system operations at this facility make use of the latest membrane bioreactor technology to treat sewage and produce extremely clean water as well as ozone treatment to ensure an even higher level of water quality for the stream that runs through Okita Central Park, which is adjacent to the facility, to provide an intimate waterfront atmosphere for town residents.

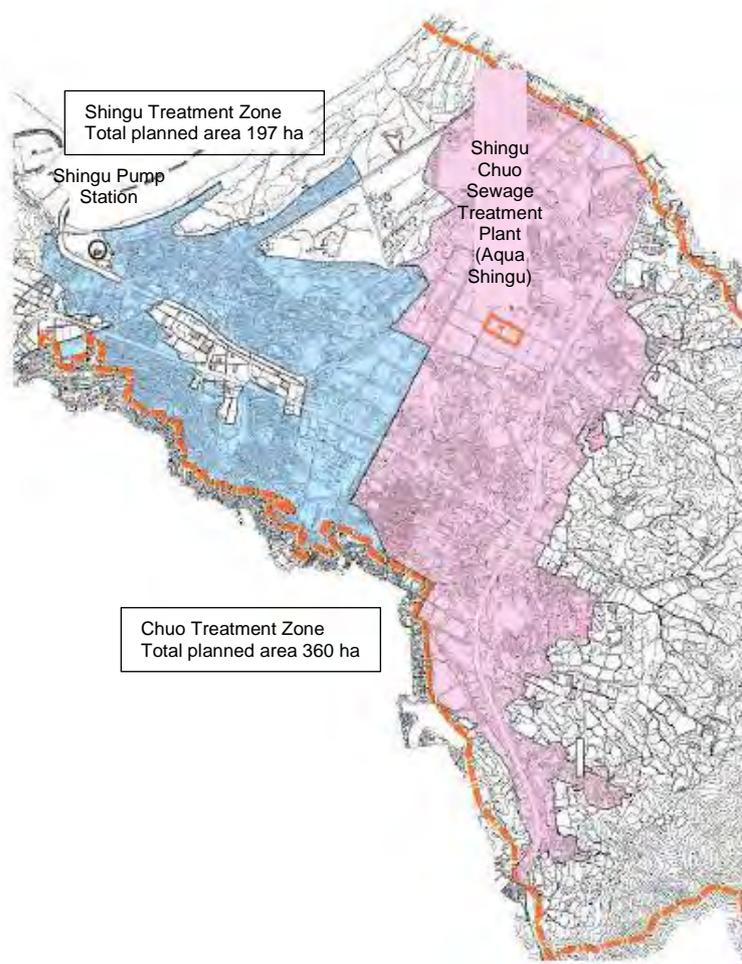
Our commitment to protect the abundant natural environment and provide an ever-improving living environment grows stronger by the day.

Thus we will continue to supply refreshing water and green spaces and strive to create wholesome, healthy water environments and promote the diffusion of an eco-friendlier sewer system.

Masaharu Nakano
Mayor, Town of Shingu
May 2010

Overview of Town of Shingu Sewer System

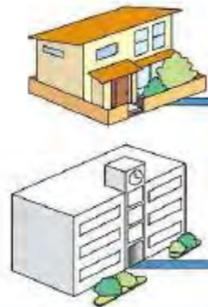
Town land area	18.91 km ²	
Expected population	33,000 (by 2020)	
Current population	24,649 (as of March 31, 2010)	
Treatment zones	Shingu Treatment Zone	Chuo Treatment Zone
Planned treatment area	197 ha	360 ha
Planned population to serve	12,200	17,000
Planned treatment volume	6,600 m ³ /day	9,090 m ³ /day
Discharge method	Separate (some combined)	Separate
Property area	Shingu Pump Station 8,879 m ²	10,480 m ²
Treatment method	Send to Wajiro Wastewater Treatment Center in Fukuoka City	Membrane bioreactor method
Treatment capacity		9,090 m ³ /day (this construction adding 6,060 m ³ /day)
Service start date	September 28, 1990	March 1, 2010
Development rate	97.9% (as of March 2010)	18.7% (as of March 2010)



Mechanism for Treating Sewage (Membrane Bioreactor Method)

Sewage inflow

Sewage is carried from houses and other places through sewage pipes to the sewage treatment plant.



1 Micro mesh screen
Removes the debris mixed in with the sewage.

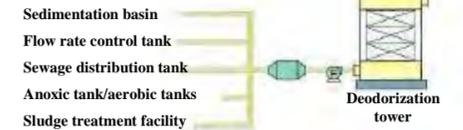
3 Sewage distribution tank
Distributes sewage to the anoxic tank.

4 Anoxic tank
Mixes incoming sewage with sludge from aerobic tanks. The tank provides anoxic conditions for anaerobic bacteria to break down organic material and remove nitrogen from the sludge.

5 Ventilators
Sucks in and sends highly pressurized air into aerobic tanks.

Deodorization facilities

Fans suck away air from various places where odors occur, and active carbon and microbes are used to break down and remove the sources of odors.



Overview of Operations

- Shingu Chuo Sewage Treatment Plant (Aqua Shingu)
- Property area: 10,480 m²
- Discharge method: Separate
- Treatment method: Membrane bioreactor method
- Planned population: 17,000 (now 11,070)
- Treatment capacity: 9,090 m³/day (now 6,060 m³/day)
- Service start date: March 1, 2010

Legend



2 Flow rate control tank
The rate of sewage inflow differs by day and time of day. This tank ensures a nearly uniform flow so that sewage can be treated consistently.

5 Aerobic tanks
Air is blown into the sewage, activating the aerobic microbes present in activated sludge (sludge that contains a large volume of microbes). The microbes consume the organic material in the sludge, reproduce and form clumps, making it easy to separate them from the water.

7 Membrane separators
Directly filter activated sludge to create clean water to send to raw water tanks. The remaining activated sludge steadily becomes concentrated, and once it reaches a certain concentration, it is sent to the sludge treatment facility. Some of it is returned to the anoxic tank.

Membrane cleaning device
Several times per year, membranes are cleaned by a chemical solution pumped backward through the pipes that normally carry treated water out.

Membrane filter pump

Ozone treatment

Sterilization unit

Discharge (Okita Central Park)

Toilet water (JR Shingu-Chuo Station, Okita Central Park)

Discharge

Mutagawa River

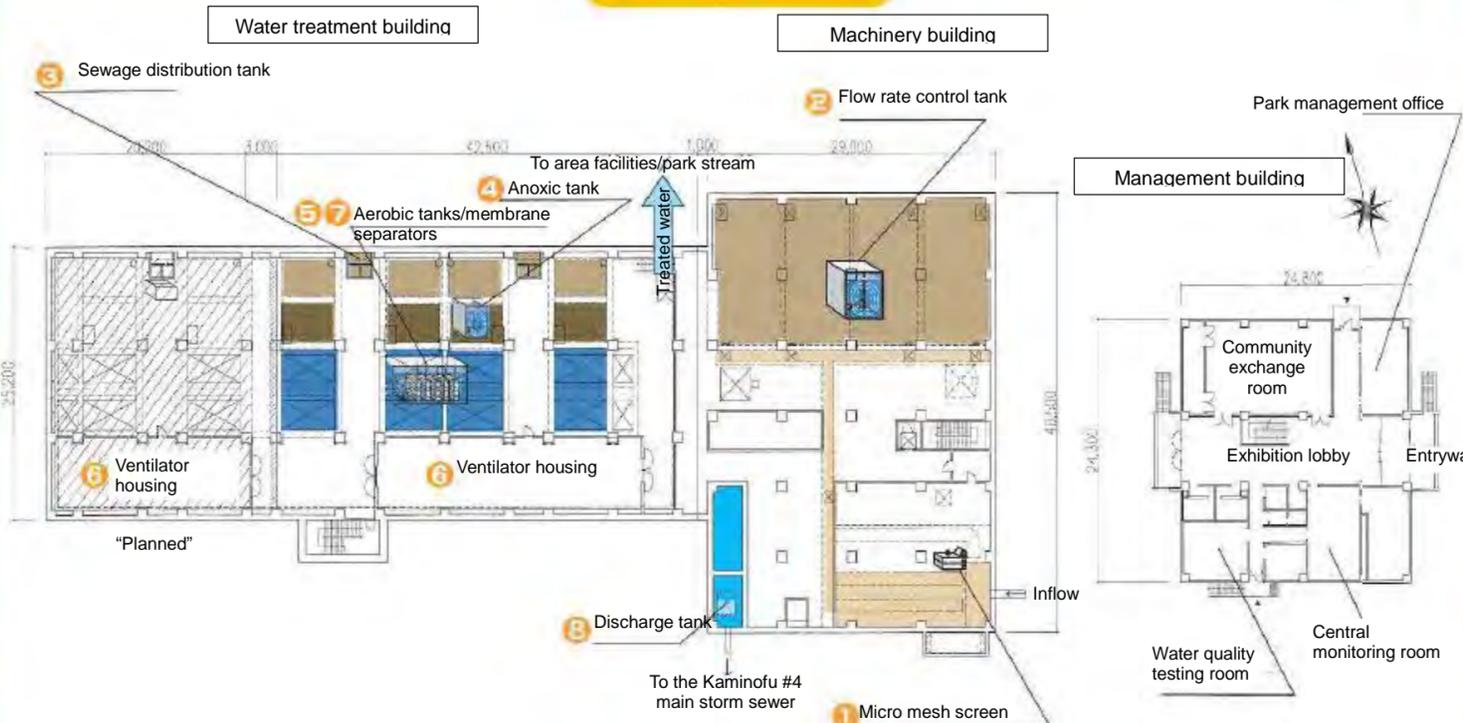
Sludge treatment facility
Sludge is dehydrated and then carried away.

The 0.4-micrometer membrane holes are small enough to remove both E. coli and SS.

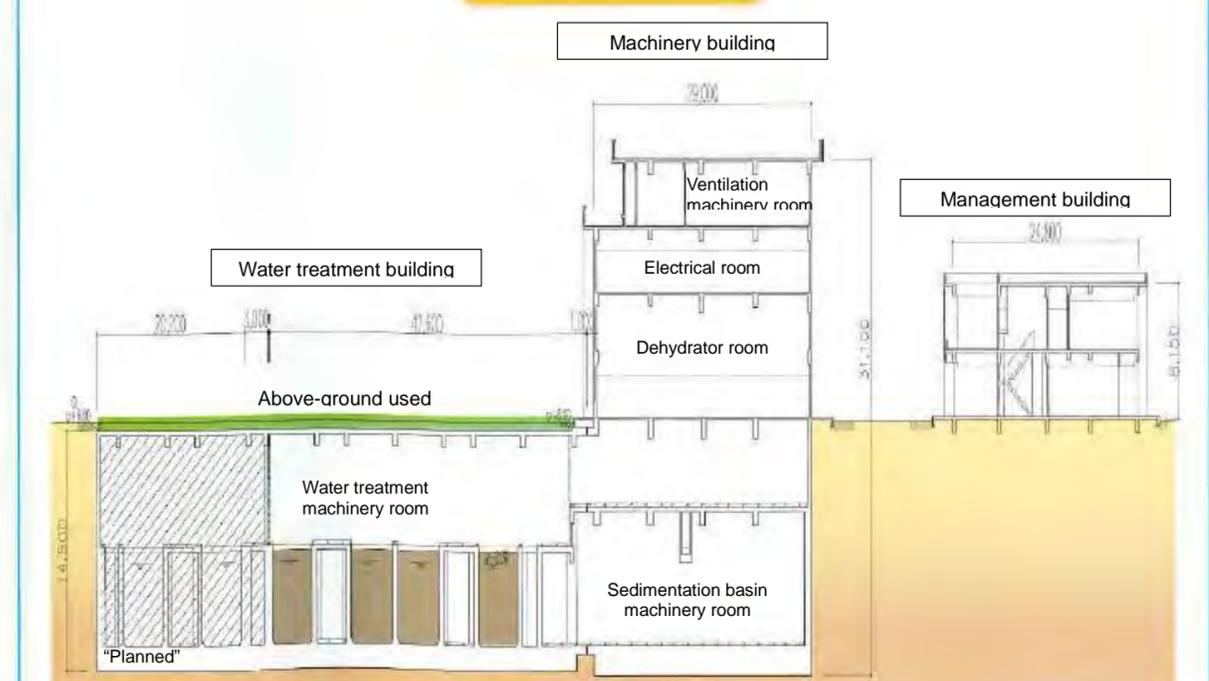


- Reasons for using the membrane bioreactor method
- (1) Requires only a small space for installation, facilitating integrated use of facility as a park.
 - (2) Excellent quality of treated water, no need to install new regeneration treatment equipment in order to reuse treated water.
 - (3) The physical structure is compact, resulting in low construction costs. Further advantageous given that the treated water will be reused.
 - (4) Maintenance is simple, and deodorization is simple because there is no early sedimentation.

Floor plan



Elevation plan



Equipment at Shingu Chuo Sewage Treatment Plant (Aqua Shingu)



Micro mesh screen



Aerobic tanks and membrane separators



Ventilators



Membrane filter pump



Deodorizing equipment



Ozone treatment

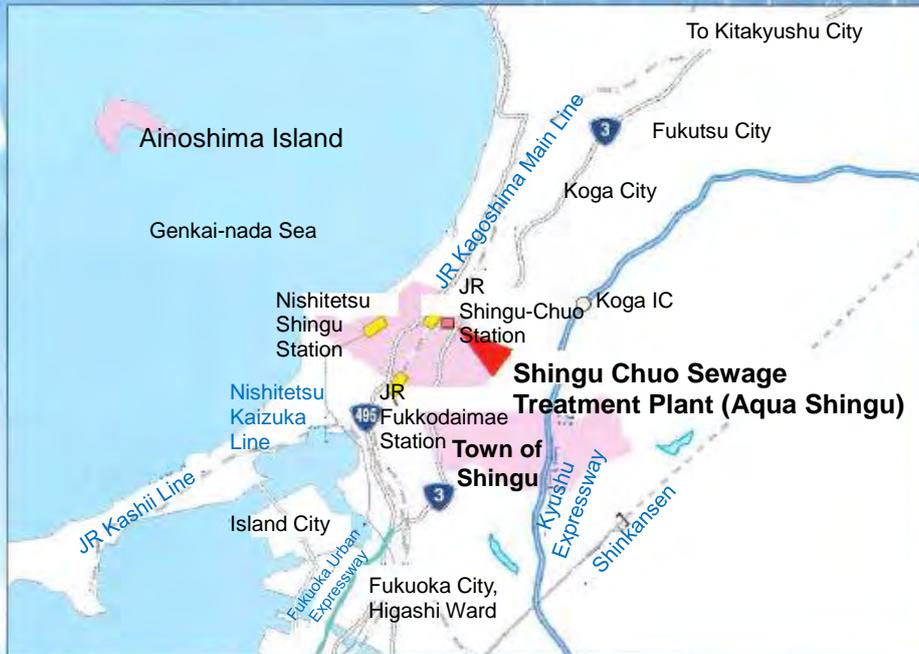


Electrical equipment



Central control room

Map of Town of Shingu



Okita Central Park
(Ozone-treated water is supplied for the babbling stream)



JR Shingu-Chuo Station
(Treated water supplied for use in toilets)

Facility Characteristics

Shingu Chuo Sewage Treatment Plant (Aqua Shingu) is located in the center of the Town of Shingu, thus striving for harmony with the surrounding environment is an ongoing process. The facility has the following characteristics for creating new roles for a terminal treatment plant.

- The water treatment facilities are all underground; above-ground, facilities are integrated with neighboring Okita Central Park, which is open to the public. The park also serves as a regional disaster management center when disasters strike.
- Ozone-treated water is supplied to the babbling stream that runs through Okita Central Park as a project for bringing nature closer to people. It is also supplied to JR Shingu-Chuo Station, the park and major commercial facilities for flushing toilets, which helps create a positive waterfront environment, secure valuable water resources for a new town area, and form a positive water cycle.
- The tiles on the outsides of the management building and machinery building are made of incinerated sewage sludge ash, which brightens the image of a terminal treatment plant, represents an effort toward harmony with the surrounding area and serves to appeal to coexistence with the environment and educate people about sewer system operations.
- The facilities are a base for exchange and information dissemination, serving as a location for community exchange through events related to the sewer system, town festivities and the like. In addition to the open space above the treatment plant, the facilities include a community exchange area and an exhibition lobby.

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