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PRELIMINARY ENGINEERING REPORT
for the
MONTICELLO DWCA
WATER SYSTEM IMPROVEMENTS

COMMUNITY OF MOTICELLO

November 20, 2007

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I. PROJECT DESCRIPTION

A. Purpose

This Preliminary Engineering Report is intended to evaluate the water system improvements needed in the community of Monticello, New Mexico, on behalf of the Monticello Domestic Water User's Association (Association). Under this report, the present conditions of the distribution facilities, water supply, and storage have been evaluated to determine what system improvements are necessary to provide adequate service to existing customers and expand the system to serve other residents of the Monticello community.

B. Project Location

Monticello is located in Sierra County, 25 miles northwest of Truth or Consequences, New Mexico. See Figure 1 for the general project location. Monticello was originally settled by ranchers and farmers in the mid-1800. It received its current name in 1881 by its original postmaster, John Sullivan who named it after Monticello, New York. Monticello is situated in Monticello canyon which also contains the town of Placitas, two miles south of Monticello. During its peak, there were up to 450 people living in the town, which contained a schoolhouse, church, three stores, a hotel, a post office, a blacksmith's shop, multiple saloons and at least 100 families. No current census data is available for Monticello. However, according to the Sierra County Assessor's office, there are a total of 64 tracts of land in the town owned by private individuals. It is estimated that not more than 20 of these have houses which are occupied on a part or full-time basis.

C. System Problems Summary

The existing system does not meet the minimum number of connections to be designated as a public water system and therefore is not required to meet minimum state water system standards. However, using minimum state standards as a benchmark, the existing system has several deficiencies. These deficiencies include low pressure during peak use periods, inadequate well capacity, lack of redundant water sources and inadequate storage capacity. The system also has no ability to provide fire protection to its customers.

As shown in Figure 2, the existing well is located in the town's plaza which is surrounded by homes, a hotel and church which discharge their wastewater into onsite septic tanks. This location does not meet the New Mexico Environment Department's (NMED) required 200 foot setback from any source of contamination, such as septic tanks and leachfields.

II. PROJECT PLANNING AREA

A. Service Area

The existing service area only covers the buildings surrounding the town plaza. The planning area being considered for this project is the entire town of Monticello.

B. Environmental Resources Present

1. Area Description - Environmental Setting

1.1 Topography

The planning area is located within the Basin and Range Province which is typified by north-south trending arid valleys bounded by mountain ranges. Monticello is located east of Elephant Butte Reservoir State Park and Interstate 25. The town is situated in Monticello Canyon along the Alamosa Creek arroyo. The Cibola National Forest is located just north of the town. The project area slopes gently to the southwest. Elevations within the planning area vary from 5,240 feet near the creek up to 5,300 feet.

1.2 Climate

Monticello is located in northern Sierra County in southern New Mexico which has a semi-arid, continental climate. Characteristics of this climate are low rainfall, wide diurnal and annual temperature ranges, distinct seasons, low relative humidity and plentiful sunshine. The summer average high temperature is around 90°F and the winter average low temperature is about 20°F. The annual average daily high and low temperatures are 70°F and 35°F respectively. The annual precipitation averages 13 inches per year. Most rainfall occurs during brief, but sometimes heavy, summer thunderstorms. The average snowfall is 11 inches per year; however, snow rarely stays on the ground longer than one day.

1.3 Soils

The soil throughout the project area is classified as Redbank-Torrifluvents association. This is a gently sloping (0-9 percent) soil found on alluvial flood plains. The native vegetation is mainly grass and shrubs. This association is deep and well-drained to excessively-drained and is made up of loam, fine sandy loam, clay loam with some gravel and sand. Permeability is moderately rapid to rapid. A copy of the Soil Map from the Sierra County Soil Survey is included in Appendix A.

1.4 Water Resources

1.4.1 Surface Water

The dominating surface hydrological feature of the Monticello area is the Alamosa Creek arroyo that runs through Monticello Canyon adjacent to the town. This creek is dry most of the year, except during periods of intermittent heavy rainfall. Alamosa Creek drains to the southeast into Elephant Butte Reservoir along the Rio Grande River.

1.4.2 Groundwater

The groundwater used by the Association comes from the Middle Rio Grande Basin in the Rio Grande aquifer system. The depth to water in Monticello is approximately 55 feet. Groundwater in the Rio Grande aquifer system generally flows to the southeast and follows the path of the Rio Grande River. Groundwater is recharged primarily by snowmelt from the surrounding mountains and from rainfall. Groundwater quality will not be directly affected by the project.

1.5 Vegetation, Wildlife, Threatened, Endangered and Sensitive Species

Vegetation, Wildlife, Threatened, Endangered and Sensitive Species within the project site are not anticipated to be disturbed. The proposed improvements of the existing water system will be located in the existing highway right-of-way, street right-of-way or developed areas. A complete Environmental Report will be conducted prior to the design and construction of the proposed project.

1.6 Archeological, Cultural and Historical Resources

The National and State Register of Historic Places were searched to identify any historical sites within the planning area. The listing obtained from national and state registers is shown in Table 1. The complete list of historical sites in Sierra County with addresses is included in Appendix B.

Table 1. Registered Historic Sites within Sierra County

Name	City	State Register List Date	National Register List Date
Alamosa Ranch House and Blacksmith Shop	Truth or Consequences	6/8/1984	-
Alert--Hatcher Building	Hillsboro	11/18/1994	4/20/1995
Architectural and Historic Resources	Hillsboro	11/18/1994	-
Various Archeological Sites	Arrey, Caballo, Cuchillo, Derry, Truth or Consequences	9/20/1985	Varies
Bucher, William H., House	Hillsboro	11/18/1994	4/20/1995
Caballo Dam	Truth or Consequences	1/20/1978	-
Carrie Tingley Hospital for Crippled Children	Truth or Consequences	6/13/2003	3/15/2005
Chambers Canyon Site (LA49028)	Truth or Consequences	9/20/1985	12/16/1989
Elephant Butte Dam	Elephant Butte	3/20/1978	4/9/1979
Elephant Butte Historic District	Elephant Butte	8/9/1996	2/10/1997
Fort McRae	Elephant Butte	6/13/2003	4/7/2005
Hendrick House	Truth or Consequences	1/13/1989	-
Hillsboro High School	Hillsboro	2/19/1993	4/15/1993
Hillsboro Historic District	Hillsboro	10/24/1986	-
Hillsboro Peak Lookout Tower and Cabin	Hillsboro	3/4/1988	1/28/1988
Horse Island Site (LA48996)	Truth or Consequences	9/20/1985	5/16/1988
Hot Springs Bathhouse and Commercial Historic District	Truth or Consequences	10/8/2004	5/10/2005
Hot Springs Main Post Office	Truth or Consequences	4/7/2000	2/23/1990
Kettle Top Butte Site (LA48995)	Truth or Consequences	9/20/1985	5/16/1988
Lake Valley School House	Lake Valley	1/30/1976	-
Lake Valley Mining District	Hillsboro	1/20/1978	-
Las Palomas (LA 8707)	Truth or Consequences	9/20/1985	-
Longbottom Canyon Site (LA49033)	Truth or Consequences	9/20/1985	12/16/1989
Meyers House	Hillsboro	11/18/1994	4/20/1995
Miller, George Tambling and Ninette Stocker, House	Hillsboro	6/20/1975	4/20/1995
Monticello Point Archeological District	Truth or Consequences	9/20/1985	5/16/1988
Murphy, Tom, House	Hillsboro	6/20/1975	-
Palomas Narrows North (LA38755)	Truth or Consequences	9/20/1985	12/16/1989
Palomas Narrows South (LA49007)	Truth or Consequences	9/20/1985	12/16/1989
Percha Bank	Kingston	4/24/1970	
Percha Creek Bridge	Hillsboro	5/9/1997	7/15/1997
Percha Diversion Dam	Arrey	1/20/1978	4/6/1979
Robins, Will M., House	Hillsboro	11/18/1994	4/20/1995
Sierra Grande Lodge and Spa	Truth or Consequences	7/18/1997	-
Sullivan, Cornelius, House	Hillsboro	11/18/1994	4/20/1995
Union Community Church	Hillsboro	6/20/1975	-
Webster, John M., House	Hillsboro	11/18/1994	4/20/1995

None of the sites listed is located within the project improvements area, thus no historic sites, cultural, or archeological resources within the project site are anticipated. With the exception of the new well and tank, the proposed improvements of the existing water system are located in the existing highway right-of-way, street right-of-way or developed areas. A letter of clearance from the State Historic Preservation Office (SHPO) will be requested during preparation of the environmental information document for the project.

1.7 Environmentally Sensitive Areas

1.7.1 Wetlands/Flood Plain

According to the FEMA Flood Insurance Rate Map dated June 3, 1986, a small portion of the community located south of NM 142 is in Zone A and the remainder of the community is in Zone C. Zone A is defined as areas within the 100-year flood plain with no base flood elevations or flood hazards determined. Zone C is defined as areas of minimal flooding. Refer to the FEMA Flood Map and legend as reproduced and included in Appendix C for locations of flood zones. No stream crossings or wetlands are known to exist within the community.

1.7.2 Farmland, Rangeland, Forestland

Agriculture is the leading industry in Monticello and the majority of the proposed service area consists of agricultural farmland. There is no rangeland or forestland in the proposed service area. The improvements recommended in this study are located on disturbed land or in existing roadways and none of the improvements are anticipated to have a negative impact on the farming industry.

2. Mitigation Measures

Mitigation measures to minimize environmental impacts of the project include:

- minimizing the amount of land that must be acquired for the project
- designing project elements within existing rights-of-way and easements where possible
- minimizing the amount of disturbance to existing features during construction
- maintaining adequate traffic control provisions during construction
- implementing adequate dust control procedures during construction
- maintaining adequate storm water detention during construction
- returning disturbed areas to their original condition after construction

These measures will be implemented during both design and construction of the Project.

C. Growth Areas and Population Trends

The population of Monticello has been declining since its peak in the late 1800's. Currently, it is estimated that no more than 20 homes are occupied on a part or full-time basis. An effort to revitalize the town through remodeling of its central plaza is now underway. The expansion of the water system to include the entire community may also encourage development in the area. According to the Sierra County Assessor, there are 64 privately owned tracts of land within the town that could potentially be occupied in the future. However, per the directive of Sierra County, the maximum number of connections that are likely to come online during the planning period is 40 connections, including the original six connections.

According to United States 2000 Census data, there is an average of 2.13 people per household in Sierra County. Table 2 shows the number of connections and corresponding populations for the present year and the projected numbers at the end of the twenty year planning period. For the purposes of this report, it is assumed that all 20 of the occupied homes will be connected to the expanded system when it is built. Construction is estimated to be completed in 2009.

Table 2. Population Projection for Monticello Water System

Year	Number of Connections	Population Served
2007	6	13
2009	20	43
2027	40	85

The total number of connections currently being serviced is six. The total number of projected connections is estimated to be 40 in the year 2027.

III. EXISTING FACILITIES

A. Location Maps

The general location of Monticello is shown in Figure 1 and the layout of the existing water distribution system is shown in Figure 2.

B. History of the Association and Water System

The Office of the State Engineer (OSE) declared the portion of the Rio Grande Underground Water Basin over which Monticello is located on December 22, 1971. The original town well, RG 41244, was a declared pre-basin well which had been in existence in some form, either as a free-flowing spring or cased well since about 1865 until 2003. The town declared 50 acre-feet of water rights for this well in 1984, which at the time was serving six households and had a 6-inch casing and a 4-inch PVC liner with a depth of 80 feet.

In 2003, Mrs. Claudia Jeffery requested an emergency change of location for the well which had been severely damaged by a tree root that had damaged the casing and was severely compromising the quality of the water produced. The emergency change of location was granted and the new well was drilled within 100 feet of the original well in April of 2003. During this process, the water rights were reduced to 12 acre-feet on the basis that the well that had once served 450 people, was now only serving five households. The OSE verbally agreed to increase the water rights if the community started using more water from RG 41244. The new well is 180 feet deep with depth to water of 55 feet. The well has a 6-inch casing, an estimated capacity of 50 gpm and is located in the N1/2 SW1/4 of Section 34, Township 10 South, Range 6 West.

The existing distribution system was built in the late 1970's and consists of a small ¾-inch PVC waterline loop. Five homes, the Plaza Hotel Partnership and a church are all connected to the system. The system is pressurized by the well pump and a small pressure tank. The system customers formed the Monticello Mutual Domestic Water Users Association in June of 2003. Figure 2 shows the layout of the existing system and Figure 3 shows a simplified system process diagram. Appendix D contains the OSE records on the Monticello system.

C. Condition of Existing Facilities

1. System Demand

1.1 Water Rights

The Association has 12 acre-feet of water rights, with a verbal agreement with the OSE that more will be available to them if their water usage increases.

1.2 Groundwater Production Well

The Association has one well designated as RG 41244. All available information on the well is summarized in Table 3. The pump flowrate was based on a hydraulic model of the existing system and the pump curve for the pump model installed in the existing well. All available groundwater production records are shown in Table 4. Individual connections are not metered, so it is not possible to estimate water losses for the Monticello system.

TABLE 3. Groundwater Well Information

Date Completed	4/9/2003
Estimated Well Capacity (gpm)	50
Pump Manufacturer/Type	Goulds/Submersible
Model/Horsepower	18GS15/1.5
Estimated Pump Capacity (gpm)	25
Casing Diameter (in)	6
Pipe Discharge Diameter (in)	1 ¼
Casing Depth (ft)	180
Total Well Depth (ft)	180
Static Water Level (ft)	55
Pumping Level (ft)	140

Table 4. Groundwater Well Production History

Date	Meter Reading, gallons	Water Production, gallons	Water Production, acre-feet
4/10/2003	0	-	-
12/31/2004	812,900	812,900	2.495
6/15/2005	813,000	100	0.000
1/30/2006	817,000	4,000	0.012
3/9/2006	848,300	31,300	0.096
12/31/2006	1,061,000	212,700	0.653
9/19/2007	1,341,900	280,900	0.862

1.3 Domestic Demand

Well production data from April 2003 to September of 2007 was analyzed to calculate base average demands. Over these 54 months, the Association used a total of 1,341,900 gallons of water, which is an average of 24,850 gallons per month or 828 gallons per day. Based on six connections and the assumed population served of 13 people, this is an average of 140 gallons per connection per day or 65 gallons per capita per day, which is within the normal range for water usage.

Generally, water systems see their largest demand during the hot summer months and lower demands during the winter months. The ratio of the maximum demand day to the minimum demand day is called the peak day factor. Since meter readings were not done frequently enough to calculate this factor, it will be assumed to be 2.0, which is similar to other peak day factors for water systems in New Mexico and within the typical range of 1.2 to 2.5 and (AWWA, 1989).

Domestic demand changes with time throughout the day, with the highest demand occurring in the morning and evening hours and the lowest demand occurring in the middle of the night. The highest demand period is called the peak hour. It is known that

the well pump is barely able to keep up with the system demand when all seven connected buildings are using water concurrently. Therefore the peak hour demand must be on the order of 25 gpm, or 3.6 gpm per building.

2. Water Quality and Treatment

All systems with more than 15 connections or 25 customers are defined by the EPA as community water systems and are required to test the quality of their water on a regular basis and report the results to the New Mexico Drinking Water Bureau. The water must meet the requirements of the Safe Drinking Water Act for primary contaminants. Since the Monticello system currently has fewer than 15 connections, they are not required to monitor their water quality. There is no disinfection or any other treatment being used currently for the system and the Association has no records of any water quality data or testing that was done since it was formed in 2003.

3. Storage

The only storage available to the system is the small pressure tank adjacent to the well. This tank is used in providing pressure to the system. It is not meant to be a major source of water. Therefore, if the existing well were to go down an electricity outage were to occur, the system would run out of water within a few hours.

4. Distribution

Water is pumped from the existing well, through the pressure tank and to the ¾-inch PVC distribution loop. All the connections come off this single loop. The total length of distribution line is approximately 700 feet.

5. Fire Flow

The Monticello system has no capability to provide fire protection to its service area.

D. Current Financial Status

1. Rate Schedule

The Association charges a flat annual fee of $240 to each of its six customers. This comes to a total annual income of $1,440.

2. Financial Stability

The Association's annual income is sufficient to cover the electricity cost of running the well, which costs an average of about $225 per year, and make minor repairs to the system. The Association has no outstanding loans. The Association does not make

enough money to expand or improve its system significantly or make major system repairs.

IV. SYSTEM EVAULATION CRITERIA

A. System Pressure

System operating pressure for water utility services in the State of New Mexico is regulated by the New Mexico Administrative Code, Title 17, Chapter 12, Part 750 which states that the pressure required at the customer's meter shall not be less than 30 psig nor more than 125 psig. However, standard engineering practice generally defines a higher minimum and lower maximum pressure than what is required by law in order to provide customers with better systems.

For example, the American Water Works Association (AWWA) Manual M32, *Distribution Network Analysis for Water Utilities*, states that "In general...the desired range of system pressures is between 30 psi and 90 psi through the range of the system demands, including average-day demand, maximum-day demand, maximum storage replenishment rate, and peak-hour demand."

Recommended Standards for Water Facilities, 2006 Edition by the New Mexico Environment Department (NMED) Construction Programs Bureau states, "The minimum working pressure in the distribution system should be at least 35 psi and the normal working pressure should be approximately 60 to 80 psi. When static pressures exceed 80 psi, pressure reducing devices should be provided on mains in the distribution system."

During a fire event, the minimum pressure is allowed to drop below what is required for normal operating conditions. The IFC requires pressure to be at least 20 psi at a working fire hydrant after 2 hours of the required fire flow. The pressure throughout the rest of the system is allowed to drop below 20 psi as long as it remains positive.

B. Fire Demand

The community of Monticello is not required by law to provide fire protection to its customers since the public structures in it were built before any fire code was adopted by Sierra County and since the residences were built individually by private individuals and were not part of any large development. However, for the safety of the community, it is desirable to have some level of fire protection. There are two recognized standards for fire protection in New Mexico – the International Fire Code (IFC) and the Insurance Services Office (ISO).

The minimum fire flow for residential structures as defined by the IFC is 1,000 gpm for 2 hours. This equates to a total volume of 120,000 gallons, which is almost twenty times the projected average day demand. Attempting to provide this flow and volume for the Monticello system is not a financially feasible option. Nor is it beneficial from a water quality standpoint. Assuming the funds could be provided to build the infrastructure needed, water would sit in the storage tank for an average of twenty days before it was used, which would be detrimental to its quality to the

customers.
ISO calculates insurance rates and develops policies based on their prediction of loss. They rate a community's protection against loss by fire according to the equipment it has to fight fires and the capacity of the water system to provide a certain volume and flowrate. The range of protection ranges from 1 to 10, with 10 meaning no fire protection and 1 being the highest level of fire protection. The minimum fire flow criteria for a Class 8 designation is 250 gpm for 2 hours. This comes to a total fire protection volume of 30,000 gallons. This volume is more financially feasible and acceptable from a water quality standpoint than the IFC minimum volume. Therefore, the ISO standard will be used to make recommendations for providing fire protection to the service area.

C. Pipe Velocity and Headloss

Maximum velocities for waterlines are chosen to balance capital cost of the pipe materials and the energy required to provide adequate hydraulic head to the system. Normally, a new system would be designed to limit velocities and headloss to 5 ft/s and 10 ft/1000 ft to conserve energy. An upper limit of 10 ft/s can be allowed, but flows exceeding this velocity will begin to erode the pipe and eventually cause leaks or breaks in waterlines. Existing pipes in the Monticello system will be subject to the upper limit of 10 ft/s under peak domestic flow conditions. Since fire flow events occur very rarely and for relatively short periods of time a maximum velocity of 15 ft/s during fire flow will be allowed.

D. Storage, Water Production, and Transfer Pumps

According to the AWWA M32 manual, the storage volume available to a system with only one well should be capable of supplying the one fire flow event as well as the domestic storage for one day of peak day demand. It is assumed that the groundwater pump has topped off the tank during the night, so that it is full at the beginning of the peak day.

A secondary storage volume requirement is given by the United States Department of Agriculture (USDA) Rural Development Service (RD) in RD Instruction 1942-A, Guide 7, requires that water systems maintain a minimum storage of 350 gallons per connection for two days. This equates to a minimum of 700 gallons of storage per connection.

E. Demand Scenarios

In accordance with the general approach to analyzing the adequacy of a water systems distribution network and storage facilities as set forth in the AWWA M32 manual, the following system demand conditions and requirements for the projected demands in 2027 were examined:

1. System piping subjected to:
   - the peak hour demand plus fire flow demand of 250 gpm.
   - the peak hour demand.
2. System storage subjected to:
   - the peak day domestic demand plus fire flow demand of 250 gpm for 2 hours.
   - 700 gallons per connection
3. Groundwater pumps subjected to:
   - the maximum day domestic demand.

As each of these scenarios were evaluated, the following minimum and maximum pressure and maximum velocity limitations were used to determine what system improvements are required.

Residual Pressures: 70 psi maximum to 35 psi minimum under any system operating condition other than fire demand. Minimum pressure of 20 psi at the working hydrant locations, and positive pressure throughout the system during a fire demand situation.

Pipe Velocities and headloss: 10 ft/s maximum under domestic water demand in existing pipes. 5 ft/s maximum under domestic water demand in new pipes with no more than 10 ft/1000 ft of headloss. 15 ft/s maximum in all pipes under fire flow demand.

F. Hydraulic Model

WaterCAD® version 7.0 with AutoCAD 2006 was used to simulate the existing system and system improvements. The water distribution system model was created based on a sketch provided by the Association and OSE well records. Pipe locations and elevations of nodes were estimated based on a site survey completed by Bohannan Huston in 2006 and the USGS quadrilateral map for the area.

All demand scenarios listed in Section IV.E for the projected 2027 usage were run in the model. The model was modified as necessary to meet pressure and velocity requirements under each demand. Corresponding improvements are discussed in Section V. The results of the hydraulic model are included in Appendix E.

G. Water Quality

If the system expands beyond 15 connections as proposed in this project, the Association will be required to monitor and report their water quality to the New Mexico Ground Water Quality Bureau and to their customers. However, as no water quality data for the system is available, no recommendations can be made with regard to compliance with the Safe Drinking Water Act.

V. NEED FOR PROJECT

After examination of the existing system and the results of the hydraulic analysis, several system improvements are needed to meet state standards for a public drinking water system. The proposed improvements are recommended based on health and safety, system operational reliability, and system growth. Proposed improvements and ways in which each component of this Project will benefit all of the water consumers are explained in the following sections.

A. Proposed Improvements Summary

In order for the Association to resolve the issues discussed in Section I.B, some system components will need to be replaced and new facilities will need to be constructed. The system problems are summarized below along with their proposed solutions. The improvements are prioritized and organized in three alternatives that are discussed further in Section VI. A preferred alternative was selected based on the alternative's financial feasibility, reliability, satisfaction of design criteria, constructability, and operation and maintenance requirements.

Water Supply

- **Problem**: Without any storage facilities, the existing well is unable to keep up with peak domestic demand for the existing customers, much less any additional users that may be connected to an expanded system. Also, the existing well is located within 200 feet of septic tanks and there is no redundant water supply per NMED requirements.
  Solution: Drill a new well to provide redundancy. This well will become the primary water source for the system and should be at least 200 feet away from any septic tank or other source of contamination. The existing well will then become the backup well. With sufficient storage facilities, either well will be able to keep up with even the expanded system demand.

Distribution

- **Problem**: The velocities in the existing distribution system are approaching the maximum recommended velocities under peak domestic demand and these lines should be upsized for domestic flow at a minimum. No distribution infrastructure is available to the majority of the Monticello community.
  Solution: Upsize the existing distribution lines and expand the system to include service to the rest of the community. The lines should be sized to meet velocity limitation for both peak domestic demand and a fire flow scenario. Fire hydrants would also need to be placed every 500 feet along the main line to access the fire protection storage.

Storage

- **Problem**: The system has essentially no storage available.
  Solution: Construct a steel storage tank to provide one peak day of domestic volume plus one ISO Category 8 fire flow event.

Treatment

- **Problem**: Monticello's water supply has never been tested.
  Solution: Monticello should have their water tested on a minimum of an annual basis for major contaminants to be sure the supply complies with the Safe Drinking Water Act and determine if any water treatment is necessary to provide a safe water supply.

B. Health, Sanitation and Security

Since no water quality data is available, it is not known if the water delivered to the Association's members meets current state and federal water quality criteria. A testing program should be established to monitor the quality of the water.

The system lacks a redundant water supply and has virtually no storage capacity. If a power outage or pump failure were to occur, the Association's customers would run out of water in a short time. The system is also pushed to its capacity when all the existing customers are using water at the same time.

Additional improvements that would improve health and safety include upgrading and expanding the main distribution lines, adding fire hydrants and a storage tank to be able to provide domestic demand and fire flow to the whole community.

C. System Operation and Maintenance

The project will allow the Association to provide adequate volume and pressures to its existing and new customers. The Association's system is run by volunteers rather than by a designated, trained operator. Therefore, the improved system needs to be as easy to operate and maintain as possible. The design of the expanded distribution system, storage and water production facilities will be according to industry standards which are meant to minimize possible system problems.

Another way to facilitate this goal is to install a transducer at the base of the new tank that will directly communicate via radio telemetry unit to the well. This will allow the system to automatically refill the tank as its volume is used and eliminate the need for someone to monitor the tank level and manually turn on the well. This system will also be in communication with an automatic alarm system that can immediately alert a designated individual of any equipment or pressure problems within the system.

D. Growth

Water use projections were estimated by calculating the average daily use per connection since April of 2003 to September of 2007. The average daily usage per connection is 140 gallons per day. Meter readings have not been taken frequently enough to calculate the peak day usage for the system so a peak day factor of 2.0 was estimated. Therefore, the peak day usage per connection is 280 gallons or 130 gallons per person. The Association has no flowrate metering capabilities to measure the peak demand when all customers are using water at the same time. However, based on the fact that the domestic demand overwhelms the groundwater well when all the system customers are using water at the same time, the peak hour demand must be on the order of 25 to 30 gpm, or about 3.6 gpm per building.

These base demands were projected based on an initial 20 total connections upon completion of the project and a maximum of 40 connections within the 20 year planning period. The required minimum storage volumes for peak day domestic demand and a 250 gpm for 2 hours fire flow event were also calculated. The minimum RUS storage requirement of 700 gallons per connection is also shown. Table 5 summarizes these calculations.

Table 5. Projected System Demand

Scenario	2007	2009	2027
Number of Connections	6	20	40
Population Served	13	43	85
Average Day Demand, gallons	830	2,770	5,540
Peak Day Demand, gallons	1,660	5,540	11,080
Peak Hour Demand, gpm	25	72	144
Average Annual Demand, ac-ft	0.93	3.10	6.21
Minimum Domestic & Fire Storage Volume, gallons	31,660	35,540	41,080
RUS Minimum Storage Volume, gallons	4,200	14,000	28,000

The minimum domestic plus fire storage volume exceeds the RUS minimum storage requirement. Therefore the recommendation for the storage tank is based on the actual demand requirement of approximately 45,000 gallons. From Table 5, the 2027 projected annual demand is 6.21 acre feet, which is much less than the 12 acre-feet available. Therefore, no additional water rights are anticipated to be required for the expanded system.

The Association currently owns one well which does not have the required 200 foot setback from the septic tanks and leachfields of the surrounding homes. The Association should purchase an additional 4 acres of land and drill a new well near the location shown on Figure 6. This new well will provide water supply redundancy required by NMAC as well as the required setback distance. The existing well will then act as a backup to the new well.

If the new storage tank is built as recommended, the new well's capacity is based on the flowrate required to produce the volume for one peak day in 16 hours of pumping time. This comes to a minimum flowrate for the new well of approximately 15 gpm.

VI. ALTERNATIVES CONSIDERED

Three alternatives were considered to improve the Association's system. Necessary improvements include a new well, an upgraded and expanded distribution system, a new storage tank capable of providing one peak day of storage and one ISO minimum fire flow event, installation of fire hydrants, and the introduction of a water quality testing program. These proposed improvements are essential components to the health, safety, operation, maintenance and growth of the Monticello water system over the design period.

The proposed tank can either be located adjacent to the proposed new well, or built on the elevated ground north of the town. If the tank is located adjacent to the new well, system pressure will have to be provided by a booster station and pressure tank. If the tank is located in the elevated area north of the town, pressure will be provided by gravity. Based on the need for reliability and simplicity in operating the system, the new tank will be located on the elevated ground north of the town. Also, the cost of building a supply waterline to the higher elevation is estimated to be substantially less than the cost of the booster station equipment.

Additional improvements include the installation of a transducer/radio telemetry system which will turn the well on and off to keep the storage tank topped off automatically, and a backup generator which will allow the well to continue running in the event of a prolonged power outage.

The possible alternatives to the system improvements for the Association are summarized as follows:

- Alternative #1: Optimizing the current facilities to provide domestic demand for the existing customers only.
- Alternative #2: New well, distribution system expansion, new elevated storage tank, introduction of water quality testing program, installation of radio telemetry control and installation of backup generator. This alternative will provide domestic demand to the entire community of Monticello.
- Alternative #3: New well, distribution system expansion, new elevated storage tank, installation of fire hydrants, introduction of water quality testing program, installation of radio telemetry control and installation of backup generator. This alternative will provide domestic demand and a minimum level of fire protection to the entire community of Monticello.

A. Alternative #1 – Optimizing the Current Facilities

1. Description

This alternative would mean that the Association would continue to operate the system as it exists today with only minimal corrective actions not requiring substantial construction activities. These improvements include replacing the existing undersized pressure tank

with a larger pressure tank and upsizing the existing distribution lines to meet requirements for maximum velocity and headloss.

The peak hour demand is estimated to be slightly more than the flowrate of the well pump. Therefore, when all existing customers are using water at the same time, the small existing pressure tank is quickly depleted and system pressure is lost until the well pump can refill the tank. In order to maintain system pressure during the peak demand, the pressure tank must have sufficient volume such that it does not run out of water during the period when demand is higher than the supply. For the purposes of sizing the pressure tank, it will be assumed that demand exceeds the supply flowrate by 5 gpm. Assuming that the period of peak flow will not last more than one hour, the minimum water volume required in the tank is 300 gallons.

A bladder well pressure tank, such as manufactured by Amtrol Inc., is recommended for this project. These tanks contain a bladder filled with air in the upper portion of a vertical cylindrical tank. As the tank fills with water, the air is compressed, providing pressure to the system. The tank will provide a range of pressures according to how much water is in the tank and how much the bladder is compressed. The total tank volume, including the air filled bladder and water volume, is sized based on the minimum allowable system pressure of 35 psi and the maximum pressure that the well pump can pump against and remain reasonably efficient. For the existing pump, this maximum pressure at the tank is approximately 90 psi. Using sizing procedures for Amtrol pressure tanks, the total tank volume needs to be approximately 550 gallons.

It has been proposed that the new pressure tank(s) for this alternative be located within the new stage structure that is being planned as part of a revitalization project for the town square. Depending on the space constraints, this volume can be provided with a single tank or with multiple tanks installed in parallel. Using Amtrol well pressure tanks as a basis, the 550 gallon total volume can be provided with one 4 foot diameter by 8 foot cylindrical tank, with two 3 foot diameter by 7 foot cylindrical tanks, or with four 2 foot diameter by 7 foot cylindrical tanks. For the purposes of the cost estimate, it will be assumed that one tank will be used.

Portions of the existing ¾-inch distribution line are experiencing velocities approaching 20 ft/s under peak demand. This high velocity will eventually erode and break the pipe. It is recommended that the ¾-inch distribution line be upgraded to 3-inch diameter line. This will keep the velocity and headloss in the line under approximately 2 ft/s and 6 ft/1000 ft respectively.

While not required by law, it is also recommended that the Association test the water quality of their well and continue to monitor it at least once per year.

2. Design Criteria

This alternative will correct system operating conditions to comply with minimum system pressure of 35 psi to the service area during all domestic demand conditions and will reduce velocity and headloss in the system to acceptable levels. This alternative does not address any system expansion to incorporate new customers, a redundant well, emergency power supply, or any additional volume for fire protection.

3. Map

The system components required for this alternative are shown on Figure 4.

4. Environmental Impacts

There would be no impacts to flood plains, wetlands, endangered species, or historical or archaeological properties. Short term impacts during construction can be mitigated to ensure no long term effect.

5. Land Requirements

No additional land would need to be acquired for these improvements.

6. Construction Problems

No construction problems are anticipated for this alternative.

7. Cost Estimates

a) Construction

The Alternative components and associated costs are shown in Table 6.

Table 6. Estimated Project Construction Cost - Alternative #1

Item	Description	Unit	Quantity	Unit Price	Extension
1	Install 300-gal pressure tank system	LS	1	$8,000	$8,000
2	Service Connections	EA	6	$750	$4,500
3	3" Distribution Pipeline	LF	700	$12	$8,400
4	Basic engineering, design fees (30% of construction)	LS	1	$5,000	$5,000
5	NMGRT (5.9375%)	LS	1	$1,500	$1,500
		Cost Estimate Alternative #1			**$27,400**

b) Non-construction

There are no non-construction costs are associated with this alternative.

c) Annual Operations and Maintenance

Introducing a water quality testing program will increase the annual operation and maintenance costs by the cost of the tests. Based on the published prices of the Soil Water Air and Agricultural Testing (SWAT) Laboratory located on the New Mexico State University campus can perform a basic range of tests for a cost of approximately $100. These tests are recommended to be done at least once per year.

8. Advantages/Disadvantages

- Advantage – for a relatively small cost the Association can correct major pressure, velocity and volume deficiencies in the system.
- Advantage – the Association will monitor their water quality so that corrective action can be taken if necessary.
- Disadvantage – the system will still lack a redundant water supply and the required setback from possible sources of contamination.
- Disadvantage – the system will not be able to expand to include any additional customers.
- Disadvantage – the community will still be without fire protection.
- Disadvantage – the community will lack a backup power supply.

B. Alternative #2

1. Description

This Alternative will provide for the expansion of the water system to include the entire community of Monticello, provide a redundant well that meets the 200 foot setback criteria, and provide sufficient storage for one peak day demand. If the Association expands their customer base as proposed in this project, they will be required by law to test the quality of their water on a regular basis and report the results to the New Mexico Water Quality Bureau and to their customers.

The flowrate for the new well should be no less than 15 gpm. However, a well with a flowrate equal to the existing well would be ideal. The distribution pipelines should be 4 inches in diameter in order to provide the projected peak consumption flowrate of 144 gpm. This pipe size would result in a maximum velocity and headloss of approximately 4 ft/s and 6 ft/1000 ft respectively. Since both the new and existing well will be pumping to a significantly higher elevation than the existing pressure tank, the pump in the existing well will have to be replaced to handle this higher head.

From Table 5, the projected peak day demand is 11,080 gallons and the minimum RD

volume requirement is 28,000 gallons. Therefore, the RD criterion controls the required volume and a 28,000 gallon tank is recommended for this alternative.

A radio telemetry system for automatic control on the well and the tank level is also included in this alternative. Lastly, a backup generator is recommended to be installed adjacent to the new primary well.

2. Design Criteria

This alternative will allow for expansion of the existing system to include the entire community of Monticello. The system will be designed to meet the system design criteria for domestic demand as discussed in detail in Section IV. However, this alternative does not consider any design criteria for fire protection.

3. Map

The system components required for this alternative are shown on Figure 6. Figure 7 is a simplified system diagram of the ground-set tank scenario.

4. Environmental Impacts Long Term

There are no long term known direct or indirect impacts on flood plains, wetlands, endangered species, or historical or archaeological properties related to this alternative. Short term impacts during construction can be mitigated to ensure no long term effect.

5. Land Requirements

Additional land will be required for both the new well and new tank sites. Approximately 4 acres should be acquired for the new well at or near the location shown on Figure 6. Because of its relatively close proximity to the existing well, it is likely that a well of similar capacity and water quality can be located there. The majority of the new pipelines are planned within existing right-of-ways. However, an easement will be required from the County Road Department for the connection of the new tank and well to the existing system.

6. Construction Problems

The water level in the new tank will be controlled by a pressure transducer that monitors the level in the new tank and communicates with the groundwater wells by radio when they need to turn on and fill up the tank. Therefore, a radio path survey will be required.

Also, the distribution line to the tank follows an old road which will likely require some reconstruction for access. No other significant construction problems are anticipated as part of this alternative.

7. Cost Estimates

a) Construction

The Alternative components and associated costs are shown in Table 7.

Table 7. Estimated Project Construction Cost - Alternative #2

Item	Description	Unit	Quantity	Unit Price	Extension
1	Install pressure transducer/radio telemetry control system with automatic alarm system	LS	1	$55,000	$55,000
2	3" PVC Transmission Pipeline	LF	1,050	$12	$12,600
3	4" Distribution Pipeline	LF	6,400	$16	$102,400
4	Service Connections	EA	40	$750	$30,000
5	Backup generator	LS	1	$30,000	$30,000
6	25 gpm water production well, disinfection equipment and meter	LS	1	$75,000	$75,000
7	Replace existing well pump for higher head	LS	1	$5,000	$5,000
8	30,000 gallon steel storage tank	GAL	30,000	$2	$60,000
	Construction Subtotal				**$370,000**
9	Basic Engineering, Design fees (10% of construction)	LS	1	$37,000	$37,000
10	Project inspection fees (4% of construction)	LS	1	$14,800	$14,800
11	NMGRT (5.9375%)	LS	1	$22,000	$22,000
			Total Cost Estimate Alternative #2		**$443,800**

b) Non-construction

Non-construction cost associated with Alternative #2 are land acquisition for the tank and well sites, and any right-of-way and easement acquisition fees for the new waterline and access road between the distribution system and the new tank.

Based on a property listing in the area it is estimated that the four acres needed for the well and one acre needed for the tank site can be purchased for approximately $3,500 per acre or $17,500. Easement acquisition is estimated to cost approximately $10,000.

c) Annual Operations and Maintenance

Three items will impact current annual operation and maintenance costs if Alternative #2 is chosen:

i) The cost of testing the water supply for contaminants is expected to be on the order of $100 per year.

ii) A monthly telephone connection at approximately $30 per month will be required. An annual telephone cost of $360 is assumed.

iii) A higher power cost will be seen due to the fact that the pumps will be

lifting to a higher elevated tank and providing water for a larger customer base. Based on the power cost, lift and production of the existing pump, the new annual power cost is estimated to be $2,250 per year once all 40 projected connections are completed.

8. Advantages/Disadvantages

- Advantage – expand the water system to meet state standards for domestic water supply to serve the entire community of Monticello which now depends on numerous private wells.
- Advantage – added reliability by the introduction of a redundant water supply and a backup power supply.
- Advantage – expand Association's customer base, increasing their annual income and ability to maintain their system.
- Advantage – the Association will monitor their water quality so that corrective action can be taken if necessary.
- Disadvantage – need to acquire land and easements to build the new well and tank.
- Disadvantage – the community will still be without fire protection.

C. Alternative #3

1. Description

Alternative #3 is identical to Alternative #2 except the distribution system would be sized to deliver the 250 gpm ISO minimum fire flow plus the 144 gpm projected peak hour flow and the tank would be built to contain both the volume needed for one peak day of domestic demand as well as one 2-hour fire flow event. Approximately 8 fire hydrants would be required along the main distribution line to meet the maximum spacing of 500 feet.

2. Design Criteria

This alternative will allow for expansion of the existing system to include the entire community of Monticello. The system will be designed to meet the system design criteria for both domestic demand and fire protection as discussed in detail in Section IV.

3. Map

Figure 6 shows the system components required for this alternative. Figure 8 is a simplified system diagram of the ground-set tank scenario.

4. Environmental Impacts Long Term

There are no long term known direct or indirect impacts on flood plains, wetlands, endangered species, or historical or archaeological properties related to this alternative. Short term impacts during construction can be mitigated to ensure no long term effect.

5. Land Requirements

No additional land above that required for Alternative #2 would be required for this alternative.

6. Construction Problems

No additional construction problems outside of those cited for Alternative #2 are anticipated.

7. Cost Estimates

a) Construction

The Alternative components and associated costs are shown in Table 8.

Table 8. Estimated Project Construction Cost - Alternative #3

Item	Description	Unit	Quantity	Unit Price	Extension
1	Install pressure transducer/radio telemetry control system with automatic alarm system	LS	1	$55,000	$55,000
2	3" PVC Transmission Pipeline	LF	1,050	$12	$12,600
3	6" Distribution Pipeline	LF	6,400	$20	$128,000
4	Service Connections	EA	40	$750	$30,000
5	Backup generator	LS	1	$30,000	$30,000
6	25 gpm water production well, disinfection equipment and meter	LS	1	$75,000	$75,000
7	Replace existing well pump for higher head	LS	1	$5,000	$5,000
8	45,000 gallon steel storage tank	GAL	45,000	$2	$90,000
9	Fire Hydrants	EA	8	$1,500	$12,000
	Construction Subtotal				**$437,600**
10	Basic Engineering, Design fees (10% of construction)	LS	1	$43,800	$43,800
11	Project inspection fees (4% of construction)	LS	1	$17,500	$17,500
12	NMGRT (5.9375%)	LS	1	$26,000	$26,000
			Total Cost Estimate Alternative #3		**$524,900**

b) Non-construction

The same non-construction costs, totaling $27,500, cited for Alternative #2 will apply for this alternative.

c) Annual Operations and Maintenance

The same increased annual operation and maintenance estimated for Alternative #2 apply to Alternative #3. From Section VI.B.7, total costs are expected to rise to $2,710 from their current average of $225.

8. Advantages/Disadvantages

- Advantages – the alternative has all the advantages of Alternative #2.
- Advantage - fire protection would be provided to the community.
- Disadvantages – need to acquire land and easements to build the new well and tank.

D. Selection of an Alternative

1. Financial Feasibility

The Association can borrow the money needed to fund the project, obtain grants or some combination of the two. The worst case would be that a loan would be taken out for the full sum of the design and construction cost. A financial feasibility analysis of each alternative using the capital cost and operation and maintenance estimates for each alternative was performed assuming all the money would be provided by a low-interest government loan. The calculations are included as Appendix E.

The financial feasibility analysis was based on the 20-year, real federal discount rate of 3.0 percent. The rate is published in Appendix C of the Office of Management and Budget Circular A-94 and takes into account the effects of inflation. The customer support base of the Association was assumed to grow as projected in Table 2 for Alternative #2 and #3.

The financial feasibility of each alternative is assessed based on the total rate per customer that would be required to fund each alternative. The revised rate should be within a reasonable range from the state average. The New Mexico Construction Programs Bureau publishes average water costs in the state on an annual basis. In 2006, monthly charges ranged from $6.75 to $50 for 6,000 gallons of water per month, while the average residential customer paid $20.68.

Based on the analysis, the cost of repaying a loan for Alternative #1 could be supported by the existing Association customers with a monthly rate increase of $9.75 per month, for a total monthly charge of $29.75. This is within 45 percent of the state average and is

considered reasonable.

Monthly rates would have to be increased to $145 and $167 to fund Alternatives #2 and #3 respectively. These rates are not reasonable when compared to the state average. Therefore, if Alternative #2 or #3 is chosen, the funding from the project would have to come almost entirely from grants. The Association could also raise rates to fund a small portion of the project with loans.

2. Rating System

While Alternative #1 is the most financially feasible and easy to implement, it does not allow for expansion of the system, fire protection or redundancy for emergency well failures.

Alternatives #2 and #3 will require the majority of the project to be funded through loans in order to keep the Association's water rates at a reasonable level. Implementing the proposed improvements will allow the customer base to expand to the entire community of Monticello, meet design criteria for domestic demand and provide a backup well source. Alternative #3 will also provide fire protection to the community.

Table 9 contains a rating of each alternative considering the alternative's financial feasibility, reliability, allowance for growth, satisfaction of design criteria, constructability, and operation and maintenance requirements as discussed.

Table 9. Comparison of Alternatives

Factor*	Alternative #1	Alternative #2	Alternative #3
Financial Feasibility	3	1	1
Reliability	1	3	3
Allows for growth	1	3	3
Meets all design criteria	1	2	3
Constructability	3	2	2
O&M Requirements	3	3	3
Composite Ranking	**12**	**14**	**15**

* 1 is least preferred, 3 is most preferred

Based on the table, Alternative #3 ranked the highest, followed by Alternative #2, then Alternative #1. Alternative #1 will solve some problems for the existing six connections on the system. However, it does not address system expansion or reliability. Alternatives #2 and #3 provide the greatest benefit to the entire community of Monticello and create a reliable water system that will require little maintenance. Alternative #3 has the advantage over Alternative #2 in that it gives the added benefit of fire protection. Based on the comparatively small difference in cost between Alternatives #2 and #3, Alternative #3 is recommended as the proposed project.

VII. PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

Based on the financial feasibility analyses and the Alternative rating in Table 9, Alternative #3 is the recommended alternative. The following paragraphs summarize the proposed project as it has been discussed in previous sections. Figure 6 shows the proposed system components and their locations.

A. Project Design

1. Water Supply

The Association owns plenty of water rights to provide the projected domestic demand for 40 connections. A new well will be built as part of this project. This well will be placed such that it is outside the 100-year flood plain and has the required 200 foot setback from any source of contamination, such as septic tanks or leachfields. The well will provide water supply redundancy as required by NMAC. When coupled with adequate storage facilities, either the new well or the existing well will be able to keep up with the peak projected demand.

2. Distribution

The existing distribution system serves only six connections and is undersized for the peak domestic demand currently being experienced. The proposed project will expand the distribution system to service the entire community of Monticello. The pipelines are sized to keep velocities and headlosses under the maximum allowed. Approximately 1,050 feet of 2-1/2-inch pipeline will be required from the new well to the distribution system and 6,400 feet of 6-inch pipeline will be required to build the distribution system and the line to the new tank site.

3. Storage

The Association currently has no significant storage facilities. The proposed project will provide adequate storage to meet the projected peak day domestic demand and one fire flow event. The storage tank will be located at a base elevation of approximately 5,400 feet, or roughly 140 feet above the town. This will provide approximately 65 psi of pressure to the majority of the town, and 55 psi to the highest connection in the system. Under a peak hour demand with a fire flow event occurring simultaneously, the pressures throughout the system range from 50 to 55 psi throughout the system.

4. Treatment

The Association's water supply has never been tested for contaminants since it currently does not fall under the jurisdiction of the New Mexico Water Quality Bureau. However, if the system expands as expected, the Association will be required to measure the quality of their water and report it on a regular basis. Therefore, a regular water quality testing

program will be implemented as part of this project.

B. Total Project Cost Estimate

Itemized construction and operation and maintenance cost estimates are included in Section VI.C.7. The total construction cost estimate is $524,900. Non-construction costs for purchasing land for the tank and well sites and utility easement acquisition are estimated to be $27,000. The annual operation and maintenance costs are projected to be approximately $2,710 per year when all 40 connections are made. At the real discount rate of 3 percent over 20 years, the present value of the annual operation and maintenance cost is equal to the yearly expense multiplied by the (P/A) factor of 14.8775 is about $40,300. Adding the present value of the operation and maintenance expenses to the total project cost gives the total present value for the project of $565,200.

C. Annual Operating Budget

1. Income

Based on information provided by the Association, their annual income from the existing six connections is $1,440 per year. The rate of $20 per month per connection is consistent with the average rate charged in New Mexico. However, because of the small number of existing and projected connections, the Association does not have sufficient annual income to fund the proposed project entirely with loans. Neither is it reasonable to increase rates enough to repay the loan that would be required. Therefore, the Association should seek grants to assist in paying for the project. See Appendix F for the financial feasibility calculations.

2. Operations and Maintenance Costs

The annual operations and maintenance costs are expected to increase to approximately $3,200 by the time all 40 connections are made and are using water. Approximately $2,000 of this total cost comes from increased power consumption, the cost of a telephone connection for the automatic alarm system and the cost of water quality testing.

The remaining operation and maintenance cost comes from the cost of hiring a certified operator. Under NMAC Section 20.7.4.20 community water systems must be operated by or be under the supervision of a certified operator who meets or exceeds the appropriate level of certification required by the size and complexity of the facility. Once the Monticello system attains at least 15 connections or 25 customers, it will require a certified operator. NMED oversees the certification of operators. The Monticello system will be classified as a small water system. The requirements for a small system operator include a high school diploma or equivalent, one year of experience, completion of ten training credits, satisfactory completion of the written examination appropriate for the certification level, as well as a nominal application fee. The community can either elect a member to go through

the certification process and supervise the water system or they can hire an operator who is already certified to supervise their system on a part-time basis. It is assumed that the Association will hire an operator from a surrounding community who is already certified and pay them a salary of $100 per month or $1,200 per year to perform periodic check-ups and maintenance on the system.

3. Debt Repayments

The Association has no outstanding debts, nor does it have sufficient income to support a substantial amount of debt.

4. Reserves

Debt Service Reserve

RD recommends that the Association keep a reserve account that contains no less than one-tenth of their annual debt repayment installment. The Association should be aware of this if they chose to finance a small portion of the project with a loan.

Short-Lived Asset Reserve

Replacement of short-lived assets, such as water meters, and well pumps should be planned for. If properly maintained, these assets will have a life of about 10 years. The following schedule lists critical equipment, expected life and expected replacement costs:

Equipment Schedule	Expected Life	Replacement Cost
Well Pump(s)	10 years	$5,000 (including truck removal/replacement)
Master Meter	10 years	$500
Telemetry Sensor	10 years	$2,500
Electrical or Telemetry Gear Damages	10 years	$2,500

Based on this schedule, it is highly likely that this equipment will require replacement on during the planning period. This cost of approximately $10,500 should be anticipated to occur during the facility life. An annual equipment reserve account of $1,050 is recommended to be set aside to account for these expected expenses.

VIII. CONCLUSIONS AND RECOMMENDATIONS

The proposed project will alleviate all of the system problems discussed in Section I.B. Due to the large capital investment required to make all of the suggested improvements, the project will have to be primarily funded through grants. The Association can seek funding from such sources as the Untied States Department of Agriculture Rural Development and from New Mexico State Legislature appropriations.

Phasing the project to break the capital expense in more manageable pieces and allow the increase in income from additional connections to help fund later phases was considered. However, the only way to keep the system functional and phase it would be to make construction of the 6-inch distribution system and new tank Phase I. Phase II, would be the construction of the new well and 2-1/2-inch supply waterline. However, this phasing scheme is not practical since Phase II is only about 7 percent of the total construction cost. Little benefit would be gained from phasing and breaking up the project would most likely increase design and construction costs.

The proposed project does not include any recommendations with regard to water treatment as no water quality data is available. The Association should be aware that if their customer base expands to over 15 connections or 25 people, they are required by law to monitor and report the quality of their water to the Drinking Water Quality Bureau and have their system supervised by a certified small water system operator. When the Association does being testing their water, primary contaminants exceeding levels defined in the Safe Drinking Water Act may be discovered and require treatment.

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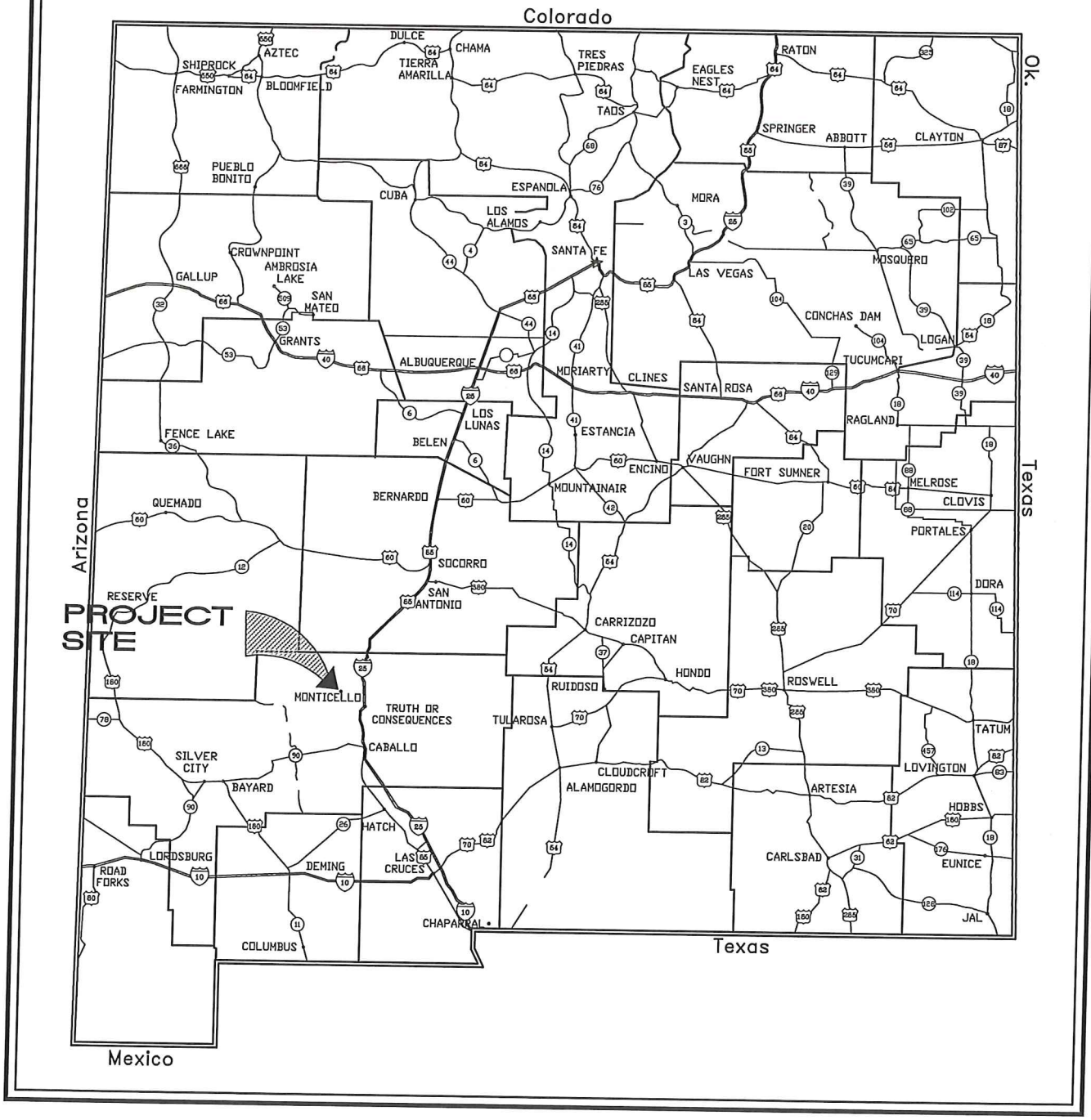
FIGURES

General Location Map
Existing and System Layout
Existing System Simplified Process Diagram
Proposed System Layout - Alternate #1
Simplified Process Diagram - Alternate #1
Proposed System Layout - Alternate #2 and #3
Simplified Process Diagram - Alternate #2
Simplified Process Diagram - Alternate #3



MONTICELL MDWCA PRELIMINARY ENGINEERING REPORT

GENERAL LOCATION MAP

FIGURE 1

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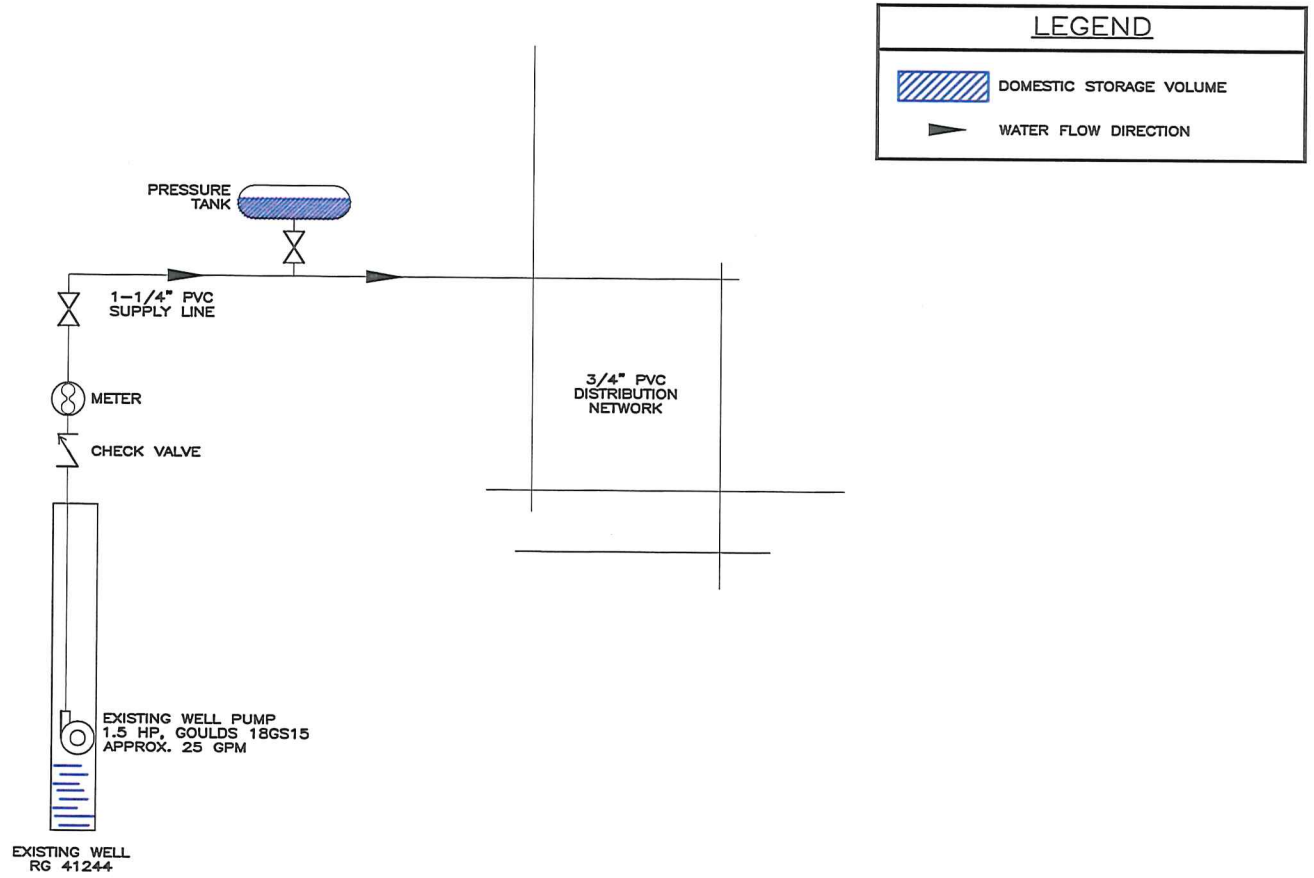
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

MONTICELLO MDWCA PRELIMINARY ENGINEERING REPORT
EXISTING SYSTEM LAYOUT
FIGURE 2



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MONTICELLO MDWCA PRELIMINARY ENGINEERING REPORT
EXISTING SYSTEM SIMPLIFIED PROCESS DIAGRAM
FIGURE 3

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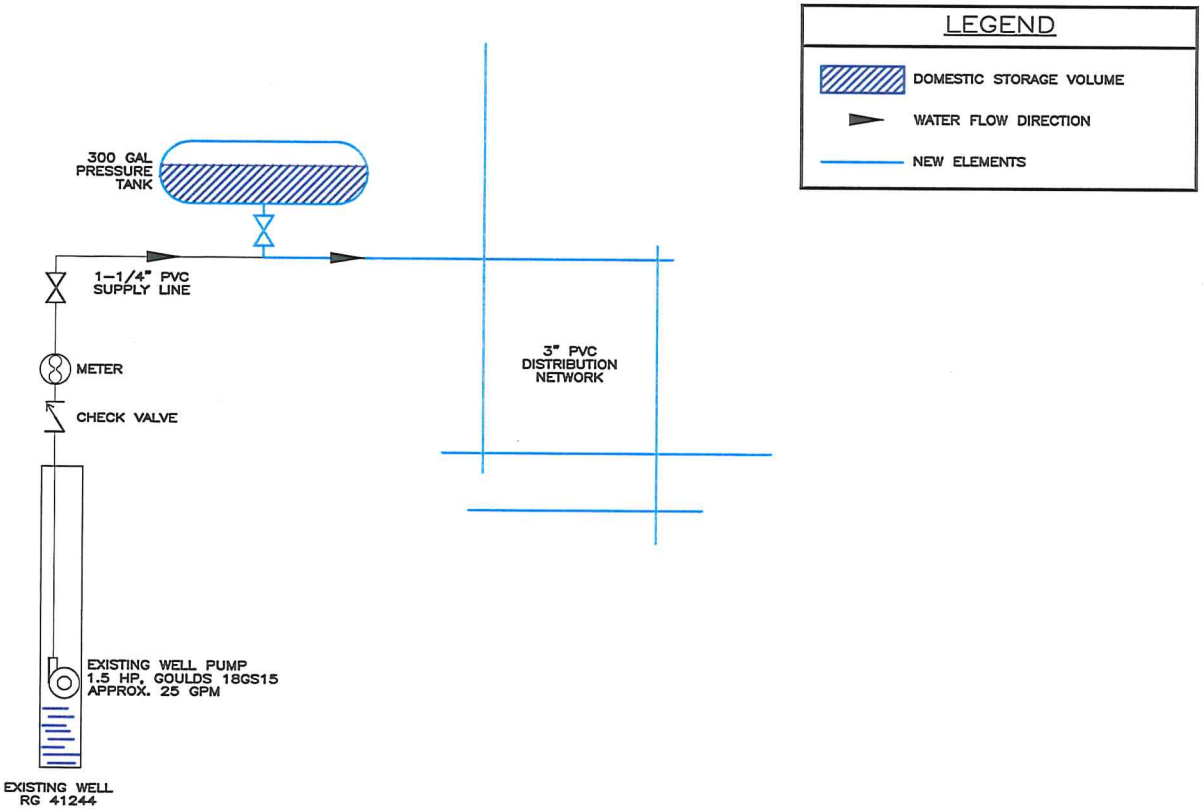
PROPOSED SYSTEM LAYOUT - ALTERNATIVE #1
FIGURE 4



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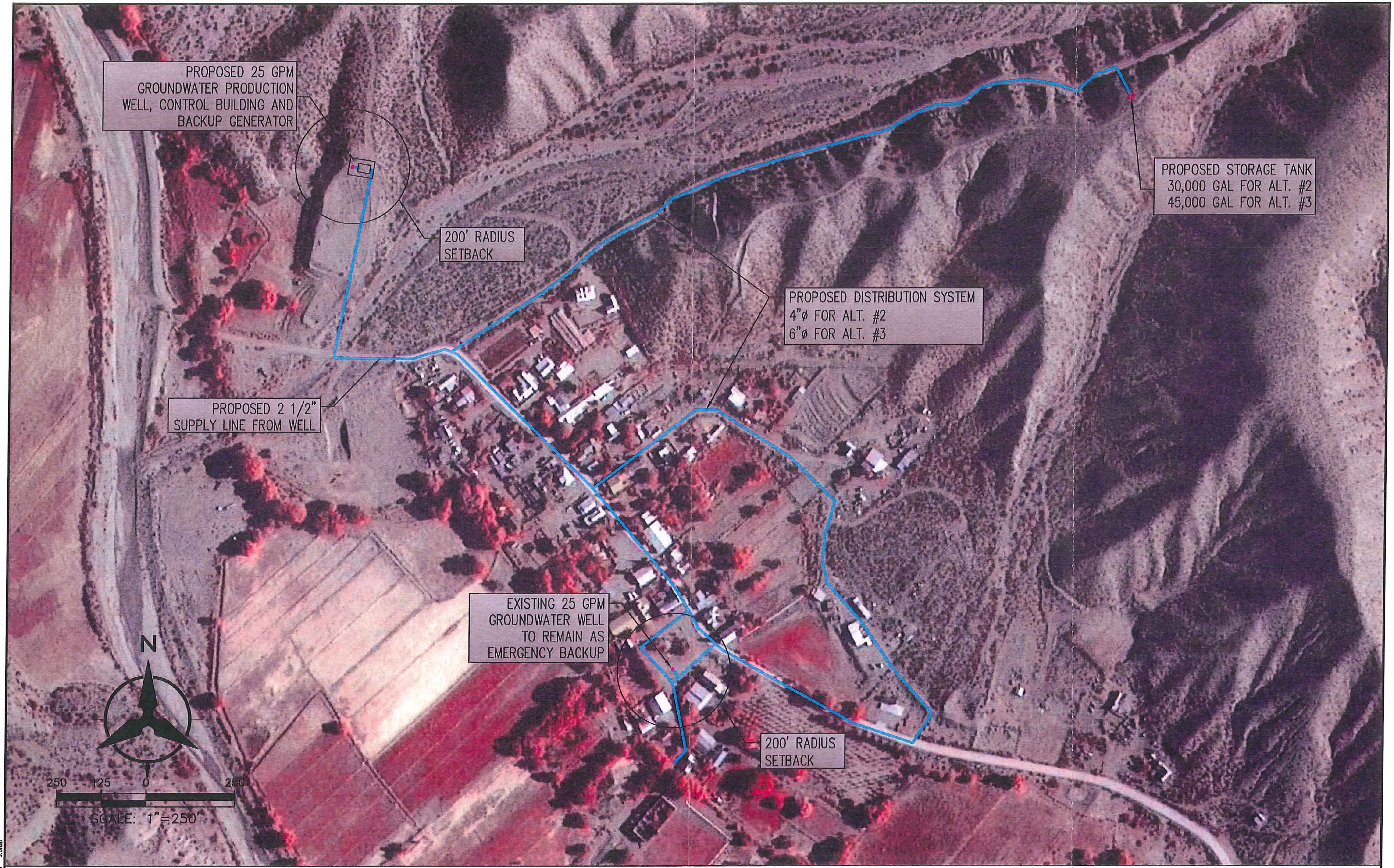
MONTICELLO MDWCA PRELIMINARY ENGINEERING REPORT
SIMPLIFIED PROCESS DIAGRAM - ALTERNATIVE #1
FIGURE 5



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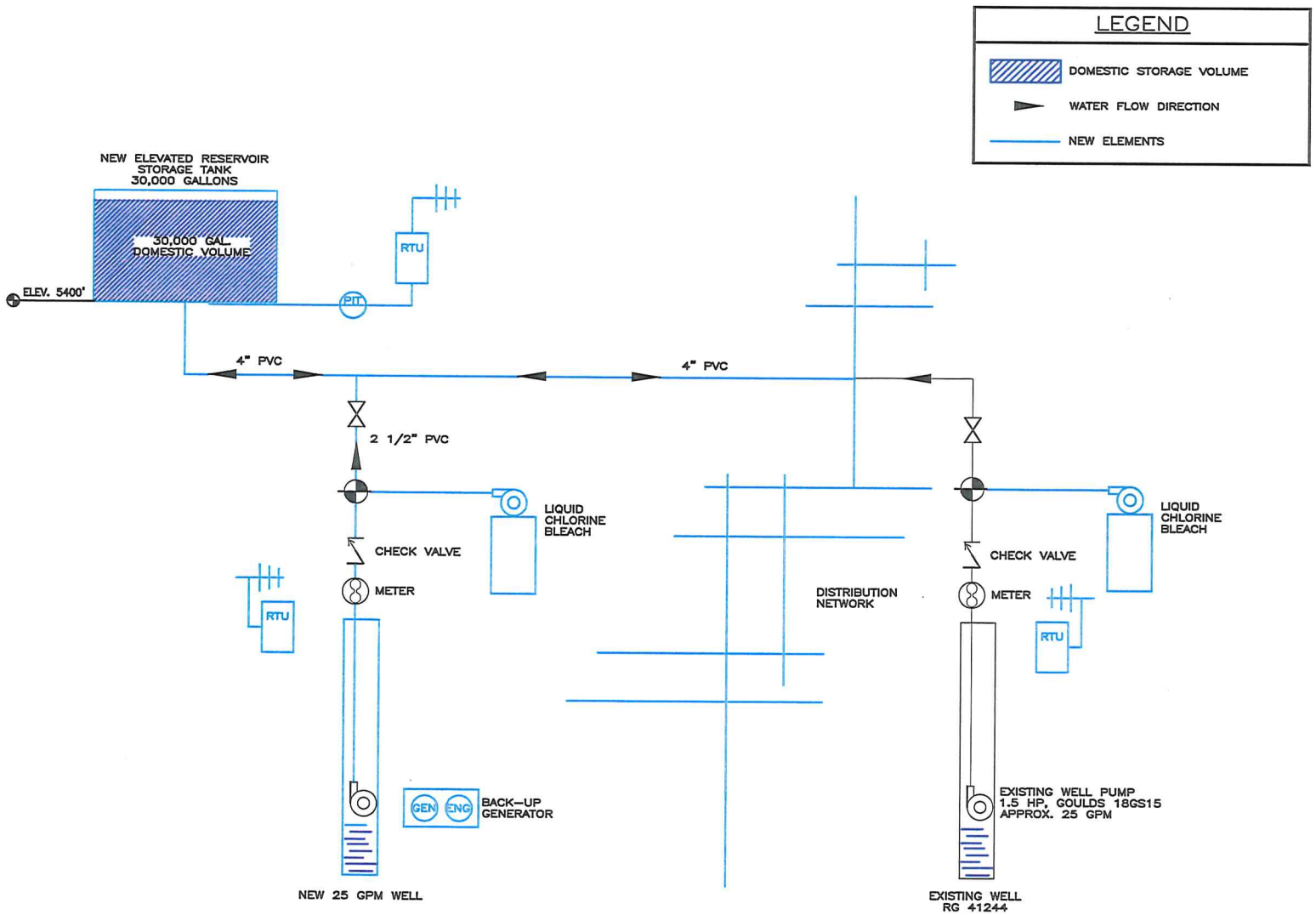
MONTICELLO MDWCA PRELIMINARY ENGINEERING REPORT

PROPOSED SYSTEM LAYOUT - ALTERNATIVES #2 AND #3

FIGURE 6

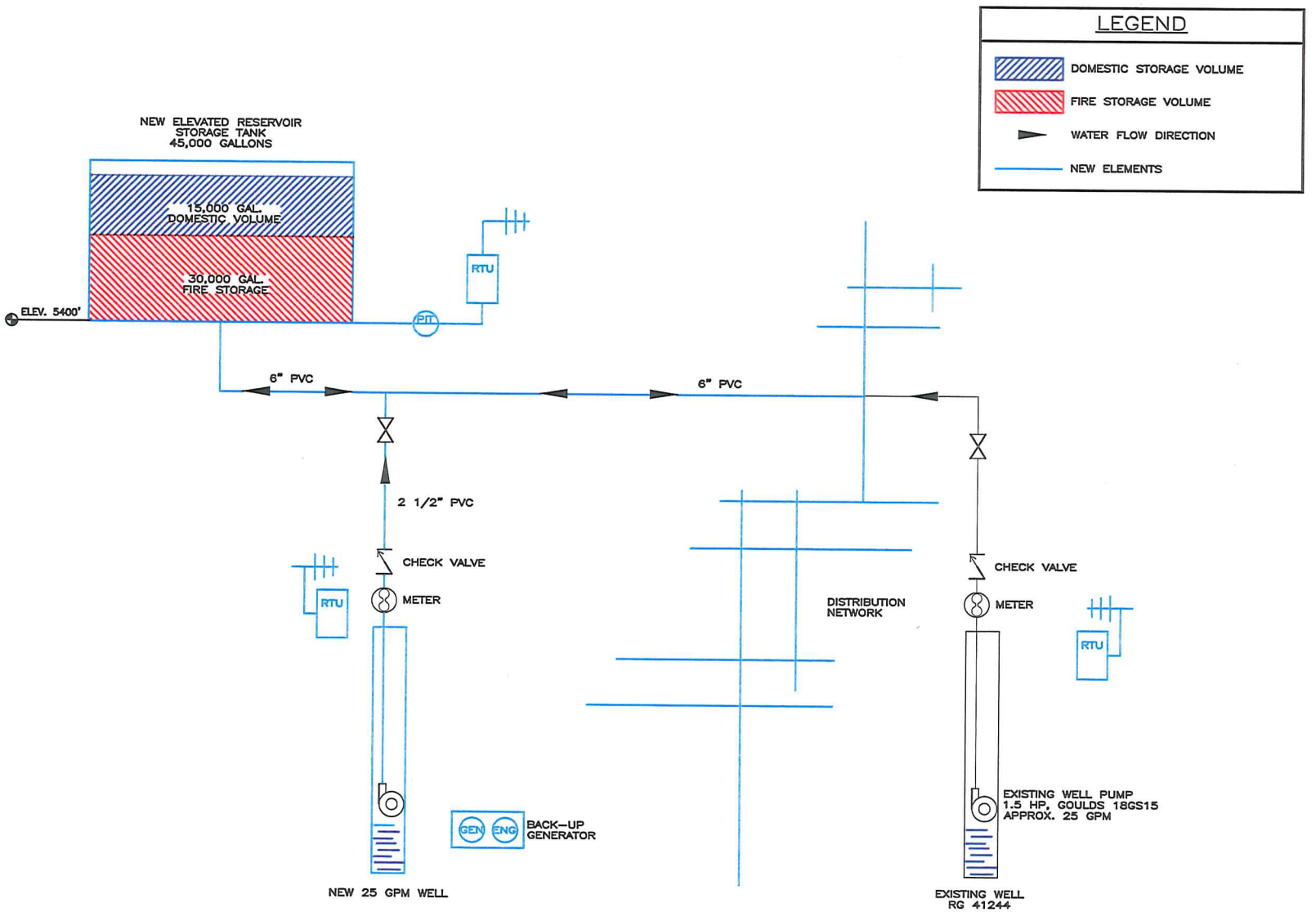


I:\BHLasCruces2\600082Monticello Pozo\Reports\Figures\Fig 3,5,7,8 - Simplified System Process Dia.dwg
Nov 14, 2007 - 11:04am

Bohannan Huston Inc.
425 S. Telshor Blvd., Suite C-103 Las Cruces, NM 88011-8237
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

MONTICELLO MDWCA PRELIMINARY ENGINEERING REPORT
SIMPLIFIED PROCESS DIAGRAM - ALTERNATIVE #2

FIGURE 7



H:\GIS\LasCruces2\000002\MonticelloPreln\Reports\Figures\Fig 3,5,7,8 – Simplified System Process 10a.dwg
Nov 14, 2007 – 11:42am

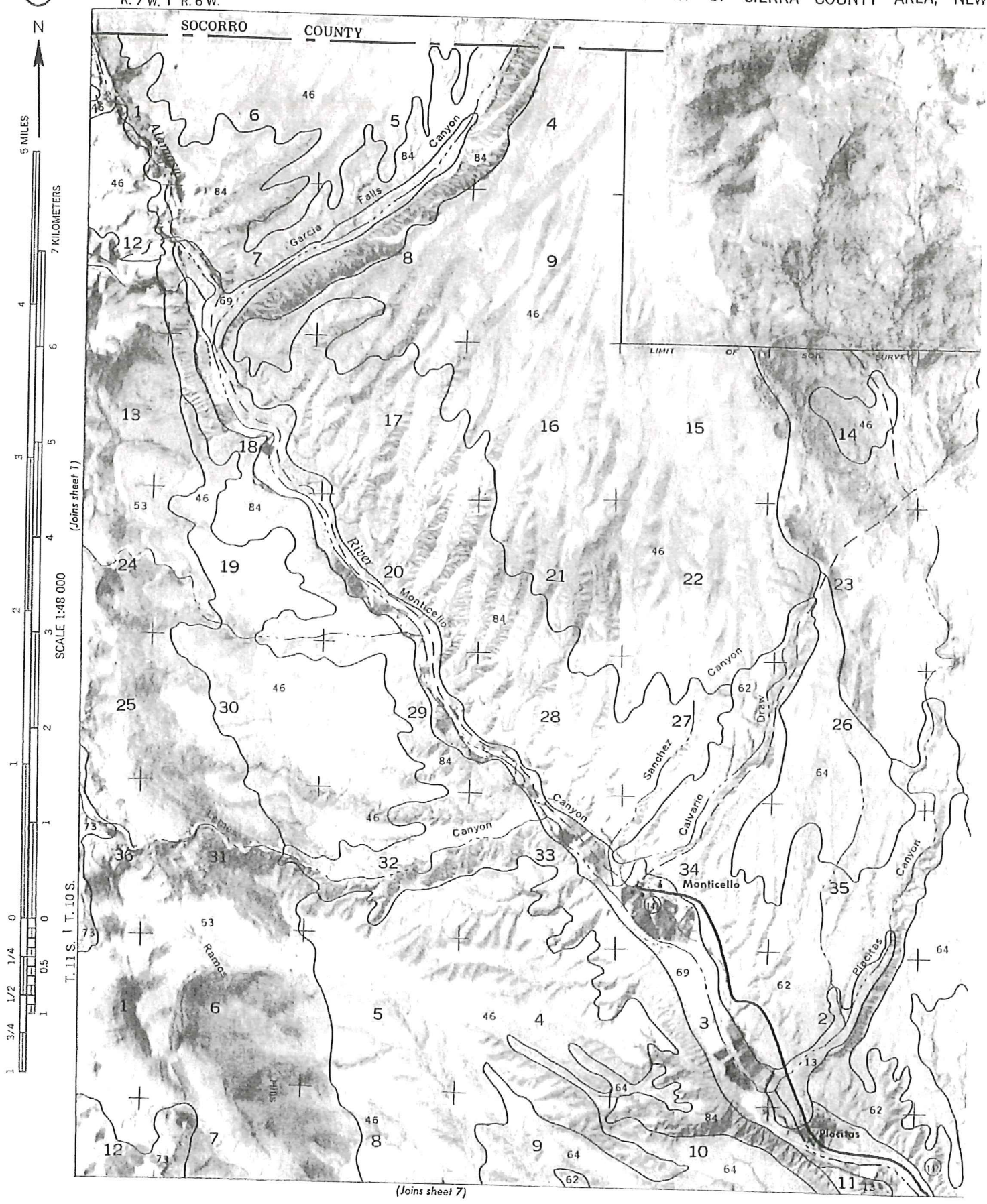
Bohannan ▲ Huston Inc.
425 S. Telshor Blvd., Suite C-103 Las Cruces, NM 88011-8237
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

MONTICELLO MDWCA PRELIMINARY ENGINEERING REPORT
SIMPLIFIED PROCESS DIAGRAM - ALTERNATIVE #3

FIGURE 8

APPENDIX A

Sierra County Soil Survey Map


R. 7 W. | R. 6 W.
SOCORRO COUNTY
N
5 MILES
7 KILOMETERS
SCALE 1:48 000
T. 11 S. | T. 10 S.
(Joins sheet 1)
(Joins sheet 7)
LIMIT OF SOIL SURVEY
Alamosa
Canyon
Falls
Garcia
River
Monticello
Canyon
Draw
Sanchez
Calvario
Canyon
Canyon
Ramos
Hills
Placitas
Canyon
Monticello
Placitas

Permeability of the Nolam soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow to medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used for livestock grazing, watershed, and wildlife habitat.

The potential natural plant community on this unit is characterized by black grama, bush muhly, cane bluestem, sideoats grama, blue grama, yucca, sotol, and ocotillo. The average annual production of air-dry vegetation ranges from 675 pounds per acre in favorable years to 275 pounds in unfavorable years. As the plant community deteriorates, black grama, bush muhly, cane bluestem, sideoats grama, and blue grama decrease, and there is an increase in fluffgrass, threeawn, tobosa, broom snakeweed, creosotebush, and annual forbs.

This unit is suited to such rangeland management practices as proper grazing use, livestock water developments, fencing, and planned grazing systems. It has limited suitability for practices such as rangeland seeding and mechanical brush control because of the low rainfall and the hazard of water erosion.

68—Reakor-Dona Ana association, gently sloping. This map unit is on piedmonts. Slope is 1 to 5 percent. Areas are irregular in shape and are 160 to 800 acres in size. The native vegetation is mainly grass. Elevation is 4,100 to 5,300 feet. The average annual precipitation is 8 to 10 inches, the average annual air temperature is 58 to 65 degrees F, and the average frost-free period is 180 to 220 days.

This unit is 50 percent Reakor silt loam, 1 to 5 percent slopes, and 30 percent Dona Ana fine sandy loam, 1 to 5 percent slopes. The Reakor soil is in the lower positions on the landscape.

Included in this unit are small areas of soils that have a clay loam subsoil; Berino, Tres Hermanos, and Wink soils that are generally in the highest positions on the landscape, and Marconi soils that have slopes of 0 to 1 percent and are in the lowest positions on the landscape. Included areas make up about 20 percent of the total acreage.

The Reakor soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is light brown silt loam about 3 inches thick. The subsoil is light brown silty clay loam about 19 inches thick. The substratum to a depth of 60 inches or more is pink and light brown silty clay loam.

Permeability of the Reakor soil is moderately slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high.

The Dona Ana soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is light brown fine sandy loam about 3 inches thick. The subsoil is reddish yellow sandy clay loam about 18 inches thick. The substratum to a depth of 60 inches or more is sandy clay loam. It is pink in the upper part and reddish yellow in the lower part.

Permeability of the Dona Ana soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is high.

This unit is used for livestock grazing, watershed, and wildlife habitat.

The potential natural plant community on this unit is characterized by black grama, bush muhly, tobosa, burrograss, dropseed, threeawn, and alkali sacaton. Scattered soaptree yucca and longleaf ephedra are in some areas. The average annual production of air-dry vegetation ranges from 675 pounds per acre in favorable years to 300 pounds in unfavorable years. As the plant community deteriorates, black grama and bush muhly decrease, and there is an increase in threeawn, burrograss, tobosa, and annual forbs. Woody plants such as mesquite invade in some areas. Eventually, burrograss dominates the plant community on the Reakor soil.

This unit is suited to such rangeland management practices as proper grazing use, fencing, livestock water developments, planned grazing systems, and chemical brush control. It has limited suitability for practices such as rangeland seeding and mechanical brush control because of the low rainfall and the hazards of soil blowing and water erosion.

69—Redbank-Torrifluvents association, gently sloping. This map unit is on alluvial flood plains. Slope is 0 to 9 percent. Areas are elongated and are 60 to 200 acres. The native vegetation is mainly grass and shrubs. Elevation is 5,800 to 6,500 feet. The average annual precipitation is 11 to 13 inches, the average annual air temperature is 50 to 58 degrees F, and the average frost-free period is 140 to 180 days.

This unit is 50 percent Redbank loam, 0 to 5 percent slopes, and 30 percent Torrifluvents, 0 to 9 percent slopes. In areas of this unit in the Lake Valley area, the Torrifluvents are nearly absent and the Redbank soil makes up about 80 percent of the unit. The Redbank soil is on stable terraces, and the Torrifluvents are along and in watercourses.

Included in this unit are small areas of soils that have sandy loam or loamy sand underlying material and are in positions similar to those of the Redbank soil. Also included are arroyos. Included areas make up about 20 percent of the total acreage.

The Redbank soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown loam about 10 inches thick. The underlying material to a depth of 60 inches or more is brown very fine sandy loam and loam. In some small areas the surface layer is fine sandy loam or clay loam.

Permeability of the Redbank soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate. This soil is subject to rare periods of flooding during June through September.

The Torrifluvents are deep and well drained to excessively drained. They formed in mixed alluvium. A sample profile has a pinkish gray very gravelly loamy sand surface layer overlying light brown, highly stratified material that has an average texture of very gravelly loamy sand and extends to a depth of 60 inches or more.

Permeability of the Torrifluvents is rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow to rapid, and the hazard of water erosion, mostly from floodwater, is severe. The hazard of soil blowing is high. This soil is subject to frequent, brief periods of flooding during June through September in 3 years out of 5.

Most areas of this unit are used for livestock grazing and wildlife habitat. A few areas are used for small irrigated pastures and crops for livestock feed.

The potential natural plant community on the Redbank soil is characterized by giant sacaton and small amounts of alkali sacaton and vine-mesquite (fig. 14). Cane bluestem and sideoats grama are in some areas. The average annual production of air-dry vegetation ranges from 4,000 pounds per acre in favorable years to 1,750 pounds in unfavorable years. Deterioration of the potential plant community results in gullying. Such deterioration is characterized by a substantial decrease in plant production. Plants such as tobosa and various shrubs replace the dominant plants in the potential plant community under these conditions. Mesquite invades in some areas.

The Torrifluvents support a variable plant community that is characterized by arrowweed pluchea, knifeleaf condalia, and, in some areas, mesquite. These soils provide only marginal forage for livestock grazing.

The Redbank soil is suited to such rangeland management practices as proper grazing use, fencing, livestock water developments, brush management, and planned grazing systems.

70—Rock outcrop, extremely steep. This map unit is on hills and low mountains. It consists of areas of exposed limestone that are in the form of peaks, dikes, ridges, and nearly vertical cliffs and areas that have less than 4 inches of soil material over limestone. Slope is 75 to 150 percent. Areas are elongated and are 200 to 640 acres. The native vegetation is mainly very sparse grasses and shrubs. Elevation is 5,300 to 7,500 feet. The average annual precipitation is 8 to 13 inches, the average annual air temperature is 56 to 62 degrees F, and the average frost-free period is 170 to 210 days.

Included in this unit are small areas of Lozier soils in very small pockets between ledges and saddles, moderately deep and deep, very stony soils on colluvial side slopes, and igneous rock, shale, and sandstone outcroppings. Included areas make up about 20 percent of the total acreage.

This unit is used for wildlife habitat, watershed, recreation, and esthetic value.

71—Rock outcrop-Courthouse complex, extremely steep. This map unit is on hills. Slope is 15 to 75 percent. Areas are irregular in shape and are 160 to 1,000 acres in size. The native vegetation is mainly grass and shrubs. Elevation is 4,400 to 6,000 feet. The average annual precipitation is 8 to 11 inches, the average annual air temperature is 57 to 65 degrees F, and the average frost-free period is 170 to 210 days.

This unit is 40 percent Rock outcrop, 15 to 75 percent slopes, and 25 percent Courthouse flaggy loam, 15 to 55 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Elbutte soils that are shallow over shale and are between ledges of sandstone outcroppings, moderately deep and deep stony soils on colluvial side slopes, deep clay loam in swales and on narrow flood plains, arroyos, and limestone, and igneous rock outcroppings. Included areas make up about 35 percent of the total acreage.

Rock outcrop consists of areas of exposed sandstone and shale and areas that have less than 4 inches of soil material over sandstone or shale. The shale erodes easily, leaving ledges of exposed sandstone in layers on hill crests and side slopes. The shale also absorbs some moisture to support limited plant growth.

The Courthouse soil is shallow and well drained. It formed in material weathered from sandstone. Typically, the surface layer is pale brown flaggy loam about 2 inches thick. The upper 3 inches of the underlying material is brown gravelly sandy clay loam, and the lower part to a depth of 8 inches is reddish brown flaggy sandy clay loam. Sandstone is at a depth of 8 inches.

Permeability of the Courthouse soil is moderate. Available water capacity is very low. Effective rooting depth is 4 to 20 inches. Runoff is rapid, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing, watershed, wildlife habitat, and urban development. Slope in some areas limits accessibility to grazing.

The potential natural plant community on the Courthouse soil is characterized by black grama, bush muhly, cane bluestem, green sprangletop, little leaf sumac, yucca, ocotillo, and cacti. Scattered oak and juniper are in some areas. The average annual production of air-dry vegetation ranges from 750 pounds per acre in favorable years to 325 pounds in unfavorable

APPENDIX B

Historic Places in Sierra County

NM Registered Cultural Properties By County: Sierra

HPD ID #	County	City	Name Of Cultural Property	SR List Date	NR List Date
1195	Sierra	Arrey	LA 50751	9/20/1985	
	Not For Publication ☐				
1207	Sierra	Arrey	LA 517	9/20/1985	12/16/1989
	Not For Publication ☐				
570	Sierra	Arrey	Percha Diversion Dam	1/20/1978	4/6/1979
	Not For Publication ☐				
1206	Sierra	Caballo	LA 1119	9/20/1985	12/16/1989
	Not For Publication ☐				
1203	Sierra	Caballo	Longbottom Canyon Ruin (LA 49033)	9/20/1985	12/16/1989
	Not For Publication ☑				
1689	Sierra	Chloride	Crawford, Austin, House	7/18/1997	
	Not For Publication ☐		Wall St.		
1539	Sierra	Chloride	Monte Christo Saloon	3/22/1991	
	Not For Publication ☐		Wall St.		
1688	Sierra	Chloride	Old Stone House	7/18/1997	
	Not For Publication ☐		Wall St.		
1538	Sierra	Chloride	Pioneer Store	3/22/1991	
	Not For Publication ☐		Wall St.		
1208	Sierra	Cuchillo	LA 50548	9/20/1985	12/16/1989
	Not For Publication ☐				
1193	Sierra	Derry	LA 1082	9/20/1985	
	Not For Publication ☐				
1194	Sierra	Derry	LA 50743	9/20/1985	
	Not For Publication ☐				

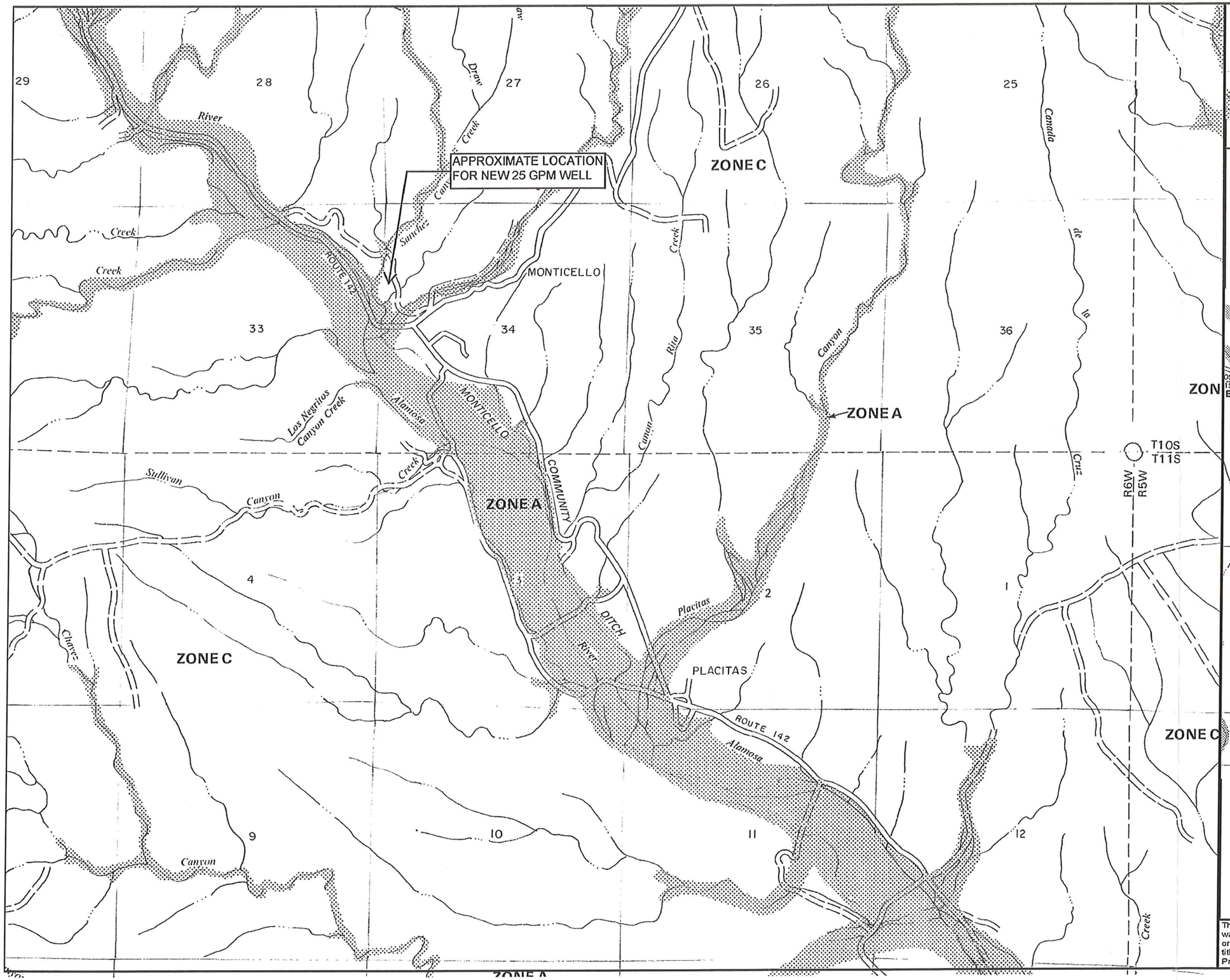
HPD ID #	County	City	Name Of Cultural Property	SR List Date	NR List Date
1196	Sierra	Derry	LA 50749	9/20/1985	
	Not For Publication ☐				
617	Sierra	Elephant Butte	Elephant Butte Dam	3/20/1978	4/9/1979
	Not For Publication ☐				
1642	Sierra	Elephant Butte	Elephant Butte National Register Historic District	8/9/1996	2/10/1997
	Not For Publication ☐				
1826	Sierra	Elephant Butte	Fort McRae (LA 4983)	6/13/2003	
	Not For Publication ☑				
1601	Sierra	Hillsboro	Alert-Hatcher Building	11/18/1994	4/20/1995
	Not For Publication ☐		Second Ave. & Main St		
1600	Sierra	Hillsboro	Architectural & Historic Resources of Hillsboro, NM	11/18/1994	
	Not For Publication ☐				
1603	Sierra	Hillsboro	Bucher, William H., House	11/18/1994	4/20/1995
	Not For Publication ☐		300 W. Main St.		
1549	Sierra	Hillsboro	Hillsboro High School (Sierra County High School)	2/19/1993	4/14/1993
	Not For Publication ☐		Elenora St.		
1304	Sierra	Hillsboro	Hillsboro Historic District	10/24/1986	
	Not For Publication ☐		State Road 90		
559	Sierra	Hillsboro	Lake Valley Mining District	1/20/1978	
	Not For Publication ☐				
1605	Sierra	Hillsboro	Meyers House	11/18/1994	4/20/1995
	Not For Publication ☐		Main St.		
385	Sierra	Hillsboro	Miller, George T., House	6/20/1975	4/20/1995
	Not For Publication ☐		Elenora St.		
386	Sierra	Hillsboro	Murphy, Tom, House	6/20/1975	
	Not For Publication ☐		Elenora St.		

HPD ID #	County	City	Name Of Cultural Property	SR List Date	NR List Date
1667	Sierra	Hillsboro	Percha Creek Bridge	5/9/1997	7/15/1997
	Not For Publication ☐		NM 152		
1604	Sierra	Hillsboro	Robins, Will M., House	11/18/1994	4/20/1995
	Not For Publication ☐		Main St. & Fifth Ave.		
1602	Sierra	Hillsboro	Sullivan, Cornelius (Neil), House	11/18/1994	4/20/1995
	Not For Publication ☐		Elenora & First Ave.		
389	Sierra	Hillsboro	Union Community Church	6/20/1975	
	Not For Publication ☐				
1606	Sierra	Hillsboro	Webster, John M., House	11/18/1994	4/20/1995
	Not For Publication ☐		Main St. & Fifth Ave.		
1443	Sierra	Kingston	Hillsboro Peak Lookout Tower and Cabin	3/4/1988	1/28/1988
	Not For Publication ☐				
179	Sierra	Kingston	Percha Bank	4/24/1970	
	Not For Publication ☐		Main St.		
431	Sierra	Lake Valley	Lake Valley School House	1/30/1976	
	Not For Publication ☐				
1711	Sierra	Multiple	Prehist. Adapts. Rio Grande Drainage, Sierra C.		5/16/1988
	Not For Publication ☐				
1023	Sierra	Truth or Consequence	Alamosa Ranch House and Blacksmith Shop	6/8/1984	
	Not For Publication ☐		Martin Ranch Rd.		
546	Sierra	Truth or Consequence	Caballo Dam	1/20/1978	
	Not For Publication ☐				
1835	Sierra	Truth or Consequence	Carrie Tingley Hospital for Crippled Children	6/13/2003	
	Not For Publication ☐		992 Broadway		
1197	Sierra	Truth or Consequence	Chambers Canyon Site (LA 49028)	9/20/1985	12/16/1989
	Not For Publication ☑				

HPD ID #	County	City	Name Of Cultural Property	SR List Date	NR List Date
1493	Sierra	Truth or Consequence	Hedrick House	1/13/1989	
	Not For Publication ☐		906 E. Riverside Dr.		
1199	Sierra	Truth or Consequence	Horse Island Site (LA 48996)	9/20/1985	5/16/1988
	Not For Publication ☑				
1874	Sierra	Truth or Consequence	Hot Springs Bathhouse and Commercial Historic District in T or C	10/8/2004	
	Not For Publication ☐				
242	Sierra	Truth or Consequence	Hot Springs Main Post Office (T or C)	4/7/2000	2/23/1990
	Not For Publication ☐		400 Main St.		
1200	Sierra	Truth or Consequence	Kettle Top Butte Site (LA 48995)	9/20/1985	5/16/1988
	Not For Publication ☑				
1205	Sierra	Truth or Consequence	LA 49016	9/20/1985	12/16/1989
	Not For Publication ☐				
1202	Sierra	Truth or Consequence	LA 49030	9/20/1985	12/16/1989
	Not For Publication ☐				
1204	Sierra	Truth or Consequence	Las Palomas (LA 8707)	9/20/1985	
	Not For Publication ☑				
1198	Sierra	Truth or Consequence	Monticello Point Ruin National Register Archaeological District (LA 48990-48994)	9/20/1985	5/16/1988
	Not For Publication ☑				
1201	Sierra	Truth or Consequence	Palomas Narrows Ruin (LA 38755)	9/20/1985	12/16/1989
	Not For Publication ☑				
1201	Sierra	Truth or Consequence	Palomas Narrows Ruin (LA 38755)	9/20/1985	12/16/1989
	Not For Publication ☑				
1691	Sierra	Truth or Consequence	Sierra Grande Lodge and Spa	7/18/1997	
	Not For Publication ☐		501 McAdoo St.		

APPENDIX C

Flood Insurance Rate Maps



APPROXIMATE SCALE

2000 0

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

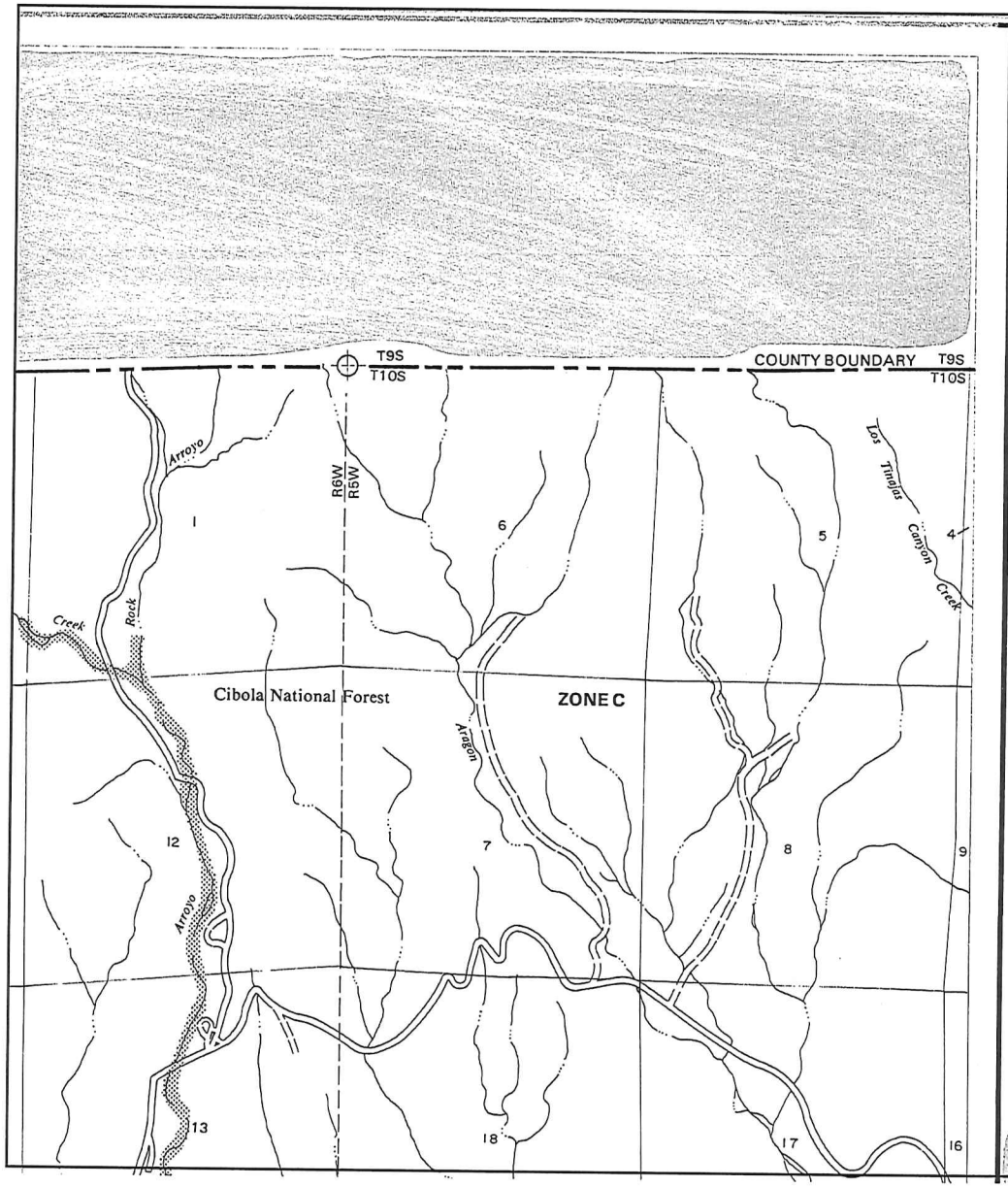
SIERRA COUNTY, NEW MEXICO
UNINCORPORATED AREAS

PANEL 75 OF 1150
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
350071 0075 B

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency



KEY TO MAP

ZONE C

Zone Designations*

ZONE A

ZONE C

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** (EL 987)

Elevation Reference Mark RM7×

Zone D Boundary

River Mile •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

A flood insurance map displays the zone designations for a community according to areas of designated flood hazards. The zone designations used by FEMA are:

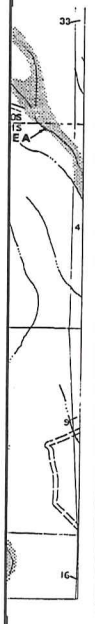
ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

APPROXIMATE SCALE
2000 0



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

SIERRA COUNTY, NEW MEXICO
UNINCORPORATED AREAS

PANEL 75 OF 1150
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
350071 0075 B

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency

APPENDIX D

New Mexico Office of the State Engineer Records for Monticello MDWCA

#25.00
RC2948S

File Number: RG 41244

NEW MEXICO OFFICE OF THE STATE ENGINEER
APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL

1. WATER RIGHT OWNER

Name: Monticello Plaza Well
Contact: Claudia B. Jeffery
Address: P.O. Box 69
City: Monticello, State: NM Zip: 87939
Work Phone: 505 744-2462
Home Phone: 505 743-3059

2. PURPOSE OF USE

Domestic: ___ Livestock: ___ Irrigation: ___ Municipal: ___ Industrial: ___
Commercial: ___ Other (specify): Mutual Domestic
Specific use: _____

3. QUANTITY

Consumptive Use: _____ acre-feet per annum
Diversion Amount: 50 acre-feet per annum

4. PLACE OF USE

_____ acres of land described as follows:

Subdivision of Section (District or Hydrographic Survey)	Section (Map No.)	Township (Tract No.)	Range	Acres
	34	105	6W	
Townsite				
Village of Monticello				

Who is the owner of the land? Monticello Plaza Well
Monticello Townsite

03 MAR 24 PM 3:54

File Number: RG 41244
Form: wr-06

page 1 of 4

Trn Number: 263814

File Number: RG 41244

NEW MEXICO OFFICE OF THE STATE ENGINEER
APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL

5. CHANGE FROM

A. LOCATION OF WELL (Location a, b, c, d required, e or f if known)

a. SE 1/4 NW 1/4 SW 1/4 Section: 34 Township: 10S Range: 6W N.M.P.M. in Sierra County.

b. X = _____ feet, Y = _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant. U.S.G.S. Quad Map _____

c. Latitude: _____d _____m _____s Longitude: _____d _____m _____s

d. East _____ (m), North _____ (m), UTM Zone 13, NAD __ (27 or 83)

e. Tract No. _____, Map No. _____ of the _____ Hydrographic Survey

f. Lot No. _____, Block No. _____ of Unit/Tract _____ of the _____ Subdivision recorded in _____ County.

g. Other: _____

h. Give State Engineer File Number of existing well: RG 41244

i. On land owned by (required): Townsite of Monticello Monticello, New Mexico

j. Is well to be plugged or capped? ____ If not, state for what use retained: _____

cement + bentonite to kill tree root.

Rubber to plug, Cap + weld

03 MAR 24 PM 3:54

File Number: RG 41244 Trn Number: 263814

Form: wr-06 page 2 of 4

File Number: RG41244

NEW MEXICO OFFICE OF THE STATE ENGINEER
APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL

6. CHANGE TO

A. LOCATION OF WELL (Location a, b, c, d required, e or f if known)

a. SE 1/4 NW 1/4 SW 1/4 Section: 24 Township: 16S Range: 30E N.M.P.M. in Chaves County.

b. X = _____ feet, Y = _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant. U.S.G.S. Quad Map _____

c. Latitude: _____d _____m _____s Longitude: _____d _____m _____s

d. East _____ (m), North _____ (m), UTM Zone 13, NAD __ (27 or 83)

e. Tract No. _____, Map No. _____ of the _____ Hydrographic Survey

f. Lot No. _____, Block No. _____ of Unit/Tract _____ of the _____ Subdivision recorded in _____ County.

g. Other: _____

h. Give State Engineer File Number of existing well: RG41244

i. On land owned by (required): Township [illegible]

j. If new well, give approximate depth(if known) 125 feet; Outside diameter of casing 6 inches. Name of driller and license number (if known) Johnson Drilling.

7. REASON FOR CHANGE

Application is made to change location of well for the following reasons:

Well failure 4 feet southeast.

8. ADDITIONAL STATEMENTS OR EXPLANATIONS:

CHAVES CO. NM 2014 MAR 24 PM 2:54

File Number: RG41244 Trn Number: 263814
Form: wr-06 page 3 of 4

File Number: RG41244

NEW MEXICO OFFICE OF THE STATE ENGINEER
APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL

ACKNOWLEDGEMENT FOR NATURAL PERSONS

(I, We) Claudia B Jeffery (Please Print) affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Claudia B Jeffery
Aplicant Signature

Applicant Signature

ACTION OF STATE ENGINEER

This application is approved/denied/partially approved provided it is not exercised to the detriment of any other ~~having~~ existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare; and further subject to the following conditions:

SEE ATTACHED CONDITIONS OF APPROVAL

Witness my hand and seal this 22ND day of DECEMBER, 20 04

JOHN R. D'ANTONIO, JR. P.E.
STATE ENGINEER

State Engineer

By: MRS.

03 MAR 24 PM 3:54

File Number: RG 41244
Form: wr-06

page 4 of 4

Trn Number: 263814

NEW MEXICO STATE ENGINEER OFFICE
CHANGE LOCATION OF WELL (GROUND)

SPECIFIC CONDITIONS OF APPROVAL

DIV The maximum amount of water that may be appropriated under this permit is 12.000 acre-feet in any year.

5B A totalizing meter shall be installed before the first branch of the discharge line from the well and the installation shall be acceptable to the State Engineer; the Engineer shall be advised of the make, model, serial number, date of installation, and initial reading of the meter prior to appropriation of water; pumping records shall be submitted to the District Supervisor on or before the 10th of Jan., April, July, and Oct. of each year for the 3 preceeding calendar months.

7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with Section 72-12-12 New Mexico Statutes Annotated.

C Driller's well record must be filed with the State Engineer within 10 days after the well is drilled or driven. Well record forms will be provided by the State Engineer upon request.

PCW The Point of Diversion RG 41244 must be completed and the Proof of Completion of Works filed on or before 12/31/2004.

PBU The Proof of Beneficial use must be filed on or before 12/31/2004.

Permittee: Monticello Plaza Well

Permit No.: RG-41244

Priorty: 1865 (Date on Declaration)

Source: Shallow underground water of the Rio Grande Underground Water Basin

Points of Diversion:

Move-from: RG-41244 located in the SE1/4 NW1/4 SW1/4 of Section 34, Township 10 South, Range 06 West, NMPM, Sierra County.

Move-to: RG-41244 to be located in the SE1/4 NW1/4 SW1/4 of Section 34, Township 10 South, Range 06 West, NMPM, Sierra County.
Purpose of Use: Community - MDWCA

Trn Desc: RG 41244 File Number: RG 41244
Trn Number: 263814

NEW MEXICO STATE ENGINEER OFFICE
CHANGE LOCATION OF WELL (GROUND)

Place of Use: located in a portion of the town site of Monticello, New Mexico, described as part of the N1/2 SW1/4 of Section 34, Township 10 South, Range 6 West, NMPM, Sierra County.

Amount of Water: 12 acre-feet per annum.

Old Well RG-41244 will be plugged or capped.

ACTION OF STATE ENGINEER

Notice of Intention Rcvd:	Date Rcvd. Corrected:
Formal Application Rcvd: 03/26/2003	Pub. of Notice Ordered: 03/26/2003
Date Returned - Correction:	Affidavit of Pub. Filed: 04/25/2003

This application is approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state; and further subject to the specific conditions listed previously.

Witness my hand and seal this 22 day of Dec A.D., 2004

John R. D Antonio, Jr., P.E., State Engineer

By: _____
JALAYNE SPIVEY

Trn Desc: RG 41244

File Number: RG 41244
Trn Number: 263814

John R. D Antonio, Jr., P.E.
State Engineer

Albuquerque Office
121 TIJERAS NE, SUITE 2000
ALBUQUERQUE, NM 87102

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 263814
File Nbr: RG 41244

CERTIFIED RETURN RECEIPT REQUESTED

Dec. 22, 2004

CLAUDIA JEFFERY
MONTICELLO PLAZA WELL
P. O. BOX 69
MONTICELLO, NM 87939

Greetings:

Enclosed is your copy of the above numbered permit, which has been approved in part and denied in part for reasons stated therein.

If you are aggrieved by this decision and wish an opportunity to present evidence in support of this application, you should so advise this office in writing before the expiration of thirty days after receipt of this letter and request that the previous action of the State Engineer be set aside and that a date for a hearing be set. In the event a hearing is requested, a reasonable time will be allowed for you to prepare for your case.

If a hearing is necessary on this matter, each party will be required to submit a hearing deposit in an amount that will be specified when the hearing is announced.

Sincerely yours,

Jalayne Spivey
(505)764-3888

Enclosure
cc: Santa Fe Office

partappr

John R. D Antonio, Jr., P.E.
State Engineer

Albuquerque Office
121 TIJERAS NE, SUITE 2000
ALBUQUERQUE, NM 87102

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

File Nbr: RG 41244
Well File Nbr: RG 41244

Nov. 30, 2004

CLAUDIA JEFFERY
MONTICELLO PLAZA WELL
P. O. BOX 69
MONTICELLO, NM 87939

Greetings:

The Conditions of Approval of your permit require that your well be metered and that meter readings be submitted to this office in writing monthly.

Failure to comply with the Rules and Regulations of the State Engineer may result in the cancellation of your permit. Additionally, you may be subject to fines up to $250.00 per day for every day you are not in compliance.

Please advise this office on the attached form of the make, model, serial number, date of installation, and initial reading of the meter prior to appropriation of the water. If you have any questions, please feel free to contact us.

Sincerely,

Spencer Shaw
(505)764-3888

Enclosure
cc: Santa Fe Office

mtrfrm_req

STATE OF NEW MEXICO
John R. D'Antonio, Jr., P.E., State Engineer
Water Resource Allocation Program
Unprotested Application Unit
District 1 Office

MEMORARANDUM
May 23, 2003

File: RG-41244

To: Wayne Canon, Water Resource Supervisor

From: Spencer Shaw, Water Resource Specialist

RE: Application for Permit to Change Location of Well in the Rio Grande Underground Basin—***Monticello Plaza Well***

HISTORY

On January 25, 1984, filed RG-41244, Declaration of Owner of Underground Water Right in the Rio Grande Underground Water Basin. Said declaration claims beneficial use of water began about 1900 for RG-41244, a diversion amount of **3.0** acre-feet per annum from the well was claimed. Well RG-41244 is a 6-inch cased well with depth of 80 feet, located in Section 34, Township 10 South, Range 6 West, NMPM, for the purpose of domestic use for six homes in the community of Monticello, New Mexico, in Sierra County, **(Exhibit A).**

Prior to the filing of the declaration, an Application for Permit to Repair or Deepen well was filed on January 17, 1984, to deepen an existing declared well RG-41244 from a depth of 70 feet to 120 feet, located in the SW1/4 NE1/4 SW1/4 of Section 34, Township 10 South, Range 6 West, NMPM, in Sierra County, Monticello, New Mexico.

Well Record was received on February 24, 1984, documenting the placement of a 4-inch PVC liner inside existing well casing to a depth of 80 feet.

On March 4, 2002, Declaration of Owner of Underground Water Right RG-41244 Amended was filed with the State Engineer. This declaration claims beneficial use of water began in about 1865, for the quantity of 50 acre-feet per annum, for the purpose of community water supply including fire prevention and livestock watering. The well is described to be in the SE1/4 NE1/4 SW1/4of Section 34, Township 10 South, Range 6 West, NMPM. An additional statement claims that the original town site consisted of 450 people, one flowing well, schoolhouse, church, three stores, hotel, post office, black smith shop, several saloons and not less than 100 dwellings. Included with the amended declaration is a copy of a sworn document dated February 2, 1886, describing the above-mentioned details and claiming the value of the town then as not less $25, 000.00 dollars.

To: Wayne Canon
File RG-41244 **May 23, 2003**

Notice was issued by the State Engineer and published in **The Herald** on April 9, 16, and 23. No protests were filed.

CONSIDERATIONS

Water Right Validity: The State Engineer declared this portion of the Rio Grande Underground Water Basin on December 22, 1971.The applicant in this application is requesting to Change Location of Declared Well RG-41244. Since this is a declared well no meter readings have been submitted to determine actual usage. The declaration and supporting information does testify that this well did supply water for the community of Monticello, New Mexico, in the late 1880's. In the declaration filed January 25, 1984, it is reported, "this well will be used to serve six households." In Ms. Claudia Jeffery's request for an Emergency Well Permit, dated February 24, 2003, she states that there are five residences depending on the well for water. Speaking to Ms. Jeffery recently about the Emergency Well Permit, she informed me that there are six homes and livestock served by this well.

Impairment of Wells of Other Ownership: Well RG-41244 is a declared pre-basin well and has been in existence in some form, either as a free-flowing spring or cased well, since about 1865 to present. Monticello Plaza Well users group is not requesting to increase the diversion amount claimed. Therefore, the issue of impairment is not an obstacle to approving this permit. Theis calculations were run to determine local effects on surrounding wells **(Exhibit B)**. No adverse effect is noted in the model if this right is exercised.

CONCLUSION: Well RG-41244 is recognized as a declared well with a claim of 50 acre-feet per annum serving in the past some 450 people. But currently this well is only serving six households and livestock. As the record shows, since at least 1984 the well has severed six homes. This fact is reiterated in the 2003 request for an emergency change location of well by Ms. Jeffery. A realistic diversion amount for a home plus livestock would be 1 or 2 acre-feet per annum per home. This would equal about six to twelve acre-feet per annum total. I feel that 12 acre-feet per annum is a justifiable amount given the current situation that exists.

RECOMMENDATIONS

Approve Change Location of Well RG-41244 in accordance with the rules and regulations of the State Engineer with the requirement that the well be metered to monitor water usage.

Exhibits

A. General Area Map
B. Theis calculations

JSS:jss
cc:Santa Fe, OSE/WRD

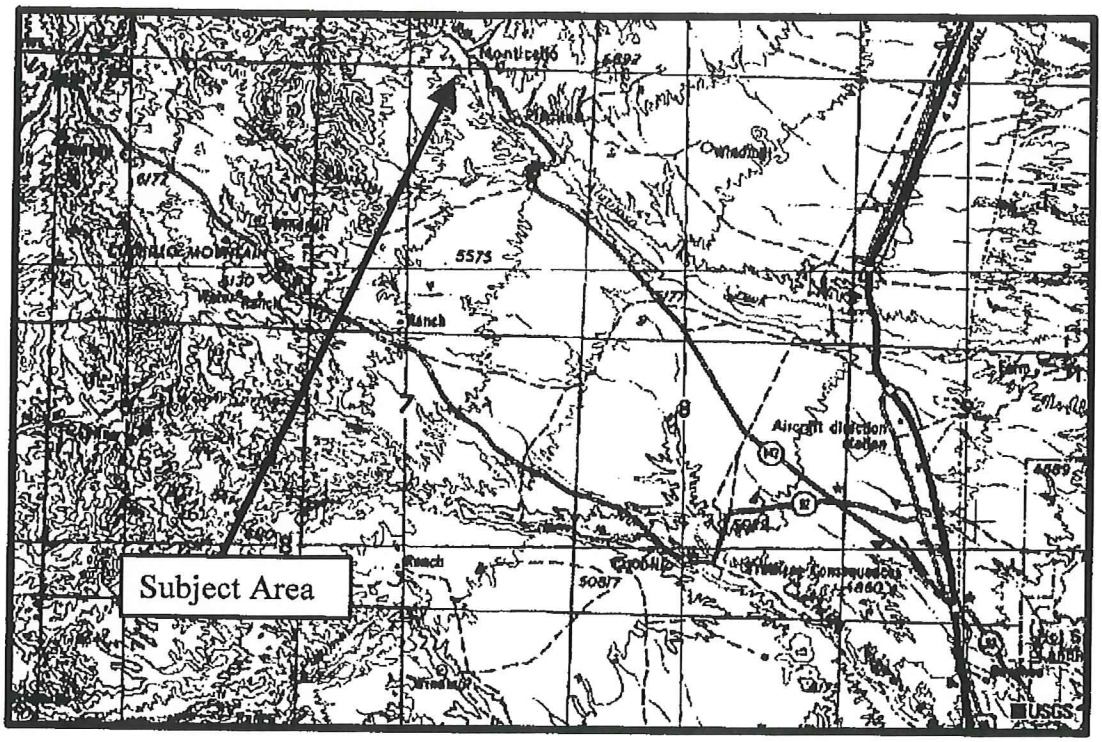


Exhibit A General Area Map-Monticello, New Mexico

Send To Printer Back To TerraServer Change to 11x17 Print Size Show Grid Lines Change to Landscape

USGS 1 km SW of Monticello, New Mexico, United States 18 Oct 1997

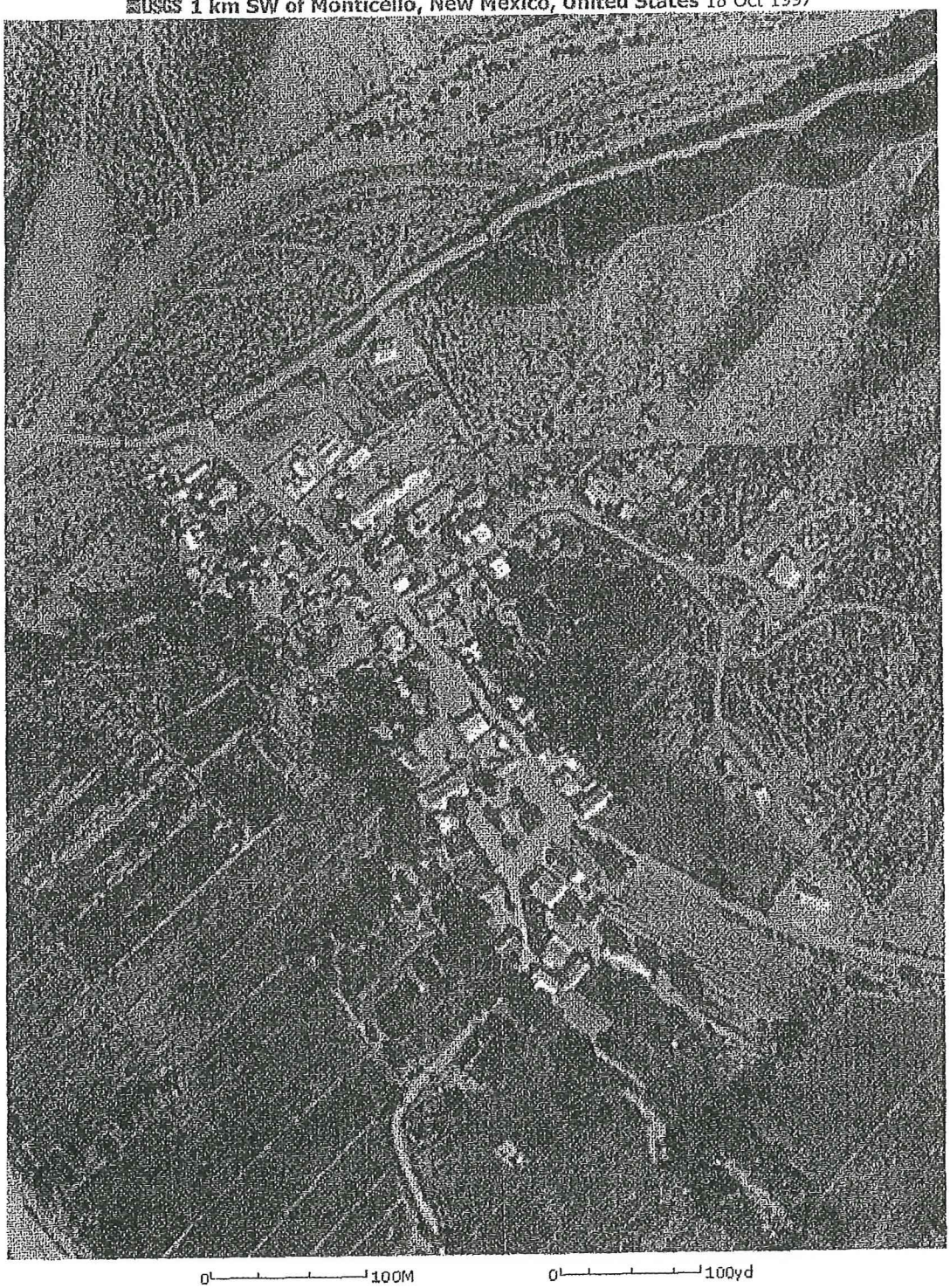


Image courtesy of the U.S. Geological Survey

ATTACHMENT B

Date (M/D/YR) = 02/27/03
Time (h:m:s:1/100) = 15:22:03.42

RG-41244,T=20,000 gpd\ft,S=0.15
Well pumps 31.0 gpm or 50 ac-ft/y
Drawdown at selected distances

DRAWDOWN AT RANDOM COORDINATES IN AN INFINITE STRIP, NON - LEAKY AQUIFER USER SPECIFIED BOUNDARIES AT Y = 0 AND A Y SPECIFIED BY USER
PUMPING MULTIPLE WELLS LOCATED AT POINTS SPECIFIED BY USER. EACH WELL MAY HAVE A DIFFERENT PUMPING SCHEDULE. ALL COORDINATES IN THE X - Y PLANE.

(Theis equation)

At y = 0, there is no boundary
There is no other boundary to system

T = 20000. gpd/ft S = 0.150000

Number of pumping wells = 1

Coordinates of pumping wells and the no. of pumping rates

Well #	X Coordinate	Y Coordinate	No. of Pumping Rates
1	0.0	0.0	1

PUMPING SCHEDULES FOR THE WELLS

Well Schedule for Pumping Well Number 1

Pumping Rate		Pumping Time
Q(1) = 31.0 gpm	for	36525.000 days

Coordinates of Computation Points

(Number of computation points = 6)

Point #	X Coordinates feet	Y Coordinates feet

1	0.0	0.5
2	0.0	500.0
3	0.0	1000.0
4	0.0	2000.0
5	0.0	2640.0
6	0.0	5280.0

Image Control = .1000000E-04

time variable (t)

t min = 365.250 days; t max = 73920.000 days;
delta t = 365.250 days

********** RESULTS **********

Drawdowns and Coordinates of computation points
Measured in feet

X = 0.0	X = 0.0	X = 0.0
Y = 0.5	Y = 500.0	Y = 1000.0

Time in days	Time in years	Drawdowns		
365.250	1.000	3.177	0.724	0.483
730.500	2.000	3.300	0.847	0.603
1095.750	3.000	3.372	0.918	0.674
1461.000	4.000	3.423	0.969	0.724
1826.250	5.000	3.462	1.009	0.764
2191.500	6.000	3.495	1.041	0.796
2556.750	7.000	3.522	1.069	0.823
2922.000	8.000	3.546	1.092	0.847
3287.250	9.000	3.567	1.113	0.867
3652.500	10.000	3.586	1.132	0.886
4017.750	11.000	3.602	1.149	0.903
4383.000	12.000	3.618	1.164	0.918
4748.250	13.000	3.632	1.178	0.933
5113.500	14.000	3.645	1.192	0.946

	5478.750	15.000	3.658	1.204
0.958				
	5844.000	16.000	3.669	1.215
0.969				
	6209.250	17.000	3.680	1.226
0.980				
	6574.500	18.000	3.690	1.236
0.990				
	6939.750	19.000	3.700	1.246
1.000				
	7305.000	20.000	3.709	1.255
1.009				
	7670.250	21.000	3.717	1.264
1.018				
	8035.500	22.000	3.726	1.272
1.026				
	8400.750	23.000	3.733	1.280
1.034				
	8766.000	24.000	3.741	1.287
1.041				
	9131.250	25.000	3.748	1.294
1.048				
	9496.500	26.000	3.755	1.301
1.055				
	9861.750	27.000	3.762	1.308
1.062				
	10227.000	28.000	3.768	1.315
1.069				
	10592.250	29.000	3.775	1.321
1.075				
	10957.500	30.000	3.781	1.327
1.081				
	11322.750	31.000	3.786	1.333
1.087				
	11688.000	32.000	3.792	1.338
1.092				
	12053.250	33.000	3.798	1.344
1.098				
	12418.500	34.000	3.803	1.349
1.103				
	12783.750	35.000	3.808	1.354
1.108				
	13149.000	36.000	3.813	1.359
1.113				
	13514.250	37.000	3.818	1.364
1.118				
	13879.500	38.000	3.823	1.369
1.123				
	14244.750	39.000	3.827	1.373
1.127				
	14610.000	40.000	3.832	1.378

1.132

	14975.250	41.000	3.836	1.382
1.136				
	15340.500	42.000	3.840	1.387
1.140				
	15705.750	43.000	3.845	1.391
1.145				
	16071.000	44.000	3.849	1.395
1.149				
	16436.250	45.000	3.853	1.399
1.153				
	16801.500	46.000	3.857	1.403
1.157				
	17166.750	47.000	3.860	1.407
1.160				
	17532.000	48.000	3.864	1.410
1.164				
	17897.250	49.000	3.868	1.414
1.168				
	18262.500	50.000	3.871	1.418
1.171				
	18627.750	51.000	3.875	1.421
1.175				
	18993.000	52.000	3.878	1.425
1.178				
	19358.250	53.000	3.882	1.428
1.182				
	19723.500	54.000	3.885	1.431
1.185				
	20088.750	55.000	3.888	1.434
1.188				
	20454.000	56.000	3.892	1.438
1.192				
	20819.250	57.000	3.895	1.441
1.195				
	21184.500	58.000	3.898	1.444
1.198				
	21549.750	59.000	3.901	1.447
1.201				
	21915.000	60.000	3.904	1.450
1.204				
	22280.250	61.000	3.907	1.453
1.207				
	22645.500	62.000	3.910	1.456
1.210				
	23010.750	63.000	3.912	1.459
1.212				
	23376.000	64.000	3.915	1.461
1.215				
	23741.250	65.000	3.918	1.464
1.218				

1.221	24106.500	66.000	3.921	1.467
1.223	24471.750	67.000	3.923	1.470
1.226	24837.000	68.000	3.926	1.472
1.229	25202.250	69.000	3.929	1.475
1.231	25567.500	70.000	3.931	1.477
1.234	25932.750	71.000	3.934	1.480
1.236	26298.000	72.000	3.936	1.482
1.239	26663.250	73.000	3.939	1.485
1.241	27028.500	74.000	3.941	1.487
1.243	27393.750	75.000	3.943	1.490
1.246	27759.000	76.000	3.946	1.492
1.248	28124.250	77.000	3.948	1.494
1.250	28489.500	78.000	3.950	1.497
1.253	28854.750	79.000	3.953	1.499
1.255	29220.000	80.000	3.955	1.501
1.257	29585.250	81.000	3.957	1.503
1.259	29950.500	82.000	3.959	1.505
1.261	30315.750	83.000	3.961	1.508
1.264	30681.000	84.000	3.964	1.510
1.266	31046.250	85.000	3.966	1.512
1.268	31411.500	86.000	3.968	1.514
1.270	31776.750	87.000	3.970	1.516
1.272	32142.000	88.000	3.972	1.518
1.274	32507.250	89.000	3.974	1.520
1.276	32872.500	90.000	3.976	1.522

	33237.750	91.000	3.978	1.524
1.278				
	33603.000	92.000	3.980	1.526
1.280				
	33968.250	93.000	3.982	1.528
1.282				
	34333.500	94.000	3.984	1.530
1.283				
	34698.750	95.000	3.985	1.532
1.285				
	35064.000	96.000	3.987	1.533
1.287				
	35429.250	97.000	3.989	1.535
1.289				
	35794.500	98.000	3.991	1.537
1.291				
	36159.750	99.000	3.993	1.539
1.293				
	36525.000	100.000	3.995	1.541
1.294				

********** RESULTS **********

Drawdowns and Coordinates of computation points
Measured in feet

		X =	0.0	X =	0.0	X = 0.0
		Y =	2000.0	Y =	2640.0	Y = 5280.0

	Time in days	Time in years	Drawdowns	
	365.250	1.000	0.256	0.176
0.035				
	730.500	2.000	0.367	0.278
0.092				
	1095.750	3.000	0.434	0.342
0.139				
	1461.000	4.000	0.483	0.390
0.176				
	1826.250	5.000	0.521	0.427
0.207				
	2191.500	6.000	0.553	0.458
0.234				
	2556.750	7.000	0.580	0.484
0.257				
	2922.000	8.000	0.603	0.507
0.278				
	3287.250	9.000	0.624	0.527
0.296				
	3652.500	10.000	0.642	0.545
0.313				
	4017.750	11.000	0.659	0.562

0.328				
	4383.000	12.000	0.674	0.577
0.342				
	4748.250	13.000	0.688	0.591
0.355				
	5113.500	14.000	0.701	0.604
0.367				
	5478.750	15.000	0.713	0.616
0.379				
	5844.000	16.000	0.724	0.627
0.390				
	6209.250	17.000	0.735	0.638
0.400				
	6574.500	18.000	0.745	0.648
0.409				
	6939.750	19.000	0.755	0.657
0.418				
	7305.000	20.000	0.764	0.666
0.427				
	7670.250	21.000	0.772	0.675
0.435				
	8035.500	22.000	0.780	0.683
0.443				
	8400.750	23.000	0.788	0.691
0.450				
	8766.000	24.000	0.796	0.698
0.458				
	9131.250	25.000	0.803	0.705
0.465				
	9496.500	26.000	0.810	0.712
0.471				
	9861.750	27.000	0.817	0.719
0.478				
	10227.000	28.000	0.823	0.725
0.484				
	10592.250	29.000	0.829	0.731
0.490				
	10957.500	30.000	0.835	0.737
0.496				
	11322.750	31.000	0.841	0.743
0.501				
	11688.000	32.000	0.847	0.749
0.507				
	12053.250	33.000	0.852	0.754
0.512				
	12418.500	34.000	0.857	0.759
0.517				
	12783.750	35.000	0.862	0.764
0.522				
	13149.000	36.000	0.867	0.769
0.527				

	13514.250	37.000	0.872	0.774
0.532				
	13879.500	38.000	0.877	0.779
0.536				
	14244.750	39.000	0.882	0.784
0.541				
	14610.000	40.000	0.886	0.788
0.545				
	14975.250	41.000	0.890	0.792
0.550				
	15340.500	42.000	0.895	0.797
0.554				
	15705.750	43.000	0.899	0.801
0.558				
	16071.000	44.000	0.903	0.805
0.562				
	16436.250	45.000	0.907	0.809
0.566				
	16801.500	46.000	0.911	0.813
0.570				
	17166.750	47.000	0.915	0.816
0.573				
	17532.000	48.000	0.918	0.820
0.577				
	17897.250	49.000	0.922	0.824
0.580				
	18262.500	50.000	0.926	0.827
0.584				
	18627.750	51.000	0.929	0.831
0.587				
	18993.000	52.000	0.933	0.834
0.591				
	19358.250	53.000	0.936	0.838
0.594				
	19723.500	54.000	0.939	0.841
0.597				
	20088.750	55.000	0.942	0.844
0.601				
	20454.000	56.000	0.946	0.847
0.604				
	20819.250	57.000	0.949	0.851
0.607				
	21184.500	58.000	0.952	0.854
0.610				
	21549.750	59.000	0.955	0.857
0.613				
	21915.000	60.000	0.958	0.860
0.616				
	22280.250	61.000	0.961	0.863
0.619				
	22645.500	62.000	0.964	0.865

0.621				
	23010.750	63.000	0.967	0.868
0.624				
	23376.000	64.000	0.969	0.871
0.627				
	23741.250	65.000	0.972	0.874
0.630				
	24106.500	66.000	0.975	0.876
0.632				
	24471.750	67.000	0.977	0.879
0.635				
	24837.000	68.000	0.980	0.882
0.638				
	25202.250	69.000	0.983	0.884
0.640				
	25567.500	70.000	0.985	0.887
0.643				
	25932.750	71.000	0.988	0.889
0.645				
	26298.000	72.000	0.990	0.892
0.648				
	26663.250	73.000	0.993	0.894
0.650				
	27028.500	74.000	0.995	0.897
0.652				
	27393.750	75.000	0.997	0.899
0.655				
	27759.000	76.000	1.000	0.901
0.657				
	28124.250	77.000	1.002	0.904
0.659				
	28489.500	78.000	1.004	0.906
0.662				
	28854.750	79.000	1.007	0.908
0.664				
	29220.000	80.000	1.009	0.911
0.666				
	29585.250	81.000	1.011	0.913
0.668				
	29950.500	82.000	1.013	0.915
0.670				
	30315.750	83.000	1.015	0.917
0.673				
	30681.000	84.000	1.018	0.919
0.675				
	31046.250	85.000	1.020	0.921
0.677				
	31411.500	86.000	1.022	0.923
0.679				
	31776.750	87.000	1.024	0.925
0.681				

0.683	32142.000	88.000	1.026	0.927
0.685	32507.250	89.000	1.028	0.929
0.687	32872.500	90.000	1.030	0.931
0.689	33237.750	91.000	1.032	0.933
0.691	33603.000	92.000	1.034	0.935
0.692	33968.250	93.000	1.036	0.937
0.694	34333.500	94.000	1.037	0.939
0.696	34698.750	95.000	1.039	0.941
0.698	35064.000	96.000	1.041	0.943
0.700	35429.250	97.000	1.043	0.945
0.702	35794.500	98.000	1.045	0.946
0.703	36159.750	99.000	1.047	0.948
0.705	36525.000	100.000	1.048	0.950

PROOF OF PUBLICATION

The following legal notice has been published in THE HERALD, a weekly newspaper published at Truth or Consequences, Sierra County, State of New Mexico.

Claudia Jeffery
RG-41244

in said newspaper on Apr. 9, 2003, to and including Apr. 23, 2003, inserting same in the issue of

Apr. 16, 2003

SIGNED: Loretta Dooley

TITLE: Legal adv. Mgr.

Subscribed and sworn to before me this 24th day of April, 2003.

Maureen Tooley
Notary Public

My Commission expires Feb. 10, 2006

LEGAL NOTICE

NOTICE is hereby given that on March 24, 2003, Monticello Plaza Well, c/o Claudia Jeffery, P.O. Box 69, Monticello, New Mexico 87939, filed Application No. RG-41244 with the STATE ENGINEER for Permit to Change Location of Well within the Rio Grande Underground Water Basin of the State of New Mexico.

The applicant proposes to discontinue the use of existing declared Well RG-41244, located in the SE/4 NW/4 SW/4 of Section 34, Township 10 South, Range 6 West, NMPM, Sierra County, also described as being in the Town of Monticello, New Mexico, and commence the drilling and use of a replacement well with 6-inch casing, approximately 120 feet deep, to be located in the SE/4 NW/4 SW/4 of Section 34, Township 10 South, Range 6 West, NMPM, further described as being within the town limits of Monticello, New Mexico, on land owned by the applicant.

Total diversion of water from the replacement well will not exceed 50 acre-feet per annum for the purpose of community water supply for the preservation of the town of Monticello, New Mexico, located in the [illegible] of Section 34, Township 10 South, Range 6 West, NMPM, [illegible] declared well RG-41244 shall be plugged. The [illegible] well and the place of use are generally located [illegible] miles northeast of the town of Truth or Consequences, New Mexico.

Any person, firm, corporation or other entity having standing to file protests or objections to the application described herein shall do so within [illegible] days after the date of the last publication of this notice. Protests or objections must be in writing and must set forth specifically the grounds upon which such protest or objection is based. The State Engineer will evaluate the application in accordance with Sections 72-2-19, 72-5-6 and 72-12-3.

Pub: Apr. 9, 16, 23, 2003

03 APR 25 AM 11:45

HERALD PUBLISHING CO., INC.
1204 North Date Street
P. O. Box 752
Truth or Consequences, NM 87901

State Engineer
121 Tijeras NE
Albuquerque, NM 87102

87102+3421 22

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Any person, firm or corporation or other entity having standing to file objections or protests shall do so in writing (legible, signed, and include the writer's complete name and mailing address). The objection to the approval of the application (1) if impairment, you must specifically identify your water rights; and/or (2) if public welfare or conservation of water within the State of New Mexico, you must show you will be substantially affected. The written protest must be filed, with the State Engineer, 121 Tijeras, N.E., Suite 2000, Albuquerque, New Mexico 87102, within (10) days after the date of the last publication of this Notice. Facsimile's (fax's) will be accepted as a valid protest as long as the hard copy is sent within 24-hours of the facsimile. Mailing postmark will be used to validate the 24-hour period. Protests can be faxed to (505) 764-3892. If no valid protest or objection is filed, the State Engineer will evaluate the application in accordance with Sections 72-2-16, 72-5-6 and 72-12-3.

NOTE TO PUBLISHER; Immediately after last publication, publisher is requested to file affidavit of such publication with the State Engineer, 121 Tijeras, N.E., Suite 2000, Albuquerque, New Mexico 87102.

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NOTE TO PUBLISHER; Immediately after last publication, publisher is requested to file affidavit of such publication with the State Engineer, 121 Tijeras, N.E., Suite 2000, Albuquerque, New Mexico 87102.

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
ALBUQUERQUE

JOHN R. D'ANTONIO, JR., PE
STATE ENGINEER

March 26, 2003

DISTRICT I
121 TIJERAS, NE, STE. 2000
ALBUQUERQUE, NM 87102-3400
(505) 841-9480

FILE: RG-41244

Ms. Claudia Jeffery
Monticello Plaza Well
P. O. Box 69
Monticello, NM 87939

Greetings:

The enclosed Notice for Publication on the following page(s) shall be published at applicant's expense once a week for three (3) consecutive weeks in the following newspaper(s): ***The Herald*** (Sierra County). First publication should be made as soon as possible after receipt of this notice. Publisher's affidavit of such publication must be filed with the State Engineer within sixty (60) days from the date hereon. If the application is for a new appropriation, failure to file proof of publication within the time allowed shall cause postponement of the priority date of the application to the date of receipt of such proof in proper form. In the case of any other type of application, failure to file proof within the time allowed will cause the application to be cancelled.

The accuracy as to the content of the Notice is the responsibility of the applicant and the State Engineer is not obligated for any additional expense incurred by the necessity of readvertisement.

Neither issuance of the Notice, nor lack of protest thereto, in any way indicates favorable action by the State Engineer or approval of the application as requested.

Sincerely,

J. Spencer Shaw
Water Resource Specialist

JSS:jss
Enclosure
cc: OSE, Santa Fe

STATE OF NEW MEXICO BEFORE THE STATE ENGINEER OFFICE

IN THE MATTER OF THE APPLICATION)
FOR PERMIT TO CHANGE LOCATION OF)
WELL IN THE RIO GRANDE UNDERGROUND)
WATER BASIN UNDER THE NAME OF)
MONTIELLO PLAZA WELL.)

File: RG-41244

EMERGENCY AUTHORIZATION TO DRILL REPLACEMENT WELL

Pursuant to the Application and Affidavit filed on February 24, 2003, requesting emergency authorization to drill a replacement well within 100 feet of the declared well, numbered RG-41244, prior to hearing and final action on the above captioned application, and pursuant to the authority of Section 72-12-22, NMSA, 1978, the State Engineer having made a preliminary investigation, finds the following:

1. The State Engineer has jurisdiction of the applicant and the subject application.

2. Declared well RG-41244 is not repairable.

3. Due to structural failure of the well, the applicant proposes to discontinue the use of the declared well, RG-41244, and drill and use a replacement well with 6-inch casing, approximately 120 feet deep, to be located in the SE1/4 NW1/4 SW1/4 of Section 34, Township 10 South, Range 6 West, NMPM, further described to be within 100 feet of the declared well.

4. An emergency situation exists in which the delay caused by publication and hearing would result in serious economic loss and delay would not be in the public interest.

5. The nearest well to proposed pumping well RG-41244 is approximately 2000 feet in distance.

6. Preliminary calculations indicate that if the replacement well is pumped at rate of 25 acre-feet for a six-month period, the resulting drawdown on a well 2000 feet away from the replacement well will be less than one foot.

7. The State Engineer, after preliminary investigation, finds that the proposed replacement well will not impair existing water rights.

Permittee: Montiello Plaza Well
File: RG-41244

THEREFORE, emergency authorization to drill and use a replacement well described in Application number RG-41244, filed February 24, 2003, is hereby granted subject to the following conditions:

1. The annual diversion of water from well RG-41244 shall not exceed 50 acre-feet.

2. Well RG-41244 shall be equipped with a totalizing meter, or meters of a type and a location(s) approved by and installed in a manner acceptable to the State Engineer.

3. Records of the total amount of water diverted from well RG-41244 shall be submitted to the State Engineer in writing on or before the 10th day of each month for the preceding calendar month.

4. This authorization shall expire on July 31, 2003, or when the State Engineer enters his final decision on pending Application numbered RG-41244, or upon violation of a condition imposed herein, whichever occurs first.

5. Issuance of this authorization does not obligate the State Engineer to recognize the declared water right or obligate favorable consideration by the State Engineer of the pending application.

Dated this 5th day of March 2003.

JOHN R. D'ANTONIO, JR., P.E.
NEW MEXICO STATE ENGINEER

By: J. Spencer Shaw

J. Spencer Shaw, District 1

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
ALBUQUERQUE

John R. D'Antonio, Jr., P.E.
STATE ENGINEER

DISTRICT I
121 TIJERAS, NE, STE. 2000
ALBUQUERQUE, NM 87102-3400
(505) 841-9480

March 5, 2003

File: RG-41244

Claudia Jeffery
Monticello Plaza Well
P. O. Box 69
Monticello, NM 87939

Dear Ms. Jeffery:

Enclosed is your Emergency Authorization to change location of well. Please be advised that Application to Change Location Well is to be filed with 30 days of receipt of this letter.

If you have any questions please don't hesitate to contact me.

Sincerely,

J. Spencer Shaw
Water Resource Specialist
(505) 764-3888

JSS:jss
Enclosure as stated
cc: Santa Fe SEO

Claudia Jeffery
Monticello Plaza Well
P. O. Box 69
Monticello, NM 87939
505/743-2059

February 24, 2003

State of New Mexico
State Engineer Office
121 Tijeras NE, Suite 2000
Albuquerque, NM 87102

72-12-22

03 FEB 24 PM 3:16

Trn Nbr: 228126
File Nbr: RG 41244 DCL Amended

Greetings:

I need to apply for an emergency well drilling permit for the Monticello Community Well. The steal casing on this well has collapsed, there is a huge tree root blocking the pump. The water has a foul smell and is yellow-green in color. We have added gallons of bleach to this well and the problem still exists. The well driller (Johnson Drilling), is afraid to pull the pump. He believes it is so lodged with roots and he will break the PVC and this will shut down the well. There are 5 houses depending on this water.

I am sending Jack Noel with the documents for this well. Please allow him to sign and act as my go between with your office to obtain this permit.

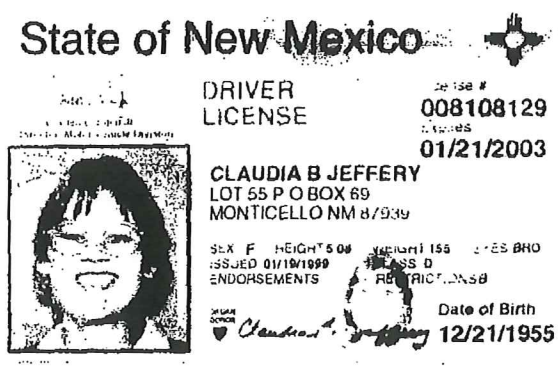
If you have any questions, please give me a call. — See ATTACHED

Thank you,

Claudia B Jeffery
Claudia Jeffery
Monticello Plaza Well

Witness: Jack L. Noel

Witness: Scott Richardson


State of New Mexico
DRIVER LICENSE
008108129
01/21/2003
CLAUDIA B JEFFERY
LOT 55 P O BOX 69
MONTICELLO NM 87939
SEX F HEIGHT 5 08 WEIGHT 155 EYES BRO
ISSUED 01/19/1999 CLASS D
ENDORSEMENTS RESTRICTIONS
Date of Birth
12/21/1955

File RG 41244 Amended

FEBRUARY 24, 2003

Attachment to letter

- The well will be drilled to ~ 120' with 6" casing.
- The Appropriation is the same as originally declared which is 50 Acre feet/year
- The new well will be drilled within 100' of the original well located in the SE¼. NW ¼. SW¼ of Section 34. T. 10S R 6W NMPM.

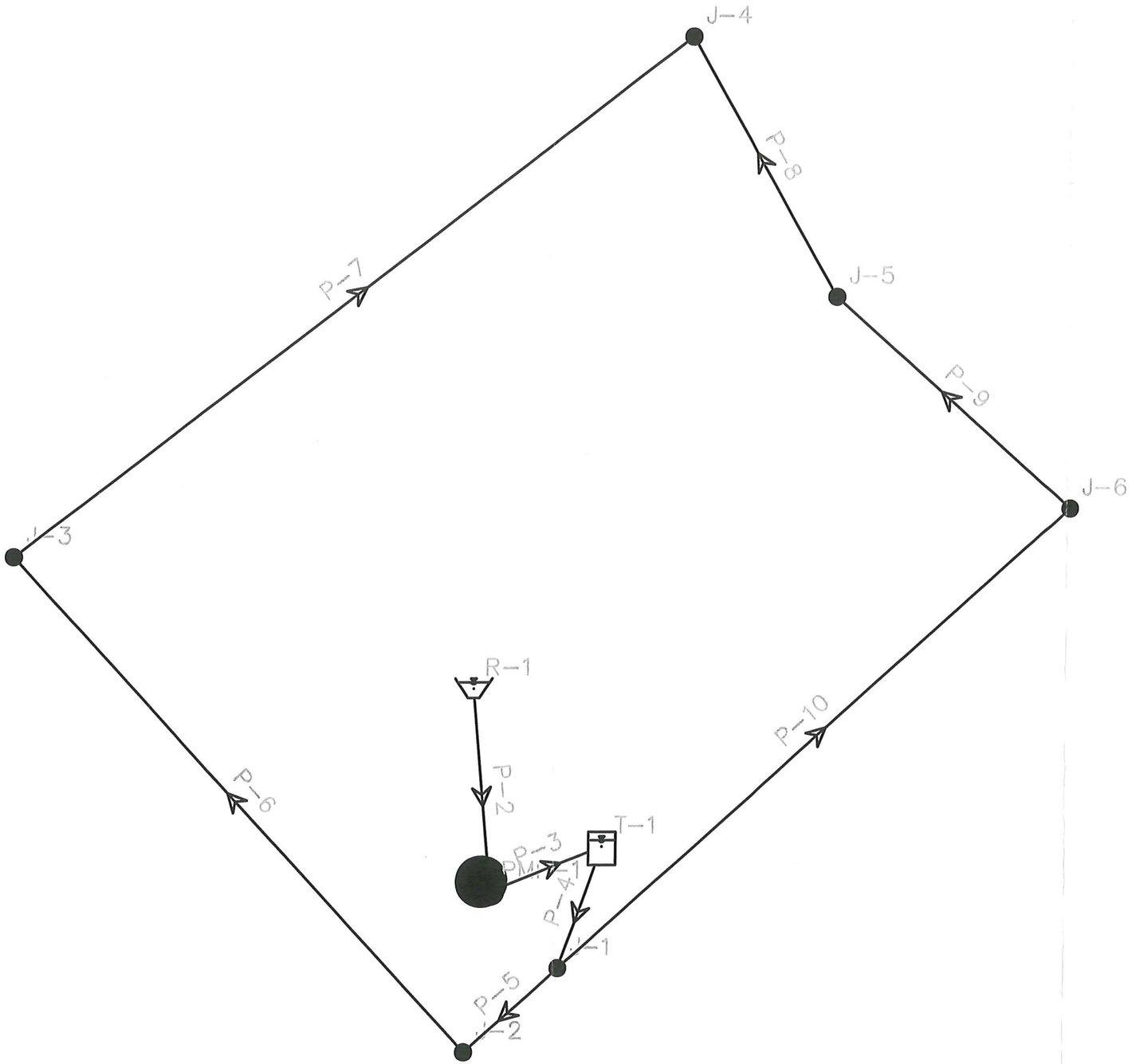
By. John V Noel III

JOHN V NOEL III

STATE ENGINEER OFFICE
SANTA FE, NEW MEXICO
03 FEB 24 PM 3:17

APPENDIX E

Hydraulic Model Output



Bohannan ▲ Huston

425 S. Telshor Blvd., Suite C-103 Las Cruces, NM 88011-8237

ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

MONTICELLO

HYDRAULIC MODEL - EXISTING SYSTEM AND ALT. #1

FIGURE E-1

Scenario: Base
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Minimum Pressure (psi)	Maximum Pressure (psi)
J-1	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,316.90	24.62	24.62	24.62
J-2	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,306.74	20.22	20.22	20.22
J-3	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,282.33	9.66	9.66	9.66
J-4	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,275.38	6.66	6.66	6.66
J-5	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,275.56	6.73	6.73	6.73
J-6	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,280.94	9.06	9.06	9.06

Scenario: Base
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)	Maximum Velocity (ft/s)
P-2	140.00	1.3	PVC	150.0	false	0.00	Open	26.23	17.55	125.36	6.56	6.56
P-3	40.00	1.4	PVC	150.0	false	0.00	Open	26.23	3.45	86.24	5.63	5.63
P-4	15.00	0.8	PVC	150.0	false	0.00	Open	25.02	23.10	1,540.30	18.17	18.17
P-5	27.00	0.8	PVC	150.0	false	0.00	Open	11.68	10.15	376.10	8.49	8.49
P-6	147.00	0.8	PVC	150.0	false	0.00	Open	7.51	24.41	166.06	5.46	5.46
P-7	187.00	0.8	PVC	150.0	false	0.00	Open	3.35	6.95	37.14	2.43	2.43
P-8	65.00	0.8	PVC	150.0	false	0.00	Open	-0.82	0.18	2.76	0.60	0.60
P-9	69.00	0.8	PVC	150.0	false	0.00	Open	-4.99	5.37	77.86	3.63	3.63
P-10	150.00	0.8	PVC	150.0	false	0.00	Open	-9.16	35.96	239.73	6.65	6.65

Scenario: Base
Steady State Analysis
Pump Report

Label	Elevation (ft)	Control Status	Intake Pump Grade (ft)	Discharge Pump Grade (ft)	Discharge (gpm)	Pump Head (ft)	Calculated Water Power (Hp)	Time (hr)	Utilization (%)	Time of Use (hr)
PMP-1	5,260.00	On	5,187.45	5,343.45	26.23	156.00	1.03	N/A	N/A	N/A

Scenario: Base
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Minimum Pressure (psi)	Maximum Pressure (psi)
J-1	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,339.92	34.58	34.58	34.58
J-2	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,339.88	34.56	34.56	34.56
J-3	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,339.79	34.52	34.52	34.52
J-4	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,339.76	34.51	34.51	34.51
J-5	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,339.77	34.51	34.51	34.51
J-6	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,339.78	34.52	34.52	34.52

Scenario: Base
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)	Maximum Velocity (ft/s)
P-2	140.00	1.3	PVC	150.0	false	0.00	Open	26.23	17.55	125.36	6.56	6.56
P-3	40.00	1.4	PVC	150.0	false	0.00	Open	26.23	3.45	86.24	5.63	5.63
P-4	15.00	2.4	PVC	150.0	false	0.00	Open	25.02	0.08	5.60	1.81	1.81
P-5	27.00	2.4	PVC	150.0	false	0.00	Open	11.68	0.04	1.37	0.85	0.85
P-6	147.00	2.4	PVC	150.0	false	0.00	Open	7.51	0.09	0.60	0.54	0.54
P-7	187.00	2.4	PVC	150.0	false	0.00	Open	3.35	0.03	0.14	0.24	0.24
P-8	65.00	2.4	PVC	150.0	false	0.00	Open	-0.82	0.00	0.01	0.06	0.06
P-9	69.00	2.4	PVC	150.0	false	0.00	Open	-4.99	0.02	0.28	0.36	0.36
P-10	150.00	2.4	PVC	150.0	false	0.00	Open	-9.16	0.13	0.88	0.66	0.66

NEW 25-30 GPM WATER PRODUCTION WELL AND CONTROL BUILDING

200' RADIUS SET BACK

NEW 2-1/2" WATER DISTRIBUTION PIPELINE

NEW WATER STORAGE TANK

EXISTING WATER WELL TO REMAIN AS EMERGENCY BACKUP

Bohannan ▲ Huston INC.
425 S. Telshor Blvd., Suite C-103 Las Cruces, NM 88011-8237
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

MONTICELLO
HYDRAULIC MODEL - ALT. #2 AND #3
FIGURE E-2

Scenario: Base
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Minimum Pressure (psi)	Maximum Pressure (psi)
J-1	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,391.40	56.85	56.85	56.85
J-2	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,391.40	56.85	56.85	56.85
J-3	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,391.42	56.86	56.86	56.86
J-4	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,391.46	56.88	56.88	56.88
J-5	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,391.44	56.87	56.87	56.87
J-6	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,391.41	56.86	56.86	56.86
J-7	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,391.37	56.84	56.84	56.84
J-8	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,391.36	56.83	56.83	56.83
J-9	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,391.36	56.83	56.83	56.83
J-10	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,391.36	56.83	56.83	56.83
J-11	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,391.38	56.84	56.84	56.84
J-12	5,260.00	Zone	Demand	9.16	Fixed	9.16	5,391.38	56.84	56.84	56.84
J-13	5,270.00	Zone	Demand	9.16	Fixed	9.16	5,391.44	52.54	52.54	52.54
J-14	5,270.00	Zone	Demand	9.16	Fixed	9.16	5,391.65	52.63	52.63	52.63
J-15	5,270.00	Zone	Demand	9.15	Fixed	9.15	5,391.78	52.69	52.69	52.69
J-16	5,270.00	Zone	Demand	9.15	Fixed	9.15	5,392.27	52.90	52.90	52.90
J-17	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,391.59	56.93	56.93	56.93
J-18	5,280.00	Zone	Demand	18.30	Fixed	18.30	5,396.02	50.20	50.20	50.20
J-19	5,280.00	Zone	Demand	0.00	Fixed	0.00	5,396.02	50.20	50.20	50.20
J-20	5,270.00	Zone	Demand	0.00	Fixed	0.00	5,396.02	54.52	54.52	54.52

Scenario: Base
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)	Maximum Velocity (ft/s)
P-2	140.00	1.3	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-3	40.00	1.4	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-4	15.00	0.8	PVC	150.0	false	0.00	Closed	0.00	0.00	0.00	0.00	0.00
P-5	27.00	4.3	PVC	150.0	false	0.00	Open	6.10	0.00	0.02	0.13	0.13
P-6	147.00	4.3	PVC	150.0	false	0.00	Open	-16.37	0.02	0.14	0.36	0.36
P-7	187.00	4.3	PVC	150.0	false	0.00	Open	-20.54	0.04	0.21	0.45	0.45
P-8	65.00	4.3	PVC	150.0	false	0.00	Open	30.17	0.03	0.44	0.67	0.67
P-9	69.00	4.3	PVC	150.0	false	0.00	Open	26.00	0.02	0.34	0.57	0.57
P-10	150.00	4.3	PVC	150.0	false	0.00	Open	10.27	0.01	0.06	0.23	0.23
P-11	211.00	4.3	PVC	150.0	false	0.00	Open	18.30	0.04	0.18	0.40	0.40
P-12	52.00	4.3	PVC	150.0	false	0.00	Open	9.15	0.00	0.05	0.20	0.20
P-13	681.00	4.3	PVC	150.0	false	0.00	Open	11.57	0.05	0.07	0.26	0.26
P-14	108.00	4.3	PVC	150.0	false	0.00	Open	2.42	0.00	0.00	0.05	0.05
P-15	515.00	4.3	PVC	150.0	false	0.00	Open	-6.73	0.01	0.03	0.15	0.15
P-16	68.00	4.3	PVC	150.0	false	0.00	Open	-15.88	0.01	0.14	0.35	0.35
P-17	187.00	4.3	PVC	150.0	false	0.00	Open	-25.04	0.06	0.31	0.55	0.55
P-18	366.00	4.3	PVC	150.0	false	0.00	Open	-34.20	0.20	0.55	0.76	0.76
P-19	158.00	4.3	PVC	150.0	false	0.00	Open	-43.36	0.14	0.86	0.96	0.96
P-20	395.00	4.3	PVC	150.0	false	0.00	Open	-52.51	0.49	1.23	1.16	1.16
P-21	383.00	4.3	PVC	150.0	false	0.00	Open	64.03	0.68	1.78	1.41	1.41
P-22	93.00	4.3	PVC	150.0	false	0.00	Open	54.88	0.12	1.33	1.21	1.21
P-23	606.00	4.3	PVC	150.0	false	0.00	Open	-125.70	3.75	6.19	2.78	2.78
P-24	2,383.00	4.3	PVC	150.0	false	0.00	Open	-144.00	18.98	7.96	3.18	3.18
P-25	21.00	2.3	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00
P-26	873.00	2.3	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00
P-27	151.00	2.3	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-28	5.00	6.0	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00

Scenario: Base
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Minimum Pressure (psi)	Maximum Pressure (psi)
J-1	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,410.70	65.20	65.20	65.20
J-2	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,410.70	65.20	65.20	65.20
J-3	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,410.71	65.20	65.20	65.20
J-4	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,410.71	65.21	65.21	65.21
J-5	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,410.71	65.20	65.20	65.20
J-6	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,410.71	65.20	65.20	65.20
J-7	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,410.70	65.20	65.20	65.20
J-8	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,410.70	65.20	65.20	65.20
J-9	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,410.70	65.20	65.20	65.20
J-10	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,410.70	65.20	65.20	65.20
J-11	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,410.70	65.20	65.20	65.20
J-12	5,260.00	Zone	Demand	9.16	Fixed	9.16	5,410.70	65.20	65.20	65.20
J-13	5,270.00	Zone	Demand	9.16	Fixed	9.16	5,410.71	60.88	60.88	60.88
J-14	5,270.00	Zone	Demand	9.16	Fixed	9.16	5,410.75	60.89	60.89	60.89
J-15	5,270.00	Zone	Demand	9.15	Fixed	9.15	5,410.77	60.91	60.91	60.91
J-16	5,270.00	Zone	Demand	9.15	Fixed	9.15	5,410.86	60.94	60.94	60.94
J-17	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,410.74	65.22	65.22	65.22
J-18	5,280.00	Zone	Demand	18.30	Fixed	18.30	5,411.54	56.91	56.91	56.91
J-19	5,280.00	Zone	Demand	0.00	Fixed	0.00	5,411.54	56.91	56.91	56.91
J-20	5,270.00	Zone	Demand	0.00	Fixed	0.00	5,411.54	61.24	61.24	61.24

Scenario: Base
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)	Maximum Velocity (ft/s)
P-2	140.00	1.3	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-3	40.00	1.4	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-4	15.00	0.8	PVC	150.0	false	0.00	Closed	0.00	0.00	0.00	0.00	0.00
P-5	27.00	6.1	PVC	150.0	false	0.00	Open	6.10	0.00	0.02	0.07	0.07
P-6	147.00	6.1	PVC	150.0	false	0.00	Open	-16.37	0.00	0.03	0.18	0.18
P-7	187.00	6.1	PVC	150.0	false	0.00	Open	-20.54	0.01	0.04	0.23	0.23
P-8	65.00	6.1	PVC	150.0	false	0.00	Open	30.17	0.01	0.08	0.33	0.33
P-9	69.00	6.1	PVC	150.0	false	0.00	Open	26.00	0.00	0.06	0.29	0.29
P-10	150.00	6.1	PVC	150.0	false	0.00	Open	10.27	0.00	0.01	0.11	0.11
P-11	211.00	6.1	PVC	150.0	false	0.00	Open	18.30	0.01	0.03	0.20	0.20
P-12	52.00	6.1	PVC	150.0	false	0.00	Open	9.15	0.00	0.01	0.10	0.10
P-13	681.00	6.1	PVC	150.0	false	0.00	Open	11.57	0.01	0.01	0.13	0.13
P-14	108.00	6.1	PVC	150.0	false	0.00	Open	2.42	0.00	0.00	0.03	0.03
P-15	515.00	6.1	PVC	150.0	false	0.00	Open	-6.73	0.00	0.00	0.07	0.07
P-16	68.00	6.1	PVC	150.0	false	0.00	Open	-15.88	0.00	0.02	0.17	0.17
P-17	187.00	6.1	PVC	150.0	false	0.00	Open	-25.04	0.01	0.06	0.27	0.27
P-18	366.00	6.1	PVC	150.0	false	0.00	Open	-34.20	0.04	0.10	0.38	0.38
P-19	158.00	6.1	PVC	150.0	false	0.00	Open	-43.36	0.02	0.16	0.48	0.48
P-20	395.00	6.1	PVC	150.0	false	0.00	Open	-52.51	0.09	0.22	0.58	0.58
P-21	383.00	6.1	PVC	150.0	false	0.00	Open	64.03	0.12	0.32	0.70	0.70
P-22	93.00	6.1	PVC	150.0	false	0.00	Open	54.88	0.02	0.24	0.60	0.60
P-23	606.00	6.1	PVC	150.0	false	0.00	Open	-125.70	0.68	1.13	1.38	1.38
P-24	2,383.00	6.1	PVC	150.0	false	0.00	Open	-144.00	3.46	1.45	1.58	1.58
P-25	21.00	2.3	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00
P-26	873.00	2.3	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00
P-27	151.00	2.3	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-28	5.00	6.0	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00

Scenario: Base
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Type	Base Flow (gpm)	Pattern	Demand (Calculated) (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)	Minimum Pressure (psi)	Maximum Pressure (psi)
J-1	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,385.50	54.30	54.30	54.30
J-2	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,385.46	54.28	54.28	54.28
J-3	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,385.62	54.35	54.35	54.35
J-4	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,385.83	54.44	54.44	54.44
J-5	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,385.79	54.42	54.42	54.42
J-6	5,260.00	Zone	Demand	4.17	Fixed	4.17	5,385.75	54.41	54.41	54.41
J-7	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,384.49	53.86	53.86	53.86
J-8	5,260.00	Zone	Demand	259.15	Fixed	259.15	5,384.27	53.76	53.76	53.76
J-9	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,385.99	54.51	54.51	54.51
J-10	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,386.04	54.53	54.53	54.53
J-11	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,386.33	54.66	54.66	54.66
J-12	5,260.00	Zone	Demand	9.16	Fixed	9.16	5,386.37	54.68	54.68	54.68
J-13	5,270.00	Zone	Demand	9.16	Fixed	9.16	5,386.52	50.41	50.41	50.41
J-14	5,270.00	Zone	Demand	9.16	Fixed	9.16	5,386.86	50.56	50.56	50.56
J-15	5,270.00	Zone	Demand	9.15	Fixed	9.15	5,387.03	50.63	50.63	50.63
J-16	5,270.00	Zone	Demand	9.15	Fixed	9.15	5,387.52	50.84	50.84	50.84
J-17	5,260.00	Zone	Demand	9.15	Fixed	9.15	5,386.14	54.58	54.58	54.58
J-18	5,280.00	Zone	Demand	18.30	Fixed	18.30	5,392.71	48.76	48.76	48.76
J-19	5,280.00	Zone	Demand	0.00	Fixed	0.00	5,392.71	48.76	48.76	48.76
J-20	5,270.00	Zone	Demand	0.00	Fixed	0.00	5,392.71	53.09	53.09	53.09

Scenario: Base
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Check Valve?	Minor Loss Coefficient	Control Status	Discharge (gpm)	Pressure Pipe Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)	Maximum Velocity (ft/s)
P-2	140.00	1.3	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-3	40.00	1.4	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-4	15.00	0.8	PVC	150.0	false	0.00	Closed	0.00	0.00	0.00	0.00	0.00
P-5	27.00	6.1	PVC	150.0	false	0.00	Open	149.68	0.04	1.56	1.64	1.64
P-6	147.00	6.1	PVC	150.0	false	0.00	Open	-122.79	0.16	1.08	1.35	1.35
P-7	187.00	6.1	PVC	150.0	false	0.00	Open	-126.96	0.21	1.15	1.39	1.39
P-8	65.00	6.1	PVC	150.0	false	0.00	Open	94.59	0.04	0.67	1.04	1.04
P-9	69.00	6.1	PVC	150.0	false	0.00	Open	90.42	0.04	0.61	0.99	0.99
P-10	150.00	6.1	PVC	150.0	false	0.00	Open	153.85	0.25	1.64	1.69	1.69
P-11	211.00	6.1	PVC	150.0	false	0.00	Open	268.30	0.97	4.59	2.95	2.95
P-12	52.00	6.1	PVC	150.0	false	0.00	Open	259.15	0.22	4.31	2.84	2.84
P-13	681.00	6.1	PVC	150.0	false	0.00	Open	-67.60	0.24	0.36	0.74	0.74
P-14	108.00	6.1	PVC	150.0	false	0.00	Open	-76.75	0.05	0.45	0.84	0.84
P-15	515.00	6.1	PVC	150.0	false	0.00	Open	-85.90	0.29	0.56	0.94	0.94
P-16	68.00	6.1	PVC	150.0	false	0.00	Open	-95.05	0.05	0.67	1.04	1.04
P-17	187.00	6.1	PVC	150.0	false	0.00	Open	-104.21	0.15	0.80	1.14	1.14
P-18	366.00	6.1	PVC	150.0	false	0.00	Open	-113.37	0.34	0.93	1.24	1.24
P-19	158.00	6.1	PVC	150.0	false	0.00	Open	-122.53	0.17	1.08	1.35	1.35
P-20	395.00	6.1	PVC	150.0	false	0.00	Open	-131.68	0.49	1.23	1.45	1.45
P-21	383.00	6.1	PVC	150.0	false	0.00	Open	234.87	1.37	3.59	2.58	2.58
P-22	93.00	6.1	PVC	150.0	false	0.00	Open	225.72	0.31	3.33	2.48	2.48
P-23	606.00	6.1	PVC	150.0	false	0.00	Open	-375.70	5.19	8.57	4.12	4.12
P-24	2,383.00	6.1	PVC	150.0	false	0.00	Open	-394.00	22.29	9.35	4.33	4.33
P-25	21.00	2.3	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00
P-26	873.00	2.3	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00
P-27	151.00	2.3	PVC	150.0	false	0.00	Open	-0.00	0.00	0.00	0.00	0.00
P-28	5.00	6.0	PVC	150.0	false	0.00	Open	0.00	0.00	0.00	0.00	0.00

APPENDIX F

Financial Feasibility Analyses

FINANCIAL ANALYSIS FOR MONTICELLO MDWCA WATER SYSTEM IM
Alternative #1: 100% Loan, 0% Grant

	CATEGORY	Jan. 2017 - Dec. 2017	Jan. 2018 - Dec. 2018	Jan. 2019 - Dec. 2019	Jan. 2020 - Dec. 2020	Jan. 2021 - Dec. 2021	Jan. 2022 - Dec. 2022	Jan. 2023 - Dec. 2023	Jan. 2024 - Dec. 2024
OPERATING EXPENSES	***Percentage increase in budget***	***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***
EXISTING	**Operating expenses** (salaries, insurance, bldg maintenance, professional service, utilities, etc.)	$ 285	$ 285	$ 294	$ 302	$ 311	$ 321	$ 321	$ 330
ALTERNATIVE #1	**Additional Operating and Maintenance Expenses associated with Alternative**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL OPERATING EXPENSES	**$ 285**	**$ 285**	**$ 294**	**$ 302**	**$ 311**	**$ 321**	**$ 321**	**$ 330**
	Population Served, 2.17 People per Household 0.00% per yr	13	13	13	13	13	13	13	13
	Historic/Projected Number of Connections	6	6	6	6	6	6	6	6
	Historic/Projected Ave Annual Water Consumption Data; 63.8 gpcd for projection	302,938	302,938	302,938	302,938	302,938	302,938	302,938	302,938

CAPITAL IMPROVEMENTS	**2008 Capital Improvements**	**Estimated Cost**
	Install 300-gal pressure tank system	$ 8,000
	Service Connections	$ 4,500
	3" Distribution Pipeline	$ 8,400
	Basic engineering, design fees (30% of construction)	$ 5,000
	NMGRT (5.9375%)	$ 1,500
	Total	**$ 27,400**

INCOMES	**Operating Income** (water usage fees, connection fees, late charges, membership fees, etc.; projection based on average annual income of app. $240 per connection)	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440
	Investment incomes	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Incomes for Water Fund	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440
LEVEL 1 FINANCIAL STABILITY ANALYSIS	**Total Annual Income**	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440
	Total Annual Expenses, excluding depreciation	$ 285	$ 285	$ 294	$ 302	$ 311	$ 321	$ 321	$ 330
	Net Income (Or Deficit If Negative)	$ 1,155	$ 1,155	$ 1,146	$ 1,138	$ 1,129	$ 1,119	$ 1,119	$ 1,110
	Available Fund Balance, end of year	$ 11,861	$ 13,016	$ 14,162	$ 15,300	$ 16,429	$ 17,548	$ 18,667	$ 19,777
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & NO RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period** A/P = 0.0672	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841
	Net Income (Or Deficit If Negative)	$ (686)	$ (686)	$ (695)	$ (704)	$ (713)	$ (722)	$ (722)	$ (732)
	Available Fund Balance, end of year	$ (4,711)	$ (5,397)	$ (6,092)	$ (6,795)	$ (7,508)	$ (8,230)	$ (8,952)	$ (9,684)
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period** A/P = 0.0672	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841
	Addition income from rate increase Monthly Increase per **$ 9.75**	$ 702	$ 702	$ 702	$ 702	$ 702	$ 702	$ 702	$ 702
	Net Income (Or Deficit If Negative)	$ 16	$ 16	$ 7	$ (2)	$ (11)	$ (20)	$ (20)	$ (30)
	Available Fund Balance, end of year	$ 468	$ 484	$ 491	$ 489	$ 479	$ 459	$ 438	$ 409

FINANCIAL ANALYSIS FOR MONTICELL MDWCA WATER SYSTEM IMPROVEMENTS
Alternative #2: 100% Loan, 0% Grant

	CATEGORY			Out-Year Budget Forecast									
				Jan. 2008 - Dec. 2008	Jan. 2009 - Dec. 2009	Jan. 2010 - Dec. 2010	Jan. 2011 - Dec. 2011	Jan. 2012 - Dec. 2012	Jan. 2013 - Dec. 2013	Jan. 2014 - Dec. 2014	Jan. 2015 - Dec. 2015	Jan. 2016 - Dec. 2016	Jan. 2017 - Dec. 2017
OPERATING EXPENSES	***Percentage increase in budget***			*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*
EXISTING	**Operating expenses** (salaries, insurance, bldg maintenance, professional service, utilities, etc.)			$ 225	$ 232	$ 239	$ 246	$ 253	$ 253	$ 261	$ 269	$ 277	$ 285
ALTERNATIVE #1	**Additional Operating and Maintenance Expenses associated with Alternative**			$ 2,330	$ 2,400	$ 2,472	$ 2,546	$ 2,622	$ 2,701	$ 2,782	$ 2,866	$ 2,952	$ 3,040
	TOTAL OPERATING EXPENSES			**$ 2,555**	**$ 2,632**	**$ 2,711**	**$ 2,792**	**$ 2,876**	**$ 2,954**	**$ 3,043**	**$ 3,134**	**$ 3,228**	**$ 3,325**
	Population Served, 2.17 People per Household	0.00% per yr		43	43	43	43	43	43	43	43	43	43
	Historic/Projected Number of Connections			20	20	20	20	20	20	20	20	20	20
	Historic/Projected Ave Annual Water Consumption Data; 63.8 gpcd for projection			1,009,796	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795
CAPITAL IMPROVEMENTS	**2008 Capital Improvements**		**Estimated Cost**										
	Install pressure transducer/radio telemetry control system with automatic alarm system		$ 55,000										
	3" PVC Transmission Pipeline		$ 12,600										
	4" Distribution Pipeline		$ 102,400										
	Service Connections		$ 30,000										
	Backup generator		$ 30,000										
	25 gpm water production well		$ 75,000										
	30,000 gallon steel storage tank		$ 60,000										
	Replace existing well pump for higher head		$ 5,000										
	Basic Engineering, Design fees (10% of construction)		$ 37,000										
	Project inspection fees (4% of construction)		$ 14,800										
	NMGRT (5.9375%)		$ 22,000										
	Land and easement aquisition		$ 27,500										
	Total		**$ 471,300**										
INCOMES	**Operating Income** (water usage fees, connection fees, late charges, membership fees, etc.; projection based on average annual income of app. $240 per connection)			$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800
	Investment incomes			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Incomes for Water Fund			$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800
LEVEL 1 FINANCIAL STABILITY ANALYSIS	**Total Annual Income**			$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800
	Total Annual Expenses, excluding depreciation			$ 2,555	$ 2,632	$ 2,711	$ 2,792	$ 2,876	$ 2,954	$ 3,043	$ 3,134	$ 3,228	$ 3,325
	Net Income (Or Deficit If Negative)			$ 2,245	$ 2,168	$ 2,089	$ 2,008	$ 1,924	$ 1,846	$ 1,757	$ 1,666	$ 1,572	$ 1,475
	Available Fund Balance, end of year			$ 2,245	$ 4,413	$ 6,503	$ 8,511	$ 10,435	$ 12,281	$ 14,038	$ 15,704	$ 17,275	$ 18,750
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & NO RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period**	A/P =	0.0672	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671
	Net Income (Or Deficit If Negative)			$ (29,426)	$ (29,503)	$ (29,582)	$ (29,663)	$ (29,747)	$ (29,826)	$ (29,914)	$ (30,006)	$ (30,100)	$ (30,197)
	Available Fund Balance, end of year			$ (29,426)	$ (27,258)	$ (56,840)	$ (86,503)	$ (116,250)	$ (146,076)	$ (175,990)	$ (205,996)	$ (236,096)	$ (266,292)
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period**	A/P =	0.0672	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671
	Addition income from rate increase	Monthly Increase per	**$ 125.00**	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
	Net Income (Or Deficit If Negative)			$ 574	$ 497	$ 418	$ 337	$ 253	$ 174	$ 86	$ (6)	$ (100)	$ (197)
	Available Fund Balance, end of year			$ 574	$ 1,071	$ 1,489	$ 1,825	$ 2,078	$ 2,253	$ 2,338	$ 2,333	$ 2,233	$ 2,037

FINANCIAL ANALYSIS FOR MONTICELL MDWCA WATER SYSTEM
Alternative #2: 100% Loan, 0% Grant

	CATEGORY	Jan. 2018 - Dec. 2018	Jan. 2019 - Dec. 2019	Jan. 2020 - Dec. 2020	Jan. 2021 - Dec. 2021	Jan. 2022 - Dec. 2022	Jan. 2023 - Dec. 2023	Jan. 2024 - Dec. 2024	Jan. 2025 - Dec. 2025	Jan. 2026 - Dec. 2026	Jan. 2027 - Dec. 2027
OPERATING EXPENSES	*Percentage increase in budget*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*
EXISTING	**Operating expenses** (salaries, insurance, bldg maintenance, professional service, utilities, etc.)	$ 285	$ 294	$ 302	$ 311	$ 321	$ 321	$ 330	$ 340	$ 351	$ 361
ALTERNATIVE #1	**Additional Operating and Maintenance Expenses associated with Alternative**	$ 2,948	$ 3,036	$ 3,128	$ 3,221	$ 3,318	$ 3,418	$ 3,520	$ 3,626	$ 3,734	$ 3,846
	TOTAL OPERATING EXPENSES	**$ 3,233**	**$ 3,330**	**$ 3,430**	**$ 3,533**	**$ 3,639**	**$ 3,738**	**$ 3,850**	**$ 3,966**	**$ 4,085**	**$ 4,208**
	Population Served, 2.17 People per Household 0.00% per yr	87	87	87	87	87	87	87	87	87	87
	Historic/Projected Number of Connections	40	40	40	40	40	40	40	40	40	40
	Historic/Projected Ave Annual Water Consumption Data; 63.8 gpcd for projection	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589
CAPITAL IMPROVEMENTS	**2008 Capital Improvements** / **Estimated Cost** Install pressure transducer/radio telemetry control system with automatic alarm system — $ 55,000 3" PVC Transmission Pipeline — $ 12,600 4" Distribution Pipeline — $ 102,400 Service Connections — $ 30,000 Backup generator — $ 30,000 25 gpm water production well — $ 75,000 30,000 gallon steel storage tank — $ 60,000 Replace existing well pump for higher head — $ 5,000 Basic Engineering, Design fees (10% of construction) — $ 37,000 Project inspection fees (4% of construction) — $ 14,800 NMGRT (5.9375%) — $ 22,000 Land and easement aquisition — $ 27,500 **Total** — **$ 471,300**										
INCOMES	**Operating Income** (water usage fees, connection fees, late charges, membership fees, etc.; projection based on average annual income of app. $240 per connection)	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600
	Investment incomes	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Incomes for Water Fund	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600
LEVEL 1 FINANCIAL STABILITY ANALYSIS	**Total Annual Income**	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600
	Total Annual Expenses, excluding depreciation	$ 3,233	$ 3,330	$ 3,430	$ 3,533	$ 3,639	$ 3,738	$ 3,850	$ 3,966	$ 4,085	$ 4,208
	Net Income (Or Deficit If Negative)	$ 6,367	$ 6,270	$ 6,170	$ 6,067	$ 5,961	$ 5,862	$ 5,750	$ 5,634	$ 5,515	$ 5,392
	Available Fund Balance, end of year	$ 25,117	$ 31,387	$ 37,557	$ 43,624	$ 49,586	$ 55,447	$ 61,197	$ 66,831	$ 72,346	$ 77,738
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & NO RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period** A/P = 0.0672	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671
	Net Income (Or Deficit If Negative)	$ (25,304)	$ (25,401)	$ (25,501)	$ (25,604)	$ (25,710)	$ (25,810)	$ (25,922)	$ (26,037)	$ (26,156)	$ (26,279)
	Available Fund Balance, end of year	$ (291,597)	$ (316,998)	$ (342,499)	$ (368,103)	$ (393,813)	$ (419,623)	$ (445,545)	$ (471,582)	$ (497,739)	$ (524,018)
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period** A/P = 0.0672	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671	$ 31,671
	Addition income from rate increase Monthly Increase per connection = **$ 125.00**	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000
	Net Income (Or Deficit If Negative)	$ 34,696	$ 34,599	$ 34,499	$ 34,396	$ 34,290	$ 34,190	$ 34,078	$ 33,963	$ 33,844	$ 33,721
	Available Fund Balance, end of year	$ 36,732	$ 71,331	$ 105,829	$ 140,225	$ 174,515	$ 208,705	$ 242,784	$ 276,746	$ 310,590	$ 344,311

End of Repayment Period

FINANCIAL ANALYSIS FOR MONTICELL MDWCA WATER SYSTEM IMPROVEMENTS
Alternative #3: 100% Loan, 0% Grant

				Out-Year Budget Forecast									
				Jan. 2008 - Dec. 2008	Jan. 2009 - Dec. 2009	Jan. 2010 - Dec. 2010	Jan. 2011 - Dec. 2011	Jan. 2012 - Dec. 2012	Jan. 2013 - Dec. 2013	Jan. 2014 - Dec. 2014	Jan. 2015 - Dec. 2015	Jan. 2016 - Dec. 2016	Jan. 2017 - Dec. 2017
OPERATING EXPENSES	**CATEGORY**												
	Percentage increase in budget			*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*
EXISTING	**Operating expenses** (salaries, insurance, bldg maintenance, professional service, utilities, etc.)			$ 225	$ 232	$ 239	$ 246	$ 253	$ 253	$ 261	$ 269	$ 277	$ 285
ALTERNATIVE #1	**Additional Operating and Maintenance Expenses associated with Alternative**			$ 2,330	$ 2,400	$ 2,472	$ 2,546	$ 2,622	$ 2,701	$ 2,782	$ 2,866	$ 2,952	$ 3,040
	TOTAL OPERATING EXPENSES			**$ 2,555**	**$ 2,632**	**$ 2,711**	**$ 2,792**	**$ 2,876**	**$ 2,954**	**$ 3,043**	**$ 3,134**	**$ 3,228**	**$ 3,325**
	Population Served, 2.17 People per Household	0.00% per yr		43	43	43	43	43	43	43	43	43	43
	Historic/Projected Number of Connections			20	20	20	20	20	20	20	20	20	20
	Historic/Projected Ave Annual Water Consumption Data; 63.8 gpcd for projection			1,009,796	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795	1,009,795
CAPITAL IMPROVEMENTS	**2008 Capital Improvements**		**Estimated Cost**										
	Install pressure transducer/radio telemetry control system with automatic alarm system		$ 55,000										
	3" PVC Transmission Pipeline		$ 12,600										
	6" Distribution Pipeline		$ 128,000										
	Service Connections		$ 30,000										
	Backup generator		$ 30,000										
	25 gpm water production well		$ 75,000										
	45,000 gallon steel storage tank		$ 90,000										
	Replace existing well pump for higher head		$ 5,000										
	Fire Hydrants		$ 12,000										
	Basic Engineering, Design fees (10% of construction)		$ 43,800										
	Project inspection fees (4% of construction)		$ 17,500										
	NMGRT (5.9375%)		$ 26,000										
	Land and Easement acquisition		$ 27,500										
	Total		**$ 552,400**										
INCOMES	**Operating Income** (water usage fees, connection fees, late charges, membership fees, etc.; projection based on average annual income of app. $240 per connection)			$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800
	Investment incomes			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Incomes for Water Fund			$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800
LEVEL 1 FINANCIAL STABILITY ANALYSIS	**Total Annual Income**			$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800	$ 4,800
	Total Annual Expenses, excluding depreciation			$ 2,555	$ 2,632	$ 2,711	$ 2,792	$ 2,876	$ 2,954	$ 3,043	$ 3,134	$ 3,228	$ 3,325
	Net Income (Or Deficit If Negative)			$ 2,245	$ 2,168	$ 2,089	$ 2,008	$ 1,924	$ 1,846	$ 1,757	$ 1,666	$ 1,572	$ 1,475
	Available Fund Balance, end of year			$ 2,245	$ 4,413	$ 6,503	$ 8,511	$ 10,435	$ 12,281	$ 14,038	$ 15,704	$ 17,275	$ 18,750
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & NO RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period**	A/P =	0.0672	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121
	Net Income (Or Deficit If Negative)			$ (34,876)	$ (34,953)	$ (35,032)	$ (35,113)	$ (35,197)	$ (35,276)	$ (35,364)	$ (35,456)	$ (35,550)	$ (35,646)
	Available Fund Balance, end of year			$ (34,876)	$ (32,708)	$ (67,740)	$ (102,853)	$ (138,050)	$ (173,326)	$ (208,690)	$ (244,145)	$ (279,695)	$ (315,341)
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period**	A/P =	0.0672	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121
	Addition income from rate increase	Monthly Increase per	**$ 147.00**	$ 35,280	$ 35,280	$ 35,280	$ 35,280	$ 35,280	$ 35,280	$ 35,280	$ 35,280	$ 35,280	$ 35,280
	Net Income (Or Deficit If Negative)			$ 404	$ 327	$ 248	$ 167	$ 83	$ 4	$ (84)	$ (176)	$ (270)	$ (366)
	Available Fund Balance, end of year			$ 404	$ 731	$ 979	$ 1,146	$ 1,229	$ 1,233	$ 1,149	$ 973	$ 704	$ 337

FINANCIAL ANALYSIS FOR MONTICELL MDWCA WATER SYSTEM II
Alternative #3: 100% Loan, 0% Grant

	CATEGORY	Jan. 2018 - Dec. 2018	Jan. 2019 - Dec. 2019	Jan. 2020 - Dec. 2020	Jan. 2021 - Dec. 2021	Jan. 2022 - Dec. 2022	Jan. 2023 - Dec. 2023	Jan. 2024 - Dec. 2024	Jan. 2025 - Dec. 2025	Jan. 2026 - Dec. 2026	Jan. 2027 - Dec. 2027
OPERATING EXPENSES	***Percentage increase in budget***	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*	*3.00%*
EXISTING	**Operating expenses** (salaries, insurance, bldg maintenance, professional service, utilities, etc.)	$ 285	$ 294	$ 302	$ 311	$ 321	$ 321	$ 330	$ 340	$ 351	$ 361
ALTERNATIVE #1	**Additional Operating and Maintenance Expenses associated with Alternative**	$ 2,948	$ 3,036	$ 3,128	$ 3,221	$ 3,318	$ 3,418	$ 3,520	$ 3,626	$ 3,734	$ 3,846
	TOTAL OPERATING EXPENSES	**$ 3,233**	**$ 3,330**	**$ 3,430**	**$ 3,533**	**$ 3,639**	**$ 3,738**	**$ 3,850**	**$ 3,966**	**$ 4,085**	**$ 4,208**
	Population Served, 2.17 People per Household 0.00% per yr	87	87	87	87	87	87	87	87	87	87
	Historic/Projected Number of Connections	40	40	40	40	40	40	40	40	40	40
	Historic/Projected Ave Annual Water Consumption Data; 63.8 gpcd for projection	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589	2,019,589
CAPITAL IMPROVEMENTS	**2008 Capital Improvements** — **Estimated Cost** Install pressure transducer/radio telemetry control system with automatic alarm system — $ 55,000 3" PVC Transmission Pipeline — $ 12,600 6" Distribution Pipeline — $ 128,000 Service Connections — $ 30,000 Backup generator — $ 30,000 25 gpm water production well — $ 75,000 45,000 gallon steel storage tank — $ 90,000 Replace existing well pump for higher head — $ 5,000 Fire Hydrants — $ 12,000 Basic Engineering, Design fees (10% of construction) — $ 43,800 Project inspection fees (4% of construction) — $ 17,500 NMGRT (5.9375%) — $ 26,000 Land and Easement acquisition — $ 27,500 **Total — $ 552,400**										
INCOMES	**Operating Income** (water usage fees, connection fees, late charges, membership fees, etc.; projection based on average annual income of app. $240 per connection)	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600
	Investment incomes	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Incomes for Water Fund	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600
LEVEL 1 FINANCIAL STABILITY ANALYSIS	**Total Annual Income**	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600	$ 9,600
	Total Annual Expenses, excluding depreciation	$ 3,233	$ 3,330	$ 3,430	$ 3,533	$ 3,639	$ 3,738	$ 3,850	$ 3,966	$ 4,085	$ 4,208
	Net Income (Or Deficit If Negative)	$ 6,367	$ 6,270	$ 6,170	$ 6,067	$ 5,961	$ 5,862	$ 5,750	$ 5,634	$ 5,515	$ 5,392
	Available Fund Balance, end of year	$ 25,117	$ 31,387	$ 37,557	$ 43,624	$ 49,586	$ 55,447	$ 61,197	$ 66,831	$ 72,346	$ 77,738
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & NO RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period** A/P = 0.0672	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121
	Net Income (Or Deficit If Negative)	$ (30,754)	$ (30,851)	$ (30,951)	$ (31,054)	$ (31,160)	$ (31,260)	$ (31,372)	$ (31,487)	$ (31,606)	$ (31,729)
	Available Fund Balance, end of year	$ (346,096)	$ (376,947)	$ (407,898)	$ (438,952)	$ (470,112)	$ (501,372)	$ (532,744)	$ (564,231)	$ (595,837)	$ (627,566)
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period** A/P = 0.0672	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121	$ 37,121
	Addition income from rate increase Monthly Increase per **$ 147.00**	$ 70,560	$ 70,560	$ 70,560	$ 70,560	$ 70,560	$ 70,560	$ 70,560	$ 70,560	$ 70,560	$ 70,560
	Net Income (Or Deficit If Negative)	$ 39,806	$ 39,709	$ 39,609	$ 39,506	$ 39,400	$ 39,300	$ 39,188	$ 39,073	$ 38,954	$ 38,831
	Available Fund Balance, end of year	$ 40,143	$ 79,852	$ 119,461	$ 158,966	$ 198,366	$ 237,667	$ 276,855	$ 315,928	$ 354,881	$ 393,713

End of Repayment Period

FINANCIAL ANALYSIS FOR MONTICELLO MDWCA WATER SYSTEM IMPROVEMENTS
Alternative #1: 100% Loan, 0% Grant

				Out-Year Budget Forecast								
OPERATING EXPENSES	**CATEGORY**			**Jan. 2008 - Dec. 2008**	**Jan. 2009 - Dec. 2009**	**Jan. 2010 - Dec. 2010**	**Jan. 2011 - Dec. 2011**	**Jan. 2012 - Dec. 2012**	**Jan. 2013 - Dec. 2013**	**Jan. 2014 - Dec. 2014**	**Jan. 2015 - Dec. 2015**	**Jan. 2016 - Dec. 2016**
	Percentage increase in budget			***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***	***3.00%***
EXISTING	**Operating expenses** (salaries, insurance, bldg maintenance, professional service, utilities, etc.)			$ 225	$ 232	$ 239	$ 246	$ 253	$ 253	$ 261	$ 269	$ 277
ALTERNATIVE #1	**Additional Operating and Maintenance Expenses associated with Alternative**			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	TOTAL OPERATING EXPENSES			**$ 225**	**$ 232**	**$ 239**	**$ 246**	**$ 253**	**$ 253**	**$ 261**	**$ 269**	**$ 277**
	Population Served, 2.17 People per Household	0.00% per yr		13	13	13	13	13	13	13	13	13
	Historic/Projected Number of Connections			6	6	6	6	6	6	6	6	6
	Historic/Projected Ave Annual Water Consumption Data; 63.8 gpcd for projection			302,939	302,938	302,938	302,938	302,938	302,938	302,938	302,938	302,938
CAPITAL IMPROVEMENTS	**2008 Capital Improvements**		**Estimated Cost**									
	Install 300-gal pressure tank system		$ 8,000									
	Service Connections		$ 4,500									
	3" Distribution Pipeline		$ 8,400									
	Basic engineering, design fees (30% of construction)		$ 5,000									
	NMGRT (5.9375%)		$ 1,500									
	Total		**$ 27,400**									
INCOMES	**Operating Income** (water usage fees, connection fees, late charges, membership fees, etc.; projection based on average annual income of app. $240 per connection)			$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440
	Investment incomes			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Incomes for Water Fund			$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440
LEVEL 1 FINANCIAL STABILITY ANALYSIS	**Total Annual Income**			$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440	$ 1,440
	Total Annual Expenses, excluding depreciation			$ 225	$ 232	$ 239	$ 246	$ 253	$ 253	$ 261	$ 269	$ 277
	Net Income (Or Deficit If Negative)			$ 1,215	$ 1,208	$ 1,201	$ 1,194	$ 1,187	$ 1,187	$ 1,179	$ 1,171	$ 1,163
	Available Fund Balance, end of year			$ 1,215	$ 2,423	$ 3,625	$ 4,819	$ 6,005	$ 7,192	$ 8,371	$ 9,543	$ 10,706
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & NO RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period**	A/P =	0.0672	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841
	Net Income (Or Deficit If Negative)			$ (626)	$ (633)	$ (640)	$ (647)	$ (655)	$ (655)	$ (662)	$ (670)	$ (678)
	Available Fund Balance, end of year			$ (626)	$ 582	$ (58)	$ (705)	$ (1,360)	$ (2,014)	$ (2,676)	$ (3,346)	$ (4,024)
LEVEL 2 FINANCIAL STABILITY ANALYSIS INCOME - W/ NEW DEBT & RATE INCREASE	**Annual debt payment starting in 2008, 3% interest rate and 20-yr loan period**	A/P =	0.0672	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841	$ 1,841
	Addition income from rate increase	Monthly Increase per	**$ 9.75**	$ 702	$ 702	$ 702	$ 702	$ 702	$ 702	$ 702	$ 702	$ 702
	Net Income (Or Deficit If Negative)			$ 76	$ 69	$ 62	$ 55	$ 47	$ 47	$ 40	$ 32	$ 24
	Available Fund Balance, end of year			$ 76	$ 145	$ 207	$ 262	$ 309	$ 357	$ 396	$ 428	$ 452