



Flint Hills' North Pole Refinery Contaminated Site

Frequently Asked Questions

On dec.alaska.gov/spar/csp/sites/north-pole-refinery,
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Health Questions

What amount of sulfolane is considered safe in drinking water?

Early in 2013 DEC set the groundwater cleanup level for sulfolane at the Flint Hills Resources North Pole Refinery site at 14 parts per billion. This level is protective of human health, both in terms of drinking water, and in ensuring the groundwater is safe to use for gardening and other general purposes.

This level is based on a toxicity value (a "Provisional Peer Reviewed Toxicity Value") announced in 2012. The U.S. Environmental Protection Agency developed this value, at DEC's request, after more than a year of researching previously published data.

Cleanup levels are the highest concentration of a hazardous substance that may be left in soil or groundwater. This is a level that will not pose a threat to the health and safety of people in contact with the contamination or to the environment itself. Setting a cleanup level for the North Pole Refinery provides a defensible, legal basis for DEC's oversight of the cleanup at the site. (See question p. 6, "*What is DEC's cleanup level, how was it set?*")

What do we know about the health effects of sulfolane?

Right now there is little information on the health effects of sulfolane on humans. What we currently know about the toxicity (health effects) of sulfolane comes from laboratory studies where test animals were exposed to relatively high levels of sulfolane for short periods of time (up to six months). We hope to gain a better understanding of sulfolane toxicity in the next 4-5 years, when the federal National Toxicity Program conducts animal studies to evaluate the short and longer term health effects of sulfolane.

In January 2012 the Alaska Department of Health and Social Services (DHSS) published a health consultation report ([see report](#)) evaluating community concerns about sulfolane in private water wells. The agency concluded that "North Pole residents who consumed water with detectable levels of sulfolane from their private wells are not likely to experience negative health effects. The levels of sulfolane in North Pole wells are low, and below those that caused subtle health effects in test animals. However, we cannot say with absolute certainty that there would not be any health effects from long-term exposure to low levels of sulfolane in drinking water, because no studies have looked at this in animals or humans."

DHSS also reviewed the rates of cancer and birth defects in the North Pole area and did not find any unusually high rates of either. This information is based on statistical analysis of reported cases of cancer and birth defects from the State of Alaska Cancer Registry and Birth Defects Registry.

In the absence of human health data, scientists commonly use animal studies and computer modeling to determine what is a "safe level" of exposure to a chemical for people. The less we know, the lower this level is set, to be more protective. (See question p. 6, "*What is DEC's cleanup level, how was it set?*")

When will we know more about the health effects of sulfolane?

In early 2012, the National Toxicology Program accepted sulfolane into its research program. This national program is designing and conducting new research to evaluate the health effects of exposure to sulfolane in laboratory animals. While results are not expected for a number of years (likely 3-5), this research will provide additional scientific information on the toxicity of sulfolane. ([Click here for more information](#)).

Until we know more about the health effects of sulfolane, how is the public protected from potential exposure?

Flint Hills continues to provide alternative water supplies or treatment to residents whose drinking water wells are contaminated with sulfolane. In 2012, the Alaska Department of Health and Social Services (DHSS) published the *Health Consultation for Sulfolane Plume in Groundwater: Evaluation of Community Concerns about Sulfolane in Private Wells*. The recommendations to the public that resulted in this evaluation are summarized in this [June 2013 fact sheet \(download PDF\)](#). (Click here to view more [health-related documents](#)).

Do you still recommend that impacted well water should not be used for gardening?

Yes, state health officials in the Alaska Department of Health and Social Services continue to recommend using water with no detectable level of sulfolane for growing fruits and vegetables, until more is known. Some scientific studies have indicated that plants can absorb sulfolane from water; however, no published studies are currently available on sulfolane uptake in edible garden plants.

In the summer of 2010, the Technical Project Team helping guide the investigation of sulfolane contamination in North Pole conducted a garden sampling project. Only seven local gardens participated, thus very few samples of each plant were available during one single growing season. With these limitations and other factors (e.g., amount of rainfall and level of sulfolane in the water) that could affect the final levels of sulfolane in the plants, we cannot draw broad conclusions about the safe use of sulfolane-impacted water for growing fruits and vegetables for all North Pole gardeners.

Nonetheless, the sampling results provide valuable information for North Pole residents:

1. Edible garden plants can take up sulfolane present in water, so people can be exposed to sulfolane by eating those foods.
2. Sulfolane was found at low levels in all parts of plants sampled (leaves, fruits, flowers, stems and roots). The highest levels were found in the leafy part of the plant.
3. Based upon what we know about sulfolane, the levels of sulfolane found in edible plants from the North Pole gardens we tested were low and not likely to harm health. To be on the safe side, however, state health officials continue to recommend using water with no detectable level of sulfolane for growing those foods, until more is known.

Flint Hills has been offering all homes within the plume area and not on city water an alternate source of water for gardening. You can read more in these fact sheets found on our documents page, "[Final Results of the North Pole Sampling Project, Jan. 18, 2011,](#)" and the "[DHSS Health Consultation - Sulfolane Plume in Groundwater.](#)"

Could sulfolane in well water cause skin rashes?

According to available studies, sulfolane applied directly to the skin of various test animals did not irritate or sensitize (make sensitive or hypersensitive) their skin. Pure sulfolane applied to the eyes of rabbits produced a mild swelling inside the eyelids, which cleared within a few hours. It is important to add that, although readily soluble in water, sulfolane has been found to be fairly impermeable across (does not readily penetrate) human skin.

In March 2012, the Alaska Department of Health and Social Services (DHSS) investigated reports of skin rashes in North Pole after learning that some residents were concerned that their skin rashes may have been related to sulfolane exposure from their well water. To address these concerns, DHSS reviewed the available scientific studies on dermal exposure to sulfolane and contacted a local family, health

professionals and health care facilities. DHSS found no evidence of a cluster or outbreak of rash illness in either North Pole or Fairbanks. Local health professionals have been asked to contact local public health nursing or the [Alaska Section of Epidemiology](#) if they notice any unusual clusters of rash illness, or if they have other concerns.

Why are no health studies being done with people in North Pole?

Some North Pole residents have asked why the Alaska Department of Health and Social Services (DHSS) is not conducting a more extensive health study to collect information about medical conditions and monitor disease outcomes potentially related to sulfolane exposure. There are many factors to consider when deciding whether to do such a study. Briefly, performing an extensive health study often takes years to successfully implement and considerable resources to complete. One of the major factors to consider is how successful the study might be in identifying a specific exposure-outcome association. When the health outcome for a particular exposure is known and is related to the exposure, the chance for success is good. Unfortunately, this is not the case with sulfolane. The historical exposure data are lacking and the health effects of sulfolane are not known. Without this information, a health study cannot currently be designed to adequately evaluate potential associations.

Due to the considerable limitations of performing an extensive health study in this situation, some stakeholders have suggested that a health registry of some sort should be established to look for unusual patterns of disease. Health registries can be useful if past exposures are well understood, specific disease endpoints are reasonably expected, and the exposed population is large enough that one could reasonably expect to detect a sufficient number of cases of a particular health endpoint over time (typically years) to identify a potential association with the exposure of interest. None of these conditions are present with sulfolane exposure in North Pole. That said, if some stakeholders feel as though a health registry is still warranted despite these substantial limitations, EPHP staff are dedicated to listening to their rationale for this point of view.

As has always been the case, DHSS's Environmental Public Health Program staff members are committed to continue working with the North Pole community on this issue by listening to community member concerns, staying abreast of new information as it becomes available, and responding appropriately using the best available evidence-based practices.

Is the North Pole city water safe?

Tests on water from North Pole's new city water wells have never shown detections of sulfolane. The two new wells for the City's water system are located outside of the contaminant plume and take water from depths starting at 122 and 145 feet below ground surface. DEC issued its final operational approval for these new wells on April 30th, 2012, however an interim operational approval was granted in December 2010. The wells are now fully approved to operate without restrictions or caveats but follow a prescribed testing schedule for sulfolane, as required by DEC.

Also, tests on water treated by the City of North Pole's public water system have never shown a detection of sulfolane. The former North Pole drinking water wells were replaced in 2010 due to trace detections of sulfolane in the raw water in both wells. Former Well #1 had detections of up to 6 parts per billion (ppb). Former Well #2 had detections of up to 9.3 ppb. Please note that the highest detections in the untreated water were still below the recently established site-specific cleanup level of 14 ppb. For more information, see "[Update #13, Sulfolane Investigation](#)," sent to the email list of interested persons, April 14, 2010.

How many properties are affected by the sulfolane plume?

According to Flint Hills, 302 properties (as of December 2012) with non-municipal drinking water wells have had a detection of sulfolane or received a long-term alternate drinking water source. The company is also providing bottled water as a precaution to other properties near the plume that have not had a detection and to properties that have not yet chosen a permanent drinking water alternative. All residents with sulfolane detections in their water currently have been offered an alternate drinking water source. Most now have a permanent solution.

What will happen to the home water systems which Flint Hills has agreed to maintain? Is there a sunset policy on their alternative water supply agreements with homeowners?

DEC has examined the templates for the three types of alternative water supply agreements which Flint Hills has made with most of the affected homeowners. There is no "sunset provision" of two years or any other time limit in the company's agreements with homeowners over providing them with a permanent source of water. According to the template and DEC's discussions with Flint Hills, the agreement will be terminated at least three months (or more in some cases) after the company notifies the homeowner that the property's well water meets DEC's cleanup level of 14 parts per billion.

DEC staff was not involved in the development of the homeowner agreements, nor do we know specifically what any given landowner signed. As a regulatory agency overseeing the investigation and cleanup, DEC requires that alternate water sources be provided so that residents and visitors to the area of sulfolane contamination are not exposed to that contamination and continue to be protected as long as the groundwater is contaminated. We don't require that this happen in a specific way or with specific technology. Flint Hills so far has been swift to respond to the problem and has developed the home treatment systems as well as other options that allow residents a degree of choice. If you have signed an agreement and you have concerns about it, please contact DEC, or Flint Hills. ([See Contact Us page.](#))

Why isn't Flint Hills testing for benzene along with sulfolane in people's well water? How can we be sure that benzene from past petroleum spills isn't leaking off the refinery property?

DEC has no reason to believe that benzene has moved off of the refinery property. DEC has overseen monitoring of benzene and other compounds in groundwater at the refinery since 1986 and will continue to do so into the future. We know from examining these many years of monitoring data that benzene has not left the refinery property. If private water wells north of the property were sampled and benzene or other petroleum compounds were detected, their origin would not be from the refinery and therefore not the responsibility of Flint Hills. If you suspect that your well contains contamination other than sulfolane we encourage you to have your well tested independently.

([See map with results of monitoring for benzene over many years.](#))

I'm still not convinced that benzene isn't coming off the property with the sulfolane.

Sulfolane and benzene don't have the same chemical properties, so they don't act the same in groundwater. They do bond well to each other, making sulfolane useful in the refining process, however sulfolane and benzene separate easily when dissolved in water.

Benzene can dissolve in water, but it clings to soil, evaporates through the soil and breaks down much more easily than sulfolane by natural processes underground. All these processes mean that benzene, like other petroleum compounds, doesn't move as far in the groundwater compared to sulfolane.

Sulfolane, by comparison, dissolves easily in water, does not cling well to soil, and does not evaporate well. When gasoline, containing both benzene and sulfolane leaks into the soil and makes its way to

groundwater, the benzene doesn't travel far, but the sulfolane dissolves into the water and travels much further.

Cleanup

What is DEC's cleanup level, how was it set, and how is it used?

Early in 2013, after three years of an extensive review of sulfolane's toxicity by close to 30 toxicologists from health and regulatory agencies, DEC announced a groundwater cleanup level of 14 parts per billion (ppb) for sulfolane at Flint Hills Resources' North Pole Refinery site. This level is protective of human health, both in terms of drinking water and water use for gardening and other general purposes. A cleanup level is the highest concentration of a hazardous substance that may be left in groundwater. This is a level that will not pose a threat to the health and safety of people in contact with the contamination or to the environment itself.

The U.S. Environmental Protection Agency (EPA) sets toxicity values for known toxic substances. The agency had never set a value for sulfolane, so DEC formally requested that EPA develop one: a Provisional Peer Reviewed Toxicity Value (PPRTV). After considering the health consults done by ATSDR in 2010 and 2011 and more than a year of their own research into previously published data, EPA established a PPRTV for sulfolane in 2012. DEC set the new cleanup level for the North Pole Refinery site based on the EPA toxicity value and a site-specific risk assessment for the North Pole Refinery.

Setting a sulfolane cleanup level for the North Pole Refinery based on EPA's analysis provides a defensible, legal basis for DEC's oversight of the cleanup at the site. After EPA established the PPRTV, the laboratory techniques for sulfolane were evaluated to ensure the detection limits were low enough to meet the new cleanup level.

Is the plume size growing or shrinking? Do the sulfolane concentrations decrease as you move away from the refinery?

Investigating the three-dimensional shape and the behavior of the plume is a key objective of the site characterization process Flint Hills is currently conducting, with DEC oversight and Technical Project Team participation. Additional monitoring wells will be installed in the summer of 2013 to improve our understanding of the plume. Sulfolane trends cannot yet be determined for some of the monitoring wells, especially those installed most recently, because there is not enough data. Therefore, definitive statements about the plume's behavior are premature at this point. There will likely be seasonal fluctuations in sulfolane concentrations, but eventually we expect the data will reflect the results of Flint Hills Resources' ongoing cleanup efforts to reduce the amount of contamination leaving the refinery.

In general, the plume concentrations do decrease in groundwater further from the refinery, but some areas have higher concentrations than others, and the contamination flow paths are not yet fully understood. ([Maps of the plume are available on our maps page.](#))

There are currently 192 monitoring and observation wells on the refinery, and 126 monitoring wells located off the refinery. Many of these locations are "nests" of monitoring wells at different depths that provide information about the vertical plume behavior. Monitoring wells have been installed to the top of permafrost or up to 150 feet deep, although none of the monitoring wells have been drilled through permafrost. More well installations are planned for targeted locations in 2013. While the horizontal or lateral extent of the plume is now fairly well understood, less is known about its vertical movement, in particular, how and where sulfolane migrates below the permafrost.

Sulfolane has been detected in private wells below permafrost as deep as 300 feet. It is extremely unusual to see contamination at that depth in the Fairbanks area. Understanding how permafrost is affecting the flow of contaminants within the plume is important so we can be sure the treatment systems are designed properly and we don't miss any movement, should it occur. Currently, Flint Hills is performing periodic sampling of selected private wells known to have depths below the permafrost. In addition, the University of Alaska, Fairbanks (UAF) is conducting research focused on acquiring additional knowledge about the effect of permafrost on groundwater flow.

What are the future plans regarding monitoring and sampling the groundwater?

Sampling and monitoring the plume of sulfolane-contaminated groundwater serves to supply new data where information gaps now exist and to track plume movement or seasonal variation. Flint Hills Resources continues to collect groundwater samples four times a year from monitoring wells located both on and off of the refinery. In addition to Flint Hills' monitoring efforts, UAF researchers are studying the plume to learn more about biodegradation of sulfolane within the plume. Biodegradation is a process in which naturally-occurring microbial organisms transform or alter the structure of chemicals introduced into the environment, thus removing it from the environment by breaking it down into different simpler components.

Where is my house relative to the plume?

One map that can show you the area of the plume and the range of sulfolane concentrations in groundwater can be found by clicking on the map image at right. You can also contact the Flint Hills Groundwater Office, at (907) 488-0723, or DEC's Project manager Tamara Cardona, at (907) 451-2192. Flint Hills has been working with each landowner in or near the affected area to test their water and provide an alternate water supply since the discovery of sulfolane in wells off of the refinery property in late 2009.

Why has DEC's cleanup level changed?

As is the case with many chemicals, the cleanup level for sulfolane has changed over the last decade as the chemical has been studied more closely. In 2004, Flint Hills purchased the refinery from Williams and submitted a [Corrective Action Plan](#) to address on-site contamination. In DEC's approval of this plan, a groundwater cleanup level for sulfolane was set at 350 parts per billion (ppb). With no federal cleanup levels set for sulfolane, DEC used available toxicity data and recommendations made by the [Canadian Province of British Columbia](#) to set the value. The 350 ppb concentration was not exceeded at the refinery boundaries, so no active remediation was required, only continued monitoring.

In late 2009, Flint Hills' sampling from new monitoring wells off their property's northern edge indicated sulfolane concentrations that were below 350 ppb, but higher than expected. This discovery led to further sampling and detection of sulfolane in private drinking water wells, as well as low detections in the City of North Pole's water supply wells. Upon seeing these results, DEC contacted the Alaska Department of Health and Social Services (DHSS) for a public health evaluation of sulfolane. DHSS worked with the federal Agency for Toxic Substances and Disease Registry (ATSDR), and together in February 2010 they recommended the action level be lowered to 25 ppb until more in-depth studies of sulfolane could be completed. ATSDR conducted a second health consultation in May 2011 setting the action level at 20 ppb for infants. After EPA officially set a toxicity value in 2012, DEC set its current sulfolane cleanup level at 14 ppb based on the EPA value. ([See a 2013 fact sheet on developing a groundwater cleanup level.](#))

Are there any other contaminants from the refinery?

While DEC and Flint Hills Resources continue their efforts to investigate and clean up sulfolane-contaminated groundwater, they're also running a parallel testing regimen for other "contaminants of potential concern." It's standard procedure that once contamination has been identified at a site, additional testing is done to ensure other types of contamination related to site operations aren't present as well.

Sulfolane is the only contaminant detected in groundwater off the refinery property. Other contaminants such as fuel, fuel constituents, including benzene, toluene, ethylbenzene, and xylenes (also known as BTEX); and perfluorinated compounds, or PFCs (man-made chemical compounds used in fire-fighting foams) are present in groundwater and/or soils at the facility. Extensive monitoring work, however, has shown those chemicals are not leaving the refinery property boundaries. Work will continue at an aggressive pace to confirm these findings and ensure nothing has been missed.

What is Flint Hills doing to clean up the contamination on the property?

DEC has given Flint Hills the goal of zero contaminant migration offsite and aggressive treatment of onsite contamination. The company has done rigorous inspections to find all potential sources of leaks and repaired them, they have enhanced the pump and treat system in an effort to minimize migration offsite through greater hydraulic control, and they are evaluating alternatives to clean up the main source areas. This evaluation of alternatives will be completed following EPA CERCLA ([see glossary](#)) guidelines to determine the most aggressive and appropriate system. In addition, Flint Hills will be preparing a feasibility study next year to compare potential cleanup options. A final cleanup plan will be established from the feasibility study results.

When sulfolane was discovered in the groundwater, Flint Hills already had an active groundwater extraction and treatment system for petroleum contamination on the refinery. The existing system includes a series of wells that pump contaminated groundwater out of the ground and into a treatment system that removes petroleum and sulfolane. The groundwater recovery system was upgraded in 2011 by adding a new recovery well and rehabilitating some of the existing wells. Planned upgrades for 2013 include replacement of two under-performing recovery wells and the addition of two new recovery wells. The addition in June 2011 of sand filters and granular activated carbon vessels enabled the treatment system to successfully remove sulfolane from contaminated groundwater.

Since 2009, aggressive efforts to identify and eliminate sulfolane discharges have taken place. These efforts, which consist primarily of improvements such as stopping leak points and associated procedural changes, are critical to preventing further contamination.

Who tests the water?

Alaska law mandates that the responsible or liable party must do the investigation and clean up the contamination at the direction of DEC and in compliance with Alaska state regulations. The responsible party must arrange for a "[qualified person](#)" (typically a contractor or consultant) to do the work, subject to DEC approval. DEC may take over cleanup, recovering costs from the responsible party(ies) if the cleanup is not conducted according to regulations.

Flint Hills leads the investigation and cleanup effort, under DEC oversight. The company's contractors conduct testing needed as part of the investigation and cleanup. Flint Hills uses qualified contractors, as defined in Alaska regulations, to collect the water samples. The water samples are then sent to independent laboratories for analysis. Robust quality control procedures established in Alaska

regulations and specifically for the sulfolane analyses on this project are followed to ensure representative results.

What happens if Flint Hills closes the refinery and leaves?

Under state law Flint Hills would continue to be a responsible party. Williams, the former owner is also a responsible party. If Flint Hills does not fulfill its obligations as the responsible party, DEC could take over site cleanup and recover costs from the responsible parties.

Background

What is sulfolane?

Sulfolane is an industrial solvent used to separate aromatic compounds from hydrocarbon mixtures and to purify natural gas. Sulfolane has been the primary solvent used in an extraction unit at the North Pole Refinery since 1985. Shell Oil Company developed this organic compound in the 1960s.

Sulfolane easily dissolves in water. When released into the environment, it tends to move into groundwater, dilute and spread out, traveling with the groundwater flow. This creates a “plume” of contaminated groundwater. Sulfolane is much less likely to attach to soil particles or stay in pure form than to dissolve in water. An even smaller amount of it will dissolve in hydrocarbons (components of fuel). ([Read more on the Site History page.](#))

Why is sulfolane a problem in North Pole?

The discovery and investigation of sulfolane contamination has been unprecedented in Alaska due to the distance that sulfolane has traveled in groundwater and the number of properties affected with private drinking water wells. All residents with sulfolane detections in their water currently have been offered an alternate drinking water source. Most now have a permanent solution. Sulfolane is a “contaminant of emerging concern” because the risk it presents to human health and the environment is not completely known.

Leaks and spills of petroleum and industrial wastewater have occurred ever since the refinery's start-up in 1977. Since the 1980s DEC has required the successive owners to conduct increasingly more investigation and cleanup of petroleum-contaminated groundwater in the subsurface of the refinery property. In 2001 ongoing monitoring results also revealed sulfolane within the plume of petroleum contamination. At the time, the solvent was not regulated by the state or federal government. DEC listed sulfolane as a “contaminant of interest” for the site, established a cleanup level, and required that it be monitored under the assumption that by removing petroleum from groundwater, sulfolane would be sufficiently contained and eventually break down.

In 2009, then-owner Flint Hills began testing groundwater off its property, near private homes with drinking water wells. Sulfolane concentrations in the test wells were significantly higher than expected, although under the cleanup level. The company then sampled some nearby private wells, also finding sulfolane.

Flint Hills, as the responsible party, notified DEC with the results and with a plan to immediately supply alternate water and begin testing residential wells. Both DEC and Flint Hills have been in direct communication with homeowners since the contaminant's discovery and have regularly provided information updates to the community.

Meanwhile DEC reviewed the sulfolane cleanup level for its protectiveness of human health. (See question on p. 2, "*What amount of sulfolane is considered safe in drinking water?*")

How is the investigation proceeding?

Flint Hills has assured DEC that they have contacted virtually every homeowner in the plume area, and all have been offered alternative water. Most have permanent solutions. Several, so far, are not reachable despite attempts. Several have chosen not to talk to Flint Hills.

Since then, efforts have centered in these areas:

- Prevent further exposure to the contamination by providing alternate water sources for people with sulfolane in well-water.
- Identify all the sources of sulfolane releases and do inspections to ensure that there are no ongoing releases.
- Understand the toxicity of sulfolane and all potential risks to human health and the environment from all of the contaminants of concern. The risk assessment, as this process is called, evaluates the risks from all of the chemicals of concern in order to set protective site-specific cleanup levels for sulfolane and the other chemicals of concern.
- Thoroughly identifying the three-dimensional shape of contamination and its potential for further movement or degradation. This is done by establishing an extensive monitoring network and doing work to more completely understand the characteristics of the chemical sulfolane.
- Evaluate alternatives to stop migration and cleanup the contamination, including a pump and treat system, an air sparging pilot study, and carbon filtration on the drinking water wells.
- Pursue aggressive remediation (cleanup) in source areas and hot spots to reduce the mass of contamination in the aquifer and prevent further migration.

Who is responsible?

Under Alaska law the responsible or liable party must investigate and clean up the spill at the direction of DEC and in compliance with Alaska State regulations. Potentially responsible parties under Alaska law include current and past landowners as well as anyone who may have helped cause the contamination. MAPCO purchased the plant in 1980, merged with The Williams Companies in 1998, and sold the facility to Flint Hills Resources in 2004. The response so far has been led by Flint Hills, and Williams has begun to take part in plans for further investigation and cleanup.

At the time of the initial discovery of sulfolane outside of the refinery property, Flint Hills began testing of drinking water wells. Although the testing showed sulfolane was present, the concentrations did not exceed the interim cleanup level existing at the time. Flint Hills responded immediately with caution, providing individual notifications and an alternative clean water supply to all residents whose drinking water wells were or were likely to be contaminated. DEC contacted the state health department and the U.S. Environmental Protection Agency (EPA) for assistance in reevaluating the cleanup level in light of the presence of the compound in drinking water wells. This effort resulted in DEC lowering the sulfolane level based on additional review of the research. DEC has done research on sulfolane, completed risk analysis, updated the cleanup level, and provided oversight of the investigation and cleanup effort to protect people from exposure and ensure compliance with all legal requirements.

DEC also established a Technical Project Team to provide the highest level of oversight of Flint Hills's work. The team consists of experts in every aspect of environmental investigation and cleanup, including members from the University of Alaska, federal and state health and regulatory agencies, and private sector consultants.

EPA can also exercise oversight over cleanup. In 1986 DEC issued a Compliance Order by Consent and in 1989 the U.S. Environmental Protection Agency (EPA) issued two Administrative Orders on Consent to then-owner MAPCO. These orders outlined a cleanup and monitoring strategy for the petroleum contamination and RCRA hazardous waste violations. EPA conducted a Preliminary Assessment in 2012 of the refinery's contamination, and has not yet made a jurisdiction decision. DEC and EPA continue to discuss the federal agency's role in the oversight of the investigation and cleanup.

How are residents in the area informed of the potential effects to their drinking water?

Both DEC and Flint Hills have been in communication with homeowners since October 2009, upon the contaminant's discovery in private water wells. Each entity has regularly provided information updates to the community. Flint Hills' contractor, Shannon & Wilson, immediately began door-to-door contact, asking permission to test residential wells, handing out a fact sheet, and encouraging residents to contact Flint Hills, DEC and Department of Health and Social Services (DHSS) regarding any concerns. DEC has used both individual and mass media contact tools. On November 23, 2009, DEC and Flint Hills hosted an open house at the North Pole High School, with Alaska Department of Health and Social Services representatives. From the attendance, DEC invited anyone interested to be on an email list, and DEC uses this list, which has expanded over the years, to send frequent emails and letters regarding all updates. ([To join our list, click here.](#))

DEC also created this website in November 2009, outlining the current status and progress of the investigation. DEC has continued to post fact sheets, plume investigation and health reports, and any relevant information [on the Documents page](#). DEC also maintains a call-in number (a local call from North Pole) direct to DEC office: 451-2182. We have stayed in communication with local and state officials, and others interested in the status of the project. DEC has given presentations to any organization that has asked, such as the Fairbanks Memorial Hospital and the local association of realtors as well as done many newspaper and television interviews.

In March 2010 DEC established a Technical Project Team (TPT) comprised of representatives of regulatory agencies, the responsible party, and other experts who help guide the investigation of sulfolane in groundwater. In addition to quarterly newsletters, the TPT has hosted open house events and conducted public surveys to discern public sentiment, concerns and/or issues.

Staying Informed

How do you communicate with residents and people affected by sulfolane in the groundwater?

At the beginning of the discovery of sulfolane in water wells, DEC developed an email list and sent frequent emails and letters to those interested. To get on our list, [click here](#). The company also has also been in direct communication with homeowners since the beginning; Flint Hills responded quickly to sample water wells and provide alternate water sources.

DEC created this website in November 2009 outlining the current status and progress. DEC has continued to post fact sheets, reports, any relevant information [on the Documents page](#). DEC also

maintains a call-in number direct to DEC offices: 907-451-2182. The State's project staff has stayed in communication with local and state officials, and others interested in the status of the project.

The Technical Project team formed to help guide the investigation and cleanup has held open house events, issued quarterly newsletter updates, and conducted public surveys to discern public sentiment, concerns and/or issues.

We encourage people to [contact us with any questions and concerns](#).

Adjudicatory Hearing

On December 20, 2013, Flint Hills filed a Request for an Adjudicatory Hearing to the Department of Environmental Conservation on Sulfolane. What is an adjudicatory hearing?

An adjudicatory hearing is an administrative process within the Department of Environmental Conservation (DEC) whereby an affected party may appeal decisions made by department officials to DEC's Commissioner. The appellant submits a Request for Adjudicatory Hearing to the Commissioner, stating the reasons a hearing should be granted. Upon receiving a request, the Office of the Commissioner issues a public notice, advising the public and the involved parties that they have 20 days to respond to the appeal. The requester then has seven days to respond to any issues raised in the responses.

The Commissioner then decides whether the reasons articulated in the Request merit the granting of an Adjudicatory Hearing per 18 AAC 15 (in Alaska's code of regulations). If the Commissioner concludes the Request satisfies the regulatory criteria for a hearing, he has the authority to grant the hearing, and if not, he can deny the request. The Commissioner can also remand the decision back to the division that issued it in order to answer questions, provide additional details or explain how they arrived at the decision.

Why did Flint Hills request a hearing?

Flint Hills Resources Alaska (Flint Hills) requested an adjudicatory hearing to appeal the decision that DEC's Spill Prevention and Response Division ("the Division") made in November 2013 approving a final cleanup level for the contaminant sulfolane at the North Pole Refinery. The Division's decision selected 14 micrograms per liters, or "µg/L" (1µg/L is the same as 1 part per billion, or "ppb") as the site-specific cleanup level for sulfolane. Flint Hills believes this number is too conservative and proposes a less stringent cleanup level of 362 µg/L.

What did the Commissioner decide?

The DEC Commissioner, Larry Hartig, in his April 4, 2014 Order regarding Flint Hills' adjudicatory hearing request, vacated the Spill Prevention and Response Division's decision setting the groundwater alternative cleanup level for sulfolane. The Commissioner remanded the cleanup level decision to the Division "for further development of the record and a decision on an approved alternative cleanup level..." The Commissioner is asking the Division to further consider and document the rationale, analysis, and data evaluation that leads to the Division's selection of a site-specific cleanup level for sulfolane. In his Order, the Commissioner also made clear that he is not taking any position regarding what the final cleanup level should be for sulfolane.

[Download the Commissioner's decision on Flint Hills' Request for Hearing](#) - Apr. 4, 2014 (96.5 KB PDF)

What happens next?

The Spill Prevention and Response Division is now undertaking the detailed analysis ordered by the Commissioner. A report containing an in-depth review of all the information and reevaluation of the cleanup level is anticipated to be delivered to the Commissioner before the end of the year.

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Information on the status of the cleanup project, current and future actions, newsletters, fact sheets and other project documents for the sulfolane investigation at the Flint Hills Refinery in North Pole can be found on the DEC website:

dec.alaska.gov/spar/csp/sites/north-pole-refinery