



Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUL 29 2014

RECEIVED

JUL 30 2014

NMED
Hazardous Waste Bureau

Ms. Jennifer Pruitt
New Mexico Environment Department
Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Semiannual Discharge Monitoring Report for January 1, 2014, through June 30, 2014, Discharge Permit 831

Dear Ms. Pruitt:

The purpose of this letter is to transmit to you the Waste Isolation Pilot Plant Discharge Monitoring Report, including Table 6 in Excel[®] format on the compact disk, for the period of January 1, 2014, through June 30, 2014. This report is required by Discharge Permit 831.

If you have any questions about this report or require any additional information, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo, Director
Environmental Protection Division

Enclosures(2)

cc: w/o enclosures

J. Kieling, NMED *ED

M. Menetrey, NMED ED

CBFO M&RC

*ED denotes electronic distribution



ATTACHMENT

**WASTE ISOLATION PILOT PLANT SEMIANNUAL MONITORING
REPORT FOR DISCHARGE PERMIT DP-831 FOR REPORTING PERIOD
JANUARY 1, 2014 THROUGH JUNE 30, 2014**

TOTAL PAGES: 9

**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE
PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

SPECIFIC REPORTING PER THE REQUIREMENTS OF DP-831 SECTION III, CONDITION 14

Condition 14a. – A summary of all activities related to permitted discharges during the preceding 6 month period. Activities may include general operations, construction or demolition of structures, erosion features, maintenance and repairs to liners, pipelines, covers, berms and other facility components covered by this Discharge Permit Renewal and Modification, water management, water quality and ground water level trends, and precipitation patterns.

Facultative Lagoon System

Table 1 shows the volume of “sewage water” discharged to the Facultative Lagoon System for this reporting period. After a release of radioactive contamination from the WIPP underground ventilation air on February 14, 2014, access to the WIPP facility was restricted to essential personnel until mid-April. The reduced number of personnel at the site had some influence on discharge volumes for this reporting period.

Table 1 – Discharge to Facultative Lagoon System

Month	Volume (gallons)
January	446,899
February	375,603
March	237,312
April	235,116
May	368,305
June	284,934
Total	1,948,169

Notes: Volume based on total domestic water use.

No miscellaneous non-hazardous water was discharged to Facultative Lagoon System lagoons B or C.

The freeboard was maintained at greater than one foot for the Facultative Lagoon System. Inspections indicated that the liners and the berms are in good condition with no erosion. No new construction or repairs have been performed. No water other than non-hazardous sewage water with some non-hazardous condensate from compressors was discharged into the Facultative Lagoon System.

A surface water sample was collected from the Facultative Lagoon System to determine the extent of radioactive contamination due to the February 14, 2014, radiological event. A composite sample was collected on April 16, 2014, and analyzed for ²⁴¹americium, ²³⁸plutonium, and ^{239/240}plutonium. These transuranic actinides are expected to occur in the waste disposed in the WIPP underground. Transuranic actinides were not detected in this sample.

H-19 Evaporation Pond

Table 2 shows the volume of miscellaneous non-hazardous water discharged to the H-19 Evaporation Pond for this reporting period. This water may be from groundwater well pumping, condensate from the Exhaust Shaft ductwork, and removal of Waste Shaft sump water. Only

**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE
PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

groundwater from well pumping was discharged to the H-19 Evaporation Pond after the radiological event on February 14, 2014.

Table 2 – Discharge to H-19 Evaporation Pond

Month	Volume (gallons)
January	1,380
February	0
March	0
April	0
May	0
June	4,235
Total	5,615

No new construction or demolition of structures related to discharge control occurred during the reporting period. The freeboard was maintained at greater than one foot. Monthly inspections found the liner in good condition, and the berms have no erosion and are in good condition. There were no maintenance/repairs needed and no new construction or demolition performed.

Facultative Lagoon System and H-19 Evaporation Pond Analytical Data

Table 3 shows the analytical results for the Facultative Lagoon System and the H-19 Evaporation Pond.

Table 3 – Facultative Lagoon System and H-19 Evaporation Pond Analytical Data

Analyte	Sample Date	Facultative Lagoon System			H-19 Evaporation Pond
		Influent Lagoon 2A	Lagoon B	Lagoon C	
Nitrate (mg/L)	4/16/14	ND	NS	NS	NS
TKN (mg/L)	4/16/14	112	NS	NS	NS
TDS (mg/L)	4/16/14	610	NS	NS	NS
Sulfate (mg/L)	4/16/14	49.0	NS	NS	NS
Chloride (mg/L)	4/16/14	89.9	NS	NS	NS

TKN: Total Kjeldahl nitrogen

TDS: Total dissolved solids

ND: Not detected, analyte below the method detection limit

NS: Not sampled, insufficient amount of liquid for sampling

Storm Water Infiltration Control Ponds 1 and 2 and Evaporation Basin A

Monthly inspections were performed on liners of the storm water infiltration control (SWIC) ponds which included erosion, floating plants and debris, deep-rooted plants, damage from burrowing animals, liner integrity, and storm water escaping from containment.

Inspections for Ponds 1 and 2 and Evaporation Basin A indicated liners were in good condition, with no signs of burrowing animals, or storm water escaping. No maintenance/repairs were needed and no new construction or demolition was performed during this reporting period. Only

**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE
PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

storm water from the WIPP facility was collected in the SWIC ponds. Water depth is presented in Table 5 to the nearest tenth of a foot.

As indicated in Table 4, no significant storm events occurred during this reporting period. However, surface water samples were collected from SWIC Ponds 1 and 2 and Evaporation Basin A to determine if there was radioactive contamination due to the February 14, 2014, radiological event. Samples were collected on February 19, 2014, and again on April 23, 2014, which were analyzed for ²⁴¹americium, ²³⁸plutonium, and ^{239/240}plutonium. These transuranic actinides are expected to occur in the waste disposed in the WIPP underground. The transuranic actinides were not detected in any of the samples.

Salt Pile Evaporation Pond and Salt Storage Extension Basins I and II

Monthly inspections of the Salt Pile Evaporation Pond found a seam at the northeast corner was loosening. This will be repaired by a contractor whose specialty is liner repair. The berms were in good condition with no signs of erosion. No construction/demolition or maintenance were performed during this reporting period. Only storm water from the capped Salt Pile is discharged into this pond. Water depth is presented in Table 5 to the nearest tenth of a foot.

The Salt Storage Extension Basin I is used to impound storm water from the Salt Storage Extension Area. The liner is in good condition and the berms have no erosion. There were no maintenance/repairs needed and no new construction or demolition performed. Sump water removal was performed as needed during the reporting period. Water depth is presented in Table 5 to the nearest tenth of a foot.

The Salt Storage Extension Basin II is used to impound outflow from the Salt Storage Extension Basin I. The liner was found to have a small hole in the north side of the basin. This will be repaired by a contractor whose specialty is liner repair. The berms showed no signs of erosion as was noted in the monthly inspections. No maintenance/repairs were needed and no new construction or demolition was performed during this report period. Sump water removal was performed as needed during the reporting period. A minimal amount of drinking water was used for priming the lines and the water removed from the sump was discharged into the basin. Water depth is presented in Table 5 to the nearest tenth of a foot.

As indicated in Table 4, no significant storm events occurred during this reporting period. However, surface water samples were collected from the Salt Pile Evaporation Pond and the Salt Storage Extension Basins I and II to determine if there was radioactive contamination in the ponds due to the February 14, 2014, radiological event. Samples were collected on February 19, 2014, and analyzed for ²⁴¹americium, ²³⁸plutonium, and ^{239/240}plutonium. These transuranic actinides are expected to occur in the waste disposed in the WIPP underground. The transuranic actinides were not detected in any of the samples.

Infiltration Controls Analytical Data

Table 4 shows "NS" for all analytical parameters. There were no significant storm events to trigger a requirement to sample during this reporting period.

**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE
PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

Table 4 – Infiltration Controls Analytical Data

Analyte	Sample Date	Salt Pile Evaporation Pond	Salt Storage Extension Basin I	Salt Storage Extension Basin II	Evaporation Basin A	Pond 1	Pond 2
TDS (mg/L)	NS	NS	NS	NS	NS	NS	NS
Sulfate (mg/L)	NS	NS	NS	NS	NS	NS	NS
Chloride (mg/L)	NS	NS	NS	NS	NS	NS	NS

NS: Not sampled, insufficient storm water to trigger requirement to sample.

Bold: Concentration exceeds the human health standards listed in 20.6.2.3103 NMAC for domestic water supply (not applicable to data in this table).

All infiltration control structures maintained greater than one foot of freeboard.

Salt Pile

The capped salt pile is inspected monthly and the liner was noted to be in good condition. No erosion has taken place on the cover of this pile. New mesquite bushes were noted in the inspections and an action request was made to have a contractor spray the mesquite with herbicide to prevent damage to the liner. No construction/demolition or maintenance was performed during this reporting period.

Salt Storage Extension Area

The Salt Storage Extension Area is inspected monthly. These inspections noted minor holes in the liner that occurred since all the liners were repaired in 2013. These will be repaired when the contractor is determined. All mined salt is currently stockpiled in this area. No construction/demolition or maintenance was performed during this reporting period.

Site and Preliminary Design Validation Salt Pile

Monthly inspections of the Site and Preliminary Design Validation Salt Pile noted no issues with the liner. New mesquite bushes were noted in the inspections and an action request was made to have a contractor spray the mesquite with herbicide to prevent damage to the liner. No construction/demolition or maintenance was performed during this reporting period. No erosion has occurred during this reporting period.

Precipitation Patterns

Total rainfall in the area of WIPP for this reporting period was 4.85 inches compared to 1.63 inches for the same time period in 2013, a difference of 3.22 inches. Total rainfall in 2013 of 10.73 inches was considerably less than the average annual rainfall for the region of 12.92 inches reported by the National Oceanic and Atmospheric Administration.

**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE
PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

Shallow Subsurface Water Monitoring Program

Water levels in the shallow subsurface water (SSW) wells (PZ-1 through PZ-15, C-2811, C-2505, C-2506, and C-2507), Figure 1, were obtained March 4 - 20, 2014, and June 2 - 5, 2014, for wells that were accessible, and are included in Table 6. These were taken on the quarterly milestones outlined in the Ground Water Monitoring Schedule, in the September 9, 2008, DP-831 Modification.

During the reporting period, the general water level trend for the SSW monitoring points was an average decrease in elevation of 0.24 feet. Overall water level elevation trends indicate that, in combination with lower rainfall since 2008, the evaporation pond liners are reducing infiltration enough to see an effect.

WQSP-6A was sampled on May 14, 2014. WQSP-6A sampling results are provided in Table 6. Sulfate, chloride, and total dissolved solids were detected in WQSP-6A samples at concentrations exceeding standards of 20.6.2.3103 NMAC, Standards for Ground Water of 10,000 mg/L TDS Concentration or Less for Human Health and Domestic Water Supply. Although the concentrations were higher than the standards, they are less than background concentrations established in the *Waste Isolation Pilot Plant RCRA Background Groundwater Quality Baseline Report* (DOE/WIPP 98-2285). Nitrate was also detected but did not exceed the standards. Total Kjeldahl Nitrogen was below the detection limit of one mg/L. The SSW identified at the WIPP site has not impacted the Dewey Lake groundwater in WQSP-6A based on the consistency of analyzed parameters in WQSP-6A.

The SSW piezometers were sampled for field and general chemistry parameters in May 2014, as required by the September 9, 2008, modification to DP-831. Three piezometers were sampled on May 12, 2014, and eight on May 13, 2014. Results for the field sampling parameters and laboratory analyses are presented in Table 6. Due to pH meter malfunction, pH was not measured during this time period. An evaluation of the pH for these wells will be conducted during the next sampling event to determine if pH values remain consistent with the water at these locations. Conductivity indicates that formation water was present in the well. Chloride concentrations exceeded values listed in 20.6.2.3103 NMAC in all shallow piezometers sampled. The maximum chloride concentration was 104,000 mg/L in PZ-13, while the minimum concentration was 407 mg/L in PZ-10. Total dissolved solids concentrations exceeded 20.6.2.3103 NMAC values in all shallow piezometers sampled, with the maximum concentration of 265,000 mg/L in PZ-13 and a minimum concentration of 1,840 mg/L in PZ-10. Sulfate concentrations exceeded 20.6.2.3103 NMAC values in 8 of 11 piezometers sampled with a maximum concentration of 4,730 mg/L in PZ-9 and a minimum concentration of 297 mg/L in C-2811.

Condition 14b. – A single table in a paper and electronic format (EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns. Tabulated field measurements to include temperature, pH and electrical conductivity corrected to 25 degrees Celsius. Monitoring sites shall be shown in rows. The second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason.

**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE
PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

This table is noted as Table 6 to follow. Electrical conductivity is listed as specific conductivity in this table. A Microsoft EXCEL spreadsheet containing these data is included on the enclosed CD.

Condition 14c. – A single table as described in Condition 13b [sic, DP-831] above that includes all available ground water data to date shall be submitted annually. For each monitoring well, the name of the well shall be entered in the far left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name.

As has been the practice for reporting this information, this table will be included in the next Semiannual Monitoring Report which is due to the Ground Water Quality Bureau on January 31, 2015, reporting data through December 31, 2014.

Condition 14d. – Discharge volumes, water depths, and calculated storm water volumes for all permitted impoundments at the facility.

Table 5 contains the SWIC Pond depths, volumes of water in the pond, and discharge volumes into the ponds.

Table 5 – SWIC Pond Depth, Volume and Discharge Volume

Analyte	Date	Salt Pile Evaporation Pond	Salt Storage Extension Basin I	Salt Storage Extension Basin II	Evaporati on Basin A	Pond 1	Pond 2
Water Depth (ft)	6/10/14	0.3	1.4	4.3	1.8	0.9	2.8
Impounded Water Volume (gallons)	6/10/14	343,220	1,593,892	1,540,196	2,596,308	125,215	962,322
Volume Discharged to Pond (gallons)	6/10/14	343,220	0	0	187,511	27,825	137,475

Condition 14e. – Copies of the signed laboratory analyses sheet shall be kept onsite and made available to NMED upon request.

Laboratory analyses with the signed analyses sheets are kept onsite and are available for inspection.

Condition 14f. – Hydrographs shall be submitted annually for all monitoring wells and piezometers covered under Condition 11a of this Discharge Permit Renewal and Modification. At a minimum, graphs shall include the previous five years of water level data, or for new wells, all data since the well was installed. Data for several wells may be included on one graph.

**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE
PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

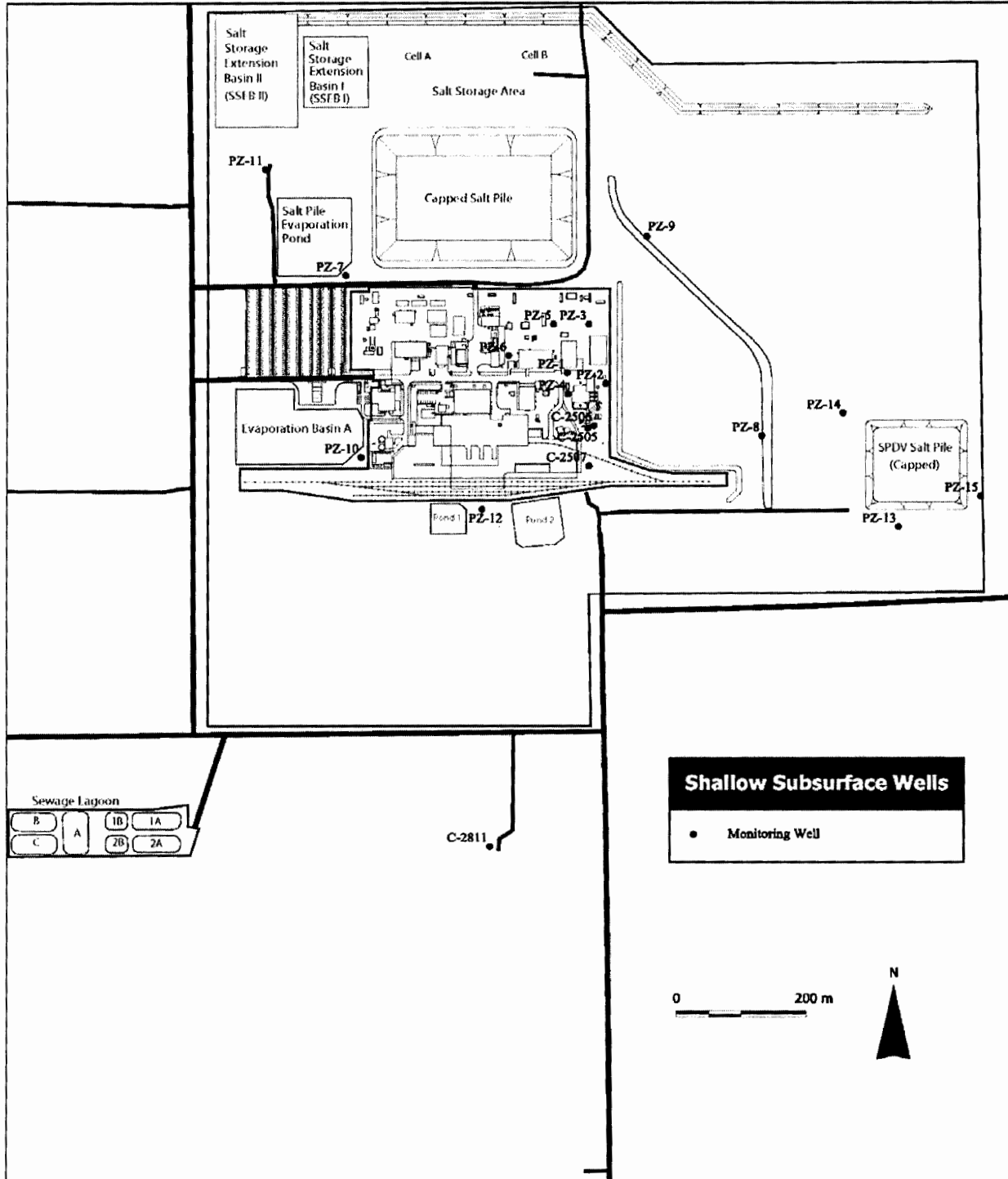
As has been the practice for reporting this information, these hydrographs will be included in the next Semiannual Monitoring Report due to the Ground Water Quality Bureau on January 31, 2015, reporting data through December 31, 2014.

Condition 14g – A potentiometric map for the WIPP facility area shall be submitted annually. The map shall incorporate the most recent water level data for all monitoring wells and piezometers installed in the SSW.

As has been the practice for reporting this information, this map will be included in the next Semiannual Monitoring Report due to the Ground Water Quality Bureau on January 31, 2015, reporting data through December 31, 2014.

**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE
PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

Shallow Subsurface Water Monitor Well Locations



**WASTE ISOLATION PILOT PLANT
SEMIANNUAL DISCHARGE MONITORING REPORT FOR DISCHARGE PERMIT DP-831
FOR REPORTING PERIOD
JANUARY 1, 2014, THROUGH JUNE 30, 2014**

Table 6 – Subsurface Water Well Water Levels and Chemical Analyses

Monitoring Site	Field and General Chemistry Parameters								Other	Water Level Monitoring (Ft AMSL)	
	Sample Date	pH (SU)	Temp. (C)	Specific Conductivity @25 °C (µS/cm)	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/L)	3/4/14-3/20/14	6/2/14-6/5/14
PZ-1	5/13/2014	ND	22.3	99,800	NA	2,010	44,000	76,000	NA	NM	3368.46
PZ-2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	3367.58
PZ-3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	3369.09
PZ-4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	NM
PZ-5	5/13/2014	ND	22.4	27,700	NA	1,180	9,080	18,100	NA	NM	3369.40
PZ-6	5/13/2014	ND	23.5	108,900	NA	2,040	46,600	80,800	NA	NM	3366.33
PZ-7	5/13/2014	ND	24.5	135,300	NA	2,650	35,400	114,000	NA	3373.56	3373.29
PZ-8	NS	NS	NS	NS	NS	NS	NS	NS	NS	3349.36	3349.38
PZ-9	5/13/2014	ND	20.0	163,700	NA	4,730	83,600	161,000	NA	3362.24	3362.01
PZ-10	5/12/2014	ND	24.6	2,754	NA	471	407	1,840	NA	3364.13	3363.50
PZ-11	5/12/2014	ND	23.3	138,300	NA	2,260	45,000	102,000	NA	3371.04	3370.82
PZ-12	5/12/2014	ND	22.9	8,560	NA	374	2,490	5,640	NA	3351.95	3351.44
PZ-13	5/13/2014	Bailed*			NA	2,900	104,000	265,000	NA	3355.16	3355.01
PZ-14	NS	NS	NS	NS	NS	NS	NS	NS	NS	3352.66	3352.62
PZ-15	NS	NS	NS	NS	NS	NS	NS	NS	NS	3381.50	3381.41
C-2811	5/13/2014	ND	21.3	3,630	NA	297	865	2,250	NA	3342.85	3342.62
C-2505	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	3364.16
C-2506	NS	NS	NS	NS	NS	NS	NS	NS	NS	NM	3364.84
C-2507	5/13/2014	ND	19.5	10,880	NA	643	2,770	7,590	NA	NM	3361.25
WQSP-6A	5/14/2014	ND	22.4	3,863	5.40	1,870	342	3,500	<1.0	NM	3196.12
Explanation:	NA: Not Analyzed, parameter not required, per permit conditions.										
	NS: Not Sampled, not required per permit conditions										
	ND: Not Determined. pH for these wells was not determined due to pH meter malfunction.										
	* PZ-13 Field Parameters were not measured since a bailer was used to collect the sample due to difficulty using Low-Flow pumps										
	"Bold" concentrations exceed standards listed in 20.6.2.3103 NMAC for Human Health and Domestic Water Supply										
	NM: Water levels were not measured for this period, as wells were not accessible										