Rye Development

220 NW 8th Ave. Portland, OR 97209

October 29, 2020

Puget Sound Energy
355 110th Ave NE
Bellevue, WA 98004

Re: Comments of Swan Lake and Goldendale
Puget Sound Energy Integrated Resource Plan
October 20, 2020 Meeting

The companies working to develop the Swan Lake and Goldendale pumped hydro storage projects ("Swan Lake and Goldendale") greatly appreciate the information provided by Puget Sound Energy ("PSE" or the "Company") at the October 20, 2020 Integrated Resource Plan ("IRP") webinar (the "October Meeting")[1] and the opportunity to provide feedback. These comments highlight three areas where Swan Lake and Goldendale would like to better understand PSE's modeling and/or analysis approach. First, the Effective Load Carrying Capability ("ELCC") for pumped hydro storage is lower than appears reasonable. Next, Swan Lake and Goldendale would like to stress that PSE's analysis should prioritize sensitivities that are consistent with Washington State policies and goals, and in particular its Clean Energy Transformation Act ("CETA") requirements. Finally, Swan Lake and Goldendale caution that PSE must secure its much needed capacity without overbuilding renewables, which could require extraordinary new land use demands throughout the region.

The ELCC Value for Pumped Hydro Storage is Low

PSE's current ELCC calculations for pumped hydro storage range from 27 and 32 percent, which Swan Lake and Goldendale find to be quite low. As PSE itself notes in the October Meeting materials, the same ELCC in PSE's last IRP was 37 percent.[2] This variance raises questions. In an effort to better understand PSE's modeling, Swan Lake and Goldendale raise the following issues for consideration to ensure that all of the unique benefits associated with pumped hydro are accurately reflected in PSE's analysis.

Swan Lake and Goldendale are interested in seeing PSE's analysis of how pumped hydro storage compares to batteries along different saturation curves. As discussed at the October Meeting, PSE is basing its preliminary ELCC calculations on a much smaller increment of batteries than for pumped hydro storage. Comparing a 25 MW battery to a 500 MW storage project unfairly pushes pumped storage further down the ELCC saturation curve, resulting in a biased comparison. While it is true that pumped storage projects are generally larger in minimum size than battery projects,

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1 *Electric Portfolio Modeling Process, Final Power Prices, Electric Sensitivities, and Inputs and Observations from Draft Results*, webinar available at https://pse-irp.participate.online/get-involved.

2 *2021 IRP Webinar #9: Electric IRP, Analyze Alternatives & Portfolios, Electric Portfolio Model* at 30 (Oct. 20, 2020) [hereinafter *Slide Deck*] (showing ELCC EUE at 5% LOLP as 27% in 2027 and 32% in 2031).

PSE's analysis ignores the reality that PSE would not necessarily need to own or contract for the full capacity of a project. PSE may find that modeling smaller slices of a pumped hydro storage project results in a higher capacity contribution for pumped storage and lower overall cost of a portfolio that includes pumped storage. We trust that this is what PSE plans to do in its portfolio optimization, but it would be helpful, even in these preliminary studies, to put different technologies on level ground to allow for fair comparisons. We recommend that PSE provide ELCC results for 100 MW blocks of both battery and pumped hydro storage projects.

Moreover, PSE may not be looking at state of charge properly, which could explain part of the lower than expected ELCC values. If the highest priority for pumped storage is reliability, then PSE would always have the ability to charge it for its longest available durations, eight hours or more. Understanding that PSE will always prioritize reliability over economic optimization, adjustments to the state of charge modeling may be appropriate. Swan Lake and Goldendale would like to better understand PSE's perspective on how pumped hydro storage would be used operationally to understand if the ELCC modeling reflects those operational assumptions. Stated another way, assuming PSE is uninterested in economic arbitrage during winter months where there is a higher loss of load probability, PSE should confirm its ELCC modeling to reflect those operational priorities.

Finally, Swan Lake and Goldendale suggest that PSE's stochastic analysis underestimates the risk of a particular variable resource not being available when needed for reliability compared to a resource like pumped storage. PSE's modeling should also consider extended cold snaps, or other highly correlative weather events, where pumped hydro storage is likely to outperform other technologies. This is an important aspect of resource diversity. Wide variations from year to year are arguably mitigated by looking at averages, but Swan Lake and Goldendale urge PSE to better explain how it is valuing the lack of variability associated with pumped hydro storage from year to year.

Sensitivities Must Reflect CETA and Other State Goals

Swan Lake and Goldendale appreciate that PSE previously requested stakeholder input to create the list of sensitivities that PSE will use to test its resource portfolios. PSE should be applauded for encouraging stakeholder involvement in this way. At the Meeting, PSE indicated that it now had 47 potential portfolio sensitivities. PSE also shared that it would not be possible to analyze all of these sensitivities before the April 1, 2020 filing deadline and therefore requested additional input from stakeholders to help PSE prioritize its analysis.[3]

Swan Lake and Goldendale participated in PSE's survey, but are not sure how much value should be attached to representative stakeholder voting. Some of the sensitivities were misaligned with and/or not representative of Washington's carbon goals. The Company should focus on sensitivities that support the direction of State policy over potentially more popular stakeholder pet sensitivities.

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3 *See Slide Deck* at 57.

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PSE Should Also Consider Land Use Issues Pertaining to A Potential Renewables Overbuild

Swan Lake and Goldendale want to highlight a recent Energy+Environmental Economics ("E3") study that concluded the elimination of electric sector GHG emissions in the Greater NW would lead to exponential cost increases and would be impractical due to the massive renewable overbuild that would be necessary to meet the corresponding capacity needs.[4] This is particularly relevant given the passage of CETA and how unlikely any new gas projects are in the region. According to E3, the amount of land that would be needed to eliminate GHG emissions from the Greater NW electric sector by 2050 would range between 20 and 100 times the area of Portland and Seattle combined.[5] PSE should work to meet its carbon reductions without overbuilding. As a reminder, Central Montana wind has a different shape than Eastern Montana wind, which has a different shape than Southern Oregon; pumped hydro storage can help optimize diverse resource shapes and is therefore uniquely situated to help PSE avoid overbuilding.

Swan Lake and Goldendale appreciate the opportunity to comment during PSE's 2021 IRP process and look forward to working with PSE during the Washington Utilities and Transportation Commission proceedings.

Sincerely,

/s/ Nathan Sandvig

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cc: Michele Kvam, michele.kvam@pse.com

[4] Resource Adequacy in the Pacific Northwest, Serving Load Reliability Under a Changing Resource Mix at 42-57 (Jan. 2019), available at https://static1.squarespace.com/static/5e9fc98ab8d9586057ba8496/t/5ee52f8fdd4fcc4948f809e2/1592078233508/E3_NW_RA_Presentation-2018-01-05.pdf.

[5] *Id.* at 57.