SUMMARIES OF EPA WATER POLLUTION REPORTING CATEGORIES USED IN THE ATTAINS DATA SYSTEM

This document includes summaries of 34 general reporting categories used for EPA ATTAINS data on polluted waters. The summaries were developed for non-technical audiences to explain clearly what the category is, where the pollution comes from, how it can harm the environment or human health, and what individuals can do to help reduce the problem. These summaries of ATTAINS reporting categories also appear along with simplified common category names in ***How's My Waterway***, a local-scale search application that retrieves ATTAINS data and translates it for general audiences. Simplified names from ***How's My Waterway*** appear in parentheses after the ATTAINS name in the coming pages.

ALGAL GROWTH (EXCESS ALGAE) *can occur when too many nutrients, warm water temperatures, and reduced flow trigger the overgrowth of naturally occurring algae into thick mats on or in the water. Blooms of algae can harm aquatic life by clogging fish gills, reducing oxygen levels, and smothering stream and lake beds and submerged vegetation. Some algae blooms can produce poisons that harm human health, pets, wildlife, and livestock when swallowed.*

What you can do: People can help reduce algae blooms in their local waters by using lawn and plant fertilizer sparingly and never before storms, regularly checking and pumping septic tanks, never dumping plant or animal waste in a waterway, disposing of pet waste in the trash, pumping boat waste to an onshore facility, and planting native plants to reduce excess nutrients entering waterways. Learn more about harmful freshwater algae, and how to reduce nitrogen and phosphorus pollution that causes excess algae growth.

Summary: Ranging from microbes to large seaweeds, algae are a natural part of the plant life in fresh and salt waters. They can become a problem when high nutrients and light, warmer temperatures, and low water flow result in very rapid growth. Runoff from over-fertilized lawns and croplands, leaking septic systems, wastes from animal feedlots, pets, industry, untreated sewage overflow, removal of shoreline plants, and reduced water flow due to irrigation or drinking water withdrawal all can contribute to a bloom. Algae blooms can harm aquatic life by clogging the gills of fish and small aquatic animals, reducing oxygen in the water, or by smothering corals and submerged aquatic vegetation. Algae blooms can also discolor the water, form huge, smelly piles on beaches, or cause drinking water, fish, and shellfish to taste bad. A small percentage of algae produce poisons that can cause illness in humans, pets, fish, livestock, and birds, which could result in death. Economic concerns associated with harmful algae blooms include increased drinking water treatment costs, loss of recreational and tourism income, loss of shellfish and fisheries jobs and food products, and livestock sickness or deaths. Coastal harmful algae blooms have been estimated to result in economic impacts to the United States of at least $82 million each year. Due to the potential human health risks, freshwater algae toxins are on the EPA drinking-water contaminants list, and fish and shellfish advisories are frequently posted in coastal areas. Around 1200 waters have been reported in this pollution category nationwide as of 2015, and several thousand more waters reported as polluted by nitrogen and phosphorus (nutrient) pollution or low dissolved oxygen can also involve algal growth problems.

AMMONIA *occurs naturally in water in trace amounts, but too much ammonia from fertilizers, sewage and other wastes can be poisonous to fish, especially when water temperature and pH are high. Ammonia can also cause heavy plant growth, foul odors, and low oxygen levels that can interfere with use for fishing, swimming and water supplies.*

What you can do: People can help reduce ammonia/nitrogen pollution by applying the correct amount of fertilizer on lawns and not applying it before storms, never dumping manure in or near a stream, picking up and disposing of pet waste in the trash, regularly pumping out septic tanks, and pumping boat waste to an onshore facility. Read more about ammonia pollution effects and what you can do to help reduce ammonia pollution.

Summary: Ammonia occurs naturally and is used in small amounts by plants for growth, but too much of it becomes poisonous to aquatic life especially in higher water temperatures and pH (water that is

more basic than acidic). Ammonia is a common cause of fish kills and can harm people's health after it is converted to nitrate by bacteria in the water. High nitrates in groundwater used for drinking have been linked to potentially fatal oxygen levels in babies, known as "blue-baby syndrome." Also, excess ammonia can cause heavy growth of harmful algae, which can cause illness in humans if swallowed during recreational activities such as swimming. Too much ammonia can also cause oxygen-poor waters, since dissolved oxygen in water is used up by bacteria and other microbes in converting ammonia into their food. Common man-made sources of ammonia pollution include fertilizer production and use, manure application to farmland, septic seepage, concentrated animal feeding operations, untreated sewage overflow, and animal and industrial waste. As of 2015, around 400 waters have been reported as polluted by ammonia. However, ammonia pollution also plays a big role in nitrogen and phosphorus pollution, which is currently the third highest reported cause of water pollution in the US affecting over 7,900 waterways as of 2015.

BIOTOXINS (BIOLOGICAL POISONS) *are toxins produced by aquatic plants, animals, and microbes that can sicken or even kill fish, shellfish, pets, livestock, wildlife, and people when swallowed or contacted. The leading producers of these poisons are blue-green algae, which can bloom into thick mats when high temperatures, still water, low water levels, and high nutrient levels are found.*

What you can do: People can help reduce the occurrence of toxic algae in their local waters by using lawn and plant fertilizer sparingly and never before storms, regularly checking and pumping out septic tanks, never dumping plant or animal waste in a waterway, disposing of pet waste in the trash, pumping boat waste to an onshore facility, and planting native plants near shores to reduce nutrient runoff into waterways. Learn more about harmful algal blooms and their toxins, and ways to reduce nitrogen and phosphorus pollution that causes excess algae.

Summary: Biological poisons (biotoxins) are water pollutants produced by microbes, animals or plants that can cause illness or death in humans, pets, fish, livestock, and birds. Most of the 82 waters reported in this category nationwide as of 2015 contain toxins produced by blue-green algae. Several thousand more waters are affected by nitrogen and phosphorus (nutrient) pollution, algae growth, or low dissolved oxygen, which can be associated with a potential biotoxin problem. Blue-green algae occur naturally in smaller numbers, but can become a problem when high nutrients and light, warmer temperatures, and/or low water flow, resulting in very rapid growth that creates dense blue-green algae blooms. Runoff of fertilizers on lawns and croplands, leaking septic systems, wastes from concentrated animal feeding operations, livestock farming, pets, and industry, untreated sewage overflow, removal of shoreline plants, and altered water flow for irrigation, municipal water supplies and industry all can contribute to cause a harmful bloom. Exposure to toxins from blue-green algae may occur through swallowing tainted water or fish, inhaling water vapor near a bloom, or contacting polluted water during recreational activities such as swimming. Economic concerns associated with harmful algae blooms include increased drinking-water treatment costs, loss of recreational and tourism revenue, loss of shellfish and fisheries revenue, and livestock sickness or death. Pets and wildlife have died after drinking from waterways with blue-green algae blooms. Due to the potential human-health risks, freshwater algae toxins are on the EPA drinking-water contaminants list, and fish and shellfish advisories are frequently posted in coastal areas with toxic algae problems.

CAUSE UNKNOWN *is a reporting category used when a state has detected degraded conditions in a waterway but has reported no specific details about those conditions or the pollution that caused them.*

What you can do: Your state water program may have more recent information on pollution cause, or added information not reported to EPA about your waterway. Contact your state water program to ask, or to report anything about possible causes that you may have observed. See EPA's CADDIS website for information on scientific methods for solving unknown causes.

Summary: This reason for reporting a degraded waterway means that a state has monitored and detected degraded conditions in a waterway, but has reported no specific details about those conditions or the pollution that caused them. About 1,150 waters are in this category as of 2015. Waters can be moved to other pollution categories as more is learned about the actual causes. The degraded conditions observed by the state but not reported may have included degraded fish or invertebrate communities, degraded aquatic habitat, or possibly other effects. Due to the uncertainty about conditions, causes, and sources, it is difficult to generalize about this category's potential effects on human health and beneficial uses or environmental impacts, or provide links for additional detailed information.

CAUSE UNKNOWN - FISH KILLS *-- large numbers of dead fish in a localized area – may be due to water conditions such as low flow, high temperatures or low oxygen levels, or to fish diseases or spills of oil or toxic substances.*

What you can do: People can help by never dumping anything for any reason in a stream or lake, and reporting evidence of fish kills immediately to a state water quality or fisheries management office.

Summary: When unusual numbers of dead fish are found in one place or along a water body, the incident is referred to as a fish kill. Usually fish kills are due to low oxygen or a contaminant in the water, not enough water, or a disease. Most waters with fish kills due to a known pollutant or other cause are reported under the pollutant type. The cause of death is sometimes unknown or unreported. This category includes 64 waters reported for fish kills of unknown cause as of 2015. Fish kills may be due to an isolated event such as a toxic spill into the water, but also can happen repeatedly under recurring conditions such as low flow or depleted oxygen. Fish kills may not affect human health, but they often mean reduced or lost fishing opportunities for up to several years. Rotting fish also degrades several other waterside recreational uses. These losses of beneficial use can hurt local economies that involve recreation. A fish kill also harms the environment by reducing or removing a major part of the water body's food chain, and this may sometimes enable less desirable aquatic life to dominate.

CAUSE UNKNOWN - IMPAIRED BIOTA (DEGRADED AQUATIC LIFE) *means that the community of aquatic animals (fish, reptiles, amphibians, aquatic insects and others) normally expected in a healthy waterway is unhealthy, reduced, or absent, and the exact cause of the problem is unknown.*

What you can do: Your state water program may have more recent information or added information not reported to EPA about your waterway. Contact your state water program to ask, or to report anything about degraded aquatic life or possible causes that you may have observed. See EPA's CADDIS website for more information on harm to aquatic life from unknown causes.

Summary: This pollution category means that the biological community normally expected in a lake, stream or other waterway is unhealthy, much reduced, or absent, and the exact pollutant cause is not known. Over 4,000 waters are listed in this category as of 2015. Degraded aquatic life associated with known causes is also a widespread problem reported under several specific pollutant names. Aquatic life includes fish, reptiles and amphibians, and a large variety of aquatic insects and other invertebrates. Normally there are enough of each of these forms of life to survive, reproduce, and serve as food for other animals. When pollution reduces or removes one form of aquatic life, this change often harms others as well. For example, a pollutant that eliminates all aquatic insects in a lake may make it unable to support fish even if the fish are not harmed by the pollutant directly. As the cause for this category is not known, it is not possible to tell whether a pollutant that has affected the fish or other life in a particular waterbody may pose a risk to human health as well. On the other hand, because this type of degradation generally involves reduction or loss of either fish or their food supply, it can impact people who make a living in the fishing industry, those who rely on fish for a source of food, and those who enjoy fishing opportunities.

CHLORINE, *used as a disinfectant and bleaching agent, is poisonous to fish and other aquatic animals at low levels. Discharges from swimming pools, storm water drains, industrial and sewage treatment facilities, and marinas can be sources of chlorine in waterways.*

What you can do: People can help reduce chlorine pollution in our waters by never dumping or rinsing off chlorine-containing disinfectants where the rinse water can wash into storm sewers or directly into a stream, lake or other waterway. Private pools should be emptied onto the ground rather than into waterways or storm drains. Read more about chlorine health effects.

Summary: Chlorine is a greenish-yellow gas that dissolves easily in water. Chlorine is not a frequently reported cause of water pollution, but over 50 waters nationwide are listed in this category. Chlorine is poisonous to fish even at very low levels. One of the most important uses of chlorine is the disinfection of drinking water to kill disease-producing bacteria. Chlorine is also used as a disinfectant in wastewater treatment plants and swimming pools, a bleaching agent in textile factories and paper mills, and is an ingredient in many laundry bleaches. Chlorine gets in our waterways from sources such as wastewater and industrial discharges and spills, urban rainfall runoff into storm water drains, and marinas. Swimming pools can be a major source of chlorinated water if they are emptied into sanitary and storm water drain systems. The storm water drain system was designed to handle runoff from rain and snow only, therefore, swimming pool water directly released into storm water drains, streets, or gutters is not treated before discharge into nearby creeks and rivers. Chlorinated waters from drinking water systems might also be released to waterways from water main breaks, leaks, and overflows. These types of releases are rarely treated before entering waterways because they happen fast and are difficult to contain. Drinking water in most towns and cities is poisonous to fish because of the chlorine it contains. Because treating municipal and industrial water supplies uses a large amount of chlorine, the excess often enters waterways where it combines with decaying material, forming other chemicals that can be cancer-causing to humans and pose a health threat to other living things.

DIOXINS, *highly toxic chemicals used in some manufacturing processes, can build up in the food chain. They may settle in sediment or on aquatic plants, then eaten and concentrated by fish, other aquatic life,*

wildlife, and people. Dioxins are considered likely to increase cancer risk and may harm the immune system, hormone levels, and fetal development.

What you can do: Human exposure to dioxins largely occurs through the food we eat. To reduce your exposure to dioxins in waterways, pay attention to local fishing advisories for fish you catch and eat yourself. See more EPA information on dioxins.

Summary: Dioxins are highly toxic chemicals formed unintentionally by burning trash or leaded gasoline and as waste byproducts from manufacturing some pesticides. These chemicals can be found in fish, some waterways, and their bottom sediments. They can reach waterways through the air, by rainfall runoff and soil erosion from contaminated sites, from pulp and paper mills, and from other industrial discharges. Dioxin levels in the environment have been declining since the early seventies but are still a concern at some sites because they are long-lasting in the environment, and some dioxins are still released at low levels. As of 2015 approximately 560 waters are reported as dioxin-polluted, mainly in the more industrialized states. Dioxins are considered likely to increase the risk of cancer in people and wildlife. At low doses, dioxins are linked to non-cancer effects on fetal development, immune systems, hormone levels and reproduction. Dioxins in water are found in sediments or on plants where they can be eaten and become concentrated in fish and other aquatic life. These chemicals may build up to harmful levels in fish and in the human body.

FISH CONSUMPTION ADVISORY (FISH UNSAFE TO EAT) *means that eating fish or shellfish caught from the waterway has been limited or banned, usually for certain species of fish/shellfish and for one or more chemicals, microbes or other conditions. In rivers and lakes, fish consumption advisories are usually issued because contaminants such as mercury or PCBs exceed safe limits in fish flesh; in coastal waters, shellfish harvesting may be banned due to unsafe levels of bacteria.*

What you can do: Pay attention to warnings, they are meant to protect your health. Note that most pollutants can't be seen or smelled in fish, and even if the catch appears normal the warnings still apply. EPA's website on fish advisories contains much more information than How's My Waterway on specific waters with this problem.

Summary: This reporting category means that a state has issued a warning to protect people from health risks of eating contaminated fish and shellfish caught in local waters. This advisory warning may recommend limiting or avoiding eating certain kinds of fish, fish from specific waters or from specific water types (such as "all lakes statewide"). Sometimes there are stricter advisories for pregnant women, nursing mothers, and children, all of which are more easily harmed. States also issue other guidelines to let people know that fish from some waters are safe to eat. Just 98 specific water bodies are currently listed in 2015 for having contaminated fish under the polluted waters reporting process. The low number is because other affected waters have been reported under the pollutant name instead. Other state and local procedures for reporting this problem account for far more waters. The 2010 total of 4,598 advisories covered 42% of the Nation's total lake acreage and 36% of the nation's total river miles. A variety of pollutants may be responsible for warnings about eating fish, and all such warnings address risk to human health. Bans on shellfish harvest in coastal waters are often due to unsafe levels of bacteria, which may come from sources such as sewage leaks or discharges, failing septic systems, or manure runoff. Fish advisories are also often due to unsafe levels of mercury, PCBs and other chemical pollutants that can build up in fish flesh.

FLOW ALTERATION (ABNORMAL FLOW) *refers to changes in river or stream volume caused by removing water for irrigation, water supply, and industry, and by dams, which hold and release water on a man-made cycle. Reduced flow can lower oxygen levels, raise water temperatures, cause build-up of sediment and pollutants, destroy aquatic wildlife habitat, and degrade swimming, boating, and fishing.*

What you can do: People can use less water wherever possible during droughts or when using water from waterways that already have low flow problems. See EPA websites for more information on flow alteration.

Summary: Major changes in stream or river flow are a form of pollution because they can reduce or eliminate fish survival, degrade a variety of beneficial human uses and indirectly make other pollutants more harmful. Although removing surface water for use is essential and widespread throughout the US, reporting of flow alteration as a direct cause of degradation is limited to approximately 200 waters mostly in the eastern and central states as of 2015. Common causes of altered flow include water removal for irrigation, municipal water supplies and industry. These uses of water are important, but in extreme cases they can reduce or eliminate other uses such as navigation, fishing or recreation. Some waterways with reduced flow dry up entirely as a result of withdrawals. Reduced water flow also indirectly affects many pollutants by providing less water to dilute contaminants. Lower water volumes can contribute to stagnant, warm water, buildup of mucky sediments, low oxygen and loss of fish and other aquatic life.

HABITAT ALTERATION (DEGRADED AQUATIC HABITAT) *occurs when stream channels are changed or diverted through man-made channels, artificial shorelines and stream banks replace natural ones, or native vegetation is removed from shores and banks. These actions reduce the habitat that fish and other animals need to reproduce, feed, and find shelter, and can also affect the appearance and value of waterfront property.*

What you can do: Waterfront property owners or users can reduce habitat degradation by not removing streamside vegetation or channelizing streams, not filling stream pools, wetlands or other waters, keeping natural shorelines intact, and leaving some rocks, logs or native aquatic plants as cover for fish. These actions can maintain recreational uses and appearance while avoiding unnecessary maintenance chores and costs. Read more about degraded habitat causes and effects.

Summary: Degraded habitats are areas where the conditions needed for fish and other aquatic life to feed, reproduce, find shelter, and survive have been reduced or lost. About 860 waters throughout the US were identified in this pollution category as of 2015. Because damages to habitat by water flow changes or specific pollutants (such as sediment) are reported separately, this habitat degradation category mainly refers to structural changes, such as loss of pools or deep channels where fish can gather, removal of plants, logs and rocks that provide cover, or changes that make areas unsuitable for spawning. Stream straightening, channelization, filling stream pools, lining streambeds with concrete, and replacing natural shorelines with artificial walls are common forms of man-made habitat degradation. These types of changes can harm aquatic life but do not directly pose risks to human health. However, degraded habitats often make fishing and other forms of water-based recreation undesirable, and can impact the appearance and value of waterfront property.

MERCURY *is found in many rocks, including coal. Released into the air by coal-fired power plants, it settles on land and is washed into waterways. Spills and improper treatment and disposal of mercury-containing products or wastes are among other top sources of mercury in water. Mercury can build up in fish, which then poses health risks to people and animals that eat fish.*

What you can do: People can help reduce mercury in the air and water by purchasing mercury-free products and correctly disposing of products that contain mercury. Fish consumption warnings for specific waters concerning mercury are also compiled by EPA. Read more about mercury sources, risks and health effects.

Summary: Mercury, a metal that is found in air, water and soil, is known to most people for its use in products like thermometers, switches, and some light bulbs. Mercury ranks among the top ten national causes of water pollution, with over 4,500 waters reported as of 2015. Many of these reported waters are in northern states where special studies have detected large numbers of mercury-polluted lakes, including many in remote areas. As a water pollutant, mercury can build up in fish tissue, be dissolved in the water, or be deposited in bottom sediments. Mercury is found in many rocks, including coal. When coal is burned, mercury is released into the environment. Coal-burning power plants account for over half of all US man-made mercury emissions, but mercury in the air also involves worldwide sources. Burning hazardous wastes, producing chlorine, breaking mercury products, and spilling mercury, as well as improper treatment and disposal, can also release it into the environment. Mercury in the air eventually settles into water or onto land where it can be washed into water. Once deposited, certain microbes can change it into a highly toxic form that builds up in fish, shellfish and animals that eat fish. The most common way people can be exposed to mercury is by eating fish or shellfish that are contaminated with mercury. Eating fish from mercury-polluted waters should be avoided, especially by children and nursing or pregnant women. Eating mercury-contaminated fish or shellfish can affect the human nervous system and harm the brain, heart, kidneys, lungs, and immune system.

METALS OTHER THAN MERCURY *enter waterways from factories, mining, and runoff from urban areas, as well as from natural processes such as erosion of soil and rocks. At high levels, all metals such as arsenic, cadmium, chromium, copper, lead, selenium, and zinc can be toxic to aquatic animals and humans.*

What you can do: People can help by following proper disposal of metal-containing appliances and products. Read more about metals in waterways.

Summary: Metals occur in nature, although the amount occurring naturally varies according to local geology. The common metals occurring in water are arsenic, cadmium, chromium, copper, lead, nickel, selenium, zinc, and mercury, but EPA tracks mercury separately. Excess metals are the third most frequent reported cause of waterbody pollution, affecting over 5,900 waters nationwide as of 2015. Metals in waterways can come from human activities (industrial processes, mining, and rainwater runoff from urban areas) and natural processes (mainly erosion of soil and rocks) resulting in the release of metals into air, water, and soil. Metals at toxic levels in water are rarely due to natural causes alone. Metals on land and in soils can also infiltrate into groundwater. Disturbed soils in metals-enriched areas can wash into streams during storms. Metals in the air from industrial emissions can be deposited onto waters or land surfaces. All metals can be toxic to aquatic animals and humans at sufficiently high exposure levels. Human health problems from high exposure, such as drinking contaminated water over a prolonged period, can include damage to organs. Excess metals at toxic concentrations can affect the survival, reproduction, and behavior of aquatic animals and can result in fish kills. Additionally, toxic

levels of metals can decrease a waterway's suitability for industrial and household water uses. Metals can be removed from water destined for human use, but treatment can be expensive.

NOXIOUS AQUATIC PLANTS (EXCESS AQUATIC WEEDS) *choke waterways, degrade healthy aquatic habitats, and interfere with recreational uses such as swimming, fishing, and boating. Fertilizers, leaking septic tanks, pet and livestock wastes, sewage overflows and water withdrawals can contribute to the growth of excess aquatic weeds.*

What you can do: People can help control aquatic plants in their local waters by using lawn and plant fertilizer sparingly and never before storms, regularly checking and pumping out septic tanks, never dumping plant or animal waste in a waterway, disposing of pet waste in the trash, pumping boat waste to an onshore facility, and planting native plants to prevent nutrient runoff into waterways. Read more about ways to reduce nutrient pollution that causes the harmful overgrowth of aquatic plants.

Summary: Aquatic plants include native (naturally occurs in the waterway) and non-native (brought from somewhere else), non-invasive (not harmful) and invasive (harmful) plants. Normally, most aquatic plants play important and beneficial roles in waterways. However, under certain water conditions such as warmer temperatures, too much nitrogen and phosphorus pollution, and low flow, 'noxious' growth of native or non- native plants can choke off waterways and interfere with human uses and other aquatic life. Around 70 waters have been reported in this category nationwide as of 2015, and several thousand more waters are polluted by nitrogen and phosphorus (nutrient) pollution and organic enrichment, which can cause undesirable aquatic plants to become noxious. Overgrowth of both native and non-native plants can interfere with oxygen levels in the water, threaten survival of fish and other animals, make waterways unattractive, reduce property value, and degrade or prevent recreational uses including swimming, fishing, and boating. The use of fertilizers on lawns and croplands, leaky septic tanks, wastes from livestock farming, pets, untreated sewage overflow, removal of shoreline plants, and excess water withdrawal all can create favorable conditions for harmful overgrowth of aquatic plants.

NUISANCE EXOTIC SPECIES (NUISANCE PLANTS OR ANIMALS, FOREIGN), *often called invasive species, are plants, animals, fish, or microbes that are not native to the region and cause harm to native species, to recreation and other uses of the waterway, and/or to human health. In general, invasive species spread vigorously and enter waterways by many means such as accidental or intentional releases and attachment to boats and other recreational equipment.*

What you can do: People can help prevent the spread of aquatic invasive species by never dumping aquarium fish, plants or water into local waters, inspecting and thoroughly cleaning boats, trailers, and recreational equipment before use and after use, allowing watercraft to dry completely before launching into another body of water, and never releasing live baitfish or other bait. Learn more about waterways degraded by non-native, invasive species and how to help. EXIT Disclaimer

Summary: Nuisance species (also called invasive species) are non-native plants, animals, or microbes whose introduction to a waterway can be harmful to the environment, economy, or human health. Invasive species are one of the largest threats to marine and fresh waters. They can take over

waterways from desirable native plants and animals, degrade water quality and fish habitat, and reduce water availability. In turn, they can cause economic losses by reducing recreational and commercial activities such as sport and commercial fishing, boating, shipping, swimming, and shellfish consumption. Invasive species also can decrease aesthetics and property value, and clog industrial and municipal water pipes. The costs to control and eradicate these species in the U.S. alone amount to more than $137 billion annually. Common sources of aquatic invasive species introduction include ballast water from ships, boat hull fouling, aquaculture escapes, and other accidental and/or intentional releases. Even though invasive species affect many waterways, only 119 waters are currently listed under this specific pollution reporting category in 2015. The reason is that many waters polluted by nuisance species are listed in categories such as excess sediment or low oxygen where an aquatic invasive species is the source of the problem.

NUISANCE NATIVE SPECIES (NUISANCE PLANTS OR ANIMALS, NATIVE) *includes aquatic plants and animals that are native to the region (not brought in from elsewhere) but have become too crowded in the waterway due to other pollution. Overgrowth can interfere with oxygen levels in the water, threaten survival of fish and other animals, make waterways unattractive, reduce property value, and degrade or prevent recreational uses including swimming, fishing, and boating.*

What you can do: People can help control aquatic plants in their local waters by using lawn and plant fertilizer sparingly and never before storms, regularly checking and pumping out septic tanks, never dumping plant or animal waste in a waterway, disposing of pet waste in the trash, pumping boat waste to an onshore facility, and planting native plants to prevent nutrient runoff into waterways. Read more about ways to reduce nutrient pollution that causes the harmful overgrowth of aquatic plants.

Summary: Very few waters have been reported in this category nationwide, although other reporting categories exist with higher numbers for nuisance non-native plants and algae overgrowth. Normally, most species of native aquatic plants play important and beneficial roles in waterways. However, under certain water conditions such as warmer temperatures, too much nitrogen and phosphorus pollution, and low flow, abnormal growth of a few types of native plants can choke off waterways and interfere with human uses and other aquatic life. Under these same conditions, non-native plants can become a problem as well. Overgrowth of both native and non-native plants can interfere with oxygen levels in the water, threaten survival of fish and other animals, make waterways unattractive, reduce property value, and degrade or prevent recreational uses including swimming, fishing, and boating. The use of fertilizers on lawns and croplands, septic tank failure, wastes from livestock farming and pets, untreated sewage overflow, removal of shoreline plants, and excess water withdrawal all can create favorable conditions for harmful overgrowth.

NUTRIENTS (NITROGEN AND PHOSPHORUS) *in excessive amounts can cause aquatic plants to grow too fast, choking waterways, causing potentially harmful algae blooms, and creating low oxygen conditions that can harm fish and other aquatic life.*

What you can do: People can help reduce nitrogen and phosphorus pollution in their local waters by using lawn and plant fertilizer sparingly and never before storms, regularly checking and pumping our septic tanks, never dumping plant or animal waste in a waterway, disposing of pet waste in the trash, pumping boat waste to an onshore facility, and planting native plants to prevent nutrient runoff into

waterways. Read more about nitrogen and phosphorus pollution and learn more about what you can do to help reduce it. Technical details on nitrogen and phosphorus pollution can be found here.

Summary: Nitrogen and phosphorus (also called nutrients) are natural elements in the environment that are essential for plant and animal growth in normal amounts but are harmful in excess – too much of a good thing. These are among the top water pollutants nationally, degrading over 100,000 river and stream miles and over 3.5 million acres of lakes, reservoirs and ponds. About 7,900 nutrient-polluted waterbodies have been reported throughout the US as of 2015. Most nutrient pollution comes from runoff or discharges from fertilizing lawns and croplands, municipal waste treatment systems, and animal wastes from livestock farming. Excess nitrogen or phosphorus can cause too much aquatic plant growth and algae blooms, sometimes choking off waterways and causing toxic or oxygen-poor conditions that can kill fish and other aquatic life. Nitrogen and phosphorus pollution can be harmful to human health if the affected waterway is used for swimming or drinking water. Nitrates in drinking water wells have been linked to the fatal "blue baby syndrome." These pollutants can also harm local economies through increased drinking water treatment costs, poor fish and shellfish harvests, less income from reduced recreational tourism, and potentially reduced property values on polluted waterways.

OIL AND GREASE *includes fuel oil, gasoline, vegetable oil, and animal fats. Oils generally enter waterways through spills, leaks, and improper disposal, and can be toxic to plants and animals even in small amounts.*

What you can do: People can help reduce oil and grease pollution by always disposing of car oil and paints properly and never in storm sewers and drains, cleaning up spilled oil and grease with absorbent towels instead of hosing them into the street where they can eventually reach local waterways, and fixing oil leaks from vehicles right away. Read more about things you can do to prevent urban runoff leading to oil and grease pollution.

Summary: Oil and grease pollutants (oils) include petroleum (fuel oil, diesel oil, and gasoline) and non petroleum (vegetable oil and animal fats) oils. Oils are almost everywhere in small amounts, but they are a reported cause of water pollution in about 190 waters nationwide as of 2015. This pollutant tends to enter waterways as a result of leaks and spills occurring on land and on the water. Although large, major spills tend to be highly publicized and can do significant damage to waterways, small unreported spills also damage local waters and are more common. Oil and grease pollution affecting inland waters is often the sum total effect of many car/truck oil leaks, small unreported spills, or improper disposal of used oil that makes its way into storm drains. Other sources of spills and leaks can include oil production onshore and offshore, industrial food production facilities, fueling stations (marine and land), boats, and jet skis. Although heavier oils may sink and build up around rocks and sediments, most oils tend to float and spread on the water surface, creating a slick. Wind, water currents, and warmer waters can cause slicks to spread. Without much water movement, oils tend to collect in one spot and remain for long periods of time. Even in small amounts, oil can be toxic to plants and animals that live on or around the water surface and those that live under water, resulting in smothering or toxic effects. Spilled oil can also damage parts of the food web, contaminating fish and plants that we eat and water used for drinking.

ORGANIC ENRICHMENT/OXYGEN DEPLETION (LOW OXYGEN) *levels in water can occur naturally for short periods, but when they are extreme or long-lasting, they can sicken and even kill fish and other aquatic animals. Sewage wastewater, leaking septic tanks, farm and feedlot runoff, and runoff from city streets contain organic materials that decompose and use up oxygen in water; higher water temperature also lowers oxygen levels.*

What you can do: People can help avoid low dissolved oxygen problems in their local waters by never dumping plant or animal waste in a waterway, applying the correct amount of fertilizer on lawns and never before storms, disposing of pet waste in the trash, pumping out septic tanks regularly, and pumping boat waste to an onshore facility. Read more about dissolved oxygen pollution and what you can do to reduce nutrient pollution that results in organic enrichment and low dissolved oxygen.

Summary: Dissolved oxygen in the water is essential for healthy waterways. Aquatic plants consume oxygen at night even in healthy waters, so oxygen levels in the water can change naturally. Severe depletion of oxygen, however, is usually due to human activities that increase the amount of plant parts, chemicals or animal and human waste in the water. Prolonged periods of low dissolved oxygen are harmful to most aquatic life and can cause fish kills and large dead zones (areas that can't support aquatic life). Low dissolved oxygen and decay can cause foul smells and make waterfront properties and recreation unattractive. When excess organic matter enters the water and decays, it depletes the oxygen below levels that fish and other aquatic life forms need to survive. Some types of chemical pollutants also decrease oxygen in water and have similar effects. Runoff of chemical and manure-based fertilizer applied to lawns and croplands, septic or untreated sewage overflow, animal wastes from livestock farming and pets, and industrial waste such as discharges from pulp and paper mills can cause low oxygen. Reservoirs and activities that involve straightening streams can also cause oxygen-poor waters because they mix the air and water less than normal streamflow and decrease aeration. Prolonged high temperatures can also decrease oxygen since warm water cannot hold as much oxygen as cold water. Around 6,700 waters have been reported in this category nationwide as of 2015, making this the fourth most common reporting category, and several thousand more waters with nitrogen and phosphorus pollution or high temperature also affect dissolved oxygen in waters.

OTHER CAUSE *is a 'miscellaneous' reporting category used for dissolved gases, floating debris and foam, leachate, stormwater pollutants, and many other uncommon causes lumped together.*

What you can do: Your state water program may have more detailed information not reported to EPA about pollution causes. Contact your state water program with questions or to report what you have observed that may involve pollution causes.

Summary: This reporting category is not commonly used, and includes about 450 waters nationwide from recent reporting as of 2015. Waters in this 'miscellaneous' category represent a wide variety of types of problems. Some examples include dissolved gases, floating debris and foam, leachate, stormwater pollutants, and many other causes. Due to the variety of causes and sources, it is difficult to generalize about this category's potential effects on human health and beneficial uses or environmental impacts, or provide links for additional detailed information.

PATHOGENS (BACTERIA AND OTHER MICROBES) *are potentially disease-causing organisms from human or animal wastes that enter waters through septic tank leaks or sewage discharges, farm and feedlot manure runoff after rain, boat discharges, and pet and wildlife waste. People can become ill by eating contaminated fish or shellfish or swimming in waters with high levels of these microbes.*

What you can do: People can help reduce pathogen contamination by never dumping animal or boat waste in a waterway, fixing leaky septic tanks, picking up pet waste, and avoiding manure application close to shorelines or drainage ditches. Read more about pathogens in waterways and drinking water and health risks from pathogens.

Summary: Disease-causing bacteria and other microbes (viruses and protozoa) are called pathogens, and they usually come from human or animal waste. They are the most commonly reported cause of water pollution nationwide, with over 10,600 waters identified as of 2015. These microbes enter US waterways from both man-made and natural sources, and can affect human and animal health as well as several beneficial uses. They reach the water directly in urban and suburban areas from wastewater treatment plants, sewer overflows, failing sewer lines, slaughterhouses and meat processing facilities; tanning, textile, and pulp and paper factories; fish and shellfish processing facilities; sewage dumped overboard from recreational boats; and pet waste, litter and garbage. Rural sources include livestock manure from barnyards, pastures, rangelands, feedlots, unfenced farm animals in streams, improper manure or sewage land application, poorly maintained manure storage, and wildlife sources such as geese, beaver and deer. The amount of bacteria and other microbes present, and thus the health risks they represent, can change rapidly due to factors such as rainfall and runoff from the sources mentioned above. Serious but rarely life-threatening illnesses are caused mainly by swallowing pathogen-contaminated water during swimming or other recreation, but can also come from skin contact with the water or eating contaminated fish or shellfish. Livestock, pet, and wildlife illnesses can also occur. Besides causing illnesses, pathogens in waterways can cause significant economic losses due to beach closures, swimming and boating bans, and closures of shellfish harvest beds. When present in raw drinking water sources, they can be treated but require advanced and expensive methods to disinfect and filter the water supply.

PESTICIDES *such as herbicides and insecticides include a variety of toxic chemicals used to kill unwanted pests or weeds. In water, pesticides can affect the health of aquatic insects, fish, plants, and animals who are exposed through feeding or contact.*

What you can do: People can reduce pesticide pollution in waterways by always using insecticides and herbicides in proper doses, well away from waters or drainage ditches, only on still days, and disposing of waste properly. See more information on pesticide human health effects, insecticide effects on waterways, or herbicide effects on waterways.

Summary: Pesticides (including insecticides, fungicides and herbicides) are a broad variety of chemicals used to kill unwanted pests or plant life. About 1,800 waters throughout the US are currently reported as polluted by pesticides in 2015. Although pesticides are mainly used around homes, forestry, and agriculture, they can easily enter waters through direct application, drift from airborne applications, stormwater or irrigation runoff, discharge from industries, or wastewater treatment plants. Timing and amount of pesticide used, rainfall and wind after use, and how fast the pesticide degrades all affect how much of it may reach the water. The potential human health effects of pesticides depend on the type of

pesticide and amount of exposure, but can include nerve damage, hormonal effects, skin or eye irritation, or cancer-causing or reproductive effects. However, in many cases the amount of pesticide to which people are likely to be exposed is too small to pose a risk. Insecticide and herbicide effects on waters can be significant. Aquatic insects may be especially susceptible to insecticides, affecting a main food supply for fish. Fish themselves also can be killed or affected by slowed growth, less disease resistance, and poor reproduction. Death of aquatic plants from herbicides can remove food sources and cover for aquatic life, reduce oxygen and water quality, and degrade fish habitat.

PH/ACIDITY/CAUSTIC CONDITIONS (ACIDITY) *outside a certain range can sicken or kill fish and other aquatic life. Highly acidic or alkaline water can also release pollutants from sediments that can further harm aquatic life. Acidity in waterways is influenced by rock and soils, as well as human sources such as industrial and car emissions, mining, and agricultural runoff.*

What you can do: People can help reduce pH problems by applying the correct amount of fertilizer on lawns (and never before storms), properly disposing of chemicals such as household cleaners, and never dumping any of the above into ditches, waterways and storm drains. Read more about pH, and what you can do to help reduce acid rain.

Summary: The health and survival of aquatic plants and animals depends heavily on pH, which is a measurement of how acidic or basic the water is. Think of acid and base as two extremes, with neutral in the middle; a pH toward either extreme is generally harder for aquatic life to survive. Most aquatic plants and animals under those extreme conditions have reduced ability to grow, reproduce, and survive. Low pH (acidic) can cause toxic metals such as aluminum and copper to dissolve into the water from bottom sediments. High pH (basic or alkaline conditions) can increase the toxic form of ammonia, which can further harm fish and other aquatic life. Natural sources that influence acidity in waterways are the surrounding rock and soils, and processes such as decay of plants. Human activities that can result in acidity include agriculture (animal feedlots), urbanization and industry (emissions from vehicles and coal-fired power plants leading to acid rain and ocean acidification), and mining (acid mine drainage). Although human activities commonly result in more acidic conditions, high alkaline conditions can occur by means of stormwater runoff from sources associated with agriculture (lime-rich fertilizers) and urbanization (asphalt roads), wastewater discharges and leakage from sources associated with industry (e.g., soap manufacturing plants), and mining (oil and gas brine mining wastes). Around 4,300 waters have been reported as polluted by pH problems as of 2015, making this the 8th most common reporting category.

POLYCHLORINATED BIPHENYLS (PCBs) *are a toxic mixture of industrial chemicals which, although banned since the 1970s, are long-lasting in fish tissue and in the bottom sediments of rivers and lakes. PCBs in fish that are eaten by humans and wildlife can build up and may have cancer-causing and other health effects. PCB contamination has caused many fishing bans and warnings.*

What you can do: Your state water program may have more information about PCBs not reported to EPA. Contact your state water program with questions. See EPA websites for basic PCB information and PCB health effects.

Summary: PCBs, or polychlorinated biphenyls, are a toxic mixture of chlorinated chemicals that were banned in the late 1970s but are still a common pollutant because they build up in fish flesh and are long-lasting in the bottom sediments of rivers and lakes. Over 6,100 water bodies are listed in the PCB-polluted category as of 2015, making this the sixth-highest water pollution cause. PCBs have reached waterways worldwide by direct dumping, leakage from landfills not designed to handle hazardous waste, and through the air after burning PCB-containing waste. Originally PCBs were widely used in industry, particularly as coolants and lubricants in transformers and other electrical equipment. PCBs have been shown to cause cancer in animals. Studies have also provided evidence of potential cancer-causing effects in humans. Non-cancer health effects on the immune system, reproductive system, and nervous system in animals have been documented. PCBs are also related to deformities in birds and heart effects in young fish. PCB risks to human health occur when PCBs build up through eating PCB-contaminated fish and other sources. Other negative effects on people include recreational and commercial fishing bans at numerous PCB-contaminated lakes and rivers and the related economic impacts over the past 30 years.

RADIATION *can enter waterways through eroding or dissolving underground deposits of radioactive metals such as uranium, from the air due to accidental or intentional release, in seepage from improper disposal sites, in mining runoff or dumped mine tailings, or from industrial activities. It can become a health concern when radioactive materials become concentrated in waterways.*

What you can do: Read more about radiation and US waterways.

Summary: Although quantities that pose a health risk are uncommon and localized, radiation can be a water pollutant in some US waterways. 52 polluted waters currently occupy this reporting category as of 2015. Radioactive atoms, known as "radionuclides," are a water pollutant that comes originally from underground deposits of radium, uranium and other radioactive metals. Radioactive materials can enter water by being deposited in surface water from the air, by entering ground water or surface water from the ground through erosion, seepage, or human activities such as mining, farming, storm water, and industrial activities, or by dissolving from underground mineral deposits as water flows through them. Health becomes a concern when radionuclides become concentrated in bodies of water due to natural occurrences, accidental releases of radioactivity, or improper disposal practices. The primary environmental and human health risks from radiation involve cancer, but the degree of risk varies with how much radiation is involved over how long a time period.

SALINITY/TOTAL DISSOLVED SOLIDS/CHLORIDES/SULFATES (SALTS) *are minerals that dissolve in water; they can be toxic to freshwater plants and animals and make water unusable for drinking, irrigation, and livestock. Water withdrawals, road de-icing, human and industrial wastewater, fertilizer applications, mining and oil or gas drilling, and repeated use of irrigation water contribute to high levels of salts*.

What you can do: People can help by minimizing the use of de-icing salts where they may be washed off into waterways, storm drains and ditches. Please see more information on the sources and effects of salts on our waterways.

Summary: Salts are minerals that dissolve in water. Common table salt is a familiar example that consists of sodium and chloride, but salts can also consist of other minerals such as calcium magnesium, sulfate, bicarbonate, and potassium. Dissolved salts are essential to life in our waters when in small quantities, but too much is harmful to freshwater aquatic life and many human uses. More than 1,900 normally fresh water bodies across the country have been listed as polluted in 2015 because they contain too much salt. Most freshwater plants and animals tolerate only very low amounts of salts, and can sicken or die when these ranges are exceeded. Although salts occur naturally, human activities can increase salts to beyond the range tolerated by freshwater aquatic life. At higher salt levels, water becomes unusable for drinking, crop irrigation, livestock watering, and manufacturing. Some of the sources and activities that increase the salts in streams, lakes, groundwater and other waters include disposal of human and industrial wastewater, fertilizer and lime application, irrigation, mining and oil production, weathering of cement in urban areas, salt-water intrusion into drinking water supplies in arid areas and along the coasts, and de-icing treatment of roads and other surfaces during the winter. Once in a waterway, excess salt is very difficult to remove. Preventing salt from entering water in the first place is the best management strategy.

***SEDIMENT** is a problem when rain washes soil into waterways from fields, construction sites, yards, logging areas, city streets and other disturbed areas. Sediment can make water murky, hurt the health and habitats of fish and other aquatic animals, interfere with uses like fishing and swimming, and carry other pollutants sometimes including toxic chemicals.*

What you can do: People can help reduce sediment pollution by limiting soil erosion in any way possible, including not removing native plants from stream edges, not disturbing soil near ditches or waterways, and routing rainwater to areas where it can soak in rather than directly dump into a lake, stream or sewer system. Read more about sediment effects on waterways and ways to help control sediment problems.

Summary: Sediment is material eroded from rocks or soil and then transported and deposited in water. Sediment in the proper quantity is a natural part of the banks and bottom of lakes, streams and other waterways, but it becomes a problem when too much fine sediment enters the water or when it is contaminated by other pollutants. Excess fine sediment is one of the most common forms of pollution, reported as of 2015 in over 6,400 water bodies from all parts of the US. These waters most often suffer from excessive suspended sediment in the water or too much deposited fine sediment on the bottom. Too little sediment below dams sometimes causes streams to scour their channels and destroy fish habitat. Sediment problems happen when rain washes silt and other soil particles off of plowed fields, construction sites, logging sites, urban areas, and strip-mined lands into waterbodies. The sediment may clog and damage fish gills or suffocate eggs and aquatic insects on the bottom. Suspended silt may interfere with recreational activities like boating, fishing or swimming and degrade the beauty of waterways by reducing water clarity. Although sediment itself is generally harmless to human health or safety, indirect environmental or health risks can happen when nitrogen and phosphorus pollution and a variety of toxic chemicals attach to sediment particles on land and ride the particles into surface waters.

TASTE, COLOR AND ODOR *problems may indicate that pollutants are present; however, these problems are of concern mainly because they affect uses of waterways, such as swimming, drinking water supply, or aesthetic enjoyment.*

What you can do: Never dispose of any kind of waste into or close to any waterway. Learn more about taste, color and odor in drinking water.

Summary: This category of waterways may imply that water pollutants are present, but it is based mainly on the undesirable sensations they cause rather than for actual harm to human or environmental health. Although an unpleasant taste, color or odor may not be harmful to people or the environment, it can have a powerful effect on whether a waterway is acceptable by a community for many beneficial uses. Odor and taste, which can be caused by a wide variety of dissolved substances, are useful indicators of water quality even though odor-free water is not necessarily safe to drink. Color may be indicative of dissolved plant material or the presence of dissolved metals. Over 100 waters nationwide are listed for taste, color or odor problems in 2015, but only a small minority of states uses this reporting category. Most state water quality standards say generally that lakes, streams and other waters must be free from objectionable odors, tastes or colors, regardless of their use. But when the waterway is also a drinking water source, these characteristics become much more important because unpleasant levels can cause a community to reject the source as drinking water or require additional, expensive drinking water treatment to remove tastes, colors or odors. Further, unpleasant colors or odors in recreational waterways can lead people to reduce or stop their recreational uses of these areas, leading to local economic losses.

TEMPERATURE: *Many fish and other aquatic animals are sensitive to changes in water temperature and require a certain temperature range to survive. If water temperature goes outside that range for too long, they can sicken or die.*

What you can do: People can help avoid water temperature problems by not removing shade trees and shrubs from streambanks, using less water during droughts, and directing rainwater on pavement to soak into the ground instead of running into streams, lakes, or sewer systems. See more information on water temperature.

Summary: Abnormally high water temperature impacts aquatic life in many streams, lakes and other waters nationwide. As of 2015 about 3,100 waters have been reported as degraded by high temperature, mostly in the Northwest and the Northeast, due to concerns over salmon and trout survival. Waters can become too warm for fish and other life due to rain running off hot pavement, warmer water discharges from industry or agriculture, increased sunlight from streambank vegetation removal, and major water withdrawals in summer, leaving less water that heats more rapidly in the sun. High water temperatures can harm or kill fish and other life mainly by reducing the oxygen in the water or by raising temperatures above their survival limits. Warmer waters can also increase toxicity of pollutants, cause faster growth of undesirable algae blooms, and increase the spread of diseases in fish. Although high water temperature does not directly affect human health, it can speed up the growth of waterborne bacteria or toxic algae that can harm people or their pets if swallowed or contacted. Elevated temperature also directly degrades valuable uses such as recreational fishing, boating, and commercial salmon fishing.

TOTAL TOXICS *include a large number of harmful, man-made substances such as solvents, pesticides, fungicides, dioxins, PCBs, and furans. They enter waterways through improper application and disposal, runoff, spills, auto exhaust, and burning of chemical wastes. These chemicals are toxic to animals and people.*

What you can do: People can help eliminate toxics in waterways by never rinsing out contaminated containers or dumping directly into waterways or storm sewers. Also never flush down the toilet anything known to be poisonous, such as paints, paint strippers, other solvents, cleansers and disinfectants, prescription drugs, and automotive products. Read more about toxic chemical effects in waters and what you can do to help reduce toxic chemicals in our waterways.

Summary: Total toxics is a term used when a mix of harmful chemical pollutants occurs in a waterway. Roughly 500 waters nationwide are in this reporting category as of 2015, which is used when the exact types of chemicals in the water are not specified. Toxics in water or contaminated sediment may have come from industrial activities, wastewater treatment plants, landfills or hazardous waste sites. The potential for toxics to harm living things is dependent on the type and amount of the chemicals and how long a living thing has been exposed to them. Toxic chemicals in water can harm aquatic plants and animals by decreasing reproduction, increasing disease, and in some cases causing death. Toxic chemicals in higher amounts and over time generally can harm people's immune, reproductive, and nervous systems, and in some instances are cancer-causing.

TOXIC INORGANICS *refers to a wide range of pollutants including metals, fire retardants, cyanide, and perchlorate (used in rocket fuel) that are poisonous to aquatic life and people. Industrial or wastewater discharges, mining, landfills, and air deposition of car exhaust and coal-fired power plant emissions can contribute to high levels of toxic inorganic chemicals in waterways.*

What you can do: People can help eliminate toxics in waterways by never rinsing out contaminated containers or dumping directly into waterways or storm sewers. Also never flush down the toilet anything known to be poisonous, such as paints, paint strippers, other solvents, cleansers and disinfectants, prescription drugs, and automotive products. Read more about toxic chemical effects in waters and what you can do to help reduce toxic chemicals in our waterways.

Summary: Toxic inorganics are human-made or naturally occurring chemicals that can harm the health of aquatic life and people if exposed at high enough levels. Toxic inorganic pollutants include a wide range of chemicals from a wide array of sources. The most common toxic inorganic water pollutants as of 2015 are reported separately in their own categories, including mercury (over 4,000 waters reported), and other metals (around 6,000 waters reported). Around 370 other waters have been reported under the category of toxic inorganics, including antimony (used as a fire retardant in textiles and plastics), fluoride (added to drinking water to promote dental health), ozone (used to treat water to kill bacteria and viruses), cyanide (used in metal treatment), and perchlorate (used in rocket fuel). Human activities are usually responsible for introducing toxic concentrations of inorganic chemicals to waterways, including direct discharges from industrial or wastewater treatment plants, rain runoff and leakage from agricultural fields, mining operations, landfills, and rocket fuel manufacturing sites, and air deposition from car exhaust and coal-fired power plants.

TOXIC ORGANICS *are harmful, man-made chemicals that all contain carbon. They can build up in animal and fish tissues and sediments or get into drinking water supplies, posing potential long-term health risks.*

What you can do: People can help eliminate toxics in waterways by never rinsing out contaminated containers or dumping directly into waterways or storm sewers. Also never flush down the toilet anything known to be poisonous, such as paints, paint strippers, other solvents, cleansers and disinfectants, prescription drugs, and automotive products. Read more about toxic chemical effects in waters and what you can do to help reduce toxic chemicals in our waterways.

Summary: Toxic organic chemicals are harmful, man-made chemicals containing carbon. These often remain in the environment for long periods and can accumulate in animal and fish tissues and sediments. They also can get into drinking water supplies, posing potential long-term health risks to humans. Toxic organic chemicals are the reported cause of water pollution in over 450 waters nationwide as of 2015. These pollutants include a large number of chemicals such as solvents, pesticides, dioxins, PCBs, furans, and other nitrogen compounds. Common sources include wood preservatives, antifreeze, dry cleaning chemicals, cleansers, and a variety of other chemical products. Two important sources of toxic organic chemicals in water are improper disposal of industrial and household wastes and runoff of pesticides. Excessive application of insecticides, herbicides, fungicides, and rodenticides, or application of any of these shortly before a storm, can result in toxic chemicals being carried by stormwater runoff from agricultural lands, construction sites, parks, golf courses, and residential lawns to receiving waters. Other organic pollutants come from auto exhaust and from burning municipal and chemical wastes. Organic pollutants can build up in aquatic animals and increase in concentration. These substances can be toxic to all forms of life, and are known to cause cancer in animals. For humans, some of them are suspected to cause cancer and are also known to be harmful to immune, reproductive, nervous, and hormone systems.

TRASH *consists of litter, debris, and other types of discarded solid waste. Trash can be contaminated with toxins or bacteria, and it harms fish and wildlife that eat it or become entangled in it. In areas where people swim or wade, it also poses a human health and safety threat.*

What you can do: Never use waterways or their sloping banks as a place to dump garbage or litter of any amount. People can help by properly disposing of trash, not littering in or near waterways, preventing trash from being blown away, and picking up visible trash in and near waterways.

Summary: Trash consists of litter, debris, rubbish, refuse and other types of solid waste discarded by people. Trash in waterways is common and unsightly, but not usually enough to be the main cause for reporting a waterway as polluted. In fact, trash is the main reporting category for 70 polluted waters nationwide as of 2015. Litter left on sidewalks, streets, yards or other open areas may be carried by rainwater to storm drains that discharge into waterways. Trash can also be carried to waters from nearby areas by wind or rainwater runoff. Also of concern are trash "hotspots" where it piles up from illegal dumping and littering, such as on steep streambanks below a roadside pull-off. What happens to trash in waterways depends on trash size, ability to float, and rate of deterioration. Marine trash or debris, which degrades ocean beaches, comes from ocean dumping and beach litter. Once trash enters a waterway, it can float (used plastic food containers, wrappers and cans), sink (glass containers, cigarettes), or become suspended underwater (plastic grocery bags), and degrade the habitat and health

of aquatic plants and animals. Floating litter in water may be contaminated with toxic chemicals and bacteria, is unattractive to look at, and can harm aquatic animals and birds if they eat trash or become entangled. Trash that sinks can contribute to sediment contamination, and large trash items such as discarded appliances can result in stream erosion or contamination. Trash in waters can threaten the health or safety of people who use them for wading or swimming. Of particular concern are the bacteria and viruses associated with diapers, medical waste such as needles, and human or pet waste. Some trash items such as containers or tires can hold still water that grows mosquitos. Litter degrades the appearance and quality of waterways that provide recreation, drinking water, and numerous other benefits to society.

TURBIDITY (MURKY WATER) *refers to water that is cloudy, muddy or opaque (turbid) because of suspended soil particles, algae, microbes, or organic matter. These tiny particles can absorb heat and raise water temperatures, reduce oxygen for aquatic animals, reduce native aquatic plant growth, clog fish gills and smother fish eggs and aquatic insects.*

What you can do: Waterfront property owners or users can reduce turbidity by not removing streamside vegetation or channelizing streams, not filling wetlands or other waters, keeping natural shorelines intact, leaving some rocks, logs or native aquatic plants as cover for fish, and routing rainwater runoff to areas where it can soak in rather than directly dump into a lake, stream or sewer system. See also EPA information on reducing and controlling turbidity in drinking water.

Summary: Turbidity, a measure of how 'murky' the water is, has been reported as a pollution cause for over 2,900 waters nationwide as of 2015. Tiny particles of suspended matter or impurities can make water cloudy, muddy or opaque (turbid). Materials that cause water to be turbid may include clay, silt, fine organic matter, and microscopic life such as algae. The primary source of turbidity is rainwater runoff from disturbed or eroding land. Additional sources may include urban waste discharges, as well as particles from the decay of plant materials. High turbidity can reduce light penetration and degrade or eliminate aquatic plants in lakes and estuaries, leaving poorer shelter, nurseries, and food for fish and other aquatic animals. Loss of aquatic plants then allows wind and waves to stir up more cloudiness, which can make waters unattractive for recreational use. Suspended particles also increase temperature, reduce oxygen in water, clog fish gills and reduce survival of fish eggs. Although turbidity is not a direct cause of human health risk, other pollutants such as metals and bacteria may attach to suspended particles. If not controlled, turbidity can promote growth of bacteria, leading to waterborne diseases such as intestinal illnesses after swimming. Numerous studies show a strong relationship between reduction of turbidity and reduction of some disease-related microbes.
