

## SOURCE DEFINITIONS

**Agriculture** – Consists of many agriculture activities that include crops, pasture, animal feeding operations, waste spreading, fertilizers, etc. Other subcategories of the Agriculture Source are Crop, Grazing and Feeding Related Agriculture which may be used to more accurately describe the source. Probable causes of impairment associated with this source are organic enrichment, nutrients, pesticides, siltation, and pathogens.

**Construction** – Earth moving and disturbance related to highway, road and bridge building activities and other land development activities (i.e. new subdivisions for residential housing and commercial properties). Probable causes of impairment associated with this source are siltation, thermal modifications, and turbidity.

**Golf Courses** – Land management activities related to maintenance of golf courses. Probable causes of impairment associated with this source include habitat alterations, siltation, pesticides, nutrients, pathogens, and thermal modifications.

**Habitat Modification** – Changes to habitat associated primarily with land development activities. Other subcategories of Habitat Modification are Removal of Vegetation, Bank Modifications, and Draining and Filling may be used to more accurately describe the impairment. Probable causes of impairment associated with this source include habitat alterations, thermal modifications, flow alterations, filling and draining, and siltation.

**Hydromodification** – Modification of hydrologic regimes by damming, channelizing, and dredging. Other subcategories of Hydromodification are Channelization, Dredging, Upstream Impoundment, and Flow Modification/Regulation may be used to more accurately describe the impairment. Probable causes of impairment associated with this source include habitat alterations (lack of or removal of habitat by concrete channels and dredging), thermal modifications, suspended solids, DO from upstream impoundments, and flow alterations due to discharge regulation.

**Municipal Point Source** - Any publicly owned treatment works (sewage and wastewater treatment plants) that process domestic, industrial and commercial waste waters. A subcategory of Municipal Point Source is Package Plants, includes single residence sewage treatment plants (SRSTP) and small STPs that are prefabricated. Probable causes of impairment associated with this source are nutrients, ammonia, chlorine, dissolved solids, suspended solids, turbidity, pH, and pathogens.

**Other** – Sources of pollutants not listed separately.

**Source Unknown** – Source that cannot be determined. Should only be used when unable to conduct an exhaustive investigation of potential sources of pollutants.

**Urban Runoff/Storm Sewers** – Runoff from impervious or urban areas to surface waters from precipitation, snowmelt and subsurface drainage and may be conveyed by storm sewers. The Small Residential Runoff (less than 25 acres developed?) subcategory may be used to more accurately describe the impairment. The most obvious probable causes of impairment associated with this source are habitat removal caused by bank erosion, or streambed scouring, or smothering of habitat by siltation. Other probable causes are oils and grease, metals, pathogens and nutrients.

Note that *Channelization*, *Flow Regulation/Modification* and *Upstream Impoundment* are subcategories of **Hydromodification**.

Note that *Removal of Vegetation* is a subcategory of **Habitat Modification**.

Note that *Grazing Related Agric* is a subcategory of **Agriculture**.

Note that *Small Residential Runoff* is a subcategory of **Urban Runoff/Storm Sewers**.

Source: *Appendix A – Sources and Cause Definitions*, PADEP, Commonwealth Of Pennsylvania, 2013 *Assessment Methodology*, downloaded September 2014  
[http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/2013%20Methodology/AppendixA\\_SourceCause%20Definitions.pdf](http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/2013%20Methodology/AppendixA_SourceCause%20Definitions.pdf)

## CAUSE DEFINITIONS

**Cause Unknown** – Used when the cause of impairment cannot be identified. Should be used only when unable to identify cause when unable to do immediate follow up or when no cause can be identified.

**Excessive Algal Growth** – Large algal standing crops generally occurring due to high concentrations of nutrients.

**Flow Alterations** – Changes in hydrologic regime as a result of water regulation (including dams without, or with insufficient minimum releases), or dewatering as a result of bedrock fracturing from mining activities, or lack of base flow due to reduced rain water infiltration in urban areas or reduction in base flow caused by ground water withdrawals.

**Metals** – High concentrations in stream of various metals caused by mining and other resource use/extraction activities as a non point source pollutant. Iron, Al, and Mn typically precipitate and are frequently obvious, but other metals may be present in high concentrations with no visible precipitate present. Metals may also enter streams as point source pollutants from industrial and municipal waste treatment plants. May also include heavy metals that biomagnify (Hg) or bioaccumulate (Pb).

**Nutrients** – Presence of excessive quantities of Phosphorus and/or Nitrogen that under the proper conditions may result in dense algal or macrophyte growth and wide fluctuations in Dissolved Oxygen levels. Average daily DO may be relatively normal. Biological impairment may occur without numeric criteria violations.

**Organic Enrichment/Low D.O.** – Excessive quantities of organic material instream causing severe DO sag, and may result in low average daily dissolved oxygen.

**Other Habitat Alterations** – Habitat changes due to sever bank erosion, removal or lack of riparian vegetation, and concrete channels and streambeds.

**Pathogens** – High levels of fecal coliform bacteria that are indicators of the potential for disease causing bacteria, viruses, and protozoans.

**PCB** – Man made compound (no known natural source of this compound) used in electrical equipment, hydraulic fluids and heat-conducting fluids and other industrial applications. Manufacture of PCBs ceased in 1977. When introduced into the environment, these compounds biomagnifying up the food chain and as a result, concentrations increase rapidly as humans and other wildlife consume them. PCBs primarily enter the environment through contaminated sites and sediments. Impairment results when fish tissue sample results exceed the chronic criteria, resulting in the issuance of fish consumption advisories to protect human health.

**Pesticides** – Group of man made chemical compounds (diazinon, carbaryl, chlproprifos, prometon, atrazine, etc) used for the control of pests. These pesticides have a direct impact on the aquatic communities and often result in aquatic life use impairment and violations of Chapter 16 criteria violations.

**Siltation** – Aggradation of “clean” sediments or soils in excess of what the stream channel can transport. Results in smothering of habitat for macroinvertebrates and fishes.

**Suspended Solids** – Organic solids suspended in the water column, primarily from sewage. May also be from inorganic sediments associated with land use.

**Water/Flow Variability** – Changes in hydrologic regime caused by water releases, increased surface runoff from impervious surfaces during storm events, scouring and drought. Results in unstable environment for macroinvertebrates and fishes. Habitat alterations include stream widening, substrate paving, shallower pools, etc.

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