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Remediation of soils polluted with 2,4-D by electrokinetic soil flushing with facing rows of electrodes: A case study in a pilot plant

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1 **Remediation of soils polluted with 2,4-D by electrokinetic soil flushing with facing**
2 **rows of electrodes: A case study in a pilot plant**

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14 **Abstract**

15 This study focuses on evaluating the application of electrokinetic soil flushing (EKSF)
16 technologies to remediate soil polluted with 2,4-dichlorophenoxyacetic acid (2,4-D).
17 This compound was selected as an example of polar herbicides that may cause soil
18 percolation and groundwater contamination due to its high water solubility, lifetime and
19 mobility. To evaluate this technology, a 40-day test was conducted on a bench-scale set-
20 up (175 dm³ of capacity) that was fully automated and operating under potentiostatic
21 mode (1 V cm⁻¹). The electrical current, temperature, pH, humidity and pollutant
22 concentration in the electrolyte wells were monitored daily, and at the end of the tests, a
23 post-analysis characterization of the soil section was performed to obtain 3-D plots of
24 the changes in each parameter. Simultaneously, a blank test was carried out (without
25 applying an electric field) to determine spreading of the pollutant in the soil that did not
26 experience an electric field. The results indicate that the 2,4-D is transported to the
27 anode wells by electromigration (the primary species is an anion under the treatment
28 pH) and the cathode wells by electroosmotic drag, even though a lower concentration is
29 obtained because a large volume of water is mobilized. After 40 days of the EKSF

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