

Certified Return Receipt: #7011 2970 0003 9281 8015

September 26, 2012

Mr. John Kieling, Chief
NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, NM 87505-6303



RE: Approval with Modifications
Requirement to Resurvey Ground Water Monitoring Wells and
Recovery Wells
Western Refining Company, Southwest, Inc., Gallup Refinery
EPA ID #NMD000333211
HWB-WRG-11-003

Dear Mr. Kieling:

Western Refining Southwest, Gallup Refinery has prepared the following responses to the comments listed regarding the above referenced matter dated September 26, 2012.

Comment 1

In comment 3 of NMED's May 18, 2012 Third Notice of Disapproval (NOD), the Permittee was required to verify that all horizontal data from the June 2011 survey was correct and represented the actual locations of the monitoring wells surveyed. The Permittee cross referenced survey data from Sterling & Mataya Engineers collected on May 13, 1991 (May 1991) and data acquired by Lynn Engineering and Surveying collected on June 21, 2007 (June 2007) to verify the monitoring well locations. Survey data from the May 1991 survey was converted from NAD 27 to NAD 83; however, the Permittee did not provide conversions for all of the May 1991 survey data. Provide revised coordinate verification worksheets that include all monitoring wells from the May 1991 survey. In addition, there is a typographical error in the reported elevation for the OW-11 monitoring well conversion. The Permittee reports an elevation of 6923.59 feet and the May 1991 reports it as 6923.89 feet. Correct the typographical errors in the revised coordinate verification worksheets.

Response: *Per NMED's request, the coordinate verification has been cross referenced for all wells listed on the Sterling & Mataya Engineers survey information dated May 13, 1991. Previous cross check for coordinate verification submitted was for only the active monitoring wells. Typographical error for elevation on OW-11 has been corrected on the coordinate verification form submitted as Attachment 1.*

Comment 2

In the *2011 Corrected Well Elevation Summary Table – Revision 3 (June 12, 2012)*, the Permittee did not report a stick up length measurement for BW-1B in the “2011 Survey Stick-up Length (feet)” column. In addition, the Permittee did not define the asterisk from the OW-1 “2011 Measuring Point Description” column. Define the symbol in the “Notes” section or remove it from the revised data table. The Permittee is reminded that all data tables must be reviewed and corrected for errors prior to submission. Correct the typographical errors and provide a revised table.

Response: *Stick up length measurement for BW-1B has been entered in the “2011 Survey Stick-up Length (feet)” column and the asterisk has been removed from OW-1 “2011 Measuring Point Description” column. A revised table is submitted as Attachment 2.*

Comment 3

Comments 8 and 11 of NMED’s September 24, 2012 Disapproval letter for the *Facility-Wide Ground Water Monitoring Work Plan – 2011 Updates* requires the Permittee to resubmit the tables in Appendix C with the approved survey data in the revised work plan. The Permittee must review these tables and ensure the correct information from this Report is incorporated into the final version of the tables in the revised Work Plan.

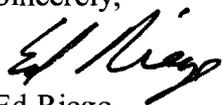
Response: *The approved survey data will be resubmitted in the revised Work Plan.*

If you have any questions regarding Western’s responses, please do not hesitate to contact Cheryl Johnson of my staff at (505) 722-0231.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,



Ed Riege
Environmental Manager

cc: K. Van Horn, NMED HWB w/attach
C. Chavez, OCD w/attach
C. Johnson, Western-Gallup

ATTACHMENT 1

Sterling & Mataya

D.E. Sterling, P.E. & L.S.
W.P. Mataya, L.S.

Engineers - Surveyors
Gallup, New Mexico 87301
(505) 863-5440

601 W. Aatze
P.O. Box 876

May 13, 1991

| Well No. | Elevation Top Inside Pipe at V Notch | New Mexico State Plane Coordinates (west zone) | | Point No. S & M Map (9-29-89) |
|----------|--------------------------------------|--|--------------|-------------------------------|
| | | X | Y | |
| SMW-6 | 6880.71 | 320,839.52 | 1,635,867.66 | 532 |
| SMW-5 | 6878.02 | 320,778.61 | 1,636,054.28 | 530 |
| MW-1 | 6878.52 | 320,903.76 | 1,636,112.13 | 529 |
| SMW-4 | 6880.08 | 320,974.85 | 1,636,153.54 | 528 |
| MW-2 | 6880.84 | 321,035.35 | 1,636,184.06 | 527 |
| MW-5 | 6883.32 | 321,233.03 | 1,636,212.58 | 526 |
| SMW-3 | 6884.56 | 321,397.90 | 1,635,948.75 | 524 |
| SMW-2 | 6884.44 | 321,542.80 | 1,635,592.65 | 523 |
| SMW-1 | 6883.29 | 321,501.32 | 1,635,501.43 | 522 |
| MW-4 | 6882.54 | 321,602.07 | 1,635,066.25 | 539 |
| OW-11 | 6923.89 | 323,167.68 | 1,632,185.21 | 645 |

Notes:

1. Geological Survey Monument ET 6 GT 1962 was the basis for this survey. The combined factor equals 0.99960744.
2. NGS Bench Mark Z 426 - 1983 having a normal ortho. Height of 2100.35015 meters (elev. 6890.91 feet) was used for this survey.
3. A Bench Mark was established for this project at SMW-3, Top of concrete pad at the south edge of the well casing. The elevation being 6882.64 feet.
4. Subtracting 0.37 feet from the elevations shown for this project should equal the elevations in this area shown on our 1989 map which was based on datum furnished by Giant Refinery.



Western Refining Company - Gallup Refinery

Coordinate Verification

26 September 2012

INPUT

State Plane, NAD27
3003 - New Mexico West, U.S. Feet
Vertical - NAVD88, U.S. Feet

OUTPUT

State Plane, NAD83
3003 - New Mexico West, U.S. Feet
Vertical - NAVD88, U.S. Feet

Accuracies of conversions from NAD 27 to NAD 83 are typically 12 to 18 cm.

SMW-6

1/11

| | |
|---|-------------------------------------|
| Northing/Y: 1635867.66 | Northing/Y: 1635926.894 |
| Easting/X: 320839.52 | Easting/X: 2543747.542 |
| Elevation/Z: 6880.71 | Elevation/Z: 6880.710 |
| Convergence: -0 20 58.10191 | Convergence: -0 20 59.42244 |
| Scale Factor: 0.999953403 | Scale Factor: 0.999953478 |
| Combined Factor: 0.999624400 | Combined Factor: 0.999627692 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.599, Delta Lon = 57.273 | |

SMW-5

2/11

| | |
|---|-------------------------------------|
| Northing/Y: 1636054.28 | Northing/Y: 1636113.514 |
| Easting/X: 320778.61 | Easting/X: 2543686.632 |
| Elevation/Z: 6878.02 | Elevation/Z: 6878.020 |
| Convergence: -0 20 58.55339 | Convergence: -0 20 59.87396 |
| Scale Factor: 0.999953428 | Scale Factor: 0.999953503 |
| Combined Factor: 0.999624554 | Combined Factor: 0.999627846 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.597, Delta Lon = 57.274 | |

MW-1

3/11

| | |
|---|-------------------------------------|
| Northing/Y: 1636112.13 | Northing/Y: 1636171.364 |
| Easting/X: 320903.76 | Easting/X: 2543811.783 |
| Elevation/Z: 6878.52 | Elevation/Z: 6878.520 |
| Convergence: -0 20 57.68198 | Convergence: -0 20 59.00253 |
| Scale Factor: 0.999953376 | Scale Factor: 0.999953452 |
| Combined Factor: 0.999624478 | Combined Factor: 0.999627770 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.597, Delta Lon = 57.273 | |

SMW-4

4/11

| | |
|---|-------------------------------------|
| Northing/Y: 1636153.54 | Northing/Y: 1636212.774 |
| Easting/X: 320974.85 | Easting/X: 2543882.873 |
| Elevation/Z: 6880.08 | Elevation/Z: 6880.080 |
| Convergence: -0 20 57.18807 | Convergence: -0 20 58.50860 |
| Scale Factor: 0.999953347 | Scale Factor: 0.999953422 |
| Combined Factor: 0.999624375 | Combined Factor: 0.999627667 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.597, Delta Lon = 57.272 | |

Remark: Verification requirement by NMED. Cross check DePauli Survey to Sterling Mataya Survey 1991.

Western Refining Company - Gallup Refinery

Coordinate Verification

26 September 2012

INPUT

State Plane, NAD27
3003 - New Mexico West, U.S. Feet
Vertical - NAVD88, U.S. Feet

OUTPUT

State Plane, NAD83
3003 - New Mexico West, U.S. Feet
Vertical - NAVD88, U.S. Feet

Accuracies of conversions from NAD 27 to NAD 83 are typically 12 to 18 cm.

MW-2

5/11

| | |
|---|-------------------------------------|
| Northing/Y: 1636184.06 | Northing/Y: 1636243.294 |
| Easting/X: 321035.35 | Easting/X: 2543943.374 |
| Elevation/Z: 6880.84 | Elevation/Z: 6880.840 |
| Convergence: -0 20 56.76713 | Convergence: -0 20 58.08765 |
| Scale Factor: 0.999953322 | Scale Factor: 0.999953398 |
| Combined Factor: 0.999624314 | Combined Factor: 0.999627605 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.596, Delta Lon = 57.271 | |

MW-5

6/11

| | |
|---|-------------------------------------|
| Northing/Y: 1636212.58 | Northing/Y: 1636271.813 |
| Easting/X: 321233.03 | Easting/X: 2544141.056 |
| Elevation/Z: 6883.32 | Elevation/Z: 6883.320 |
| Convergence: -0 20 55.38266 | Convergence: -0 20 56.70314 |
| Scale Factor: 0.999953241 | Scale Factor: 0.999953317 |
| Combined Factor: 0.999624114 | Combined Factor: 0.999627406 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.596, Delta Lon = 57.270 | |

SMW-3

7/11

| | |
|---|-------------------------------------|
| Northing/Y: 1635948.75 | Northing/Y: 1636007.984 |
| Easting/X: 321397.9 | Easting/X: 2544305.927 |
| Elevation/Z: 6884.56 | Elevation/Z: 6884.560 |
| Convergence: -0 20 54.19144 | Convergence: -0 20 55.51185 |
| Scale Factor: 0.999953174 | Scale Factor: 0.999953249 |
| Combined Factor: 0.999623987 | Combined Factor: 0.999627279 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.599, Delta Lon = 57.268 | |

SMW-2

8/11

| | |
|---|-------------------------------------|
| Northing/Y: 1635592.65 | Northing/Y: 1635651.884 |
| Easting/X: 321542.8 | Easting/X: 2544450.829 |
| Elevation/Z: 6884.44 | Elevation/Z: 6884.440 |
| Convergence: -0 20 53.12879 | Convergence: -0 20 54.44912 |
| Scale Factor: 0.999953115 | Scale Factor: 0.999953190 |
| Combined Factor: 0.999623934 | Combined Factor: 0.999627225 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.602, Delta Lon = 57.266 | |

Remark: Verification requirement by NMED. Cross check DePauli Survey to Sterling Mataya Survey 1991.

Western Refining Company - Gallup Refinery

Coordinate Verification

26 September 2012

INPUT

State Plane, NAD27
3003 - New Mexico West, U.S. Feet
Vertical - NAVD88, U.S. Feet

OUTPUT

State Plane, NAD83
3003 - New Mexico West, U.S. Feet
Vertical - NAVD88, U.S. Feet

Accuracies of conversions from NAD 27 to NAD 83 are typically 12 to 18 cm.

SMW-1

9/11

| | |
|---|-------------------------------------|
| Northing/Y: 1635501.43 | Northing/Y: 1635560.664 |
| Easting/X: 321501.32 | Easting/X: 2544409.348 |
| Elevation/Z: 6883.29 | Elevation/Z: 6883.290 |
| Convergence: -0 20 53.40847 | Convergence: -0 20 54.72879 |
| Scale Factor: 0.999953132 | Scale Factor: 0.999953207 |
| Combined Factor: 0.999624006 | Combined Factor: 0.999627297 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.603, Delta Lon = 57.267 | |

MW-4

10/11

| | |
|---|-------------------------------------|
| Northing/Y: 1635066.25 | Northing/Y: 1635125.485 |
| Easting/X: 321602.07 | Easting/X: 2544510.099 |
| Elevation/Z: 6882.54 | Elevation/Z: 6882.540 |
| Convergence: -0 20 52.64584 | Convergence: -0 20 53.96608 |
| Scale Factor: 0.999953091 | Scale Factor: 0.999953166 |
| Combined Factor: 0.999624001 | Combined Factor: 0.999627292 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.607, Delta Lon = 57.266 | |

OW-11

11/11

| | |
|---|-------------------------------------|
| Northing/Y: 1632185.21 | Northing/Y: 1632244.448 |
| Easting/X: 323167.68 | Easting/X: 2546075.724 |
| Elevation/Z: 6923.89 | Elevation/Z: 6923.890 |
| Convergence: -0 20 41.29121 | Convergence: -0 20 42.61069 |
| Scale Factor: 0.999952454 | Scale Factor: 0.999952529 |
| Combined Factor: 0.999621388 | Combined Factor: 0.999624676 |
| Grid Shift (U.S. ft.): X/Easting = 2222908.0, Y/Northing = 59.2 | |
| Datum Shift (m.): Delta Lat. = 2.634, Delta Lon = 57.250 | |

Remark: Verification requirement by NMED. Cross check DePauli Survey to Sterling Mataya Survey 1991.

ATTACHMENT 2

2011 CORRECTED WELL ELEVATION SUMMARY TABLE
Revision 4 - September 26, 2012

| Date of Installation | Well ID Number | 2011 Survey Measurement date ¹ | Previous Casing Diameter (Inch) | 2011 Verified Casing Diameter ² (Inch) | Previous Ground Level Elevation (feet) | 2011 Survey Ground Level Elevation ¹ (feet) | Previous Well Casing Rim Elevation (feet) | 2011 Survey Well Casing Rim Elevation ¹ (feet) | 2011 Measuring Point Description ¹ | Previous Stick-up length ³ (feet) | 2011 Survey Stick up Length ⁴ (feet) | Previous Well Casing Bottom Elevation (feet) | 2011 Survey Well Casing Bottom Elevation ⁵ (feet) | Previous Total Well Depth (feet) | 2011 Survey Total Well Depth ⁶ (feet) | Screened Interval Depth Top to Bottom ⁷ (feet) | Previous Stratigraphic unit in which screen exists | 2012 Re-Evaluated Stratigraphic unit in which screen exists ⁸ |
|----------------------|----------------|---|---------------------------------|---|--|--|---|---|---|--|---|--|--|----------------------------------|--|---|--|--|
| 11/10/2003 | BW-1A | 6/7/2011 | 2.00 | 2.00 | 6,876.73 | 6,874.10 | 6,876.73 | 6,876.68 | North edge PVC casing | 4.38 | 2.58 | 6,836.73 | 6,839.06 | 40.00 | 37.62 | 30 - 35 | Chinle/Alluvium | Upper Sand |
| 10/28/2003 | BW-1B | 6/7/2011 | 2.00 | 2.00 | 6,876.91 | 6874.13 ⁹ | 6,876.91 | 6,876.94 | North edge PVC casing | 2.39 | 2.81 | 6,811.71 | 6,809.49 | 67.55 | 67.45 | 54.6 - 64.6 | Chinle/Alluvium | Chinle/Alluvium Interface |
| 11/10/2003 | BW-1C | 6/7/2011 | 2.00 | 2.00 | 6,876.75 | 6,873.95 | 6,876.75 | 6,876.78 | North edge PVC casing | 4.52 | 2.83 | 6,719.75 | 6,740.39 | 157.00 | 136.39 | 125 -135 | Sonsela Sandstone | Sonsela |
| 11/10/2003 | BW-2A | 6/7/2011 | 2.00 | 2.00 | 6,874.72 | 6,871.88 | 6,874.72 | 6,874.69 | North edge PVC casing | 4.27 | 2.81 | 6,809.22 | 6,807.12 | 65.50 | 67.57 | 55 - 65 | Chinle/Alluvium | Upper Sand |
| 10/28/2003 | BW-2B | 6/7/2011 | 2.00 | 2.00 | 6,874.58 | 6,871.66 | 6,874.58 | 6,874.50 | North edge PVC casing | 4.50 | 2.84 | 6,784.08 | 6,782.24 | 90.50 | 92.26 | 80 - 90 | Sonsela sandstone | Chinle/Alluvium Interface |
| 10/28/2003 | BW-2C | 6/7/2011 | 2.00 | 2.00 | 6,875.40 | 6,872.90 | 6,875.40 | 6,875.30 | North edge PVC casing | 2.98 | 2.40 | 6,724.40 | 6,722.46 | 151.00 | 152.84 | 139.5 - 149.5 | Sonsela sandstone | Sonsela |
| 6/15/2004 | BW-3A | 6/7/2011 | 2.00 | 2.00 | 6,878.22 | 6,875.94 | 6,878.22 | 6,878.39 | North edge PVC casing | 3.00 | 2.45 | 6,828.22 | 6,826.04 | 52.60 | 52.35 | 39.5 - 49.5 | Chinle/alluvium | Upper Sand |
| 10/15/2003 | BW-3B | 6/7/2011 | 2.00 | 2.00 | 6,878.79 | 6,876.16 | 6,878.79 | 6,878.59 | North edge PVC casing | 3.15 | 2.43 | 6,803.79 | 6,809.19 | 75.00 | 69.40 | 63 - 73 | Chinle/alluvium | Chinle/Alluvium Interface |
| 7/20/2004 | BW-3C | 6/7/2011 | 2.00 | 2.00 | 6,878.08 | 6,875.72 | 6,878.08 | 6,877.95 | North edge PVC casing | 2.69 | 2.23 | 6,723.08 | 6,723.40 | 155.00 | 154.55 | 144.5 - 154.5 | Sonsela sandstone | Sonsela |
| 1/5/1981 | OW-1 | 6/7/2011 | 4.00 | 4.00 | 6,868.00 | 6,866.32 | 6,868.45 | 6866.62 ¹⁰ | North edge PVC casing | 1.92 | 0.30 ¹⁰ | 6,773.96 | 6,772.07 | 94.04 | 94.55 | 89.3 - 99.3 | Sonsela sandstone | Sonsela |
| 11/25/1980 | OW-10 | 6/7/2011 | 4.00 | 4.00 | 6,872.00 | 6,873.67 | 6,875.12 | 6,874.91 | North edge PVC casing | 1.59 | 1.24 | 6,804.00 | 6,814.58 | 68.00 | 60.33 | 40 - 60 | Chinle/alluvium | Sonsela |
| 9/25/1981 | OW-11 | 6/7/2011 | 4.00 | 4.00 | 6,923.89 | 6,922.05 | 6,923.51 | 6,923.51 | North edge PVC casing | 2.08 | 1.46 | 6,857.27 | 6,857.72 | 66.62 | 65.79 | 43 - 65 | Chinle/alluvium | Sonsela |
| 12/15/1980 | OW-12 | 6/7/2011 | 4.00 | 4.00 | 6,940.43 | 6,939.57 | 6,940.43 | 6,940.69 | North edge PVC casing | 1.88 | 1.12 | 6,795.43 | 6,811.84 | 145.00 | 128.85 | 117.8 - 137.8 | Sonsela sandstone | Sonsela |
| 12/10/1980 | OW-13 | 6/7/2011 | 4.00 | 4.00 | 6,920.12 | 6,918.95 | 6,920.12 | 6,920.07 | North edge PVC casing | 4.79 | 1.12 | 6,820.12 | 6,820.92 | 100.00 | 99.15 | 78.2 - 98.2 | Sonsela sandstone | Sonsela |
| 12/17/1980 | OW-14 | 6/7/2011 | 4.00 | 4.00 | 6,926.64 | 6,924.55 | 6,926.64 | 6,926.65 | North edge PVC casing | 2.25 | 2.10 | 6,881.64 | 6,880.13 | 45.00 | 46.52 | 35 - 45 | Chinle/alluvium | Chinle/Alluvium Interface |
| 8/23/1996 | OW-29 | 6/7/2011 | 4.00 | 4.00 | 6,913.50 | 6,913.89 | 6,913.50 | 6,917.00 | North edge PVC casing | 3.88 | 3.11 | 6,864.50 | 6,865.92 | 49.00 | 51.08 | 37.5 - 47.5 | Chinle/alluvium | Chinle/Alluvium Interface |
| 8/28/1996 | OW-30 | 6/7/2011 | 4.00 | 4.00 | 6,921.60 | 6,921.81 | 6,921.60 | 6,924.69 | North edge PVC casing | 4.85 | 2.88 | 6,873.20 | 6,874.79 | 48.40 | 49.90 | 37.9 - 47.9 | Chinle/alluvium | Chinle/Alluvium Interface |
| 10/5/2009 | OW-50 | 6/7/2011 | 2.00 | 2.00 | 6,914.37 | 6,912.63 | 6,914.37 | 6,914.21 | North edge PVC casing | 2.71 | 1.58 | 6,977.37 | 6,850.21 | 63.00 | 64.00 | 48 - 63 | Chinle/alluvium | Chinle/Alluvium Interface |
| 10/5/2009 | OW-52 | 6/7/2011 | 2.00 | 2.00 | 6,906.26 | 6,906.53 | 6,907.68 | 6,907.68 | North edge PVC casing | 2.21 | 1.15 | 6,985.26 | 6,829.94 | 79.00 | 77.74 | 64 - 79 | Chinle/alluvium | Chinle/Alluvium Interface |
| 10/14/1981 | MW-1 | 6/7/2011 | 5.00 | 5.00 | 6,878.52 | 6,876.63 | 6,878.15 | 6,878.12 | North edge PVC casing | 1.25 | 1.49 | 6,746.50 | 6,747.29 | 132.02 | 130.83 | 117.72 - 127.72 | Chinle/Alluvium | Sonsela |
| 10/15/1981 | MW-2 | 6/7/2011 | 5.00 | 5.00 | 6,878.40 | 6,878.39 | 6,880.84 | 6,880.30 | North edge PVC casing | 1.88 | 1.91 | 6,741.90 | 6,742.82 | 138.94 | 137.48 | 112 - 122 | Chinle/alluvium | Sonsela |
| 10/16/1981 | MW-4 | 6/7/2011 | 5.00 | 5.00 | 6,882.54 | 6,879.89 | 6,882.20 | 6,881.63 | North edge PVC casing | 2.31 | 1.74 | 6,760.40 | 6,759.91 | 122.14 | 121.72 | 101 - 121 | Sonsela sandstone | Sonsela |
| 7/21/1986 | MW-5 | 6/7/2011 | 4.00 | 4.00 | 6,883.32 | 6,880.20 | 6,882.93 | 6,882.83 | North edge aluminum casing | 2.02 | 2.63 | 6,750.30 | 6,752.00 | 133.02 | 130.83 | 115 - 125 | Sonsela sandstone | Sonsela |
| 3/28/1995 | RW-1 | 6/7/2011 | 4.00 | 4.00 | 6,943.50 | 6,942.86 | 6,943.50 | 6,946.06 | North edge PVC casing | 4.42 | 3.20 | 6,900.50 | 6,903.02 | 43.00 | 43.04 | 25 - 40 | Chinle/alluvium | Chinle/Alluvium Interface |
| 3/29/1995 | RW-2 | 6/7/2011 | 4.00 | 4.00 | 6,927.20 | 6,926.40 | 6,927.20 | 6,928.53 | North edge PVC casing | 3.58 | 2.13 | 6,889.20 | 6,888.73 | 38.00 | 39.80 | 26.1 - 36.1 | Chinle/alluvium | Chinle/Alluvium Interface |
| 8/27/1997 | RW-5 | 6/7/2011 | 4.00 | 4.00 | 6,942.50 | 6,941.53 | 6,942.50 | 6,943.57 | West Edge PVC Casing (Existing Mark) | 2.92 | 2.04 | 6,902.50 | 6,903.98 | 40.00 | 39.59 | 29.5 - 39.5 | Chinle/alluvium | Chinle/Alluvium Interface |
| 8/27/1997 | RW-6 | 6/7/2011 | 4.00 | 4.00 | 6942.6 ¹¹ | 6,941.96 | 6942.6 ¹¹ | 6,944.01 | North edge PVC casing | 2.58 | 2.05 | 6,933.80 | 6,903.11 | 38.80 | 40.90 | 28.5 - 38.5 | Chinle/alluvium | Chinle/Alluvium Interface |
| 9/26/1985 | SMW-2 | 6/7/2011 | 2.00 | 2.00 | 6,884.44 | 6,881.63 | 6,884.11 | 6,883.97 | North edge aluminum casing | 4.54 | 2.34 | 6,827.10 | 6,831.17 | 57.34 | 52.80 | 34.31 - 54.31 | Chinle/alluvium | Chinle/Alluvium Interface and Upper Sand |
| 9/25/1985 | SMW-4 | 6/7/2011 | 2.00 | 2.00 | 6,882.54 | 6,877.63 | 6,882.73 | 6,879.52 | North edge aluminum casing | 3.83 | 1.89 | 6,760.40 | 6,809.84 | 122.14 | 69.68 | 51.7 - 71.7 | Chinle/alluvium | Chinle/Alluvium Interface |

2011 CORRECTED WELL ELEVATION SUMMARY TABLE
Revision 4 - September 26, 2012

| Date of Installation | Well ID Number | 2011 Survey Measurement date ¹ | Previous Casing Diameter (Inch) | 2011 Verified Casing Diameter ² (Inch) | Previous Ground Level Elevation (feet) | 2011 Survey Ground Level Elevation ¹ (feet) | Previous Well Casing Rim Elevation (feet) | 2011 Survey Well Casing Rim Elevation ¹ (feet) | 2011 Measuring Point Description ¹ | Previous Stick-up length ³ (feet) | 2011 Survey Stick up Length ⁴ (feet) | Previous Well Casing Bottom Elevation (feet) | 2011 Survey Well Casing Bottom Elevation ⁵ (feet) | Previous Total Well Depth (feet) | 2011 Survey Total Well Depth ⁶ (feet) | Screened Interval Depth Top to Bottom ⁷ (feet) | Previous Stratigraphic unit in which screen exists | 2012 Re-Evaluated Stratigraphic unit in which screen exists ⁸ |
|----------------------|----------------|---|---------------------------------|---|--|--|---|---|---|--|---|--|--|----------------------------------|--|---|--|--|
| 7/8/2004 | GWM-1 | 6/7/2011 | 2.00 | 2.00 | 6,912.65 | 6,910.22 | 6,912.65 | 6,912.61 | North edge PVC casing | 3.88 | 2.39 | 6,888.95 | 6,886.41 | 23.70 | 26.20 | 17.5 - 23.5 | Chinle/alluvium | Chinle/Alluvium Interface |
| 9/25/2005 | GWM-2 | 6/7/2011 | 2.00 | 2.00 | 6,913.17 | 6,910.32 | 6,913.17 | 6,913.09 | North edge PVC casing | 4.75 | 2.77 | 6,896.97 | 6,894.28 | 18.97 | 18.81 | 3.2 - 16.2 | Chinle/alluvium | Chinle/Alluvium Interface |
| 9/25/2005 | GWM-3 | 6/7/2011 | 2.00 | 2.00 | 6,912.65 | 6,907.35 | 6,912.65 | 6,910.25 | North edge PVC casing | 4.85 | 2.90 | 6,896.15 | 6,892.45 | 17.94 | 17.80 | 3 - 15 | Chinle/alluvium | Chinle/Alluvium Interface |
| 3/14/2008 | NAPIS-1 | 6/7/2011 | 2.00 | 2.00 | 6,918.43 | 6,913.62 | 6,918.43 | 6,913.86 | North edge PVC casing | 0.29 | 0.24 | 6,904.40 | 6,900.33 | 14.00 | 13.53 | 3.7 - 13.7 | Chinle/alluvium | Chinle/Alluvium Interface |
| 3/14/2008 | NAPIS-2 | 6/7/2011 | 2.00 | 2.00 | 6,917.27 | 6,913.40 | 6,917.27 | 6,912.65 | North edge PVC casing | 0.10 | -0.75 | 6,902.80 | 6,899.04 | 14.50 | 13.61 | 4.2 - 14.2 | Chinle/alluvium | Chinle/Alluvium Interface |
| 3/14/2008 | NAPIS-3 | 6/7/2011 | 2.00 | 2.00 | 6,917.31 | 6,913.38 | 6,917.31 | 6,912.76 | North edge PVC casing | 0.29 | -0.62 | 6,886.60 | 6,882.34 | 30.70 | 30.42 | 25.4 - 30.4 | Chinle/alluvium | Chinle/Alluvium Interface |
| 6/11/2007 | KA-3 | 6/7/2011 | 2.00 | 2.00 | 6,917.17 | 6,913.29 | 6,917.17 | 6,912.52 | North edge PVC casing | 0.17 | -0.77 | 6,892.40 | 6,889.32 | 25.00 | 23.20 | 15 - 25 | Chinle/alluvium | Chinle/Alluvium Interface |

NOTES:

- 1) Surveyed by DePauli Engineering & Surveying, LLC on June 7, 2011 at request of NMED due to discrepancies on well casing and ground level elevations.
- 2) Field verified using a tape measure by Gallup Refinery field technician.
- 3) Original measurements were given in inches and converted to feet by dividing by 12.
- 4) Stick up length is determined by subtracting 2011 Survey Ground Level Elevation from 2011 Survey Well Casing Rim Elevation.
- 5) 2011 Survey Well Casing Bottom Elevation is determined by subtracting the 2011 Survey Well Casing Rim Elevation from the 2011 Survey Total Well Depth Measurement.
- 6) Total well depth was determined using a bottom sensing meter, Testwell Water level meter with bottom sensing indicator.
- 7) Screened interval for each well was verified to the well boring logs. Settlement may have occurred since installation of well which is why total well depth is higher or equal to the screened interval levels.
- 8) Stratigraphic interpretation conducted by Peregrine Geoconnect to re-evaluate the named zones they produce water from. Tables were updated to reflect correct stratigraphic zone.
- 9) BW-1B 2011 Survey Ground Level Elevation is to the lowest concrete pad elevation surrounding the well.
- 10) OW-1 original stick up length was measured to the top of the pvc casing which is connected to the well shroud with a rubber coupling. 2011 survey measurement was taken to the top segment of pvc casing not connected to the rubber coupling. (Coupling is where elevation is referenced)
- 11) RW-6 elevation data was originally entered incorrectly as 6972.6 feet. Correct elevation is 6942.6 feet.
- 12) NAPIS 2, 3 and 4 well shroud is located below ground level therefore values entered in "2011 Survey Stick-Up Length (feet)" indicate a negative value.
- 13) Previous measurements and elevations are from the Well Data Summary Table from the 2009 Annual Ground Water Monitoring Report.