mcf 31A

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

OFFICE USE ONLY
Log No. 109387
Permit No.
Basin

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

34208

NOTICE OF INTENT NO.

1. OWNER Seity of Henderson
MAILING ADDRESS 240 Water ST. PO Box 95050 HD NV 89009

ADDRESS AT WELL LOCATION 1650 E Galleria Dr.
Subdivision Name: County: Clark

2. LOCATION SE¼ SE¼ Sec 29 T 21 N/S R 63 E
PERMIT/WAIVER No. H-000688 | 16029901003
Issued by Water Resources Parcel No.

Latitude 36086015014 UTM E ☐ NAD 27
Longitude 449 669422 SN ☒ 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 Drill

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
attached Log				

DCNR/DWR RECEIVED SEP 01 2009 LAS VEGAS OFFICE

Date started: 5-28, 20 09
Date completed: 6-3, 20 09

9. WELL CONSTRUCTION
Depth Drilled 381 Feet Depth Cased 381 Feet

HOLE DIAMETER (BIT SIZE)

		From		To	
8"	Inches	0	Feet	381	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 80	0	381

Perforations:
Type of perforation Slotted Sl Rigch
Size of perforation 0.010
From 361 feet to 381 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 3475 ☒ Pumped ☐ Poured
☐ =30% Bentonite Grout to ☐ Pumped ☐ Poured

Gravel Pack: ☒ Yes ☐ No 353 to 381 ☐ Pumped ☒ Poured
Type: Cemex sand 2/16
Bentonite Chips: ☒ Yes ☐ No 3475 to 353 ☐ Pumped ☒ Poured
Type: Time Release Hole Plug 3/8

7. Water Level
Static water level: 0.8" 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)

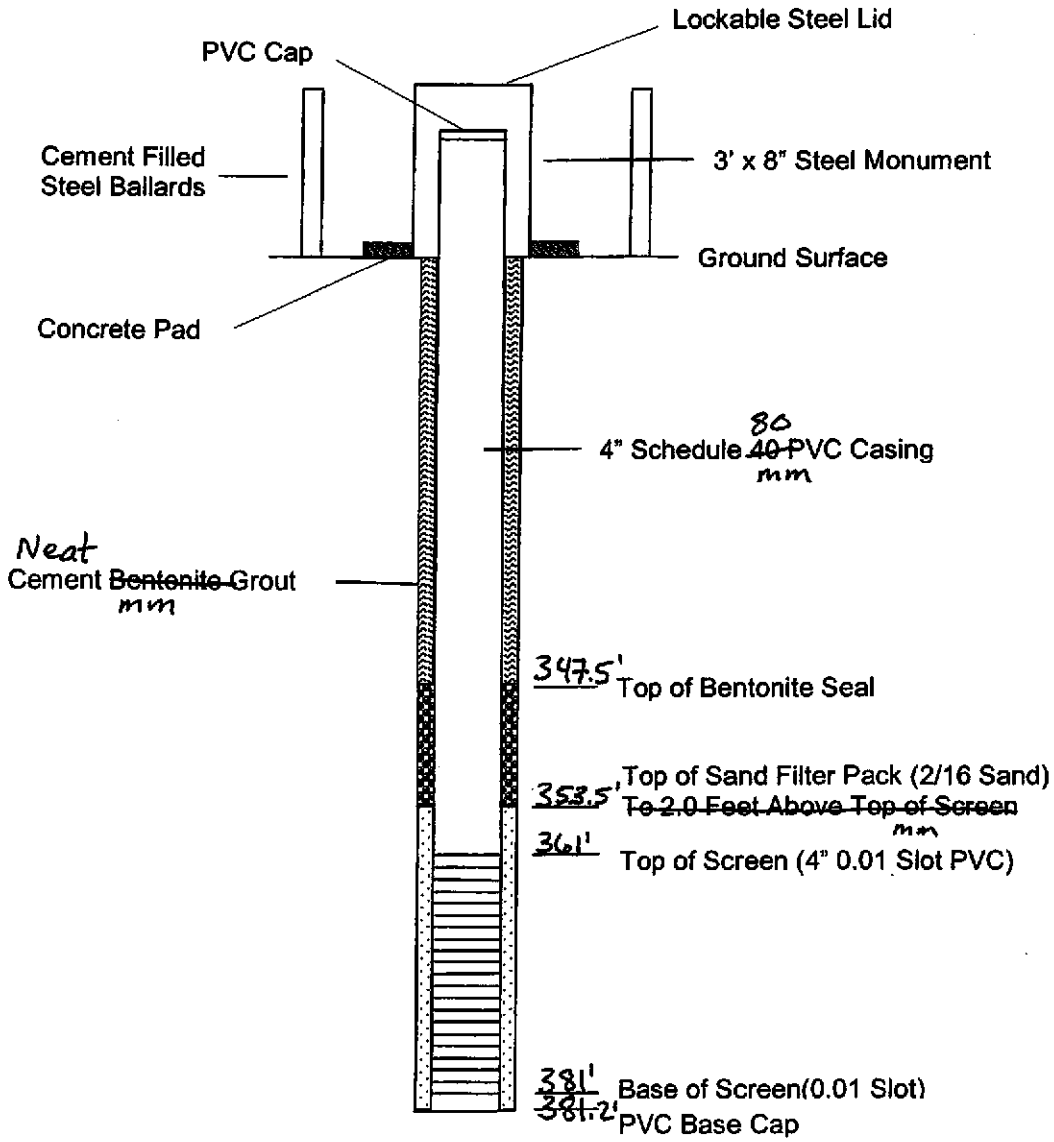
10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name EAGE Drilling
Contractor
Address 7150 Placid Street
Contractor
Las Vegas NV 89119
Nevada contractor's license number issued by the *State Contractor's Board* 51266
Nevada driller's license number issued by the Division of Water Resources, the *on-site driller* 2066
Signed [signature]
By driller performing actual drilling on site or contractor
Date 7-6-09

(Rev. 05-06)

USE ADDITIONAL SHEETS IF NECESSARY

MCF - SERIES MONITOR WELL CONSTRUCTION DIAGRAM

MCF-31A



GES	Job Name: BRC MONITOR WELLS	Boring No. MCF-31A

Job No. 20092509V1	Start: 5-21-09	Location: See fig. 2
	End: 6-3-09	
Total Depth: 380'	Groundwater	Comments: 6.5': TMEF encountered. Well Construction Information: 0'-347.5': "Neat" Cement Grout; 347.5'-353.5': 3/8" Bentonite Pellets; 353.5'-381': #2-/16 Sand; 0'-361': 4" Schedule 80 PVC Riser Pipe; 361'-381': 4" Schedule 80 PVC 0.010-slot Screen
Elevation: 1529'	Depth: / Date: / Time:	
Equipment: "Sonic" Drill Rig	Type of Bit: 6" O.D. Sonic Core Barrel	
Hammer (lbs/inches): 140 #/30"	Driller: Shawn Sears	Surface Dry Density (pcf): / Surface Moisture Content (%):
Surface Condition: Leveled Native	Logger: Monty Mehlhorn	

Depth (feet)	REC	Sample Type	Blows/ 6 Inches	USCS	Description	Pene-trometer	Depth (feet)
				SM	Qal: Light yellowish brown (10YR 7/4) silty SAND (~20% silt, ~~60%~~ 70% sand (subrounded, well-graded, (~25% cs, 30% ms, 45% fs)), 10% gravel (subangular, poorly graded, ~20% cg, 80% fg)), moist, v. dense, homogeneous, strong reaction to HCl, sand: ~80% felsics, 20% mafics; gravel: ~90% dacite, 10% andesite.		
1							1
2							2
		MCF-31A-3, pH=9.08					
3							3
3.5'				CALI	3.5': CALI: White (10YR 8/1) CALICHE (~100% med. crystalline/granular carbonate), moist, moderately-strongly cemented, stratified (1.0"-2.0" thick layers), strong reaction to HCl, abrupt contact w/: 6.5': SM: Pale yellow (2.5Y 7/3) silty SAND (~30% silt, 70% sand (subrounded, poorly graded, ~20% ms, 80% fs)), moist, v. dense, weakly-		
4	Run #1						4
5							5
6							6
6.5'							
7				SM			7
8							8
9							9
10							10
11	Run #2						11
12							12

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509VI	Start: 5-21-09 / End: 6-3-09	Location: See fig. 2

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				SM	moderately cemented, laminated		
13					(0.25"-0.5" thick layers),		13
					strong reaction to HCl.		
14					...at 13': light greenish gray		14
					(Gley 1, 7/10Y), ≈30% granular		
15					gypsum, 0.5"-1.0" thick		15
	Run #2				silt (ML) laminae.		
16							16
17		MCF-31A-17,			...sample #MCF-31A-17		17
		pH=8.64			(10' below Qal/TMCF).		
18							18
19	Run #3						19
20					... light brown (7.5YR 6/4)		20
21							21
22							22
23							23
24		MCF-31A-24,			...wet (23.5'-24.5'), sample		24
		pH=8.40			#MCF-31A-24		
25				ML	Light brown (7.5YR 6/4)		25
					SILT (≈80% silt, trace		
26	Run #4				sand, ≈20% gypsum as		26
					fs-sized grains/matrix		
27					cement), moist, weakly-		27
					moderately cemented, v. stiff,		
28					laminated, weak reaction		28

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 End: 6-3-09	Location: See fig. 2

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
	Run#4			ML	to HCl		
29							29
30							30
31							31
32		MCF-31A-32,			...moderately - strongly		32
		MCF-31A-32-			cemented		
33	Run#5	FD, pH=8.67			...abrupt contact w/:		33
				CL	Mottled/layered reddish		
34					yellow (5YR 6/6) and lt.		34
					greenish gray (GLey1, 7/5GY)		
35					lean CLAY (~80% lean clay,		35
					trace sand, ~20% cs-ms		
36					sized gypsum), moist, v. stiff,		36
				ML	laminated, weak reaction		
37					to HCl, abrupt contact with:		37
					36': ML: Light yellowish brown		
38					(10YR 6/4) SILT (~75% silt,		38
		MCF-31A-40,		SP-SM wet	trace sand, 25% gypsum		
39		pH=8.63			as cs-sized grains, matrix		39
					cement), moist, mod-strongly		
40					cemented, laminated (1"-2"		40
	Run#6			CL	layers), weak reaction to		
41					HCl, contact abrupt w/:		41
					38': SP-SM: Light gray (GLey1		
42					7/N) poorly graded SAND w/		42
					silt (~10% silt, 90% sand(		
43					subrounded, ~10% ms, 90% fs),		43
					wet, v. dense, stratified		
44					(2"-6" thick beds), strong		44

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509w/	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
45	Run #6			CL	reaction to HCl, abrupt contact with: 40': CL: Light greenish gray (GLey 1, 8/5GY) lean		45
46							46
47	Run #7			ML	CLAY (~70% lean clay, trace sand, ~30% gypsum as matrix cement, CS-sized grains, and clear, randomly-oriented crystals), moist, weakly		47
48							48
49					cemented, v. stiff, stratified (1"-2" beds), weak reaction		49
50					to HCl, gradational contact w/: 46': ML: Pale brown (10YR6/3)		50
51					SILT (~80% silt, trace sand, ~20% gypsum)), moist, weakly		51
52					cemented, v. stiff, laminated		52
53				CALI	(0.25"-1.0" thick beds), weak reaction w/HCl. ...51': light greenish gray		53
54					(Gley 1, 7/5GY), ~40% granular		54
55	Run #8			ML	gypsum, abrupt contact w/: 52': CALI: Light greenish gray (Gley 1, 7/5GY) CALICHE		55
56	mm				(~20% silt, 60% granular gypsum, 20% carbonate		56
57		MCF-31A-57, pH=8.06			(calcite)), moist, ~~to~~ mm moderately-strongly cemented, stratified,		57
58	Run #8				(2"-4" thick beds), strong reaction to HCl, abrupt		58
59					~~reaction~~ contact w/: 54': ML: Light greenish		59
60					gray (GLey 1, 7/5GY) SILT		60

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
61	Run #9			CL	(~80% silt, trace sand, ~20% granular gypsum), moist, weakly cemented, v. stiff, stratified, strong reaction to HCl.		61
62							62
63					...56': yellowish brown (10YR 5/4).		63
64					...59': light greenish gray (Gley 1, 8/10GY).		64
65					60': CL: Light greenish gray (Gley 1 8/10GY) lean CLAY (~80% lean clay, trace sand, ~20% gypsum as cloudy, randomly oriented crystals, trace organic matter), moist, v. stiff,		65
66							66
67							67
68							68
69				ML	homogenous, strong reaction to HCl, abrupt contact w/: 68': ML: Light yellowish brown (10YR 6/4) SILT (~75% silt,		69
70							70
71	Run #10			CL	trace sand, ~25% gypsum as matrix cement/fs-sized grains), moist, weakly-moderately cemented, v. stiff, laminated (0.25" thick beds), weak reaction to HCl.		71
72							72
73							73
74					70': CL: Light greenish gray (Gley 1, 7/10GY) lean CLAY (~80% lean clay, trace ~~gyp~~ sand, 20% gypsum as matrix cement and cs-sized grains), moist, strongly		74
75							75
76							76

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
	Run #10			CL	cemented, v. stiff, laminated (0.25"-0.5" thick laminae), weak reaction to HCl, past 72': brown (10YR 4/3).		
77							77
78							78
79	Run #11						79
80					...same as above; cementation gradually weakens.		80
81							81
82							82
83					...abrupt contact with:		83
84				CH	Light greenish gray (Gley 1, 7/10GY) fat CLAY (~75% fat clay, trace sand, ~25% gypsum as cs-sized grains), moist, weakly-moderately cemented, v. stiff, laminated (0.5" thick laminae), weak reaction to HCl.		84
85							85
86							86
87					...at 85': grayish brown (10YR 5/2), abrupt contact w:/ 87.5': CL: Dark yellowish brown (10YR 4/4) lean CLAY (~90% lean clay, trace sand, ~10% gypsum as fs-sized grains, veinlets, matrix cement), moist, weakly cemented, v. stiff, stratified (0.5"-1.0" beds), no reaction		87
88				CL			88
89							89
90	Run #12						90
91							91
92							92

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL	to HCl.		
93							93
94					...abrupt contact w/:		94
				ML	Yellowish brown (10YR 5/4)		
95	Run #12				SILT (~90% silt, trace sand,		95
96					~10% gypsum as fs-sized		96
					grains), moist, weakly cemented,		
97					v. stiff, stratified (0.5"-1.0"		97
					thick beds), weak reaction		
98					to HCl.		98 5-21-09
					...same as above, contact		5-22-09
99					abrupt with:		99
		MCF-31A-		ML wet	Light brownish gray (10YR 6/2)		
100		100, pH=7.72			sandy SILT (~65% silt,		100
					30% sand (subrounded, poorly		
101				ML	graded, ~10% ms, 90% fs), ~5%		101
					gypsum as matrix cement),		
102					wet, weakly cemented in		102
					nodules and layers, v. stiff,		
103	Run #13: 98'-107'				laminated (0.125"-0.25" beds),		103
					weak reaction to HCl, abrupt		
104					contact w/:		104
					100.5': ML: Yellowish brown		
105					(10YR 5/4) SILT (~80% silt,		105
					trace sand, ~20% gypsum		
106					as fs-sized grains/matrix		106
					cement), moist, weakly		
107					cemented, v. stiff, laminated		107
	Run #14				(0.125"-0.5" thick beds,		
108					weak reaction to HCl.		108

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509U1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				ML	...same as above, mottled light greenish gray (Gley1, 5mm 7/5GY).		
109							109
110		MCF-31A-110 (~100' below Qal/TMCF contact, pH= 7.34)			...~50% granular gypsum and matrix cement, contact abrupt with:		110
111	Run #14						111
112				CL	Yellowish brown (10YR 5/4) lean CLAY (~90% lean clay, trace sand, ~10% gypsum as fs-sized grains/matrix cement), moist, weakly cemented, v. stiff, laminated (0.25"-0.5" beds) with silt interbeds, weak reaction to HCl.		112
113							113
114							114
115							115
116					...same as above; ~20% gypsum as clear, randomly-oriented 0.25" long euhedral crystals, silt beds become absent.		116
117							117
118							118
119							119
120	Run #15: 113'-127'						120
121							121
122					...same as above.		122
123							123
124							124

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL	...1.0' thick bed of clear, randomly-oriented euhedral gypsum crystals ≈1.0" long, ~40% total gypsum		
125	Run #15						125
126							126
127							127 5-22-0 5-26-0'
128	Run #16: 127'-137'				...strong brown (7.5YR 4/6), ≈15% gypsum as cs-sized grains and matrix cement.		128
129							129
130					...mottled light greenish gray (Gley1, 7/5GY) in irregular nodules and randomly-spaced beds.		130
131							131
132							132
133					...stratified (10mm thick beds).		133
134							134
135							135
136					...pale brown (10YR 6/3) ...brown (7.5YR 5/4).		136
137							137
138	Run #17				...mottled pale brown (10YR 6/3) and light greenish gray (7/10Y, Gley1), ≈40% gypsum as 0.25"-1.5" long euhedral crystals.		138
139							139
139.5				wet	...wet along gypsum crystal faces to ≈140.5'.		
140							140

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509U1	Start: 5-21-09 End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
140.5'		MCF-31A-		CL wet	...no reaction to HCl.		
141		140, pH=8.04			...moist.		141
		T=33.1°C					
142					...brown (10YR 5/3), gypsum		142
					occurs as clear, randomly-		
143					oriented euhedral crystals to		143
					~0.5" long.		
144							144
145							145
146					...brown (7.5YR 5/4), lensed		146
					and laminated (2mm-5mm		
147					laminae), gypsum as matrix		147
					cement and cs-sized		
148					grains.		148
149							149
150					...abrupt contact w/:		150
				CH	Greenish gray (Gley 1 5/10GY)		
151					fat CLAY (~80% fat clay,		151
					trace sand, 20% gypsum		
152					as clouded-clear crystals,		152
					cs-sized grains and matrix		
153					cement, trace organics,		153
					trace pyrite), moist, weakly		
154					cemented, v. stiff, stratified		154
					(1.0"-2.0" beds), no reaction		
155					to HCl, organic odor.		155
156							156

Run #17: 137'-147'

Run #18: 147'-156'

GES	Job Name: ~~MCM~~ BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509VI	Start: 5-21-09 / End:	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
157	Run#19: 156'-165'			CH	...same as above, gypsum content approaches 50%, occuring as cs-sized grains.		157
158					...~5% organic matter as irregularly dissemenated pale green material.		158
159							159
160							160
161							161
162							162
163					...organics occur as seed pods (along bedding).		163
164		pH=7.70			...layers of black, carbonaceous organic matter, appears to have been burned.		164
165							165
166	Run#20: 165'-179'				...same as above. ...mottled/layered dark bluish gray (Gley 2 4/5BPB), light bluish gray (Gley 2, 7/5B) and light greenish gray (Gley 1, 7/5GY), laminated to stratified (5mm-30mm thick beds). ~20% gypsum as clouded crystals that parallel beds, are randomly oriented, and ~2" clear layers @ 166'-170'		166
167							167
168							168
169							169
170							170
171							171
172					...from 170' on: warm trails as irregular marks		172

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509W1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
	Run #20	PIDs	17.2	CH	that randomly cross beds.		
173		10.6eV=	~~17.2ppm~~ 9 mm		...~20% organic matter as		173
		11.7eV=	10.5ppm		plant (leafs, seed pods, stems)		
174					matter and carbonized		174
	Run #21: 174'-190' (Lost ~5' from 174'-184')				layers.		
175							175
176					...Core lost from 174'-184',		176
					same as above.		
177							177
178							178
179							179
180							180
				CH/MH	Mottled/laminated dark		
181					bluish gray (Gley 2, 7/5 mm 4/5PB),		181
182					light bluish gray (Gley 1, 7/5G),		182
					and light greenish gray		
183					(Gley 1, 7/5GY) interbedded		183
					fat CLAY and elastic SILT		
184					(~65-70% fat clay/elastic		184
					silt, trace sand, ~15-20%		
185					gypsum as subhedral, chunded		185
					crystals parallell to bedding,		
186					cs-sized grains, matrix		186
					cement, 20-25% organic		
187					mater (as leaf fragments,		187
					seed pods, carbonaceous		
188					material), moist, weakly		188
					cemented, v. stiff,		

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CH/MH	laminated (1mm-3mm thick beds), weak reaction to HCl, @189': PIDs: 10.6eV=93.6 ppmV, 11.7eV=29.2 ppmV.		
189	Run #21	pH=7.84, t=42.6°C					189
190					...same as above, becomes stratified (2" to 0.5' thick beds).		190
191	Run #22: 190'-200'						191
192					..."soft" material encountered to 198'; was lost on 1st retrieval attempt.		192
193							193
194							194
195					...contact abrupt with:		195
				CL	Dark bluish gray (Gley 2, 4/10B) lean CLAY (~40% lean clay, trace sand, 60% gypsum as matrix cement and cs-sized grains; trace organic matter), moist, moderately-strongly cemented, v. stiff, stratified (0.5"-6" thick beds), weak reaction to HCl, abrupt contact w/:		
196							196
197							197
198							198
199							199
200							200 5-26-0 5-27-0
				CH	Light greenish gray (Gley1, 7/10GY) fat CLAY (~85% fat clay, trace sand, ~10% gypsum as fs-sized grains/matrix cement, ~5% organic matter), moist, weakly cemented, v. stiff, stratified (5mm-10mm thick beds),		
201	Run #23: 200'-210'						201
202							202
203							203
204							204

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509U1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
		MCF-31A-205,		CH	weak reaction to HCl		
205		pH=8.12,			...sample #MCF-31A-		205
		PID's:			205 (~200' below Qal/TMCF		
206		10.6eV=448			contact), strong sulfur		206
		ppmV, 11.7eV=			organic odor.		
207	Run #23	106 ppmV					207
208					...~50% gypsum as fs-sized		208
					grains and matrix cement.		
209					...2"-6" thick layers of		209
					black, carbonaceous		
210					organic matter, trace pyrite,		210
					abrupt contact w/:		
211		No sample;		CL wet	210.75': CL: Greenish		211
		low volume		CL	gray (Gley 1, 5/5GY) sandy		
212		pH=9.94			lean CLAY (~70% lean		212
					clay, ~30% sand (subrounded,		
213					poorly graded, ~20% ms,		213
					80% fs)), wet, v. stiff,		
214					homogenous, weak reaction		214
					to HCl, contact abrupt w/:		
215					211.25': CL: Greenish gray		215
					(Gley 1, 5/5GY) lean CLAY		
216	Run #24				(~85% lean clay, trace		216
					sand, ~15% gypsum as		
217					fs-sized grains/matrix		217
					cement), moist, weakly		
218					cemented, v. stiff, laminated		218
					(2-5mm beds, weak		
219					reaction to HCl.		219
					...past 213': ~50% granular		
220					gypsum, abrupt contact w/:		220 5-27-09

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509U1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description (10YR 6/4)	Pene-trometer	Depth (feet)
				CL	Light yellowish brown lean CLAY (~60% lean clay, trace sand, ~40% granular gypsum /matrix cement), moist, moderately cemented, v. stiff, laminated (3-5mm thick lenses), weak reaction to HCL, from 224'-226': greenish gray (Gley 1, 6/5G), abrupt contact w/ (at 226.5')		
221							221
222							222
223							223
224							224
225							225
					226.5': ML: wet:		
226	Run #25			ML wet	Light brownish gray (10YR 6/2) Sandy SILT (~60% silt, 25% sand (subrounded, poorly graded, ~100% fs), 15% gypsum as granules and matrix cement), wet (in 1"-0.5' wide layers between cemented beds), moderate-strongly cemented, v. stiff, stratified (2"-0.5" thick beds), weak reaction to HCl, abrupt contact w/: 229.5': CL: Pale brown (10YR 6/3) lean CLAY (~75% lean clay, trace sand, ~25% gypsum as fs-sized grains and matrix cement), moist, moderately cemented, v. stiff, stratified (3mm-10mm) thick beds, weak reaction to HCl		226
226.5'							
227		MCF-31A-228 (composite) from 226.5'-229.5', pH=8.80		ML wet			227
228							228
229		PIDs:					229
230		10.6eV=10.2ppmV		CL			230
		11.7eV=38.1ppmV					
231	Run #26: 230'-237'						231
232							232
233							233
234							234
235							235
236							236

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5-28-

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509U1	Start: 5-21-09 End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
237	Run #26			CL	...@ 237': gypsum as 0.25" long randomly oriented crystals.		237
238					...@ 233': brown (7.5YR 4/4), gypsum crystals to 0.75".		238
239					...@ 235': brown (10YR 5/3), granular gypsum only.		239
240					...@ 236': ~50% granular gypsum, moderately-strongly cemented		240
241					...@ 238': ~30% gypsum as 0.25" long randomly oriented crystals.		241
242					...240'-245': layered (0.2'-0.5' thick beds of alternating pale brown (10YR 6/3) and brown (10YR 5/3), gypsum		242
243	Run #27						243
244					as 1.0"-0.5" long euhedral, clear, and randomly-oriented		244
245					crystals.		245
246					...245': mottled reddish brown (5YR 5/4) w/minor ~~light~~ mm		246
247					greenish gray (Gley1, 6/10Y) beds, ~15% gypsum as fs-sized grains and matrix		247
248					cement.		248
249					...246'-248': same as 240'-245' above.		249
250	Run #28				...mottled/stratified lt. greenish gray (Gley1, 8/5G)		250
251					and pale ~~brown~~ mm brown (10YR 6/3), ~30% gypsum		251
252					as cs-sized granules.		252

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL			
253					...2.0' thick layer of gypsum as 1.0" long, euhedral, clear, randomly-oriented crystals.		253
254	Run #28						254
255					...light greenish gray (Gley1, 7/10GY), gypsum as randomly-oriented cs-sized crystals.		255
256							256
				CH	Mottled bluish gray (Gley 2, 5/5B), light greenish gray (Gley 1, 7/10GY) fat CLAY (~80% fat clay, trace sand, ≈15% gypsum as cs-sized grains, ~5% green organic matter), moist, weakly cemented, v. stiff, laminated (2-5mm thick beds), weak reaction to HCl, mod. decay odor.		
257							257
258				-wet-			258
259		pH=7.96, PID's: (ppmV)		-wet-			259
260		10.6eV = 35.4					260
		11.7eV = 33.1					
261							261
262					...@ 258', 259': wet along gramulose gypsum layers, zones are 0.5" thick, resemble mud, not sampled due to low volume.		262
263	Run #29						263
264							264
265					...past 260': dark gray (gley 1, 4/N), ~25% gypsum as matrix infilling and cs-sized grains, and clouded, randomly oriented crystals. ~20% organic matter localized along crystal faces, contact abrupt w/:		265
266							266
267	Run #30						267
268				CALI wet (trace)			268

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
269				CALI wet (trace)	267': CALI: Lt. greenish gray (Gley 1, 7/5GY) CALICHE (~40% lean clay, trace sand, ~60% gypsum as matrix cement, cs-sized grains, and randomly-oriented crystals), wet (traces of water along crystal faces), moderately cemented, homogeneous, strong reaction to HCl, moderate decay odor, abrupt contact w/:		269
270		MCF-31A-270, pH=7.42					270
271	Run #30	PIDs:					271
272		10.6eV=161ppmV 11.7eV=88ppmV					272
273				CH			273
274							274
275					273': CH: Mottled greenish gray (Gley 1, 5/10GY (~90%) and brown (7.5YR 4/4 (~10%)		275
276				CL	fat CLAY (~80% fat clay, trace sand, ~15% gypsum as randomly-oriented, 0.5" long, euhedral clear-cloudy crystals, ~5% organic matter, trace pyrite), moist, weakly cemented, v. stiff, stratified (5-10 mm thick beds), weak reaction to HCl, gradational contact w/:		276
277							277
278							278
279							279
280							280
281	Run #31				276: CL: Lt brown (7.5YR 6/3) lean CLAY (~80% lean clay, trace sand, ~20% gypsum as 0.25" clear, randomly oriented crystals, matrix cement, and cs-fs sized		281
282							282
283							283
284							284

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GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
285	Run #32			CL	grains), moist, weakly-moderately cemented, v. stiff, stratified (5mm to 20mm thick beds), weak reaction to HCl.		285
286					...285'-286': ~30% gypsum as 2"+ randomly oriented, black clouded crystals.		286
287					...from 286': gypsum as clear, subhedral randomly oriented, 0.25" crystals and matrix cement; laminated (1mm-3mm beds).		287
288					...at 286': mottled dark grayish brown (10YR 5/2), ~60%) and lt. reddish brown (5YR 6/3, ~40%) in 2"-6" alternating layers.		288
289					...291': brown (7.5YR 5/4)		289
290					...lt. brown (7.5YR 6/3)		290
291	Run #33				...brown (7.5YR 5/3), gypsum occurs as matrix cement and cs-sized granules, strongly cemented and hard in 2.0" thick layers, strong reaction to HCl.		291
292					...2" thick layer colored lt. greenish gray (Gley 1, 7/10Y).		292
293							293
294							294
295							295
296							296
297							297
298							298
299							299
300	Run #34						300

5-28-0
5-29-0

Harder drilling

GES	Job Name: BRC Monitor~~ing~~ mn Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
	Run #34: 299.5'-308' dropped			CL	...same as above, irregularly-shaped zones mottled greenish gray (Gley 1, 6/10GY).		
301							301
302							302
					...same as above		
303							303
304							304
305					...gradational contact w/:		305
				CH	Reddish brown (2.5YR 5/4) fat CLAY (~90% fat clay, trace sand, ~10% gypsum as cs-sized grains), moist, v. stiff, stratified (2"-6.0" beds), weak reaction to HCl.		
306							306
307							307
308							308
308.5'		MCF-31A-309,			...Sample #MCF-31A-309		
309		pH = 7.59					309
309.5'		PIDs:			...laminae/beds of light red (2.5YR 6/6), gray (10YR 6/1), and brown (~~10YR~~ mm 7.5YR 5/4, abrupt contact w/:		
310		10.6eV =	4.2ppm				310
		11.7eV =	6.6ppm				
311							311
				~~CL~~ mm ML	Yellowish brown (10YR 5/4) SILT (~75% silt, trace sand, ~25% gypsum as ms-sized grains and matrix cement), moist, wet @ 312', 316', and 319.5' (water localized along granular gypsum layers, 1/8" thick; volume insufficient for sampling), v. stiff, stratified (5mm-2" thick beds),		
312				--- wet			312
313							313
314							314
315							315
		pH = 7.81					
316				wet ---			316

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
	Run #35			ML	weak reaction to HCl.		
317					...~25% gypsum as matrix		317
					infilling and cs-sized clear		
318					grains.		318
319							319
				wet	...traces of water along		
320					gypsum crystal faces, & mm		320
	Run #36: 328'-330' lost.				gradational contact w/:		
321				CL	Yellowish brown (10YR 5/4)		321
					lean CLAY (~80% lean clay,		
322					trace sand, ~20% gypsum		322
					as 0.5" long clear euhedral		
323					crystals randomly-oriented		323
					and matrix cement), moist,		
324					weakly cemented, v. stiff,		324
					stratified (0.5'-1.0' beds),		
325					weak reaction to HCl. At		325
					323': 1.0" thick bed of SILT,		
326					mottled pale brown (10YR 6/3)		326
					and greenish gray (Gley1,		
327					5/10GY).		327
					...324'-326': ~40% gypsum		
328					crystals, same as above.		328
					...326': brown (10YR 4/3),		
329					~20% gypsum, as above.		329
330							330 5-29-09 6-1-09
331	Run #37				...abrupt contact w/:		331
				ML	Light greenish gray (Gley1,		
332					7/10GY) SILT (~75% silt,		332

GES	Job Name: BRC Monitoring Wells	Boring No. MCF-31A
Job No. 20092509VI	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
333	Run #37			ML wet	trace sand, ~25% gypsum as cs-sized granules), wet (along gypsum crystal faces and bedding surfaces) weakly cemented (in layers and 0.5" nodules), v. stiff, stratified (5mm-10mm thick beds), weak reaction to HCl, from ~334'-336': 2"-5" thick laminae		333
334							334
335		MCF-31A-335, (331'-337'), pH=7.61					335
336							336
337				CL	of fat CLAY with black carbonaceous material, contact abrupt w/: ~~Brown (10YR 5/3) with 2" beds colore~~ mm 337': CL: Mottled brown (10YR 5/3) and reddish brown (5YR 5/3) lean CLAY (~70% lean clay, trace sand, ~30% gypsum as 0.25" long sub-hedral crystals, cs-fs sized grains, and matrix cement), moist, weakly cemented, v. stiff, stratified (2"-6" thick beds), weak reaction to HCl.		337
338							338
339							339
340							340
341	Run #38: 340'-349'				...at 341': becomes interbedded w/silt laminae, gypsum content decreases to ~15%.		341
342							342
343							343
344							344
345							345
346							346
347							347
348							348

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
349	Run #38			CL	...same as above.		349
350	Run #39 - lost 357'-356'				...brown (10YR 4/3) and laminated (1mm-3mm thick layers).		350
351					...layered brown (7.5YR 5/4) with minor greenish gray (Gley 1, 6/10GY) layering.		351
352							352
353					...moderate to strong cementation in 2"-4" thick beds.		353
354							354
355					...gypsum content increases to 20% as matrix cement and fs-sized grains, contact w/next interval is marked by increasing gypsum content.		355
356							356
357							357 6-1-09 6-2-09
358	Run #40: 357'-364'	Possible wet zone, not sampled due to water above zone, pH=7.89		ML Wet?	357: ML: Mottled/layered greenish gray (Gley 1, 6/5GY, ≈80%) and reddish brown (5YR 5/3, 20%) sandy SILT (≈65% silt, 25% sand (sub-rounded, poorly graded, ≈100% fs), 10% gypsum as matrix cement as ms-fs sized grains), wet? (difficult to determine because of location near top of run), moderately-strongly cemented, v. stiff, stratified (2mm-15mm)		358
359							359
360				CL			360
361							361
362							362
363							363
364							364

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
				CL	thick beds), strong reaction		
365					to HCl, abrupt contact w/:		365
		MCF-31A-366,			360': CL: Brown (7.5YR 5/4)		
366		pH=7.82		ML wet	lean CLAY (~80% lean clay,		366
				ML	trace sand, ~20% gypsum		
367					as 0.25" thick columnar layers,		367
					randomly oriented clear		
368					2" euhedral crystals), moist,		368
	Run #41: 364'-370'				moderately to strongly		
369					cemented, v. stiff, stratified		369
					(5mm-12mm thick beds), weak		
370					reaction to HCl, abrupt		370
		MCF-31A-			contact w/:		
371		371		wet	365.5': ML: Mottled grayish		371
		pH=7.85			brown (10YR 5/2) and greenish		
372					gray (Gley 1, 6/10GY, at contact		372
					(lower)) sandy SILT (~70%		
373					silt, 30% sand (subrounded,		373
					poorly graded, ~100% fs),		
374					trace gypsum as matrix		374
					cement), wet, weakly		
375					cemented in layers / 2.0"		375
					nodules, v. stiff, laminated		
376					(2mm beds), weak reaction		376
					to HCl, abrupt contact w:		
377					366': ML: Yellowish Brown (10YR 5/4)		377
	Run #42				SILT (~85% silt, trace sand,		
378					~15% gypsum as matrix		378
		MCF-31A-			cement / fs-sized grains),		
379		379, pH=7.70			moist, weakly cemented,		379
					v. stiff, laminated (1mm-		
380					4mm laminae), weak reaction to HCl,		380

GES	Job Name: BRC Monitor Wells	Boring No. MCF-31A
Job No. 20092509V1	Start: 5-21-09 / End: 6-3-09	Location:

Depth (feet)	REC	Sample Type	Blows/ 6 inches	USCS	Description	Pene-trometer	Depth (feet)
381					...370'-371': wet along 2.0" long gypsum crystal faces and a ~0.5" thick "mud" layer; ~40% gypsum as 2.0" clear randomly oriented crystals.		381
382							382
383							383
384					...past 375': gypsum occurs as fs-sized grains and matrix cement.		384
385					End of Boring @ 380'		385
386							386
387							387
388							388
389							389
390							390
391							391
392							392
393							393
394							394
395							395
396							396