

Study on the application of the vacuum flying in the sewage sludge drying technology

Whole term

1996. 4 ~ 1997.3

(Purpose)

It is difficult to acquire landfill sites because of environmental problems and the public-disapproval. Landfilling is not a sound technology in the environmental and public viewpoint. The answer of the City Planning Council in 1995 was a suggestion to use the wastewater sludge effectively, hence reduction and recycling would be really necessary.

In this situation, the Mikasagawa Water Treatment Center at Fukuoka Prefecture adopted a sludge melting system and started the study on the vacuum flying of the sewage sludge drying technology. In this study, the sludge from the Mikasagawa Water Treatment Plant was used and basic data were collected by a treatment test. As per the results of the test, the applicability of this technology as a system was investigated and recycling of drying sludge was also examined.

This study was conducted by the Japan Institute of Wastewater Engineering Technology and Fukuoka Prefecture as making use of the innovative technology.

(Results)

1. Evaluation of the vacuum flying as a drying technology

(1) Vacuum flying drying facility

- Even the characteristics of the raw dewatered sludge were changed, the percentage of the water and oil contents of the dried sludge were approximately 3% and 30~40%, respectively.
- Even though, the dewatered sludge was changed, the generated energy in the drying sludge was 5,000~5,500 kcal/kg.
- The ratio between the dewatered sludge and the oil mixed was 1:0.6-0.8 and 1:1-3 in the digestion and none-digestion, respectively.
- The noise and the vibration of the equipment were the same as the other equipment, and there was no special problem.

(2) Wastewater

The condensed wastewater possessed a high concentration of BOD, NH₄-N and hexane-extract. However, if the flow rate would be low compared with the inflow, there would be no much effect on the treated water quality.

(3) Odor

Though the problem of odor of the sewage sludge has been overcome these days, dried sludge has an odor of its own. High concentration of the odor in the drying facility can be removed in the odor incinerator. Low concentration of the odor in the other facilities can be removed in the ventilation system.

(4) Economical efficiency

The total management cost including the construction and maintenance cost is economical in comparison with the incineration.

2. Evaluation of recycled dried sludge

(1) Applicability as cement resource

Because dried sludge possesses low percentage of water and oil content, the generated energy is high, and good to be used as an aid for the combustion.

(2) Applicability as a special fertilizer

The concentrations of the toxic materials in the drying water of the leaching test and its contents were less than the target. C/N ratio was a little bit higher than the standard of that for sludge fertilizer.

(3) Treatment of dried sludge

Dried sludge is easily burnable. Hence, it is better to use it as soon as possible avoiding a

long storage.

Collaborators: Sewerage Division of Buildings Department- Fukuoka Prefecture
Japan Institute of Wastewater Engineering Technology

Personnel in charge of the study: Akira Yamane, Tomiaki Sekine, Shigeru Inoue

Keywords

Technology of drying by vacuum flying, Utilization as cement, Aid for the combustion, sludge fertilizer