

Robert Sappington

The following comments address the Department of Ecology's proposed amendments to Chapter 173-441 WAC (Reporting of Emissions of Greenhouse Gases). These comments constitute an addendum to comments submitted on November 1, adding NAICS agricultural codes. These codes were omitted for brevity from the first comments submitted; however, during the public hearing for WAC 173-441, Ecology staff indicated an interest in receiving specific input for table Table 050-1 in WAC 173-441-050. Thus, I have included specific codes, units of measure, a data source, and expanded the rationale for reporting agricultural emissions.

Statistics for Washington's major agricultural products may be found in the USDA's Census of Agriculture (the "Census"). See

https://www.nass.usda.gov/Statistics_by_State/Washington/index.php. The Census provided category indicators and units of measure for the NAICS codes.

The codes listed below represent the largest product categories; however, GHG emissions will vary significantly not only by product type and volume but also by management practices, such as tillage, irrigation, and fertilization. Two examples illustrate the variation. Example 1: Fertilizer type, amount, timing, and method of application affect nitrous oxide emission volumes. See, e.g., Venterea, R.T., et al. (2012), Challenges and opportunities for mitigating nitrous oxide emissions from fertilized cropping systems; *Frontiers in Ecology and the Environment*, 10: 562-570; <https://doi.org/10.1890/120062>. Example 2: Soil moisture (and by extrapolation, irrigation) affects soil CO₂ emissions from heterotrophic respiration. See, e.g., Moyano, F. E., et al., The moisture response of soil heterotrophic respiration: interaction with soil properties, *Biogeosciences*, 9, 1173–1182, <https://doi.org/10.5194/bg-9-1173-2012>, 2012.

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For the foregoing reasons, I request the following changes to the regulations:

1. Add the NAICS codes and measurement units for agricultural crops to Table 050-1 in WAC 173-441-050. These include (NAICS code, descriptive label, and units):

- a) 111140 Wheat Farming (Bushels)
- b) 111150 Corn Farming (Tons for silage, Bushels for grain, CWT for sweet corn)
- c) 111940 Hay Farming [including Alfalfa] (Dry Tons and Green Tons)
- d) 111331 Apple Orchards (Lbs)
- e) 111334 Berry (except Strawberry) Farming (Lbs or Tons depending upon product)
- f) 111332 Grape Vineyards (Tons)
- g) 111991 Sugar Beet Farming (Tons)
- h) 111211 Potato Farming (CWT)
- i) 111199 All Other Grain Farming (Lbs)
- j) 111219 Other Vegetable (except Potato) and Melon Farming (CWT)
- k) 111339 Other Non-Citrus Fruit Farming (Tons)
- l) 111130 Dry Pea and Bean Farming (CWT)
- m) 112111 Beef Cattle Ranching and Farming (Heads)
- n) 112120 Dairy Cattle and Milk Production (Lbs)
- o) 112210 Hog and Pig Farming (Heads)
- p) 1124XX Sheep and Goat Farming (Heads)

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