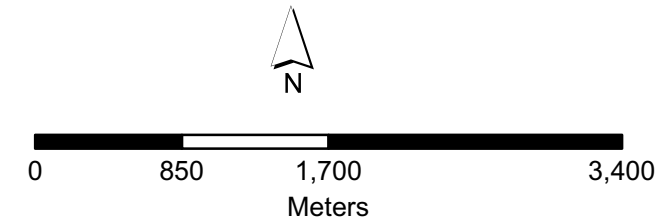


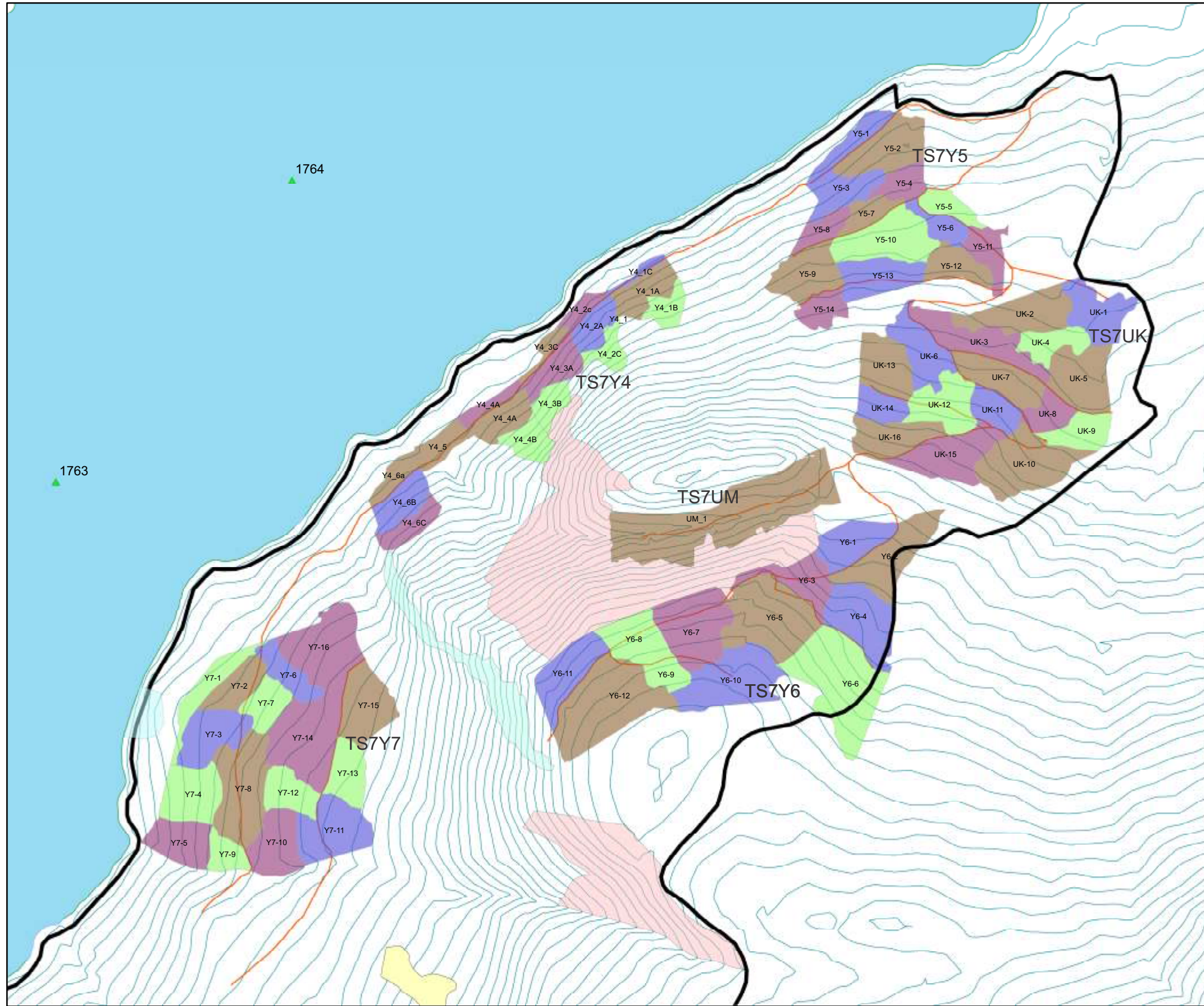
BC Timber Sales - Kamloops Business Area
Tshinakin Creek Integrated Visual Design
Phase 1 Partial Retention (light)
 prepared by
RDI Resource Design Inc
 February, 2013

- Rock2
- Tshinakin_Rock
- Tshinakin_Op_area
- RDI Entry Period**
- 1
- 2
- 3
- 4
- RDI_Roads_Phase_1
- Depletion_Op_Area
- FSP_OGMA_Op_Area
- GPS2
- GPS1
- AdamsLk
- LakePolys



Tshinakin Creek Integrated Visual Design - Phase 1 - Partial Retention (light)





**BC Timber Sales - Kamloops Business Area
Tshinakin Creek Integrated Visual Design
Phase 1 Partial Retention (light)
prepared by
RDI Resource Design Inc
February, 2013**

- Rock2
- Tshinakin_Rock
- Tshinakin_Op_area
- RDI Entry Period**
- 1
- 2
- 3
- 4
- RDI_Roads_Phase_1
- Depletion_Op_Area
- FSP_OGMA_Op_Area
- GPS2
- GPS1
- AdamsLk
- LakePolys

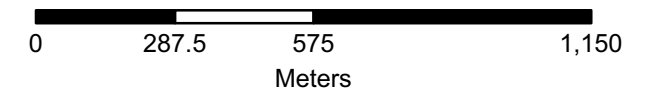
Tshinakin IVD Design Unit Scheduling by Entry Period

Entry Period	Area (ha)	Area (ha)	Area (ha)
	Main Blocks*	**CC Blocks	All
1	73	24	97
2	51	5	56
3	48	6	54
4	45	7	52
Total	217	42	259

*Main: TS7 - Y5, Y6, Y7, UK

**CC: TS7 - Y4, UM

Length of Entry Period (years) - to be determined



Contents

Page	
1	Cover Map
2	Detailed Map
3	Contents
4	Report 1
5	Report 2
6	Entry 1 VNS Overview
7	Entry 1 Simulations - All Viewpoints
8	Viewpoint 1768 - Entry 1
9	Viewpoint 1772 - Entry 1
10	Viewpoint 1773 - Entry 1
11	Viewpoint 1774 - Entry 1
12	Entry 2 VNS Overview
13	Entry 2 Simulations - All Viewpoints
14	Entry 3 VNS Overview
15	Entry 3 Simulations - All Viewpoints
16	Entry 4 VNS Overview
17	Entry 4 Simulations - All Viewpoints

Integrated Visual Design Planning Process

1 Introduction

RDI Resource Design Inc was contracted by BC Timber Sales, Kamloops Business Area to prepare an Integrated Visual Design for the Tshinakin Creek Operating Area. The 1518 ha operating area is located midway on the lower half of the east side of Adams Lake within the 6150 ha Visual Sensitivity Unit (VSU) 477, opposite from and just north of Agate Bay. The north end of the VSU wraps around Spillman Beach Marine Provincial Park on a separate landform. The large VSU has been assigned the Visual Quality Objective (VQO) of Retention (R). The KLRMP VSU is actually a composite of 4 MFLNRO VSUs (557, 1875, 1880, 1884), all assigned R (under FRPA 181: DM 03 July 2003). The portion of the KLRMP unit behind Spillman Beach on a separate landform made known as VSU 557 in the MoF inventory is isolated from the operating area. The operating area sits within only two of the original VSUs: 1875 and 1880, these having a total area of 3809 ha. VSU 1875 has a Visual Sensitivity Class (VSC) of 3 while VSU 1880 is VSC 2. The operating area is concentrated on the lower parts of the landforms (in the western half of the VSUs), occupying just 28% of the two VSUs combined, the greatest proportion being within VSU 1880.

Retention means an alteration of a forest landscape resulting from the presence of cutblocks or roads, such that when assessed from a viewpoint that is representative of significant public viewing opportunities, the alteration

- (a) is difficult to see,
- (b) is small in scale, and
- (c) has a design that mimics natural occurrences.

The VQO of Retention assigned to VSU 477 is unlike several other landforms on the east side Adams Lake and along the entire south-west side of the lake which has the less restrictive VQO of Partial Retention. The portion of the VSU east of the park sits on a distinct landform, separated from the main landform and, as such has not entered into the analysis, and sits well outside of the operating area.

Recognizing the economic, silvicultural, and operational challenges of operations within a Retention VQO area, BCTS opted to request a slightly more lenient objective - that of Partial Retention (light) - one that would allow some more flexibility for operations while achieving visual conditions approaching Retention. While the request had not been approved at the time of preparing this report, it was decided to proceed with an examination of "Partial Retention (light)" in Phase 1 of the operating area (Blocks TS7Y4, Y5, Y6, Y7, UK, and UM), primarily to utilize the remaining budget in the 2012 fiscal year's contract with RDI.

The intent of an Integrated Visual Design Plan is to provide long-term direction for the development of the timber resources for an area of 5,000 hectares or less in a manner consistent with higher-level planning direction and respectful of other resource values. Integrated Visual Design employs a process that considers all resource values simultaneously in an integrated fashion. It is applied in both the plan and perspective view so as to address visual quality concerns while optimising harvest opportunities in visually sensitive areas. A procedural document for IVD can be found at:

http://www.for.gov.bc.ca/hfp/values/visual/Publications/legislation_policy/FIA-Standards-Final.pdf.

According to the source document, an Integrated Visual Design plan must:

1. Define the visual design unit.
2. Establish management objectives to be achieved.
3. Assemble all available resource inventory information.
4. Conduct a resource analysis, which must include visual force and land feature analyses.
5. Develop a concept design
6. Produce a detailed design
7. Test the design through visual simulations

The Tshinakin Creek IVD had the following planning steps:

1. The Tshinakin Creek Operating Area was as defined by BCTS.
2. The management objectives were to produce an IVD plan capable of meeting the established VQO of Retention over the short and longer term, while meeting other key resource management and operational objectives.
3. All available resource inventory information was acquired from BCTS. This information included:
 - o Mature Forest Available
 - o Depletion
 - o FSP 2004 OGMA
 - o Steep Slopes >60%
 - o Kamloops VQOs
 - o Operating Area
 - o Contours
 - o "Existing" block plan
 - o VRI Forest Cover
 - o BCTS roads
 - o No information was received about wildlife, winter range, etc.

In addition, panoramic photography was taken by RDI from viewpoints set by RDI to capture the full operating unit from points mid-lake and along the west side of the lake. The boat was provided by BCTS. Additional viewpoints/photo-points were located along the Forest Service Road on the west side of the lake.

The data was assembled in ArcGIS and in Visual Nature Studio (VNS):

- o Clip data for Operating Area
 - o Build terrain model TIN and 20m GRID from contours
 - o Assign viewpoints from GEO-tagged imagery from lake
 - o Build the Visual Nature Studio (VNS) 3-D Model:
 - o Build VNS DEM from ArcGRID.
4. The resource analysis was conducted in both ArcGIS and VNS
 - o Import "available" forest, assign heights from HEIGHT_PROJ
 - o Import Constraints and Opportunities; VSU
 - o Import "Existing" block plan
 - o Prepared a resource analysis, including visual force and land features.

1. A concept plan was developed for the "existing" block plan to meet a "Partial Retention (light)" VQO. The concept plan for Phase 1 provides the foundation for a discussion of the application and implications with BCTS for subsequent phases to be completed.
2. A detailed plan of design blocks and roading suggestions for Phase 1. The plan envisaged and tested a 4-entry approach over time, providing for visually effective green-up to occur in adjacent blocks as the progressed from entry to entry. The number of years allocated for each entry has been left to be determined, though green-up was added at the rate of 5m per entry period in the model. The plan of design blocks stops short of being a field-ready logging plan, but will provide much guidance and advance implications on visual quality to those charged with the actual field planning.
3. The concept and detailed plans were tested iteratively using Visual Nature Studio visual simulation techniques throughout the planning steps described above.

2 Tshinakin Creek Integrated Visual Design - Phase 1 Procedures

BCTS encouraged RDI to firstly examine the potential of the "existing" block plan to meet the Retention VQO. The blocks had been identified some years earlier. The blocks had the following harvest methods, silviculture systems and identifier numbers:

Cable-based, clearcut: TS7Y4 and TS7UM
Ground-based, partial cut: TS7Y5, TS7Y6, TS7Y7, TS7UK

The findings of that approach were provided in a previous document. While visual quality expectations were considered paramount, the interests of silviculture, ecosystem health, biodiversity, and operational requirements were, by necessity, also considered to be integral to this plan. The large scale and concentration (pattern) of the blocks required that an innovative approach be devised for the conceptual Phase 1 Partial Retention (light) IVD plan.

The comparative visual effects of the 4 entry periods were examined in renderings of each from 4 viewpoints along the west side of Adams Lake (viewpoints 1768, 1772, 1773, and 1774). The Phase 1 blocks are oriented from west-facing to north-facing, encouraging deep landform shading and shadows casts across mainly small openings for most if not all of the day. The shadow casting procedure was not activated in the model, thereby increasing the degree of visibility of bare ground and its colour contrast with the surrounding vegetation. The time of day and season of year will cause great variations the amount of visibility. In winter snow conditions the patterns will be more distinct.

3 Phase 1 Results

Results are presented for comparison of each entry period from the 4 viewpoints. In all, 259 ha were placed into design units over the 4 entries. These are identified and summarized by areal extent on Page 2 Key Map. The intent of the multiple entries was to provide sufficient flexibility for harvest operations while allowing sufficient open ground for reforestation. Rapid and healthy re-growth will allow the units in each entry to achieve visually effective green-up (VEG) within a shorter time period, thereby providing for the ability of the landscape to accept subsequent harvesting entries. Actual field implementation and scheduling may introduce changes to the plan. In particular, roading may dictate design block changes, in-stand tree retention may be identified to break up some units somewhat, or units somewhat re-shaped or re-grouped to fit the landscape better.

The visual result of operations on visual quality is determined by water-based viewing, therefore monitoring of operations, as they proceed, would be advantageous and highly recommended. Only in this way can the approach be validated, the density and opacity/permeability of the residual tree canopy determined, and adjustments made for shape and/or tree retention as required to satisfactorily achieve the Partial Retention (light) VQO.

The other measure of achieving the VQO is percent alteration - a limit somewhat above 1.5% of the VSU or landform for Partial Retention (light). The VSU is complex, comprising several small landforms (knolls) within one large one. The Phase 1 blocks are located on a smaller landform; block TS7UM sits between two knolls. Seen in isolation, a small degree of alteration can easily dominate the small landform components of the VSU. It is somewhat of a judgement call as to the landform measure and can vary amongst those doing the measuring, such as in a post-harvest audit. No calculations were made for Percent Alteration in this report pending review by BCTS for operational feasibility.

The Tshinakin landscape was photographed from the viewpoints by RDI. Additional viewpoints were photographed while travelling mid-lake from south to north (viewpoints 1759-1767), and 2 more travelling south along the far shore (1776 and 1777 by Agate Bay). The closer viewpoints would provide some closer viewing but also more intervening screening, so were left for spot analysis. As well, several viewpoints were determined and photographed along the west-side Forest Service road. These views were considered to be temporal and brief amidst roadside screening, with no real stopping points. As such, they weren't considered for the analysis.

RDI used the existing old road network for primary access in Phase 1. The roads show in the forest cover and have been drawn on the key maps. The lower road connects to the more southern set of roads provided by BCTS. Extensions were made to access each design block over the 4 entries. An additional road will likely be required to access the entry 4 blocks in TS7Y4. Subsequent roading will be determined for the remainder of the operating unit when design blocks are identified for the next phase(s).

4. Conclusions

RDI concludes that the original BCTS plan can be accommodated, generally, as Phase 1 of the IVD with 4 entries while meeting the Partial Retention (light) VQO. Overall patterns of the design blocks appear to flow down and around the central knoll, largely emulating the visual force lines. The actual number of years involved in each entry period is to be determined through discussions with BCTS. Greenup was added at the rate of 5m regen. height per successive entry.

Subsequent phases to access the remaining mature available forest areas will be brought into the design as Phase 2, following discussions with BCTS. The approach offered in Phase 1 is without knowledge or consideration of wildlife or forest health issues. These can be brought in to Phase 1 and subsequent phases if made known.



Ken B. Fairhurst PhD RPF
RDI Resource Design Inc
March, 2013

Entry Period 1 - Harvest Area = 97 ha



See Page 2 Map for Design Block Numbers

Tshinakin Creek Integrated Visual Design - Entry 1 - Partial Retention (light)

Viewpoint 1768

Design Blocks



Viewpoint 1772

Design Blocks

Design Blocks



Viewpoint 1773

Design Blocks

Design Blocks



Viewpoint 1774

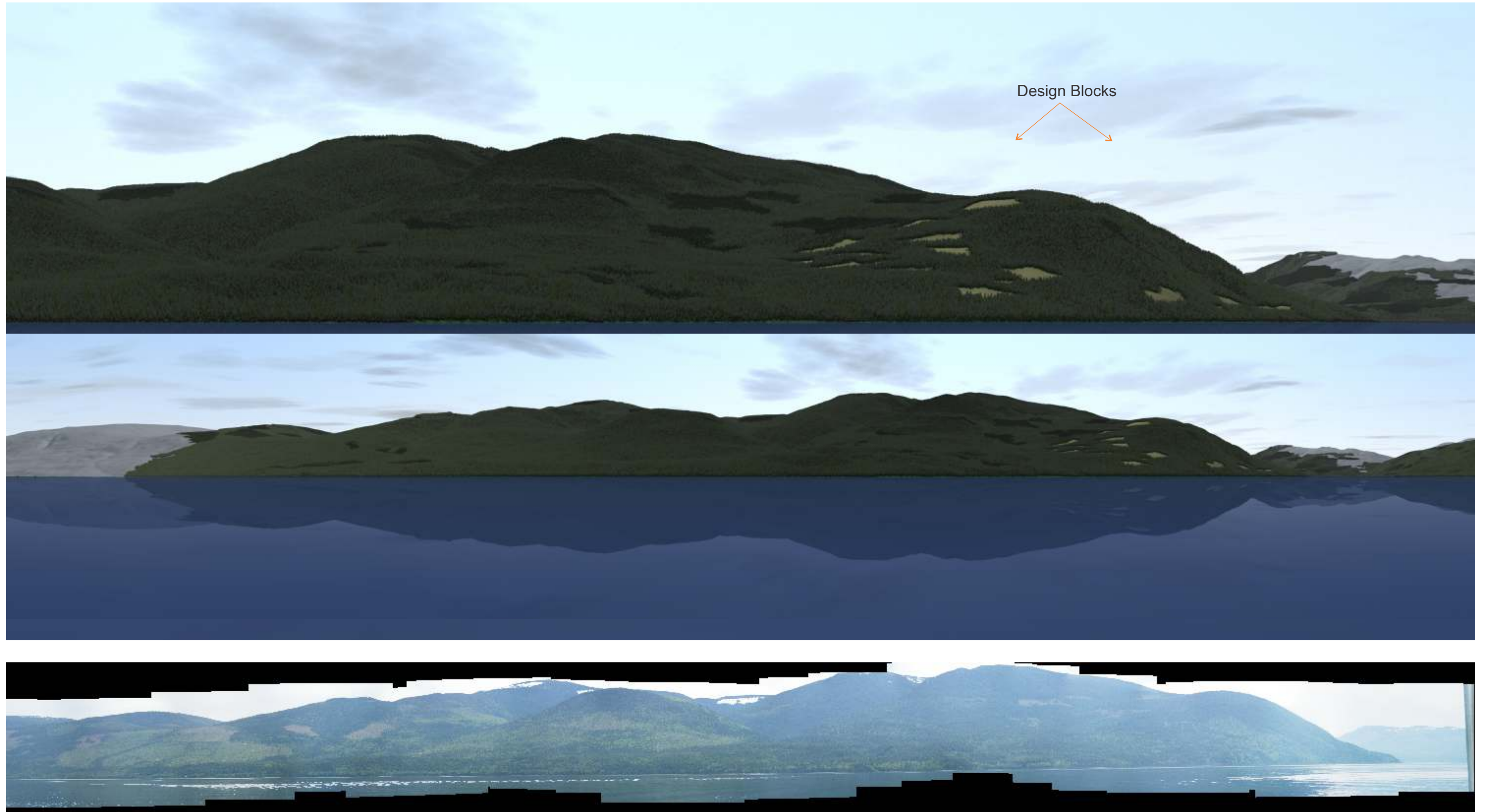
Design Blocks



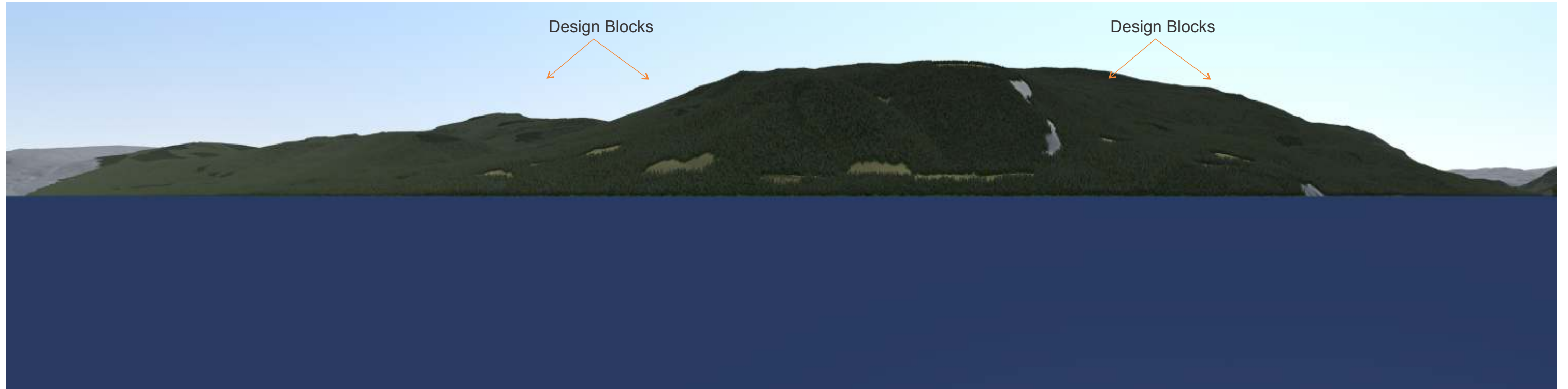
1768

Tshinakin Creek Integrated Visual Design - Entry 1 - All Viewpoints - Partial Retention (light)

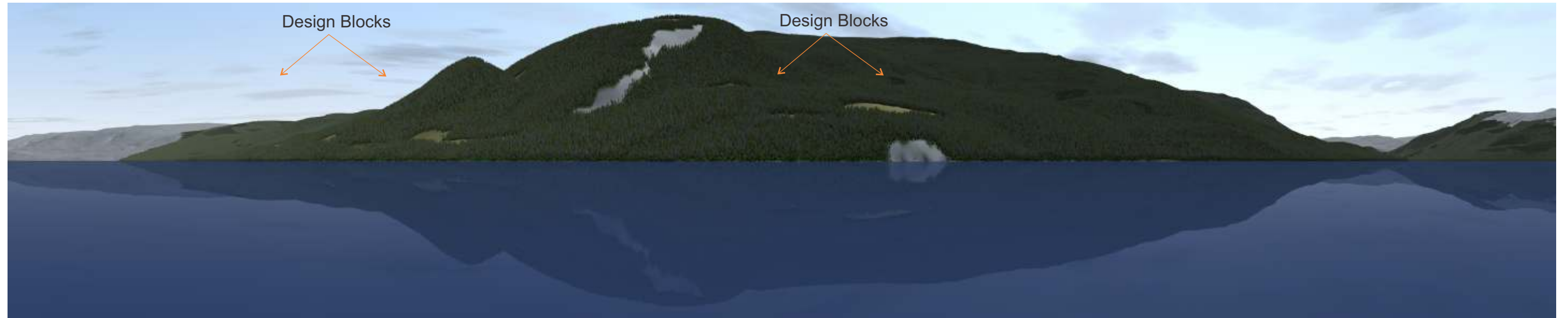




Tshinakin Creek Integrated Visual Design - Phase 1 Entry 1 - Partial Retention (light)

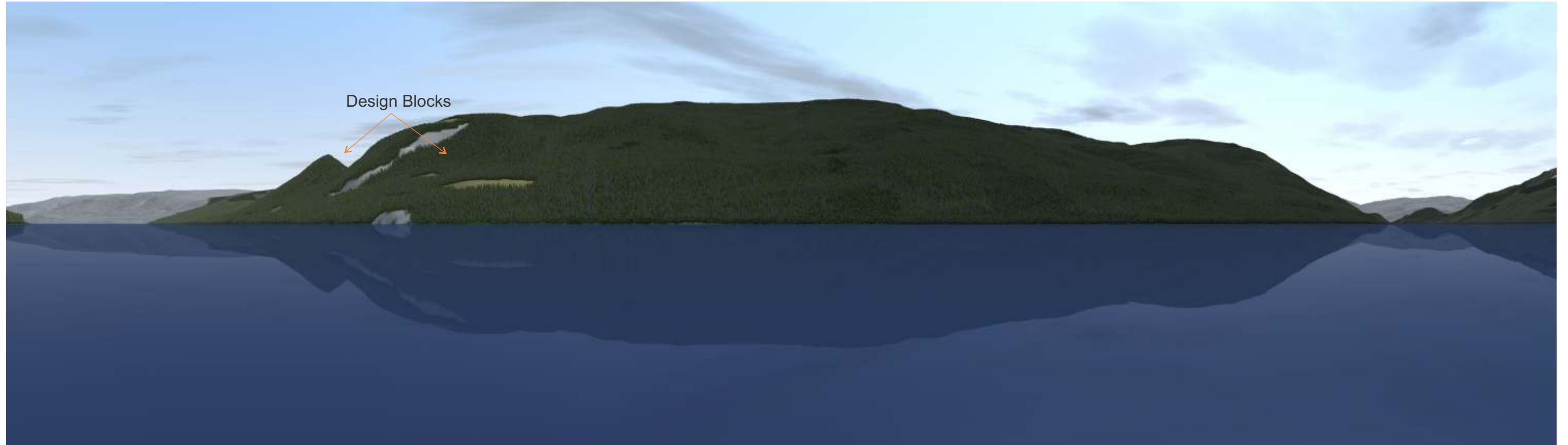


1772
Tshinakin Creek Integrated Visual Design - Phase 1 Entry 1- Partial Retention (light)



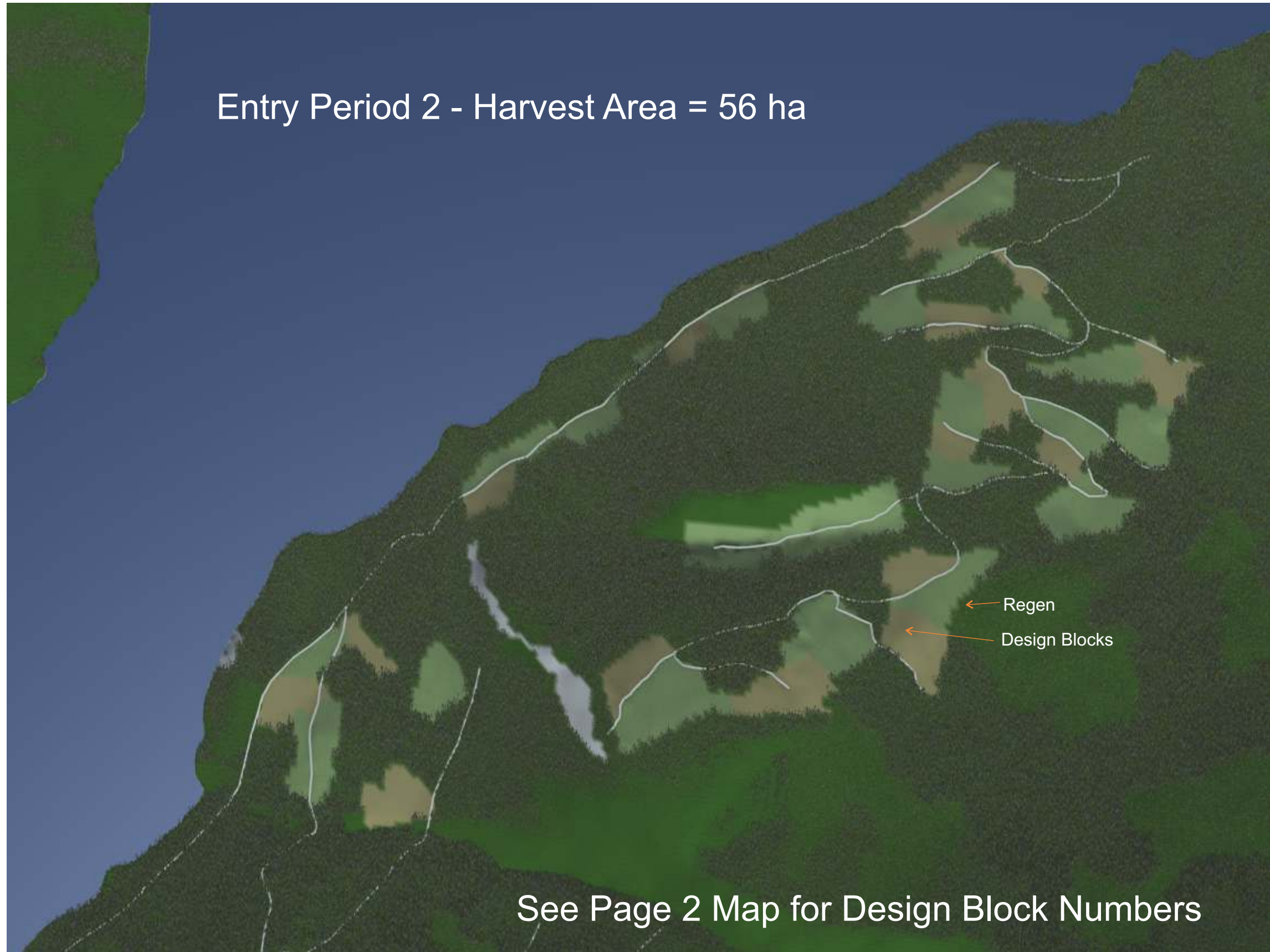
1773

Tshinakin Creek Integrated Visual Design - Phase 1 Entry 1- Partial Retention (light)

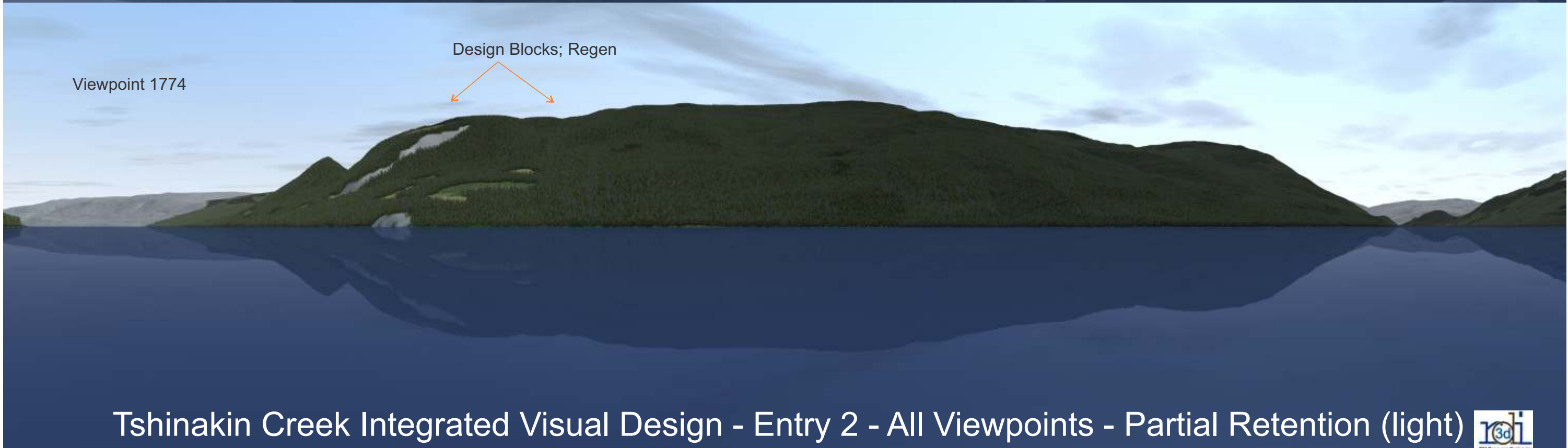


1774
Tshinakin Creek Integrated Visual Design - Phase 1 Entry 1- Partial Retention (light)

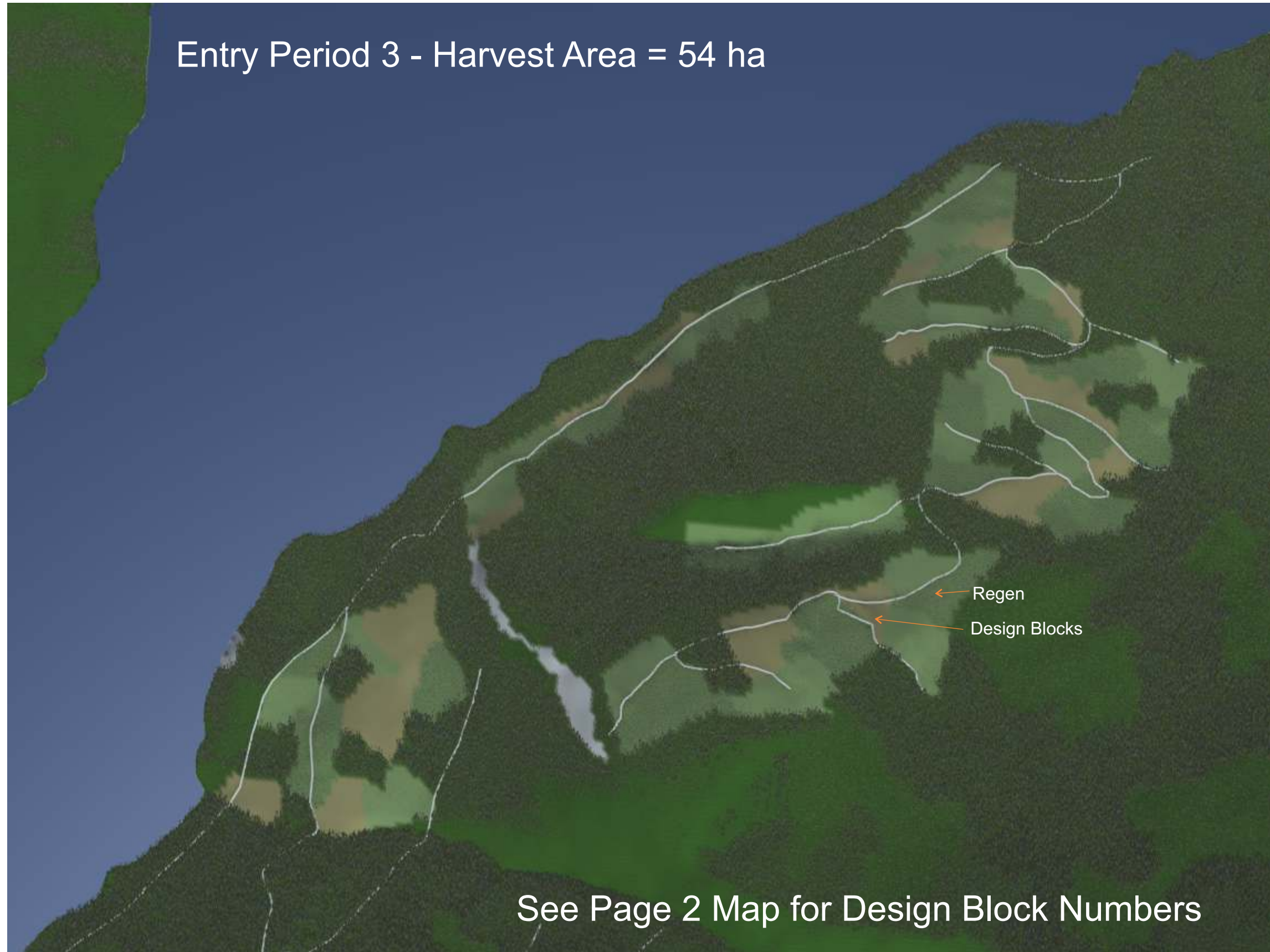
Entry Period 2 - Harvest Area = 56 ha



See Page 2 Map for Design Block Numbers



Entry Period 3 - Harvest Area = 54 ha





Entry Period 4 - Harvest Area = 52 ha

