DRAFT TECHNICAL PAPER
DEVELOPMENT OF PROJECTED FIRM DEMANDS FOR POWER PLANTS
MAY 2018

INTRODUCTION

For this revision to the LCRA Water Management Plan (WMP), future firm customer demands were updated to reflect the projected demand in 2025. This technical paper addresses the projected demands at power plants supplied with water by LCRA. The demands generally are based on recent actual water use and are weather-varied for most facilities.

GENERAL DEMAND METHODOLOGY

LCRA supplies water to the following customer power plant facilities: Bastrop Energy Center Power Plant, Decker Power Plant, Fayette Power Project (owned by LCRA and the City of Austin), Thomas C. Ferguson Power Plant, Lost Pines Power Park, and the South Texas Project (operated by STP Nuclear Operating Company).

The Lost Pines Power Park is supplied almost entirely with groundwater, and LCRA projects its demands through 2025 will continue to be met with groundwater. Thus, no demands for the Lost Pines Power Park are included in this WMP update.

The water use for the Decker Power Plant and the Fayette Power Project are simulated in the Water Management Plan model as a demand from the Colorado River. The demands from the Colorado River are used to offset both the natural evaporation from the cooling reservoirs and the forced evaporation that results from the generation of electricity at those facilities. The historic demands for these facilities vary greatly. For this WMP update, the demands for these facilities are weather-varied as presented below.

The Bastrop Energy Partners facility also diverts water from the Colorado River. This facility does not have a cooling reservoir. In recent years, the demand for water at Bastrop Energy Center Power Plant has been relatively constant at about 2,300 acre-feet per year.

The Ferguson Power Plant diverts water from Lake LBJ, with the lake serving as a cooling reservoir. For this lake and power plant, there is both natural and forced evaporation. The modeling of the WMP includes Lake LBJ as an impoundment, and the natural evaporation is weather-varied within the model based on historic evaporation rates. For this WMP update, the demands for forced evaporation are projected as a constant, equal to the recent high-water use at the facility.

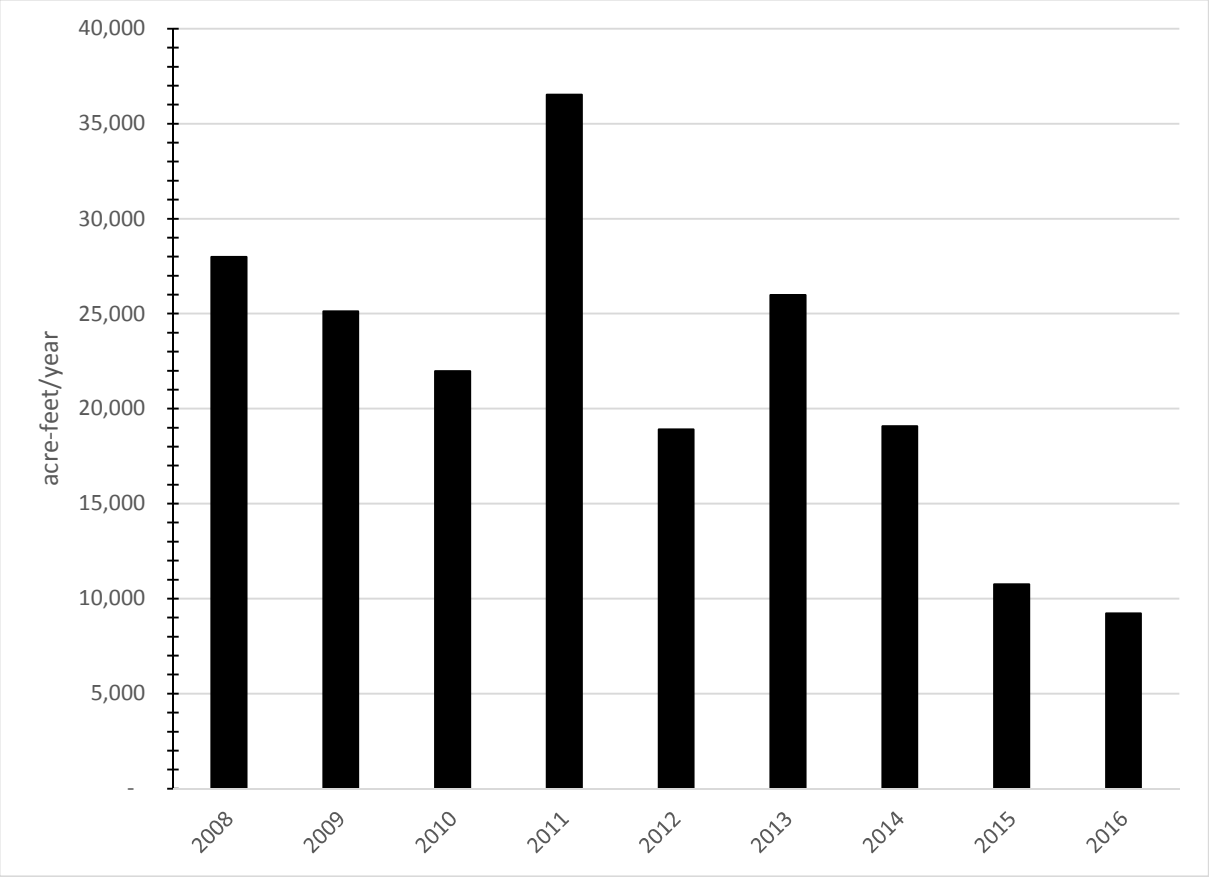
The South Texas Project diverts water from the Colorado River into an off-channel reservoir that serves as a cooling reservoir. For this reservoir and power plant, there is both natural and forced evaporation. The modeling of the WMP includes the cooling reservoir as an impoundment, and the natural evaporation is weather-varied within the model based on historic evaporation rates. Actual demands for the forced evaporation are

relatively constant and for this WMP update, the demands for forced evaporation are projected as a constant, equal to the customer's recent high-water use in 2011.

WEATHER-VARIED METHODOLOGY FOR THE DECKER POWER PLANT AND FAYETTE POWER PROJECT

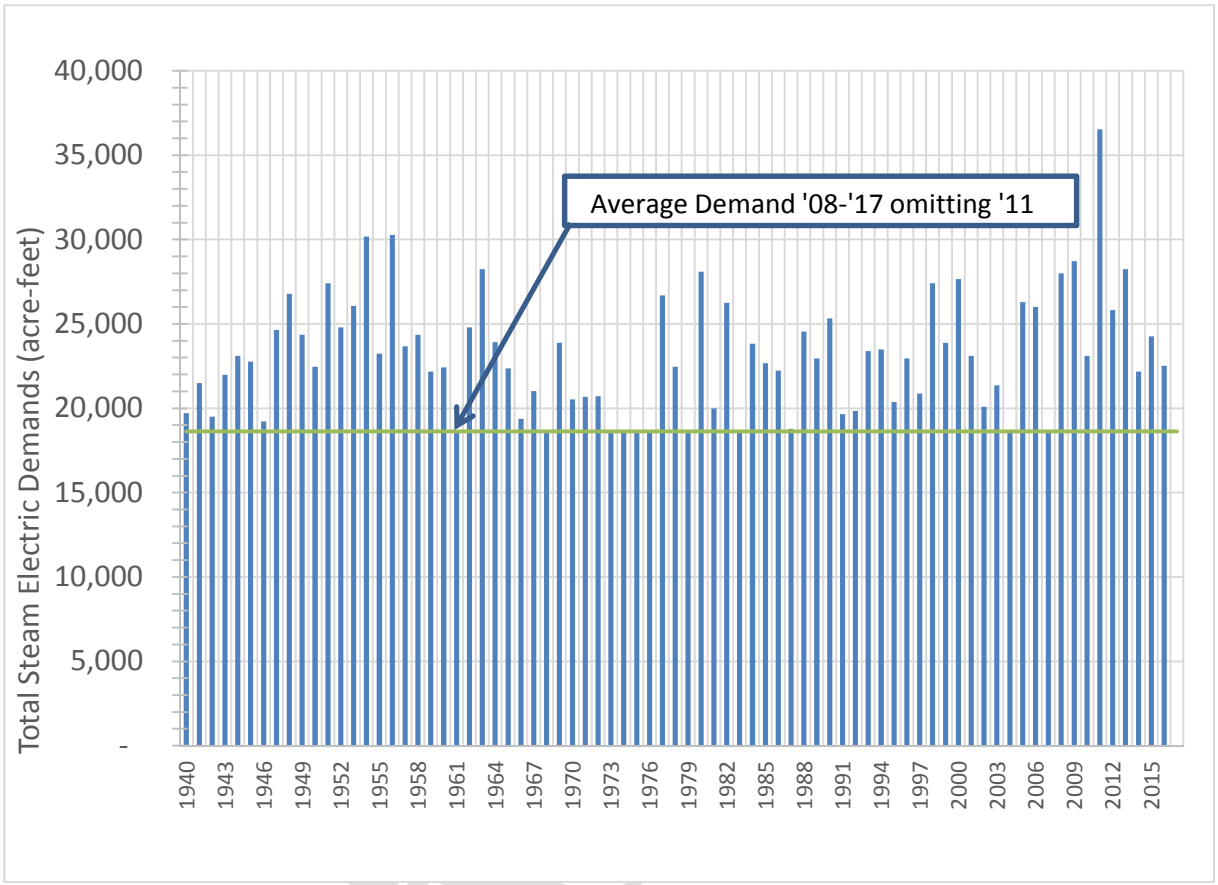
Diversions from the Colorado River for the Decker Power Plant and Fayette Power Project have varied significantly from year to year as shown in Figure 1.

Figure 1. Total Annual Diversions to the Decker Power Plant and Fayette Power Project



As stated above, the diversion demands for these facilities vary based on the natural evaporation from the cooling reservoirs and from forced evaporation, which is a function of the power demands. For this WMP update, LCRA staff developed a relationship between warm season temperature and demand that results in demands that equal or exceed the actual water use for each of the past 10 years, and has a minimum annual demand level approximately equal to the average demand over the past 10 years, omitting 2011. Figure 2 shows the actual diversions from the Colorado River to these facilities and the projected demands for this WMP update.

**Figure 2. Total Projected Demands for
the Decker Power Plant and Fayette Power Project**



SUMMARY OF PROJECTED DEMANDS FOR POWER PLANTS

As part of this WMP update, a weather-varied approach is used for most power plants supplied water by LCRA. For the Thomas C. Ferguson Power Plant and South Texas Project, the natural evaporation from the cooling reservoirs varies based on monthly evaporation data, while the forced evaporation is a constant demand each year. For the Decker Power Plant and Fayette Power Project, demands are weather-varied and reflect both the natural evaporation and forced evaporation. For the Bastrop Energy Partners facility, the demand will be modeled as a fixed amount each year.

Table 1 summarizes the projected annual demands for power plants for this WMP update.

Table 1. Power Plant Demand Summary

	Minimum	Average	Maximum
Decker Power Plant	4,200	5,300	8,300
FPP – Austin	5,300	6,600	10,300
FPP – LCRA	9,100	11,300	17,900
Ferguson Power Plant[1]	1,800	1,800	1,800
STPNOC[2]	39,400	39,400	39,400
Bastrop Energy Partners	2,300	2,300	2,300

1. Demand shown is for forced evaporation. Natural evaporation from Lake LBJ is simulated within the modeling.
2. Demand shown is for forced evaporation. Natural evaporation from the cooling reservoir is simulated within the modeling.