577068

Sandia National Laboratories

Operated for the U.S. Department of Energy

By: **Sandia Corporation**

Carlsbad, New Mexico 88220

date: March 29, 2022

to: Records Center

from: Mike Farinacci, SNL Contractor

subject: 2021 Calculated Densities

The groundwater densities for the WIPP Culebra monitoring wells were calculated for 2021 as described in the Activity/Project Specific Procedure (SP) 9-11 *Calculation of Densities for Groundwater in WIPP Wells, Revision 3*. The derivation of the data is explained in the following sections and supporting data are attached.

1. Calculation Process:

As stated in SP 9-11, for each calculation the observed water pressure is divided by the height of the water column. Specifically, the measured pressure value minus the closest corresponding barometric pressure value was divided by the pressure gauge install depth minus the closest corresponding depth to water (from or adjusted to the same measurement point elevation), and that result was then divided by 0.4335 (psi to feet of water conversion at 4°C, at which temperature the density of pure water is 1.000 g/cm^3). The individual calculated density results for each well were then averaged for a final density value.

The density data are included in the *2021 Calculated Densities.xlsx* workbook file created in Excel. Within that workbook, the worksheet *2021 Calc Dens* summarizes the resulting density values and supporting information for the calculated densities, and the worksheet *2021 Calc Dens Formulas* provides the formulas in the worksheet. In addition, the Excel file contains individual well worksheets that include the data used for the calculations and plots of the pressure gauge pressure data. The columns in the worksheets and their contents are described below:

- A – Monitor Well – Well name
- B – 2021 Avg Calc Dens (g/cm^3) – Average calculated density value for 2021
- C – 2021 Specific Gravity (Reference: Freshwater at 70°F) – Average calculated density value for 2021 divided by 0.998 g/cm^3 to represent specific gravity in reference to freshwater at 70°F
- D – 2020 Avg Calc Dens (g/cm^3) – Average calculated density value for 2020
- E – 2021 - 2020 Difference (g/cm^3) – Difference between 2021 and 2020 calculated densities (Column B - Column D)
- F – # of Dens Averaged – number of density values averaged to get the final value
- G – 2021 Timeframe of Data – Time period for pressure data used in calculations
- H – Pressure Gauge File Name (Gauge SN) – File name for pressure data and INW or In-Situ gauge serial number

Information Only

- I – Pressure Gauge Install Depth (ft BTOC/BTEC/BTOT) – Depth below primary measuring point at which the pressure gauge was installed
- J – Pressure Gauge Ideal Install Depth (ft BTOC/BTEC/BTOT) – Mid-Culebra depth below top of referenced casing
- K – Length Off Ideal Depth (ft) – Depth in feet that the pressure gauge is installed below or above the ideal (Column I - Column J)
- L – Date of Install – Date(s) the pressure gauge(s) was/were installed
- M – Installation Logbook Page – Reference to scientific notebook(s) and page(s) where the pressure gauge installation(s) is/are documented
- N – Comments/Explanations – Comments and/or explanations regarding data, as needed

The spreadsheet entries were verified by Tricia Johnson (8882) and Shelly Nielsen (8880).

2. Identification/Listing of Input, Input sources, and Output:

- Excel workbook including the data – 2020 Calculated Densities.xls
  - Worksheet 1 – 2021 Calc Dens
  - Worksheet 2 – 2021 Calc Dens Formulas
  - Worksheet 3 – Baro Data
  - Worksheet 4 – AEC-7R
  - Worksheet 5 – C-2737
  - Worksheet 6 – ERDA-9
  - Worksheet 7 – H-4bR
  - Worksheet 8 – H-6bR
  - Worksheet 9 – H-9bR
  - Worksheet 10 – H-10cR
  - Worksheet 11 – H-11b4R
  - Worksheet 12 – H-12R
  - Worksheet 13 – H-15R
  - Worksheet 14 – H-16
  - Worksheet 15 – H-19b0
  - Worksheet 16 – IMC-461
  - Worksheet 17 – SNL-1
  - Worksheet 18 – SNL-2
  - Worksheet 19 – SNL-3
  - Worksheet 20 – SNL-5
  - Worksheet 21 – SNL-6
  - Worksheet 22 – SNL-8
  - Worksheet 23 – SNL-9
  - Worksheet 24 – SNL-10
  - Worksheet 25 – SNL-12
  - Worksheet 26 – SNL-13
  - Worksheet 27 – SNL-14
  - Worksheet 28 – SNL-15
  - Worksheet 29 – SNL-16
  - Worksheet 30 – SNL-17a
  - Worksheet 31 – SNL-18
  - Worksheet 32 – SNL-19
  - Worksheet 33 – WIPP-11R
  - Worksheet 34 – WQSP-1
  - Worksheet 35 – WQSP-2
  - Worksheet 36 – WQSP-3

3. Data Qualification for Compliance Decision Analysis:

Data sources are documented in Column H (Pressure Gauge File Name (Gauge SN)), Column M (Installation Logbook Page), and in the References Section of this memorandum.

4. Software Used:

Dell Precision 7920, Intel® Xeon® Gold 6230R CPU, Windows 10 Enterprise, Microsoft 365 Apps for enterprise

5. Reviews:

Technical: Tricia Johnson, 8882
QA: Shelly Nielsen, 8880

6. References:

Information Only

- Pressure gauge installation data and SNL water level data from the following scientific notebooks (package ERMS 543277):
  Long-Term Monitoring Notebook (LTM)-32
  Long-Term Monitoring Notebook (LTM)-33
  Long-Term Monitoring Notebook (LTM)-34
  Long-Term Monitoring Notebook (LTM)-35
- RES Water Level Data submitted to SNL in monthly memoranda (package ERMS 525178)
- Johnson, Patricia B., Culebra Center Depths for Use in Calculating Equivalent Freshwater Heads of the Culebra Dolomite Member of the Rustler Formation near the WIPP Site, Revision 3, June 10, 2010 (ERMS 553781)
- Pressure Transducer Calibration Certificates (INW Certificates ERMS 558531, Troll Certificates ERMS 506685)
  - Post-calibration certificates for SNL-5 and SNL-8 were erroneously deleted, but the data are inline with historical data and are deemed to be representative of the pressure in the well.

7. List of Attachments:

1. Printout of Excel file worksheet 2021 Calc Dens.xls
2. Printout of Excel file worksheet 2021 Calc Dens Formulas.xls
3. All is archived at /data/cvs/CVSLIB/WIPP_EXTERNAL/SP911_2021
4. Digital copies of pages used from LTM-32, LTM-33, LTM-34, and LTM-35 in PDF package

WIPP:4.4.2.3.1:TD:QA-L:RECERT:541153

Information Only

2021 Calculated Densities

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Monitor Well	2021 Avg Calc Dens (g/cm^3)	2021 Specific Gravity (Reference: Freshwater at 70°F)	2020 Avg Calc Dens (g/cm^3)	2021 - 2020 Difference (g/cm^3)	# of Dens Averaged	2021 Timeframe of Data	Pressure Gauge File Name (Gauge SN)	Pressure Gauge Install Depth (ft BTOC/BTEC/ BTOT)	Pressure Gauge Ideal Install Depth (ft BTOC/BTEC/ BTOT)	Length Off Ideal Depth (ft)	Date of Install	Installation Logbook Page	Comments/Explanations
AEC-7R	1.067	1.069	1.065	0.002	8	Mar - Jun	AEC-7R C20 011320 (21918012)	866.00	868.98	-2.98	1/13/2021	LTM-33 pg 133	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
C-2737	1.026	1.028	1.022	0.004	8	Aug - Nov	C-2737 C40 070221 (21830039)	688.85	689.78	-0.93	7/2/2021	LTM-34 pg 119	
ERDA-9	1.073	1.075	1.072	0.001	8	Aug - Nov	ERDA-9 C30 060721 (21237047)	717.20	717.81	-0.61	6/7/2021	LTM-34 pg 99	
H-4bR	1.021	1.023	1.018	0.003	8	Aug - Nov	H-4bR C23 052121 (21918011), H-4bR C24 081021 (21830038)	507.90	507.72	0.18	5/21/2021,8/10/2021	LTM-34 pg 92, LTM-34 pg 144	
H-5bR	Not Available --DTW measurements were not available during pumping tests and while pump was installed												
H-6bR	1.038	1.040	1.037	0.001	8	May - Oct	H-6bR C24 050521 (21927001), H-6bR C25 092121 (21534011)	616.60	616.58	0.02	5/5/2021, 9/21/2021	LTM-34 pg 68, LTM-35 pg 24	Dates chosen for density calculation reflects available data in the time series.
H-9bR	1.002	1.004	1.000	0.002	8	Aug - Dec	H-9BR C21 081021 (21918008)	660.54	660.47	0.07	8/10/2021	LTM-34 pg 142	
H-10cR	1.089	1.091	1.087	0.002	8	Aug - Nov	H-10CR C17 071621_Append_2021-12-14_09-15-34-567 (793273)	1374.10	1368.38	5.72	7/16/2021	LTM-34 pg 135	File name in logbook is shorter due to test download/append date not being added yet.
H-11b4R	1.079	1.081	1.077	0.002	8	Aug - Nov	H-11b4R C22 060721 (6202173)	735.85	736.72	-0.87	6/7/2021	LTM-34 pg 97	
H-12R	1.103	1.105	1.101	0.002	8	Aug - Nov	H-12R C18 112420 (8200113)	835.80	834.69	1.11	11/24/2020	LTM-33 pg 102	
H-15R	1.124	1.126	1.124	0.000	8	May - Aug	H-15R C25 030221 (6202180)	872.50	872.57	-0.07	3/2/2021	LTM-34 pg 30	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
H-16	1.030	1.032	1.031	-0.001	7	Mar - Nov	H-16 C17 030521 (6202183)	715.10	714.50	0.60	3/5/2021	LTM-34 pg 35	Construction of nearby well restricted access to well for water levels
H-19b0	1.065	1.067	1.065	0.000	8	Aug - Nov	H-19B0 C32 020321 (8200116)	754.00	753.49	0.51	2/3/2021	LTM-34 pg 8	
IMC-461	0.997	0.999	0.996	0.001	8	Aug - Nov	IMC-461 C38 020321 (21237011)	376.50	376.10	0.40	2/3/2021	LTM-34 pg 11	
SNL-1	1.029	1.031	1.030	-0.001	8	Jun - Sep	SNL-1 C41 030221 (21237068)	612.90	612.23	0.67	3/2/2021	LTM-34 pg 28	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-2	1.009	1.011	1.007	0.002	8	Aug - Nov	SNL-2 C47 062121 (6202168)	470.70	470.69	0.01	6/21/2021	LTM-34 pg 116	
SNL-3	1.027	1.029	1.027	0.000	8	Aug - Nov	SNL-3 C32 071621 (21918013)	766.50	766.19	0.31	7/16/2021	LTM-34 pg 138	
SNL-5	1.005	1.007	1.004	0.001	8	Aug - Dec	SNL-5 C44 081821 (6202190)	649.00	648.84	0.16	8/18/2021	LTM-35 pg 13	
SNL-6	1.259	1.262	1.230	0.029	8	Aug - Nov	SNL-6 C30 062121_Append_2021-12-15_09-26-15-458 (539743)	1298.20	1338.03	-39.83	6/21/2021	LTM-34 pg 117	File name in logbook is shorter due to test download/append date not being added yet.
SNL-8	1.090	1.092	1.088	0.002	8	May - Oct	SNL-8 C54 030221 (21933001), SNL-8 C55 081821 (6202177)	969.70	968.56	1.14	3/2/2021, 8/18/2021	LTM-34 pg 33, LTM-35 pg 15	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-9	1.015	1.017	1.016	-0.001	8	Jun - Nov	SNL-9 C42 020321 (8200111), SNL-9 C43 081721 (21830026)	567.20	566.07	1.13	2/3/2021, 8/17/2021	LTM-34 pg 10, LTM-35 pg 6	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-10	1.011	1.013	1.010	0.001	8	Apr - Oct	SNL-10 C33 071320 (21830039), SNL-10 C34 080521 (21741069)	613.50	612.53	0.97	7/13/2020, 8/5/2021	LTM-32 pg 128, LTM-34 pg 140	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-12	1.010	1.012	1.008	0.002	8	Aug - Nov	SNL-12 C34 112420 (8200115)	570.90	570.68	0.22	11/24/2020	LTM-33 pg 101	
SNL-13	1.024	1.026	1.020	0.004	8	Aug - Nov	SNL-13 C37 111620 (8203060), SNL-13 C38 101921 (21918009)	401.00	400.62	0.38	11/16/2020, 10/19/2021	LTM-33 pg 86, LTM-35 pg 54	
SNL-14	1.043	1.045	1.043	0.000	8	Jan- Apr	SNL-14 C42 082620 (3200499)	668.95	668.95	0.00	8/26/2020	LTM-33 pg 25	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-15	1.230	1.232	1.232	-0.002	8	Sep - Dec	SNL-15 C41 081921 (6202189)	922.18	922.18	0.00	8/19/2021	LTM-35 pg 17	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-16	1.015	1.017	1.016	-0.001	8	Aug - Dec	SNL-16 C38 081021 (21237005)	207.86	207.86	0.00	8/10/2021	LTM-34 pg 141	
SNL-17a	1.013	1.015	1.012	0.001	8	Jul - Nov	SNL-17A C36 091420 (21237007), SNL-17A C37 072821 (21237010)	349.60	349.93	-0.33	9/14/2020, 7/28/2021	LTM-33 pg 29, LTM-34 pg 139	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-18	1.011	1.013	1.008	0.003	8	Aug - Nov	SNL-18 C42 030221 (21549048)	549.30	549.30	0.00	3/2/2021	LTM-34 pg 27	
SNL-19	1.004	1.006	1.002	0.002	8	Aug - Nov	SNL-19 C30 030221 (21933004)	355.10	354.19	0.91	3/2/2021	LTM-34 pg 25	
WIPP-11R	1.030	1.032	1.029	0.001	5	May - Jul	WIPP-11R C2 050521 (21237052)	853.14	853.14	0.00	5/5/2021	LTM-34 pg 70	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
WIPP-13	Not Available -- Well Plugged and Abandoned March 2021												
WQSP-1	1.042	1.044	1.042	0.000	8	Feb - Nov	WQSP-1 C3 012621 (8200114), WQSP-1 C5 082521 (6202188)	707.00	710.68	-3.68	1/26/2021, 8/25/2021	LTM-33 pg 144, LTM-35 pg 18	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
WQSP-2	1.031	1.033	1.032	-0.001	8	Jan - Dec	WQSP-2 C3 082720 (21741067), WQSP-2 C5 082521 (3200497)	814.00	822.20	-8.20	8/27/2020, 8/25/2021	LTM-33 pg 26, LTM-35 pg 19	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
WQSP-3	1.139	1.141	1.140	-0.001	7	Jan - Dec	WQSP-3 C4 092420 (3200500), WQSP-3 C6 082521 (6202178)	849.00	857.39	-8.39	9/24/2020, 8/25/2021	LTM-33 pg 48, LTM-35 pg 19	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.

Notes:
All pressure gauges except H-10cR and SNL-6 are INW brand and cables are all non-vented
H-10cR and SNL-6 pressure gauges are InSitu brand
Barometric data are from INW gauges - SN 21237000 and SN 21237002
ft BTOC = feet below top of casing
ft BTEC = feet below top of environmental casing
ft BTOT = feet below top of tubing
LTM = Long-Term Monitoring
PT = Pressure Transducer
NA = Not available
Mid Depths are from ERMS 553781, except for AEC-7R, H-9bR, H-11b4R, H-5bR, WIPP-11R, and H-12R, which are from RES BDRs and/or construction diagrams, and WQSP wells which are from DOE-WIPP-95-2154

Information Only

2021 Calculated Densities

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Monitor Well	2021 Avg Calc Dens (g/cm^3)	2021 Specific Gravity (Reference: Freshwater at 70°F)	2020 Avg Calc Dens (g/cm^3)	2021 - 2020 Difference (g/cm^3)	# of Dens Averaged	2021 Timeframe of Data	Pressure Gauge File Name (Gauge SN)	Pressure Gauge Install Depth (ft BTOC/BTEC/ BTOT)	Pressure Gauge Ideal Install Depth (ft BTOC/BTEC/ BTOT)	Length Off Ideal Depth (ft)	Date of Install	Installation Logbook Page	Comments/Explanations
AEC-7R	1.067	1.069	1.065	0.002	8	Mar - Jun	AEC-7R C20 011320 (21918012)	866.00	868.98	-2.98	1/13/2021	LTM-33 pg 133	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
C-2737	1.026	1.028	1.022	0.004	8	Aug - Nov	C-2737 C40 070221 (21830039)	688.85	689.78	-0.93	7/2/2021	LTM-34 pg 119	
ERDA-9	1.073	1.075	1.072	0.001	8	Aug - Nov	ERDA-9 C30 060721 (21237047)	717.20	717.81	-0.61	6/7/2021	LTM-34 pg 99	
H-4bR	1.021	1.023	1.018	0.003	8	Aug - Nov	H-4bR C23 052121 (21918011), H-4bR C24 081021 (21830038)	507.90	507.72	0.18	5/21/2021,8/10/2021	LTM-34 pg 92, LTM-34 pg 144	
H-5bR	Not Available --DTW measurements were not available during pumping tests and while pump was installed												
H-6bR	1.038	1.040	1.037	0.001	8	May - Oct	H-6bR C24 050521 (21927001), H-6bR C25 092121 (21534011)	616.60	616.58	0.02	5/5/2021, 9/21/2021	LTM-34 pg 68, LTM-35 pg 24	Dates chosen for density calculation reflects available data in the time series.
H-9bR	1.002	1.004	1.000	0.002	8	Aug - Dec	H-9BR C21 081021 (21918008)	660.54	660.47	0.07	8/10/2021	LTM-34 pg 142	
H-10cR	1.089	1.091	1.087	0.002	8	Aug - Nov	H-10CR C17 071621_Append_2021-12-14_09-15-34-567 (793273)	1374.10	1368.38	5.72	7/16/2021	LTM-34 pg 135	File name in logbook is shorter due to test download/append date not being added yet.
H-11b4R	1.079	1.081	1.077	0.002	8	Aug - Nov	H-11b4R C22 060721 (6202173)	735.85	736.72	-0.87	6/7/2021	LTM-34 pg 97	
H-12R	1.103	1.105	1.101	0.002	8	Aug - Nov	H-12R C18 112420 (8200113)	835.80	834.69	1.11	11/24/2020	LTM-33 pg 102	
H-15R	1.124	1.126	1.124	0.000	8	May - Aug	H-15R C25 030221 (6202180)	872.50	872.57	-0.07	3/2/2021	LTM-34 pg 30	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
H-16	1.030	1.032	1.031	-0.001	7	Mar - Nov	H-16 C17 030521 (6202183)	715.10	714.50	0.60	3/5/2021	LTM-34 pg 35	Construction of nearby well restricted access to well for water levels
H-19b0	1.065	1.067	1.065	0.000	8	Aug - Nov	H-19B0 C32 020321 (8200116)	754.00	753.49	0.51	2/3/2021	LTM-34 pg 8	
IMC-461	0.997	0.999	0.996	0.001	8	Aug - Nov	IMC-461 C38 020321 (21237011)	376.50	376.10	0.40	2/3/2021	LTM-34 pg 11	
SNL-1	1.029	1.031	1.030	-0.001	8	Jun - Sep	SNL-1 C41 030221 (21237068)	612.90	612.23	0.67	3/2/2021	LTM-34 pg 28	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-2	1.009	1.011	1.007	0.002	8	Aug - Nov	SNL-2 C47 062121 (6202168)	470.70	470.69	0.01	6/21/2021	LTM-34 pg 116	
SNL-3	1.027	1.029	1.027	0.000	8	Aug - Nov	SNL-3 C32 071621 (21918013)	766.50	766.19	0.31	7/16/2021	LTM-34 pg 138	
SNL-5	1.005	1.007	1.004	0.001	8	Aug - Dec	SNL-5 C44 081821 (6202190)	649.00	648.84	0.16	8/18/2021	LTM-35 pg 13	
SNL-6	1.260	1.263	1.230	0.030	8	Aug - Nov	SNL-6 C30 062121_Append_2021-12-15_09-26-15-458 (539743)	1298.02	1338.03	-40.01	6/21/2021	LTM-34 pg 117	File name in logbook is shorter due to test download/append date not being added yet.
SNL-8	1.090	1.092	1.088	0.002	8	May - Oct	SNL-8 C54 030221 (21933001), SNL-8 C55 081821 (6202177)	969.70	968.56	1.14	3/2/2021, 8/18/2021	LTM-34 pg 33, LTM-35 pg 15	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-9	1.015	1.017	1.016	-0.001	8	Jun - Nov	SNL-9 C42 020321 (8200111), SNL-9 C43 081721 (21830026)	567.20	566.07	1.13	2/3/2021, 8/17/2021	LTM-34 pg 10, LTM-35 pg 6	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-10	1.011	1.013	1.010	0.001	8	Apr - Oct	SNL-10 C33 071320 (21830039), SNL-10 C34 080521 (21741069)	613.50	612.53	0.97	7/13/2020, 8/5/2021	LTM-32 pg 128, LTM-34 pg 140	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-12	1.010	1.012	1.008	0.002	8	Aug - Nov	SNL-12 C34 112420 (8200115)	570.90	570.68	0.22	11/24/2020	LTM-33 pg 101	
SNL-13	1.024	1.026	1.020	0.004	8	Aug - Nov	SNL-13 C37 111620 (8203060), SNL-13 C38 101921 (21918009)	401.00	400.62	0.38	11/16/2020, 10/19/2021	LTM-33 pg 86, LTM-35 pg 54	
SNL-14	1.043	1.045	1.043	0.000	8	Jan- Apr	SNL-14 C42 082620 (3200499)	668.95	668.95	0.00	8/26/2020	LTM-33 pg 25	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-15	1.230	1.232	1.232	-0.002	8	Sep - Dec	SNL-15 C41 081921 (6202189)	922.18	922.18	0.00	8/19/2021	LTM-35 pg 17	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-16	1.015	1.017	1.016	-0.001	8	Aug - Dec	SNL-16 C38 081021 (21237005)	207.86	207.86	0.00	8/10/2021	LTM-34 pg 141	
SNL-17a	1.013	1.015	1.012	0.001	8	Jul - Nov	SNL-17A C36 091420 (21237007), SNL-17A C37 072821 (21237010)	349.60	349.93	-0.33	9/14/2020, 7/28/2021	LTM-33 pg 29, LTM-34 pg 139	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
SNL-18	1.011	1.013	1.008	0.003	8	Aug - Nov	SNL-18 C42 030221 (21549048)	549.30	549.30	0.00	3/2/2021	LTM-34 pg 27	
SNL-19	1.004	1.006	1.002	0.002	8	Aug - Nov	SNL-19 C30 030221 (21933004)	355.10	354.19	0.91	3/2/2021	LTM-34 pg 25	
WIPP-11R	1.030	1.032	1.029	0.001	5	May - Jul	WIPP-11R C2 050521 (21237052)	853.14	853.14	0.00	5/5/2021	LTM-34 pg 70	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
WIPP-13	Not Available -- Well Plugged and Abandoned March 2021												
WQSP-1	1.042	1.044	1.042	0.000	8	Feb - Nov	WQSP-1 C3 012621 (8200114), WQSP-1 C5 082521 (6202188)	707.00	710.68	-3.68	1/26/2021, 8/25/2021	LTM-33 pg 144, LTM-35 pg 18	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
WQSP-2	1.031	1.033	1.032	-0.001	8	Jan - Dec	WQSP-2 C3 082720 (21741067), WQSP-2 C5 082521 (3200497)	814.00	822.20	-8.20	8/27/2020, 8/25/2021	LTM-33 pg 26, LTM-35 pg 19	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.
WQSP-3	1.139	1.141	1.140	-0.001	7	Jan - Dec	WQSP-3 C4 092420 (3200500), WQSP-3 C6 082521 (6202178)	849.00	857.39	-8.39	9/24/2020, 8/25/2021	LTM-33 pg 48, LTM-35 pg 19	Due to equipment failures during the targeted time frame, a more representative data timeframe was utilized.

Notes:
All pressure gauges except H-10cR and SNL-6 are INW brand and cables are all non-vented
H-10cR and SNL-6 pressure gauges are InSitu brand
Barometric data are from INW gauges - SN 21237000 and SN 21237002
ft BTOC = feet below top of casing
ft BTEC = feet below top of environmental casing
ft BTOT = feet below top of tubing
LTM = Long-Term Monitoring
PT = Pressure Transducer
NA = Not available
Mid Depths are from ERMS 553781, except for AEC-7R, H-9bR, H-11b4R, H-5bR, WIPP-11R, and H-12R, which are from RES BDRs and/or construction diagrams, and WQSP wells which are from DOE-WIPP-95-2154

Information Only