

**Date:** May 2, 2019

**From:** Dr. Mehdi Nemati, Assistant Professor and Water Resources Cooperative Extension Specialist

**To:** Robb Barnitt, CEO, Dropcountr

**Re:** Report for the Effect of Dropcountr (DC) on Water Consumption in the Denver Water Utility Service Area

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Dear Mr. Barnitt:

Please find a summary report related to the *Effect of Dropcountr (DC) on Water Consumption in the Denver Water Utility Service Area* enclosed. The initial results indicate that on average, Dropcountr enrolled households decreased consumption by 172.03 gallons per day. In terms of heterogeneity, households in the first quintile increased consumption by 30.05 gallons per day, the second quintile increased by 35.96 gallons per day, third increased by 11.07 gallons per day, fourth decreased by 10.75 gallons per day, and fifth decreased by 238.35 gallons per day.

Note that because of limitations on data availability, these results are not finalized and are subject to change when we have access to the full dataset.

Sincerely,



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**Summary Report: Analysis of DC Pilot Program for Denver Water**

We use the following specification to estimate Dropcountr effect by quintile in Denver:

$$\log(q_{hmy}) = \sum_{i=1}^{i=5} \alpha_i Q_i \text{Dropcountr} + \gamma_{hm} + \mu_{my} + \varepsilon_{hmy} \quad (1)$$

In equation 1,  $\log(q_{hmy})$  is average daily water consumption in household h, month m, and year y.  $Q_i$  is the quintile indicator.  $\gamma_{hm}$  is the household by month fixed effect, and  $\mu_{my}$  is the month by year fixed effect.

Table 1: The estimated impact of Dropcountr on average daily water consumption (gallons/day) in the Denver water utility service area

Dropcountr Effect in Quintile 1	0.314** (0.104)
Dropcountr Effect in Quintile 2	0.189*** (0.053)
Dropcountr Effect in Quintile 3	0.032 (0.034)
Dropcountr Effect in Quintile 4	-0.019 (0.055)
Dropcountr Effect in Quintile 5	-0.193** (0.090)
Household by Month Fixed Effects	Yes
Month by Year Fixed Effects	Yes
R <sup>2</sup>	0.865

Notes: Numbers in parentheses are standard errors which are clustered by household ID. 2015-2017 summer months (May, June, August, September) data are used to calculate these effects. Cut-offs for the quintiles are 4000, 7000, 13000, 21000 (gallons per month in the summer of a baseline period (2015-2016)).

- The aggregate treatment effect for the population of households participating in DC: -**7.52%**
- Aggregate treatment effect for the case if we assume everybody in the 3-region participates in DC: -**5.13%**