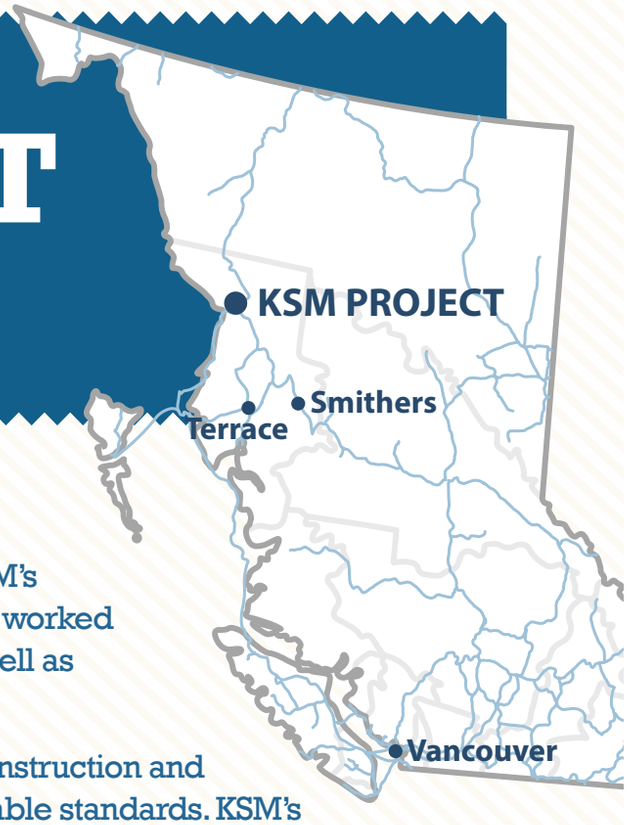
SEABRIDGE GOLD

KSM PROJECT

TAILINGS MANAGEMENT FACILITY

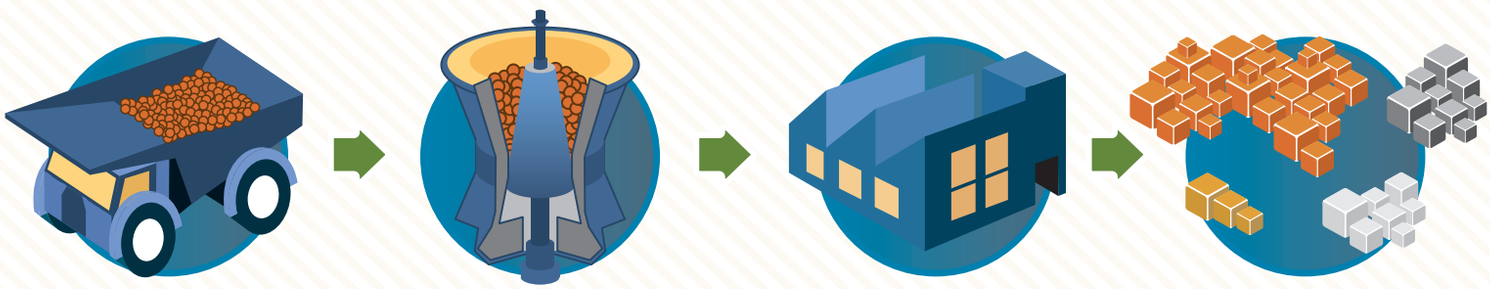
Engineered for Safety Through Long Term Responsible Operation and Reclamation



The KSM Project underwent a rigorous independent joint harmonized BC-CANADA Environmental Assessment over a seven-year period and received approvals in 2014. During KSM's permitting, planning and preliminary design, Seabridge Gold worked alongside Treaty and First Nations, community members as well as federal and provincial regulators, and continue to do so.

KSM Project's Tailings Management Facility's (TMF) design, construction and operation has been planned to meet the most rigorous applicable standards. KSM's TMF will be regulated and monitored in compliance with the Canadian Dam Safety Association (CDA), International Commission on Large Dams (ICOLD), International Council on Mining and Metals (ICMM), Mining Association of Canada (MAC), and Engineers and Geoscientists BC (EGBC), along with regular reviews by an eight-member Independent Geotechnical Review Board.

What Are Tailings?



Ore is transported from the mine operations to the mill by haul truck and a conveying system

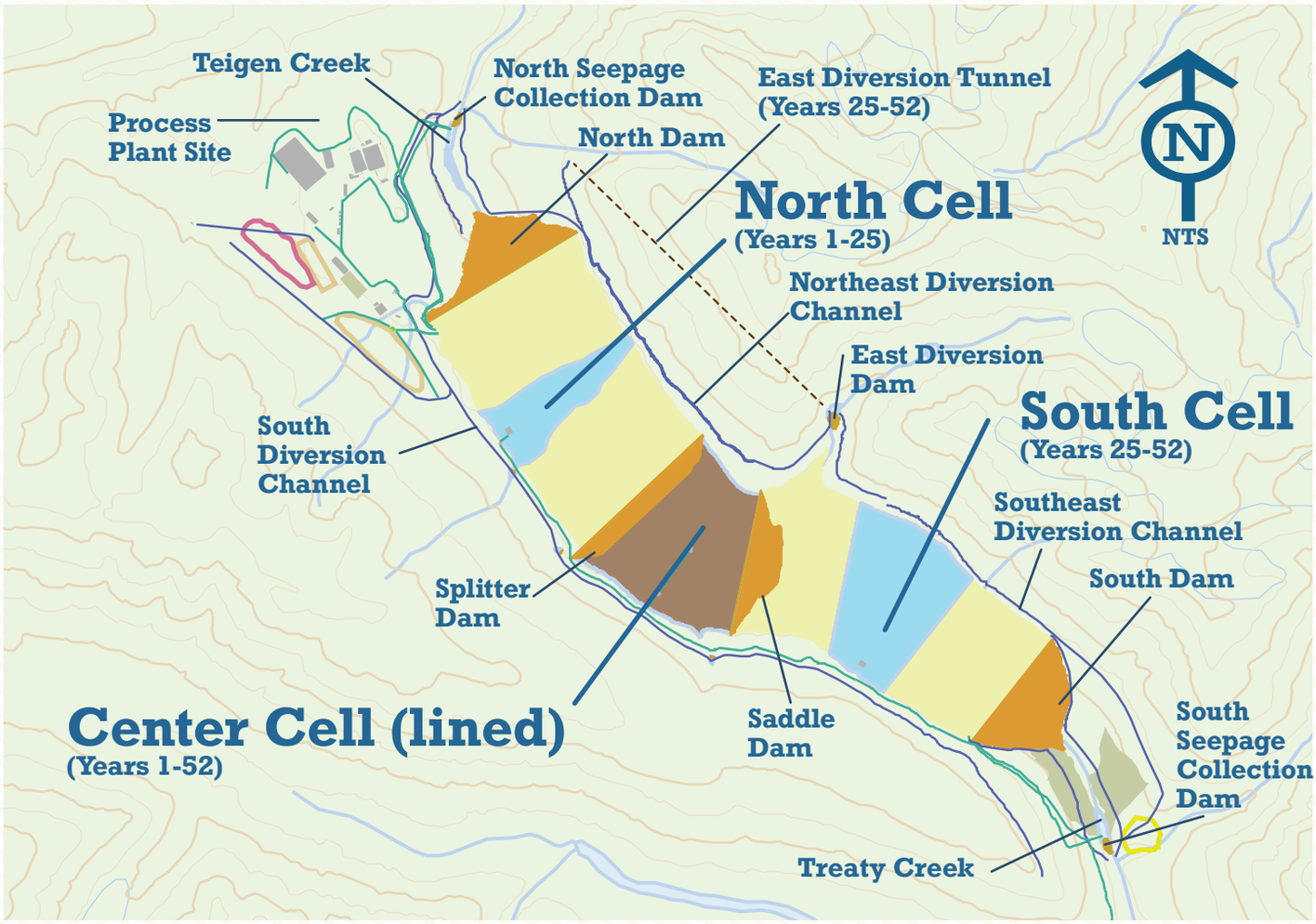
To break the ore into smaller pieces for processing it is fed through a crusher

Once it is crushed, the ore is transported by tunnel to the processing plant where the metals are extracted

The metal concentrates are then sent offsite where they are refined

The TMF is designed to work with the shape of the valley which provides natural containment. It is situated in the Canadian Nass River watershed which drains into Canadian waters. There will be comprehensive monitoring throughout the TMF to assist in water quality protection for the receiving environment.

Tailings are the leftover crushed rock and water from the ore processing. They are similar in composition to beach sand and are stored at the TMF.



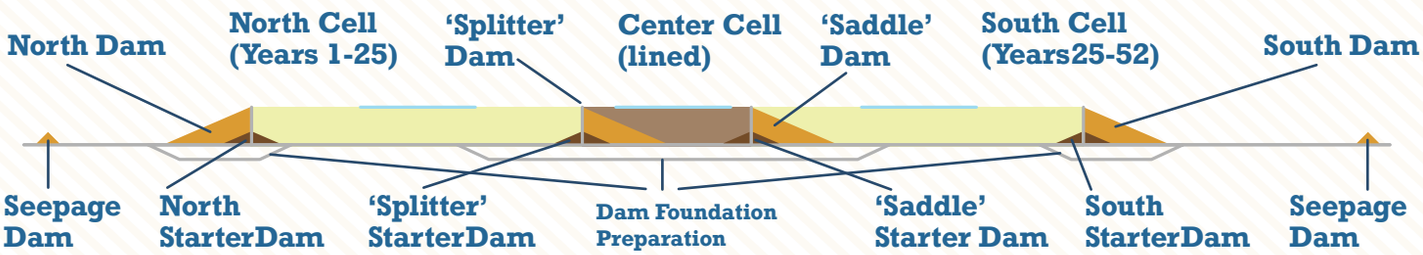
Key TMF Aspects:

- Permitted after an independent joint Canada / BC harmonized environmental assessment review and under the Canadian Metal and Diamond Mining Effluent Regulations, Schedule 2.
- Location selected after completing an extensive alternative assessment which examined 14 different sites. Chosen site minimizes long term environmental impacts and is the most secure site from operability and closure perspectives.
- Location intentionally selected at watershed divide to minimize catchment impact area.
- Tailings deposition and construction method selected after completing a Best Available Tailings Technology review.
- The centerline design method was developed in the mid 1960's to replace upstream dam design methods and provide increased stability.
- Precedence of centerline cyclone sand dams include: Copper Mountain, Gibraltar, Highland Valley Copper, Brenda, and Kemess South in British Columbia and numerous dams in high seismic areas such as Chile and Peru.

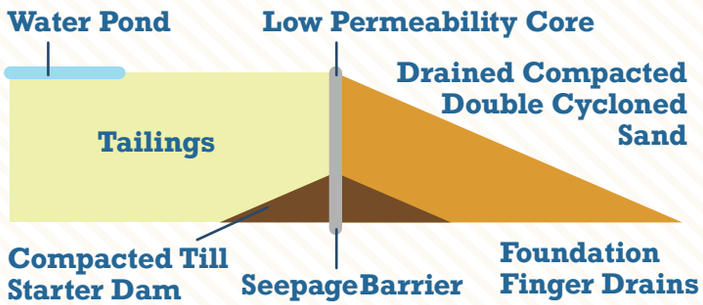
KSM Tailings Management Facility Dams

The design and operational method for KSM's TMF dams have been specifically engineered to be stable under all conditions, including earthquakes, and comply with the highest standards of static stability.

Section View of TMF



Centerline Cyclone Sand Dam



The underlying dam foundation conditions will be examined and designed to safely accommodate the expected load of these structures

Dam Dimensions

Dam	Starter Dam Height[1] (m)	Ultimate[2] Dam Height (m)	Ultimate Crest Length (km)
North Dam	80	218	1.9
Splitter Dam	61	194	1.9
Saddle Dam	35	168	1.6
Southeast Dam	101	239	1.4

1. Starter dam heights built prior to impoundment of tailings in adjacent cell.
2. Over mine life, average rate of rise for dams is 5.5 m/year.

Quick Facts

- Dams designed by a leading engineering firm, Klohn Crippen Berger, who are responsible for many safe operating cyclone sand dam designs in BC and internationally.
- The TMF is regularly reviewed by an independent 8-member review board comprised of world class experts in tailings management with more than 300 years combined experience. Reports available to public on KSM Website.
- An Engineer of Record will be retained for facility and annual dam safety inspections will be performed, when constructed.
- Comprehensive dam safety reviews, as mandated by the Provincial Government, by an independent third party every five years will be performed when constructed.
- Oversight is carried out by BC Ministry of Mines, independent of Seabridge Gold.

Dams built over the proposed 52-year mine life:

- Four cross-valley, centerline style cyclone sand dams within an 11 km portion of South Teigen and North Treaty Creeks.
- Centerline dams raised progressively to form a stable embankment while maintaining the original starter dam centerlines.
- Controlled placement of compacted fill provide full structural support for stability to downstream sections.

KSM Tailings Management Facility Key Features

Every stage of the construction, operation and closure of the TMF is designed with safety and minimizing environmental impact as the top priorities.

Construction and operation will occur in stages. This approach will minimize surface disturbance and potential environmental impacts.

- Meets or exceeds CDA (2014) and Ministry of Mines (HSRC for Mines in British Columbia, 2017) requirements.
- Foundation investigation followed EGBC Guidelines for Site Characterization for Dam Foundations in BC (2016).
- Extreme flood storage management design exceeds regulatory requirements by 100%
- Seepage controlled by low permeability materials and 90% of tailings will be sand and classified as non-potentially acid generating material.
- 10% of tailings will be potentially acid generating material. They will be deposited in the lined center cell, stored underwater and isolated from the natural environment and the rest of the TMF to mitigate acid generation.
- Seepage is collected by seepage dams and recycled to TMF.
- Course angular sand on downstream shell has high strength and drains well. The system includes underdrains to maintain a drained shell, that is critical for dam stability.
- Annual discharge of water into nearby receiving water courses will meet government regulated water discharge criteria.
- Instrumentation will be installed to monitor performance from initial construction through to post-closure (settlement, pore pressure, seepage flow, water quality).

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Closure & Post Closure

Closure of the TMF will include:

- Stability in closure managed physically and geochemically by maintaining water cover over potentially acid-generating waste.
- At closure valley walls comprise 85% of the facility perimeter.
- Armouring the downstream dam slopes with rockfill, to mitigate slope erosion.
- Vegetating the tailings beaches to provide surface stability and resist erosion.
- Excavating spillways in the stable rock abutments at both ends of the facility, to prevent overtopping the dam structures.
- Storage of a minimal amount of water (the excess will flow out through the spillways).
- Long-term physical and geochemical monitoring.
- Reviews of statistics of the closure success will continue on a regular basis by the Independent Geotechnical Review Board. Reviews will continue until local Indigenous peoples are satisfied that "project closure has been achieved" and their concerns have been addressed.

KSM's dams are engineered to be much stronger than required for the intended load as demonstrated below (Factors of Safety). Additionally, they are designed to withstand Magnitude M8 (Queen Charlotte Fault) and M6 local fault as shown in the table.

Loading Condition	Design Standard	Minimum CDA Required FoS	Calculated FoS[1]
Static Loading	2D Limit-Equilibrium (LE) with operating pore pressures	1.5 - for operating and closure conditions	Greater than 1.7
Seismic Loading[2]	2D LE with residual shear strength for contractant soils and tailings	1.2 - assuming liquefaction of un-compacted tailings	Greater than 1.2

1. Factor of Safety expresses how much stronger a system is than it needs to be for an intended load.