

September 14, 2018

MEMORANDUM

To: Western Regional Air Partnership Oil and Gas Workgroup (WRAP OGWG) Project Management Team
From: John Grant and Amnon Bar-Ilan; Ramboll
Subject: WRAP OGWG Survey Data Collection Synthesis

As part of technical improvements to the oil and gas emission inventory in the western US, a survey data collection effort will be used to collect information that has not previously been available for incorporation into the inventory, but is critical to emission inventory accuracy. Survey data collection will target the equipment types, production areas, and operators that can most efficiently enhance western oil and gas emission inventories. First, the survey will be distributed to state agencies so that in-house agency data can be leveraged prior to asking oil and gas operators to provide survey data. After state agencies fill-out the survey, it will be distributed to oil and gas operators to fill remaining data gaps.

Survey Content

The survey is focused on specific source categories and data fields for which updates could substantially enhance emission inventory accuracy. Survey data will be collected that can enhance both historical year and future year emission inventories, but the emphasis for several source categories will be to more accurately characterize fleet turnover and emission controls.

The survey will include the source categories below; Attachment 1 shows the source categories and data fields to be gathered as part of the survey.

- **Drill rigs:** Update rig configuration and emission rate estimates. *Ramboll is currently exploring alternate data sources for drill rig configurations; if an alternate data source is found, this category will be dropped.*
- **Hydraulic fracturing (fracing) engines:** Update fracing engine configuration and criteria pollutant emission rate estimates.
- **Condensate and oil tanks:** Enhance the accuracy of emissions by better characterizing inputs relevant to emission reductions expected from tank controls.
- **Wellhead engines:** Enhance accuracy of emissions by better characterizing fleet turnover and criteria pollutant emission rates. To the extent feasible, the survey will include default equipment configurations that can be updated if they are not accurate.

- **Gas composition:** Extended gas composition data are prioritized for collection in this survey effort because extended gas compositions (1) are a critical component to estimating volatile organic compound (VOC) emissions from vent and leak sources, (2) are a critical input to air quality models to accurately model emission chemistry, and (3) are substantially variable across fields and basins.
- **Point source data:** Certain air agencies collect location and/or stack specific emission inventory data for upstream oil and gas sources which may be included in current emission inventories as nonpoint sources. To enhance emission inventory accuracy, state agencies will be encouraged to submit upstream oil and gas emissions in point source format for incorporation into the WRAP oil and gas emission inventory.

For many survey data fields, default assumptions will be included in the survey which can be left as-is or updated by survey respondents.

Survey Distribution and Schedule

The survey will be distributed in early October 2018 to state agencies. State agencies will fill-out the survey based on information from their internal databases and return the survey to Ramboll within 4 to 6 weeks. Subsequently, surveys will be distributed to operators to fill remaining data gaps (completed surveys returned by operators within 4 to 6 weeks) and provide updates to the survey to the extent feasible.

Survey data collection will focus on the basins, plays, and well types that are expected to continue to be the focus of oil and gas development and production in the foreseeable future. The fraction of oil and gas activity (well count, production, and spuds) by state, basin, spud type, and well type will be used to prioritize data gathering. Oil and gas operators with the highest share of oil and gas production ownership will be the focus of survey collection. Initially the top 3-5 operators in each basin will be asked to provide survey responses.



Attachment A
Survey Content

Table A1. Survey Content

Source Category	Survey Data Fields
Upstream Exploration	
Drill Rigs ¹	representative engine configuration (number, hours per spud, horsepower), engine age distribution, fleet turnover frequency
Fracing Engines	representative engine configuration (number, hours per spud, horsepower), engine age distribution, fleet turnover frequency
Upstream Production	
Condensate Tanks	tank/separator configuration, VOC flashing emission rate, control type and prevalence, capture efficiency and basis, inspection type and frequency
Oil Tanks	VOC flashing emission rate, control type and prevalence, capture efficiency and basis, inspection type and frequency
Wellhead Engines	Number of engines per well by function (compressor, artificial lift, etc.), representative engine configuration (number, hours per spud, horsepower), fleet turnover frequency
Gas Composition	
Produced Gas	Extended gas composition by spud type and/or well type.
Flash Gas Composition	Extended gas composition by spud type and/or well type; sample method
Point Source Data	
Upstream Sources ²	Emissions in point source data format for source categories which are currently included in the emission inventory as nonpoint sources. ³

¹ This category may be dropped if rig information can be obtained from existing databases.

² Agencies, not operators would submit point source data.

³ Detailed information on the requested source types and data formats will be described in the survey.