



**GEOTECHNICAL ASSESSMENT  
Eight (8) Lot Residential Subdivision  
9669 Pemberton Portage Road, Devine, BC**

Document Type: Final Report

Date: January 11, 2021

Project No.: **K-211121-00**

Submitted to:

Sebastian De la Rosa  
9669 Pemberton Portage Road, BC

Attention: Sebastian de la Rosa  
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Submitted by:

**Kontur Geotechnical Consultants Inc.**

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Per: Evan Sykes, P.Eng.  
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## 1.0 INTRODUCTION

In accordance with your recent authorization, Kontur Geotechnical Consultants Inc. (Kontur) has completed this geotechnical assessment for 9669 Pemberton Portage Road, Devine, BC (Lot A, District Lot 5024, Lillooet District Plan KAP 92970). The purposes of the assessment were to provide a characterization of observed naturally occurring geologic hazards, including locations of the potential geological hazards, opinions as to the nature of the hazards, consequences and influence areas of the identified potential hazards. Kontur's assessment of potential naturally occurring geologic hazard events follow generally accepted guidelines provided by the Engineers and Geoscientists of British Columbia (EGBC) "Guidelines of Legislated Landslide Assessments for Proposed Residential Developments in BC", dated May 2010.

As the Squamish Lillooet Regional District (SLRD) does not provide a level of geologic hazard acceptability, Kontur has referenced the British Columbia Ministry of Transportation and Infrastructure (MOTI) guidance for acceptability of geologic hazard occurrence. The MOTI guidelines are:

- 1 in 475 years for damaging events related to landslides;
- 1 in 200 years for damaging events related to flooding;
- 1 in 300 years for damaging events related to snow avalanches;
- 1 in 10,000 years for life threatening events.

The lack of comprehensive historical records spanning the time periods noted in the MOTI guidelines with respect to natural occurring geologic hazards within or adjacent to the subject property limits the ability of Kontur to complete a detailed quantitative assessment of all potential or identified hazards. Therefore, Kontur is providing a qualitative assessment based on Kontur's experience and interpretations of existing site conditions, in accordance with standard and widely accepted geotechnical principles and practices for similar project in this region.

It should be noted that MOTI does not provide acceptability limits for hazard risk associated with residential development and the approving authority (SLRD) must determine risk acceptability for development approval.

Specifically, this assessment focused on the following naturally occurring geologic hazard events:

- Slope instabilities;
- Rockfall;
- Snow avalanche;
- Debris flows/ torrents; and,
- Flooding.

The SLRD web-based terrain mapping of the subject property indicates that about the southern 325m of the property contains areas where sites near steep slopes may require professional advice and the Building Inspector should be able to assess most sites. The remaining northern portion of the property contains areas of potential stream avulsion, debris flood from Blackwater Creek and slope stability concerns, professional advice required.



Attached to this report are a Site Plan, Site Photos and an Appendix D – Landslide Assessment Assurance Statement.

This report, which summarizes the findings of the assessment, has been prepared in accordance with standard and widely accepted geotechnical engineering principles and practices for similar projects in this region. This letter does not address any environmental issues or considerations related to the proposed project.

Review and use of this letter should be completed in accordance with the attached Interpretation and Use of Study and Report document. It is included as an integral part of this letter and should be read in conjunction with all parts of this letter.

## **2.0 SOURCES OF INFORMATION**

The following sources of information were reviewed as part of the desktop component of this study:

- Kontur's nearby experience in the area;
- Historical aerial photographs obtained from the UBC Geographic Information Centre;
- "Proposed Bareland Strata Plan of Lot A, District Lot 524 Lillooet District Plan KAP92970" prepared by Bunbury & Associates Land Surveying Ltd.;
- Relevant information obtained from the SLRD online web-mapping application; and,
- A site reconnaissance conducted by senior Kontur personnel.

## **3.0 UNDERSTANDING OF PROJECT**

Based on discussions with property owner and review of the provided "Proposed Bareland Strata Plan" the proposed subdivision generally consists of eight (8) single family residential lots and a common property. An access road and services for the proposed lots would be brought from Pemberton Portage Road.

## **4.0 SITE DESCRIPTION**

### **4.1 General**

The subject property was located on the west side of Pemberton Portage Road about 3.5km south of D'Arcy. The property was irregular in shape with the northern boundary defined by Blackwater Creek, the eastern boundary defined by Pemberton Portage Road and a rectangular boundary for 9665 Pemberton Portage Road occupied by a school. The western and southern boundaries consisting of straight lines in a northeast-southwest direction and northwest-southeast direction, respectively. Property dimensions in the east-west direction ranged from about 390m along the northern boundary to about 278m along the southern boundary and in the north-south direction from about 552m along the eastern boundary to about 255m along the western boundary. The property had an area of about 11Ha. The property was bounded by Blackwater creek to the north, crown land to the south, BC Hydro Right-of-Way to the west and Pemberton Portage Road and a school yard to the east.

A gravel access road had been constructed from Pemberton Portage Road north of the school yard to access the property. It is understood that water wells had been drilled for each of the proposed lots. An



overgrown access road was noted near the northern property boundary on the south side of the Blackwater Creek gully extending about 200m into the property.

#### **4.2 Surface Conditions**

Topography within the subject property consisted of a generally flat lying area with moderately inclined slopes along the eastern and northern boundaries. The slopes along the northern property formed the south side off the Blackwater Creek gully boundary. These slopes were north facing and generally inclined at about 2H: 1V with heights of up to about 20m. The overgrown access road formed a bench about 8m below the slope crest and about 6m wide in the eastern portion of the slope. At the toe of the slopes was Blackwater Creek.

The slopes in the eastern portion of the property were east facing, up to about 30m height and inclined at about 2H:1V to 3H:1V. At the toe of the slopes was a school yard in the at the south end and Pemberton Portage Road in the north end. It appeared that the portions of the slope had been excavated to accommodate the construction of the school.

Blackwater Creek flowed from west to east along the northern property boundary flowing into Gates River east of Pemberton Portage Road. The creek was about 2m wide and incised into the surface about 0.5m with near vertical banks.

Vegetation in the flat lying areas generally consisted of grasses with some coniferous trees. On the slopes vegetation generally consisted of widely spaced coniferous trees with trunk diameters up to about 450mm. Tree trunks were generally straight with some trees having slight leans downslope.

#### **4.3 Soil Conditions**

Soils observed in cut slopes within the property generally consisted of SAND with some gravel and trace to some silt, indicative of fluvial deposits.

#### **4.4 Groundwater Condition**

No seepage or groundwater was noted on the ground surface or on the slopes. It should be noted that groundwater conditions typically vary with changes in season, precipitation, water levels in the nearby creek, local land use and other factors.

#### **4.5 Aerial Photography Review**

A review of Aerial Photographs dated from 1946, 1948, 1957, 1962, 1967, 1973, 1977, 1981, 1988, 1993, 1997 and 2006 was conducted.

Aerial photographs indicated that prior to 1967 there was no development. The BC Hydro Power line was noted in the 1967 aerial photograph. The east facing slope appeared to have been excavated to the existing slope prior to the 1973 aerial photograph. The property appeared to be completely forested with coniferous trees up to the 1997 aerial photograph.

No significant indications of landslide or debris flows were noted.



## **5.0 COMMENTS AND RECOMMENDATIONS**

### **5.1 General**

The proposed development area is located in an area of generally flat lying ground surface with moderately inclined slopes in the areas of the northern and eastern portions of the property.

The granular soils would provide adequate bearing support for proposed single-family residential buildings within acceptable settlement tolerances. The slopes are considered to be globally stable for static and seismic conditions

The sections below provide comments and recommendations with regards to potential naturally occurring geologic hazards within and adjacent to the subject area that could influence the development.

### **5.2 Slope Stability**

No significant indications of global slope instabilities were noted within or adjacent to the subject property. It is recommended that habitable buildings be setback from slope crests a minimum of 5m to mitigate potential surficial instabilities within the slopes and potential erosion of the slope toe along Blackwater Creek. Crest of slope and 5m setback should be confirmed in the field by a legal surveyor.

Proposed construction of structures closer than the recommended setback should retain a Geotechnical Engineer to provide further study and appropriate recommendations.

Provided the recommendations provided are implemented the probability of slope instabilities influencing the proposed subdivision is considered to be very low.

### **5.3 Rockfall**

No sources for rockfall were noted during review of aerial photographs or site reconnaissance. The probability of slope instabilities influencing the subject property is considered to be very low.

### **5.4 Debris Flow**

No significant indications of previous debris flows were noted on aerial photographs or during site reconnaissance. Blackwater Creek is located well below proposed building sites and debris flows would likely be contained by the gully slopes. The probability of debris flows influencing the subject property are considered to be very low.

### **5.5 Flooding**

No significant water courses were noted on or near the subject property. Blackwater Creek is confined by the deep gully and it is considered unlikely the creek could rise to levels above the slope crests. No other significant water courses were noted within the property. The probability of a flood influencing a proposed building on the property is considered very low.



## 5.6 Snow Avalanche

Historic snow avalanches are generally identifiable from an abrupt change in the age and type of trees. The property is generally flat lying and prior to logging operation in the 1990's tree covered with uniform coniferous trees. The probability of snow avalanches influencing the subject property is considered very low.

## 6.0 ADDITIONAL STUDY

Prior to construction of a building within the subject property a geotechnical engineer should be engaged to confirm location of the proposed building and recommended mitigative measures are in compliance with this report.

## 7.0 CLOSURE

The above noted and attached information presents Kontur's understating of the proposed development, interpretations of site conditions and opinions as to the existence of naturally occurring geologic hazards, within and adjacent to the proposed development, and the influence areas of those hazards that could affect the proposed development. The lack of comprehensive historical records with respect to naturally occurring geologic hazards within or adjacent to the proposed development limits the ability of Kontur to complete a quantitative assessment of specifically identified hazards. Therefore, Kontur has provided a qualitative assessment based on Kontur's experience and interpretations of existing site conditions. Some understanding of terminology and associated ranges of annual probability of occurrence connected with this approach is provided in a reference prepared by the Resource Inventory Committee, Government of British Columbia, Slope Stability Task Force (1996) as shown in Table A below.

**TABLE A**  
**Relative Terms and Ranges of Annual Probability of Hazard Occurrence**  
**(Resource Inventory Committee, 1996)**

Relative Term of Probability	Range of Annual Probability of Occurrence (Pa)	Comments
Very High	>1/20	Indicates the hazard is imminent and well within the lifetime of a person or typical structure. Events occurring with a return interval of 1/20 or less generally have clear and relatively fresh signs of disturbance.
High	1/100 to 1/20	Indicates that the hazard can happen within the approximate lifetime of a person or typical structure. Events are clearly identifiable by deposits and vegetation but may not appear fresh.
Moderate	1/500 to 1/100	Indicates that the hazard, within a given lifetime, is not likely but possible. Signs of previous events, such as vegetation damage may not be easily identified.
Low	1/2500 to 1/500	Indicates the hazard is of uncertain significance.
Very Low	<1/2500	



Provided the recommendations of this report are implemented the proposed residential lots are considered to be safe for the intended use, that being the development of the lot with a single-family residential building. The term "safe" specifically refers to the ability of the subsurface soils to provide adequate bearing to support a building within typical settlement tolerances and global slope stability is adequate and the subject property is free of hazards with a return period less than that indicated in Section 1.0; however, the approving authority must determine risk acceptability for development approval.

Recommendations for a safe area for construction of a single-family residential building include limiting the area of the proposed building to those shown on the attached Site Plan. It is Kontur's opinion that other area within the proposed lots are safe as defined above but should be reviewed by a Geotechnical Engineer prior to finalizing building locations.

This report has been prepared for the exclusive use of the Sebastian de la Rosa, SLRD and their designated agents or consultants. Any use of the information contained in this letter for other than its intended purpose or by any other party must first be verified in writing by Kontur. Kontur does not accept any responsibility or damages because of any other party relying on or using the information, interpretations, opinions, comments, and/or recommendations that are contained in this report.

Kontur trusts that the information described above meets your current requirements. If you should have any concerns or questions, please do not hesitate to contact the undersigned.

Sincerely,

**Kontur Geotechnical Consultants Inc.**

Per:

Evan Sykes, P.Eng.  
Principal Geotechnical Engineer

Reviewed by:


FOR Matthew Yip, P.Eng.  
Principal Geotechnical Engineer



January 11, 2021  
Project No.: **K-211121-00**

Geotechnical Assessment  
Proposed Eight Lot Residential Subdivision  
9669 Pemberton Portage Road, Devine, BC

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**APPENDIX A**   
Interpretation and Use of Study and Report Document



## INTERPRETATION AND USE OF STUDY AND REPORT DOCUMENT

### 1.0 STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental engineering or consulting.

### 2.0 COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

### 3.0 BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

### 4.0 USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

### 5.0 INTERPRETATION OF THE REPORT

Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelope assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

Reliance on Provided information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

To avoid misunderstandings, KONTUR should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by KONTUR. Further, KONTUR should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with KONTUR's recommendations. Any reduction from the level of services normally recommended will result in KONTUR providing qualified opinions regarding adequacy of the work.

### 6.0 ALTERNATE REPORT FORMAT

When KONTUR submits both electronic file and hard copies of reports, drawings and other documents and deliverables (KONTUR's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by KONTUR shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by KONTUR shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of KONTUR's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except KONTUR. The Client warrants that KONTUR's instruments of professional service will be used only and exactly as submitted by KONTUR.

The Client recognizes and agrees that electronic files submitted by KONTUR have been prepared and submitted using specific software and hardware systems. KONTUR makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

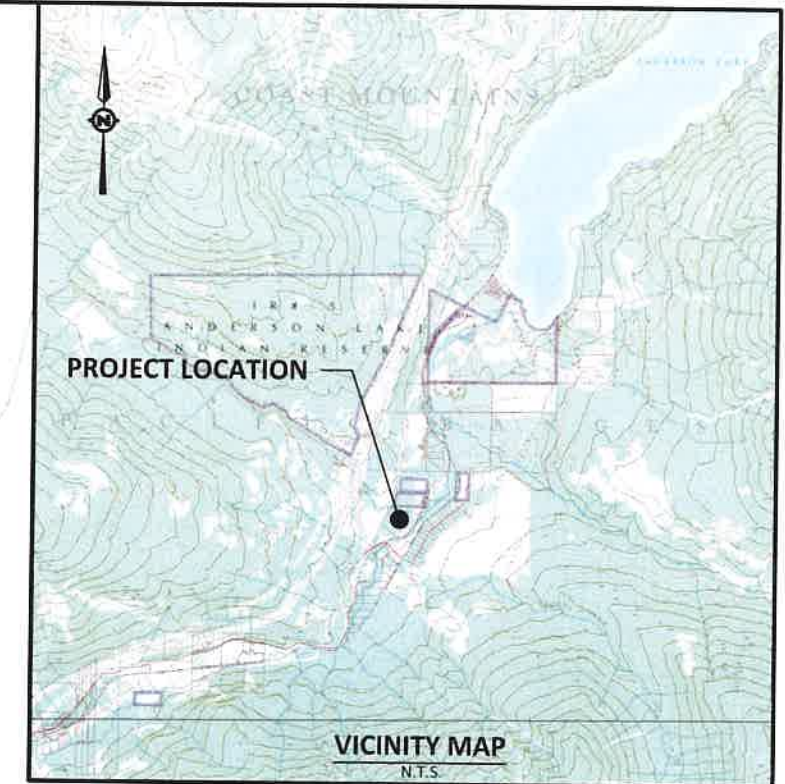
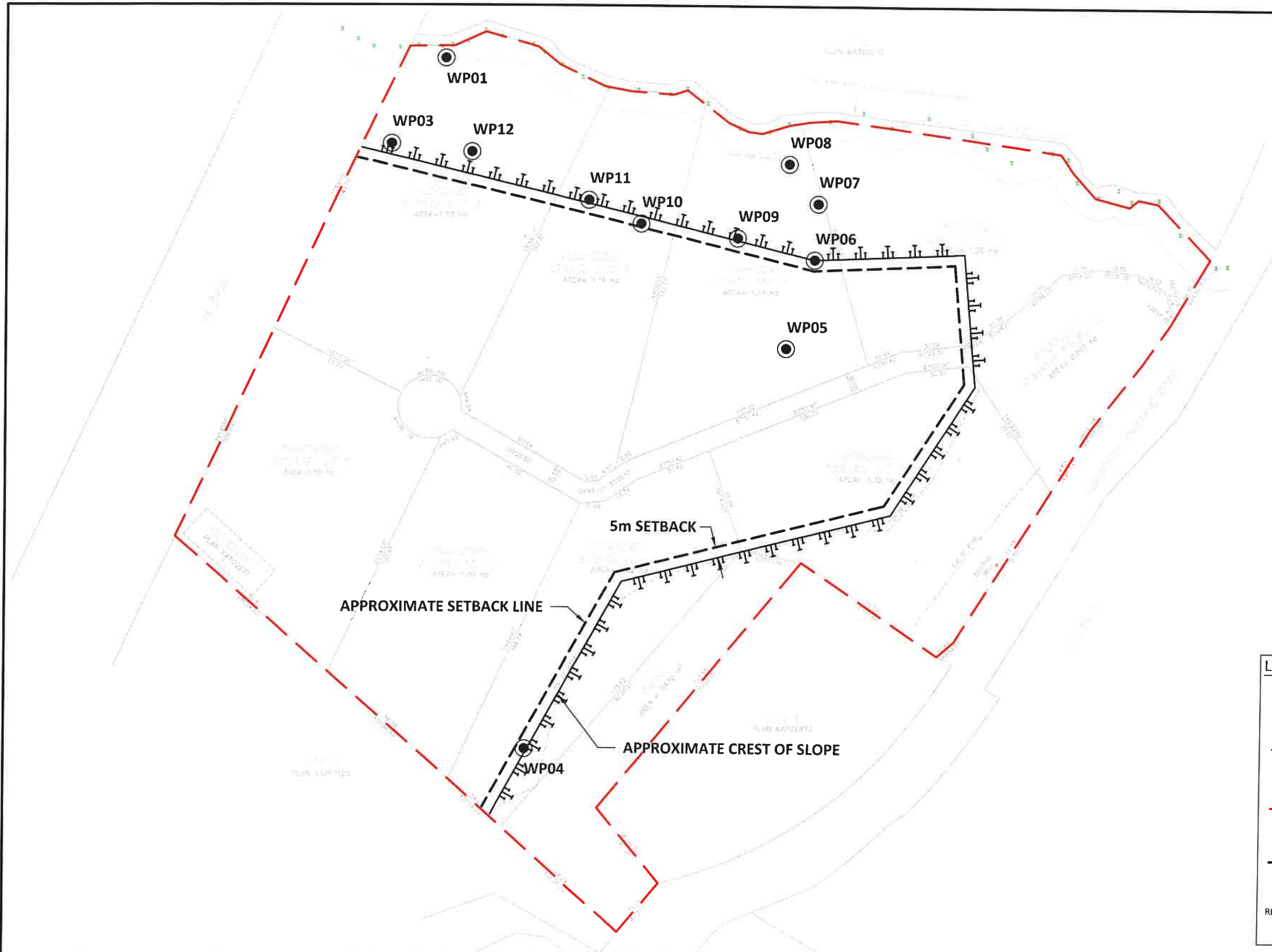


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Geotechnical Assessment  
Proposed Eight Lot Residential Subdivision  
9669 Pemberton Portage Road, Devine, BC

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**APPENDIX B**   
Figures



**LEGEND**

- WAYPOINT OR OBSERVATION POINT
- |—|— CREST OF SLOPE/TOP OF SLOPE
- — — — — PROPERTY BOUNDARY
- - - - - GEOTECHNICAL SETBACK LINE

REFERENCE: "PROPOSED BARELAND STRATA PLAN" PREPARED BY BURNABY AND ASSOCIATES LAND SURVEYING LTD. DATED 2020-10-15

**KONTUR**  
**GEOTECHNICAL CONSULTANTS**  
 inc.

Unit 65, 1833 Coast Meridian Road, Port Coquitlam, B.C. V3C 6G5  
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SEAL	VERSIONS		TITLE	PROJECT NO.:		
	NO	DESCRIPTION	DATE	K-211121-00		
	0	ISSUED FOR REPORT	2021-01-11	CLIENT	DATE:	SCALE:
				SEBASTIAN DE LA ROSA	2021-01-11	1:2000
				PROJECT LOCATION	DRAFT:	DWG NO.:
				9669 PEMBERTON PORTAGE ROAD, DEVINE, B.C.	JL	FIGURE 1
					DESIGN:	CHECK:
					-	EGS


January 11, 2021 10:21:31 AM



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Geotechnical Assessment  
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**APPENDIX C**   
Photographs



January 12, 2021  
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Geotechnical Assessment  
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9669 Pemberton Portage Road, Devine, BC

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**APPENDIX C**   
Photographs



**PHOTO 1 – Slope to Blackwater Creek WP 1**



**PHOTO 2 –Blackwater Creek Bank Erosion WP 1**



**PHOTO 3 – Slope Crest WP 3**



**PHOTO 4 – Slope Crest WP4**



**PHOTO 5 – Generally Flat Lying Ground Surface WP5**



**PHOTO 6 – Slope Crest WP6**



**PHOTO 7 – Old Access Road WP7**



**PHOTO 8 – Slope Below Old Access Road/ Blackwater Creek WP8**



**PHOTO 9 – Slope Crest WP9**



**PHOTO 10 – Generally Flat Lying Ground Surface WP10**



**PHOTO 11 – Slope Crest WP 11**



**PHOTO 12 – Excavation NW Corner Exposing Soils WP11**



**PHOTO 13 – Slope Crest WP12**




**PHOTO 14 – Access Road to Proposed Lots**



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Geotechnical Assessment  
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9559 Pemberton Portage Road, Devine, BC

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**APPENDIX D**   
Appendix D: Landslide Assessment Assurance Statement

## APPENDIX D: LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

Note: This Statement is to be read and completed in conjunction with the "APEGBC Guidelines for Legislated Landslide Assessments for Proposed Residential Development in British Columbia", March 2006/Revised September 2008 ("APEGBC Guidelines") and the "2006 BC Building Code (BCBC 2006)" and is to be provided for *landslide assessments* (not floods or flood controls) for the purposes of the Land Title Act, Community Charter or the Local Government Act. Italicized words are defined in the APEGBC Guidelines.

To: The Approving Authority

Date: December 30, 2020

Squamish-Lillooet Regional District

PO Box 219 - 1350 Aster St, Pemberton, BC, V0N 2L0

Jurisdiction and address

With reference to (check one):

- Land Title Act (Section 86) – Subdivision Approval
- Local Government Act (Sections 919.1 and 920) – Development Permit
- Community Charter (Section 56) – Building Permit
- Local Government Act (Section 910) – Flood Plain Bylaw Variance
- Local Government Act (Section 910) – Flood Plain Bylaw Exemption
- British Columbia Building Code 2006 sentences 4.1.8.16 (8) and 9.4 4.4.(2) (Refer to BC Building and Safety Policy Branch Information Bulletin B10-01 issued January 18, 2010)

For the Property:

9669 Pemberton Portage Road, D'Arcy, BC (Lot A District Lot 5024 Lillooet District Plan KAP92970)

Legal description and civic address of the Property

The undersigned hereby gives assurance that he/she is a *Qualified Professional* and is a *Professional Engineer* or *Professional Geoscientist*.

I have signed, sealed and dated, and thereby certified, the attached *landslide assessment* report on the Property in accordance with the *APEGBC Guidelines*. That report must be read in conjunction with this Statement. In preparing that report I have:

Check to the left of applicable items

- 1. Collected and reviewed appropriate background information
- 2. Reviewed the proposed *residential development* on the Property
- 3. Conducted field work on and, if required, beyond the Property
- 4. Reported on the results of the field work on and, if required, beyond the Property
- 5. Considered any changed conditions on and, if required, beyond the Property
- 6. For a *landslide hazard analysis* or *landslide risk analysis* I have:
  - 6.1 reviewed and characterized, if appropriate, any *landslide* that may affect the Property
  - 6.2 estimated the *landslide hazard*
  - 6.3 identified existing and anticipated future *elements at risk* on and, if required, beyond the Property
  - 6.4 estimated the potential *consequences* to those *elements at risk*
- 7. Where the *Approving Authority* has adopted a *level of landslide safety* I have:
  - 7.1 compared the *level of landslide safety* adopted by the *Approving Authority* with the findings of my investigation
  - 7.2 made a finding on the *level of landslide safety* on the Property based on the comparison
  - 7.3 made recommendations to reduce *landslide hazards* and/or *landslide risks*

- 8. Where the *Approving Authority* has **not** adopted a *level of landslide safety* I have:

- 8.1 described the method of *landslide hazard analysis* or *landslide risk analysis* used
- 8.2 referred to an appropriate and identified provincial, national or international guideline for *level of landslide safety*
- 8.3 compared this guideline with the findings of my investigation
- 8.4 made a finding on the *level of landslide safety* on the Property based on the comparison
- 8.5 made recommendations to reduce *landslide hazards* and/or *landslide risks*
- 9. Reported on the requirements for future inspections of the Property and recommended who should conduct those inspections.

Based on my comparison between

Check one

- the findings from the investigation and the adopted *level of landslide safety* (item 7.2 above)
- the appropriate and identified provincial, national or international guideline for *level of landslide safety* (item 8.4 above)

I hereby give my assurance that, based on the conditions<sup>[1]</sup> contained in the attached *landslide assessment report*,

Check one

- for subdivision approval, as required by the Land Title Act (Section 86), "that the land may be used safely for the use intended"

Check one

- with one or more recommended registered covenants.
- without any registered covenant.

- for a development permit, as required by the Local Government Act (Sections 919.1 and 920), my report will "assist the local government in determining what conditions or requirements under [Section 920] subsection (7.1) it will impose in the permit".

- for a building permit, as required by the Community Charter (Section 56), "the land may be used safely for the use intended"

Check one

- with one or more recommended registered covenants.
- without any registered covenant.

- for flood plain bylaw variance, as required by the "Flood Hazard Area Land Use Management Guidelines" associated with the Local Government Act (Section 910), "the development may occur safely".

- for flood plain bylaw exemption, as required by the Local Government Act (Section 910), "the land may be used safely for the use intended".

Evan Sykes, P.Eng.  
Name (print)

December 30, 2020  
Date

  
Signature

<sup>[1]</sup> When seismic slope stability assessments are involved, *level of landslide safety* is considered to be a "life safety" criteria as described in the National Building Code of Canada (NBCC 2005), Commentary on Design for Seismic Effects in the User's Guide, Structural Commentaries, Part 4 of Division B. This states:

*"The primary objective of seismic design is to provide an acceptable level of safety for building occupants and the general public as the building responds to strong ground motion; in other words, to minimize loss of life. This implies that, although there will likely be extensive structural and non-structural damage, during the DGM (design ground motion), there is a reasonable degree of confidence that the building will not collapse nor will its attachments break off and fall on people near the building. This performance level is termed 'extensive damage' because, although the structure may be heavily damaged and may have lost a substantial amount of its initial strength and stiffness, it retains some margin of resistance against collapse."*

Unit 65, 1833 Coast Meridian Road  
Address

Port Coquitlam, BC, V3C 6G5

778-773-0220  
Telephone



(Affix Professional seal here)

If the *Qualified Professional* is a member of a firm, complete the following.

I am a member of the firm Kontur Geotechnical Consultants Inc.  
and I sign this letter on behalf of the firm. (Print name of firm)