Annual Environmental Flows Achievement Report

Submitted by: Brazos River Authority

Submitted to: Texas Commission on Environmental Quality

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Reporting Period: November 1, 2020, through October 31, 2021

The Brazos River Authority System Operation Permit was approved by the Texas Commission on Environmental Quality (TCEQ) and was issued November 30, 2016. The conformed Water Management Plan (WMP) was subsequently approved on April 2, 2018. The Annual Environmental Flows Achievement Report is required in Support of the WMP.

This report summarizes environmental flow achievement for the reporting period from November 2020 through October 2021. If environmental flow conditions were not achieved, the report identifies if operations (i.e. water storage and/or diversion) under the System Operation Permit WMP caused the non-achievement, and if so, how further non-achievement will be prevented. Herein *WMP water use* refers to WMP water storage and/or diversion that is accounted against the System Operation Permit.

There was 15,622.8 ac-ft of WMP run-of-river diversion and 0.0 ac-ft of WMP lakeside diversions and storage for a total of 15,622.8 ac-ft of water use under the System Operation Permit Water Management Plan (WMP) during this period. Run-of-river water use reported in this annual report occurred during January, February, March, May, June, July, August, September and October 2021. Table 1 is a summary of all WMP measurement points and if WMP water use impacted achievement of HFP, baseflow or subsistence environmental flow conditions during the reporting period.

Table 1. WMP Measurement Point Summary.

Measurement Point	Did WMP Water Use Impact HFP Achievement?	Did WMP Water Use Impact Baseflow Achievement?	Did WMP Water Use Impact Subsistence Achievement?
USGS 08088000 Brazos River near South Bend	No	No	No
USGS 08089000 Brazos River near Palo Pinto	No	No	No
USGS 08089100 Brazos River near Glen Rose	No	No	No
USGS 08089500 Brazos River near Waco	No	No	No
USGS 08100500 Leon River near Gatesville	No	No	No
USGS 08104500 Little River near Little River	No	No	No
USGS 08106500 Little River near Cameron	No	No	No
USGS 08108700 Brazos River at SH21 near Bryan	No	No	No
USGS 08110500 Navasota River near Easterly	No	No	No
USGS 08111500 Brazos River near Hempstead	No	No	No
USGS 08114000 Brazos River near Richmond	No	No	No
USGS 08116650 Brazos River near Rosharon	No	No	No

Measurement Points' Hydrologic Condition, Baseflow, & Subsistence

Table 2 lists each measurement point's seasonal hydrologic condition, total number of days per season that baseflow conditions were not met, and the total number of days subsistence conditions were not met.

Table 2. WMP Measurement points' hydrologic conditions, baseflow and subsistence days not met.

Measurement Point	Season	Hydrologic Condition	Total Number of Days Baseflow not Met	Total Number of Days Subsistence not Met	Did water storage or diversion under the WMP occur in applicable reach on any days not meeting criteria?
USGS 08088000 Brazos River near South Bend	Winter	Average	57	0	No
	Spring	Average	15	0	No
	Summer	Average	0	0	No
USGS 08089000 Brazos River near Palo Pinto	Winter	Average	0	0	No
	Spring	Average	0	0	No
	Summer	Average	3	0	No
USGS 08089100 Brazos River near Glen Rose	Winter	Average	111	0	No
	Spring	Average	43	2	No
	Summer	Average	52	23	No
USGS 08089500 Brazos River near Waco	Winter	Average	94	0	No
	Spring	Average	61	0	No
	Summer	Average	55	0	No
USGS 08100500 Leon River near Gatesville	Winter	Average	53	0	No
	Spring	Average	20	0	No
	Summer	Average	0	0	No
USGS 08104500 Little River near Little River	Winter	Average	65	0	No
	Spring	Average	62	0	No
	Summer	Average	56	0	No
USGS 08106500 Little River near Cameron	Winter	Average	61	0	No
	Spring	Average	48	0	No
	Summer	Average	19	0	No
USGS 08108700 Brazos River at SH21 near Bryan	Winter	Average	74	0	No
	Spring	Average	62	0	No
	Summer	Average	37	0	No
USGS 08110500 Navasota River near Easterly	Winter	Average	15	0	No
	Spring	Average	0	0	No
	Summer	Average	0	0	No
USGS 08111500 Brazos River near Hempstead	Winter	Average	73	0	No
	Spring	Average	49	0	No
	Summer	Average	29	0	No
USGS 08114000 Brazos River near Richmond	Winter	Average	60	0	No
	Spring	Average	46	0	No
	Summer	Average	18	0	No
USGS 08116650 Brazos River near Rosharon	Winter	Average	71	0	No
	Spring	Average	50	0	No
	Summer	Average	0	0	No

Measurement Points' High Flow Pulses & WMP Water Use

Table 3 lists each WMP measurement point and information related to achievement of HFP environmental flow conditions. At some measurement points during select hydrologic conditions, no pulse is required ("no pulse req'd").

Table 3. WMP Measurement Points' HFP events and WMP water use.

Measurement Point	Season	Were SB3 HFP Standards met?	During HFP did WMP water use occur at a rate greater than diversion rate trigger levels?[1]	Did WMP water use occur during HFP after all HFP criteria were met?	Total WMP water storage or diversion within applicable reaches during season (acre-ft)
USGS 08088000 Brazos River near South Bend	Winter	No pulse req'd	No	No	0.0
	Spring	Yes	No	No	0.0
	Summer	Yes	No	No	0.0
USGS 08089000 Brazos River near Palo Pinto	Winter	No	No	No	0.0
	Spring	Yes	No	Yes	51.2
	Summer	No	No	No	387.1
USGS 08089100 Brazos River near Glen Rose	Winter	No	No	No	0.0
	Spring	Yes	No	Yes	7.2
	Summer	Yes	No	Yes	81.5
USGS 08089500 Brazos River near Waco	Winter	No	No	No	0.0
	Spring	Yes	No	Yes	660.9
	Summer	Yes	No	No	647.4
USGS 08100500 Leon River at Gatesville	Winter	No pulse req'd	No	No	0.0
	Spring	Yes	No	No	0.0
	Summer	Yes	No	No	0.0
USGS 08104500 Little River near Little River	Winter	No	No	No	0.0
	Spring	Yes	No	Yes	17.1
	Summer	Yes	No	Yes	30.3
USGS 08106500 Little River near Cameron	Winter	No	No	No	0.0
	Spring	Yes	No	No	0.0
	Summer	Yes	No	No	41.4
USGS 08108700 Brazos River at SH21 near Bryan	Winter	Yes	No	No	0.0
	Spring	Yes	No	No	142.7
	Summer	Yes	No	No	208.0
USGS 08110500 Navasota River near Easterly	Winter	Yes	No	No	35.4
	Spring	Yes	No	Yes	204.9
	Summer	No pulse req'd	No	No	523.0
USGS 08111500 Brazos River near Hempstead	Winter	Yes	No	No	0.0
	Spring	Yes	No	No	0.0
	Summer	Yes	No	No	0.0
USGS 08114000 Brazos River near Richmond	Winter	No	No	No	416.0
	Spring	Yes	No	Yes	7,639.3
	Summer	Yes	No	Yes	4,529.4

[1] Diversion rate trigger levels apply only to run-of-river diversions

Measurement Point	Season	Were SB3 HFP Standards met?	During HFP did WMP water use occur at a rate greater than diversion rate trigger levels?[1]	Did WMP water use occur during HFP after all HFP criteria were met?	Total WMP water storage or diversion within applicable reaches during season (acre-ft)
USGS 08116650 Brazos River near Rosharon	Winter	No	No	No	0.0
	Spring	Yes	No	No	0.0
	Summer	Yes	No	No	0.0

Brazos River near South Bend

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08088000 Brazos River near South Bend was used to determine if environmental flow conditions at the Brazos River near South Bend measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average. There was no WMP water storage or diversion during this period in any reaches associated with this applicable measurement point. No WMP water storage or diversion occurred at rates lower than diversion rate trigger levels during pulse events. WMP water use did not contribute to non-achievement of environmental flow conditions.

Brazos River near Palo Pinto

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08089000 Brazos River near Palo Pinto was used to determine if environmental flow conditions at the Brazos River near Palo Pinto measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average.

There was 438.3 ac-ft of run-of-river diversions made during this period in the Palo Pinto gage to Lake Granbury Headwaters reach associated with this applicable measurement point. There was no WMP lakeside diversion nor storage during this period in any reach associated with this applicable measurement point. WMP run-of-river diversions occurred at rates lower than diversion rate trigger levels during pulse events.

WMP water use did not contribute to non-achievement of environmental flow conditions.

Brazos River near Glen Rose

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08089100 Brazos River near Glen Rose was used to determine if environmental flow conditions at the Brazos River near Glen Rose measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average.

There was 88.7 ac-ft of run-of-river diversions made during this period in the Lake Granbury Dam to Lake Whitney headwaters reach associated with this applicable measurement point. There was no WMP lakeside diversion nor storage during this period in any reach associated with this applicable measurement point. WMP run-of-river diversions occurred at rates lower than diversion rate trigger levels during pulse events.

WMP water use did not contribute to non-achievement of environmental flow conditions.

Brazos River near Waco

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08089500 Brazos River near Waco was used to determine if environmental flow conditions at the Brazos River near Waco measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average.

There was 1,308.3 ac-ft of run-of-river diversions made during this period in the Lake Whitney Dam to Highbank gage reach associated with this applicable measurement point. There was no WMP lakeside diversion nor storage during this period in any reach associated with this applicable measurement point. WMP run-of-river diversions occurred at rates lower than diversion rate trigger levels during pulse events.

WMP water use did not contribute to non-achievement of environmental flow conditions.

Leon River at Gatesville

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08100500 Leon River at Gatesville was used to determine if environmental flow conditions at the Leon River at Gatesville measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average. There was no WMP water storage or diversion during this period in any reaches associated with this applicable measurement point. No WMP water storage or diversion occurred at rates lower than diversion rate trigger levels during pulse events. WMP water use did not contribute to non-achievement of environmental flow conditions.

Little River near Little River

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08104500 Little River near Little River was used to determine if environmental flow conditions at the Little River near Little River measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average.

There was 47.4 ac-ft of run-of-river diversions made during this period in the Leon River near Belton gage to Little River gage reach associated with this applicable measurement point. There was no WMP lakeside diversion nor storage during this period in any reach associated with this applicable measurement point. WMP run-of-river diversions occurred at rates lower than diversion rate trigger levels during pulse events.

WMP water use did not contribute to non-achievement of environmental flow conditions.

Little River near Cameron

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08106500 Little River near Cameron was used to determine if environmental flow conditions at the Little River near Cameron measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average.

There was 41.4 ac-ft of run-of-river diversions made during this period in the Little River gage to Little River/San Gabriel River Confluence reach associated with this applicable measurement point. There was no WMP lakeside diversion nor storage during this period in any reach associated with this applicable measurement point. No WMP water storage or diversion occurred at rates lower than diversion rate trigger levels during pulse events.

WMP water use did not contribute to non-achievement of environmental flow conditions.

Brazos River at SH121 near Bryan

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08108700 Brazos River at SH21 near Bryan was used to determine if environmental flow conditions at the Brazos River at SH121 near Bryan measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average.

There was 350.7 ac-ft of run-of-river diversions made during this period in the Brazos River/Little River Confluence to Brazos River/Yegua Creek Confluence reach associated with this applicable measurement point. There was no WMP lakeside diversion nor storage during this period in any reach associated with this applicable measurement point. WMP run-of-river diversions occurred at rates lower than diversion rate trigger levels during pulse events.

WMP water use did not contribute to non-achievement of environmental flow conditions.

Navasota River near Easterly

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08110500 Navasota River near Easterly was used to determine if environmental flow conditions at the Navasota near Easterly measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average.

There was 763.3 ac-ft of run-of-river diversions made during this period in the Easterly gage to Brazos River/Navasota River Confluence reach associated with this applicable measurement point. There was no WMP lakeside diversion nor storage during this period in any reach associated with this applicable measurement point. WMP run-of-river diversions occurred at rates lower than diversion rate trigger levels during pulse events.

WMP water use did not contribute to non-achievement of environmental flow conditions.

Brazos River near Hempstead

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08111500 Brazos River near Hempstead was used to determine if environmental flow conditions at the Brazos River near Hempstead measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average. There was no WMP water storage or diversion during this period in any reaches associated with this applicable measurement point. No WMP water storage or diversion occurred at rates lower than diversion rate trigger levels during pulse events. WMP water use did not contribute to non-achievement of environmental flow conditions.

Brazos River near Richmond

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08114000 Brazos River near Richmond was used to determine if environmental flow conditions at the Brazos River near Richmond measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average.

There was 12,584.7 ac-ft of run-of-river diversions made during this period in the Hempstead gage to Richmond gage reach associated with this applicable measurement point. There was no WMP lakeside diversion nor storage during this period in any reach associated with this applicable measurement point. WMP run-of-river diversions occurred at rates lower than diversion rate trigger levels during pulse events.

WMP water use did not contribute to non-achievement of environmental flow conditions.

Brazos River near Rosharon

For the reporting period November 2020 through October 2021, data reported at USGS Gage 08116650 Brazos River near Rosharon was used to determine if environmental flow conditions at the Brazos River near Rosharon measurement point were achieved (see Table 2 and Table 3). The hydrologic condition for all three seasons was average. There was no WMP water storage or diversion during this period in any reaches associated with this applicable measurement point. No WMP water storage or diversion occurred at rates lower than diversion rate trigger levels during pulse events. WMP water use did not contribute to non-achievement of environmental flow conditions.