MCF 29B

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S REPORT

OFFICE USE ONLY
Log No. 108603
Permit No.
Basin 212

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

NOTICE OF INTENT NO. 32184

1. OWNER Land well company
MAILING ADDRESS 875 W Warm Springs Rd Henderson 89011
ADDRESS AT WELL LOCATION Henderson 8901 S
Subdivision Name: County: Clark

2. LOCATION SW ¼ NE ¼ Sec 06 T 22 N/S R 63 E
PERMIT/WAIVER No. H-000688 | 17906301004
Issued by Water Resources Parcel No.
Latitude 36.09.156 Longitude 114.58.898
UTM E N
☐ NAD 27 ☒ NAD 83/WGS 84

3. WORKED PERFORMED
☒ New Well ☐ Replace ☐ Recondition ☐ Deepen ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal/Industrial ☒ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC ☐ Air ☒ Other Sonic Dri

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
attached Log				

DCNR/DWR RECEIVED SEP 01 2009 LAS VEGAS OFFICE

Date started: 4-24, 20 09
Date completed: 4-28, 20 09

7. Water Level
Static water level: 11.2" feet below land surface
Artesian Flow: G.P.M. P.S.I.
Water Temperature: °F
Quality:

8. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

9. WELL CONSTRUCTION
Depth Drilled 175 Feet Depth Cased 175 Feet

HOLE DIAMETER (BIT SIZE)

		From		To	
8"	Inches	0	Feet	175	Feet
	Inches		Feet		Feet
	Inches		Feet		Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
4"	PVC	SCH 40	0	175

Perforations:
Type of perforation Slotted slot
Size of perforation 0.010
From 155 feet to 175 feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Annular Seal: ☐ Yes ☐ No

☐ Neat Cement	to		☐ Pumped	☐ Poured
☐ Cement Grout	to		☐ Pumped	☐ Poured
☐ Concrete Grout	0 to 145.2		☒ Pumped	☐ Poured
☐ =30% Bentonite Grout	to		☐ Pumped	☐ Poured

Gravel Pack: ☒ Yes ☐ No 155 to 175 ☐ Pumped ☒ Poured
Type: Cemex sand 2/16
Bentonite Chips: ☒ Yes ☐ No 149.5 to 155 ☐ Pumped ☒ Poured
Type: Time Release Hole Plug 3/8

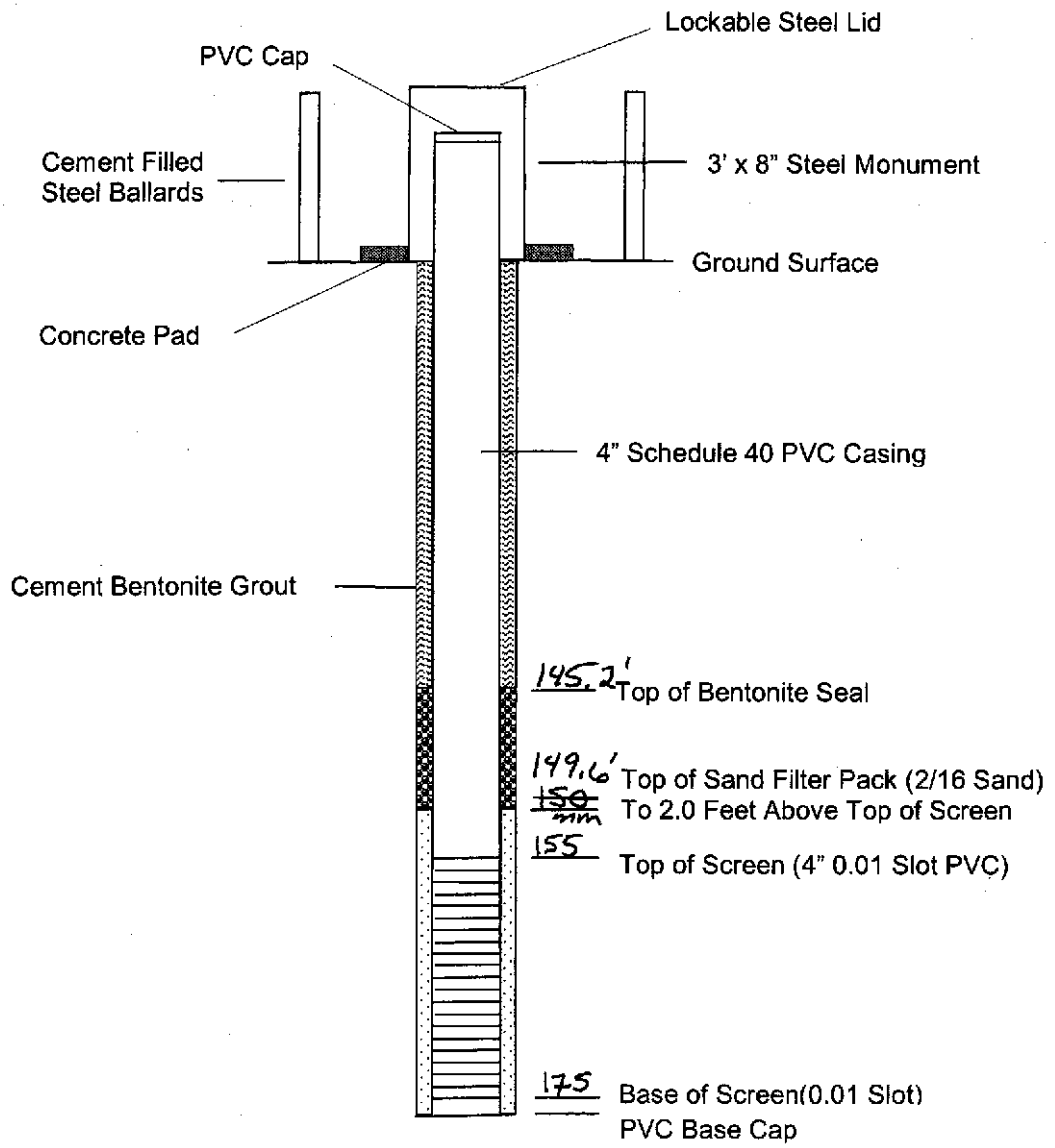
10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name EAGLE Drilling (Contractor)
Address 7150 Placid Street (Contractor)
Las Vegas NV 89119
Nevada contractor's license number issued by the *State Contractor's Board* 51266
Nevada driller's license number issued by the Division of Water Resources, the *on-site driller* 2097
Signed (By driller performing actual drilling on site or contractor)
Date 7-6-09

(Rev. 05-08)

USE ADDITIONAL SHEETS IF NECESSARY

MCF - SERIES MONITOR WELL CONSTRUCTION DIAGRAM

MCF-~~28B~~ mm 29B



Monty Mehlhorn/Monty Mellon

GES	Job Name: BRC MONITOR WELLS	Boring No. MCF-29B

Job No. 20092509V1	Start:	Location: See fig. 2
	End:	
Total Depth:	Groundwater	Comments:
Elevation:	Depth: / Date: / Time:	
Equipment: Sonic Drill Rig	Type of Bit: 6.0" Core Barrel	
Hammer (lbs/inches): 140 #/30"	Driller: Tim Thomsen	Surface Dry Density (pcf):
Surface Condition: Leveled native	Logger: Monty Mehlhorn	Surface Moisture Content (%):

Depth (feet)	REC	Sample Type	Blows/ 6 Inches	USCS	Description	Pene-trometer	Depth (feet)
1	Air Knife			GM	Very pale brown (10YR 6/3) silty GRAVEL w/sand (~20% silt, ~20% sand (subround, well-graded (~30% cs, 20% ms, 40% fs), ~60% gravel (subangular-subrounded, well-graded, ~20% cobbles, 30% cg, 50% fg)), moist, very dense, stratified (0.5" beds), strong reaction to HCl, sand: ~30% mafics, 70% felsics; gravel: ~20% basalt, 30% dacite, ~50% andsite.		1
2							2
3							3
4							4
5							5
6	Run #1						6
7							7
8							8
9		pH = 9.31 ...regular sample MCF-29A-10.			...at 10.0': ...abrupt contact w/		9
10				SM	Very pale brown (10YR 6/3) silty SAND w/gravel (~15% silt, ~65% sand (subrounded, poorly graded (~10% cs, 25% ms, 65% fs), ~20% gravel (sub-angular, well-graded, ~5%		10
11	Run #2	10.6eV = 0.0 ppm//, 11.7eV = 1.6 ppm//.					11
12							12

GES	Job Name: BRC Monitor Wells	Boring No. MCF-29 B
Job No. 20092509V	Start: / End:	Location: See fig. 2

Depth (feet)	REC	Sample Type	Blows/ 6 Inches	USCS	Description	Pene-trometer	Depth (feet)
13	Run #2			SM	cobbles, 45% cg, 50% fg), moist, v. dense, stratified (0.5' thick beds), strong reaction to HCl, same composition as above.		13
14							14
15							15
16	Run #3						16
17					...same as above; the 18'-20.0' interval was lost.		17
18							18
19							19
20							20
21	Run #4						21
22							22
23							23
24							24
25				SC	...abrupt contact with: Layered (0.5" beds) light yellowish brown (10YR 6/4) and light greenish gray (Gley 1 8/10Y) clayey SAND (~45% lean clay, ~55% sand (subrounded, poorly		25
26				GM			26
27		MCF-29A-27, wet, pH=9.40					27
28							28

GES

Job Name: BRC Monitor Wells

Boring No. MCF-29 B

Job No. 20092509V1

Start:

End:

Location: See fig. 2

Depth (feet)	REC	Sample Type	Blows/ 6 Inches	USCS	Description	Pene-trometer	Depth (feet)
29				SM	graded, ~10% fs)), moist, very dense, no reaction to HCl, has 0.5" wide weakly cemented gypsiferous nodules, stratified, contact abrupt with:		29
30							30
31	Run #5			SM	26'-28': Yellowish brown (10YR 5/4) silty GRAVEL w/sand (~20% silt, ~20% sand (sub-rounded, poorly graded, ~20% c.s., 10% ms, 70% fs), 60% gravel (subangular, poorly graded, ~10% cg, 90% fg)), wet, very dense, stratified (0.1mm 1.0" beds), wk reaction to HCl, same composition as to 0'-9' interval, abrupt contact with:		31
32							32
33							33
34							34
35							35
36	Run #6				28': SM: Pale yellow (2.5Y 7/3) silty SAND (~40% silt, 60% sand (subrounded, poorly graded, ~100% fs)), wet, v. dense, laminated (2mm thick beds, w/~0.6 mm cs lenses), weak reaction to HCl, coarsens downward into:		36
37							37
38							38
39							39
40							40
41	Run #7				30': SM: Yellowish brown (10YR 5/4) silty SAND w/gravel (~20% silt, ~60% sand (sub-rounded, subangular well graded, ~40% cs, 30% ms, 30% fs), ~20%		41
42							42
43							43
44				SM			44

GES

Job Name: BRC Deep Monitor Wells

Boring No. MCF-29B

Job No. 20092509V1

Start:

End:

Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
45	Run #7			SM	gravel (subangular, poorly graded, ~100% fg)), wet, very dense, homogenous, weak reaction to HCl, ~20% organic layer @ 35', becomes stratified past 35' (1.0' thick beds), moderately to strongly cemented @ 39'.		45
46							46
47							47
48							48
49	Run #8			ML	43': SM: Yellowish brown (10YR 5/4) silty SAND (~15% silt, 85% sand (subrounded, poorly graded, ~100% fs)), wet, very dense, stratified with 0.5'-0.25' thick beds, has ~2" thick interbeds of silty SAND w/ gravel, weak reaction to HCl, contact marked by increasing laminae (1.0 mm thick beds) of silt w/:		49
50							50
51							51
52	Run #9	Regular sample #MCF-29A-52 pH=9.27					52
53							53
54					48': ML: Brown (7.5YR 5/4) sandy SILT (~70% silt, ~30% sand (subrounded, poorly graded, ~100% fs), trace gypsum), wet, v. stiff, laminated, ~~55~~ mm (5mm thick beds), weak reaction to HCl.		54
55							55
56							56
57							57
58	Run #10	pH=9.63		SM	...at ~53': 4.0" thick bed of: very pale brown (10YR 6/3) lean CLAY, interbedded with silty SAND layers, strong reaction to HCl.		58
59							59
60					57: SM: Brown (7.5YR 5/3)		60

GES

Job Name: BRC Monitor Wells

Boring No. MCF-29B

Job No. 20092509V1

Start:

End:

Location: See Fig. 2

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
61	Run #11			SM	silty SAND w/ gravel (~15% silt, 65% sand (subrounded-subangular, well-graded, ~50% cs, 25% ms, 25% fs),		61
62				CL	~20% gravel (subrounded-subangular, poorly graded, ~10% cg, 90% fg), wet, very		62
63							63
64					dense, stratified (0.5' thick		64
65				CH	beds), strong reaction to HCl, gravel: ~20% dacite,		65
66	Run #12	pH = 8.71			60% basalt, 5% limestone, ~15% andesite; sand: same as gravel, abupt contact		66
67					with:		67
68					262': Tertiary Muddy Creek Formation: CL: White (Gley 1, 8/N) lean CLAY (~90% lean		68
69					CLAY, trace sand, ~10%		69
70					gypsum as matrix cement), moist, weakly cemented (0.5'		70
71					nodules and laminae), v. stiff, laminated, weak reaction to		71
72	Run #13	MCF-29A-72 (10' below MCF/Qal contact)			HCl, abrupt contact with: 64': CH: Dark bluish gray (4/5		72
73					B) fat CLAY (~80% fat clay, trace sand, 10% gypsum as		73
74		pH = 8.47			nodules, 10% organic matter), moist, weakly cemented in		74
75					layers, laminated, weak reaction to HCl, from 65'-68'		75
76					~15% organic mater as seed pods, leaves along bedding.		76

GES

Job Name: BRC Monitor Wells

Boring No. MCF-29 B

Job No. 20092509V

Start:

End:

Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CH	...past 68': ~10% organic		
77					mater, strong organic		77
					decay odor.		
78					...same as above, ~10%		78
	Run #13				gypsum as crystals along		
79					bedding; organic mater		79
					back to ~15%, same as		
80					65'-68'.		80
81							81
					...same as above		
82							82
83							83
84							84
85					...0.5"-0.3 mm thick beds/		85
					laminae of organic mater		
86	Run #14				(5/10Y, consists of seed		86
					pods, leaf materials),		
87		MCF-29A-			...86': ~60% granulose gypsum		87
		87 (25' below			grains along bedding, moist		
88		Qal/MCF			to wet along gypsum crystal		88
		contact).			faces, weak reaction to HCl.		
89		pH=6.56					89
90					...bluish gray (Gley 2, 5/5B),		90
91	Run #15				gypsum crystals are clear,		91
					oriented along bedding, ~4"		
92					long, 2" wide, subhedral,		92
					traces of pyrite granules		

GES	Job Name: BRC Monitor Wells	Boring No. MCF-29, B
Job No. 20092509V1	Start: End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 Inches	USCS	Description	Pene-trometer	Depth (feet)
				CH	along crystal faces; gypsum crystals are oriented parallel to beds.		
93					...organic matter decreases to ~5% in matrix.		93
94					...past 92': greenish gray (Gley1, 5/10GY).		94
95							95
96							96
97	Run #15				...becomes stratified, w/ bedding thicknesses ranging from 0.5"-2" thick.		97
98							98
99							99
100							100
101							101
102							102
103							103
104					...abrupt contact with:		104
105	Run #16	MCF-29A-105 (wet zone). pH=6.87		ML Wet	Greenish gray (Gley1, 5/10GY) sandy SILT (~70% silt, 25% sand (sub-rounded, poorly graded, ~10% ms, 90% fs), 5% gypsum as 0.5" thick weakly cemented nodules), wet, very stiff, homogeneous, strong		105
106				CH			106
107							107
108							108

GES

Job Name: BRC Monitor Wells

Boring No. MCF-29 13

Job No. 20092509VI

Start:

End:

Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
109	Run #16			CH	reaction to HCl, strong organic odor, contact abrupt with: 106': CH: Greenish gray (GLEY 1, 5/10GY) fat CLAY (~75% fat clay, trace sand, trace organics, ~25% gypsum crystals as clear, fibrous gains, nodules, and subhedral crystals), moist, weakly cemented, very stiff, stratified (0.5' thick beds), weak reaction to HCl, strong organic odor, past 108', gypsum also occurs as clear, fibrous layers (0.5"-1.0") parallel to bedding. Abrupt contact w/:		109
110							110
111							111
112							112
113							113
114							114
115	Run #17	MCF-29A-115 (~50' below Qal/MCF Contact) pH=6.51					115
116							116
117				CL	117': CL: Light greenish gray (Gley 1, 8/5GY) lean CLAY (~50% lean clay, trace sand, ~50% gypsum as fs-cs sized grains, clear, 0.5" thick fibrous layers)), moist, weakly-moderately cemented, v. stiff, laminated (3mm-6mm thick beds), strong reaction to HCl,		117
118							118
119							119
120							120
121	Run #18			CH	122': CH: MOTTLED GREENISH GRAY (7/10 GY & 6/N) FAT CLAY (80%), TRACE SAND		121
122							122
123							123
124							124

GES

Job Name: BRC Monitor Wells

Boring No. MCF-29 B

Job No. 20092509V1

Start:

End:

Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CH	LAYERS ⊥ TO BEDDING @ 120-122 & 126-127' GYPSUM (10%) AS FINE SIZED GRAINS IN CLEAR 3 mm THICK LAYERS, ORGANIC MATTER (10%) MOIST, WEAKLY CEMENTED, LAMANATED, HCl REACTION WEAK, STRONG ORGANIC ODER		
125							125
126							126
127							127
128	Run #18				...BLACK ORGANIC, CARBONACEOUS MATERIAL (10%)		128
129							129
130							130
131							131
132					...gradational contact, marked by increasing percentage of ~~gypsum~~ silt mm content		132
133				ML	Light greenish gray (Gley 1, 7/10GY) SILT (~85% silt, trace sand, ~15% gypsum as fs-sized grains and matrix cement), moist, weakly cemented, very stiff, stratified (0.5"-2.0" thick beds), no reaction to HCl. At ~138', 0.5" euhedral, doubly-terminated, clear gypsum crystals occur in ~3" thick layers.		133
134							134
135							135
136							136
137	Run #19						137
138							138
139					...139': ~~reddish yellow (7.5YR 6/6)~~ mm brown (7.5YR 5/4).		139
140							140

GES	Job Name: BRC Monitor Wells	Boring No. MCF-29 B
Job No. 20092509VI	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
141	Run #20			CL	Brown (7.5 YR 5/4) lean CLAY (~80% lean CLAY, trace sand, ~20% gypsum as 0.5"-2.0" long clouded, double terminated euhedral crystals), moist, v. stiff,		141
142							142
143							143
144				ML	stratified (2" thick beds), weak reaction w/HCl, gradational contact w/:		144
145		...ASTM	D2488		143': ML: Light brown (7.5 YR 6/4) SILT (~75% silt, trace sand, ~25% gypsum as ms-fs sized grains), moist, weakly cemented, very stiff, homogenous, weak reaction to HCl, abrupt contact with:		145
146		-00 X4.1	-"Jar				146
147		Method, clear					147
148		(mostly w/in					148
149		6 min).		CL	White (Gley 1, 8/N) lean CLAY (~70% lean clay, trace sand, ~30% gypsum as clear, randomly-oriented, doubly terminated euhedral crystals to ~2.0"), moist, v. stiff, stratified (0.5' thick beds), weak reaction		149
150							150
151	Run #21						151
152							152
153				ML	to HCl, @149': Brown (7.5YR 5/4).		153
154					150': ~~CL~~ ML ~~LIGHT~~ BROWN (7.5 YR 4/4) SILT (~70% SILT, TRACE SAND, ~30% GYPSUM CS-MS SIZED GRAINS), MOIST, WEAKLY CEMENTED, V. STIFF, HOMOGENOUS, HCL WEAK REACTION		154
155		pH=7.23					155
156							156

GES	Job Name: BRC MONITOR WELLS	Boring No. MCF-29 B
Job No. 20092509 v1	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 Inches	USCS	Description	Pene-trometer	Depth (feet)
				ML	... @ 154'-155' CS GRAIN		
157					GYPSUMIFEROUS LAYER ⊥		157
					TO BEDDING		
158	Run #21						158
159							159
160					...same as above		160
161							161
					...abrupt contact with:		
162		MCF-29A-162 (100' below contact, wet). pH=7.30		ML Wet	Light greenish gray (GLEY 1, 7/5GY) sandy		162
163				ML	SILT (~60% silt, 40% sand (subrounded, poorly graded, ~100% fs), trace gypsum, wet, very stiff, laminated (0.1-3.0mm layers), strong		163
164					reaction to HCl, abrupt		164
165					contact with:		165
166	Run #22				162.5': ML: Yellowish brown (10YR 5/4) SILT (~70% silt,		166
167					trace sand, ~30% gypsum as 1.0" long, randomly-oriented and clear gypsum crystals),		167
168					moist, very stiff, stratified		168
169					in 1.0"-2.0" thick beds,		169
170					weak reaction to HCl.		170
				CL	... 167': brown (7.5YR		
171	Run #23				5/4).		171
					BROWN (7.5YR 5/3) CLAY		
172					(85%), TRACE SILT, ~15%		172

GES	Job Name: BRC MONITORING WELLS	Boring No. MCF-29 B
Job No. 20092509V1	Start: / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL	GYPSUM, RANDOMLY ORIENTED		
173					CRYSTALS, MOIST, V. STIFF,		173
				ML	HCL (WEAK REACTION). 171'		
174					COLOR CHANGE TO LIGHT		174
					GREENISH GRAY (8/5GY)		
175					@ 174' CS-FS SIZED GYPSUM		175
					CRYSTALS ONLY. END @ 174'		
176	RUN #23				@ 174' 4" CL LAYER/BED		176
					... 173': ML: BROWN (7.5YR		
177					5/4) SILT (~75% SILT, TRACE		177
					SAND, ~25% GYPSUM FS		
178					SIZED GRAINS, MOIST, WEAKLY		178
					CEMENTED, V. STIFF,		
179					HOMOGENOUS, HCL WEAK REACTION		179
					... 179'-182' SAME AS ABOVE		
180					... 182'-184' COLOR CHANGE		180
					GREENISH GRAY (GLEY 6/5GY)		
181					... 184'-188' BACK TO COLOR		181
					BROWN (7.5YR 5/4)		
182							182
					End of		
183					Boring @ 179'		183
184							184
185	RUN #24						185
186							186
187							187
188							188