



Location Package

Rankin Inlet

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1. Introduction

Overview of the project



Introduction

Kivalliq Alternative Energy (KAE) is developing a wind energy project in Rankin Inlet to produce clean energy and increase energy independence. Currently, Rankin Inlet relies exclusively on imported fossil fuels for 100% of its electricity production which has brought about environmental, wildlife, economic and social limitations and risks.

KAE has been developing this project since 2018, collecting data and considering all aspects of development, including technology, cost, land, permitting, environment, and wildlife. This information package is part of the next milestone: preparing an application to the Nunavut Planning Commission (NPC) and Nunavut Impact Review Board (NIRB).

The purpose of this package is to provide you with the necessary information to provide feedback on the proposed locations for the wind turbines.

KAE is inviting Rankin Inlet's key stakeholders, as well as the general public, to participate in another opportunity to provide input on a variety of topics that may influence the project's location. The information package includes:

- **Location Maps** and geographical data
- **Constraints Maps** showing areas unsuitable for development
- **Wildlife Study** summaries outlining data collection results
- **Environmental Considerations** overview for each location
- **Community Feedback** gathered during previous engagement efforts
- **Cost Overviews** comparing project expenses and potential impacts on the community

Your feedback will be carefully reviewed and considered as KAE makes the final decision on the project location. The information package is designed to help you make an informed decision. The key themes for the project are human impact, environmental impact, and cost impact. KAE is committed to an open and transparent process and values community input.

If you have any questions about the information or the process, feel free to reach out to contact@kivalliqalternativeenergy.com.

2. Location Maps & Geographical Data

General information and geographical data of the proposed locations



Map: Project Location Overview

Location 1

Location 2

Thomson Island

Rankin Inlet

Barrier Islands



Legend:

Location 1:

Bluff between Apache Pass and Second Landing Lake

Location 2:

Area next to the Suublu and Diane trail

2 km



Project Locations

Location 1 is the site of KAE's meteorological tower, in place since 2018. At the time of installing the tower, the current HTO and other community members recommended this site due to its elevated location, which separates it from caribou migratory routes.

Location 2 is a secondary site that was established in 2023 as a backup in the event Location 1 was not acceptable. This site is away from constraints, yet remains close enough to the community to be financially feasible.



Location 1

Bluff between
Apache Pass and
Second Landing Lake



Location 2

Area next to
the Suublu and
Diane trail

KAE's Preferred Location

Since 2018 when initial site considerations, consultations, data collection, and analysis began, the Project has been primarily developed at the bluff between Apache Pass and Second Landing Lake (**Location 1**), at the recommendation of community members including the board of the HTO at that time.

This particular site continues to perform marginally better than an alternative site at an area next to the Suublu and Diane trail (**Location 2**), when considering site information gathered on topics including environmental performance, human impact, and financial performance.

As the Project approaches an application to NPC and NIRB at **Location 1**, we would like to hear from Rankin Inlet stakeholders and residents who have local knowledge, experience and opinions on the two sites when comparing them against the same set of criteria:

- Environmental
- Human
- Cost analysis
- Other criteria as identified by stakeholders



3. Constraints Maps

A visual representation of locations that are not possible due to practical or regulatory limitations



Location Constraints Map

This section presents a visual representation of areas that are unsuitable for development of the wind energy project. The map takes into account several key constraints that are necessary for the safe and effective operation of wind turbines, as well as to ensure the well-being of the community and the local environment.

The following constraints have been considered in creating this map:

- **Turbine proximity to water bodies:** Turbines must be at least 50 meters away from any water bodies.
- **Turbine proximity to residences:** Turbines should be approximately 500 meters away from permanent residential dwellings. This is to reduce the impact of noise and visual effects on residents. Turbines are not audible from more than 300 meters away.
- **Turbine Spacing:** A set spacing between turbines is required to prevent wake interference (air turbulence caused downwind of a spinning turbine). Larger turbines require more space, especially in the direction of predominant wind flow, which in this case is from the Northwest to the Southeast.
- **Airport Proximity:** Wind projects cannot be built within 4 kilometers of an airport, or along the airport approach pathway.
- **Distance from Community:** The project should be built a reasonable distance from the community, preferably within a 10km radius, to avoid high road and interconnection costs. Islands are also challenging to build on, due to the high cost of building bridges and under or over water electrical lines.

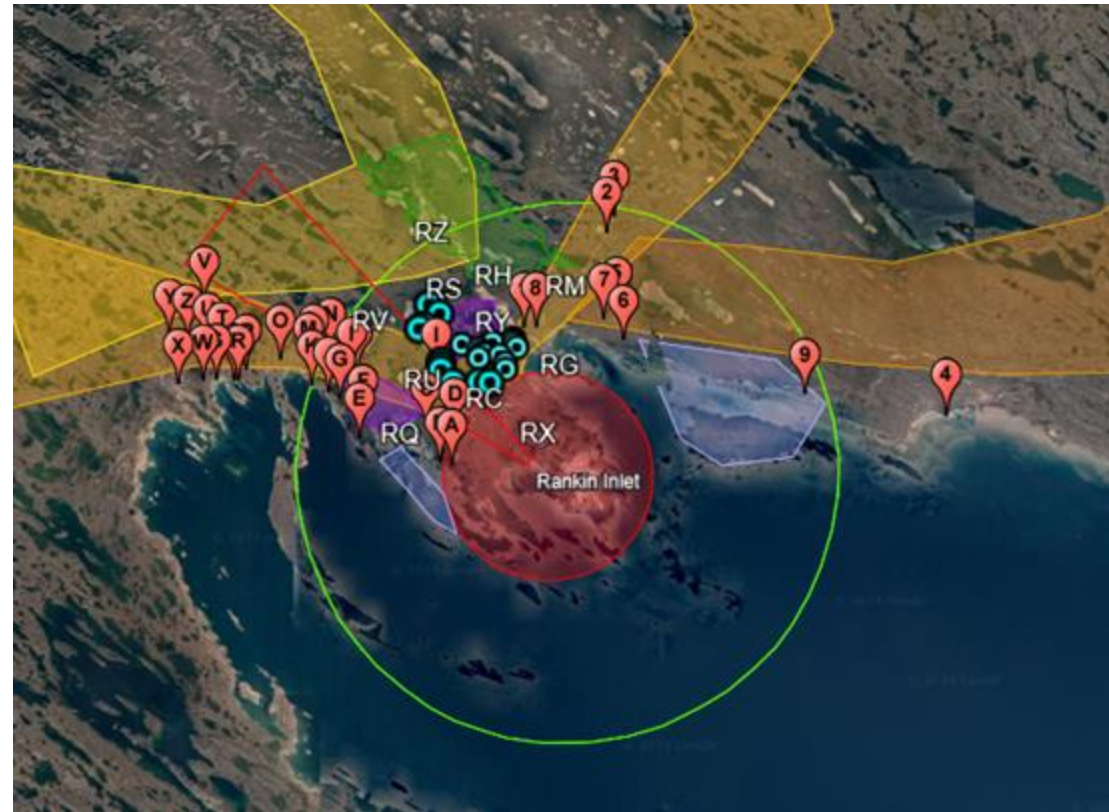
These constraints are based on industry best practices, regulatory requirements, and KAE's commitment to minimizing the project's impact on the community and environment. By identifying these areas, we can ensure that the proposed wind turbine locations are both safe and viable. The constraints map will help in making an informed decision about the most suitable location for the project.

The project team has carefully considered these factors to identify locations that meet both technical and community needs, while also minimizing potential risks and impacts.

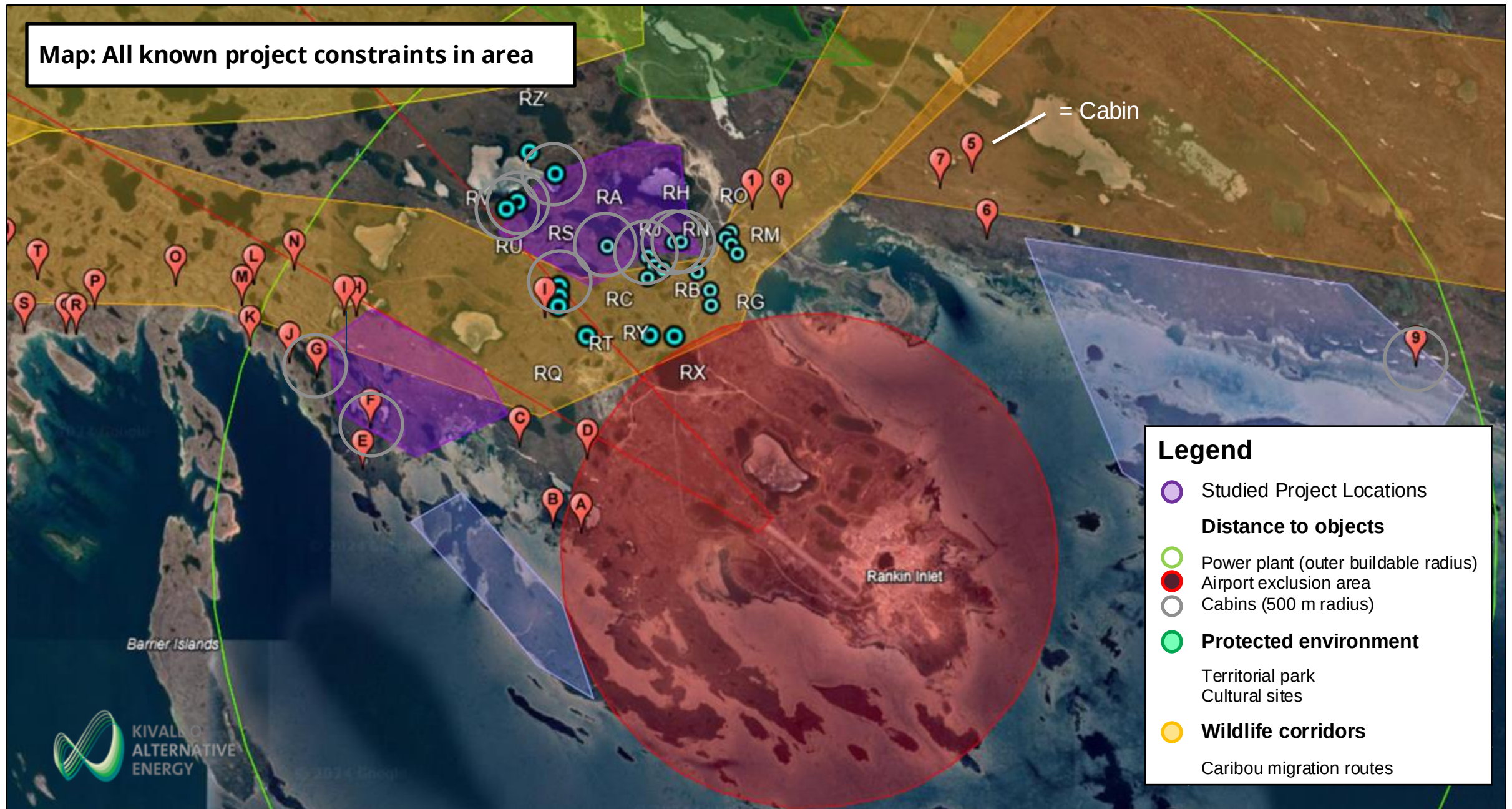
SITE SELECTION

GENERAL CRITERIA FOR SITE SELECTION

Feature	Criteria
Geological features	
Enough wind	> 6 m/s
Landscape/topography	Not too rugged
Waterbodies	50m away
Distance to objects	
○ Power plant	< 10 km
● Airport	> 4 km
○ Homes	> 1 km
○ Cabins	> 500 m
Protected environment	
● Territorial park	Yes/ <u>No</u>
Cultural sites	Yes/ <u>No</u>
Wildlife corridors	
Caribou migration routes	Minimal impact
Caribou calving grounds	Yes/ <u>No</u>
Bird nesting areas	Yes/ <u>No</u>
Other wildlife concerns	Minimal impact



Map: All known project constraints in area

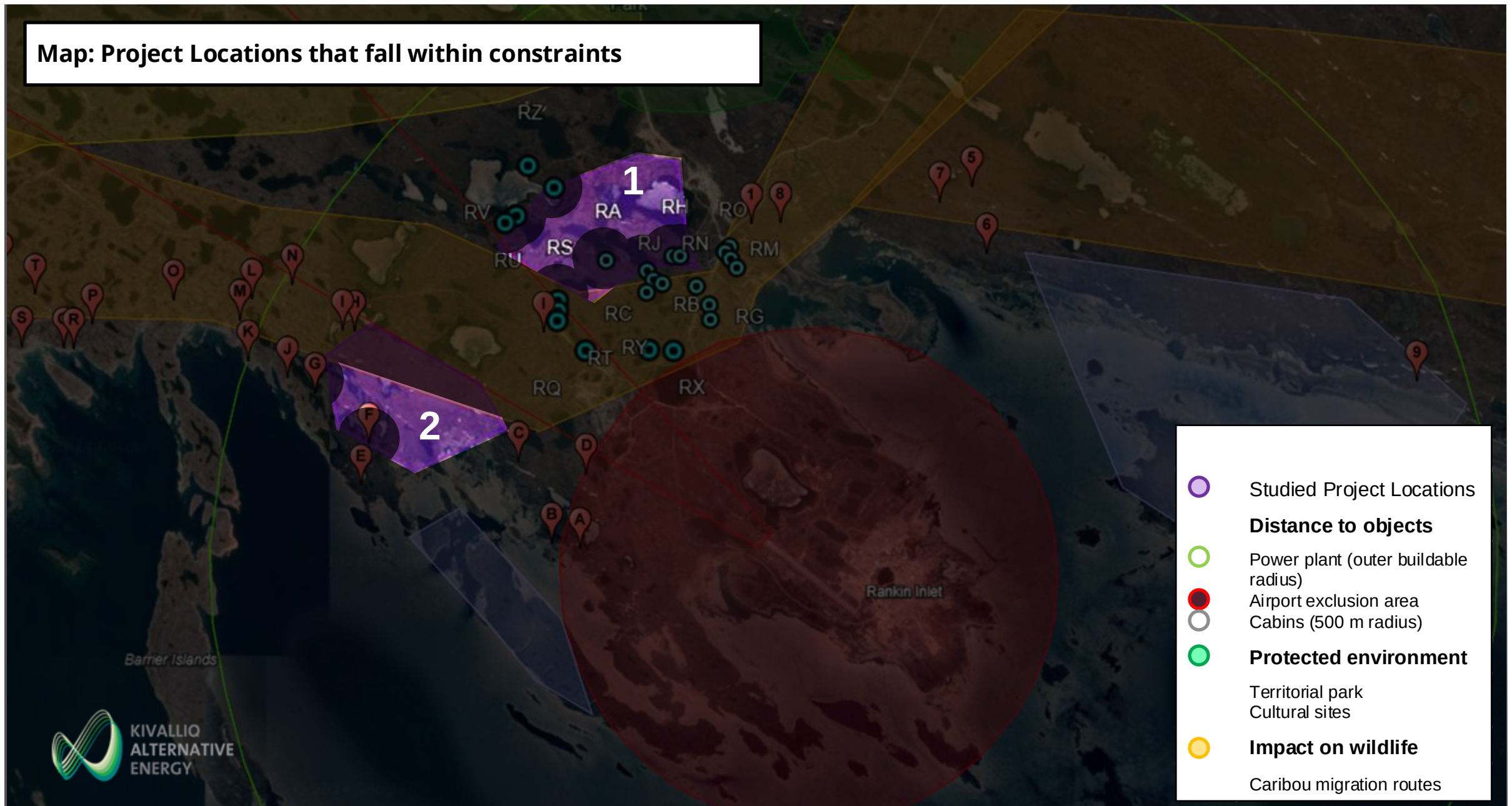


Narrowing Down Locations



- Initially, KAE identified **four** potential project sites (denoted in light and dark purple)
- After completing cost analysis and initial conversations with stakeholders, **two of the four sites were removed** due to cost or wildlife constraints:
 - Southern island site was removed due to financial barriers (high cost of building a bridge and over-water electrical line)
 - Far eastern site was removed due to concerns about interactions with both caribou and birds
- The southern island site could still be considered for a large project (supporting the mine), but is not economically feasible for a community scale project
- The final two successful sites are shown in **dark purple** on the next slide

Map: Project Locations that fall within constraints



4. Wildlife Study

High-level outcomes of the wildlife study
with regards to the proposed locations



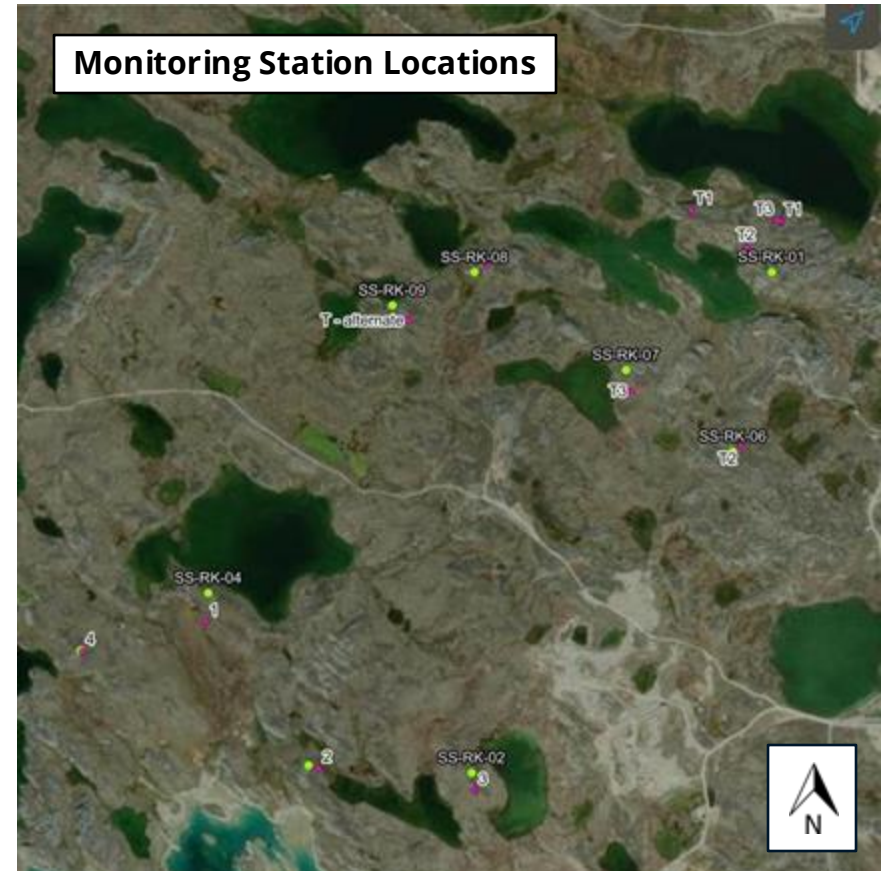
Wildlife Study Overview

Studies or activities performed at each site:

- Bird field studies (Jun)
- Wildlife recording stations (Jun-Nov)
- Discussions with HTO and CLARC to understand traditional knowledge and traditional land use at sites
- Literature review of existing studies examining barren ground caribou and wind projects

Wildlife study summary

- No migratory caribou activity at any stations
- Individual caribou detected on 4 occasions, at 3 stations
- 20 wildlife species documented in total. Hare, ground squirrel, and arctic fox most frequent
- 14 bird species detected, primarily tundra swan, sandhill crane, and Canada goose.
- No avian species of concern detected



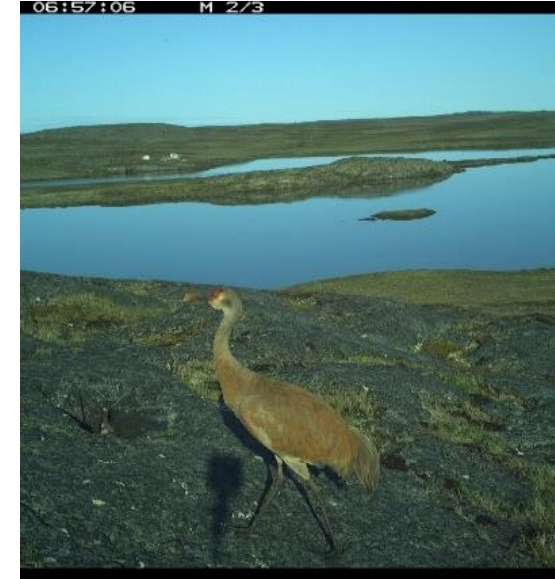
Location Differences

Following the conclusion of wildlife studies in Rankin Inlet, there was no significant difference between the two locations with regards to wildlife.



Location 1

- Slightly lower documentation of wildlife overall
- Individual caribou detected at both locations, low frequency
- No migratory caribou movement detected
- Similar bird activity



Location 2

- Slightly greater documentation of wildlife overall
- Individual caribou detected at both locations, low frequency
- No migratory caribou movement detected
- Similar bird activity

5. Environmental Considerations

High-level information about environmental impact and how this differs between proposed locations



Environmental Considerations

The below environmental criteria should be considered when locating a wind project:

1. **Interaction with birds and bats.** Wind projects should be located away from major bird nesting areas or migratory hot spots. Smaller passerine birds are at greatest risk. Raptors, corvids, and larger birds are at lower risk. Bat habitat should also be avoided.
2. **Interactions with other wildlife.** Turbines may present a perceived barrier to migratory herd species like caribou, and should be placed away from major route pinch points. Caribou are most sensitive during calving and post calving, and least sensitive during rutting and winter forage. Caribou will adjust to new barriers like turbines over time. Other wildlife are at low risk of impact.
3. **Footprint changes.** Like any construction project, a wind project will require a small area of land to be disturbed. Plant life will be cleared for roads, crane pads, electrical equipment enclosures, and turbine foundations to be built. Areas with threatened or at-risk plant species or traditional foraging areas should be avoided.
4. **Water bodies.** Turbine blades must not hang over water bodies and should be a minimum distance (50 m) away. Water bodies are also higher areas of biodiversity, which must be considered for wildlife interactions.
5. **Construction considerations.** During construction there will be heavy machinery on site including excavators, trucks, cranes, generators, and drills. These machines create loud noises, and may create dust. While the wind project will not consume fuel during operations, construction equipment does require fuel, which will be safely and securely stored on site.
6. **Elevation and wind speed.** Typically, wind speeds are better at higher elevations. Wind mapping is completed as part of project development.
7. **Noise.** Wind turbines generate noise when in close proximity. Turbines sound similar to a Honda engine when right underneath, and similar to a refrigerator when 100-200 m away. Beyond 300 m away, turbines cannot be heard above background noise.



Environmental Considerations

Both locations have been sited while keeping previously mentioned criteria in mind. Turbines would be placed minimum distances away from water bodies, cabins, and known wildlife routes.



Location 1

- Summer cabins nearby, but all at acceptable distances away
- On an elevated ridge away from caribou and bird routes, with good wind speeds
- Less new road and electrical lines needed



Location 2

- Summer cabins nearby, but all at acceptable distances away. Less cabins than at Location 1
- Slightly greater requirements for new road and electrical line
- Some community indications that caribou may travel through area, but no major pinch points
- Slightly lower wind speeds, but still within acceptable range

6. Community Feedback

A summary of community feedback received during previous engagement trips



Community Feedback

General Feedback

- **Arctic Safety:** KAE should make sure wind turbines are safe and reliable for use in arctic conditions
- **Bird Concerns:** Birds are everywhere in Rankin Inlet. Coastal areas in particular should have wildlife studies completed
- **Community Involvement:** Residents are generally supportive of renewable energy, however it's important that project developers talk to the community to ensure project success
- **Energy Independence:** A community owned project would be a good way to achieve energy independence from fossil fuels

Location Specific Feedback

- **Location 1**
 - Most stakeholders favor this location and have not raised objections to this location
 - The current HTO has raised a few concerns that the ridge is not far enough away from caribou activity
- **Location 2**
 - Some stakeholders foresee the possibility of interaction with wildlife. Monitoring will help answer this question
 - Caribou may move through this area sometimes. Keeping turbines further south may help mitigate interactions

7. Cost Overview

A high-level comparison of the costs of building in both locations and the impact of higher costs on community members



Cost Overview

KAE has completed a cost analysis for all sites.

Analysis includes pricing out all equipment, materials, roads, interconnection, and labour costs, against the projects expected revenue and operating expenses.

The project must generate enough revenue to pay for its operations and pay back any debt taken on during construction. Windier sites will generate more revenue and can justify greater construction costs.

	Description	Location 1	Location 2
CAPEX	<i>Cost it takes to build the project</i>	\$37-42M	\$39-44M
% Difference from lowest	<i>How much more expensive is the location compared to the cheapest option</i>	(cheapest option)	+5%
Reason	<i>What causes the increase in costs?</i>	Closer to existing roads, minimizing construction costs	Further from existing roads, adding to construction costs
Difficulty of obtaining grant funding	<i>What is the impact of the project cost on the difficulty of getting the money for the project?</i>	Moderate	Slightly higher, simply because more funding is needed.
Community Benefits	<i>What is the result of the project cost on the benefits to the community in the long term?</i>	Because of lower debt burden, higher community benefits would be available	Because of higher debt burden, lower community benefits would be available

Next Steps



The Rankin Inlet Wind Project is preparing to enter into the next phase of development. Immediate next steps will include:

- Survey close on April 4, 2025
- KAE will review survey feedback received, in combination with feedback received over the last year of engagement, and technical information gained from studies, to select a final project location.
- The final successful location will be shared with the community

Once a project location is selected, the project will move forward with development work, including:

- **Spring/summer 2025** - Completing remaining technical studies needed to inform engineering and design (topographical survey, geotechnical assessment, archaeological impact assessment)
- **Summer/fall 2025** - Project application to regulatory bodies including the Nunavut Planning Commission and the Nunavut Impact Review Board. Additional opportunities for community and stakeholder input are available at this stage
- **Winter/spring 2025-26** - Pending results of regulatory reviews, the project will then move forward into construction readiness (securing financing, contractor selection, equipment ordering, land tenure)