
6.0 ENVIRONMENTAL ASSESSMENT METHODOLOGY

6.1 Overview and Approach

The environmental assessment methodology to be used has been developed to satisfy the regulatory requirements of both CEAA and the British Columbia Ministry of Environment. The methodology is focused on environmental components of greatest concern to potentially affected parties. In general, the methodology is designed to:

- focus on issues of greatest concern;
- address regulatory requirements;
- address issues raised by the public and other stakeholders;
- integrate engineering design and mitigation and monitoring programs into a comprehensive environmental management planning process; and
- integrate a cumulative effects assessment into the overall assessment of residual environmental effects.

The environmental assessment methodology includes an evaluation of the potential effects, including cumulative effects, of each Project phase (e.g., construction, operation and decommissioning) as well as malfunctions and accidents, with regard to valued components (VCs). Project related effects are assessed within the context of temporal and spatial boundaries established for the Project. The evaluation of potential cumulative effects with regard to other projects and activities includes existing, approved and proposed activities that will interact temporally or spatially with the Project.

6.2 Guidance from CEAA and BC Parks

Guidance material from the Canadian Environmental Assessment Agency and BC Parks has been utilized for this environmental assessment, including:

- Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects (CEA Agency 1994);
- Addressing Cumulative Environmental Effects (CEA Agency 1994)
- Cumulative Effects Assessment Practitioners Guide (Hegmann et al 1999)



- BC Parks Impact Assess Process Users Guide (MELP 1999)

The methodology and criteria described in these guides has been followed to identify effects on protected area values that may be associated with project activities, evaluate the significance of the effects, determine mitigation measures and assist with making decisions on whether or not the project should proceed. The steps described in the BC Parks Impact Assessment process have been followed. The process is comprised of four basic parts:

1. Screening for location action specific effects;
2. Screening for cumulative effects;
3. Audit record; and
4. Decision statement.

6.2.1 Screening for Location Action Specific Effects

This step is completed by the proponent and utilizes the BC Parks Screening Matrix and the BC Parks Significance Matrix. The Screening Matrix is used to identify components of the Project that result in interactions with the identified valued components. The Significance Matrix is used to identify all the individual effects that may result from interactions identified in the Screening Matrix and helps to determine their significance.

6.2.2 Screening for Cumulative Effects

This step is completed by the proponent and utilizes the BC Parks Cumulative Effects Screening Matrix. A cumulative effects assessment is completed to ensure that the incremental effects resulting from combined influences of various projects and activities are considered.

6.2.3 Audit Record

The Audit Record provides a permanent record for all decisions made throughout the screening and assessment process and is completed by the proponent. The record permits review and scrutiny of the assessment by BC Parks, other agencies, technical experts, First Nations and the public. According to BC Parks (MELP 1999), the Audit Record should include the following:

- the rationale used in selecting each value or VC;
- any justification, data, calculations or assumptions used in the ranking of interactions (e.g., low, moderate, high) and the significance of local and cumulative effects;



- identification of any action components, mitigation, or design features that will influence the extent of significance of the effects;
- any additional measures required to mitigate effects that are determined to be significant;
- references and personal communications; and
- an assessment of the reliability of the data, while considering the source, date, confirmation of data, applicability of data and the sample size use.

6.2.4 Decision Statement

Under the BC Parks Impact Assessment process, the Decision Statement is completed by the BC Parks assessor who is required to review the environmental assessment report and make a decision regarding the proposed project. One of the following decisions will be made:

1. The project is approved as proposed with the necessary conditions and mitigation;
2. The project is approved with stated minor amendments;
3. Major amendment(s) are required to the application and further information is required from the proponent before a decision can be made;
4. A comprehensive impact assessment (Level 3, Full Impact Assessment Report) of the proposed project is required before a decision can be made; or
5. Approval is denied due to unacceptable environmental, social or economic consequences of the proposed project.

If major amendments are required, the proponent should ensure that the proposed changes to the action are adequately described and documented. The BC Parks district manager will review the Decision Statement and provide final approval.

Canadian Heritage will also provide its decision within a screening report. The decision will be based on Subsection 20(1) of *CEAA* that states:

20. (1) The responsible authority shall take one of the following courses of action in respect of a project after taking into consideration the screening report and any comments filed pursuant to subsection 18(3):



(a) subject to subparagraph (c)(iii), where, taking into account the implementation of any mitigation measures that the responsible authority considers appropriate, the project is not likely to cause significant adverse environmental effects, the responsible authority may exercise any power or perform any duty or function that would permit the project to be carried out in whole or in part;

(b) where, taking into account the implementation of any mitigation measures that the responsible authority considers appropriate, the project is likely to cause significant adverse environmental effects that cannot be justified in the circumstances, the responsible authority shall not exercise any power or perform any duty or function conferred on it by or under any Act of Parliament that would permit the project to be carried out in whole or in part; or

(c) where

(i) it is uncertain whether the project, taking into account the implementation of any mitigation measures that the responsible authority considers appropriate, is likely to cause significant adverse environmental effects,

(ii) the project, taking into account the implementation of any mitigation measures that the responsible authority considers appropriate, is likely to cause significant adverse environmental effects and paragraph (b) does not apply, or

(iii) public concerns warrant a reference to a mediator or a review panel,

the responsible authority shall refer the project to the Minister for a referral to a mediator or a review panel in accordance with section 29.

6.3 Screening Matrix and Determination of Assessment Area

The Screening Matrix is used to identify components of the action that result in interactions with the values (i.e., VCs) identified during the pre-screening process. The Screening Matrix involves four steps:

1. Identification of project phases;
2. Identification of environmental and social values (i.e., VCs);
3. Identification of project activities; and
4. A ranking of interactions.



Each of these steps is described in detail below. Prior to screening the Project interactions, the boundaries for the assessment area determined.

6.3.1 Determination of Assessment Area

The spatial and administrative boundaries defined for the environmental assessment (i.e., the Project Assessment Area) will include the development area, and lands immediately adjacent, that may be affected by the project. Watercourses and surface water bodies within 200 m of the project activities will be considered within the spatial boundaries (Figure 6-1).

The temporal boundaries of the project include the construction (approximately 9 months in total from 2006 to 2009), operation (2 months) and decommissioning (3 months). The construction phase will occur during the summer seasons of 2006 and 2007 for the permanent facilities and in the summer season of 2009 for the temporary facilities.

The operation phase will commence in January of 2010 with the final preparations before the Games period. The Games period will be from February 12 – 28, 2010. Events at the Cypress Venue will be held on 12 days during the Games period. The proposed schedule for the competitions is provided in Table 6-1.

Table 6-1 Proposed Cypress Venue Competition Schedule.

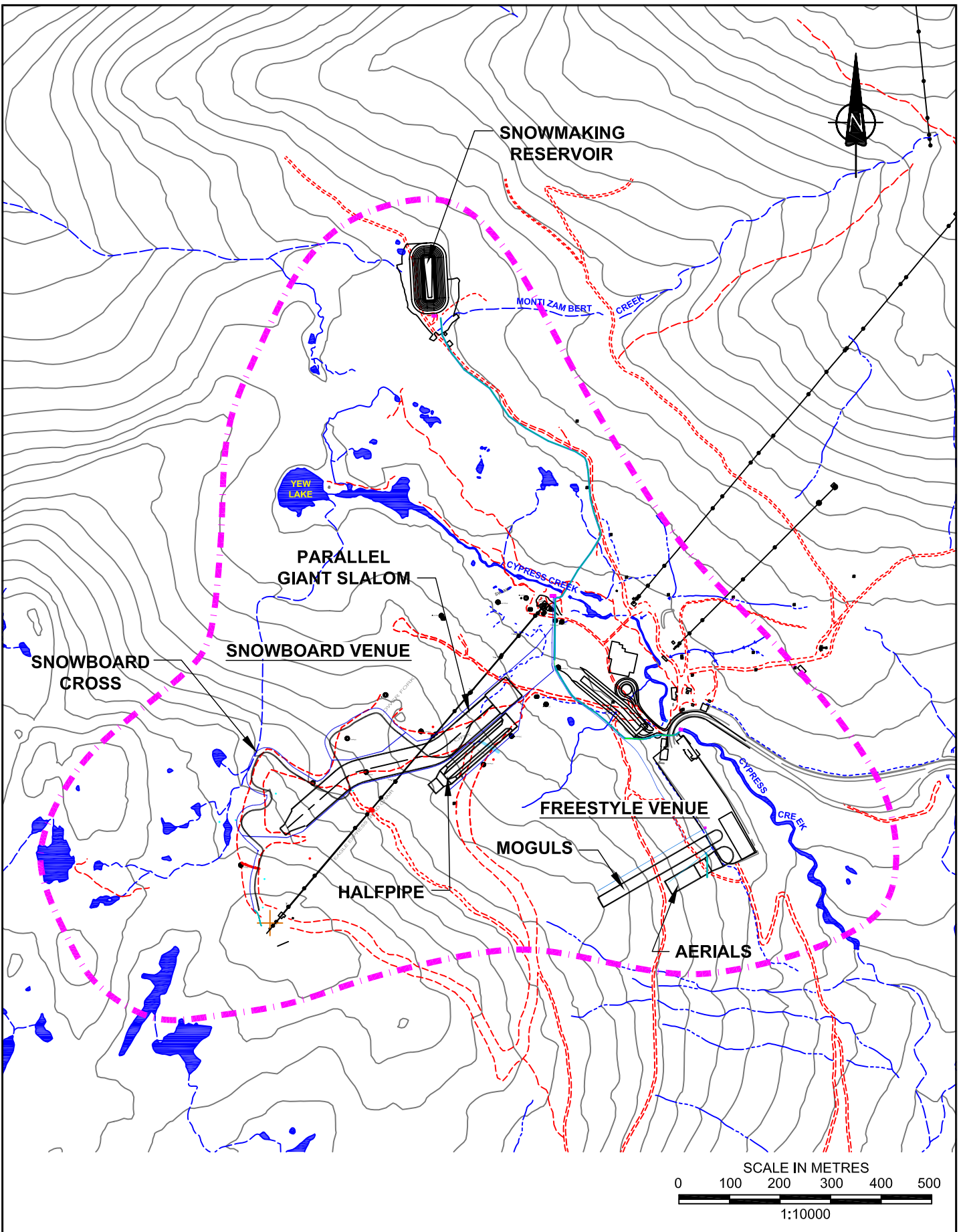
Event Day	Date	Time	Freestyle	Snowboard
Day 1	Fri, Feb 12	No competition events scheduled		
Day 2	Sat, Feb 13	09:00-10:00	Moguls – Women Qual.	
		12:00-13:00	Moguls – Women Final	
Day 3	Sun, Feb 14	10:00-11:30		SBX – Men Qual.
		12:00-14:30		SBX – Men Final
Day 4	Mon, Feb 15	09:00-10:00	Moguls – Men Qual.	
		12:00-13:00	Moguls – Men Final	
Day 5	Tue, Feb 16	10:00-13:00		SBX – Women Qual.
		13:00-14:30		SBX – Women Final
Day 6	Wed, Feb 17	No competition events scheduled		



Event Day	Date	Time	Freestyle	Snowboard
Day 7	Thu, Feb 18	15:30-17:30		Halfpipe – Women Qual.
		18:30-19:30		Halfpipe – Women Final
Day 8	Fri, Feb 19	15:30-17:30		Halfpipe – Men Qual.
		18:30-19:30		Halfpipe – Men Final
Day 9	Sat, Feb 20	10:00-11:00		PGS – Women Qual.
		13:00-14:30		PGS – Women Final
Day 10	Sun, Feb 21	10:00-11:00		PGS – Men Qual.
		13:00-14:00		PGS – Men Final
Day 11	Mon, Feb 22	No competition events scheduled		
Day 12	Tue, Feb 23	18:00-19:00	Aerials – Women Qual.	
Day 13	Wed, Feb 24	18:00-19:00	Aerials – Women Final	
Day 14	Thu, Feb 25	18:00-19:00	Aerials – Men Qual.	
Day 15	Fri, Feb 26	18:00-19:00	Aerials – Men Final	
Day 16	Sat, Feb 27	No competition events scheduled		
Day 17	Sun, Feb 28	No competition events scheduled		

The decommissioning of the temporary facilities will occur in the summer season of 2010.





CLIENT:	VANOC		
PROJECT No:	BCV50473	DATE:	09-Mar-06
DRAWN BY:	NP	CHECKED BY:	MD

PROJECT ASSESSMENT AREA
 CYPRESS VENUE - ENVIRONMENTAL ASSESSMENT
 CYPRESS PROVINCIAL PARK, BRITISH COLUMBIA

Fig No.
6-1

6.3.2 Identification of Project Phases

Pursuant to Section 15(1) of CEAA the Project has been assessed to include project phases, each of which may result in varying effects. These phases include construction, operation, and the decommissioning and legacy phase, as illustrated in Figure 6-2.

Figure 6-2 Estimated Project Construction, Operation and Decommissioning / Legacy Timeline

	2006				2007				2008				2009				2010				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
Construction of Permanent Facilities		■	■	■		■	■	■													
Construction of Temporary Facilities														■	■	■					
Test Competitions									■				■								
Recreation use	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			■	■	■
2010 Olympic Games																	■				
Decommissioning activities																			■	■	■

6.3.2.1 Construction

Some permanent infrastructure will be required for the Games and to support the long-term operation of the facility. Construction of infrastructure will require the delivery and temporary storage of heavy equipment.

Snowboard Facility: There will be limited vegetation clearing, primarily shrub and brush, required for the Snowboard facilities. Course regrading and halfpipe construction will employ conventional excavation machinery (e.g., cat 300 or equal excavator).

Freestyle Facility: Development of this venue will require the clearing of approximately two hectares of second growth forest. Grubbing of the area will be required to reduce impacts on design and operation of the runs. Some blasting of



the cliff adjacent the parking lot will be required in order to grade the course to meet FIS specifications.

Snowmaking and Associated Water Reservoir and Piping: Construction of the water reservoir will require some clearing of second growth forest, shrubs and brush. A portion of the area has been previously cleared from the operation of the old gravel borrow pit. The overall footprint for the reservoir will be less than two hectares. Materials excavated from the site will be used to construct the reservoir berm. Conventional excavation methods (e.g., cat 330 or similar equipment) will be used for the construction. The installation of snowmaking infrastructure will require trenching along existing roads and trails, the laying of pipe. Site preparation for the construction of the Creek, Main and Reservoir Pump Houses will also be required. The excavation and trenching for the low pressure water lines will occur on existing service roads and trails along the base of the mountain. The high pressure water lines will be installed on the edge of the ski runs.

Outdoor Lighting: Site preparation will be required for the installation of outdoor lighting towers. Final lighting configuration is unknown at this time but it is expected that a combination of permanent and temporary lights or all temporary lights will be installed. Construction of the permanent facilities is expected to commence in the spring of 2006 and conclude in the fall of 2007.

Temporary Facilities: Construction of the temporary facilities will occur in the spring, summer and fall of 2009. This will involve transporting the equipment to site, establishing temporary storage areas for the equipment and construction of the infrastructure. All temporary facilities will be constructed in areas that have been previously cleared or disturbed. Consequently, no additional clearing of vegetation or forest is required. These facilities will be decommissioned in the summer of 2010.

Baden-Powell Trail: Construction of the upper portion of the rerouted Baden-Powell trail will occur in the spring of 2006. Trail construction will likely employ small earth moving equipment and conventional hand tools.

6.3.2.2 Operation

The proposed Cypress Venue will use approximately 4.9 ha for the events, permitted parking areas, drop-off areas and general spectator seating. This area will be closed to the general public for skiing during the Games period (i.e., 12 days) and the ski operations will be taken over by VANOC. Most competition events will take place during a 2-3 hour period in the afternoon and early evening. Practice events will run throughout the day when competitions are not being conducted. Events will not be held at this venue during the Paralympic Games. Events will be held during the winters of 2008 and 2009 to test all aspects of the Games



infrastructure (e.g., course runs, ticketing, and safety). It is anticipated that Black Mountain will be closed to the public during these test events; however other sections of the ski area (alpine and Nordic) would remain open.

During the Games, the Cypress Venue will operate six days of Freestyle skiing events and six days of Snowboard events. The venue capacity is approximately 12,000 people, including, athletes, judges, volunteers and spectators, each day. Transportation of spectators to the events will comply with the Games Transportation Plan. This will involve employing shuttle buses to transport spectators to the venue from various pick up points within the Greater Vancouver area. A check point will be established along the Cypress Bowl Road so that only vehicles permitted by VANOC will be allowed up to the venue.

During the Games, bottled water will be available on site as a source of potable water for Games personnel, athletes and spectators. Additional water for use in facilities such as concessions and washrooms will be brought on site by water trucks. Temporary washroom facilities will be installed to accommodate spectators. Black and grey water will be removed daily by vacuum truck and transported off site to an approved waste disposal facility. During the Games recycling and composting will be maximized in efforts to move towards zero waste and to minimize waste at landfills. Recyclable materials and solid waste will be removed from the site daily and transported to an approved waste disposal facility.

The amount of water used for snowmaking will depend on the climatic conditions at the time of the Games. The snowmaking facilities will ensure adequate snow depth in excess of 1.0 m over the entire competition area. The snow making reservoir will be filled with water from Cypress Creek during periods of high water flows. The course runs at each venue will be prepared well in advance of the Games period.

6.3.2.3 Decommissioning and Legacy

Permanent facilities will remain in place and the responsibility for their operation will be taken over by CBRL after the Games are complete. Removal of the temporary facilities will commence in the spring of 2010. Materials will be salvaged and reused off site where appropriate. Materials that cannot be salvaged or reused will be transported off site to an approved waste disposal facility.

6.3.3 Identification of Project Environmental and Social Values

The second step to the Screening Matrix involves the identification of environmental and social values (i.e., VCs or Valued Components) from the pre-screening process, and any new VCs that were recognized during scoping consultation, the analysis of field study results and through professional judgment. Valued components that are



important factors to consider during the decision-making process are incorporated into the Screening Matrix. Documentation for VC justification is provided in the Audit Record. From the pre-screening and scoping process the freshwater, terrestrial, atmospheric, socio-economic and cultural environments were identified as important environmental and social components.

6.3.3.1 Freshwater Environment

A fish and fish habitat survey was conducted in 2002 (ENKON 2002) and a hydrological and water quality study was conducted in 2004 (Kerr Wood Leidal 2004). No additional baseline surveys were proposed for the freshwater environment. Using existing data, the following objectives have been identified for the freshwater component:

- determine if species at risk identified on Schedule 1 of the *Species at Risk Act (SARA)* or Red and Blue-listed species in British Columbia are vulnerable to project environmental effects and assess their use of habitat within the Assessment Area;
- identify basic water quality and quantity values for potentially affected streams;
- determine potential environmental and cumulative effects on fish species, hydrology and water quality within the Assessment Area; and
- propose strategies to minimize and mitigate potential environmental effects on fish and fish habitat, hydrology and water quality and quantity.

6.3.3.2 Terrestrial Environment

The terrestrial environment will focus on terrestrial wildlife, avifauna, vegetation and species at risk identified on Schedule 1 of the *SARA* or Red and Blue-listed species in British Columbia. The following objectives were identified for the terrestrial environment component:

- determine if species at risk identified on Schedule 1 of *SARA* or Red and Blue-listed species in British Columbia may be vulnerable to project effects and assess their relative abundance, distribution and habitat use within the Assessment Area;
- identify important habitats for species identified above including local and regional habitat, and if possible, seasonal use and movement corridors;
- determine potential environmental and cumulative effects on species identified on Schedule 1 of *SARA* or Red or Blue-listed species within the Assessment Area; and



- propose strategies to minimize and/or mitigate potential environmental effects on affected species and their habitats identified above.

Baseline terrestrial studies that have previously been conducted include:

- a bird survey (Robertson and Toochin 2001);
- two spotted owl surveys (Hilton et al. 2001 and ENKON 2004);
- Environmental Assessment of Proposed New Ski Trails – Cypress Provincial Park (ENKON 2002); and
- Preliminary Environmental Assessment of the Proposed 2010 Olympic Venues: Cypress Provincial Park (ENKON 2002).

Baseline surveys were also completed in 2005 to assist in the assessment of potential effects. These surveys included a nest survey, rare plant and community survey and vegetation mapping. The results of these surveys have been included in the assessment of potential effects. The following methodology was utilized for the baseline surveys:

Nest Survey

Since baseline surveys for birds were previously conducted within the Assessment Area, the objective of the nest survey was to confirm the presence/absence of nest for bird species listed under Section 34(b) of the British Columbia *Wildlife Act* (i.e., eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl) and species listed under Schedule 1 of *SARA* that may have been built since the last survey in 2004. A ground-based survey was completed in the Assessment Area. The presence of the birds listed above was documented by recording observations of individuals plus evidence of their presence including feathers, pellets, areas of fecal staining and vocalizations.

Rare Plant and Community Survey

The areas proposed to be cleared were surveyed during the peak growing season (July 2005) in order to document any at risk plant and natural vegetation communities. Initially, a search and review of all documented literature and file information relating to sensitive plant communities, plant species habitat requirements, distribution and abundance within the project area was conducted.

Vegetation Mapping

The plant species within the proposed areas to be cleared were recorded and mapped using a Global Positioning System (GPS). The proportion of plant species within the tree, shrub and herbaceous layer were documented. Results of this mapping will be used to supplement the preparation of the revegetation plan.



6.3.3.3 Atmospheric Environment

For the purposes of the assessment, components of the atmospheric environment that will be considered include: air quality, noise and viewshed. No baseline surveys were conducted for the atmospheric environment. Using existing information, the following objectives have been identified for the atmospheric component:

- determine if air quality parameters will be significantly affected from the construction, operation and decommissioning of the Project.
- identify noise levels as a result of construction and operation activities and the potential effect they may have on the valued components.
- determine if there will be a significant effect on the viewshed from habitat alteration and an increase in light pollution from the Project.

6.3.3.4 Socio-Economic Environment

As part of the environmental assessment, socio-economic effects will focus on the issues of recreation access and park use by the public. The following objectives have been identified for the socio-economic environment component:

- determine the number of recreational users by individual and user group;
- identify key periods (i.e., days of the week, time of day, season) of recreational use of the park; and
- document the pros and cons of the user groups with respect to the Olympic venue being built at the Cypress Venue.

6.3.3.5 Cultural Environment

Effects to the cultural environment will be assessed based on an archaeological overview assessment (AOA). The purpose of the AOA is:

- to assess the potential for archaeological sites in the project area; and
- to assess the need for further archaeological work in light of the proposed development plans, and the evaluation of archaeological potential.

6.3.4 Identification of Project Activities

All activities or disturbances that may be associated with the project phases must be reviewed as per Section 16 of *CEAA*, which states:



16.(1) Every screening or comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of the following factors:

- a) the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
- b) the significance of the effects referred to in paragraph (a);
- c) comments from the public that are received in accordance with this Act and the regulations;
- d) measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project; and
- e) any other matter relevant to the screening, comprehensive study, mediation or assessment by a review panel, such as the need for the project and alternatives to the project, that the responsible authority or, except in the case of a screening, the Minister after consulting with the responsible authority, may require to be considered.

Listed in column one of the Screening Matrix (Appendix A), the activities or disturbances are as specific as possible and are inventoried for each of the project phases (e.g., construction phase – clearing of second-growth forest).

6.3.5 Ranking Interactions

The interaction of project activities with valued components is ranked, within the Screening Matrix, as part of the initial screening process. This ranking determines the degree of possible interaction between each activity or disturbance and each of the identified valued components. According to the BC Parks Impact Assessment process (MELP 1999), the Screening Matrix has been completed by entering a ranking of **Low** (L), **Moderate** (M) or **High** (H) into each cell on the matrix. Where an interaction is considered beneficial a positive notation has been used (e.g., M+). To determine the ranking, for each interaction, ranking guidelines (Table 6-2) that best described the duration and magnitude under column A are cross-referenced to the geographic extent under column B to determine the degree of interaction. Definitions for duration, magnitude and geographic extent are also provided by the BC Parks Impact Assessment Users Guide.



Table 6-2 Ranking guidelines for interactions between activities and Values.

A	B			
Duration and Magnitude	Geographical Extent			
	Local	Regional	Provincial	National / International
Short-term and Low	L	L	M	M
Short-term and Moderate or High	L	M	M	M
Medium-term and Low	M	M	M	M
Medium-term and Moderate or High	M	M	H	H
Long-term and Low	M	M	H	H
Long-term and Moderate or High	M	H	H	H

Duration: The period of time required for a value component to recover from a disturbance caused by an activity, not the duration of the disturbance. For example, for biological species, the recovery time for a population to return to pre-action levels; or for a social component, when human use/appreciation is no longer affected by the disturbance. Duration can be rated as:

- Short-term:** less than 1 year
- Medium-term:** 1-10 years
- Long-term:** 11 years or more

Magnitude: The portion of the valued component that may be affected by an activity. For example, routing a trail through a large forested area may only affect a small percentage of the population of a common vascular plant; routing a trail close to a river may affect a larger portion of a plant population which is only found along riparian corridors. Magnitude can be rated as:

- Low:** less than 10 percent
- Moderate:** 10 percent
- High:** more than 10 percent



Geographic Extent: The geographic area that may be affected by the activity. For example, noise generated by a boat motor on a lake may adversely affect local recreational users, i.e., local extent; the effects of introduction of a noxious weed in the area of a rare plant may be felt at the provincial level, i.e., provincial extent. Geographic Extent can be defined as:

Local:	within the immediate action “footprint”
Regional:	within the larger area surrounding the action (e.g., watershed)
Provincial:	throughout BC
National/International:	outside BC

According to the BC Parks Impact Assessment process, all interactions ranked as **Moderate** or **High** in the Screening Matrix, require a rationale for the decision, which must be documented in the Audit Record. For interactions ranked as **Low**, the Audit Record should be used as appropriate to document any assumptions or provide qualifying evidence in support of decision. An interaction that does not contain at least one ranking of **Moderate** or **High** (i.e., those ranked as **Low**) are also considered to have a significance rating of **Low** (i.e., are screen out) and do not need to be considered further in the Significance Matrix. Interactions ranked as **Moderate** or **High** are further assessed within the Significance Matrix.

6.4 Significance Matrix

The Significance Matrix is a three step process used to identify and rank the significance of potential effects. Sections 6.4.1, 6.4.2 and 6.4.3 outline each of the steps involved in the Significance Matrix.

6.4.1 Identifying Potential Effects

The Significance Matrix is divided into the project phases (e.g., construction, operation, decommissioning). The valued components that may be affected by an activity or disturbance (i.e., those ranked as Moderate or High in the Screening Matrix) are carried forward. Under each activity or disturbance all the specific effects, both adverse and beneficial, that may arise are identified. For example vegetation removal or rock blasting may result in the following effects:



- Reduction in visual quality;
- Habitat loss;
- Changes in water quality or
- Potential increase in rate of soil erosion.

6.4.2 Ranking the Significance of Effects

Under the BC Parks Impact Assessment process the significance of each of these effects is determined by responding to a series of questions and/or by professional judgment. The questions are categorized according to whether they apply to Biological, Physical-Chemical or Socio-Economic valued components (Tables 6-3, 6-4 and 6-5))

Table 6-3 Ranking the significance of local effects on Biological Valued Components (e.g., wildlife, vegetation or habitat).

A	B			C
Questions	Significance Rankings			Conclusion
	Low (L)	Moderate (M)	High (H)	
1. How much of the valued component may be affected by the action? E.g., for habitat, how much of the productive capacity of the habitat may be affected?	<1%	1-10%	>10%	L if Low. If M or H, go to question 2.
2. How much recovery of the valued component could occur, even with mitigation?	Complete	Partial	None	H if High. If M or L, go to question 3.
3. How soon could restoration occur to acceptable conditions?	<1 year or <1 generation	1-10 years or 1 generation	>10 years or >1 generation	L, M or H



Table 6-4 Ranking the significance of local effects of Physical-Chemical Valued Components (e.g., water, air, soil).

A	B			C
Questions	Significance Rankings			Conclusion
	Low (L)	Moderate (M)	High (H)	
1. How much could changes in the valued component as a result of the action exceed the natural variability in the region or regulated levels?	<1%	1-10%	>10%	L if Low. If M or H, go to question 2.
2. How much recovery of the valued component could occur, even with mitigation?	Complete	Partial	None	H if High. If M or L, go to question 3.
3. How soon could restoration occur to acceptable conditions?	<1 year	1-10 years	>10 years	L, M or H

Table 6-5 Ranking the significance of local effects on Socio-economic Valued Components (e.g., human use, visual, artifacts).

A	B			C
Questions	Significance Rankings			Conclusion
	Low (L)	Moderate (M)	High (H)	
1. Could the effect on the valued component be of concern to administrative authorities, First Nations, the public or recreational users?	Little or no concern or change	Some concern or change	Substantial concern or change	L if Low. If M or H, go to question 2.
2. Could the effect be unacceptable to users even after the application of mitigation?	Acceptable to most people	Somewhat acceptable	Unacceptable to most people	L if Low. If M or H, go to question 3.
3. How soon could restoration occur to acceptable conditions?	<1 year	1-10 years	>10 years	L, M or H

The decision is documented by placing L (Low), M (Moderate), H (High) or U (Unknown) in the Significance Matrix. Where a value is not affected by a



disturbance the cell is left blank. The Audit Record explicitly states the rationale for all conclusions.

6.4.3 Mitigation

The last step in the Significance Matrix is documenting opportunities for mitigation. The type of recommended mitigation is documented in the Audit Record. Any residual effects, i.e., effect that are likely to remain a factor after mitigation, are addressed in the cumulative effects screening matrix.

6.5 Cumulative Effects Screening Matrix

Cumulative environmental effects have been considered pursuant to Section 16.1(a) of *CEAA* for likely future projects. According to the Reference Guide for Addressing Cumulative Environmental Effects (CEA Agency 1994) a cumulative environmental effect is defined as the effect on the environment which results from effects of a project when combined with those of other past, existing and imminent projects and activities that occur over a certain period of time and distance. In order for cumulative effects to be considered a residual environment effect must result from the project. It must then be assessed in combination with environmental effects from other projects and activities. If environmental effects of other past or future projects are not likely to act in combination then they are not included in the cumulative effects assessment of the project. Only those projects or activities that are very likely to occur (e.g., those within the government approval process or are very certain to occur) are to be considered in the cumulative effects assessment.

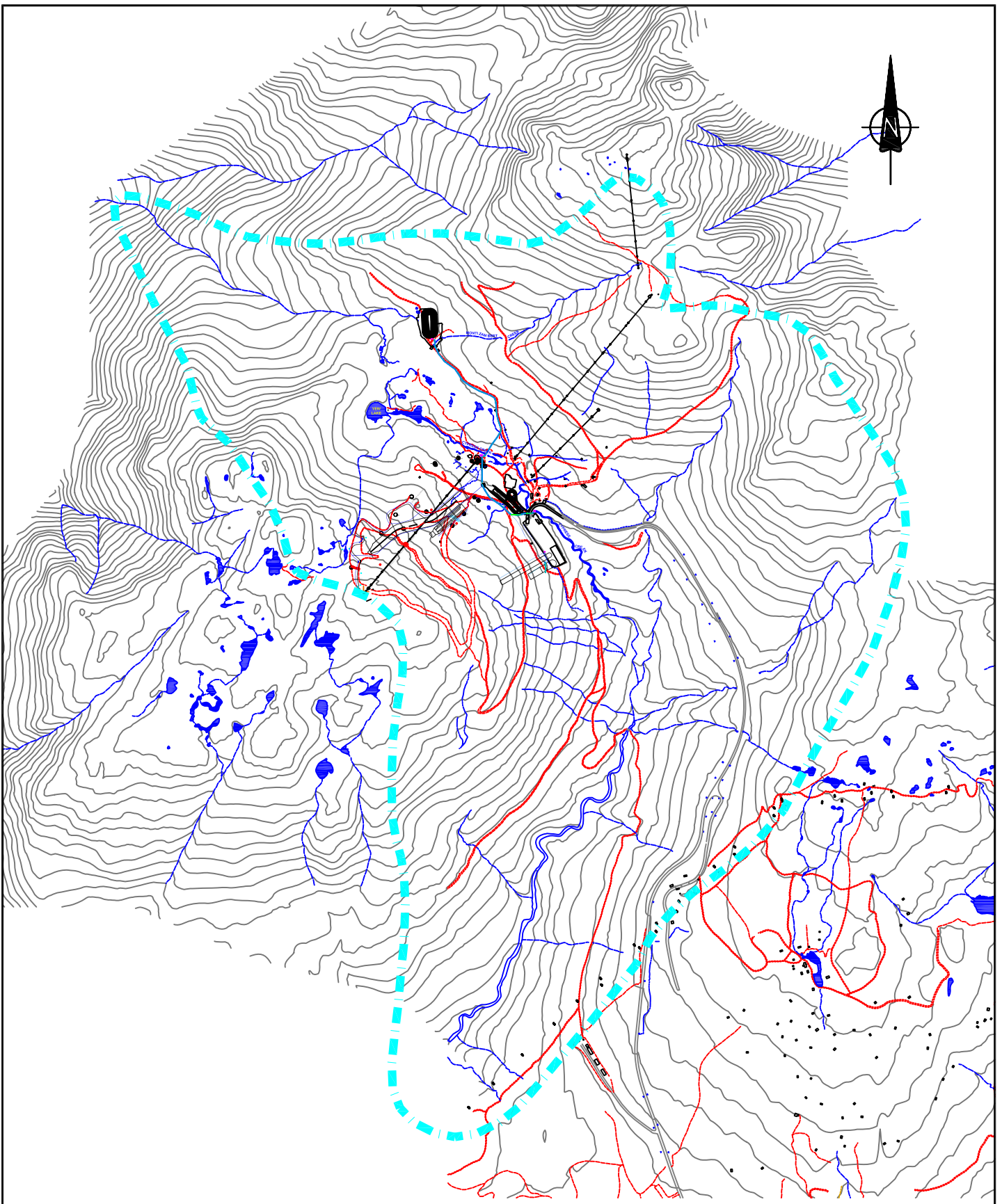
According to the BC Parks Impact Assessment process (MELP 1999), cumulative effects occur when two or more actions combine to result in an incremental effect that is greater than the effects from any single action. The assessment of cumulative effects is done to ensure that incremental effects resulting from the combined influence of various actions are considered. The combined cumulative effects may be evaluated as significant despite the fact that the individual effects taken singly may have been assessed as not significant. The following sections outline the process for screening cumulative effects.




6.5.1 Determination of Cumulative Effects Assessment Area

The assessment area for the cumulative effects includes that catchment areas for Cypress Creek and Montizambert Creek (Figure 6 3). This cumulative effects area was selected based on ecological limits (e.g., watershed and topographic features) and the requirements of the BC Parks Stage II environmental assessment process and is considered reasonable to address the potential extent of impacts to ecosystem components.





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	CLIENT: VANOC		CUMULATIVE EFFECTS ASSESSMENT AREA CYPRESS VENUE - ENVIRONMENTAL ASSESSMENT CYPRESS PROVINCIAL PARK, BRITISH COLUMBIA	Fig No.
	PROJECT No: BCV50473	DATE: 09-Mar-06		6-3
	DRAWN BY: NP	CHECKED BY: MD		

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6.5.2 Identification of Other Actions or Activities

As per the requirements of the BC Parks Impact Assessment process and *CEAA*, the other activities whose environmental effects have a reasonable likelihood of interacting with the environmental effects of the Project, usually as a result of similar activities or spatial or temporal overlap, are included within the Cumulative Effects Screening Matrix. For this assessment these other activities include:

- Historic development of the Cypress ski area on Black Mountain and Mount Strachan as per the Cypress Park Master Plan;
- Construction of the new day lodge; and
- Development of new ski runs and mountain bike park on Black Mountain, including the construction of the new high speed chairlift and upgrades to the Windjammer run.

6.5.3 Identification of Other Effects

The BC Parks Impact Assessment process has identified five ways in which cumulative effects may occur. These include:

1. Sensory disturbance – noise, light or smells from one activity may combine with similar disturbances from other nearby activities.
2. Contaminant transport – contaminants are emitted from one activity and travel through air or water to interact or combine with contaminants from other activities.
3. Habitat loss and fragmentation – habitat is destroyed and patches of remaining habitat become smaller and more distantly separated.
4. Viewshed degradation – the scenic or visual quality of the protected area is degraded by the combined visual impacts of two or more activities.
5. Experiential degradation – enjoyment of the park by visitors may diminish due to the perceived collective disturbances from many activities.

This step has been utilized to identify the environmental effects of other activities that may act cumulatively with the environmental effects of the Project.



6.5.4 Identification of Values

The valued components identified in the Significance Matrix, that are expected to be affected by a disturbance or activity of the project, are listed within the Cumulative Effects Screening Matrix.

6.5.5 Ranking Interactions

The degree of interaction between the effects attributable to the Project and the effects known or expected to result from each of the other activities are determined. This determination is based on the degree to which the effect on a valued component may be exacerbated due to the incremental effects of all activities. The ranking system, based on the BC Parks Impact Assessment process is as follows:

Low (L): It is unlikely that the cumulative effects should result in an incremental detrimental effect.

Moderate (M): It is likely that a cumulative effect will occur; however, the effect is expected to be only slightly detrimental and is mitigable over a few years.

High (H): A cumulative effect is likely and will probably be detrimental. The effect may or may not be mitigable over a few years.

Cumulative effects with a ranking of **Low** are considered not significant and conversely those with a ranking of **High** are considered significant. For those cumulative effects with a ranking of **Moderate** measurable standards or thresholds and/or professional judgment of the project team is used to determine if the effects were outside the range of acceptable conditions and significant or not significant. The decision-making process is documented in the Audit Record with a statement outlining the rationale behind the cumulative effects ranking.

6.6 Evaluating the Need for Follow-Up

As part of the environmental effects analysis, appropriate monitoring and follow-up programs are described where warranted. These programs may involve the implementation of adaptive management to address the sustainability principles. In developing a follow-up program, the outcomes of the Screening Matrix, Significance Matrix and Cumulative Effects Screening Matrix will help to focus important interactions, where there is a high level of uncertainty about environmental effects predictions, where significant adverse environmental effects are predicted, or in areas of particular sensitivity. The contribution of the Project to overall cumulative



environmental effects may influence decisions regarding the responsibility for monitoring of these effects.

