The study to establish the countermeasures to Prevent Global Warming in Sewage Works		
Whole term	1998.4-1999.3	P29-P34

(Purpose)
At the Kyoto conference on the prevention of global warming held in Dec. 1997, Japan was supposed to reduce the emission of greenhouse gases to a level 6% below the level at 1990 by 2010. The countermeasures against global warming that Japanese Government has to drive urgently were revised as “Guideline for Countermeasures to Prevent Global Warming” in June 1998. “Law Concerning the Promotion of Countermeasures to Cope with Global Warming” was proclaimed in October 1998. It was enacted in April 1999 and the basic policies concerning the Promotion of Measures to Cope with Global Warming were adopted at a Cabinet meeting simultaneously.

The electricity consumption of sewage system is 0.6% of whole electricity consumption in Japan. Since fossil fuel such as heavy oil are used at sludge incineration and methane and dinitrogen monoxide are emitted from sewage treatment system, the emission of greenhouse effect gases in sewage treatment have to be reduced as much as possible with new technologies in sewage management and introducing energy and resource saving measures.
In this study, the relationship between sewage system and green house effect is made clear and then the emission amount of greenhouse gases is estimated. In addition, a guideline for deciding the action plan is proposed in this study in order to prevent global warming at sewage system by examining countermeasures, evaluating the reduction impact; and listing up the future tasks.
(Results)
The guideline for establishment of measures to prevent global warming in sewage works was proposed. Contents are as follows.
[Main part]
Chap 1. General statement
To determine the purpose and objective of action plan, to describe the mechanism of greenhouse effect, and to define the related terminologies.
Chap 2. Identification of the emission source and emission of greenhouse effect gas
To understand the emission source and emission mechanism of greenhouse effect gas from sewage system and to describe the method which is used for assessment of the greenhouse effect gas emission and its emission coefficient from each sources
Chap 3. Calculation of total emission of greenhouse effect gas
To show the calculation method of total emission (CO_2 equivalent) from each emission source and each greenhouse effect gas emission by considering warming coefficient
Chap4. Countermeasure for greenhouse effect prevention
To show possible countermeasures for greenhouse effect prevention in each process from the viewpoint of energy saving and emission control at sewage treatment process.
Chap 5. Formulation and promotion of action plan for greenhouse effect prevention
To list points that should be incorporated in the action plan and to suggest the ways to implement the plan.

[Case study part]
Two case studies of establishment of action plan for greenhouse effect prevention are shown. One is a case study in a local government with several large scale treatment plants, and another is the case study in a local government with several small scale treatment plants.

[References]
Literature
Law governing greenhouse effect prevention
Law governing energy saving
Example of estimated greenhouse gas emission at the nationwide level from sewage treatment plants
Analyzing method of emission of greenhouse gas from sewage treatment process

Funded research by Construction Ministry's City Bureau Sewage department
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