

# Water-Quality Assessment, and Citizen Monitoring Networks

Tuluksak River Gold Dredging Water-Quality Assessment,  
Nyac, Alaska

A subsidiary of Noranda Mining has proposed to dredge approximately 1200 acres of alluvial lowland beneath and adjacent to the Tuluksak River, near Bethel, Alaska. The mining company has proposed a complex, multi-phased operations plan, which will lead to reworking of the entire width of the valley to a depth of approximately 85 feet. Much of this area had previously been dredged to a shallower depth during the first decades of this century, with recovery aided by using mercury for amalgamation. The technologies in use at the time were only partially successful in recovering mercury; considerable amounts of spent mercury remain within the tailings. Barry Hecht, was originally retained as an expert witness regarding the technical adequacy of the environmental impact assessments and of the wetlands restoration plan. Balance staff ultimately recommended or conducted several supplemental studies as a means of resolving outstanding issues.



One such study involved comparing the mercury and arsenic contents of fish livers in dolly varden living in ponds within the existing tailings, with those taken from the Tuluksak River in the vicinity, and with those from the largest local stream (the Kuskokwim River) which has high naturally-occurring levels of mercury in its sediment. Results of this study were provided to representatives of the four local Yupik

(‘Western Eskimo’) villages; these representatives were then able to work with each family in the village to develop their own assessment of additional exposure based on that family’s fishing patterns.

Balance staff adapted existing quality control/quality assurance programs for Alaskan conditions and proposed as the basis for sampling, preservation, and analysis of the fish livers. We also provided an approach to quantify the delivery of additional mercury to the Kuskokwim River system, based on partitioning the mercury into the adsorbed and dissolved phases following elutriate testing, plus established relations between stream flow and suspended-sediment transport which had been developed from actual measurements in the region. Balance is currently working on behalf of the Regional Coastal Zone Management District to quantify water rights and water-quality rights in the Tuluksak and Kwethluk watersheds.



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