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**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Docket UG-230393

Complainant,

v.

PUGET SOUND ENERGY

Respondent.

**CROSS-ANSWERING TESTIMONY OF
RANAJIT SAHU
ON BEHALF OF THE PUYALLUP TRIBE OF INDIANS**

OCTOBER 6, 2023

PUYALLUP TRIBE OF INDIANS
CROSS-ANSWERING TESTIMONY OF
RANAJIT SAHU

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PUYALLUP TRIBE OF INDIANS
CROSS-ANSWERING TESTIMONY OF
RANAJIT SAHU

LIST OF EXHIBITS

- Exh. RXS-36** PSE Response to WUTC Staff Data Request No. 31.
- Exh. RXS-37** PSE Response to WUTC Staff Data Request No. 32.
- Exh. RXS-38** Table summarizing NOV's issued by PSCAA to Tacoma LNG on May 12, 2023.

1 **PUYALLUP TRIBE OF INDIANS**

2 **TESTIMONY OF**
3 **RANAJIT SAHU**

4 **I. PROFESSIONAL BACKGROUND AND QUALIFICATIONS**

5 **Q. Please state your name and business address.**

6 **A:** My name is Ranajit Sahu. I am now, and at all times mentioned herein, a citizen of
7 the United States and a resident of the State of California. I am over 18 years of age, competent to
8 make this declaration, and make this declaration from my own personal knowledge. If called to
9 testify verbally before the Washington Utilities and Transportation Commission (WUTC or
10 Commission) regarding the contents of this pre-filed testimony, my testimony would be consistent
11 with this written testimony. My business address is: 311 North Story Place, Alhambra, CA 91801.

12 **Q: Please describe your education and employment experience that is relevant to**
13 **your testimony here.**

14 **A:** As I explained in more detail in my prior testimony in this matter, which has been
15 designated Exhibit RXS-1T and is incorporated herein by reference, I have over thirty years of
16 experience in the fields of environmental, mechanical, and chemical engineering. My resume was
17 previously submitted as Exhibit RXS-2. I have successfully managed and executed numerous
18 projects in this time period. This includes basic and applied research projects, design projects,
19 regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and
20 projects involving the communication of environmental data and information to the public.

21 Further, I have provided consulting services to numerous private sector, public sector, and
22 public interest group clients. And for approximately twenty years, I have taught numerous courses
23 at universities in several Southern California, including UCLA (air pollution), UC Riverside (air
24 pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk
25 assessment, hazardous waste management). I have also taught at the California Institute of
26 Technology (Caltech), my alma mater (various engineering courses), at the University of Southern

1 California (air pollution controls), and at California State University, Fullerton (transportation and
2 air quality).

3 In sum, I have a multifaceted understanding of the relevant technology and processes
4 utilized at the Tacoma LNG Project and the applicable regulatory regime, as well as substantial
5 knowledge regarding details of the design and construction of the facility and PSE's proffered
6 rationale for constructing the Tacoma LNG facility. This background provides a foundation for
7 my analysis of the inequities involved in the operation of the LNG plant and the prudence of the
8 costs incurred by PSE for the Tacoma LNG Project.

9 **Q: Have you previously testified as an expert witness before a court or an
10 administrative tribunal?**

11 **A:** Yes. Several times. I have provided, and continue to provide, expert witness
12 services in a number of environmental areas discussed above in both state and federal court
13 proceedings, as well as before administrative bodies. In 2022, my prefiled written testimony and
14 written response testimony were submitted to the Commission by the Puyallup Tribe as Exhibits
15 RSX-1T and RSX-30T in WUTC Consolidated Dockets UE-220066 and UG-220067. Even
16 though I was asked no questions regarding my written testimony, I attended and was available to
17 testify at the evidentiary hearing in that matter.

18 **Q: What information did you evaluate in conducting your analyses in this case?**

19 **A:** In addition to the materials I previously reviewed and identified in my prior
20 testimony (RXS-1T), I have reviewed the Response Testimony of Robert Earle on behalf of Public
21 Counsel (Exh. RLE-1CT) and the Testimony of Betty Erdahl on behalf of WUTC Staff (Exh.
22 BAE-1CT) and their related exhibits. I have also reviewed PSE responses to Data Requests that
23 were produced following the submission of my prior written testimony on September 8, 2023.

1 **II. SCOPE AND SUMMARY OF TESTIMONY**

2 **Q. Please explain the purpose and scope of your testimony.**

3 **A:** This cross-answering testimony follows my prior testimony dated September 8,
4 2023, which was submitted as Exhibit RXS-1T. My testimony here responds to Exhibit BAE-
5 1CT, the Testimony of Betty A. Erdahl on behalf of the Staff of Washington Utilities and
6 Transportation Commission, and to Exhibit RLE-1CT, the Response Testimony of Robert L. Earle
7 on behalf of the Washington State Office of Attorney General’s Public Counsel Unit.

8 Further, my testimony addresses information disclosed by PSE in response to WUTC Staff
9 Data Request Nos. 31 and 32. PSE provided documentation of numerous Notices of Violation
10 (NOVs) issued to PSE by the Puget Sound Clean Air Agency (PSCAA) for violations of the
11 Tacoma LNG facility’s air permit. This important information became available after my prior
12 testimony was filed, which is why I am now first addressing it here.

13 **Q: Have you arrived at any opinions in response to the testimony and conclusions**
14 **of Mr. Earle and Ms. Erdahl?**

15 **A:** Yes. As I will discuss below, I agree with Mr. Earle’s analysis and conclusions.
16 And while I agree with Ms. Erdahl’s analysis regarding the costs that should be disallowed, I am
17 compelled to disagree with her conclusion because she fails to consider several factors that were
18 noted in my prior testimony and discussed further below that support a full (rather than partial)
19 disallowance of the costs incurred through the Tacoma LNG Project.

20 **Q: What is the significance of the NOVs issued to the Tacoma LNG facility by**
21 **PSCAA to the Commission’s prudence analysis?**

22 **A:** Despite the very short duration of its operations, the Tacoma LNG facility has
23 repeatedly violated several of the conditions in its PSCAA air permit. As I have noted in my prior
24 testimony here, the facility’s air permit is intended to ensure compliance with the requirements of
25 the Clean Air Act, but such compliance does not establish that the emissions allowed under the
26 permit cause no harm to receptors in the surrounding airshed.

1 In that context, PSE’s repeated violation of permit conditions that are intended to protect
2 human health and the environment undercuts PSE’s assertions that, because the facility has been
3 permitted, it is safe.

4 III. TESTIMONY

5 **A. Response to Testimony of Robert Earle on Behalf of Public Counsel (Exh. RLE-1CT)**

6 **Q: Are you aware of the “design day” calculations and forecasts utilized by PSE
7 that are discussed by Mr. Earle?¹**

8 **A:** Yes. I agree with Mr. Earle’s criticisms of how PSE used design day calculations
9 and ignored actual forecasts for sizing equipment.

10 **Q: Mr. Earle discusses the use of the vaporizer at the Tacoma LNG facility.² Has
11 Tacoma LNG been used for its designed purpose—peak shaving to meet PSE rate payers’
12 design day criteria?**

13 **A:** Not to my knowledge.

14 **B. Response to Testimony of Betty Erdahl on Behalf of WUTC Staff (Exh. BAE-1CT)**

15 **Q: Based on your understanding of the operations of the Tacoma LNG Project,
16 what benefit does the four-mile pipeline provide to PSE’s ratepayers?**

17 **A:** The four-mile pipeline provides no benefit to PSE’s ratepayers. It is necessary now
18 only because PSE wanted to site the facility close to its nonregulated customer, TOTE Maritime,
19 requiring this pipeline to convey vaporized gas to its distribution system. As I discussed in my
20 prior testimony, there are many reasons why it would have been most beneficial to rate payers for
21 PSE to site the Tacoma LNG facility close to its supply of pipeline gas. Instead, PSE sited the
22 facility at its current location to reduce costs associated with providing LNG to its nonregulated
23 maritime fuel customer, TOTE Maritime. If the Tacoma LNG facility was constructed closer to
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25 ¹ See Exh. RLE-1CT at pp. 8-15.

26 ² See Exh. RLE-1CT at 15.

1 its source of feed gas there would be no need for rate payers to contribute to the cost of an
2 expensive and unnecessary four-mile pipeline. PSE is asking the Commission to burden rate
3 payers with the entire cost of infrastructure that PSE made necessary only to allow lower-cost
4 delivery of LNG to its maritime fuel customers, with no benefit to rate payers.

5 **Q: Is it prudent to require rate payers to assume the share of pipeline costs that**
6 **are associated with the use of the pipeline during peak shaving operations?**

7 **A:** No, because the pipeline was necessitated only to maximize profits from PSE's
8 non-regulated business, it was not prudent to construct the four-mile pipeline on behalf of
9 ratepayers. All costs associated with constructing and operating the pipeline should be disallowed.
10 Peak shaving, if and as needed, could have been accomplished without this cost had the facility
11 been sited closer to or adjacent to PSE's current gas distribution system. Therefore, it is improper
12 to use peak shaving as a justification for burdening rate payers with the costs of the pipeline.

13 **Q: Have you reviewed the allocation of costs associated with the four-mile**
14 **pipeline proposed by PSE and by WUTC Staff?**

15 **A:** Yes. My understanding is that PSE is seeking an allocation of 50 percent of pipeline
16 costs to Puget LNG and the remaining 50 percent to PSE ratepayers. WUTC Staff disagrees with
17 this proposal and recommends a different allocation—that 70.4 percent, of the costs be allocated
18 to Puget LNG while 29.6 percent of the costs be allocated to PSE, based on maximum capacity
19 and how the pipeline will be used to transport gas to and from the facility.³

20 **Q: If the Commission determines that rate payers should share a portion of the**
21 **pipeline costs, are the allocations of the pipeline costs proposed by PSE and Staff**
22 **appropriate?**

23 **A:** No. To the extent that the Commission disagrees with my rationale and determines
24 that some share of the pipeline costs should be allocated to PSE's ratepayers, the only proper
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26 ³ See Exh. BAE-1CT at 23-24; see also Exh. BAE-3.

1 allocation would be the cost of a very short pipeline that may have been needed if PSE had properly
2 sited the facility closer to its distribution system. That would be a fraction of the current four-mile
3 cost. Making a reasonable presumption that such a pipeline would not have been more than a few
4 hundred feet (say, 250 feet) had the facility been sited adjacent to PSE’s current gas distribution
5 network, the approximate cost allocation would be (250 feet/4 miles), or roughly one percent of
6 the cost of the four-mile pipeline.

7 Alternatively, basing the cost allocation on the volume of gas used for peak shaving versus
8 the volume of gas liquified for the benefit of TOTE, the cost allocation would be a similarly low
9 number—at the most a few percent.

10 **Q: Have you identified other contexts where WUTC Staff’s analysis regarding**
11 **costs that should be disallowed should be extended?**

12 **A:** Yes. If the Commission agrees with WUTC Staff’s position that costs incurred by
13 PSE related to imprudent investments in equipment that is necessary only to address gas quality
14 standards in the TOTE contract should be disallowed—there are additional costs that cannot be
15 reimbursed by rate payers under that analysis.

16 In finding that PSE did not prudently incur expenses related to the facility redesign, WUTC
17 Staff notes that “while Puget LNG may have had a need to redesign the facility with more capital-
18 intensive equipment, neither PSE nor its customers did.”⁴ The disallowance proposed by Staff is
19 insufficient, however, because it is only for the \$500,000 incurred for the redesign and not the full
20 scope of costs to construct and operate that imprudent equipment associated only with meeting
21 TOTE’s needs.

22 My prior testimony discusses PSE costs associated with the construction and operation of
23 the extra degree of pretreatment processes related to the removal of heavy hydrocarbons from the
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26 ⁴ Exh. BAE-1CT at 19.

1 LNG produced at the facility.⁵ Because there is no rate payer need for this extra pretreatment
2 stage, PSE's recovery of costs associated with the construction and operation of the extra degree
3 of pretreatment processes related to the removal of heavy hydrocarbons from the LNG produced
4 at the facility should also be disallowed.

5 **Q: Is that the extent of the costs that arise from the additional pretreatment**
6 **necessary for PSE to meet its marine fuel quality requirements rather than rate payer needs?**

7 **A:** No. Again, as noted in my prior testimony, when PSE decided to direct the excess
8 heavy hydrocarbons removed from feed gas to satisfy its marine fuel requirements, that decision
9 triggered the need to design and construct a complex and unique flare (with bypass capabilities)
10 capable of addressing the significant increase in waste gases produced by the Tacoma LNG
11 facility. Accordingly, all costs of redesign, construction, and operation of this complex and unique
12 flare, which were incurred by PSE only to accommodate the modified waste gas stream resulting
13 from such pretreatment of heavy hydrocarbons, should be allocated to PSE rather than ratepayers.⁶

14 **C. Significance of Tacoma LNG Permit Violations Disclosed by PSE in Responses to**
15 **WUTC Staff Data Requests 31 and 32.**

16 **Q: Have you reviewed PSE's Responses to WUTC Staff DRs 31 and 32?**

17 **A:** Yes. These materials became available after my September 8, 2023 testimony was
18 submitted as Exhibit RXS-1T. WUTC Staff submitted its Data Requests 31 and 32 on September
19 11, 2023, and PSE provided its responses on September 20, 2023.⁷

20 **Q: What is the subject of WUTC Staff DR 31?**

21 **A:** WUTC Staff Data Request 31 requested information from PSE regarding its
22 communications with PSCAA regarding the air permit's condition limiting Tacoma LNG to
23 producing a daily maximum of 250,000 gpd of LNG, and PSE's proposal to PSCAA regarding

24 ⁵ See Exh. RXS-1T at Section III(C)(2).

25 ⁶ See Exh. RXS-1T at Section III(D).

26 ⁷ Exh. RXS-36 (PSE Response to WUTC Staff DR 31); Exh. RXS-37 (PSE Response to WUTC Staff DR 32).

1 how the boil-off gas that is re-liquefied and recycled back into the storage tank should be factored
2 into that permit limitation.⁸

3 **Q: What is the subject of WUTC Staff DR 32?**

4 **A:** WUTC Staff Data Request 32 referred to PSE's response to Public Counsel's Data
5 Request 46, wherein PSE disclosed that the Tacoma LNG facility received Notices of Violation
6 (NOVs) from PSCAA on June 8, 2023. WUTC Staff requested details regarding the NOVs issued
7 to the Tacoma LNG facility and PSE's related communications with PSCAA.⁹

8 **Q: Have you reviewed the information NOVs issued to the Tacoma LNG facility
9 that PSE provided in response to WUTC Staff DR 32?**

10 **A:** Yes. The Tacoma LNG facility received NOVs for violations that occurred on 45
11 days during its operations between December 31, 2021 and March 30, 2023.¹⁰ Unfortunately,
12 PSCAA did not issue these NOVs promptly in response to the violations, as all the NOVs were
13 issued on the same date—May 12, 2023.

14 **Q: Why are PSE's violations of the PSCAA air permit relevant to the
15 Commission's prudence analysis?**

16 **A:** PSE Responses to WUTC Staff Data Requests 31 and 32 confirm that, despite the
17 very short duration of its operations, the Tacoma LNG has often violated several of the conditions
18 in its PSCAA air permit that are intended to protect human health and the environment. This is
19 new evidence that was not in the record at the time of my September 8, 2023 testimony, which is
20 why I was unable to address it there.

21 Based on the information in PSE's Responses noted above, I have summarized the various
22 violations identified by PSCAA in attached Exhibit RXS-38. Exhibit RXS-38 shows the date of
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24 ⁸ See Exh. RXS-36 (PSE's response contains the text of WUTC Staff's DR 36).

25 ⁹ See Exh. RXS-37 (PSE's response contains the text of WUTC Staff's DR 37).

26 ¹⁰ Exh. RXS-38 (Table summarizing NOVs issued by PSCAA to Tacoma LNG on May 12, 2023).

1 the violation and the summary reason for the violation, demonstrating that that PSE has been cited
2 for multiple types of violations, including repeated violations of the same type. Considering that
3 the first violation date is December 31, 2021, PSCAA's issuance of all NOV's more than a year
4 later was very tardy.

5 In particular, I note the multiple instances of bypass events, in which waste gases that
6 should have been flared were instead bypassed to the atmosphere without flaring. These bypass
7 events significantly increase the facility's total actual emissions. The air permit anticipates that
8 the flare at Tacoma LNG is supposed to destroy over 99% of the toxic air pollutants in the waste
9 gases. This high level of destruction efficiency is necessary for the Tacoma LNG facility to remain
10 in compliance with its permitted emission thresholds. When the flare is bypassed and Tacoma
11 LNG waste gases are released directly to the atmosphere, the facility's emissions are roughly 100
12 times higher than when the flare is properly operated. Thus, each minute of a bypass event at the
13 Tacoma LNG facility emitted the equivalent of 100 minutes of emissions during flaring.

14 These events are particularly concerning to the Tribe because PSE has repeatedly asserted
15 that this type of bypass would rarely or never occur. But we now have records demonstrating that
16 the flare was bypassed at least 30 times between December 31, 2021 and January 1, 2023. As
17 plainly evidenced by the NOV's that PSE disclosed in its responses to WUTC Staff Data Requests,
18 which are summarized in Exhibit RXS-38, PSE's claims otherwise were not credible.

19 **Q: Beyond the flare bypass occurrences, were other types of permit violations**
20 **related to the operation of the flare described in the NOV's issued by PSCAA?**

21 Yes, PSE has been unable to maintain required the minimum temperatures for various
22 flaring conditions—which are pre-requisites for ensuring that the flare is properly destroying toxic
23 air pollutants at the required efficiency. Exhibit RXS-38 shows that there have been at least 11
24 violations of the PSCAA air permit requirement to that the flare maintain minimum temperatures.
25 In each such instance, the flare was operated in a manner that would not have destroyed
26 contaminants to the degree required—resulting in the Tacoma LNG facility emitting more of these

1 contaminants that PSE had asserted would occur. Again, these NOV's confirm that PSE's
2 assertions about the lack of harm from the Tacoma LNG facility emissions are not credible.

3 Each of the permit violations noted above—whether due to flare bypass or PSE's failure
4 to maintain required minimum flare temperatures—resulted in the emission of significant
5 quantities of harmful and toxic air contaminants into the Tacoma airshed that cause direct harm to
6 the surrounding community.

7 **Q: Do the PSCAA NOV's describe violations of other permit conditions at the**
8 **Tacoma LNG facility?**

9 They do. In addition to the violations related to flare bypass and minimum operating
10 temperature, PSE violated other permit conditions throughout the short operational history of the
11 facility. Specifically, there have been repeated instances of not collected the required quantity of
12 valid monitoring data—which is essential to verify compliance; at least one instance of clearly
13 violating a permit limit for the quantity of VOCs (including harmful air toxics) allowed by the
14 permit; and a violation of a gas flow condition—namely that the facility would not use gas for
15 liquefaction that did not originate in Canada and that therefore did not reach the facility except by
16 flowing from the north.¹¹

17 **Q: Do these additional types of permit violations disparately impact the Tribe and**
18 **surrounding communities?**

19 Yes. The permit conditions are intended to be protective, so these violations all have
20 negative impacts which are most significant those living or working nearby. Violating the permit
21 limit for VOCs directly results in more emissions and more harm to the Tribe and surrounding
22 communities. Violation of the permit requirements regarding the collection of sufficient quantities
23 of valid monitoring data means that there are greater periods of time in which no one has any
24 ability to determine what was being emitted into the local airshed. More emissions could have
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26 ¹¹ See Exh. RXS-38; Exh. RXS-37.

1 been emitted than permissible during such periods of time with inadequate monitoring. And, as to
2 the violation of the southward gas flow condition (i.e., the requirement to conduct liquefaction
3 only on gas delivered from Canada) means that the composition of the gas (including the types of
4 contaminants in it) that was liquified is unknown.

5 PSE's responses to PSCAA regarding these multiple and repeated violations is some
6 variant of "we will review the root causes" or that "it won't happen again", which considering the
7 large number of repeated permit violations, is inadequate. And in that context, I note again that
8 PSCAA's very delayed issuance of the Notices of Violations in many of these instances does not
9 inspire confidence. These facts support my prior testimony that the Commission cannot rely on
10 the existence of the PSCAA air permit as confirmation that the Tacoma LNG facility is not causing
11 harm to the surrounding community. And collectively, these violations confirm that PSE's claims
12 in the past were empty and call into question the credibility of PSE's claims regarding the negative
13 externalities of the Tacoma LNG Project.

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