Northern New Mexico Stockman's Association

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The Future of Livestock Grazing on New Mexico's National Forests
Northern New Mexico Stockman's Association

Canjilon Allotment
Assessment 2023

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CANJILON ALLOTMENT

Area: 42,626 acres
22,146 grazeable acres

Number of Allotment Owners: 11

Total Permitted Livestock: 468 head
Possible Stocking Rate: 2,725 head (based on 40% use of 2023 forage production)

Allotment is permitted at 17% of actual carrying capacity.
Permitted livestock are consuming 6.9% of allowable use forage.

Transects:
Lower Lopez Canyon
Mesa Montosa
Mesa Juan Domingo
Los Fuertes
Montoya

Monitoring dates:
5/19/23
6/13/23
8/1/23
10/19/23

Data Collection Participants:
Dr. Cristóbal Valencia (PI)
Dr. Casey Spackman (Co-PI)
Donald Martinez (Co-PI/Producer)
Moises Morales (Producer)
Benjamin Leyba (Producer)
Carlos Salazar (Producer)
Cornelio Salazar (Producer)
Levi Lucero (Producer)

Methodology: Qualitative data was systematically gathered using ethnographic methods: face-to-face accompaniment in diverse social, political, and economic contexts of everyday life (Valencia 2015). The Project Team conducted participant-observation (DeWalt and DeWalt 2002) prior to livestock entry, during livestock grazing, and after livestock exit. The Project Team also attended cattle association meetings, annual feast days, fiestas, local county fair events, and meetings between producers and management agencies. During participant-observation the Project Team paid close attention to producers' descriptions, interpretations, and explanations of rangeland conditions and impacts on their livestock operations. The Project Team also focused on ranchers' management practices and decision-making processes. Dr. Valencia kept ethnographic field notes (Emerson et al. 2011) of participant-observation, recording what is meaningful and important to producers, how producers grapple with sustainability, how understandings of conditions and impacts emerge and change over time, and what knowledge ranchers rely on to make assessments and management decisions. Dr. Valencia also conducted structured and unstructured interviews (Warren and Karner 2015, Brinkmann 2013, Weiss 2004) with producers focusing on their descriptions, interpretations, and explanations of climate and rangeland conditions and impacts on livestock operations. Additionally, the Project Team conducted participatory mapping exercises (Robinson et al. 2016) with producers to plot forage, water, and wildlife observations. The Project Team also used visual and audio methods to record qualitative data (Warren and Karner 2015).

Objective: Qualitative data produces culturally situated understandings of rangeland conditions and impacts on livestock operations. It supports the development of better management targets and more inclusive decision-making processes.

SUMMARY

- Utilization for the 2023 grazing season exceeded the allocated 40 percent use guideline. Utilization in 2023 was 71.7%.
- Permitted livestock are consuming 6.9% of allowable use forage.
- Allotment is permitted at 17% of actual carrying capacity.
- Brush treatments have been ineffective and increased bare ground.
- Brush is using water and choking out grass.
- Water issues are related to water infrastructure.
- Increasing numbers of elk decrease and destroy forage for livestock.
- Increased numbers of mountain lions are killing livestock.
- Livestock often miss out on the best grass due to rotation in place.
- Seasonally deferred or resting pastures benefit elk not livestock.
- Road and fence conditions prohibit producers ability to access, maintain, and utilize key areas.
- A lack of sheep and horse permits prohibit producers from spending more time on the allotment.

CONDITIONS

There is very little pasture area throughout the allotment. Bareground and brush dominate limiting livestock grazing and creating a fire hazard. Livestock must move through a maze of brush. for a bit of grass. Precipitation is consistent throughout the grazing season. Rainfall throughout the grazing season is between 3.07 inches and 4.07 inches. Micro-climate differences between the high country and lower key areas are 1.25inches over the grazing season. However, brush is using water and choking out grass. The water quality in the VIDAL TANQUE and in the MONTOYA TANQUE were of concern. The lab analysis showed extremely high iron likely due to improper equipment function resulting in increased microbial growth and biofilm buildup in watering equipment. High iron in drinking water may also reduce water intake which can directly reduce feed intake or milk production. This water may impart an off-taste to the meat of young animals (e.g., veal calves) or to milk. Excess absorbed iron from drinking water can lead to cellular oxidative stress, can inhibit copper and zinc absorption, and reduced growth or production. Producers are advised to seek professional advice regarding use of this water for livestock. The lab also showed that manganese was extremely high likely due to improper equipment functions resulting in increased microbial growth and biofilm buildup rather than specific livestock health problems. Manganese may impart an off-taste to meat of young animals (e.g., veal calves). Finally, the lab showed that water from both of these sources and the LOPEZ CANYON TANK were brackish with NO direct effect on drinking water safety or animal health. However, brackish water can cause scale buildup and clogging of pipes and drinkers, leading to reduced water consumption and associated problems. Producers are paying 5% of the costs under a NRCS program to clean water sources. tanks.

Elk are abundant and detrimental to grass. Increased elk beds in key pastures such as FUERTES (left) and MONTOYA damage forage. A wildlife camera on FUERTES showed deer and elk beating livestock to the grass and establishing themselves on pastures, remaining throughout the day and the night including after livestock re-enter in the mornings. Wildlife cameras on MESA MONTOSA show elk grazing throughout the night. Elk are grazing before, after, and during livestock presence day and night throughout the allotment. Elk are grazing "resting" pastures. When you rest a pasture elk are the beneficiares. Elk trampling and waste destroy forage by trampling. Increased predator wildlife like mountain lions kill livestock. Elk are destroying riparian areas and using the water.

PRODUCER PRACTICES

- Self-imposed proactive rotation system: 1st month of May half of the livestock are put on MESA MONTOSA and half on JUAN DOMINGO. Livestock are moved to LOPEZ for June and July, to MONTOYA for July and August, and to FUERTES from August to October.
- Grazing starts at the lower elevations due to winter conditions and the possible presence of larkspur.
- Producers delay use of key pastures where forage is abundant such as FUERTES due to elk use.
- Livestock must be moved onto "resting patures" more often because of dry conditions.
- Producers pay the cost of water quality maintenance with 1-2 calves each year.
- Producers graze two portions of the allotment at a time due to dry conditions.
- Producers keep livestock out of riparian areas.
- At some point producers will have to begin ignoring USFS guidelines in order to survive.
- Producers are being proactive to keep livestock on the allotment.

PRODUCER RECOMMENDATIONS

- Extend grazing by returning livestock to MESA JUAN DOMINGO and MESA del MEDIO if there is water at the end of the season.
- Increase stocking rate based on grass production within limitations of producers winter feeding capacities.

- Use data to insist that NM Game & Fish contribute more or provide funds for cleaning water sources, repairing fence, and salting, especially since elk are using the largest percentage of grass.
- Address roads.
- Allow producers access to make repairs.
- Recuperate and reintegrate MARTINEZ CANYON in to the CANJILON ALLOTMENT.

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The following information is a summary of the data collected over the 2023 grazing season. Data was collected using the Rapid Assessment Methodology (RAM; Spackman et al., 2022). Summaries were produced using the Rangeland Data Analysis and Record program (RaDAR; rangelandradar.app) and include individual pasture assessments and the allotment averages for each collection period. This is a single year of data and should not be used to make long-term management decisions or increases/decreases in stocking rates. Multiple years of monitoring is required (minimum of 3-5 years) to begin developing management decisions (Holecheck et al., 2011). An explanation of report contents is explained below.

Biomass Availability (also called standing crop or production residuals) is the amount of vegetation, expressed as a weight per area, present during a given point in time, not excluded from grazing activity. Five clippings were taken along the transect, dried, and weighed. The five weights were then converted to pounds per acre based on a 0.96 ft^2 hoop and averaged to obtain biomass availability +/- standard error (variability in weights). It can be used as a grazing intensity guide during the season, if location and number of samples are representative of the landscape, to make temporary adjustments in livestock distribution.

Annual Forage Production is plant material collected from grazing exclusion cages, expressed as a weight per area, and used to assess forage production for an entire year. This an estimate of what the land can produce without grazing. Three cages were placed near each transect at the beginning of the grazing season. Samples were collected at the end of the season by clipping forage within a 0.96 ft^2 hoop, which was placed in the middle of each cage. Each sample was subsequently dried, weighed and converted to pounds per acre. The three clippings were averaged and a standard error calculated.

Estimated Stocking Rate is the calculation of animal unit equivalents (AUE) that the allotment could support for a duration of one month (AUM). Mid-season stocking rates were not calculated as stocking rates can only be estimated from annual forage production. Furthermore, individual pasture stocking rates were not calculated as grazable acres were only known for the whole allotment. Estimates are based upon the average collected annual forage production across the allotment, forest service provided grazable acres (pasture size in report), cattle forage demand of 26 pounds per day (SRM 1998), a conservative 40 percent forage use allocation (Holechek & Galt 2000), and a 30 day grazing period (Holecheck et al., 2011; Vallentine 2001). The AUM calculation equation is:

$$\frac{(annual\ production\ \times\ grazable\ acres\ \times\ use\ allocation)}{animal\ forage\ demand\ \times 30\ days} = AUM$$

Percent Cover is the proportion of the ground surface that is covered by vegetation, litter, rocks, bare soil, or other attributes. It is used to assess distribution and composition of different material covering the ground. The assessment was done along a transect using the step-point method. At each step basal cover was recorded at the tip of the boot until 100 readings were taken. Each cover type was summed to give a percent. Percent cover is slow to change and should be looked at over several years (5 to 10 years) to provide insights about vegetation density, potential erosion, and livestock management (Holechek et al., 2011).

Vegetation Cover – Grasses is the percentage of grasses (grazing forage) by common name and scientific abbreviation (symbol) based on the amount of percent cover of vegetation along the transect. The percentage provides the land manager with species forage composition and diversity. Furthermore, changes in composition can be used as an indicator of grazing impact and vegetation trends over time.

Other Vegetation Cover is the percentage of vegetation that are not grasses based on percent cover of vegetation along the transect. This is similar to vegetation cover – grasses and can also be used as an indicator of forage and habitat for wildlife.

Forage Composition is the percentage of all grass species found along the transect even if cover was not vegetation; where nearest grass species was recorded on the datasheet. Additionally, height of each species is recorded by extending leaves upward and recording the average leaf lengths of all leaves. This provides and inventory and relative abundance (vegetation cover) or diversity of all grasses including their stubble heights. It identifies the specific combination and distribution of different species and helps assess the overall forage biodiversity within the plant community. Furthermore, the stubble heights give an estimate of grazing intensity and potential insight to make mid-season adjustments to grazing strategies (i.e., animal distribution and duration). Species are listed by their common name, scientific abbreviation (symbol), percent, with the addition of height and their minimum height grazing guideline (Holechek and Galt 2000).

Fecal Counts are used to estimate and monitor relative presence or absence of animals. It is not used to assess animal abundance but can be used generally as an indicator of increases or decreases in animal visitations over time (years).

Photos are used as a qualitative assessment to support quantitative information. They can be used as an illustrative record of the conditions that occurred at a given point in time. Ground photos when accompanied with a scaled ruler can be used to quantify cover or species composition, but are limited unless multiple ground photos are taken. Landscape photos can be used to demonstrate grazing intensity and correlated to the quantitative data.

Utilization

A summary of production and utilization is provided at the end of the reports (Table 1). Utilization is a guide and should not be used as a standard or threshold for range management decisions (SRM-RAMC 2018; Ruyle et al., 2007). Conservative grazing (30-40 percent utilization) is the recommended in the southwest to sustain or improve rangeland conditions an optimize livestock productivity (Holechek and Galt 2000). The following equation was used to calculate percent utilization:

$$\frac{(annual\ production\ -\ available\ biomass)}{annual\ production} \times 100\ = percent\ utilization$$

Physical Constraint of Animal Intake

Utilization is a very useful guide when all grazing species are accounted for. When multiple grazing species or uncontrolled grazers such as wildlife are present, it becomes difficult if not

impossible to determine how much each species has consumed in relation to utilization. This concept, known as resource partitioning, is an ongoing issue for rangeland managers. Currently there is no direct measurement to partition use on rangelands. However, forage intake of range cattle has been extensively researched (Vallentine 1990, McKown et al., 1991, and Holechek et al 2011) and a 1,000-pound mature cow consumes on average 26 pounds of dry forage per day (SRM 1998). Intake can vary depending on other factors such as reproductive status or environmental conditions but the scientifically accepted intake is between 2 and 2.6 percent of the animals body weight (NASEM 2016). Thus, a physical constraint of intake model can be used to calculate approximate cattle use on rangelands. This calculation uses the stocking rate equation, described previously, rearranging the parameters to solve for the desired utilization rather than animal units. It is worth noting that this is a calculation, not a direct measurement of utilization, and should be used as an approximate use level by cattle. A calculated estimate of cattle use can be found in Table 2. The equation used was:

$$\frac{(animal\ demand\ \times\ grazing\ duration\ \times\ permitted\ animals)}{(animal\ production\ \times\ grazable\ acres)} \times 100\ = percent\ utilization$$

Similarly, the equation can be rearranged to determine how much an individual animal would consume daily (animal demand) to account for the observed utilization level. This equation helps determines if there is any disparity between physical constraint of intake and the observed utilization level on the allotment. Excess intake above 26 pounds can be contributed to other grazing animals and environmental influences.

$$\frac{(annual\ production\ \times grazable\ acres\ \times observed\ utilization)}{(grazing\ duration\ \times permitted\ animals} = animal\ demand\ or\ daily\ intake$$

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RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Fuertes**	
Date:	**8/1/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.51381, -106.377**	**(273°)**

Notes: lots of elk beds and droppings adjacent to transect

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
2371.4 ± 513.7 lbs per acre	22146 acres	n/a AUM	n/a n/a

Percent Cover

Bare Ground	15
Litter	35
Vegetation	49
Rock (>3/4")	1
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
West. Wheatgrass	AGSM	33
Brome spp.	Brome	6
Sleepygrass	ACRO	6
Interm. Wheatgrass	AGIN	1
		46

Other Vegetation Cover

Common Name	*Percent*
Forb Unknown	2
Yarrow	1
	3

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
West. Wheatgrass	AGSM	77	8.1	2.5
Brome spp.	Brome	10	4.5	4
Sleepygrass	ACRO	8	8.1	8
Foxtail Barley	HOJU	3	5.3	
Interm. Wheatgrass	AGIN	2	6.0	4
		100	7.7	

Fecal Counts

Horse	0	Elk	10	Cattle	1	Deer	1	

Photos

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Fuertes**	
Date:	**10/19/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.51381, -106.377**	**(273°)**

Notes: 0.22 inches precipitation

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
788.6 ± 114.5 lbs per acre	22146 acres	n/a AUM	1886.7 ± 370 lbs per acre

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	7	Kentucky Bluegrass	POPR	5	Forb Unknown	5
Litter	78	West. Wheatgrass	AGSM	2		
Vegetation	15	Interm. Wheatgrass	AGIN	2		
Rock (>3/4")	0	Needlegrass	STIPA	1		
	100			10		5

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
West. Wheatgrass	AGSM	49	4.3	2.5	
Kentucky Bluegrass	POPR	23	2.1	2.5	Below Minimum Height
Interm. Wheatgrass	AGIN	9	5.5	4	
Needlegrass	STIPA	9	8.1	4	
Sedge	Carex	7	5.4	1.5	
		97	4.4		

Fecal Counts

Horse	0	Elk	5	Cattle	10	Deer	0

Photos


Canyon Allotment
Fuertes Pasture
10-19-2023


Canyon Allotment
Fuertes Pasture
10-19-2023

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Montoya**	
Date:	**8/1/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.49167, -106.38**	**(85°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
485.8 ± 19.6 lbs per acre	22146 acres	n/a AUM	n/a n/a

Percent Cover

Bare Ground	2
Litter	5
Vegetation	93
Rock (>3/4")	0
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
West. Wheatgrass	AGSM	45
Kentucky Bluegrass	POPR	26
Grass Unknown	GUNK	17
Interm. Wheatgrass	AGIN	1
		89

Other Vegetation Cover

Common Name	*Percent*
Yarrow	4
	4

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
West. Wheatgrass	AGSM	48	9.1	2.5	
Kentucky Bluegrass	POPR	27	7.1	2.5	
Grass Unknown	GUNK	24	8.2		
Interm. Wheatgrass	AGIN	1	2.5	4	Below Minimum Height
		100	8.3		

Fecal Counts

Horse	0	Elk	0	Cattle	5	Deer	0

Photos

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Montoya**	
Date:	**10/19/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.49167, -106.38**	**(85°)**

Notes:
0.22 inches precipitation
heavy use of POPR observed (Elk suspected)

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
478.4 ± 128 lbs per acre	22146 acres	n/a AUM	2021.3 ± 490 lbs per acre

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	35	Kentucky Bluegrass	POPR	14	Forb Unknown	8
Litter	38	West. Wheatgrass	AGSM	3		
Vegetation	25					
Rock (>3/4")	2					
	100			17		8

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Kentucky Bluegrass	POPR	62	2.6	2.5
West. Wheatgrass	AGSM	38	3.6	2.5
		100	3.0	

Fecal Counts

Horse	0	Elk	21	Cattle	6	Deer	0		

Photos

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Mesa Montosa**	
Date:	**8/1/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.38539, -106.4271**	**(269°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
206.4 ± 87.7 lbs per acre	22146 acres	n/a AUM	n/a n/a

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	47	Blue Grama	BOGR	13	Big Sagebrush	4
Litter	27	Squirreltail	ELEL	6		
Vegetation	25	Sedge	Carex	1		
Rock (>3/4")	0	West. Wheatgrass	AGSM	1		
	100			21		4

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Blue Grama	BOGR	51	2.0	1.5
Sedge	Carex	21	3.6	1.5
West. Wheatgrass	AGSM	14	5.6	2.5
Squirreltail	ELEL	12	7.3	4
Grass Unknown	GUNK	2	5.8	
		100	3.6	

Fecal Counts

Horse	0	Elk	0	Cattle	0	Deer	0	

Photos

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Mesa Montosa**	
Date:	**10/19/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.38539, -106.4271**	**(269°)**

Notes:
0.14 inches precipitation
0

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
173.8 ± 52.6 lbs per acre	22146 acres	n/a AUM	966.3 ± 390 lbs per acre

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	54	Blue Grama	BOGR	8	Big Sagebrush	3
Litter	34	Sedge	Carex	1		
Vegetation	12					
Rock (>3/4")	0					
	100			9		3

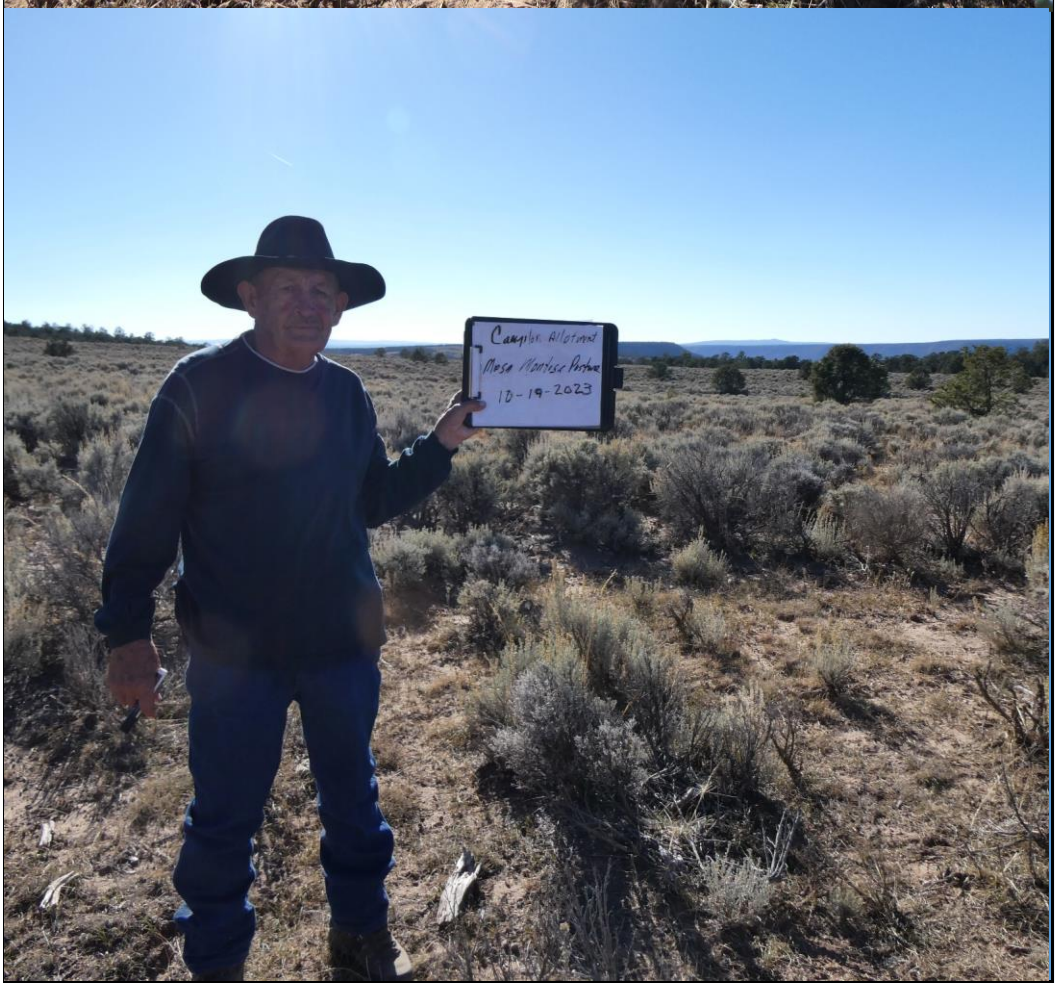
Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Blue Grama	BOGR	59	2.7	1.5
West. Wheatgrass	AGSM	14	7.6	2.5
Sedge	Carex	12	4.6	1.5
Squirreltail	ELEL	12	6.5	4
Crested Wheatgrass	AGCR	1	6.0	2.5
Junegrass	KOCR	1	5.0	2.5
		99	4.2	

Fecal Counts

Horse	0	Elk	0	Cattle	0	Deer	0

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Juan Domingo**	
Date:	**8/1/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.42372, -106.4114**	**(280°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
356.2 ± 154.4 lbs per acre	22146 acres	n/a AUM	n/a n/a

Percent Cover

Bare Ground	57
Litter	4
Vegetation	38
Rock (>3/4")	0
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
Blue Grama	BOGR	31
West. Wheatgrass	AGSM	8
		38

Other Vegetation Cover

Common Name	*Percent*
	0

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Blue Grama	BOGR	64	1.5	1.5	Below Minimum Height
West. Wheatgrass	AGSM	34	4.6	2.5	
Indian Ricegrass	ORHY	1	10.0	4	
		100	2.7		

Fecal Counts

Horse	0	Elk	1	Cattle	6	Deer	0

Photos

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Juan Domingo**	
Date:	**10/19/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.42372, -106.4114**	**(280°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
258.8 ± 51.2 lbs per acre	22146 acres	n/a AUM	1470.0 ± 120 lbs per acre

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	53	Blue Grama	BOGR	24	Forb Unknown	3
Litter	15	Needle and Thread	STCO	4		
Vegetation	32	West. Wheatgrass	AGSM	1		
Rock (>3/4")	0					
	100			29		3

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Blue Grama	BOGR	63	2.8	1.5
West. Wheatgrass	AGSM	26	5.8	2.5
Needle and Thread	STCO	8	7.1	4
Indian Ricegrass	ORHY	3	11.3	4
		100	4.2	

Fecal Counts

Horse	0	Elk	0	Cattle	0	Deer	1	

Photos

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Lower Lopez**	
Date:	**8/1/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.44878, -106.4146**	**(130°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
566.0 ± 173.5 lbs per acre	22146 acres	n/a AUM	n/a

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	61	West. Wheatgrass	AGSM	34		
Litter	2	Blue Grama	BOGR	1		
Vegetation	37	Smooth Brome	BRIN	1		
Rock (>3/4")	0	Indian Ricegrass	ORHY	1		
	100			37		0

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
West. Wheatgrass	AGSM	91	4.8	2.5
Blue Grama	BOGR	4	2.0	1.5
Smooth Brome	BRIN	3	6.7	4
Indian Ricegrass	ORHY	2	9.0	4
		100	4.9	

Fecal Counts

Horse	0	Elk	0	Cattle	4	Deer	0		

Photos

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**Lower Lopez**	
Date:	**10/19/2023**	**Collector Names:**	**NNMSA, FS**	
Transect Number:	**1**	**GPS Coordinates:**	**36.44878, -106.4146**	**(130°)**

Notes: 0.17 inches precipitation

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
343.0 ± 100.8 lbs per acre	22146 acres	n/a AUM	852.7 ± 80 lbs per acre

Percent Cover

Bare Ground	74
Litter	6
Vegetation	20
Rock (>3/4")	0
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
Crested Wheatgrass	AGCR	11
Smooth Brome	BRIN	5
West. Wheatgrass	AGSM	4
		20

Other Vegetation Cover

Common Name	*Percent*
	0

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Crested Wheatgrass	AGCR	57	4.6	2.5
Smooth Brome	BRIN	23	4.8	4
West. Wheatgrass	AGSM	20	6.2	2.5
		100	5.0	

Fecal Counts

Horse	0	Elk	2	Cattle	0	Deer	0

Photos


Canyon Allotment
Lower Lopez/Astor
10-19-2023


Canyon Allotment
Lower Lopez/Astor
10-19-2023

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**n/a**	
Date:	**8/1/2023**	**Collector Names:**	**n/a**	
Transect AVERAGES	**1,2,3,4,5**	**GPS Coordinates:**	**n/a**	**n/a**

Notes: **AVERAGES**

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
797.2 ± 193.1 lbs per acre	22146 acres	n/a AUM	n/a

Percent Cover

Bare Ground	30
Litter	18
Vegetation	52
Rock (>3/4")	0
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
West. Wheatgrass	AGSM	26
Blue Grama	BOGR	9
Kentucky Bluegrass	POPR	6
Grass Unknown	GUNK	4
Squirreltail	ELEL	1
Brome spp.	Brome	1
		47

Other Vegetation Cover

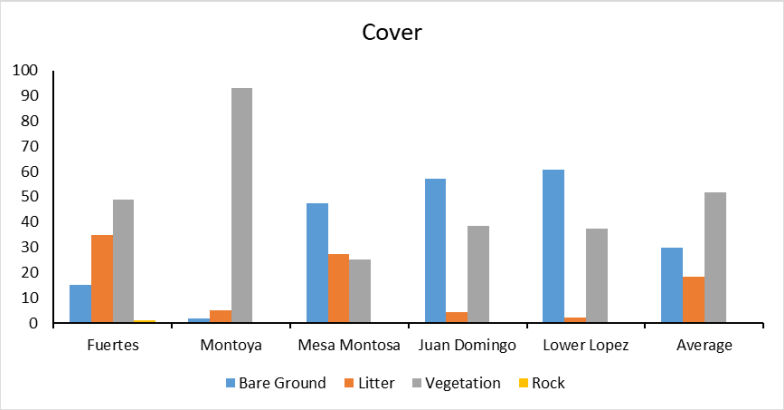
Common Name	*Percent*
Yarrow	1
Big Sagebrush	1
Forb Unknown	0
	2

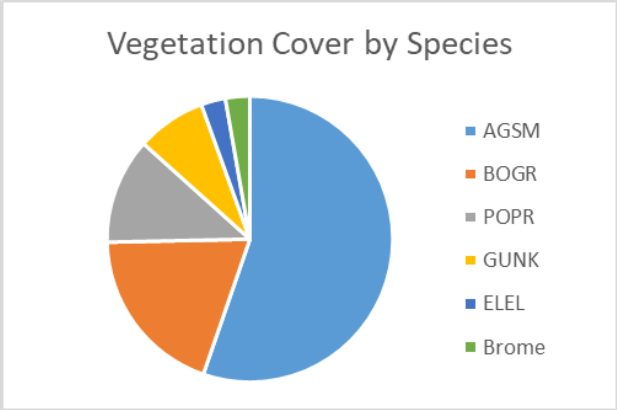
Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
West. Wheatgrass	AGSM	54	6.6	2.5
Blue Grama	BOGR	23	1.7	1.5
Kentucky Bluegrass	POPR	6	7.1	2.5
Grass Unknown	GUNK	5	8.0	
Sedge	Carex	4	3.6	1.5
Squirreltail	ELEL	2	7.3	4
		94	5.5	

Fecal Counts

Horse	0	Elk	11	Cattle	16	Deer	1	0





RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Canjilon**	**Pasture Name:**	**n/a**	
Date:	**10/19/2023**	**Collector Names:**	**n/a**	
Transect AVERAGES	**1,2,3,4,5**	**GPS Coordinates:**	**n/a**	**n/a**

Notes: **AVERAGES**

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
408.5 ± 58.5 lbs per acre	22146 acres	16347.2 AUM	1439.4 ± 205.5 lbs per acre

Percent Cover

Bare Ground	37
Litter	41
Vegetation	21
Rock (>3/4")	1
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
Blue Grama	BOGR	6
Kentucky Bluegrass	POPR	4
Crested Wheatgrass	AGCR	2
West. Wheatgrass	AGSM	2
Smooth Brome	BRIN	1
Needle and Thread	STCO	1
		16

Other Vegetation Cover

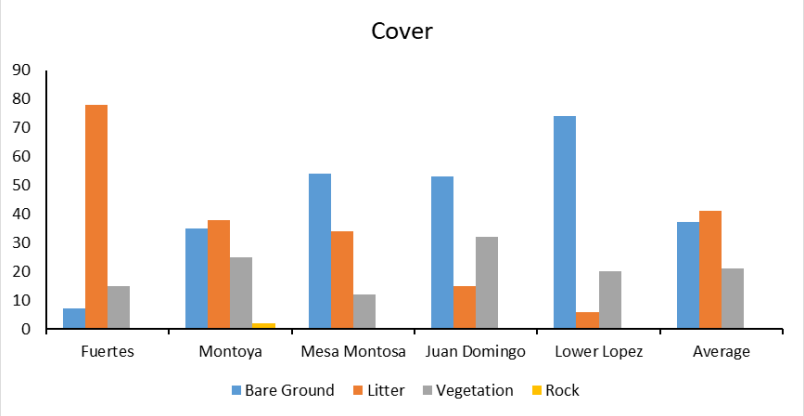
Common Name	*Percent*
Forb Unknown	3
Big Sagebrush	1
	4

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
West. Wheatgrass	AGSM	29	4.9	2.5	
Blue Grama	BOGR	24	2.8	1.5	
Kentucky Bluegrass	POPR	17	2.5	2.5	Below Minimum Height
Crested Wheatgrass	AGCR	12	4.6	2.5	
Smooth Brome	BRIN	5	4.8	4	
Sedge	Carex	4	4.9	1.5	
		91	4.1		

Fecal Counts

Horse	0	Elk	28	Cattle	16	Deer	1	0



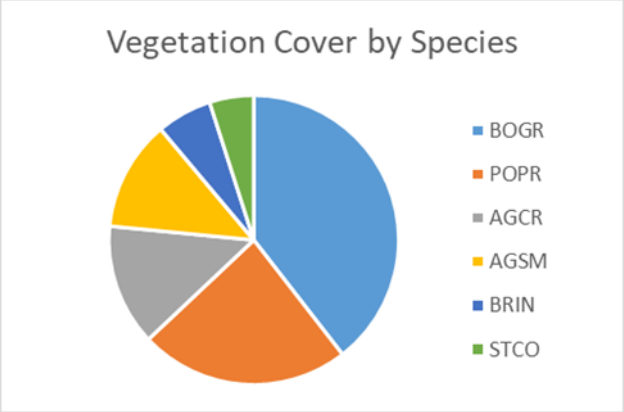


Table 1. Canjilon Allotment Production and Use				
	Mid-Year Biomass (lbs/acre)	Year-End Biomass (lbs/acre)	Annual Production (lbs/acre	Utilization as a Percent
Lower Lopez	566.0 ± 173.5	343.0 ± 100.8	852.7 ± 80.0	59.7
Montoya	485.8 ± 19.6	478.4 ± 128.0	2021.3 ± 490.0	76.3
Fuertes	2371.4 ± 513.7	788.6 ± 114.5	1886.7 ± 370.0	58.2
Juan Domingo	356.2 ± 154.4	258.8 ± 51.2	1470.0 ± 120.0	82.4
Mesa Montosa	206.4 ± 87.7	173.8 ± 52.6	966.3 ± 390.0	82.0
Averages	797.2 ± 193.1	408.5 ± 58.5	1439.4 ± 205.5	71.7 ± 5.3

Table 2. Canjilon Allotment Physical Constraint of Cattle Intake				
	Observed Utilization as a Percent	Cattle Utilization as a Percent	Other Utilization as a Percent	Cow Intake for Observed Utilization (pounds/day)
Allotment Average	71.7	6.9	64.8	271.3

Canjilon Allotment Precipitation Record 2023

Elevation	Key Area	Date	Inches
8562 ft.	Fuertes	6/13/2023	hang
		8/21/2023	1.75
		8/31/2023	0.15
		9/15/2023	1
		9/17/2023	0.4
		9/24/2023	0.55
		10/19/2023	0.22
	Total		**4.07**
8606 ft.	Montoya	6/13/2023	hang
		8/1/2023	rehang
		8/21/2023	0.3
		8/31/2023	0.38
		9/15/2023	1
		9/17/2023	0.5
		9/24/2023	1
		10/19/2023	0.22
	Total		**3.4**
7630 ft.	Lower Lopez	6/13/2023	hang
		8/22/2023	0.5
		8/31/2023	0.25
		9/14/2023	0.7
		9/17/2023	0.9
		9/24/2023	0.55
		10/19/2023	0.17
	Total		**3.07**

Elevation	Key Area	Date	Inches
7961 ft.	Juan Domingo	8/1/2023	hang
		8/22/2023	0.6
		8/31/2023	0.32
		9/14/2023	0.6
		9/17/2023	0.75
		9/24/2023	0.45
		10/19/2023	0.03
	Total		**2.75**
7906 ft.	Mesa Montosa	8/1/2023	hang
		8/22/2023	0.95
		8/31/2023	0.12
		9/14/2023	0.9
		9/17/2023	0.57
		9/24/2023	0.4
		10/19/2023	0.14
	Total		**3.08**

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Lab No.: 3950

LABORATORY ANALYSIS RESULTS

Date Reported: 08/17/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102

Amy Meier
Data Review Coordinator

Sample ID:	LOPEZ CANYON TANK	**Date Received:**	
Client Name:		**Invoice No:**	423654
Location:		**P.O. #:**	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/01/2023	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Excellent	Good	Fair	Poor	Very Poor
		1000	2000	4000	6000	10000
Total Dissolved Solids (Calc) (TDS), mg/L	685					

		Very Low	Low	Medium	High	Very High
		10.0	30.0	70.0	100	300
Nitrate Nitrogen (NO3-N), mg/L	<0.1					

		200	500	1000	2500	4000
Sulfate (SO4), mg/L	420					
		65	170	340	670	1300
Sulfate-Sulfur (SO4-S), mg/L	140					
		35	130	250	500	1000
Chloride (Cl), mg/L	5.6					
		25	75	150	300	500
Total Sodium (Na), mg/L	42					
		40	100	200	400	600
Total Calcium (Ca), mg/L	147					
		25	50	120	250	500
Total Magnesium (Mg), mg/L	60					
		40	80	120	160	200
Total Potassium (K), mg/L	8					
		0.10	0.20	0.40	0.80	1.20
Total Iron (Fe), mg/L	0.41					
		0.010	0.025	0.050	0.075	0.150
Total Manganese (Mn), mg/L	0.063					

		Soft	Moderately Hard	Hard	Very Hard	Brackish
		60	120	180	270	400
Hardness (CaCO3), mg/L	610					
		3.5	7.0	11	16	24
Hardness (CaCO3), grains/gal	36					

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	1070

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Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Acidic			Neutral			Alkaline
		5.0	6.0	7.0	8.0	9.0		
pH, unit	8.3							

INTERPRETATIONS for GENERAL LIVESTOCK PRODUCTION ..... The following statements are general interpretations for a wide range of common livestock and poultry animals. The actual effect of a particular water source on health or performance depends on many factors, including diet, animal activity, air temperature, animal size, and condition. Interpretations for specific livestock types are available on request, including: *beef cattle, beef calves, dairy cattle, dairy calves, mature hogs, young pigs, poultry, horses, or sheep/goats*.

TOTAL DISSOLVED SOLIDS, CONDUCTIVITY: EXCELLENT QUALITY ("fresh" water): Low salinity level. Suitable for all classes of livestock and poultry.

NITRATE-NITROGEN: VERY LOW: Should have no effect on animal health or performance.

SULFATE: LOW: Considered safe for all classes of livestock. No problems are expected, but availablity of certain trace minerals could be affected. Likely to affect poultry performance, especially when sodium, magnesium, or chloride levels are high. Consider diluting 1:2 to 1:4 with low sulfate water for use with poultry.

CHLORIDE: VERY LOW: Chloride is considered a dissolved solid. See TDS comments. Levels greater than 15 to 25 mg/L might affect poultry production when sodium exceeds 50 mg/L.

SODIUM: LOW: Sodium by itself poses little risk to livestock, but is considered a dissolved solid. See TDS comments. Water with sodium over 50 mg/L may affect poultry performance if the sulfate plus chloride is 75 mg/L or greater.

CALCIUM: MEDIUM: No effect expected for livestock or poultry use.

MAGNESIUM: MEDIUM: Presents little risk to livestock, but considered part of dissolved solids (See Total Dissolved Solids comments.) Levels over 50 mg/L Mg may affect poultry if the sulfate plus chloride is 75 mg/L or greater.

POTASSIUM: VERY LOW: This water is considered satisfactory for all classes of animals.

IRON: HIGH: No particulaar production problems are expected from using this water. May impart off-taste to milk or to meat of young animals (e.g., veal calves).

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Amy Meier
Data Review Coordinator

Sample ID:	LOPEZ CANYON TANK	**Date Received:**	
Client Name:		**Invoice No:**	423654
Location:		**P.O. #:**	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/01/2023	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

MANGANESE: HIGH (0.050 - 0.075 mg/L): No production problems expected for livestock consuming this water. May impart off-taste to meat of young animals (e.g., veal calves).

HARDNESS: BRACKISH: Hardness has no direct effect on drinking water safety or animal health. It can cause scale buildup and clogging of pipes and drinkers, leading to reduced water consumption and associated problems.

AVERAGE DAILY WATER CONSUMPTION (gallons per day)

Beef cattle ..... 7 to 12 per head	Sheep, goats ..... 2 to 4 per head
Dairy cattle ..... 10 to 40 per head	Chickens ..... 8 to 10 per hundred birds
Swine ..... 2 to 8 per head	Turkeys ..... 10 to 15 per hundred birds
Horses ..... 8 to 12 per head	

(Note: Water consumption may increase by 1½ to 2 times when temperatures exceed 80°F.)

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Lab No.: 3951

LABORATORY ANALYSIS RESULTS

Date Reported: 08/18/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102

Amy Meier
Data Review Coordinator

Sample ID:	MONTOYA TANQUE	**Date Received:**	
Client Name:		**Invoice No:**	423654
Location:		**P.O. #:**	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/01/2023	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Excellent	Good	Fair	Poor	Very Poor
		1000	2000	4000	6000	10000
Total Dissolved Solids (Calc) (TDS), mg/L	294					

		Very Low	Low	Medium	High	Very High
		10.0	30.0	70.0	100	300
Nitrate Nitrogen (NO3-N), mg/L	0.49					
		200	500	1000	2500	4000
Sulfate (SO4), mg/L	8.1					
		65	170	340	670	1300
Sulfate-Sulfur (SO4-S), mg/L	2.7					
		35	130	250	500	1000
Chloride (Cl), mg/L	6.5					
		25	75	150	300	500
Total Sodium (Na), mg/L	8					
		40	100	200	400	600
Total Calcium (Ca), mg/L	63					
		25	50	120	250	500
Total Magnesium (Mg), mg/L	21					
		40	80	120	160	200
Total Potassium (K), mg/L	23					
		0.10	0.20	0.40	0.80	1.20
Total Iron (Fe), mg/L	23.3					
		0.010	0.025	0.050	0.075	0.150
Total Manganese (Mn), mg/L	0.715					

		Soft	Moderately Hard	Hard	Very Hard	Brackish
		60	120	180	270	400
Hardness (CaCO3), mg/L	240					
		3.5	7.0	11	16	24
Hardness (CaCO3), grains/gal	14					

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	459

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LABORATORY ANALYSIS RESULTS

Date Reported: 08/18/2023

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Amy Meier
Data Review Coordinator

Sample ID:	MONTOYA TANQUE	**Date Received:**	
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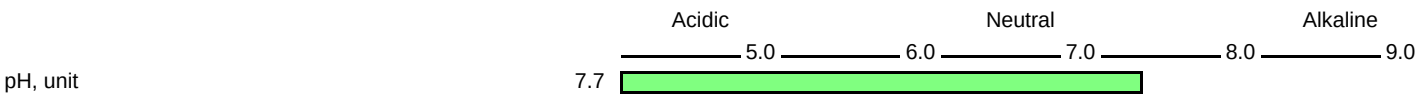
Location:		**P.O. #:**	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/01/2023	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock



INTERPRETATIONS for GENERAL LIVESTOCK PRODUCTION ..... The following statements are general interpretations for a wide range of common livestock and poultry animals. The actual effect of a particular water source on health or performance depends on many factors, including diet, animal activity, air temperature, animal size, and condition. Interpretations for specific livestock types are available on request, including: *beef cattle, beef calves, dairy cattle, dairy calves, mature hogs, young pigs, poultry, horses, or sheep/goats*.

TOTAL DISSOLVED SOLIDS, CONDUCTIVITY: EXCELLENT QUALITY ("fresh" water): Low salinity level. Suitable for all classes of livestock and poultry.

NITRATE-NITROGEN: VERY LOW: Should have no effect on animal health or performance.

SULFATE: VERY LOW: Considered safe for all classes of livestock. No problems are expected. Could possibly affect poultry performance at upper end of range when sodium, magnesium, or chloride levels are high.

CHLORIDE: VERY LOW: Chloride is considered a dissolved solid. See TDS comments. Levels greater than 15 to 25 mg/L might affect poultry production when sodium exceeds 50 mg/L.

SODIUM: VERY LOW: Presents little or no risk to livestock or poultry.

CALCIUM: LOW: No effect expected for livestock or poultry use.

MAGNESIUM: VERY LOW: Presents little or no risk to livestock or poultry.

POTASSIUM: VERY LOW: This water is considered satisfactory for all classes of animals.

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Client Name:		**Invoice No:**	423654
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Date/Time Sampled:	08/01/2023	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

IRON: EXTREMELY HIGH: Performance likely to be affected by improper equipment function, due to high iron concentration resulting in increased microbial growth and biofilm buildup in watering equipment. High iron in drinking water may also reduce water intake which can directly reduce feed intake or milk production. This water may impart off-taste to meat of young animals (e.g., veal calves) or to milk. Excess absorbed iron from drinking water can lead to cellular oxidative stress, can inhibit copper and zinc absorption, and reduced growth or production. Seek professional advice regarding use of this water for livestock consumption.

MANGANESE: EXTREMELY HIGH (over 0.0150 mg/L): Performance likely to be affected by improper equipment functions due to high manganese concentration (resulting in increased microbial growth and biofilm buildup) rather than specific livestock health problems. May impart off-taste to meat of young animals (e.g., veal calves).

HARDNESS: VERY HARD: Hardness has no direct effect on drinking water safety or animal health. It can cause scale buildup and clogging of pipes and drinkers, leading to reduced water consumption and associated problems.

AVERAGE DAILY WATER CONSUMPTION (gallons per day)

Beef cattle ..... 7 to 12 per head	Sheep, goats ..... 2 to 4 per head
Dairy cattle ..... 10 to 40 per head	Chickens ..... 8 to 10 per hundred birds
Swine ..... 2 to 8 per head	Turkeys ..... 10 to 15 per hundred birds
Horses ..... 8 to 12 per head	

(Note: Water consumption may increase by 1½ to 2 times when temperatures exceed 80°F.)

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Fax: 806.677.0329

Lab No.: 3949

LABORATORY ANALYSIS RESULTS

Date Reported: 08/18/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102

Amy Meier
Data Review Coordinator

Sample ID:	VIDAL TANQUE	**Date Received:**	
Client Name:		**Invoice No:**	423654
Location:		**P.O. #:**	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/01/2023	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Excellent		Good		Fair		Poor		Very Poor
		1000		2000		4000		6000		10000
Total Dissolved Solids (Calc) (TDS), mg/L	273									
		Very Low		Low		Medium		High		Very High
		10.0		30.0		70.0		100		300
Nitrate Nitrogen (NO3-N), mg/L	<0.1									
		200		500		1000		2500		4000
Sulfate (SO4), mg/L	1.7									
		65		170		340		670		1300
Sulfate-Sulfur (SO4-S), mg/L	0.55									
		35		130		250		500		1000
Chloride (Cl), mg/L	13									
		25		75		150		300		500
Total Sodium (Na), mg/L	2									
		40		100		200		400		600
Total Calcium (Ca), mg/L	298									
		25		50		120		250		500
Total Magnesium (Mg), mg/L	36									
		40		80		120		160		200
Total Potassium (K), mg/L	50									
		0.10		0.20		0.40		0.80		1.20
Total Iron (Fe), mg/L	94.5									
		0.010		0.025		0.050		0.075		0.150
Total Manganese (Mn), mg/L	2.61									
		Soft		Moderately Hard		Hard		Very Hard		Brackish
		60		120		180		270		400
Hardness (CaCO3), mg/L	890									
		3.5		7.0		11		16		24
Hardness (CaCO3), grains/gal	52									

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	426

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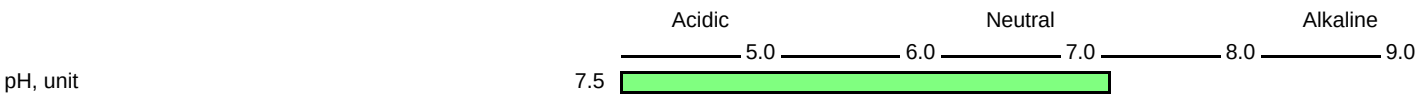
Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock



INTERPRETATIONS for GENERAL LIVESTOCK PRODUCTION ..... The following statements are general interpretations for a wide range of common livestock and poultry animals. The actual effect of a particular water source on health or performance depends on many factors, including diet, animal activity, air temperature, animal size, and condition. Interpretations for specific livestock types are available on request, including: *beef cattle, beef calves, dairy cattle, dairy calves, mature hogs, young pigs, poultry, horses, or sheep/goats*.

TOTAL DISSOLVED SOLIDS, CONDUCTIVITY: EXCELLENT QUALITY ("fresh" water): Low salinity level. Suitable for all classes of livestock and poultry.

NITRATE-NITROGEN: VERY LOW: Should have no effect on animal health or performance.

SULFATE: VERY LOW: Considered safe for all classes of livestock. No problems are expected. Could possibly affect poultry performance at upper end of range when sodium, magnesium, or chloride levels are high.

CHLORIDE: VERY LOW: Chloride is considered a dissolved solid. See TDS comments. Levels greater than 15 to 25 mg/L might affect poultry production when sodium exceeds 50 mg/L.

SODIUM: VERY LOW: Presents little or no risk to livestock or poultry.

CALCIUM: HIGH: No effect expected for livestock or poultry use. Consider including drinking water calcium in ration formulation. Each 1 mg/L Ca is equivalent to 3.8 milligrams per gallon.

MAGNESIUM: LOW: Presents little risk to livestock. Levels over 50 mg/L Mg may affect poultry if the sulfate plus chloride is 75 mg/L or greater.

POTASSIUM: LOW: This water is considered satisfactory for animal consumption.

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Amy Meier
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Client Name:		**Invoice No:**	423654
Location:		**P.O. #:**	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/01/2023	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/09/2023	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

IRON: EXTREMELY HIGH: Performance likely to be affected by improper equipment function, due to high iron concentration resulting in increased microbial growth and biofilm buildup in watering equipment. High iron in drinking water may also reduce water intake which can directly reduce feed intake or milk production. This water may impart off-taste to meat of young animals (e.g., veal calves) or to milk. Excess absorbed iron from drinking water can lead to cellular oxidative stress, can inhibit copper and zinc absorption, and reduced growth or production. Seek professional advice regarding use of this water for livestock consumption.

MANGANESE: EXTREMELY HIGH (over 0.0150 mg/L): Performance likely to be affected by improper equipment functions due to high manganese concentration (resulting in increased microbial growth and biofilm buildup) rather than specific livestock health problems. May impart off-taste to meat of young animals (e.g., veal calves).

HARDNESS: BRACKISH: Hardness has no direct effect on drinking water safety or animal health. It can cause scale buildup and clogging of pipes and drinkers, leading to reduced water consumption and associated problems.

AVERAGE DAILY WATER CONSUMPTION (gallons per day)

Beef cattle ..... 7 to 12 per head	Sheep, goats ..... 2 to 4 per head
Dairy cattle ..... 10 to 40 per head	Chickens ..... 8 to 10 per hundred birds
Swine ..... 2 to 8 per head	Turkeys ..... 10 to 15 per hundred birds
Horses ..... 8 to 12 per head	

(Note: Water consumption may increase by 1½ to 2 times when temperatures exceed 80°F.)

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Lab No.: 346

LABORATORY ANALYSIS RESULTS

Date Reported: 10/30/2023

Send To: 55267	NORTHERN NM STOCKMANS ASSOC DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102

Amy Meier
Data Review Coordinator

Sample ID:	MONTOYA - CANJILON	**Date Received:**	
Client Name:		**Invoice No:**	424247
Location:		**P.O. #:**	
Date/Time Sampled:	10/19/2023	**Name of Sampler:**	
Date/Time Submitted:	10/24/2023	**Name of Submitter:**	
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Excellent	Good	Fair	Poor	Very Poor
		1000	2000	4000	6000	10000
Total Dissolved Solids (Calc) (TDS), mg/L	189					

		Very Low	Low	Medium	High	Very High
		10.0	30.0	70.0	100	300
Nitrate Nitrogen (NO3-N), mg/L	<1					
		200	500	1000	2500	4000
Sulfate (SO4), mg/L	99					
		65	170	340	670	1300
Sulfate-Sulfur (SO4-S), mg/L	33					
		35	130	250	500	1000
Chloride (Cl), mg/L	130					
		25	75	150	300	500
Total Sodium (Na), mg/L	8					
		40	100	200	400	600
Total Calcium (Ca), mg/L	27					
		25	50	120	250	500
Total Magnesium (Mg), mg/L	16					
		40	80	120	160	200
Total Potassium (K), mg/L	13					
		0.10	0.20	0.40	0.80	1.20
Total Iron (Fe), mg/L	4.22					
		0.010	0.025	0.050	0.075	0.150
Total Manganese (Mn), mg/L	0.220					

		Soft	Moderately Hard	Hard	Very Hard	Brackish
		60	120	180	270	400
Hardness (CaCO3), mg/L	130					
		3.5	7.0	11	16	24
Hardness (CaCO3), grains/gal	7.8					

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	296

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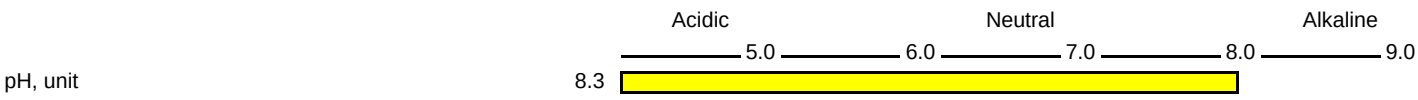
Date/Time Submitted:	10/24/2023	**Name of Submitter:**	
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock



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CHLORIDE: MEDIUM: Chloride is considered a dissolved solid. See Total Dissolved Solids comments.

SODIUM: VERY LOW: Presents little or no risk to livestock or poultry.

CALCIUM: VERY LOW: No effect expected for livestock or poultry use. Calcium mineral supplementation may be needed in certain cases.

MAGNESIUM: VERY LOW: Presents little or no risk to livestock or poultry.

POTASSIUM: VERY LOW: This water is considered satisfactory for all classes of animals.

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