MEMORANDUM

July 21, 2021

The Honorable Michael S. Regan
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, D.C. 20460

Dear Administrator Regan,

This memo summarizes the results of our recently published research on the environmental and health impacts of excess emissions (emissions above the applicable SIP emission limitation threshold that occur during startup, shutdown, malfunction or other modes of operation (Environmental Protection Agency, 2015)). Our findings indicate that excess emissions have important environmental and premature mortality costs. On January 20th 2021, the White House asked the EPA to review the guidance memorandum on "*Inclusion of Provisions Governing Periods of Startup, Shutdown, and Malfunctions in State Implementation Plans*"[1] as part of its Executive Order: "*Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.*"[2] We submit this memo in light of the decision to review the October 2020 EPA guidance memorandum.

Our paper titled "*The health consequences of excess emissions: Evidence from Texas*" (Hollingsworth et al., 2021) is the first study to directly connect excess emissions with adverse changes in ambient air quality and mortality. Analyzing data from the Texas Commission on Environmental Quality (TCEQ) Air Emission Report Database[3] from 2002-2017 (Q1) as well as mortality micro-data from the Centers for Disease Control and Prevention Multiple Cause of Death (MCOD) files for 2002-2017, we show that excess emissions events of VOCs, CO and NO_x lead to increases in ambient ozone concentrations that increase elderly mortality in Texas. More specifically, we find that a 10% increase in monthly average ozone increases elderly mortality by 3.9%, driven by increased deaths in the oldest age groups. In addition, we find that in an average year, approximately 35 elderly deaths occur in Texas, exclusively attributable to VOC, CO and NO_x excess emissions.

[1] https://www.epa.gov/sites/production/files/2020-10/documents/placeholder_0.pdf

[2] https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/fact-sheet-list-of-agency-actions-for-review/

[3] http://www2.tceq.texas.gov/oce/eer/

In complementary published research, we show that excess emissions occur on a regular basis and can represent a substantial share of a facility's regular (i.e. routine) emissions. For the period 2004-2015, excess emissions of VOCs from industrial sources in Texas represented 7.5% of routine emissions. For individual pollutants, that share of excess vs. routine emissions can be substantially higher (eg. 13.4% for isobutane, 16.1% for butane, 16.3% for butene, and 19.7% for propylene (Zirogiannis et al., 2018)). There are, on average, 3,400 excess emissions events annually in Texas. While the majority of those events emit less then 1 ton of a pollutant, large events are quite frequent. Our work has shown that, on an annual average basis, Texas experiences one excess emissions event every day that releases over 10 tons of pollutants, three excess emissions events per month that release over 100 tons of pollutants and three events per year that release over 1,000 tons (Hollingsworth et al., 2021). In addition, we find that excess emissions tend to disproportionately burden communities with more Black Americans (Li et al., 2019).

We view our work as particularly important in light of EPA's October 2020 guidance memorandum to, once again, allow various enforcement exemptions of excess emissions events in State Implementation Plans. While our research does not address the abatement cost of avoiding/preventing excess emissions, we provide important evidence on the monetary cost of the health damages induced by excess emissions and on the health costs of ozone pollution more generally. Accounting for mortality displacement (i.e., the likelihood that premature elderly deaths due to excess emissions events might have occurred at a somewhat later time, even in the absence of excess emissions) and using an age-adjusted value of a statistical life (VSL), we estimate a range of health damages from excess emissions between \$13.6-\$23.8 million annually.

We are able to study the health impacts of VOCs, CO and NO_x because of the extensive network of state and federal air quality monitors that measure those pollutants. However, given the lack of monitoring of a series of air toxics it is likely that our mortality results represent a conservative estimate of the actual health damages induced by excess emissions.

The analysis in our research is limited to Texas because it is the only state in the country that has such extensive reporting and record keeping rules for excess emissions events. The Texas Commission on Environmental Quality requires that facilities experiencing excess emissions report them to the state within 24 hours. The information becomes immediately available on the TCEQ website. In addition, following a Public Information Request one can obtain detailed information about each excess emission event (including day and duration of occurrence, amounts of pollutants released, etc.).

During the course of our research we reached out to several other state environmental agencies requesting data on excess emissions (namely, California, Indiana, Louisiana, Min-

nesota, New Jersey, North Carolina, Ohio, Oklahoma, Pennsylvania and Wyoming). Oklahoma, Louisiana, and Wyoming have extensive record keeping rules for excess emissions, although not at the same temporal granularity as Texas. North Carolina has a a 24-hour reporting requirement for excess emissions events, but all official public files of the NC Department of Environmental Quality are paper-based and thus cannot be easily analyzed. Indiana and Pennsylvania, require that facilities report excess emissions in their quarterly compliance reports that are publicly available. However, compiling a list of excess emission events from all facilities in those two states would entail surveying tens of thousands of quarterly compliance reports. California, Minnesota, New Jersey and Ohio do not keep systematic records of excess emissions.

In light of our findings with regards to the magnitude, severity, and health damages of excess emissions, we believe that all states in the US should develop the type of detailed and publicly available record keeping and reporting system that the Texas Commission on Environmental Quality has in place. Better information about the incidence of excess emissions will enable the design of an effective regulatory framework. In addition, we believe the agency should consider the results of our work in it's review of the October 2020 guidance memorandum. The health damage estimates we discuss in this memo pertain only to the state of Texas. Given the lack of information on excess emissions events in other states, it is very likely that health damages of similar magnitude are experienced by people in states other than Texas. We believe the EPA should carefully consider its allowance of enforcement exemptions in SIPs given the lack of knowledge about the magnitude, severity, and health effects of excess emissions.

We remain at your disposal for any additional information regarding our work.

Sincerely,

Alex J. Hollingsworth, Associate Professor, Indiana University Bloomington
David M. Konisky, Professor, Indiana University Bloomington
Nikolaos Zirogiannis, Assistant Professor, Indiana University Bloomington

References

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