

July 09, 2021

Hillary Young, P.E.
Chief Engineer - Land Protection Division
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City, OK 73162

Re: Resurvey of Monitoring Wells, Reevaluation of Groundwater Flow Direction, and Request to discontinue quarterly sampling of GWMP-13A
Evans and Associates Construction Co, Inc.
Big Fork Ranch Coal Combustion Residuals (CCR) Landfill, Ponca City, Noble County, OK
Solid Waste Permit #352014

Dear Ms. Young:

In its letter dated March 9, 2021, the Oklahoma Department of Environmental Quality (DEQ) requested that Evans and Associates Construction Company, Inc. (Evans) *“verify groundwater flow with re-surveying of the top of casing (TOC) elevations and ground surface elevations; and provide more information to support the inclusion of MW-11A water quality data into the background pool.”* A copy of this letter is included in **Attachment A**. The location, TOC elevations, and surface elevations for each of the monitoring wells were resurveyed on May 12, 2021 (Cowan Group Engineering). Findings from the May 12, 2021 survey are included in **Attachment B**.

Top of casing and ground surface elevations from the May 12, 2021 survey are different than those of the prior survey. Evans reevaluated groundwater flow utilizing the updated survey. Revised potentiometric Surface Maps for each of the year 2020 and 2021 sampling events (January 2020, April 2020, July 2020, October 2020, January 2021 and April 2021) are included in **Attachment C**.

From the revised potentiometric surface maps, groundwater appears to flow away from the central portion of the Site to the north/northeast and to the west/southwest. This is consistent with previous interpretations. As such, GWMP-11A appears to be at a down-gradient location from portions of the CCR Unit. Based on this, Evans retracts its request to utilize GWMP-11A as an upgradient monitoring well. Instead, Evans proposes to utilize GWMP-11A as a compliance monitoring well; pending additional data that would suggest otherwise.

Also, from discussion with DEQ on May 11, 2021, GMWP-13A continues to not contain sufficient water for sample collection. This monitoring well did not contain sufficient water for sample collection during any of the quarterly sampling events conducted in the year 2020 or the January and April 2021 sampling events; and over the course of its history has only once contained sufficient water for sampling.

Hillary Young, P.E.
Oklahoma Department of Environmental Quality
Resurvey of Monitoring Wells, Reevaluation of
Groundwater Flow Direction, and Request to
discontinue quarterly sampling of GWMP-13A
Evans and Associates Construction Co., Inc.
July 09, 2021

Page 2

From the revised potentiometric surface maps based on the May 2021 survey, this well does not appear to be down-gradient of the CCR unit. Evans requests that monitoring of GWMP-13A be discontinued, but that this well continue to be gauged for water during semi-annual sampling events.

Please contact me at 405-701-8215 or at Chris.Schaefer@altamira-us.com if you have any questions.

Sincerely,

Altamira-US, LLC


Chris Schaefer, PE
Hydrogeologist

cc: Saeed Zahrai, P.E. / EMERA, Corp.
Lee Evans / Avans & Associates Construction Co., Inc.

ATTACHMENT A

DEQ LETTER (MARCH 9, 2021)



26 9

SCOTT A. THOMPSON
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT
Governor

March 9, 2021

Mr. Lee Evans
Evans & Associates Construction Company, Inc.
P.O. Box 30
Ponca City, OK 74602

Re: 2020 Annual Groundwater Monitoring and Corrective Action Report, Big Fork Ranch Coal Combustion Residuals (CCR) Landfill, Solid Waste Permit # 3552014, Noble County, Oklahoma.

Dear Mr. Evans:

The Oklahoma Department of Environmental Quality (DEQ) received the 2020 Annual Groundwater Monitoring and Corrective Action Report (Report) dated January 29, 2021. The Report was submitted by Altamira on behalf of Evans and Associates Construction Company, Inc. (Evans). The Report documents groundwater monitoring activities conducted throughout 2020 at the Big Fork Ranch CCR Landfill in accordance with Oklahoma Administrative Code (OAC) 252:517-9-1(e).

The Report includes all groundwater data collected under OAC 252:517 and documents the status of the groundwater monitoring and corrective action program for the CCR units, summarizes key actions completed, and projects key activities for 2021. Assessment monitoring samples were collected in January, April, and October during 2020. The Report notes that no significant problems were encountered and therefore no actions were required to resolve them.

The groundwater monitoring network at Big Fork Ranch consists of existing site monitoring wells GWMP-6A, GWMP-8A, GWMP-9A, GWMP-10A, and new monitoring wells GWMP-11A, GWMP-12A, and GWMP-13A. GWMP-6A is designated as an upgradient well. Groundwater flow appears to be to the north/northeast with a contingent of flow to the west/ southwest. The groundwater flow rate is estimated to be 0.58 ft/year during the April 2020 monitoring event and 0.64 ft/ year at the October 2020 monitoring event towards the northeast.

New monitor wells GWMP-11A, GWMP-12A, and GWMP-13A were installed at the facility on September 26, 2018 for potential inclusion to the monitoring network. Sampling to establish background has been completed at GWMP-11A and GWMP-12A. Monitor well GMW-12A has already been approved for inclusion into the monitoring network. Monitoring well GWMP-13A did not recover sufficient water for sampling at any event in 2020; and has been sampled only once since its installation. If this well continues to be dry during sampling, Evans may discuss with DEQ potential alternative sampling means.

Evans transitioned from detection to assessment monitoring after statistically significant increases of TDS, boron, chloride, fluoride, and sulfate initially occurred in various monitoring wells during the April 2019 and subsequent monitoring events. Evans submitted an Alternate Source Demonstration and eventual Assessment Monitoring Plan due to the exceedances. The Assessment Monitoring Plan, dated December 10, 2019, was approved by DEQ on January 21, 2020. Assessment monitoring was implemented in 2020 and will continue throughout 2021 in accordance with OAC 252:517-9-6 and the Assessment Monitoring Plan.

Three assessment monitoring events occurred in 2020 for Appendix A and B parameters. Statistical analysis was conducted on all data sets with inter- and intra-well analyses conducted for Appendix A parameters to detect for statistically significant increases (SSIs) over background. Appendix B parameters concentrations were compared to the groundwater protection standards (GWPS). A trend analysis was conducted for each



Mr. Lee Evans
March 9, 2021
Page 2 of 2

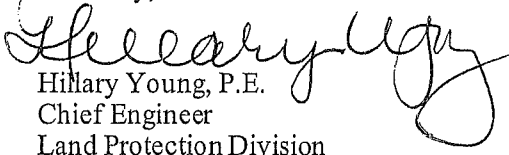
well/ constituent combination and a confidence interval established for all 2020 Appendix B constituents. A statistically significant level (SSL) above a GWPS is determined if the lower confidence limit for an Appendix B constituent exceeds the established GWPS. There were no SSLs detected for the 2020 assessment monitoring program. However, during the October monitoring event, arsenic at GWMP-10A was detected at a concentration slightly exceeding the GWPS. Since the lower confidence limit did not exceed the established GWPS; no SSL above the GWPS is indicated.

It is noted that the EPA promulgated alternative risk-based contaminant level for molybdenum was used as the GWPS. Please note that DEQ's regulations at OAC 252:517 have not incorporated the revised EPA alternative risk-based groundwater standards for Appendix B constituents that do not have maximum contaminant levels (MCLs). Accordingly, please ensure that assessment monitoring analyses are utilizing the established MCL or background level as appropriate in accordance with OAC 252:517-9-6(h) and assess if any SSLs would be triggered as a result.

Evans proposes to add MW-11A to the groundwater monitoring network as a background well that is not an upgradient well. This is allowed according to OAC 252:517-9-2(a)(1) provided the groundwater there is representative of background water quality not affected by leakage from the CCR unit. The highest groundwater elevation appears to be near the southeast corner of landfill Cell 8 and the MW-11A is positioned on the south side of the landfill, where there is a component of groundwater flow to the southwest. This seems contrary to the expected flow direction to the northeast and Table 2 shows great variability in depth to water measurements at GWMP-11A, leading DEQ to question the validity of the groundwater elevations at MW-11A. Therefore, prior to inclusion of the water quality data into the background pool along with MW-6A, DEQ requests Evans verifies the groundwater flow with re-surveying of the top of casing (TOC) elevations and ground surface elevations; and provides more information to support the inclusion of MW-11A water quality data into the background pool. Also, if the groundwater flow distribution is validated, more wells may be needed in the future due to complex groundwater.

The Report meets the requirements of OAC 252:517-9-1(e) with the exception of using the EPA risk-based groundwater standard for molybdenum as a GWPS. In an addendum, please reevaluate whether an SSL exists for molybdenum using background as the GWPS and assess the viability of MW-11A as a background well. It is noted that the Report has been placed on Big Fork's publicly accessible website. Should you have any questions, please contact Kaylee Shipler at (405) 702-5196 or Kaylee.shipler@deq.ok.gov.

Sincerely,


Hillary Young, P.E.
Chief Engineer
Land Protection Division

HY/ks

cc: Chris Schaefer, Hydrogeologist, Enviro Clean Cardinal
Saeed Zahrai, P.E., Emera Corporation

ATTACHMENT B

UPDATED SURVEY

(MAY 12, 2021 SURVEY – COWAN GROUP ENGINEERING)

Surveyed Monitoring Well Locations

Site Identification	State Plane Coordinates OK North Zone (NAD 83)		Top of PVC Elevation, feet above MSL	Top of Outer Casing Elevation, feet above MSL	Ground Elevation, feet above MSL	(NAD 83)	
	Northing (Y)	Easting (X)				Latitude	Longitude
GWMP #6A	574719.367	2258948.309	1060.29	1060.48	1058.87	36°34'29.02158" N	97°00'39.09423" W
GWMP #8A	574853.556	2258164.008	1062.97	1063.10	1061.39	36°34'30.42733" N	97°00'48.69240" W
GWMP #9A	575204.046	2259374.208	1034.37	1034.55	1032.72	36°34'33.77110" N	97°00'33.81242" W
GWMP #10A	575353.539	2259217.603	1022.44	1022.66	1020.98	36°34'35.26506" N	97°00'35.71362" W
GWMP #11A	574514.013	2258440.999	1072.17	1072.66	1070.27	36°34'27.04213" N	97°00'45.33904" W
GWMP #12A	575341.281	2258533.003	1046.71	1047.07	1045.00	36°34'35.21282" N	97°00'44.10797" W
GWMP #13A	575428.288	2258030.682	1053.29	1053.87	1051.52	36°34'36.12362" N	97°00'50.25531" W

Notes:

1. MSL - Mean Sea Level (NAVD 88)
2. State Plane Coordinates on Oklahoma North Zone (NAD 83) based on Leica Smartnet GPS Network.

EMERA Corporation
 Site: Big Fork Ranch
 CGE Project No. : 18-680
 Date Surveyed : May 12, 2021



ATTACHMENT C

UPDATED GROUNDWATER ELEVATIONS AND POTENTIOMETRIC SURFACE MAPS

(BASED ON MAY 12, 2021 SURVEY – COWAN GROUP ENGINEERING)

**DEPTH TO GROUNDWATER AND POTENTIOMETRIC SURFACE
EVANS AND ASSOCIATES - BIG FORK RANCH**

Date	Well	Depth to Water (Ft, TOC)	Updated Potentiometric Surface (Feet, MSL)	Well	Depth to Water (Ft, TOC)	Updated Potentiometric Surface (Feet, MSL)	Well	Depth to Water (Ft, TOC)	Updated Potentiometric Surface (Feet, MSL)	Well	Depth to Water (Ft, TOC)	Updated Potentiometric Surface (Feet, MSL)	Well	Depth to Water (Ft, TOC)	Updated Potentiometric Surface (Feet, MSL)	Well	Depth to Water (Ft, TOC)	Updated Potentiometric Surface (Feet, MSL)	Well	Depth to Water (Ft, TOC)	Updated Potentiometric Surface (Feet, MSL)				
2/26/2017	FORMER	31.7	1028.59	FORMER	41.7	1021.27	FORMER	12.9	1021.47	FORMER	28.6	993.84	FORMER	FORMER	FORMER	FORMER	FORMER	FORMER	FORMER	FORMER	FORMER	FORMER	FORMER	FORMER	FORMER
7/29/2017	T.O.C.	31.2	1029.09	T.O.C.	41.2	1021.77	T.O.C.	12.6	1021.77	T.O.C.	29.8	992.64	T.O.C.	1066.5	1044.2	T.O.C.	1051.5								
9/10/2017	1055.42	31	1029.29	1057.97	42.4	1020.57	1028.96	12.2	1022.17	1017.59	30.5	991.94													
10/14/2017		32.9	1027.39		40.6	1022.37		12.3	1022.07		29.4	993.04													
11/11/2017	UPDATED	31.6	1028.69	UPDATED	32.4	1030.57	UPDATED	11.5	1022.87	UPDATED	28.6	993.84	UPDATED			UPDATED			UPDATED						
1/6/2018	T.O.C.	33	1027.29	T.O.C.	41.3	1021.67	T.O.C.	11.4	1022.97	T.O.C.	29.1	993.34	T.O.C.												
3/3/2018	1060.29	34.5	1025.79	1062.97	41	1021.97	1034.37	12.7	1021.67	1022.44	28.8	993.64	1072.66												
4/14/2018		32.6	1027.69		40.5	1022.47		13.5	1020.87		29.4	993.04													
5/26/2018		34	1026.29		41	1021.97		14	1020.37		30	992.44													
6/23/2018		33.8	1026.49		41.4	1021.57		12.9	1021.47		30.2	992.24													
7/29/2018		34.6	1025.69		40.9	1022.07		13.3	1021.07		>33	<989.44													
9/2/2018		33.4	1026.89		40.4	1022.57		12.3	1022.07		>33	<989.44													
10/18/2018		33.3	1026.99		45.1	1017.87		12.65	1021.72		31.65	990.79													
11/27/2018		33	1027.29		43	1019.97		>23.5	<1010.87		>33	<989.44													
12/24/2018		NM	NM		NM	NM		NM	NM		NM	NM													
1/22/2019		NM	NM		NM	NM		NM	NM		NM	NM													
1/29/2019		NM	NM		NM	NM		NM	NM		NM	NM													
4/22/2019		32.9	1027.39		41.5	1021.47		12	1022.37		28.1	994.34													
6/18/2019		NM	NM		38	1024.97		8.6	1025.77		23.9	998.54													
8/13/2019		31.1	1029.19		40.9	1022.07		11.6	1022.77		29.9	992.54													
10/29/2019		31.4	1028.89		41.3	1021.67		11.8	1022.57		29.4	993.04													
11/29/2019		NM	NM		NM	NM		NM	NM		NM	NM													
12/16/2019		NM	NM		NM	NM		NM	NM		NM	NM													
1/20/2020		31.9	1028.39		41.5	1021.47		15.5	1018.87		29.4	993.04													
4/21/2020		31.04	1029.25		41.54	1021.43		12.02	1022.35		26.98	995.46													
7/22/2020		31.41	1028.88		41.41	1021.56		13.67	1020.7		30.55	991.89													
10/13/2020		31.66	1028.63		41.43	1021.54		14.05	1020.32		30.83	991.61													
1/11/2021		31.38	1028.91		41.52	1021.45		12.69	1021.68		29.18	993.26													
4/26/2021		30.68	1029.61		41.23	1021.74		11.78	1022.59		26.15	996.29													

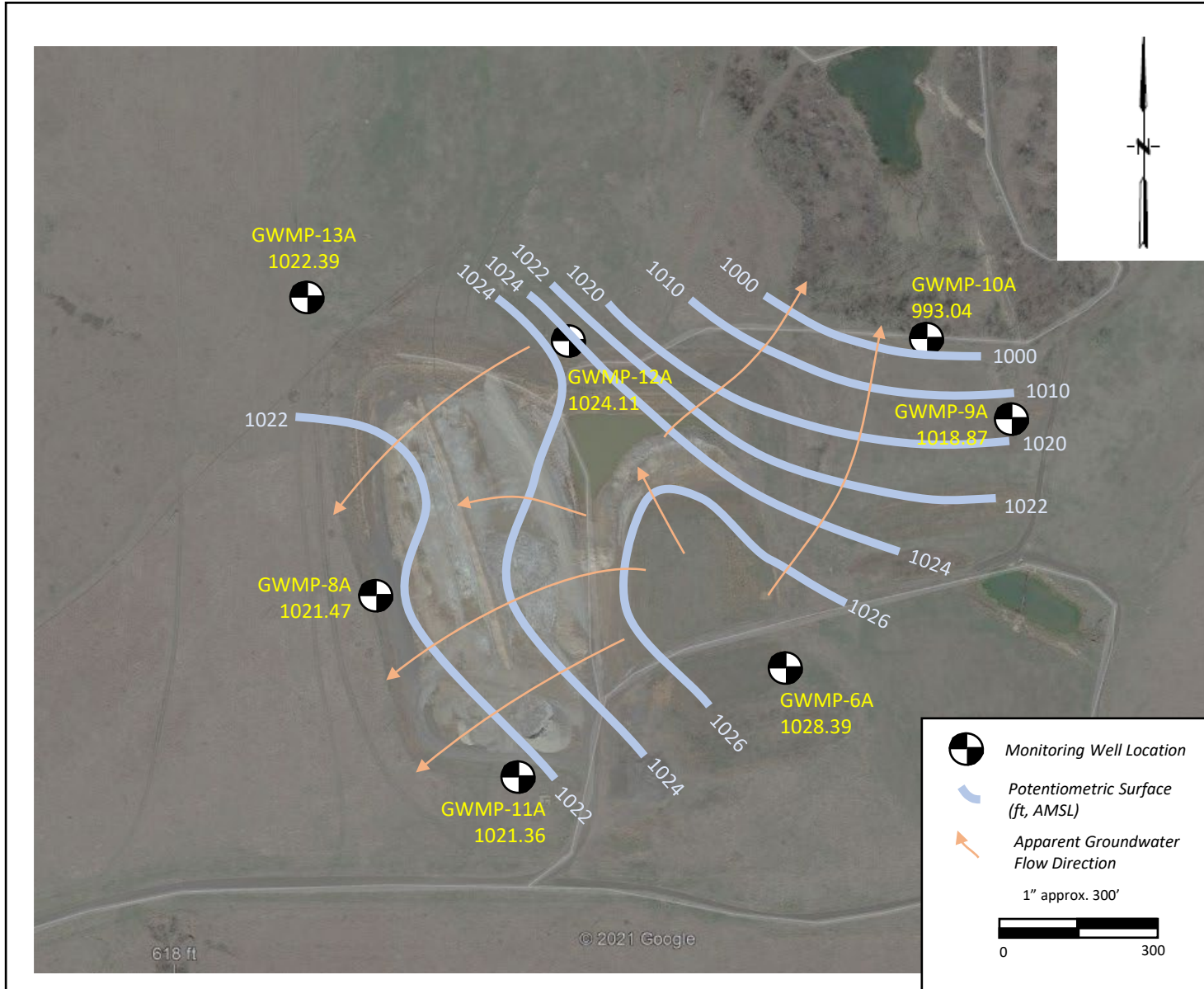
Former T.O.C. : Former surveyed elevation for top of casing (ft, MSL)
 Updated T.O.C. : Updated top of casing (ft, MSL) based on May 12, 2021 Survey (Cowan Group Engineering).
 Updated Potentiometric Surface : Updated Potentiometric Surface (ft, MSL) to reflect the May 12, 2021 Survey
 Ft, TOC : Feet below top of casing
 Ft, MSL : Feet above mean sea level
 NM : Depth to water not measured on specified date

EVANS & ASSOCIATES CONSTRUCTION CO., INC.

3320 NORTH 14TH STREET, PONCA CITY, OKLAHOMA 74602

FACILITY NAME: BIG FORK RANCH

PREPARED FOR:



PROJECT

EVANS & ASSOCIATES
BIG FORK RANCH FACILITY

LOCATION

PONCA CITY, OK

PREPARED FOR

EVANS & ASSOCIATES

DRAWING TITLE

POTENTIOMETRIC SURFACE
(January 20, 2020)

Project No.

Drawn By CSS

Checked By CSS

Date 06/15/2021

Scale AS SHOWN

Issued For.

Drawing No.



525 Central Park Drive, Suite 500
Oklahoma City, OK 73105
Phone 405.842.1066 Fax 405.843.4687

3700 W. Robinson, Suite 200
Norman, OK 73072
Phone 405.701.5058 Fax 405.701.5208

<http://www.EnviroCleanPS.com>

Potentiometric Surface (January 20, 2020)

(Base Map: Google Earth Image: Imagery Date 3/30/2019)

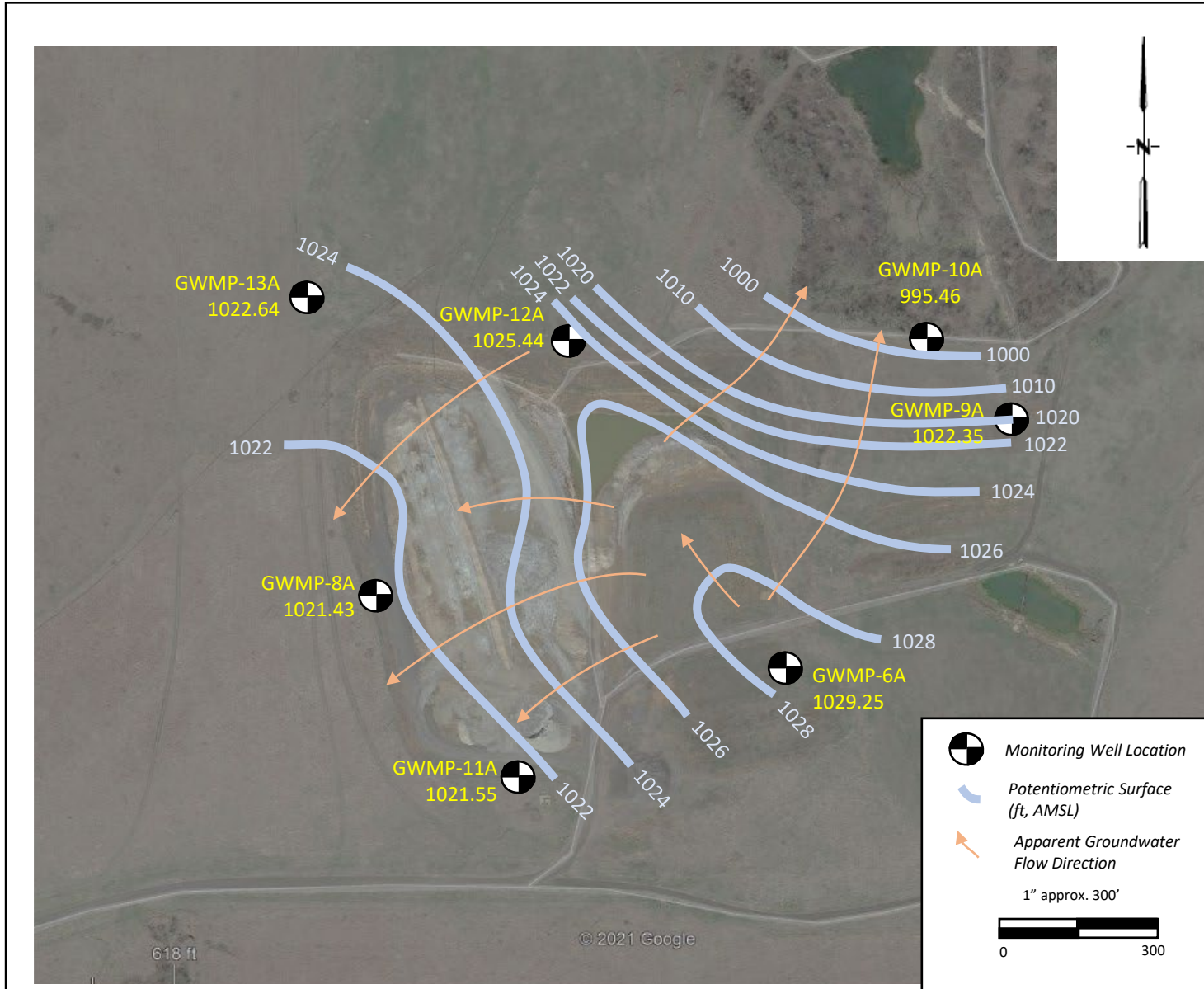
Well locations from May 12, 2021 Survey (Cowan Group Engineering)

EVANS & ASSOCIATES CONSTRUCTION CO., INC.

3320 NORTH 14TH STREET, PONCA CITY, OKLAHOMA 74602

FACILITY NAME: BIG FORK RANCH

PREPARED FOR:



PROJECT
EVANS & ASSOCIATES
BIG FORK RANCH FACILITY

LOCATION
PONCA CITY, OK
PREPARED FOR
EVANS & ASSOCIATES

DRAWING TITLE
POTENTIOMETRIC SURFACE
(April 21, 2020)

Project No.	
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Potentiometric Surface (April 21, 2020)

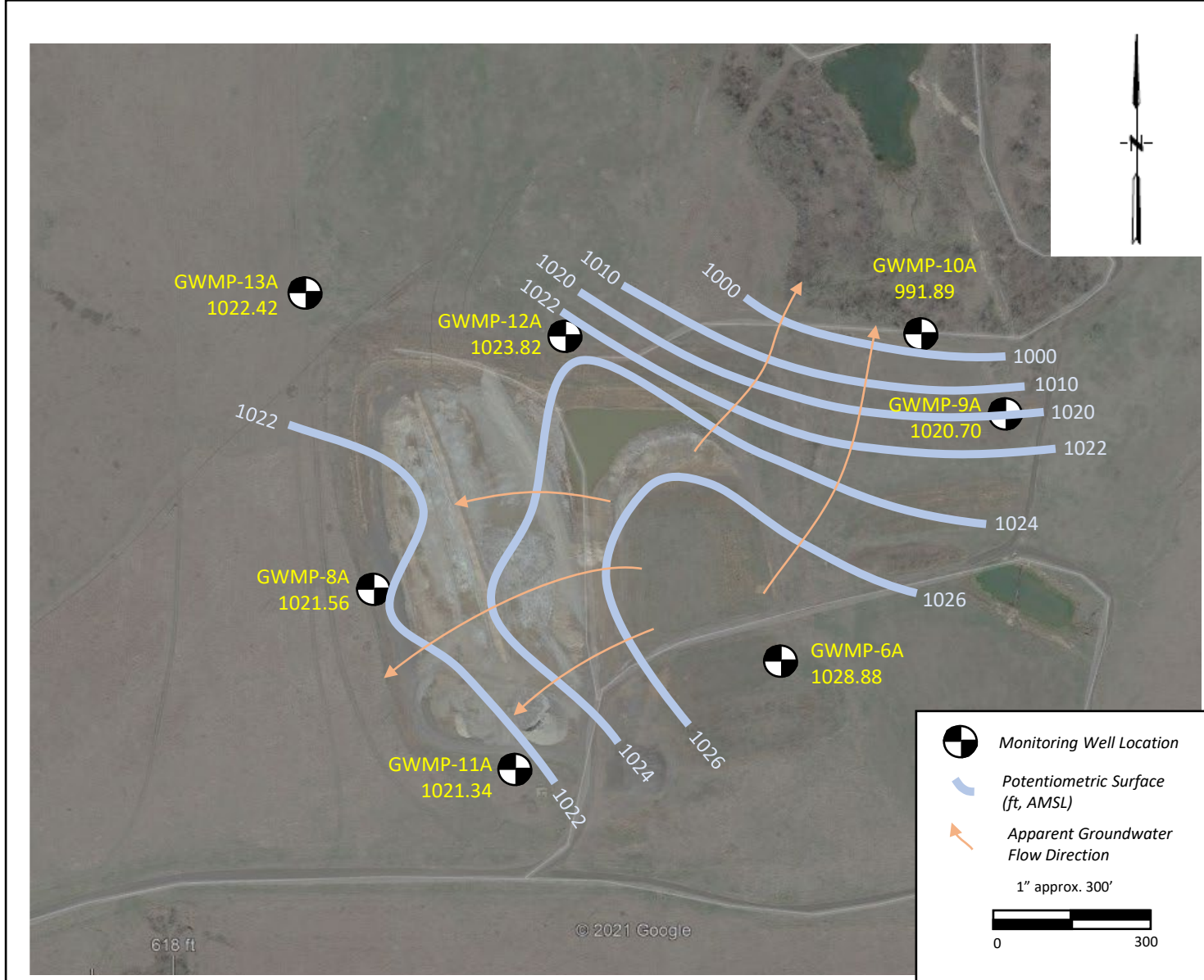
(Base Map: Google Earth Image: Imagery Date 3/30/2019)
Well locations from May 12, 2021 Survey (Cowan Group Engineering)

EVANS & ASSOCIATES CONSTRUCTION CO., INC.

3320 NORTH 14TH STREET, PONCA CITY, OKLAHOMA 74602

FACILITY NAME: BIG FORK RANCH

PREPARED FOR:



PROJECT
EVANS & ASSOCIATES
BIG FORK RANCH FACILITY

LOCATION
PONCA CITY, OK

PREPARED FOR
EVANS & ASSOCIATES

DRAWING TITLE
POTENTIOMETRIC SURFACE
(July 22, 2020)

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Potentiometric Surface (July 22, 2020)

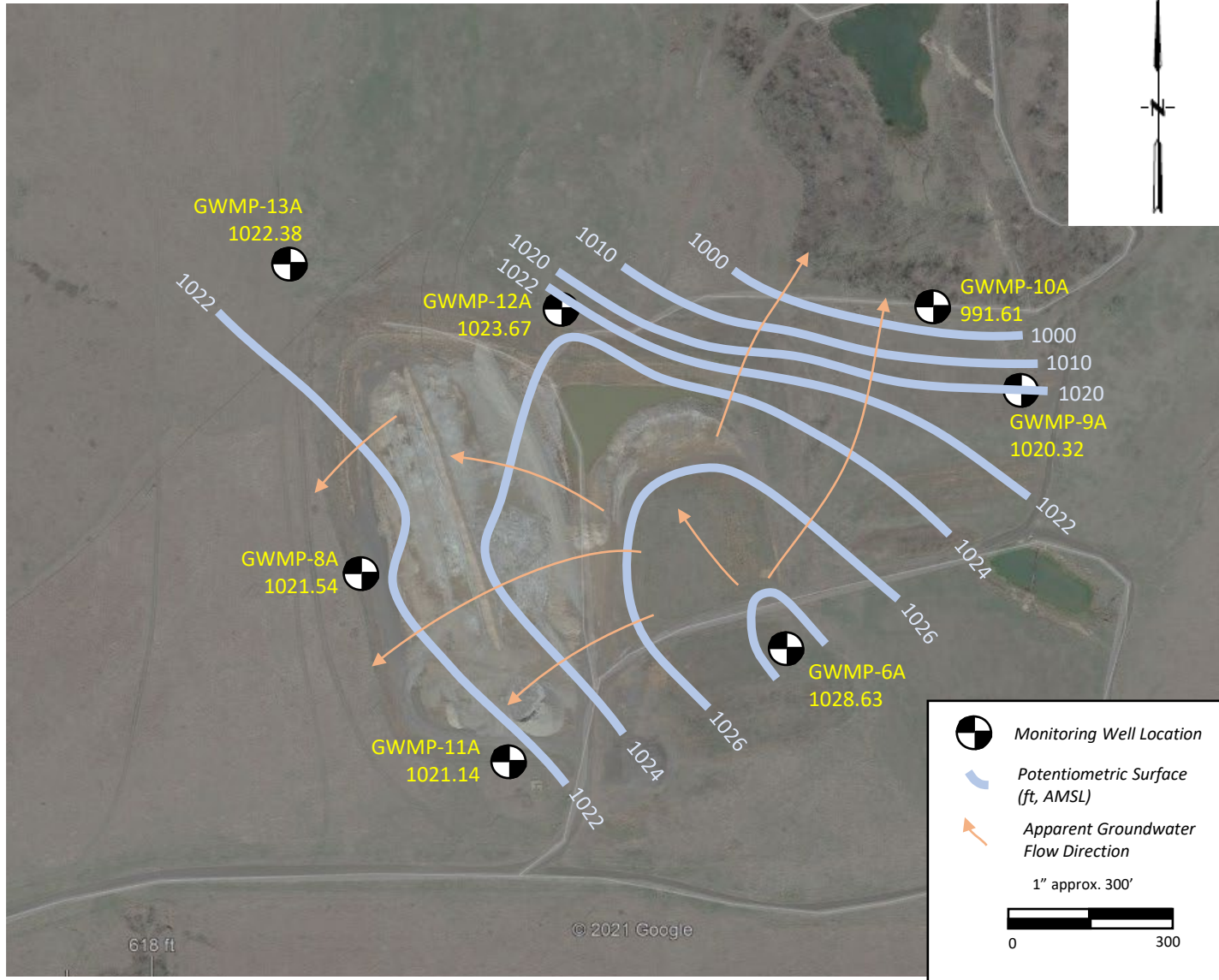
(Base Map: Google Earth Image: Imagery Date 3/30/2019)
Well locations from May 12, 2021 Survey (Cowan Group Engineering)

EVANS & ASSOCIATES CONSTRUCTION CO., INC.

3320 NORTH 14TH STREET, PONCA CITY, OKLAHOMA 74602

FACILITY NAME: BIG FORK RANCH

PREPARED FOR:



PROJECT
EVANS & ASSOCIATES
BIG FORK RANCH FACILITY

LOCATION
PONCA CITY, OK

PREPARED FOR
EVANS & ASSOCIATES

DRAWING TITLE
POTENTIOMETRIC SURFACE
(October 13, 2020)

Project No.	
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Date	06/15/2021
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Potentiometric Surface (October 13, 2020)

(Base Map: Google Earth Image: Imagery Date 3/30/2019)

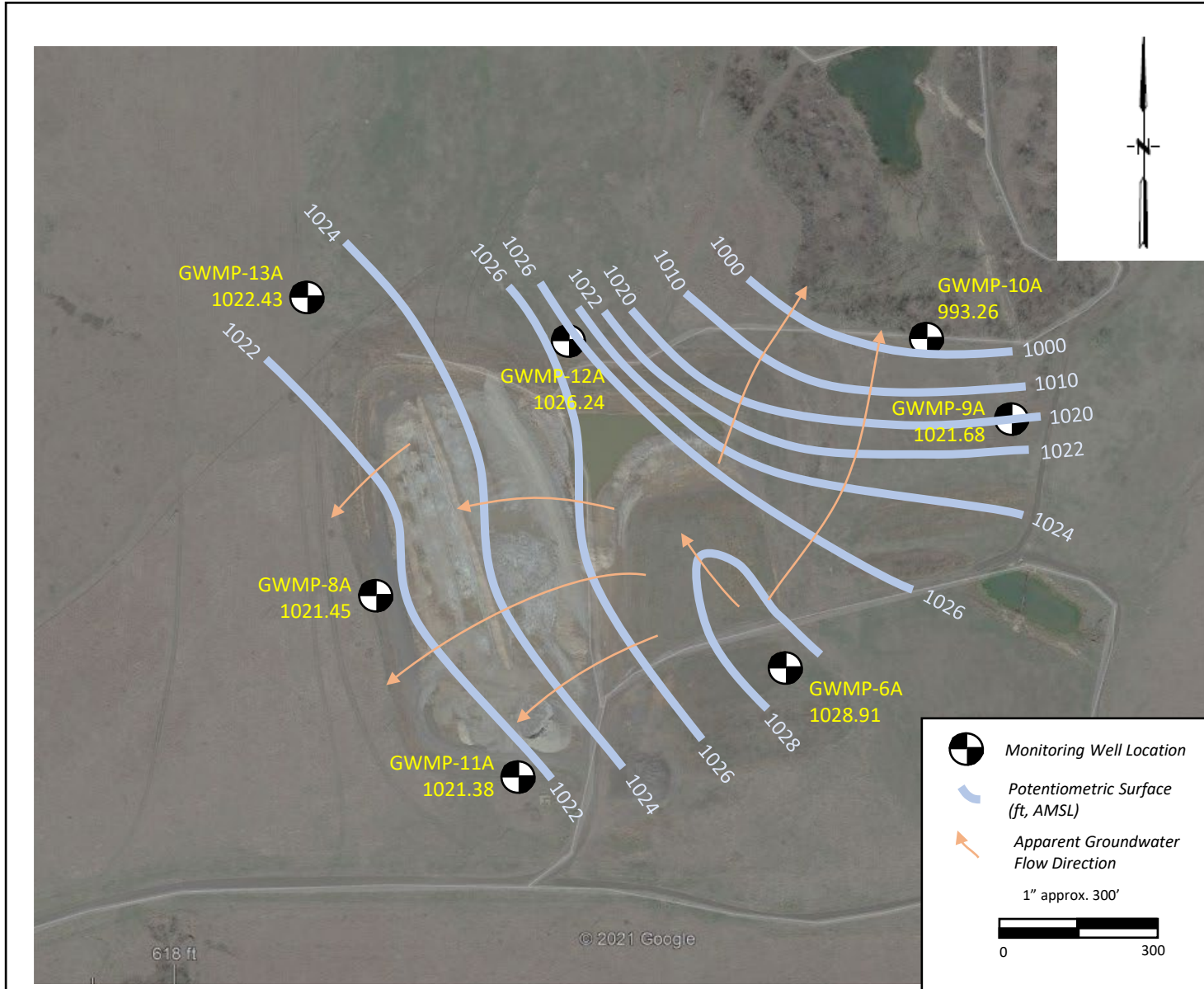
Well locations from May 12, 2021 Survey (Cowan Group Engineering)

EVANS & ASSOCIATES CONSTRUCTION CO., INC.

3320 NORTH 14TH STREET, PONCA CITY, OKLAHOMA 74602

FACILITY NAME: BIG FORK RANCH

PREPARED FOR:



PROJECT

EVANS & ASSOCIATES
BIG FORK RANCH FACILITY

LOCATION

PONCA CITY, OK

PREPARED FOR

EVANS & ASSOCIATES

DRAWING TITLE

POTENTIOMETRIC SURFACE
(January 11, 2021)

Project No.

Drawn By CSS

Checked By CSS

Date 06/15/2021

Scale AS SHOWN

Issued For.

Drawing No.



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Potentiometric Surface (January 11, 2021)

(Base Map: Google Earth Image: Imagery Date 3/30/2019)

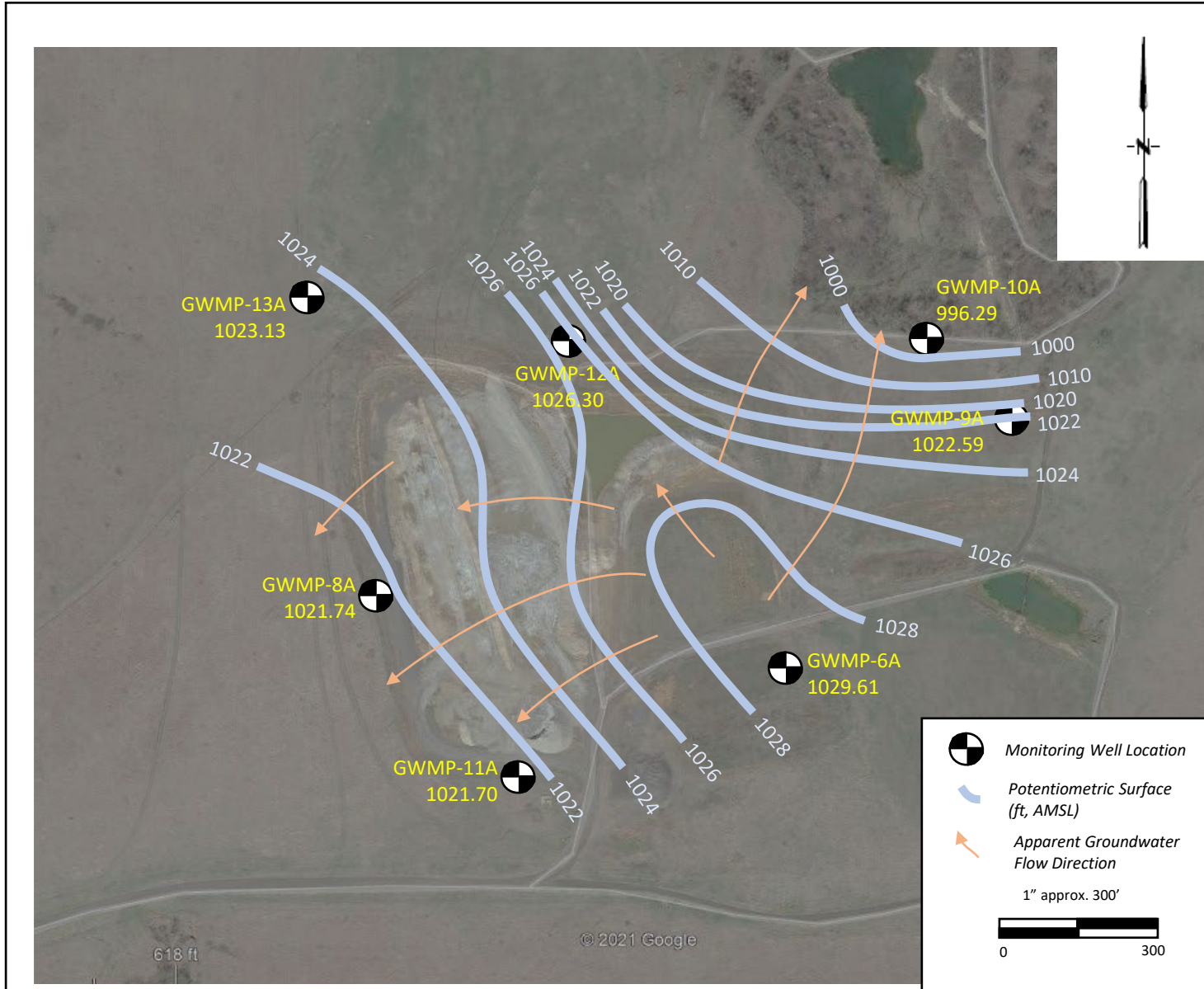
Well locations from May 12, 2021 Survey (Cowan Group Engineering)

EVANS & ASSOCIATES CONSTRUCTION CO., INC.

3320 NORTH 14TH STREET, PONCA CITY, OKLAHOMA 74602

FACILITY NAME: BIG FORK RANCH

PREPARED FOR:



PROJECT	EVANS & ASSOCIATES BIG FORK RANCH FACILITY
LOCATION	PONCA CITY, OK
PREPARED FOR	EVANS & ASSOCIATES
DRAWING TITLE	POTENTIOMETRIC SURFACE (APRIL 26, 2021)
Project No.	
Drawn By	CSS
Checked By	CSS
Date	06/15/2021
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Potentiometric Surface (April 26, 2021)

(Base Map: Google Earth Image: Imagery Date 3/30/2019)
Well locations from May 12, 2021 Survey (Cowan Group Engineering)