

## Hazardous Waste Factsheet

***“No type of photographic waste may ever be disposed in a septic system.”***

# Photo Processing Wastes

Photo developing produces various hazardous wastes, which must be managed properly to protect the environment and worker health and safety. The Thurston County Nonpoint Source Pollution Ordinance requires that hazardous chemicals be disposed of by recycling or use of a permitted hazardous waste management facility. Chemicals such as fixer, bleach fixer, stabilizer, C-41 RA bleach, and wash water may all contain silver, which is toxic to humans and aquatic organisms and therefore cannot be dumped down the drain. Used developers commonly contain hydroquinone, which may be disposed in the local sanitary sewer. However, *no* type of photographic waste may *ever* be disposed in a septic system.

How you decide to manage your waste partially depends on your generator status. Those who generate less than 220 pounds of hazardous waste per month are small quantity generators (SQG) and are conditionally exempt from state or federal rules; however, Thurston County regulations still apply. If you generate more than 220 pounds of hazardous waste per month, you must notify the Department of Ecology about your waste activities. Most photo processors are SQGs; if you are unsure, call the Thurston County Business Pollution Prevention Program at (360) 867-2664.

## On-Site Management Options

Managing silver-bearing waste is unique because silver is a valuable commodity. For businesses that generate a large amount of silver waste, installing an on-site silver recovery system may be a profitable method of waste disposal. These systems remove silver from your solutions and discharge the non-hazardous liquid into the local sewer system. There are many different types of systems available, at a variety of costs, so it is important to get a system that suits your needs. Whichever system you decide to purchase, you must comply with local discharge regulations by ensuring that your wastewater never exceeds 0.2 parts per million (ppm) total silver.

### On-Site Silver Recovery Systems

#### Advantages

- Treated waste will not count towards your 220 lb. SQG limit
- Reclaimed silver is valuable and may offset some of your treatment system costs
- Convenience
- Eliminates liability risks associated with off-site shipment

#### Disadvantages

- Due to high start-up costs, may not be cost-effective for small waste volumes
- Requires regular use and maintenance to work effectively
- Requires adequate space near a sink drain
- If the system malfunctions, you may violate local sewer discharge limits
- Treated waste still cannot go into a septic system
- Some recovery systems may not remove enough silver to comply with local sewer discharge limits

Thurston County Public  
Health and Social Services  
Environmental Health Division

412 Lilly Rd. NE  
Olympia, WA 98506-5132  
Hazardous Waste Hotline:  
360-867-2664

TDD Line: 360-867-2603

<http://www.co.thurston.wa.us/health/ehhw/index.html>



In order to ensure that your system complies with local sewer discharge regulations, LOTT Wastewater Alliance requires you to purchase a system that contains two recovery units in series, with a sample port located in the middle. These dual systems provide the greatest assurance that your silver will be adequately treated before being discharged. Utilizing silver test strips, you will be required to test your wastewater from this sample port on a monthly basis to ensure that the system is operating properly. You will also be required to keep a log detailing sample dates and cartridge change-out frequency. For more information on the various types of silver recovery systems, call the Department of Ecology or visit <http://www.ecy.wa.gov/pubs/94138.pdf>.

To help determine if a silver recovery unit is cost effective for your business, consider the calculations listed below. If the value of recovered silver exceeds your operating and maintenance costs, a recovery system may be a good option. Please note that these calculations are only estimates and may vary based on the type or manufacturer of a system.

### Estimated Silver Value for Solutions Containing 2000 parts per million (ppm) Total Silver

Liters/gallons of silver solution per month	Troy oz. of recovered silver per month	Silver Price	Projected value of silver per month*
3.8 L (1 gal)	0.2 oz.	\$4.85	\$1.12
19 L (5 gal)	1.2 oz.	\$4.85	\$5.89
75 L (20 gal)	4.8 oz.	\$4.85	\$23.39
200 L (55 gal)	12.7 oz.	\$4.85	\$61.75

\*Note: Projected value does not include refining fees.

### Metallic Replacement or Chemical Recovery Cartridges (CRCs)

CRCs are hollow canisters that contain steel wool or fiberglass impregnated with iron. When silver-bearing liquids are passed through this filter, the iron dissolves and is replaced by silver. CRCs are typically the most economical type of silver recovery system, ranging from \$200 to \$1,500 or more for a dual-canister system.

These systems, however, have several drawbacks. In order to work properly, CRCs require regular use and maintenance. If the cartridges are only used intermittently, the filter media may dry out and not work effectively. Even with proper care, these systems may not remove enough silver to comply with LOTT wastewater discharge regulations, so check with the individual manufacturers. If your business currently uses CRCs, please use these maintenance procedures:

- 1) Use two CRCs in a series.
- 2) Install a sampling valve located between the two cartridges. Using silver test papers, regularly test your effluent to see when the first cartridge is spent (200-500 ppm silver). When the effluent from the first canister reaches this level, it is time to remove it, putting the second cartridge first in line and adding a new second cartridge. In addition, if your CRCs have clear tubing between them, visually inspect the solution flowing through it. If it contains brown debris, it's a good indication that the first cartridge is spent. Silver test strips are available from the following vendors:
  - a. Gallard-Schlesinger, [www.gallard.com](http://www.gallard.com), (800) 645-3044
  - b. Hallmark Refining Corporation, [www.hallmarkrefining.com](http://www.hallmarkrefining.com), (800) 327-7759
  - c. Metafix: [www.metafix.com](http://www.metafix.com), (514) 633-8663
  - d. White Mountain: [www.wmi-t2.com](http://www.wmi-t2.com), (603) 648-2124
- 3) Keep a sampling/changeover logbook. Sampling and changeover will vary based on your waste volume and type of cartridge. Work with your CRC supplier to establish a maintenance schedule.
- 4) Combine your silver-bearing waste prior to treatment. Add washless stabilizers and C-41 RA bleach into spent fixer and run them through as a single batch.
- 5) Monitor the flow of solution through the cartridges and always follow the manufacturer's recommendations. If the flow is too fast, the CRCs will not work properly, resulting in non-compliance with LOTT wastewater discharge regulations. Use a metered pump or restricted gravity feed system and adjust the flow rate according to the manufacturer's specifications.
- 6) Using simple pH test papers, make sure that the waste entering the CRCs has a pH between 5.5 and 6.5. This will maximize the life of your CRCs and help them work efficiently.
- 7) Fill the CRCs with water before putting them into service. This will extend the life of the cartridges by preventing the steel wool from dissolving as they fill with fixer.

## Off-Site Management Options

**Waste Management Companies.** Utilizing a company to pick up your waste has certain advantages over on-site silver recovery systems. There are no start-up costs, and you never need to worry about equipment failure or maintenance. However, there are downsides to sending your waste off-site:

- 1) You will need to purchase storage containers, which require extra space and will add to your maintenance costs.
- 2) If you produce small quantities of waste, you may need to store the material for a long time before filling the container.
- 3) Storing waste on-site for long periods increases the risk of spills or leaks.
- 4) Even if your waste is managed by a third party, you are still responsible for the proper disposal of the material, so be sure to carefully select the right company.

In some cases, companies may allow you to mail small quantities of silver waste directly to their facilities, but be aware of shipping guidelines from the Department of Transportation. Contact your preferred mail service directly for the latest regulations and shipping prices.

**Recycling at another Local Business.** If you are a small quantity generator, you have the option of taking your silver waste to a local business that is able to properly treat photographic wastes with on-site silver recovery. If you choose this service, be sure to obtain a receipt so you can document where your waste is managed. Any business that receives waste from an SQG must conduct proper treatment and ensure that local wastewater discharge limits are being met (0.2 ppm total silver).

The following companies sell silver recovery systems and/or transport silver waste for recycling:

### Drop-Off Services

- Evergreen State College, free by appointment, contact Hugh Lentz, (360) 867-6313
- Philip Services, Tacoma, pre-registration required, disposal fees apply, (800) 327-7759
- Thurston County HazoHouse, pre-registration is required, free drive-through service Friday through Monday from 8:00 am to 5:00 pm, (360) 867-2901.
- LOTT Alliance – Budd Inlet Treatment Facility, free drop-off service, no appointment necessary, Monday through Friday from 12:00 pm to 3:00 pm, contact Ken Butti, (360) 528-5708

### Pick-Up Services and/or Silver Recovery Systems

Advanced Images, Kent	(800) 875-7311
Agco Metalex, Mukilteo	(888) 743-7887
CMX Corporation, Seattle	(800) 869-7191
Envirotech, Seattle	(800) 922-9395
Hallmark Refining, Mt. Vernon	(800) 255-1895
Kleen Env. Tech., Seattle	(206) 285-8010
Safety-Kleen, Auburn	(253) 939-2022

Check the Department of Ecology's Hazardous Waste Service Directory for additional resources:

<http://www.ecy.wa.gov/apps/hwtr/hwsd/default.htm>

## Best Management Practices

**Developer:** Photo developer contains hydroquinone and is considered hazardous waste if unused. However, hydroquinone is chemically consumed during the developing process and consequently, spent developer is not considered hazardous.

- It is illegal to dump developer into a septic system, storm drain, dry well, or on the ground.
- Used developer may be disposed in the sanitary sewer, which will be treated at the LOTT wastewater treatment plant. However, unused product is not acceptable for sewer disposal.
- Consider using low-replenishment developers for both film and paper. They can substantially reduce replenishment rates.
- Do not put developer into chemical recovery cartridges (CRCs) for silver-bearing wastes. They can plug the CRCs, resulting in pressure build-up.

**Fixer and Bleach-Fixer Solution:** Fixers typically contain high amounts of silver (3,000-8,000 ppm) and designate as a hazardous waste. Thus, all fixers must be treated on-site or properly disposed or recycled off-site.

- Never put treated or untreated fixer into your septic system, storm drain, dry well, or on the ground.
- If you generate large amounts of waste fixer, a silver recovery system may be beneficial to your operation. These systems remove silver from fixer solutions, which can be sold to metal recyclers.

- Never put fixer into the sanitary sewer unless it has been treated and meets sewer discharge limits.
- Consider using low replenishment bleach-fixer, which can substantially reduce replenishment rates.
- If your fixer is sent off-site for disposal or stored on-site, the amount of waste counts towards your Washington State waste generator status on a monthly basis. This is not necessary if your fixer is sent directly to a silver recovery system.
- Make sure your employees know that fixer and bleach-fixer is a hazardous waste.

**Bleach Solution:** Used C-41 bleach may contain 3 ppm silver, which exceeds sanitary sewer discharge limits of 0.2 ppm.

- It is illegal to put bleach solution into your septic system, storm drain, dry well, or on the ground.
- If you use CRCs for on-site silver recovery, consider mixing used C-41 bleach with your used fixer and washless stabilizer prior to recovery.
- Consider regenerating your used bleach solutions. This will reduce waste and save you money. Check with your chemical supplier for more information.
- Make sure your employees know that bleach solutions must not be disposed in the sanitary sewer.

**Stabilizer:** Stabilizers typically contain 100-300 ppm silver, which designates as a hazardous waste.

- Never put stabilizer into your septic system, storm drain, dry well, or on the ground.
- If you do on-site silver recovery, mix stabilizer with your used fixer and bleach prior to treatment.
- If your stabilizer is sent off-site for disposal or stored on site, the amount of waste must count towards your monthly total. This is not necessary if your stabilizer is sent directly to a silver recovery system.
- Make sure your employees know that stabilizer solutions must not be disposed in the sanitary sewer.

**Wash Water:** Wash waters may contain small amounts of film developing chemicals, including fixer. Although these chemicals are found in very small amounts, the silver content may still exceed local sewer discharge limits. Before disposing of wash waters into the sanitary sewer, routinely test the water to ensure that the silver levels meet the local discharge limits (0.2 ppm). However, wash waters that are contaminated with silver or other chemicals must never go into a septic system.

**Photographic Solution Filters:** Fixer and washless stabilizer filters likely contain enough silver to be considered hazardous, so they should not be thrown into the garbage unless they can be proven non-hazardous by lab tests. If hazardous, these filters should be managed by a waste disposal company.

**Cleaning Wastes:** Various cleaning agents, such as bleaches and system cleaners, may be considered hazardous waste due to chromium, cyanide, corrosive characteristics, or other heavy metals.

- If the cleaners are considered hazardous wastes, it is illegal to dispose in the sanitary sewer, septic system, storm drain, dry well, or on the ground. If they are hazardous, collect and send off-site to a licensed disposal business.
- See if your chemical supplier sells less-toxic cleaners that do not designate as a dangerous waste.

**Other Wastes:** The following items are not considered hazardous waste and may be recycled. Contact the product manufacturer or local camera shops for additional information.

- Paper cores, film containers, single use cameras, film magazines: These items may be accepted for recycling by the various manufacturers. Check with individual manufacturers or local camera shops for more information.
- Scrap film and paper: In color photo finishing, all of the silver is removed from the film or paper during the photo finishing process. As a result, processed scrap film and paper do not designate as a hazardous waste and may be thrown away in the trash. Unprocessed film or paper will have some silver on it, but data indicates that silver in this form will not leach out over time. However, soaking film-ends in fixer to remove silver will leave a coating of leachable silver that may make the film-ends a hazardous waste.

## Additional Information

For any questions regarding wastewater discharge regulations, please contact LOTT Wastewater Alliance at (360) 664-2333. For other questions on small business hazardous waste, contact the Business Pollution Prevention Program at (360) 867-2664, Monday through Friday during regular business hours or TDD (360) 867-2603 or visit: <http://www.co.thurston.wa.us/health/ehhw/index.html>