

HAPS EMISSION CHARACTERIZATION TO ESTABLISH EMISSION FACTORS FOR KOREAN WASTEWATER AND SEWAGE TREATMENT FACILITIES

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Structure of processes, production rate and details of operating conditions were investigated to develop emission factors of hazardous air pollutants (HAPs) from major wastewater and sewage treatment facilities in Korea. Volatile organic HAPs (mainly VOCs) and odor substances were selected to estimate emission rate. Seven different sources were chosen and two specific processes for each source were investigated to measure their emission strength (wastewater treatment facilities: oil refinery, plastic manufacturing, paint manufacturing, paper and pulp industry, industrial complex wastewater treatment/sewage treatment, landfill site leachate treatment etc). Most important sources were considered wastewater collection tanks (flow control tank and storage tank) while sedimentation tank, oil/water separator, air floatation facilities were also suspected to emit volatile HAPs. Flow control process and denitrification process were chosen major emission sources for landfill site leachate treatment facility. Canistor sampling technique and GC/MS analysis were mainly utilized to determine emission levels (FPD was used for the analysis of hydrogen sulfide). Emission rate could be estimated using several site-specific methodologies including flow rate of processes with concentration application and surface emission calculation with mass transfer models. Aromatic hydrocarbon substance emissions like BTEX were generally noticeable. Toluene emission level was highest in most cases and following were ethylbenzene, xylene. Styrene emission level was highest at paint-manufacturing process. Odorous substances like sulfur compounds were substantially detected at oil refinery, plastic manufacturing, leachate treatment processes.