Letter USR 7

October 15, 2001

Allen Fiksdal
Energy Facility Site Evaluation Council
P.O. Box 43172
Olympia, WA 98504-3172

Dear Mr. Fiksdal,

I am writing to express my opposition to the siting of the Sumas Energy 2 Generation Facility in Sumas, Washington. My reasons for requesting a denial of this permit include the impact of this project on the potable water supply for Whatcom County residents, the air quality impact from numerous pollutants generated by the facility and the necessity of storing large quantities of hazardous wastes on site.

I have been a resident of the Sumas/Everson area for the last 25 years. Having been employed as an Environmental Health Specialist for 10 years and a Public Health Nurse for approximately 4 years, I feel it would be unethical for me to remain quiet about potential impacts to the health of my neighbors.

The aquifer from which many of the residents of Sumas, Everson and Nooksack receive their water has been well defined in the EIS documents provided by the proponent of this project. Approximately 1,500 people are served by the public water supply and others have private wells in the proximity of the proposed power plant. As was specified in the documentation, the Sumas-Abbotsford aquifer is already adversely impacted by practices which allow for infiltration of nitrates into the potable water supply. Graphs of the wells demonstrate levels of approximately 8 mg/l in one well in the municipal system and 12 mg/l in the May Road wellfield.

"Nitrate is considered an acute contaminant because short-term exposures to levels above the MCL (10 mg/l) can cause methemoglobinemia, a blood disorder in sensitive individuals." Those most at risk include young infants, women who are pregnant and persons who have reduced gastric acidity or a hereditary lack of methemoglobin reductase. (DOH position paper 1997). In young infants, the blood disorder caused by nitrate exposure is potentially fatal. A fact sheet published by the Washington State Department of Health (enclosed) summarizes the reasons babies are more susceptible and describes the difficulty in identifying the disorder until infants turn a brownish-blue and have trouble breathing. 1

Documentation for the proposed power plant indicates that the levels of nitrates in the potable water system will probably be impacted by the large amount of water (over 800 gpm) that will be withdrawn for industrial use. The SEIS states that "this essentially constant, substantially increased pumping rate could contribute to drawing nitrate-contaminated groundwater into the wells, exacerbating a problem that the City already faces-the potential for nitrates in the aquifer to contaminate its potable water supply". It further explains why the higher withdrawal rates "might expedite nitrate intrusion into the well fields and draw contaminants into the wells that might otherwise not have been intercepted". Clearly, the potential impact on our drinking water is unacceptable.

In regards to the mitigation proposals, what the SEIS does not elaborate on is exactly how expensive and difficult it is to manage a "nitrate treatment system". Not only does the technology of reverse osmosis require a certified manager to maintain it, but it is adversely impacted by water with high mineral content. As stated in the Final EIS, the Sumas aquifer typically contains calcium or manganesium bicarbonate and chlorides. What is not defined is how long it would take to put any effective treatment system or other mitigation in place. How many infants would be exposed in the meantime? 2

The air quality in northeast Whatcom County already suffers from increasing pressures of a growing population in the Greater Vancouver area. Reports from the Canadian officials indicate that the Abbotsford area experiences 4 extra human deaths per million population per year related to the increase in ozone and 6 extra deaths per million related to PM10 particulates. They further conclude that "potential impacts related to exacerbation of illnesses such as asthma and other respiratory conditions are orders of magnitude higher". Although the Final EIS minimizes the impact that SE2 would have on the overall air quality, I question why we would find the numbers already presented as acceptable. As someone who has recently been diagnosed with asthma, I will most certainly resent becoming an "exacerbation statistic". The air quality is already bad enough. 3

Finally, I would like to comment on the types and quantities of hazardous chemicals that will be stored at the power plant. I appreciate the withdrawal of the 2,500 gallon diesel storage tank and the proposal to use diesel as a backup fuel source. But as I review the list of storage tanks, I am alarmed at the 20,000 gallons of ammonia, 500 gallons of bleach (sodium hypochlorite) and 6,000 gallons of sulfuric acid solution that will remain. This is not a complete list of the chemicals that are proposed. Given the recent world events and the threat of terrorist activities, I do not welcome a potential "hazardous waste site" in my backyard. 4

Whatcom County has permitted sites that already accommodate heavy industry. I feel that a rural farming community with an international border that is adjacent to a densely populated and growing residential area (Abbotsford) is not the best choice for siting a power plant. The proposal to use valuable potable water for industrial purposes, thereby limiting the options for other types of economic growth does not make any sense to me.

I want to thank you for this opportunity to comment and I hope that the commission realizes that it is not just the citizens of Canada who are in opposition to this proposal.

Sincerely submitted,

Joni Hensley, RN

Joni Hensley, R.N
3160 Alm Rd
Everson, WA 98247

Nitrate in Drinking Water

September 1996

Fact Sheet

Environmental Health Programs
Office of Environmental Health & Safety

Washington State Department of Health

Fertilizers And Septic Systems Can Contaminate Well Water

When nitrogen fertilizers are used to enrich soils, nitrate may be carried by rain, irrigation, and other surface waters through the soil and into ground water aquifers. Natural sources of nitrate are from geological deposits and decomposing vegetation.

Nitrate can more easily impact well water if the well is shallow, poorly constructed, or improperly located. Such conditions could allow entry of contaminated waters from nearby agricultural lands, feedlots, barnyards, or septic systems.

Testing Your Drinking Water

The only way to know if drinking water is contaminated with nitrate is to have it tested. Public water systems are tested routinely. If you own a single family (domestic) well, your county health agency can give you advice about how to obtain a water sample. The fee for a nitrate test is about twenty dollars.

Nitrate May Indicate Other Pollutants in Well Water

Nitrate levels in drinking water can be an indicator of overall water quality. Elevated nitrate levels suggest the possible presence of other contaminants, such as microorganisms or pesticides, that could cause health problems.

Babies at Risk

High levels of nitrate in drinking water can cause a potentially fatal blood disorder in infants called "blue baby syndrome" or methemoglobinemia. Although methemoglobinemia can occur at any age, nitrate contaminated water principally causes this illness in children under six months of age.

Infants are at greater risk of methemoglobinemia than older children and adults because they have:

- Lower stomach acidity, which allows certain kinds of bacteria to grow in the stomach and intestines. If a baby is fed formula made from nitrate contaminated water, these bacteria convert nitrate to nitrite. Nitrite then changes the oxygen carrying hemoglobin to methemoglobin, which does not carry oxygen.
- A higher proportion of fetal hemoglobin that is more easily converted to methemoglobin.
- A high liquid diet per body weight which increases the relative dosage of nitrate.

- More incidences of vomiting and diarrhea that lowers stomach acidity.

Although nitrate is found in breast milk, there are no confirmed reports of nitrate poisoning of breast fed infants due to maternal ingestion of nitrate-contaminated water. Poisonings usually occur when contaminated water is used to prepare infant formula and foods. Boiling water for infant formula kills bacteria, but will not destroy nitrates.

Symptoms Can Be Subtle

An infant with mild to moderate methemoglobinemia may be lethargic and have diarrhea and vomiting. This can be misdiagnosed as poor nutritional status or an upset stomach. Though methemoglobinemia is easily diagnosed from a blood test, the illness is often only recognized in acute cyanotic stages, when the infant turns a brownish-blue color (this sign can be missed in dark skinned children) and has trouble breathing.

Switch To Safe Water

If the condition is not life-threatening, no treatment is needed other than a switch to uncontaminated water. The symptoms will improve within two to three days. For severely affected infants, intravenous treatment with methylene blue will convert the methemoglobin back to hemoglobin and bring rapid recovery.

Infants under one year of age should not drink water exceeding the drinking water standard of 10 parts per million (ppm) of nitrate expressed as nitrogen (equivalent to 45 ppm of nitrate expressed as nitrate).

Although no health based standards exist for adult exposures, the following people may be at risk:

- Individuals with reduced gastric acidity.
- Individuals with a hereditary lack of methemoglobin reductase.
- Women who are pregnant.

Bibliography

- Johnson, Carl J. and Kross, Burton C., "Continuing Importance of Nitrate Contamination of Groundwater and Wells in Rural Areas," *American Journal of Industrial Medicine*, 18:449-456, 1990.
- National Research Council, "Nitrate and Nitrite in Drinking Water," *National Academy Press*, Washington D.C., 1995
- Walton, Graham, "Survey of Literature Relating to Infant Methemoglobinemia Due to Nitrate-Contaminated Water," *American Journal of Public Health*, 41:986-996, August 1951.

Need More Information?

- For **public** water systems contact your water utility, **or**

Washington State Department of Health
Division of Drinking Water
1 (800) 521-0323

- For **single family (domestic)** wells contact your county health agency
- Additional copies of this fact sheet can be obtained from:

Washington State Department of Health
Office of Environmental Health & Safety
P.O. Box 47825
Olympia, Washington 98504-7825
(360) 236-3380
Tollfree 1 - 888 5 TOXICS

Washington State Department of Health (DOH)
Nitrates in Drinking Water
Position Paper

Washington State Department of Health

Purpose

Nitrate contamination of drinking water supplies is an issue of concern for regional, state, national and international public and environmental health practitioners. Ingestion of nitrate can cause anemia and, if not treated, death to young infants. The information in this paper is intended to increase local health officials' understanding of nitrate contamination in water and provide helpful recommendations in addressing these problems.

Background: What is the Contaminant, What is the Concern

Nitrate is considered an "acute contaminant" because short-term exposures to levels above the Maximum Contaminant Level (MCL)[1] can cause methemoglobinemia, a blood disorder, in sensitive individuals (especially young infants). Elevated levels of nitrate may also indicate that the water source is susceptible to other contaminants, such as microbial pathogens and pesticides.

The MCL for nitrate is 10 milligrams per liter (10 mg/l). Unlike most drinking water MCLs, the nitrate MCL is based upon an observed human effect in highly sensitive persons. There is no safety factor incorporated into the standard. In fact, cases of methemoglobinemia are known to have occurred in infants exposed to nitrate concentrations only slightly above 10 mg/l.

No information is currently available linking adverse health impacts for Washington residents to nitrate exposure through drinking water. However, portions of Adams, Benton, Clark, Franklin, Grant, Thurston, Walla Walla, and Whatcom Counties have nitrate concentrations in ground water that exceed 10 mg/l. Of particular concern are persons using private or domestic (nonpublic) wells that receive little or no water quality monitoring. Without monitoring, users may not realize they are being exposed to elevated nitrate levels. In addition, nitrate concentrations often fluctuate, so a single sample may not represent the average or peak concentration within the water supply.

Source of the Contaminant/Agent: Common Routes of Exposure

Sources of excess nitrate in drinking water include fertilizers, animal manure piles, and septic systems. Shallow wells, poorly sealed or constructed wells, and wells that withdraw from unconfined water table aquifers are at highest risk.

Infants are most commonly exposed to high nitrate levels when contaminated drinking water is used to make formula and beverages.

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[1] The maximum permissible level of a contaminant in water delivered to any public water system user. Nitrate is generally measured as NO_3-N (nitrate-nitrogen). When measured as nitrate-nitrogen, the MCL is 10 milligrams per liter (mg/l). It can also be measured as nitrate only, in which case the MCL is 45 mg/l NO_3.

Affected Populations and Clinical Manifestations

At particular risk are infants less than one year old, pregnant women, and persons of all ages with reduced gastric acidity or a hereditary lack of methemoglobin reductase. In some situations, ingestion of high levels of nitrate leads to methemoglobinemia, a condition that renders the hemoglobin in an individual's red blood cells less capable of transporting oxygen from the lungs to the rest of the body. This can result in an anemic condition. A dusky or blue hue may affect the skin tone of persons who suffer methemoglobinemia. Untreated, the condition can be fatal. Elevated levels of nitrate also can cause diarrhea and other gastrointestinal symptoms.

Based upon national data, even short-term consumption of water with nitrate levels above the MCL can cause methemoglobinemia in infants less than one year of age. At greatest risk are infants younger than three months. As the infant matures, its blood changes over from fetal hemoglobin to adult hemoglobin. As the infant reaches six months of age, most of the hemoglobin is adult hemoglobin. Susceptibility decreases then and the symptoms disappear. Any damage caused by anemia in the early months of life may not be detectable for several years.

Labored breathing, low blood pressure, below average weight gain, failure to meet developmental milestones, and respiratory exhaustion are additional findings in young infants[2]. Methemoglobinemia is difficult to diagnose and is easily mistaken for other "normal" early infant illnesses involving fatigue, diarrhea, lassitude, or failure to thrive. Often the illness may be misdiagnosed unless death occurs and the condition is detected during autopsy, if a blood sample is taken, or the dusky or bluish skin color is observed by a parent or health care provider aware of the potential for methemoglobinemia caused by drinking water.

Public Health Implications

Among infants less than one year old, pregnant women, and persons of all ages with reduced gastric acidity or a hereditary lack of methemoglobin reductase, those most at risk for exposure are those who depend upon private domestic wells for their drinking water. Most private domestic wells are shallow, often located near potential sources of nitrate contamination (such as septic tanks or agricultural areas), and rarely have their water quality assessed on a periodic basis.

Determination of how common methemoglobinemia caused by exposure to nitrate-contaminated drinking water has been in Washington is difficult because methemoglobinemia is not a reportable illness. Available data are based upon mother or health care provider recall. Until caregivers are made more aware of the potential for methemoglobinemia, the number of cases reported will not be a reliable measure of the problem. Instead, the seriousness of the potential health impacts to infants and other sensitive populations is the criteria defining the public health significance.

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[2] Please refer to *ATSDR's Case Studies in Environmental Medicine: Nitrate/Nitrite Toxicity* for more detailed information on diagnosis and treatment of methemoglobinemia. See reference section at the end of this paper for information on how to obtain a copy.

Legal Standards and/or Requirements

The MCL of 10 mg/l for nitrate-nitrogen in drinking water was established by the World Health Organization and the US Environmental Protection Agency. This level was adopted as a standard by the Washington State Board of Health under Chapters 246-290 and 246-291 WAC.

Public water systems are required to monitor nitrate concentrations on a periodic basis (every one to three years). If nitrate concentrations above one-half of the MCL are detected, the water system is required to monitor the source on a quarterly basis. If a concentration above the MCL occurs, the water system must notify all customers so sensitive individuals can be protected. Public water systems also are required to evaluate the development of alternate drinking water sources and treatment/blending options when technologically and economically feasible to reduce the nitrate concentration.

Legal water quality monitoring requirements for owners of private domestic drinking water wells apply only at the initial approval stage. Depending upon when and where the well was drilled, requirements for monitoring for nitrates at the time of drilling or subsequently may not exist.

Recommended Prevention and Response Actions

Most preventive measures and response actions to address nitrate contamination in Washington fall into one of several major categories: new drinking water source approvals; public health surveillance and assessments; educational outreach, including targeted outreach for private well owners; and continued environmental assessments/data collection.

New Source Approvals

One of the most effective preventive measures is to reduce or eliminate the use of nitrate-contaminated water by new drinking water systems. DOH and local health jurisdictions can accomplish this by coordinating with building officials during water supply adequacy and potability determinations for building permit applications under the state's Growth Management Act.

Future water quality monitoring for potability and adequacy of drinking water in Washington should include nitrate as an analyzed parameter.

New Public Water Systems

When nitrate is detected at concentrations between 5 mg/l and 10 mg/l, public water systems are required to monitor for nitrate on a quarterly basis to better characterize changes over time; evaluate potential sources of nitrate, other contaminants, and microbes; and identify available resources for installing, operating, and maintaining a water treatment process or other mitigation measures.

If the concentration of nitrate equals or exceeds the MCL (10 mg/l), public water systems should be required to install and operate a water treatment system, or take other mitigation measures that will reduce nitrate (plus any other contaminants) concentrations below the MCL.

Public water systems should also be required to show the capability to maintain the water treatment process (or other mitigation measures) over an extended period of time prior to receiving approval or a finding of adequacy.

New Individual Water Systems

Health officials should consider requiring private water systems that exceed 5 mg/l of nitrate be connected to existing or future public water systems. State guidelines already recommend water treatment systems be installed if nitrate concentrations exceed the MCL of 10 mg/l.[3]

Owners or developers of private domestic water systems with nitrate levels at or above 10 mg/l should be required to treat water or provide alternate drinking water supplies if they serve vulnerable persons (e.g., infants less than one year of age, pregnant women, and persons of all ages with reduced gastric acidity or a hereditary lack of methemoglobin reductase). These owners or developers also should be required to inform future owners or consumers of the potential hazards associated with elevated nitrate concentrations (disclosure on the property title plus other mechanisms).

Personal Health Surveillance and Assessments

Immediate, ongoing efforts should be taken to identify and educate vulnerable persons and their health care providers about the potential dangers of nitrate ingestion so they will evaluate the quality of their drinking water supplies.

In conjunction with local public health agencies, the DOH Office of Environmental Health Assessment Services will evaluate establishing an epidemiological surveillance program to detect any new cases of methemoglobinemia for investigation and intervention.

Educational Outreach

Health care professionals and the public should be made aware of the potential hazards and clinical manifestations associated with elevated nitrate levels in drinking water, especially methemoglobinemia. Development and distribution of appropriate educational materials is a joint responsibility of the state and local health jurisdictions. DOH will take the lead in developing educational materials and will assist local health jurisdictions in their distribution.

In areas where evidence suggests there may be nitrate contamination of ground water used for drinking, educational materials should be developed and distributed to private well owners. These materials should explain why it is important to monitor drinking water quality, ways to minimize current and future risks of contamination, and how people can get their well water tested. It is important that these educational materials be used in conjunction with efforts to implement long term solutions to reduce nitrates.

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3 *Guidelines for Determining Water Availability for New Buildings*, Washington State Departments of Ecology and Health, Ecology Publication 93-27, 1993.

Continued Environmental Assessment

Public and environmental health agencies should continue to assess water supplies to determine the extent and degree of nitrate contamination, incidence of health effects, and the characteristics of the affected persons. When wells are determined to be contaminated with nitrate, a site-specific evaluation should be made to identify the source of the nitrates and corrective measures to lower nitrate concentrations. Efforts to better coordinate water quality data collection and management are needed to summarize and analyze existing information, and identify data gaps and problem areas.

The state Interagency Ground Water Committee is the appropriate lead entity at the state level to lead this data management project.

References

An overview of diagnosing nitrate toxicity is presented in the *ATSDR's Case Studies in Environmental Medicine: Nitrate/Nitrite Toxicity*. Copies of this document can be obtained by contacting ATSDR at:

Continuing Education Coordinator
Agency for Toxic Substances and Disease Registry
Division of Health Education, E33
1600 Clifton Road NE
Atlanta GA 30333

Department of Health Points of Contact:

Division of Drinking Water	- David Jennings	(360) 236-3149
Office of Epidemiology	- Paul Stehr-Green	(360) 236-4240
Interagency Ground Water Committee (Department of Ecology)	- Diane Dent-White	(360) 407-6616
WEBSITE:	- http://www.doh.wa.gov/ehp/dw	