

ORDER ADOPTING CHANGES TO REGULATIONS OF
THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

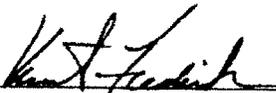
The attached one page of regulations, dealing with site-specific water quality standards for Red Dog Creek, is hereby adopted and certified to be a correct copy of the regulation changes that the Department of Environmental Conservation adopts under the authority of AS 46.03.020, 46.03.050, 46.03.070, and 46.03.080, and after compliance with the Administrative Procedure Act (AS 44.62), specifically including notice under AS 44.62.190 and 44.62.200 and opportunity for public comment under AS 44.62.210.

This action is not expected to require an increased appropriation.

In considering public comments, the Department of Environmental Conservation paid special attention to the cost to private persons of the regulatory action being taken. The Department of Environmental Conservation also gave special attention to alternate practical methods in this regulatory action, as required by AS 46.03.024.

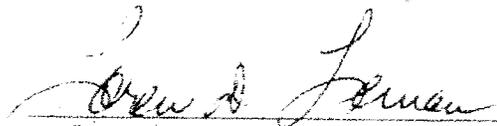
The regulation changes adopted under this order take effect on the 30th day after they have been filed by the lieutenant governor, as provided in AS 44.62.180.

DATE: January 12, 2006
Juneau, Alaska


Kurt Fredriksson, Commissioner
Department of Environmental Conservation

FILING CERTIFICATION

I, Loren Leman, Lieutenant Governor for the State of Alaska, certify that on January 16, 2006, at 11:34 am, I filed the attached regulations according to the provisions of AS 44.62.040 - 44.62.120.


Loren Leman, Lieutenant Governor

Effective: February 15, 2006

Register: 177 April

MEMORANDUM**State of Alaska
Department of Law**

TO: Hon. Kurt Fredriksson
Commissioner

DATE: January 13, 2006

Department of Environmental Conservation FILE NO.: 993-06-0063

TELEPHONE NO.: 465-3600

FROM: Steven C. Weaver 
Assistant Attorney General
Legislation/Regulations Section--Juneau

SUBJECT: Regulations re: site-specific
water quality standards for
Red Dog Creek (18 AAC
70.236(b)(5))

Under AS 44.62.060, we have reviewed the attached amendments to these regulations by the Department of Environmental Conservation, and approve the changes for filing by the lieutenant governor. I have reviewed this project under a specific delegation dated January 12, 2006 from the Regulations Attorney. A duplicate original of this memorandum is being furnished to the lieutenant governor, along with the one page of regulations and the related documents.

You might wish to contact the lieutenant governor's office to confirm the filing date and effective date of the attached regulation changes.

The September 29, 2005 public notice, the November 5, 2005 supplemental public notice, and the January 12, 2006 adoption order all state that this action is not expected to require an increased appropriation. Therefore, a fiscal note under AS 44.62.195 is not required.

In accordance with AS 44.62.125(b)(6), some corrections have been made in the regulations, as shown on the attached copy.

SCW

cc went: Gary Mendivil, Regulations Contact
Department of Environmental Conservation

Lynn Kent, Director
Division of Water
Department of Environmental Conservation

William Ashton
Division of Water
Department of Environmental Conservation

Carmen M. Leonard
Assistant Attorney General
Natural Resources Section--Fairbanks

**Alaska Department of Environmental Conservation
Decision Document for a Total Dissolved Solids
Site-Specific Criterion for Red Dog Creek**

I. Department Decision

In accordance with 18 AAC 70.235, the Alaska Department of Environmental Conservation (Department) modifies the site-specific criterion (SSC) for Total Dissolved Solids (TDS) described herein this document for the mainstem of Red Dog Creek located in the vicinity of Red Dog Mine in the Northwest Arctic Borough.

As a result of its analysis of information described below and referenced in this document, the Department finds that the evidence:

1. Reasonably demonstrates that the TDS SSC will fully protect the designated uses of this water body [see 18 AAC 70.235(c)];
2. Reasonably demonstrates the existing SSC in 18 AAC 70.235(b)(5) is more stringent than necessary to ensure full protection of the designated uses of this water body [see 18 AAC 70.235(c)(1)]; and
3. Reasonably demonstrates that the species present, or expected to be present under natural conditions, are less sensitive to TDS than indicated in 18 AAC 70.235(b)(5) [see 18 AAC 70.235(d)(1)].

The Department's findings are based on an analysis of the following information:

- The Department's decision document on creating the site-specific criterion for Red Dog Creek in 2003,
- Laboratory studies conducted on the effects of TDS on Arctic grayling and Dolly Varden,
- Laboratory studies conducted on the effects of TDS on aquatic species,
- Literature reviews of the effects of TDS on aquatic species,
- Aquatic biomonitoring collected as part of the NPDES permit requirements, and
- Review of written and oral comments received during the public comment period from September 26, 2005 until November 17, 2005.

II. Background Information on Red Dog Creek and Red Dog Mine

Red Dog Creek is located in the northwestern Brooks Range in an area with high levels of naturally occurring metals. In the 1980's geologists explored the area and found high grade mineral deposits. In 1989 Red Dog Mine opened. The mine primarily produces lead and zinc ore concentrates, with other metals in much smaller quantities. The mine

consists of the mine site, port facility, and a 52 mile haul road that connects them. The mine is located approximately 60 miles from the village of Kivalina and approximately 40 miles from the village of Noatak. The village of Kivalina gets its drinking water from the Wulik River using a fill and draw system, filling large storage tanks during the open water season and drawing them down during the rest of the year. Red Dog Creek flows into Ikalukrok Creek which flows into the Wulik River.

III. Background on Total Dissolved Solids

The term "total dissolved solids" refers to a diverse group of compounds that can become dissolved in water. There are two broad categories of dissolved solids. The first are those compounds that can exert toxic effects at very low concentrations. These include the heavy metals like chromium, lead and cadmium. The second group includes materials dissolved in water such as carbonate, bicarbonate, chloride, sulfate, phosphate, nitrate, calcium, magnesium, sodium, organic ions and other ions. Natural waters contain varying types and concentrations of dissolved solids. Dissolved solids are essential constituents of water for growth, reproduction, and the general wellbeing of aquatic organisms (McKerney, 1995). In laboratories TDS is measured directly through controlled evaporation of a filtered sample and then weighing the residue. In the field specific conductance is measured using electronic probes and is an indirect measure of TDS.

IV. Total Dissolved Solids in Red Dog Creek

The main source of TDS in Red Dog Creek is calcium and magnesium sulfates from the treated wastewater from the Red Dog Mine. Calcium hydroxide (lime) is used in the wastewater treatment process to remove ore metals (such as lead and zinc). In 2002 the mine's effluent had TDS with a median concentration of 3,430 mg/l, with a range of 1,710 mg/l to 3,640 mg/l (ADEC, 2003). During the period 1999 to 2002 the median concentration of TDS ranged from approximately 1,300 mg/l to 950 mg/l at station 10 in Red Dog Creek (Weber Scannell, 2003). During the same period the median concentration ranged from approximately 450 mg/l to 290 mg/l at Station 160, Ikalukrok Creek downstream of Dudd Creek (Weber Scannell, 2003).

Teck Cominco Alaska (TCAK) installed automated monitoring equipment at the water treatment plant and at Stations 10 and 160 to continuously monitor flow, temperature, and specific conductance. Information is transmitted frequently to the treatment plant. A well-established relationship between TDS (measured in the lab) and specific conductance (measured in the stream with a conductivity meter) allows TCAK to adjust treatment plant discharge flow which then adjusts the TDS entering Middle Fork Red Dog Creek (ADEC, 2003). The regression analysis using TDS, temperature, and conductivity data is recalibrated over multiple discharge events. This improves the treatment plants control of TDS at Station 10 and 160. If TDS concentrations approach 1,500 mg/l at Station 10 (with corresponding TDS of up to 500 mg/l at Station 160), then the water treatment plant reduce the discharge rate of mine effluent into Middle Fork Red