



ENGINEERING • PERMITTING • ENVIRONMENTAL • WASTE MANAGEMENT • MINING • RECLAMATION
GEOLOGICAL INVESTIGATION • SEDIMENTATION • EROSION CONTROL • REGULATORY COMPLIANCE ASSISTANCE

October 19, 2018

Mr. Jeff Biddick
Oklahoma Dept. of Environmental Quality
Land Protection Division
P. O. Box 1677
Oklahoma City, OK 73101-1677

Re: Evans and Associates Construction Co., Inc., Big Fork Ranch Facility
Three Additional Monitoring Wells

Dear Mr. Biddick:

On Behalf of Evans and Associates Construction Co., Inc. (EVANS), I submit the enclosed construction details, drill logs, and multi-purpose well completion & plugging reports for the three new groundwater monitoring wells located at Big Fork Ranch facility. These wells are identified as GWMP-11A, GWMP-12A, and GWMP-13A. The documentation of the well installation will be placed in the facility operating record and facility's CCR web site.

The first groundwater sample from each well will be collected on October 19, 2018, and subsequent monthly water samples will be collected for the next eleven (11) months to establish background information. Water samples will be analyzed for the constituents listed in Appendix A (detection monitoring) and Appendix B (assessment monitoring).

Please contact me at (405) 557-0000 or at mszahrai@gmail.com should you have any questions.

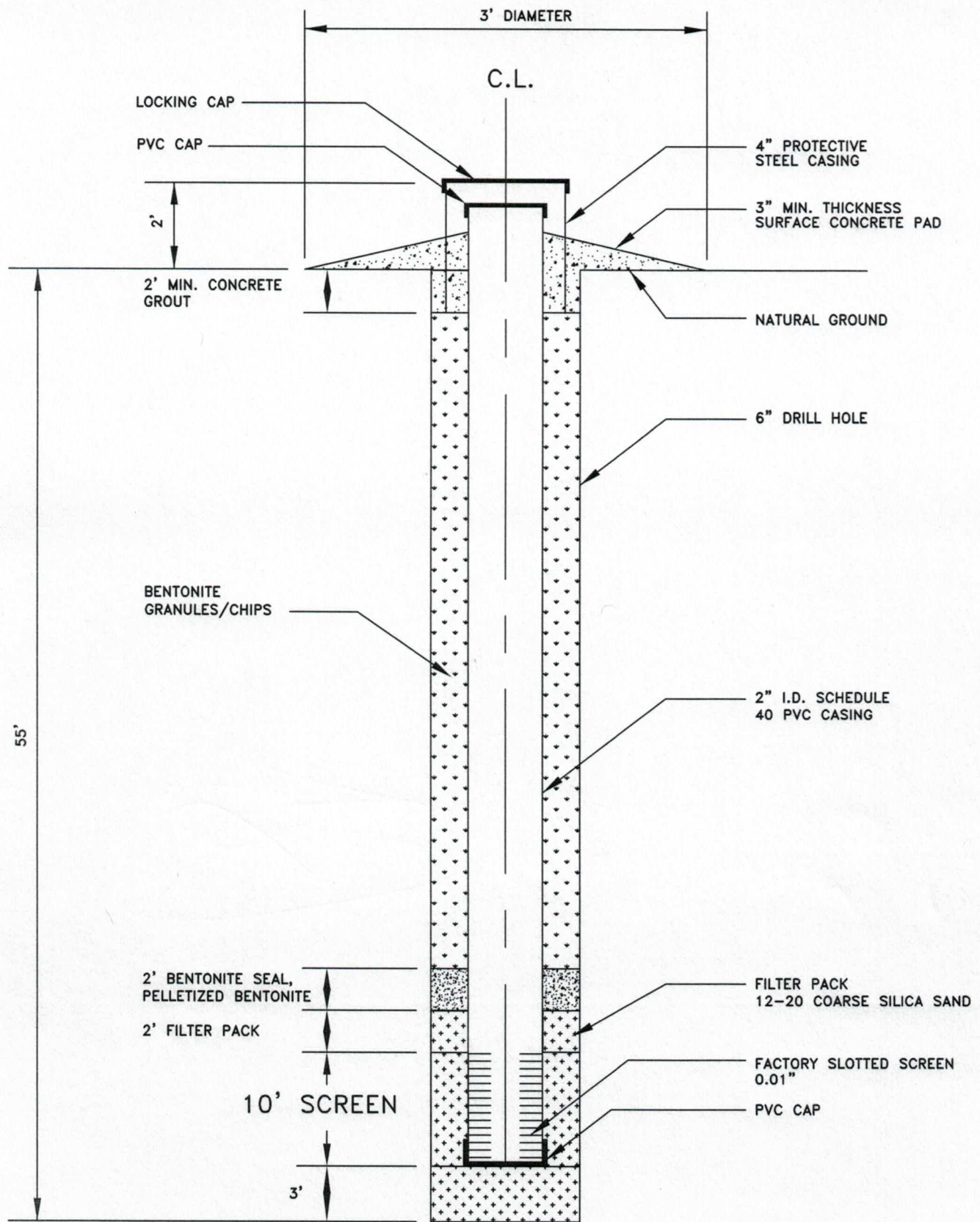
Sincerely,

A handwritten signature in black ink, appearing to read "Saeed Zahrai", is written over a large, loopy scribble that also contains the word "Sincerely,".

Saeed Zahrai, P. E.
President
EMERA, Corp.

Enclosures

cc: Mr. Lee Evans, President, EVANS



NOT TO SCALE

CONSTRUCTION DETAILS FOR GWMP NO. 11A

WELL / BORING NO. GWMP-11A
 CLIENT: Evans & Associates Construction Company
 PROJECT: Big Fork Ranch
 LOCATION:

SURFACE ELEVATION: NA
 BORING DEPTH: 55.0'
 DATE: 09-26-2018

DEPTH from Surface	SAMP DEPTH INTERVAL	SAMP TYPE	SAM #	AMB OVM	RECV ft	DESCRIPTION OF MATERIAL	SOIL CLASS	LAB. OR FIELD TESTS	OVM PPM	DRILLING & SAMPLING NOTES
						0 to 10" TOPSOIL- red-brown, silty, clay loam, dry, many fine roots				
-2.5		CS			4.8	10"-11' MUDSTONE - dark red-brown, clayey, dry, silty, soft	MH			
-5.0		CS								
-7.5		CS			5.0					
-10.0		CS					MH			Drill Rig: Terrasonic Model TS-150 - 5 1/8" direct-push
-12.5		CS			4.9	11-15' MUDSTONE - light red-orange, dry, soft, clay-silt-fine sand mixture, occasional 1-4 mm bedding planes perpendicular to core axis				
-15.0		CS					MH			
-17.5		CS			5.0	15-20' MUDSTONE - same as above, dry, clay-silt-fine sand mix, soft, red-orange				
-20.0		CS					MH			
-22.5		CS			5.0	20-30' MUDSTONE - light red-orange, soft, clay-silt-fine sand mix, bedding perpendicular to core axis, <u>slightly damp</u>				
-25.0		CS								
-27.5		CS			5.0					

DRILLING DATA

START DATE: 09-26-2018
 COMPLETION DATE: 09-26-2018
 LOGGED BY: AJH
 DRILLING METHOD: 5 1/8" Direct-Push
 DRILLING CONTRACTOR: Associated Industries

S.A.A. = Same As Above
 NS = No Sample
 CS= Continuous Sampler
 EOB = End of Boring
 AS = Auger Sample
 TOC = Top of Casing
 N/A = Not Applicable

Water Level Information (Datum = Surf)

DEPTH AT COMPLETION: 55.0 ft.
 LATER TIME/DEPTH: 52.0 ft.
 CAVE IN DEPTH: N/A
 DRILLING LOSSES: 0.3 ft.

WELL / BORING NO. GWMP-11A
 CLIENT: Evans & Associates Construction Company
 PROJECT: Big Fork Ranch
 LOCATION:

SURFACE ELEVATION: NA
 BORING DEPTH: 55.0'
 DATE: 09-26-2018

DEPTH from Surface	SAMP DEPTH INTERVAL	SAMP TYPE	SAM #	AMB OVM	RECV ft	DESCRIPTION OF MATERIAL	SOIL CLASS	LAB. OR FIELD TESTS	OVM PPM	DRILLING & SAMPLING NOTES
-30.0						30-39' CLAY - medium-red, soft, dry, plastic, "ball clay"	CL			
-32.5		CS			4.8					
-35.0		CS								
-37.5		CS			5.0					
-40.0		CS				39-43' GRAVELLY CLAY - red-brown , plastic, hard, dry, 1/8 - 1/2" silicious pebbles	GC			Drill Rig: Terrasonic Model TS-150 - 5 1/8" direct-push
-42.5		CS			4.9					
-45.0		CS				43-44' MUDSTONE- light green, hard, silty, dry	MH			
-47.5		CS			5.0					
-50.0		CS				44-49' MUDSTONE - maroon, dry, hard, plastic, bedding perpendicular to core axis,	MH			
-52.5		CS			5.0					
-55.0		CS				49-49.4' LIMESTONE - light gray, very hard, dry, 49.4-51' CLAY - orange-brown, plastic, soft, WET; limestone pebbles WET @ 49.4 - 51.0'	CL			
-57.5		CS			5.0					
		CS				55.0' EOB				

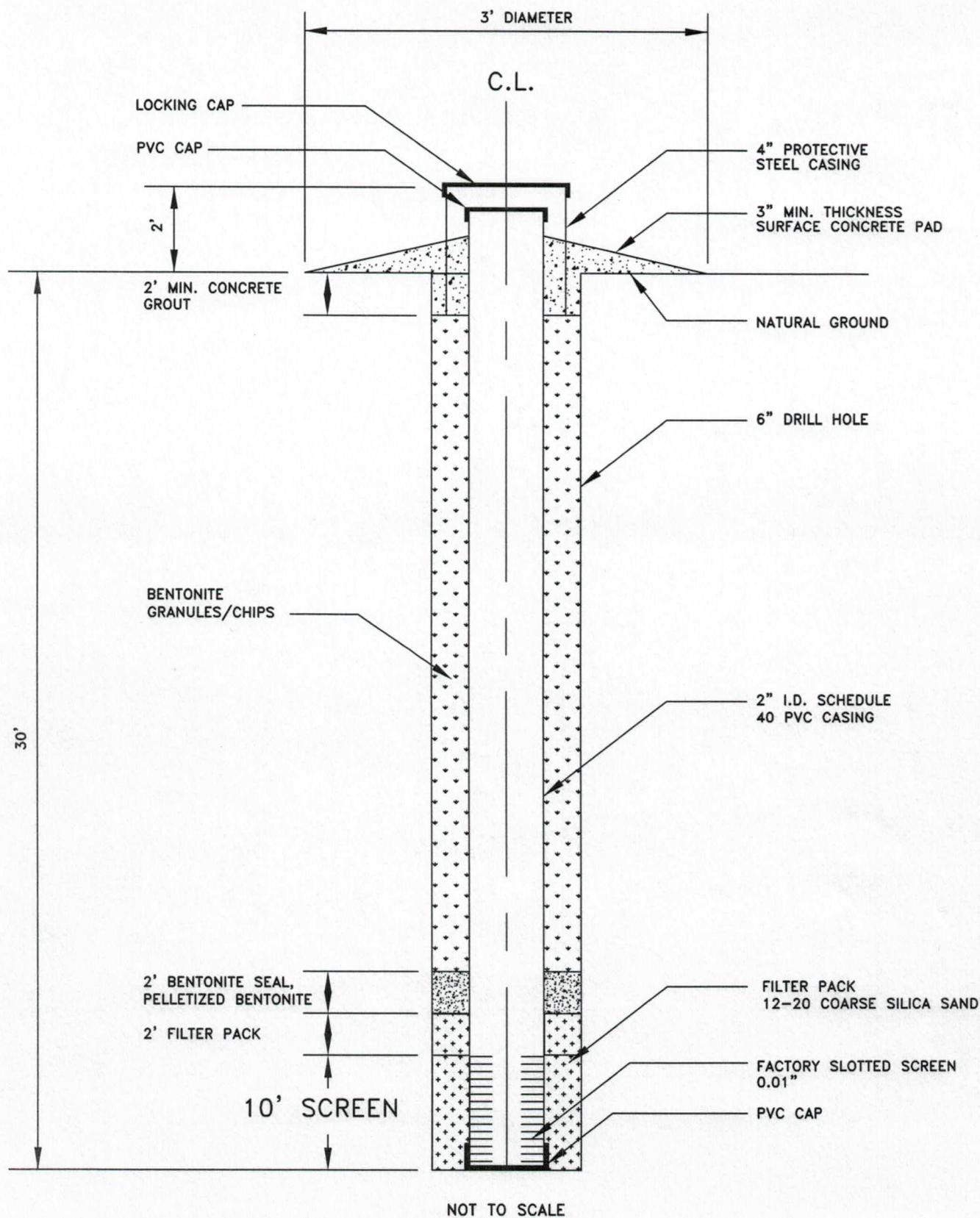
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 TOC = Top of Casing
 N/A = Not Applicable

Water Level Information (Datum = Surf)

DEPTH AT COMPLETION: 55.0 ft.
 LATER TIME/DEPTH: 52.0 ft.
 CAVE IN DEPTH: N/A
 DRILLING LOSSES: 0.3 ft.



CONSTRUCTION DETAILS FOR GWMP NO. 12A

DEPTH from Surface	SAMP DEPTH INTERVAL	SAMP TYPE	SAM #	AMB OVM	RECV ft	DESCRIPTION OF MATERIAL	SOIL CLASS	LAB. OR FIELD TESTS	OVM PPM	DRILLING & SAMPLING NOTES
-2.5		CS			1.9	0 to 2" TOPSOIL- red-brown, silty, clay loam, dry 2"- 2' GRAVEL – light brown, damp, unconsolidated, few 2-5 mm shale fragments 2-6.5' CLAY - red-brown, plastic, dry, firm	MH GW CL			
-5.0		CS								
-7.5		CS			2.5	6.5-8' CLAYSTONE – light gray to light green, very hard, silty, dry (8-10': no core recovery)	CH			Drill Rig: Terrasonic Model TS-150 – 5 1/8" direct-push
-10.0		CS				10-11.5' CLAY – light brown to beige, plastic, soft, damp	CL			
-12.5		CS			2.6	11.5-13' MIXED ORGANIC CLAY – dry, red & black mixed clay, plastic, 5% black organic plant residue (13-15': no core recovery)	OH			
-15.0		CS				15-15.5' CLAY – medium brown, plastic, dry, firm 15.5-19.5' MUDSTONE – maroon, firm, silty, dry, bedding perpendicular to core axis, green 16-16.5'	CL MH			
-17.5		CS			3.5					
-20.0		CS				19.5-20.5' LIMESTONE – light gray, coarse-grained, crystalline, fossiliferous 20.5-25' MUDSTONE – dark maroon, soft, silty, bedding perpendicular to core axis; <u>WET 20.5-25.0'</u>	MH			
-22.5		CS			4.8	WET 20.5-25.0'				
-25.0		CS				25-29.5' LIMESTONE – medium to light gray, very hard, micritic				
-27.5		CS			4.7		OH			
-30.0						29.5-30.0' CLAYSTONE – black, soft, bedding planes Perpendicular to core axis 30.0' EOB				

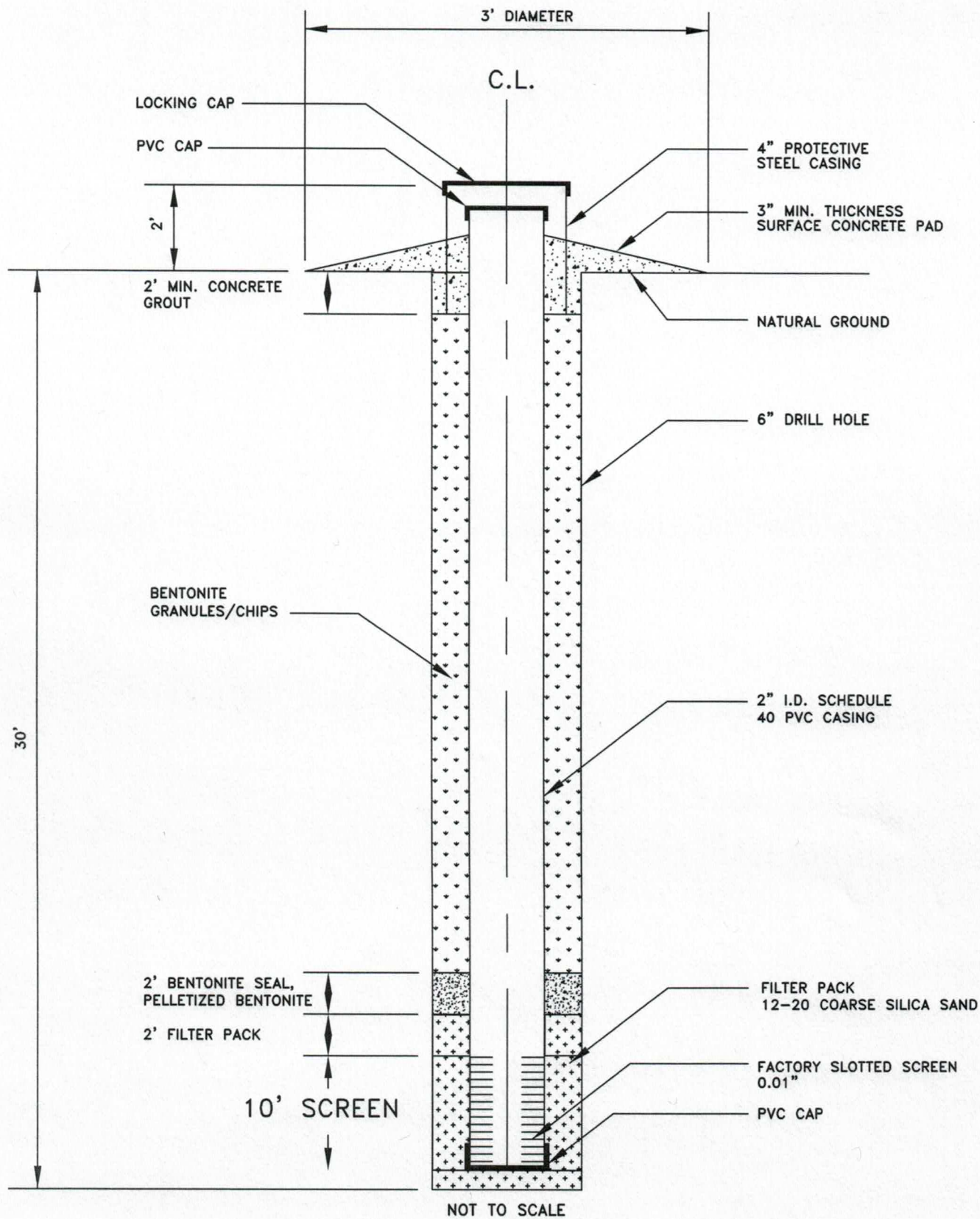
DRILLING DATA

START DATE: 09-26-2018
 COMPLETION DATE: 09-26-2018
 LOGGED BY: AJH
 DRILLING METHOD 5 1/8" Direct-Push
 DRILLING CONTRACTOR: Associated Industries

S.A.A. = Same As Above
 NS = No Sample
 CS= Continuous Sampler
 EOB = End of Boring
 AS = Auger Sample
 TOC = Top of Casing
 N/A = Not Applicable

Water Level Information (Datum = Surf)

DEPTH AT COMPLETION: 30.0 ft.
 LATER TIME/DEPTH: 30.0 ft.
 CAVE IN DEPTH: N/A
 DRILLING LOSSES: 9.7 ft.



CONSTRUCTION DETAILS FOR GWMP NO. 13A

WELL / BORING NO. GWMP-13A
 CLIENT: Evans & Associates Construction Company
 PROJECT: Big Fork Ranch
 LOCATION:

SURFACE ELEVATION: NA

BORING DEPTH: 30.0'

DATE: 09-26-2018

DEPTH from Surface	SAMP DEPTH INTERVAL	SAMP TYPE	SAM #	AMB OVM	RECV ft	DESCRIPTION OF MATERIAL	SOIL CLASS	LAB. OR FIELD TESTS	OVM PPM	DRILLING & SAMPLING NOTES
						0 to 6" TOPSOIL- red-brown, silty, clay loam, dry, many fine roots	MH			
-2.5		CS			4.8	6" -10' MUDSTONE – bright red-orange, soft, dry, silt-clay-fine sand mixture; 0.5% 1mm black organic carbon specks; fissile & shaly 9-10'	MH			
-5.0		CS								
-7.5		CS			5.0					
-10.0		CS				10-12' MUDSTONE – red-orange, dry, soft, plastic, clay-silt-fine sand mixture	MH			Drill Rig: Terrasonic Model TS-150 – 5 1/8" direct-push
-12.5		CS			4.9	12-15' CLAY – red-orange, plastic, dry, silty, soft, bedding perpendicular to core axis	CL			
-15.0		CS				(15-20': no core recovery)				
-17.5		CS			0					
-20.0		CS				20-25' CLAY – red-orange, plastic, 0.5-1 % black organic carbon streaks; slightly damp	CL			
-22.5		CS			5.0					
-25.0		CS				25-30' LIMESTONE – light gray, very hard, dry, 1-2% black organic carbon specks				
-27.5		CS			5.0					
-30.0						30.0' EOB				

DRILLING DATA

START DATE: 09-26-2018
 COMPLETION DATE: 09-26-2018
 LOGGED BY: AJH
 DRILLING METHOD 5 1/8" Direct-Push
 DRILLING CONTRACTOR: Associated Industries

S.A.A. = Same As Above
 NS = No Sample
 CS= Continuous Sampler
 EOB = End of Boring
 AS = Auger Sample
 TOC = Top of Casing
 N/A = Not Applicable

Water Level Information (Datum = Surf)

DEPTH AT COMPLETION: 30.0 ft.
 LATER TIME/DEPTH: 29.0 ft.
 CAVE IN DEPTH: N/A
 DRILLING LOSSES: 5.0 ft.

FILTER PACK INFORMATION

Filter Pack Material: Sand 10-20 (coarse)

Filter Pack Interval: From 40 ft to 55

WELL SEAL INFORMATION

Type of Surface Seal Cement Grout

Surface Seal Interval: From 0 ft to 2 ft

Type of Annular Seal n/a

Annular Seal Interval: From n/a ft to n/a ft

Filter Pack Seal Material Bentonite Granules/Chips

Filter Pack Seal Interval: From 2 ft to 40 ft

TYPE OF COMPLETION: Above Ground

HYDROLOGIC INFORMATION

Depth to water at time of drilling ft

Estimated yield of well gpm

First water zone ft

LITHOLOGY DESCRIPTION

MATERIAL	ENCOUNTERED		SATURATED
	FROM (ft.)	TO (ft.)	
Top Soil-red-brown, silty, clay loam, dry, many fine roots	0	10	N
Mudstone-dark red-brown, clayey, dry, silty, soft	10	11	N
Mudstone-light red-orange, dry, soft, cly-silt-fine sand	11	30	N
Clay-medium-red, soft, driy, plastic,	30	39	N
Gravelly Clay-red-brown, plastic, hard, dry	39	43	N
Mudstone-light green, hard, silty, dry	43	44	N
Mudstone-maroon, dry, hard, plastic	44	49	N
Limestone-light gray, very hard, dry	49	49.4	N
Clay-orange-brown, plastic, soft, WET; limestone pebbles	49.4	51	N
Limestone-light gray, very hard, micritic, dry	51	55	N

WELL LOCATION TO POTENTIAL SOURCES OF POLLUTION

Has this well been disinfected after completion of work? No

Are there any potential sources of pollution or wastewater lagoons within 300 ft. of the well? n/a

Distance of Well is n/a from possible source. Type of possible source: n/a

PLUGGING INFORMATION

Date Well or Boring Was Plugged n/a

Total Depth of well being plugged ft.

Was the well contaminated or was it plugged as though it was contaminated? n/a

If the well or boring was plugged as if it was contaminated, was the casing removed or perforated? n/a

Was the grout tremied? n/a

Backfilled with n/a

Backfilled from ft. to ft.

Grouted with n/a

Grouted from ft. to ft.

Grouted with Cement

Grouted from ft. to ft.

Firm Name ASSOCIATED ENVIRONMENTAL INDUSTRIES, CORP. D/PC No. DPC-0269

Operator Name CHARLES CLARK OP No. OP-1210

Date 10/18/2018

Comments: n/a

FILTER PACK INFORMATIONFilter Pack Material: Sand 10-20 (coarse)Filter Pack Interval: From 18 ft to 30**WELL SEAL INFORMATION**Type of Surface Seal Cement GroutSurface Seal Interval: From 0 ft to 2 ftType of Annular Seal n/aAnnular Seal Interval: From n/a ft to n/a ftFilter Pack Seal Material Bentonite Granules/ChipsFilter Pack Seal Interval: From 2 ft to 18 ftTYPE OF COMPLETION: Above Ground**HYDROLOGIC INFORMATION**Depth to water at time of drilling ftEstimated yield of well gpmFirst water zone ft**LITHOLOGY DESCRIPTION**

MATERIAL	ENCOUNTERED		SATURATED
	FROM (ft.)	TO (ft.)	
Top Soil-red-brown, silty, clay loam, dry	0	.2	N
Gravel-light brown, damp, unconsolidated	.2	2	N
Clay-red-brown, plastic, dry, firm	2	6.5	N
Claystone-light gray to light green, very hard, silty, dry	6.5	8	N
No Core Recovery	8	10	N
Clay-light brown to beige, plastic, soft, damp	10	11.5	N
Mixed Organic Clay-dry, red & black mixed clay, plastic	11.5	13	N
No Core Recovery	13	15	N
Clay-medium brown, plastic, dry, firm	15	15.5	N
Mudstone-maroon, firm, silty, dry	15.5	19.5	N
Limestone-light gray, coarse-grained, crystalline, fossilife	19.5	20.5	N
Mudstone-dark maroon, soft, silty	20.5	25	N
Limestone-medium to light gray, very hard, micritic	25	29.5	N
Claystone-black, soft	29.5	30	N

WELL LOCATION TO POTENTIAL SOURCES OF POLLUTIONHas this well been disinfected after completion of work? NoAre there any potential sources of pollution or wastewater lagoons within 300 ft. of the well? n/aDistance of Well is n/a from possible source. Type of possible source: n/a**PLUGGING INFORMATION**Date Well or Boring Was Plugged n/aTotal Depth of well being plugged ft.Was the well contaminated or was it plugged as though it was contaminated? n/aIf the well or boring was plugged as if it was contaminated, was the casing removed or perforated? n/aWas the grout tremied? n/aBackfilled with n/aBackfilled from ft. to ft.Grouted with n/aGrouted from ft. to ft.Grouted with CementGrouted from ft. to ft.Firm Name ASSOCIATED ENVIRONMENTAL INDUSTRIES, CORP. D/PC No. DPC-0269Operator Name CHARLES CLARKOP No. OP-1210Date 10/18/2018

MULTI-PURPOSE WELL COMPLETION & PLUGGING REPORT



Oklahoma Water Resources Board
 3800 North Classen Boulevard
 Oklahoma City, OK 73118
 Telephone (405) 530-8800

Legal Location
 North

WELL ID NUMBER: 189873

X							

Quarters SW-NW-NW Section 08 Township 24N Range 03E1

Latitude <u>36.5772222</u>	Longitude <u>-97.0138889</u>
Date collected(latitude and longitude), if different from date the well was drilled: <u>09/26/2018</u>	
Method latitude and longitude was collected: <u>GPS - uncorrected data</u>	

«———— One Mile —————»
 Each square is 10-acres

County Noble

Variance Request No. (if applicable) n/a

WELL OWNER - NAME AND ADDRESS

Well Owner E & A Construction Co., Inc.

Phone (580) 765-6693

Address/City/State P.O Box 30 Ponca City OK

Zip 74602

Finding Location from the int of Hwy 66 and Hwy 177, S approx. 7.97 miles to Cowboy Road, E NE on Cowboy Road approx. 3.72 miles

Well Name GWMP#13A

Water Rights #:

TYPE OF WORK: Monitoring Well

USE OF WELL: Site Assessment

NEW WELL CONSTRUCTION DATA

Date Well or Boring Was Completed 09/26/2018

Number of wells or borings represented by this log 1

* (Borings are within the same 10 acre-tract and with the same general depths and lithologies)

Hole Diameter 6 inches to a depth of 30 ft.

CASING INFORMATION *Note: If surface casing is used please indicate that on the appropriate well casing information line.

Surface Pipe Material: Surface Pipe Diameter inches Surface Pipe From ft to ft

1) Well Casing Material PVC Casing Diameter 2 inches Casing From 0 ft to 19 ft

SCREEN OR PERFORATION INFORMATION

Type of Screen: PVC Type of Slots or Openings: Factory Slotted - 10 slot (0.010 inch) From 19 ft to 29 ft.

FILTER PACK INFORMATIONFilter Pack Material: Sand 10-20 (coarse)Filter Pack Interval: From 17 ft to 30**WELL SEAL INFORMATION**Type of Surface Seal Cement GroutSurface Seal Interval: From 0 ft to 2 ftType of Annular Seal n/aAnnular Seal Interval: From n/a ft to n/a ftFilter Pack Seal Material Bentonite Granules/ChipsFilter Pack Seal Interval: From 2 ft to 17 ftTYPE OF COMPLETION: Above Ground**HYDROLOGIC INFORMATION**Depth to water at time of drilling ftEstimated yield of well gpmFirst water zone ft**LITHOLOGY DESCRIPTION**

MATERIAL	ENCOUNTERED		SATURATED
	FROM (ft.)	TO (ft.)	
Top Soil-red-brown, silty, clay loam, dry	0	.5	N
Mudstone-bright red-orange, soft, dry silt-clay-fine-sand	.5	10	N
Mudstone-red-orange, dry, soft, plastic, clay-silt-fine sand	10	12	N
Clay-red-orange, plastic, dry, silty, soft	12	15	N
No Core Recovery	15	20	N
Clay-red-orange, plastic	20	25	N
Limestone-light gray, very hard, dry	25	30	N

WELL LOCATION TO POTENTIAL SOURCES OF POLLUTIONHas this well been disinfected after completion of work? NoAre there any potential sources of pollution or wastewater lagoons within 300 ft. of the well? n/aDistance of Well is n/a from possible source. Type of possible source: n/a**PLUGGING INFORMATION**Date Well or Boring Was Plugged n/aTotal Depth of well being plugged ft.Was the well contaminated or was it plugged as though it was contaminated? n/aIf the well or boring was plugged as if it was contaminated, was the casing removed or perforated? n/aWas the grout tremied? n/aBackfilled with n/aBackfilled from ft. to ft.Grouted with n/aGrouted from ft. to ft.Grouted with CementGrouted from ft. to ft.Firm Name ASSOCIATED ENVIRONMENTAL INDUSTRIES, CORP. D/PC No. DPC-0269Operator Name CHARLES CLARKOP No. OP-1210Date 10/18/2018Comments: n/a