Robert Sappington

The following comments address the Department of Ecology's proposed amendments to Chapter 173-441 WAC (Reporting of Emissions of Greenhouse Gases).

Comment 1

WAC 173-441-050(7)(e) states, "The owner or operator must retain documentation for three years to support any revision made to an annual GHG report." This three year period conflicts with the 10 year recordkeeping requirement of section six. Preservation of annual report revision documentation assists auditors in understanding why changes were made. I request changing the retention period for annual report revision documentation to ten years.

Comment 2

Humanity must resolve the climate crisis. Shifting climate dynamics and expanding scientific knowledge of both causation and impacts necessitate an adaptive approach to climate laws and regulation to manage risks appropriately. These changes in knowledge and environmental conditions combined with current operating practices have created significant unreported sources of GHGs in forest and agricultural lands.

The proposed regulations govern these sources. WAC 173-441-020(1)(g) defines "Facility" as "any physical property [or] source . . . that emits or may emit any greenhouse gas." "`Biomass' means nonfossilized and biodegradable organic material originating from plants, animals, or microorganisms, including products, by-products, residues and waste from agriculture, forestry, and related industries . . ." See WAC 173-441-020(1)(b). "`Greenhouse gas,' `greenhouse gases,' `GHG,' and `GHGs' includes carbon dioxide, methane, . . ." See WAC 173-441-020(1)(j). The annual emissions report must include biogenic emissions (WAC 173-441-050(3)(d) et seq.).

A search of Washington's GHG Reporting Multi-Year Dataset showed no reports from forest or agricultural lands. Aggregate federal and state reports appear to be the only source of information on forest and agricultural land. This data focuses on carbon sequestration—wildfires being the sole emissions source reported for forests. See Washington Department of Natural Resources, Summary of Natural and Working Lands Carbon Inventories and Incentive Programs, December 1, 2020. Agricultural soils produced 2.6% of Washington's three-year average emissions of ~98.5 million metric tons of CO_2e (or ~2.6 million metric tons of CO_2e). See Washington State Department of Ecology, Washington State Greenhouse Gas Emissions Inventory: 1990-2018, p. 24 Figure 9. Management practices coupled with climate change cause significant emissions from forests and farms. Fragmented ownership has no effect on the physical and chemical processes altering our planet. Nevertheless, the 10,000 metric ton applicability threshold exempts many land owners from the reporting requirements. Large-scale forest holdings of federal, state, and tribal governments, non-governmental organizations, and industrial timberland owners likely breach the threshold. Thus, this comment will focus on forest lands, but the magnitude of emissions from fertilizer, tillage, and animal waste (beyond feedlot) practices of larger farms should be monitored for reporting applicability.

Forests present a paradox in that they both store carbon and emit GHGs. Research has documented an ongoing shift in forests from carbon sinks to sources. Trees emit both methane and carbon dioxide. These emissions have historically been offset by carbon sequestration in tree growth; however, rising average temperatures and increasing climate volatility, producing both extreme weather events and regularly occurring temperature spikes, have caused trees to become periodic GHG emitters now. These emissions occur both seasonally and inter-annually within the five-year reporting window of WAC 173-441-030 (6). (See an early analysis of extreme heat event frequency in Philip, S. Y. et al, Rapid attribution analysis of the extraordinary heatwave on the Pacific Coast of the US and Canada June 2021, World Weather Attribution July 7, 2021 (https://www.worldweatherattribution.org/western-north-american-extreme-heat-virtually-impossible-without-human-caused-climate-change/).

Reporting forest GHG emissions is both a legal requirement and a necessary step in resolving the climate crisis. Forests currently sequester more carbon annually than they emit; however, Washington's GHG reporting requirements do not allow for netting sequestration against emission. See WAC 173-441-030(1)(b). Carbon offset standards do not consider GHG emissions from living forests when calculating sequestration volumes for offsets. Thus, reporting these emissions becomes necessary for understanding forest sequestration efficacy because these emissions represent an increasing sequestration impairment. Further, a forest's current net annual emissions may be positive for one or more years. Weather-induced respiration emissions alone or coupled with timberland operations-induced emissions, such as fertilization, prescribed burning, thinning, harvest residue (i.e. slash and stumps) decay, and soil-disturbing timber harvest, may produce net positive GHG emissions in a year. Finally, forests will become net annual emitters. Tracking the degradation of this ecosystem service prevents over reliance on reforestation and afforestation as climate solutions and overestimating the value of forest carbon offsets.

A substantial and growing body of research documents the forest carbon sink-to-source shift. For illustrative works, see:

a) Huntingford, C., Atkin, O.K., Martinez-de la Torre, A. et al. Implications of improved representations of plant respiration in a changing climate. Nat Commun 8, 1602 (2017) (https://doi.org/10.1038/s41467-017-01774-z) [revising forest carbon models with respiration analysis];

b) Daniel L. Warner et al, Carbon Dioxide and Methane Fluxes From Tree Stems, Coarse Woody Debris, and Soils in an Upland Temperate Forest, Ecosystems (2017) (http://dx.doi.org/10.1007/s10021-016-0106-8) [tree trunk emissions of GHGs];

c) Mary A. Heskel, Odhran S. O'Sullivan, Peter B. Reich et al., Convergence in the temperature response of leaf respiration across biomes and plant functional types, Proceedings of the National Academy of Sciences Apr 2016, 113 (14) 3832-3837, (http://www.pnas.org/cgi/doi/10.1073/pnas.1520282113) [assessing respiration changes with temperature];

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practices such as prescribed burns]; and
l) Marino BDV, Mincheva M, Doucett A. 2019. California air resources board forest carbon protocol invalidates offsets. PeerJ 7:e7606 (https://doi.org/10.7717/peerj.7606) [testing validity of carbon offset standards against field measurements].
For the foregoing reasons, I request the following changes to the regulations:
1. Add the NAICS codes for forest lands to Table 050-1 in WAC 173-441-050. These include: 111421 (Nursery and Tree Production), 115310 (Support Activities for Forestry), 113110 (Timber Tract Operations), 113310 (Logging), 924120 (Administration of Conservation Programs), 712190 (Nature Parks and Other Similar Institutions), and other codes as appropriate. The traditional industry measure of board feet is inadequate because board feet ignores carbon stores in non-merchantable biomass and soils. Metric tons of carbon or CO2e stored are better measures to assess ecosystem service volumes.
2. NAICS farm codes and metrics have been omitted for brevity, but should be added as well.
3. WAC 173-441-050(8) governing calibration and accuracy of meters focuses on point source measurements. Remote sensing and/or point source sampling and modeling offer a practical approach for measuring forest (and agricultural) land emissions. Add language to permit these measurement protocols for land emissions only.
I recommend that the Department of Ecology take the following actions beyond the proposed regulations:
1. Inform forest and farm owners of their reporting requirements because these owners have not historically reported.
2. Identify forests and agricultural land capable of triggering reporting under WAC 173-441-030(1)(a) by considering not only parcel size but also elevation, slope aspect, and other environmental factors that affect emissions such as moisture, stand age and structure, and species (or crop) composition.

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