Water Utility Information (FY 2014)

Basics

Name of utility:	Water and Sewer Bureau of the City of Kitakyushu		Service type:	Wholesale and retail water supply	
Administrative population:	957,000		Start of service:	1907	
Population served:	995,000		Service area:	270.16	km^2

Water supply volume

Average daily water supply:	310,000	m^3/d	Break down	Household use	213	m^3/d
				Commercial and institutional use:	61	m^3/d
				Others:	1.3	m^3/d
				Wholesale water supply	12	m^3/d
Average daily water supply per capita:	311	L/person/d	Service coverage:		99.6	%
Effectiveness:	93.11	%	Revenue water:		90.4	%
NRW:	2.69	%	Water loss		6.66	%

Water rates

Water rates for 10m^3/month:	842 / 780 yen (including taxes/excluding) *Calculation condition: The fixed charge is 680 yen. The volumetric charge is 10 yen/m^3. In case of service pipe of 13-mm diameter.		
Water production cost: 145.21 yen/m^3	Water supply cost: 144.65 yen/m^3		

Facilities

Water Treatment Plant and Facilities (including water for wholesale supply):

Name	Capacity	Water source	Treatment process
Ideura WTP	255,200 m^3/d	Dam, subsoil water, surface water	Coagulation/sedimentation + Rapid filtration
Dobaru WTP	7,800 m^3/d	Dam	Slow filtration
Hata WTP	24,000 m^3/d	Dam	Coagulation/sedimentation + Rapid filtration
Ano WTP	300,000 m^3/d	Dam, surface water	Biological contact filtration + Coagulation/sedimentation + Rapid filtration
Honjo WTP	141,000 m^3/d	Dam, surface water	Biological contact filtration + Coagulation/sedimentation + Rapid filtration
Total	728,000 m^3/d		

Pipes

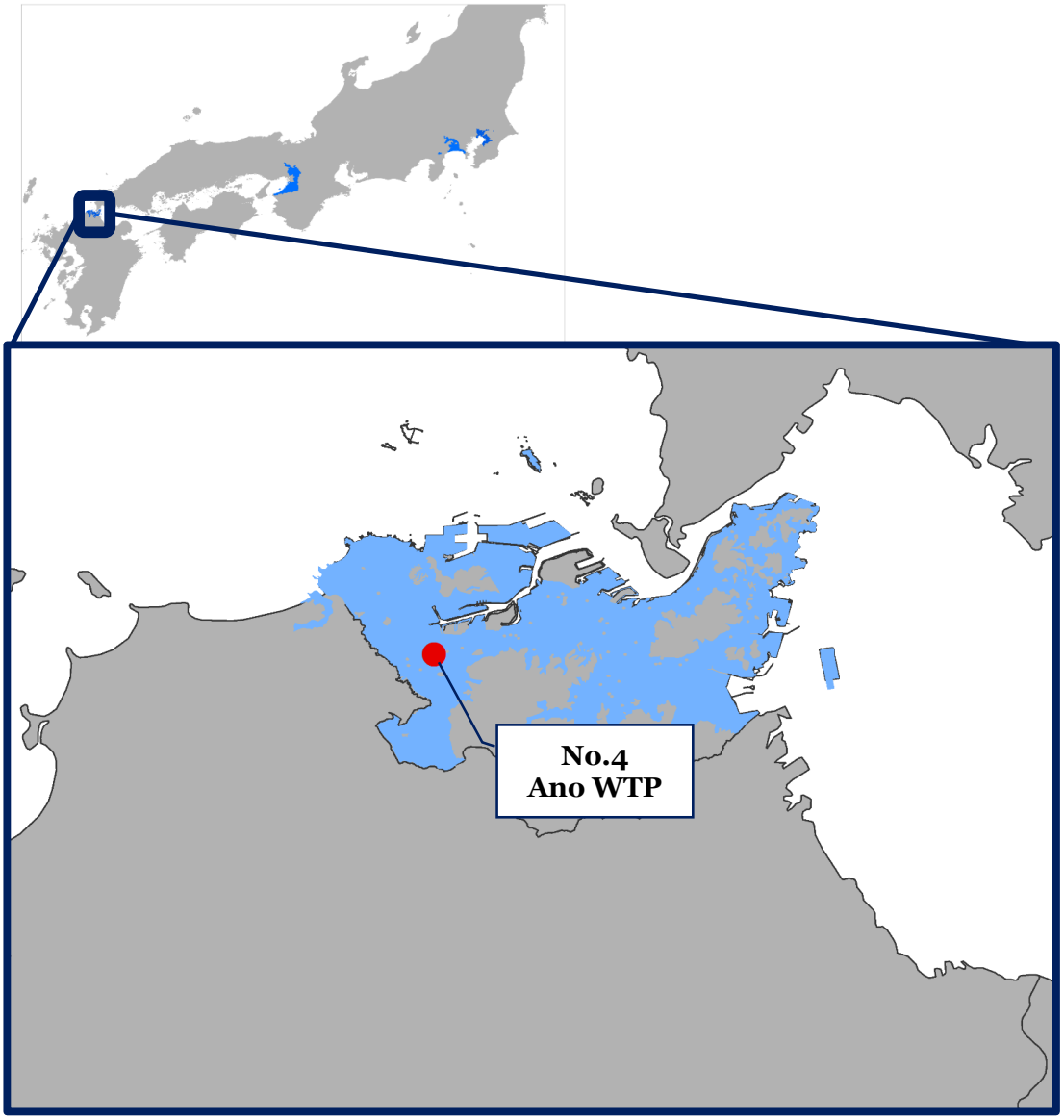
Pipieline length:	4,518.2 km	Conveyance:	188.6 km	Transmission:	230.8 km		
		Distribution:	4,098.6 km	Others:	– km		
Type of material:	・Ductile iron 3950.6 km ・Cast iron 265.7 km ・Steel 98.8 km ・Others (GP, VLP, etc) 156.4 km						

Others

Other information:	・Number of employees: 379 ・Maximum daily supply: 340,000 m^3 ・Maxiumum facility utilization rate: 44.4% (Maximum daily supply/treatment capacity) ・Facility utilization rate: 40.2% (Average daily water supply/treatment capacity)
Remarks:	●Kitakyushu City Water and Sewer Bureau. Outline of the Water and Sewer Services: https://www.city.kitakyushu.lg.jp/suidou/s00101009.html

Water Utility Information (FY 2014)

Service area



Case Study Report

Water treatment process

Case #4

Ano Water Treatment Plant (Upward Biological Contact Filtration: U-BCF)

Key word:	Advanced water treatment, Upward Biological Contact Filtration,Taste and Odor, Surface water (dam)

Outline:

<Characteristics>

1. Features of U-BCF

The Upward Biological Contact Filtration (U-BCF) system can remove ammonia nitrogen, dissolved manganese, and musty odor causing substances like geosmin efficiently. Using the U-BCF helped reduce the chemical dose at the Ano Water Treatment Plant.

2. U-BCF in other countries

The *Haiphong Water Supply One Member Company Limited* , the water utility in Haiphong City in Vietnam, has installed a U-BCF system in their Vinh Bao Water Treatment Plant.

<Outline>

・As the utility's primary water treatment plant, the Ano Water Treatment Plant has the capacity of 300,000 m3/d (39% of the total production).

・The U-BCF was developed by the utility itself. It was first installed in 2003.

<Characteristics of U-BCF>

・The core function of the U-BCF is to artificially reproduce a natural environment in which aquatic microorganisms decompose micropollutants in a more efficient manner.

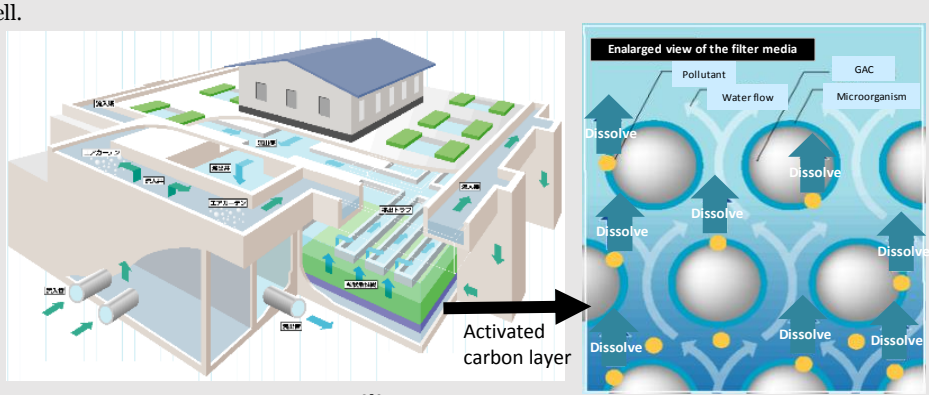
・The filter mediaum is granular activated carbon.

・Due to its porus, rugged, uneven surfaces, the granular activated carbon provides a much better environment than, for example pebbles in a riverbed for microorganizams to live in.

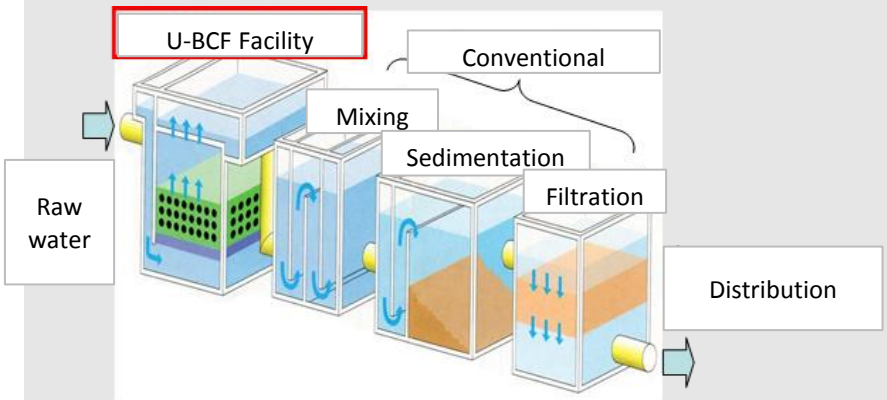
・An upward water flow through the activated carbon layers makes the raw water contact with microorganisms.

・The upward water flow stirs the granuler activated carbon, contributing to an improved biological contact.

・When the U-BCF was installed at the Ano Water Treatment Plant, it was placed before the receiving well.

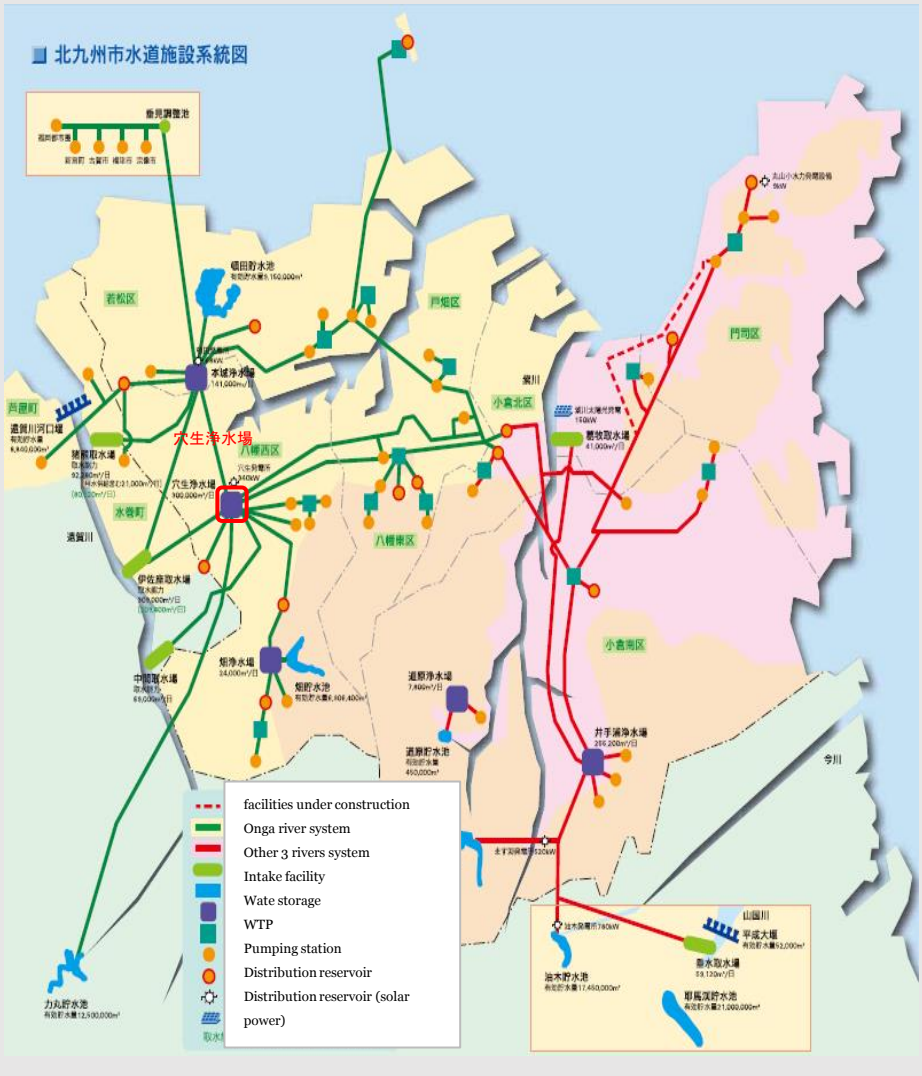


U-BCF Facility



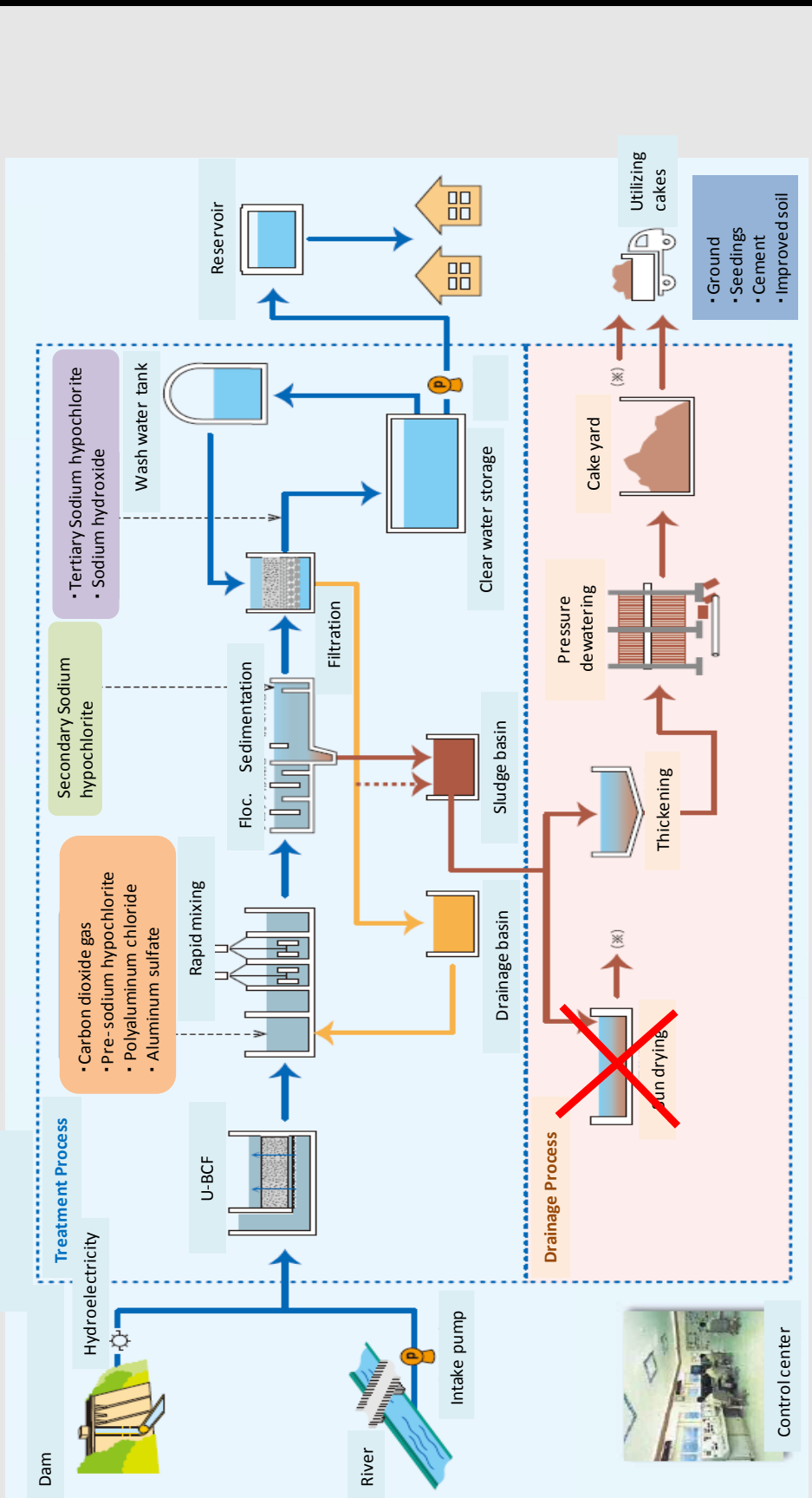
Case Study Report

Water treatment process

Address:	Takanosu 3-10-16, Yahata-Nishi Ku, Kita-Kyushu City, Fukuoka Prefecture
Land area:	84,150m^2
Water treatment process:	U-BCF + Coagulation/sedimentation + Rapid filtration
Water source:	Surface wtaer (river/dam)
Raw water quality:	■The raw water contains much musty odor substances, ammonia nitrogen and manganeze. <Average raw water quality in FY2014 (maximum)> ・Turbidity: 14 degrees (44 degrees) ・Color: 16 degrees (48 degrees) ・pH: 7.6 (7.8) ・Hardness: 66 mg/L (102 mg/L) ・TOC: 1.8 mg/L (2.7 mg/L) ・Ammonia nitrogen: 0.02 mg/L (0.09 mg/L) ・Dissolved manganeze: 0.007 mg/L (0.033 mg/L) ・Geosmin: 0.002 μg/L (0.006 μg/L) ・2-Methylisoborneol (2-MIB): 0.001 μg/L (0.002 μg/L)
Chemical dose:	As for the U-BCF, it requires no chemical dose.
Capacity:	171,000 m^3/d
Start of operation:	The U-BCF started operation in 2003 in the Ano Water Treatment Plant (in 2000 in the Honjo Water Treatment Plant).
Water supply network, City of Kitakyushu	

Water treatment process

Treatment process flow diagram:



Case Study Report

Water treatment process

Pictures	  Ano Water Treatment Plant — Upward Biological Contact Filtration (U-BCF)
Other facilities:	Small-size hydropower generation system
Order/ contract:	Tendering
Expenses:	Unknown
Other information:	–