SOILS/HYDROLOGIC SCOPING REPORT

for

Boulder Bay Resort Crystal Bay, Nevada

Prepared for:

Heather Gustafson
Tahoe Regional Planning Agency
P.O. Box 5310
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Prepared by:

LUMOS and ASSOCIATES, INC.

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August 2008

JN: 7139.000

SOILS/HYDROLOGY SCOPING REPORT For BOULDER BAY RESORT Crystal Bay, Nevada

Submitted here within are the results of Lumos and Associates, Inc. (Lumos) soils/hydrology scoping report for the proposed Boulder Bay Resort in Crystal Bay, Nevada (Plate 1). The site is composed of Placer County APN 090-305-016 and Washoe County APNs 123-052-02, 03, 04; 123-053-02, 04; 123-054-01, 123-071-04, 34, 35, 36 and 37. Specifically, the site is bound to the east by State Route 28, to the north by residential properties, to the west by State Line Road and to the south by Crystal Drive (Plate 2)

In August of 2008 Lumos utilized a rubber tired backhoe and a truck mounted drill rig with hollow stem and air rotary drilling capabilities to examine subsurface soil conditions. Within the project site six (6) test pits were excavated to a maximum depth of twelve (12) feet below ground surface (bgs) and nine (9) borings were advanced to a maximum depth of fifty five (55) feet bgs. Excavation locations are shown on Plate 2. Subsurface materials were continuously logged and visually classified in the field by our Field Technician in accordance with the Unified Soil Classification System (USCS). Representative soils samples were collected at various intervals shown on the logs (Appendix A). All test pits and borings were backfilled with excavated material.

Additionally, In June of 2008, Gasch and Associates performed a surface refraction microtremor seismic shear-wave investigation, report and results are included in Appendix B.

Subsurface materials generally consisted of layers of light olive brown (2.5Y 5/4)

to brownish yellow (10YR 6/8) fill, which is loose to moderately dense silty sand

to sandy silt with gravel and cobbles; native layers of brown (2.5YR 5/4) to very

dark grayish brown (10YR 3/2) silty sand/sandy silt with gravel and cobbles over

light yellowish brown (2.5YR 6/2) to brownish yellow (10YR 6/6) decomposed

and weathered granodiorite bedrock.

No groundwater or evidence of seasonal groundwater was encountered during

our field investigation. It is our opinion, based on observations of borings and

test pits that seasonal groundwater will not be encountered in the proposed

excavations.

If you have any questions or require and additional information, please contact

the undersigned at (530) 899-9503.

David A. Sullivan, MBA, PE Location Principal

Lumos and Associates, Inc.

Chad Borean

Engineering Technician Lumos and Associates, Inc.

Lumos_Soils_Report_9_2008.doc August 2008

She			C. Borean		Tota	ıl Da	oth:	25	feet			RIN	<u> </u>	10.	_
Logg		-				al Dep				. m. d	roto:	ones		2 r c d	
	_	_	8-19-2008			er De	•		_			enco	unte	erea	
Drill	Туре) :	Mobile Drill B-47		Gro	und E	iev.:	No	Sur	veye	a	, , , , , , , , , , , , , , , , , , ,		I	_
Depth in Feet	Graphic Log	Sample Type	Shelby Tube Standard Split Spoot (SPT) Modified California Bag Sample	▼ Static Water Table		Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests
			SOIL DESCRIPT												<u> </u>
-	\(\frac{1}{2}\), \(\frac{1}\), \(\frac{1}\), \(\frac{1}{2}\), \(\frac{1}2\		Asphalt Concrete Topsoil - Silty Sand, reddish be slightly moist, very loose, orga	rown, 5YR 4/3,	0,8										
-	<u>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</u>	X			4.0	3									
- - 5 - -			Silty Sand (decomposed grani 10YR 5/6, slightly moist, medic	te), yellowish red, um dense.		15									
	-		Silty Sand (weathered granite)		7.5										\vdash
-		A	slightly moist, very dense.	, 5.000, 7.011(0/1,		50+									
10		Z	Light yellowish brown, 2.5Y 6/3 drilling.	3, switch to air rotar	у	50+									
- - 15 — - -		Z	1.75 minutes for 5 foot advance	ement.											
- 20 — -		Z	2.25 minutes for 5 foot advance	ement											
- - - 25 —		Z			5.0										
20 —			2.75 minutes for 5 foot advance. Boring terminated at 25 feet. Boring backfilled with drill cuttings and tamped at	ement.											
		<u> </u>	Lumos & Associates Inc.	İ		Dai	اطمد	Dev.					<u> </u>		<u>_</u>
			Lumos & Associates, Inc. 3259 Esplanade, Suite 102			Bor	ulder	вау					11	PLA	۱Τ

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She Logg			C. Borean	Ta	tal De	nth:	10	5 fee			RIN	<u> </u>	10.	
		-	: 8-19-2008		ater De					ıater	enco)Unt	hare	
	_	_			ound f	•		_			CHIC	uiill	ei eu	
Drill	ιyρε	5 . ├──	Mobile Drill B-47		ound I	_167	140	ı əul	rveye	u			l	Π
Depth in Feet	Graphic Log	Sample Type	Shelby Tube Standard Split Spoon (SPT) Californi Sampler	r	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	uid t, %	Plasticity Index, %	Gravel, % " - #4 Sieve)	Sand, % - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests
Dep	Graph	Sample	Modified California Bag Static W Table Table	/ater	Blows	Mois	Dry Weigh	Liquid Limit, %	Plas	Grav (3" - #4	Sand, % (#4 - #200 Sieve	Fine (< #200	3	Other
			SOIL DESCRIPTION	2.0										
-			Asphalt Concrete. Silty Sand, dark gray, slightly moist, loose. Silty Sand (weathered granite), brownish yellov 10YR 6/6, slightly moist, very dense.	0.2 0/5 N,	50+									
5 —		×	Switch to air rotary drilling.		50+									
-			Light brownish gray, 2.5Y 6/2.											
10 -		<u></u>	Grayish brown, 2.5Y 5/2. 2 minutes for 5 feet advancement.											
-		Z	Light yellowish brown, 2.5Y 6/3.											
15 —		Z	Light brownish gray, 2.5Y 6/2. 3 minutes for 5 f advancement.	feet										
- -	+ + + + + + + + + + +	Z	Granite, gray, 2.5Y 5/1, very hard. Practical response for 2 feet advancement.	17.5 fusal,										
			Boring terminated at 19.5 feet. Boring backfilled with drill cuttings and tamped at the surface.											
		_	Lumos & Associates, Inc.		Во	ulder	Bay					T	PLA	LΤ
			3259 Esplanade, Suite 102				-					1 '		• •

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Sheet													BO	RIN	IG I	NO.	B-
Logge			C. Borean					otal De			feet						
		ea:	8-15 -2008					ater D	•		_			ence	ounte	erea	
Drill Ty	/pe:		Mobile Drill B	-47			G	round I	=lev.:	No	t Sur	veye	d		1	ı	
Depth in Feet	c Log	- Abe	Shelby Tube	Standard Split Spoo (SPT)		California Sampler	а	/Foot	ture nt, %	Jnit t, pcf	pir %:	icity ,%	al, % Sieve)	Sand, % - #200 Sieve)	s, % Sieve)	<u>د</u>	Other Tests
Depth i	Graphic Log	Salliple —	Modified California	Bag Sample		▼ Static Wa	ater	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve	Sand, % #4 - #200 Si	Fines, % (< #200 Sieve)	CBR	Other
		<u> </u>		SOIL DESCRIP	TION									\vdash			
- · · · · · · · · · · · · · · · · · · ·			Asphalt concre Silty Sand with dry to slightly n	Clay and Grav	el, brov dense.	vn, 7.5YR	0,3 - 5/4,										
- : - ::							4.5	16									
5 -			Silty Sand with Brown, 7.5YR !				∋.	21									
								22									
10 -																	
			Auger refusal o drilling.	on boulder, swit	ch to a	ir rotary											
15 -			Sandy Silt with 10YR 3/2, sligh			yish brown	,	50+									
- 0 - 0 - 0			Silty Sand (wea), light y	yellowish	18.5										
20 -		_	brown, 2.5Y 6/3 Switch to air ro	-													
· · · · · · · · · · · · · · · ·	: . ² : . -	_															
25 —	Z	Z - -	Light brownish	grav. 2 5V 6/2	275 ~	ninutes for	5										
]	:		foot advancem		2.10 II	iiiuics IUI	J										
	Z	7															
		,	Lumos &	Associates, Inc				Boi	ulder	Bay					T	PLA	T
		A	3259 Espla	nade, Suite 102						-					'		۱ ۱
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Job Number: 7139.000

Sheet 2 of	2				во	RIN	IG I	No.	B-3	(C	ON	T'D)
Logged By:	C. Borean	Tota	I Dep	th:	55	feet						-
Date Logged:	8-15 -2008	Wate	er De	pth:	No	grou	ındw	/ater	ence	ount	ered	
Drill Type:	Mobile Drill B-47	Grou	und E	lev.:	No	t Sur	veye	d				
Depth in Feet Graphic Log Sample Type	Shelby Tube Standard Split Spoon (SPT) Modified California Bag Sample Solu DESCRIPTION		Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests (See Legend)
	SOIL DESCRIPTION	+						<u> </u>				
Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	2 minutes for 5 foot advancement. 2.75 minutes for 5 foot advancement. Light yellowish brown, 2.5Y 6/3. 4 minutes for 5 foot advancement. Light brownish gray, 2.5Y 6/2. 5.5 minutes for 5 foot advancement. Grayish brown, 2.5Y 5/2 Light brownish gray, 2.5Y 6/2. 5 minutes for 5 foot advancement. Grayish brown, 2.5Y 5/2. Light brownish gray, 2.5Y 6/2. 6.25 minutes for 55 foot advancement. Boring terminated at 55 feet. Boring backfilled with drill cuttings and tamped at the surface.											
LUMOS	Lumos & Associates, Inc. 3259 Esplanade, Suite 102 Chico, CA 95973 530-899-9503 Fax: 530-899-9649 LOG OF	EX		ilder OR/	-	RY	' B(ORI	NG		_	ATE 3.2

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She												BO	RIN	IG I	NO.	B-
Logg		-	C. Borean			Tota				feet						
	_	_	8-19-2008			Wate		•		_			ence	ount	ered	
Drill	Туре) :	Mobile Drill B-	-47		Grou	ınd E	Elev.:	No	t Sur	veye	d		ı		
Depth in Feet	Graphic Log	Sample Type	Shelby Tube Modified California	Standard Split Spoon (SPT) Bag Sample	California Sampler Static Water Table		Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % ' - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % #200 Sieve)	CBR	Other Tests
	Э	l S		SOIL DESCRIPTION	<u> </u>		ш		>			(3,	4	v		١٠
			Asphalt sanarat			,2										
-			Asphalt concret Silty Sand, light moist, medium	yellowish brown 2												
-		X				4.0	20									
5 -				thered granite), lig , sightly moist, me ary drilling.			64									
-		Z	Light olive brow	n, 2.5Y 5/3.												
10 -		Z Z	Light yellowish foot advancement	brown, 2.5Y 6/3. 2 ent.	2 minutes for 5											
15 — -		 Z	1.5 minutes for	5 foot advanceme	nt.											
-		Z	Light olive brow	rn, 2.5Y 5/3.												
20 -		Z Z	Light yellowish foot advanceme	brown, 2.5Y 6/3. 3 ent.	3.25 minutes for	5										
25 — - -		Z 	3 minutes for 5	foot advancement												
-																
30 —				Associates, Inc.			Βοι	ılder	Bay	1	<u> </u>	1	<u> </u>			<u>'</u> \T
	1	A	3259 Esplar Chico, CA 9 530-899-950		LOG OF	EX	PL	OR	ATC	RY	B (PI	NG		_	_

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Sheet 2 of	2		E	BORIN	IG No.	B-4 (CON	T'D)
Logged By:	C. Borean	Total Dep		35 feet				
Date Logged:		Water Dep		_	undwate	r encou	ntered	
Drill Type:	Mobile Drill B-47	Ground El	lev.:	Not Su	rveyed	1 1		1
Depth in Feet Graphic Log Sample Type	Shelby Tube Shelby Tube Shelby Split Spoon (SPT) Modified California Sample Soll DESCRIPTION Static Water Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf Liquid Limit, %	Plasticity Index, % Gravel, %	Sand, % (#4 - #200 Sieve) Fines, %	(<#200 Sieve) CBR	Other Tests (See Legend)
1								
Z	2.5 minutes for 5 foot advancement. Light olive brown, 2.5Y 5/3. Light yellowish brown, 2.5Y 6/3. 3.5 minutes for 5 foot advancement. Boring terminated at 35 feet. Boring backfilled with drill cuttings and tamped at the surface.	5.0						
2 LOG 7139000.GP								
- I I I I I I I I I I I I I I I I I I I	Lumos & Associates, Inc.	Boul	lder B	Bay			PL/	\TF
	3259 Esplanade, Suite 102 Chico, CA 95973 LOG OF			-	/ ROR	ING		· · ·



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LOG OF EXPLORATORY BORING

Sheet 1	of 2						во	RIN	G I	lo.	B-5
Logged By:	C. Borean	Total D	epth:	55	feet						
	d: 8-14-2008	Water	Depth:		_			enco	ount	ered	
Drill Type:	Mobile Drill B-47	Ground	d Elev.	No	t Su	veye	ed				
Depth in Feet Graphic Log Sample Type	Shelby Tube Standard Split Spoon (SPT) Modified California Bag Sample Soll DESCRIPTION California California Sampler Static Water Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests (See Legend)
		0,2									
	Undocumented Fill - Silty Sand with Gravel, light olive brown, 2.5Y 5/4, slightly moist, loose.	8									
5	Silty Sand (weathered granite), light olive brown, 2.5Y 5/4, slightly moist, medium dense.	25									
- 10	Light yellowish brown, 2.5Y 6/4, very dense.	50+									
	Light yellowish brown 2.5Y 6/3, very dense. @ 10 switch to air rotary drilling.	50+									
_ 15	Light olive brown, 2.5Y 5/3.										
	Light yellowish brown, 2.5Y 6/3.										
Z	Light gray, 2.5Y 7/1.										
Z Z	Light yellowish brown, 2.5Y 6/3.										
	Pale yellow, 2.5Y 7/3.										
	Light yellow brown, 2.5Y 6/3. 6.25 minutes for 5 foot advancement.										
	Lumos & Associates, Inc.	В	oulder	Bay							TE
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Date: September 2008 Job Number: 7139.000

		2 of	2							IG I	No.	B-5	(C	ON.	T'D
	ged I	-	C. Borean			Total De			feet						
Date	e Log	gged:	8-14-2008			Water D	epth:	No	grou	ındw	/ater	enco	ounte	ered	
Drill	Тур	e:	Mobile Drill B-	-47		Ground	Elev.	No	t Sur	veye	d			,	
Depth in Feet	Graphic Log	Sample Type	Shelby Tube	Standard Split Spoon (SPT)	California Sampler	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	ticity x, %	Gravel, % (3" - #4 Sieve)	Sand, % - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests
Dep	Graph	Sampl	Modified California	Bag Sample	▼ Static Water Table	Blows	Mois	Dry Weigl	Li Li	Plas	Grav (3" - #4	San (#4 - #20	Fine (< #200	5	Other
	 			SOIL DESCRIPTION			<u> </u>								
		Z	advancement.	gray, 2.5Y 6/2. 7 r	ninutes for 5 foo										
		Z	Light yellowish	brown, 2.5Y 6/3.											
- 35 -		Z	Light olive brow advancement.	n, 2.5Y 5/4. 6 min	utes for 5 foot										
- 40 -		Z	Light olive brow advancement.	n, 2.5Y 5/3. 8 min	utes for 5 foot										
- 45 -		Z	Light brownish advancement.	gray, 2.5Y 6/2. 11	minutes for 5 fo	ot									
- 50 -		<u> </u>		ive brown, 2.5Y 5/3 ot advancement.	3, very hard. 11										
		Z	Light yellow bro	own, 2.5Y 6/3.											
- 55 -	<u> - ; - ;</u>		Light olive brow advancement.	vn, 2.5Y 5/3. 22.5	minutes for 5 fo	to									
			Boring terminated at 55 f Boring backfilled with dril	eet. I cuttings and tamped at the su	rface.										
	1			Associates, Inc.		Во	 ulder	Bay					Ti	PLA	TE
,,,	A INA	4	Chico, CA 9 530-899-950 Fax: 530-89	95973 03	LOG OF	EXPL	OR	ATC	ORY	B (DRI	NG		∆ _ <i>[</i>	5 (

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Job Number: 7139.000

Sheet 1 of	2						во	RIN	IG I	No.	B-6
Logged By:	C. Borean	Total De	pth:	45	feet						
Date Logged:	8-12-2008	Water De	epth:	No	grou	undw	<i>ı</i> ater	enco	ount	ered	
Drill Type:	Mobile Drill B-47	Ground E	Elev.:	No	t Suı	rveye	ed				
Depth in Feet Graphic Log Sample Type	Shelby Tube Standard Split Spoon (SPT) Modified California Bag Sample Static Water Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests (See Legend)
	SOIL DESCRIPTION										
	Undocumented Fill - Sandy Silt with Gravel and Cobbles, dark brown, 7.5YR 5/3 to very dark brown 7.5YR 2/5, dry, moderately dense, sample to cobble.	50+									
	Dark yellowish brown, 10YR 3/6, slightly moist, medium dense.	15									
		.0									
- 10	Sandy Silt (weathered granite), light brownish gray 2.5Y 6/2, slightly moist, dense.	30									
- 15	Light olive brown, 2.5Y 5/4, very dense.	50+									
		50+ 50+									
- 20	No recovery.										
	Light olive brown, 2.5Y 5/3.	50+									
	No recovery.	50+									
	Lumos & Associates, Inc.	Вог	ulder	Bay					T		TE
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Sheet 2						RING	No.	B-6 (CON	T'D
Logged By			Total Dep		45 f					
Date Logg	ed: 8-12-2008	,	Water De	epth:	No (ground	water	encou	ntered	
Drill Type:	Mobile Drill B-47	ı	Ground E	lev.:	Not	Survey	ed			
Depth in Feet Graphic Log	Shelby Tube Shelby Tube Shelby Shel	California Sampler Static Water Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, % Plasticity	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve) Fines, %	(< #200 Sieve) CBR	Other Tests
	SOIL DESCRIPTION							#)		
35	Olive, 5Y 4/4.		50+							
40	No recovery.	45.	50+							
	Boring terminated at 45 feet. Boring backfilled with drill cuttings and tamped at the surface.									
	Lumos & Associates, Inc. 3259 Esplanade, Suite 102 Chico, CA 95973			ılder					PL#	\ \T
LUMC	530-899-9503	LOG OF		NG	A- (6.				

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Shee	et 1	of	2							во	RIN	G N	lo.	B-7
Logg	ed By	/ :	C. Borean		Total De	epth:	55	feet						
Date	Logg	ed:	8-11-2008		Water D	epth:	No	grou	ındw	ater	enco	ounte	ered	
Drill ⁻	Type:		Mobile Drill B-47		Ground	Elev.:	No	t Sur	veye	ed				
Depth in Feet	Graphic Log	Sample Type	Shelby Tube Standard Split Spoon (SPT) Modified Bag Sample SOIL DESCRIPTION	California Sampler Static Water Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests (See Legend)
			Undocumented Fill - Silty Sand, ve 10YR 7/3, faint motteling ~20% yel dry, dense.	low, 10YR 7/6,	35									
			Undocumented Fill - Sandy silt, ver 10YR 8/2, dry, medium dense.	ry pale brown,	17									
		$^{\times}$	Light olive brown 2.5Y 5/6, slightly	!	32									
- 10 - 			Silty Sand (weathered granite), ligh 2.5Y 6/4, slightly moist, very dense		50+									
			Pale olive yellow, 2.5Y 6/6.		50+									
- 15 - 					50+									
 20 -			Pale olive, 5Y 6/4		50+									
	· · · · · · · · · · · · · · · · · · ·		Olive, 5Y 5/4.		50+									
25 – 25 – 30 – 30 – 30 – 30 – 30 – 30 – 30 – 3														
	1	7_	Lumos & Associates, Inc.		Вс	oulder	Вау						PLA	TE
	4	4	3259 Esplanade, Suite 102 Chico, CA 95973 530-899-9503	LOG OF	EXPL	.OR	ATC	RY	BC	ORII	NG			

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Sheet									IG I	NO.	B-7	(C	ON'	Γ'D
Logged	-	C. Borean			Total De			feet						
		8-11-2008			Water D						enco	ount	ered	
Drill Typ	e:	Mobile Drill B	-47		Ground	Elev.:	No	t Sur	veye	d				
Depth in Feet Graphic Log	Sample Type	Shelby Tube Modified California	Standard Split Spoon (SPT) Bag Sample	California Sampler Static Water Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests
ق	s		SOIL DESCRIPTION			-0	>			[] [5]	4	*)		0 (
35		No recovery.			50+									
45		No recovery.			50+									
55		No recovery. Boring terminated at 55 Boring backfilled with dri	eet. I cuttings and tamped at the su		5.0 50+									
		3259 Esplar	Associates, Inc.	1000		oulder	-					Ī	PLA	\ <u></u>
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Logg		0.0								IG I		
_	•	C. Borean	Total D	-		feet				_		
		: 8-18-2008	Water D	•		_			ence	ount	ered	
Drill 7	Type:	Mobile Drill B-47	Ground	Elev.:	No	t Sui	rveye	ed				
Depth in Feet	Graphic Log Sample Type	Shelby Tube Standard Split Spoon (SPT) Modified California Bag Sample Static Water Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % #4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests
		SOIL DESCRIPTION										
-		Undocumented Fill - Silty Sand, brownish yellow, 10YR 6/8, slightly moist, medium dense.	19									
			1.0									
5 -		Silty Sand (decomposed granite), light yellow brown, 2.5Y 6/4, slightly moist, medium dense.	15									
-			22									
10 -		Olive yellow, 2.5Y 6/6, medium dense.	27									
-		Sildy Sand (weathered granite), uellowish brown, 2.5Y 6/4, very dense.	50+									
15 -		Switch to air rotary drilling.	50+									
-		Light olive brown, 2.5Y 5/3										
20 -		2 minutes for 5 foot advancement.										
-		Light brownish gray, 2.5Y 6/2.										
25 -		Pale yellow, 2.5Y 7/3. 3.25 minutes for 5 foot advancement.										
-		Light yellowish brown, 2.5Y 6/3.										
30 -		Lumos & Associates, Inc.	- l Re	oulder	Bav	l	I	I	I	Τ.	PL/	<u></u>

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LOG OF EXPLORATORY BORING

Logg		of	C. Borean	Total De	anth:		feet	I DI	NU.	B-8) (C	UN	1 1
		-	8-18-2008	Water E	-			ındv	vatar	enc	ount	orod	
Drill ⁻	_	_	Mobile Drill B-47	Ground	•		_			CIIC	Juiit	cicu	
	ype	;. 	Otendend	Ground		140	Jui	Veye	T			1	
h in et	c Log	Type	Shelby Tube Standard Split Spoon (SPT) California Sampler	/Foot	ture nt, %	Jnit t, pcf	pir % :	c, %	el, % Sieve)	I, % 0 Sieve	s, % Sieve)	<u>~</u>	Tests
Depth in Feet	Graphic Log	Sample Type	Modified Bag Static Wate Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % #4 - #200 Sieve	Fines, % (< #200 Sieve)	CBR	Other Tests
			SOIL DESCRIPTION							*			
			4.25 minutes for 5 foot advancement.										
_		Z											
_													
_													
		Z											
35 —			6 minutes for 5 foot advancement.										
-		7											
_													
_			Light olive brown, 2.5Y 5/3.										
		z											
			Light alive brown 2 EV 4/2 E E minutes for E foot	0.0									
40 —			Light olive brown 2.5Y 4/3. 5.5 minutes for 5 footh advancement.	0.0									
			Boring terminated at 40 feet.	_									
			Boring backfilled with drill cuttings and tamped at the surface.										
	•	_	Lumos & Associates, Inc.	R	oulder	Bay	'		•	•		DI A	, -
			3259 Esplanade, Suite 102	EXPL	, a.a.o.i	Juy						PLA	1

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Sheet 1 of	2						во	RIN	G I	lo.	B-9
Logged By:	C. Borean	Total De	pth:	37.	5 fee	et					
Date Logged:	8-15-2008	Water D	epth:	No	grou	undw	<i>ı</i> ater	enco	ount	ered	
Drill Type:	Mobile Drill B-47	Ground I	Elev.:	No	t Sur	veye	ed				
Depth in Feet Graphic Log Sample Type	Shelby Tube Standard Split Spoon (SPT) Modified California Bag Sample Soll DESCRIPTION California Sampler Static Water Table	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests (See Legend)
			+			 				l	
	Undocumented Fill - Sandy Silt with Gravel and Cobbles, brown, 7.5YR 4/4, dry to slightly moist, medium dense. Silty Sand (weathered granite), pale olive, 5Y 6/3-4 slightly moist, very dense.	37 I, 50+ 50+									
	Olive yellow, 2.5Y 6/6.										
- 20 - : : -	Olive, 5Y 5/3. 3 minutes for 5 foot advancement.										
	Pale olive, 5Y 6/3.										
25 Z	3 minutes for 5 foot advancement.										
	Lumos & Associates, Inc.	Во	ulder	Вау					T		TE
LUMOS	550-655-5505	LOG OF EXPLORATORY BORING						_	9.1		

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She	et 2	e of	2			во	RIN	IG I	۷o.	B- 9	(C	ON.	T'D)
Logg	jed E	By:	C. Borean	Total D	epth:	37.	5 fee	t					
Date	Log	ged:	8-15-2008	Water	Depth:	No	grou	ındw	ater	enco	ounte	ered	
Drill '	Туре	: :	Mobile Drill B-47	Ground	d Elev.	: No	t Sur	veye	ed				
Depth in Feet	Graphic Log	Sample Type	Shelby Tube Standard Split Spoon (SPT) Modified Bag Sample Soll DESCRIPTION California California Sample California	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	CBR	Other Tests (See Legend)
	·		5 minutes for 5 foot advancement.										
 		Z Z	Granite, light gray, 5Y 7/2, very hard.	2.5									
- 35 - 	++++++++	Z	10 minutes for 5 foot advancement.	. 6									
	+ +	\dashv	Practical refusal. 38 minutes for 2.5 foot 37 advancement.	. }	+								
LUMOS LOG 7139000.GPJ US LAB.GDT 9/17/08			Boring terminated at 37.5 feet. Boring backfilled with drill cuttings and tamped at the surface.										
) 		_	Lumos & Associates, Inc.	В	oulder	Bay					Ti		TF
		Λ	3259 Esplanade, Suite 102 Chico, CA 95973			-)DV	D(וםר	NG	Ι'		

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LOG OF EXPLORATORY BORING

									TE	EST	· PI	ΓΝ	o. T	P-1
	ged I		C. Borean		Total De	-	8 fe							
	_	-	8-13-2008		Water D	epth:	No	grou	ındw	ater	ence	ount	ered	
Drill	Тур	e:	CAT 416B		Ground	Elev.:	No	t Sur	veye	d				
Depth in Feet	Graphic Log	Sample Type	Percolation Test Split Spoon California Sample Bulk Sample	Ziplock Sample Y Static Water Table	SPT (N) Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			SOIL DESCRIPTION											
- 1		Z	Asphalt concrete Undocumented Fill - Silty Sand wi Cobbles, dark brown, 10YR 3/3, s loose. Silty Sand with Gravel and Cobble	lightly moist,	1									
- 2		Z	brown, 10YR 4/4, slightly moist, m											
- 3 - 4 - 5 -			Silty Sand with Gravel, common C Boulders, brownish yellow, 10YR medium dense.	Cobbles, common 6/8, slightly mois	n t,									
- 8			Practical refusal, difficult digging, hole.	boulders, unsafe										
IP FULL PAGE 7139000.GPJ US LAB.GDJ 9/11/08			Test pit terminated at 8 feet. Test Pits backfilled without compaction verification											
OMO	ı	_	Lumos & Associates, Inc.		R∩	ulder	Bav	·		<u> </u>	ı	Τ.	PLA	TE

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LOG OF EXPLORATORY TEST PIT

										TE	EST	· PI	ΓN	o. T	P-2
Logg			C. Borean			Total De	-	6 fe							
			8-13-2008			Water De			_			ence	ounte	ered	
Drill	Туре) :	CAT 416B			Ground I	Ξlev.:	No	t Sur	veye	≱d				
Depth in Feet	Graphic Log	Sample Type	Percolation Test California Sampler	Split Spoon Bulk Sample	Ziplock Sample Static Water Table	SPT (N) Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
	ا ت	"		SOIL DESCRIPTIO)NI	_ "		>			(3,	4	\ \v	!	Exp
-		\vdash	Asphalt concrete		11		+	<u>I </u>	<u> </u>	<u> </u>	<u></u>	+-	\vdash	+	
- 1 - - 2 - - 3 -	++++++++++++	В	Silty Sand (deco), pale olive, 5Y 6, ging.	3,									
- 4 - - 5 - - 6 -	+ + + + + + + + + + + + + + + + + + +														
			Test pit terminated at 6 fee Test Pits backfilled without	t compaction verification											
	1		3259 Esplan	Associates, Inc.			ulder							PLA	ιΤΕ
		+1	Chico, CA 9	95973	LOG O	F EXPL	OR/	4TO	RY	TES	ST I	PIT			

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Date: September 2008 Job Number: 7139.000

												TE	EST	PI	ΓN	o. T	P-3
Logg	jed E	Зу:	C. Borean				Tota	l Dep	th:		feet						
Date	Log	ged	8-13-2008				Wate	er De	pth:	No	grou	ındw	ater	ence	ount	ered	
Drill	Туре	e:	CAT 416B				Grou	ınd E	lev.:	No	t Sur	veye	d				
h in	c Log	Туре	Percolation Test	Split Spoon	Z	Ziplock Sample	á á	Foot	ture nt, %	Jnit t, pcf	pir %,	icity	al, % Sieve)	Sand, % #200 Sieve)	s, % Sieve)	lue	n Index
Depth in Feet	Graphic Log	Sample Type	California Sampler	Bulk Sample	_	Static Water Table	CDT	Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand (#4 - #200	Fines, % (< #200 Sieve)	R-Value	Expansion Index
				SOIL DESCRIPTION	DN											<u> </u>	
	XXX	-	Asphalt concrete Undocumented I		with trav	oo Gravel											
- 1 -		Z	light yellowish br medium dense.	own, 2.5Y 6/4, s	slightly	moist,											
- 2 -		Z	Silty Sand (weat 7/3, slightly mois	hered granite), ¡ st, very dense, d	oale yel ifficult c	low, 2.5Y ligging.											
9/11/08																	
US_LAB.GD																	
39000.GPJ																	
LUMUS IP FULL PAGE //139000.GPJ US LAB.GDI 9/11/08																	
구 -			Test pit terminated at 2.6 fe														
SOMO.	l .	_	Test Pits backfilled without	ssociates, Inc.	İ			Bou	lder	Bay		l		<u> </u>		<u> </u>	TF

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LOG OF EXPLORATORY TEST PIT

										TE	EST	. bi.	ΓN	o. T	P-4
Logo		-	C. Borean			Total De			feet						
	_	_	8-13-2008			Water Do	-		_			ence	ount	ered	
Drill	Тур) :	CAT 416B			Ground I	Elev.:	No	t Su	veye	ed				
Depth in Feet	Graphic Log	Sample Type	Percolation Test California Sampler	Split Spoon Bulk Sample SOIL DESCRIPTION	Ziplock Sample Static Water Table	SPT (N) Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
	$\stackrel{L}{\boxtimes}$		Undocumented	Fill - Silty Sand/S											
- 1 - - 2 - - 3 -		В	some Gravel an 10YR 6/4, dry to	nd Cobbles, light of Saliday	yellowish brown, nedium dense.										
- 4 - - 5 - - 6 -		Z	Silty Sand (deco brown, 2.5Y 6/4 difficult digging.	omposed granite), light yellowish noderately dense,										
LOWING IF TOLL TAGE / 139000.GF3 US LAB.GD1 8/11/00			Test pit terminated at 9.5 f Test Pits backfilled without												
				Associates, Inc.		Во	ulder	Bay						PLA	ιΤΕ
		A	3259 Esplan Chico, CA 9		LOG O	F EXPL	OR	ATO	RY	TE	ST I	PIT			

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Date: September 2008 Job Number: 7139.000

										TE	EST	. bi.	ΓN	o. T	P-5
Logg		-	C. Borean			Total De	-		feet						
	_	-	8-13-2008			Water De	-		_			enc	ount	ered	
Drill	Туре) :	CAT 416B			Ground I	Elev.:	No	t Sur	veye	d	1			
Depth in Feet	Graphic Log	Sample Type	Percolation Test California Sampler	Split Spoon Bulk Sample SOIL DESCRIPTION	Ziplock Sample Static Water Table	SPT (N) Blows/Foot	Moisture Content, %	Dry Unit Weight, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
		\perp	Undogumented				<u> </u>								
- 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 9 - 9 - 9 - 9 - 9 - 9 - 9 - 9		B	Silty Sand (deco	omposed granite), st, dense.	YR 6/4, slightly										
T T T T T T T T T T T T T T T T T T T			Test Pits backfilled without				<u> </u>	<u> </u>					_		
				Associates, Inc. nade, Suite 102		Boi	ulder	Bay					[]	PLA	TE
15 KALENSES	1	A	Chico, CA 9 530-899-950	95973	LOG O	F EXPL	OR	OTA	RY	TES	ST I	PIT		_	

LUMOS Fax: 530-899-9649 www.lumosengineering.com

Logo	ged By:	C. Borean	Т	otal De	oth:	12	feet			PIT		<u> </u>	•
		ed: 8-13-2008		Vater De				ındv	<i>ı</i> ater	enco	ounte	ered	
	Type:	CAT 416B		Fround E	•		t Sur						
Depth in Feet	Graphic Log Sample Type	Percolation Split Spoon Ziploc Sample Sample Ziploc Sample	е	SPT (N) Blows/Foot	Moisture Content, %				Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	
		SOIL DESCRIPTION								#)			
1 -	B	Undocumented Fill - Silty Sand to Sandy Silt of Gravel and Cobbles, light yellowish brown, 10 6/4, slightly moist, loose to medium dense, lui and metal debris throughout.)YR										
3 -		Undocumented Fill - Sandy Silt to Silty Sand	with										
5 —		Gravel and Cobbles, brown, 10YR 4/3, slightly moist, medium dense, metal debris.	y										
7 -	B												
9 -													
11 -													
_		Test pit terminated at 12 feet. Test Pits backfilled without compaction verification											
		Lumos & Associates, Inc. 3259 Esplanade, Suite 102 Chico, CA 95973 LOC		Воц	ulder								١T

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February 18, 2009

File#: 7139.000

Ms. Heather Gustafson Tahoe Regional Planning Agency P.O. Box 5310 Stateline, NV 89449

Re: Boulder Bay

Dear Ms. Gustafson:

Please replace page 9 in our Geotechnical Investigation Reports numbered 7139.000 and dated September, 2008 reports with the following page. The following page 9 supercedes the previous page 9.

If you have any questions, please contact our office at (775) 883-7077.

Sincerely,

Mitch Burns, P.E.

Lumos and Associates, Inc. Construction Services Engineer Vo. 15001

4, 5, and 6 and the percolation test pit. The depth of the fill ranged from zero (0) feet to a minimum of 12 feet in test pit #6. Compaction tests performed on the fill indicate the fill was compacted to a lesser density than specified later in the report.

Groundwater was not encountered in our exploratory borings or test pits at the time of our field investigation and is not expected to impact development of this site.

TAHOE REGIONAL PLANNING AGENCY

128 Market Street Stateline, Nevada www.trpa.org P.O. Box 5310 Stateline, Nevada 89449 (775) 588-4547 Fax (775) 588-4527 Email: trpa@trpa.org

February 24, 2009

Brian Helm PO Box 307 Crystal Bay, NV 89402

RE: SOIL HYDROLOGIC APPROVAL BOULDER BAY LLC, BOULDER BAY CEP, WASHOE COUNTY, NV

APN	TRPA File #:
123-052-03	LCAP2008-0295
123-052-02	LCAP2008-0291
123-052-04	LCAP2008-0297
123-053-02	LCAP2008-0299
123-053-04	LCAP2008-0301
123-054-01	LCAP2008-0303
123-071-04	LCAP2008-0304
123-071-34	LCAP2008-0305
123-071-35	LCAP2008-0306
123-071-36	LCAP2008-0307
123-071-37	LCAP2008-0308
090-305-16	LCAP2008-0292

Dear Mr. Helm:

The Tahoe Regional Planning Agency (TRPA) Land Capability Program's staff has reviewed the Soils/Hydrologic Scoping Report Application dated July 22, 2008, made multiple site visits to the project area, and reviewed subsequent boring logs, seismic shear wave data and geotechnical analyses and recommendations. Based upon the aforementioned, TRPA staff approves the following excavation depths. These approvals are based upon the cross sections provided on February 11 and 24, 2009 (and located in the above-referenced TRPA files). The approvals are for the depths and approximate locations presented in these cross sections.

Please be aware that groundwater may be encountered during construction. A dewatering plan must be submitted and approved prior to commencement of the project. In the event that groundwater is intercepted, TRPA Land Capability staff and the TRPA Compliance inspector must be immediately notified and work must stop until further review by TRPA.

APN	Depth(s) Requested in feet	Depth(s) approved in feet
123-052-03	3 - 7	7
123-052-02	8	8
123-052-04	3.5 - 29.7	30
123-053-02	33.8 -3 5	35
123-053-04	5.66	6
123-054-01	49	49
123-071-04	20-Sep	20
123-071-34	24.78 - 44.4	44.5
123-071-35	No depth requested	5
123-071-36	No depth requested	5
123-071-37	No depth requested	5
090-305-16	5.5	5.5

The TRPA has the following recommendations for the project:

- 1. Temporary Best Management Practices (BMPs) are to be installed and maintained prior to excavation and during all phases of the proposed project.
- 2. All excavated materials shall be hauled away from the site to a legally acceptable location. No fills or recontouring, other than backfill for the cut-retaining structures, shall be allowed.
- 3. Blasting of rocks should be kept to an absolute minimum to avoid damage to surrounding rocks and vegetation.

This letter only approves the depth of the excavation and does not represent approval for the project.

Pursuant to Rule 11.2 of the TRPA Rules of Procedure, this soils/hydrological approval may be appealed within twenty-one (21) days from the date of this correspondence. Thank you for your cooperation. Should you have any questions about these matters, please contact this office at (775) 589-5313.

Sincerely,

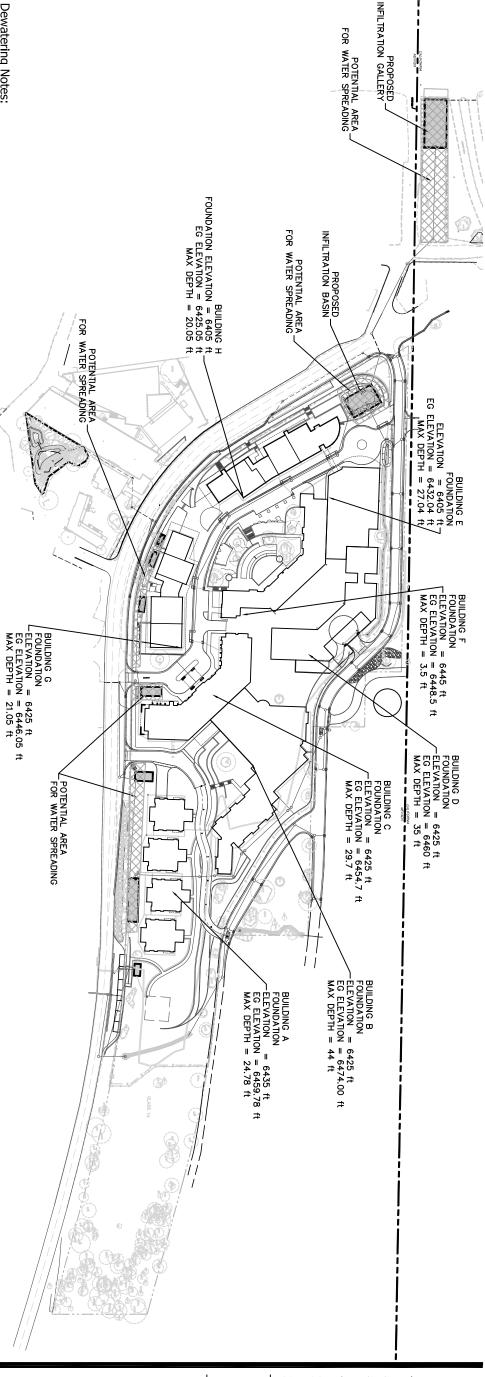
Heather Gustafson

Interim Senior Planner / Land Capability Program Manager

Environmental Review Services

Tahoe Regional Planning Agency

C: Brian McRae, Lumos & Assoc., PO Box 3570, Stateline, NV 89449



Dewatering Notes

EGEND:

DETENTION BASIN INFILTRATION GALLERY

BIO-RETENTION TREATMENT UNIT STORMWATER TREATMENT VAULTS SW MANHOLE CATCH BASIN

- Dewatering groundwater cannot be discharged without prior notice to and approval from the TRPA. Once the discharge is allowed, appropriate BMPs must be implemented to ensure the discharge complies with all permit requirements and regional and watershed specific requirements.
 It is the contractor's responsibility to coordinate all monitoring and permit compliance for any dewatering operation.
 Interception of groundwater during excavation shall only take place under circumstances falling under TRPA's Code of Ordinances Section 64.7.A(2) and 64.7.B.
- Dewatered groundwater discharges must meet discharge limits set forth in TRPA's Code of Ordinances Section 81.2:

 a. For <u>Surface Discharge</u>: Pollutant concentrations in surface runoff shall not exceed the following reading s at the 90th percentile:
- Dissolved Inorganic Nitrogen as N Dissolved Phosphorus as P Dissolved Iron as Fe Grease and Oil Maximum Concentration
 0.5 mg/l
 0.1 mg/l
 0.5 mg/l
 0.5 mg/l
 2.0 mg/l
 2.0 mg/l
- If the constituent levels of water entering a site from upstream areas are of a superior or equal quality to the above, those waters shall meet the quality level listed above prior to discharge from the site.

 If the constituent levels of waters entering a site do not meet the quality levels above, there shall be no increase in the concentrations of these
- constituents in water discharged from the site, based on a 24-hour average.
- For Discharges to Ground waters: Waters infiltrated into soils shall not exceed the following maximum constituent levels:

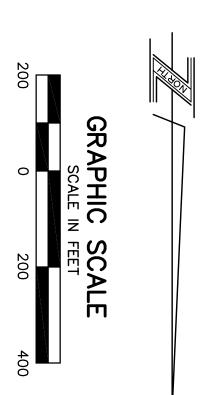
Ь

Constituent	Maximum Concentration
Total Nitrogen as N	5 mg/l
Total Phosphate as P	1 mg/l
ron as Fe	4 mg/l
Turbidity	200 NTU
Grease and Oil	40 mg/l

Where there is a direct hydrologic connection between ground and surface waters, discharges to groundwater shall meet the standards for surface runoff. A direct hydrologic connection is presumed to exist wherever, by virtue of proximity to a surface water body, nature of soils, or slope or gradient, and the residence time of runoff water discharged into the ground is too short to remove pollutants from the runoff. Sediment traps, consistent with the Handbook of Best Management Practices, shall be used to protect infiltration devices from excessive levels of silication.

- It is the contractor's responsibility to ensure dewatered groundwater shall be treated with a dewatering bag or "dirt bag", sediment basin, dewatering tank, or some other treatment method for the removal of sediments, oil and grease, and other constituents prior to discharge.
 It is the contractor's responsibility to monitor, with grab samples, the dewatered groundwater and ensure it meets TRPA's discharge requirements, summarized above in Notes 3 & 4, prior to discharging to either surface or ground waters. Continuous monitoring shall take place throughout the dewatering
- process.

 Dewatering discharges shall not cause erosion at the discharge point.



DESCRIPTION EX

BOULDER BAY, LLC **BOULDER BAY DEWATERING PLAN** CRYSTAL BAY WASHOE COUNTY NEVADA