



Citizens for a Healthy Bay

September 9, 2019

535 Dock Street
Suite 213
Tacoma, WA 98402
Phone (253) 383-2429
chb@healthybay.org
www.healthybay.org

Puget Sound Clean Air Agency
Attn: Ralph Munoz
1904 Third Ave, Suite 105
Seattle, WA 98101
publiccomment@psclicleanair.org

Re: Puget Sound Energy (PSE) Tacoma Liquefied Natural Gas (LNG) Facility final Supplemental Environmental Impact Statement (FSEIS), Notice of Construction (NOC) Worksheet, and Proposed Order of Approval

Executive Director
Melissa Malott

Dear Mr. Munoz,

Thank you for providing the opportunity to review and comment on the PSE Tacoma LNG Facility FSEIS, NOC Worksheet, and Proposed Order of Approval

Board of Directors
Desiree Wilkins Finch
Bryan Flint
Barry Goldstein
Kelly McCord
Sheri Tonn

Citizens for a Healthy Bay (CHB) is a 29-year-old organization whose mission is to represent and engage people in the cleanup, restoration, and protection of Commencement Bay, its surrounding waters and natural habitat. We are a 501(c)3 nonprofit providing practical, solutions-based environmental leadership in the Puget Sound area. We work side-by-side with residents, businesses, and government to prevent and mitigate pollution and to make our community healthier and more vibrant.

CHB has a Policy and Technical Advisory Committee (PTAC) which is composed of experts from many fields, including chemists, hydrogeologists, biologists, lawyers, and public health professionals. PTAC provides CHB depth of knowledge about Commencement Bay and the Tideflats, threats to the Bay's health, surrounding waters, and the community from pollution, contaminated sites, and the climate crisis.

**A tax-exempt
501(c)(3) Washington
nonprofit corporation**

CHB's technical staff and members of PTAC have spent innumerable hours reviewing background information and the documents relevant to CHB's comment. They reviewed background materials for the LNG project, including the original draft and final EIS, the draft and final SEIS, and draft NOC Order of Approval, along with performing research and review of relevant published scientific materials on the climate crisis, the impact of methane on climate, and the advancement of clean energy technology in the maritime industry. After our review of literature on the climate crisis and the NOC permit and associated documents, CHB strongly urges PSCAA to exercise its authority to deny the NOC permit as it currently stands.

The PSE LNG project has been framed by PSCAA as a project that will have a positive benefit on the climate crisis. There has never been a more important time in history to advance projects that will have a net reduction GHG emissions. The climate crisis poses an immediate and incomprehensively large risk to our environment and human society as we know it, with local climate models showing a 2-4°C rise in temperature by 2050. In its October 2018 report, the International Panel on Climate Change (IPCC) indicated that we must achieve a 50% reduction in global climate emissions by 2030 and 100% reduction in global GHG emissions by 2050 if we want to have any hope of keeping the planet from warming more than 2°C, an amount they say would be devastating, and beyond which they say would be catastrophic for human society.

As we learn more about climate science and the shrinking window of time we have to address climate change, we must prioritize actions and projects that will significantly reduce GHG emissions between now and 2050. Changing systems to meet the IPCC goals will be very difficult, and because we will need to develop new reliable technologies, that difficulty cannot be understated. For agencies that implement state regulations, like PSCAA, the urgency and magnitude of the climate crisis requires the use of good judgment and discretion on understanding when Washington state code may be outdated or ill-suited for the circumstances.

Proponents of the LNG project claim it will have positive climate impacts, pointing to the fact that methane, the most potent GHG that will be released, eventually breaks down into carbon dioxide (CO₂), and that 100 years down the road, this project will have resulted in less CO₂ in the atmosphere than if the project had never advanced. Assuming this is correct, it may be tempting to say that the ultimate impacts of this project are beneficial to the climate crisis. However, the potency of the methane emissions before 2050 – the timeframe in which we must reduce GHGs - mean this project will make it more difficult to meet the IPCC GHG emission reduction goals of 2030 and 2050. Ultimately, because the project will have its most significant climate harming impacts during this timeframe, its overall impact on the climate crisis is negative.

PSCAA is dedicated to protecting public health and reducing our region's contribution to climate change. Your work at this moment in history, with the very significant risks posed by the climate crisis, is incredibly important. This project poses too big a risk to our climate at a very vulnerable time. We urge you to reject this NOC permit for the fact that it will make the climate crisis worse during a time that is most critical to preventing it.

CHB strongly urges PSCAA to deny this permit. In the alternative, CHB urges PSCAA to, first, publish public information about the project using updated scientific information in your models and relevant, appropriate information about the impacts of the project for the public. Second, CHB urges PSCAA to require PSE mitigate the emissions caused by this project. Third, CHB urges PSCAA fully apply the law to the extent of the activities proposed at the site. Finally, CHB recommends permit modifications to better ensure the protection of public and environmental health.

Our detailed comments are outlined below, in addition to oral testimony from staff on August 27, 2019.

USE UPDATED AND RELEVANT SCIENCE TO DETERMINE THE REAL IMPACTS OF THE PROPOSED PROJECT

In order to allow the public to understand the costs and benefits of the proposed project, it is important that they have accurate information about its relevant pollution impacts. Unfortunately, the information PSCAA published about the project uses outdated, inaccurate information about methane leakage and the climate impacts of the project on a relevant timeline. CHB urges PSCAA to publish information about the project using updated scientific information in your models and relevant, appropriate information about the impacts of the project for the public.

Accurately Account for the Methane Gas Source and Leakage Rate

The FSEIS' conclusion that the LNG project will result in a GHG reduction hinges on the requirement that all the methane gas comes from British Columbia (BC). The SEIS assumes the BC methane gas network has fewer fugitive emissions than the US', stating that flaring is prohibited and because of BC's "comprehensive drilling and production regulations." However, PSCAA referenced BC's 2012 Oil & Gas Commission report as a source for flaring and venting information, despite the availability of the 2018 report, which shows routine methane

flaring is permitted and does occur in BC. ¹ Further, PSCAA ignored literature that shows BC's methane leakage rate to be 2.5-6 times higher than previously reported. ^{2,3}

At a time of climate crisis, understanding GHG emissions is critical to adequately reducing them. CHB recommends PSCAA use up to date information about methane leakage rates in estimating the GHG emissions that will result from the extraction of gas for this project, and re-publish the Life Cycle Analysis (LCA) accordingly.

Use LCA Methods Relevant to the Urgency and Difficulty of Responding to the Climate Crisis

The LCA uses the 2007 IPCC Fourth Assessment Report as its reference for Global Warming Potential (GWP) values, despite the availability of the IPCC's more recent 2013 Fifth Assessment (AR5). Additionally, this LCA uses the 100-year GWPs for all GHGs analyzed, stating that "[t]he 100-year GWP is also consistent with the policy targets of the Paris Climate Agreement...." CHB disagrees with this assertion – the target of the Paris Climate Agreement is to prevent rises in global temperature beyond 1.5°C while reaching net-zero emissions by 2050. Recent literature suggests that committed fossil fuel projects, like the Tacoma LNG facility, will propel temperature rises well above these established targets, and that only deep decarbonization will allow us to reach these targets. ⁴⁻⁸

The FSEIS also states, "The 20-year GWP effectively cuts off the warming effect of CO₂ and N₂O [nitrogen dioxide] after 20 years while capturing the entire warming effect of CH₄ [methane]...." CHB maintains that using the 100-year GWP is inappropriate, as it obscures the real climate change impacts of this project by discounting the significant warming effect methane has in its first 20 years (methane is 86-times more effective at warming the planet than CO₂).⁹ Given that we have only 11 years to make bold, innovative changes in our energy infrastructure to address the realities of climate change, using a GWP that amortizes the global warming impacts beyond the time we have left to make these changes is short-sighted and irresponsible.

In their Response to Comments, PSCAA acknowledged that the AR5 "includes a higher GWP for methane and lower GWP for N₂O. The AR5 represents newer data on radiative forcing of methane and other gases, secondary effects, and their lifetime in the atmosphere."

CHB recommends PSCAA analyze the GHG emissions of the proposed project using the 20-year GWP from the AR5 report and reconsider the costs and benefits of the project. CHB further recommends PSCAA publish these results, so the public can fully understand the impacts of the proposed project.

PSCAA's conclusion that the Proposed Action will result in a reduction in greenhouse gases also rests on the carbon content of the LNG used: "...the emissions from the LNG facility plus upstream emissions are higher than those for the no action alternative. However, the carbon content of LNG results in lower end use emissions; so, the net life cycle GHG emissions are reduced under most circumstances." Table C1. shows the carbon content of LNG to be 75.1%, while the carbon content of marine gasoil and on-road diesel to be 85.5%.

Given that PSCAA's major conclusion rests on such a small confidence interval - which in their analysis only produces a 2.17% reduction in GHGs - CHB requests PSCAA detail how it will ensure this lower LNG carbon content property is met.

REQUIRE PSE TO MITIGATE THE ENVIRONMENTAL AND PUBLIC HEALTH IMPACTS OF THEIR PROPOSAL

Mitigating Greenhouse Gas Emissions

While CHB does not support this project in any capacity, if PSCAA decides to approve this permit, we request the new emissions that will result from this facility's operation be fully mitigated. Again, recent literature has shown that only deep decarbonization (including early retirement of existing infrastructure) will put us on the right path towards meeting the goals of the Paris Climate Agreement and the IPCC. Continuing to permit fossil fuel infrastructure in Washington alone will result in the state exceeding its greenhouse gas reduction targets

by 50%.⁴⁻⁸ PSCAA must hold PSE accountable for releasing new GHGs into the atmosphere, and must incorporate mitigation requirements into their permit, if approved. Regardless the status of Ecology's Clean Air Rule, PSCAA can use its discretion in requiring mitigation measures, as Ecology did for WestRock's Steam Limit permit in 2018 (NOC Order 4153-AQ07 Modification 1).

Many sources of methane gas exist within the Tacoma Tidelands, Pierce County, and the greater Puget Sound region. These sources are often vented or flared directly into the air, further loading our atmosphere with harmful GHGs while wasting a significant source of energy. One way PSE could mitigate the negative GHG impacts of their proposed project is to make use of these sources, and incorporate them back into their system for use in synthetic liquid fuels as well as back into their pipeline network to serve existing energy needs.

CHB recommends PSCAA incorporate the following mitigation requirements into PSE's NOC permit, if approved: Within one year of startup, PSE should be required to;

- 1) Catalog the sources of vented and flared methane locally and regionally.**
- 2) Develop an action plan for how they will capture all of these emissions.**
- 3) Develop a progressive work plan for how they will incorporate emerging technologies into their system so that within 10 years from startup, the Tacoma LNG facility and associated end-use applications will be run solely on local/regional sources of renewable, sustainable energy.**

Technology exists *today* to allow PSE to develop these plans and apply them in the field. This "Power-to-X" technology is especially useful for marine shipping and other applications where the use of batteries or conversion to complete electrification is not feasible. Power-to-X is a system in which electrolysis is used to split water into hydrogen, and then combined with captured CO₂ to create a synthetic, renewable gas which can also be converted into a synthetic fuel for more energy intensive application like marine shipping. Fortunately, these synthetic gases and fuels can be blended with other fuel sources without damaging existing end-use equipment or transport infrastructure, and can be applied anywhere fossil fuels are utilized today.^{8,10} MAN Energy Systems, the very company retrofitting TOTE Maritime's ship engines to run on LNG, has committed to researching and developing Power-to-X technologies in their marine engines, with actual implementation in the near future.¹¹

CHB further recommends PSCAA incorporate interim mitigation measures into PSE's permit while PSE is developing the plans described above. Interim mitigation activities can include: carbon capture and sequestration; carbon capture and reinsertion to the grid; biogas capture and sequestration; biogas capture and reinsertion to the grid, and; local reforestation.

Mitigating Harmful Air Pollutants

One of the stated purposes of the Tacoma LNG facility is to find alternate marine fuel sources that will burn "cleaner" than more traditional fuels. While the final emissions calculations show a real reduction in nitrous oxide emissions, particulate matter emissions within 200 nautical miles of shore will see no change when switching from marine gasoil-vessels to LNG-fueled vessels. Air quality close to shore is what most impacts public health. Pierce County residents, especially those of color, already experience higher rates of heart disease than the state average, which is worsened by exposure to particulate matter. Asthma and chronic obstructive pulmonary disease are also exacerbated by exposure to particulate matter.^{12,13}

Given that one of the stated purposes of this project is to reduce emissions harmful to public health, CHB requests PSCAA be more transparent about the analyzed pollutants by highlighting all emissions calculations – especially those showing no decrease in particulate matter close to shore - not just PSCAA's purported reduction in GHGs. Further, CHB recommends PSCAA include particulate matter mitigation requirements in PSE's permit, if approved.

The NOC worksheet states, "...there is substantial evidence showing that arsenic and mercury is present in natural gas in quantifiable amounts." Additionally, PSCAA's modeling showed that "...formaldehyde, benzene,

toluene, naphthalene, phenanthrene, 2-methylnaphthalene and fluorene were detected at levels greater than the field blank.”

The impacts of these toxic air pollutants should be mitigated to protect public health. How will PSE be required to mitigate for these additional toxic emissions?

FULLY APPLY THE PROTECTION OF APPLICABLE LAWS TO ALL ACTIVITIES PROPOSED AT THE PROJECT SITE

A review of all the permitting documents, going back to when this project was first proposed, reveals a lack of clarity about the scope of project activities that will actually occur. In the NOC Worksheet and Order of Approval, PSCAA fails to apply many regulations because of this lack of clarity, but should be erring on the side of applying more regulatory protections.

The NOC worksheet concludes that the Tacoma LNG facility will not be subject to many federal regulations, including subparts of New Source Performance Standards ([NSPS]40 CFR part 60). The worksheet claims that because the Tacoma LNG project is “not a natural gas processing facility” subparts LLL and KKK of NSPS do not apply. The Pipeline and Hazardous Materials Safety Administration defines a natural gas processing facility as “a facility designed to ‘clean’ raw natural gas by separating impurities and various non-methane hydrocarbons and fluids...”¹⁴ Section 2-3 of the FSEIS entitled, “LNG Processing Facility” shows that the methane gas entering the Tacoma LNG facility will undergo both amine pretreatment and non-methane hydrocarbon removal.

CHB requests PSCAA provide clarification on why the Tacoma LNG facility is not a natural gas processing facility and therefore not subject to these subparts of the NSPS.

The NOC worksheet goes on to state, “The Tacoma LNG project will only be fueling vessels, not filling tank ships or tank barges that transport LNG,” and the “PSE Tacoma LNG is not engaged in marine tank vessel loading operations...” and is therefore not subject to regulation under the National Emission Standards for Hazardous Air Pollutants ([NESHAP] 40 CFR part 63). However, the FSEIS states, “LNG may also be supplied to bunker vessels for subsequent transfer to ships,” with over 55% of the total LNG produced slated for use by “Other Marine (by bunker barge).” We are particularly concerned about the lack of clarity around bunkering operations for the proposed action. The FSEIS, NOC and Order of Approval all contain conflicting language making it entirely unclear how LNG bunkering will occur.

CHB requests PSCAA obtain confirmation regarding bunkering operations, as well as provide further justification why the Tacoma LNG facility is not subject to NESHAP.

Not having clarity on bunkering operations is of particular concern for public and environmental safety. A 2018 review of the original *LNG Project Spill Consequence Analysis* also found ambiguity around the bunker barge operations for this project, going on to say, “If [bunkering barges] were an element of the liquefaction facility, then the fire and vapor dispersion hazards associated with an accidental spill from loading or unloading operations, possible collisions or allisions of the barge along the waterway or in the harbor could have much different safety impacts for the public.” The review goes on to say that if LNG bunkering by barge is to occur, then “appropriate LNG spill on water fire and dispersion hazards modeling should be conducted... This would need to include evaluation of expected bunkering operations and locations, port traffic and ship sizes, estimate of likelihood of collisions and at what speeds, and estimates of expected LNG cargo tank breach sizes and spill volumes. This could then be used to estimate pool fire diameters and dire and dispersion hazard distances, similar to what was done in the report for on-land spills.”¹⁵

Given that PSCAA is tasked with protecting human and environmental health, this dangerous ambiguity around bunkering operations is in scope for PSCAA’s analysis and should be reason enough for PSCAA to deny this permit.

MODIFY THE PERMIT APPROVAL CONDITIONS TO ENSURE THE PROTECTION OF ENVIRONMENTAL AND PUBLIC HEALTH

The following are CHB's recommended changes for the draft approval conditions. These changes are needed in order to make the facility, if permitted, more safe by requiring further accountability from PSE:

Condition 7: Performance tests of the LNG vaporizer to verify compliance with the stated emissions standards should be conducted annually.

Condition 12a: A schedule is needed for monitoring of the flare pilot flame; i.e., how often is the flare pilot flame being monitored?

Condition 16: SO₂ emission rate of the enclosed ground flare should be tested annually, regardless of previous testing performance.

Condition 21: An ongoing testing schedule is needed for compliance with the VOC minimum destruction efficiency, beyond initial startup testing.

Condition 25: An ongoing testing schedule is needed for compliance with the particulate matter standard, beyond initial startup testing.

Condition 27: Language should be added to clarify that performance tests of the enclosed ground flare need to *commence* within 60 days of the ground flare startup, but no later than 180 days from plant startup.

Condition 32: The Leak Detection and Repair Plan for fugitive emissions should be submitted to- *and approved-* by PSCAA *prior* to facility startup, in order to ensure fugitive emissions are not left unchecked.

Condition 40: To maintain consistency with page 8 of the worksheet, this condition needs to state, "...the sole source of natural gas supply to the facility is from British Columbia or Alberta Canada, *but entering Washington through British Columbia.*" Further, how will the public be notified if this condition is not met and plant operations cease?

Condition 44: Records from Condition 40 need to be included in this section to ensure accountability and compliance with this very significant condition.

As a final note, we wanted to remark on the FSEIS issued by PSCAA. We are disappointed with the FSEIS, as PSCAA did not seem to consider our reasonable comments. In addition to our comments above about PSCAA's inaccurate portrayal of the climate impacts of the project, we are disappointed by PSCAA's response to the arguments made about the Puyallup Tribe of Indians.

In their response to comments on the draft SEIS, PSCAA stated, "the FEIS does not show the proposed plant to be located on Puyallup Tribal lands or Future Tribal Lands." The Tacoma LNG facility is not just an LNG storage tank. As part of this project and as described in the FEIS, a new pipeline was constructed - which will have emissions regulated by PSCAA - and sits inside the Puyallup Tribe of Indians Reservation lands as well as the 1873 Survey Area, which is used as the basis for government-to-government consultation in the Puyallup Land Claims Settlement Act of 1989.¹⁶ Additionally, the LNG tank itself sits on man-made fill, which covers the lands which the Puyallup Tribe and other Coast Salish peoples have used for hunting, fishing, and ceremonial practices since Time Immemorial.

CHB requests PSCAA update their project documentation to reflect these facts about the lands of the Puyallup Tribe.

Thank you for the opportunity to provide feedback on the Tacoma LNG FSEIS, NOC Worksheet, and draft Order of Approval.

Sincerely,



Melissa Malott
Executive Director, Citizens for a Healthy Bay
mmalott@healthybay.org, (253) 383-2429

1. BC Oil and Gas Commission. (2018). *Flaring and Venting Reduction Guideline. Version 5.1 May 2018*.
2. Atherton et. al. (2017). Mobile measurement of methane emissions from natural gas developments in northeastern British Columbia, Canada. *Atmospheric Chemistry and Physics*, 17, 12405–12420.
3. Wisen et. al. (2017). *A Portrait of Oil and Gas Wellbore Leakage in Northeastern British Columbia, Canada*. Conference Paper for Geo Ottawa. Oct. 2017.
4. Tong, D. et. al. (2019). Committed emissions from existing energy infrastructure jeopardize 1.5°C climate target. *Nature (Letter)*, 572, 373-389.
5. Pfeiffer, A. et. al. (2018). Committed emissions from existing and planned power plants and asset stranding required to meet the Paris Agreement. *Environmental Research Letters*, 13, 054019.
6. Smith, C.J. et. al. (2018). Current fossil fuel infrastructure does not yet commit us to 1.5°C warming. *Nature Communications*, 10, 101.
7. Hall, K. and V. Gutman-Britten. (2018). *Within Reach: The Path to 100% Fossil-Free Electricity in the Pacific Northwest*. Climate Solutions.
8. Climate Energy Transition Institute. (2019). *Meeting the Challenge of Our Time: Pathways to a Clean Energy Future for the Northwest: An Economy-Wide Deep Decarbonization Pathways Study*. Author.
9. IPCC (2013). *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.
10. Wärtsilä. "Synthetic fuels: Supporting Wärtsilä's vision of a 100% renewable energy future." *Hellenic Shipping News*. June 18, 2019. Accessed from <https://www.hellenicshippingnews.com/synthetic-fuels-supporting-wartsilas-vision-of-a-100-renewable-energy-future/> on September 3, 2019.
11. MAN. "Synthetic Bunker Fuel Can Reduce CO2 Emissions Where Electrification Not Possible. MAN." *Ship and Bunker*. February 11, 2019. Accessed from <https://shipandbunker.com/news/world/851131-synthetic-bunker-fuel-can-reduce-co2-emissions-where-electrification-not-possible-man> on September 3, 2019.
12. Eberhard, K., Skelton, L., and S. Cornett. (2018). "i-1631 Could Save Lives and Improve Health by Reducing Pollution: Washingtonians Could Save Billions in Health Costs by Cleaning the Air". Accessed on March 5, 2019 from Sightline Institute.
13. Wood, S. (2018). "Opinion: Take it from a nurse: Tacoma can't gamble with air quality, public health". Accessed on March 5, 2019 from Tacoma News Tribune.
14. Pipeline & Hazardous Materials Safety Administration. (n.d.) *Fact Sheet: Natural Gas Processing Plants*. Accessed from <https://primis.phmsa.dot.gov/comm/factsheets/fsnaturalgasprocessingplants.htm> on September 8, 2019.
15. Sandia National Laboratories. (March 21, 2018). "Review of 'LNG Project Spill Consequence Analysis', October 2015".
16. United States. Congress. Senate. Select Committee on Indian Affairs. (1989). *Settlement of land claims of Puyallup Tribe of Indians in the state of Washington: hearing before the Select Committee on Indian Affairs, United States Senate, One Hundred First Congress, first session, on S. 402 ... February 24, 1989, Washington, DC. Washington: U.S. G.P.O..*