STATE WELL REPORT

Part 1
Driller's Log

Mississippi Department of Environmental Quality
Office of Land and Water Resources
P.O. Box 2309
Jackson, MS 39225-2309
(601)961-5555
(601)961-5228 (fax)

County: Washington - MS
Permit #:
Driller: Roland W Tollett (RMO-00009026)
Date drilling completed: 07-30-2019

USGS site name: BP-04a-EC

For Office Use Only:
Well #: J135
Aquifer:
E-Log #:

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State Law requires that this report be prepared by the license holder responsible for the work and filed with the Department at the above address within 30 days of completion of drilling of the well or borehole.

Well Owner Information
(Landowner if borehole is not for a water well)

Owner Name: Bubba Simmons (landowner)
Mailing Address: USGS (driller - rtollett@usgs.gov)
3095 W. California Ave
Ruston (City) LA (State) 71270 (Zip Code)
Telephone No. (318) 251-9630 (245-8639 cell)

☑ Well or ☐ Borehole Location

Latitude: 33.28159 Longitude: -090.83719
Method of Lat/Long (*check one*): Conventional Survey_____,
USGS quad_____, Hand-held GPS X, Survey-grade GPS_____
NE ¼ NE ¼, Sec 32 T 17N R 06W
3 (*Distance*) Miles E/NE (*Direction*) of Arcola, MS (*Nearest Town*)

Well / Borehole Data

Date drilling started: 7/30/19 Date drilling completed: 7/30/19 Hole depth: 98 ft bls Hole diameter: 3.25 in
Location of the source of any surface water used for drilling: none used
Method of dosing and volume of Chlorine used in drilling and development: none used
Logs run (check *applicable*): ☐ No log run ☑ Electric ☐ Gamma Ray ☐ Density ☐ Sonic ☐ Neutron ☐ Other:_____
Name of organization running log(s): USGS, 3095 W. California Ave, Ruston, LA 71270 (318) 251-9630 x13
Purpose of borehole (check one): ☐ Water Well ☑ Geotechnical/Geological Investigation ☐ Ground Source Heat Pump ☐ Seismic Survey ☐ Other (*describe*) _____

If drilling is not related to water well construction, skip the remainder of this block

Purpose of Well (check *all applicable*): ☐ Home ☐ Industrial ☐ Public Supply ☐ Irrigation ☐ Fish Culture ☑ other
Other (*describe*): monitoring well
If a flowing well, method of flow regulation: Valve _____ Other (*describe*) _____
Static Water Level: 14.35 feet [☐ above or ☑ below] land surface (check *one*) Date measured: 7/31/2019 @ 1030
Method of measurement (check *one*) ☐ Steel tape ☑ Electric tape ☐ Air line ☐ Other (*describe*): _____
Well depth: 81 Well grouted to a depth of: 30 feet Type of grout (check *one*): ☑ Neat Cement ☐ Bentonite ☐ Mix
Casing length: 71 feet Casing diameter: 2 inches Type of casing: PVC
Screen length: 10 feet Screen diameter: 2 inches Type of screen: PVC
Screen slot size: .010 inches Setting depth: From 71 feet to 81 feet
Type of completion (check *all applicable*): ☐ Gravel packed ☐ Underreamed ☐ Open hole ☑ Natural Development
Other (*describe*):
Top of lap pipe or reduction in casing: NA feet

If telescoped or more than one screen, describe on next page

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County: Washington - MS

Permit #:

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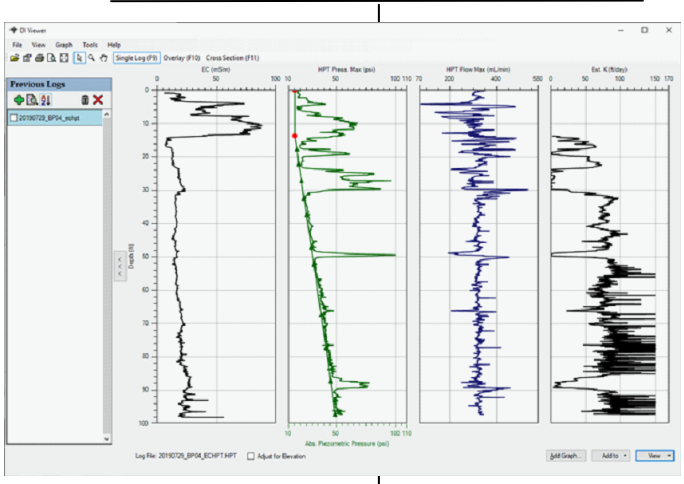
The sketch below only required for water wells

If well telescopes, show depths on sketch.

Ground Level 110 ft



If more than one screen, show location of each on sketch

Description of formations encountered must be provided for all wells and boreholes, unless specifically exempted by regulations

Description of Formations Encountered	From (*depth*)	To (*depth*)
	Ground level	
From EC log:		
clay w silt layers	0	5
clayey w silts and clay	5	15
clayey silts	15	30
fine to medium sand	30	98
(clay lens noted ~86 to 89 ft bls)		

Sketch the property layout and include the following:

BP-04a-EC is the southmost well (left) and BP-04b is the northmost well (right).

Wells are about 3 mi ENE of Arcola MS on west side of Martha Plantation Rd.

Landowner Name: Bubba Simmons

I HEREBY CERTIFY that the well/borehole was drilled, constructed, and completed in accordance with all applicable requirements of the Mississippi Department of Environmental Quality and the Mississippi Department of Health regulations, if applicable, and state laws.

Roland W Tollett	10/22/2019	ROLAND TOLLETT Digitally signed by ROLAND TOLLETT Date: 2019.10.22 14:35:05 -05'00'
Print Name of Responsible Licensee and License No.	Date	Signature of Licensee

Form: OLWR-SWR-1B (*4/13*)

151J0135

Driller: Roland W Tollett, USGS, 3095 W California Ave, Ruston, LA 71270 [318-245-8639] (MS LIC RMO-00009026)

Site number: BP-04a-EC_

Drill date: 20190730 **Plugged date:** active monitoring well

Site type: USGS monitoring well

EC-log depth ~98 ft bls

Rig Type: Geoprobe 7822DT with EC-HPT probe

Lat/Long 33.28159 -090.83719 +-8ft **Sec Township Range:** NE1/4,NE1/4,S32,T17N,R06W

Land surface elevation: 33.5 meters (110 feet) [data source: DEM]

Topo Map Name: Tribbett, MS **County/Parish:** 151 Washington County, MS (1:24,000)

HUC code: 080302071402 Fourmile Bayou Bogue **Associated well in USGS NWIS:** 331654090501401

Land owner: Bubba Simmons

********** **USER NOTES** **********

Drilled by Roland (USGS Ruston LA) and Wesley Bolton (USDA ARS Oxford MS) and Will (USDA ARS Oxford MS).

EC-HPT log notes:
0-5 ft bls was mostly clay with some silty zones. We saw a silty brown clay on the rod wiper which is typically found in the shallower intervals.
5-15 ft bls was mostly clayey silts and clay
15-30 ft bls was mostly clayey silts
30-98 ft bls was mostly fine to medium sand, with thin clay lenses at 85-98 ft bls
Note that 80-90 ft bls was hard to push.

Noticeable change at 80 ft bls (more diff to push rods), as the Geoprobe had a slight shake, tight feel during hammering/pushing. There appears to be a clay lens at 85-90 ft bls.
Cores will also be collected at this site.

HPT log: The last 11 dissipation tests produced a theoretical water level of about 13.8 ft bls which matched the measured WL of 14.35 ft bls very well.

Well construction: This 2" PVC monitoring well is ~85 ft from bottom of point to TOC with a 10 ft screen; screened interval is ~71-81 ft bls; MP is 3.00 above land surface with aluminum protective riser and 2 ft radius concrete slab; a 4" point was added to btm of casing; about 10 gallons of tap water were poured into PVC casing prior to pulling rods; this technique was used to balance and equalize pressure.

About 2 cups of bentonite granules were poured into the annular space of the borehole and bridged over around 20 ft below land surface (bls). Portland cement at a tap water ratio of 5-6 gals per 92-lb bag was used to seal the borehole from about 30 ft bls to land surface.

Water level:

7/31/19 @ 1030 = 18.35 - 1.00 - 3.00 = 14.35 ft bls measured with e-tape by Roland W Tollett of the USGS.

*Note that all water level tapes used by the USGS are calibrated by the HIF.

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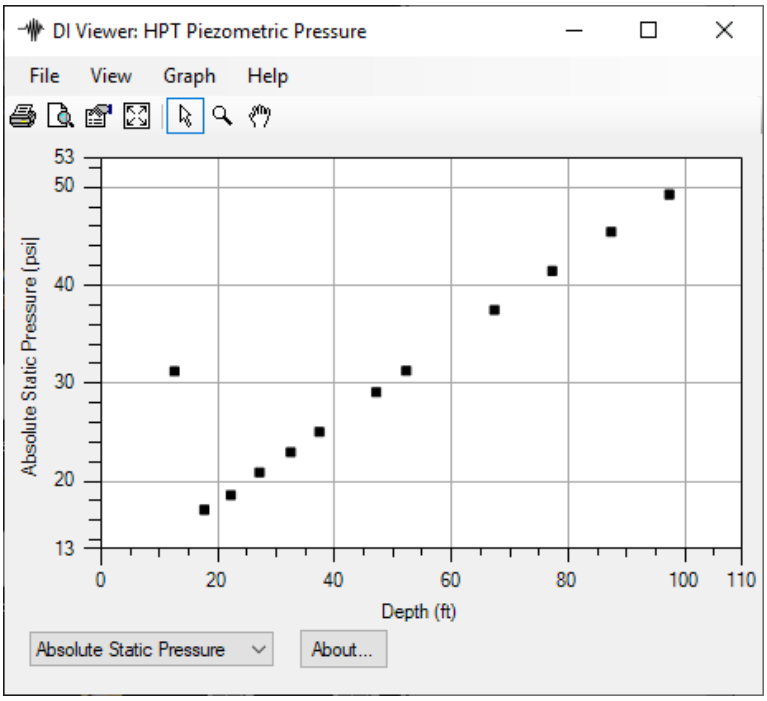
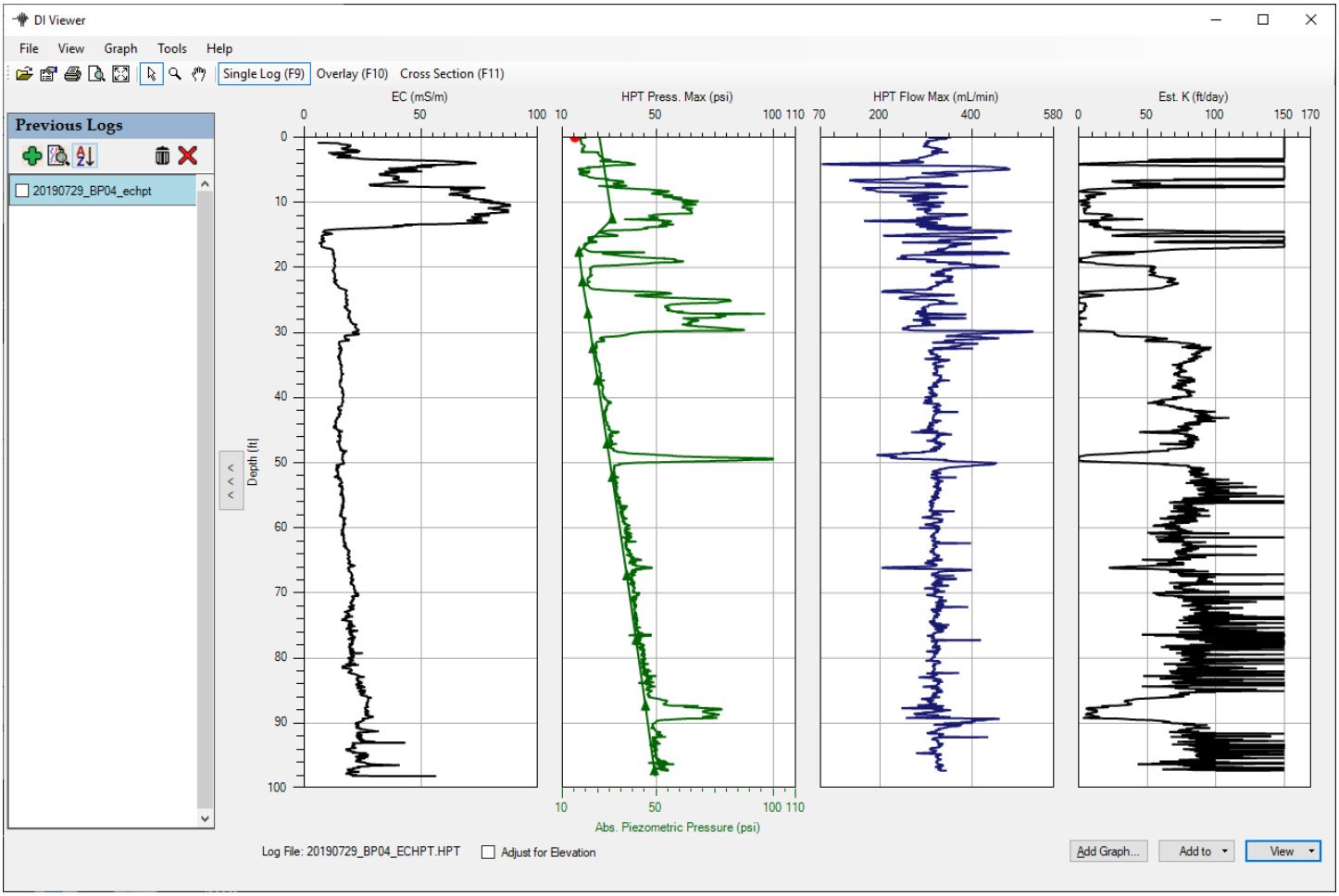
USGS Borehole BP-04a-EC (continued)

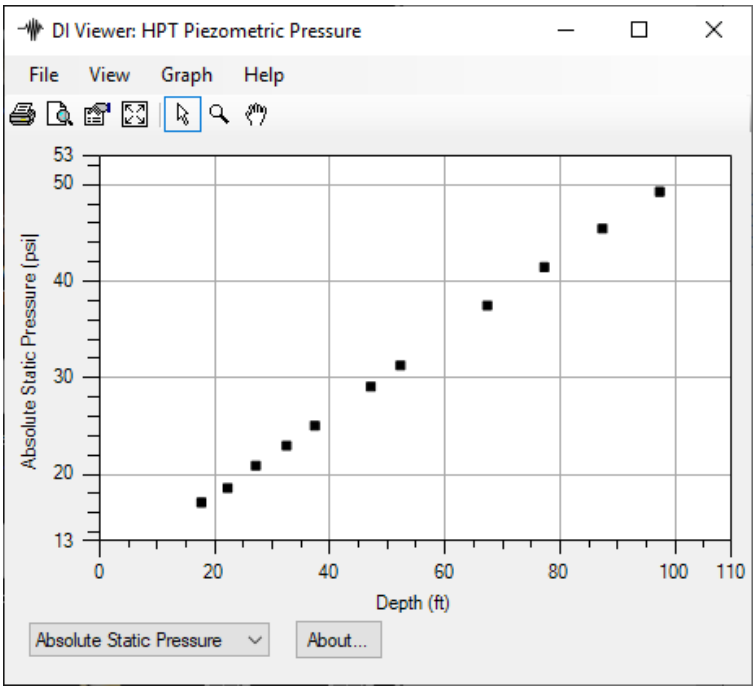
Figure 1. Graph of all dissipation tests and EC-log showing 12 dissipation points from both the unsaturated and saturated zones.

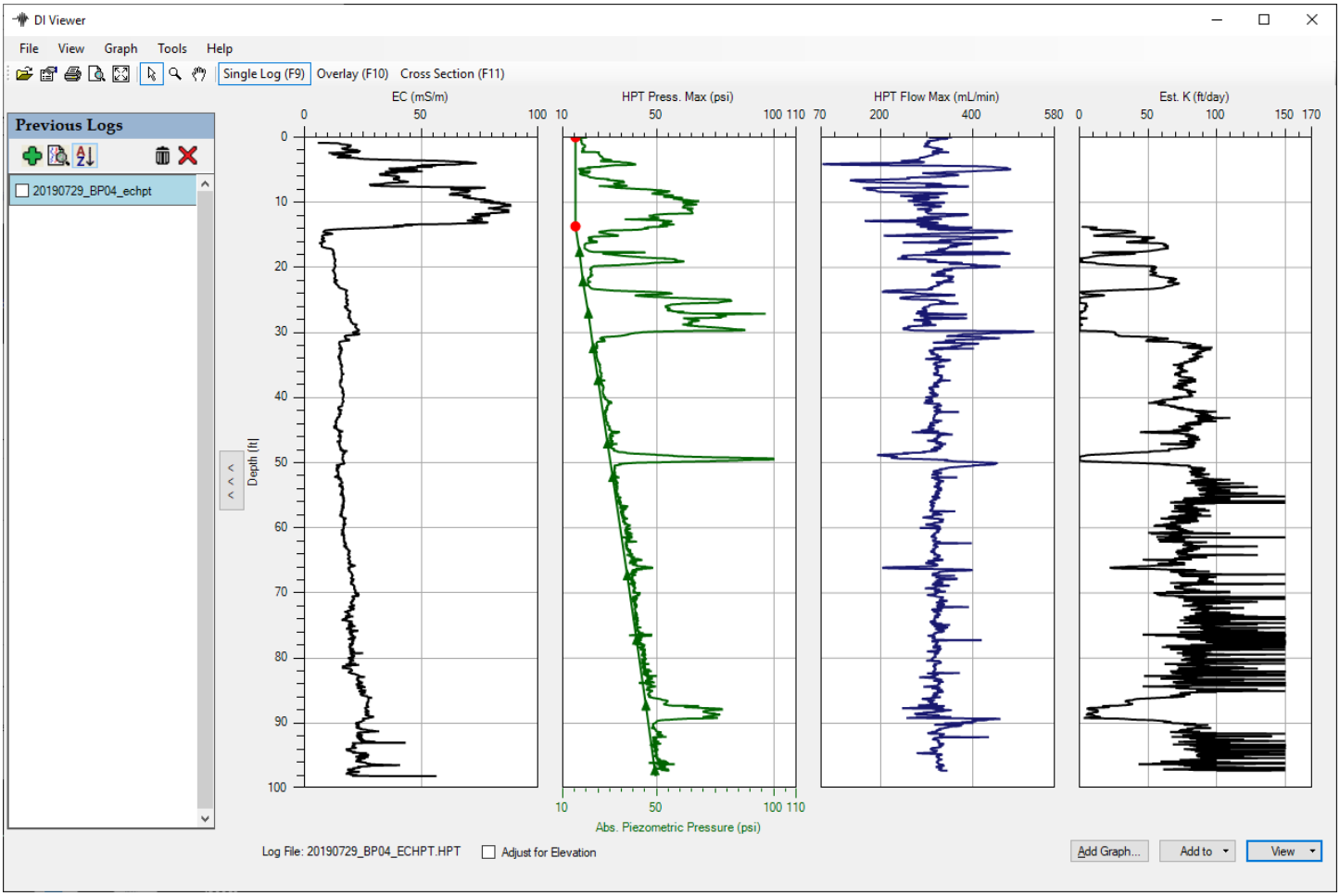




USGS Borehole BP-04a-EC (continued)

Figure 2. Graph of dissipation tests and EC-log showing the best 11 dissipation points and the associated calculated estimated hydraulic head. The water level was estimated to be 13.8 ft bls from the dissipation tests, which is a good estimate of the actual water level measured of 14.35 ft bls.





USGS Borehole BP-04a-EC (continued)

20190729_BP04_echpt.zip
SITE INFORMATION -- DIRECT IMAGE HPT PROBE
Geoprobe DI Acquisition Software for Windows
Version: 3.2 Build: 18113

Pre-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Test 1	195.0	205.8	5.6	PASS
Test 2	97.0	101.7	4.8	PASS
Test 3	24.0	25.2	5.1	PASS

COMPANY: Geoprobe
OPERATOR: rtollett
PROJECT ID: usgs_office
CLIENT: USGS
UNITS: ENGLISH
PROBE AND ARRAY: K6050 HPT Probe with Wenner
LOCATION: LA
100 INCH STRING POT USED
ROD LENGTH: 5 feet

PRE-LOG HPT REFERENCE TEST VALUES

PRE TEST TIME: Mon Jul 29 2019 14:22:10

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	16.010	0.0	110.380
TOP with FLOW>0	15.732	0.0	108.470
BOTTOM with FLOW=0	15.788	0.0	108.850
BOTTOM with FLOW>0	15.522	0.0	107.020

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa)

TRANSDUCER TEST PASSED

HPT IDEAL COEFFS: 2.2696e1,-2.2356
HPT SENSOR CAL NUMBERS: XD30959A,0.0000,0.0000,0.0000,0.0000,9.9490e-1,-1.3100
LOG START TIME: Mon Jul 29 2019 14:30:13

LOG END DEPTH: 97.30 ft (29.657 m)
LOG END TIME: Mon Jul 29 2019 15:32:07

LATITUDE: 33.281590000
LONGITUDE: -90.837190000
ELEVATION: 0.000 METERS 0.00 FEET
GPS Quality: Manual

USGS Borehole BP-04a-EC (continued)

POST-LOG HPT REFERENCE TEST VALUES
POST TEST TIME: Mon Jul 29 2019 16:04:01

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	15.603	0.0	107.580
TOP with FLOW>0	15.886	312.0	109.530
BOTTOM with FLOW=0	15.403	0.0	106.200
BOTTOM with FLOW>0	15.678	316.4	108.090

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%
ACTUAL FLOW=0 HPT DIFF.: 0.20 psi (1.4 kPa)

TRANSDUCER TEST PASSED

Post-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Test 1	195.0	213.6	9.5	PASS
Test 2	97.0	105.6	8.8	PASS
Test 3	24.0	26.4	10.0	PASS

********** USER NOTES **********

Pushed by rwt and wesley bolton on 7/29.2019.

Clay lens from 5 to 15 ft bls. Silty clayey from 15 ft bls to end of log. The silt was very fine grained and medium to dark gray in color (nasty stuff).

Rods pushed difficult from 82 ft bls to 90 ft bls. Note that the HPT pressure increased in certain lenses but the EC was fairly consistent.

Core intervals likely: 10-15; 25-30; 40-45; 60-65?

USGS Borehole BP-04a-EC (continued)

USGS Borehole BP-04a-EC (continued)

New Site Sheet Form - MAPS

File Tables Search Network Help

NEW SITE

- Site
- Datums
- Physical Characteristics
- Administrative
- Groundwater
- Other Data Available
- Miscellaneous Values
- Special Cases
- Spring

Site Record

Agency Code: USGS : U.S. Geologica | Site Number: 331654090501401 | Site Type Code: GW

Station Name: BP-04a-EC | Agency Use Code:

Coordinate/Altitude Data

Latitude: 331653.72 | Longitude: 0905013.88 | Coordinate Accuracy: H: Hndrth secor | Coordinate Method: G: GPS

Coordinate Datum: NAD83: NA Datum of 1983 | Latitude NAD83 in decimal degrees | Longitude NAD83 in decimal degrees

Altitude in ft: 110 | Altitude Datum Code: NAVD88: V Datum of 1988 | Altitude Method Code: N: DEM | Altitude Accuracy Value in ft

Surface Water Data

Drainage Area in sq mi | Basin Code

Contributing Drainage Area in sq mi

Hydrologic Unit Code: 080302071402: Fourmile Bayou-Bogue

Spatial Data

Land Net: S32 T17N R06W O | Topographic Code

Map Name: TRIBBETT, MS | Map Scale: 24000

Groundwater Data

Aquifer Code | National Aquifer Code | Aquifer Type Code | Well Depth in ft | Hole Depth in ft | Source of Depth

Administrative Data

Country Code: US: United Stat | State Fips Code: 28: Mississippi | County Fips Code: 151: Washingto | Minor Civil Division: 91422: District 2 | District Code: 28: MISSISSIPF | Time Zone Code: CST : Central Standar | Daylight Savings Time Flag: Y: Yes

Use Data

Primary Use of Site | Secondary Use of Site | Tertiary Use of Site Code | Primary Use of Water Code | Secondary Use of Water Code | Tertiary Use of Water Code | National Water Use Code

Data Collection and Dates

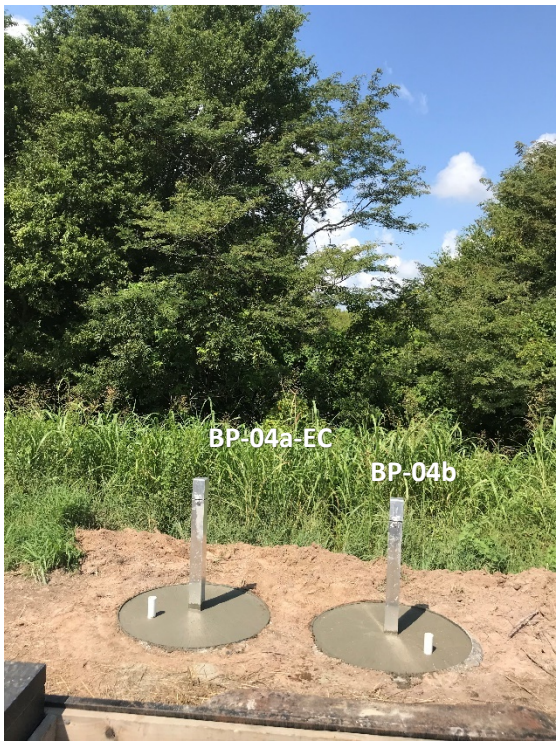
Data Reliability Code | Site Establishment Date | First Construction Date

Instruments | Data Types

Remarks | Project Number

Record Data

Created by: | Date: | Modified by: | Date: | Web Ready: C: Data Not Che



USGS Borehole BP-04a-EC (continued)