

PAME II-2019 –Agenda Item 6.2(a)

Arctic Marine Shipping Assessment (AMSA) Recommendation I(B)

Heavy Fuel Oil (HFO) Project Phase IV(b)

U.S. Response to

Collect, Report and/or Review Information about On-Shore use by Indigenous Peoples and Local Communities or their Reliance on HFO

Background

AMSA Report Recommendation I(B) provides in relevant part:

“That the Arctic States, in recognition of the unique environmental and navigational conditions in the Arctic, decide to cooperatively support efforts at the International Maritime Organization to strengthen, harmonize and regularly update international standards for vessels operating in the Arctic.”¹

Under this Recommendation, PAME II-2017 decided to include in its 2017-2019 Work Plan four projects in connection with mitigating risks associated with the use and carriage of HFO by vessels in the Arctic.² Senior Arctic Officials (SAOs) subsequently approved PAME’s 2017-2019 Work Plan, which includes the following project description:

“A project in partnership with the Sustainable Development Working Group to collect, report and/or review information about on-shore use by indigenous peoples and local communities of HFO as well as the extent to which such peoples and communities rely on ships that burn HFO to deliver supplies and provisions.”³

This paper is one of the responses of the United States to these invitations.

¹ Arctic Council, *Arctic Marine Shipping Assessment 2009 Report*, at 6 (2009) https://www.pame.is/images/03_Projects/AMSA/AMSA_2009_report/AMSA_2009_Report_2nd_print.pdf; Arctic Council, *The Arctic Ocean Review Final Report* (May 2013)s, <https://oaarchive.arctic-council.org/bitstream/handle/11374/67/AOR%20Final%20report%202013.pdf?sequence=1&isAllowed=y> (noting that PAME is conducting a study on the environmental risks associated with the use and carriage of HFO by vessels in the Arctic and “will identify options and make recommendations – including the possible adoption of new international regulations – to mitigate those risks”).

² Arctic Council, Protection of the Arctic Marine Environment’s (PAME) Work Plan 2017-2019, at 1-2, EDOCS #4141 (Feb. 10, 2017), https://oaarchive.arctic-council.org/bitstream/handle/11374/2006/EDOCS-4141-v1A-ACSAOUS204_JUNEAU_2017_3-2-4_PAME_Work_Plan_2017-19.PDF?sequence=1&isAllowed=y.

³ *Id.* at 2.

Discussion

In support of the ROD, the U.S. conducted a literature review to gather information about the use of Heavy Fuel Oil (HFO) by the shipping industry and Arctic communities, resulting in the annotated bibliography attached as Appendix A.⁴

As sea ice diminishes, the Arctic sea routes have seen an increase in shipping volume.⁵ Two years ago, a Russian-owned tanker became the first ship to traverse the Northern Sea Route without the aid of an icebreaking ship.⁶ Many ships in the Arctic use HFO, also known as Bunker C Fuel oil, no.6 Fuel Oil, or Residual Fuel Oil. As the volume of shipping traffic in the Arctic continues to grow, the potential release of oil by ships in the Arctic, whether accidental or illegal, has been reported by the Arctic Council as a significant threat to the Arctic marine environment from shipping activity.⁷ As governments consider how best to phase out the use of HFO on ships in the Arctic, it is important to assess the potential social and economic impacts on indigenous and local Arctic communities, many of which are in remote locations and rely on episodic deliveries by ships.

This bibliography is broken into two sections: Heavy Fuel Oil Use in Arctic Shipping and Heavy Fuel Oil Use in Arctic Communities. It is intended to be an initial overview of sources on these topics and may be expanded or supplemented with further appendices, as needed.

Section I - Heavy Fuel Oil Use in Arctic Shipping

Section I provides an overview of current and projected shipping traffic in the Arctic as well as sources describing the types of fuel currently used, to the extent such information was able to be located. Due to inexact terminology used between sources, the section also provides an overview of current standards and specifications to help guide the reader. In preparing this Section, the United States found a number of sources on the topic of air pollution in the Arctic that lend valuable information to the subject of fuel use. Resources on air pollution were included if they were determined to have value to the topic of fuel use generally, but should not be considered comprehensive in the area of air pollution. In order to provide greater granularity, the sources related to marine activity in the Arctic are divided into current and projected activity, with much of the projected activity containing current and past data. Finally, while this bibliography does not cite specific datasets, it does provide references to datasets in annotations.

⁴ The bibliography itself has not been peer reviewed, but it summarizes a collection of peer-reviewed papers, grey reporting, government records, and media coverage.

⁵ Amir A. Aliabadi et al., *Ship emissions measurement in the Arctic by plume intercepts of the Canadian Coast Guard icebreaker Amundsen from the Polar 6 aircraft platform*, 16 *ATMOSPHERIC CHEMISTRY & PHYSICS*, 7899 (2016).

⁶ Russell Goldman, *Russian Tanker Completes Arctic Passage Without Aid of Icebreakers*, *N.Y. TIMES* (Aug. 25, 2017), <https://www.nytimes.com/2017/08/25/world/europe/russia-tanker-christophe-de-margerie.html>

⁷ See Arctic Council, *Arctic Marine Shipping Assessment 2009 Report*, *supra* note 1, at 152; See also Arctic Council, *HFO Project Phase III(a) Heavy Fuel Oil & Other Fuel Releases from Shipping in the Arctic and Near-Arctic* (2016), https://pame.is/images/03_Projects/AMSA/Heavy_Fuel_in_the_Arctic/HFO_project_-_Phase_3_Final_report.pdf.

Section II - Heavy Fuel Oil Use in Arctic Communities

Section II provides an overview of the importance of HFO and other fuels to onshore Arctic communities. This section aims to provide the reader with a general understanding of Arctic heating and energy needs in order to begin assessing how a ban on HFO use in the Arctic would impact Arctic communities.⁸

Use of HFO for energy generation:

Arctic States consume various types of fuel oil for transportation and residential purposes, including HFO. Fuel oils are categorized from Grade No. 1 thru Grade No. 6 with No. 1 being the lightest and No. 6 (known as Heavy Fuel Oil or HFO) being the heaviest. Grades No. 4 and No. 5 are mixtures that include No. 6 HFOs.⁹

Most academic sources discuss the use of HFO and other fuel oil for shipping with respect to general emissions estimates and do not specifically discuss the impacts of vessel operations on Arctic communities. Discussions of oil used for heating and energy generation tend to fall within publications regarding the development of energy sources, changes to energy generation, and renewable energies.¹⁰ Literature that discusses both fuel oil as a source of energy and fuel oil (HFO) use in the shipping industry is limited.¹¹

Informal surveys conducted by the U.S. Environmental Protection Agency and U.S. Department of the Interior suggest that HFO is not used in Alaskan Arctic communities as a source of heat or energy. This conclusion is supported by the data from the U.S. Energy Information Administration.¹² The broad understanding is that communities within the pan-Arctic area do not generally use HFO for heat or energy production. Canadian Arctic communities run almost exclusively on diesel for heat and electricity, and Russian Arctic communities use liquefied natural gas for heating and coal for power generation.¹³

A general trend emerging from this literature and information review, specifically with respect to energy generation and grid development, is that many Arctic States are looking to

⁸ United States Arctic Research Commission, Arctic Renewable Energy Working Group, *Residential Heating in Remote Arctic Villages: Research Needs* (Jan. 20, 2016), https://storage.googleapis.com/arcticgov-static/arewg/publications/heat_wksp_report.pdf.

⁹ Brad Kelechava, *ASTM Fuel Oils Standard Specification*, AMERICAN NATIONAL STANDARDS INSTITUTE (Feb. 23, 2018), <https://blog.ansi.org/2018/02/astm-fuel-oils-standard-specification>.

¹⁰ SENATE OF CANADA, STANDING SENATE COMMITTEE ON ENERGY, THE ENVIRONMENT AND NATURAL RESOURCES, *POWERING CANADA'S TERRITORIES* (2015), <https://sencanada.ca/content/sen/committee/412/enev/rep/rep14jun15-e.pdf>.

¹¹ See Emily Russell, *Organizations call for ban of heavy fuel oil in Arctic waters*, ALASKA PUBLIC MEDIA (Feb. 12, 2016), <https://www.alaskapublic.org/2016/02/12/oragnizations-call-for-ban-of-heavy-fuel-oil-in-arctic-waters>.

¹² U.S. Energy Information Administration, *Alaska Residual Fuel Oil Sales/Deliveries to Electric Utility Consumers*, PETROLEUM & OTHER LIQUIDS (Jan. 25, 2019), <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=KPRVEUSAK1&f=A>.

¹³ Victoria Hermann, *The Geographies of Energy Poverty: Where North and South Intersect*, ARCTIC INSTITUTE (Mar. 1, 2017), <https://www.thearcticinstitute.org/geographies-energy-poverty-north-south-intersect>.

increase alternative and sustainable energy sources in remote areas and move away from traditional sources of energy, including HFO.¹⁴

Use of HFO for resupply and industry support:

Communities in the U.S. Arctic generally do not rely on HFO-fueled vessels for resupply, with the exception of fuel tankers that serve as offshore lightering locations for fuel barge operations.¹⁵ Over the past five years, fuel suppliers changed their supply chain operations to spot charter fuel tanker vessels as a less expensive means to resupply fuel, rather than using multiple smaller tankers to offload and transship from barges.

Commercially, the Red Dog Mine in Alaska, one of the largest zinc mines in the world, is the major industrial user of HFO fueled vessels. The mineral resources and land are owned by NANA Regional Corporation Inc., an Alaska Native Corporation established through the Alaska Native Claims Settlement Act of 1971 (ANCSA).¹⁶ Teck Alaska operates the mine. Alaska Natives benefit from the mine in four primary ways: 1) hiring preference for NANA shareholders (54 percent of employees that work at the mine are shareholders);¹⁷ 2) dividends to NANA shareholders when performance is strong; 3) payment in lieu of taxes and contributions to a village improvement fund;¹⁸ and 4) 70 percent of NANA's royalties are shared by the original twelve Alaska Native regional corporations.¹⁹ NANA and Teck Alaska contract with FedNav to provide spot charter vessels on an as-needed, availability basis during the approximately 100-day open shipping season for the mine. Most of these vessels use or carry HFO as fuel during normal operations and would, by extension, be using or carrying HFO when chartered for Red Dog Mine operations.

¹⁴ See Suzanna Caldwell, *New 'super-insulated' homes rising across Alaska's North Slope*, ANCHORAGE DAILY NEWS, Sep. 28, 2016, <https://www.adn.com/arctic/article/after-years-designs-first-super-insulated-homes-built-alaskas-north-slope/2015/01/04>; See also *New alliance to bring renewable energy to remote communities in Canada's Arctic, WWF-Canada announces*, WORLD WILDLIFE FUND (Mar. 31, 2016), <http://www.wwf.ca/newsroom/?20583/New-alliance-to-bring-renewable-energy-to-remote-communities-in-Canadas-Arctic-WWF-Canada-announces>; Daniel Chade et al, *Feasibility study of wind-to-hydrogen system for Arctic remote locations – Grimsey island case study*, 76 RENEWABLE ENERGY 204 (2015), <https://www.sciencedirect.com/science/article/pii/S0960148114007381>; Anatole Boute, *Off-grid renewable energy in remote Arctic areas: An analysis of the Russian Far East*, 59 RENEWABLE & SUSTAINABLE ENERGY REVIEWS 1029 (2016), <https://www.sciencedirect.com/science/article/pii/S1364032116000642>; *District heating on the Faroe Islands?* NORDIC ENERGY RESEARCH (Nov. 8, 2016), <https://www.nordicenergy.org/article/district-heating-on-the-faroe-islands>; Dave Lovekin & Barend Dronkers, *The True Cost of Fuel in the Arctic*, Pembina Institute (Sept. 29, 2016), http://assets.wwf.ca/downloads/pembina_final_report.pdf.

¹⁵ *Types and routes of ships using HFO as fuel* (United States submission to PAME II-2017 Working Group Meeting, Sep. 17, 2017).

¹⁶ *About Us*, NANA (July 3, 2019), <https://nana.com/about-us>.

¹⁷ *Regional Benefits*, NANA (Apr. 11, 2019, 22:19:07 GMT), <http://webcache.googleusercontent.com/search?q=cache:h-eVYH21U0J:nana.com/regional/resources/red-dog-mine/shareholder-employment/education-and-training/+&cd=4&hl=en&ct=clnk&gl=us>.

¹⁸ Gabe Colombo, *Northwest Arctic Borough Village Improvement Fund projects being determined*, ALASKA PUBLIC MEDIA, Apr. 27, 2018, <https://www.alaskapublic.org/2018/04/27/northwest-arctic-borough-village-improvement-fund-projects-being-determined>.

¹⁹ *Alaska Native Claims Settlement Act (ANCSA) Provisions – Sections 7(i) and 7(j) – Revenue Sharing*, DOYON LIMITED (Apr. 21, 2017), <https://www.doyon.com/alaska-native-claims-settlement-act-ancsa-provisions-sections-7i-and-7j-revenue-sharing>.

ANCSA contains a natural resource revenue-sharing provision under section 7(i). This provision is intended to achieve rough equality in assets among all Alaska Native Regional Corporations (NANA is one of twelve Regional Corporations). Under 7(i), 70 percent of all revenues received by each Regional Corporation from timber and subsurface estate resources must be divided among the 12 Regional Corporations in proportion to the number of Alaska Natives enrolled in each region.²⁰ In turn, the Regional Corporations must redistribute at least 50 percent of the revenues received among smaller village corporations, many of which depend on this revenue-sharing arrangement.²¹

More than one billion dollars has been distributed among the Regional Corporations under section 7(i). In 2011 alone, the mining industry paid \$172 million to Regional Native Corporations, with over \$82 million redistributed to other regional and village corporations.²² Because of ANCSA's revenue sharing provisions, any operational changes to Red Dog Mine may have impacts on Alaska Native communities across the state.

Apart from commercial use of HFO in mining, the commercial fishing industry's larger fish processing vessels may also use HFO. While not strictly operating in the Arctic area, fishing vessels may seasonally operate in Arctic waters, and employ community residents.

Next Steps and Recommendation

The U.S. invites PAME members to review the information provided and identify any significant errors or omissions by 15 December 2019.

²⁰ *Alaska Native Corporations*, RESOURCE DEVELOPMENT COUNCIL (July 3, 2019), <https://www.akrdc.org/alaska-native-corporations>.

²¹ *Id.*

²² *Id.*