

An illustration showing several blue raindrops falling from the top. Below them is a dark blue storm drain with a white vertical pipe. To the left of the drain, blue wavy lines represent water flowing into it. The background is white above the drain and dark blue below it.

only rain
storm drain in the

a citizen's guide
to controlling
polluted runoff

Rural Clark County, Nevada



Clark County, Nevada



polluted runoff in rural Clark County

In Nevada's arid climate, water is a precious resource. In addition to having enough water for our communities, it is essential that the water be of good quality to support swimming, fishing, drinking, irrigating, and other uses. While we've made a lot of progress in cleaning up specific sources of pollutants, our everyday actions continue to affect water quality. Water washing over the land, whether from rain, car washing, or the watering of crops or lawns, picks up a variety of contaminants. These contaminants include oil and sediment from roadways, agricultural chemicals from farmland, and nutrients and toxic materials from urban and suburban areas. The runoff finds its way into our waterways, either directly or through storm drain collection systems.

The term **nonpoint source pollution** (also called polluted runoff) is used to distinguish this type of pollution from point source pollution. Point source pollution comes from specific sources, such as sewage treatment plants or industrial facilities. Scientific evidence shows that although huge strides have been made in cleaning up major point sources, our precious water resources are still threatened by the effects of polluted runoff. In fact, the United States Environmental Protection Agency has estimated that polluted runoff is now the single largest cause of the deterioration of our nation's water quality.

whatever they call it, why should I care about it?

Polluted runoff does not just affect large lakes and washes. In fact, chances are that polluted runoff is affecting your neighborhood. Water pollution in your town, and perhaps in your own backyard, can result in anything from weed-choked areas to contaminated drinking water. An additional impact of nonpoint source pollution

or polluted runoff is financial. It affects our pocketbooks! When polluted runoff enters surface waters, water treatment plants have to work longer and harder to process the water, especially drinking water. This translates into increased costs to you and your community. The bottom line is that both polluted runoff and its management are likely to increasingly affect you and your community.

but wait a minute! we live in the desert, don't we?

Yes, we do. That doesn't mean we don't get rain. In fact, rainfall in Nevada doesn't just come in gentle drizzles with no runoff. Rainfall in our area often comes during brief, but intense, storms with significant amounts of rainfall occurring in a short time frame. This increases the polluted runoff problem. Several months of pollutants may have accumulated on surfaces and roads by the time a storm occurs.

Desert soils also have poor water infiltration rates, meaning they don't readily absorb water, so that much of the water from a storm may move as surface runoff, collecting pollutants as it flows. The runoff moves down hill, either over the land or through a storm drain system, where water conduits deliver the stormwater to the Muddy or Virgin Rivers. The result is a huge influx of pollutants in our waterways after storms.

who causes polluted runoff?

We all do. Polluted runoff is the cumulative result of our everyday personal actions and our local land-use policies.

Here's a brief rundown of the causes and effects of the major types of pollutants carried by runoff.

pathogens

Pathogens are disease-causing microorganisms, such as bacteria and viruses that come from the fecal waste of humans and animals. Exposure to pathogens can cause a number of health problems and can affect recreational safety. Pathogens wash off the land from wild animal, farm animal, and pet wastes. They can also enter our waterways from improperly functioning septic tanks, leaky sewer lines and boat sanitary disposal systems.

nutrients

Nutrients are chemicals, both natural and manmade, that stimulate plant growth, such as nitrogen and phosphorus. Under normal conditions, nutrients are beneficial and necessary. However, in high concentrations, they can become an environmental threat. Having too many nutrients in ponds and lakes can lead to massive algal blooms that can cause reduction in water clarity. As the algae die and decay, they can create odors and rob the waters of life-sustaining dissolved oxygen, which in turn can kill fish. Nutrients in polluted runoff can come from both organic and inorganic agricultural fertilizers, septic systems, home lawn-care products, atmospheric deposition (car exhaust), car washing, and landscape debris and animal wastes.

sediment

Sand, soil and gravel eroded by runoff ends up in the storm drain system and in our washes and lakes. This sediment can alter stream flow and decrease the availability of healthy aquatic habitat. Sediment affects water clarity, may clog fish gills, and smothers spawning fish. Some major sources of sediment include poorly protected construction sites, bare soil at newly built sites, overly steep slopes resulting from poor construction methods, areas recently burned by wildfire, fallow agricultural fields, roadways and suburban gardens.

toxic contaminants

Toxic contaminants are chemicals that can harm the health of aquatic life and/or human beings. These chemicals result from a wide variety of human practices and products. Many of these chemicals are very resistant to breakdown and tend to be passed through the food chain and concentrated in large predators. Toxic chemicals include such things as hydrocarbons, metals (lead, mercury, cadmium), pesticides (DDT), and organic compounds such as polychlorinated biphenyls (PCBs). Oil, grease and gasoline (hydrocarbons) from roadways; industrial practices; and chemicals used in homes, gardens and yards, and on farm crops are major sources of toxic contaminants.

debris

Trash is without a doubt the simplest type of pollution to understand. It interferes with enjoyment of our water resources and, in the case of plastic and styrofoam, can be a health threat to aquatic organisms and other animals found in wetland habitats. Typically this debris starts as either street litter that is carried by runoff into our waterways.

thermal

Removal of streamside vegetation, land clearing for development, paved surfaces, shallow water impoundments, concrete canals and other artificial structures can result in heated runoff and elevated temperatures of surface water. This can be detrimental to aquatic life by negatively impacting aquatic health and reproductive cycles.

OK, but what's the purpose of this manual?

The purpose of this manual is to educate residents in Rural Clark County on polluted runoff in our community. Once everyone knows about polluted runoff, we'll be better able to manage its presence in our environment. This manual is organized into two sections, Home and Garden, and Within the Community. In the first sections, Home and Garden, you'll learn about pollution management within your four walls and outside in your yard or garden. The second section, Within the Community, will help you learn about other causes of water pollution that we see every day: trash, oil stains in parking lots, and pet waste, just to name a few.

With a small bit of effort on everyone's part, we'll be one step closer to cleaning up Southern Nevada's waters.



home & garden

herbicides and pesticides

Picture-perfect, pest-free gardens and lush, green, weed-free landscapes are common goals for many homeowners. In reality, achieving this vision can be expensive, impractical and environmentally unsound. Fertilizers, herbicides and insecticides cost money. If they are improperly or unnecessarily applied, they also contribute to polluted runoff. A more practical approach focuses on maintaining weeds and garden insects at non-damaging levels and encouraging healthy plant populations native to Nevada.

follow these tips...

- Accept that a certain level of weeds and insects are part of the natural balance.
- Read fertilizer, insecticide, and herbicide labels and apply them only as directed. Remember, more is not better!
- When possible, purchase only the amount of insecticide or herbicide you need for the job.
- Store fertilizers, herbicides and insecticides in their original containers in an area that maintains the suggested temperature ranges.
- Store fertilizers, herbicides and insecticides away from water, kids, and pets.
- Test your soil before applying fertilizers. Over-fertilization is a common problem, and excess nutrients can leach into groundwater or contaminate washes.
- Consider using organic fertilizers, such as bone meal, blood meal, organic mixes, and compost.
- Avoid using fertilizers or pesticides within 75 feet of waterways or wetlands.
- Avoid using fertilizers or pesticides near cisterns and wellheads.
- Do not apply insecticides, herbicides, or fertilizers before or during rain to avoid runoff.
- Keep fertilizers and pesticides off sidewalks and driveways, where they may be washed into storm drains.

- Use slow-release fertilizers on areas where the potential for water contamination is high, such as sandy soils, steep slopes, and compacted soils. In such areas, low-phosphate or phosphate-free fertilizers are good choices. If your favorite garden supply store does not carry such items, request that they do. These products may also be ordered through the internet.
- Select the proper season to apply fertilizers. Incorrect timing may encourage weeds to grow or may stress grasses.
- Calibrate your applicator to the appropriate rate before applying insecticides, herbicides or fertilizers. As equipment ages, annual adjustments may be needed.
- If you elect to use a professional lawn care service, select a company that employs trained technicians and follows practices designed to minimize the use of fertilizers and pesticides.

household hazardous waste and chemicals

Many common household products such as paint, paint thinners, drain and oven cleaners, as well as many cleansers, contain toxic chemicals. When improperly used or discarded, these products are a threat to public health and the environment.

follow these tips...

- Buy only what you need for the immediate job. A three-pack of drain cleaner at a discount warehouse store may cost less per can, but do you really need three bottles of drain cleaner in your home? Can you use up the product in a reasonable amount of time?
- Follow label directions for use. More is not better!
- Read labels and select nontoxic substitutes or less toxic alternatives whenever possible.
- Select phosphate-free, biodegradable detergents and cleaners to help reduce the amount of nutrients discharged to surface waters and groundwater.

- Choose water-based products whenever possible, as these are typically less toxic and biodegrade more rapidly than petroleum- or solvent-based products.
- Store any leftover products in their original containers in a location that maintains the suggested storage temperatures.
- Share unused products with friends and neighbors. Keep them in their original labeled containers.
- Never mix chemicals together.
- Don't burn or bury leftover chemicals or containers.
- Do not pour toxic chemicals down any drain or dispose of them in the toilet. Both septic systems and treatment plants rely on bacterial processes to break down human wastes. Toxic chemicals can kill these beneficial bacteria, disrupting waste processing and increasing treatment costs.
- Never dispose of toxic chemicals in storm drains. Storm drains deliver these chemicals directly to washes and rivers, with no prior treatment. It's like dumping the chemicals directly into your local river!
- Never pour unwanted toxic chemicals on the ground.
- Most toxic substances include disposal instructions on the label. Always read and follow the directions. For more information, access the internet and search for the product name or manufacturer. Contact the manufacturer for disposal information.

Properly dispose of these chemicals by taking them to a hazardous waste collection center. Call **Republic Services at (800) 752-8719** for information regarding household hazardous waste collection in your area.

landscape and garden

The choices you make in your landscape or garden can either help prevent nonpoint source pollution or contribute to it.

here's what you can do about landscapes and gardens...

- Don't water the pavement! It won't grow!
- When designing your landscape, reduce grass areas and use plants that have low requirements for water, fertilizers, and pesticides. For more information on the incentive program for water efficient landscapes, please visit www.snwa.com.
- Minimize impervious (hard) surfaces by installing wood decking, bricks or interlocking stones instead of impermeable cement. This will decrease runoff.
- Create a landscape buffer between lawns and impervious surfaces. This helps minimize runoff and creates a buffer to compensate for wind drift during watering.
- Check your sprinklers several times during the season to make sure they are functioning properly and the direction of spray has not shifted.
- Change the time on automated sprinkler systems as the weather cools or warms. Turn off the system if your landscape received enough water from rainfall that day. Don't water in the middle of a rain storm!
- Use landscaping techniques such as grassy swales (low areas in the lawn) or porous walkways to increase infiltration and decrease runoff from your property.
- Reduce stormwater runoff from your site by redirecting rain gutters onto vegetated or mulched areas, rather than bare soil or pavement. Your plants will benefit from the extra water and you'll avoid polluted runoff.
- Disperse runoff by grading all impervious surfaces, including driveways and walkways, so that they drain onto vegetated areas. If driveways are already in place, infiltration trenches may be installed to capture runoff from driveways and allow it to infiltrate into the ground.

- Leave lawn clippings on your lawn so that nutrients in the clippings are recycled. This will reduce the frequency and amount of fertilizers you need to apply and will reduce yard waste that ends up in the landfill.
- When plants decompose, nutrients are released and oxygen is consumed. When excess yard debris winds up in our water, it has a detrimental effect on water quality. Sweeping up leaves and yard trimmings from impervious surfaces and properly disposing of them or composting them will prevent nutrients from being delivered to washes and rivers via the storm drain system. Compost is a valuable soil conditioner that gradually releases nutrients to your lawn and garden. Compost also helps retain moisture in the soil, helping you conserve water.
- Restore bare patches in your lawn as soon as possible. Spread mulch on bare ground to avoid erosion.
- Litter, leaves, sediment and other debris can clog storm drain systems and result in flooding. To prevent this, keep street gutters and storm drains free of these materials. Although major municipalities are responsible for maintaining storm drain inlets, there are too many to maintain frequently. You can help by frequently checking the street gutters surrounding your property and keeping them free of debris.
- If you live adjacent to washes, wetlands, or other water bodies, allow thick vegetation to establish on the banks. This buffer acts to slow runoff and remove some pollutants before they enter the wash.

septic systems

Improperly installed or maintained septic systems can contaminate groundwater and surface water with nutrients and pathogens. By following the recommendations below, you can help ensure that your system continues to function properly.

here's what you can do about septic systems...

- Know where your septic tank and drain field or leach field are located. Do not park on, drive over, or build on top of your septic tank or leach field. Heavy, impermeable surfaces placed over the drain field may damage your tank or leach field and will interfere with evaporation and air flow necessary for effluent treatment.
- Avoid using household drains to dump chemicals. These substances can destroy the bacteria in your septic tank.
- Do not use septic system additives. There is no scientific evidence that biological or chemical additives aid or speed up decomposition in septic tanks. Some additives may even harm the septic system or contaminate groundwater.
- Don't use toilets as trash cans! Excess solids may clog your drain field and necessitate more frequent pumping.
- Inspect your septic system annually and pump it out regularly.
- Avoid or reduce the use of your garbage disposal. Garbage disposals contribute unnecessary solids to your septic system. This will require you to pump your septic tank more frequently.
- Plant any new trees at least 25 feet away from your septic tank and leach field. Tree roots can crack pipes or obstruct the flow of wastewater through drain lines.
- Avoid or reduce the use of phosphate-containing detergents, which contribute to phosphorus pollution.
- Conserve water and stagger water use to moderate the water inflow to the septic system. This will reduce the chance of hydraulic overloading and septic system failure.

agriculture and livestock management

The United States has over 330 million acres of agricultural land that produce an abundant supply of low-cost, nutritious food and other products. American agriculture is noted worldwide for its high productivity, quality, and efficiency in delivering goods to the consumer. However, when improperly managed, agricultural activities can affect water quality.

what to do about agriculture management...

- Exercise proper pesticide application practices. See the “Herbicides and Pesticides” section of this manual for further details.
- Store and manage facility wastewater and runoff with appropriate waste management systems.
- Improve your water use efficiency. Measure actual crop needs and apply only the amount of water required.
- Implement a management plan which includes drainage systems that keep rainwater separated from contaminated water.
- Establish a Wellhead Protection Area around your local well. Avoid spilling or disposing of animal waste, fuels, pesticides, fertilizers, paints, or any similar materials within the Wellhead Protection Area.
- Site your well outside areas of potential contamination. Wells should not be located in corrals, pastures, feedlots, or near underground fuel storage tanks. Wells should also be at least 150 feet from a septic tank and its leach field.
- Maintain vegetation along stream banks and around other water bodies.

what to do about livestock management...

- Reduce the impacts of grazing on water quality – adjust grazing intensity, keep livestock out of sensitive areas, provide alternative sources of water and shade, and promote revegetation of ranges, pastures, and riparian zones.
- Reduce the potential for channel degradation by adhering to soil and water conservation principles, upgrading existing channel capacity when increased runoff volumes are anticipated, and fencing critical riparian areas.
- Confined livestock areas such as feedlots, livestock and poultry barns and outdoor animal pens sometimes require runoff collection. This runoff may be stored and applied later to agricultural land as a fertilizer or soil conditioner.
- Locate your barns, corrals, paddocks, and pasture fences appropriately to keep home, yard, and garden chemicals out of your water supply.
- Fence off or otherwise control access to stream banks, irrigation ditches, ponds, and wetlands to protect them from overgrazing and trampling.
- Locate salt licks, feeding areas, and watering troughs, where animals congregate, away from slopes and water bodies.
- Keep waste and fill materials like manure and garbage out of all water bodies.



within the community

automobiles

For most of us, automobiles are a necessary part of our daily lives. Thoughtful use can reduce polluted runoff as well as air pollution.

here's what you can do about automobiles...

- Plan errands to minimize the number of trips. Driving less reduces the amount of pollution your automobile releases into the environment.
- Regularly inspect and maintain your vehicle to help keep automotive waste, toxic metals, and petroleum byproducts from contaminating runoff.
- Clean up spilled brake fluid, oil, grease, antifreeze and other toxic chemicals, rather than hosing them into the street where they may enter the storm drain system and eventually reach local washes and lakes.
- Never pour used oil or other chemicals down storm drains, on the soil, or in the trash.
- Recycle used oil, antifreeze and batteries by taking them to recycling centers or auto parts stores. Recycling just 2 gallons of used oil can generate enough electricity to run the average household for almost 24 hours.
- Wash your car at a certified car wash. Detergents contain nutrients that can run off impervious surfaces. Certified carwashes are required to collect and dispose of wash water properly.
- If you must wash your car at home, park on a lawn area, gravel driveway or other permeable surface so the soapy water can soak into the ground.
- Use a spray nozzle or hose equipped with a shutoff valve to minimize water use. Don't let the hose run throughout the whole car washing process.
- Many schools, clubs and organizations use car washes as fundraisers. Try to plan ahead and divert the wastewater to a sanitary sewer, grassy area or catch basin instead of a storm drain. If possible, work with a local carwash to host the fundraiser. Many will donate a portion of their profits in exchange for the sweat equity of your volunteers.

pet waste

Pet waste contains nutrients and pathogens that can contaminate surface waters. If ingested, many pathogens found in animal wastes can harm humans. Organisms such as Cryptosporidium, Giardia lamblia, Salmonella, and E. coli can cause symptoms ranging from skin sores, to diarrhea and gas, to chest pain. Symptoms are more severe in the very young, the elderly and those individuals who are immunosuppressed. Some strains of E. coli can cause serious illnesses and fatalities. Cryptosporidium is also of particular concern because it is highly resistant to disinfection with chlorine.

Animal wastes can also contain parasites such as roundworms, pin worms and other parasitic nematodes. Infection by a few worms is usually not a problem, but severe infections may cause fever, bronchitis, asthma, or vision problems. Many people feel that the waste from their pet doesn't make much of a contribution to polluted runoff. When you combine all the waste from all the pets in the community, however, the impact becomes significant. The easiest way to avoid health and aesthetic problems is to clean up pet waste and dispose of it properly.

here's what you can do about pet wastes...

- When taking your pet for walks, remember to bring several plastic bags to clean up after him or her. Scoop the poop! ... And then place it in the trash.
- Many parks and other recreational areas in Clark County have dog poop stations that provide small plastic bags and garbage cans. These units allow you to clean up after your pet and then toss it in the trash, so you won't have to carry the filled bags for the remainder of the walk.

- Flush dog poop down the toilet. The water from toilets goes to a septic system or sewage treatment plant that removes pollutants before it reaches washes and Lake Mead. Avoid adding kitty litter to the toilet, however. Cat poop and used litter should be scooped out and put in a securely closed bag in the trash.
- Avoid letting your pet do their business within 200 feet of a water body.
- Never dump pet waste directly in or near a ditch, catch basin, storm drain, or water body.
- For dogs, cats, and other meat eaters, dispose of the waste in the garbage or down the toilet. Wastes from meat eaters should not be placed in compost piles. The parasites, bacteria and/or viruses present in their feces are not readily destroyed during the composting process and can be passed on to humans.

recreational activities

We all enjoy the many recreational opportunities found in Clark County. To ensure our natural resources will continue to be enjoyable, follow these suggestions:

- When possible, carpool.
- Dispose of all waste properly. Pack it in and pack it out. Learn more at Leave No Trace, www.LNT.org.
- Deposit human waste in sanitary facilities or in 6- to 8-inch deep "catholes," 200 feet or more away from a water body.
- Pick up after your pets and don't let them do their business within 200 feet of a water body.
- When camping, try to keep your campsite at least 200 feet away from the edge of a stream or lake.
- Build fires only in designated areas and only during permitted times.

What to do while boating to prevent pollution:

In Clark County, Lake Mead and the Colorado River system offers many outstanding recreational opportunities. These water bodies also provide drinking water to our communities. It is important to protect the scenic beauty and water quality of our lakes, rivers, wetlands and other water bodies so we can continue to use and enjoy them.

- Avoid producing large wakes within 500 feet of the shore. This will help reduce shoreline erosion and sediment pollution of nearby washes.
- Rinse your boat with a brush and water and avoid the use of soap whenever possible. If you must use soap, select a phosphate-free variety.
- Inspect and remove all aquatic vegetation from your boat when removing it from the water to avoid transferring undesirable weeds from one water body to another.
- Use tarps to catch any boat scrapings, especially toxic paint and antifouling chips or dust.
- Use sanders and other maintenance equipment that is equipped with vacuum attachments when working near the water.
- Don't use toxic polishes or stain removers.
- Only discharge boat sewage into pump-out stations. It is against federal law to discharge sewage into navigable U.S. waters.
- Do not dump any trash overboard. Bring all trash back to shore for dumping or recycling.
- Avoid gas tank overflows during refueling.
- Never pump oil- or fuel-contaminated water overboard.
- Properly dispose of drain oil.
- Keep engines well maintained and free of leaking fuel or lubricants.
- Keep oil- and fuel-absorbing pads on hand for accidental spills. Properly dispose of these pads.

so... what now?

After reading through this manual, you should now have a better understanding of polluted runoff in our community. Think about this manual and what you've learned next time you take your dog for a walk, wash your car, or plan a boating trip to Lake Mead. Management of polluted runoff is not difficult; it simply takes a little bit of knowledge and a few small changes to our routines.

remember...

it's your water...
protect it!



For more information on polluted runoff in Clark County, visit www.clarkcountynv.gov – keyword: water quality, or call the Clark County Water Quality Team at (702) 668-8674.

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