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# Deep Creek Groundwater Contaminants: Health Statement

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## What kind of health effects could we expect given current levels of exposure?

It is unlikely that NDMA, perchlorate, and TCE would cause identifiable health effects at current exposure levels.

Studies that examine long term exposure resulting in higher cumulative doses show the following health consequences:

NDMA: Liver toxicity and DNA damage, and increased risk of certain types of cancer with long term exposure.

Perchlorate: Long term exposure can decrease thyroid hormone levels in the body.

TCE: Liver, kidney, and heart damage and increased risk of kidney/prostate/cervical cancers, leukemia, and lymphoma.

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## Are there any populations that are more susceptible to the effects of these chemicals?

NDMA: Persons who smoke, drink excessive amounts of alcohol, or have protein deficient diets may be more susceptible to the effects of NDMA because these affect the metabolism of NDMA. Currently, studies do not support special vulnerabilities of the developing fetus or children to the effects of NDMA.

### Range of Measured Levels of Chemicals in Deep Creek Drinking Water Wells

NDMA: < 0.0001 – 0.0071 ppb

Perchlorate: <0.01 – 2.1 ppb

TCE: <1.0 – 59.5 ppb

Perchlorate: The developing fetus is more susceptible to health risks than adults. However, most human studies have not found changes to thyroid function in neonates whose mothers were exposed to low levels of perchlorate in drinking water.

TCE: Children and the developing fetus are more susceptible to the effects of TCE than adults. Several studies link TCE contaminated drinking water and increased incidence of birth defects. Adverse birth outcomes include low birth weight, neural tube defects, cleft lip, and heart defects (most of these studies have much higher maternal exposure to TCE). Water that contains TCE above the MCL of 5 ppb should not be used for consumption.

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## Can these chemicals get into breast milk?

NDMA, TCE, and perchlorate have all been found in human breast milk. Currently, it is not clear to what extent drinking water exposures contribute to these levels. Further research needs to be conducted to determine sources of exposure for contaminated breast milk and potential doses to the breast feeding infant.

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## Are there any tests for these chemicals in our bodies?

There are tests to detect exposure to all three of these chemicals but they are not readily or routinely available in commercial medical laboratories. Use of these tests in research studies has not yet provided reference levels for interpreting how urine or blood levels relate to specific health effects in an individual patient.

If you or your family member is experiencing symptoms that you are concerned may be related to exposure to NDMA, TCE, or perchlorate, consultation with your health care provider is recommended. There are routinely available tests of organ function that can be performed (see below).

NDMA: Your doctor may conduct liver function tests if you are experiencing symptoms of liver toxicity (nausea/vomiting, upper abdominal pain, yellow skin)

TCE: Your doctor may conduct liver, kidney, or heart function tests if you are experiencing symptoms related to these organs (nausea/vomiting, upper abdominal pain, yellow skin, increased urination, whole body swelling/bloating, palpitations/arrhythmias)

Perchlorate: Your doctor may conduct thyroid function tests if you are experiencing symptoms of hypothyroidism (dry skin, brittle hair, fatigue, increased weight gain)

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## When should I see my health care provider?

If you are having any kind of health symptoms out of the ordinary, we recommend seeing your health care provider.

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## What if my health care provider isn't knowledgeable about the health effects of these contaminants?

Staff at the Washington State Department of Health and physicians at the University of Washington Pediatric Environmental Health Specialty Unit (children) are available to provide consultation to general practice providers who may be unfamiliar with these exposures. Contact information is provided below.

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## Is it safe to drink the water?

Based on sampling to date, the levels of contamination should not result in health problems. It is important to closely monitor contaminant levels to continue to identify any increases in exposure levels.

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