



August 17, 2023

Dr. Cheryl Laskowski  
Chief, Low Carbon Fuel Standard  
California Air Resources Board  
1001 I Street, Sacramento, CA 95814  
Submitted electronically via [helpline@arb.ca.gov](mailto:helpline@arb.ca.gov)

**RE: 2022 Annual Crude Average Carbon Intensity Calculation Draft**

Dear Dr. Laskowski,

Thank you to the California Air Resources Board (CARB) for soliciting stakeholder input on the 2022 Annual Crude Average Carbon Intensity Calculation Draft.

Pacific Environment is a 501(c)(3) public-benefit corporation, headquartered in San Francisco, with regional offices in Anchorage, Alaska, and Chongqing, China. Pacific Environment has earned rare permanent consultative status at the International Maritime Organization (IMO), the United Nations' entity that sets international shipping law. At the IMO, Pacific Environment has played a lead role in advocating for a new international regulatory regime (called the "Polar Code") to regulate ship traffic, pollutant emissions, and waste dumping in Arctic waters.

**Methodology Error : Need to Include Land Use Impact of using ANS Crude**

California is a large importer of Alaska North Slope (ANS) oil, which is getting dirtier and dirtier. The ramp up of ANS viscous/heavy oil production is well underway, now at more than 91,000 barrels/day. Because heavy oil is more carbon intensive than conventional oil, the overall ANS blended stream is becoming more carbon intensive. Just as the LCFS attempts to account for land use impacts of biofuels and for other impacts on the carbon intensity of imported crude oil streams, it should also account for the land use impacts of using ANS crude. The current methodology is flawed by not treating land use effects similarly for all sources. **Land Use Change (LUC) factor should be modified to apply to ANS crude and its impacts.**

Petroleum operations on the North Slope contribute to and exacerbate climate, ecological and social impacts in the region including loss of sea ice, release of methane and tundra subsidence due to thawing permafrost, destruction of vital habitats for migratory birds, waterfowl, caribou, polar bears and other wildlife, reduction of air quality due to methane leakages from industry operations, black carbon emissions, and loss of subsistence opportunities for residents.

Thawing permafrost is one such significant land use change resulting from petroleum development. The Alaska North Slope is overlain by continuous permafrost covering more than 90% of the landscape. The thawing of permafrost, caused by the warming climate, has the ancillary effect of releasing methane previously trapped in frozen soil for thousands of years into the atmosphere. Although quantifying the volume of carbon releases from permafrost thaw is uncertain due to gaps in monitoring and modeling, permafrost thaw is dramatically changing the atmosphere and land upon which people live. Methane is a potent GHG with a near-term warming potential 86 times greater than carbon dioxide <sup>1</sup>.

The ANS heavy oil accumulation is a huge resource (20-30 billion barrels original oil in place), a portion of which has recently become commercial to produce due to advances in Enhanced Oil Recovery (EOR) using polymer flooding technology. Polymer flooding technology was field tested and validated at the Milne Point Unit in a U.S. Department of Energy-funded, four-year study that concluded in 2022, which dramatically improved the outlook for production of ANS heavy oil. The study was conducted by the petroleum engineering department of the University of Alaska - Fairbanks, with technical support from Hilcorp.<sup>2</sup>

All other things being equal, more viscous oil, including heavy oil, requires more energy per barrel to produce and move to markets. The combination of rapidly aging fields (Prudhoe, Kuparuk, Alpine), new fields in the West, e.g., Willow and Pika, and viscous/heavy oil (Milne Point, Schrader Bluff, Ugnu, et al) will continue to drive the carbon intensity of ANS oil upward from its already high levels. See attached chart.

**Reliance on carbon intensive ANS heavy oil means more air pollution and adverse health impacts for California communities and residents living near refineries.**

To further discourage the import of carbon-intensive heavy oils, such as ANS, Canadian tar sands and Amazonian Ecuador oils, into California refineries, CARB should consider adopting rules for California refineries that parallel the U.S. Environmental Protection Agency's proposed new carbon pollution standards for coal and natural gas-fired power plants to reduce GHG emissions.

Thank you for your consideration of these comments. We would welcome the opportunity to discuss them with respective staff, and we look forward to continued participation and discussion to further strengthen the LCFS.

Sincerely,

*Kay Brown*  
Kay Brown  
Arctic Policy Director  
Pacific Environment

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<sup>1</sup> Shideler J and Hetzel J. (2021, November 18). Introduction to Climate Change Management. *Springer Climate*. [https://link.springer.com/chapter/10.1007/978-3-030-87918-1\\_1](https://link.springer.com/chapter/10.1007/978-3-030-87918-1_1)

<sup>2</sup> <https://www.netl.doe.gov/projects/project-information.aspx?k=FE0031606>; <https://www.osti.gov/biblio/1916626/>

CC: Steve Cliff  
Members of the Board

California Air Resources Board: Carbon Intensity of Refinery  
Crude Oil Supply (2021)

