

The Pollution of Stormwater Runoff: Some Causes and Responses

(Courtesy of SDA News Letter)

What is NPS Pollution?

Nonpoint source water pollution (“NPS”) – polluted runoff – results when precipitation interacts with pollutants to carry them over the surface of the ground or leach them into the ground water. Because storm drains are not connected to sanitary sewer systems or treatment plants, debris and pollutants are carried directly into rivers, lakes and streams.

NPS pollution can have a variety of impacts on the services provided by special districts, including increased water treatment costs, harm to recreational activities such as swimming and fishing and increased costs to maintain storm drainage systems clogged by debris and sedimentation.

NPS pollution cannot easily be “turned off” by technology. Rather, people must change their habits and practices that affect the quality of our water. The key to controlling NPS pollution is prevention.

Causes of NPS Pollution

NPS pollution comes from sources both large and small: agricultural operations (livestock and crop farming), resource extraction, highway/road runoff, and construction runoff (debris and erosion/sedimentation), as well as common residential sources such as pet wastes, lawn care and car washing.

A 2005 report by the National Environmental Education & Training Foundation found that 78% of the American public does not understand that runoff from agricultural lands, roads, and lawns is now the most common source of water pollution; nearly half of Americans (47%) believes that industry still accounts for most water pollution.

Non man-made factors also contribute to the problem. For example, Colorado’s devastating 2002 wildfire season resulted in massive amounts of fire debris and soil from the subsequent erosion entering the water supply system for the Denver-metro area. All this is exacerbated by the recent drought which reduces dilutional flows thereby increasing the concentration of harmful chemicals.

Residential Level Issues

Sources of residential NPS pollution include:

- Lawn and Garden Care
- Pet Waste Management
- Motor Vehicle Care
- Household Chemical and Waste Disposal
- Septic System Care

The top three items in the list have the most significant impact in urban and suburban areas.

Lawn Care

Lawn care and landscaping occur in all parts of the country, in all types of climates, and in every type of community. Homeowners tend to own an estimated 40 million acres of turf. If classified as a crop, lawns would rank as the fifth largest in the country on the basis of area after corn, soybeans, wheat and hay.

Lawns produce significant amounts of nutrient-rich runoff which research shows can potentially cause eutrophication in streams, lakes, and estuaries, and pesticide runoff can contaminate drinking water supplies with chemicals toxic to both humans and aquatic organisms. Despite this, few residents consider lawn fertilizer, pesticides and yard clippings and leaves as causes of water quality problems.

In 2004, American's homeowners spent \$36.8 billion on lawn and garden maintenance. The public's desire for a green lawn is probably the biggest impediment to limiting pollution from this source.

Pet Wastes

When pet waste is improperly disposed of, it can be picked up by Stormwater runoff and washed into storm drains and nearby waterbodies. Decaying pet wastes can alter water chemistry resulting in damage to the health of fish and other aquatic life, plus it may carry bacteria, viruses, and parasites that can make swimming and other recreation unhealthy.

Pet waste should either be sealed securely in a plastic bag before placing it out for your trash collection or flushed down the toilet where it can be treated before being released into discharge water. Since there are pet owners in all communities, public education on proper pet waste disposal can be very successful. Many communities implement programs by posting signs and plastic bag dispensers in pet-frequented areas to encourage owners to pick-up after their pets.

On a related topic, thirty-three percent of Colorado households are on a septic system. Leaks or overflow from these systems can leach pollutants into groundwater and are also a source of NPS water pollution.

Residential Car Washing and Maintenance

Car washing is a common routine for residents and a popular way for scout troops, schools and sports teams to raise funds. Outdoor car washing uses detergent-rich water that flows down the street and into the storm drain. According to surveys, 55-70% of households wash their own cars, with the remainder going to commercial car washes. Sixty percent of residents could be classified as "chronic car washers" who wash their cars at least once a month. Residents are typically not aware of the water quality consequences of car washing and do not understand the chemical content of the soaps and detergents they use.

Car washing is a difficult behavior to change since it is often hard to define a better alternative. Some best management practices in this area include using a commercial car wash, washing cars on permeable surfaces, using hoses with automatic shut-off nozzles and using biodegradable soaps. Similarly, disposing of used motor oil, antifreeze, and other automotive by-products down storm drains contributes to water pollution.

The Need for Public Education

Back in 1999, the League of Women Voters of Colorado Education Fund implemented a comprehensive media campaign along with supportive activities concerning household-generated polluted runoff. A follow-up survey demonstrated that the campaign had increased awareness and understanding of the concept that individual household activities contribute to NPS pollution and that individual actions can prevent some of it.

If your district wishes to implement a public education and outreach program on this topic, there are many resources available to help you. Examples of educational materials and strategies include brochures and fact sheets, recreational guides, establishing a library of educational materials, storm drain stenciling, tributary signage, and bill inserts, but whatever your approach, it is important to make it relevant to your local situation and constituency. Forming partnerships with other governmental and nongovernmental entities will also help get the message out to diverse audiences, including minority and disadvantaged communities and children.

District Level Issues

Lest districts think that the problem rests elsewhere, districts themselves may want to examine and subsequently alter their own actions. Many activities that districts conduct may pose a threat to water quality, including:

- Road repairs and winter road maintenance;
- Landscaping, golf course and park maintenance;
- New construction, infrastructure work and other land disturbance;
- Automobile fleet maintenance and washing;
- Stormwater system maintenance;
- Flood management projects; and
- Building maintenance.

Golf Course Guidelines

In December 1996, Wright Water Engineers, Inc. and Denver Regional Council of Governments released Guidelines for Water Quality Enhancement at Golf Courses Through the Use of Best Management Practices. Golf course managers, architects, consultants, and representatives of the Colorado State University Cooperative Extension provided input for this publication which includes twenty-eight key Best Management Practices for use in connection with golf course maintenance, construction, and operation.

Districts with Vehicle Fleets

Districts with their own vehicle washing facilities which desire to minimize the risk

ofcontamination from wash water discharge may adopt the following practices:

On-Site storm drain locations should be mapped to avoid discharge to the storm drain system. No pressure cleaning or steam cleaning should be done in areas designated as wellhead protection areas for public water supply.

Vehicle washing should be done in areas designed to collect the wash and rinse water for recycling or discharge into the sanitary sewer system.

Mountain Districts

There are additional challenges to erosion control in Colorado's high country. Road construction, mines, and even driveways in mountainous areas, can be a significant source of sediment and erosion products that reach streams and other water bodies. Due to the short growing season, thin atmosphere, poor soil quality, etc., erosion-controlling vegetation projects may take several seasons to mature.

In any case, seek input from your managers and field crews to determine the most appropriate and effective best management practices for your district.

Responses to the Problem

The State of Colorado faces significant challenges due to the pressures of a rapidly increasing population. Urban development and associated construction activities both within the urban context and for infrastructure development are significant elements contributing to NPS pollution in Colorado. Development activities are affecting all four river basins, with the greatest impact to the South Plate River system.

Because the solutions are largely voluntary, the path from awareness to behavior change to direct water quality improvement is not one of instant gratification. For more information on this topic, see:

<http://www.npscolorado.com/> This is the web page for Colorado's nonpoint source program. Be sure to check out the brochures developed by Colorado cities with some good basic information.

<http://epa.gov/nps/toolbox/> This is the U. S. Environmental Protection Agency's Nonpoint Source Outreach Toolbox.

<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm> This is the EPA's Best Management Practices Fact Sheets. Go to the "Public Education" section.

Emergency Response Team Number

During normal business hours, Tri-County staff in Spill Response or Emergency Preparedness can be reached via phone to the Administrative Office at 303-220-9200. After hours, this number has a recorded message referring callers to press one for emergencies. This action will page the person who is on-call and is trained to respond to spills in addition to a number of other public health and environmental health emergencies.