Plan of Operations

Red Dog Mine Millsite Lease ADL 233521

Teck

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1.0 INTRODUCTION

This updated Plan of Operations (PoO) is being submitted by Teck Alaska Incorporated, Red Dog Mine (TAK) as part of the renewal of Plan of Operations Approval F20209958POOA. The current PoO Approval expires on September 28, 2021.

This PoO describes past, present, and future mine-related activities within the boundaries of Millsite Lease ADL 233521. The Millsite Lease authorizes the activities as they are described in this PoO. The boundaries of the Millsite Lease are illustrated Figure 1.

The Red Dog Mine is located nearly entirely on NANA lands. However, the boundary between State of Alaska and NANA lands was encroached starting in 2020 as the mine tailings storage facility (TSF) expanded because of ongoing tailings deposition and rising water levels within the TSF.

In addition to the use of leased State lands for the disposal of mine tailings, future activities will include construction of an emergency spillway for the TSF. Detailed engineering and construction of the spillway are at least two years in the future and will be addressed in a future update to this PoO.

This Plan of Operations describes the following activities on Millsite Lease Lands:

- Tailings disposal and management
- Construction of TSF spillway
- Material Sale
- Reclamation

Figure 1. Location Map

2.0 ACTIVITIES ON MILLSITE LEASE LANDS

The mine TSF lies almost entirely on NANA lands as illustrated in Figure 1. However, with the addition of more tailings, a sequence of dam raises, and rising pond water levels in the TSF, it began encroaching on State land. In the future, TAK plans to construct an emergency spillway on lease lands to connect the TSF pond with a tributary to Middle Fork Red Dog Creek. In 2020, TAK placed tailings within an excavated depression, partially on lease lands, within the old boundaries of material site DD-2 and is now managing those tailings as part of the overall management of the TSF. Finally, TAK also extracts construction rock from a material site under the terms of a material sales contract with DNR within the boundaries of the Millsite lease. All these activities are described below.

2.1 Tailings Disposal

During the period May 9 thru June 12, 2020, TAK pumped tailings slurry for permanent storage into the large, excavated depression created in the DD-2 material site. This area is illustrated in Figure 2. The western third of this area falls inside the boundary of the Millsite Lease, the remainder is on NANA land. The dewatered volume of the tailings deposited into the DD-2 site excavation was approximately 50 million gallons equivalent to 247,555 cubic yards. Approximately 30% or 164,200 cubic yards of that total were deposited on Millsite Lease lands. The remainder were deposited on NANA lands.

At the time that the tailings were deposited, the floor of this depression had an elevation of approximately 970 ft; the driving surface of the causeway separating it from the TSF has an elevation ranging from 995 ft to 1000 ft; the culvert base below the road causeway was at an elevation of approximately 981 ft msl and the surface water elevation in the TSF was at approximately 981 ft.

This DD-2 site depression was filled by diverting tailings slurry from the existing tailings slurry pipeline situated along the west side of the TSF. The tailings slurry was composed of about 22% solids, 78% water. Tailings slurry was diverted by a 26 inch pipe initially terminated close to the highwall at the western-most part of the DD-2 excavation. As tailings accumulated and started to inundate the discharge end of the slurry pipeline, the pipe was broken farther back so the slurry could continue filling the area. In this way the depression was systematically filled from the base of the highwall and then progressively toward the road and existing TSF pond. As the area began to fill, and tailings solids settled, free water flowed toward the main TSF pond and through the coarse road causeway fill or the existing culvert. An idealized cross-section of the deposited tailings shortly following deposition is illustrated in Figure 3.

2.2 Emergency Spillway Construction

In the future, as the TSF approaches full capacity toward the end of mine life, TAK will construct an emergency spillway on the west side of the TSF. A portion of the proposed spillway location is situated on Millsite Lease lands as illustrated on Figure 1. The spillway will connect the TSF pond with a tributary of the Middle Fork Red Dog Creek. The spillway invert elevation will be constructed to allow excess water to pass and prevent the tailings main and/or back dams from overtopping. Golder has developed a preliminary design for the spillway and that design will be advanced as the mine approaches the end of mine life. The current design calls for constructing the spillway in bedrock. This PoO will be updated in the future as more detailed design and planning information for the spillway becomes available. Estimated construction costs for the spillway are included in the updated (2021) Red Dog Mine reclamation cost estimate and will become part of the 2021 updated reclamation bond for the mine.

2.3 Material Sales

TAK is actively excavating construction materials within the boundary of the proposed Millsite Lease. However, the material sale is authorized separate from the approval of this PoO and is authorized under a material sales contract between TAK and DNR (ADL # 419715) and the site is referred to as the DD-2 Material Site. It is illustrated in Figure 2. The Material Sale predates the effective dates of the Millsite Lease and the PoO Approval. The sales contract authorizes TAK to remove up to 1.5 million cubic yards of crushed and screened shale and chert through June 2023. Likely the contract will be renewed. Exploitation of the material site resulted in the depression used as the disposal site for tailings deposition described in Section 2.1 in this PoO. However, in 2020 the boundary of the material sales site was modified to exclude the excavated area subsequently used for the tailings disposal that same year. TAK will continue to excavate material from the DD-2 site, to the west of the tailings disposal area. This will not interfere with TAK's plan to manage and reclaim the tailings deposition area.

2.4 Reclamation

Red Dog Mine has reclamation obligations within the Millsite Lease lands and within Material Site DD-2. This reclamation is discussed in the updated (2021) Red Dog Mine Reclamation Plan and estimated costs are included in the updated (2021) Red Dog Mine reclamation cost estimate. They are also briefly discussed here.

The tailings within the DD-2 excavation have now dewatered and settled to an elevation of 990 feet or less. The result is a relatively dry stable surface with a gentle slope toward the TSF, covering an area of approximately 10 acres. The NANA/State land boundary passes through this area, so approximately one-third of this area is on the Millsite Lease lands. The entire area will eventually be inundated by the TSF pond water by the time mine approaches closure in 2031.

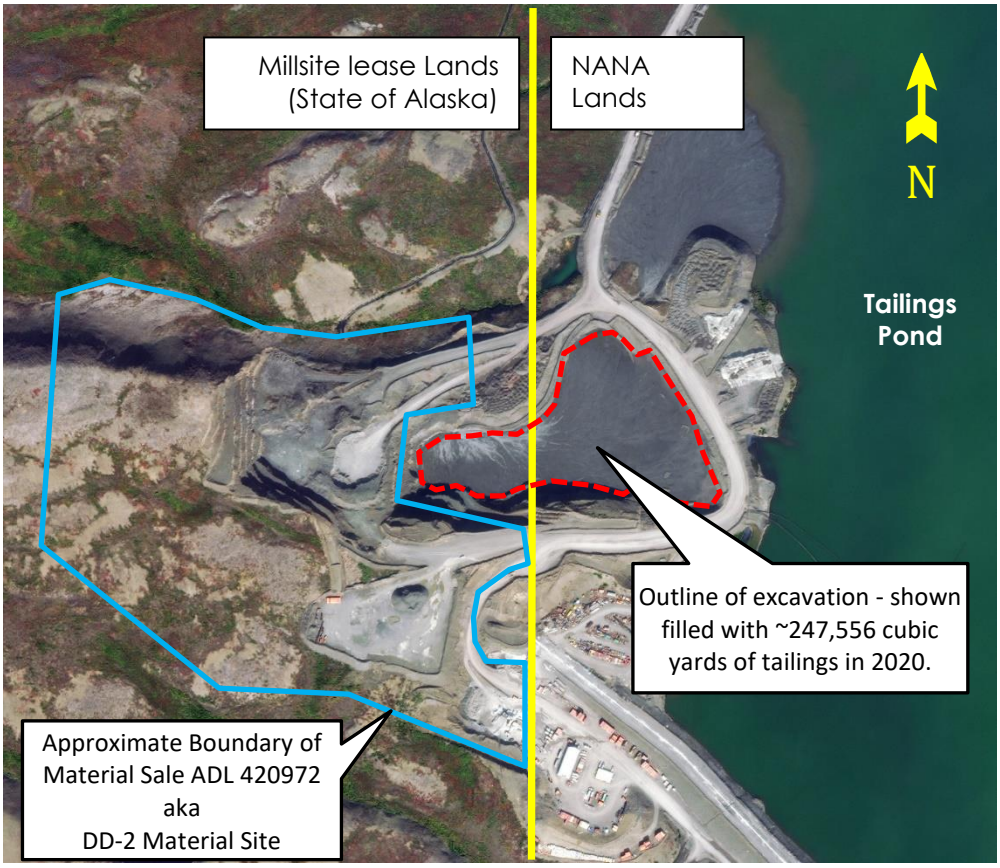

Figure 2. Detailed Location Map of Tailings Disposal Area and Existing DD-2 Material Site

Under the current Red Dog Mine Reclamation Plan Approval (F20169958), the TSF will receive a "wet" closure. The tailings will remain covered with at least two feet of water cover and that water pond will be maintained for the long-term following mine closure. The water cover is expected to reduce oxygen availability to the tailings and slow their oxidation. To reduce the potential for fugitive dust and reduce water infiltration onto the tailings, until the TSF water level submerges the tailings, the mine will place a layer of DD2 quarry material on top of the tailings. This area will also be used as a laydown location to place non-construction grade DD2 material, which will further reduce water infiltration onto the tailings and reduce oxygen availability to the tailings and slow their oxidation until they are submerged by TSF water.

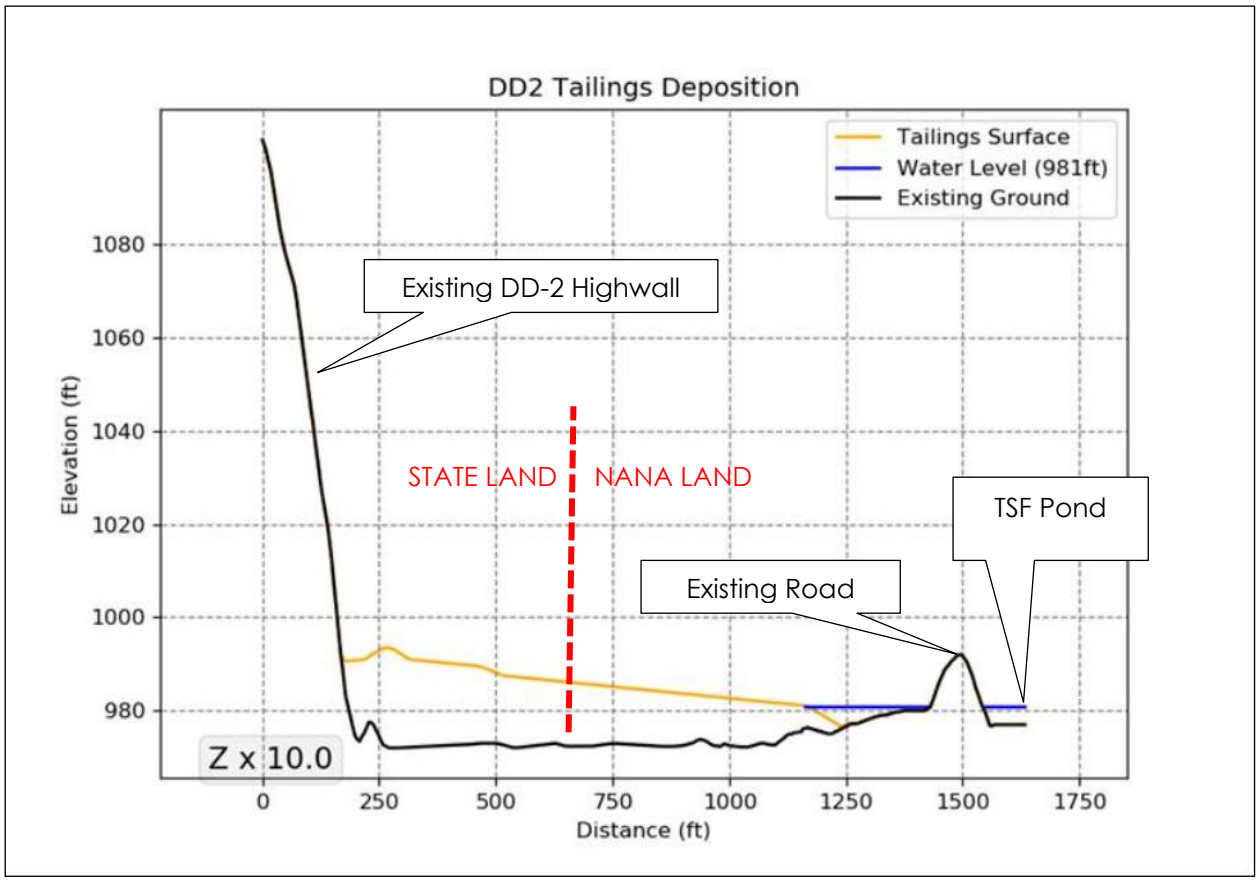

Figure 3. Idealized Cross Section of DD-2 Tailings Disposal Area – View Looking North

Reclamation of any other disturbed land within the current boundaries of Material Site DD-2 will include covering disturbed areas with soil and revegetation as described in the updated (2021) Red Dog Mine Reclamation Plan. Costs for this reclamation are also include in the updated (2021) Red Dog Mine reclamation cost estimate and the reclamation bond tied to that estimate.

3.0 MONITORING

TAK will perform sufficient visual monitoring of the tailings to assure that measurable fugitive dust is not generated from the uncovered tailings before they are covered. Mitigation measures, including the application of water, can be used to mitigate generation of fugitive dust. Post-Reclamation monitoring is discussed more fully in the updated (2021) Red Dog Mine Reclamation Plan.