**Tracy Research Technical Report Abstract**

***Volume 41***
Craft, D., B. Fowler, R. Housewright, L. Mao, and J. Fields. 2008. *Composite Sampling and Analysis of Low Concentration Organic Compounds and Trace Elements in Surface Waters at the Tracy Fish Collection Facility, Tracy, California*. Tracy Fish Collection Facility Studies. Volume 41. U.S. Bureau of Reclamation, Mid Pacific Region and Denver Technical Service Center. 124 pp.

Monthly composite water samples for organic analyses (current use and persistent pesticides and hydrocarbons) were collected from late May 1999 through January 2000 from the intake channel at the Bureau of Reclamation’s Tracy Fish Collection Facility (TFCF), Tracy California. When site power was uninterrupted, organic samples were pumped at a rate of 0.4-liter (L) per hour through a 1.0-micrometer pore-size disk filter and then extracted using solid phase extraction with XAD-2 Amberlite resin. During the organic sampling period, 2,642 L were pumped over 249 days. Filter disks and XAD columns were replaced monthly and then extracted and fractionated before analysis using high-resolution gas chromatography-low resolution mass spectrometry (HRGC-LRMS). These open scan LRMS data are generally described in this report and total ion chromatograms are included in electronic format for further mass spectra compound searching and identification. Frozen fractions from open scan analysis were later analyzed using quantitative methods for organic compounds using high resolution GC-high resolution MS (HRGC-HRMS) and liquid chromatography – tandem mass spectrometry (LC-MS/MS). These sensitive MS methods and the large volumes of water preconcentrated on filters and XAD columns allowed detection limits in the range of 0.010 to 0.100 nanograms per liter (ng/L). The HRMS and MS/MS data were summarized and compared with local agricultural chemical applications data from1997 and reported data from other studies. Several agricultural chemicals considered compounds of concern (Chlorpyrifos, Diazinon, Metolachlor, Trifluralin, and others) were detected at average concentrations from under 1 ng/L up to 120 ng/L (Metolachlor). Persistent and banned pesticides such as Aldrin, Chlordane, Lindane, and Mirex were mostly present at sub-ng/L concentrations, with some persistent analytes detected in the 1 – 10 ng/L range. Because of the dilution associated with composite sampling volumes, the average concentrations reported here may be much lower compared to actual short-term concentration spikes for detected organic compounds.

Trace metal composite sampling was also performed from May through November 1999 using a programmable peristaltic sampling pump that pumped 125 milliliters every 3 hours into sealed and clean high-density polyethylene containers. These samples were collected monthly, digested, and analyzed using inductively-coupled plasma – mass spectrometry (EPA method 6020A). The 1999 composite sample trace element data are presented and compared with 1997 discrete sampling and low-detection limit analysis of TFCF waters, along with other reported trace element data. Composite sample concentrations of all trace elements were below water quality guidelines except for mercury and possibly copper, and there were indications that contamination artifacts may have affected results.