Technical Support for Sludge Treatment/Utilization of Fukaya City Public Sewerage Using Policy Development process "Think Together"

(Research for FY 2016-17)

1. Purpose

Fukaya City and Japan Sewage Agency (JS) jointly study on the future business development process for sludge treatment/utilization at Fukaya City public sewerage as a "Think together project." Resource & Energy Division, R&D Department of JS, carries out the experiments on anaerobic digestion of sewage sludge generated at Fukaya city purification center (Fukaya WWTP) as an operation of "Experimental study on sewage sludge anaerobic digestion at Fukaya City purification center (2016)." The experiment provided basic information to consider the adoption of the digestion process. This year, Resource & Energy Division and Policy Development section consider the sludge treatment/utilization plan based on the present status and future direction.

2. Achievements of 2016

The anaerobic digestion experiment was carried out at laboratories of JS Training Center in Toda City. The experiment used the primary sludge and excess sludge generated at Fukaya WWTP, with the condition of mesophilic digestion and a digestion period of 20 days. LCC estimation based on the experiments showed the effectiveness of the introduction of the digestion process to Fukaya WWTP.

3. Achievement of this year

JS and Fukaya city implemented some investigations and considerations to develop the sludge treatment/utilization plan.

① Investigated the present quantities of inflow and sludge and estimated their future amounts.

② Compared some kinds of a digester and dehydrator, and drying process of sludge when introducing the digestion system to Fukaya WWTP. The result of the comparison indicated that a concrete digester or steel digester and the integrated system of dehydration and drying were beneficial.

③ Estimated LCC of anaerobic digestion and the sludge treatment of highly efficient dewatering and drying. LCC was lowest when introducing the anaerobic digestion and the integrated system of dehydration and drying, utilizing generated biogas for sludge drying, and generating no electricity.

④ Investigated the potential demand for organic fertilizer, and the heavy metal concentration included in dewatered sludge generated at Fukaya WWTP. The investigation indicated that producible amount of fertilizer from sewage sludge generated at the Fukaya WWTP was about 1/20 to 1/40 of demands for organic fertilizer, and included heavy metal concentration was maximum 1/10 of the standard value.

⑤ Wastewater administrators of Fukaya city, related sections of resource utilization, and JS held four workshops. The workshops not only improved the knowledge for the sludge treatment/utilization of Fukaya city administrators but enabled sharing information and needs for the future cooperation between parties interested.

⑥ After the above consideration, the party decided strategic goals for the sludge utilization of Fukaya city and developed short/mid-term plans.

4. Conclusion

After repeated discussions, related parties of Fukaya city and JS achieved to develop the strategic goals and short/mid-term plans for sludge treatment/utilization of Fukaya city. Further detailed consideration goes on to introduce a digester. The continuous study and arrangement among related parties are required to promote resource utilization such as sludge or regional biomass smoothly after introduction.

Keywords: Sludge treatment, Resource utilization, Digestion, Policy development support