

Osborne, Ken (TREASURY)

From: Posthumus, Dick (GOV) <Posthumusd@michigan.gov>
Sent: Thursday, February 04, 2016 10:43 AM
To: Osborne, Ken (TREASURY)
Cc: Ackerman, Darin (GOV)
Subject: FW: Water Use Determination for Flint
Attachments: Household Water Use Distribution Rates docx; Water Relief Analysis (65R_20C Levers + No Late Fees).pdf

This is what we sent to the Democrats. Same as we sent to the Republican leaders.
Dick

From: Posthumus, Dick (GOV)
Sent: Wednesday, February 03, 2016 2:40 PM
To: senjananich@senate.michigan.gov; 'Rep. Sheldon Neeley (District 34)' <SheldonNeeley@house.mi.gov>; 'Philphelps@house.mi.gov' <Philphelps@house.mi.gov>
Cc: Baird, Richard (GOV) <bairdr@michigan.gov>; Ackerman, Darin (GOV) <ackerman3@michigan.gov>; Lange, Michelle (GOV) <LangeM3@michigan.gov>; Khouri, Nick (TREASURY) <KhouriN@michigan.gov>; Roberts, John (DTMB) <RobertsJ9@michigan.gov>
Subject: Water Use Determination for Flint

Senator and Representatives;

Attached are

- 1) The way in which we determined that 65% of the water usage (not including sewer) is cooking, drinking and bathing.
- 2) Applying that stat to the aggregate costs of water in Flint, how we came up with \$30M for credits

Dick

Household Water Use Distribution Rates

There appear to be a number of online resources (including online calculators) that indicate the distribution of water used for cooking, drinking, and bathing. A good example is the pie chart in this EPA document: <http://www3.epa.gov/watersense/pubs/indoor.html>. Flushing the toilet and washing clothes, alone, make up about 48% of the average indoor use. Add in leaks, and you're at 62%. Also, keep in mind that this is only indoor use, so any outdoor use would further dilute the percentage used in cooking, drinking, and bathing. So on this scale cooking, drinking, and bathing range from 38% to 52%. So reimbursing for 65% of total water used (not sewer costs) should cover almost anyone's cost for those items.

Another way to check this is using a fairly detailed calculator (<http://wecalc.org/calc/#>) to map consumption. Here are the stats that we entered, which are aimed at generating an atypically high ratio of refundable uses to other uses:

Single person

Relatively modern dishwasher, washing machine, toilet

1 toilet

7 showers/wk (avg is 4.7)

1 bath per week

4 flushes/day (avg is 5)

No aerators and old faucets

Energy star dishwasher used 0.7 times/week (that's the avg. per person, though a single person is likely to run the dishwasher at least once, and probably twice, per week—I'm assuming hand washing would use even more water)

2 loads of laundry/week (avg is 11 loads/month)

No apparent leaks

No outside water use

With all of that, the combined faucet*, shower, and bath percentage was 70% of household usage.

If we only change the shower and toilet figure to reflect average use, that percentage goes down to 65%.

If we plug in a 4-person household that uses the dishwasher, washing machine, toilet, and shower the average number of times, and I also allow for 2 baths per week, keeping all of the other parameters the same, the percentage goes down to 64%.

*It's important to note, however, that in all of these calculations we are using "faucet" as a proxy for cooking and drinking. The default faucet statistic allows for 8.1 minutes of use per person per day. That's much more water than would be used for those two purposes. If we change that one stat to allow for a total of 8 minutes of water use per day for drinking and cooking, the above percentage plummets to 50%. And if we don't count the water we waste while waiting for it to heat up (this is a toggle that is in addition to the 8 minutes noted above), the percentage drops to 48%. If we assume that the home doesn't have a washing machine at this point (and that laundry is done at a laundromat), the percentage use for faucet, shower, and bath is 64%.

That's a fair amount of detail, but the point is that even with all of the variables at play, we think that a 65% refund would cover the cost of water used for drinking, cooking, and bathing for most, and possibly all, Flint residents.