Surveillance study on destination of primary effluent discharge related to confluence improvement works

Whole term	2002.11 ～ 2004.3	

(Purpose)

Otsu City is presently permitted to proceed with the scheme on the condition that the present primary effluent planned to be upgraded by implementing the "Otsu City Urgent Improvement Plan for Combined Sewerage" will be discharged at the estuary of the class 1 Sagami River running beside the Otsu Purification Center (hereinafter the place at which the effluent is discharged is referred to as "discharge point"). However, in the case where the scheme is promoted in accordance with the permission, when a new effluent discharge conduit is installed, some of the tie rods buried for stably supporting the embankment bodies of the Sagami River must be cut off, and the flood safety of the Sagami River, construction security and economic warranty are threatened. So, Otsu City is planning to change the discharge point to about 240 m upstream of the estuary of the Sagami River.

On the other hand, along the coast of Lake Biwa near the Otsu Purification Center, there is "Nagisa Park" constructed as an enjoyable water park. Otsu City is now fostering an improvement idea of improving the Sagami River Area (240 m long and 10 m wide; hereinafter referred to as "the area concerned") ranging from the new discharge point to the Nagisa Park using treated sewage in future in connection with the change of discharge point, from the viewpoints of "Otsu City Water Environment Master Plan" now being compiled.

The purpose of the present study is to quantitatively discuss the influence of changing the discharge point on the present Sagami River in view of water amount and water quality as an effort to justify the aforesaid idea, and also to present the image of the area concerned improved with the use of treated sewage.

(Result)

1. Examination concerning the change of discharge point

(1) Examination from the aspect of water amount

The degree of influence of the effluent amount newly added to the Sagami River as a result of changing the discharge point on the Sagami River Flood Plan was examined according to the following procedure.

a. Basic flood discharge of the Sagami River (Q_r) = 41 m^3/s (10-year probability) [from the FY2002 Commissioned Report on the Improvement Designs of the Sagami River and Other Single Rivers]

b. Drainage area of the Sagami River (A_r) = 310.4 ha

c. Combined sewerage area in the drainage basin of the Sagami River (A_c) = 31.5 ha

d. Rainfall collected by the sewage treatment plants through sewerage in the drainage basin of the Sagami River (Q_1) = Q_r x (A_c/A_r) = 4.16 m^3/s

e. Effluent amount newly added to the Sagami River (Q_2) = 0.86 m^3/s (amount of primary effluent planned to be upgraded)

f. Flood discharge of the Sagami River after change of discharge point (Q) = Q_r – Q_1 + Q_2 = 37.7 m^3/s

From the above, we have "Q < Q_r," showing that even if the discharge point is changed, there will be no problem in flood safety in view of water amount.

(2) Examination from the aspect of water quality

The influence of changing the discharge point on the present water quality of the Sagami River was evaluated. The results are shown in Table 1.

Table 1 List of examination results

	Water quality (mg/l)		
	SS	COD	BOD
Primary effluent planned to be discharged	12.00	4.30	3.90
Sagami River	11.65 – 45.00 ↓	4.40 – 6.50 ↓	1.90 – 2.70 ↓
Primary effluent planned to be discharged + Sagami River	11.64 – 41.71	4.39 – 6.28	2.10 – 2.82

From Table 1, it can be seen that the variation of the present water quality of the Sagami River by changing the discharge point is very slight, and considering the dilution effect by the river water, it is judged that the change of discharge point will little affect the water quality of the Sagami River.

2. Planned targets

The image of the area concerned improved is presented, sufficiently considering the following viewpoints of Otsu City Water Environment Master Plan: "water amount·water quality," "water enjoyableness," "flood control," "aqueous culture" and "co-working with citizens"

3. Summary

It was quantitatively demonstrated that even if the discharge point is changed, the flood safety of the Sagami River will be maintained in view of water amount while the present Sagami River will be little affected also in view of water quality. Further, the entire image of the area concerned improved with the use of treated effluent was presented. Henceforth, it is expected that particular examination will be further made for implementation of the scheme based on the examination made so far.

Collaborators: Otsu City, Japan Institute of Wastewater Engineering Technology
Person in charge of study: Takahashi Ryuichi, Kirihara Takashi, Matsuda Hiroki, Tsuchiya Gen, Inoue Tsuyoshi

Keywords	Discharge, Flood control safety, Water quality, Volume of water	J903A026