

Description of Data Files in Appendix G

These data files are organized by Study Unit (see Figure 1 in the body of the report, and Table A1 in Appendix 1) and Network (see Table A1 in Appendix 1).

Each file contains a “Summary” table that includes USGS site identification numbers, dates of sample collection, tracer-based piston-flow ages and tracer-based piston-flow recharge dates, selected environmental tracer data, and ancillary data such as well-construction data and basic geochemical data. The sources of these data and interpretations were described in the body of the report.

Each file also contains a “Raw Tracer Data” table. This table contains detailed information on environmental tracer concentrations. The sources of these data were described in the body of the report.

For Networks where major dissolved-gas data were collected, a “Major Dissolved Gases” table is included. This table contains detailed information on major dissolved-gas concentrations. The source of these data was described in the body of the report.

Remark Codes used to Censor Tracer-Based Piston-Flow Ages and Tracer-Based Piston-Flow Recharge Dates

The following remark codes were associated with some of the tracer-based piston-flow ages and tracer-based piston-flow recharge dates:

“>”, meaning greater than

“<”, meaning less than

“≥”, meaning greater than or equal to

“≤”, meaning less than or equal to

where:

“>”, where used with a tracer-based piston-flow recharge date, means greater than or more recent than that date

“<”, where used with a tracer-based piston-flow recharge date, means less than or older than that date

“>”, where used with a tracer-based piston-flow age, means greater than or older than that age

“<”, where used with a tracer-based piston-flow age, means less than or younger than that age

Other Remarks Codes used in these Tables

“<” less than

“E” estimated

“v” The “v” remark code accompanies some of the ancillary data retrieved from the U.S. Geological Survey Data Warehouse (the Data Warehouse is described in the body of this report). The “v” remark code is used to identify environmental values where the analyte was detected in both the environmental sample and associated blanks. The “v” code indicates that the environmental values have been affected by measurable contamination.

Units of Concentration

Concentrations of most chemical constituents in water are given either in milligrams per liter (mg/L) or micrograms per liter (µg/L).

Chlorofluorocarbon (CFC) concentrations are given in units of picograms per kilogram (pg/kg) and picomoles per kilogram (pmol/kg). One picogram is 10^{-12} grams. One picomole is 10^{-12} moles. One mole contains 6.022×10^{23} atoms or molecules of a substance. Sulfur hexafluoride (SF₆) concentrations are given in units of femtograms per kilogram (fg/kg) and femtomoles per kilogram (fmol/kg). One femtogram is 10^{-15} grams. One femtomole is 10^{-15} moles. CFC and SF₆ concentrations in gases are expressed as a mixing ratio, that is, volume of gas per volume of dry air, in parts per trillion [parts per trillion by volume (pptv)]. The mixing ratio is calculated as the atmospheric concentration that would yield the measured aqueous concentration assuming equilibrium partitioning between atmosphere and water under the specified conditions (recharge temperature, recharge elevation, and excess air concentration).

Tritium concentrations are given in units of Tritium Units (TU). Based upon a tritium half-life of 12.32 years (Lucas and Unterweger, 2000), 1 TU is equal to 3.22 picocuries per liter. [Lucas, L.L., and Unterweger, M.P., 2000, Comprehensive review and critical evaluation of the half-life of tritium: Journal of Research of the National Institute of Standards and Technology, v. 105, p. 541-549.]

Helium-3 (³He) data are reported as δ values computed from the formula

$$\delta = \left[\left(\frac{R_x}{R_{STD}} \right) - 1 \right] 100$$

where R_x is the ratio of ³He to ⁴He in the sample, R_{STD} is the ³He to ⁴He ratio of the reference standard air (1.384×10^{-6}), and δ³He is expressed in parts per hundred.

Excess air concentrations, He concentrations, and Ne concentrations are reported in units of cubic centimeters (at standard temperature and pressure) per kilogram of water (cc(STP)/kg). One cc(STP) of He or Ne is equal to 2.6868×10^{19} atoms.

Abbreviations used in these Tables

“DOC”	dissolved organic carbon
“DWH”	Data Warehouse [the DWH is a publically available database of NAWQA data (http://infotrek.er.usgs.gov/traverse/f?p=NAWQA:HOME:0:)]
“MAAT”	mean annual air temperature
“n/d”	not determined or no data
“TU”	tritium units

Other Terms used in these Tables

“ $\Delta^4\text{He}$ ” is the amount of ^4He in a water sample that is in excess to that attributed to solubility equilibrium with air, expressed as a percent of the ^4He in water at solubility equilibrium.

“ ΔNe ” is the amount of Ne in a water sample that is in excess to that attributed to solubility equilibrium with air, expressed as a percent of the Ne in water at solubility equilibrium.

“Contaminated”, where used in the context of CFC or SF_6 dating, indicates concentrations greater than those that would be found in groundwater that was at equilibrium with peak atmospheric CFC or SF_6 concentrations at the assumed recharge elevation, recharge temperature, and excess air

conditions. Samples that are contaminated relative to dating purposes are not necessarily contaminated relative to human health benchmarks.

“Modern”, where used in the context of CFC-based piston-flow ages, slight enrichment above concentrations that would be found in groundwater that was at equilibrium with peak atmospheric CFC concentrations may be referred to as “modern”, to differentiate minor enrichment from greater enrichment. Minor enrichment is enrichment that could reasonably be attributed to uncertainties in the methodology, for example, young groundwater recharged under conditions of a local atmospheric CFC anomaly, or minor bias in estimated recharge temperature or recharge elevation. Greater enrichment frequently indicates the presence of CFCs from non-atmospheric sources.

A Note on Significant Figures

Following the example of the U.S. Geological Survey Data Warehouse (which provides unrounded data values), values for environmental tracer concentrations, major dissolved-gas data, and ancillary data are provided as unrounded values in these tables. Providing unrounded data allows the user to round data at the appropriate step in analysis and in a manner appropriate for the purposes of the analysis. The presentation of unrounded data values does not indicate that the data carry precision commensurate with the reported number of significant figures.