

Lackawanna River Citizens

Water Quality Handbook



Lackawanna River Citizens Water Quality Handbook

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INTRODUCTION

Intended for residents of the Lackawanna River watershed; this Lackawanna River Citizens Water Quality Handbook provides information on protecting water quality of the Lackawanna River and tributaries. The first section describes pollutants found in the River and explains how they get there. The Handbook illustrates what concerned citizens can do to prevent pollution and protect water quality. Best Management Practices (BMP) describes practices we can use to control pollution in our homes and businesses. The last section is a resource on recycling in our watershed complete with a list of agencies providing information on Best Management Practices (“Getting Help”) or recycling (“Recyclers”).

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TABLE OF CONTENTS

Section 1

The Lackawanna River Watershed

Section 2

How We Affect Water Quality

Section 3

Best Management Practices for Pollution Prevention

Section 4

Recycling

The Lackawanna River Watershed

Watersheds are land areas from which all water flows to a specific body of water. The sixty-two mile long Lackawanna River drains a three hundred fifty square mile land area or watershed. Its boundaries cross four counties: Susquehanna, Wayne, Lackawanna and Luzerne, and include 53 municipalities, home to nearly 250,000 people.

The River rises in two branches from a number of glacial ponds and wetlands on the Allegheny-Pocono Plateau along the Wayne-Susquehanna County line. The east and west branches of the river meet at Stillwater Dam near Uniondale. Just below the Dam, the Lackawanna passes scenic Stillwater Cliffs and begins its 40-mile course through the northern anthracite coalfield to the confluence with the Susquehanna River at Coxtton, between Duryea and Pittston in Luzerne County. The Lackawanna is the largest tributary to the North Branch of the Susquehanna River in Northeastern Pennsylvania. The Susquehanna River flows into the Chesapeake Bay, which means that water quality conditions of our River directly affect the Bay's environment.

The Lackawanna River watershed stretches along the River between Uniondale and the Susquehanna River, bounded to the east by the Moosic Mountains and to the west by the Lackawanna Range. The Lackawanna watershed also includes many smaller watersheds (also called drainage basins) that flow directly to the River. There are 76 smaller streams, such as Roaring Brook, Rush Brook, Racket Brook, and Grassy Island Creek, which feed the Lackawanna.

Our watershed has had a long history of use by man. Native Americans lived along the river for centuries, and settlers arrived by the late 1700's. By the 1820's, anthracite coal was being mined. Of all human activities, anthracite coal mining has had the most significant impact on our River.

The River and other streams played a vital role in the development of the region's coal mining, railroading and milling industries. Railroads and canals followed the River and streams in and out of our watershed to other East Coast urban centers. Since the first colonists arrived, man's activities have shaped water quality conditions of the River and its tributaries. Whether a natural process, or the result of man's activities; everything that occurs within our watershed affects Lackawanna River water quality.

How We Affect Water Quality

Runoff and Non-Point Source Pollution

Water that flows across the land as a result of rain, snowmelt, irrigation, or just rinsing things off is called **storm water runoff** or **urban runoff**. As this runoff makes its way to a body of water, it picks up and carries along a variety of pollutants. Pollutants are natural or man-made compounds that accumulate as waste products and cause environmental harm. Pollution causes undesirable changes in physical, chemical, or biological characteristics of the natural environment. For example, runoff from streets and driveways picks up oil and grease dripped from cars. Pesticides and fertilizers are washed from lawns and fields, and eroded soil finds its way to the River. All of these are harmful to natural water quality conditions. Because this pollution comes from many different sources, it is called **non-point source pollution**. Such pollution is the greatest threat to our River's water quality.

How Pollution Gets in Our Streams

The most obvious way we pollute our River and streams is when we dump waste directly into a stream or along its banks. Much **point source pollution**, such as industrial pipes discharging into a body of water, has been reduced. Many are regulated and monitored, so that they have a less negative affect on water quality. Not so obvious may be the pollution that is carried to our streams by runoff, or the non-point source pollution. Runoff reaches our streams in two ways: it runs directly into a stream or is carried there by **storm water drains**. These are the drains that you see along streets and in parking lots that are connected to pipes leading to a stream or into a sewer line. Storm water drains

can carry pollutants into our streams from sources that may be far from their banks. Only runoff should go down a storm water drain. In our area, most storm water drains are directly connected to sewer lines. During storm events and longer periods of wet weather the capacity of this system can be exceeded. When that happens, a combination of storm water and sewage can be released into the River. The next section discusses this occurrence.

Combined Sewer Overflows

Many municipalities within the Lackawanna River watershed have storm water drains that are connected to large, **interceptor sewer lines**. Interceptor pipes usually follow along the River and receive sewage from smaller street pipes that carry sewage from homes and businesses. Interceptors were installed to receive the sewage from street sewer pipes and carry it to treatment plants. Before treatment plants were built, street pipes ran directly into the River, dumping untreated wastes from homes and industry. When runoff goes down storm drains, it mixes with sewage in an interceptor pipe, and gets treated along with the sewage at the plant. If it rains for a longer period of time, or for a shorter intense period, interceptor pipes are not able to hold the additional load of runoff. When this happens, excess water in the interceptor pipe flows out special openings on top of the pipe, and into the River. These overflow openings are called **combined sewer outflows** or **CSO's**. They are the structures along the River that release excess sewage and storm water directly into the River. Without these openings, excess water in an interceptor pipe would flood downstream sewage treatment plants, or back up into our streets, homes, and businesses. There are



approximately 140 of these overflows along the Lackawanna River, as well as some on Roaring Brook, Leggetts Creek, and Spring Brook. During storm events, water released from these overflows is a significant source of pollution to the River. In the next section, we will discuss some of the common pollutants that reach our River and its tributaries, by way of storm water runoff, combined sewer outflows, or by being dumped directly into a river.



Pollutants that Reach Our River

Any substance that makes water harmful to people, fish, and other wildlife, or makes it unhealthy for us to use is considered a pollutant.

Toxic and Hazardous Substances: A substance is considered toxic if it is poisonous, causes cancer, or kills people and organisms. Hazardous substances are usually less harmful, but can accumulate in a stream and become toxic. Proper storage, use, and disposal of toxins are usually clearly defined, reducing the chances that these materials will enter a stream. However, when improperly discarded, they can have a widespread effect on aquatic life. Most of the fluids in a car are considered toxic when they reach a stream or lake in large quantities. Paint and paint thinner, pesticides, and other household solvents are also potentially toxic. Metals found in these chemicals are often what make them toxic. Certain metals such as, arsenic, chromium, copper, lead, and mercury are considered toxic pollutants.

Oil and Grease: No type of oil or grease belongs in a stream. They contain chemicals that are toxic to aquatic life, even in small quantities.

Oil reaches our streams when it gets dumped down a storm drain, or is picked up by storm water runoff from our streets, parking lots and driveways. Food grease can leak from outdoor dumpsters and also reach a stream. When oil or grease enter a stream, they can coat fish gills (making it hard for the fish to breathe), and block oxygen from entering the water and being used by other aquatic organisms, such as **macro-invertebrates** (the insect larvae, snails, clams, crayfish, worms, etc., living in or along the stream bottom). In addition, oils and grease can clog the drains and pipes that carry away runoff. Poorly maintained storm drains can cause runoff to pool on our roads and parking lots, adding to flooding problems.

Nutrients: The most common nutrient pollutants are phosphorous and nitrogen compounds. Both are used by plants, however, when excess nutrients reach a stream, more aquatic plants, like algae, are produced than would naturally occur. Common sources of nutrients include fertilizers, detergents containing phosphorus, and animal waste. Human waste in untreated sewage also contains phosphorus and nitrogen. Nutrients enter our streams when we put too much fertilizer on lawns and gardens. This gets washed off by storm water runoff, or from over-watering. Runoff also carries fertilizers and animal wastes from agricultural land. Phosphorus and nitrogen are directly added to a stream by way of the sewage released from a CSO, and to some extent by the treated water released from a sewage treatment plant. Nutrients are hazardous substances that do not directly kill aquatic plants and animals. They become toxic when they deteriorate water quality to the point where plants, fish and macroinvertebrates cannot survive. Excess nutrients result in more growth of aquatic plants. When all of these plants die off, they use oxygen in the water in order to decay. In addition, some of the chemicals released from a plant while they decay can leave behind unpleasant odors and surface scum. These conditions can be toxic to fish.

Sediments: Sediments are particles of gravel, soil, sand and clay washed or eroded into a stream by runoff. It is the most common pollutant in runoff and causes streams to become cloudy. Soil sediment enters a stream from eroding riverbanks, eroded soil from cleared land or exposed soil. It is of particular concern because many other pollutants, including bacteria, metals, and some nutrients and toxins are carried by soil particles. Sediment also enters a stream in the form of gravel, sand, and deicing materials, such as road salts and cinders, which are washed off roads and parking lots. Sediment from roadways can clog storm drains and pipes, resulting in higher maintenance costs. Piles of waste rock, known as **culm**, or **mine spoils**, separated from coal during mining operations, are another source of sediment to local streams. Large piles of mine spoils are scattered throughout our watershed, often within close proximity of a stream. When it rains, fine particles of the rock are washed off the pile and carried to a nearby stream. This runoff is naturally acidic and contains metals, affecting water quality of the stream it enters. Regardless of its source, excess sediment can drastically affect the water quality of a stream, sometimes making it toxic. Sediment can also cover food sources and habitat for fish and macro-invertebrates, making survival difficult.

Oxygen-demanding substances: These substances come in two types: yard and garden waste, including leaves, grasses, and branches, and food products. Plant material is often dumped in or along a stream bank, or swept into a storm water drain. Once this organic waste gets into a stream, oxygen is needed by bacteria to break it down. This decaying process robs oxygen needed by stream organisms and for naturally occurring processes. Food products that reach streams from spills during delivery or from leaking dumpsters have much of the same effect.

Bacteria and viruses: Though some kinds of bacteria occur naturally in water, others

can be considered pollutants. These bacteria, along with viruses, enter a stream from improperly maintained or leaking sewer lines and septic tanks. Animal wastes and even carcasses thrown into a stream by careless hunters and trappers can also contaminate a stream. If bacteria or viruses are ingested or attach to fish, it can weaken or even kill that fish. They are also not safe for human contact.



Trash: Unfortunately it is common to see trash both in and along the banks of the Lackawanna. Construction material, food wrappers, beverage containers, and plant material are often illegally dumped along banks or carelessly tossed nearby. When water levels rise, trash gets washed in and swept downstream. Used tires and shopping carts are commonly found in the River. These objects attract other trash in the River. If enough of this material collects in a spot it can change the River's natural flow. Trash may not have the direct impacts on water quality that other pollutants have, however, it does not belong in a river. It makes the River ugly, leaves the impression that we don't care about it - that it is okay to pollute. However, it is **not** okay to pollute the River!



Effects on Water Quality

How clean is our River?

All of the pollutants listed here are found in the Lackawanna. **Pollutants have changed the River's water quality from its natural, pollution-free condition, to one showing signs of pollution problems.** Between Stillwater Dam and Forest City, the River is pollution-free and in its most natural condition. The remainder of the River's course flows through a developed, urban area, which has been impacted by pollution for the last 150 years. Most obvious have been sediment, metal, and nutrient pollutants. Sediment and metals have been an almost constant pollutant in the River since coal mining days. Large piles of culm, composed of metal-rich waste rock, have been one of the primary sources. Runoff from these piles accumulates fine sediment and metals from broken-up pieces of culm. These are carried into the River or a tributary. Metals also enter the River from **acid mine drainage (AMD)**, which is water from flooded abandoned mine tunnels that drain into the River. As ground water flows through the underground tunnels and mine workings in the Lackawanna Valley, the water dissolves minerals that are contained in coal and the rock found between coal seams. Iron pyrite, also known as "fool's gold," manganese and aluminum sulfides are the major metal compounds in AMD. When

the mineral-rich water flows through old mining tunnels and pours into the River, dissolved metals combine with oxygen in the river, form a precipitate, and sink to the bottom of the River. AMD is naturally acidic (low pH), uses up dissolved oxygen (DO) in the stream, and coats the stream bottom and banks with yellow-orange, iron oxides, known as “yellow boy.”

Excess nutrients were also a large problem in the River before sewage treatment plants were constructed to treat the sewage coming from our homes and businesses. Prior to the 1960's, untreated sewage was simply directed into the River and carried downstream. **Coliform bacteria** found in human waste, viruses, and other bacteria unsafe to humans entered the River from untreated sewage. Some untreated sewage, mixed with storm water runoff, still enters the River from CSO's. Nutrients also reach our River in the form of fertilizers, carried away by runoff from lawns and fields.

As pollutants accumulated in the River, water quality declined to the point where fish and other aquatic organisms could not survive. Such stretches of the River were considered “dead,” unable to support any aquatic life. These areas were also unhealthy for recreational purposes, and most people simply stayed away from the River. Smaller tributary streams to the Lackawanna suffered as well, adding their own loads of pollution to the River.

Within the past few decades, however, water quality conditions have begun to improve. By the early 1970's, six sewage treatment plants along the River were on-line treating the large amounts of sewage from homes and industry. Reduced pollution in the River, has allowed fish and other aquatic life to make a comeback. A large section of the River now supports trout and a diverse community of macroinvertebrates. This means that water quality conditions are slowly returning to the more natural conditions necessary for aquatic organisms to thrive. The River and

some of its tributaries are also being used again for fishing, swimming, and canoeing. Problems still exist however, and awareness of today's non-point source pollution problems is important if we want to continue to help our River recover.

Working to Reduce Pollution

Polluting is against the law, regardless of amount. Small amounts from many places add up to big problems. Prevention depends on steps taken by all businesses and households in our watershed. Because it is easier and cheaper to prevent pollution than it is to clean it up, it is in everyone's best interest to protect water quality. What prevention steps can be taken? A good first step is to identify drains on or near your property and where they go. What goes down those drains? Take a look at your activities and what you might be doing on your property that ends up going down that drain. In the next section we will discuss what we can do to protect water quality in our watershed. We'll talk about **Practices** that keep pollutants from entering streams or storm water drains. A variety of practices or technologies you can use to reduce pollution will be discussed. These are called **Best Management Practices – BMP's**.



Best Management Practices for Pollution Prevention

This section describes a variety of practices you can use to stop pollution from reaching the River and streams in our watershed. The effects these pollutants have on water quality are also discussed. Best management practices in this section include:

Drainage System Maintenance

BMP 1 Catch Basins

BMP 2 Detention Ponds and Ditches

Good Household Practices

BMP 3 Keeping a Clean Work Site

BMP 4 Waste and Materials Storage

BMP 5 Cleaning Up Spills

BMP 6 Vehicle and Equipment Cleaning

Chemicals and Petroleum Products

BMP 7 Pesticide, Fertilizer Selection and Storage

BMP 8 Applying Pesticides

BMP 9 Applying Fertilizers

BMP 10 Vehicle Fluid Storage and Disposal

BMP 11 Paint Storage and Disposal

BMP 12 Hazardous Household Solvent Storage
and Disposal

Erosion and Sedimentation

BMP 13 Preventing Erosion

BMP 14 Controlling Sedimentation

Landscaping and Water Quality

BMP 15 Landscaping to reduce runoff

BMP 16 Using beneficial plants

Drainage Systems

Drainage systems carry runoff from land to a stream. Systems may include storm water drains, detention ponds, and ditches. Each needs to be maintained properly so that runoff can be carried off the land without causing flooding problems.



*Be aware of what goes down storm water drains
on your property.*

BMP 1. Inspect catch basins and storm water drains regularly: Catch basins are structures located under grates that water flows through to reach a storm water drain. Many catch basins extend below the pipes that drain them. This means there is an area at the bottom of the catch basin where sediment and other pollutants can collect, rather than be swept directly down the pipe. It is important to inspect basins for sediment, leaves or trash that can collect there. These can get stirred up during a storm, clog the outlet pipe or wash through to a stream. Check basins on or along your property regularly.

Remove litter and leaves from grates, so that water can easily flow into the basin. If a catch basin is full of debris or appears clogged, call your local sewer authority (see “Getting Help” at the end of this booklet), or your borough’s Department of Public Works. Large puddles of water in our streets after a rain are usually the result of clogged grates or catch basins. Stenciling catch basins with warnings against dumping waste down a storm water drain is also a good idea. The Lackawanna River Corridor Association (LRCA) sponsors stenciling efforts in this area (see “Getting Help”).

BMP 2. Detention Ponds and Ditches: If you have a detention pond or ditch on your property, you may be obligated to maintain it. Detention ponds collect runoff and the pollutants it carries. It may be necessary to remove debris from a detention pond as it fills. Removing debris keeps it from washing into a stream, should a pond exceed its holding capacity and overflow. You may also have ditches on your property which carry runoff to a stream. Ditches should be vegetated, to prevent erosion, and to filter and absorb excess nutrients in runoff. It is also important to keep ditches clean of debris that may get carried to a stream. Contact your County Conservation District, or the LRCA for more information (see “Getting Help”).

Good Household Practices

BMP 3. Keeping a clean work place: Keeping a clean work place can decrease your chances of allowing pollutants to reach a stream. Substances such as paint chips, metal shavings, or automobile fluids can end up on a surface that drains to a stream. To prevent them from being carried away by runoff, you should regularly sweep and remove material found around dumpsters or on driveways and parking lots. Hosing an area down is not the answer. The pollutants end up being carried down a storm water drain. If you have a fluid spill such as gasoline or paint, cat litter

makes an excellent absorbent material. It can be swept up after absorbing the spill and properly discarded. Keeping paved surfaces on your property and around storm water drains free of sediment, plant material, and trash, further prevents pollutants from being picked up by runoff and carried away.

BMP 4. Waste and Materials Storage:

Keeping waste and materials properly stored also reduces the chances of polluting. Cover piles of building and other material, such as lumber, metal products, topsoil, sand, gravel, and compost, so that rain will not carry off pollutants. Make sure liquids and fluids are properly stored in approved leak proof containers. Keep these containers in areas where a spill or leak can be quickly cleaned. This is especially important for dumpsters. Do not place dumpsters near a curb or drain, where leaks can be carried to a storm drain.

BMP 5. Cleaning up Spills: When cleaning up spilled pollutants make sure that the cleaning process does not permit pollutants to be transported to a storm drain. **Never hose pollutants off a paved surface from which they can flow to a storm drain.** This defeats the purpose of the clean up. If a liquid such as oil, grease, or a food product is spilled use cat litter or absorbent rags to clean it. Properly dispose of these materials. For solids such as fertilizers, leaves, and trash sweep or wipe up the material and properly discard. Larger spills or, for clean up of toxic chemicals or petroleum products, you should call 911 and tell the emergency operator what has spilled to the best of your knowledge. Such efforts usually require a special contractor. Toxic chemicals spills, and spills into a stream mandate a call to the Department of Environmental Protection’s emergency number. If toxic spills reach a storm drain or sewer drain, you should also notify your local sewer authority (see “Getting Help”).

BMP 6. Vehicle and equipment cleaning:

Washing cars and equipment usually involves removing dirt, grime, oil, grease, and sometimes paint or metal. It is best to do the cleaning at a commercial washing facility that drains to the sanitary sewer, or at any other facility that has a drain connected to the sewer system. Washing equipment off on a driveway or parking lot allows the pollutants to be carried to a storm drain. If you cannot use a proper facility, it is best to do the cleaning on a flat, vegetated surface, where the water will soak into the ground and not run off.

Chemicals and Petroleum Products: General Guidelines

If handled improperly, hazardous chemicals and petroleum products can be a source of water pollution. Know the hazards of the materials. Labels such as dangerous, combustible, warning, caution, poisonous, caustic, corrosive, volatile, explosive, and flammable indicate hazardous products. Care should be taken to keep these materials out of storm drains. If possible, use nontoxic or less toxic materials, and buy only what you need.

Store and use products carefully:

Always keep materials in their original containers. This insures that the directions for use of a product are always handy. Read and follow directions carefully. Never use more material than directions suggest. Twice as much does not mean twice the result. If you have extra chemicals you do not need, share with a neighbor, or save them for future use. Do not pour them down the any drain.

Pesticide/Fertilizer Use

Pesticides and fertilizers can do more harm than good if handled improperly. Some pesticides kill helpful organisms (such as

honeybees, earthworms, and organisms that feed on pests) as well as the pest itself. Using more fertilizer than you need can “burn” a plant and kill it. Exposure to pesticides and fertilizers are harmful to people as well. The risks of using such a product are greatest when the label directions are not followed exactly. In fact, it is against the law not to follow directions, or illegally apply it on someone else’s property without a license.

BMP 7. Select and store carefully: Make sure you select the correct and least hazardous pesticide for eliminating the intended pest(s), or the appropriate fertilizer that meets the specific needs of the plant(s) to be fertilized. Before buying either, calculate how much you need and buy only that amount. Don’t buy more than you need. Store containers in an area where leaks can be quickly cleaned. Store powders and dusts above liquids and off the floor, so it won’t get wet and be carried to a drain. By using organic fertilizers or compost, and following alternative pest management practices, you can reduce the impacts that pesticides and fertilizers have on water quality. For more information call the Lackawanna County Recycling Center (see “Recyclers”), or the LRCA (see “Getting Help”).

BMP 8. Applying Pesticides: Follow all label directions. Do not use more than the recommended amount or you may kill more than the intended pest. Using more than you need may also result in the excess product getting washed into a stream, especially if it rains shortly after application. If you need to mix a pesticide with water, do it where accidental spills will not run into a stream. Finally, when spraying - make sure that wind does not carry material near or over water.

Effects on water quality: When toxic pesticides reach a stream, they kill, weaken, or deform aquatic organisms and plants. When more than one kind of pesticide reaches a stream, they

can combine to affect an even wider range of plants and animals.

BMP 9. Applying Fertilizers: Apply fertilizer at times and in amounts best used by plants. Follow label directions for application rates and amounts needed by plants being fertilized. Most plants use fertilizer most effectively if it is applied before or just as the new growth begins in the spring. Don't over-fertilize. Consider organic fertilizers such as manures and meals, which break down slower than chemical fertilizers. These provide nutrients to plants over a longer period of time. Apply small amounts of fertilizer more often rather than applying one large dose. Don't fertilize on windy or very rainy days. Keep fertilizer off sidewalks, driveways and other surfaces where rain can easily transport it to a drainage system and into a stream. Use extra care when applying near a lake, wetland, or stream. Following these practices will minimize the chance of fertilizer being washed into a body of water.

Effects on Water Quality: Excess fertilizers that reach a stream are high in the nutrients (phosphorus and nitrogen) that make plants grow. Algae in a stream absorb these nutrients. This promotes growth and reproduction of even more algae. As algae begin to die and decay, bacteria uses dissolved oxygen to decompose. When more oxygen is needed for decomposition, it leaves less oxygen for use by fish or macroinvertebrates. Large mats of decaying algae can also produce bad smells, and scum on top of the water. In addition, some of the compounds released during the decaying process are toxic to fish.

Vehicle Fluids

Improperly disposing of used vehicle fluids can have a significant impact on water quality. Used motor oil is one of the largest single sources of pollution in our lakes and streams. About 86 percent of the 11 million

gallons of used motor oil changed each year in Pennsylvania is dumped down sewer drains, on the ground, or into the trash. This motor oil usually contains toxic substances such as, lead, benzene, zinc, cadmium, and arsenic. These have direct negative effects on aquatic life. Just one quart of oil is enough to create a two-acre sized oil slick on surface water, and a gallon of used oil can ruin a million gallons of freshwater - a year's supply for 50 people.



BMP 10. Storage and Disposal: Vehicle fluids should be stored in their appropriate containers, away from drains in case of a spill. Organize your work place to reduce the chance of spills. For instance, use a funnel when transferring fluids and place a tray underneath to catch spills. Don't hose down your work area. If you have a spill, soak it up and dispose of it in the garbage. Vehicle fluids should never be dumped or washed down a storm drain or sewer drain. Oil is not removed from sewage treated at sewage

treatment plants. In fact some plants use processes that create additional pollutants from the chemicals in the oil. In order to properly dispose of vehicle fluids, they should be recycled. It is easy and often free to recycle. Pour all used fluids into a clean, empty container that can be sealed, such as a plastic milk jug. Used oil containers can also be purchased.

Effects on Water Quality: Used vehicle fluids are especially harmful to aquatic organisms. An oily film on the water surface prevents oxygen from entering the water and being used. Oxygen is needed by fish, macroinvertebrates, and for numerous naturally occurring biological and chemical processes. Even small amounts of oil in the water can kill macroinvertebrates, which fish feed on, and coat fish gills, making it difficult for them to breathe. Contaminates found in used motor oil further affect water quality. The concentration of heavy metals in the water increases and accumulates in macroinvertebrates and fish. The result is reduced growth and reproduction, especially for pollution sensitive trout.

Paints, Thinners and Household Solvents

Paints, thinners, and other household solvents are hazards to our environment. They need to be stored, used, and discarded properly. Paint is the most common household product that becomes hazardous waste. It contains oil-based products and metals harmful to water quality - much the same as vehicle fluids. Oil-based paints are generally more hazardous than latex or water-based paint. Common household items such as paint thinners and cleaning solvents contain similar hazardous substances.

Do not mix fluids that you plan to recycle. A list of recyclers within the Lackawanna watershed can be found at the end of this booklet. Locate the nearest one, and call first for details (see “Recyclers”). They may accept only limited amounts or charge a small fee.

BMP 11. Storage and Disposal of Paint:

All paints should be stored in their original containers, tightly sealed and upside down. This reduces the amount of air entering the can and drying out of the paint. Brushes used for latex painting should be cleaned with as little water as possible. Do this in sinks connected to sewage treatment systems. Use small amounts of paint thinner to clean oil-based paint from brushes. Squeeze thinner into a waste container and use small amounts of soap and hot water to finish cleaning. Save the waste thinner for later disposal. If you cannot use leftover paints, try giving it to: community service groups, church groups, paint contractors, sign painters, shelters, theater groups, and neighbors or friends. If you must dispose of paint, solidify them before discarding in the regular trash. Do not throw liquid paint in the trash. There is always the possibility that paint will leak from the can and into the ground. Never pour paint down household drains. Many of the chemicals in paint will not be treated by sewage treatment systems.

BMP 12. Storage and Disposal of Hazardous Household Solvents:

Hazardous household solvents are those products where the words *danger*, *warning*, or *caution* appears on the label. They contain hazardous ingredients such as organic solvents and oil-based products, and are generally used for cleaning. They include disinfectants, furniture polish, bleach, abrasive powders, detergents, fabric softeners and products to clean bathrooms, drains, ovens, windows,

floors, and rugs. These items should always be stored in their original container, and never mixed together. By mixing certain solvents together, you could create a more hazardous substance. Buy only what you need thus limiting the need for disposal. Give unwanted household cleaners to someone who can use them. For information on proper disposal of such material, as well as using less hazardous, alternative solvents contact your county recyclers (see “Recyclers”) or the LRCA (see “Getting Help”).



Effects on Water Quality: Paints and hazardous household cleaners have much of the same effect on water quality as vehicle fluids. They contain ingredients not naturally found in streams, which can be toxic to aquatic life. Usually they pass untreated through a sewage treatment plant, and are released into a stream. They disrupt naturally occurring process and can weaken or kill aquatic life.

Sediment

Best Management Practices used to reduce the amount of sediment reaching a stream usually involves controlling erosion. How much soil erodes depends on the amount of exposed soil, soil type, slope, rainfall, erosion and sedimentation (E & S) control measures used. E & S control efforts should focus first on preventing erosion. However, once soils are picked up by

runoff, sediment controls help keep sediment and associated pollutants on-site, away from nearby streams, wetlands, and lakes. Any land cleared of vegetation, such as poorly managed construction sites, and mine spoils are major sources of sediment to our streams.

BMP 13. Preventing Erosion: Perhaps the simplest way to control erosion is to preserve as much vegetation as possible. Plants help keep soil in place, absorb excess nutrients and reduce runoff velocity. Water will flow much quicker over cleared land, picking up more sediment in its path. If needed, provide temporary vegetation or cover. Plant grass and cover cleared land with straw, hay, mulch, or plastic sheeting anchored into the ground. You can also construct ditches lined with grass to collect and carry away runoff from cleared land, reducing runoff. For more information on such practices or to report erosion problems contact your County Conservation District or the LRCA (see “Getting Help”).

BMP 14. Controlling Sedimentation: The greater the amount and speed of runoff, the more sediment it can carry to a stream. Preventing erosion and slowing the velocity of runoff reduces the amount of sediment that gets carried away. You can slow runoff by vegetating exposed soils and ditches, and by terracing or contouring, so that water does not have a straight and easy course across a site. “Check Dams” made from straw bales, rock, or sandbags can be used to control runoff from unvegetated or eroding sites. For more information on such practices or reporting sedimentation problems, call your County Conservation District or the LRCA (see “Getting Help”).

Effects on Water Quality: Sediment makes a stream cloudy and it covers up and fills in the spaces between the rocks and cobbles on the streambed. It sometimes accumulates to form new sand or gravel bars. This not only changes the natural flow of a stream, but can also cover

spaces between the rocks that fish and macroinvertebrates use for cover and foraging. This is of particular concern for streams with trout. Sediment can cover fish eggs, destroy habitat of macroinvertebrates - a trout food source - and cover spawning areas. Pollutants carried along by sediment such as metals and nutrients; further affect water chemistry of a stream. These can make survival even tougher on aquatic plants and animals. The acidic, metal rich runoff from mine spoils is especially stressful on trout. Finally, a cloudy and sediment choked stream just looks dirty, and who wants to fish, wade, or canoe in such a stream.

Landscaping and Water Quality

Plant selection and landscape design can significantly affect water quality. Proper design, which limits volume and velocity of storm water, helps water quality. Slower runoff reduces soil erosion and lessens pollutants washed into a stream. Planting low-maintenance, pest-resistant vegetation reduce the need for harmful pesticides and fertilizers. The following landscaping practices can be used to protect water quality.

BMP 15. Landscaping to reduce runoff:

The most important impact proper landscaping can have on water quality protection is reducing runoff. Concrete, asphalt, and brick do not allow water to soak into the ground. These materials increase runoff across their non-porous surfaces. Designing sites so runoff from paved areas is

directed through grass-lined ditches slows runoff and helps remove pollutants. Organic materials like mulch, or inorganic materials like stone, can also be used around driveways or as walking paths. Minimizing paved surfaces and using alternatives such as, pebbles, gravel, or porous asphalt, reduces runoff, by allowing water to soak into the ground. For information on designing a landscape to protect water quality contact the LRCA (see “Getting Help”).

BMP 16. Using beneficial vegetation: Using beneficial vegetation in your landscape design also helps protect water quality. Beneficial plants are those that require little fertilizer or pesticides, little additional watering, and provide food or habitat for wildlife. Using native trees, shrubs, vines, and grasses can be very useful in the landscape design. They have survived for years without extra care within their environment and met many landscape and wildlife requirements. Native species and other beneficial plants are becoming increasingly available in area nurseries. Beds of such plants are a good alternative for lawn areas. Lawn areas generally require more water, nutrients and pest control. For information on selecting and using beneficial plants, contact the Northeast Pennsylvania Community Tree Association, the State Bureau of Forestry (Department of Conservation and Natural Resources), or the LRCA (see “Getting Help”).

Recycling

One of the easiest and more cost effective ways to protect water quality is to recycle whenever you can. This insures that used petroleum products, trash, and yard wastes and associated contaminants do not end up in or near streams. Recycling is also the law in Pennsylvania. Act 101 mandated 25 percent recycling by 1997. Here's how to make recycling work:

Purchase recycled products: Close the "Recycling Loop" by buying recycled products. Markets for recycled material collected from your home or business will develop only when you buy back the recyclables in the form of new products.

Separate wastes: Keep your recyclables in separate containers according to the type of materials you are recycling. Combining different types of wastes can prevent recycling and greatly increase disposal costs. For example, used motor oil can easily be recycled. However, used oil mixed with other vehicle fluids requires costly and complicated recycling processes.

Recycle what you can: The following materials can all be recycled in our area:

- Aluminum and tin cans
- Glass bottles and jars
- Plastic bottles and jars
- Paper and corrugated cardboard
- Used vehicle fluids
- Used tires and car batteries
- Scrap metal
- Leaves, brush and grass
- Computers, TV's, VCR's

County and Municipal Recycling



Recycling programs are mandatory for municipalities with populations over 5,000, or at least 300 people/ sq. mile. The following is a breakdown of county or municipal recycling programs and opportunities for the four county watershed area.

Lackawanna: Curbside pick-up of the following material is available by participating municipalities:

Cans: Aluminum and tin food cans, as well as aluminum pie tins and foil. *No can lids or paint cans.*

Glass: Clear, brown or green bottles and jars. *No mirrors, dishes, cups, light bulbs, crystal or ceramics.*

Plastic: Bottle and jar containers only. *No motor oil bottles, plastic cups, flowers, pens, toys, plastic wrap, or Styrofoam.*

Newspapers: All newspapers and phone books. *No junk mail.*

Magazines and Catalogs: Glossy publications including catalogs. *No hard or soft cover books.*

The Lackawanna County Recycling Center also accepts mixed office paper, computer paper and unwanted mail. For a small fee - leaves, brush, and grass are also accepted for the Center's composting operation. Households and businesses that do not have curbside pick-up can bring all of the above materials to the Center. For more information call the County Recycling Center (see "Recyclers").

Luzerne: Residents of the Lackawanna River watershed in northeastern Luzerne County have curbside pick-up of recyclables. This program accepts the same recyclables as the Lackawanna County program, so the same details apply. Recyclables not collected under this program may be taken to private recycling operations. For more information call the county recycling office, or check the list of additional recyclers (see "Recyclers").

Susquehanna: Residents of the Lackawanna River watershed in southeastern Susquehanna County have two drop-off sites available to them; Forest City and Clifford Township. Both sites accept cans, glass, plastic, newspaper, and cardboard. A new county recycling center is being built near Montrose. For more information call your county recycling office (see "Recyclers").

Wayne: Residents of the Lackawanna River watershed in western Wayne County have two drop-off sites available to them; Forest City and the Wayne County Recycling Center. These Centers accept most of the same materials as the Lackawanna County center; except for leaves, brush, and grass. In addition, they accept white goods, such as washers, dryers, and refrigerators. For more information call the County Recycling Center (see "Recyclers").

Additional Recyclables

A number of other household and business items not accepted under county programs are recyclable as well. Many of these items are common sights along the River, where they are illegally dumped. Often times we are not aware of recycling opportunities for such items, and we just want to get rid of them. These items include: tires, scrap metal, white goods (refrigerators, dryers, washers), and brown goods (TV's, VCR's, computer equipment, etc.). You may be reimbursed for recycling scrap metal, however other items may require a small fee to recycle. For example, a certified technician must professionally remove Freon in refrigerators and freezers before recycling (See Yellow Pages under Refrigeration Service/Repair). Though it may cost a small fee to recycle such items, it saves valuable landfill space and keeps it away from our River and streams.

Benefits of Recycling

There are many good reasons why we should recycle. It conserves natural resources like aluminum, steel, trees, and oil, which are used to make new products. It reduces the chance of pollution and litter from reaching our streams and damaging water quality. Finally, it reduces the amount of trash that goes to a landfill, reducing the chances of it from contaminating our River and streams. Also, consider reducing your trash load by buying product you can recycle, not buying over-packaged products, and composting leaves and grass. For more ideas on reducing trash and recycling more, contact your county recycling centers (see "Recyclers").

Getting Help

Lackawanna River Corridor Association 347-6311

Northeastern Pennsylvania Community Tree Association 825-1701
(Penn State Cooperative Extension)

County Conservation Districts

Lackawanna 281-9495

Luzerne 674-7991

Susquehanna 278-4600

Wayne 253-0930

Wyoming 836-2589

State Agencies

Bureau of Forestry (DCNR) 963-4561

Department of Environmental Protection 24-hr Emergency Hotline 826-2511

Sewer Authorities

Lackawanna River Basin Sewer Authority 489-7563

Scranton Sewer Authority 348-5330

Lower Lackawanna Valley Sanitary Authority 655-1665

RECYCLERS

County Recycling/Waste Reduction Centers

| | | |
|-------------|---|----------|
| Lackawanna | 3400 Boulevard Ave., Scranton | 963-6868 |
| Luzerne | **No county collection site, call for info.** | 820-6300 |
| Susquehanna | **No county collection site, call for info** | 278-4600 |
| Wayne | Rte. 652, East of Indian Orchard | 253-9727 |

Motor Vehicle Fluid Recyclers

DON'T FORGET - Never Mix Fluids - Call Before Arriving

Avoca

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|------------------------------|--------------|----------|--------------------------------|
| Mike's Citgo Service Station | 935 Main St. | 457-7909 | Motor Oil (limited amounts) |
|------------------------------|--------------|----------|--------------------------------|

Blakley

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|-----------|--------------|----------|-----------|
| Auto Zone | 306 Main St. | 383-8660 | Motor Oil |
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Carbondale

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|--------------------------|-----------------|----------|-----------|
| Smitty's Service Station | 99 N. Main Ave. | 282-3359 | Motor Oil |
|--------------------------|-----------------|----------|-----------|

Chinchilla

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|------------|---------------|----------|-----------|
| Jiffy Lube | Routes 6 & 11 | 586-2217 | Motor Oil |
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Clarks Summit

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|---------------------|---------------------|----------|-----------|
| Advanced Auto Parts | 1133 Northern Blvd. | 586-0160 | Motor Oil |
|---------------------|---------------------|----------|-----------|

Dickson City

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|---------------------------|-------------------|----------|--|
| Pep Boy's | Scran.-Carb. Hwy. | 383-3600 | Motor Oil, Antifreeze (limit 5 gals. of each) |
| Johnnie's Service Station | 1417 Main Ave. | 489-9026 | Motor Oil, Gas and Antifreeze |

Dunmore

| | | | |
|---------------------|------------------------|----------|-----------|
| Advanced Auto Parts | O'Neill Shopping Cntr. | 969-1080 | Motor Oil |
|---------------------|------------------------|----------|-----------|

Mayfield

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|-----------------------|-----------------|----------|-----------|
| T & R Service Station | 306 Main Street | 876-0122 | Motor Oil |
|-----------------------|-----------------|----------|-----------|

Moscow

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|----------------------|-----------|----------|-----------|
| A.J. Chevrolet, Inc. | Route 435 | 842-7697 | Motor Oil |
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Olyphant (Scott Twp.)

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|----------------------|------|----------|-----------|
| Meoni's Auto Service | RD 2 | 586-0114 | Motor Oil |
|----------------------|------|----------|-----------|

Pittston

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|--------------|----------------------|----------|-----------|
| Borino Tire | 3600 N. Township Rd. | 655-2295 | Motor Oil |
| John's Citco | 215 Williams St. | 655-9438 | Motor Oil |
| TJ's Auto | 342 S. Main St. | 655-9469 | Motor Oil |
| Venesky's | 303 N. Main St. | 655-8912 | Motor Oil |
| Vullo, Inc. | Rt. 420 | 655-6828 | Motor Oil |

Pittston Twp.

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|------------------------|-------------|----------|-----------|
| Steve Insalaco Service | 346 Rt. 315 | 654-9253 | Motor Oil |
|------------------------|-------------|----------|-----------|

Scranton

| | | | |
|-----------------------------|-----------------------|----------|--------------------------------|
| Auto Zone | 387 Madison Ave. | 969-4131 | Motor Oil |
| Advanced Auto Parts | 313 Mulberry St. | 969-1080 | Motor Oil |
| Fletcher's Hill Top Station | 2646 Jackson St. | 347-8776 | Motor Oil (limited amounts) |
| Jiffy Lube | 208 Madison Ave. | 346-5960 | Motor Oil |
| Jiffy Lube | 1700 N. Keyser Ave. | 346-5823 | Motor Oil |
| Gavern's Garage | 1016 River St, Rear | 342-9600 | Motor Oil |
| Lou's Service Station | 1501 Lafayette St. | 961-8360 | Motor Oil (limited amounts) |
| Stop-N-Go Sunoco | Moosic & Prospect St. | 344-4040 | Motor Oil |

Used Tires

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|-------------------------------|-----------------------------------|----------|
| Apex Waste Services, Inc. | 13 Peggy Parkway., Dunmore | 344-7812 |
| Hawk Recycling Center | 191 Clark Rd., Duryea | 655-9840 |
| Waste Reduction and Recycling | 2100 San Souci Hwy., Hanover Twp. | 825-3522 |

Scrap Metal

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|------------------------------|-------------------------------|----------|
| Archbald Wrecking Co | S. Main St., Archbald | 876-1180 |
| DeNaples Scrap Iron & Metals | Mill St., Dunmore | 346-7673 |
| Fiegleman's Recycling Center | Morgan Hwy., Scranton | 342-5242 |
| Mike's Scrap Recycling | 3001 Boulevard Ave., Scranton | 346-8124 |

Recycling Centers

| | | |
|------------------|-------------------------------|----------|
| Allan Industries | I-81 & Blackman, Wilkes-Barre | 826-0123 |
| Diamond K Inc. | 900 Battle St., Scranton | 346-4684 |
| Philip May Co. | 601 Capouse Ave., Scranton | 347-5628 |

Brown Goods

(TV's, VCR's, computers, copiers, telephones, etc.)

| | | |
|--------------|----------------------------|----------|
| Enviro Cycle | Rt. 81, Exit 68, Hallstead | 879-2862 |
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