Whitehorse Power Centres

With thanks and gratitude

Yukon Energy recognizes that this project takes place on the Traditional Territories of the Kwanlin Dün First Nation and the Ta’an Kwäch'än Council.

Today's discussion

- Introductions
- Background
- What is being proposed and why we need it now
- Short-listed site locations
- Air and sound considerations
- Q&A

Feedback

- Wait for the Q&A at the end of the meeting
- Email: yec.wpc@stantec.com
- Feedback collected until **March 13, 2026**
- YESAB process

Introductions

Yukon Energy

- Joe MacGillivray
  President & CEO
- Michael Muller
  Vice President, Planning, Environment, Health & Safety
- Tom Buzzell
  Director, Partnerships
- Amy McClintock
  Manager, Resource Planning
- Lisa Wiklund
  Manager, Community Relations
- Tim Hogan
  Contractor, Project Management Support
- Art Küpper
  Contractor, Acoustical Services Support

Stantec

ENGAGEMENT SUPPORT

- Zoë Morrison
- Lesley Cabott

Background

Who we are

yukon energy

Based on a 25-year average, over 90% of the electricity we generate is renewable.

- A publicly-owned electrical utility, established in 1987
- Operating as a business, arm's length from the Yukon government
- Generating, transmitting, and distributing electricity across the Yukon

The Yukon's electricity system

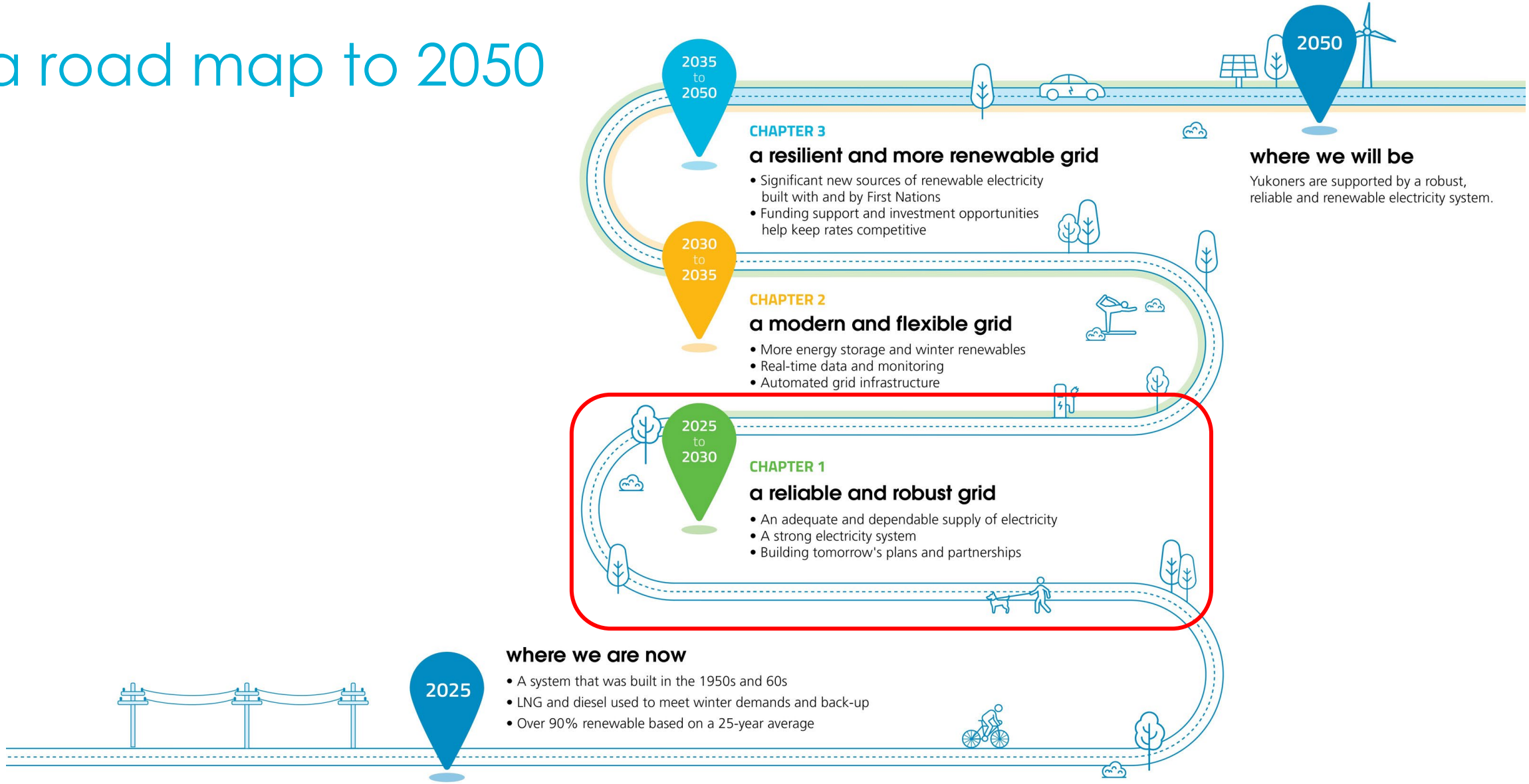
- Islanded grid
- Aging infrastructure
- Transmitting hydro
- Thermal near communities
- Winter demand over twice summer
- Use thermal resources to meet peak

What are thermal resources?

When we say thermal, we mean LNG and diesel, or fossil fuel-based electricity generation.

Our vision for the future

a road map to 2050



What is being proposed

Whitehorse Power Centres

- Build two new diesel power centres
- Build one new substation
- Transmission and distribution infrastructure to connect to the grid

Planning ahead. Assessing more. Building as needed.

Project phases

Phase 1

Build Power Centre 1

Construct 15 MW power centre.

EXPECTED IN-SERVICE DATE
2027/2028

Phase 2

Build Power Centre 2

Construct 30 MW power centre.

Construct substation and transmission infrastructure.

Add incremental capacity to Power Centre 1 to meet load growth in the Whitehorse area while Power Centre 2 is being built.

EXPECTED IN-SERVICE DATE
2030

Phase 3

Expand Power Centres

Add incremental capacity to both power centres as needed (up to 60 MW in south and 90 MW in north).

Construct high voltage transmission lines.

EXPECTED IN-SERVICE DATE
2035

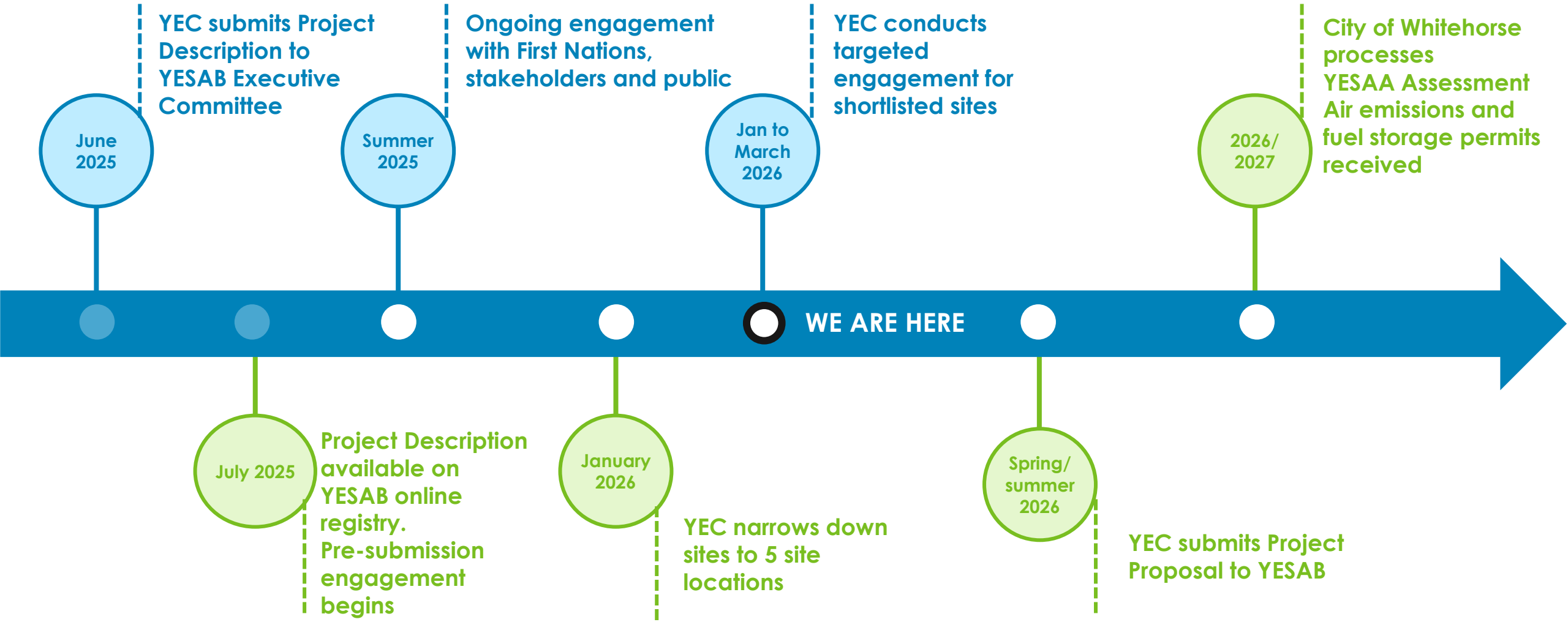
Yukon Environmental and Socio-economic Assessment Act (YESAA) Process

- Executive Committee screening
  - Fossil-fuel generating stations > 5 MW
  - High voltage transmission lines
- Project Description (submitted June 2025)
  - Pre-Submission Engagement underway
- Project Proposal (to be submitted summer 2026)
- Public will have opportunity to engage through assessment process

City of Whitehorse
Process

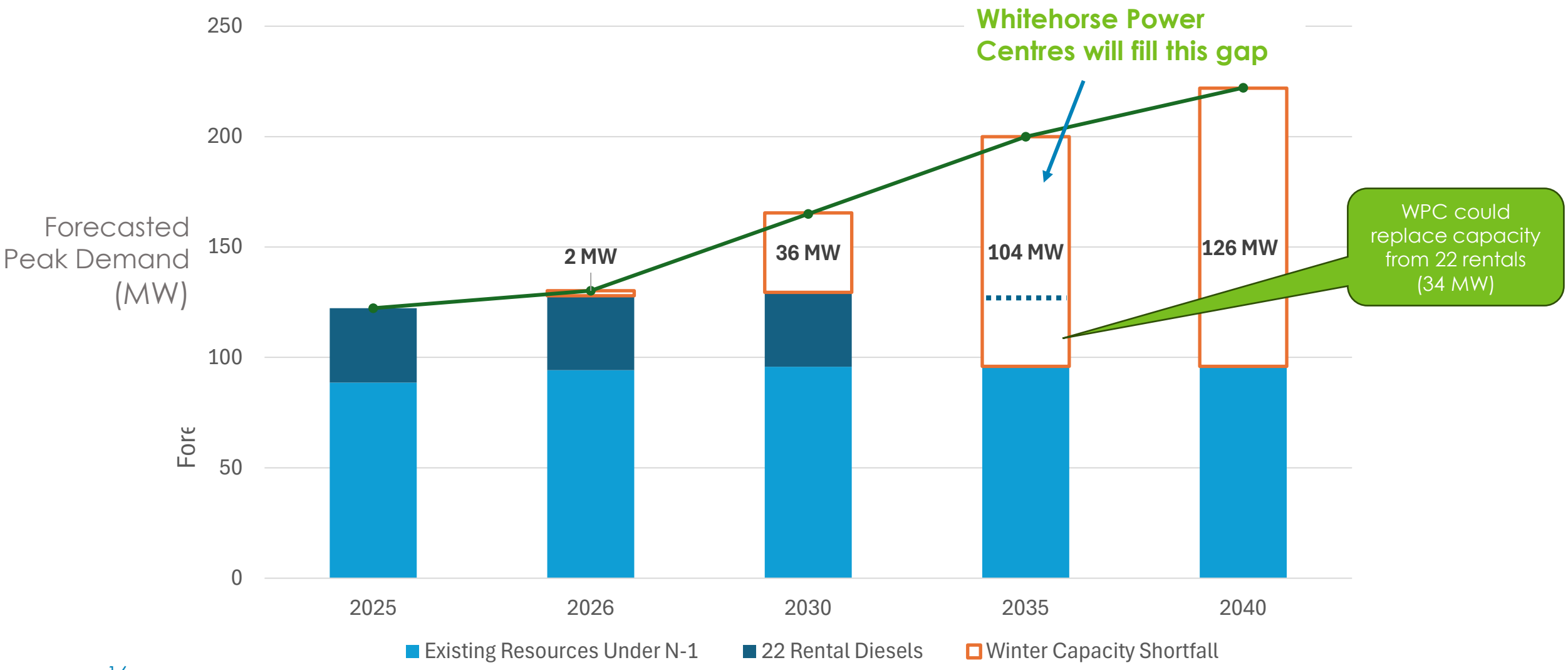
- Master Planning
  - Power centre in city limits require approved Master Plan
  - Requirement waived for Substation
  - All short-listed sites within City limits are in areas zoned for heavy industrial or future planning
- OCP and Zoning Amendments
  - Generation sites will require OCP and zoning amendment to Public Utility
  - Substation will not require OCP amendment but will require a zoning amendment

Overall schedule



Why we need it now

Capacity Gap Projections (to 2040)



Short-listed site locations

Why one north site and one south site?

- Locate generation near load growth
- Reduce large contingency risk
- Lower air quality impacts
- Supports load from multiple transmission lines and allows for new connections
- Flexibility to allow for maintenance

Site evaluation criteria

Technical

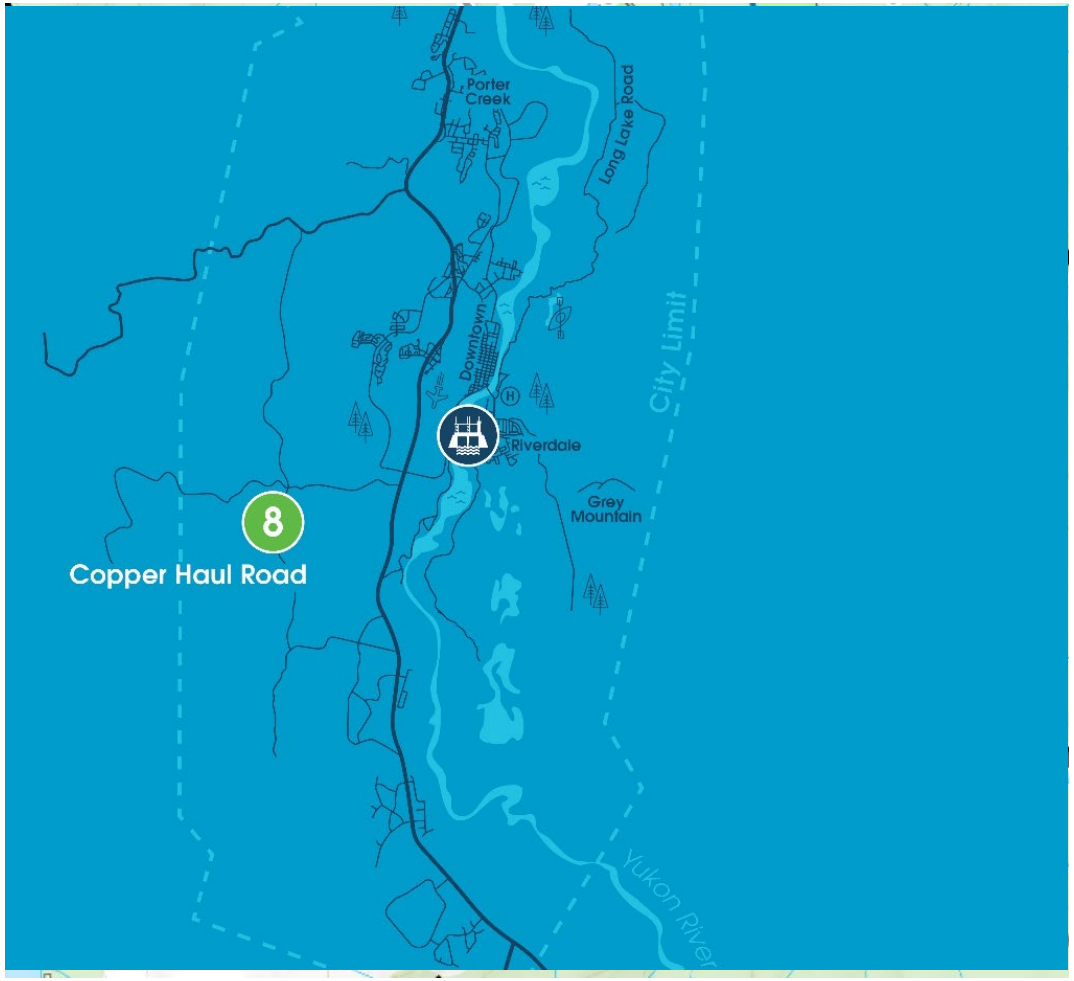
- **Proximity** to existing infrastructure; electrical demand
- Added **reliability** to the system
- **Size** of the site for operation
- **Accessibility** from major roads
- **Cost** to build the project

Socio-Economic

- **Impacts** to the environment and sensitive receptors
- Existing **planning and zoning**
- **Land ownership**
- **Feedback** from First Nations governments, Yukon Government, and public
- Preexisting **site conditions** (brownfield site)

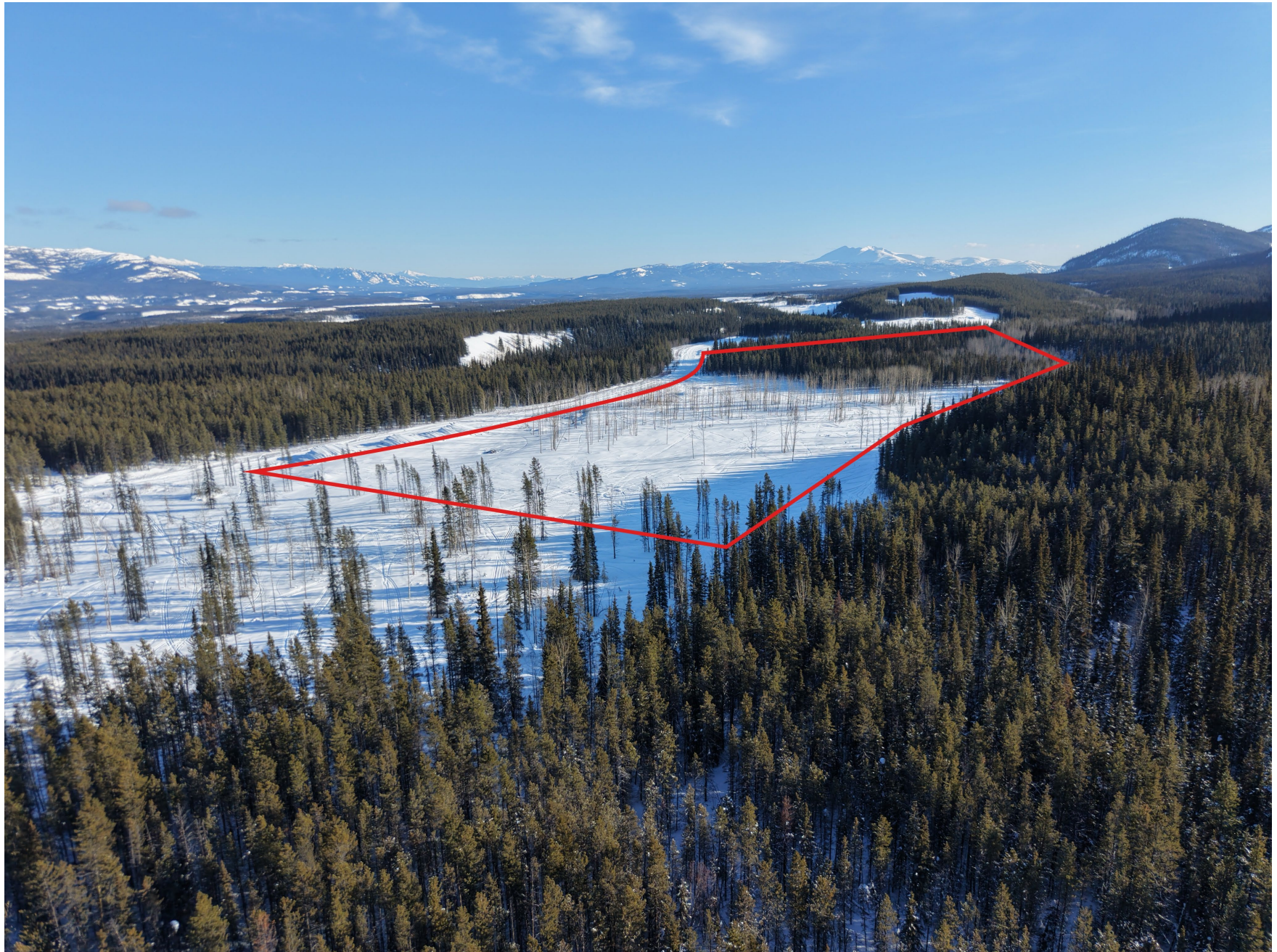
Copper Haul Road
Overview

South Site



OWNER	Yukon Government
CURRENT USE	Undeveloped (Greenfield site)
LOCATION NOTES	• Beside industrial area and near gravel pits • Outside of the OCP Urban Containment Boundary

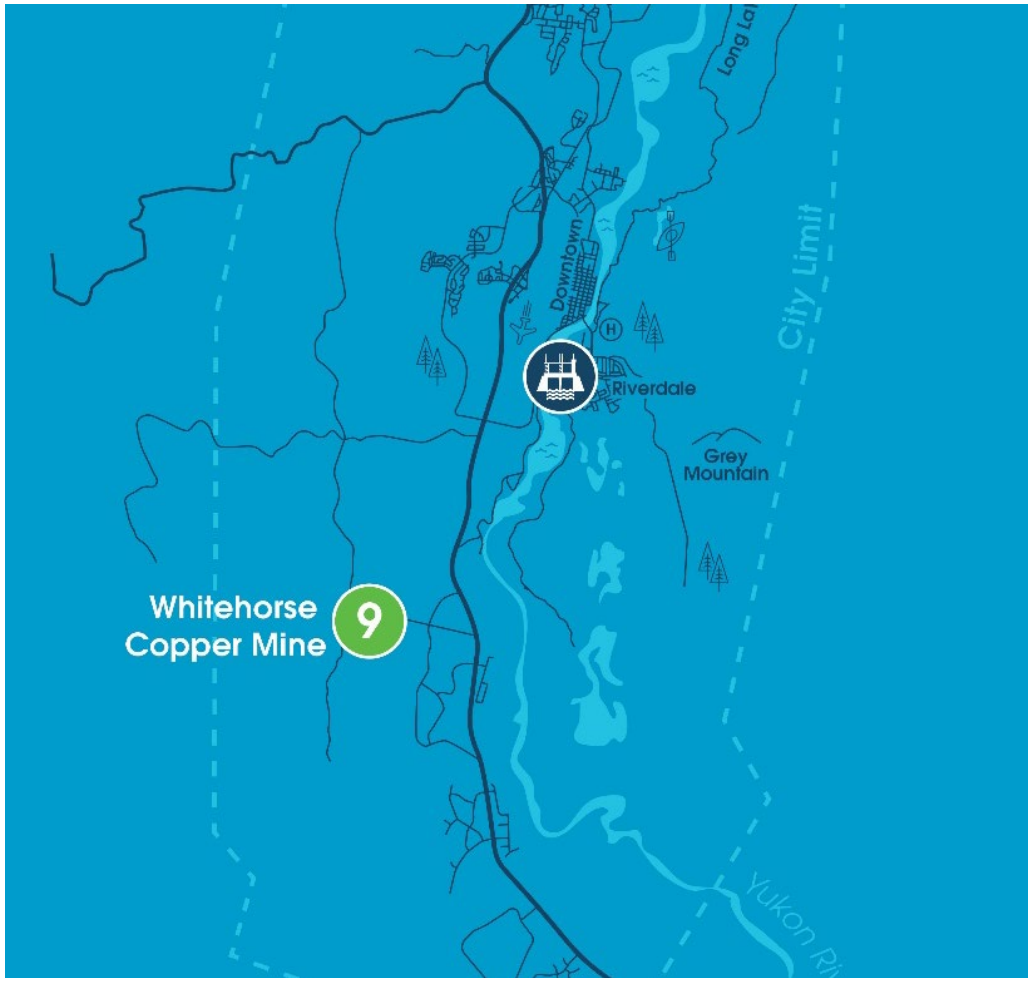
Distance to nearest residence	**~2,400 m**



Whitehorse Copper Mine

Overview

South Site



OWNER	Yukon Government
CURRENT USE	Undeveloped (Greenfield site)
LOCATION NOTES	• Located outside of the OCP Urban Containment Boundary • Surrounded by industrial, resource extraction, and historical mining uses. • Compatible with surrounding industrial and quarry activities allowed under the current Industrial OCP Land Use Designation. • Existing access road

Distance to nearest residence	**~1,400 m**

KM 232 North Klondike Highway

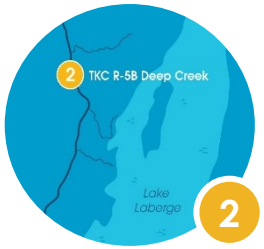
Overview

North site

OWNER	Yukon government
CURRENT USE	Greenfield site
LOCATION NOTES	• Outside of City limits • Next to high voltage power line right-of-way • Within Deep Creek Community Planning area

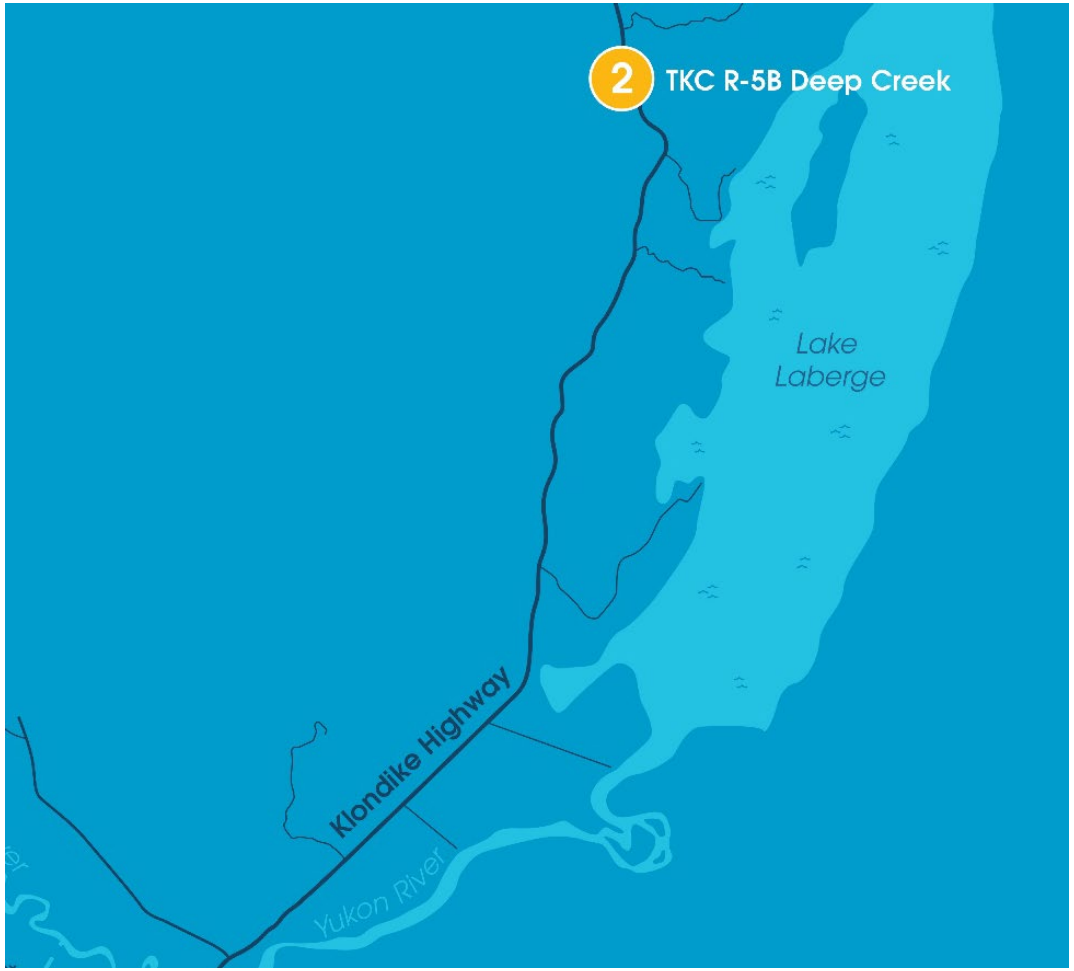
Distance to nearest residence	**~2,000 m**


Klondike Hwy
2



TKC Deep Creek
Overview

North site



OWNER	Ta'an Kwäch'än Council
CURRENT USE	Abandoned gravel pit
LOCATION NOTES	• Land parcel TKC R-5B • Klondike Highway km 227 • Outside of City limits • Next to high voltage power line right-of-way • Site partially cleared • Within Fox Lake Local Area Plan

Distance to nearest residence	**~2,000 m**

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Substation Site

Long Lake Road

Overview

OWNER	Yukon government
CURRENT USE	Beside abandoned sewage lagoon
LOCATION NOTES	• KDFN settlement land to the east • Adjacent to two existing transmission lines


KDRN C-116B

Engagement to date

Landowners

- Ongoing engagement with:
  - Ta'an Kwäch'än Council
  - Kwanlin Dün First Nation
  - Government of Yukon
  - City of Whitehorse

Stakeholders

- Phase 1 – meetings with groups like the Yukon Fish and Wildlife Management Board and Yukon University Northern Energy Innovation Hub
- Phase 2 – follow-up meetings

Public

- Phase 1 – open houses, mailer, online form, email, website
- Phase 2 – open houses, mailer, online form, email, website

What We Heard Report

What We Heard

- Air quality
- Noise
- Need for renewables

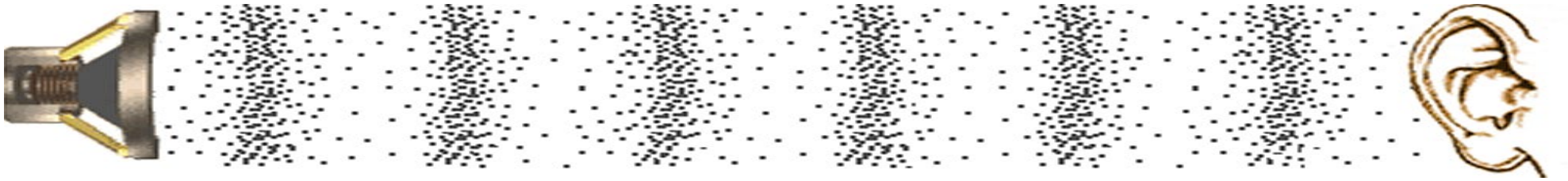
Air Quality

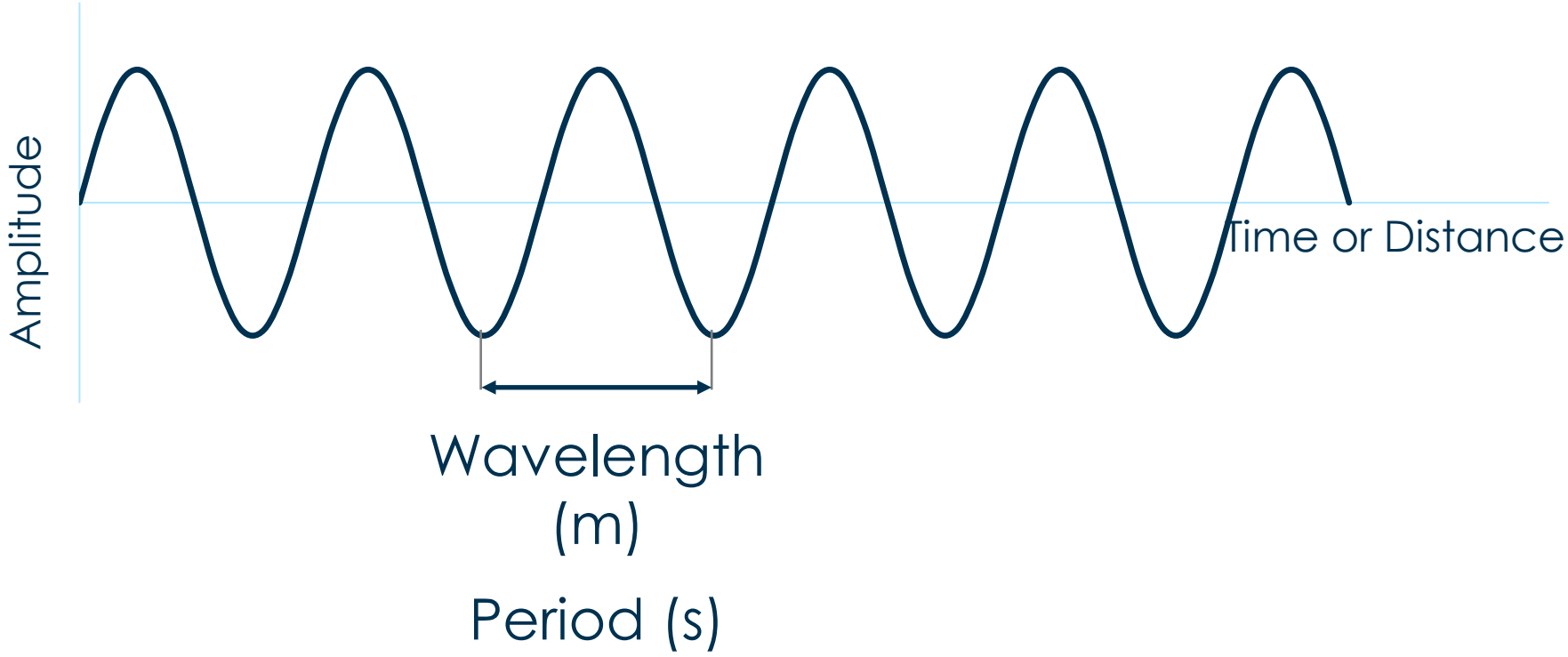
- Initial desktop studies completed for site feasibility
- Modelling underway, results included in Project Proposal to YESAB
- Will consider:
    - Worst case scenario – all units running 24hrs/day
    - Distance between potential site and receptor
    - Prevailing wind path direction

Sound Considerations

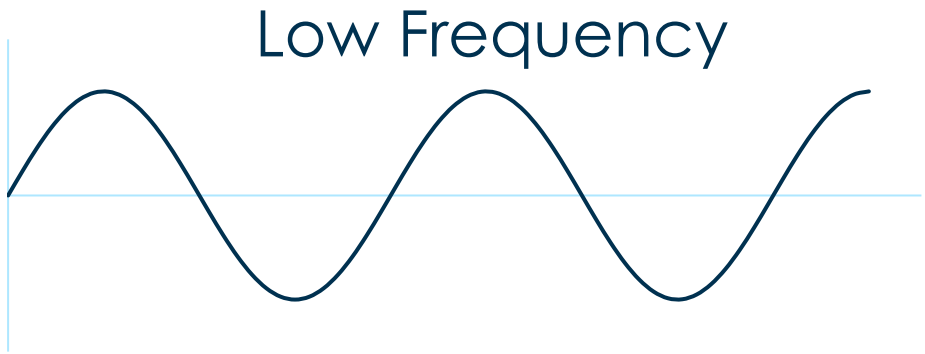
What is Sound?

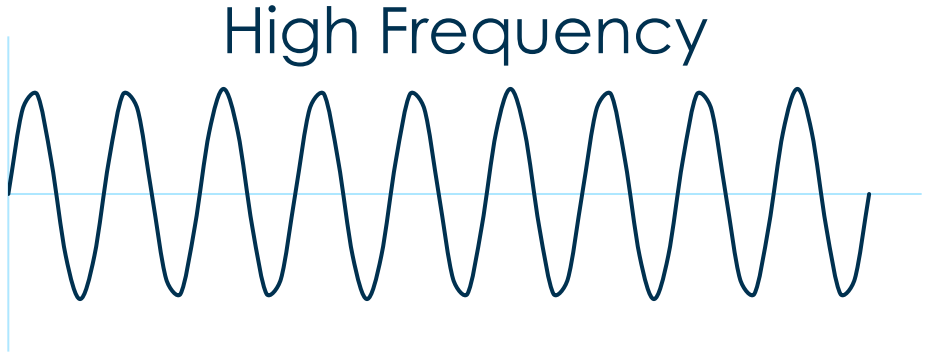
Sound is a series of pressure waves





What is Sound?





Octave Bands

Low		Mid					High	
31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz

VERY LOUD	
110	Concerts of any genre, car horns, sporting events
100	Snowmobiles, earbuds/ mobile devices at full volume
90	Lawnmowers, power tools
LOUD	
80	Alarm clock
70	Traffic, vacuum
MODERATE	
60	Normal conversation, dishwasher
50	Moderate rainfall
SOFT	
40	Quiet library
30	Whisper

Source: American Academy of Audiology

Sound Level References:

Examples of Ambient Sound Levels:

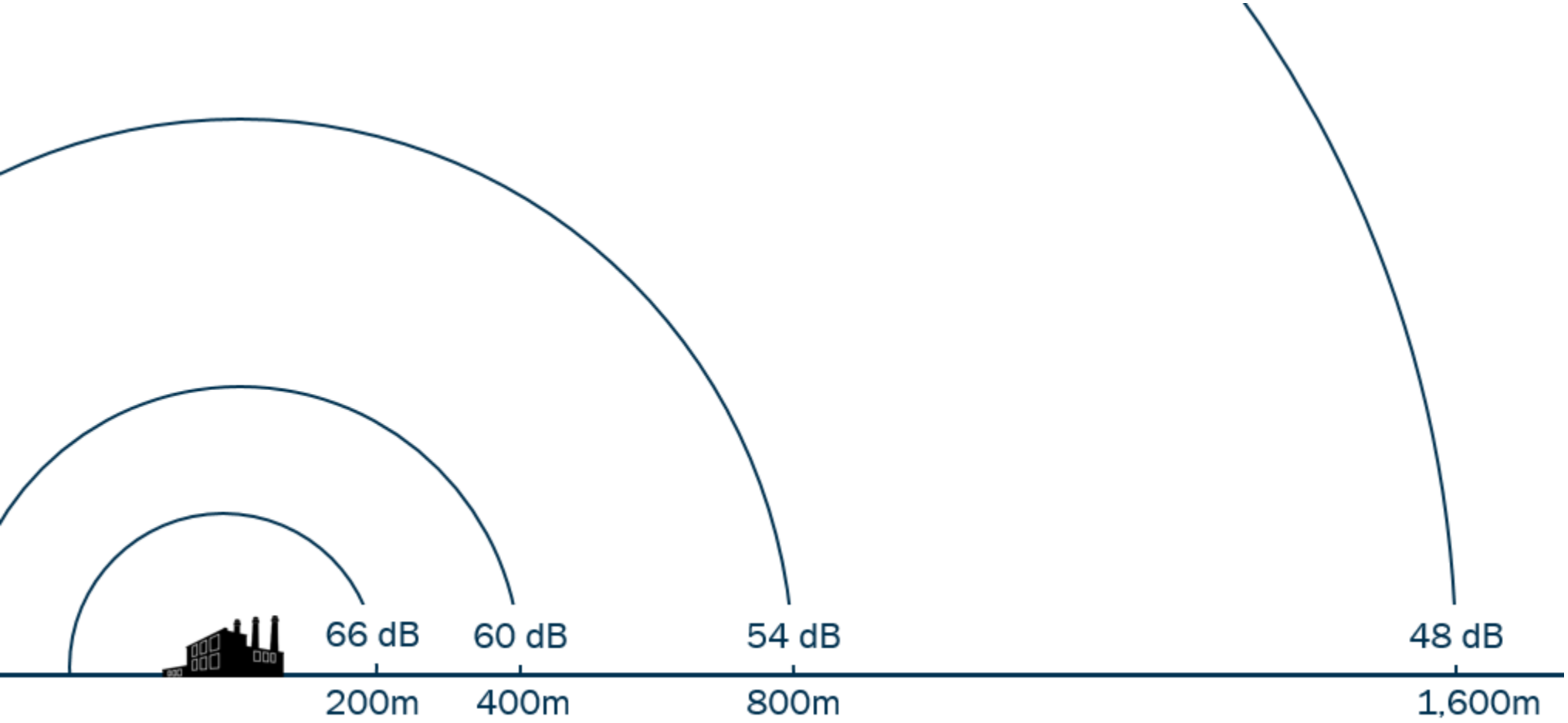
Location Description	Sound Level (dBA)	
	Daytime	Nighttime
Rural Area	35 - 45	29 - 37
Suburban Residential at City Outskirts	42 - 58	35 - 45
Urban Residential	48 - 59	45 - 57

Loudness Perception:

- +/- 3 dB barely perceptible
- +/- 5 dB clear & noticeable change
- +/- 10 dB twice or half as loud

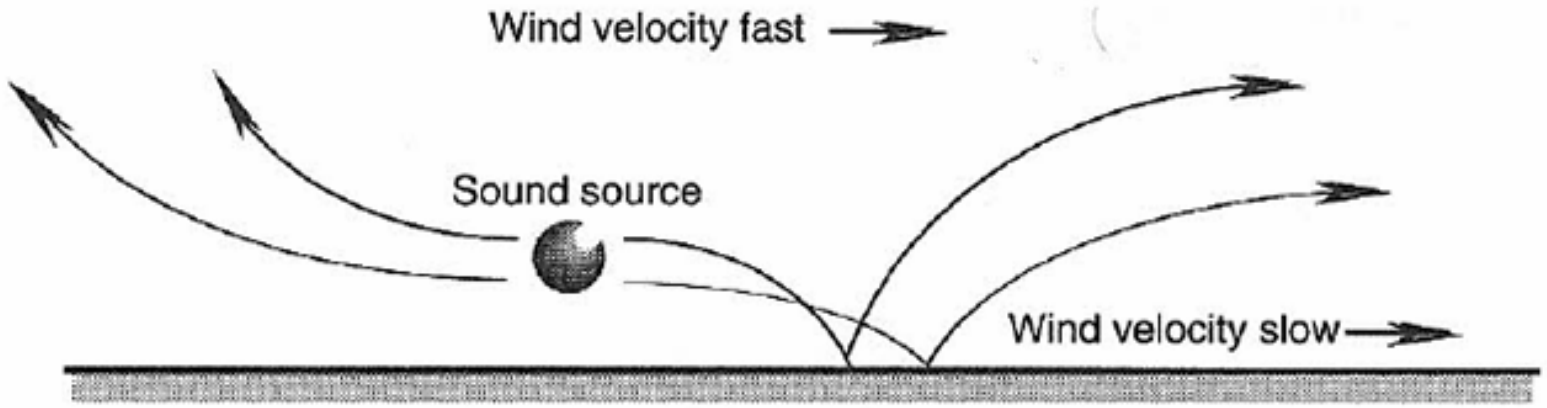
Factors Influencing Sound Propagation:

Geometric Spreading: 6 dB loss per doubling of distance



Factors Influencing Sound Propagation:

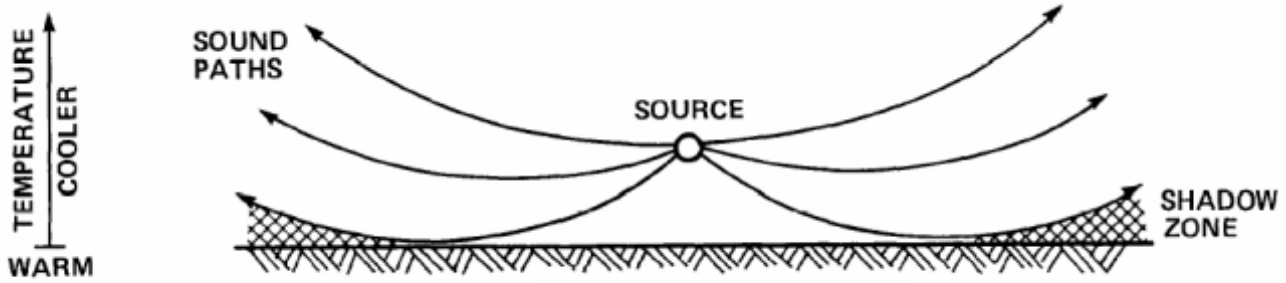
Wind Direction & Speed



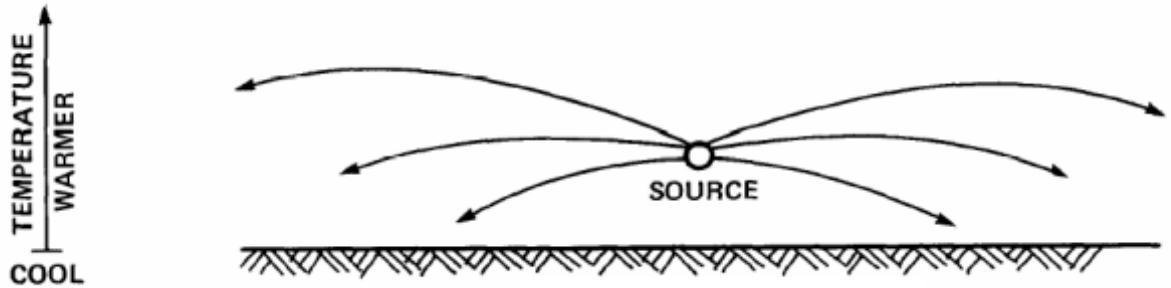
https://www.softdb.com/blog/effect-of-wind-and-temperature-gradients-on-sound-waves/

Factors Influencing Sound Propagation:

Temperature Gradient



Regular Condition



Inversion Condition

Hannah, L. (2007). Wind and temperature effects on sound propagation, New Zealand Acoustics. 20;2.

Factors Influencing Sound Propagation:

Ground Condition (ground absorption)

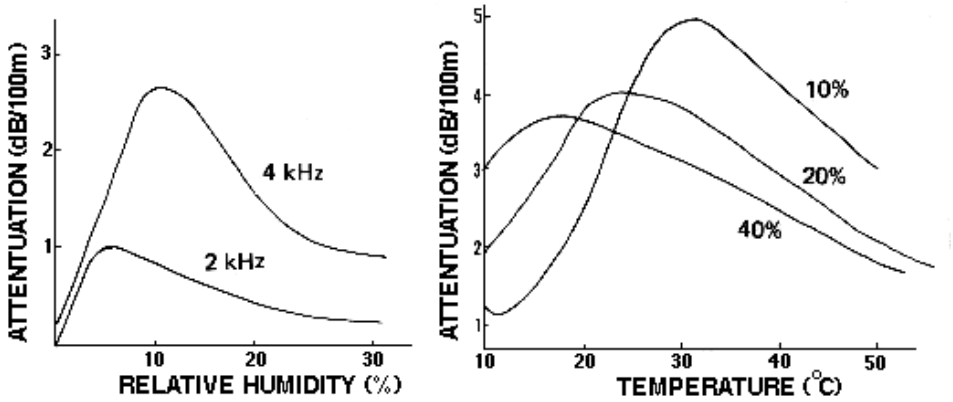
- Fresh snow is acoustically absorptive (G = 1)
- Transitions to reflective as an ice crust forms (G = 0.1)
- Vegetation is typically absorptive (G = 0.7)
- Bare ground (G = 0.3)
- Hard Ground (G = 0)

Foliage

- Large stands of trees can act as barriers
- Wind through the leaves can cause noise masking

Temperature and Humidity (air absorption)

- Complicated, dependent on frequency



Sound considerations
Site Selection

- Copper Mine site is approximately **1 km** away from nearest residences.
- Copper Haul Rd site, and both North sites are approximately **2 km** away from nearest residences
- For reference, the generators at the Whitehorse Rapids Generating Station are approximately **200 m** away from Riverdale Residents.

Sound considerations
Modelled scenario

Full build-out: 60/90 MW

- all new units with built-in sound mitigation
- 60 MW at South Sites
- 90 MW at North Sites

Sound considerations
Potential Generator Units

New unit with built-in sound mitigation

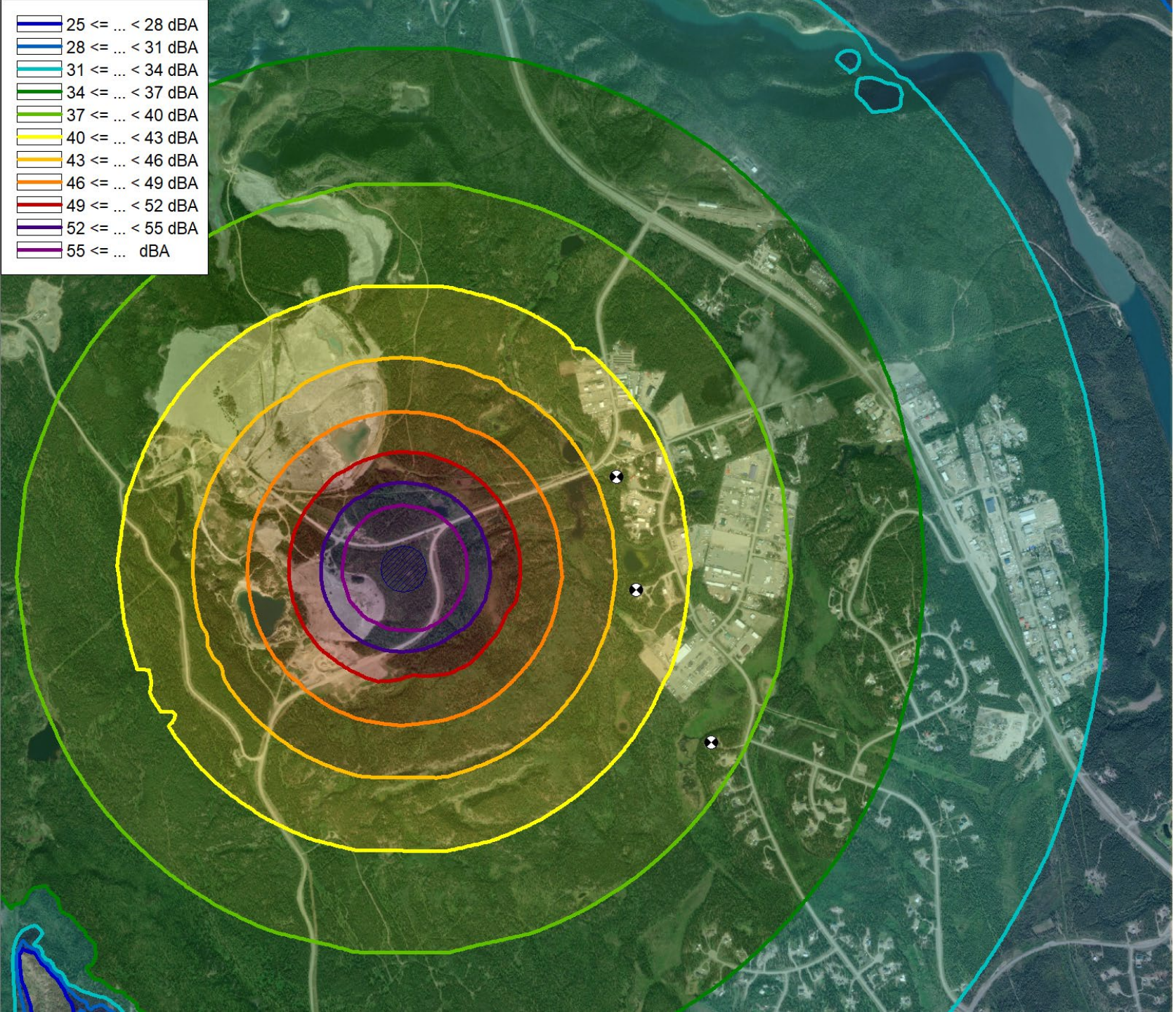
Sound considerations
Potential Generator Units

Mobile units –

could be used
in the short-term

Sound considerations
Noise Criteria

- There are no directly applicable noise criteria for the Yukon
- YEC will compare the noise to the British Columbia Energy Regulator (BCER) Noise Control Best Practices Guideline
- BCER sets Permissible Sound Levels (PSLs) for daytime and nighttime periods at residential receptors
- Typically for this project, nighttime **PSL = 40 dBA**



South Site

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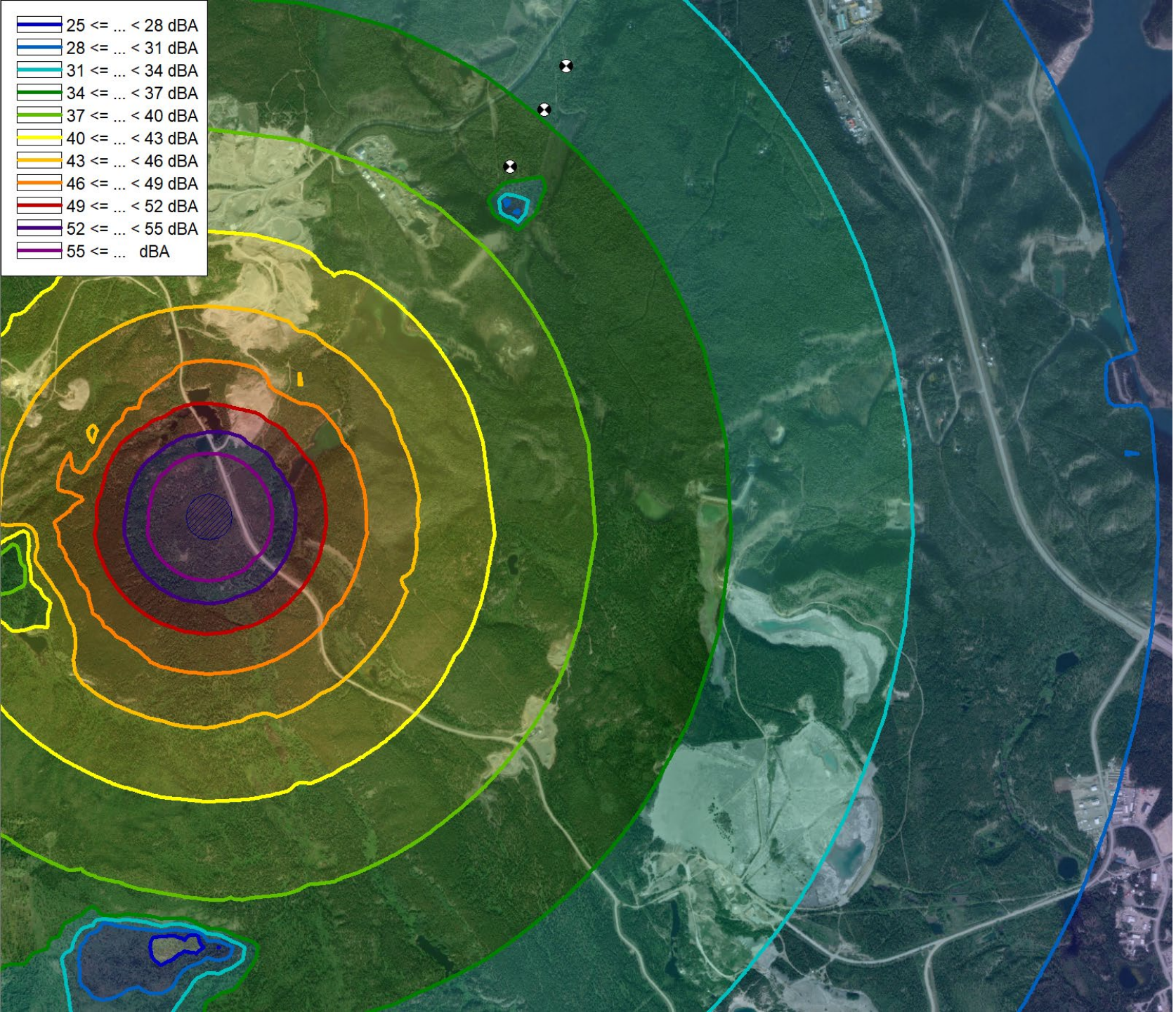
Whitehorse Copper Mine

Fully Built Facility Sound Levels



South Site

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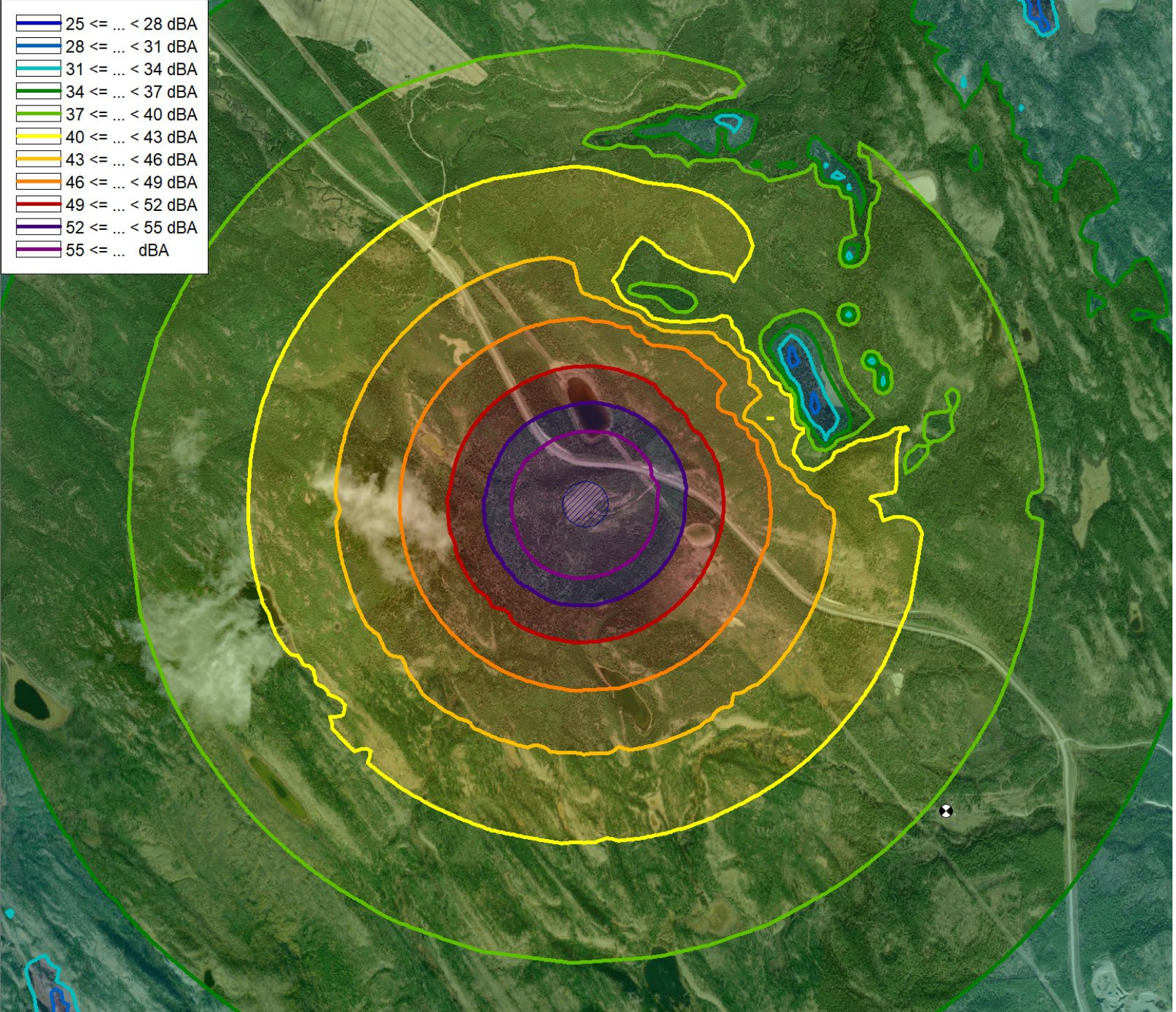
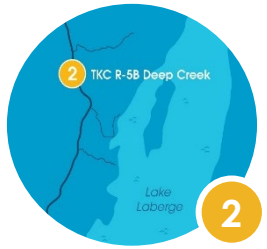
Copper Haul Road

Fully Built Facility Sound Levels





North site

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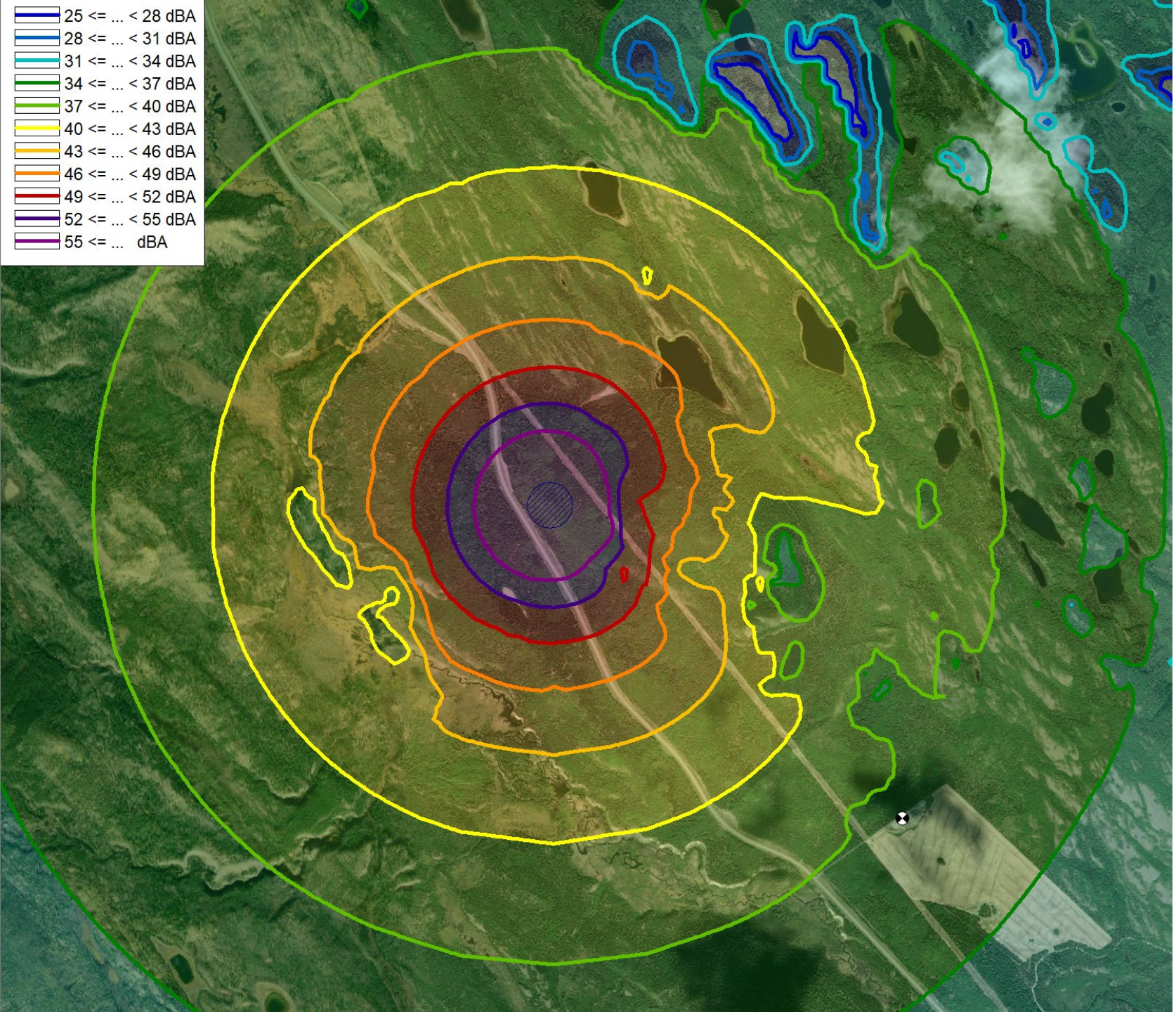
TKC Deep Creek

Fully Built Facility Sound Levels



North site

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KM 232 North Klondike Highway

Fully Built Facility Sound Levels

Sound Conclusions

- Sound is a key concern in the siting and design of the Whitehorse Power Centre facilities
- Preliminary noise assessments have been completed for the four proposed sites
- The results demonstrate that compliance with the 40 dBA PSL is feasible
- Detailed assessment work will continue as the projects progress

Thank you for your time

Feedback

- Email: yec.wpc@stantec.com
- Feedback collected until **March 13, 2026**
- YESAB process

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the power of yukon