

Table 3A
Geologic Hazard Unit Risk Matrix & Mitigation Measures for Grading & Slope Shaping

GHU #	GHU	Probability of slope movement with disturbance	Severity of impact	Possible Consequences	GHU-Specific Mitigation	Comments
1 A	Upper West Slide	H	H	Reactivation of existing slumps or initiation of new slumps; shallow slope failures transitioning into earthflows possible; increased erosion; changes in drainage patterns; erosion.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; avoid shear zones and outcrops/scarps	use re-distribution of slope grading to increase resisting forces and decrease driving forces
1 B	Lower West Slide	M	H	Reactivation or initiation of slumps and earthflows, surface drainages could be disrupted creating bank erosion and downstream sedimentation; earthflows could be rapid.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills	integrate grading and drainage plans
2	Slump Block	M	M	Reactivation of slumps.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; avoid more recent slump scarps and infiltration	integrate grading and drainage plans; upper portion of unit is more sensitive; consider relocating structures out of this unit
3	Middle Slide Complex	H	H	Reactivation of large slump blocks, transitioning into earthflows.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills	slope stability enhancement to protect towers
4	Lower Earthflow	M	M	Reactivation of earthflow; rapid failure possible.	control drainage to reduce infiltration and erosion; revegetation; avoid soil saturation	upper portion more stable, but sensitive to infiltration
5 A	Upper East Slide	H	H	Reactivation of large slump blocks, transitioning into earthflows.	avoidance is primary recommendation; minimize all disturbance; control of drainage is critical	integrate grading and drainage plans
5 B	Lower East Slide	H	H	Acceleration of movement of earthflow could remove support from the Upper East Slide and initiate retrogressive failures upslope; earthflows could be rapid.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; drainage is critical; minimize disturbance	integrate grading and drainage plans
6	Chicken Bone	M	M	Recent slumps could be reactivated; additional infiltration could destabilize the Middle and Lower West Slide Complexes.	avoid infiltration and wetlands; create dense pattern of drains and subdrains	integrate grading and drainage plans; intercept drainage around unit so it cannot infiltrate and reactivate lower, sensitive units.
7	East Facet	H	M	Shallow slope failures transitioning into earthflows possible; additional infiltration could destabilize Chicken Bone or East Face; erosion.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills	integrate grading and drainage plans; use natural grades to the extent possible.
8	Upper Narrows	H	H	Additional infiltration could destabilize Chicken Bone, Middle and Lower West Slide Complexes. Excavation to reduce side hill slope could destabilize slopes above and create a rockfall hazard.	soil densification and soil amenities for rapid revegetation; soil nails; engineered cuts/fills; rock bolting; bank reinforcement	ski trail down narrows would expose rock rubble or bedrock surface; both surfaces would be difficult to revegetate and be visually intrusive; retaining walls would be visible
9	Upper Bowl	L	L	Additional infiltration could destabilize Chicken Bone or Middle and Lower West Slide Complexes.	intercept and divert drainage; engineered cuts/fills; control erosion	integrate grading and drainage plans
10 A	West Face - North	M	M	Additional shallow landslides transitioning into earthflows possible; retrogressive failure progressing upslope above rock slumps; erosion.	avoid sensitive areas; revegetate; avoid soil saturation	integrate grading and drainage plans; possible rockfall; utilize natural slopes
10 B	West Face - South	H	H	Additional shallow landslides transitioning into earthflows possible; failures of earthflows could be rapid; erosion.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills	keep grading and slope shaping on the North component of the West Face whenever possible
11	North Face	H	H	Additional debris/rock slides from loss of root reinforcement; erosion.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; avoid outcrops/scarps	integrate grading and drainage plans
12	East Face	M	M	Additional shallow landslides transitioning into earthflows possible; major grading could reactivate or initiate slumps.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; avoid outcrops/scarps	integrate grading and drainage plans

Key for probability of movement:

L	Low (white)
M	Moderate (yellow)
H	High (orange)

Key for Severity of Impact:

L	Low (white)
M	Moderate (gray)
H	High (black)

Note: The ratings represent risk or impacts for an un-mitigated mountain. The risk of instability within each GHU is a generalized rating that represents the average impact of a ski area activity on the sensitive slopes within a unit.

Table 3A

**Grading
and Slope
Shaping**

**Table 3B
Geologic Hazard Unit Risk Matrix & Mitigation Measures for Clearing**

GHU #	GHU	Probability of slope movement with disturbance	Severity of impact	Possible Consequences	GHU-Specific Mitigation	Comments
1 A	Upper West Slide	H	H	Reactivation of existing slumps or initiation of new slumps; shallow slope failures transitioning into earthflows possible; increased erosion; changes in drainage patterns.	revegetation; control drainage in upper unit; minimize clearing	avoid clearing near existing drainage channels; integrate grading and drainage plans
1 B	Lower West Slide	M	M	Reactivation or initiation of slumps and earthflows; surface drainages could be disrupted, creating bank erosion and downstream sedimentation.	revegetation; reduce infiltration opportunities in lower unit	integrate grading and drainage plans
2	Slump Block	M	M	Reactivation of slumps.	revegetation; avoid clearing all mature trees	upper portion of unit is more sensitive; consider relocating structures out of this unit
3	Middle Slide Complex	M	M	Reactivation of large slump blocks, transitioning into earthflows.	revegetation; avoid clearing all mature trees	erosion control adjacent to drainage
4	Lower Earthflow	L	L	Reactivation of earthflow; rapid failure possible.	revegetation; avoid clearing all mature trees; careful water management; minimal cuts/fills	reduce soil permeability
5 A	Upper East Slide	H	H	Reactivation of large slump blocks, transitioning into earthflows.	avoidance is the primary recommendation; revegetation; avoid clearing all mature trees	reduce soil permeability; no increase in additional water
5 B	Lower East Slide	L	L	Acceleration of movement of earthflow could remove support from the Upper East Slide and initiate retrogressive failure progressing up the slope	revegetation; avoid clearing all mature trees	reduce soil permeability
6	Chicken Bone	M	M	Recent slumps could be reactivated. Additional infiltration could destabilize the Middle and Lower West Slide Complexes.	revegetation; avoid clearing all mature trees; add more trees to absorb moisture	reduce soil permeability; enhance wetland vegetation to protect it.
7	East Facet	H	M	Shallow slope failures transitioning into earthflows possible. Additional infiltration could destabilize Chicken Bone or East Face.	revegetation; avoid clearing all mature trees	reduce soil permeability
8	Upper Narrows	M	M	Additional infiltration could destabilize Chicken Bone, Middle and Lower West Slide Complexes.	revegetation; avoid clearing all mature trees; leave stump base and roots to bind soil	trail down narrows would expose rock rubble or bedrock surface, both difficult to revegetate and be visually intrusive
9	Upper Bowl	M	M	Additional infiltration could destabilize Chicken Bone or Middle and Lower West Slide Complexes.	revegetation; avoid clearing all mature trees	reduce soil permeability
10 A	West Face - North	M	M	Additional shallow landslides transitioning into earthflows possible; retrogressive failure progressing upslope above rock slumps; erosion.	revegetation; leave stump base and roots to bind soil due to steep slopes	reduce soil permeability
10 B	West Face - South	H	H	Additional shallow landslides transitioning into earthflows possible; failures of earthflows could be rapid.	revegetation; avoid clearing all mature trees; leave stump base and roots to bind soil	drainage important; reduce soil permeability
11	North Face	H	H	Additional debris/rock slides from loss of root reinforcement.	revegetation; avoid clearing all mature trees; leave stump base and roots to bind soil	chose trail design to avoid clearing, wherever possible
12	East Face	M	M	Additional shallow landslides transitioning into earthflows possible; major clearing could reactivate or initiate slumps.	revegetation; avoid clearing all mature trees; leave stump base and roots to bind soil	reduce soil permeability

Key for probability of movement:

L	Low (white)
M	Moderate (yellow)
H	High (orange)

Key for Severity of Impact:

L	Low (white)
M	Moderate (gray)
H	High (black)

Note: The ratings represent risk or impacts for an un-mitigated mountain. The risk of instability within each GHU is a generalized rating that represents the average impact of a ski area activity on the sensitive slopes within a unit.

Table 3B
Clearing

**Table 3C
Geologic Hazard Unit Risk Matrix & Mitigation Measures for Snowmaking**

GHU #	GHU	Probability of slope movement with disturbance	Severity of impact	Possible Consequences	GHU-Specific Mitigation	Comments
1 A	Upper West Slide	H	H	Reactivation of existing slumps or initiation of new slumps; shallow slope failures transitioning into earthflows possible; additional infiltration could destabilize Lower West Slide.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation
1 B	Lower West Slide	H	M	Reactivation or initiation of slumps and earthflows; surface drainages could be disrupted, creating bank erosion and downstream sedimentation.	Control drainage (upper unit) and prevent infiltration (lower unit) - lined ditches, intercept drains, etc.; manual removal of excess accumulation prior to melt-off.	Regulate snow application to prevent excessive accumulation
2	Slump Block	H	M	Reactivation of slumps.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation
3	Middle Slide Complex	H	H	Reactivation of large slump blocks, transitioning into earthflows; very sensitive to moisture originating from Chicken Bone.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation
4	Lower Earthflow	H	M	Reactivation of earthflow; rapid failure possible; could result in blocked drainages and increased sediment in streams.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation
5 A	Upper East Slide	H	H	Reactivation of large slump blocks, transitioning into earthflows.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation
5 B	Lower East Slide	H	H	Acceleration of movement of earthflow could remove support from the Upper East Slide and initiate retrogressive failure progressing up the slope.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation
6	Chicken Bone	H	M	Recent slumps could be reactivated; additional infiltration could destabilize the Middle and Lower West Slide Complexes.	Manual removal of excess accumulation prior to melt-off; control drainage; minimize snowmaking; control runoff from melt zones.	Regulate snow application to prevent excessive accumulation
7	East Facet	H	M	Shallow slope failures transitioning into earthflows possible; additional infiltration could destabilize Chicken Bone or East Face.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation; integrate drainage with downhill diversions
8	Upper Narrows	M	M	Additional infiltration could destabilize Chicken Bone, Middle and Lower West Slide Complexes.	Control drainage	Regulate snow application to prevent excessive accumulation
9	Upper Bowl	M	M	Additional infiltration could destabilize Chicken Bone or Middle and Lower West Slide Complexes.	Control drainage	Regulate snow application to prevent excessive accumulation
10 A	West Face - North	M	M	Additional shallow landslides transitioning into earthflows possible; retrogressive failure progressing upslope above slumps; erosion.	Control drainage	Regulate snow application to prevent excessive accumulation
10 B	West Face - South	H	H	Additional shallow landslides transitioning into earthflows possible; failures of earthflows could be rapid.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation
11	North Face	M	L	Increased risk of avalanches; cleared avalanche paths could cause additional debris/rock slides during summer/fall months.	Control drainage	Regulate snow application to prevent excessive accumulation
12	East Face	H	M	Additional shallow landslides transitioning into earthflows possible.	Manual removal of excess accumulation prior to melt-off; control drainage	Regulate snow application to prevent excessive accumulation

Key for probability of movement:

L	Low (white)
M	Moderate (yellow)
H	High (orange)

Key for Severity of Impact:

L	Low (white)
M	Moderate (gray)
H	High (black)

Note: The ratings represent risk or impacts for an un-mitigated mountain. The risk of instability within each GHU is a generalized rating that represents the average impact of a ski area activity on the sensitive slopes within a unit.

Table 3C
Snowmaking

**Table 3D
Geologic Hazard Unit Risk Matrix & Mitigation Measures for Buried Utilities**

GHU #	GHU	Probability of slope movement with disturbance	Severity of impact	Possible Consequences	GHU-Specific Mitigation	Comments
1 A	Upper West Slide	M	L	Reactivation of existing slumps or initiation of new slumps; shallow slope failures transitioning into earthflows possible; increased erosion; changes in drainage patterns.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement; bedrock may be difficult to trench
1 B	Lower West Slide	M	M	Reactivation or initiation of slumps and earthflows, surface drainages could be disrupted creating bank erosion and downstream sedimentation; earthflows could be rapid.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement
2	Slump Block	M	M	Reactivation of slumps; broken or displaced utility lines.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement
3	Middle Slide Complex	M	M	Reactivation of large slump blocks, transitioning into earthflows; broken water lines could add additional water to slope.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement
4	Lower Earthflow	M	M	Reactivation of earthflow; rapid failure possible.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement
5 A	Upper East Slide	H	H	Reactivation of large slump blocks, transitioning into earthflows; broken or displaced utility lines; broken water lines could add additional water to slope.	Avoidance is primary recommendation; avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement
5 B	Lower East Slide	H	H	Acceleration of movement of earthflow could remove support from the Upper East Slide and initiate retrogressive failures upslope; earthflows could be rapid; broken/displaced utility lines.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement
6	Chicken Bone	M	M	Recent slumps could be reactivated. Additional infiltration could destabilize the Middle and Lower West Slide Complexes.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement; trenches may require dewatering
7	East Facet	L	M	Shallow slope failures transitioning into earthflows possible. Additional infiltration could destabilize Chicken Bone or East Face.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement; prevent erosion/scour
8	Upper Narrows	L	M	Additional infiltration could destabilize Chicken Bone, Middle and Lower West Slide Complexes; excavation of trenches could destabilize slopes above and create a rockfall hazard.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement; bedrock may be difficult to trench
9	Upper Bowl	L	L	Additional infiltration could destabilize Chicken Bone or Middle and Lower West Slide Complexes.	backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement; bedrock may be difficult to trench
10 A	West Face - North	L	L	Additional shallow landslides transitioning into earthflows possible; retrogressive failure progressing upslope above rock slumps; erosion.	backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement; bedrock may be difficult to trench
10 B	West Face - South	M	M	Additional shallow landslides transitioning into earthflows possible; failures of earthflows could be rapid; broken or displaced utility lines could saturate slope.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement
11	North Face	L	M	Debris/rock slides from exposed rock during excavation.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement; bedrock may be difficult to trench
12	East Face	M	M	Additional shallow landslides transitioning into earthflows possible, which could damage utilities; trench excavations could reactivate or initiate slumps.	avoid sensitive areas; backfill with material to prevent infiltration; revegetate; soil berms to deflect runoff; cross drainages at right angles	Can initiate failure by causing artificial soil fracture and can serve as conduit for water movement; bedrock may be difficult to trench

Key for probability of movement:

L	Low (white)
M	Moderate (yellow)
H	High (orange)

Key for Severity of Impact:

L	Low (white)
M	Moderate (gray)
H	High (black)

Note: The ratings represent risk or impacts for an un-mitigated mountain. The risk of instability within each GHU is a generalized rating that represents the average impact of a ski area activity on the sensitive slopes within a unit.

Table 3D
Buried Utilities

**Table 3E
Geologic Hazard Unit Risk Matrix & Mitigation Measures for Roads**

GHU #	GHU	Probability of slope movement with disturbance	Severity of impact	Possible Consequences	GHU-Specific Mitigation	Comments
1 A	Upper West Slide	H	H	Reactivation of existing slumps or initiation of new slumps; shallow slope failures transitioning into earthflows possible; increased erosion; changes in drainage patterns.	avoid sensitive areas; minimize cuts/fills; engineered reinforcement uphill and downhill; minimize road width.	combine road and utility corridors to reduce affected area; combine road design with drain system
1 B	Lower West Slide	M	M	Reactivation or initiation of slumps and earthflows, surface drainages could be disrupted creating bank erosion and downstream sedimentation; earthflows could be rapid.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; provide erosion-resistant surfaces.	combine road and utility corridors to reduce affected area
2	Slump Block	M	M	Reactivation of slumps.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; avoid more recent slump scarps.	combine road and utility corridors to reduce affected area; consider relocating structures out of this unit
3	Middle Slide Complex	M	M	Reactivation of large slump blocks, transitioning into earthflows; could damage roads.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills	combine road and utility corridors to reduce affected area; probable weak, wet soil conditions
4	Lower Earthflow	M	L	Reactivation of earthflow; rapid failure possible; increased maintenance.	control drainage to reduce infiltration and erosion; revegetation; avoid soil saturation	combine road and utility corridors to reduce affected area; probable weak, wet soil conditions
5 A	Upper East Slide	H	H	Reactivation of large slump blocks, transitioning into earthflows.	Avoidance is primary recommendation; control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; avoid more recent slump scarps; minimize road width.	no cuts >2 feet; choose most gentle slopes; combine road and utility corridors to reduce affected area
5 B	Lower East Slide	H	M	Acceleration of movement of earthflow could remove support from the Upper East Slide and initiate retrogressive failures upslope. Earthflows could be rapid.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; minimize road width.	combine road and utility corridors to reduce affected area
6	Chicken Bone	M	M	Recent slumps could be reactivated; additional infiltration could destabilize the Middle and Lower West Slide Complexes; increased maintenance.	avoid infiltration and wetlands; create dense pattern of drains and subdrains.	potential for saturated and weak soil; special roadbase preparation may be necessary; combine road and utility corridors to reduce affected area
7	East Facet	M	M	Shallow slope failures transitioning into earthflows possible; additional infiltration could destabilize Chicken Bone or East Face.	control downhill drainage to reduce infiltration to downhill units and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; minimize road width.	potential for rockfall; combine road and utility corridors to reduce affected area
8	Upper Narrows	M	M	Additional infiltration could destabilize Chicken Bone, Middle and Lower West Slide Complexes; excavation of roads could destabilize slopes above and create a rockfall hazard.	soil densification and soil amenities for rapid revegetation; probable soil nails or rock bolting to retain cut slopes in bedrock; minimize road width.	bedrock surfaces/rock outcrops as sources of rockfall; combine road and utility corridors to reduce affected area; bedrock dips into valley (W) on east side of drainage
9	Upper Bowl	L	L	Additional infiltration could destabilize Chicken Bone or Middle and Lower West Slide Complexes.	control drainage to not impact downhill units; engineered cuts/fills; control erosion.	combine road and utility corridors to reduce affected area
10 A	West Face - North	L	L	Additional shallow landslides transitioning into earthflows possible; retrogressive failure progressing upslope above rock slumps; erosion.	avoid sensitive areas; revegetate; avoid soil saturation; minimize road width.	combine road and utility corridors to reduce affected area
10 B	West Face - South	M	M	Additional shallow landslides transitioning into earthflows possible; failures of earthflows could be rapid; earthflows could damage roads.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; minimize width.	combine road and utility corridors to reduce affected area
11	North Face	M	H	Additional debris/rock slides from loss of root reinforcement.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; avoid outcrops/scarps.	potential for rockfall; combine road and utility corridors to reduce affected area
12	East Face	M	M	Additional shallow landslides transitioning into earthflows possible; earthflows could damage roads; major grading for roads could reactivate or initiate slumps.	control drainage to reduce infiltration and erosion; revegetation; engineered cuts/fills; limiting and reinforcing cuts/fills; avoid outcrops/scarps; minimize road width.	combine road and utility corridors to reduce affected area

Key for probability of movement:

L	Low (white)
M	Moderate (yellow)
H	High (orange)

Key for Severity of Impact:

L	Low (white)
M	Moderate (gray)
H	High (black)

Note: The ratings represent risk or impacts for an un-mitigated mountain. The risk of instability within each GHU is a generalized rating that represents the average impact of a ski area activity on the sensitive slopes within a unit.

Table 3E
Roads

**Table 3F
Geologic Hazard Unit Risk Matrix & Mitigation Measures for Lifelines and Structures**

GHU #	GHU	Probability of slope movement with disturbance	Severity of impact	Possible Consequences	GHU-Specific Mitigation	Comments
1 A	Upper West Slide	M	M	Reactivation of existing slumps or initiation of new slumps; shallow slope failures transitioning into earthflows possible; increased erosion; changes in drainage patterns.	site-specific geotechnical investigations; avoid sensitive areas such as scarps and shear zones; possibly span difficult areas	foundation conditions would vary from igneous bedrock in upper unit to colluvium in lower unit; steep slopes.
1 B	Lower West Slide	M	M	Reactivation or initiation of slumps and earthflows, surface drainages could be disrupted creating bank erosion and downstream sedimentation; earthflows could be rapid.	site-specific geotechnical investigations	potential saturated and soft soils create difficult construction and foundation conditions
2	Slump Block	H	H	Reactivation of slumps.	avoidance is the primary recommendation; site-specific geotechnical investigations; avoid sensitive areas, especially in the upper portion of this unit	due to the heavy weight of lift terminals and need for snowmaking, their presence at the crest of this unit is problematic
3	Middle Slide Complex	M	H	Reactivation of large slump blocks, transitioning into earthflows; could damage lift towers and terminals.	site-specific geotechnical investigations; pin structures to bedrock	potential for earthflow damage; probable weak and wet soil conditions
4	Lower Earthflow	H	H	Reactivation of earthflow; rapid failure possible; could damage lift towers and terminals	site-specific geotechnical investigations	span this unit wherever possible; probable weak and wet soil conditions
5 A	Upper East Slide	H	H	Reactivation of large slump blocks, transitioning into earthflows; could damage lift towers and terminals.	avoidance is the primary recommendation; site-specific geotechnical investigations	due to the heavy weight of lift terminals and need for snowmaking, their presence at the crest of this unit is problematic
5 B	Lower East Slide	H	H	Acceleration of movement of earthflow could remove support from the Upper East Slide and initiate retrogressive failures upslope; earthflows could be rapid and damage lift towers and terminals.	site-specific geotechnical investigations	potential saturated and soft soils create difficult construction and foundation conditions; span, if possible
6	Chicken Bone	M	M	Recent slumps could be reactivated; additional infiltration could destabilize the Middle and Lower West Slide Complexes.	site-specific geotechnical investigations	potential saturated and soft soils create difficult construction and foundation conditions
7	East Facet	L	M	Shallow slope failures transitioning into earthflows possible.	site-specific geotechnical investigations	foundation conditions would vary from igneous bedrock in upper unit to colluvium in lower unit; steep slopes.
8	Upper Narrows	L	L	Additional infiltration could destabilize Chicken Bone, Middle and Lower West Slide Complexes; excavation of towers could destabilize slopes above and create a rockfall hazard.	site-specific geotechnical investigations	foundation conditions could contain igneous bedrock; some rockfall hazard
9	Upper Bowl	L	L	Possibly initiate small slumps.	site-specific geotechnical investigations	structures and lift terminals generally suitable here
10 A	West Face - North	L	L	Additional shallow landslides transitioning into earthflows possible; retrogressive failure progressing upslope above slumps; erosion.	site-specific geotechnical investigations	Very steep but more stable than West Face - South unit; structures and lift terminals generally suitable in the upper portion of this unit
10 B	West Face - South	H	H	Additional shallow landslides transitioning into earthflows possible; failures of earthflows could be rapid; earthflows could damage lift towers; creep may progress to slumps or earthflows.	avoidance is the primary recommendation; site-specific geotechnical investigations; pin structures to bedrock	consider no lift towers on this unit; keep lifelines to north on West Face - North unit.
11	North Face	M	M	Initiate small slumps or rockfall from exposed excavations.	site-specific geotechnical investigations	structures and lift terminals generally suitable in the upper portion of this unit
12	East Face	M	M	Additional shallow landslides transitioning into earthflows possible; earthflows could damage lift towers; significant cuts could reactivate or initiate slumps.	site-specific geotechnical investigations; protection of towers or structures from debris/rockfall.	structures and lift terminals generally suitable in the upper portion of this unit

Key for probability of movement:

L	Low (white)
M	Moderate (yellow)
H	High (orange)

Key for Severity of Impact:

L	Low (white)
M	Moderate (gray)
H	High (black)

Note: The ratings represent risk or impacts for an un-mitigated mountain. The risk of instability within each GHU is a generalized rating that represents the average impact of a ski area activity on the sensitive slopes within a unit.

**Table 3F
Lifelines
and
Structures**

Table 4
Composite Risk and Impacts Matrix for All Activities

GHU #	GHU	A. Grading		B. Clearing		C. Snowmaking		D. Buried Utilities		E. Roads		F. Liftlines & Structures		
		Probability of slope movement with disturbance	Severity of impact	Probability of slope movement with disturbance	Severity of impact	Probability of slope movement with disturbance	Severity of impact	Probability of slope movement with disturbance	Severity of impact	Probability of slope movement with disturbance	Severity of impact	Probability of slope movement with disturbance	Severity of impact	
1	A	Upper West Slide	H	H	H	H	H	H	M	L	H	H	M	M
1	B	Lower West Slide	M	H	M	M	H	M	M	M	M	M	M	M
2		Slump Block	M	M	M	M	H	M	M	M	M	M	H	H
3		Middle Slide Complex	H	H	M	M	H	H	M	M	M	M	M	H
4		Lower Earthflow	M	M	L	L	H	M	M	M	M	L	H	H
5	A	Upper East Slide	H	H	H	H	H	H	H	H	H	H	H	H
5	B	Lower East Slide	H	H	L	L	H	H	H	H	H	M	H	H
6		Chicken Bone	M	M	M	M	H	M	M	M	M	M	M	M
7		East Facet	H	M	H	M	H	M	L	M	M	M	L	M
8		Upper Narrows	H	H	M	M	M	M	L	M	M	M	L	L
9		Upper Bowl	L	L	M	M	M	M	L	L	L	L	L	L
10	A	West Face - North	M	M	M	M	M	M	L	L	L	L	L	L
10	B	West Face - South	H	H	H	H	H	H	M	M	M	M	H	H
11		North Face	H	H	H	H	M	L	L	M	M	H	M	M
12		East Face	M	M	M	M	H	M	M	M	M	M	M	M

Key for probability of movement:	Key for Severity of Impact:
L Low (white)	L Low (white)
M Moderate (yellow)	M Moderate (gray)
H High (orange)	H High (black)

Note: The ratings represent risk or impacts for an un-mitigated mountain. The risk of instability within each GHU is a generalized rating that represents the average impact of a ski area activity on the sensitive slopes within a unit.

Table 4
Composite Risk & Impacts Matrix