

**BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION****Docket UG-230393  
Puget Sound Energy  
Tacoma LNG Tracker****PUBLIC COUNSEL DATA REQUEST NO. 040:****Re: Design Peak Temperature. PSE 2023 Gas Utility Integrated Resource Plan, Appendix D at D.13, Table D.11.**

- a. Please provide in Excel format the observations referred to in Table D.11 for both the “Previous IRP” (79 observations) and “Current 2023 Gas Utility IRP” (98 observations).
- b. What geographical location(s) are the observations in Table D.11 made at or forecasted for?
- c. Please describe how the 1-in-50 daily temperature of 13 was derived in each case.

**Response:**

- a. Attached as Attachment A to Puget Sound Energy’s (“PSE”) Response to Public Counsel Data Request No. 040 is an Excel workbook with the observations referred to in Table D.11. The “Previous IRP” observations are in the first table. The “Current 2023 Gas Utility IRP” observations are in the second table. Please note that the second table contains a mix of actual observations and modeled projections. In preparing this response, it was discovered that the number of observations referenced, as stated in the Gas Utility Integrated Resource Plan are incorrect. It should have been stated as: “Previous IRP” (70 observations) and “Current 2023 Gas Utility IRP” (120 observations), where “observations” refers to the number of numerical values used in the percentile equation. Since future climate is uncertain model projections were used from three climate models, as well as historical actuals, for a 40 year period, resulting in 120 “observations” that were used to calculate a 1-in-50 percentile.
- b. The geographic location for the observations and for the modeled projections is National Oceanic and Atmospheric Administration’s (“NOAA”) Seattle-Tacoma Airport weather station in Washington State.
- c. The “1-in-50 daily temperature” was derived by first averaging all of the hourly data within a day to create the daily temperature. Next, the Excel function “percentile” was used to get the 1-in-50 occurrence. Attached as Attachment A to PSE’s Response to Public Counsel Data Request No. 040 is the underlying calculation provided in cells K7 and K8.

# **ATTACHMENT A to PSE's Response to Public Counsel Data Request No. 040**

Previous IRP methodology	
Actual SeaTac Observations	
Year	Coldest average daily temperature Temperature (F)
1950	12.04
1951	20.71
1952	22.08
1953	33.71
1954	23.25
1955	15.54
1956	17.83
1957	19.79
1958	32.25
1959	19.08
1960	28.54
1961	27.21
1962	22.08
1963	17.21
1964	13.04
1965	31.83
1966	33.46
1967	30.96
1968	12.50
1969	19.33
1970	31.83
1971	28.75
1972	19.29
1973	22.54
1974	26.21
1975	30.13
1976	30.83
1977	27.79
1978	18.75
1979	25.54
1980	23.50
1981	32.58
1982	20.33
1983	16.96
1984	26.63
1985	19.42
1986	28.88
1987	30.96
1988	31.33
1989	13.67
1990	15.71
1991	31.33
1992	29.50
1993	26.21
1994	28.33
1995	30.08
1996	22.92
1997	27.58
1998	20.13
1999	32.50
2000	32.21
2001	32.50
2002	31.58
2003	30.25
2004	22.88
2005	31.38
2006	23.92
2007	24.54
2008	21.71
2009	24.17
2010	20.88
2011	25.79
2012	28.21
2013	25.33
2014	25.17
2015	32.42
2016	28.33
2017	27.04
2018	30.33
2019	26.63

Current 2023 Gas Utility IRP methodology				
Actual SeaTac Observations and Modeled SeaTac				
Coldest average daily temperature				
	CanESM*	CCSM*	CNRM*	
Year	Temperature (F)	Temperature (F)	Temperature (F)	
2010	20.88	20.88	20.88	
2011	25.79	25.79	25.79	
2012	28.21	28.21	28.21	
2013	25.33	25.33	25.33	
2014	25.17	25.17	25.17	
2015	32.42	32.42	32.42	
2016	28.33	28.33	28.33	
2017	27.04	27.04	27.04	
2018	30.33	30.33	30.33	
2019	26.63	26.63	26.63	
2020	29.31	29.16	13.34	
2021	26.86	28.76	15.08	
2022	29.99	35.28	7.22	
2023	33.27	34.31	29.42	
2024	28.29	33.53	29.10	
2025	31.16	35.22	36.43	
2026	31.77	30.02	30.17	
2027	23.85	22.91	21.47	
2028	26.28	31.68	28.34	
2029	34.52	34.36	33.77	
2030	30.54	29.57	29.81	
2031	36.82	25.75	23.35	
2032	29.80	26.15	21.70	
2033	29.64	34.42	13.73	
2034	24.51	23.56	36.62	
2035	31.15	27.41	38.67	
2036	33.77	34.54	33.31	
2037	35.16	25.67	22.37	
2038	26.50	23.24	14.66	
2039	26.59	25.45	25.89	
2040	29.24	28.27	22.07	
2041	32.23	33.66	19.37	
2042	29.24	28.02	18.42	
2043	37.07	36.51	19.72	
2044	22.83	27.29	31.56	
2045	25.45	24.45	28.44	
2046	28.06	31.93	32.48	
2047	34.35	32.56	22.42	
2048	33.03	28.76	(1.12)	
2049	31.48	22.59	18.71	

Data Set	Years Used	1-in-50 Daily Temperatures (F)
Previous IRP	1950-2019	13
Current 2023 Gas Utility IRP (Includes Climate Change)	2010-2049	13

\*CanESM, CCSM and CNRM are names of global climate models. Actual SeaTac data was used for years 2010-2019 and global climate model data was used for years 2020-2049.