

APPENDIX A

TABLES AND FIGURES

Figure 1: General Project Area

Figure 2: Existing Facilities and Aqqaluk Deposit

Figure 3: Alternative B after Closure

Table 1: Comparison of Alternatives

Table 2: Summary of Potential Impacts of Each Alternative by Resource

Table 3: Mitigation Measures by Resource

Table 4: Selected Monitoring by Resource

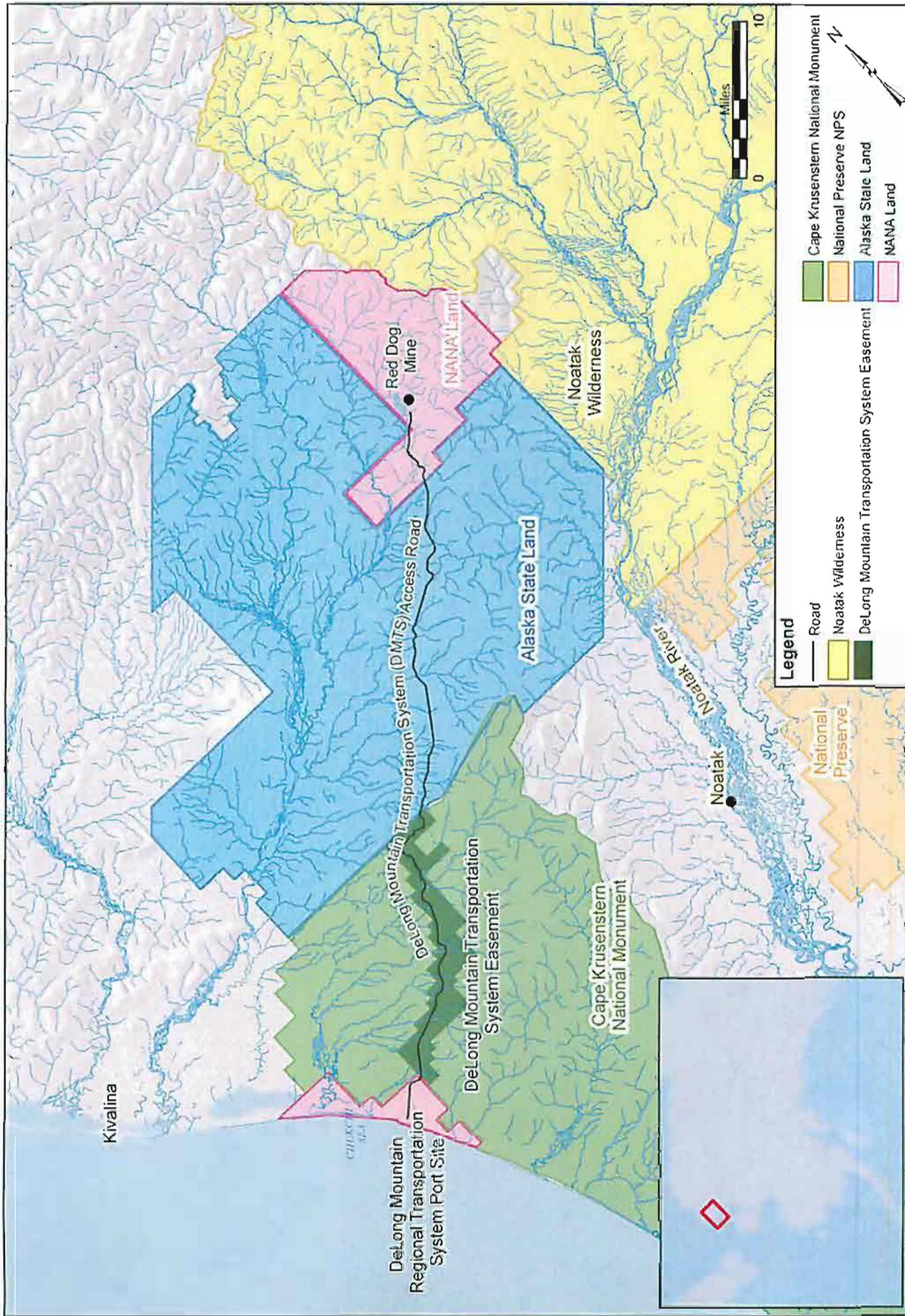


FIGURE 1

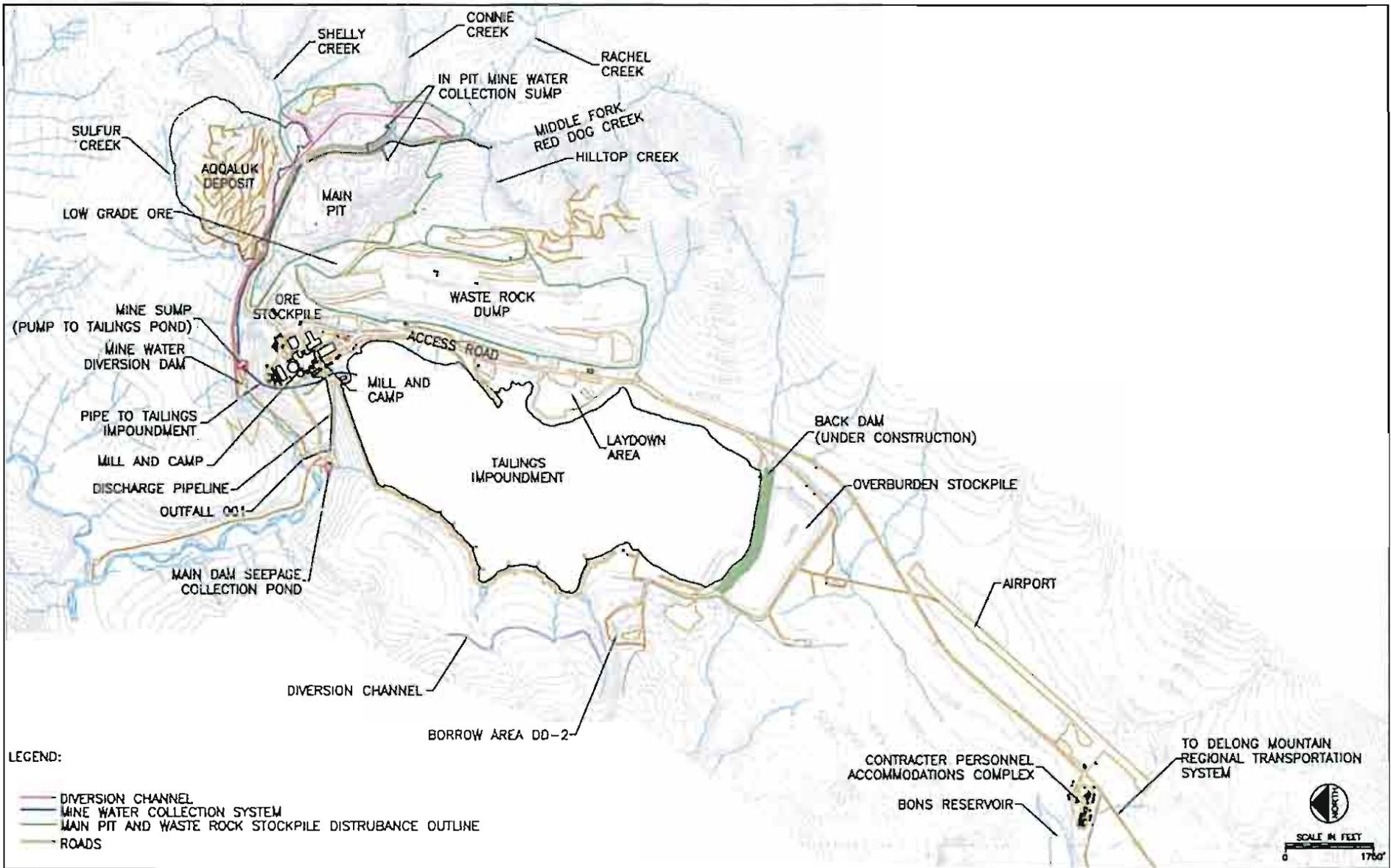


FIGURE 2
EXISTING FACILITIES AND AQALUK DEPOSIT

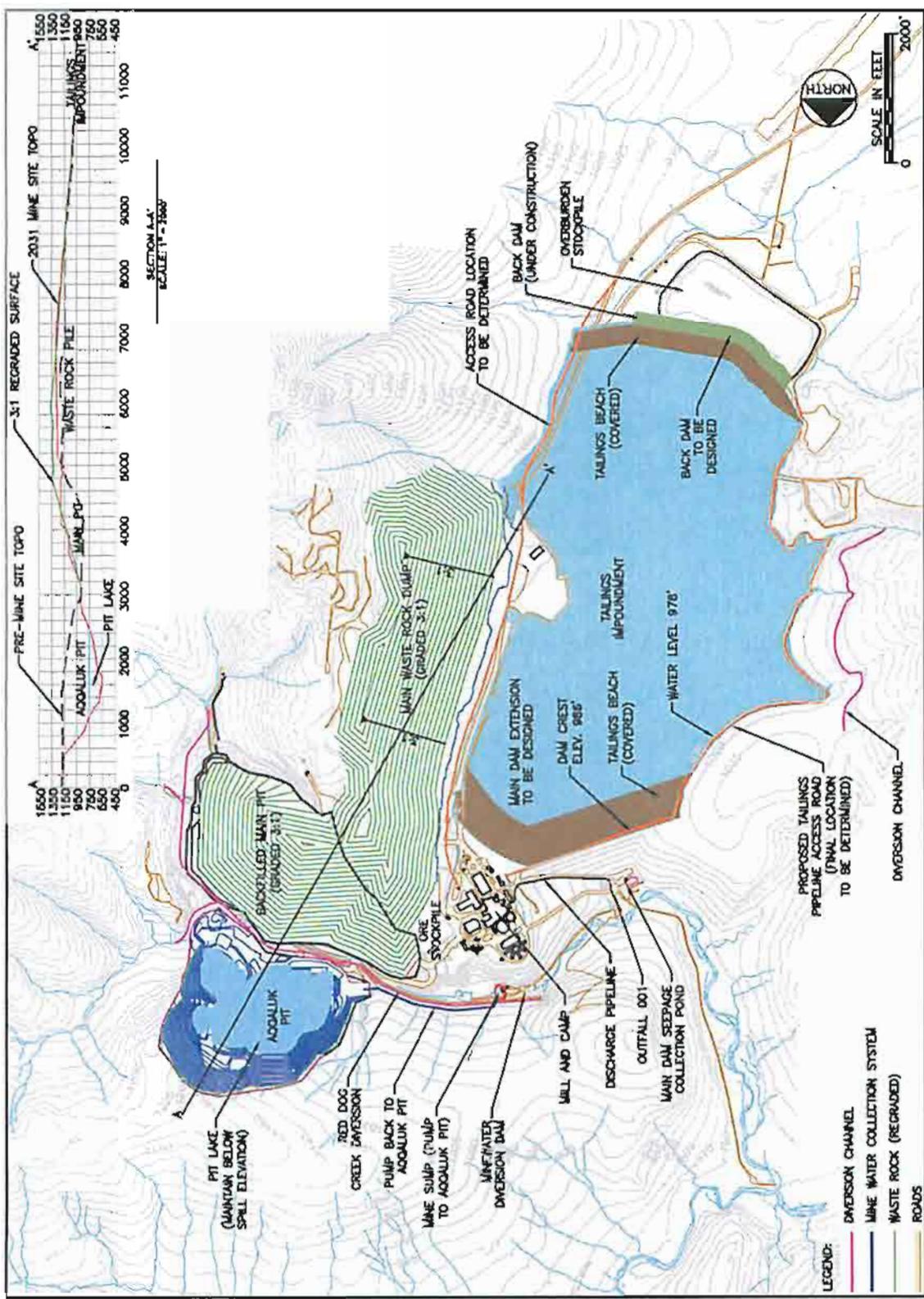


FIGURE 3
ALTERNATIVE B - AFTER CLOSURE 2031

Table 1 Comparison of Alternatives

Component	Alternative A No Action	Alternative B Proposed Action	Alternative C Concentrate and Wastewater Pipelines	Alternative D Wastewater Pipeline and Additional Measures
<i>Mining Method</i>	No Aqqaluk Project.	Aqqaluk Open Pit.	Same as Alternative B.	Same as Alternative B.
<i>Waste Rock Disposal</i>	Waste rock dump.	Waste rock dump/Main Pit backfilled with Aqqaluk Pit waste rock.	Main Pit backfilled with Aqqaluk Pit waste rock/Aqqaluk Pit partially backfilled from existing waste rock dump.	Same as Alternative B.
<i>Wastewater Treatment</i>	Aluminum or barium hydroxide pretreatment, followed by reverse osmosis.	Existing high-density sludge/lime precipitation plus, as needed, barium hydroxide precipitation.	Existing high-density sludge/lime precipitation for mine. Barium hydroxide precipitation or other enhanced TDS treatment not needed. New sludge/lime system at port (different water quality permit limits for marine outfall).	Existing high-density sludge/lime precipitation for mine. Barium hydroxide precipitation or other enhanced TDS treatment not needed.
<i>Wastewater Outfall Location</i>	Red Dog Creek.	Same as Alternative A.	Chukchi Sea during operations. Red Dog Creek after closure.	Chukchi Sea.
<i>Concentrate Transport</i>	Concentrate truck.	Same as Alternative A (longer duration).	Slurry pipeline.	Same as Alternative B (plus truck washes).
<i>Power</i>	Additional 10 megawatts of power demand for wastewater treatment.	No change from existing operations.	Additional three megawatts of power at port for filter presses and pumps (supplemented with wind power).	No change from existing operations.
<i>Subsistence Closures</i>	None.	None.	None.	Late opening of port (July 1) and closure of DMTS road in fall.
<i>New Construction</i>	New water treatment plant and generator.	Aqqaluk Pit Development.	Same as Alternative B plus new pipeline bench incorporated into the DMTS road.	Same as Alternative C plus truck washes at contractor PAC and port site CSBs.
<i>Fugitive Dust Control</i>	Per draft fugitive dust risk management plan.	Per draft fugitive dust risk management plan.	Per draft fugitive dust risk management plan. Pipeline would eliminate concentrate truck and fuel truck traffic.	Per draft fugitive dust risk management plan plus enhanced truck washes.

Component	Alternative A No Action	Alternative B Proposed Action	Alternative C Concentrate and Wastewater Pipelines	Alternative D Wastewater Pipeline and Additional Measures
<i>Reclamation/ Closure</i>	Pit lake in Main Pit (below 850 feet); wet cover over tailings; soil cover over waste rock dumps (3:1 [horizontal:vertical] grading). Long-term wastewater treatment required.	Main Pit backfilled; pit lake in Aqqaluk Pit; wet cover over tailings; soil cover over waste rock dumps (3:1 grading) (oxide ore stockpile and waste rock dump ½ reclaimed by 2017, fully reclaimed by 2020). Long-term wastewater treatment required.	Main pit backfilled; partial backfill Aqqaluk Pit; geosynthetic dry liner cover over tailings impoundment and waste rock dump (regraded waste rock dump to 5:1). Long-term wastewater treatment required.	Same as Alternative B except continued wastewater pipeline and discharge to the Chukchi Sea. Long-term wastewater treatment required.

Table 2 Summary of Potential Impacts of Each Alternative by Resource

Resource	Impact	Alternative A	Alternative B	Alternative C	Alternative D
Air quality	Stack and fugitive emissions	Higher stack emissions due to 10MW generator for reverse osmosis system; will continue to be required after closure. Duration of fugitive emissions minimized after end of mining in 2011.	Stack emissions comply with all Federal and State air quality standards. Fugitive dust emissions along DMTS road continue at current levels through 2031, unless controls implemented through the draft fugitive dust risk management plan. Elevated metals levels in soils extend >50 miles.	Same stack emissions as Alternative B. Fugitive dust emissions associated with DMTS road traffic largely eliminated by pipeline construction. Additional fugitive dust emissions associated with the dry cover over the tailings impoundment and cover material stockpiles	Same stack emissions as Alternative B. Fugitive dust emissions associated with DMTS road greater than Alternative C but less than Alternative B.
Geochemistry	Acid rock drainage and metal loadings	Acid drainage will continue during operations. After closure, wet cover over tailings should minimize acid generation potential and could lead to reduced wastewater treatment requirements over long term.	Same as Alternative A for acid generation potential although a larger volume of source material. Metals loadings from fugitive dust emissions continue through 2031 with increased metals concentrations in downwind soils and plants.	Dry closure of waste rock and tailings impoundment would reduce flow volumes requiring treatment but acid generation expected over long term. Metals loadings to soils and plants from fugitive dust emissions along DMTS road greatly reduced.	Same as Alternative A for acid generation. Metals loadings from fugitive dust emissions along DMTS road reduced more than Alternative B, but less than alternatives A and C.
Geotechnical stability	Probability of failure	Risk of failure of tailings dam low. However, long-term concerns due to the level of the phreatic surface and dam design below proposed safety factor. ADNR will implement mitigation measures during final dam design to remedy concerns and ensure long-term stability. Stability of waste rock pile also ensured through permitting and ongoing oversight by ADNR.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.