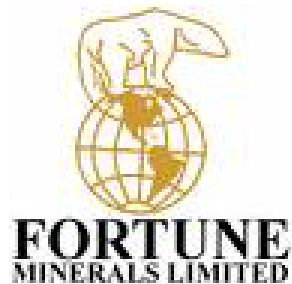

Fortune Minerals – NICO Project

Water Quality Operations



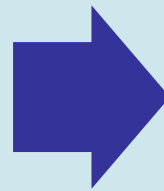


Importance of Water Quality



Water quality has an important ecological and human health value

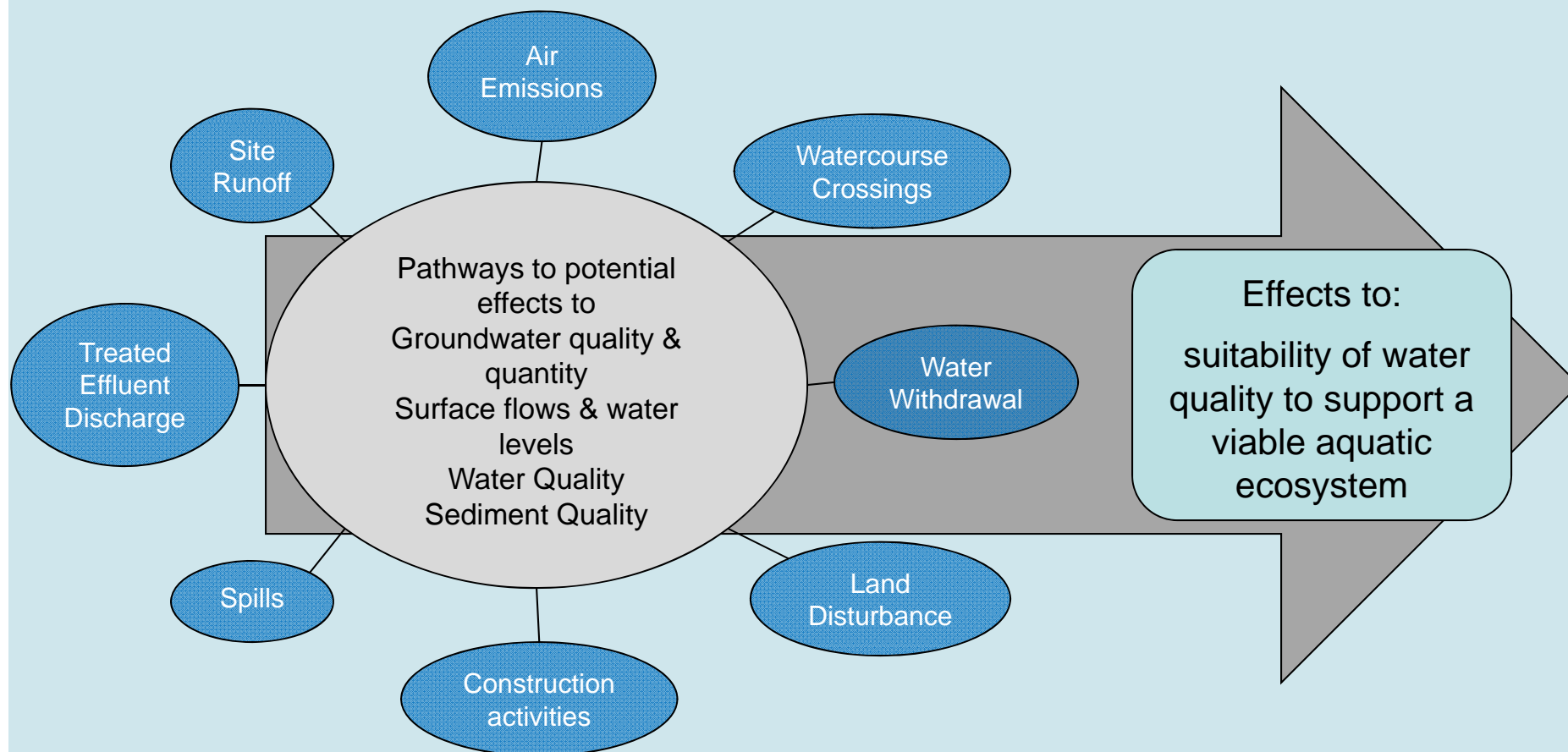
**Change to
water quality**



**May affect fish,
wildlife, and
human health**

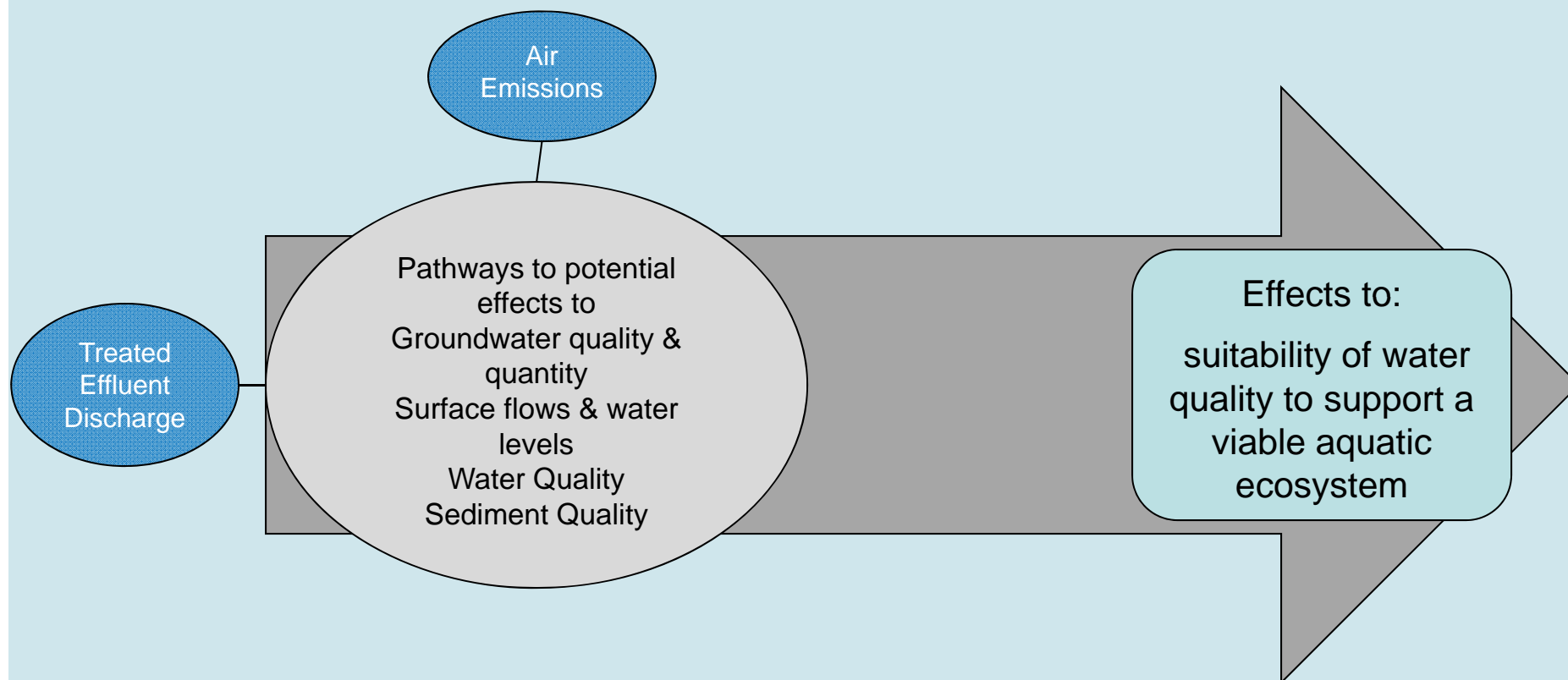


Approach to WQ Effects Analysis





Approach to WQ Effects Analysis



Proposed Project Location



- The Burke Lake watershed represents ~0.4% of Marian River watershed that flows into Great Slave Lake.
- Along the Marian River, the NICO Project is approximately 56 km from Marian Lake

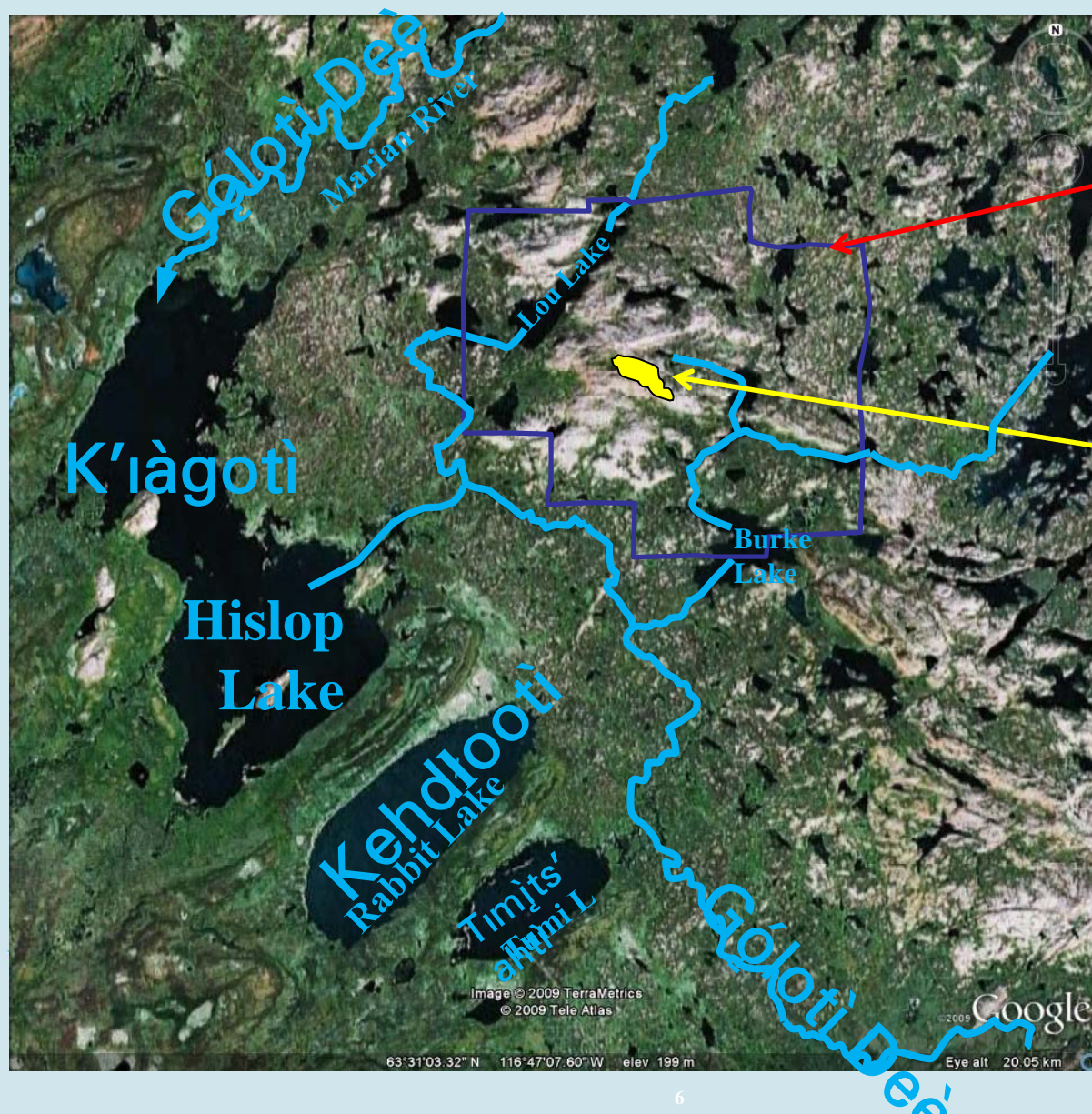
LEGEND

- LOCAL STUDY AREA WATERCOURSE
- REGIONAL STUDY AREA WATERCOURSE
- LOCAL STUDY AREA WATERBODY
- REGIONAL STUDY AREA WATERBODY





Water Flow



NICO Property Boundary

Proposed Mine Pit





Water Quality – Baseline Conditions



- Water quality in lakes and ponds in the upper Burke Lake watershed is strongly influenced by existing exposed rocks
- Concentrations of salts and metals are higher in the Grid Ponds, Nico and Peanut lakes compared to Burke Lake and Marian River
- These substances naturally get reduced from the Grid Ponds (i.e., natural wetlands) to Burke Lake
- Lakes outside of the Burke Lake watershed, such as Lou Lake and Reference Lake, are not influenced by the existing exposed rock
- Some metals are present in concentrations above guidelines throughout the local study area



Water Quality – Existing Condition



Notable metals with concentrations that commonly exceed CCME fresh water guidelines for protection of aquatic life

Total Metal	Grid Pond	Little Grid Pond	Nico Lake	Peanut Lake	Burke Lake	Marian River	Lou Lake	Reference Lake
Aluminum				✓				
Arsenic	✓	✓	✓					
Copper	✓	✓						
Iron	✓	✓	✓	✓	✓	✓		

✓ = greater than 50% guideline exceedances during open water or under ice sampling



Sediment Quality – Existing Conditions



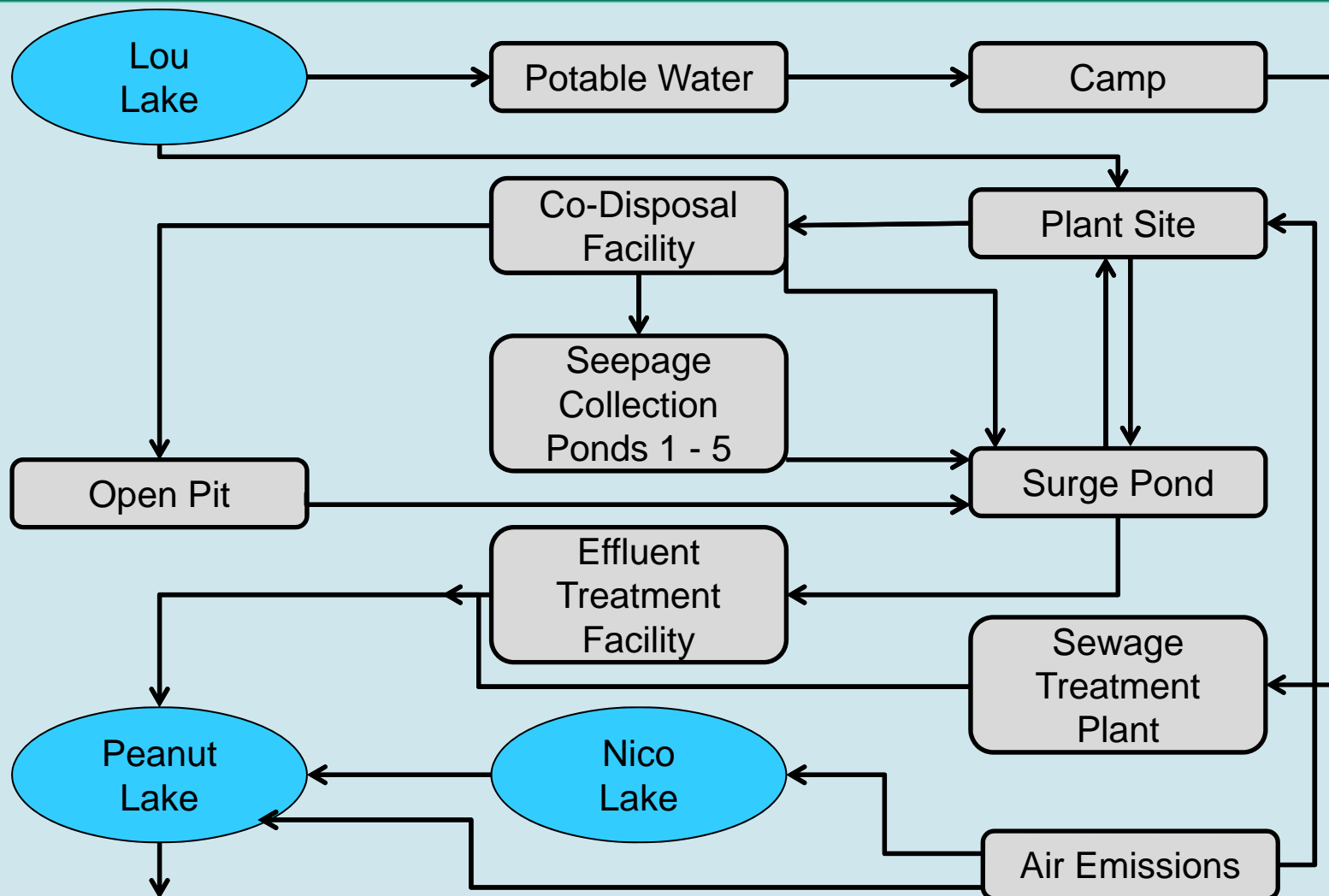
Notable metals with concentrations that commonly exceed CCME sediment quality guidelines

Total Metal	Little Grid Pond	Grid Pond	Nico Lake	Peanut Lake	Burke Lake	Marian River	Lou Lake	Reference Lake
Arsenic	✓	✓	✓	✓	✓		*	*
Chromium			*	*	*		*	*
Copper	✓	✓	*	*	*		*	*
Zinc	*	*	*	*	*			

✓ = Exceeds PEL * = Exceeds ISQG



WQ Model Components – Operations





Assessment Findings – Operations



Project Air Emissions

- Limited spatial and temporal extent of air emissions expected
 - Assessment very conservative
 - Active dust mitigation on site is planned
- Lake acidification is not expected
- Low risk predicted to aquatic life
- Once operations completed all emissions sources cease



Assessment Findings – Operations



Treated Effluent and SCP Discharge

- Seepage from the SCP Nos. 1, 2, and 3 to Nico Lake expected to be small
 - The water collected in SCPs will be recycled to the process plant
 - Any seepage from SCPs will drain through wetlands to Nico Lake
- Treated effluent discharge from the ETF expected to meet SSWQOs at the outlet of Peanut Lake
- Water chemistry will improve as water moves towards Marian River
- The water quality in Marian River is expected to be similar to baseline conditions
- Local communities can continue to use the Marian River resources as they have traditionally



Aquatic Health – Assessment Methods



Predicted effects to aquatic health evaluated through two exposure pathways:

- Direct Exposure

- Contact or uptake across the body surface
 - For example, wildlife drinking the water or a fish living in water
- Predicted WQ concentrations compared to benchmarks

- Indirect Effects

- Ingestion and bioaccumulation into the body tissue
 - For example, a bird eating fish that have been exposed to the water
- Predicted tissue concentrations compared to benchmarks



Site-specific Water Quality Objectives



- SSWQOs are
 - developed for those parameters that are expected to exceed Canadian Water Quality Guidelines or baseline concentrations
 - designed to be protective of the aquatic life that is present in the local water bodies, taking into account local water quality conditions
 - not effluent quality criteria
- Negligible risks are predicted to aquatic life, wildlife, or human receptors in the receiving waters and downstream
 - Chemicals of potential concern from the operation are projected to be below SSWQOs



Assessment Summary – Operations



- ❖ **Project expected to result in negligible adverse effects from deposition of air emissions or discharges of seepage or treated effluent**
- ❖ **Project expected to result in negligible, or negligible to low potential adverse effects to aquatic, wildlife, and human health to the Burke Lake watershed and the Marian River**
- ❖ **Changes to people's opportunity for traditional use of the Marian River from the NICO Project will be negligible**