

Appendix B

QUESTIONS AND ANSWERS

Elevated Selenium Levels in Southeastern Idaho February 2007

General Information

What is Selenium?

Selenium is a naturally occurring element widely, but unevenly, distributed in the earth's crust and commonly found in sedimentary rock. It is found in soil and through natural interaction with soil, water is also a carrier of the element. Plants absorb selenium from the soil and water.

What is it used for?

Selenium is an essential element for humans and animals. In the body, selenium helps prevent damage by oxygen to tissues.

Commercial uses of selenium include electronics and chemical uses such as rubber compounding chemicals and gun bluing. Selenium is also used in anti-dandruff shampoos and as a dietary supplement for humans and livestock.

Is it harmful to people?

As with almost every element in nature, too much selenium can be harmful. Humans and animals need selenium in their diets and are exposed to it in small amounts daily in food and water. The normal human intake of selenium in food, about 50 to 150 micrograms per day, is enough to meet the daily need for this essential nutrient. However, selenium compounds can be harmful at exposure levels that are only somewhat higher. The seriousness of the effects of excess selenium depends on the intake (how much) and exposure (over what time period).

What about fish and wildlife?

While the habitat may exist, no fish are known to currently reside in Pole Creek. Selenium has appeared in Hoopes Springs and further downstream in Sage and Crow Creeks. High levels of selenium may affect aquatic life such as fish, macroinvertebrates and plants, and it can have serious effects on fish and waterfowl. Efforts are underway to understand research collected worldwide that can help improve our understanding of the risks and remedial efforts necessary to protect aquatic systems. Some studies have indicated the effects to livestock species may extend to deer, elk and moose, but no specific research has proven this to be true. Idaho Fish and Game conducted an elk liver and tissue study in 2000 and 2001. Data from this effort led researchers to conclude that tissue from animals harvested on or near phosphate mines contained an elevated level of selenium when compared to those animals not living near a mine site.

What about other livestock in the area?

There have been other incidents of selenium toxicosis that have affected sheep in the area. One incident occurred in 1999 and involved sheep trailing across a mine waste dump that was closed to sheep; another occurred on private land as part of a University

of Idaho sheep grazing study. Selenium is added to salt and feed in southeast Idaho as a dietary supplement for cows and sheep. Some testing of cows and sheep has occurred over the last couple of years. There is little information available to help us predict effects on other livestock.

What's causing the elevated levels?

The highest levels of selenium are present adjacent to the waste rock dumps at Nu-West's North Maybe, South Maybe Canyon Mines and Simplot's Smoky Canyon Mine. All of these dumps have unique rock drains that allow water to pass through. Water transports the selenium and other contaminants of concern. We are working with the mining industry to find out if these drains are causing this release of selenium and other contaminants of concern, or if some other factor of nature, chemistry or a combination of factors are the culprit.

Is selenium in any other streams?

In the Salt River, Wyoming watershed, Selenium has been measured in Sage Creek, South Sage Creek spring, Hoopes Springs, and Crow Creek. In the Blackfoot River Watershed, selenium has been measured in East Mill Creek and Spring Creek above their confluence with the Blackfoot River. Maybe Creek and Dry Valley Creek have concentrations of selenium above background levels, and Sheep Creek, West Fork Sheep Creek, Angus Creek, and No-name Creek have measurable selenium concentrations. Measurable concentrations of selenium exceeding background values are found in the Blackfoot River downstream to the Blackfoot Reservoir. Several other small streams may have selenium present above background concentrations.

Where did the horses get the large amounts of selenium?

We believe the six affected horses grazed on plants that bio-accumulated (stored) selenium. In addition, the same water used to irrigate the pasture was provided as the drinking water source. Five of the horses were euthanized due to selenium toxicosis; one horse survived after veterinarian treatment.

How did you know selenium was present?

In December of 1996, the IDEQ alerted the Forest Service and BLM that there were sick horses in the Dry Valley area. A landowner adjacent to the Caribou-Targhee National Forest also notified the Soda Springs Ranger District that six horses had been diagnosed and confirmed with selenium poisoning. Testing by Agrium and the landowner confirmed elevated levels of selenium in both Maybe Creek and a private upland site in Dry Valley used as a pasture for the horses.

Has monitoring been conducted?

Yes. Current mine plans approved for the mining companies contain monitoring requirements. Several of the older mine sites have extensive investigations underway to monitor the surrounding environment for the presence of environmental contaminants. In some cases, monitoring results gathered under legally enforceable orders, are delivered to the Forest Service, EPA, IDEQ, and the BLM. These monitoring reports show trends indicating long-term trends, seasonal variation, and the effectiveness of changed management practices and remediations. As a result of monitoring, the oversight agencies have developed a list of Contaminants of Primary Concern (COPC) that includes not only selenium, but also cadmium, chromium, nickel, manganese, and zinc.

Has this happened anywhere else?

Selenium occurs throughout the world in varying quantities both naturally and as a result of man's activities. Generally, southeastern Idaho is considered to be selenium poor while other parts of the state have varying concentrations in the rocks and soils. Certain geologic formations found throughout the western United States contain selenium in abundance. In the San Joaquin Valley of Central California, selenium occurs naturally at high levels in the Permian aged shale and is further concentrated by irrigation practices. These practices led to well publicized selenium poisoning incidents at the Kesterson National Wildlife refuge in the 1980's. Naturally high concentrations of selenium in Montana, Wyoming, the Dakotas, New Mexico, Arizona, Utah and other western states are known to have caused selenium toxicosis in livestock.

Are you closing the area?

No. The Forest Service and IDEQ along with several support agencies and the Shoshone-Bannock tribes, have entered into Administrative Orders on Consent at several site to investigate the release of hazardous substances into the environment and to develop alternative to remediate or control those releases. At this time, fish consumption from East Mill Creek and elk liver are the only known risks to human health attributable to selenium in Southeast Idaho. None of the most severely affected streams Pole, Spring, East Mill and Maybe Creeks are a source of drinking water for humans.

How is the problem going to be addressed?

A regional investigation to determine the broad extent of the problem has been conducted by Idaho Department of Environmental Quality and funded by the Idaho Mining Association. The Forest Service Site, IDEQ, EPA and the cooperative agencies and tribe have initiated specific investigations that will be completed on each inactive or historic mine site to determine the extent that each mine is contributing to contamination. An Engineering Evaluations / Cost Analysis will be developed for each mine site, and will discuss the range of treatment alternatives specifically developed for each site.

Pole Canyon Investigation

Where is Pole Canyon?

Pole Canyon is located in Caribou County, in the southeast corner of Idaho, approximately 10 miles west of Afton, Wyoming, and 23 miles east of Soda Springs, Idaho. This is part of J.R. Simplot Company's (Simplot) Smoky Canyon Mine.

What are the issues with Pole Canyon?

A Site Investigation was complete in 2005, which determined that significant concentrations of selenium and other containments of potential concern were discharged into the environment down gradient and beneath the Pole Canyon Overburdened Area (ODA). The identified release of hazardous substances has been determined to pose a threat to public health, welfare, or the environment.

What occurred during the Site Investigation?

Simplot completed a Site Investigation in 2005 for the inactive portions of Smoky Canyon Mine. Samples of surface water, ground water, soil, vegetation, fish, insects

and small mammals were collected and analyzed to identify the extent of contamination from the Site. Selenium in surface water was at Hoopes Springs, Sage Creek in Sage Valley and in Pole Canyon Creek down gradient of the ODA and found to be contaminated with selenium at concentrations above pre-mine levels and in some cases above the preventative standard for chronic exposure to aquatic life set by EPA in the Clean Water Act.

What was found in the Site Investigation?

The Site Investigation found that surface and groundwater along with soil, sediment, and vegetation are affected by mine operations. Water percolating into the Pole Canyon Cross valley fill waste rock embankment or ODA and is infiltrating to groundwater or emerging as Pole Canyon Creek releasing a substantial load of selenium to Sage Valley and to associated groundwater systems. A water balance performed as part of the investigation confirmed more water is entering the ODA inlet than is discharged. Contaminant dissolved in water is exiting as polluted surface and groundwater. Evidence developed in the Site Investigation shows that the ODA was placed over the Wells Formation. This highly permeable and sandy limestone formation is accepting the wasterock under flow where it is becoming groundwater. The Wells Formation occurs throughout southeast Idaho and is consider a regional ground water aquifer. Water infiltrating into the Wells Formation appears to flow southward along the Sage Valley Branch fault (thrust fault) where it discharges at Hoopes Springs.

What is the water from Pole Canyon Creek used for?

Water from the sources associated with the Smoky Canyon mine is used as the principal source of irrigation water for the Petersen Ranch in Sage Valley. Additional water from Pole, Sage, South Fork Sage and Crow Creeks all serve as a source of drinking water for grazing animals, primarily sheep, cows and wildlife in the area. Hoopes Springs, South Sage Springs, South Sage Creek, and Sage Creek merge with flows from Crow Creek to create continuous fish habitat.

Seasonal residents in Sage Valley get their culinary water from wells and springs associated with younger geology in the hills east of the alluvium groundwater system in Sage Valley. Their water was tested as part of the Site Investigation and found to be free from contaminants related to phosphate mining at Smoky Canyon.

Hoopes Springs is a source stream for Sage Creek. It emanates from the West Sage Valley Branch Fault, on the west of Sage Valley, between Sage Creek and South Fork Sage Creek. Hoopes Springs' average flow is about 6-7 cubic feet per second.

What are the levels of selenium?

The Forest Service identified the Pole Canyon ODA and the groundwater transport of contaminants to Hoopes Springs as the area of highest priority because of the elevated selenium concentrations in Hoopes Springs two miles downstream from the ODA.

At Hoopes Springs selenium concentrations were measured and reported from 0.007-0.019 mg/L. Selenium concentrations at Hoopes Springs are documented to be increasing gradually. Selenium levels in Pole Canyon Creek in 2005 ranged from non-detect above the ODA to nearly 1.5 mg/L below the ODA, almost 300 times the cold water biota criteria of 0.005 mg/L.

Are there fish in these streams?

Hoopes Springs, Crow, Sage and South Fork Sage Creeks are fish bearing streams which contain Yellowstone cutthroat trout and other fish species.

What is being done concerning the high selenium levels?

October of 2006, Regional Forester Jack Troyer signed an Action Memorandum request for non-time critical removal action for the Pole Canyon ODA. Simplot started implementing the proposed actions at this time, which included:

1. a 30" pipeline to divert Pole Canyon Creek around the Pole Canyon ODA
2. an infiltration gallery to collect all water not diverted by the pipeline and to inject that water into the Wells Formation aquifer
3. a run-on ditch on the north side of the ODA to collect water before it flows onto the dump
4. effectiveness monitoring of parts 1-3

How often does the water get monitored?

In some cases, water is monitored monthly, in other situations, it is monitored every quarter. Some situations require that monitoring data is collected twice a year.

Who tests and monitors the levels of water contaminants?

Where the mine is still active, J.R. Simplot Co. or their environmental contractor is required to sample according to the applicable schedule. Samples collected under the enforceable CERCLA agreement are the responsibility of Simplot's environmental contractor. These samples are collected and processed under the oversight of the Forest Service, IDEQ, or EPA. Splits of these samples and independent sampling are conducted by the agencies to verify the quality of all samples collected. All samples are collected and processed under specific protocols designed to assure accuracy and to guarantee they are representative of site conditions.

Are there any other hazardous contaminants in Pole Creek?

Selenium is the primary contaminant of concern at the Site. However, cadmium, chromium, copper, nickel, vanadium and zinc are routinely sampled since there are indications these too could lead to pollution from the Site.

How long does this project go for? When will this be done?

Project was initiated in October 2006 and we are anticipating last parts of plan will be completed mid-summer.

What is the durability of the pipeline?

Pipeline is intended to be a permanent feature of the site.

What happens if the pipeline breaks?

Simplot is responsible for the operation and maintained of the pipeline. This includes any repair of leaks or breaks.

If the pipeline is buried, how do you know that there is a break in the pipeline or a leak?

We measure the flow going into the pipe and the flow going out of the pipe. If there is a difference than we know there is a leak.

Has the public been involved during this process?

The Forest Service held several public meetings during the summer of 2006 and was asking for public comments. A legal notice was posted in the Star Valley Independent, Caribou County Sun and Idaho State Journal asking for public comments. The Forest received over 52,000 comments on the EE/CA. A response to significant comments is included in the Administrative Record.

Public interviews were held in the winter/spring of 2007. A legal notice was posted in the Star Valley Independent and Caribou County Sun asking for personal interviews, along with letters and newsletters distributed to concerned citizens.

A newsletter was created and has been distributed on a quarterly basis. This newsletter not only covers Pole Canyon, but other Site Investigations.

More information and documents can be found on the Caribou-Targhee National Forest website at <http://www.fs.fed.us/r4/caribou-targhee/phosphate/> or on the Idaho State University website at http://giscenter-ims.isu.edu/SISP/SISP_Home_Page.html.