

FINAL

AMEC Geomatrix



**CREDIBLE/SUITABLE
WELL
DETERMINATION**

MAY 2009



FINAL

PLAN OF STUDY
for
CREDIBLE/SUITABLE WELL DETERMINATION

INTERIM PLAN, PAPA ROD
PINEDALE ANTICLINE OIL AND GAS
EXPLORATION AND DEVELOPMENT PROJECT

Sublette County, Wyoming

Prepared for:

U.S. Department of Interior, Bureau of Land Management, Pinedale Field Office
Wyoming Department of Environmental Quality, Water Quality Division
U.S. Environmental Protection Agency, Region 8
Shell Rocky Mountain Production
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I.0 INTRODUCTION

A consortium of agencies and companies prepared an Interim Plan (Geomatrix 2008a) that was designed to fulfill certain requirements of a recent U.S. Department of Interior, Bureau of Land Management (BLM) Record of Decision (ROD; BLM 2008) for the Pinedale Anticline Oil and Gas Exploration and Production Area (also known as the Pinedale Anticline Project Area, or PAPA) in Sublette County, Wyoming (**Figure I**). The group is comprised of representatives and technical specialists with the BLM, Wyoming Department of Environmental Quality's Water Quality Division (DEQ/WQD), and Region 8 of the U.S. Environmental Protection Agency (EPA), as well as Shell Exploration and Production Company (Shell), Questar Market Resources (Questar), and Ultra Resources, Inc. (Ultra). AMEC Geomatrix, Inc. (Geomatrix) is providing technical support to the group. Collectively, the agencies are referred to herein as the "BDE" (BLM/DEQ/EPA) and the three oil and gas companies are referred to as the "Operators."

The Operators desire to comply with BLM's 2008 ROD and more fully understand the groundwater system being monitored in the PAPA. In order to do this, the Operators retained Geomatrix to compile and analyze existing groundwater data in the PAPA, and execute various Plans of Study specified in the Interim Plan. In doing so, existing physical and chemical groundwater information will be collected from existing wells that are determined to be capable of producing accurate and reliable data (i.e., credible/suitable wells). Types of data include:

- Static water levels;
- Aquifer test data (single and multiple well tests);
- Groundwater chemistry (inorganic data [e.g., common ions], dissolved gases [e.g., methane], isotopic data for carbon and hydrogen in methane, and petroleum hydrocarbon compounds [e.g., benzene]); and
- Lithology (e.g., drillers' well completion logs and geophysical logs).

Potential uses of these data include:

- Characterize groundwater flow within hydrostratigraphic units (HSUs);
- Characterize groundwater flow between HSUs;
- Characterize flow between groundwater and surface water;
- Define aquifer hydraulic properties (e.g., horizontal and vertical hydraulic conductivity) and lithology for HSUs; and
- Characterize groundwater quality and evaluate potential water quality impacts from oil and gas activities (e.g., surface releases and excursions from drilling/operating gas wells).

I.1 PROBLEM STATEMENT

There are over 300 potential study wells inside or adjacent to the PAPA. These are water supply wells that were not designed or constructed to be used as monitoring wells or piezometers in hydrogeologic investigations. A credible/suitable determination should be made for each water supply well that could potentially be used for the collection of data specified in the Interim Plan and the various Plans of Study for the PAPA project, and/or that could eventually be included in a monitoring program for the PAPA. Each credible/suitable study well must be geographically located and constructed in a manner such that credible data can be obtained from the well that meet the data quality objectives described in this Plan of Study.

I.2 STUDY OBJECTIVES

This Plan of Study describes the process by which credible/suitable wells will be identified from the existing inventory of water supply wells. Wells that are identified as credible/suitable will be included on a source list of potential wells for use in the hydrogeologic data gaps study and low level petroleum hydrocarbon detection study described in the Interim Plan (Geomatrix 2008a). The source list will also identify wells from which existing physical (e.g., static water levels) and chemical data can be used. This will be an iterative process, as additional information from both studies will also be used to refine or develop additional criteria for the continued credible/suitable well determination. Ultimately, some credible/suitable wells may be candidates for monitoring wells in the long-term monitoring program.

The primary study objective is to identify credible/suitable wells from the inventory of existing water supply wells at the PAPA. Specific data objectives for these credible/suitable wells include:

1. Characterize horizontal groundwater flow within a particular HSU using water level data.
2. Characterize vertical groundwater movement between HSUs using water levels from “clusters” of wells.
3. Characterize flow between groundwater and surface water using water levels from wells located near the rivers and streams.
4. Collect aquifer test data to:
 - a. Define hydraulic properties of each HSU;
 - b. Define hydraulic properties of individual lithologies within each HSU; and
 - c. Define both horizontal and vertical flow components.
5. Characterize general water quality and potential water quality impacts from oil and gas activities resulting from releases/spills at ground surface.
6. Characterize potential water quality impacts from subsurface excursions resulting from drilling/operating gas wells.

I.3 PLAN OF STUDY ORGANIZATION

Section 2 of this Plan of Study describes the hydrologic and hydrogeologic setting of the PAPA. Data Quality Objectives for this Plan of Study are discussed in **Section 3**. **Section 4** describes four specific tasks that are designed to identify credible/suitable wells for inclusion on a source list of potential study wells. Quality assurance and quality control are described in **Section 5**. A tentative schedule for the four tasks is included in **Section 6**. Key personnel identified to complete the tasks are presented in **Section 7**. References used to develop this Plan of Study are listed in **Section 8**. Figures and tables associated with this Plan of Study are compiled in **Appendices A** and **B**, respectively. An example of the matrix that will be used to make a credible/suitable determination for existing wells is included in **Appendix C**.

2.0 STUDY AREA DESCRIPTION

Natural gas exploration and production targets natural gas accumulations in a subsurface geologic trap called the Pinedale Anticline. The uppermost gas-bearing geologic formations of economic significance are located approximately 8,000 to 12,000 feet below ground surface. The Anticline Crest is approximately 2 to 3 miles wide, and is oriented northwest to southeast parallel to the Wind River Range located to the east. The PAPA encompasses an area of approximately 308 square miles, and is about 12 miles wide by 26 miles long (Figure 1). More detailed information about the PAPA is presented in the Geomatrix (2008b) Hydrogeologic Conceptual Model Report.

For the Hydrogeologic Conceptual Model Report, Geomatrix (2008b) researched and accessed available well location and construction information/data for the PAPA and surrounding region from a variety of sources, including the Sublette County Conservation District (SCCD), Wyoming State Engineers Office (SEO), BLM, and the U.S. Geological Survey (USGS). The SCCD began collecting surface water and groundwater data in the PAPA in 2000-2001. Data are stored in a Microsoft Access database constructed and maintained by the SCCD. Data contained in the database include:

- Results of initial field inventory of water supply wells that required monitoring in accordance with the ROD;
- Water well permit information, including ownership, location, depth and a summary table cross-referencing permit numbers and SCCD well IDs;
- Well locations determined using survey grade and non-survey (e.g., recreational) grade GPS units;
- Lithologic and well construction information, including type and size of casing, screened or perforated intervals, and total depth; and
- Static water level measurements from monitored wells.

Geomatrix added additional wells to the database which are reported in USGS documents. These wells are not owned by the USGS and are identified according to their USGS nomenclature (e.g., USGS-32-110-13ab01). In addition, Geomatrix amended the SCCD database with additional data obtained for the PAPA. Geomatrix reviewed SCCD data and any apparent anomalous data were identified, examined, and either rejected or retained in the database. SCCD (2008) monitoring data are currently available through August 2008.

Finally, Geomatrix requested and received additional water well permits and water quality data from the Operators that were not included in the SCCD database. Permit information that was not included in the SCCD database was added to the Project database, including lithologic and well construction information.

All study wells monitored by SCCD, which include existing industrial, stock, and domestic water supply wells, are shown on **Figure 2**. Each of these wells, and any other wells identified during execution of this Plan of Study that are strategically located, will be subjected to the credible/suitable determination. Due to well location, construction, and/or history of use, some wells may be unsuitable for use as study wells. As previously mentioned, wells may be added to or deleted from the source list as additional information becomes available during execution of other Plans of Study described in the Interim Plan.

3.0 DATA QUALITY OBJECTIVES

The Data Quality Objective (DQO) process is used to establish performance or acceptance criteria for data collection activities. These criteria in turn serve as the basis for designing a plan for collecting data of sufficient quality and quantity to support goals of the study. The DQO process is systematic and begins by defining the problem and identifying the goals and objectives of the study (Section 3.1). Subsequent steps identify information inputs (Section 3.2) and measurement performance criteria (Sections 3.3 through 3.8). Data collection activities and methods designed to satisfy study goals and objectives are presented in Section 4. Specific procedures for ensuring data quality assurance and quality control are explained in Section 5.

3.1 STUDY GOALS AND OBJECTIVES

Potential study wells include Operator and private water supply wells that were designed to produce large volumes of water for industrial purposes and not for monitoring water quality. As such, the construction and/or location of these water supply wells may make many of them unsuitable for use as study wells or monitoring wells. The overall objective of this Plan of Study is to critically review the data/information available for these water supply wells and determine their suitability for use as study wells. Specific data objectives for the wells are discussed in Section 1.2.

3.2 INFORMATION INPUTS

Various data and information are required to meet the objectives stated above. For this Plan of Study, the following data/information from existing wells will be used to make the credible/suitable well determination:

- Well location and elevation
- Total depth of well and depth of perforated/screened interval
- Lithology
- Casing type and diameter
- Depth of surface seal
- Well integrity
- History of use and maintenance.

Most data will come from the existing project database, well completion reports, and operator records. Much of the data and information considered by this Plan of Study (e.g., measurements recorded on driller's logs) are crudely measured compared to chemical laboratory analyses data typically considered by the DQO process, with few quality control considerations. However, some elements of the DQO process are applicable to this Plan of Study, and are addressed below.

3.3 MEASUREMENT PERFORMANCE CRITERIA

Measurement performance criteria are established for each measurement parameter or similar group of parameters. Measurement performance criteria are specifications for the quality of data needed for the project, such as measurement precision, accuracy, representativeness, completeness, and comparability (PARCC). In the context of this study, evaluation of these criteria is generally subjective. These criteria are addressed in the following sections.

3.4 PRECISION

Precision is a measure of the degree to which two or more measurements are in agreement. Precision in the context of this Plan of Study applies to surveying horizontal and vertical position for potential study wells. The existing data describing well positions are not considered accurate due to the methods used for surveying (see Section 3.2). Therefore, the concept of precision is not applicable to this Plan of Study because only existing information will be compiled. As part of the Monitoring Program Augmentation Plan of Study (Geomatrix 2009a), the horizontal and vertical positions of each water supply study well deemed to be credible/suitable will be determined by a professional land surveyor licensed in Wyoming (see that Plan of Study for further information on precision of the planned survey).

3.5 ACCURACY

Accuracy is the degree of agreement between an observed value and an accepted reference or true value. In the context of this Plan of Study, accuracy is applicable for the following information:

- Database entry;
- Geographical coordinates for water supply study wells;
- Casing reference elevations; and
- Information and measurements stated on well completion reports.

Geographical coordinates and casing reference elevations contained in the current project database were determined using methods with varying accuracies. The SCCD used survey-grade GPS units for approximately 10 percent of the wells, and resource or recreational grade GPS units (Trimble® or Garmin® units) for the remaining wells. Although attempts were made to improve confidence in vertical accuracies, the existing data-set is not considered accurate for the purpose of determining groundwater flow direction. Horizontal and vertical positions of each water supply study well will be determined by a professional land surveyor licensed in Wyoming as part of the Monitoring Program Augmentation Plan of Study.

Accuracy of the project database will be determined by the following method:

- 10 percent of data in the existing project database will be independently checked against its source; and
- Each new data entry will be independently verified.

Accuracy of measurements and information stated on well completion reports cannot be determined with any degree of certainty. Individual measurements will be scrutinized relative to other stated measurements for discrepancies (e.g., bottom of perforated interval exceeds total well depth). Questionable measurements will be discarded if they cannot be reconciled.

3.6 REPRESENTATIVENESS

In the context of this Plan of Study, credible/suitable wells must be positioned and constructed in a manner so that data are representative of the target aquifer or a portion thereof. The position of the perforated interval must span the appropriate interval within the target HSU, and the well must be sealed from overlying and underlying HSUs.

3.7 COMPLETENESS

Completeness is the percentage of valid measurements or data points obtained, as a proportion of the number of measurements or data points planned for the project. Completeness in the context of this Plan of Study is affected by such factors as missing records (e.g., well completion reports) and missing data/information on individual records (e.g., type and depth of surface seal). Percent completeness (C) is calculated by the following equation:

$$C (\%) = V \div P \times 100$$

where: V = number of valid measurements/data points obtained; and
P = number of measurements/data points planned.

Critical information/data for each well, based on intended data usage, will be included in a matrix (see Section 4, Task 1). The matrix will include a scoring system based on critical information for each intended use (Appendix C). In order for a well to be credible/suitable for its intended use, all required information must be available and complete.

3.8 COMPARABILITY

In the context of this Plan of Study, comparability is not applicable because the information/data available for existing water supply wells cannot be compared to other similar data.

4.0 APPROACH

The approach detailed in this section is based on guidance contained in the American Society of Testing and Materials (ASTM) D5980-96 (Re-approved 2004) “Standard Guide for Selection and Documentation of Existing Wells for Use in Environmental Site Characterization and Monitoring” (ASTM 2004). This ASTM Standard describes a process by which a well is determined to be suitable for a particular study based on: 1) current understanding of the hydrogeologic system being monitored (Conceptual Model); 2) the well’s geographical location; and 3) details of the well’s construction. Also, a well’s credibility/suitability depends on the type of data being collected. Therefore, the credible/suitable determination for a well may change depending on objectives of the specific study for which it is being considered.

The current hydrogeologic conceptual model for the PAPA is described in the Hydrogeologic Conceptual Model Report (Geomatrix 2008b). Three principal HSUs are located within the PAPA: Alluvium (river alluvium and mesa terrace gravel), Shallow Wasatch Formation bedrock, and Regional Wasatch Formation bedrock. The overall pattern of groundwater flow within the PAPA is from northeast to southwest away from primary recharge areas adjacent to the Wind River Range. Groundwater in the Shallow Wasatch Formation HSU migrates downward to the Regional Wasatch Formation HSU under variable degrees of saturation. Some of this water may become perched above the Regional Wasatch HSU. Groundwater in the Regional Wasatch Formation HSU flows through the aquifer in sandstone units and along joints and fractures in sandstone, mudstone, and siltstone.

Discharge of groundwater in the PAPA occurs primarily to streams and rivers, including the New Fork and Green Rivers. There is some lateral movement of groundwater in the Shallow Wasatch HSU to discharge points in the form of springs and seeps. Groundwater exchange with rivers probably occurs through the Alluvium HSU and at areas where Wasatch Formation bedrock is exposed in the river channels. Upward vertical gradients, potentiometric contours, and gains in stream flow are evidence that the Regional Wasatch HSU is a source of recharge for the New Fork River.

The current conceptual model is incomplete, as described in the data gaps section of the Hydrogeologic Conceptual Model Report (Geomatrix 2008b). The Hydrogeologic Data Gaps Plan of Study (Geomatrix 2009b) and Low-Level Hydrocarbon Compound Detection Evaluation Plan of Study (Geomatrix 2009c) more fully describe data gaps and identify study objectives designed to increase understanding of the groundwater system.

This section describes four specific tasks that will be completed to make the credible/suitable well determinations. The general approach is to:

- Develop specific criteria in relation to study objectives;
- Inventory existing wells; and
- Screen wells against selection criteria to identify wells that meet the credible/suitable criteria.

4.1 TASK 1 – REFINE WELL SELECTION CRITERIA

Criteria have been developed that are specific to each potential data-collection use/objective and tailored to meet objectives of the PAPA monitoring program. In general, to meet the credible/suitable definition, wells must:

- Be suitably located in the PAPA;
- Be completed in target HSU(s);
- Not yield biased water level or water quality data due to design, construction, inadequate well development, or past use;
- Be accessible and secure; and
- Be free of defects or maintenance issues (e.g., cracked casing) that might influence water level and/or water quality data.

Preliminary data objectives and associated well selection criteria are summarized in the list below. These criteria will be refined as the information for each well is inventoried (Task 2) and screened for selection of credible/suitable well status (Task 3).

Data Objective	Well Selection Criteria
<p>I. Determine credible/suitable wells for collection of water level data to characterize horizontal flow within HSU.</p>	<ul style="list-style-type: none"> • Well must be perforated/screened in a single HSU and isolated from overlying HSU(s) (i.e., properly sealed). • Perforated/screened interval must be relatively short (<50 feet) so that water level measurements represent conditions in a discreet vertical section of the HSU. • If vertical gradients are known to be negligible (<0.01), the perforated/screened interval may be longer. Vertical flow must be characterized first.

Data Objective	Well Selection Criteria
<p>2. Determine credible/suitable wells for collection of water level data to characterize vertical flow between HSUs.</p> <p>(Note: Very few if any existing wells expected to meet these criteria due to lack of well “clusters” completed in different HSUs; well clusters may consist of one or more existing wells and new well(s). Also, there is little or no coverage of Alluvial aquifers and Fort Union Fm)</p>	<ul style="list-style-type: none"> • Well pairs or clusters are needed. • Well pairs must be located in close proximity so the effects of horizontal gradient are minimal. Ideally wells used for this type of analysis would be located directly adjacent to each other. • Individual wells must be completed in a single HSU and isolated from overlying HSU(s) (i.e., properly sealed). • Each well must be perforated/screened in discreet intervals (<50 feet) within HSU.
<p>3. Determine credible/suitable wells for collection of water level data to characterize flow between groundwater and surface water.</p>	<ul style="list-style-type: none"> • Well pairs or clusters must provide data for each HSU; at least one existing or planned well should be completed in Alluvium HSU. • Well clusters should be located adjacent to existing or planned surface water gaging stations. • Vertical gradients need to be characterized between Wasatch and New Fork/Green River Alluvial HSUs, and within the Alluvial HSUs. • Criteria for Data Objective 2 apply.
<p>4. Determine credible/suitable wells for collection of aquifer test data.</p>	<ul style="list-style-type: none"> • Wells must be perforated/screened within the target HSU and open to the appropriate lithologic interval. • Perforated/screened intervals must be isolated from non-target lithologies (i.e., properly sealed). • In relation to each other, wells used for multiple well tests must be suitably located so that aquifer response to pumping can be measured in a reasonable timeframe. • Well pairs used to characterize vertical flow parameters must be located in close proximity; ideally, directly adjacent to each other. • Appropriate testing must have been performed for the given hydrogeologic conditions.

Data Objective	Well Selection Criteria
<p>5. Determine credible/suitable wells to monitor potential water quality impacts from oil and gas activities from releases/spills at ground surface.</p> <p>(Note: Very few if any existing wells expected to meet these criteria)</p>	<ul style="list-style-type: none"> • Located hydraulically downgradient in close proximity to potential source(s). Background wells may also be necessary. • Where water table conditions occur, perforations/screen should bracket the water table to allow detection of light non-aqueous phase liquids. • Where water table conditions occur, well perforations/screen should bracket water table. • In order to minimize potential effects of monitoring multiple water bearing zones, screened/perforated intervals should be limited to <50 feet.
<p>6. Determine credible/suitable wells to monitor potential water quality impacts from oil and gas excursions resulting from drilling/operating gas wells.</p>	<ul style="list-style-type: none"> • Pending hydrogeologic data gaps study and characterization of low level hydrocarbon detections.

4.2 TASK 2 – INVENTORY WELLS

Geomatrix obtained a copy of the SCCD database that was current as of June 2007 and updated it with additional water supply well information obtained from the Operators, Wyoming SEO, and USGS. **Table I** summarizes known information for each well shown on **Figure 2** based on information in the project database. Blank cells within **Table I** indicate a lack of information. Some information critical to the credible/suitable well determination is incomplete (e.g., perforated interval) or completely missing (e.g., well seal). The accuracy of other information is known or suspected to be inadequate (e.g., locations and casing elevation).

Additional industrial, domestic, and stock well records will be obtained from the SEO, Operators, USGS, and SCCD (if available). This information will be used to update the project database. Other potential sources of information include the Wyoming Water Resources Data System, Wyoming Geological Survey, National Water Information System, and Wyoming GIS Coordination Structure. Critical data/information to obtain for existing wells include:

- Well location and elevation
- Total depth of well and depth of perforated/screened interval
- Lithology
- Casing type and diameter
- Depth of surface seal
- Well integrity
- History of use and maintenance.

Additional data/information on static water levels and chemical data will also be entered into the project database, if available.

4.3 TASK 3 – SCREEN WELLS AND SELECT CREDIBLE/SUITABLE WELLS

Criteria developed for each potential data objective (Task 1) were used to develop a credible/suitable well screening matrix, against which each potential study well will be screened (**Appendix C**). Each potential study well will be evaluated against each criterion. The criteria may be refined as information is collected and reviewed for existing wells in the PAPA. All screening criteria listed in the matrix for each potential use are mandatory. Wells that do not meet each criteria for an intended data use will be excluded for that use; however, some wells may be credible/suitable for certain uses, but not for others.

4.4 TASK 4 – PREPARE TECHNICAL MEMORANDUM

A technical memorandum will be prepared that documents the credible/suitable well determination. The key component of the memorandum will be the completed credible/suitable well screening matrix and the source list(s) of credible/suitable wells. The memorandum will also include:

- Results of the existing study well inventory;
- Description of the screening process and results;
- Updated well construction summary table (**Table I** in this Plan of Study); and
- Map showing credible/suitable well locations.

5.0 QUALITY ASSURANCE AND QUALITY CONTROL

The quality assurance and quality control (QA/QC) program described herein has been developed to ensure the usability and reliability of critical information for credible/suitable well determination, and provides for routine application of procedures for controlling the measurement and data management process. Standard procedures described in this section ensure that data/information collected in the field (e.g., surveying), culled from various sources described in Section 4.2, and entered into the PAPA project database will be of appropriate quality to meet data needs and DQOs (see Section 3).

Quality control is a system of routine technical activities that accounts for and quantifies as many potential measurement errors as possible in order to evaluate uncertainties associated with any given measurement. With regard to this Plan of Study, the greatest potential for error will occur when entering data and information into the project database (e.g., data transcription errors). There is also potential error associated with surveying the geographical position and elevation of wells; however, this activity is described and will be conducted as part of the Monitoring Program Augmentation Plan of Study (Geomatrix 2009a).

5.1 DATABASE AND REPORTING

Entry of new data/information into the electronic project database is the activity with the largest potential for error. Similarly, data that are already housed in the project database may have been entered incorrectly. Finally, reporting errors can occur when database queries are improperly written, or a poor database design results in erroneous data being generated in response to queries. The following procedures will be used to minimize the potential for erroneous data to be entered into the project database and subsequently reported:

- At least 10 percent of data in the existing project database will be independently checked against its source. Data/information sources include field notes, laboratory reports, and well drilling and completion records.
- Each new data entry will be independently verified against its source.
- Suspect data from existing records will be discarded or flagged in the database if they cannot be verified.
- At least 25 percent of all data in reports generated by a database query will be verified against data in the database.

5.2 DATA/INFORMATION REVIEW

Data and information will be validated to the extent possible to identify any unreliable or invalid measurements or recorded entries. Data/information contained in well completion reports are difficult to validate with any certainty because the reviewer has no control over the accuracy of

the original reports (see Section 3.2). However, individual data/information contained in well completion reports will be reviewed relative to other data/information contained in the same report for obvious measurement or recording inaccuracies. Erroneous or suspect data/information that cannot be adequately validated will be discarded or flagged in the project database.

6.0 SCHEDULE

A master schedule for all PAPA-related environmental activities to be completed in 2009 is included in the “Project Administration Plan” (Geomatrix 2009d). The following tentative schedule was developed for issuance of the Technical Memorandum – Credible/Suitable Well Determination described in Section 4.4 of this Plan of Study:

- The Draft Technical Memorandum will be issued for review and comment to the BDE and Operators by June 17, 2009.
- BDE and Operators will submit their comments to Geomatrix by July 3, 2009.
- The Final Technical Memorandum will be issued by July 10, 2009.

7.0 PERSONNEL

The following key personnel from Geomatrix will complete the four tasks described in this Plan of Study for credible/suitable well determination:

- Steve Wright (Helena) – Study and Task Manager; screening criteria development
- Adam Johnson (Missoula) – Task Manager; apply screening criteria
- Shane Fox (Missoula) and Sally Staley (Helena) – Database/GIS Managers
- Kevin Van Hook (Houston) – Quality Assurance and Quality Control project officer

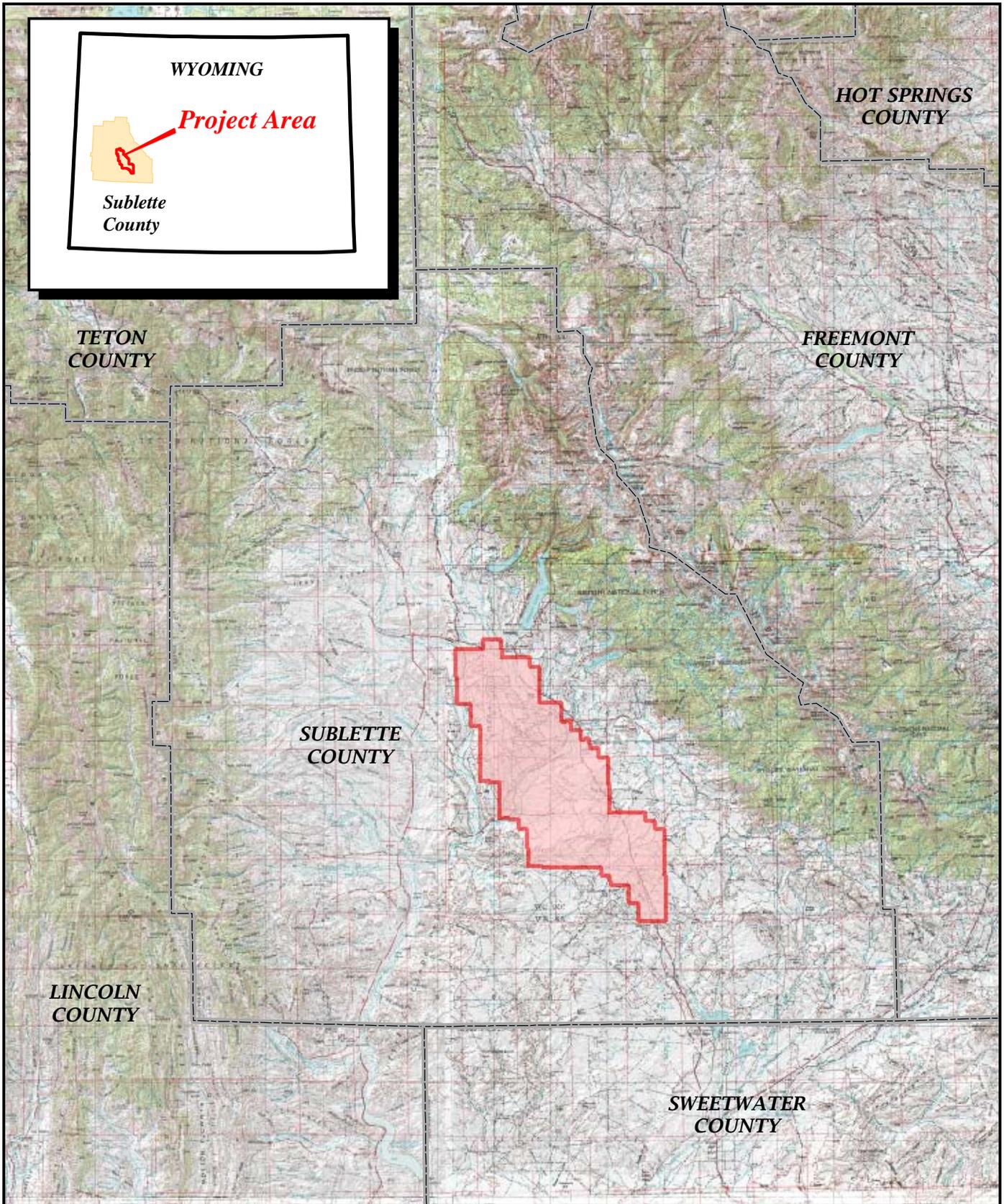
8.0 REFERENCES

- ASTM, 2004.** D5980-96 (Re-approved 2004), Standard Guide for Selection and Documentation of Existing Wells for Use in Environmental Site Characterization and Monitoring. May.
- Geomatrix Consultants, Inc. (Geomatrix or AMEC Geomatrix), 2009a.** Draft Plan of Study for the Monitoring Program Augmentation. Interim Plan, PAPA ROD, Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming.
- Geomatrix, 2009b.** Draft Hydrogeologic Data Gaps Plan of Study. Interim Plan, PAPA ROD, Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming.
- Geomatrix 2009c.** Draft Low-Level Hydrocarbon Compound Detection Evaluation Plan of Study. Interim Plan, PAPA ROD, Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming.
- Geomatrix 2009d.** Draft Project Administration Plan. Interim Plan, PAPA ROD, Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming.
- Geomatrix, 2008a.** Final Interim Groundwater/Aquifer Pollution Prevention, Mitigation, and Monitoring Plan. Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming. Prepared for U.S. Department of Interior, Bureau of Land Management, Pinedale Field Office, Wyoming Department of Environmental Quality, Water Quality Division, U.S. Environmental Protection Agency, Region 8, Shell Rocky Mountain Production, Questar Market Resources, and Ultra Resources, Inc. December.
- Geomatrix, 2008b.** Final Hydrogeologic Conceptual Model, Pinedale Anticline Project Area, Sublette County, Wyoming. March.
- Sublette County Conservation District (SCCD), 2008.** Summary of Pinedale Chemical and Field Data 2000-2008. September 10, 2008.
- U.S. Department of Interior, Bureau of Land Management (BLM), 2008.** Record of Decision for the Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming. September 12.



APPENDIX A

FIGURES



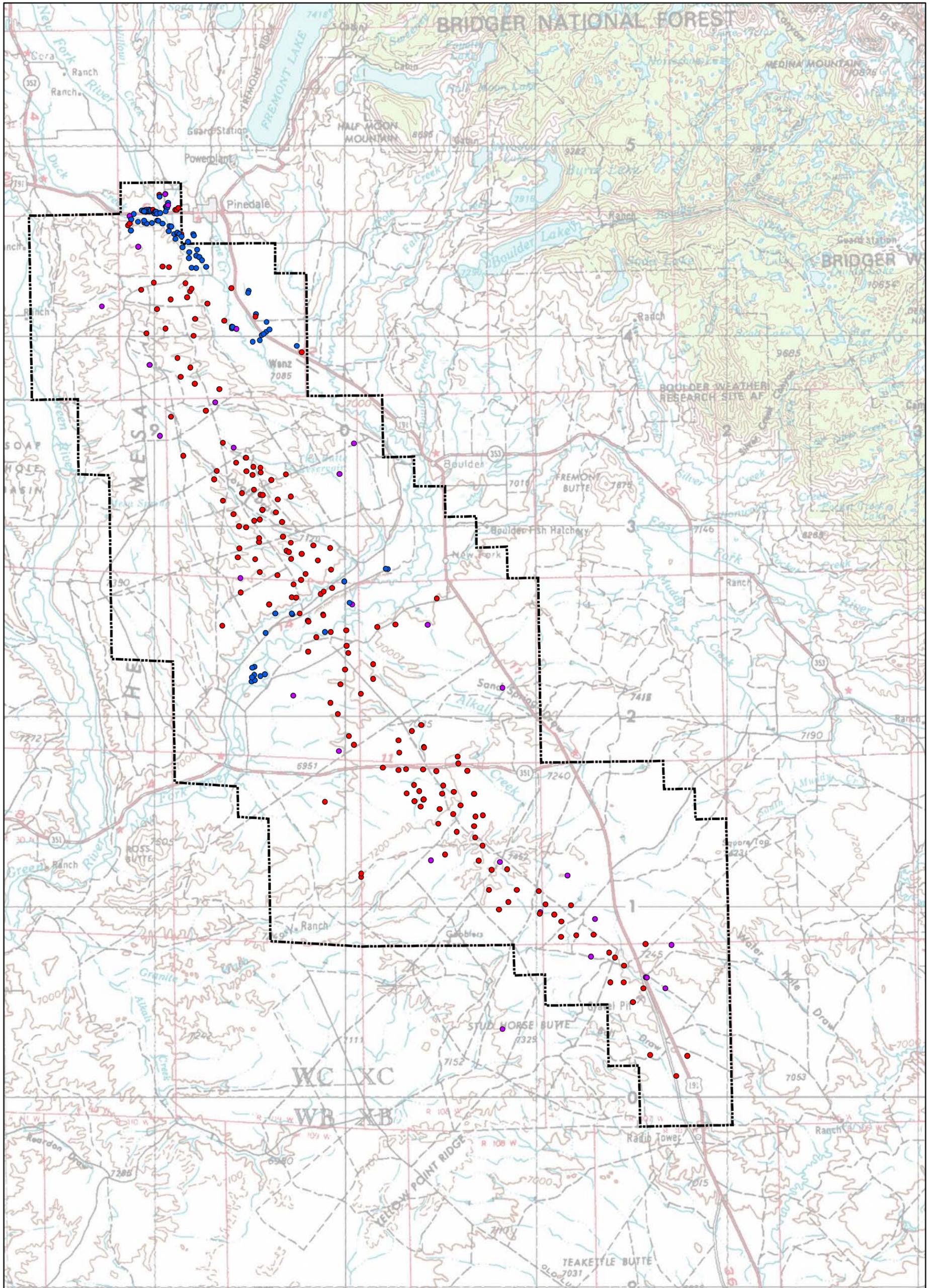
H:\13655 Pinedale Anticline\5000 GIS\Loc.mxd

Source: 250K WYGISC, BLM

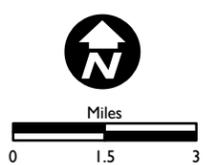


Project Area

Project Location Map
Pinedale Anticline Project Area
Sublette County, Wyoming
FIGURE 1



Source: 100K WYGISC, BLM



Note: Wells shown are those that have coordinate information.

-  Project Area
-  Domestic Well
-  Industrial Well
-  Stock Well

Existing Wells Monitored by SCCD
 Credible/Suitable Well Determination Plan of Study
 Pinedale Anticline Project Area
 Sublette County, Wyoming
FIGURE 2



APPENDIX B

TABLES

Table 1
Summary of Information for Inventoried Wells
Interim Plan for PAPA ROD

SCCD Well ID	Well Name	Permit Number	Well Status ¹	Type ²	Easting ³	Northing ³	Reference Elevation ³	Date Drilled	Total Depth	Type of Seal	Depth of Seal	Multiple Casings	Casing Diameter	Casing Depth	Perforated (P) or Screened (S)	Start of Perforated or Screened Interval	Bottom of Perforated or Screened Interval
AD001	Townsend No.1	P9230P	---	AD	596382.6131	4725358.205	6915.25	5/30/1965	105	---	---	---	---	---	---	---	---
AD002	Mocroft #1	P9605P	---	AD	594135.664	4740411.803	7069.05	7/1/1962	95	---	---	NO	---	---	FALSE	---	---
AD003	Mocroft #2	P9606P	---	AD	---	---	---	12/31/1914	65	---	---	NO	5	---	---	---	---
AD004	Mocroft #3	P9607P	---	AD	594101.8182	4740341.777	7059.26	12/31/1959	65	---	---	YES	6	2-100	TRUE	90	100
AD006	Mocroft Windmill No.1	P38439W	---	AD	594101.8591	4740424.001	7067.59	11/3/1977	92	---	---	YES	8	---	FALSE	---	---
AD007	Possibles #1	P43263W	---	AD	595874.0188	4724353.34	6851.31	7/15/1978	70	---	---	NO	6	0-70	FALSE	---	---
AD008	Dabb #1	P68111W	---	AD	---	---	---	7/1/1985	134	---	---	YES	6	---	FALSE	---	---
AD009	NERD Farm #1	P107024W	---	AD	597236.83	4725358.578	6886.98	10/10/1997	145	---	---	YES	6	0-145	FALSE	---	---
AD014	Chidsey #1	P64890W	---	AD	602169.321	4727718.068	6941.73	---	141	---	---	---	---	---	---	---	---
AD016	Schell #1	P66630W	---	AD	595289.5	4722561	6892.00	---	43	---	---	---	---	---	---	---	---
AD017	The Watering Hole #1	P44818W	---	AD	595164	4722522	---	---	56	---	---	---	---	---	---	---	---
AD018	Edwards #1	P98297W	---	AD	595273	4722143	6857.00	---	180	---	---	---	---	---	---	---	---
AD020	Jeremy #1	P63795W	---	AD	595310	4721849	6877.00	---	132	---	---	---	---	---	---	---	---
AD021	Christina Rae #1	P61393W	---	AD	595130	4721785	6881.00	---	220	---	---	---	---	---	---	---	---
AD022	Watersdown #1	P99291W	---	AD	595145	4722012	---	---	120	---	---	---	---	---	---	---	---
AD033	Bloom #4	P11404P	---	AD	590653	4746473	---	---	130	---	---	---	---	---	---	---	---
AD034	Wanner #1	P15466P	---	AD	590362	4746397	7174.00	8/14/1965	90	---	---	---	---	---	---	---	---
AD035	Vance #2	P87074W	---	AD	590080.8287	4746465.385	7161.63	---	200	---	---	---	---	---	---	---	---
AD036	Koch #1	P48453W	---	AD	590137.2571	4746464.882	7156.29	---	165	---	---	---	---	---	---	---	---
AD037	Delmoe #1	P52276W	---	AD	590081.765	4746470.476	7152.21	---	126	---	---	---	---	---	---	---	---
AD038	Susan #1	P96672W	---	AD	590055.416	4746382.117	7149.44	---	100	---	---	---	---	---	---	---	---
AD039	Mortenson #1	P61788W	---	AD	590187.048	4746370.174	7157.24	---	157	---	---	---	---	---	---	---	---
AD040	Bryant #1	P72862W	---	AD	590261.962	4745985.924	7158.40	---	87	---	---	---	---	---	---	---	---
AD041	Burrough 1 (deepened)	P61066W	---	AD	590196.834	4745996.805	7142.69	---	52	---	---	---	---	---	---	---	---
AD042	Cole #5	P84291W	---	AD	---	---	---	---	120	---	---	---	---	---	---	---	---
AD044	Hay #1	P56040W	---	AD	590846.766	4745712.754	7170.28	---	150	---	---	---	---	---	---	---	---
AD045	Grossman #1	P46371W	---	AD	590936	4745688	---	---	152	---	---	---	---	---	---	---	---
AD046	Trombly #1	P80163W	---	AD	591151	4745038	---	---	185	---	---	---	---	---	---	---	---
AD047	Stevens #1	P102716W	---	AD	591087	4745288	---	---	105	---	---	---	---	---	---	---	---
AD050	Isaacs #1	P3380P	---	AD	589475	4746483	7251.00	---	81	---	---	---	---	---	---	---	---
AD052	Dunning #2	P33396W	---	AD	589783.44	4746469.732	7175.59	---	12	---	---	---	---	---	---	---	---
AD053	Dunning #1	P10329P	---	AD	589781.5	4746469	7253.50	---	90	---	---	---	---	---	---	---	---
AD054	Davis #1	P78005W	---	AD	589748.9568	4746534.703	7149.11	---	51	---	---	---	---	---	---	---	---
AD056	Roberts Well #1	P13825W	---	AD	589699.409	4746476.967	7152.72	---	90	---	---	---	---	---	---	---	---
AD057	Wood #1	P64294W	---	AD	589647.421	4745841.086	7194.47	---	283	---	---	---	---	---	---	---	---
AD058	Kenyon #1	P13940W	---	AD	589714.973	4746481.784	7157.37	---	96	---	---	---	---	---	---	---	---
AD059	Clark #1	P5276P	---	AD	---	---	---	---	120	---	---	---	---	---	---	---	---
AD060	Marys #1	P102181W	---	AD	588832.401	4746064.647	7166.04	---	75	---	---	---	---	---	---	---	---
AD062	Licking 1	P98395W	---	AD	---	---	---	---	120	---	---	---	---	---	---	---	---
AD063	Brown #1	P57161W	---	AD	590797.412	4745442.47	7174.00	---	112	---	---	---	---	---	---	---	---
AD084	Max #1	P45131W	---	AD	591522.46	4744593.953	7154.70	---	142	---	---	---	---	---	---	---	---
AD085	Dave #1	P94486W	---	AD	591797.568	4744879.055	7111.45	---	96	---	---	---	---	---	---	---	---
AD086	LaMere 99	P119088W	---	AD	592290.09	4744462.745	7080.49	---	110	---	---	---	---	---	---	---	---
AD087	Leslie Well #1	P109008W	---	AD	591869.4167	4744330.973	7101.83	---	110	---	---	---	---	---	---	---	---
AD089	Abercrombie	P81127W	---	AD	592402.1652	4744088.098	7109.16	---	68	---	---	---	---	---	---	---	---
AD090	Steege #1	P99486W	---	AD	592245.4913	4743499.653	7114.19	6/30/1995	125	---	---	YES	6	---	FALSE	---	---
AD091	Brown #1	P45364W	---	AD	592751.4871	4743573.145	7107.65	---	73	---	---	---	---	---	---	---	---
AD124	McGinnis #1	P99888W	---	AD	---	---	---	---	100	---	---	---	---	---	---	---	---
AD129	Thompson 4	P70929W	---	AD	---	---	---	---	287	---	---	---	---	---	---	---	---
AD134	Steele #1	P19016P	---	AD	590326.688	4747250.618	7156.26	---	104	---	---	---	---	---	---	---	---
AD135	Hoke #1	P99090W	---	AD	590714.605	4746669.238	7163.05	---	80	---	---	---	---	---	---	---	---
AD136	Andy	P55174W	---	AD	590472.344	4745842.587	7177.38	---	110	---	---	---	---	---	---	---	---
AD137	Palubiak #1	P54407W	---	AD	---	---	---	---	168	---	---	---	---	---	---	---	---
AD140	Dale Jensen	No Permit	---	AD	589840.5	4746481.5	7202.50	---	---	---	---	---	---	---	---	---	---
AD142	Ruland	No Permit	---	AD	589574	4746539	7267.00	---	---	---	---	---	---	---	---	---	---
AD145	Corbisier	No Permit	---	AD	589513.4114	4745877.282	7184.77	---	---	---	---	---	---	---	---	---	---
AD149	Swinger's Green 2nd, Lot 2 Well	P143763W	---	AD	591261	4745369	---	---	100	---	---	---	---	---	---	---	---
AD150	T Bone # 1	P144627W	---	AD	589639.5	4746558.5	7220.50	---	65	---	---	---	---	---	---	---	---
AD151	D.C. # 1	P140037W	---	AD	589183	4745933	---	---	303	---	---	---	---	---	---	---	---
AD157	Blooming Ranch #1	P161459W	---	AD	590752.5	4746930.5	7195.50	---	---	---	---	---	---	---	---	---	---
AD174	McMillen II	P158836W	---	AD	---	---	---	---	160	---	---	---	---	---	---	---	---
AD175	Dew Well #1	P15870W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD192	Washburn #1	P163069W	---	AD	592234	4744161.333	7165.67	---	---	---	---	---	---	---	---	---	---
AD193	Sullivans	P61602W	---	AD	595832	4722179	6883.00	---	---	---	---	---	---	---	---	---	---
AD194	Chief #1	P170712W	---	AD	589508	4746003	---	---	---	---	---	---	---	---	---	---	---
AD195	Industrial Well #4	P163557W	---	AD	588819	4745478	7257.00	---	---	---	---	---	---	---	---	---	---
AD196	PBC #1	P162580W	---	AD	588968	4746344	---	---	---	---	---	---	---	---	---	---	---

SCCD	Well ID	Well Name	Permit Number	Well Status ¹	Type ²	Easting ³	Northing ³	Reference Elevation ³	Date Drilled	Total Depth	Type of Seal	Depth of Seal	Multiple Casings	Casing Diameter	Casing Depth	Perforated (P) or Screened (S)	Start of Perforated or Screened Interval	Bottom of Perforated or Screened Interval
AD197	Williams #1		39/3/192W	---	AD	595596	4722083	---	---	---	---	---	---	---	---	---	---	---
AD198	PFUFF 1		39/3/311W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD199	WATER HOLE #31		39/9/338W	---	AD	589506	4746478	---	---	---	---	---	---	---	---	---	---	---
AD200	FAIRWAY LOOP WELL #3		P163561W	---	AD	591348	4745282	---	---	---	---	---	---	---	---	---	---	---
AD201	ESPENSCHIED #1		P164742W	---	AD	591248	4745323	---	---	---	---	---	---	---	---	---	---	---
AD202	CONWAY HAWKS WELL #1		P85838W	---	AD	591470	4745154	---	---	60	---	---	---	---	---	---	---	---
AD204	DELGADO #1		P62079W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD205	JAZ #1		P106546W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD206	SWINGER'S GREEN #1		P109394W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD207	JAMIE #1		P89326W	---	AD	592080	4745285	---	---	---	---	---	---	---	---	---	---	---
AD208	PHILLIPS #1-94		P95598W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD209	AGOSTINI II		P95764W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD210	LAINEY'S WISH # 1		P130732W	---	AD	592117	4745207	---	---	---	---	---	---	---	---	---	---	---
AD211	AGOSTINI III		P144354W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD212	WALSH #1		P154809W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD213	CORWIN 2		P170960W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD214	33 RANCH # 2		P134273W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD215	CHAMBERS #1		39/4/270W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD216	DC-10		40/3/108W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD217	DC-5		40/1/108	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD218	DC-8		40/2/108W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
AD219	STEPP BY STEPP #1		39/4/201W	---	AD	---	---	---	---	---	---	---	---	---	---	---	---	---
ADS003	Chidsey #2		P60515W	---	ADS	600270.5	4725932.5	6910.05	5/21/1982	84	---	---	YES	6	0-84	FALSE	---	---
ADS004	Jensen No.2		P62550W	---	ADS	598980.598	4724391.003	6864.74	11/25/1982	155	---	---	YES	10	0-155	---	---	---
ADS006	Sheffy Well #1		P11186P	---	ADS	---	---	---	---	155	---	---	---	---	---	---	---	---
ADS007	Gosar #1		P9622P	---	ADS	589850.7945	4746537.952	7155.22	---	160	---	---	---	---	---	---	---	---
ADS008	Elwood Meyers #1		P53464W	---	ADS	589926.752	4745867.638	7194.69	---	360	---	---	---	---	---	---	---	---
ADS009	Sid's Well #1		P126569W	---	ADS	---	---	---	---	---	---	---	---	---	---	---	---	---
ADS011	Kramer #1		P115665W	---	ADS	591857.9769	4744032.464	7129.95	---	120	---	---	---	---	---	---	---	---
ADS012	Almquist #1		P74394W	---	ADS	591999.5375	4743511.372	7130.52	---	100	---	---	---	---	---	---	---	---
ADS028	Irwin #1		P52783W	---	ADS	---	---	---	---	125	---	---	---	---	---	---	---	---
ADS029	Snow #1		P98998W	---	ADS	592541.4732	4743918.893	7094.67	---	100	---	---	---	---	---	---	---	---
ADS030	John Scott		No Permit	---	ADS	599997.866	4727058.459	6899.87	---	---	---	---	---	---	---	---	---	---
ADS035	SKW #1		P154075W	---	ADS	589390	4746521	7170.00	---	120	---	---	---	---	---	---	---	---
ADS038	33 RANCH #1		P101518W	---	ADS	---	---	---	---	---	---	---	---	---	---	---	---	---
	1 Rellstab #1		P122411W	---	---	589768.01	4746561.85	7150.00	---	100	---	---	---	---	---	---	---	---
AMI001	Enl. Wagon Wheel No.1		P85754W	---	AMI	---	---	---	---	2500	---	---	NO	7	0-2500	---	---	---
AMI002	Enl. Wagon Wheel No.2		P85755W	---	AMI	---	---	---	5/22/1971	5200	---	---	YES	10	0-5200	FALSE	---	---
AMI003	Blue Rim #4		P29128W	---	AMI	---	---	---	---	306	---	---	NO	8	0-303	FALSE	---	---
AMI004	Blue Rim #8		P29129W	---	AMI	---	---	---	---	306	---	---	NO	8	0-304	FALSE	---	---
AMI007	Mesa Water Well NO 15-8		P138175W	---	AMI	593639	4734334	7491.33	---	813	---	---	NO	6	1-813	FALSE	---	---
AMI008	Warbonnet 9-23		P107612W	---	AMI	608519.676	4711943.293	7347.53	10/7/1997	753	---	---	NO	6	1-753	FALSE	---	---
AMI009	Lizard Head 13-28		P107650W	---	AMI	604013.14	4719499.451	7002.18	10/8/1997	553	---	---	NO	6	1-553	TRUE	455	470
AMI010	Lizard Head 11-8		P107746	---	AMI	602671.348	4724792.46	6992.00	10/24/1997	413	---	---	NO	6	1-413	FALSE	---	---
AMI011	Falcon #1-36W		P134656W	---	AMI	610234	4709611.667	7297.67	---	733	---	---	NO	10	1-20	FALSE	---	---
AMI012	Pinedale Federal #13-19W		P134549W	---	AMI	600871	4721145.333	6992.33	---	493	---	---	NO	6	1-493	TRUE	425	440
AMI014	Mesa Water Well NO 3-22		P138174W	---	AMI	596163.5	4732386	7452.50	---	772	---	---	NO	6	2-772	TRUE	750	772
AMI017	Antelope 15-4 WSW		P167531W	---	AMI	614636.4735	4706866.346	7155.71	---	712	---	---	---	---	---	---	---	---
AMI018	Antelope 15-23 WSW		P167532W	---	AMI	617960.7814	4702144.021	7112.20	---	650	---	---	NO	6	2-650	FALSE	---	---
AMI019	Stewart Point 11-34		P116193W	---	AMI	593450.3333	4737141	7529.67	7/6/1999	930	---	---	NO	6	2-910	TRUE	890	930
AMI020	Mcroft 11-22		P117255W	---	AMI	593702.4431	4740740.263	7082.81	8/6/1999	292	---	---	NO	6	1-292	TRUE	265	292
AMI023	Mcroft 1-21		P117259W	---	AMI	592811.809	4741631.835	7098.29	8/8/1999	292	---	---	NO	6	1-292	TRUE	270	292
AMI026	New Fork Unit #11-24W		P132627W	---	AMI	599787.7062	4721647.79	6948.58	2/24/2001	585	---	---	---	---	---	FALSE	---	---
AMI027	Mesa 3-20		P126623W	---	AMI	593166.25	4732419.25	7465.00	---	900	---	---	NO	6	0-940	FALSE	---	---
AMI028	Stewart Point 11-33		P126624W	---	AMI	592152	4737436.333	7559.00	---	980	---	---	NO	6	0-980	FALSE	---	---
AMI029	Mesa 13-5		P126625W	---	AMI	592745.5	4736017	7530.00	8/13/2000	940	---	---	NO	6	0-940	TRUE	930	940
AMI030	STEWART POINT WATER WELL #05-20		P145957W	---	AMI	590174.1446	4741351.406	7346.55	---	745	---	---	---	---	---	TRUE	695	745
AMI033	Highway #11		P131814W	---	AMI	615774.266	4708010.91	7229.52	---	700	---	---	---	---	---	TRUE	685	700
AMI034	Antelope #11-4W		P131008W	---	AMI	614170.7537	4707304.305	7159.18	12/30/2000	700	---	---	---	---	---	FALSE	---	---
AMI037	Rainbow #7-31		P131661W	---	AMI	611363.711	4709188.365	7322.03	1/7/2001	765	---	---	---	---	---	FALSE	---	---
AMI038	Warbonnet 13-19		P107467W	---	AMI	600882	4711721	7228.00	9/28/1997	753	---	---	---	---	---	---	---	---
AMI043	Mesa Lovatt Draw 15-8		P107747W	---	AMI	593611.6748	4724720.826	7022.35	11/11/1997	490	---	---	---	---	---	TRUE	425	490
AMI047	Crosswinds #1		P96037W	---	AMI	591152.9754	4746557.397	7142.95	---	90	---	---	---	---	---	---	---	---
AMI054	Grove #1		P93035W	---	AMI	591232.9636	4746556.674	7148.13	---	80	---	---	---	---	---	---	---	---
AMI061	NFIDW #5		P67302W	---	AMI	589970.7722	4746556.491	7156.34	5/29/1984	15	---	---	NO	4	0-15	TRUE	11	15
AMI062	Raridan #1		P98051W	---	AMI	---	---	---	---	150	---	---	---	---	---	---	---	---
AMI063	Penton #1		P85685W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI064	Dew Lumber #1		P7352W	---	AMI	588751.3596	4745840.726	7179.49	---	210	---	---	---	---	---	---	---	---
AMI065	Dew Lumber #2		P43819W	---	AMI	588662.532	4745742.476	7192.57	---	147	---	---	---	---	---	---	---	---
AMI066	Flugel #2		P86975W	---	AMI	---	---	---	---	148	---	---	---	---	---	---	---	---
AMI067	Williams #1		P89287W	---	AMI	---	---	---	---	120	---	---	---	---	---	---	---	---
AMI068	KOA #1		P39515W	---	AMI	---	---	---	---	402	---	---	---	---	---	---	---	---

SCCD Well ID	Well Name	Permit Number	Well Status ¹	Type ²	Easting ³	Northing ³	Reference Elevation ³	Date Drilled	Total Depth	Type of Seal	Depth of Seal	Multiple Casings	Casing Diameter	Casing Depth	Perforated (P) or Screened (S)	Start of Perforated or Screened Interval	Bottom of Perforated or Screened Interval
AMI069	Schriner #1	P23266W	---	AMI	---	---	0.00	---	160	---	---	---	---	---	---	---	---
AMI074	NFIDW #4	P67301W	---	AMI	590313.3848	4747346.357	7163.34	5/29/1984	30	---	---	NO	4	0-30	TRUE	5	30
AMI075	Driggs #2	P69137W	---	AMI	591300	4746650	7339.00	---	68	---	---	---	---	---	---	---	---
AMI076	Pinedale Shop #1	P70736W	---	AMI	591299.6741	4746653.413	7160.74	---	200	---	---	---	---	---	---	---	---
AMI077	Mesa 2-28D Water Well	P133241W	---	AMI	595698.619	4730804.951	7169.09	3/29/2001	512	---	---	NO	9	0-512	TRUE	497	510
AMI078	Pinedale 1-4	P137015W	---	AMI	595563.7177	4727534.608	7108.06	---	610	---	---	---	---	---	TRUE	592	610
AMI079	Pinedale 2-2	P155230W	---	AMI	597970.2658	4727443.886	6962.36	7/29/2001	410	---	---	---	---	---	TRUE	386	410
AMI080	Gannet 13-16	No permit	---	AMI	591754.881	4741965.915	7184.79	---	---	---	---	---	---	---	---	---	---
AMI081	Mesa 7-27-32-109	P134220W	---	AMI	596727.9667	4730172.371	7146.16	4/28/2001	645	---	---	---	---	---	FALSE	---	---
AMI089	Warbonnet 6-26	P137014W	---	AMI	607577	4710841.5	7388.00	7/15/2001	630	---	---	---	---	---	TRUE	610	630
AMI090	Mesa 4-28-32-109W	P138432W	---	AMI	594187	4730577	7447.00	---	903	---	---	---	---	---	TRUE	760	780
AMI092	SCOTT WELL #1	39/3/502W	---	AMI	---	---	---	---	210	---	---	---	---	---	---	---	---
AMI094	Mesa Unit # 10-21D # 2	P138390W	---	AMI	595723	4731589.333	7461.00	---	900	---	---	---	---	---	---	---	---
AMI097	Mesa 8-28 Water Well	P138669W	---	AMI	595576	4730299	7243.50	---	---	---	---	---	---	---	---	---	---
AMI098	Mesa 7-28 Water Well	P138920W	---	AMI	595282	4730245	7325.50	---	715	---	---	---	---	---	---	---	---
AMI099	Paradise Ditch State 36-13 Water Well	P134281W	---	AMI	599305	4727663	7036.50	---	290	---	---	---	---	---	---	---	---
AMI107	Riverside 9-2	P155229W	---	AMI	598917.33	4726522	6948.33	---	310	---	---	---	---	---	TRUE	274	310
AMI108	Jensen # 11-11W	P138431W	PA	AMI	598074	4724990.667	6893.00	---	---	---	---	---	---	---	FALSE	---	---
AMI109	State 36-1 Water Well	P135460W	---	AMI	600237.6667	4718930	7005.33	---	450	---	---	---	---	---	---	---	---
AMI111	Stewart Point 15-17 WSW	P144088W	---	AMI	590908.6667	4741852.667	7273.00	---	940	---	---	---	---	---	TRUE	922	940
AMI113	Stewart Point 11-21 WSW	P144091W	---	AMI	592178.3333	4740822	7202.33	---	980	---	---	---	---	---	TRUE	785	980
AMI114	Mesa 6-16 Water Source Well	P139429W	---	AMI	594834	4733535	7465.00	---	1000	---	---	---	---	---	TRUE	980	1000
AMI115	Mesa 12-16 Water Source Well	P139428W	---	AMI	594336.6667	4733274.333	7477.33	---	1000	---	---	---	---	---	TRUE	940	1000
AMI116	Mesa 14-16 Water Source Well	P141309W	---	AMI	594866.3333	4732833.667	7471.67	---	930	---	---	---	---	---	TRUE	902	930
AMI117	Mesa 9-16 Water Source Well	P141307W	---	AMI	595596	4733018	7356.25	---	750	---	---	---	---	---	TRUE	741	750
AMI118	Mesa 10-16 Water Source Well	P141308W	---	AMI	595240.3333	4733065	7457.33	---	900	---	---	---	---	---	TRUE	855	900
AMI119	Mesa 15-16 Water Source Well	P139427W	---	AMI	595191	4732631	7458.00	---	1000	---	---	---	---	---	TRUE	840	1000
AMI120	Mesa 16-16 Water Source Well	P141310W	---	AMI	595623	4732765	7475.00	---	950	---	---	---	---	---	TRUE	914	950
AMI121	Mesa 7-21 Water Source Well	P162527W	---	AMI	595268	4731870.333	7462.33	---	---	---	---	---	---	---	TRUE	972	990
AMI122	Riverside 3-3	P150530W	---	AMI	596480	4727379	7100.00	---	570	---	---	---	---	---	TRUE	561	570
AMI123	Riverside 16-3	P146039W	---	AMI	597243	4726220.667	6989.33	---	310	---	---	---	---	---	TRUE	275	310
AMI124	Riverside 8-3	P150384W	---	AMI	597340	4726900	7023.00	---	520	---	---	---	---	---	FALSE	---	---
AMI127	Mesa 7-34	P144541W	---	AMI	596970	4728664	7151.00	---	510	---	---	---	---	---	TRUE	503	510
AMI128	Mesa 9-34	P144540W	---	AMI	597207.3333	4728224	7081.00	---	410	---	---	---	---	---	TRUE	390	410
AMI130	Riverside 4-10	P144027W	---	AMI	596054.6667	4725846.667	7027.00	---	350	---	---	---	---	---	FALSE	---	---
AMI131	Antelope 5-4 (WW)	P146982W	---	AMI	613875.3333	4707570.333	7221.50	---	---	---	---	---	---	---	---	---	---
AMI132	Riverside 15-12 Water Well	P140566W	---	AMI	600093	4724471	6970.00	---	410	---	---	---	---	---	---	---	---
AMI133	Riverside 2-14W	P159448W	---	AMI	598533.5	4724129.75	6926.00	---	---	---	---	---	---	---	FALSE	---	---
AMI134	Rainbow 13-32W	P140800W	---	AMI	612149.6667	4708466.667	7339.67	---	760	---	---	---	---	---	---	---	---
AMI135	Warbonnet 7-4 Water Well	P140569W	---	AMI	604808	4717084	7149.00	---	470	---	---	---	---	---	---	---	---
AMI136	Warbonnet 13-24	P141738W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI137	Warbonnet 9-26	P141737W	---	AMI	608594	4710224	7331.00	---	570	---	---	---	---	---	TRUE	555	570
AMI139	Stewart Point 14-20 WSW	P138913W	---	AMI	590630	4740324	7496.50	---	1000	---	---	---	---	---	TRUE	972	1000
AMI140	North Mesa 4-7-32-109W	P136063W	---	AMI	590917	4735697.5	7531.00	---	1040	---	---	---	---	---	FALSE	---	---
AMI145	Warbonnet 11-10	P147314W	---	AMI	606084.6667	4715291	7227.33	---	820	---	---	---	---	---	FALSE	---	---
AMI146	Antelope 11-10D	P147485W	---	AMI	615649	4705688.5	7214.00	---	680	---	---	---	---	---	FALSE	---	---
AMI147	Warbonnet 13-11	P150186W	PA	AMI	607260.5	4714771.5	7330.00	---	650	---	---	---	---	---	TRUE	629	650
AMI148	Warbonnet 13-14	P147821W	---	AMI	607238	4713182	7438.50	---	863	---	---	---	---	---	FALSE	---	---
AMI149	Blue Rim State # 2	P150200W	---	AMI	604921	4714320	7417.00	---	---	---	---	---	---	---	TRUE	673	710
AMI150	Stewart Point 16-18D Water Source Well	P150487W	---	AMI	589360.5	4742356.25	7328.00	---	980	---	---	---	---	---	FALSE	---	---
AMI151	Boulder 7-19 Water Well	P145790W	---	AMI	601514.3333	4721941.333	7026.67	---	390	---	---	---	---	---	TRUE	361	390
AMI154	Mesa 11-21 WSW	P147528W	---	AMI	594631	4731683.333	7361.00	---	910	---	---	---	---	---	TRUE	848	910
AMI156	Riverside 2-24	P150521W	---	AMI	600027.5	4722417.5	6989.00	---	700	---	---	---	---	---	FALSE	---	---
AMI157	Mesa 1-28D Well # 2	P138391W	---	AMI	595703	4730817	7177.00	---	645	---	---	---	---	---	---	---	---
AMI158	Enl. Mesa 1-28D	P143295W	---	AMI	---	---	---	---	645	---	---	---	---	---	---	---	---
AMI159	Mesa 11-28-32-109 W	P134221W	---	AMI	594838.75	4729884.75	7436.00	---	865	---	---	---	---	---	FALSE	---	---
AMI160	MESA 12-28	P173005W	---	AMI	594484	4729951.5	7440.00	---	---	---	---	---	---	---	FALSE	---	---
AMI161	Stewart Point 5-29D Water Source Well	P150488W	---	AMI	589625.6667	4740079.667	7739.33	---	1210	---	---	---	---	---	TRUE	1098	1123
AMI162	Rainbow 3-31 (WW)	P146981W	---	AMI	610988.6667	4709558.333	7288.33	---	---	---	---	---	---	---	---	---	---
AMI163	Rainbow 15-32 (WW)	P149067W	---	AMI	613042.3333	4708497.333	7287.67	---	---	---	---	---	---	---	---	---	---
AMI164	Mesa 1-33	P146979W	---	AMI	595516	4729115	7228.00	---	590	---	---	---	---	---	TRUE	577	590
AMI165	Stewart Point 4-33 WSW	P139248W	---	AMI	591926.5	4738294	7537.00	---	1043	---	---	---	---	---	TRUE	985	1043
AMI166	Mesa 10-33	P150192W	---	AMI	595326	4728220	7276.00	---	790	---	---	---	---	---	FALSE	---	---
AMI167	Mesa 12-33	P148359W	---	AMI	594413	4728309.333	7421.33	---	1000	---	---	---	---	---	FALSE	---	---
AMI168	Mesa 5-33	P148375W	---	AMI	594497	4728790	7434.00	---	940	---	---	---	---	---	FALSE	---	---
AMI169	Mesa 5-35	P145208W	---	AMI	597765	4728499	7149.00	---	450	---	---	---	---	---	---	---	---
AMI173	SAND DRAW 7-11 WATER WELL	P167536W	---	AMI	---	---	---	---	715	---	---	---	---	---	---	---	---
AMI181	MESA 2-35	P151114W	---	AMI	598368.5	4728932	7108.50	---	---	---	---	---	---	---	---	---	---
AMI182	HIGHWAY #7 WATER WELL	P151470W	---	AMI	613929	4705998.5	7292.50	---	610	---	---	---	---	---	TRUE	594	610
AMI183	MESA 11-22	P151650W	---	AMI	596507.5	4731346	7343.00	---	---	---	---	---	---	---	---	---	---
AMI184	MESA 6-18	P151651W	---	AMI	591563	4733651.5	7509.00	---	---	---	---	---	---	---	---	---	---
AMI186	WARBONNET 8-6	P152074W	---	AMI	602004.8333	4717275.333	7051.50	---	---	---	---	---	---	---	FALSE	---	---

SCCD	Permit	Well Status	Type	Easting	Northing	Reference Elevation	Date Drilled	Total Depth	Type of Seal	Depth of Seal	Multiple Casings	Casing Diameter	Casing Depth	Perforated (P) or Screened (S)	Start of Perforated or Screened Interval	Bottom of Perforated or Screened Interval
Well ID	Number	1	2	3	3	3								(S)	Interval	Interval
AMI187	ANTELOPE 1-16-29-107	P171606W	---	AMI	615101	4704954	7279.50	---	---	---	---	---	---	---	---	---
AMI188	NORTH PINEDALE 14-8	P152076W	---	AMI	590465.5	4743574.5	7298.00	---	---	---	---	---	---	FALSE	---	---
AMI189	RAINBOW 15-31 (WWW)	P152351W	---	AMI	611347	4708388.667	7317.00	---	---	---	---	---	---	---	---	---
AMI190	RIVERSIDE 11-34	P152871W	---	AMI	598100	4723371.5	6963.00	---	510	---	---	---	---	---	---	---
AMI191	VIBLE 1-11D	P152931W	---	AMI	598894.5	4725265.5	6897.00	---	460	---	---	---	---	FALSE	---	---
AMI192	RAINBOW 13-3	P153150W	---	AMI	610541	4710085.333	7300.67	---	650	---	---	---	---	TRUE	647	650
AMI193	WARBONNET 4-10	P153812W	---	AMI	605719	4716002.5	7184.00	---	510	---	---	---	---	FALSE	---	---
AMI194	LOVATT DRAW STATE 36-4	P153851W	---	AMI	599263	4728810	7046.50	---	710	---	---	---	---	---	---	---
AMI196	WARBONNET #8-22	P154029W	---	AMI	607031.6667	4712393.667	7378.33	---	---	---	---	---	---	---	---	---
AMI197	WARBONNET 11-23	P154030W	PA	AMI	607698.6667	4711907.667	7405.67	---	710	---	---	---	---	TRUE	698	710
AMI198	WARBONNET 16-5	P175196W	---	AMI	603643.3333	4716368	7081.67	---	390	---	---	---	---	FALSE	---	---
AMI199	MESA 16-28	P154055W	---	AMI	595538.5	4729321	7238.50	---	---	---	---	---	---	---	---	---
AMI201	RIVERSIDE 13-12	P154228W	---	AMI	599291	4724391.5	6929.00	---	450	---	---	---	---	TRUE	441	450
AMI202	WARBONNET 3-3	P154552W	---	AMI	605967.3333	4717487.333	7273.67	---	910	---	---	---	---	FALSE	---	---
AMI203	ULTRA - WARNONNET 16-4	P154558W	---	AMI	605175	4716335.25	7152.75	---	570	---	---	---	---	TRUE	537	570
AMI204	WARBONNET 16-10	P154822W	---	AMI	606864.5	4714712.5	7347.00	---	710	---	---	---	---	TRUE	702	710
AMI205	WELL	P154968W	---	AMI	591413	4737791	7554.00	---	---	---	---	---	---	---	---	---
AMI206	WARBONNET 5-9	P154981W	PA	AMI	604140.5	4715605	7164.00	---	---	---	---	---	---	---	---	---
AMI209	WARBONNET 15-26	P155127W	---	AMI	608089.6667	4709815.333	7318.00	---	800	---	---	---	---	FALSE	---	---
AMI210	WARBONNET 10-9D	P155128W	---	AMI	604986.5	4715099	7186.00	---	710	---	---	---	---	TRUE	682	710
AMI211	Gannet 11-16	P155331W	---	AMI	591995	4742427	7214.67	---	---	---	---	---	---	---	---	---
AMI212	WARBONNET 9-15	P155520W	---	AMI	606854.6667	4713605.333	7415.33	---	730	---	---	---	---	TRUE	710	730
AMI213	PETROGULF STATE 36-9	P156828W	---	AMI	600494.3333	4718477.333	7048.67	---	---	---	---	---	---	---	---	---
AMI214	WARBONNET 12-9	P157396W	---	AMI	603987.6667	4715226.333	7108.67	---	---	---	---	---	---	FALSE	---	---
AMI216	Mesa Unit well #2	P55085W	---	AMI	594844	4733532	7496.00	---	---	---	---	---	---	---	---	---
AMI228	Rainbow 16-30 Water Well	P158825W	---	AMI	611871	4710041	7329.33	---	---	---	---	---	---	---	---	---
AMI230	Mesa 3-27	P158916W	---	AMI	596415	4730674.5	7201.00	---	---	---	---	---	---	---	---	---
AMI231	Riverside 10-13	P159471W	---	AMI	600213	4723295.25	7013.00	---	710	---	---	---	---	TRUE	701	710
AMI232	Warbonnet 5-25	P160863W	PA	AMI	609020.6667	4710841	7335.33	---	710	---	---	---	---	FALSE	---	---
AMI233	Boulder 15-4	P161093W	---	AMI	604844.3333	4726158.667	7011.67	---	410	---	---	---	---	TRUE	403	410
AMI234	Warbonnet 5-4	P161262W	PA	AMI	604116	4717176	7139.67	---	450	---	---	---	---	FALSE	---	---
AMI235	Warbonnet 2-8	P161333W	---	AMI	603261.75	4715923.5	7109.50	---	350	---	---	---	---	FALSE	---	---
AMI236	NERD Farms Yard Well	P161385W	---	AMI	597467	4726205.5	7046.33	---	410	---	---	---	---	---	---	---
AMI237	Warbonnet 7-15D	P162197W	---	AMI	606794.75	4714189.25	7387.25	---	750	---	---	---	---	FALSE	---	---
AMI238	Mesa 12-17 Water Source Well	P162525W	---	AMI	593324	4732850.5	7477.00	---	---	---	---	---	---	FALSE	---	---
AMI239	Mesa 15-20 Water Source Well	P162526W	---	AMI	593637	4731285	7459.00	---	---	---	---	---	---	FALSE	---	---
AMI240	Stewart Point 6-17	P162528W	---	AMI	590018	4742748	7283.00	---	1000	---	---	---	---	---	---	---
AMI242	Warbonnet 8-25	P162587W	---	AMI	610177	4710788	7319.00	---	670	---	---	---	---	TRUE	658	670
AMI245	Mesa 9-22 CD	P163495W	---	AMI	597191	4731509	7188.00	---	---	---	---	---	---	---	---	---
AMI247	Boulder 15-18	P163504W	---	AMI	601516.5	4722714.5	6985.50	---	530	---	---	---	---	TRUE	518	530
AMI248	Boulder 12A-33	P163669W	---	AMI	604184	4718338.5	7191.00	---	450	---	---	---	---	FALSE	---	---
AMI249	Warbonnet 2D-3D	P163881W	---	AMI	606437	4717116	7276.50	---	950	---	---	---	---	FALSE	---	---
AMI250	Boulder 1-32	P169651W	---	AMI	603532.5	4719193.5	7093.50	---	---	---	---	---	---	FALSE	---	---
AMI251	BOULDER 14-34	P164892W	---	AMI	605942	4717848.5	7196.00	---	950	---	---	---	---	TRUE	937	950
AMI252	Boulder 15D-7D	P168749W	---	AMI	601714	4724650	7016.67	---	450	---	---	---	---	TRUE	408	450
AMI253	Boulder 6-32	P169908W	---	AMI	602823	4718699	7091.00	---	510	---	---	---	---	FALSE	---	---
AMI254	JONAH FIELD OFFICE	38/8/100W	---	AMI	617383	4701075	7101.00	---	---	---	---	---	---	---	---	---
AMI255	Mesa 15B-27D	P168351W	---	AMI	596781	4729400	7183.00	---	600	---	---	---	---	FALSE	---	---
AMI257	Mesa 7C-35D	P170383W	---	AMI	598614	4728154	7046.50	---	660	---	---	---	---	FALSE	---	---
AMI258	Riverside 11-25	P169298W	---	AMI	599654.5	4720081.5	7036.50	---	---	---	---	---	---	FALSE	---	---
AMI259	Riverside 13-4 Water Well	P165690W	---	AMI	594575	4726479	7051.50	---	720	---	---	---	---	FALSE	---	---
AMI261	Riverside 4D-1D	P167596W	---	AMI	599348	4726693.333	6958.67	---	510	---	---	---	---	FALSE	---	---
AMI262	Riverside 4D-25D	P168966W	---	AMI	599273	4720687	6999.00	---	---	---	---	---	---	FALSE	---	---
AMI263	Warbonnet 1-21	P168967W	PA	AMI	605276	4712711	7283.00	---	750	---	---	---	---	TRUE	742	750
AMI264	Warbonnet 1B-10D	P170670W	---	AMI	606785	4715887	7226.00	---	---	---	---	---	---	---	---	---
AMI265	Warbonnet 5D-15D	P164137W	---	AMI	605880	4713906	7324.00	---	790	---	---	---	---	TRUE	763	790
AMI266	Warbonnet 6-5	P164446W	---	AMI	602835.5	4717143	7091.50	---	390	---	---	---	---	TRUE	371	390
AMI267	Warbonnet 8-10	P164447W	---	AMI	606794	4715900	7270.00	---	940	---	---	---	---	TRUE	840	940
AMI269	Warbonnet 8-8	P163590W	---	AMI	603659	4715508	7135.00	---	---	---	---	---	---	---	---	---
AMI270	2 Buttes 16-15 CD	P169139W	---	AMI	596946	4732673.5	7309.00	---	---	---	---	---	---	---	---	---
AMI272	Mesa 7-34 Water Well	P170950W	---	AMI	597087	4728606	7188.00	---	---	---	---	---	---	---	---	---
AMI274	RIVERSIDE 7-13	38/1/589W	---	AMI	600101	4723671	6999.00	---	---	---	---	---	---	FALSE	---	---
AMI276	Riverside 4-2	P174022W	---	AMI	597725	4727140	7025.00	---	400	---	---	---	---	TRUE	384	400
AMI279	Warbonnet 1-9	39/10/363W	---	AMI	605122	4715896	7196.00	---	---	---	---	---	---	---	---	---
AMI280	BOULDER 14-32	39/3/172W	---	AMI	602876	4718055	7064.00	---	---	---	---	---	---	FALSE	---	---
AMI285	WARBONNET 7-5	39/9/363W	---	AMI	603230	4717182	7091.00	---	---	---	---	---	---	FALSE	---	---
AMI290	Jonah #1	P173791W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---
AMI291	Warbonnet 4-9	P173792W	---	AMI	603926	4716053	7110.00	---	600	---	---	---	---	TRUE	571	600
AMI292	KELSON #1	P94914W	---	AMI	591446	4745289	7157.00	---	66	---	---	---	---	---	---	---
AMI293	WELL #1	P158696W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---
AMI294	MESA 10-21D, #2	P166917W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---
AMI295	WHITE WATER #4	P170547W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---

SCCD Well ID	Well Name	Permit Number	Well Status ¹	Type ²	Eastings ³	Northing ³	Reference Elevation ³	Date Drilled	Total Depth	Type of Seal	Depth of Seal	Multiple Casings	Casing Diameter	Casing Depth	Perforated (P) or Screened (S)	Start of Perforated or Screened Interval	Bottom of Perforated or Screened Interval
AMI296	MESA 13-26	40/5/61W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI297	RAINBOW 13-29 WATER WELL	39/7/508W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI298	RAINBOW 8-31	39/2/540W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI299	RIVERSIDE 12-3	39/2/550W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI300	SOUTH MESA 12-14 IDW	39/5/508W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI301	WARBONNET 11-4 WW	39/4/502W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI302	MESA 5-26	39/1/550W	---	AMI	---	---	---	---	---	---	---	---	---	---	---	---	---
AMI304	Jensen 11-11 (new)	39/4/172W	---	AMI	598106	4724944	---	---	---	---	---	---	6	1-600	---	---	---
AS001	Blue Rim Well 4084	P8520W	---	AS	604542	4712412	7301.00	5/2/1972	600	---	---	YES	6	1-325	TRUE	570	600
AS002	Mesa Horse Well	P9348P	---	AS	594558	4727234	---	6/21/1965	325	---	---	NO	8	1-70	---	---	---
AS003	Mud Hole Well #630	P9349P	---	AS	615788.9445	4706255.175	7111.68	9/15/1966	70	---	---	NO	6	1-199	---	---	---
AS004	Lander Well # 583	P9352P	---	AS	---	---	---	6/30/1967	238	---	---	NO	8	1-70	TRUE	215	237
AS005	Mud Hole Well #629	P9353P	---	AS	615845.6278	4706239.24	7095.75	9/1/1966	70	---	---	NO	6	1-199	---	---	---
AS006	Steele-Hittle Square Top Well	P9354P	---	AS	613135.5505	4709314.033	7287.45	10/14/1966	233	---	---	NO	6	1-195	TRUE	200	230
AS007	MT. Airy Well #19	P9357P	---	AS	593234.2283	4736460.006	7394.23	12/23/1960	343	---	---	NO	6	1-99	TRUE	300	343
AS008	Mesa Well #106	P9359P	---	AS	594204.4575	4734078.198	7356.26	8/2/1941	150	---	---	NO	6	1-146	FALSE	---	---
AS010	Buckhorn Well #307	P9367P	---	AS	612923.3405	4707354.97	7195.62	4/11/1948	200	---	---	NO	6	1-55	FALSE	---	---
AS011	Mud Hole Well #69	P9369P	---	AS	616812.1615	4705675.667	7093.10	7/6/1963	102	---	---	NO	6	1-490	FALSE	---	---
AS013	Mount Airy-2 #4694	P59933W	---	AS	589798.3333	4738412	7651.00	8/19/1983	490	---	---	NO	5	0-227	FALSE	---	---
AS014	N.W. Squaretop	P68609W	---	AS	611680.6822	4711603.523	7351.62	10/21/1985	227	---	---	YES	6	0-190	TRUE	216	226
AS015	Water Hole Draw	P71946W	---	AS	617131.9322	4707969.359	7254.19	3/18/1986	190	---	---	NO	6	2-35	TRUE	175	185
AS016	Microft #4	P75830W	---	AS	594340.1843	4740320.315	7049.12	11/14/1987	35	---	---	NO	6	0-192	FALSE	---	---
AS019	Clark Bloom Well	P89321W	---	AS	589199.5	4744629.5	7403.00	7/16/1994	192	---	---	YES	---	---	FALSE	---	---
AS025	East Fork Well #580	P9345P	---	AS	604360.031	4724770.116	6985.31	---	200	---	---	---	---	---	---	---	---
AS028	Cut-Off Spring 4111	P23521W	---	AS	597317	4721046	6921.00	---	4	---	---	---	---	---	---	---	---
AS029	Bertram #1	P76369W	---	AS	---	---	---	---	60	---	---	---	---	---	---	---	---
AS030	Olson #4	P7549P	---	AS	---	---	---	---	---	---	---	---	---	---	---	---	---
AS035	East Mesa Well #1	P8525W	---	AS	599732	4732692	7071.00	---	160	---	---	---	---	---	---	---	---
AS036	Middle Mesa Well #509 (deepened)	P9372P	---	AS	590341.25	4734704.5	7520.33	---	425	---	---	---	---	---	---	---	---
AS039	Clark #2	P5277P	---	AS	588743.4153	4746235.737	7161.43	---	176	---	---	---	---	---	---	---	---
AS046	Bloom #3	P11403P	---	AS	590673.2883	4746732.981	7149.35	---	120	---	---	---	---	---	---	---	---
AS047	Bloomfield #2	P83512W	---	AS	590755.5783	4746807.451	7158.16	---	52	---	---	---	---	---	---	---	---
AS053	JONAH 1-11 CP	P155228W	---	AS	---	---	---	---	300	---	---	---	---	---	---	---	---
AS054	RAMSEY #1	P156052W	---	AS	590651	4746716	7219.00	---	100	---	---	---	---	---	---	---	---
AS063	Stockwell #5	P163558W	---	AS	590620.5	4747376	7195.50	---	---	---	---	---	---	---	---	---	---
AS065	SAND SPRINGS NO. 13	P172914W	---	AS	---	---	---	---	---	---	---	---	---	---	---	---	---
AS066	SAND SPRINGS NO. 10	P172911W	---	AS	---	---	---	---	---	---	---	---	---	---	---	---	---
AS067	SAND SPRINGS NO. 11	P172912W	---	AS	---	---	---	---	---	---	---	---	---	---	---	---	---
AS068	SAND SPRINGS NO. 12	P172913W	---	AS	---	---	---	---	---	---	---	---	---	---	---	---	---
AS069	WILSON SCOTT FAMILY NO. 1 WELL	39/2/459W	---	AS	---	---	---	---	---	---	---	---	---	---	---	---	---
AD005	Westman #1	P10620P	---	AD	597271.228	4725314.807	6876.43	23968	50	---	---	---	---	---	---	---	---
AD048	---	P9388P	---	AD	589604.8851	4746452.186	7189.27	---	95	---	---	---	---	---	---	---	---
AD049	Davis #1	P9384P	---	AD	589743	4746538	7181.00	---	100	---	---	---	---	---	---	---	---
AD106	---	P100175W	---	AD	595922.6052	4740662.691	7101.73	---	90	---	---	---	---	---	---	---	---
AD115	---	P22472W	---	AD	597509.2774	4739408.613	7054.84	---	100	---	---	---	---	---	---	---	---
AD118	---	P41674W	---	AD	595914.2347	4740157.15	7073.04	---	259	---	---	---	---	---	---	---	---
AD119	---	P93195W	---	AD	595671.5448	4739976.19	7046.23	---	85	---	---	---	---	---	---	---	---
AD123	---	P109683W	---	AD	595206.6907	4739641.123	7028.53	---	70	---	---	---	---	---	---	---	---
AD143	---	Relistab	---	AD	589768.4118	4746543.656	7131.86	---	---	---	---	---	---	---	---	---	---
AD147	---	Feltner	---	AD	589922.5889	4746482.777	7145.24	---	---	---	---	---	---	---	---	---	---
ADS015	---	P105464W	---	ADS	594987.7774	4742305.963	7127.63	---	125	---	---	---	---	---	---	---	---
ADS016	---	P111503W	---	ADS	594961.906	4742190.355	7110.34	---	115	---	---	---	---	---	---	---	---
ADS017	---	P91168W	---	ADS	595361.2397	4741079.948	7100.33	---	105	---	---	---	---	---	---	---	---
ADS018	---	P37928W	---	ADS	596073.5804	4740276.34	7089.14	---	70	---	---	---	---	---	---	---	---
ADS026	---	P109514W	---	ADS	595756.8724	4740033.736	7064.03	---	100	---	---	---	---	---	---	---	---
ADS027	---	P13213W	---	ADS	595567.9629	4739722.469	7053.06	---	100	---	---	---	---	---	---	---	---
AMI005	New Fork Unit 13-10	P130850W	---	AMI	605688.037	4714841.037	7217.78	---	755	---	---	---	---	---	FALSE	295	640
AMI013	Stewart Point 3-28	P138176W	---	AMI	592097.3116	4739940.519	7211.35	---	593	---	---	---	---	---	FALSE	220	555
AMI015	Antelope #14-22	P141914W	---	AMI	616002	4702192	7147.00	---	710	---	---	---	---	---	FALSE	555	705
AMI016	Sherlock Federal 15-8	P111580W	PA	AMI	590812.968	4743542.753	7183.26	36058	670	---	---	---	---	---	FALSE	110	635
AMI025	Gannett #5-15	P120975W	---	AMI	591672.537	4742707.931	7142.85	---	500	---	---	---	---	---	---	---	---
AMI031	---	P128546W	---	AMI	591251.3633	4738782.311	7504.02	---	1040	---	---	---	---	---	---	---	---
AMI032	Mesa 10-21D	P129042W	---	AMI	595601.5166	4731607.068	7427.05	36789	750	---	---	---	---	---	---	---	---
AMI035	---	P130658W	---	AMI	614631.5388	4706007.668	7176.21	---	---	---	---	---	---	---	---	---	---
AMI036	---	P72773W	---	AMI	595341.6641	4740955.252	7098.99	---	226	---	---	---	---	---	---	---	---
AMI071	---	P60647W	---	AMI	597760.8155	4739086.149	7050.25	---	118	---	---	---	---	---	---	---	---
AMI082	Vible #1	---	---	AMI	598894.5	4725265.5	6867.39	---	---	---	---	---	---	---	---	---	---
AMI083	Jensen #1	P61704W	---	AMI	597663.5852	4725370.643	6882.45	---	146	---	---	---	---	---	FALSE	---	---
AMI268	---	P168906W	---	AMI	615103	4704953	7283.00	---	---	---	---	---	---	---	---	---	---
AMI275	Warbonnet 5-9	38/10/563W	---	AMI	604138	4715601	7112.00	---	450	---	---	---	---	---	TRUE	435	450
AS009	---	P9365P	---	AS	608136.2718	4712310.75	7344.47	18079	375	---	---	---	---	---	---	---	---
AS034	---	P71948W	---	AS	600489	4734297	7123.00	---	131	---	---	---	---	---	---	---	---

SCCD Well ID	Well Name	Permit Number	Well Status ¹	Type ²	Easting ³	Northing ³	Reference Elevation ³	Date Drilled	Total Depth	Type of Seal	Depth of Seal	Multiple Casings	Casing Diameter	Casing Depth	Perforated (P) or Screened (S)	Start of Perforated or Screened Interval	Bottom of Perforated or Screened Interval
AS045	Wilson #2	P53956W	---	AS	590629.816	4747390.528	7159.01	---	59	---	---	---	---	---	---	---	---
AS048	---	Well	---	AS	610262.2119	4709689.163	7244.35	---	---	---	---	---	---	---	---	---	---
AS050	---	---	---	AS	608284	4721465	7125.00	---	---	---	---	---	---	---	---	---	---
AS051	---	---	---	AS	608284	4703548	7192.00	---	---	---	---	---	---	---	---	---	---
AS061	Scott Stock Well	---	---	AS	600402.5	4725849.5	6902.50	---	---	---	---	---	---	---	---	---	---
AS062	Old Cow Camp Well	---	---	AS	599701	4718142	6987.00	---	---	---	---	---	---	---	---	---	---
AS064	---	---	---	AS	587297	4741489	7354.00	---	---	---	---	---	---	---	---	---	---

Notes:

1 - A = active; PA = plugged and abandoned; UNK = unknown

2 - AMI = miscellaneous/industrial; AD = domestic; AS = stock; ADS = domestic/stock

3 - Value based on SCCD location/elevation information. All locations will be surveyed to a common datum by a professional land surveyor.

"---" - information not available

Source: SCCD September 10, 2008



APPENDIX C

**CREDIBLE/SUITABLE
WELL SCREENING
MATRIX**

APPENDIX C
Credible/Suitable Well Screening Matrix
Interim Plan for PAPA ROD

Data Objective	Well Selection Criteria	Data Objective Target Score	Number of Wells Meeting Data Objective Target Score	Score (1 = yes; 0 = no)											
				Well ID											
				Boulder XX AM1000											
Critical Information Common to All Data Objectives	Existing Monitoring Data Collected in Accordance with BLM Requirements			1											
	Well Completion Report Available			1											
	Lithology Recorded on Driller's Log			1											
	Geographic Location Known			1											
	Casing Reference Elevation Known or Can Be Obtained			1											
	Total Depth Known			1											
	Casing Sealed and Depth of Seal Known			1											
	Position of Perforated Interval Known			1											
Total Score		8	1	8											
1 - Characterize Horizontal Flow within an HSU	Well Accessible for Water Level Measurements			1											
	Well Perforated/Screened in Single Hydrostratigraphic Unit (HSU)			1											
	Well Adequately Sealed from Adjacent HSU(s)			1											
	Perforated/Screened Interval <50 ft ¹			0											
Total Score		4	0	3											
2 - Characterize Flow between HSUs (Vertical Gradients)	Well Accessible for Water Level Measurements			1											
	Well Located <200 ft from Companion Well Completed in Different HSU ²			1											
	Well Perforated/Screened in Single HSU and Adequately Sealed			0											
	Discreet Perforated/Screened Interval (<50 feet)			0											
Total Score		4	0	2											
3 - Characterize Flow between Groundwater and Surface Water	Well Accessible for Water Level Measurements			1											
	Well Near River/Stream			0											
	Well Perforated/Screened in Single HSU			1											
	Well Located Near an Existing/Planned Surface Water Gaging Station			0											
	All Criteria for Objective 2 are Met			0											
Total Score		5	0	2											
4 - Collect Credible Aquifer Test Data	Well Accessible for Water Level Measurements			1											
	Perforated/Screened Interval in Appropriate Lithologic Interval of Target HSU			1											
	Perforated Intervals Isolated from Non-Target Lithologies			1											
Total Score		3	1	3											
5 - Monitor Water Quality Impacts from Oil & Gas Activities - Surface Release	Well Accessible for Sampling			1											
	Well is Secure and Access is Controlled (e.g. locking cap)			1											
	No Non-Oil and Gas PHC Sources Located in Immediate Vicinity			1											
	Perforated/Screened Interval in Uppermost HSU and Brackets Water Table			0											
	Perforated/Screened Interval <50 ft			0											
	No Prior PHC Detections ³			1											
Total Score		6	0	4											
6 - Monitor Water Quality Impacts from Oil & Gas Activities - Excursion from Drilling/Operating Gas Wells	Well Accessible for Sampling			1											
	Well Located in Pinedale Field or Immediately Downgradient of Field			1											
	Well is Secure and Access is Controlled (e.g. locking cap)			1											
	No Prior PHC Detections ³			1											
Total Score		4	1	4											

Notes:
1 - longer screen interval is acceptable if the vertical gradient is negligible (<0.01)
2 - or a companion well can be installed
3 - PHC occurrences in industrial water wells are being evaluated under a separate but related investigation (Low Level PHC Evaluation). Wells with known PHC occurrences will not be recommended for monitoring purposes until the source(s) of PHC are determined and such use is determined to be appropriate.

- shading indicates well is credible/suitable for indicated Data Objective
 - shading indicates well is **not** credible/suitable for indicated Data Objective