SITE OBSERVATION FORM:	**DNV Landslide Risk Assessment**
LOCATION:	**2125 Berkley Avenue**
INSPECTION DATE: (mm/dd/yy)	**10/27/05**
WEATHER:	**Sunny, clear skies, no rain 1 day prior, heavy rain 2 days prior to visit.**

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
500 - 1045 Howe Street
Vancouver, BC
Canada V6Z 2A9

THICKNESS OF LOOSE MATERIALS	**<1 m**	**1-2 m**	**2-3 m**	**>3 m**
CREST LINE		☑		
11.5 m DOWNSLOPE FROM FENCE		☑		

SLOPE BELOW FENCE/ RETAINING STRUCTURE	**SLOPE =** 31°		
	CRACKS	**SLIDES**	**EROSION**

OBSERVATIONS: No slope deformation observed.

TREES BELOW FENCE/ RETAINING STRUCTURE		**STRAIGHT**	**PISTOL-BUTT**	**LEANING**
PERCENT CONIFER:	30%	☑		

OBSERVATIONS: Mix of tree species on slope: Maple, Alder, Hemlock.

RETAINING STRUCTURES	**YES** ☑	**NO**	**HEIGHT=** 0.25 m

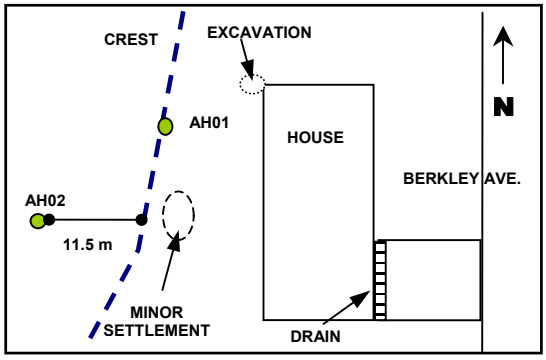
TYPE	**BLOCKS**	**CONCRETE**	**TIMBER CRIB**	**OTHER:** Boulders
				☑
DEFORMATION	**UNDEFORMED**	**CRACKED**	**SETTLED**	**BULGING**
	☑			

OBSERVATIONS: Row of boulders (250 mm diameter)

DEFORMATION IN BACKYARD	**YES** ☑	**NO**
LOCATION: Backyard		
DESCRIPTION: Very minor settlement.		

POOLS	**YES**	**NO** ☑
DESCRIPTION: None		

SEEPAGE/ SPRINGS IN OR BELOW FILL	**YES**	**NO** ☑
OBSERVATIONS: None observed		



HOUSE DISTANCE TO CREST = 14 m

RECEIVES SURFACE RUNOFF FROM	**BACKYARD**	**½ ROOF**	**FULL ROOF**	**FRONT YARD**	**STREET**
	☑	☑	☑	☑	☑

OBSERVATIONS: Drain in the driveway near house. Unsure where roof drains and driveway flow. In a high rainfall event water will likely flow down driveway to drain. (Curb < 10 cm)

CONNECTED TO STORM SEWER	**YES**	**NO** ☑	**UNSURE**
OWNERS COMMENTS: DNV reports that this property is not connected to storm sewer.			

GENERAL OBSERVATIONS

- Old logging road 20 m below crest of slope.
- Debris and compost from garden in area of down slope holes.
- Small excavation at north west corner of house around roof drain where water is directed below the ground surface. No drain outlets observed on slope.

Figure 1. 2125 Berkley Avenue – Front of the house and sloping driveway

Figure 2. 2125 Berkley Avenue – View south along fence line (backyard)

Figure 3. 2125 Berkley Avenue – Pit dug on NW corner of house near roof drain

Figure 4. 2125 Berkley Avenue – View from crest to house

Figure 5. 2125 Berkley Avenue – View north along fence line (backyard)

INSPECTION LOCATION # 2125 Berkley

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2125 Berkley
Drill Method : Dutch Hand Auger
Inspection Date : 27 Oct 05
Logged by : SF/JB
Reviewed by : MJP

AUGERHOLE: BGC05-2125BER-AH01 on Slope Crest
FINAL DEPTH OF AUGERHOLE: 1.75 m
THICKNESS OF LOOSE MATERIALS: 1.75 m minimum

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SILT (ML) Sandy, fine to medium sand, trace gravel, poorly graded, very loose, max particle size = 10 mm, sub-rounded, dark brown, moist, homogeneous, trace roots [TOPSOIL]	
0.5	SAND (SM) Medium to fine sand, silty, trace fine to coarse gravel, medium gravel sized silty sand clasts, poorly graded, loose, max particle size = 30 mm, sub-rounded, light brown with orange mottling, moist, homogeneous, no cementation [FILL] 0.80 m: Organics present 0.90 m: Material becomes grey, fewer silt clasts.	
1.0		
	1.25 m: Material becomes denser and lighter grey	
1.5	1.40 m: Organics present	
	1.75 m: EOH - Refusal of auger on cobble or root.	
2.0		
2.5		
3.0		

AUGERHOLE: BGC05-2125BER-AH02 10 m Downslope
FINAL DEPTH OF AUGERHOLE: 1.10 m
THICKNESS OF LOOSE MATERIALS: 1.10 m minimum

Depth (m)	Lithologic Description	Depth To Water Table
0.0	ORGANICS SILT (ML) Some fine sand, trace medium gravel, low plastic, very soft, dark brown, organic odour, moist, homogeneous, rootlets and organics [TOPSOIL]	
0.5	SILT (ML) Some fine sand, trace fine to medium gravel sized silt clasts, non to low plastic, soft, grey brown, organic odour, trace rootlets [FILL]	
1.0	SAND (SW) Gravelly, some silt, gravel sized silt clasts, well graded, very loose to loose, sub-angular to sub-rounded gravel, brown with orange staining, moist, homogeneous [FILL / COLLUVIUM]	
	1.10 m: EOH - Refusal of auger on gravel / cobble	
1.5		
2.0		
2.5		
3.0		

SITE OBSERVATION FORM:	**DNV Landslide Risk Assessment**
LOCATION:	**2141 Berkley Avenue**
INSPECTION DATE: (mm/dd/yy)	**10/27/05**
WEATHER:	**Sunny, clear skies, no rain 1 day prior, heavy rain 2 days prior to visit.**

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
500 - 1045 Howe Street
Vancouver, BC
Canada V6Z 2A9

THICKNESS OF LOOSE MATERIALS	**<1 m**	**1-2 m**	**2-3 m**	**>3 m**
CREST LINE			☑	
11.5 m DOWNSLOPE FROM FENCE			☑	

SLOPE BELOW FENCE/ RETAINING STRUCTURE	**SLOPE =** 31°		
	CRACKS	**SLIDES**	**EROSION**

OBSERVATIONS: No evidence of slope deformation.

TREES BELOW FENCE/ RETAINING STRUCTURE		**STRAIGHT**	**PISTOL-BUTT**	**LEANING**
PERCENT CONIFER:	90%	☑		

OBSERVATIONS:

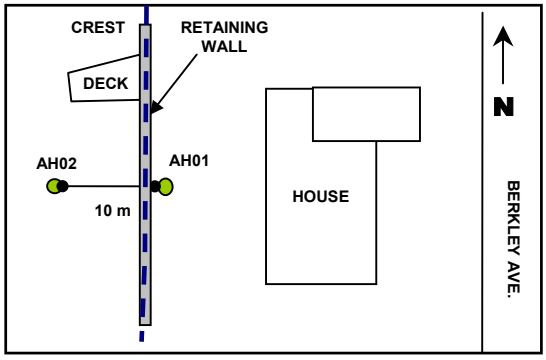
RETAINING STRUCTURES		**YES** ☑	**NO**	**HEIGHT=** 1.60 m
TYPE	**BLOCKS**	**CONCRETE**	**TIMBER CRIB**	**OTHER:**
			☑	
DEFORMATION	**UNDEFORMED**	**CRACKED**	**SETTLED**	**BULGING**
	☑			

OBSERVATIONS: Wall spans width of yard. A sun deck extends down slope from the wall structure. No deformation observed.

DEFORMATION IN BACKYARD	**YES**	**NO** ☑
LOCATION:		
DESCRIPTION: Backyard gently slopes toward sundeck.		

POOLS	**YES**	**NO** ☑
DESCRIPTION: None		

SEEPAGE/ SPRINGS IN OR BELOW FILL	**YES**	**NO** ☑
OBSERVATIONS: None observed		



HOUSE DISTANCE TO CREST = 5 m

RECEIVES SURFACE RUNOFF FROM	**BACKYARD**	**½ ROOF**	**FULL ROOF**	**FRONT YARD**	**STREET**
	☑	☑			

OBSERVATIONS: Front driveway and front yard slope towards the street.

CONNECTED TO STORM SEWER	**YES**	**NO** ☑	**UNSURE**
OWNERS COMMENTS: DNV reports that this property is not connected to storm sewer.			

GENERAL OBSERVATIONS

- Occupant unsure if septic tank is still in place on property.
- House distance from crest is measured at south corner of house.

Figure 1. 2141 Berkley Avenue - Front of the house

Figure 2. 2141 Berkley Avenue - Timber crib retaining wall

Figure 3. 2141 Berkley Avenue - View down-slope looking NW from south end of property

Figure 4. 2141 Berkley Avenue - View down-slope looking SW from north end of property

INSPECTION LOCATION # 2141 Berkley

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2141 Berkley
Drill Method : Dutch Hand Auger
Inspection Date : 27 Oct 05
Logged by : MB/ES
Reviewed by : MJP

AUGERHOLE: BGC05-2141BER-AH01 on Slope Crest
FINAL DEPTH OF AUGERHOLE: 3.00 m
THICKNESS OF LOOSE MATERIALS: 2.70 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SM) Silty, trace fine gravel, poorly graded, loose, max particle size = 5 mm, sub-rounded, dark brown, no odour, moist, homogeneous, no cementation, landscaping mesh [TOPSOIL]	
0.5	SAND (SP) Trace to some gravel, trace silt, poorly graded, gravel sized silt and sand clasts, loose, max particle size = 20 mm, sub-angular, light brown to brown, no odour, moist, homogeneous, no cementation [FILL] SAND (SM) Silty, trace gravel, gravel sized silt clasts, poorly graded, loose, max particle size = 30 mm, sub-angular, brown, no odour, moist, homogeneous, no cementation [FILL]	
1.0	0.93 m: Orange mottling begins	
1.5		
2.0	SAND (SM) Fine to medium sand, silty, poorly graded, loose, dark brown, no odour, moist, homogeneous, no cementation [FILL] SILT (ML) and SAND (SP) Fine sand, trace clay, gravel sized silt clasts, poorly graded, loose to compact, light brown, moist to wet, homogeneous, no cementation [COLLUVIUM]	
2.5		▼
3.0	SILT (ML) Sandy, fine grained sand, low plastic, stiff, grey with some orange mottling, no odour, wet, homogeneous, no cementation, no dilatancy [Weathered GLACIOMARINE] 3.00 m: EOH - Limit of auger	

AUGERHOLE: BGC05-2141BER-AH02 10 m Downslope
FINAL DEPTH OF AUGERHOLE: 2.70 m
THICKNESS OF LOOSE MATERIALS: 2.70 m minimum

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SM) Fine grained sand, silty, poorly graded, very loose, max particle = 1 mm, dark brown, no odour, moist, homogeneous, no cementation [TOPSOIL]	
0.5	SILT (ML) and SAND (SP) Fine sand, trace clay, trace fine grained gravel, poorly graded, compact / firm, max particle size = 25 mm, sub-rounded, brown and grey with some orange mottling, no odour, moist, homogeneous, no cementation, trace charcoal and rootlets [FILL / COLLUVIUM]	
1.0		
1.5		▼
2.0	1.80 m: Material becomes wet, soil also becomes looser with increasing moisture	
2.5		
3.0	2.70 m: EOH - Refusal of auger on rock	

SITE OBSERVATION FORM:	**DNV Landslide Risk Assessment**
LOCATION:	**2157 Berkley Avenue**
INSPECTION DATE: (mm/dd/yy)	**10/26/05**
WEATHER:	**Sunny, clear skies, no rain 1 day prior, heavy rain 2 days prior to visit.**

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
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			☑	
CREST LINE			☑	
10 m DOWNSLOPE FROM CREST		☑		

SLOPE BELOW FENCE/ RETAINING STRUCTURE	**SLOPE =** 31°		
	CRACKS	**SLIDES**	**EROSION**
		☑	

OBSERVATIONS: 10 m below crest, roots of trees, exposed possibly from erosion.

TREES BELOW FENCE/ RETAINING STRUCTURE		**STRAIGHT**	**PISTOL-BUTT**	**LEANING**
PERCENT CONIFER:	100%	☑		

OBSERVATIONS:

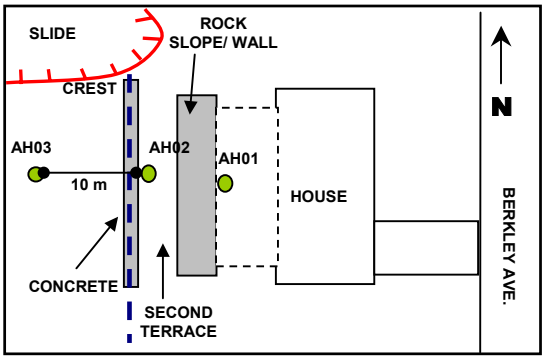
RETAINING STRUCTURES		**YES** ☑	**NO**	**HEIGHT=** 1.50 m
TYPE	**BLOCKS**	**CONCRETE**	**TIMBER CRIB**	**OTHER:** Rocks
	☑	☑		☑
DEFORMATION	**UNDEFORMED**	**CRACKED**	**SETTLED**	**BULGING**
	☑			

OBSERVATIONS: Between AH01 and AH02 there is a rock wall sloping down to the second terrace of backyard. Concrete wall between AH02 and AH03 at the crest, 0.3 m high, with some cracking at corner.

DEFORMATION IN BACKYARD	**YES**	**NO** ☑
LOCATION:		
DESCRIPTION: None observed.		

POOLS	**YES**	**NO** ☑
DESCRIPTION: None		

SEEPAGE/ SPRINGS IN OR BELOW FILL	**YES**	**NO** ☑
OBSERVATIONS: None observed.		



HOUSE DISTANCE TO CREST = 16.5 m

RECEIVES SURFACE RUNOFF FROM	**BACKYARD**	**½ ROOF**	**FULL ROOF**	**FRONT YARD**	**STREET**
	☑	☑	☑		

OBSERVATIONS:

CONNECTED TO STORM SEWER	**YES**	**NO** ☑	**UNSURE**

OWNERS COMMENTS: DNV reports that this property is not connected to storm sewer.

GENERAL OBSERVATIONS

- Fallen log and concrete rubble placed along slope approximately 2 m below crest.
- Adjacent property site of January 2005 slide.

Figure 1. 2157 Berkley Avenue –Front of the house

Figure 2. 2157 Berkley Avenue – View looking north along fenceline

Figure 3. 2157 Berkley Avenue – View looking south along fenceline

INSPECTION LOCATION # 2157 Berkley

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2157 Berkley
Drill Method : Dutch Hand Auger
Inspection Date : 26 Oct 05
Logged by : MB/ES
Reviewed by : MJP

AUGERHOLE: BGC05-2157BER-AH01 @ Fence Line, 9m Back From Crest
FINAL DEPTH OF AUGERHOLE: 3.00 m
THICKNESS OF LOOSE MATERIALS: 1.64 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SM) Fine to medium sand, silty, trace fine gravel, poorly graded, very loose, max particle size = 10 mm, sub-rounded, dark brown, moist, homogeneous, no cementation, rootlets and organics [TOPSOIL]	
0.5	SAND (SM) Fine to medium sand, some silt, trace gravel, gravel sized silt clasts, poorly graded, loose, max particle size = 10 mm, sub-rounded, brown, moist, homogeneous, no cementation [FILL]	
1.0		
1.5		
	SILT (ML) and CLAY (CI) Trace fine to medium sand with fine sand lenses, medium plasticity, firm, light grey with orange mottling, no odour, moist, homogeneous, no cementation, non dilatant [Weathered GLACIOMARINE]	
2.0		
	2.40 m: Interbedded layers of silty sand with silt and clay, 50 to 150 mm thick, silty sand layer are thinner than silt and clay layers.	▼
2.5		
3.0	3.00 m: EOH - Limit of auger	

AUGERHOLE: BGC05-2157BER-AH02 on Slope Crest
FINAL DEPTH OF AUGERHOLE: 1.15 m
THICKNESS OF LOOSE MATERIALS: 1.15 m minimum

Depth (m)	Lithologic Description	Depth To Water Table
0.0	TOPSOIL	
	GRAVEL (GW) Sandy, trace silt, well graded medium sand to medium gravel, max particle size = 20 mm, sub-angular, grey [FILL]	
	SAND (SM) Fine to coarse sand, some silt, some fine to coarse gravel, sub-angular, light brown, moist, homogeneous [FILL]	
0.5		
	0.80 m: Possible ORGANICS layer; black, discontinuous	
	0.90 m: Material becomes silty with trace gravel, some sand. Material is grey / brown with trace orange mottling.	
1.0		
	1.10 m: Some charcoal, trace organics, material becomes sandy	
1.5	1.45 m: Some charcoal encountered 1.50 m: Material becomes silty	
	1.60 m: Material becomes wet	▼
	SILT (ML) Fine to medium gravel, angular, orange brown mottling, homogeneous, some organics [FILL / COLLUVIUM]	
2.0		
	2.30 m: Material becomes firm	
	SILT (ML) Trace fine sand, trace clay, low plastic, firm, light brown to grey with orange mottling, no odour, wet, homogeneous, no cementation, slow dilatancy [Weathered GLACIOMARINE] 2.60 m: Material density becomes 'stiff' 2.70 m: Fine laminations evident 2.80 m: Some gravel evident	
2.5		
	2.90 m: EOH - Refusal as material is too stiff to auger through.	
3.0		

INSPECTION LOCATION # 2157 Berkley - Downslope

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2157 Berkley - Downslope
Drill Method : Dutch Hand Auger
Inspection Date : 26 Oct 05
Logged by : SF/JB
Reviewed by : MJP

AUGERHOLE: BGC05-2157BER-AH03 10 m Downslope From Crest
FINAL DEPTH OF AUGERHOLE: 1.15 m
THICKNESS OF LOOSE MATERIALS: 1.15 m minimum

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SM) Fine to medium sand, silty, trace fine gravel, poorly graded, loose, max particle size = 3 mm, sub-rounded, dark brown, moist, homogeneous, no cementation, rootlets and organics [TOPSOIL]	
0.5	SAND (SM) Fine to medium sand, some silt, trace gravel, gravel sized silt clasts, poorly graded, loose, max particle size = 3 mm, sub-rounded, brown, moist, homogeneous, no cementation [FILL]	
	SAND (SM) Silty, some gravel, trace clay, gravel sized silt clasts, well graded, loose to firm, max particle size = 3 mm, sub-rounded, grey, moist, homogeneous, no cementation [FILL]	▼
1.0	0.70 m: Material becomes wet 1.00 m: Orange mottling begins 1.10 m: Plastic button recovered	
	1.15 m: EOH - Refusal of auger on rock or root.	
1.5		
2.0		
2.5		
3.0		

AUGERHOLE:
FINAL DEPTH OF AUGERHOLE:
THICKNESS OF LOOSE MATERIALS:

Depth (m)	Lithologic Description	Depth To Water Table
0.0		
0.5		
1.0		
1.5		
2.0		
2.5		
3.0		

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:	**2175 Berkley Avenue**
INSPECTION DATE: (mm/dd/yy)	**10/26/05**
WEATHER:	**Sunny, clear skies, no rain 1 day prior, heavy rain 2 days prior to visit.**

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
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			☑	

SLOPE BELOW FENCE/ RETAINING STRUCTURE	**SLOPE =** 30°		
	CRACKS	**SLIDES**	**EROSION**
		☑	

OBSERVATIONS: Site of January 2005 slide.

TREES BELOW FENCE/ RETAINING STRUCTURE	**STRAIGHT**	**PISTOL-BUTT**	**LEANING**
PERCENT CONIFER: 0%			

OBSERVATIONS: No trees present.

RETAINING STRUCTURES	**YES**	**NO** ☑	**HEIGHT=** n/a

TYPE	**BLOCKS**	**CONCRETE**	**TIMBER CRIB**	**OTHER:**
DEFORMATION	**UNDEFORMED**	**CRACKED**	**SETTLED**	**BULGING**

OBSERVATIONS: None.

DEFORMATION IN BACKYARD	**YES** ☑	**NO**

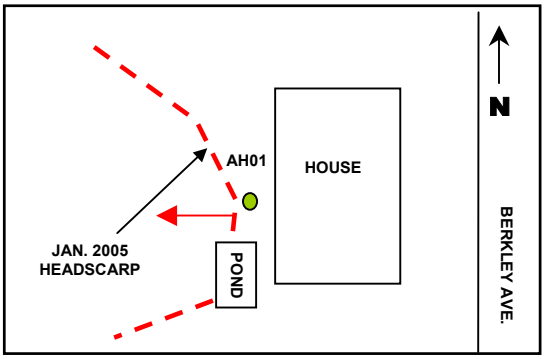
LOCATION: Backyard
DESCRIPTION: Site of January 2005 slide.

POOLS	**YES** ☑	**NO**

DESCRIPTION: Existing concrete fish pond, no cracks observed.

SEEPAGE/ SPRINGS IN OR BELOW FILL	**YES**	**NO** ☑

OBSERVATIONS: None observed.



HOUSE DISTANCE TO CREST = 1.20 m

RECEIVES SURFACE RUNOFF FROM	**BACKYARD**	**½ ROOF**	**FULL ROOF**	**FRONT YARD**	**STREET**
	☑	☑	☑	☑	☑

OBSERVATIONS: Potential for run off from street from 2191 Berkley driveway.

CONNECTED TO STORM SEWER	**YES**	**NO** ☑	**UNSURE**

OWNERS COMMENTS: DNV reports that this property is not connected to storm sewer.

GENERAL OBSERVATIONS

- Site of January 2005 slide.
- No auger hole drilled down slope, no fill remains down slope of headscarp.

Figure 1. 2175 Berkley Avenue –Front of the house

Figure 2. 2175 Berkley Avenue – View looking north from scarp

Figure 3. 2175 Berkley Avenue – View down-slope of January 2005 slide

INSPECTION LOCATION # 2175 Berkley

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2175 Berkley
Drill Method : Dutch Hand Auger
Inspection Date : 26 Oct 05
Logged by : MB/ES/SF/JB
Reviewed by : MJP

AUGERHOLE: BGC05-2175BER-AH01 on Slope Crest
FINAL DEPTH OF AUGERHOLE: 2.48 m
THICKNESS OF LOOSE MATERIALS: 2.45 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SM) Fine to medium sand, silty, poorly graded, loose, max particle size = 40 mm, sub-rounded, brown with orange mottling, no odour, moist, homogeneous, no cementation, rapid dilatancy [FILL]	
0.5		
1.0		
1.5	1.60 m: Material becomes light brown	
	1.80 m: Orange mottling evident	
	1.91 m: Water table, material becomes wet.	▼
2.0		
2.5	SILT (ML) Sandy, low plastic, firm to stiff, grey with orange mottling, no odour, wet, homogeneous, no cementation, slow dilatancy [Weathered GLACIOMARINE]	
	2.48 m: EOH - Refusal as material is too stiff to auger through	
3.0		

AUGERHOLE:
FINAL DEPTH OF AUGERHOLE:
THICKNESS OF LOOSE MATERIALS:

Depth (m)	Lithologic Description	Depth To Water Table
0.0	No Log completed as minimal fill remains on Jan 19, 2005 Slide scarp.	
0.5		
1.0		
1.5		
2.0		
2.5		
3.0		