

## **AIRBORNE EXPOSURE TO TRIHALOMETHANES FROM TAP WATER IN HOMES WITH REFRIGERATION-TYPE AND EVAPORATIVE COOLING SYSTEMS**

**Brent D. Kerger,<sup>1</sup> David R. Suder,<sup>2</sup> Chuck E. Schmidt,<sup>3</sup>  
Dennis J. Paustenbach<sup>4</sup>**

<sup>1</sup>Health Science Resource Integration, Inc., Tallahassee, Florida,

<sup>2</sup>Consultant, Davis, California,

<sup>3</sup>Consultant, Red Bluff, California, and

<sup>4</sup>ChemRisk, San Francisco, California, USA

*This study evaluates airborne concentrations of common trihalomethane compounds (THM) in selected living spaces of homes supplied with chlorinated tap water containing >85 ppb total THM. Three small homes in an arid urban area were selected, each having three bedrooms, a full bath, and approximately 1000 square feet; two homes had standard (refrigeration-type) central air conditioning and the third had a central evaporative cooling system ("swamp cooler"). A high-end water-use pattern was used at each home in this exposure simulation. THM were concurrently measured on 4 separate test days in tap water and air in the bathroom, living room, the bedroom closest to the bathroom, and outside using Summa canisters. Chloroform (trichloromethane, TCM), bromodichloromethane (BDCM), and dibromochloromethane (DBCM) concentrations were quantified using U.S. EPA Method TO-14. The apparent volatilization fraction consistently followed the order: TCM > BDCM > DBCM. Relatively low airborne THM concentrations (similar to outdoors) were found in the living room and bedroom samples for the home with evaporative cooling, while the refrigeration-cooled homes showed significantly higher THM levels (three- to fourfold). This differential remained after normalizing the air concentrations based on estimated THM throughput or water concentrations. These findings indicate that, despite higher throughput of THM-containing water in homes using evaporative coolers, the higher air exchange rates associated with these systems rapidly clears THM to levels similar to ambient outdoor concentrations.*