SITE OBSERVATION FORM:	**DNV Landslide Risk Assessment**
LOCATION:	**2402 Swinburne Avenue**
INSPECTION DATE: (mm/dd/yy)	**11/02/05**
WEATHER:	**Rain, 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 (North)		☑		
11 m DOWNSLOPE FROM SLOPE CREST (North)		☑		
FENCE LINE (West)			☑	
10 m DOWNSLOPE FROM SLOPE CREST (West)		☑		

SLOPE BELOW FENCE/ RETAINING STRUCTURE	**SLOPE =** 47°		
	CRACKS	**SLIDES**	**EROSION**
			☑

OBSERVATIONS: Soil erosion on northwest side of property.

TREES BELOW FENCE/ RETAINING STRUCTURE		**STRAIGHT**	**PISTOL-BUTT**	**LEANING**
PERCENT CONIFER:	99 %		☑	☑

OBSERVATIONS: Most trees are the same age class (estimated ~60-80 years old). Pistol butt is common; several trees have fallen over.

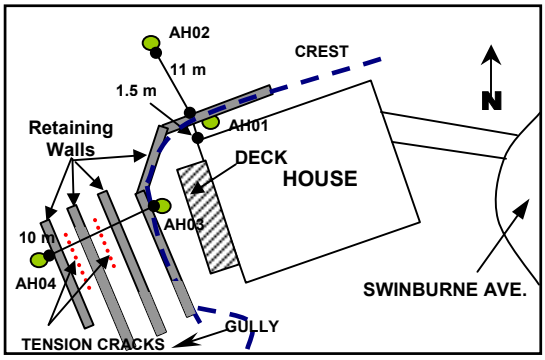
RETAINING STRUCTURES		**YES** ☑	**NO**	**HEIGHT =** 6.5 m
TYPE	**BLOCKS**	**CONCRETE**	**TIMBER CRIB**	**OTHER:**
			☑	
DEFORMATION	**UNDEFORMED**	**CRACKED**	**SETTLED**	**BULGING**
			☑	☑

OBSERVATIONS: Height is the total height of 4 terraces of retaining walls. Wall height increases down slope, ranging from 0.15 m to 1.5 m. Fill contained by wall is settling due to rotting, bulging timbers.

DEFORMATION IN BACKYARD	**YES** ☑	**NO**
LOCATION: Southeast side of property.		
DESCRIPTION: Tension cracks observed in fill behind bulging timber retaining walls.		

POOLS	**YES**	**NO** ☑
DESCRIPTION:		

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



HOUSE DISTANCE TO CREST = 1.5 m

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

OBSERVATIONS: Unsure where roof drainage is directed.

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

OWNERS COMMENTS: Originally connected after 1979, however the drainage may be blocked with debris. DNV reports that this property is not connected to the storm sewer.

GENERAL OBSERVATIONS

- The timber cribbing at the lowest terrace level on the southeast side of the property is failing.
- Gully located on south side of property.

Figure 1. 2402 Swinburne Avenue – Front of the house

Figure 2. 2402 Swinburne Avenue – Retaining wall

Figure 3. 2402 Swinburne – View west along fenceline (backyard)

Figure 4. 2402 Swinburne – View south along fenceline (backyard)

INSPECTION LOCATION # 2402 Swinburne - West

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2402 Swinburne - West
Drill Method : Dutch Hand Auger
Inspection Date : 23 Nov 05
Logged by : MB/ES
Reviewed by : MJP

AUGERHOLE: BGC05-2402SWI-AH03 on Slope Crest
FINAL DEPTH OF AUGERHOLE: 2.20 m
THICKNESS OF LOOSE MATERIALS: 2.00 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SW) Some fine to medium gravel, trace silt, well graded, loose, max particle size = 20 mm, sub-angular, grey peppered appearance, no odour, moist, homogeneous, no cementation [FILL]	
0.5	SAND (SP) Fine to medium sand, some silt, trace fine gravel, poorly graded, loose, max particle = 3 mm, rounded, brown, no odour, moist, homogeneous, no cementation, trace rootlets [FILL] 0.70 m: Orange mottling begins. Some gravel sized clasts of sand are evident.	
1.0	1.00 - 1.10 m: ORGANICS layer, some charoal evident.	
1.5	SAND (SP) Some silt, fine sand, fine gravel sized silt clasts, poorly graded, compact, brown with orange mottling, no odour, moist, homogeneous, no cementation, trace roots [FILL or COLLUVIUM]	
2.0	SAND (SM) Fine sand, silty, gravel sized silt and sand clasts, poorly graded, loose to compact, grey and brown with orange mottling, no odour, moist to wet, homogeneous, no cementation [COLLUVIUM]	
	SILT (ML) Some fine sand, low to non plastic, firm to stiff, grey with orange mottling, no odour, moist to wet, homogeneous, no cementation, non dilatant [Weathered GLACIOMARINE]	
2.5	2.20 m: EOH - Refusal as material is too stiff to auger through	
3.0		

AUGERHOLE: BGC05-2402SWI-AH04 10 m Downslope
FINAL DEPTH OF AUGERHOLE: 1.40 m
THICKNESS OF LOOSE MATERIALS: 1.40 m minimum

Depth (m)	Lithologic Description	Depth To Water Table
0.0	ORGANIC SILT (ML) Some fine sand, non plastic, very soft, dark brown, no odour, dry to moist, homogeneous, no cementation, no dilatancy, rootlets [TOPSOIL]	
0.5	SILT (ML) Sandy, fine sand, trace fine gravel sized silt clasts, low plastic, soft, brown with orange mottling, no odour, moist, homogeneous, no cementation, no dilatancy, rootlets and charcoal [FILL] 0.60 - 0.65 m: Charcoal layer Material becomes wet	
1.0	SILT (ML) and SAND (SW) Some fine to coarse gravel, well graded sand, well graded gravel, non plastic, firm, max particle size = 20 mm, sub-angular, grey with some orange mottling, no odour, wet, homogenous, no cementation, slow dilatancy [Weathered GLACIOMARINE]	
1.5	1.40 m: EOH - Refusal of auger on gravel.	
2.0		
2.5		
3.0		

INSPECTION LOCATION # 2402 Swinburne - North

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2402 Swinburne - North
Drill Method : Dutch Hand Auger
Inspection Date : 02 Nov 05
Logged by : SF/JB
Reviewed by : MJP

AUGERHOLE: BGC05-2402SWI-AH01 at Fence Line
FINAL DEPTH OF AUGERHOLE: 1.95 m
THICKNESS OF LOOSE MATERIALS: 1.55 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	ORGANICS - moist	
	SAND (SW) Fine to coarse sand, silty, some fine to coarse gravel, well sorted, very loose, max particle size = 45 mm, sub-angular to sub-rounded, brown, moist, homogeneous [FILL]	
	0.40 m - 0.5 m: Partially decomposed log	
0.5	0.50 m: Material density changes from very loose to loose.	
1.0	SAND (SP) Medium to fine sand, some fine to medium gravel sized clasts of silt, poorly graded, loose to compact, max particle size = 4 mm, sub-rounded, light grey, moist, homogeneous [COLLUVIUM]	
1.5	1.55 m: Material becomes denser	
	SILT (ML) Some fine sand, low plasticity, firm (disturbed sample), light grey with orange mottling, no odour, moist, homogeneous, trace organic matter [Weathered GLACIOMARINE]	
	1.80 m: Material becomes darker grey, and trace clay is noted	
2.0	1.95 m: EOH - 1. Refusal on tree root or dense glaciomarine material 2. Small sample of dark grey compact/stiff glaciomarine silt reovered from bottom of hole.	
2.5		
3.0		

AUGERHOLE: BGC05-2402SWI-AH02 11 m Downslope
FINAL DEPTH OF AUGERHOLE: 1.50 m
THICKNESS OF LOOSE MATERIALS: 0.80 m minimum

Depth (m)	Lithologic Description	Depth To Water Table
0.0	ORGANICS grading to ORGANIC SAND (SP) Fine to medium sand, very loose, dry, homogeneous, organic odour, roots and bark present [COLLUVIUM]	
0.5	SAND (SP) Fine to medium sand, trace silt, trace coarse sand to medium gravel sized clasts of silt, poorly graded, very loose, max particle size = 15 mm, sub-rounded, brown, dry to moist, trace charcoal, roots and bark [COLLUVIUM]	
1.0	SILT (ML) Trace fine sand, non plastic, firm (loose to compact augering), light grey with orange mottling, moist, homogeneous, non dilatant, trace organics [GLACIOMARINE]	
1.5	1.45 m: Material becomes wet, sand content increases slightly to 'some'.	▼
	1.50 m: EOH - Refusal as material is too stiff to auger through.	
2.0		
2.5		
3.0		

SITE OBSERVATION FORM:	**DNV Landslide Risk Assessment**
LOCATION:	**2410 Swinburne Avenue**
INSPECTION DATE: (mm/dd/yy)	**11/02/05**
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		☑		
10 m DOWNSLOPE FROM SLOPE CREST	☑			

SLOPE BELOW FENCE/ RETAINING STRUCTURE	**SLOPE =** 34°		
	CRACKS	**SLIDES**	**EROSION**
			☑

OBSERVATIONS: Some soil erosion below old stump. Exposed glaciomarine sediment.

TREES BELOW FENCE/ RETAINING STRUCTURE		**STRAIGHT**	**PISTOL-BUTT**	**LEANING**
PERCENT CONIFER	80 %		☑	☑

OBSERVATIONS: Most trees are straight, some leaning and pistol-butt trees observed with increased occurrence halfway down slope.

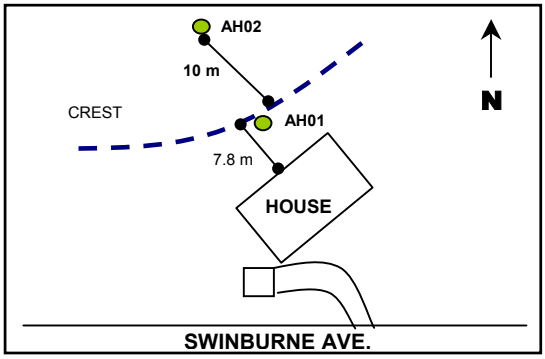
RETAINING STRUCTURES		**YES**	**NO** ☑	**HEIGHT:** n/a
TYPE	**BLOCKS**	**CONCRETE**	**TIMBER CRIB**	**OTHER:**
DEFORMATION	**UNDEFORMED**	**CRACKED**	**SETTLED**	**BULGING**

OBSERVATIONS:

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

POOLS	**YES**	**NO** ☑
DESCRIPTION: Owner noted that there was an old pond somewhere in the vicinity of his home and filled in when house was built; location uncertain.		

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



HOUSE DISTANCE TO CREST

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

OBSERVATIONS: Backyard dips southwest away from crest.

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

GENERAL OBSERVATIONS

- Owner notes that water generally flows south away from slope, supported by observations that the property dips away from slope.
- Grass near crest begins to die immediately after the rainy season.

Figure 1. 2410 Swinburne Avenue – Front of the house

Figure 2. 2410 Swinburne Avenue – View of backyard dipping towards the south

INSPECTION LOCATION # 2410 Swinburne

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2410 Swinburne
Drill Method : Dutch Hand Auger
Inspection Date : 02 Nov 05
Logged by : MB/ES
Reviewed by : MJP

AUGERHOLE: BGC05-2410SWI-AH01 at Fence Line
FINAL DEPTH OF AUGERHOLE: 2.00 m
THICKNESS OF LOOSE MATERIALS: 1.30 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SP) Fine to coarse but mainly fine sand, some silt, some fine to medium gravel, trace cobbles, gravel sized clasts of fine sand, poorly graded, loose, max particle size = 80 mm, sub-rounded, light brown, no odour, dry, homogeneous, no cementation, trace rootlets [FILL]	▼
0.5		
1.0	SAND (SP) Fine to medium sand, trace to some silt, gravel sized clasts of fine sand, poorly graded, loose to compact, max particle size = 1 mm, grey to light brown with orange mottling, no odour, moist, homogeneous, no cementation [COLLUVIUM] 1.10 m - 1.30 m: Medium to coarse grained sand noted	
1.5	SAND (SP) Fine sand, trace to some silt, poorly graded, compact, max particle = <1 mm, grey to light brown with orange mottling, no odour, moist, homogeneous, no cementation [Weathered GLACIOMARINE]	
2.0	2.00 m: EOH - Refusal as material is too stiff to auger through.	
2.5		
3.0		

AUGERHOLE: BGC05-2410SWI-AH02 10 m Downslope
FINAL DEPTH OF AUGERHOLE: 1.10 m
THICKNESS OF LOOSE MATERIALS: 0.80 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SM) Fine sand, silty, trace fine to coarse gravel, poorly graded, loose, max particle size = 25 mm, sub-rounded, dark brown, no odour, moist, homogeneous, no cementation [TOP SOIL]	
0.5	SILT (ML) Some fine to medium sand, trace fine to coarse gravel, trace clay, low plasticity, soft, grey and light brown with orange mottling, no odour, moist, homogeneous, no cementation, no dilatancy [COLLUVIUM]	
1.0	SAND (SP) Fine sand, trace to some silt, poorly graded, compact, max particle size = <1 mm, grey to light brown with orange mottling, no odour, moist, homogeneous, no cementation [Weathered GLACIOMARINE]	
1.5	1.10 m: EOH - Refusal as material is too stiff/compact to auger through	
2.0		
2.5		
3.0		

SITE OBSERVATION FORM:	**DNV Landslide Risk Assessment**
LOCATION:	**2414 Swinburne Avenue**
INSPECTION DATE: (mm/dd/yy)	**11/02/05**
WEATHER:	**Light rain, 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		☑		
10 m DOWNSLOPE FROM SLOPE CREST		☑		

SLOPE BELOW FENCE/ RETAINING STRUCTURE	**SLOPE =** 38°		
	CRACKS	**SLIDES**	**EROSION**
	☑		☑

OBSERVATIONS: Signs of erosion, and a few cracks opening.

TREES BELOW FENCE/ RETAINING STRUCTURE		**STRAIGHT**	**PISTOL-BUTT**	**LEANING**
PERCENT CONIFER:	**70%**		☑	☑

OBSERVATIONS: West corner of property has a large 0.9 m diameter leaning tree at crest of slope.

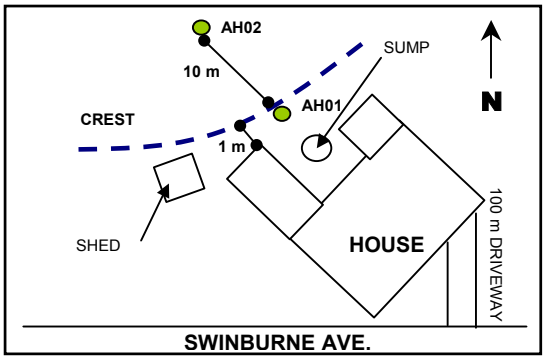
RETAINING STRUCTURES		**YES** ☑	**NO**	**HEIGHT:** 1.1 m
TYPE	**BLOCKS**	**CONCRETE**	**TIMBER CRIB**	**OTHER:** Brick Wall
				☑
DEFORMATION	**UNDEFORMED**	**CRACKED**	**SETTLED**	**BULGING**
	☑			

OBSERVATIONS: Retains garden only, not house.

DEFORMATION IN BACKYARD	**YES**	**NO** ☑
LOCATION:		
DESCRIPTION: No backyard. Some possible slumping steps at crest.		

POOLS	**YES**	**NO** ☑
DESCRIPTION:		

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



HOUSE DISTANCE TO CREST = 1.0 m

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

OBSERVATIONS: Unsure where roof drainage is directed.

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

OWNERS COMMENTS: All roof drains collect in sump. Owner is unsure of where the sump drains. DNV reports that this property is not connected to the storm sewer system.

GENERAL OBSERVATIONS

- Owner spent $200,000 repairing house foundation because house was settling. Owner noted that the new foundation is on 'hardpan'.
- Owner has downspouts collecting in a sump. (Location uncertain)
- Shed in West corner of property is settling and twisting with deformation. Some foundations are located on the crest and are settling.

Figure 1. 2414 Swinburne Avenue – Front of the house

Figure 2. 2414 Swinburne Avenue – Leaning trees downslope

Figure 3. 2414 Swinburne Avenue – View north along fenceline (backyard)

Figure 4. 2414 Swinburne Avenue - View looking south at tilted shed

INSPECTION LOCATION # 2414 Swinburne

Project : DNV Landslide Risk Assessment

Project No. : 0404-002-01

Location : 2414 Swinburne
Drill Method : Dutch Hand Auger
Inspection Date : 02 Nov 05
Logged by : MB/ES
Reviewed by : MJP

AUGERHOLE: BGC05-2414SWI-AH01 at Fence Line
FINAL DEPTH OF AUGERHOLE: 2.10 m
THICKNESS OF LOOSE MATERIALS: 1.90 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SAND (SW) Some silt, some fine gravel, trace cobbles, max particle size = 40 mm, sub-rounded, dark brown to brown, no odour, moist, homogeneous, no cementation [FILL]	
0.5	0.60 m: Organic layer with some charcoal	
	SAND (SW) Trace to some silt, some fine to coarse gravel, well graded sand, loose, max particle size = 20 mm, sub-rounded, brown, no odour, moist, homogeneous, no cementation [COLLUVIUM]	
1.0		
	1.30 m: Soil changes from brown to light brown. Also, silt content is lowered to 'trace'	
1.5		
	SAND (SW) Trace silt, trace fine to coarse gravel, well graded, loose, max particle size = 20 mm, sub-rounded, grey and brown with orange mottling, no odour, moist, homogeneous, no cementation [COLLUVIUM]	▼
2.0	SAND (SP) Fine sand, trace to some silt, poorly graded, compact, max particle size = <1 mm, grey to light brown with orange mottling, no odour, wet, homogneous, no cementation [Weathered GLACIOMARINE]	
	2.1 m: EOH - Refusal as material is too stiff/compact to auger through.	
2.5		
3.0		

AUGERHOLE: BGC05-2414SWI-AH02 10 m Downslope
FINAL DEPTH OF AUGERHOLE: 1.50 m
THICKNESS OF LOOSE MATERIALS: 1.10 m

Depth (m)	Lithologic Description	Depth To Water Table
0.0	SILT (ML) Trace fine to medium sand, trace fine to medium grained gravel, low plasticity, very soft to soft, dark brown, no odour, moist, homogeneous, no cementation, non-dilatant [TOPSOIL]	
	SILT (ML) Sandy, fine sand, trace clay, trace medium to coarse gravel, gravel sized silt clasts, poorly graded, loose, light brown, no odour, moist, homogeneous, no cementation [FILL / COLLUVIUM]	
0.5		
1.0		▼
	SAND (SP) Fine sand, some silt, poorly graded, compact, max particle size = <1 mm, grey to light brown with orange mottling, no odour, wet, homogeneous, no cementation [Weathered GLACIOMARINE] 1.20 m - 1.30 m: Medium to coarse sand noted	
1.5		
	1.50 m: EOH - Refusal as material is too stiff/compact to auger through.	
2.0		
2.5		
3.0		