

MEMORANDUM

State of Alaska

Department of Fish and Game
Habitat Section

TO: Al Ott
Operations Manager

DATE: September 6, 2019

SUBJECT: Transboundary Mines:
KSM Trip Report

FROM: Kate Kanouse *KK*
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On July 15, 2019, I traveled with Department of Natural Resources Office of Project Management and Permitting Associate Director Kyle Moselle to Stewart, British Columbia, to tour three hard rock mine projects located in transboundary watersheds. On July 15, Seabridge Gold Inc. provided our ground transportation between Hyder and Stewart and Kevin Hidber joined us for an aerial tour via helicopter of Seabridge's Kerr-Sulphurets-Mitchell (KSM) project. We visited many of the locations that Mr. Moselle and former Habitat Biologist Nicole Legere visited in 2017.^a

Seabridge received their provincial environmental assessment certificate and federal environmental assessment approval for the KSM project in 2014 and continues to explore the project and advance project development. Proposed as an open pit copper and gold project located in the Unuk watershed about 35 km by air from the U.S./Canada border, mining, waste rock disposal, and water treatment facilities would occur in the Sulphurets and Mitchell watersheds which drain to the transboundary Unuk River, and milling and tailings disposal would occur in the Teigen and Treaty watersheds which drain to the non-transboundary Bell-Irving and Nass Rivers (Figures 1, 2).

In transboundary watersheds, we observed the Kerr, Sulphurets, Mitchell, and Iron Cap deposits (Figures 3–6), Sulphurets and Mitchell Creeks (Figure 7–9), Sulphurets Creek and Unuk River confluence (Figure 10), Unuk and South Unuk Rivers confluence (Figure 11), and the Unuk River at the U.S./Canada border (Figures 12, 13). In non-transboundary watersheds, we observed the headwaters of Treaty Creek (Figure 14), and the North Treaty and South Teigen watersheds where the tailings management facility would be located (Figure 15, 16).

^a Nicole Legere, Habitat Biologist, to Jackie Timothy, Southeast Regional Supervisor, ADF&G Division of Habitat. Memorandum: Transboundary Mines Site Visits Trip Report September 11-13, 2017; dated 10/25/2017.

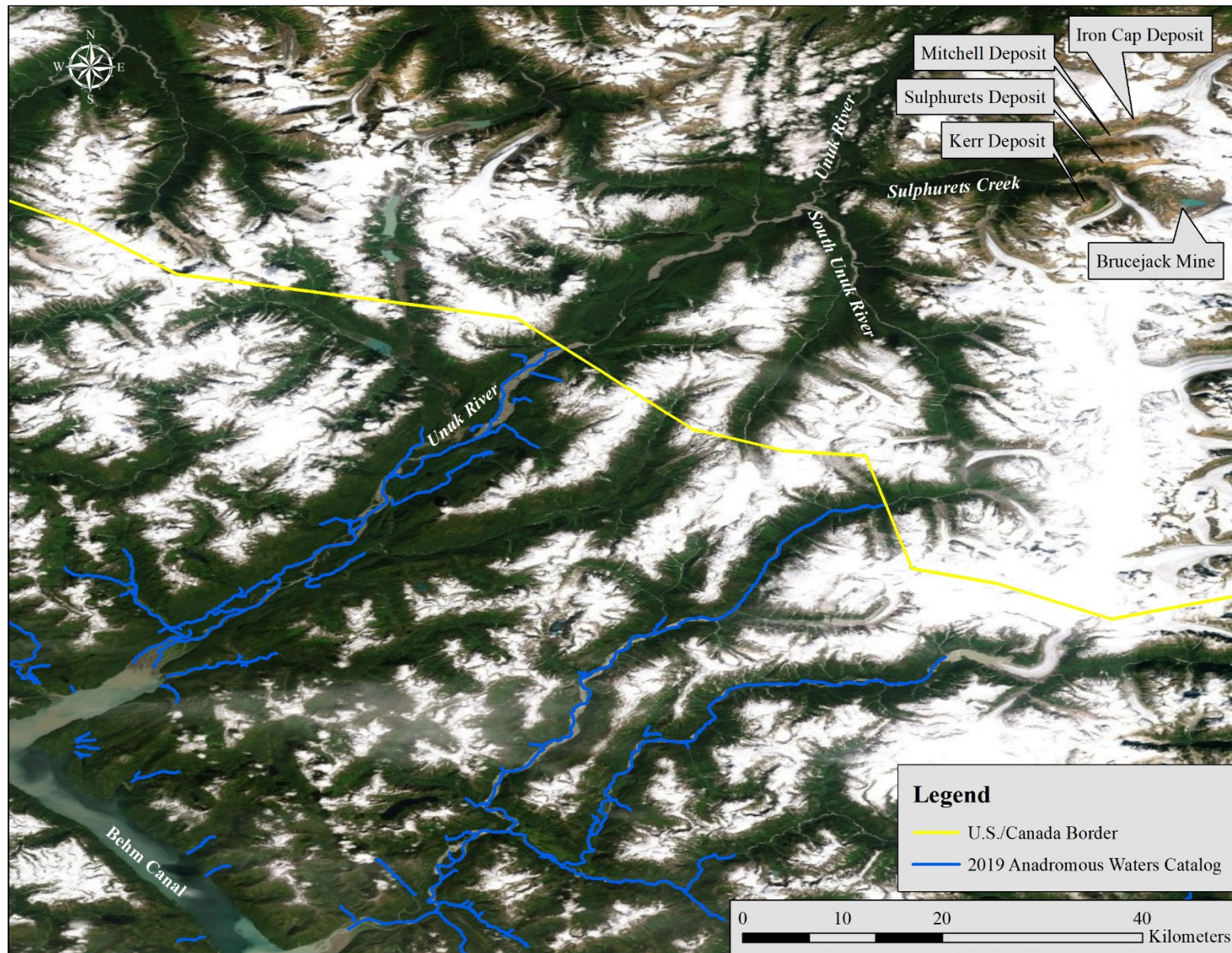


Figure 1.-KSM deposits in watersheds draining to Alaska.



Figure 2.–KSM project features; courtesy of Seabridge Gold Inc.

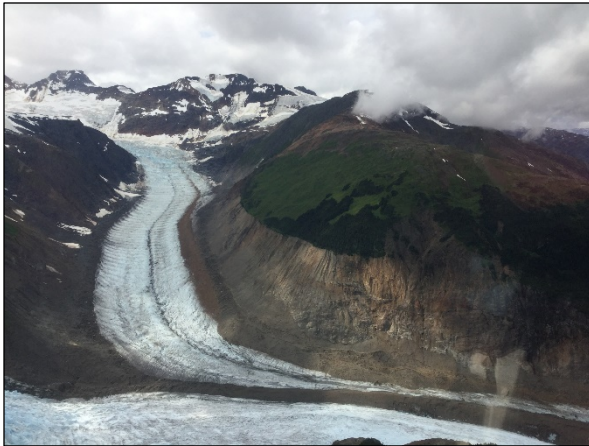


Figure 3.–Kerr Glacier and deposit.

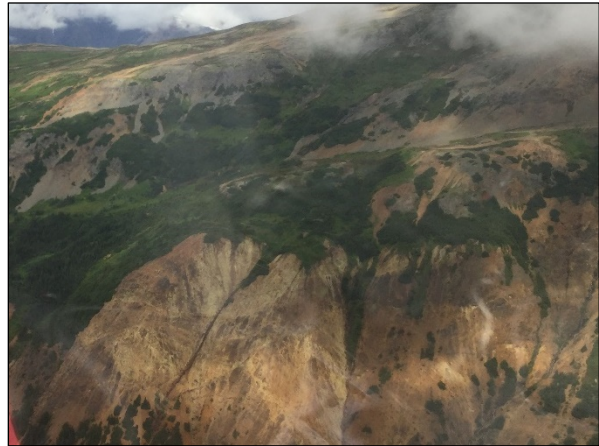


Figure 4.–Sulphurets deposit.



Figure 5.–Mitchell Glacier and deposit.



Figure 6.–Iron Cap deposit.

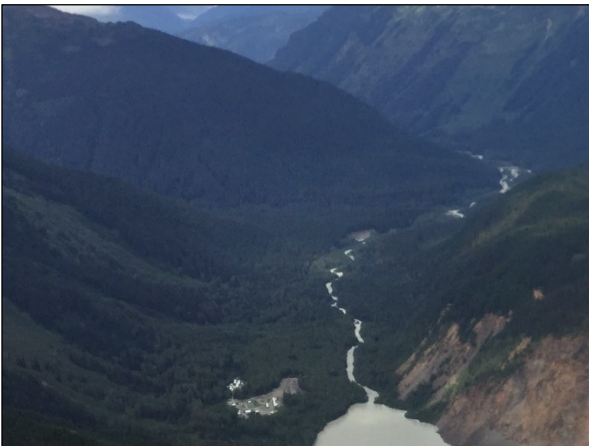


Figure 7.–Sulphurets Creek headwaters.



Figure 8.–Mitchell Creek headwaters.



Figure 9.—Mitchell Creek (center) and Sulphurets (right) Creek confluence.



Figure 10.—Sulphurets Creek (center) and Unuk River confluence.



Figure 11.—Unuk River (foreground) and South Unuk River (background) confluence.

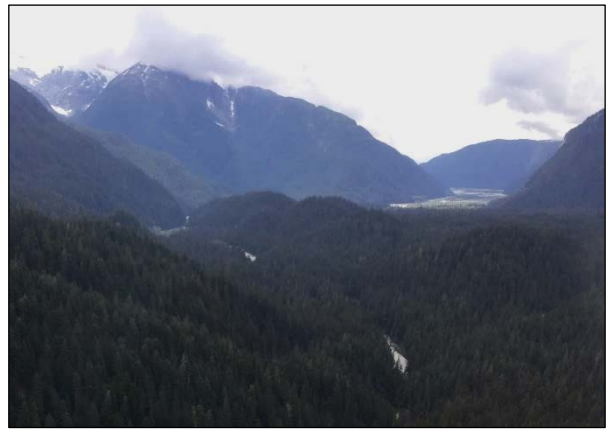


Figure 12.—Unuk River canyon (foreground) upstream of the U.S./Canada border.

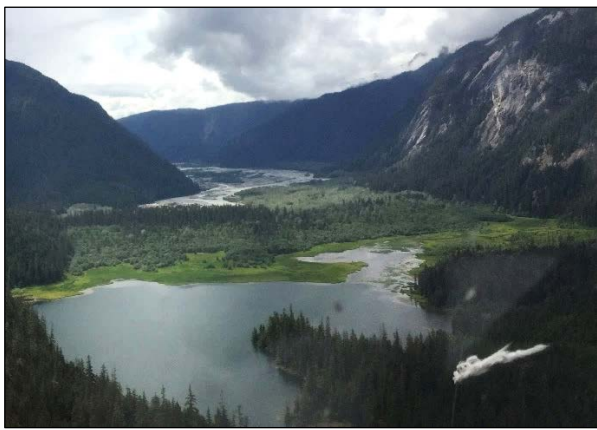


Figure 13.—Border Lake (foreground) and Unuk River at the U.S./Canada border.

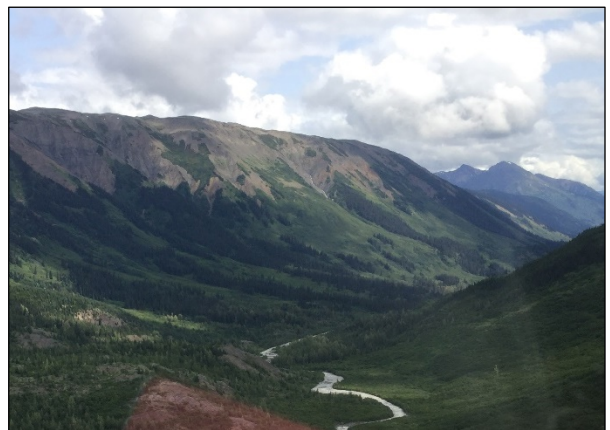


Figure 14.—Treaty Creek headwaters.



Figure 15.–North Treaty Creek.

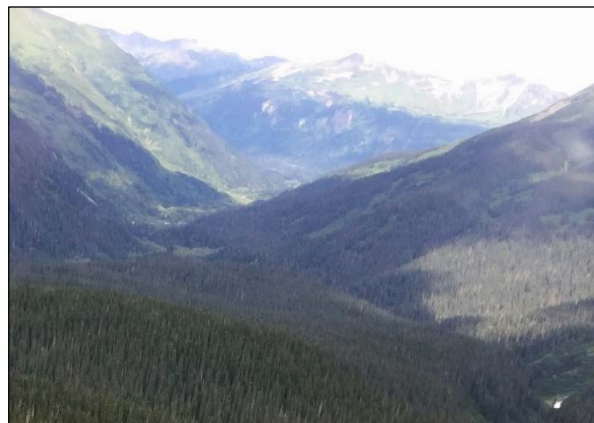


Figure 16.–South Teigen Creek (right) and Teigen Creek (background).

Fish Distribution in Transboundary Watersheds

Mitchell Creek drains to Sulphurets Creek, a tributary of the transboundary Unuk River. Sulphurets Creek drains to Unuk River about 90 km upstream of the mouth, and cascades about 500 m upstream of the confluence prevent fish passage. Below the barrier, few Dolly Varden char are present; drainages upstream of the barrier are void of fish and many have naturally degraded water due to weathered minerals (Rescan 2013). Throughout the Mitchell and Sulphurets valleys, we observed colorations in the exposed rock that suggest presence of high mineralization (Figures 4–6). We also observed color variations in Mitchell and Sulphurets Creeks and Unuk River (Figures 9, 10) that suggest weathering of the exposed mineralized rock has degraded water quality through natural processes, compared to non-mineralized areas in the Unuk watershed.

Like Mitchell and Sulphurets Creeks and the South Unuk River, the 129 km Unuk River originates from a heavily glaciated area in British Columbia. Downstream of the U.S./Canada border, the Unuk River flows through the Misty Fjords National Monument and discharges to Burrows Bay in Behm Canal. The Unuk River (Stream No. 101-75- 10300) provides habitat for Chinook, chum, coho, pink, and sockeye salmon, eulachon, steelhead trout, and Dolly Varden char. Most Chinook salmon spawn in Unuk River tributaries within the lower 39 km of the river, downstream of the U.S./Canada border (Lum and Fair 2018). Pink and chum salmon are unable to navigate beyond the Unuk River canyon near the U.S./Canada border (Figure 12), while Chinook, coho, and sockeye salmon spawn and rear in the Unuk River and its tributaries upstream of the canyon and the Sulphurets Creek confluence (Rescan 2013). Dolly Varden char are present throughout the Unuk River watershed.

References

- Lum, J. L. and L. Fair. 2018. Unuk River king salmon stock status and action plan, 2018. Alaska Department of Fish and Game, Regional Information Report No. 1J18-04, Douglas, AK.
- Rescan Environmental Services Ltd. 2013. Application for an environmental assessment certificate/environmental impact statement for the KSM Project. Prepared for Seabridge Gold Inc., Vancouver, BC.

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