Geophysical Research Abstracts
Vol. 17, EGU2015-9607, 2015
EGU General Assembly 2015

Mercury cycling in a wastewater treatment plant treating waters with high mercury contents.

Eva M. García-Noguero (1), Carolina García-Noguero (1), Pablo Higueras (1), Lorenzo Reyes-Bozo (2), and José M Esbrí (1)

(1) Universidad Castilla-La Mancha, Instituto de Geología Aplicada, Almaden, Spain (pablo.higueras@uclm.es), (2) Universidad Nacional Andrés Bello, Departamento de Ciencias de la Ingeniería. Santiago, Chile (lreyes@unab.cl)

The Almadén mercury mining district has been historically the most important producer of this element since Romans times to 2004, when both mining and metallurgic activities ceased as a consequence both of reserves exhaustion and persistent low prices for this metal. The reclamation of the main dump of the mine in 2007-2008 reduced drastically the atmospheric presence of the gaseous mercury pollutant in the local atmosphere. But still many areas, and in particular in the Almadén town area, can be considered as contaminated, and produce mercury releases that affect the urban residual waters. Two wastewater treatment plants (WWTP) where built in the area in year 2002, but in their design the projects did not considered the question of high mercury concentrations received as input from the town area.

This communication presents data of mercury cycling in one of the WWTP, the Almadén-Chillón one, being the larger and receiving the higher Hg concentrations, due to the fact that it treats the waters coming from the West part of the town, in the immediate proximity to the mine area. Data were collected during a number of moments of activity of the plant, since April 2004 to nowadays.

Analyses were carried out by means of cold vapor-atomic fluorescence spectroscopy (CV-AFS), using a PSA Millennium Merlin analytical device with gold trap. The detection limit is 0.1 ng/l. The calibration standards are prepared using the Panreac ICP Standard Mercury Solution (1,000±0,002 g/l Hg in HNO_3 2-5%).

Results of the surveys indicate that mercury concentrations in input and output waters in this plant has suffered an important descent since the cessation of mining and metallurgical activities, and minor reduction also after the reclamation of the main mine's dump. Since 2009, some minor seasonal variations are detected, in particular apparently related to accumulation during summer of mercury salts and particles, which are washed to the plant with the autumn's rains. Further research should be conducted in the next years to validate the stable mercury concentration observed since 2009.