

SITE OBSERVATION FORM: DNV Landslide Risk Assessment
LOCATION: 1839 Layton Drive
INSPECTION DATE: (mm/dd/yy) 10/31/05
WEATHER: Raining, heavy rain for several days prior to visit.



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500 - 1045 Howe Street
 Vancouver, BC
 Canada V6Z 2A9

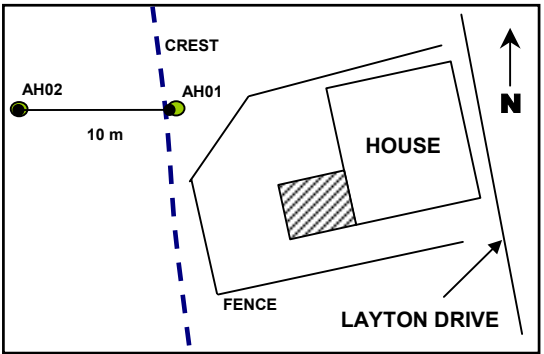
THICKNESS OF LOOSE MATERIALS	<1 m	1-2 m	2-3 m	>3 m
FENCE LINE		<input checked="" type="checkbox"/>		
10 m DOWNSLOPE FROM SLOPE CREST		<input checked="" type="checkbox"/>		

SLOPE BELOW FENCE/ RETAINING STRUCTURE	SLOPE = 34°		
	CRACKS	SLIDES	EROSION
OBSERVATIONS: No evidence of slope deformation.			

TREES BELOW FENCE/ RETAINING STRUCTURE	STRAIGHT	PISTOL-BUTT	LEANING
PERCENT CONIFER: 80%	<input checked="" type="checkbox"/>		
OBSERVATIONS:			

RETAINING STRUCTURES	YES	NO <input checked="" type="checkbox"/>	HEIGHT= n/a
TYPE	CONCRETE	TIMBER CRIB	OTHER:
DEFORMATION	UNDEFORMED	CRACKED	BULGING
OBSERVATIONS: None observed			

DEFORMATION IN BACKYARD	YES	NO <input checked="" type="checkbox"/>
LOCATION: None		
DESCRIPTION: None observed		



HOUSE DISTANCE TO CREST = 20-25 m

POOLS	YES	NO <input checked="" type="checkbox"/>
DESCRIPTION: None observed		

SEEPAGE/ SPRINGS IN OR BELOW FILL	YES	NO <input checked="" type="checkbox"/>
OBSERVATIONS: None observed.		

RECEIVES SURFACE RUNOFF FROM	BACKYARD	1/2 ROOF	FULL ROOF	FRONT YARD	STREET
OBSERVATIONS:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

CONNECTED TO STORM SEWER	YES <input checked="" type="checkbox"/>	NO	UNSURE
OWNERS COMMENTS: DNV reports that this property is connected to the storm sewer system.			

GENERAL OBSERVATIONS

- Oversteepening at crest of slope due to loose, organic compost deposit
- 25m from crest (downslope) 1m vertical outcrop of Sand (SP) med-coarse sand, also found @ 1.2m in downslope hole
- Appears to be very little fill in backyard for levelling purposes



Figure 1. 1839 Layton Drive – Front of the house



Figure 2. 1839 Layton Drive – View looking north along crest



Figure 3. 1839 Layton Drive – View looking SE towards house from crest

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 1839 Layton
Drill Method : Dutch Hand Auger
Inspection Date : 31 Oct 05
Logged by : SF/JB
Reviewed by : MJP

Depth (m)	Lithologic Description	Depth To Water Table	Depth (m)	Lithologic Description	Depth To Water Table
	<p>AUGERHOLE: BGC05-1839LAY-AH01 on Slope Crest FINAL DEPTH OF AUGERHOLE: 1.65 m THICKNESS OF LOOSE MATERIALS: 1.65 m minimum</p>			<p>AUGERHOLE: BGC05-1839LAY-AH02 10 m Downslope FINAL DEPTH OF AUGERHOLE: 1.30 m THICKNESS OF LOOSE MATERIALS: 1.30 m minimum</p>	
0.0	<p>ORGANICS Moist, organic odour, rootlets, twigs [COMPOST - FILL] 0.05 m: Plastic garbage</p>		0.0	<p>ORGANICS Loose, dark brown</p>	
0.5	<p>SAND (SP/SM) Fine to medium sand, silty, poorly graded, very loose, max particle size = 15 mm, sub-angular, light grey with some orange mottling, homogenous, roots and bark [FILL] 0.75 m: Grades to medium sand with some silt, grey brown</p>		0.5	<p>SAND (SP) Fine to medium sand, silty, trace fine to medium gravel, some fine to medium gravel sized silt clasts, poorly graded, very loose, max particle size = 45 mm, sub-angular, light orange brown, moist, homogeneous, roots [FILL/ COLLUVIUM] 0.30 m: Material colour becomes 'light grey and brown'</p>	
1.0	<p>SAND (SP) Medium to coarse sand, some medium to coarse gravel, trace silt, poorly graded, loose, max particle size = 15 mm, sub-rounded, orange brown, moist, homogeneous, trace rootlets [FILL]</p>		1.0	<p>0.95 m: Material density becomes 'loose to compact'</p>	
1.5	<p>1.65 m: EOH - Refusal on cobbles and roots No groundwater encountered, four holes attempted</p>		1.5	<p>1.20 m: Medium sand and medium gravel sized fine sand clasts present 1.30 m: EOH - Refusal on a tree root No groundwater encountered</p>	
2.0			2.0		
2.5			2.5		
3.0			3.0		

BGC05-1839LAY-AH01

SITE OBSERVATION FORM: DNV Landslide Risk Assessment
LOCATION: 1847 Layton Drive
INSPECTION DATE: (mm/dd/yy) 10/31/05
WEATHER: Raining, heavy rain for several days prior to visit.



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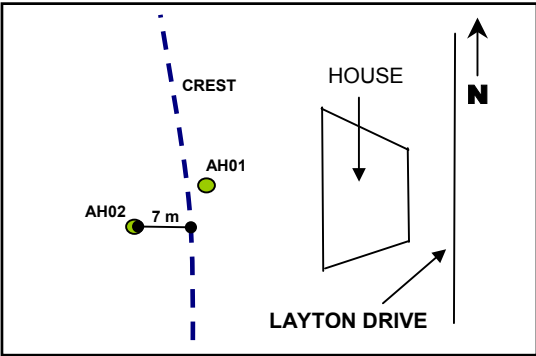
THICKNESS OF LOOSE MATERIALS	<1 m	1-2 m	2-3 m	>3 m
FENCE LINE		<input checked="" type="checkbox"/>		
7 m DOWNSLOPE FROM SLOPE CREST		<input checked="" type="checkbox"/>		

SLOPE BELOW FENCE/ RETAINING STRUCTURE	SLOPE = 31°		
	CRACKS	SLIDES	EROSION
OBSERVATIONS: A few fallen trees, no signs of erosion			

TREES BELOW FENCE/ RETAINING STRUCTURE	STRAIGHT	PISTOL-BUTT	LEANING
PERCENT CONIFER: 90%	<input checked="" type="checkbox"/>		
OBSERVATIONS:			

RETAINING STRUCTURES	YES	NO <input checked="" type="checkbox"/>	HEIGHT= n/a	
TYPE	BLOCKS	CONCRETE	TIMBER CRIB	OTHER:
DEFORMATION	UNDEFORMED	CRACKED	SETTLED	BULGING
OBSERVATIONS: None observed.				

DEFORMATION IN BACKYARD	YES <input checked="" type="checkbox"/>	NO
LOCATION: At/near crest		
DESCRIPTION: Some settlement in yard		



HOUSE DISTANCE TO CREST = 16 m

POOLS	YES	NO <input checked="" type="checkbox"/>
DESCRIPTION: None observed		

SEEPAGE/ SPRINGS IN OR BELOW FILL	YES	NO <input checked="" type="checkbox"/>
OBSERVATIONS: None observed.		

RECEIVES SURFACE RUNOFF FROM	BACKYARD	1/2 ROOF	FULL ROOF	FRONT YARD	STREET
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
OBSERVATIONS: Storm/high-flow waters could potentially overtop curb and flow around south side of house between the house and berm (against neighbour's house).					

CONNECTED TO STORM SEWER	YES <input checked="" type="checkbox"/>	NO	UNSURE
OWNERS COMMENTS: DNV reports that this property is connected to the storm sewer system.			

GENERAL OBSERVATIONS



Figure 1. 1847 Layton Drive – Front of the house



Figure 2. 1847 Layton Drive – View looking NW downslope from crest



Figure 3. 1847 Layton Drive – View downslope looking west from north side of property

INSPECTION LOCATION # 1847 Layton

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 1847 Layton
Drill Method : Dutch Hand Auger
Inspection Date : 01 Nov 05
Logged by : SF/JB
Reviewed by : MJP

Depth (m)	Lithologic Description	Depth To Water Table	Depth (m)	Lithologic Description	Depth To Water Table
	<p>AUGERHOLE: BGC05-1847LAY-AH01 on Slope Crest FINAL DEPTH OF AUGERHOLE: 1.40 m THICKNESS OF LOOSE MATERIALS: 1.40 m minimum</p>			<p>AUGERHOLE: BGC05-1847LAY-AH02 7 m Downslope FINAL DEPTH OF AUGERHOLE: 2.00 m THICKNESS OF LOOSE MATERIALS: 1.20 m minimum</p>	
0.0	<p>SAND (SM) Fine to medium sand, silty, trace fine gravel, poorly graded, very loose to loose, max particle size = 4 mm, sub-angular, dark brown, no odour, moist, homogeneous, no cementation, trace rootlets and wood fragments [TOPSOIL]</p>		0.0	<p>SAND (SM) Fine sand, silty, poorly graded, very loose to loose, dark brown, no odour, moist, homogeneous, no cementation, trace rootlets, charcoal and wood fragments [TOPSOIL]</p>	
-0.5	<p>SAND (SM) Fine to coarse sand, silty, trace fine gravel, gravel sized silt and sand clasts, well graded, loose, max particle size = 10 mm, sub-angular, brown, no odour, moist, homogeneous, no cementation, trace rootlets [FILL]</p>		-0.5	<p>SAND (SM) Fine to medium sand, some silt to silty, some gravel, loose, max particle size = 15 mm, sub-rounded, light brown, no odour, moist, homogeneous, no cementation, trace rootlets [FILL/ COLLUVIUM]</p>	
-1.0	<p>SAND (SW) Fine to coarse sand, trace silt, trace cobbles, gravel sized silt and sand clasts, well graded sand, loose, sub-rounded particles, brown, no odour, moist, homogeneous, no cementation [FILL]</p>		-1.0	<p>1.2 m: Material becomes 'firm' Orange mottling, silt and fine sand clasts encountered SILT (ML) and SAND (SP) Fine sand, trace clay, trace fine to coarse gravel, low plastic, firm to stiff, brown with orange mottling, no odour, moist to wet, homogenous, non dilatant, trace roots [Weathered GLACIOMARINE]</p>	
-1.5	<p>1.40 m: EOH - Refusal of auger on gravel/cobble No groundwater encountered</p>		-1.5		
-2.0			-2.0	<p>2.00 m: EOH - Refusal of auger on gravel/cobble No groundwater encountered</p>	
-2.5			-2.5		
-3.0			-3.0		

BGC05-1847LAY-AH01

BGC ENGINEERING INC.
 AN APPLIED EARTH SCIENCES COMPANY
 Vancouver, BC Phone: (604) 684 5900

Client: District of North Vancouver

SITE OBSERVATION FORM: DNV Landslide Risk Assessment
LOCATION: 1855 Layton Drive
INSPECTION DATE: (mm/dd/yy) 10/27/05
WEATHER: Raining, heavy rain for several days prior to visit.



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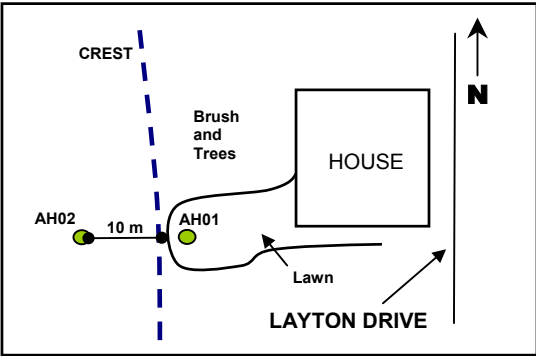
THICKNESS OF LOOSE MATERIALS	<1 m	1-2 m	2-3 m	>3 m
FENCE LINE	<input checked="" type="checkbox"/>			
10 m DOWNSLOPE FROM SLOPE CREST		<input checked="" type="checkbox"/>		

SLOPE BELOW FENCE/ RETAINING STRUCTURE	SLOPE = 35°		
	CRACKS	SLIDES	EROSION
OBSERVATIONS: No signs of erosion			

TREES BELOW FENCE/ RETAINING STRUCTURE	STRAIGHT	PISTOL-BUTT	LEANING
PERCENT CONIFER: 80%	<input checked="" type="checkbox"/>		
OBSERVATIONS: Slight pistol butting in some trees			

RETAINING STRUCTURES	YES	NO <input checked="" type="checkbox"/>	HEIGHT= n/a	
TYPE	BLOCKS	CONCRETE	TIMBER CRIB	OTHER:
DEFORMATION	UNDEFORMED	CRACKED	SETTLED	BULGING
OBSERVATIONS: None observed.				

DEFORMATION IN BACKYARD	YES	NO <input checked="" type="checkbox"/>
LOCATION:		
DESCRIPTION: None observed		



HOUSE DISTANCE TO CREST = 14 m

POOLS	YES	NO <input checked="" type="checkbox"/>
DESCRIPTION: None observed		

SEEPAGE/ SPRINGS IN OR BELOW FILL	YES	NO <input checked="" type="checkbox"/>
OBSERVATIONS: None observed.		

RECEIVES SURFACE RUNOFF FROM	BACKYARD	1/2 ROOF	FULL ROOF	FRONT YARD	STREET
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
OBSERVATIONS: Frontyard dips away from street towards house. Potential for storm waters to run into yard.					

CONNECTED TO STORM SEWER	YES <input checked="" type="checkbox"/>	NO	UNSURE
OWNERS COMMENTS: DNV reports that this property is connected to the storm sewer system.			

GENERAL OBSERVATIONS

- Many fallen logs on slope



Figure 1. 1855 Layton Drive – Front of the house



Figure 2. 1855 Layton Drive – View looking NW downslope from crest



Figure 3. 1855 Layton Drive – Back of the house looking east

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 1855 Layton
Drill Method : Dutch Hand Auger
Inspection Date : 28 Oct 05
Logged by : MB/ES
Reviewed by : MJP

Depth (m)	Lithologic Description	Depth To Water Table	Depth (m)	Lithologic Description	Depth To Water Table
	<p>AUGERHOLE: BGC05-1855LAY-AH01 on Slope Crest FINAL DEPTH OF AUGERHOLE: 0.80 m THICKNESS OF LOOSE MATERIALS: 0.80 m minimum</p>			<p>AUGERHOLE: BGC05-1855LAY-AH02 10 m Downslope FINAL DEPTH OF AUGERHOLE: 1.90 m THICKNESS OF LOOSE MATERIALS: 1.70 m minimum</p>	
0.0	SAND (SM) Silty, poorly graded, loose, dark brown, no odour, moist, homogeneous, no cementation, trace rootlets [TOPSOIL]		0.0	SAND (SM) Silty, poorly graded, loose, dark brown, no odour, moist, homogeneous, no cementation, trace rootlets [TOPSOIL]	
0.5	SAND (SP) Silty, trace fine gravel, poorly graded, loose, max particle size = 3 mm, brown, no odour, moist, homogeneous, no cementation, trace rootlets [FILL]		0.5	SAND (SP) Some silt, trace gravel, trace cobbles, poorly graded, loose, max particle size = 150 mm, brown, no odour, moist, homogeneous, no cementation, trace rootlets [FILL/ COLLUVIUM]	
1.0	0.70 m: Material becomes 'gravelly', max particle size = 30 mm 0.80 m: EOH - Refusal on cobbles, attempted four holes No groundwater encountered		1.0		
1.5			1.5		
2.0			2.0	SILT (ML) and SAND (SW) Fine to coarse sand, trace clay, trace fine gravel, low plastic, well graded sand, stiff, grey/brown with orange mottling, no odour, moist, homogeneous, no cementation, non dilatant [Weathered GLACIOMARINE]	
2.5			2.5	1.90 m: EOH - Refusal of auger on gravel/cobble No groundwater encountered	
3.0			3.0		

BGC05-1855LAY-AH01

SITE OBSERVATION FORM: DNV Landslide Risk Assessment
LOCATION: 1863 Layton Drive
INSPECTION DATE: (mm/dd/yy) 10/28/05
WEATHER: Raining



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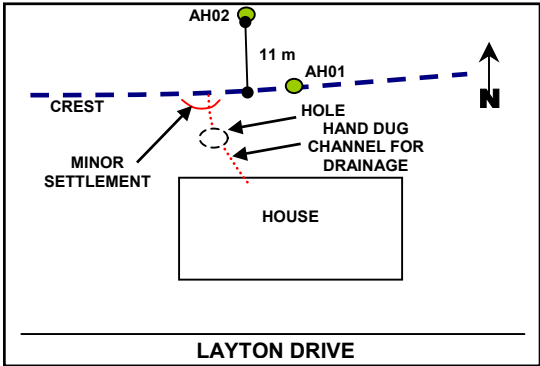
THICKNESS OF LOOSE MATERIALS	<1 m	1-2 m	2-3 m	>3 m
FENCE LINE		<input checked="" type="checkbox"/>		
11 m DOWNSLOPE FROM SLOPE CREST		<input checked="" type="checkbox"/>		

SLOPE BELOW FENCE/ RETAINING STRUCTURE	SLOPE = 42° below crest and 34° below inflection		
	CRACKS	SLIDES	EROSION
OBSERVATIONS: No deformation observed. Crest of slope oversteepened.			

TREES BELOW FENCE/ RETAINING STRUCTURE	STRAIGHT	PISTOL-BUTT	LEANING
PERCENT CONIFER: 80%	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
OBSERVATIONS: Some pistol butt trees observed in young trees approximately 20 m below slope crest.			

RETAINING STRUCTURES	YES	NO <input checked="" type="checkbox"/>	HEIGHT= n/a	
TYPE	BLOCKS	CONCRETE	TIMBER CRIB	OTHER:
DEFORMATION	UNDEFORMED	CRACKED	SETTLED	BULGING
OBSERVATIONS: None observed.				

DEFORMATION IN BACKYARD	YES <input checked="" type="checkbox"/>	NO
LOCATION:		
DESCRIPTION:	Minor settlement in northwest corner of property.	



POOLS	YES	NO <input checked="" type="checkbox"/>
DESCRIPTION:	There is hole (1.5 m x 2.5 m x 0.30 m) in the lawn that is lined with plastic that is connected to drainage channel. Some water collects here.	
SEEPAGE/ SPRINGS IN OR BELOW FILL	YES	NO <input checked="" type="checkbox"/>
OBSERVATIONS:	None observed.	

HOUSE DISTANCE TO CREST = 20 m

RECEIVES SURFACE RUNOFF FROM	BACKYARD <input checked="" type="checkbox"/>	½ ROOF <input checked="" type="checkbox"/>	FULL ROOF <input checked="" type="checkbox"/>	FRONT YARD	STREET
OBSERVATIONS: Roof drain at back of house drains into yard into a hand-dug channel towards the crest of the slope. Front driveway/yard dips steeply toward the street.					

CONNECTED TO STORM SEWER	YES <input checked="" type="checkbox"/>	NO	UNSURE
OWNERS COMMENTS: DNV reports that this property is connected to the storm sewer system.			

GENERAL OBSERVATIONS

- There is a 3 m high over steepened slope below crest undercut by a trail.
- North east corner of back yard backs onto old gravel pit active in the 1950's
- Crest of slope oversteepened.



Figure 1. 1863 Layton Drive – Front of the house



Figure 2. 1863 Layton Drive – View of backyard looking NE



Figure 3. 1863 Layton Drive – View of backyard towards slope crest looking NW

INSPECTION LOCATION # 1863 Layton

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 1863 Layton
Drill Method : Dutch Hand Auger
Inspection Date : 28 Oct 05
Logged by : SF/JB
Reviewed by : MJP

Depth (m)	Lithologic Description	Depth To Water Table	Depth (m)	Lithologic Description	Depth To Water Table
	<p>AUGERHOLE: BGC05-1863LAY-AH01 on Slope Crest FINAL DEPTH OF AUGERHOLE: 1.05 m THICKNESS OF LOOSE MATERIALS: 1.05 m minimum</p>			<p>AUGERHOLE: BGC05-1863LAY-AH01 11 m Downslope FINAL DEPTH OF AUGERHOLE: 0.90 m THICKNESS OF LOOSE MATERIALS: 0.90 m minimum</p>	
0.0			0.0		
	<p>SILT (ML) Sandy, fine to coarse sand, trace fine to coarse gravel, non plastic, soft, max particle size = 30 mm, sub-rounded, dark brown, sand content increasing with depth [TOPSOIL]</p>			<p>ORGANICS and SAND (SP) Fine to coarse sand, mainly medium sand, some fine to medium gravel, loose, sub-rounded to rounded, dark brown, moist, homogeneous, no odour, some ash [TOPSOIL / FILL]</p>	
-0.5			-0.5	<p>SAND (SW) Fine to coarse sand, gravelly, fine to coarse gravel, trace silt, well graded, loose, max particle size = 60 mm, sub-rounded, brown, no odour, moist, homogeneous, no cementation [FILL]</p>	
	<p>SAND (SP) Some fine to medium gravel, trace cobbles, trace silt, poorly graded, loose, max particle size = 170 mm, sub-rounded, brown, moist, homogeneous [FILL]</p>			<p>0.90 m: EOH - Refusal of auger on gravel/cobble Attempted two additional holes 3 m and 5 m downslope. No groundwater encountered</p>	
-1.0			-1.0		
	<p>1.05 m: EOH - Refusal on cobbles, attempted three holes No groundwater encountered</p>				
1.5			1.5		
2.0			2.0		
2.5			2.5		
3.0			3.0		

BGC05-1863LAY-AH01