CROOKED CREEK WATERSHED DRAFT TOTAL MAXIMUM DAILY LOAD (TMDL)FACTSHEET

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER

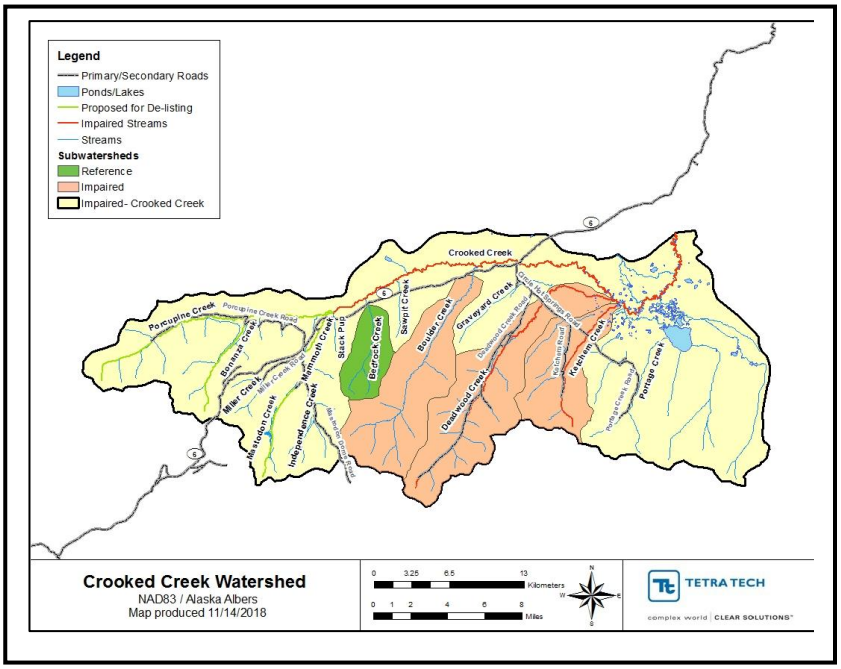
Improving And Protecting Alaska's Water Quality

1. What is the problem with water quality in the Crooked Creek watershed?

Several streams in the Crooked Creek watershed are polluted from turbidity. These include Crooked Creek, Boulder Creek, Deadwood Creek and Ketchem Creek.

Turbidity comes from excess sediment which makes the water look cloudy. Sources include active placer mining and sediment erosion from historically disturbed sites.

The Crooked Creek watershed is approximately 319 mi^2. This area, near Central, Alaska, has been a major gold mining area for over 100 years and contains highly mineralized terrain.



2. How do we know which creeks in the watershed are polluted?

Alaska's Department of Environmental Conservation (ADEC) first put several streams in the Crooked Creek watershed on the Clean Water Act (CWA) Section 303(d) list as polluted for turbidity in 1992. Additional studies by ADEC in 2014, 2016 and 2017 indicate that Crooked Creek, Boulder Creek, Deadwood Creek and Ketchem Creek continue to be polluted. Data indicate that Porcupine Creek, Bonanza Creek, Mammoth Creek and Mastodon Creek are meeting turbidity criteria.

3. What's turbidity, where does it come from and why should I care?

Turbidity is a measure of water clarity in streams, rivers, lakes, and the ocean. Turbidity describes the

amount of light scattered or blocked by suspended particles in a water sample. Clear water has low turbidity and cloudy or murky water has a higher turbidity level. Turbidity is caused by particles of soil, organic matter, metals, or similar matter suspended in the water column.

Potential sources of turbidity in the Crooked Creek watershed include permitted point sources (such as wastewater discharges from active placer mines) and nonpoint sources (such as runoff from historically disturbed placer mine sites).

Increased levels of turbidity impact drinking water sources and make treatment more difficult; diminish fish rearing success with negative impacts to fisheries; and impair recreational uses by making waterbodies less appealing. Land use activities can cause loss of riparian vegetation and soils, elimination of stream banks, and loss of natural habitat. The presence of turbidity indicates effects from excess erosion and sediment inputs on watershed health.

4. How will the water quality be improved?

Reducing turbidity in the Crooked Creek watershed will involve controlling runoff from currently active and historic mine sites. Best management practices must be implemented to prevent sediment from reaching the creek. These include methods to manage runoff and site water, such as silt fences, berms, sediment ponds, and mulching or planting vegetation to retain soil cover (see example photos below).

Examples of best management practices. Silt fence (left), elongated sediment ponds (right)

5. What is a Total Maximum Daily Load (TMDL)?

The TMDL is basically a "pollutant budget". This budget is an important component of the overall recovery plan. The budget calculates the maximum amount of sediment that can enter the Crooked Creek watershed while still meeting the state's allowed limit for turbidity. A TMDL is established to meet the requirements of Section 303(d)(1)(C) of the Clean Water Act.

The TMDL budget was developed using standard mathematical equations, actual creek water quality data, and other landscape and weather measurements. The calculations show the pollutant reductions in sediment inputs needed to allow the creek meet the state's allowed turbidity limit. The reductions are expressed as monthly Total Suspended Solids (TSS) targets and turbidity threshold values (NTU). The draft TMDL explains these calculations in detail. A summary of the TMDL targets and turbidity threshold values are shown in the table below:

Parameter (units)	Storm-related[a]	Last week of May[b]	June[b]	July[b]	August[b]	September[b]
Turbidity (NTU)	58.6	5.4	5.4	6.8	6.5	6.0
TSS (mg/L)	108.9	6.4	6.4	7.8	7.5	7.1

[a]Storm-related tubidity threshold = median Bedrock Creek storm-related turbidity of 53.3NTU * 1.1 (10% increase).
[b]Monthly turbidity thresholds = median monthly turbidity at Bedrock Creek plus 5NTU (May: 0.4 + 5NTU; June: 0.4 + 5NTU; July: 1.8 + 5NTU; August: 1.5 + 5NTU; and September: 1 + 5NTU).

What are three important "fixes" for cleaning up the Crooked Creek watershed?

- ✓ Implement best management practices on actively disturbed areas to prevent erosion and runoff.
- ✓ Follow permit guidance and monitor water quality.
- ✓ Keep the naturally vegetated corridor along the creek to filter pollutants.

6. How can I learn more about this draft TMDL recovery plan or make comments?

The draft TMDL is available by request from the contact below.

DEC is asking for public review and comments at this time. **Written public comments must be mailed, faxed, emailed, or hand delivered to the address below before 5:00 PM on April 30, 2019.**

Answers to commonly asked questions about TMDLs in general can be found on the DEC website at: http://dec.alaska.gov/water/tmdl/pdfs/Commonly_asked_questions_about_TMDLs_Final.pdf

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