

Reasons to Require an Environmental Impact Statement for the Sunnyside Renewable Natural Gas Methane Plant

For Immediate Release: March 28, 2024

Contact: Friends of Toppenish Creek at 509-874-2798

Introduction

A new and much hyped “green” technology is renewable natural gas (RNG). Major producers of oil and gas are spending billions to develop RNG projects that convert trash, food, and manure into marketable natural gas. One of the largest RNG plants in the country is planned for Sunnyside Washington (SS RNG) by the company Pacific AG, and taxpayers will partially fund building this facility.

Sunnyside Washington is in the Lower Yakima Valley and is bordered by numerous confined animal feeding operations (CAFOs) which produce vast quantities of manure daily. The proposed SS RNG plant is touted as being a solution for safely disposing of manure and generating natural gas in the process. Liquefied manure and other waste agricultural products are heated in the digester, and methane gas is produced under a low oxygen environment. The waste products from this process, called digestate, will be used as fertilizer and animal bedding.

Sunnyside officials have given carte blanche approval to construct this plant without seeking an Environmental Impact Statement (EIS) which would have included among other things, the potential hazards it might create. This is a concern given the large scale of this facility and its potential impact on the environment. Their acquiescence, however, was not surprising. For decades, the Lower Yakima Valley has been a dumping ground for agricultural enterprises that pollute and have been prohibited elsewhere in the country. Revenue generation and job creation have superseded concern for the environment. The Lower Yakima Valley is already struggling with over 200 nitrate-poisoned domestic wells and an inadequate supply of water, yet plans are in place to construct massive digesters.

Residents of Lower Yakima Valley are primarily poor and have been unwilling to voice opposition to environmental degradation.

As a public service, the Friends of Toppenish Creek presents reasons to require an EIS for the proposed SS RNG. FOTC believes this analysis should have been performed by the agencies with expertise under the WA State Environmental Policy Act (SEPA). Since the agencies did not do so, FOTC has done our best to gather information and present it to the public. We welcome comments, corrections, and additional information. We fact check and provide sources for our statements.

Reason # 1: Ammonia produced by digestion.

On Thursday, March 14, the Friends of Toppenish Creek presented the Yakima Regional Clean Air Agency (YRCAA) Board of Directors with EPA studies that estimate ammonia emissions from Yakima dairies at 7,476 tons per year.¹ FOTC has asked the YRCAA to measure ammonia levels in the ambient air in the Lower Yakima Valley, but the agency has not done so. The EPA modeled estimates comprise the best data currently available. FOTC research in 2019 found ammonia levels in the LYV at 66 times levels in the upper valley.²

Ammonia is a precursor to PM 2.5. The 2015 Yakima Air Winter Nitrate or YAWN study stated that there is so much ammonia in the Yakima air that the only feasible way to reduce ammonium nitrate (NH_3NO_3) particulate levels is to reduce nitrate (NO_3) in the air.³ But ammonia is also a hazardous air pollutant that damages the lungs, especially the lungs of growing children and those with asthma.^{4, 5}

Pacific Ag states that the SS RNG will reduce the levels of methane in Yakima air. This may or may not be true but there is no way to prove or disprove their assertion because no one measures methane levels in the Yakima air.

IMPORTANT: Ammonia emissions increase significantly with anaerobic digestion. A 2017 study from the University of Wisconsin⁶ found that anaerobic digestion resulted in a gas emission tradeoff as it increased NH_3 emissions by 81% during storage . . .” Increased ammonia emissions from anaerobic digestion have been confirmed by other research teams.^{7, 8} The SS RNG plant could increase ammonia emissions in Yakima County by approximately 5,000 tons per year.

The YRCAA is obliged, as the agency with expertise, to evaluate this impact before issuing a New Source Review air permit for the SS RNG. FOTC believes

that increased ammonia emissions should have been addressed when the YRCAA contributed to the SEPA review for the digester.⁹

The liquid portion of the digestate, which will be used as a fertilizer, is also high in ammonia. Microbes in the soil rapidly converted ammonia to nitrate, and the Lower Yakima Valley already has a serious problem with nitrate pollution in its groundwater. Hundreds of private domestic wells have been rendered toxic by nitrate contamination, and those residents must rely on bottled water or reverse osmosis systems to obtain drinking water. Using the digestate water as a fertilizer will only exacerbate this problem.

Reason # 2: Excessive water consumption by the RNG digesters.

One of our major concerns has been the amount of groundwater this plant will use. The proposed RNG digesters are designed to use a slurry which will take at least a gallon of water for every gallon of manure. Different digesters require different consistencies. Pacific AG estimates there will be 140 tanker trucks delivering slurry daily. These trucks will typically carry between 5,000 and 11,600 gallons of slurry and half of the volume will be 2,500 to 5,800 gallons of water. That means 350,000 to 812,000 gallons of water per day, or 127,750,000 to 296,380,000 gallons per year. Thanks to Washington laws, groundwater is free to farmers for animal watering¹⁰. Liquifying manure is unimportant to Pacif Ag and local dairymen, because, for them, water is as free as air.

Depleting groundwater will have serious consequences for the impoverished population in the Lower Yakima Valley. The question, as FOTC sees it, will be answered in upcoming years as climate change brings more frequent drought and wells go dry as they did in 2015. How much would withdrawal of 200 million gallons of groundwater per year lower the South Yakima County aquifers? Our public officials should answer this question before allowing the SS RNG project to move forward.

Reason # 3: Air emissions and highway damage from trucks that deliver slurry.

The trucks that will deliver slurry to the digesters will have an impact on air quality and road maintenance in the Sunnyside area. Health problems have been shown to be linked to pollution from vehicles, and heavy trucks are the largest source of emission of the precursors of dangerous ozone and particulate matter.

It has been estimated that 140 tanker trucks will deliver manure to the digesters each day. According to our calculations, the total distance these trucks would travel is 1360 miles per day or approximately half a million miles per year.¹¹ According to the U. S. Department of Transportation, a large diesel truck emits 2.99 grams of NOx (nitrogen oxides) per mile.¹² In a year these trucks will emit about 1.7 tons of NOx (i.e., 500,000 miles/year X 2.99 gm/mile = 1,495,000 gm or 1.7 tons).

The combination of ammonia emissions from the digesters and NOx from the delivery trucks could create potent respiratory irritants for those who live near the plant.

Heavy vehicles also are a major source of damage to pavement. Excluding events such as storm damage, about 80% of all road maintenance costs are a result of damage caused by trucks. The City of Sunnyside should anticipate and budget for the damage this truck traffic will cause.

Reason # 4: Pathogens in Digestate

We all know that fecal material contains harmful pathogens. That is why our mothers taught us to wash our hands after going to the bathroom. Cow manure contains microorganisms that impact soil health and contains pathogens that can infect people. One important pathogen is cryptosporidium, a parasite that kills young calves¹³ and causes severe diarrheal illness in humans.¹⁴ Cryptosporidium spores can live for long periods of time in soil and water.¹⁵

What will happen:

- If manure containing cryptosporidium is fed into a manure methane bio-digester where it is mixed with manure from cryptosporidium free facilities under conditions that encourage the parasite to thrive and even proliferate?
- If liquid digestate containing cryptosporidium spores is spread on other fields, where it can be taken up by livestock and wildlife.
- If solid digestate is used for animal bedding where it can infect whole herds.

Proponents of anaerobic digestion say that digestion kills most pathogens, which is not strictly true. Not all digesters are the same. There are mesophilic digesters that operate in the range of 86 to 108 degrees Fahrenheit. There are thermophilic digesters that operate in the range of 109 to 135 degrees Fahrenheit. Thermophilic digesters are likely to decrease, but not eliminate, the number of pathogens while mesophilic digesters will not.

Burch et al (2018)¹⁶ state:

Pathogen inactivation is highly variable among full-scale anaerobic digesters. Pathogen inactivation by full-scale digesters on cattle farms needs optimization. Most microbes end up in the liquid fraction during solids separation of manure.

Jiang et al (2020)¹⁷ state:

Thermophilic temperature can inactivate most pathogens effectively, with ambient and mesophilic temperatures not effective.

The U.S. Environmental Protection Agency¹⁸ states:

In general, mesophilic digesters are easier to operate and maintain, but will not result in sufficient pathogen kill to produce Class A Biosolids.

The proposed Sunnyside RNG digester would be mesophilic, operating in the 86 to 108 degrees Fahrenheit range.

Friends of Toppenish Creek asked Pacific Ag about testing manure feedstock and digestate to measure change in the number of pathogens present. We asked:¹⁹

How often will you test manure and crop residue?

Answer: DAILY, UPON ARRIVAL

Will you test for:

- a. *Pesticides? Which ones?*
- b. *Pesticide coated seeds?*
- c. *Veterinary pharmaceuticals? Which ones?*
- d. *Bacteria? Coliform? Salmonella? Shigella? Campylobacter? Leptospira? Protozoa? Cryptosporidium? Giardia?*
- e. *Antibiotic Resistance?*

Answer: FEEDSTOCKS WILL BE TESTED FOR PHYSICAL CHARACTERISTICS AT RECEIPT. FURTHER TESTING WILL BE DEFINED BASED ON OPERATIONAL PROTOCOLS AND CUSTOMER REQUIREMENTS. WASHINGTON DEPARTMENT OF AGRICULTURE WAS CONSULTED REGARDING SPECIFIC PATHOGENIC CONCERNS, NONE WERE IDENTIFIED. WE ARE NOT AN ENFORCEMENT AGENCY ON THE CONTENTS OF MANURE AND WON'T TAKE THAT ROLE, NOR IS IT APPROPRIATE FOR US TO. THAT IS BEST HANDLED UNDER EXISTING STATE AND FEDERAL AGENCIES.

This is not good enough. We are especially concerned if it is true that the WA State Dept. of Agriculture identified no concerns. WSDA is supposed to be the agency with expertise and should have described the different impacts of mesophilic and thermophilic digesters.

Thank you for reading.

Friends of Toppenish Creek

3142 Signal Peak Road
White Swan, WA 98952

Citations

- 1-National Emissions Inventory for Non-Point Sources – Ag Livestock Waste – Yakima County.
<https://awsedap.epa.gov/public/single/?appid=20230c40-026d-494e-903f-3f112761a208&sheet=5d3fdda7-14bc4284-a9bb-cfd856b9348d&opt=ctxmenu,cursel>
- 2-FOTC. 2019. Study Finds Elevated Ammonia Levels at Lower Yakima Valley Site Near Large CAFO Dairies.
<http://www.friendsoftoppenishcreek.org/cabinet/data/EPA%20Air%20Attachment%2019%20Ammonia%20Levels%20in%20Yakima%20County%20FOTC.pdf>
- 3-WA State Dept. of Ecology. 2015, Yakima Air Winter Nitrate Study Final Report. Page 6.
<https://ecology.wa.gov/getattachment/a67789dd-aed4-461e-b138-e77537dd1952/20140225YakimaAirWinterNitrate.pdf>
- 4-Heederik, D., Sigsgaard, T., Thorne, P. S., Kline, J. N., Avery, R., Bønløkke, J. H., ... & Merchant, J. A. (2007). Health effects of airborne exposures from concentrated animal feeding operations. *Environmental health perspectives*, 115(2), 298-302. <https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.8835>
- 5-Brumberg, H. L., Karr, C. J., Bole, A., Ahdoot, S., Balk, S. J., Bernstein, A. S., ... & Trasande, L. (2021). Ambient air pollution: health hazards to children. *Pediatrics*, 147(6).
<https://pubmed.ncbi.nlm.nih.gov/34001642/>
- 6-Holly, M. A., Larson, R. A., Powell, J. M., Ruark, M. D., & Aguirre-Villegas, H. (2017). Greenhouse gas and ammonia emissions from digested and separated dairy manure during storage and after land application. *Agriculture, Ecosystems & Environment*, 239, 410-419.
<https://www.sciencedirect.com/science/article/pii/S0167880917300701>
- 7-Koirala, K., Ndegwa, P. M., Joo, H. S., Frear, C., Stockle, C. O., & Harrison, J. H. (2013). Impact of anaerobic digestion of liquid dairy manure on ammonia volatilization process. *Transactions of the ASABE*, 56(5), 1959-1966. https://d1wqtxts1xzle7.cloudfront.net/36037847/Kedar-libre.pdf?1419471703=&response-contentdisposition=inline%3B+filename%3DIMPACT_OF_ANAEROBIC_DIGESTION_OF_LIQUID.pdf&Expires=1710641982&Signature=LnRlqHRVQ68kvi2048hCFJFN6q4DQ1EajrK0GIzFzPH6yfeLbiWwYrYGy0ftyI0SstWntW~uLqLIBH9aXQGfIM8dC-LwzCF826SB8~Jtt0IBL7pHGHqHra8Tsr1AdNgqTzwVNAKL1A3o3J1DWluZ39Vr7Wyy3ZUf9iHzRua u3DD80RzpiXlhv-vTHN9S5AThkTZM1XolHjxxRbPIESxdHmPsUuytfcOV9BRUwmMheuo7uLYT1ic8MkdGCzpyHrsIMx9UibB9CXhjBAA-G3FCqkPFA1kuty9YTb2U59eqO832kXbmjflUn6KnRwEKcbWUmXcgx-wf~Y7QOWNnZ35A_&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA
- 8-Neerackal, G. M., Ndegwa, P. M., Joo, H. S., Wang, X., Harrison, J. H., Heber, A. J., ... & Frear, C. (2015). Effects of anaerobic digestion and solids separation on ammonia emissions from stored and land applied dairy manure. *Water, Air, & Soil Pollution*, 226, 1-12. <https://www.researchgate.net/profile/Xiang-Wang->

[65/publication/282716583_Effects_of_Anaerobic_Digestion_and_Solids_Separation_on_Ammonia_Emissions_from_Stored_and_Land_Applied_Dairy_Manure/links/56efff8b08ae01ae3e70ec09/Effects-of-Anaerobic-Digestion-and-Solids-Separation-on-Ammonia-Emissions-from-Stored-and-Land-Applied-Dairy-Manure.pdf](https://www.wa.gov/publication/282716583_Effects_of_Anaerobic_Digestion_and_Solids_Separation_on_Ammonia_Emissions_from_Stored_and_Land_Applied_Dairy_Manure/links/56efff8b08ae01ae3e70ec09/Effects-of-Anaerobic-Digestion-and-Solids-Separation-on-Ammonia-Emissions-from-Stored-and-Land-Applied-Dairy-Manure.pdf)

9-Yakima Regional Clean Air Agency Comments on SS RNG SEPA Review. 2023.
[SKM_C30823112118190 \(sunnyside-wa.gov\)](https://www.sunnyside-wa.gov/SKM_C30823112118190)

10-RCW 90.44.050

11- See attached map of Anticipated Dairies Served from the SS RNG Traffic Study. Page 11.
<https://www.sunnyside-wa.gov/DocumentCenter/View/3150/SEPA2023-0200-Traffic-Impact-Analysis>

12- U.S. Bureau of Transportation Statistics. Table 04 43. <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-type-using-gasoline-and>

13- Penn State Extension. The Endemic Calf Parasite Cryptosporidium Parvum. 2023. [https://extension.psu.edu/the-endemic-calf-parasite-cryptosporidium-parvum#:~:text=The%20parasite%20Cryptosporidium%20is%20transmitted,et%20al.%2C%202017\).](https://extension.psu.edu/the-endemic-calf-parasite-cryptosporidium-parvum#:~:text=The%20parasite%20Cryptosporidium%20is%20transmitted,et%20al.%2C%202017).)

14- Center for Disease Control. Parasites – Cryptosporidium (Also known as “crypto”).
<https://www.cdc.gov/parasites/crypto/index.html>

15- Koh W, Clode PL, Monis P, Thompson RC. Multiplication of the waterborne pathogen Cryptosporidium parvum in an aquatic biofilm system. Parasit Vectors. 2013 Sep 19;6:270. doi: 10.1186/1756-3305-6-270. PMID: 24330483; PMCID: PMC3848567.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3848567/>

16-Burch TR, Spencer SK, Borchardt SS, Larson RA, Borchardt MA. Fate of Manure-Borne Pathogens during Anaerobic Digestion and Solids Separation. J Environ Qual. 2018 Mar;47(1):336-344. doi: 10.2134/jeq2017.07.0285. PMID: 29634802; PMCID: PMC7166490.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7166490/#bib37>

17-Jiang, Y., Xie, S. H., Dennehy, C., Lawlor, P. G., Hu, Z. H., Wu, G. X., ... & Gardiner, G. E. (2020). Inactivation of pathogens in anaerobic digestion systems for converting biowastes to bioenergy: a review. Renewable and Sustainable Energy Reviews, 120, 109654.
<https://www.sciencedirect.com/science/article/abs/pii/S1364032119308603>

18-U.S. Environmental Protection Agency. Types of Anaerobic Digesters. [https://www.epa.gov/anaerobic-digestion/types-anaerobic-digesters#:~:text=Wet%20\(low%2Dsolids\)%20and%20Dry%20\(high%2Dsolids\)&text=The%20feedstocks%20for%20a%20wet,are%20often%20described%20as%20stackable](https://www.epa.gov/anaerobic-digestion/types-anaerobic-digesters#:~:text=Wet%20(low%2Dsolids)%20and%20Dry%20(high%2Dsolids)&text=The%20feedstocks%20for%20a%20wet,are%20often%20described%20as%20stackable)

19-Friends of Toppenish Creek. Pacific Ag Response to Questions. 2024.
http://www.friendsoftoppenishcreek.org/cabinet/data/SS%20RNG%20Pacific%20Ag%20Response_respone%202.01.24.pdf

Attachment

