

Attachment B – Definitions

Attachment B

Seattle Public Schools
Drinking Water Quality Program

General Information and Definitions

Descriptions of Contaminants / Constituents Measured as Part of the Water Quality Testing Program

1.1 CONTAMINANTS ASSOCIATED WITH HEALTH AND SAFETY

Lead is a metallic element that is commonly found in red brass alloys used in faucet and drinking fountain fixtures of all types, as well as in lead-tin solder that was commonly used for joining copper plumbing pipes until 1992. Lead enters tap water via chemical and physical interactions between the water and the materials. Lead is not normally found in source water supplies; Seattle's water supply has virtually no lead. It is a regulated contaminant for health concerns.

Cadmium is a metallic element that is present in trace amounts in zinc (galvanized) coatings. Cadmium enters tap water via chemical and physical interactions between the water and the pipe materials. Cadmium is not normally found in source water supplies; Seattle's water supply has virtually no cadmium. It is a regulated contaminant for health concerns.

Copper enters tap water via chemical and physical interactions between the water and copper piping and brass alloys found in fixtures. Copper is generally a concern for aesthetic reasons because it can cause staining of fixtures and hair, but it is also a health concern at higher concentrations for persons with a relatively rare disease called Wilson's Disease.

Total Coliforms are the group of bacteria that serve as indicator organisms of warm-blooded animal fecal contamination in drinking water. Total coliforms are a regulated drinking water quality parameter.

Chlorine Residual is the concentration of chlorine compounds that serve as disinfectants in the drinking water supply. Chlorine is added to all water supplied in the City of Seattle.

1.2 CONSTITUENTS ASSOCIATED WITH AESTHETIC CHARACTERISTICS

Iron is present in very low levels in Seattle’s water supply, but is present in tap water primarily because of chemical and physical interactions between the water and older steel and iron pipes in buildings. Iron is not a regulated contaminant for health reasons, but is regulated because of aesthetic problems like staining of fixtures and discolored water.

Turbidity is a measurement of the relative cloudiness of the water caused by the presence of suspended matter or air bubbles, resulting in the scattering and absorption of light. Turbidity is a general indicator of water quality, both from a health and an aesthetic standpoint. The units of measurement for turbidity are “nephelometric turbidity units” (NTU). Low turbidity values indicate very clear water with relatively few particles, while higher turbidity values indicate greater numbers of particles and degraded water quality. At turbidity values less than about 5 NTU, there is no cloudiness perceptible to the human eye – the water looks perfectly clear. For water samples taken from older steel plumbing (as is most common in Seattle schools), the source of turbidity is almost completely attributable to iron oxide (rust) particles which are not harmful to human health.

Color is a physical characteristic describing the appearance of water (different from turbidity, which is the cloudiness of water). Color is measured in “color units” (CU), with larger numbers indicating stronger color. Generally, color measured at 15 CU or less has no apparent color to the naked eye. For water samples taken from older steel plumbing (as is most common in Seattle schools), the source of color is almost completely attributable to iron oxide (rust) particles that are not harmful to human health.

Zinc enters tap water via chemical and physical interactions between the water and galvanized steel pipes. Zinc is not a regulated contaminant for health reasons. Zinc is regulated at 5 mg/L under the National Secondary Drinking Water Standards – these standards are non-enforceable guidelines that regulate contaminants that may cause cosmetic or aesthetic effects.

Units of Concentration Used in Water Testing Results

Parts per million (ppm) is a common unit of measurement for representing the concentration of a constituent in water. For constituents in fluids, ppm is the same as milligrams per liter (mg/L).

Parts per billion (ppb) is another common unit of measurement for representing the concentration of a constituent in water and is usually used when the concentrations are very small. For constituents in fluids, ppb is exactly equivalent to micrograms per liter (ug/L). This unit of measurement is 1000 times smaller than ppm, in other words 1 ppm = 1000 ppb. Most often, lead and cadmium concentrations are shown as ppb.

Terms Used in Water Sampling

Drinking Water Source refers to any drinking fountain or faucet that is supplied from the building water piping and whose primary purpose is to provide water for drinking or other human consumption. School buildings typically have multiple water sources.

First-draw or standing sample refers to the first portion of water drawn from a source (drinking fountain or sink faucet) that has remained in stagnant contact with the end-use fittings and plumbing for 15 – 18 hours, unless otherwise noted.

Flushed sample refers to a portion of water collected from a source (drinking fountain or sink faucet) after first flowing water through the source for a specified period of time. Flushed samples represent water that has been in contact with piping farther back in the building piping system.

Pipe and Plumbing Components

End-use plumbing is defined as those plumbing components starting with the shut-off (or stop) valve to an individual sink or drinking water fixture up to and including the faucet or bubbler fitting itself. Typically this includes the shut-off valve, a flexible tube extending from the valve that connects to a threaded connector (nipple) at the base of the faucet or bubbler, the faucet or bubbler fitting itself, and any incidental fittings at the points of connection for these components (bushings, etc.). If the drinking water source has an in-line point-of-use filter, the filter and the pre-filter units and associated fittings are also considered end-use plumbing components. Most often, but not always, all end-use plumbing components are easily accessible and are not behind walls or other enclosures. End-use plumbing does not include the connecting pipe that extends back from the shut-off valve through the wall or floor to a building supply pipe. *Note that end-use plumbing and components are referred to as “components” or “end-use components” or “end-use plumbing” throughout the main report. Other appendices may*

use the term “fittings” which should be interpreted as meaning the same as “components”, “end-use components” or “end-use plumbing”

Bubbler is the fitting used for drinking water fountains and includes the projector head, integral stream flow regulator, valve handle or button, and basin shank.

Faucet is the fitting used for sinks and basins and includes the flow projector, mixing chamber, and valves (cold and hot water).

Flexible connector is used to connect the shutoff valve to the faucet or bubbler. It typically consists of a flexible plastic tube with threaded nuts at both ends. The flexible tube may be shielded in a flexible sheath made of braided stainless steel or polymeric materials.

Service line or pipe is the pipe extending from a city water distribution main in the street to a building. Service lines to schools are typically 3 inches in diameter, but may be smaller or larger depending upon the size of the building. Older service lines are typically cast iron or galvanized steel; newer service lines are usually copper or ductile iron.

Service entrance is the point at which the service line enters the building. Samples drawn from at or near the service entrance represent city-supplied water that enters the building.

Other Terms Used in this Report

Accessibility Criteria (as described in the Board Adopted Policy E10.01 – Attachment A): Drinking water shall be easily accessible to all students and staff throughout the school day. In elementary schools with fountains in classrooms and libraries this means drinking water shall be accessible in each classroom, gym, auditorium and library. In elementary schools that do not have fountains in individual classrooms and libraries, this means drinking water shall be accessible in hallway locations dispersed throughout the school. In middle and high schools, this means it shall be available in a number of locations dispersed throughout the school. Staff lounge fountains which do not meet standards will be disabled instead of fixed; lounge sinks which do not meet standards will be posted with signs.

Point-of-Entry (POE) treatment device. A treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building (USEPA, 2007)

Point-of-Use (POU) treatment device. A treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap (USEPA, 2007)

References

USEPA. 2007. Office of Ground Water and Drinking Water- Drinking Water Glossary. <http://www.epa.gov/OGWDW/Pubs/gloss2.html#P> accessed 03/29/2007.

