

2014 WATER-ENERGY GRANT PROGRAM GRANT APPLICATION

SACRAMENTO STATE TURF AND IRRIGATION REPLACEMENT

ATTACHMENT 6

PROPOSAL MONITORING

PROJECT MONITORING PLAN

The project monitoring plan focuses on water and energy savings created by the renovation of water and energy intensive turf-based landscaping sites throughout the Sacramento State campus.

Water

Because the turf sites to be replanted are scattered, and interspersed within a much larger campus irrigation system, it is not cost-effective to put a water meter at each site. For this reason, water and energy savings will be based on field sampling and scaling calculations. The basic equation is:

$$\text{Project water use} = \left(\text{irrigation rate, } \frac{\text{gal}}{\text{hr sqft}} \right) (\text{project area, sqft}) (\text{irrigation time, } \frac{\text{hr}}{\text{y}})$$

Pre-Planting: All of the project sites will be carefully mapped and their individual and cumulative areas calculated. A representative sampling of the sites will be chosen for sampling. The irrigation rate for each sampling site will be measured using collection buckets set on the turf. Based on irrigation controller settings and records, the number of irrigation hours per year will be calculated. These two values will be multiplied together to obtain the irrigation demand (gal/sq ft/yr) for that site. The average irrigation demand of the sampled sites will be multiplied by the total project area to obtain the total irrigation demand.

Post-Planting: The pre-planting sampling methodology will be repeated to determine the post-project water use. Rather than using collection buckets, measurements will be taken at individual emitters. After determining the average irrigation rate, the other calculations are the same.

Energy

Electrical energy use will be calculated by multiplying the water use by the energy intensity. Electrical meters installed as part of this project will give direct readings of pump energy use, which can be used to calculate actual energy intensity.

Fuel savings will be monitored by keeping inventory records and comparing fuel used by mowers before and after landscape conversion. Alternatively, the time needed to mow the project sites can be measured before conversion, and the fuel used can be calculated from the fuel use per hour for the equipment used.

Calculation of Savings

The water and electrical energy savings will be calculated by subtracting post-project use from pre-project use. Post-project measurements will be repeated annually for three years to allow for fine-tuning of the irrigation system and the establishment of the vegetation. The mower fuel savings will be calculated just once.