

Yukon Biathlon Location Feasibility

Final Report

Prepared for Biathlon Yukon
Prepared by Stantec

Date: June 2021



Photo Credit:
Biathlon Yukon

Design with
community in mind

Table of Contents

1.0	INTRODUCTION.....	1
1.1	CONTEXT	1
1.2	PURPOSE OF THIS FEASIBILITY STUDY	2
1.3	FEASIBILITY STUDY PROCESS.....	2
2.0	STAKEHOLDER MEETINGS.....	4
2.1	BIATHLON YUKON.....	4
2.2	CITY OF WHITEHORSE	5
2.3	GOVERNMENT OF YUKON	5
2.4	CROSS COUNTRY YUKON	5
2.5	WHITEHORSE CROSS COUNTRY SKI CLUB.....	6
2.6	FORMAL SUBMISSION FROM WCCSC AND CCY.....	6
2.7	BIATHLETE PERSPECTIVE	7
3.0	BIATHLON OPERATIONAL NEEDS.....	8
4.0	POTENTIAL SITES.....	9
5.0	ZONING AND PERMITTING.....	14
5.1	MUNICIPAL PERMITTING	14
5.2	SHOOTING RANGE PERMITTING	14
6.0	COST ESTIMATES.....	15
7.0	SITE ASSESSMENT.....	19
7.1	SITE #1 - GREY MOUNTAIN ROAD	19
7.2	SITE #2 - TELEMAR HILL.....	20
7.3	SITE #3 – RAVEN'S RIDGE	22
7.4	SITE #4 – SELWYN'S LOOP	23
7.5	SITE #5 – KOPPER KING	25
7.6	SITE #6 – MCLEAN LAKE.....	26
8.0	DECISION CRITERIA	28
9.0	RECOMMENDATIONS	32
LIST OF TABLES		
Table 1 - Costing Assumptions		15
Table 2 - Decision Criteria Matrix		31
LIST OF FIGURES		
Figure 1 Proposed Sites.....		10



BIATHLON LOCATION FEASIBILITY STUDY

Figure 2 Site #1 – Grey Mountain Road (existing site)	11
Figure 3 Site #2 – Telemark Hill	12
Figure 4 Site #3 – Raven’s Ridge (left image) & Site #4 – Selwyn’s Loop (right image)	13

LIST OF APPENDICES

APPENDIX A	– LETTER FROM WCCSC AND CCY	1
APPENDIX B	– MAX SAENGER REPORT.....	2



BIATHLON LOCATION FEASIBILITY STUDY

Introduction

1.0 INTRODUCTION

1.1 CONTEXT

Biathlon Yukon (BY) has been operating at their current location on Grey Mountain Road for over 35 years. Since the original building was constructed in 1989, the BY board members and volunteers have worked to grow their sport and develop the infrastructure needed to support athletes. The facilities at this location include approximately 25 km of groomed ski trails, an official's hut, the blue trailer, a cabin for coaching and athlete preparation (the Bear's Den), a cold storage garage, a heated storage garage, bleachers, an outhouse, a stadium and a shooting range.

In the off-season, the trails are used by walkers and mountain bikers, and the Whitehorse Archery Club, the Aboriginal Sports Circle, and the Company of the White Wolf use the area for training, events and activities. In the past, other groups including the Learning Disabilities Association of Yukon, the Fulda Challenge, Cadets and the Amazing Race have also used this location. BY has a lease with the City of Whitehorse for a large parcel of land (LOT 1115 QUAD 105D/10) that covers the biathlon's trails and buildings. The current lease is up in 2023 and BY is currently working with the City to renew this lease.

The three buildings used for programming, the Official's Hut, the Bear's Den and the blue trailer are no longer meeting BY's needs in terms of athlete preparation space, administration, and storage. The size and condition of the buildings do not support the organization's plans for future growth, the ability to host a variety of larger events and do not provide a healthy and comfortable recreational environment for athletes. The blue trailer is passed its design life; the City will no longer issue an occupancy permit for this structure.

BY has been working towards securing the funding needed to build a new building. In 2019, BY hired kobayashi+zedda to produce a Strategic Planning Report. This report provides an assessment of the type and amount indoor space required, the servicing considerations, parking needs, site layout, building design criteria, and building design concepts.

Yukon government (YG) has committed to funding this new building. There is \$250,000 identified in the 2021-2022 budget to complete the detailed design and \$2 million in total funding in the long-term plans. BY would like to complete this building by 2024, so that it is ready for the 2027 Canada Winter Games, which are being hosted in Whitehorse. BY is planning to build this new building at their current site on Grey Mountain Road. Once the new building is finished, the blue trailer would be removed, and the other buildings would be demolished or repurposed.

Over the years, there have been many conversations about the potential benefits of moving the biathlon facility across town, to a location that is connected to the ski trail network at the Whitehorse Nordic Centre at Mount McIntyre. This facility is operated by Whitehorse Cross Country Ski Club (WCCSC) and offers 85 km of groomed trails for skiing and snowshoeing at this location, and there are an additional 25 km of



BIATHLON LOCATION FEASIBILITY STUDY

Introduction

un-groomed single-track trails for fat biking. WCCSC has a license of occupation for these trails. In summer, trails are used by mountain bikers and walkers.

1.2 PURPOSE OF THIS FEASIBILITY STUDY

When the funding for the new biathlon building was announced by Yukon government, two other local groups, WCCSC and Cross Country Yukon (CCY), saw this as an opportunity to reopen the conversation about moving the biathlon facilities to the Mount McIntyre trails. These two groups contacted both the BY Board and the Minister of Community Services to request that the feasibility of moving the biathlon facility to the Mount McIntyre facility be assessed before the Grey Mountain location is developed any further.

To respond to this request from WCCSC and CCY, Yukon government Sport and Recreation Branch provided funding for BY to carry out this feasibility study. The objectives of this study are to:

- assess the suitability of five sites at Mount McIntyre and the Grey Mountain Road site for the development of a biathlon facility;
- consider the issues related to land tenure and permitting for the gun range at each of the proposed locations;
- estimate the costs and timelines that would be involved in moving the biathlon facility to a new location;
- identify the criteria that BY will use to make a decision about the future location of the biathlon facility and assess the six sites against these criteria; and
- support BY as they decide on the future location of the new biathlon building and the entire biathlon facility.

1.3 FEASIBILITY STUDY PROCESS

In January 2021, BY hired Stantec Architecture Ltd. to complete this work. To do this work Stantec took the steps listed below.

Step #1 – Stakeholder Outreach

Stantec met with several stakeholder groups and government representatives to discuss this project, gather information, and understand different perspectives. Meetings were held with the BY Board, WCCSC, CCY, representatives from Yukon government Sport and Recreation Branch and representatives from the City of Whitehorse.

Step #2 – Potential Site Identification

WCCSC staff, board and volunteers worked together to identify five potential locations at Mount McIntyre that they felt would work for a new biathlon facility. Sites were selected that had flat area for the stadium and building, space for trail development, reasonable access, and would work with the existing trails. The group produced a map showing these potential locations.



BIATHLON LOCATION FEASIBILITY STUDY

Introduction

Step # 3 – Site Suitability and Design Workshop

In order to understand the suitability of each of the site, Max Saenger, a biathlon planning and design consultant, was hired. His role was to examine the five Mount McIntyre sites and report on the feasibility of developing a new biathlon facility at this location. He also provided an assessment of the current Grey Mountain site.

On April 21, 2021 a design workshop was held with representatives from WCCSC and Max Saenger. At this workshop, the sites were reviewed for their development potential, possible trail and stadium configurations were identified, and the group worked together to identify each site's pros and cons.

Step #4 – Legislative Review

Stantec completed a legislative review to better understand the suitability of each potential site. This included reviewing the City of Whitehorse Official Community Plan and Zoning Bylaw to determine if a biathlon facility would be allowed in each location. Regulations related to developing a new shooting range were also examined.

Step #5 – Cost Estimates

The next step involved providing cost estimates. Costs were developed for the current site and the three sites at Mount McIntyre that were identified during the workshop as being the most promising. In order to be able to develop the cost estimates, trail and stadium layouts were used along with a series of assumptions.

Step #6 – Identifying the Decision Criteria

In order to support BY as they decide how to move forward, decision criteria were developed. These criteria were based on the values and requirements identified by BY, the features that a site needs to support biathlon, and site developability. A matrix was then created to assess each of the six site options against the criteria.

Step #7 – Report Writing

Finally, this report was written to present the information and provide a tool to support BY's decision making process.



BIATHLON LOCATION FEASIBILITY STUDY

Stakeholder Meetings

2.0 STAKEHOLDER MEETINGS

To clearly understand the operations at the current biathlon facility and the benefits and challenges of selecting a new location on the Mount Macintyre ski trails, discussions were held with staff from the City of Whitehorse and YG, representatives from CCY and WCCSC, and BY. The following provides a high-level summary of each of these discussions.

2.1 BIATHLON YUKON

A meeting with the BY Board was held to understand the perspective of the current board members. The following provides a summary of this meeting.

- Board members and volunteers have worked hard to develop and maintain BY's existing infrastructure.
- BY Board, coaches and participants agree that the club has a culture that fosters sportsmanship, belonging, a life-long interest in the sport, healthy lifestyles and team attitude. There is space in the organization for kids who want to ski at an elite level and those who are not interested in racing but wish to pursue the sport as part of a healthy lifestyle.
- BY offers programs for kids, youth and adults and are satisfied with what they are currently able to offer. The programs generally run at capacity, with a waiting list for most age groups.
- The BY board members feel that the biathlon programs provide different options for pursuing the sport than the programs offered by CCY and WCCSC and want to continue to be able to offer these options to the community.
- BY would like to make the following improvements to their existing facilities: new building, formalized parking area with additional spaces, bringing trails up to national standards, and expansion of the gun range to add more lanes.
- BY's current locations meet their needs and support the current programs run by the organization and can also accommodate the proposed new building and associated upgrades.
- The BY board wants to continue to have the autonomy to plan their operations and run their programs to best serve their members and the broader community.
- BY board members are concerned about planning and designing a new gun range. They do not want to move to a new location and have nearby residents complain about the noise. This is especially true considering that they do not have to engage in a review process if they continue to use their existing location.
- All board members would prefer to stay at their current location as it meets their group's needs and moving to a new site would require significant additional effort, time and money. Members are particularly concerned about the work and time involved with negotiating a new lease from the City and obtaining all permits required for the new gun range.
- The Board would like to improve their current facilities in order to grow their support, better meet athletes' needs, host national events and ensure a safe environment for athletes, coaches, volunteers and community members.
- It will be important to consider the ongoing maintenance costs of a new location, for example, snow clearing and annual maintenance of a new access road.



BIATHLON LOCATION FEASIBILITY STUDY

Stakeholder Meetings

2.2 CITY OF WHITEHORSE

To understand the City of Whitehorse perspective, meetings were held with the Director of Community and Recreation Services and the Manager of Land and Building Services.

- The City does not have a preference for any of the proposed biathlon facility locations.
- BY's current location on Grey Mountain and the proposed locations at Mount McIntyre are all designated as Greenspace – Recreation Areas under the Official Community Plan.
- The City's perspective is that each recreation facility adds value to the community, and the City will work to support all recreation groups as they plan and develop facilities needed to support their activities and members.
- The City is currently working with BY to renew their lease at their Grey Mountain site.
- There is a process involved with any new lease through the City of Whitehorse and it would require approval from City Council.

2.3 GOVERNMENT OF YUKON

To understand the YG perspective, discussions were held with representatives from Community Services, Sports and Recreation Branch.

- The branch is interested in supporting the community's recreation groups and wants all groups to be satisfied with plans for the future.
- The branch would like the decision about the future location of the biathlon facilities to consider all the reasonable options, be financially and technically feasible, and support the growth of the sport.
- As a funder of the new building, cost is an important consideration to YG, but they understand that this is not the only thing to be considered.
- YG will support BY through this decision-making process.

2.4 CROSS COUNTRY YUKON

CCY is the sport governing body for cross country skiing in the Yukon. CCY plans, evaluates, coordinates and administers various programs devoted to the promotion and development of recreational and competitive cross-country skiing in Yukon. A meeting was held with the CCY board president. Below is a summary of the conversation.

- CCY's main goal is to run programs to develop elite cross-country skiers. In addition to high level coaching and training, it is important to CCY to get as many kids involved in skiing as early as possible as this will help identify and develop elite athletes.
- Having more overlap, socializing, and connection between youth in skiing and biathlon will benefit athletes in both programs and may encourage people to continue with the programs.
- Having biathlon and cross-country skiing located in the same facility is not necessary, but will likely help grow both sports.
- Nationally, the sport governing bodies for biathlon and cross-country skiing are finding ways to work together, align programs, and share resources.



BIATHLON LOCATION FEASIBILITY STUDY

Stakeholder Meetings

2.5 WHITEHORSE CROSS COUNTY SKI CLUB

A meeting was held with several WCCSC staff and board members; a follow-up email also provided additional information. Below is a summary of that conversation and letter.

- Integrating biathlon facilities with the existing Mount McIntyre ski trails was discussed in the lead-up to the 2007 Canada Winter Games, and at other times before that as well.
- Good relationships between all the groups involved in cross-country skiing is important to WCCSC Board, as is clear and regular communication between groups.
- Working with BY to explore the feasibility of integrating the sport into their facilities and infrastructure is important to WCCSC and was a strategy identified in the group's 2020-2022 Strategic Plan.
- Building a new biathlon building at the Grey Mountain Road location will solidify the future of the club at a separate location.
- Funding a new biathlon building is a big investment and the WCCSC board wants to ensure that the option to relocate the biathlon facilities is carefully and thoroughly considered before a final decision is made. This assessment should include a cost/benefit analysis and an investigation to make sure that the potential locations are feasible.
- Having more groups invested in, and using the trails, at Mount McIntyre will help to build the case to make this area a park and could help to secure support and funding for cross-country skiing.
- WCCSC believes that having the biathlon facilities located at Mount McIntyre will make biathlon more visible, more accessible, and attract more athletes, all of which will work to grow the sport in Yukon.
- The WCCSC board has been working to make their programs more accessible and provide program options that will attract and retain a wider range of kids and youth.
- WCCSC has paid staff, which allows them to provide a higher level of grooming.
- Having more volunteer groups co-located and working together (similar to at Mount Sima) can mean more powerful advocacy and can bring more weight to funding requests.
- BY athletes also train at Mount McIntyre and participate in programs run by the CCY and the WCCSC. Many members of BY are also members of the WCCSC.
- An ongoing positive relationship with the BY board, coaches, and members is important to the WCCSC.
- Climate change will likely increase the costs of keeping snow on the trails, could shorten or interrupt the skis season or required the developing of trails at higher elevations. Some of the potential locations for a new biathlon facility could, as an additional benefit, provide easier access to Selwyn's loop which has better snow in early fall and late spring.

2.6 FORMAL SUBMISSION FROM WCCSC AND CCY

A letter from the boards of CCY and WCCSC was sent to BY in December 2020. This letter outlines the importance of considering a full range of options before funding a new biathlon building at the Grey Mountain Road location. CCY and WCCSC are concerned that continuing to develop biathlon facilities on Grey Mountain Road will cement the existing separation of cross-country skiing and biathlon and will result in a lost opportunity for synergy, efficiency and excellence. This letter is included as Appendix A.



BIATHLON LOCATION FEASIBILITY STUDY

Stakeholder Meetings

In their letters, the two groups listed the following potential benefits of moving the biathlon facilities to the Mount McIntyre trail network:

- Shared grooming and snow-making resources, and greater ability to pool resources to mitigate and adapt to climate change;
- Expansion and improvement of trails to better serve our growing membership, including in early/late season conditions;
- Access to shared infrastructure for hosing major competitions (as is standard for Canada Games);
- Easier access to trails and facilitates for biathletes (ability to bus, walk, bike, and ski to training);
- Improved ability for athletes to develop in both sports from a young age and grow the pool of Nordic athletes in Yukon overall;
- Sharing coaching services and the potential to increase athlete excellence in both sports;
- Increased consolidation of sport users into the Mount McIntyre recreational areas towards developing a regional recreation park;
- Presenting a common front to government when seeking funding to improve facilities (for example, Mount Sima is supported by five separate sport bodies); and
- WCCSC has recently completed a Strategic Plan and members would like to see a greater connection and integration of biathlon within the ski club community.

2.7 BIATHLETE PERSPECTIVE

This project did not involve formal engagement with biathletes, however, conversations about the athlete experience were held with athletes and members of the BY organization. Generally, training for biathletes involves days where they are both skiing and shooting and days when they are just skiing. This means that some training days are spent skiing short laps and shooting at the biathlon range and some days are spent on other trails that are not necessarily adjacent to the biathlon range. As they become more competitive, Yukon biathletes generally train several days a week at the biathlon facility on Grey Mountain Road and several days a week at Mount McIntyre, but this use of different ski trails at different locations does not pose a barrier to athletes.



BIATHLON LOCATION FEASIBILITY STUDY

Biathlon Operational Needs

3.0 BIATHLON OPERATIONAL NEEDS

In terms of the site layout, trails and facilities, there are a number of requirements that are unique to the sport of biathlon and will need to be met to support BY's current programs and to be able to host future events. The current site on Grey Mountain Road works well the current programs and events; some upgrades are needed to the trails, buildings, and stadium to be able to host national competitions. The following is a list of the basic requirements for biathlon facilities.

Stadium and Gun Range

This is the area where most of the activities take place during events and includes the start and finish lines, shooting range, penalty loop, and areas for coaches, the press, and spectators. An estimated minimum size required for the stadium is 160 m by 90 m. An outdoor gathering space with a view of the finish line and bleachers are also important. The location and design of the stadium also needs to adhere to Biathlon Canada requirements and standards.

The planning and layout of the shooting range is very important to guarantee safety every time shooting is in progress and to ensure it adheres to federal regulations (RCMP). BY currently has 24 shooting lanes but is working on expanding so that there are 30 lanes.

Building

A range of indoor spaces are needed to support biathlon training and events. In 2019, BY had a design report completed to help plan for a new building. It was estimated that a 315 m² building would be needed and would include athlete preparation space, a vault to store rifles and ammo, changerooms, washrooms, an official's area, administrative office, and space to be used for meetings or a lounge. The building should be oriented so that the windows in the official's space provide a clear view of the start line, penalty loop, and shooting range. While BY has flexibility in the buildings design its features need to adhere City of Whitehorse standards, and to Biathlon Canada guidelines and standards.

Trails

Biathlon needs a range of looping trails of different lengths to be able to train effectively and host different types of events. As a starting place for planning, a 1.5 km loop with 30 m of vertical and a 2.5 km loop with 75 m of vertical are needed and will need to adhere to Biathlon Canada guidelines and standards.

Parking

A parking area is needed and should meet the minimum standards required in the City of Whitehorse Zoning Bylaw. Using current information and plans for future growth, 23 stalls would be needed for regular operations. More parking would need to be provided when hosting large events such as the Canada Winter Games or Nationals.



BIATHLON LOCATION FEASIBILITY STUDY

Potential Sites

4.0 POTENTIAL SITES

For this study, six potential locations have been considered and assessed. One of the locations is BY's existing site on Grey Mountain Road and the other five sites are adjacent to the WCCSC trails at Mount McIntyre. The five sites at Mount McIntyre were selected by a small group WCCSC board members, staff and volunteers who know the trail system and the area well. They looked for potential sites on the existing trail network, with reasonable access, a developable area for the building and parking lot, a flat area for the stadium, and sufficient space and hills for the biathlon trail network. The current Grey Mountain site and five potential Mount McIntyre sites are shown in Figure 1.

Figures 2, 3, and 4 show the detailed site layouts for the current location, and the three preferred Mount McIntyre locations. Only the proposed 1.5 km and 2.5 km loops are shown on the figures because, in general, if you have enough elevation and space to make these distances work, it will be possible to add additional trails to get the other route lengths needed for training and competitions.

A short report provided by Max Saenger is provided in Appendix B.

Cost estimates were only completed for Site #1 through Site #4. Cost estimates were not completed for Site #5 and Site #6 for the following reasons:

- Site #5 (Kopper King)
 - Difficult and costly to develop stadium area due to existing terrain
 - Downhill approach to the range is not favoured
 - No natural backstop for the range
 - Potential race trails would disrupt existing ski trails
- Site #6 (McClean Lake Road)
 - Remote location, far from existing ski facilities
 - Near active gravel quarries (potential for wind and dust issues)
 - No natural range backstop
 - Distance from existing services (power)



BIATHLON LOCATION FEASIBILITY STUDY

Potential Sites



Figure 1 Proposed Sites



BIATHLON LOCATION FEASIBILITY STUDY

Potential Sites

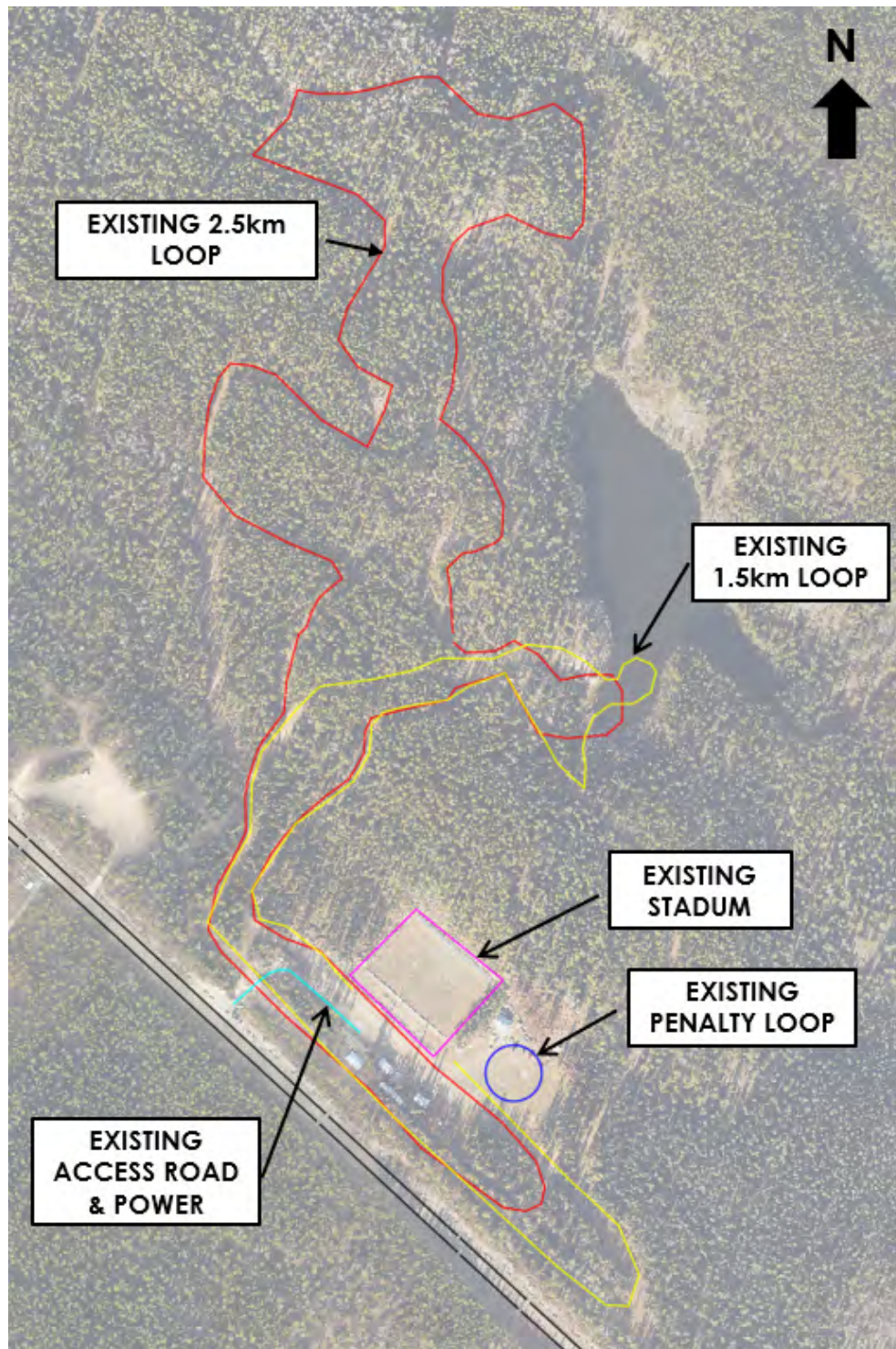


Figure 2 Site #1 – Grey Mountain Road (existing site)



BIATHLON LOCATION FEASIBILITY STUDY

Potential Sites

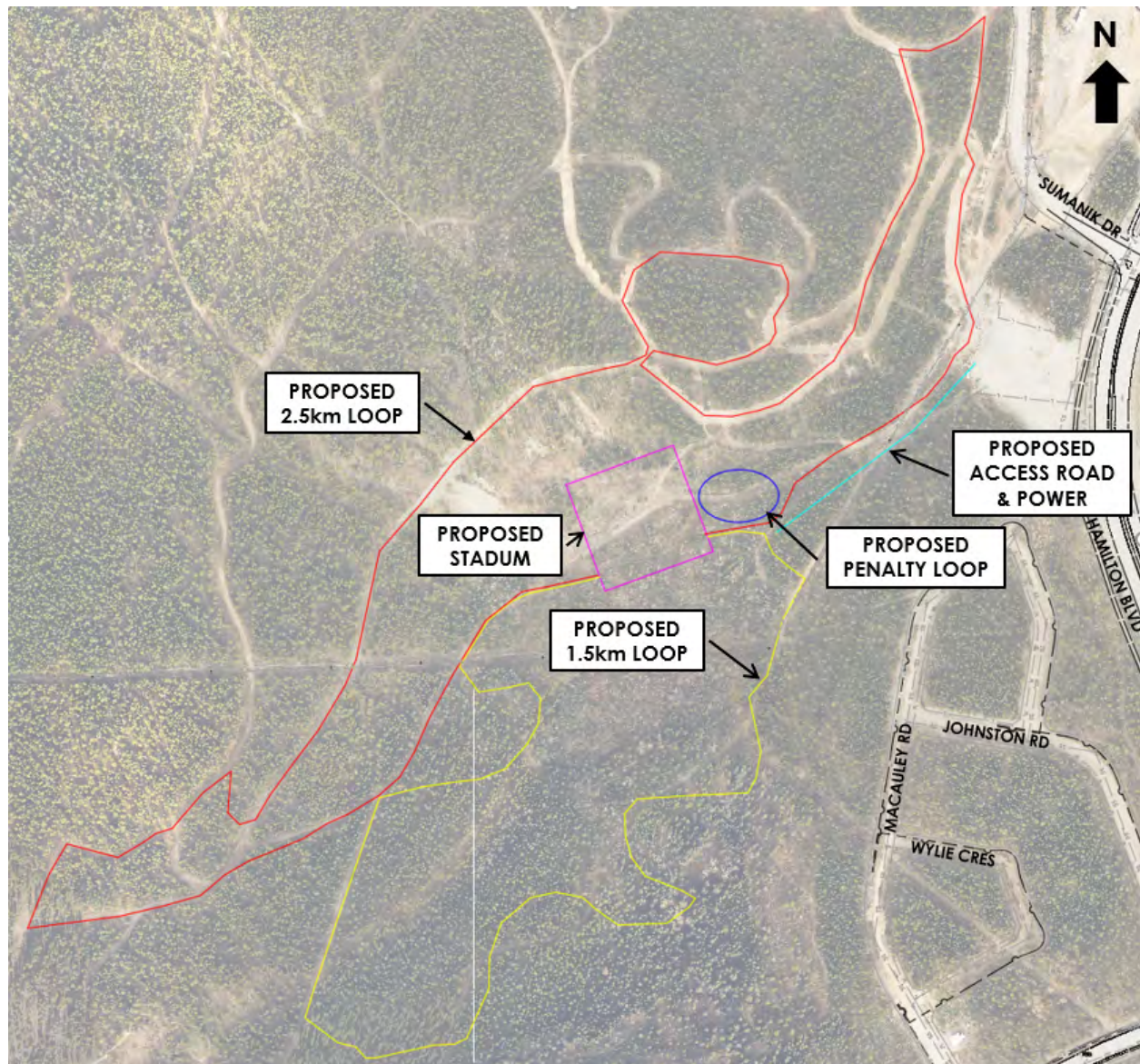


Figure 3 Site #2 – Telemark Hill



BIATHLON LOCATION FEASIBILITY STUDY

Potential Sites

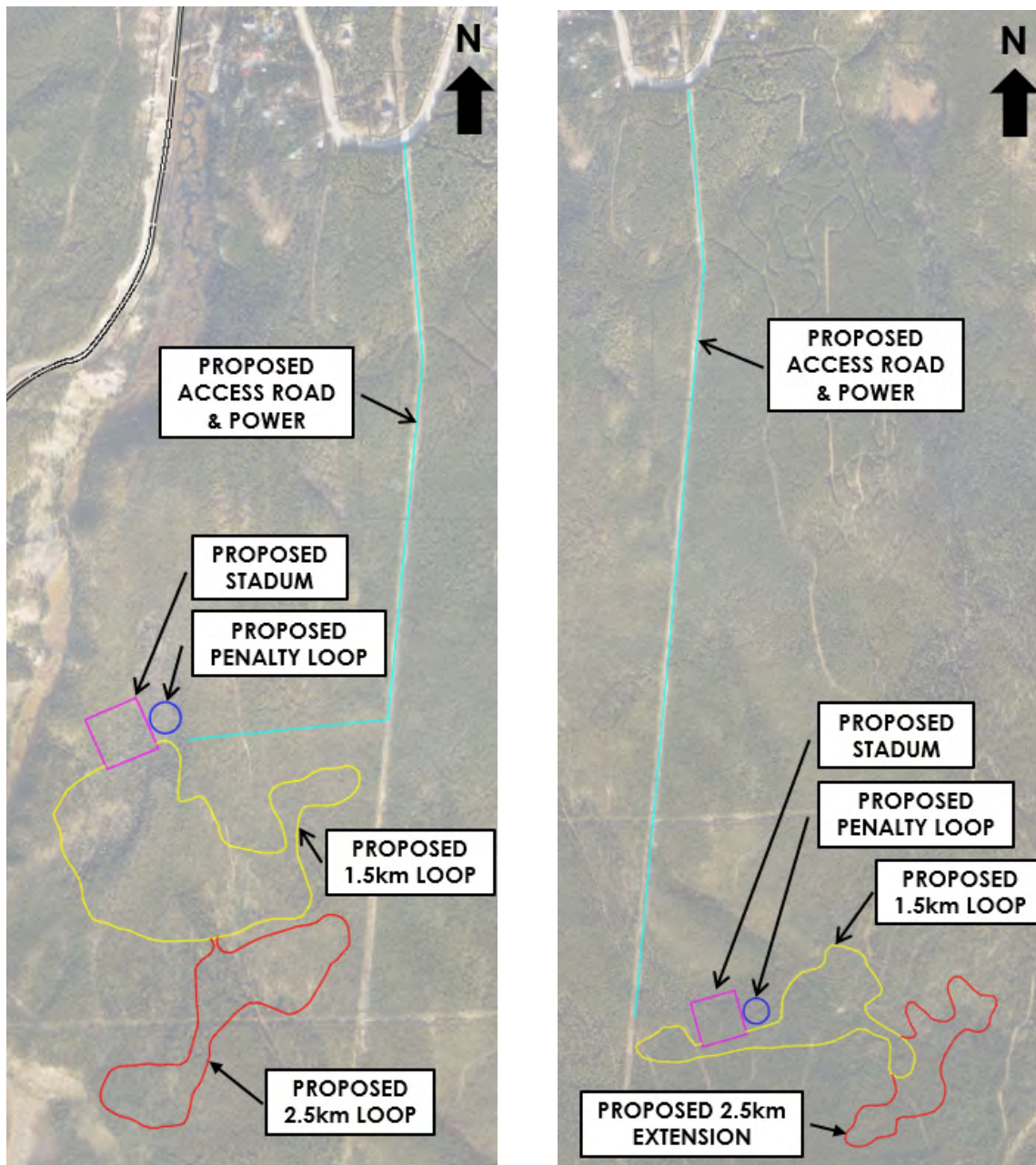


Figure 4 Site #3 – Raven's Ridge (left image) & Site #4 – Selwyn's Loop (right image)



BIATHLON LOCATION FEASIBILITY STUDY

Zoning and Permitting

5.0 ZONING AND PERMITTING

5.1 MUNICIPAL PERMITTING

The biathlon trails, facilities, shooting range, and buildings are considered Outdoor Participant Recreation Services in the City of Whitehorse Zoning Bylaw. This use is allowed as a principal use in the CR – Commercial Recreation and the PR – Parks and Recreation zones and as a conditional use in the CS – Commercial Service, FP – Future Planning, PE – Environmental Protection, PG – Greenbelt, PS – Public Service, and PU – Public Utilities zones. This type of recreational use fits best in the Greenspace – Recreation Areas designation in the Whitehorse Official Community Plan.

The shooting range is considered a permitted use in the Outdoor Participant Recreation Services and would be allowed in any zone where this use is allowed. There are no additional permits that would be required from the City.

A new lease between the City and BY would be required for the building and the shooting range. For the lease, land would first need to be transferred from YG to the City and then the lease area and conditions would need to be approved by City Council.

Although a shooting range is allowed under the CR – Commercial Recreation and the PR – Parks and Recreation zones, it is recommended that a stakeholder and public engagement process be conducted to provide information and discuss concerns with residents before the final location is selected. At a minimum, this process should involve notifying nearby residents about the plans, providing information about the planned development and shooting range, and giving people an opportunity to engage in meaningful discussion and provide comments on the proposed development.

5.2 SHOOTING RANGE PERMITTING

Shooting ranges are regulated under the federal *Firearms Act* and are subject to the *Shooting Clubs and Shooting Ranges Regulations*. The RCMP has developed a document called Range Design and Construction Guidelines; this provides detailed information about how the range should be constructed. If a new shooting range was to be constructed, these guidelines would need to be followed and the RCMP Chief Firearms Officer would inspect the range before granting permission to operate. The guidelines state that the organization in question needs to have clear form of land tenure; and a lease is preferred as it gives more direct control over the area. In April 2021, the RCMP Firearms office said that inspections were behind schedule and were taking up to two years to complete.



BIATHLON LOCATION FEASIBILITY STUDY

Cost Estimates

6.0 COST ESTIMATES

The Class 'D' Opinion of Probable Cost have been identified to understand would be involved in both developing the existing site or moving to a new location. The estimates for both new and existing construction are based on existing site conditions, materials, regulatory approvals, and estimated measurements.

An opinion of probable does not include all front-end costs, overhead and profit, or any elements that would require the completion and review of detailed drawings, specifications, and material schedules. Stantec does not guarantee the accuracy of these costs and shall incur no liability where actual construction costs are exceeded. Table 1 lists the assumptions we have used to prepare the cost estimates.

Table 1 - Costing Assumptions

Cost Item	Assumptions
Planning	<ul style="list-style-type: none">• All work in done under a single contract• Construction takes place in summer• Public competitive tender with minimum of three tenders• For costing, 2021 prices have been used for all phases (even if it is understood that construction may take place in 2022)
General Requirements	Includes: <ul style="list-style-type: none">• Mobilization / Demobilization at 10% of subtotal• Traffic control, utility coordination and survey
Building	Biathlon Building <ul style="list-style-type: none">• Costs for the new building and to relocate the existing buildings are based on the Class C estimates provided in the Biathlon Yukon Strategic Planning Final Report, by kobayashi+zedda, dated October 2019 Storage Buildings <ul style="list-style-type: none">• Two storage buildings are required; one heated and one cold storage shed both approximately 6 m by 8 m
Road Access	<ul style="list-style-type: none">• Road right-of-way is 13 m wide and road width is 8 m wide• Road sub-base is 0.40 m depth of 80 mm minus pit run and road base is 0.20 m depth of 20 mm minus crush• Grubbing and stripping, tree clearing and chipping cost accommodate the entire road right-of-way (13 m)• Rough grading and subgrade preparation costs accommodate the road width (8 m)• For Site #1, access is from Grey Mountain Road and no new road is needed• For Site #2 access from Hamilton Boulevard, and 220 m of new road is needed• For Site #3, access is from War Eagle Way and 1,500 m of new road is needed• For Site #4, access is from War Eagle Way and 2,100 m of new road is needed
Water & Sewer	<ul style="list-style-type: none">• Drilled well and septic field costs are based on <i>Biathlon Yukon Strategic Planning Final Report</i>, by kobayashi+zedda, dated October 2019• It is assumed that each site will have onsite services (drilled well and septic field)
Power	<ul style="list-style-type: none">• Power costs are based on costs provided with ATCO Electric Yukon from projects with similar locations



BIATHLON LOCATION FEASIBILITY STUDY

Cost Estimates

	<ul style="list-style-type: none"> Spacing between poles of 60 m has been assumed to allow for road lighting (trail lighting was not considered at this stage)
Biathlon Facility	<p>Penalty Loop Area</p> <ul style="list-style-type: none"> 2,500 m² area needed for (150 m loop) Costs include grubbing, stripping, tree clearing, chipping and rough grading <p>Stadium Area</p> <ul style="list-style-type: none"> Assumed area of 14,400 m² (160 m x 90 m) Costs include grubbing, stripping, tree clearing, chipping and rough grading <p>Parking Area</p> <ul style="list-style-type: none"> Athlete & Spectator Parking <ul style="list-style-type: none"> 550 m² (assuming 10-year projection numbers: 69 users for a minimum 23 spaces) Spectator parking (for large events, ie. Canada Winter Games or Nationals) is assumed be double the parking required by the City of Whitehorse Zoning Bylaw (46 spaces) Total parking area is 1,100 m² Sizes based on City of Whitehorse Zoning Bylaw Costs include grubbing, stripping, tree clearing, chipping and rough grading Sub-base material will be 0.40 m of 80 mm minus pit run and base material will be 0.20 m of 20 mm minus crush Event Parking for waxing cabins (trailers) is approximately 500 m²; this parking lot will have only sub-base materials <p>Shooting Range</p> <ul style="list-style-type: none"> Backstop <ul style="list-style-type: none"> 2.5 m high wooden wall No backstop required at Grey Mountain Facilities; existing backstop is sufficient Firing Line <ul style="list-style-type: none"> Assumed that the 24 existing firing lines at Grey Mountain are in reasonable condition and can be reused at existing site or transported to new site Assumed that only 6 firing lines are to be purchased to have a total of 30 firing lines Range Hood <ul style="list-style-type: none"> Assumed that the 24 existing range hoods are in reasonable condition and can be reused at existing site or transported to new site Assumed that only 6 range hoods are to be purchased to have a total of 30 range hoods Targets <ul style="list-style-type: none"> Assumed that the 24 existing targets are in reasonable condition and can be reused at existing site or transported to new site Assumed that only 6 targets are to be purchased to have a total of 30 targets Asphalt Firing Line – 96 m x 2.5 m Security – Fencing and gates around entire facility (approx. 500 lineal meters) <p>Ski Trails</p> <ul style="list-style-type: none"> Assuming existing BY trails (Grey Mountain Road) are between 4 and 6 m, with an average width of 7 m; clearing and grubbing for an additional 2 m for the entire network will be needed to get trails to required 7 m width All new trails built at Mount McIntyre will be 7 m wide (average of 7 m wide as unable to tell where there are hills ie 8m width and flats ie 6 m width) Creation of trails at each facility for the 0.6, 0.75 km, 1.0 km, 2.0 km, 3.0 km, 3.3 km, and 4.0 km trails – assumed half of the total length as some trails will be shared Creation of 500 m of new dog trail at Telemark Hill (Site #2)



BIATHLON LOCATION FEASIBILITY STUDY

Cost Estimates

Item	Description	Site #1	Site #2	Site #3	Site #4
Part 1A.1 - General Requirements		\$ 171,946.00	\$ 271,938.40	\$ 362,210.00	\$ 396,895.60
Part 1A.2 - Building		\$ 1,422,660.00	\$ 1,542,660.00	\$ 1,542,660.00	\$ 1,542,660.00
Part 1A.3 - Road Improvements		\$ 27,500.00	\$ 73,700.00	\$ 412,500.00	\$ 577,500.00
Part 1A.4 - Biathlon Facility Requirements					
.1	Stadium	\$ -	\$ 100,800.00	\$ 100,800.00	\$ 100,800.00
.2	Penalty Loop	\$ -	\$ 17,500.00	\$ 17,500.00	\$ 17,500.00
.3	Shooting Range	\$ 90,000.00	\$ 290,000.00	\$ 290,000.00	\$ 290,000.00
.4	Athlete & Spectator Parking - ~46 stalls	\$ 28,600.00	\$ 33,000.00	\$ 33,000.00	\$ 33,000.00
.5	Event Trailer Parking (~12 waxing trailers)	\$ 13,000.00	\$ 13,000.00	\$ 13,000.00	\$ 13,000.00
.6	Trail Building	\$ 86,696.00	\$ 248,724.00	\$ 297,640.00	\$ 279,496.00
.7	Security	\$ -	\$ 250,000.00	\$ 250,000.00	\$ 250,000.00
Part 1A.5 - Power		\$ -	\$ 40,000.00	\$ 500,000.00	\$ 700,000.00
SUMMARY OF SCHEDULE 1A					
	Part 1A.1 - General Requirements	\$ 171,946.00	\$ 271,938.40	\$ 362,210.00	\$ 396,895.60
	Part 1A.2 - Building	\$ 1,422,660.00	\$ 1,542,660.00	\$ 1,542,660.00	\$ 1,542,660.00
	Part 1A.3 - Road Improvements	\$ 27,500.00	\$ 73,700.00	\$ 412,500.00	\$ 577,500.00
	Part 1A.4 - Biathlon Facility Requirements	\$ 214,296.00	\$ 953,024.00	\$ 1,001,940.00	\$ 983,796.00
	Part 1A.5 - Power	\$ -	\$ 40,000.00	\$ 500,000.00	\$ 700,000.00
	SCHEDULE 1A SUBTOTAL	\$ 1,836,402.00	\$ 2,881,322.40	\$ 3,819,310.00	\$ 4,200,851.60
	Contingency	\$ 734,561.00	\$ 1,152,528.96	\$ 1,527,724.00	\$ 1,680,340.64
	Engineering & Construction Management	\$ 367,280.00	\$ 576,264.48	\$ 763,862.00	\$ 840,170.32
	SCHEDULE 1A TOTAL	\$ 2,938,243.00	\$ 4,610,115.84	\$ 6,110,896.00	\$ 6,721,362.56



BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

7.0 SITE ASSESSMENT

In this section, the current location and the five potential Mount McIntyre locations are assessed. This assessment includes:

- location and distances from key points;
- current Official Community Plan and Zoning Bylaw designation;
- land tenure and surrounding land uses;
- geotechnical and environmental considerations;
- information about the access and site services;
- potential of the site to be developed as a biathlon facility;
- timelines and costs.

This information has been collected to support a comprehensive understanding of each of these sites, which in turn will allow each site to be assessed against the decision criteria.

7.1 SITE #1 - GREY MOUNTAIN ROAD

Location	Significant resources have been invested over the years into developing and maintaining the current home and facility of Biathlon Yukon. Public funds from various sources over the years have been used to build the existing infrastructure. The BY board, coaches and volunteers are attached to this site and have strongly expressed it meets their current and future needs.
Distances	This is the current location of the BY facilities, approximately 4.3 km up the Grey Mountain Road. This location is a 6.3 km drive from downtown Whitehorse.
OCP and Zoning	<ul style="list-style-type: none">• OCP Designation – Greenspace - Recreation Area• Zoning – PR – Parks and Recreation
Land Tenure	BY leasing the land from the City of Whitehorse; it is a 10-year lease and will need to be renewed in 2023. The lease covers 167 hectares and includes all BY's facilities and trails. The leased area adjacent to Grey Mountain Road is fenced and has two access gates.
Current Land Use	The area is currently home to BY. There is an approved shooting range. The existing trails meet BY's needs and, with minor upgrades, can facilitate national level competitions. There are several other groups who use the land and facility to run programs including the Whitehorse Archery Club, the Aboriginal Sports Circle and the Company of the White Wolf. The site is located within the Chadburn Lake Park, one of the City of Whitehorse's Regional Parks.
Adjacent Land Use	Further up Grey Mountain Road and to the south-east is the Whitehorse Rifle & Pistol Club Shooting Range; across the Grey Mountain Road there is a private lot owned by NorthwesTel and zoned PU – Public Utility. The remaining area surrounding Site #1 is vacant Commissioner's land, with many existing trails used by walkers and cyclists. The nearest residence is 2.8 km away (as the crow flies), on Hyland Crescent in Riverdale. The adjacent land uses are compatible with BY trails, facilities and activities.
Access	The site is accessed directly off the Grey Mountain Road. Currently, the only parking available during winter is along the plowed shoulder of the road. This location is not accessible by public transit. There is large parking lot to the north, within the BY lease, that

BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

	can be used to accommodate additional parking during large events. It is also possible to park along the Grey Mountain Road.																																																																												
Geotechnical and Environmental Conditions	<p>The area surrounding this site is wooded with northern deciduous trees and surficial organics. Where outcrops of soil are visible, it consists of silt till with varying amounts of sand, gravel and cobbles. There are rolling hills and a small lake.</p> <p>A desktop geotechnical study was completed in 2018, and based on this information, the site is considered acceptable for the development of a building. Shallow foundations such as strip/spread footings and/or slab on grade are feasible here.</p>																																																																												
Services	There is no piped water or sewer in the area. A new drilled well and septic field would be required to support the new building. The infrastructure required to bring power to the site is already there.																																																																												
Biathlon Feasibility	The site meets the current needs and the future plans for BY's operations, events, and programs. The existing trails can be improved to meet the requirements to host national events. There is space near the existing buildings for a new building to be developed.																																																																												
Timeline to Develop	<p>This site can be developed more quickly than the others as it will not require land lease negotiating or rifle range approval.</p> <table><thead><tr><th></th><th colspan="2">2021</th><th colspan="3">2022</th><th colspan="4">2023</th></tr><tr><th></th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th></tr></thead><tbody><tr><td>Detailed Design</td><td colspan="3">■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Lease Negotiations + YESAB</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Site Development</td><td></td><td></td><td></td><td colspan="2">■</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Rifle Range Approval</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Building Construction</td><td></td><td></td><td></td><td></td><td colspan="6">■</td></tr></tbody></table>		2021		2022			2023					Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Detailed Design	■										Lease Negotiations + YESAB											Site Development				■							Rifle Range Approval											Building Construction					■					
	2021		2022			2023																																																																							
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4																																																																			
Detailed Design	■																																																																												
Lease Negotiations + YESAB																																																																													
Site Development				■																																																																									
Rifle Range Approval																																																																													
Building Construction					■																																																																								
Cost	\$ 2,938,243.00																																																																												

7.2 SITE #2 - TELEMAR HILL

Location	This site is relatively close to the WCCSC ski chalet. This location could lead to shared programs, higher visibility for the sport of biathlon, and other potential synergies.
Distances	Site #2 is located off Hamilton Boulevard, approximately 750 m from the Mount McIntyre ski chalet. The site is a 4.3 km drive from downtown Whitehorse.
OCP and Zoning	<ul style="list-style-type: none"> OCP Designation – Greenspace - Recreation Area Zoning – PR – Parks and Recreation
Land Tenure	This site is vacant Commissioner's land. It is adjacent to YG land disposition 2006-0051, which is a 9 ha parcel that has been set aside for land claims. The site is very close to Kwanlin Dün First Nation's (KDFN) main residential area at McIntyre Village and land parcel KDFNC-41B1, which has been identified for residential uses. Any development nearby would require consultation with KDFN under the compatible land use provisions in the self-government agreement.

BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

	A new lease would need to be negotiated and this may be complicated because of the proximity to KDFN's residential area. To obtain a lease, the land will need to be transferred from the YG to the City of Whitehorse, which would involve a YG administrative review process, and cabinet approval. Once the land has been transferred to the City, a lease can be negotiated between the City and BY, which also requires approval by staff and City Council.																																								
Current Land Use	This site is currently undeveloped, with the exception of the dog trail, which runs through the centre of the site. This site is located within the planned Mount McIntyre Park area. This area is well used both summer and winter and the construction of biathlon facility here could impact the routes and use of these trails.																																								
Adjacent Land Use	To the west, north and east of this site, lands are largely undeveloped, and are used for recreation both summer and winter. The closest residence is 500 m to the south, on McIntyre Drive. To the south-east of the site is McCauley Road; this is KDFN Settlement Land that is slated to be a future expansion area of McIntyre Village. Roads and services have been developed but there are only a few homes. If this area were developed, residences would be an estimated 280 m from the site. As indicated earlier, consultation with KDFN would be required as part of the application review process for the land to be transferred to the City.																																								
Access	The site is accessed off Hamilton Boulevard, through the parking lot for the dog trail. A new access road 300 m long would need to be developed to access this site. The proper authorizations will be also be required for the construction of a new road from both YG and the City of Whitehorse. This site is the only site that is accessible by public transit.																																								
Geotechnical and Environmental Conditions	From the review of aerial photos, the area surrounding this site is mainly wooded with coniferous trees, with some deciduous. The site looks fairly flat and suitable for development. Yukon Surficial Geology Compilation, 20k-25k web map: <ul style="list-style-type: none">• Texture: mixed fragments, silt, and sand• Surficial material: morainal A geotechnical evaluation for this site was not completed for this study.																																								
Services	There is city water and sanitary sewer lines and power lines, running along Hamilton Boulevard, which is approximately 300 m from the site. Bringing piped water and sewer from the road to the potential site would cost approximately \$290,000 and, for this study, it has been assumed that onsite services (well and septic field) will be used.																																								
Biathlon Feasibility	This site can accommodate the stadium, building, shooting range and trails that BY needs. There is sufficient space and elevation to develop the required biathlon trail loops. The space constraints, terrain and existing trails mean that it will be challenging to fit the trails, new building, storge sheds, parking, bleachers, shooting range and stadium on this site. In order to ensure safety for the public, berms and fences may be required behind targets. Access to the shooting range, building, penalty loop and a portion of the trail network will need to be restricted to ensure public safety. This is especially important because this site is in a populated area, close to residences, well-used trails and a busy road. It is not ideal to have dogs off-leash near the shooting range. The dog trail, and possibly other existing ski trails, would need to be re-routed, and this will be an additional cost. There are also some concerns about the optics of having a shooting range adjacent to an important and growing residential area.																																								
Timeline to Develop	This site will take more time to develop due to the rifle range approval timelines. <table><tr><th colspan="2">2021</th><th colspan="2">2022</th><th colspan="2">2023</th><th colspan="2">2024</th><th colspan="2">2025</th></tr><tr><td>Q3</td><td>Q4</td><td>Q1</td><td>Q2</td><td>Q3</td><td>Q4</td><td>Q1</td><td>Q2</td><td>Q3</td><td>Q4</td><td>Q1</td><td>Q2</td><td>Q3</td><td>Q4</td><td>Q1</td></tr></table>																2021		2022		2023		2024		2025		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
2021		2022		2023		2024		2025																																	
Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1																											

BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

Cost	\$ 4,610,115.84

7.3 SITE #3 – RAVEN’S RIDGE

Location	This location is just south of Raven's Ridge. It is on developed WCCSC trails. There may be the ability to share grooming equipment, however, the site is 2.5 km from the WCCSC ski chalet that developing a new biathlon facility here, may not bring the two groups together and will not provide many synergies.
Distances	Site # 3 is located south of Raven's Ridge and is 1 km south off War Eagle Way. This site is an 8 km drive from downtown Whitehorse.
OCP and Zoning	<ul style="list-style-type: none"> OCP Designation – Greenspace - Recreation Area Zoning – PR – Parks and Recreation
Land Tenure	This site is vacant Commissioner's land. To obtain a lease, the land will need to be transferred from the YG to the City of Whitehorse, which would involve an administrative review process, and cabinet approval. Once the land has been transferred to the City, a lease can be negotiated between the City and BY, which also requires approval by staff and City Council.
Current Land Use	This area is currently undeveloped. This site is located within the planned Mount McIntyre Park area.
Adjacent Land Use	The area surrounding this site is forested, with trails used for recreation in both summer and winter. The nearest residence is 1 km to the north on War Eagle Way.
Access	The site would be accessed via a new access road that would run approximately 1 km south from War Eagle Way. The proper authorizations will be also be required for the construction of a new road from both YG and the City of Whitehorse. This location is not accessible by public transit.
Geotechnical and	From the review of aerial photos, the area surrounding this site is mainly wooded with both coniferous and deciduous trees. From local knowledge, the area around Raven's Ridge

BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

Environmental Conditions	<p>neighbourhood is quite rocky and difficult for development. To the west of the site is an escarpment to McIntyre Creek. The site looks relatively flat and suitable for development.</p> <p>Yukon Surficial Geology Compilation, 20k-25k web map:</p> <ul style="list-style-type: none">• Texture: mixed fragments, silt, and sand• Surficial material: morainal <p>A geotechnical evaluation for this site was not completed for this study.</p>																																																																																																															
Services	<p>There is no piped water or sewer in the area. A drilled well and septic field have been assumed for costing purposes at this time. Power would need to be brought in from War Eagle Way.</p>																																																																																																															
Biathlon Feasibility	<p>This site has some of the best terrain for biathlon courses, and there should be no difficulties in finding space to accommodate the stadium, building, and shooting range that biathlon needs. The range would likely require a berm, as it is not located near any physical features that could act as a back stop. Access to the biathlon shooting range, facilities, penalty look and a portion of the trail network will need to be restricted for safety and security issues.</p>																																																																																																															
Timeline to Develop	<p>This site will take more time to develop with the long access road and timeline for rifle range approval.</p> <table><thead><tr><th></th><th colspan="2">2021</th><th colspan="3">2022</th><th colspan="4">2023</th><th colspan="4">2024</th><th colspan="1">2025</th></tr><tr><th></th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th></tr></thead><tbody><tr><td>Detailed Design</td><td colspan="3"></td><td colspan="3"></td><td colspan="9"></td></tr><tr><td>Engagement, Lease Negotiations + YESAB</td><td colspan="5"></td><td colspan="10"></td></tr><tr><td>Site Development</td><td colspan="5"></td><td colspan="5"></td><td colspan="5"></td></tr><tr><td>Rifle Range Approval</td><td colspan="7"></td><td colspan="8"></td></tr><tr><td>Building Construction</td><td colspan="7"></td><td colspan="4"></td><td colspan="4"></td></tr></tbody></table>		2021		2022			2023				2024				2025		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Detailed Design																Engagement, Lease Negotiations + YESAB																Site Development																Rifle Range Approval																Building Construction															
	2021		2022			2023				2024				2025																																																																																																		
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1																																																																																																	
Detailed Design																																																																																																																
Engagement, Lease Negotiations + YESAB																																																																																																																
Site Development																																																																																																																
Rifle Range Approval																																																																																																																
Building Construction																																																																																																																
Cost	<p>\$ 6,110,896.00</p>																																																																																																															

7.4 SITE #4 – SELWYN’S LOOP

Location	<p>This location is somewhat south of Raven’s Ridge. It is on WCCSC trails, there may be the ability to share grooming equipment. However, the site is 2.5 km away from the WCCSC ski chalet that developing a new biathlon facility here, may not bring the two groups together and will not provide many synergies.</p> <p>Upper Selwyn’s Loop is a popular destination for skiers; having the biathlon facility here might work to raise the sport’s profile. The area also has good late and early season snow. Providing this access would work to mitigate the impacts of climate change on the ski season for all the skiers.</p>
-----------------	--

BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

Distances	Site #4 is located south of Raven's Ridge, south of Site #3 and 2 km south of War Eagle Way. This site is a 9 km drive from downtown Whitehorse.																																																																															
OCP and Zoning	<ul style="list-style-type: none">OCP Designation – Greenspace - Recreation AreaZoning – PR – Parks and Recreation																																																																															
Land Tenure	This site is vacant Commissioner's land. To obtain a lease, the land will need to be transferred from the YG to the City of Whitehorse, which would involve an administrative review process, and cabinet approval. Once the land has been transferred to the City, a lease can be negotiated between the City and BY, which also requires approval by staff and City Council.																																																																															
Current Land Use	The area is currently undeveloped, but the Upper Selwyn's Loop ski trail runs very close to this site. This site is located within the planned Mount McIntyre Park area.																																																																															
Adjacent Land Use	The area surrounding this site is forested, with trails used for recreation in both summer and winter. The nearest residence is 2 km to the north on War Eagle Way.																																																																															
Access	The site would be accessed via a new access road that would run approximately 2 km south from War Eagle Way. The proper authorizations will be also be required for the construction of a new road from both YG and the City of Whitehorse. This location is not currently accessible by public transit.																																																																															
Geotechnical and Environmental Conditions	<p>From the review of aerial photos, the area surrounding this site is mainly wooded with coniferous and some deciduous trees. From lidar imagery, there is a mound to the north of the site which would serve well as a natural backstop for the shooting range. The site looks relatively flat and suitable for development.</p> <p>Yukon Surficial Geology Compilation, 20k-25k web map:</p> <ul style="list-style-type: none">Texture: mixed fragments, silt, and sandSurficial material: morainal <p>A geotechnical evaluation for this site was not completed for this study.</p>																																																																															
Services	There is no piped water or sewer in the area. A drilled well and septic field have been assumed for costing purposes. Power would need to be brought in from War Eagle Way.																																																																															
Biathlon Feasibility	This site can accommodate the stadium, building, and shooting range that biathlon needs. The shooting range could be built into an existing hill, so there would be a good backstop. There is sufficient space for the stadium, and there should be enough relief to make the trails work. Access to the biathlon shooting range, facilities, penalty look and a portion of the trail network will need to be restricted for safety and security issues.																																																																															
Timeline to Develop	<p>This site will take the longest to develop and has the longest new access road.</p> <table><thead><tr><th></th><th colspan="2">2021</th><th colspan="2">2022</th><th colspan="4">2023</th><th colspan="4">2024</th><th colspan="2">2025</th></tr><tr><th></th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th></tr></thead><tbody><tr><td>Detailed Design</td><td colspan="3"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Engagement, Lease Negotiations + YESAB</td><td colspan="5"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Site Development</td><td></td><td></td><td></td><td></td><td></td><td colspan="4"></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>		2021		2022		2023				2024				2025			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Detailed Design																Engagement, Lease Negotiations + YESAB																Site Development															
	2021		2022		2023				2024				2025																																																																			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1																																																																	
Detailed Design																																																																																
Engagement, Lease Negotiations + YESAB																																																																																
Site Development																																																																																

BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

	Rifle Range Approval	
	Building Construction	
Cost	\$ 6,721,362.56	

7.5 SITE #5 – KOPPER KING

Location	<p>Site # 5 is located south and uphill from the Kopper King mobile home park. As this site is on WCCSC trails, there may be the ability to share grooming equipment.</p> <p>Adding trails and activity has the potential to bring more users to the area, which does not see a lot of use currently. This location is 1 km from the WCCSC chalet, and would allow skiing between the chalet and the biathlon building. This proximity could raise the profile of biathlon and present opportunities for the two groups to work together.</p>
Distances	The site is approximately 600 m south of the Alaska Highway. The location is a 5.75 km drive from downtown Whitehorse.
OCP and Zoning	<ul style="list-style-type: none"> • OCP Designation – Greenspace - Recreation Area • Zoning – PR – Parks and Recreation
Land Tenure	This site is vacant Commissioner's land. To obtain a lease, the land will need to be transferred from the YG to the City of Whitehorse, which would involve an administrative review process, and cabinet approval. Once the land has been transferred to the City, a lease can be negotiated between the City and BY, which also requires approval by staff and City Council.
Current Land Use	This site is currently undeveloped. This site is located on the planned Mount McIntyre Park area.
Adjacent Land Use	To the north, west and south of the site is forested undeveloped land, crossed by trails used for biking and skiing. To the north-east is a mobile home park, a shipping warehouse and several other commercial uses. The nearest residence is 300 m away, at the Kopper King mobile home park.
Access	The site is accessed directly off the Alaska Highway. The proper authorizations will be also be required for the construction of a new road from both YG and the City of Whitehorse. This location is not easily accessible by public transit.
Geotechnical and Environmental Conditions	<p>From the review of aerial photos, the area surrounding this site is mainly wooded with coniferous trees, and some deciduous. From lidar imagery, a large cut and fill balance is needed to make the site suitable for development.</p> <p>Yukon Surficial Geology Compilation, 20k-25k web map:</p> <ul style="list-style-type: none"> • Texture: mixed fragments, silt, and sand • Surficial material: morainial <p>A geotechnical evaluation for this site was not completed for this study.</p>

BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

Services	There are piped water and sanitary services running to the commercial buildings at the Kopper King on the Alaska Highway. Power is available adjacent to the Kopper King mobile home park. Costing was not completed for this site, but it is assumed that a drilled well and onsite septic field would be the most feasible for water and sanitary services at this site.																
Biathlon Feasibility	This site can accommodate the stadium, building, and shooting range that biathlon needs. There appears to be good terrain for trails. This site requires a fair amount of cut and fill work to create a level stadium. Because of the steep and rocky terrain, developing the access road and preparing the site for development would be difficult. Access to the biathlon shooting range, facilities, penalty look and a portion of the trail network will need to be restricted for safety and security issues.																
Timeline to Develop		2021		2022			2023				2024				2025		
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	
	Detailed Design																
	Engagement, Lease Negotiations + YESAB																
	Site Development																
	Rifle Range Approval																
	Building Construction																
Cost	Costs were not completed for this site option, as it was not one of the preferred sites.																

7.6 SITE #6 – MCLEAN LAKE

Location	Site #6 is off the McLean Lake Road and adjacent to the ski trail called Mordor. This site is over 7 km from the WCCSC ski chalet and the most popular trails, that developing a new biathlon facility here will not bring the two groups together and will not provide many synergies. Given the prevailing winds, dust may blow onto the ski trails from the adjacent quarries. This area does not get much traffic or use, and facilities here might be subject to vandalism.
Distances	The site is an 8.5 km drive from downtown Whitehorse.
OCP and Zoning	<ul style="list-style-type: none"> OCP Designation – Industrial and Greenspace – Green connection areas Zoning – FP – Future Planning and PG - Greenbelt
Land Tenure	This site is vacant Commissioner's land. To obtain a lease, the land will need to be transferred from the YG to the City of Whitehorse, which would involve an administrative review process, and cabinet approval. Once the land has been transferred to the City, a lease can be negotiated between the City and BY, which also requires approval by staff and City Council.

BIATHLON LOCATION FEASIBILITY STUDY

Site Assessment

Current Land Use	This site is undeveloped.																																																																																																																
Adjacent Land Use	The site is mostly surrounded by undeveloped forested land. Directly to the south of the site, along McLean Lake Road there are several active gravel quarry leases. The nearest residence is south of McLean Lake Road, approximately 1.5 km away.																																																																																																																
Access	<p>The site would be accessed using a new access road off McLean Lake Road. The proper authorizations will be also be required for the construction of a new road from both YG and the City of Whitehorse. Access to the site is through an active gravel quarry.</p> <p>This location is not easily accessible by public transit.</p>																																																																																																																
Geotechnical and Environmental Conditions	<p>From the review of aerial photos, the area surrounding this site is mainly wooded with coniferous trees and some deciduous.</p> <p>Yukon Surficial Geology Compilation, 20k-25k web map:</p> <ul style="list-style-type: none">• Texture: mixed fragments, silt, and sand• Surficial material: morainal <p>A geotechnical evaluation for this site was not completed for this study.</p>																																																																																																																
Services	There is no piped water or sewer in the area. Power will need to be extended from the Alaska Highway.																																																																																																																
Biathlon Feasibility	This site can accommodate the stadium, building, and shooting range that biathlon needs. There is sufficient space and elevation to develop the required biathlon trail loops. Access to the biathlon shooting range, facilities, penalty loop and a portion of the trail network will need to be restricted for safety and security issues.																																																																																																																
Timeline to Develop	<table><tr><th></th><th colspan="2">2021</th><th colspan="4">2022</th><th colspan="4">2023</th><th colspan="4">2024</th><th>2025</th></tr><tr><th></th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th></tr><tr><td>Detailed Design</td><td colspan="2">■</td><td colspan="13"></td></tr><tr><td>Engagement, Lease Negotiations + YESAB</td><td colspan="6">■</td><td colspan="9"></td></tr><tr><td>Site Development</td><td colspan="4"></td><td colspan="4">■</td><td colspan="7"></td></tr><tr><td>Rifle Range Approval</td><td colspan="4"></td><td colspan="4"></td><td colspan="7">■</td></tr><tr><td>Building Construction</td><td colspan="4"></td><td colspan="4"></td><td colspan="4">■</td><td colspan="3"></td></tr></table>		2021		2022				2023				2024				2025		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Detailed Design	■															Engagement, Lease Negotiations + YESAB	■															Site Development					■											Rifle Range Approval									■							Building Construction									■						
	2021		2022				2023				2024				2025																																																																																																		
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1																																																																																																		
Detailed Design	■																																																																																																																
Engagement, Lease Negotiations + YESAB	■																																																																																																																
Site Development					■																																																																																																												
Rifle Range Approval									■																																																																																																								
Building Construction									■																																																																																																								
Cost	Costs were not completed for this site option, as it was not one of the preferred sites.																																																																																																																

BIATHLON LOCATION FEASIBILITY STUDY

Decision Criteria

8.0 DECISION CRITERIA

This report is intended to gather the information that will support BY as they decide how, and where, their organization will grow in the future. These criteria were based on:

- values identified during discussions with BY board and volunteers;
- an understanding of the growth plans as identified by BY;
- site design characteristics that are required for biathlon facilities;
- physical attributes of each of the sites; and
- an understanding of the development process.

The decision criteria are listed below and Table 2 presents a matrix that assesses each of the six site options against the criteria.

Criteria #1 – History and Commitment to the Site

The BY board members, coaches and volunteers have put a lot of time, effort and energy into developing and maintaining the facilities at the Grey Mountain Road location. Funding has been received from various government sources to support the growth of the sport at this location. BY board members feel that the Grey Mountain location meets the current needs of the organization and, with some improvements, can be expanded to meet their future needs. BY board members and volunteers are committed to the current location because of the work they have put into its development over the last 30 years.

Criteria #2 – Board Goals

The BY board members are working on a strategic plan and have informally stated that the goals of their organization are to grow their sport, host national events, and foster a culture of sportsmanship, belonging, and healthy lifestyles among their athletes. The future location of the biathlon facilities must allow the group to work towards these goals.

Criteria #3 – Biathlon Feasibility

It is technically feasible to develop a biathlon facility at any of the sites that have been considered in this report, however, each of the potential sites has its own unique set of benefits and challenges. The current Grey Mountain site already has a trail network, shooting range, and buildings. During the Site Suitability and Design Workshop with Max Saenger and members of the WCCSC, Sites 2, 3 and 4 were thought to more suited to the development of a new biathlon facility than Sites 5 and 6.

BIATHLON LOCATION FEASIBILITY STUDY

Decision Criteria

Criteria #4 – Ability to Host National Events

BY would like to be able host national level biathlon competitions. This will involve making sure that the various areas of the stadium have enough space, the trails meet all the requirements and there are enough shooting lanes. BY is working on adding shooting lanes and making improvements to trails bring the facility up to standards. If a new facility is developed, it will need to be developed to meet all required standards.

Criteria # 5 – Athlete Development

This project did not involve a formal engagement process with biathletes; however, conversations were had about the athlete experience with athletes and members of the BY organization. Generally, training for biathletes involves days where they are skiing and shooting and days when they are just skiing. As they become more competitive, Yukon biathletes generally ski train several days a week at biathlon and several days a week at Mount McIntyre, but this use of different ski trails at different locations does not pose a barrier to athletes.

Criteria #6 – Partnerships and Synergy

Locating the biathlon facility on the WCCSC trails could present some opportunities for shared programs, raise the profile of the sport of biathlon, and make it possible to share equipment and infrastructure. However, the benefits of co-location seem to go down, the farther away the new biathlon stadium and range are from the Mount McIntyre ski chalet.

Moving biathlon to Mount McIntyre could expose more skiers to the sport, but BY programs are usually full and the cross-country ski community is small enough that kids and parents all know that biathlon is an option in Whitehorse. There may also be some opportunities to create partnerships and align programs between the two groups, even if they are geographically separated.

Criteria #7 – Development Timelines

BY would like to be ready to host the Canada Winter Games in 2027. In order to be ready to host, the new building, trails, shooting range and parking should be ready by 2024 at the latest. Continuing to develop at the current site would be the most efficient as there is already a lease in place, the site is cleared, and trails, stadium and the shooting range are in place. Sites #2 through #6 will take longer to develop because of the land tenure negotiations, site clearing, and new access roads will need to be developed before a building can get underway.

Building on this existing site, BY can be reasonably sure that the facilities will be ready in time. Moving to a new location brings with it some uncertainty about timelines. Establishing a new lease will require agreement from both YG and the City of Whitehorse. A public engagement process may also be required and may reveal concerns about the selected site.

BIATHLON LOCATION FEASIBILITY STUDY

Decision Criteria

Criteria #8 – Development Costs

Moving to a new location will cost more than continuing to develop at their current location. Cost is important, but it is only one thing that should be considered.

BIATHLON LOCATION FEASIBILITY STUDY

Table 2 - Decision Criteria Matrix

		Site #1	Site #2	Site #3	Site #4	Site #5	Site #6
	Location Description	Grey Mountain	Telemark Hill	Raven's Ridge	Selwyn's Loop	Kopper King	MacLean Lake
1	History and Commitment	Long history and significant attachment to the site	No history or attachment to site	No history or attachment to site	No history or attachment to site	No history or attachment to site	No history or attachment to site
2	Board Goals	Current site meets BY goals	When fully developed, could meet board goals	When fully developed, could meet board goals	When fully developed, could meet board goals	When fully developed, could meet board goals	When fully developed, could meet board goals
3	Biathlon Feasibility	Existing; some improvements desired	Significant development constraints	Good development potential	Good development potential	Some development constraints	Good development potential
4	Supports Athletes	Trails, shooting range, stadium and buildings are existing; buildings need improvement	Trail network, shooting range, stadium and buildings would need to be developed; some existing trails could be used	Trail network, shooting range, stadium and buildings would need to be developed	Trail network, shooting range, stadium and buildings would need to be developed	Trail network, shooting range, stadium and buildings would need to be developed	Trail network, shooting range, stadium and buildings would need to be developed
5	Ability to Host National Event	Shooting range expansion, some trail work and building upgrades are needed	Trail network, shooting range, stadium and buildings would need to be developed; some existing trails could be used	Trail network, shooting range, stadium and buildings would need to be developed	Trail network, shooting range, stadium and buildings would need to be developed	Trail network, shooting range, stadium and buildings would need to be developed	Trail network, shooting range, stadium and buildings would need to be developed
6	Partnerships and Equipment Sharing	Limited ability for partnerships, equipment sharing with WCCSC	Good opportunities for partnerships, equipment sharing with WCCSC	Some ability for partnerships, equipment sharing with WCCSC	Some ability for partnerships, equipment sharing with WCCSC	Some ability for partnerships, equipment sharing with WCCSC	Limited ability for partnerships, equipment sharing with WCCSC
7	Development Timeline	1-2 years	3+ years	3+ years	3+ years	3+ years	3+ years
8	Development Costs	\$ 2,938,243.00	\$ 4,610,115.84	\$ 6,110,896.00	\$ 6,721,362.56	N/A	N/A

BIATHLON LOCATION FEASIBILITY STUDY

Recommendations

9.0 RECOMMENDATIONS

Below are several recommendations based on a consideration of the background research, discussions with stakeholder groups and analysis of the sites that was completed for this feasibility report.

Communication

It would be beneficial for representatives from the boards of BY, CCY and WCCSC to meet at least once a year. The purpose of these meetings would be to share goals and plans, discuss potential partnerships and find ways to align programs.

Year-Round Use and Partnerships

As Government of Yukon is planning to make a significant investment in Yukon's biathlon infrastructure by funding a new building, it will be important for BY to find ways to put this building to use year-round. Also, relationships with the other groups that use the Grey Mountain BY site should be formalized to provide greater certainty for how spaces and buildings will be shared now and in the future.

Finding partners who can use the building in spring, summer and fall will be important for BY's financial stability. Regardless of where the new building is located, BY will need to engage with other groups who can contribute financially so that operations and maintenance of the building does not become too big of a financial burden.

Potential Sites at Mount McIntyre

Site #2 Telemark Hill and Site #4 Selwyn's Loop were identified at the most promising options by the group of WCCSC board members and staff who attended the workshop. Although both sites are technically feasible, each one has its own set of challenges.

Site #2 Telemark Hill is quite close to the ski chalet, and thus has the most potential for synergy, but the site will need to be designed carefully to fit into the allowable space, and the existing dog trail will need to be rerouted. The biggest challenge of this location is the proximity to KDFN's current and future residential areas. KDFN leadership, staff and citizens may see a shooting range as being incompatible with residential uses and a biathlon facility cannot be developed here without the approval of the First Nation.

Site #4 Selwyn's Loop has enough space, good terrain, and would offer access to popular ski trails with good early- and late-season snow. On the other hand, this is a remote location, far away from the ski chalet and this distance will mean that there is less opportunity for synergy between the WCCSC and BY. A long access road would be required which will be expensive to build and to maintain. Also, all traffic heading to the biathlon facility would travel along War Eagle Way, which is a quiet residential street with very low traffic volumes. Residents may not be in favour of a biathlon range at this location.

BIATHLON LOCATION FEASIBILITY STUDY

Recommendations

Moving the biathlon facility to a new location means that significant work will need to be done before construction can begin on a new building. This additional work includes site selection, engagement with the public, stakeholders and the First Nation, YESAB review, negotiating a lease, developing an access road and clearing and preparing the site. This work will take approximately six to eighteen months, if each step goes ahead with no delays. The political decisions and permitting processes could be subject to drawn-out negotiation or lengthy discussion. Moving to a new location could jeopardize the goal of having the new facilities in place in time to adequately prepare for, and host, the 2027 Canada Winter Games.

Moving to a new location would involve the additional work listed above, as well as designing and building the biathlon trails, stadium, storage buildings and shooting range. It is estimated that the moving to a new location will cost approximately \$1,670,000 to \$3,780,000 more than continuing to develop BY's current site.

Recommended Future Site for Biathlon

Developing a building to support biathlon in Whitehorse will solidify the future location of the facility. This feasibility report shows that BY's existing facility is a suitable site for the new building and can continue to support the operation and growth of the sport. The report also demonstrates that a biathlon facility could be developed at both Site #2, Site #3 and Site #4 at Mount McIntyre, although each site comes with unique challenges.

While the BY's current Grey Mountain Road location would require the demolition of existing buildings and construction of new ones, upgrades to some of the trails and development of a formal parking area. Sites #2, Site #3 and Site #4 at Mount McIntyre would not only require new road infrastructure and servicing, but also the construction of trails, shooting range, new building, storage sheds, stadium, security fencing and parking lots. The move would also require working to get the land transferred from Government of Yukon, negotiating a new lease, carrying out public engagement and obtaining the required shooting range permits from the RCMP. These are additional steps that would not be required at the current Grey Mountain location.

Asking a volunteer group to take on moving to a new location should not be considered lightly. Over the last 40 years, there has been significant public investment in infrastructure as well as volunteer time put into developing the current site. For BY board members and volunteers, the Grey Mountain location meets their current needs, and will support their organization's future growth.

Given the information gathered in this report, it does not seem that the benefits of moving to a new location would outweigh the additional time and expense that would be involved. That said, it is up to the BY board, volunteers, and members to make the final decision about where to locate their facilities.

BIATHLON LOCATION FEASIBILITY STUDY

Appendix A – Letter From WCCSC and CCY

Appendix A – LETTER FROM WCCSC AND CCY



Whitehorse Biathlon Site Location Long Distance Review

April 30, 2021

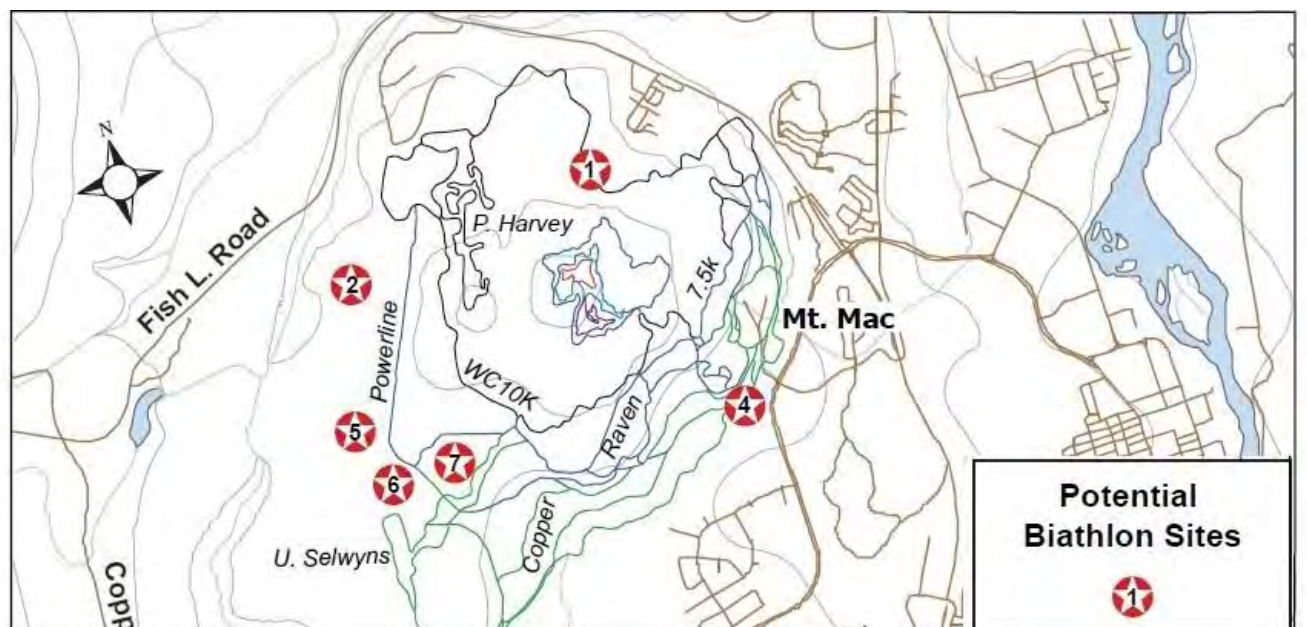
Assignment

I was asked to review several new potential sites (7 in all). After an initial paper review of the areas, I was asked to present the findings on the various sites in a conference call workshop with members of the Whitehorse Cross Country Ski Club. I was also asked to review the existing Biathlon Yukon site on Grey Mountain Road and discuss the findings with biathlon Yukon in another separate conference workshop.

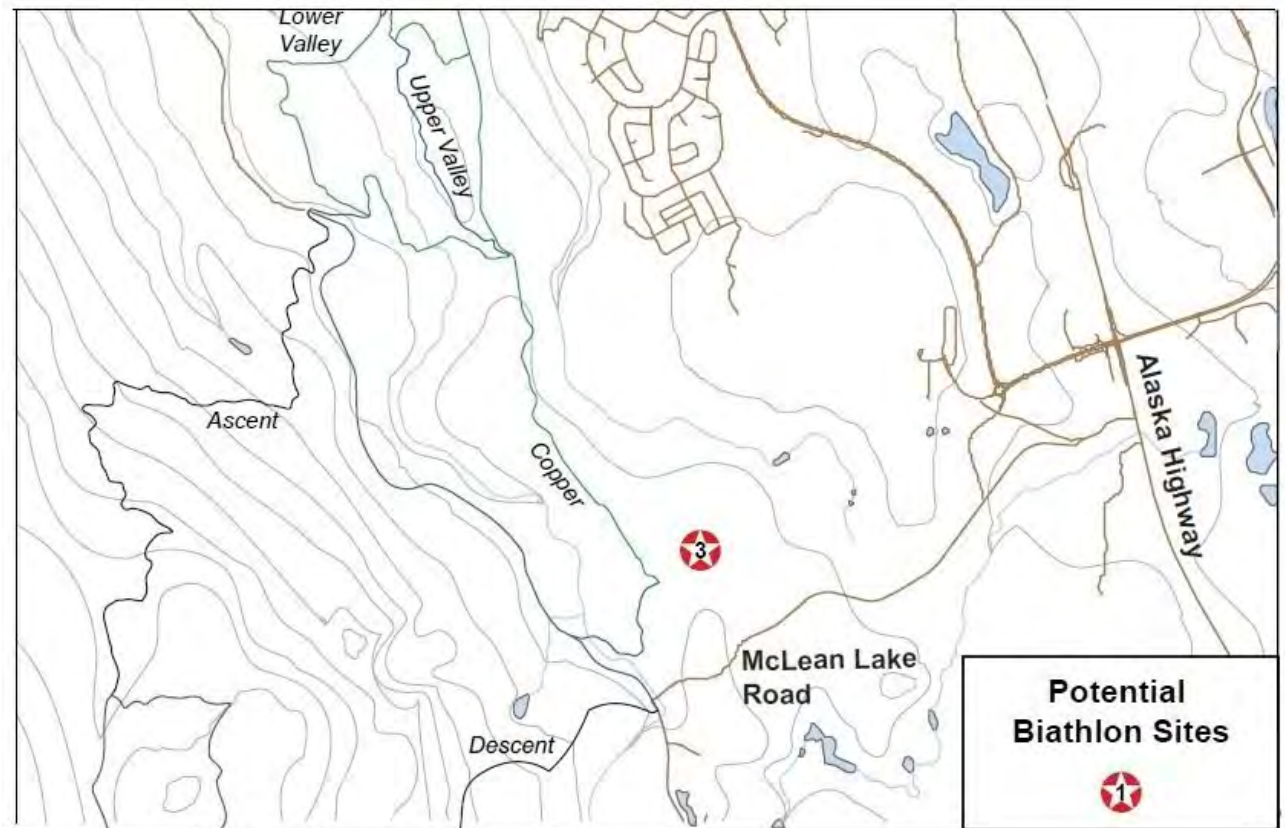
It should be mentioned as a preface that this assignment was not to design new courses for each site but to evaluate the potential at each site for a good biathlon course, range and stadium. Checking the terrain is usually done with maps and Google Earth. Once suitable terrain is found then Google Earth is a great tool to quickly do some sample courses that illustrate the potential of the terrain. These are strictly for conversational purposes only and not meant to be an actual design. Since Google Earth was not accurate to within better than 25% anywhere, creating sample courses fell by the wayside in an effort to not grossly exceed the time allotted to the project.

By checking the distance on Google Earth and then counting contours at each site I was, however, able to evaluate each site's potential and give some general notion of where the best terrain for the courses lay. I did not go through the process of making sample courses at the best sites.

Fortunately, Grant did this and I have included them as examples of courses that would work for the various sites. Of course, any real course design meant for more than discussion needs to be on the ground with actual readings taken physically not just virtually.



Map of the New Sites 1, 2, 4, 5, 6, 7



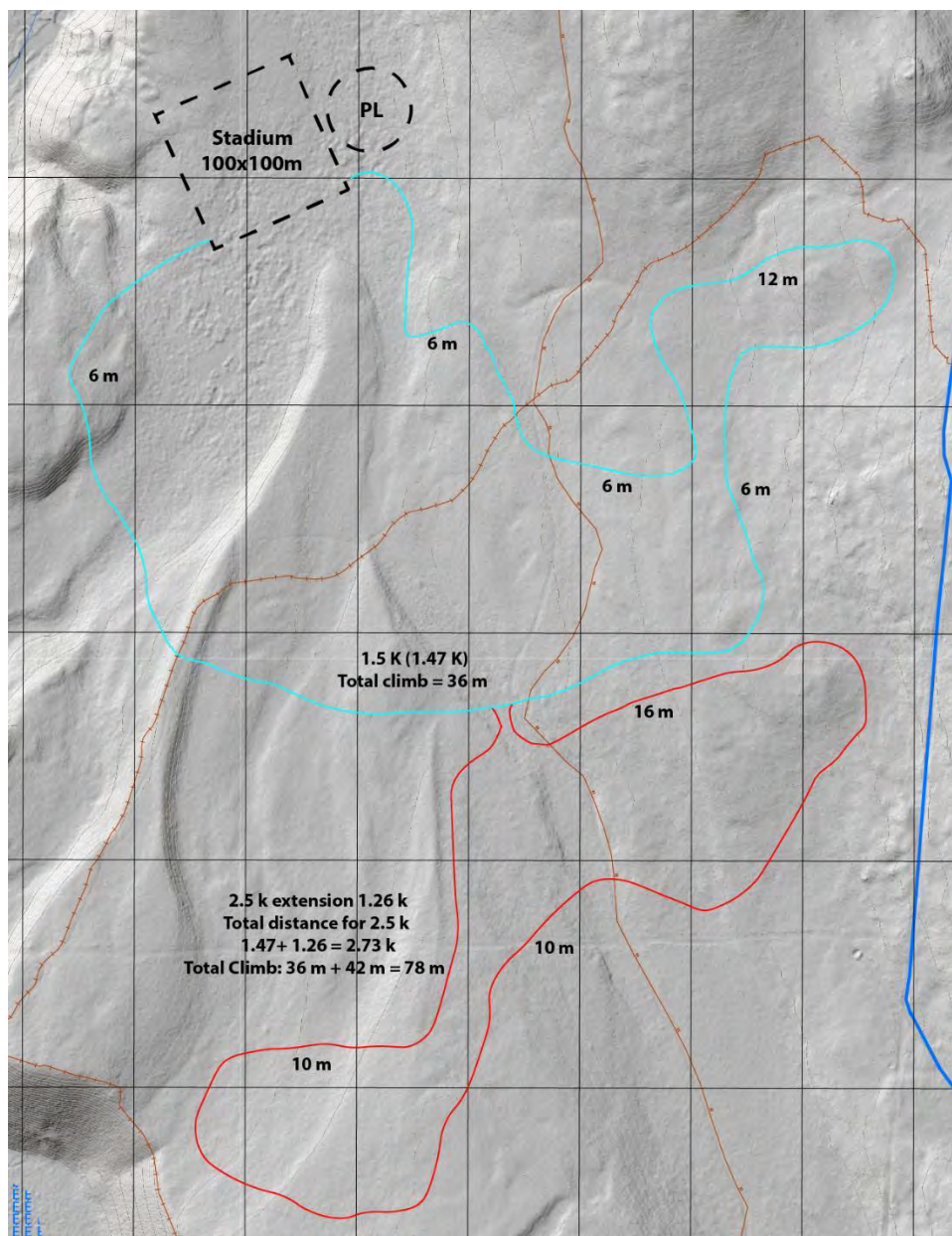
Map of New Site 3

Site Evaluation

Site 1: A stadium design would likely be a horseshoe stadium open on the right or east side. There appears to be plenty of terrain for courses, but this site could need a fair amount of cut and fill work to create a level stadium of approximately 120m x 120m. One negative is that this site almost certainly would have a downhill approach into the range. There does not appear to be any natural backstop for the range so a berm would have to be constructed. The current ski trail, World Cup 10k, would be disrupted by new biathlon loops.

Site 2: Similar to site 1, a stadium design would either be horseshoe stadium open on the east side or an open stadium with the courses making clockwise loops south of the stadium with a flat arrival at the stadium/range after a short jog to the west, avoiding dropping off the bench. Most of the terrain is quite suitable and located to the east and south of the stadium area. There appears to be some wetland in the stadium area, and the range is not particularly anchored to physical feature or backstop. Berms would have to be built.

This site has some of the best terrain for biathlon courses and designing courses here should not be difficult. After our discussions, Grant spent some time paper-designing a stadium with 1.5km and 2.5km loops on the lidar maps that show the 1 m contours. This is a great example of what is possible at this site. There should be no difficulty in creating a stadium/range and courses that meet IBU specifications.



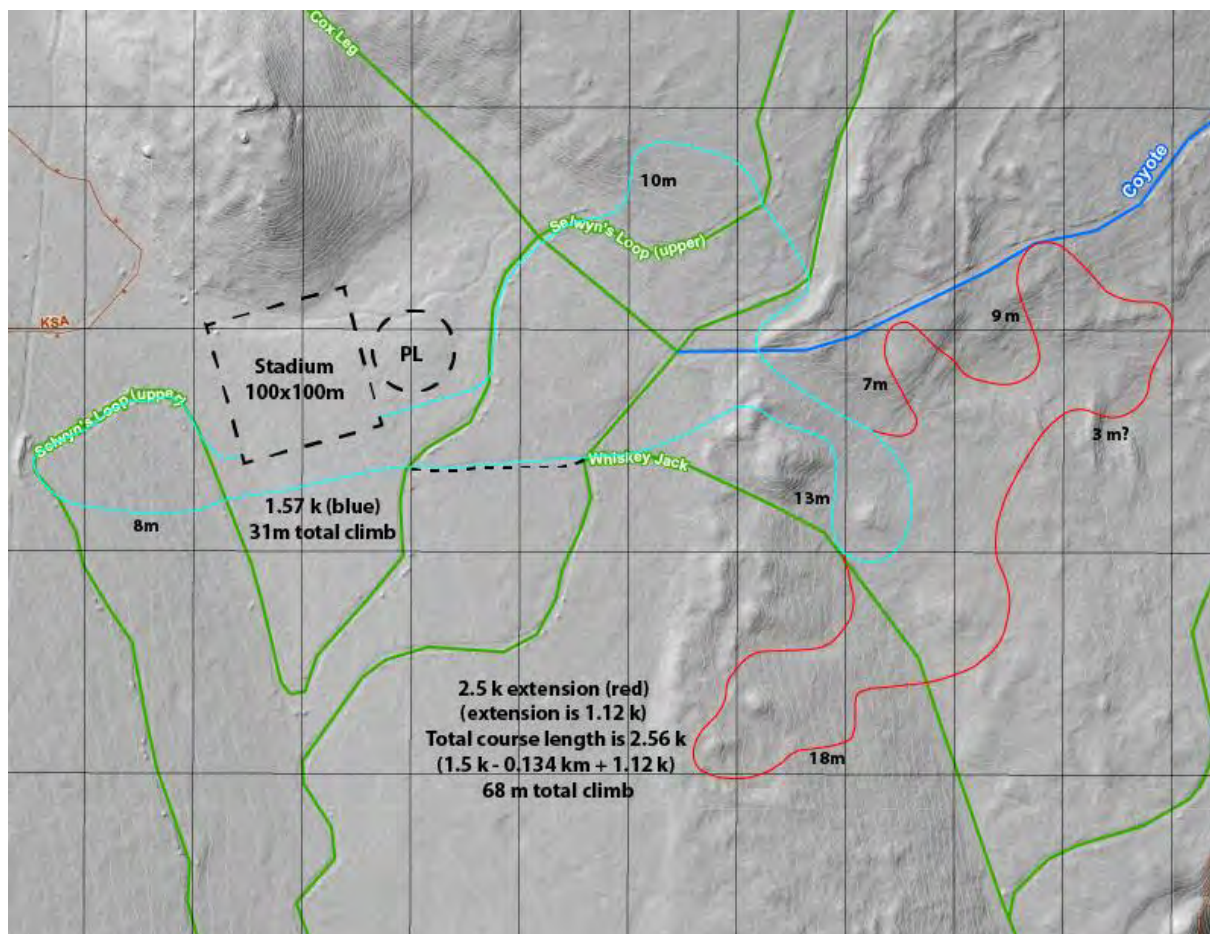
Site 3: Site 3 is located just north of an existing gravel pit, has no range backstop, has potential wind and dust issues and was eliminated early on in the discussions.

Sites 5,6,7: Of the 3 sites it was decided at an early meeting that I should pick the best of the trio and this is site 6. The range would be built into the hill that is just west of Cox Leg trail. There is a good backstop and anchors the range and stadium perfectly. The majority of the terrain is to the east so the stadium configuration would be horseshoe open to the east. The west end of the horseshoe could be extended westward to make the course loops ski clockwise and give the feel of an open ski-through stadium. The approach to the range can be a gradual uphill rising with the terrain using part of the existing Selwyn's.

While the terrain is fairly gradual, there is enough relief to be able to meet the vertical requirements, although it might mean being creative and using several little bumps and humps to gain 2m here and 3m there to meet the specifications. This could also make for some fun "roller coaster" or "camel hump" skiing. In any case it is easier to look for more vertical in a course on gradual terrain than it is to try to smooth out a course that has too much vertical because the surrounding terrain is very steep. This site should lend itself easily to the design good courses for biathlon.

Grant has done some sample courses on the lidar maps. While the 2.5km is 2m short of the requirement, I think there is at least 5m of more climb than the 31m noted in the 1.5km loop as well as a few untapped meters in the 2.5km. I would be inclined to move the range more westward so there might be less cut and fill. This would mean shooting more north west than due north.

From a sport perspective this is my favorite site because of the good range location and the easy gradual terrain for the courses. I think the courses here could be designed so they meet the IBU requirements and also so that recreational skiers would enjoy skiing them as well.



Biathlon Yukon Grey Mountain Road Site: I received several plan maps from Zoë and from Bill. I also was given access to a data sheet of the gps data collected for the elevations and length of the courses. Similar to the other sites, Google Earth was not accurate enough to be of any use. Without Google Earth and confirmed plan maps that match the profiles it was impossible to independently review the course data.

Based solely on the data sheet of elevations and length, I found that the 1.5km and 2.5km meet both vertical and distance IBU requirements, but the 2.0km is at least 70 m short and at the very edge of the IBU requirement of 55m total climb. From the maps, it appears there is ample opportunity to find the another 100m in length and 5m more of climb to place the loop comfortably within the specifications. There was no data to evaluate for a 3.0km, 3.3km or 4.0km loop.

IND Men	MASS Men	PUR Men	SPR Men	REL Men			
	IND Women	MASS Women		SPR Women	PUR Women	REL Women	PUR YW
20 km	15 km	12,5 km	10 km	7,5 km	10 km	6 km	1,5 km

1	-20	-20	2533		2533	1884	1884	1555
2			2553		2553	1904	1904	1575
3			2553		2543	1904	1894	1575
4			2553			1904		1575
5	-10	-10	2543			1894		1565

L	-30	-30	12735	0	7629	9490	5682	7845
---	-----	-----	-------	---	------	------	------	------

MC								
TC loop			76		76	55	55	50
TC Course	0	0	380	0	228	275	165	250

Tolerance (- 2%, +5%)

19600	14700	12250	9800	7350	9800	5880	7350
20000	15000	12500	10000	7500	10000	6000	7500
21000	15750	13125	10500	7875	10500	6300	7875

TC	550 - 800	400 - 600	350 - 500	270 - 405	200 - 300			150 - 300
		400 - 600	350 - 500		210 - 300	275 - 400	165 - 240	150 - 300

In general, the terrain is nicely suited to skiing and the current courses look like they would indeed be fun to ski. I suggested that the lake portion of the courses are not suitable for a higher level facility because of their unreliable snow conditions, not to mention that they would be difficult to measure with a wheel in the summer. 😊

Bill mentioned there was quite a bit of work to be done to bring the facility up to meet the standard for a Canadian Championship. Some items mentioned were widening the trails to at least 6m of skiable surface width, making sure no grades are steeper than 25%, and widening the stadium to accommodate all formats of competition starts and finishes. It appears that there is enough space to accomplish these tasks, it will just take work and money. While renovations are under way it is important to think about athlete, coach and official pathways through the stadium area. During major competitions walking across the competition course while the competition is in progress may not be appropriate.

Thought should also be given to how athletes and coaches will access the start and finish areas for all competition formats from their wax cabins. In addition, attention should be paid to the locations of storage areas, competition management buildings and timing rooms so they work well for major competitions and are also useful (maybe multi-use) for “normal” training days- summer and winter. You only get one chance to build it right, so take the time to plan and think through all the uses and configurations.

Max Saenger

Submitted to Zoë Morrison for distribution

April 30, 2021

BIATHLON LOCATION FEASIBILITY STUDY

Appendix B – Max Saenger Report

Appendix B – MAX SAENGER REPORT



Message to Biathlon Yukon Board from WCCSC Board and CCY Board

December 16, 2020

Cross Country Yukon and the Whitehorse Cross Country Ski Club recently became aware of potential investments by Yukon Government in the Biathlon Yukon facilities and trails. We understand that these investments may total close to 2 million dollars. This would constitute the single largest investment in Nordic skiing in Yukon's history.

By resolution, the Boards of both our organizations have indicated a wish to learn more about Biathlon Yukon's projects and a desire to discuss with Biathlon Yukon the possibility of conducting a feasibility study to explore whether it would be possible to develop biathlon trails and facilities at the WCCSC.

As you know, our memberships have significant overlap and BY's athletes spend much of their time training at the ski club and within the programs offered by the club or Cross Country Yukon. Because of this overlap, we believe that it may be in the interest of the members of all organizations to conduct a due diligence exercise before governments make a large and historic investment in Nordic skiing in Whitehorse. We are concerned that an investment of the proposed size might cement the existing separation of trails and facilities for generations and result in a lost opportunity for synergy, efficiency and excellence on an ongoing basis.

We believe there may be significant benefits for all organizations, including:

- shared grooming and snowmaking resources, and greater ability to pool resources to mitigate and adapt to climate change;
- expansion and improvement of trails to better serve our growing memberships, including in early/late season conditions;
- access to shared infrastructure for hosting major competitions (as is standard for Canada Games);
- easier access to trails and facilities for biathletes (bus, walk bike, ski);
- improved ability for athletes to develop abilities in both sports from a young age and grow the pool of Nordic athletes in Yukon overall;
- sharing of coaching services and the potential to increase our athletes' excellence in both sports;
- increased consolidation of sport users into the Mt. Macintyre recreational area toward developing a regional recreation park;
- presenting a common front to government when seeking funding to improve facilities (Mt. Sima, with 5 separate sport bodies is an example).

The Whitehorse Cross Country Ski Club has recently published its 2020 to 2022 Strategic Plan. This Plan involved the largest engagement of members by a non-profit in Yukon's history. There were over 400 responses and 35 stakeholder interviews, including with

Biathlon Yukon). A notable result from this survey is that our membership would like to see a greater connection and integration of biathlon with the ski club community. This objective is now clearly reflected in the ski club's strategic plan.

We believe it is essential, with the 2027 Games fast approaching, that we meaningfully explore the feasibility of co-location. A preliminary attempt to explore the concept was made for the 2007 Games, but was quickly abandoned due to organizational and interpersonal conflicts. Many in the Whitehorse ski community still regret this missed opportunity. We would like to ensure we do not miss this chance again, which comes only once in a generation.

Our proposal is simple: our organizations would jointly select a professional firm (e.g. engineering/planning consultants) to conduct a feasibility study on potential locations for biathlon facilities and trails at the Mt McIntyre Recreation Area, within or attached to the WCCSC network. The terms of reference would be established by the three organizations. After the report is finalized, each organization could weigh the pros and cons to determine for itself whether the concept is worth pursuing any further.

Our organizations are prepared to make a financial contribution toward this work. We would also ask Yukon Government Sport and Recreation Branch or the Community Development Fund for financial support.

Should the project be deemed not feasible, we would of course offer our continued support to Biathlon Yukon and look forward to deepening our partnerships with your organization in other ways.

Jean-Paul Molgat
President, Whitehorse Cross Country Ski
Club

Dominic Bradford
President, Cross Country Yukon