

**Study on Evaluation of Environmental Pollution Caused by Heavy Metal Elements
in Natural Ground**

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The pollution of surface and/or ground water caused by the inflow of drainage water from mudstone excavation sites is a serious issue in Japan. It has been recognized that this issue results from the discharge of sulfate generated by the decomposition of pyrite contained in the mudstone. In general, marine mudstone includes the primary framboidal-type pyrite formed during sedimentation and diagenesis. The pyrite in mudstone discharges acid water into the environment by decomposition during the weathering process. The ground under the big Japanese cities such as Tokyo and Osaka contains sand and/or mud sediments formed in the late Pliocene to Pleistocene. When the underground environment in these cities is altered by tunnels and other underground openings pollution by acid water originated from the mud sediments is possible. Therefore, the evaluation and prediction of the possibility of pollution by the acid water from mud sediment is an important theme of environmental geology when tunnels and other underground openings are constructed in these cities. We have made an attempt to predict the spatial extent of pollution due to the exudation of the acid water and/or the heavy metals from mud sediment by numerical simulation that combines advection/diffusion and geochemical models.