

# NYE County NWRPO -Technical Data Report

RID No.	Transmitter	Org.	Receiver	Org.	Key word1	Title/Description
6409	Gilmore	Nye County	QARC	Nye	19IM1	EWDP-19IM1 Westbay Data, 1/24/03 - 4/15/03

**Doc. Date** 10/22/2004    **General Doc. Type** QA Program Doc    **Keyword2** WB  
**Entry Date** 11/3/2004    **Detailed Doc. Type** Data    **Keyword3** Data

**Data Originator** Tom Buqo  
**Preparer**  
**Title of Data** EWDP-19IM1 Westbay Data, 1/24/03 - 4/15/03

**Description of Data** One CD containing an Excel file "041503\_19IM1QA.xls". This file contains probe pressure data for atmospheric pressure for probe 0, calculated water elevations for zones 1, 2, 3, 4 and 5, and temperature data for probes 0, 1, 2, 3, 4 and 5 for the period from 1/24/03 to 4/15/03 collected at Phase III EWDP-19IM1 Westbay instrumented well.

**Data Collection Method** Westbay Mosdax Datalogger and pressure and temperature probes

**Data Location(s)** NC-EWDP-19IM1

**Data Collection Period(s)** 1/24/03 to 4/15/03

**Data Source(s)** Westbay datalogger SN 2765 (Probe 0 - atmospheric); two 250 psi probes - Probe 1 SN 2615, and Probe 2 SN 2616; two 500 psi probes - Probe 3 SN 2617 and Probe 4 SN 2618; and one 1000 psi probe - Probe 5 SN 2458.  
 Probe 1 depth = 415.07 ft  
 Probe 2 depth = 519.38 ft  
 Probe 3 depth = 618.78 ft  
 Probe 4 depth = 767.44 ft  
 Probe 5 depth = 886.61 ft  
 Depths reflect measured values from the well ground surface to the subject measurement port.

Supporting Data: original Westbay pressure and temperature data can be found in RIDs 5540 and 5614; Well Completion Diagram in RID 5259; Wellhead Protection Detail in RID 5572; Summary Westbay Casing Log in RID 4819; and field notes in Scientific Notebooks #143 (Rid 5522) and #155 (RID 6350).

**Data Censoring** No data were censored; however, there are limitations associated with the use of these data because of unexplained fluctuations.

**Data Processing** The water elevation (ft, amsl [above mean sea level]) in a Westbay isolated zone is calculated from the pressure probe measurement (lb/ft<sup>2</sup>) below the water table by subtracting the atmospheric pressure measurement (lb/ft<sup>2</sup>) at the ground surface from the pressure measurement, dividing the result by the specific weight (lb/ft<sup>3</sup>) of water at 15 degrees Celsius, and adding to this result the elevation (ft, amsl) of the probe. This calculation is made prior to submitting a QA processed data file to the Quality Assurance Records Center (QARC).

**Data Limitations** EWDP-19IM1 Westbay data limitations (data collection period 1/24/03 to 4/15/03). The following text contains additional information necessary for interpretation of the attached water elevation and temperature data. Time frames are listed for each activity. Certain activities, such as equipment testing or water sampling, may have impacted the data and the data analyzer should be aware of this.

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4/7/03 2:00 - 4/15/03 9:24 - data gap due to a datalogger malfunction.

There were a number of significant fluctuations in the water level data for Probes 1-3. Attachment 1 shows charts of atmospheric pressure, seismic events, water level elevation, and temperature for Zones 1 through 5. A comparison between the atmospheric probes and water level elevations was done to identify anomalies (where water level trends were inconsistent with barometric trends. Nine anomalies were identified and are labeled A through I on the Groundwater Elevation chart (middle chart). Observations regarding these anomalies are as follows:

A - Step decline in Pressure Probes 1, 2, and 3 on 1/27/03. - There were two minor seismic events on 1/25/03 and 1/28/03 but these events do not correspond with the step decline. No decline in water levels was observed in the data for Pressure Probes 4 and 5 on 1/27/03. There was a small increase in Temperature Probe 2 that corresponds with the decline in Pressure Probes 1, 2, and 3 but no change in the other four temperature probes. The reason for this decline is not known. A review of the data by Westbay® technical representatives concluded that the observed decline is a "real hydraulic event". However, Pressure Probe 2 does not show the variability after the sudden drop suggesting that the cause of this anomaly is either electronic (a step in the data logger) or physical (consolidation of the gravel pack).

B - Sharp decline, rise, and decline in Pressure Probes 1, 2, and 3 and slight decline in Pressure Probe 4 on 2/7-8/03 - There were no seismic events during this period. There were slight increases in Temperature Probe 2 and a corresponding slight decrease in Temperature Probe 1. The reason for this decline is not known. A review of the data by Westbay® technical representatives concluded that the observed decline is a "real hydraulic event". Again, the Pressure Probe 2 water level data does not exhibit the variability indicated in Probes 1 and 3 suggesting a mechanical or physical problem.

C - Sharp decline in Pressure Probes 1 and 2, slight decline in Pressure Probe 3, and very slight decline in Pressure Probe 4 on 2/22/03. - There were no seismic events during this period. There were slight increases in Temperature Probes 1 and 2. The reason for this decline is not known. A review of the data by Westbay® technical representatives concluded that the observed decline is a "real hydraulic event". Unlike anomalies A and B, this anomaly is also distinct in the Pressure Probe 4 data set.

D - Significant rise in Pressure Probe 1 on 2/28/03 through 3/4/03. - There were no seismic events during this period and no other rises in the other four pressure probes. There was a corresponding rise in Temperature Probe 1 but not in any of the other four temperature probes. Precipitation was recorded at the Mercury Desert Rock Airstrip on Feb 12, 13, 14, 15, 25, 26, and 28, and March 2, 2003. If precipitation occurred over Buckboard Mesa or Jackass Flat during this time frame, it could be the cause of the observed water level rise.

E - Moderate peak in Pressure Probe 1 and Temperature Probe 1 on 3/24-25/03. - There were no seismic events during this period. There were no corresponding increases in any of the other pressure or temperature probes. Precipitation was recorded at the Mercury Desert Rock Airstrip on March 2,5,16,17, and 18. If precipitation occurred over Buckboard Mesa or Jackass Flat during the March 18 through March 24 time frame, it could be the cause of the observed water level rise.

F - Large increase in Pressure Probe 1 and Temperature Probe 1 coincident with sharp peak in Temperature Probe 1, and slight increase in Pressure Probe 2 coincident with beginning of decline in Temperature Probe 2. Both occurred on 4/4/03. - There was a minor seismic event on 4/5/03 14:18, after the water level and temperature increases. Starting at 4/4/03 21:20, there was a 1.47 ft rise in Pressure Probe 1 from the 21:00 reading; a 0.21 rise in Pressure Probe 2; no change in Pressure Probes 3 or 4; and a 0.07 rise in Pressure Probe 4. A sharp peak in Temperature Probe 1 records began at same time and peaked at 23:40 on 4/4/03. A decrease in Temperature Probe 2 records began on 4/4/03 at 23:20 and continuing through the period of record. The seismic event is the likely cause of the observed water level rise. Manual water level measurements taken in Zones 1 through 5 on 1/23/03 and 7/10/03 (RID 6360) indicate a rises in the water levels between the two measurements ranging from 7.1 ft for Zone 1 to 0.6 ft for Zone 5. These manual measurements verify a marked water level rise. Data from the period 4/3/03 to 4/15/03 should be used with caution and should be evaluated in conjunction with data collected after 4/15/03.

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G - Slight peak in Pressure Probe 1 and slight rise in Temperature Probes 2 and 4 on 1/28/03. - A minor seismic event on 2/18/03 may be related. The rise in water levels was very slight and should not pose any limitations on the use of the data.

H and I - Two slight peaks in Pressure Probe 1 on 3/11/03 and 3/17/03.- There was a minor seismic event on 3/13/03 that did not appear to have any effect on either temperature or pressures. There were very slight corresponding rises in Temperature Probe 1. The fluctuations are quite small and, although the cause is unknown, should not pose any limitations on use of these data. Precipitation at the Mercury Desert Rock Airstrip was recorded on March 2, 5, 15, 16, and 17, 2003. If precipitation occurred over Buckboard Mesa or Jackass Flat during these same time frames, it could be the cause of the observed water level rises.

Summary - Two water level rises may be attributable to seismic events, with some uncertainty. Three water level rises may be attributable to precipitation, again with some uncertainty. The cause or causes of the abrupt water level declines could not be definitively identified, but possible causes include mechanical problems or an abrupt change in well conditions. Data contained within this data set should be used with caution because of these anomalies. The data should be used in conjunction with earlier and later water level data sets for 19IM1. Finally, there may have been cross flow between zones because of conditions and activities at nearby wells (19IM2 and 19D) and water level conditions at these well should be taken into account in the analysis and interpretation of this data set.

Port depths used for water elevation calculations are directly measured values reflecting the distance between ground level and the measurement port and are reported in RID 5616 (accuracy = +/- 0.015% of the depth measured).

Accuracy of the downhole probe pressure is based on the probe pressure range: 250 psi probe = +/- 0.25 psi (approx. +/-0.58 ft), 500 psi probe = +/-0.50 psi (approx. +/-1.15 ft), and 1000 psi probe = +/-1.0 psi (approx. +/-2.31 ft).

Specific weight values used in calculations assume a uniform water temp of 15 ° C. Probe temperature accuracy = +/- 1° C. The elevations were not corrected for temperature or borehole deviation; temperature and deviation information are available in the geophysical logging suite for this well (RID 4620).

The water-level elevations presented must be considered approximate because of the potential error in the GPS-based elevation of the land surface at the well site which is believed to be on the order of +/- 1.75 ft. according to work performed by the Center for Nuclear Waste Regulatory Analyses. The potential error in the GPS-based elevations does not affect the depth to water nor the absolute change in water levels over time that may be calculated using the elevation datum for land surface. The potential error may, however, result in limitations in the use of these data for the calculation of hydraulic gradients between wells with the error induced in such calculations being inversely proportional to the distance between the two wells being used to perform the calculation, and directly proportional to the differences in surveying and processing techniques if different surveys were conducted for the two wells.

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**Governing  
 QA Docs.** TP-9.2 Rev. 1

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**Frequency  
 of  
 Transmittal** Biannually

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**Direct Questions  
 About Data  
 To-** Nye County QA Records Center