

3M settlement: key facts

The State of Minnesota and the 3M Company announced an agreement to settle the state's Natural Resource Damage lawsuit on February 20, 2018. Under the terms of the agreement, 3M will make an \$850 million grant to the state to be used for clean drinking water and natural resource projects, and the state's lawsuit expenses. After legal and other expenses are paid, about \$720 million will be invested in drinking water and natural resource projects in the Twin Cities east metropolitan region.

Grant trustees

The grant trustees are the Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Natural Resources (DNR).

Priority one — ensure safe drinking water

The top priority for investing the grant money is to improve the quality and quantity of drinking water in the east metropolitan area. This area includes, but is not limited to, the cities of Afton, Cottage Grove, Lake Elmo, Newport, Oakdale, St. Paul Park, Woodbury and the townships of Grey Cloud Island and West Lakeland.

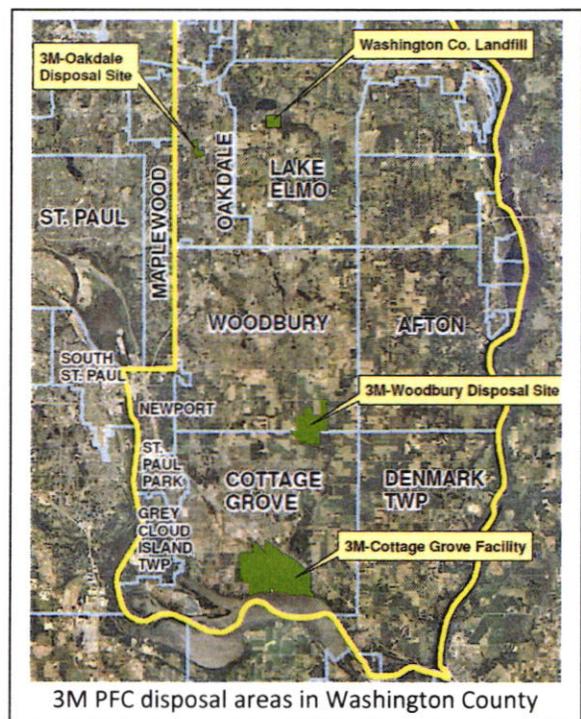
Funded projects will help provide the region's 157,000 residents and businesses with clean drinking water to meet current and future needs. Such efforts could include alternative sources of drinking water for cities or private well owners, treating existing contaminated drinking water wells, or connecting homes served by private wells to municipal drinking water systems.

Grant funds could also support the sustainability of drinking water sources with projects such as promoting water conservation or preserving open spaces to help recharge drinking water sources and enhance water quality.

Priority two — enhance natural resources

The second priority for grant spending is to enhance water resources, wildlife habitat, and outdoor recreational opportunities in the east metropolitan area, or downstream of the area on the Mississippi and St. Croix Rivers. Such projects might include restoring and protecting fish and wildlife habitat, building boat ramps and fishing piers to provide access to fish unaffected by PFC contamination, or cleaning up contaminated river sediments.

The MPCA and DNR will have immediate access to \$20 million in grant funds for projects in this priority category. After the safe drinking water goals of the first priority are reasonably achieved, more grant money can be used for natural resource projects.



3M PFC disposal areas in Washington County

Remaining grant funds

If there are funds remaining after the first two priority goals have been met, the grant can be used for statewide environmental improvement projects. Only projects in categories such as statewide water resources, habitat restoration, open space preservation, recreation improvements, or other sustainability projects would be considered.

Recent settlement agreement and 2007 Consent Order

A 2007 Consent Order between the MPCA and 3M spelled out what activities 3M is required to pay for related to PFC contamination. The 2007 Consent Order remains in place, and the recent settlement agreement outlines how the grant will work in conjunction with the 2007 Consent Order.

For the next five years, 3M will pay up to \$40 million for the short-term drinking water needs — out of its own funds on a reimbursable basis — under the terms of the 2007 Consent Order. This includes expenses such as providing bottled water and installing temporary in-home water filtering systems to residents with PFC-contaminated wells. The company will also pay for the operation and maintenance of temporary municipal drinking water treatment systems, such as those recently installed to treat wells in Cottage Grove. These dollars are intended to be used as a bridge to the long-term solutions funded under priority one.

Once the five years are over or \$40 million is spent, any remaining short-term drinking water expenses will be covered by the grant, if grant funds remain available. After the grant funds are gone, 3M under the 2007 Consent Order continues to be required to cover all drinking water expenses due to the contamination.

3M will also continue to pay remediation costs under the 2007 Consent Order at the three Washington County disposal sites for which the company has assumed responsibility:

- 3M Cottage Grove facility
- 3M Oakdale disposal site
- 3M Woodbury disposal site

Next steps

- Continue to ensure all interim safe drinking water needs are met.
- Identify potential water quality and natural resource projects through a series of public open houses and working groups. The first steps in this process include:
 - Spring 2018 — Host open houses/listening sessions in the east metro area
 - Spring/Summer 2018 — Establish one or more working groups to help identify possible projects and prioritize funding. Groups will include representatives of east metro communities, 3M, and the state of Minnesota
- Determine a schedule for reporting progress on investing funds in clean water and natural resource projects (MPCA, DNR).

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Operating group

The Operating Group will support and coordinate the work of the Working Group and the Subgroups.

Structure

This group will be composed of staff from DNR, MPCA and consultants. This group would:

- Coordinate meetings, direct state contractors, and report to the Working Group regarding tasked items.
- Develop the Subgroups' draft charters, project goals and objectives, and evaluation criteria.
- Prepare agendas for the Working Group and the Subgroups.
- Coordinate preparation of reports on settlement implementation.
- Coordinate technical groups of the Subgroups as needed.
- Track project proposals and review ideas for the potential of dual or multiple restoration goal benefits.

Additional Subgroups will be established at a later date to address other provisions of the 3M Settlement (e.g. Natural Resources Restoration and Enhancement).



Harmful Substance Compensation Program

This fact sheet, prepared by the Minnesota Pollution Control Agency (MPCA) explains how individuals can get financial aid for property damage or personal injury caused by harmful chemical substances.

What is the Harmful Substance Compensation Program?

The Harmful Substance Compensation Program (HSCP) was created to compensate persons who suffer certain kinds of injury or property damage from exposure to harmful substances in Minnesota. This exposure may come from water, soil, or air contaminated by improperly disposed of or discharged chemical waste, petroleum, or agricultural chemicals.

The HSCP was established to provide an administrative alternative to filing lawsuits against the person or company responsible for the damage. Decisions on compensation are made by the Commissioner of the MPCA. The Commissioner receives advice as necessary from physicians knowledgeable in toxicology, from health professionals knowledgeable about injuries caused by harmful substances, and from the Minnesota Attorney General's staff.

What kinds of personal injury are eligible for compensation?

Injuries eligible for compensation from the HSCP are those caused by exposure to an identifiable harmful substance and may include:

- A chronic or progressive disease, illness or disability, such as cancer, organic nervous system disorder, reproductive disorder, or physical deformity.
- Acute diseases or conditions that are obvious after limited exposure to a harmful substance released into the environment, provided the party responsible for the release is unknown or unable to compensate the victim.

What kinds of property damage are eligible for compensation?

If the contamination is at the person's principal residence, eligible damages include:

- The reasonable cost of replacing or decontaminating drinking water at a home when the Minnesota Department of Health has advised that the water not be used for drinking.
- The reasonable cost to install a vapor mitigation system at a home when the MPCA has recommended a system be installed to protect human health due to soil vapor intrusion of harmful substances.
- Losses for the sale of a home at less than the appraised market value if the sale was necessary due to a hardship for the owner. Compensation is limited to 75% of the difference in the appraised market value and the selling price.
- The increased cost to maintain two residences when caused by the inability of a property owner in a hardship situation to sell the property due to the contamination.

For eligible property damage, the compensation is limited to \$25,000 for each loss.

Claims for rental or business property or second homes are not eligible.

What types of injuries are ineligible for compensation?

Injuries that are not eligible for compensation include:

- Injuries that result from workplace exposures and for which an award is made under worker's compensation.
- Injuries caused by use of consumer products.

The person responsible for the release of the harmful substance cannot file a claim.

How are injuries compensated?

For eligible injuries, compensation includes:

- Reimbursement for medical expenses.
- Reimbursement for lost wages or income and for lost household labor.
- Payment of death benefits to dependents.

Compensation for lost wages, lost household labor, and death benefits is limited to \$24,000 each per year. There is no limit on medical expenses, but the maximum award to any one person cannot exceed \$250,000.

Is there a time limit on filing a claim?

A personal injury claim must be filed within two years after the injury and its connection to exposure to a harmful substance was discovered.

A property damage claim must be filed within two years after the total amount of compensable losses can be determined.

Are there restrictions on filing a claim?

- A claim cannot be filed by a person who has received compensation for the injury or damage from the party responsible for the release of the harmful substance.
- A person cannot bring an action in court and before the MPCA Commissioner for the same injury or damage at the same time.
- Double recovery is prohibited. If a person accepts an award from the MPCA Commissioner, the person cannot bring an action in court for that same injury or damage.
- If a person has received a favorable court judgment, the person cannot file a claim with the MPCA Commissioner unless the judgment was not paid.

A person does not need an attorney to file a claim. If the person chooses to be represented by an attorney, the attorney's fee for a property damage claim is limited to 15% of the amount awarded. No limit exists for fees on injury awards.

How are claims decided by the MPCA Commissioner?

After an investigation of a claim, the MPCA Commissioner or Commissioner's delegate drafts a preliminary decision to grant or deny compensation with an explanation. This preliminary decision is provided to the claimant for review. If the decision is accepted by the claimant, it becomes final. If the claimant is not satisfied with the preliminary decision, the claimant can challenge the preliminary decision. A notice of the challenge must be received by the MPCA Commissioner within 30 days of receiving the preliminary decision. This challenge consists of an informal hearing before the Commissioner, in which more evidence can be introduced or witnesses can be heard. After this informal hearing, the MPCA Commissioner's decision is finalized. There is no right to judicial review.

For personal injury claims, the MPCA Commissioner must grant compensation when information provided by the claimant and the Commissioner's investigation show it to be likely that:

- The claimant has an eligible injury and eligible losses.
- The claimant has been exposed to an identifiable harmful substance.
- The claimant's exposure was due to the release of the harmful substance from a facility in Minnesota.
- The claimant's injury can be caused or significantly contributed to by exposure to the harmful substance in the amount and duration of the claimant's exposure.

For property damage claims, the MPCA Commissioner must grant compensation when information provided by the claimant and the Commissioner's investigation show it to be likely that:

- The claimant has eligible damage and eligible losses under the law governing the HSCP.
- A release from a facility in Minnesota could have caused the presence of the harmful substance on the property.
- The MPCA determines that drinking water or soil vapor corrective measures taken are comparable to actions the agency would implement to protect public health.

For more information

For more information or to obtain a claim application form, call Gary Krueger, MPCA Superfund Program, at 651-757-2509.

For an authoritative description of the rights and procedures that govern the Harmful Substance Compensation Program, please refer to [Minn. Stat. §§ 115B.25-36](#) and [Minn. R. ch. 7190](#).

MPCA website: <http://www.pca.state.mn.us>.

Draft 3M Settlement Working Groups proposal

The Minnesota Pollution Control Agency (MPCA) and Department of Natural Resources (DNR) have proposed a set of workgroups consisting of stakeholders and technical staff that will provide recommendations on priorities and projects to be funded with money from the state's recent settlement with the 3M Company.

Comments on this draft proposal can be emailed to pfcinfo.pca@state.mn.us. Comments must be received by April 16, 2018.

Working Group

The Working Group will review work products of the Subgroups and provide recommendations on projects and priorities to the DNR and the MPCA.

Structure

This group will be composed of one representative each from DNR, MPCA, Minnesota Department of Health (MDH), 3M Company, Metropolitan Council and Washington County. The cities of Afton, Cottage Grove, Lake Elmo, Maplewood, Newport, Oakdale, St. Paul Park, Woodbury, and the townships of Denmark, Grey Cloud Island and West Lakeland will also have one representative each. Ten at-large citizens, businesses, and non-governmental representatives self-nominated and selected by DNR and MPCA will also sit on the Working Group.

- This group will meet once a quarter and be briefed on all the work in progress and seek input on topics to explore.
- Consultants selected by MPCA and DNR will assist and support the group.
- The meetings will be open to the public, and time will be reserved at the end of each meeting for public questions or comments.

Subgroup 1: Drinking Water Replacement

This Subgroup will analyze options and deliver recommendations to the Working Group for long-term options for alternative drinking water sources and treatment of existing water supplies that will improve the quality and quantity of drinking water for communities and individuals in the East Metropolitan Area.

Structure

The group will be composed of technical experts from DNR, MPCA, MDH, 3M, Metropolitan Council, and Washington County. The cities of Afton, Cottage Grove, Lake Elmo, Maplewood, Newport, Oakdale, St. Paul Park, Woodbury, and the townships of Denmark, Grey Cloud Island and West Lakeland will each have one representative on the Subgroup.

- The Subgroup will meet monthly. While all members will be invited to every meeting, actual participation at a given meeting may be driven by the agenda for that meeting. It is understood that those who are interested in specific projects and approaches will be most likely to attend a particular meeting.

- The meetings will be open to the public, and time will be reserved at the end of each meeting for public questions or comments.

Project selection approach

Potential projects include private well use alternatives, multi-municipal drinking water supply concepts, individual municipal drinking water supply systems, neighborhood connections to municipal systems, groundwater studies, and monitoring/modeling needs.

- Proposed project options will be developed by the Subgroup. Municipalities will provide information on needs, and feedback on emerging recommendations. Involvement by particular communities will vary and evolve over time.
- Under Operating Group and Subgroup direction, technical subgroups will likely evolve to address specific project approaches, and the technical subgroups will work with individual communities depending on project proposals.
- Consultants will assist and support the group as needed on issues including natural resource damage restoration, facilitation, and contamination remediation.

Subgroup 2: Groundwater Protection, Sustainability, Conservation and Recharge

This Subgroup will analyze options and deliver recommendations to the Working Group for long-term solutions for groundwater protection, recharge, conservation, sustainability, and for groundwater studies and modeling needs in the East Metropolitan Area.

Structure

The group will be composed of technical experts from DNR, MPCA, MDH, 3M, Metropolitan Council, Washington County, Washington Conservation District, South Washington Watershed District, and the Valley Branch Watershed District. One technical representative each from the cities of Afton, Cottage Grove, Lake Elmo, Maplewood, Newport, Oakdale, St. Paul Park, Woodbury, and the townships of Denmark, Grey Cloud Island and West Lakeland will also be a part of this group.

- The Subgroup will meet monthly. While all members will be invited to each meeting, actual participation at a given meeting may be driven by the agenda set by the Operating Group for that meeting. It is understood that those who are interested in specific projects and approaches will be most likely to attend a particular meeting.
- The meetings will be open to the public, and time will be reserved at the end of each meeting for public questions or comments.

Project selection approach

Potential projects include water conservation and efficiency, open space acquisition, and groundwater recharge.

- The project options could be a mix of grants, where the grantee would develop the projects, and group-developed projects similar to Subgroup 1. Municipalities, counties and local non-governmental organizations (NGOs) will provide needs and feedback on emerging recommendations. Involvement by particular entities will vary and evolve over time.
- Under Operating and Subgroups' direction, technical subgroups will likely evolve to address specific project approaches, and the technical subgroups will work with individual communities depending on project proposals.
- Consultants will assist and support the group as needed on issues including natural resource damage restoration, facilitation, and contamination remediation.

Perfluorochemicals (PFCs) and Health

ALSO REFERRED TO AS PERFLUOROALKYL SUBSTANCES (PFAS)

PFCs are a family of manmade chemicals used for decades to make products that resist heat, oil, stains, grease and water. PFCs are extremely stable and do not breakdown in the environment. Common uses include 1) nonstick cookware; 2) stain-resistant carpets and fabrics; 3) coatings on some food packaging (especially microwave popcorn bags and fast food wrappers); 4) components of fire-fighting foam; and 5) many industrial applications.

Our understanding of and ability to detect PFCs in the environment has evolved since Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Health (MDH) began investigating them in 2002. Laboratories at that time could not detect very low concentrations of PFCs and the science suggested that exposure to very small amounts of PFCs was not a health concern. We now are able to measure PFCs in extremely small amounts (parts per trillion in water) and newer studies suggest long-term exposure in this range might affect the health of the most vulnerable members of the population.

What do we know about PFCs in the environment?

In the environment: PFCs have been released to the environment through spills and disposal. Because PFCs are so stable, they may be found in soil, sediments, water or other places. Some PFCs travel through soil and easily enter groundwater where they may move long distances. Some experts suggest PFCs can also travel long distances in air. For information about where PFCs have been found in Minnesota, see the MPCA webpage: [Perfluorochemicals](#).

In wildlife: PFCs have been found in wildlife around the world, including fish, bald eagles and mink in the mid-western United States. One PFC (PFOS) can accumulate to levels of concern in fish. Most fish have low levels of PFOS. However, fish in some lakes have levels of PFOS that require restrictive fish consumption advice of only one meal of fish per month. For information about PFOS and fish consumption guidelines, visit the MDH Fish Consumption Guidance webpage: [Site-Specific Meal Advice](#)

In Minnesota lakes and rivers: PFCs may be present in lakes and rivers at very low levels. Exposure through swimming is not of concern. PFCs are poorly absorbed through skin and incidental ingestion of surface water while swimming will not result in a significant exposure. Breathing them in while swimming or bathing is not a health concern because there is very little evaporation of PFCs from water into the air.

In people: Studies show nearly all people have some PFCs in their blood, regardless of their age. The PFCs most commonly found in blood are PFOS, PFOA, and PFHxS. People are exposed through food, water, dust or from using consumer products. Some PFCs can build up and stay in the body for many years, but they can slowly decline if the exposure source is removed. For information about studies by MDH that measured PFCs in the blood of East Metro residents, visit the MDH webpage: [East Metro PFC Biomonitoring Follow-up Project](#).

Are PFCs harmful to people?

Scientists are still studying whether PFCs cause health problems. Researchers have found links between PFCs and some human health outcomes. In some studies, higher levels of PFCs in a person's body were

associated with higher cholesterol, changes to liver function, reduced immune response, thyroid disease, and kidney and testicular cancer. However, more work needs to be done to determine if PFCs cause health outcomes or if they are due to other factors. Studies of workers exposed to PFCs on the job have not found consistent evidence that these chemicals cause health problems.

In laboratory animal studies, effects of PFC exposure included developmental changes such as delayed bone growth, delayed mammary gland development, and accelerated male sexual development. Other effects of exposure included decreased body weight, increased kidney weight, changes to the liver, reduced immune response, and decreased thyroid hormone levels.

Recent studies indicate exposure to PFOA and PFOS could present a possible risk for developing fetuses and infants. Long-term exposure to PFOA and PFOS leads to accumulation of these chemicals in people. Accumulation in women of child-bearing age can result in exposure to the fetus and to breastfed infants. Breastfeeding is important for the short and long-term health of both a mother and infant. MDH recommends that women currently breastfeeding, and pregnant women who plan to breastfeed, continue to do so. Bottle-fed infants are also of concern because they drink more water for their body weight compared to older children and adults.

How does MDH protect Minnesotan's drinking water?

MDH is responsible for ensuring safe drinking water for all Minnesotans. One way MDH does this is through regular testing of public water supplies for contaminants. MDH also works with the MPCA to investigate situations where groundwater contaminants may affect private wells.

In addition, MDH develops health-based guidance for drinking water contaminants. The guidance can be in the form of Health-Based Values (HBVs) or Health Risk Limits (HRLs). Visit the MDH webpage for information about [Guidance Values and Standards for Contaminants in Drinking Water](#). MDH provides guidance for evaluating the safety of a mixture of chemicals that are found in groundwater. For more information, visit the MDH webpage: [Evaluating Concurrent Exposures to Multiple Chemicals](#).

Minnesota's public water systems can use MDH health-based guidance as goals, benchmarks, or indicators of potential concern. Some public water suppliers may strive to meet health-based guidance for contaminants for which it is possible and cost effective.

MDH continues to monitor the growing body of science about PFCs and will adjust our health advice if further evidence suggests additional protection is needed in the future.

What levels of PFCs are safe to drink?

Because PFCs are known to be in the environment in Minnesota, MDH has developed drinking water guidance values for several PFCs to represent levels of chemicals in drinking water that MDH considers safe for people, including sensitive populations. The table below provides basic information about these values. More information for each PFC is on the MDH webpage: [Human Health-Based Water Guidance Table](#).

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In May 2017, MDH released revised guidance values for PFOA and PFOS. The guidance values apply to short periods of time (i.e., weeks to months) during pregnancy and breastfeeding, as well as over a lifetime of exposure. The revision is based on the understanding that PFOA and PFOS stay in the human body for years and can increase with additional exposures, and can cross the placenta and are secreted in breastmilk.

PFCs Detected in Minnesota	Drinking Water Guidance Value parts per billion (ppb or µg/L)	Year Value Established
perfluorooctane sulfonate (PFOS)	0.027 ppb (27 parts per trillion [ppt])	2017 ¹
perfluorooctanoic acid (PFOA)	0.035 ppb (35 parts per trillion [ppt])	2017 ¹
perfluorobutane sulfonate (PFBS)	7 ppb	2011
perfluorobutanoic acid (PFBA)	7 ppb	2011
perfluorohexane sulfonate (PFHxS)	Not established ²	NA
perfluorohexanoic acid (PFHxA)	Not established ³	NA
perfluoropentanoic acid (PFPeA)	Not established ³	NA

¹ Previous MDH guidance for PFOS and PFOA were established in 2009.

² MDH recommends using the health based value for PFOS (27 ppt) as a surrogate for PFHxS until more toxicological research on PFHxS is available. PFHxS remains in the body longer than PFOS and appears to be similar in toxicity.

³ Due to limited toxicological research, there is not enough scientific information to develop a guidance value.

Water with PFC levels above MDH guidance values is safe for bathing, showering or washing clothes and cleaning. To protect infants and young children who could be exposed in utero and early in life, water should not be used for drinking or cooking.

How can I reduce my exposures to PFCs?

PFCs are in people and animals all over the world. They are found in some food products and in the environment (air, water, soil, etc.). Completely stopping exposure to PFCs is unlikely. You can take the following steps to reduce your exposure to PFCs:

If you live near sources of drinking water contaminated with PFCs

Reverse osmosis and activated carbon filter treatment systems can reduce the levels of PFCs in drinking water. MDH has information about inexpensive and easy to use systems you can install in your home to reduce your exposure to PFCs through drinking water. You may choose to use bottled water for drinking and cooking for a short time, but long-term bottled water use will be more expensive than installing a treatment system. Information can be found on the following MDH webpages:

- [Water Treatment Using Carbon Filters: GAC Filter Information](#)
- [Home Water Treatment Units: Point-of-Use Devices](#)
- [Evaluation of Perfluorochemical Removal by a Small, Point-of-Use Filter \(PDF\)](#)

Breastfeeding is important for the short and long-term health of both a mother and infant. MDH recommends that women currently breastfeeding, and pregnant women who plan to breastfeed, continue to do so.

- If your drinking water comes from a private well, and you are breastfeeding or preparing infant formula, you may want to consider using filtered tap water or bottled water until a treatment systems is installed. More information about faucet filters and treatment systems can be found on the MDH webpage: [Perfluorochemicals \(PFCs\) and Home Treatment](#).
- If your drinking water comes from a public drinking water system, tap water can be used for

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cooking or drinking or preparation of infant formula. All affected community public drinking water systems have put in place interim measures that will provide drinking water at or below the new MDH health-based guidance.

- More information about breastfeeding is found on the MDH webpage: [Breastfeeding](#)

You can be exposed to PFCs through the food you eat.

For example, PFOS and PFOA can be present on crops due to environmental contamination and some food packaging may transfer PFOS to food items. PFOS may also be present in the fish people catch and eat. Fish Consumption Guidance for fish caught in areas affected by PFOS can be found on the MDH webpage: [Site-Specific Meal Advice](#).

House Dust and PFCs

Interior sources of PFCs (e.g., consumer products) contribute most to PFCs in house dust. Ingestion of PFC-containing household dust can be a significant route of exposure, especially for infants and young children. Keeping floors and other surfaces free of dust will limit exposure. For more information, see the MDH webpage: [Perfluorochemicals in Homes and Gardens Study Summary](#).

Links

- MPCA, Perfluorochemicals webpage
<https://www.pca.state.mn.us/waste/perfluorochemicals-pfcs>
- MDH Fish Consumption Guidance, Site-Specific Meal Advice webpage
<http://www.health.state.mn.us/divs/eh/fish/eating/sitespecific.html>
- MDH, East Metro PFC Biomonitoring Follow-up Project webpage
<http://www.health.state.mn.us/tracking/biomonitoring/projects/eastmetropfc.html>
- MDH, Guidance Values and Standards for Contaminants in Drinking Water webpage,
<http://www.health.state.mn.us/divs/eh/risk/guidance/gw/>
- MDH, Human Health-Based Water Guidance Table webpage
<http://www.health.state.mn.us/divs/eh/risk/guidance/gw/table.html>
- MDH, Water Treatment Using Carbon Filters: GAC Filter Information webpage
<http://www.health.state.mn.us/divs/eh/hazardous/topics/gac.html>
- MDH, Home Water Treatment Units: Point-of-Use Devices webpage
<http://www.health.state.mn.us/divs/eh/water/factsheet/com/pou.html>
- MDH, Evaluation of Perfluorochemical Removal by a Small, In-home Filter PDF
<http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/poueval201701.pdf>
- MDH, Breastfeeding
<http://www.health.state.mn.us/divs/fh/wic/bf/index.html>
- MDH, Perfluorochemicals (PFCs) and Home Treatment
<http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/wateranalysis.html>
- MDH, Perfluorochemicals in Homes and Gardens Study
<http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/pihgssumm.pdf>

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Evaluation of Perfluorochemical Removal by a Small, In-home Filter

Background:

On behalf of the Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Health (MDH), West Central Environmental Consulting (WCEC) tested an inexpensive and easy to install carbon filter to determine how well it removes perfluorochemicals (PFCs) from drinking water.

Method:

WCEC tested a PUR faucet mount water filter (model FM-2000B, FM-3333B), which is intended for home use to treat water from a single faucet. The filter contains a proprietary carbon formulation that, according to the manufacturer, meets ANSI/NSF standards 53 and 401 for removal of a wide range of contaminants (metals, pesticides, volatile organic compounds, and emerging contaminants). The manufacturer makes no claims about PFC removal.



Water containing all seven PFCs typically detected in south Washington County groundwater was used to test the filter. The amount of PFCs in the water was at or above what is commonly detected in residential wells. The water was run through the filter and samples of treated water were taken after 25, 50, 75, and 100 gallons had passed through the filter. This corresponds to 25, 50, 75 and 100 percent of the manufacturer's recommended capacity for the filter to treat 100 gallons.

Tests were conducted on non-chlorinated and chlorinated water to determine if the presence of chlorine would affect the filter's performance. The Minnesota Public Health Laboratory analyzed the non-chlorinated samples; AXYS Analytical Services Ltd. analyzed the chlorinated samples.

Results:

All values in the tables below are in parts per billion (ppb).

Non-chlorinated Water

Chemical	Untreated water	25% of filter capacity	50% of filter capacity	75% of filter capacity	100% of filter capacity	MDH drinking water advice	Reporting Limit	Method Detection Limit
PFBS	0.021	ND	ND	ND	ND	7	0.05	0.009
PFBA	1.0	ND	ND	0.013*	0.024*	7	0.05	0.008
PFHxS	0.03	ND	ND	ND	ND	0.027**	0.025	0.005
PFHxA	0.075	ND	ND	ND	ND	NE	0.05	0.01
PFOS	0.25	ND	ND	ND	ND	0.027	0.025	0.007
PFOA	0.24	ND	ND	ND	ND	0.035	0.035	0.01
PFPeA	0.043	ND	ND	ND	ND	NE	0.05	0.009

ND = not detected above Reporting Limit

NE = no criteria established

* These are estimated concentrations, detected below Reporting Limit but above Method Detection Limit

** MDH recommends using the health-based value for PFOS (0.027 ppb) as a surrogate for PFHxS until more toxicological research on PFHxS is available.

Chlorinated Water

Chemical	Untreated water	25% of filter capacity	50% of filter capacity	75% of filter capacity	100% of filter capacity	MDH or EPA drinking water criteria	Reporting Limit*
PFBS	ND	ND	ND	ND	ND	7	0.01
PFBA	0.361	0.0134	0.0315	0.0635	0.0954	7	0.005
PFHxS	ND	ND	ND	ND	ND	0.027	0.01
PFHxA	0.0263	ND	ND	ND	ND	NE	0.005
PFOS	0.0798	ND	ND	ND	ND	0.027	0.01
PFOA	0.0658	ND	ND	ND	ND	0.035	0.005
PFPeA	0.0112	ND	ND	ND	ND	NE	0.005

ND = not detected above Reporting Limit (RL)

NE = no criteria established

*Reporting limits varied slightly for each sample (RLs for PFBS, PFHxS, PFOS: 0.00899 – 0.00967 ppb; RLs for PFBA, PFHxA, PFOA, PFPeA: 0.0045 – 0.00484 ppb)

** MDH recommends using the health-based value for PFOS (0.027 ppb) as a surrogate for PFHxS until more toxicological research on PFHxS is available.

The filter removed six of the seven PFCs to below the Reporting Limit and Method Detection Limit in all samples. In the non-chlorinated water, PFBA was removed to below the Reporting Limit in all samples; only small amounts were seen above the Method Detection Limit after 75 gallons of water were treated. In the chlorinated water, small amounts of PFBA were detected in all samples, but the filter removed most of the PFBA. In all samples, the filter reduced PFBA to far below MDH's Health Risk Limit of 7 ppb.

Conclusion:

The test results suggest that this type of filter unit, when installed and maintained according to manufacturer's instructions, can effectively remove nearly all of the PFCs typically found in south Washington County groundwater to below detectable levels and MDH health recommendations. This was observed in non-chlorinated and chlorinated (city) water. Although PFBA did break through the filter, the amounts in treated water never exceeded (or even approached) levels of health concern.

Disclaimer:

MDH and MPCA make no endorsement of this product. This was one test of one filter from one manufacturer. Although the results are consistent with those from a similar test by MDH in 2007, the test isn't a comprehensive evaluation of the model tested or other similar filters. Results may vary between individual filter units and between different models or brands. We simply offer this information to people who may be considering buying a filter to reduce exposure to PFCs.

Please note, **carbon filters do not remove bacteria or nitrate, a common contaminant in Minnesota groundwater.** MDH advises well owners to test their water annually for bacteria and nitrate, and provide treatment to address these problems if needed. Contact Washington County for sampling kits at 651-430-6655 or www.co.washington.mn.us/637/Water-Tests.

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Granular Activated Carbon Filters

Uncontaminated well water is usually considered to be a safe source of drinking water. When a well becomes contaminated, a water treatment system (a filter with granular activated carbon, or GAC) is a proven method for removing organic chemicals like trichloroethylene and perfluorochemicals from the water. When contaminant levels in a well exceed health-based limits, the Minnesota Pollution Control Agency (MPCA) may install a whole-house GAC filter. This filter traps the contaminants so that your drinking water meets health-based limits. This fact sheet is intended to provide you with information about the filter and steps you can take to ensure it operates properly.

What is GAC?

Granular activated carbon is made from raw organic materials, such as coconut shells or coal, which are high in carbon. Heat is used to activate the surface area of the carbon. The activated carbon removes certain chemicals from the water passing through a GAC filter by trapping the chemical in the GAC. However, other chemicals, like iron and nitrate, are not attracted to the carbon and therefore are not effectively removed.

It is important to know the level of contaminants and the volume of water used in order to determine the correct size and components of the filtration system. All treatment systems require proper installation, periodic monitoring, and maintenance. Eventually, the GAC loses its ability to trap and remove chemicals and it needs to be changed. The MPCA determines when MPCA-installed filters need to be changed. In some cases, the GAC can last several years depending on contaminant levels and water use.

About your GAC filter system

A whole-house filter is installed at a point on the home's water supply plumbing which will result in treatment of all water that travels to any faucet or fixture in the home. Typically, the MPCA will exclude outside faucets and sprinkler systems. It removes the chemicals before they are ingested, inhaled, or absorbed through the skin during washing or bathing. This is important for some chemicals that readily evaporate from water or easily pass through the skin.

The filters are usually cylindrical in shape and about four feet tall and 15 inches in diameter. These filters are usually installed as a pair, although more may be required in some situations. Two filters arranged in sequence

ensure that any organic chemical that might get past the first filter is trapped by the second. When the MPCA recommends a filter be changed out, the second filter is moved to the first position and a new filter is



placed in the second position. Often MPCA contractors will perform the change-outs. Sample ports located before, between and after the filters allow for testing of the water at each location (see diagram).

Systematic monitoring and a maintenance schedule based on contaminant levels and water use are essential to ensure that the GAC filters function properly and that a change-out occurs before the system loses its ability to trap chemicals.

Typically, a simple water meter is installed with the GAC filter to monitor water use. The MPCA will contact you periodically for a meter reading. This is critical to properly monitor the performance of the GAC filter system.

What can I do to ensure that my drinking water remains safe?

The GAC filter system is designed to remove the contaminants detected in your well water. However, there are some important steps you need to take to ensure that the filter continues to operate properly:

- Consider testing your unfiltered well water once a year for nitrate and coliform bacteria. These are common contaminants in private wells, often resulting from septic systems or fertilizer use. Your county public health department may be able to provide you with a simple test kit. Please provide a copy of the results to your MPCA staff contact.
- If a test detects coliform bacteria and you need to chlorinate (“shock”) the well to kill the bacteria, you may need to temporarily bypass the filter system to prevent the chlorine from quickly using up filter capacity. Talk to your MPCA staff contact for guidance before doing this.
- Allow the MPCA or its contractor to collect a sample or conduct maintenance on the system when the MPCA deems it necessary, and provide the MPCA with meter readings when asked. This is very important to monitor and ensure continued filter system performance.
- If you are away from home for a week or more, thoroughly flush the system by completely opening a filtered tap or faucet for at least 30 minutes before using any water for drinking or cooking purposes. This will help remove any bacteria or other contaminants that may have built up while the GAC filter system was not in use. Although rare, bacteria

in the system can convert nitrate to nitrite, which can be especially toxic for infants and young children.

- Check your system on a monthly basis to ensure that there are no leaks, or that the system has not been accidentally bypassed (allowing untreated water to reach the taps). Report any problems, changes in water pressure, or unusual taste, odor or appearance to your MPCA staff contact.
- If you are installing other types of water treatment units, such as a water softener or reverse osmosis unit, please work with the MPCA to ensure that the additional systems do not compromise the operation of the GAC filter system.

Properly maintained, the GAC filter system will provide drinking water for you and your family that meets health-based limits for the contaminants found in your well.

Contact information

If you have questions or concerns regarding the installation or operation of the GAC filter system, contact the MPCA staff person who is assigned to your project. The MPCA general telephone number is 651-296-6300 or 800-657-3864.

If you have questions regarding health concerns associated with contaminants in drinking water, please contact the Minnesota Department of Health’s Site Assessment and Consultation Unit at 651-201-4897 or health.hazard@state.mn.us.

