August 3, 2021

Submitted via electronic submittal

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: AB 32 Scoping Plan – Natural and Working Lands

The California Association of Winegrape Growers and Wine Institute are writing to provide input in the development of the natural and working lands chapter of the California Air Resources Board's (CARB) AB 32 Scoping Plan (Scoping Plan). The California Association of Winegrape Growers protects and promotes the interests of California winegrape growers by providing members a unified voice, effective advocacy and strong leadership. Wine Institute is a public policy advocacy group representing approximately 1,000 California wineries and affiliated organizations responsible for 85 percent of the nation's wine production. The California wine community has a long history of adapting to change and demonstrating its commitment to sound environmental practices and social responsibility. This history and engagement in sustainability programs has made California wine a leader in addressing climate change.

Wine Institute provided general comments on July 9, 2021, to provide input into the development of CARB's Scoping Plan. These comments are more specific to questions raised by staff during the July 20, 2021 natural and working lands technical workshop. Staff asked for input as they work to select a model to determine carbon emissions and sequestration potential from California's agricultural lands. California's wine industry has made significant investments in developing models to estimate detailed carbon emissions and sequestration potential from California vineyards. The model used by the California Sustainable Winegrowing Alliance is the DNDC (DeNitrification-DeComposition) model. The DNDC model is a process-based model that simulates carbon and nitrogen cycling among soil, air, and crops. Further, the model has not just been calibrated for winegrapes, but for over 40 other crops including rice, tomatoes, and almonds. Further information on the DNDC model and its use in California vineyards is attached. Given the calibration of the DNDC to California vineyards, we recommend CARB consider using the DNDC model for emission and sequestration estimates within the Scoping Plan.

Significant investments have been made by California wineries and vineyards to reduce carbon emissions and increase carbon sequestration. The vast majority of these investments have been done voluntarily. We recommend a continuation of a voluntary approach to implementing

practices to reduce carbon emissions and increase sequestration. Partnering with businesses through both the U.S. Department of Agriculture and California Department of Food and Agriculture programs to promote the adoption of climate smart practices is the best way to continue building support within California vineyards for practices to reduce climate impacts.

We appreciate the opportunity to provide comments as CARB works to develop its AB 32 Scoping Plan update. The most effective way to gain broad acceptance of climate smart practices is to build partnerships and allow for voluntary adoption of practices. We urge this approach as CARB works to meet California's goal of carbon neutrality. California's vineyards and wineries have already seen direct impacts due to the changing climate through wildfire losses and damaged vines through unseasonably cold and hot temperatures and are committed to building a resilient climate and will continue to do their part to ensure this occurs.

Sincerely,

Michael Miiller
Director of Government Affairs
California Association of Winegrape Growers

Noelle G. Cremers
Director, Environmental and Regulatory Affairs
Wine Institute

Enclosure

CC: Karen Ross, Secretary, California Department of Food and Agriculture
Jenny Lester-Moffitt, Undersecretary, California Department of Food and Agriculture

Benefiting the environment, the community and high quality grapes and wine

CALIFORNIA
SUSTAINABLE WINEGROWING
ALLIANCE

CSWA would like to thank the U.S. Department of Agriculture and the California Department of Food and Agriculture for the Specialty Crop Block Grant that helped make this project possible, in addition to the many project partners who also contributed their time and expertise.

Project Partners:

American Carbon Registry

Applied GeoSolutions

California Association of Winegrape Growers

Environmental Defense Fund

SureHarvest

University of California, Davis

USDA Agricultural Research Service

Wine Institute

DNDC Greenhouse Gas Modeling for California Vineyards

What Is DNDC?

DNDC (DeNitrification-DeComposition) is a computer model that simulates carbon and nitrogen cycling among soil, air, and crops. Because it is a process-based model, DNDC simulates the interactions among local climate, local soils, and on-site management practices to simulate crop growth and yield, and the emissions and consumption of gases within the soil environment. Gases include ammonia (NH_3) and the greenhouse gases (GHGs) carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4). Calculations by most GHG models do not account for vineyard-specific interactions, and instead rely on constant emission factors or simple empirical relationships. Thus, process-based GHG models are presumed to provide more realistic simulations because they simulate the mechanisms that drive emissions.

Why is DNDC Needed for the California Wine Industry?

For more than a decade, the California wine industry has promoted sustainable practices through the California Sustainable Winegrowing Program (SWP; www.sustainablewinegrowing.org) and regional activities. Most efforts to date have involved growers and vintners assessing their use of management practices that have been determined to be more sustainable by peers and experts. In spring 2012, the California Sustainable Winegrowing Alliance (CSWA) expanded the SWP to include performance metrics for energy, water, and nitrogen use, and GHG emissions. Calculating and linking metrics with practices helps practitioners "measure to manage," to reduce input costs and risks (environmental and production), and potentially benefit from market and regulatory incentives.

Although the wine industry has identified GHG metrics as important, minimal research has been conducted to quantify soil-related GHG

California Vineyard Climate Change Projects

Vineyard Management Practices and Carbon Footprints Grower Handout

A short summary of the key management practices that influence carbon sequestration and GHG emissions in the vineyard.

www.sustainablewinegrowing.org/docs/GHGhandout.pdf

California Vineyard Greenhouse Gas Emissions: Assessment of the Available Literature and Determination of Research Needs

A summary report of a literature review used to determine what was known about California vineyard GHG production and sequestration potential. The report also provides a strategic plan to prioritize research to advance understanding of the influence of vineyard management practices on GHG emissions.

www.sustainablewinegrowing.org/docs/GHGreport.pdf

DNDC simulates the interactions among local climate, local soils, and on-site management practices to simulate crop growth and yield, and the emissions and consumption of gases within the soil environment.

emissions and carbon sequestration in California vineyards. Because of this, and prior to application of DNDC modeling, calculations of GHG metrics for California vineyards used unrefined emission factors for soil processes or only considered emissions from energy use. Nevertheless, to increase grower awareness and begin influencing on-the-ground actions, key practices expected to mitigate soil-related GHG emissions and enhance carbon sequestration were highlighted in a grower handout. DNDC enables the California wine industry to more accurately and completely quantify vineyard GHG emissions and carbon sequestration.

How Has DNDC Been Modified for California Vineyards and Linked to the SWP Online System?

Modification of the DNDC model involved calibrating it to account for the growth, development, and fate of above- and below-ground plant tissues (vine and cover crop) based on interactions among climate, soils, and management practices. After calibration, the model was validated by comparing field-collected data to modeled results for soil temperature and moisture, vine growth, and GHG emissions.

The full California vineyard DNDC model is a powerful tool for quantifying the effects of management practices on GHG emissions. Its application, however, requires extensive knowledge and data inputs. To increase the usability by growers while retaining sufficient accuracy for educational purposes, a simplified version has been linked to the SWP online system. This version limits the data inputs for practices to those having the greatest impacts on soil-related emissions and carbon sequestration (row spacing, type of tillage, use and type of cover crop, amount of compost, and amount of nitrogen applied as fertilizer). Results help growers understand relationships between key practices and emissions, and how to improve. The full DNDC model also has the potential to be used to simulate results for other practices or circumstances requiring the highest level of accuracy (e.g., for saleable carbon offsets).

How Does DNDC Function Within the SWP Online Framework?

The Metrics Calculator within the SWP online system is used to provide inputs to the simplified DNDC model that subsequently

returns estimates of N_2O emissions, change in soil carbon content (CO_2 emissions minus carbon sequestered), and the total of soil-related GHG emissions for the year simulated. Inputs needed are selected within the Metrics Calculator (location, tillage practices, cover cropping, row spacing, fertilizer and compost amounts, etc.) and run through the simplified model. The model integrates the selected management practices with historical climate information via the nearest CIMIS station and soils data via the NRCS Soil Survey for its calculations. DNDC results are then combined with Metrics Calculator results for GHG emissions from fuel use and purchased electricity to provide cumulative GHG metrics (CO_2 equivalents per acre and per ton of yield).

SWP participants can access the Metrics Calculator User Guide from the SWP online system homepage for more details about how to use the Calculator and its DNDC application.

What Are Potential Future Uses of the DNDC Model for Winegrapes?

The DNDC model offers one of the most promising, cost-effective and accurate ways to estimate GHG emissions in agricultural ecosystems, which is why its use has increased over the past two decades. The model has been calibrated for over 40 crops, including corn, rice, wheat, grapes, tomato, pasture, and almonds in locations from India to Belgium to Costa Rica to the United States. Application of the model is supporting the development of offset protocols for cap-and-trade markets and voluntary supply chain initiatives.

California's cap-and-trade system provides some agricultural producers with the opportunity to generate additional revenue for practices that are not yet widely adopted and that reduce overall GHG emissions through a voluntary carbon market. Winegrape growers may be able to participate in this market by aggregating carbon offsets. Since the DNDC model has been calibrated and validated for California winegrapes, an important step in the development of carbon offset protocols for winegrapes has been achieved.

California Vineyard Climate Change Projects

Sustainable Winegrowing Performance Metrics Calculator

A user-friendly online tool for California growers and vintners to measure and track their use of energy, water, nitrogen and GHG emissions. Knowing and understanding the relationship between management practices and measured outcomes is important for benchmarking and managing performance to optimize business operations, decrease costs, and conserve natural resources.

https://metrics.sustainablewinegrowing.org/

Use the New DNDC Online Tool to Calculate Your Vineyard GHG Emissions

DNDC Tool Inputs:

- Vineyard location
- Row spacing
- Tillage practices
- Use and type of cover crop
- Amount of compost
- Amount of nitrogen applied as fertilizer

https://metrics.sustainablewinegrowing.org/

DNDC stands for DeNitrification and DeComposition, two processes dominating losses of N and C from soil and GHG emissions into the atmosphere.

CALIFORNIA
SUSTAINABLE WINEGROWING
ALLIANCE

425 Market Street, Suite 1000
San Francisco, CA 94105
415-512-0151
www.sustainablewinegrowing.org
info@sustainablewinegrowing.org

CALIFORNIA
ASSOCIATION
of WINEGRAPE
GROWERS

1325 J Street, Suite 1560
Sacramento, CA 95814
800.241.1800
www.cawg.org • info@cawg.org

WINE
INSTITUTE

425 Market Street, Suite 1000
San Francisco, CA 94105
415.512.0151
www.wineinstitute.org
communications@wineinstitute.org

Additionally, retailers, food producers, and agricultural trade groups are developing and implementing GHG measurement and reduction initiatives for the food and beverage supply chain. Initiatives include The Sustainability Consortium and the Stewardship Index for Specialty Crops. A key goal is to encourage growers, processors, and other businesses within the supply chain to measure the impacts of their practices on GHG emissions and natural resources.

Use of the SWP online Metrics Calculator and its integration with the DNDC model can help California winegrape growers participate in supply chain initiatives and – in the future – potentially benefit from cap-and-trade markets by calculating and tracking GHG emissions.

About the California Sustainable Winegrowing Alliance

The California Sustainable Winegrowing Alliance (CSWA) is a San Francisco-based 501(c)3 non-profit organization created in 2003 by Wine Institute and the California Association of Winegrape Growers to promote the adoption of sustainable winegrowing practices and enlist industry commitment through the implementation of the Sustainable Winegrowing Program (SWP). In addition to this DNDC handout, CSWA has a number of additional resources available on its website. To view CSWA educational videos, including videos on Performance Metrics and DNDC, visit http://www.sustainablewinegrowing.org/CSWA-video.php. For more information and a calendar of upcoming CSWA workshops, visit www.sustainablewinegrowing.org/workshopcalendar.php.

CSWA promotes sustainability through continuous improvement with the implementation of best practices, but also recognizes that not all practices are relevant or appropriate for every operation. CSWA strives to provide information and resources to help growers and vintners make the most sustainable decisions for their individual operations.