

The Legacy of Chromium Contamination in Hinkley, California: A tool for Environmental Chemistry students to develop their soft-skills

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In the year 2000, the Erin Brockovich movie brought to public attention one of the most controversial cases regarding Chromium (Cr) contamination. For 13 years, starting in 1952, Pacific Gas & Electric (PG&E) used Cr as an anticorrosive in cooling water of a compression station located close to Hinkley, California. The water was stored in unlined ponds, likely the origin of a Cr groundwater contamination, which, later, was associated with adverse health effects for the town's population.

We have taken the legal case between the people of Hinkley and PG&E to design a master students' class in "Environmental Forensics" and turned the out-of-court-settlement into a mock-court hearing, set as a role-play. Students team either with the town or the company, acting as attorneys/lawyers or scientific experts, addressing the case's contradictory points. After two introductory sessions, each team receives a folder including company reports, scientific papers, maps, and environmental guidelines. They must summarize facts and present arguments to support their claims regarding formation of the Cr plume, impact on the population's health, and remediation efforts taken by PG&E. These arguments are delivered in front of their peers and the teachers (acting as judges) in a weekend-extensive retreat. During the court hearing, the Plaintiff's isotope chemist, using isotope fractionation data, would try to prove that the Cr in the area is of anthropogenic origin; the analytical chemist supporting PG&E would try to convince the judges that detection of toxic Cr(VI) is an artifact produced by inadequate sampling and wrong analytical methods, and the toxicologists from both sides would debate on controversial publications regarding the effects of Cr(VI) on human health.

This case is particularly interesting for such a setting because of the amount of information and scientific facts supporting arguments for both sides. Over the past 10 years, the course's modality has proven to be a formidable way for teaching students in being apprehensive and critical about information they are confronted with, delivering arguments in structured and retraceable ways, and improving communication skills on peer- and layperson-level. Here, opposing lines of arguments based on scientific papers and student feedback will be presented.