STATE OF COLORADO

Gibson - DNR, Amber <amber.gibson@state.co.us>

Ghost River Adequacy Review and Decision Date Extension Request

PFM Consulting <pfmconsultingcompany@gmail.com> Fri, Oct 25, 2024 at 8:00 AM
To: "Gibson - DNR, Amber" <amber.gibson@state.co.us>, PowerHouse Excavation & Construction <phexcavationco@gmail.com>, lynsie pye-steele <lynsie1205@hotmail.com>

Good morning, Amber.

I apologize for the delay. Please see the Adequacy Review #1 Response, as well as the updated application page, narrative, soils information, updated maps, weed control plan and updated letter from CPW. This should address all of the adequacy items.

Also, as the decision date is October 29th, 2024, could we request a 15 day extension to allow for review of the documents submitted?

Thank you,

Jodi Schreiber, Owner
PFM Consulting LLC
719-529-0916
pfmconsultingcompany@gmail.com

PFM Consulting Website

"Success is stumbling from failure to failure with no loss of enthusiasm."
-Winston Churchill

18 attachments

- **Adequacy Review #1 Response 8.23.2024.pdf**
  113K
- **Official Series Description - WILID Series.pdf**
  124K
- **20240828_10514710561_25_Rangeland_and_Forest_Vegetation_Classification_Productivity_and_Plant_Composition--Huerfano_County_Area.pdf**
  132K
- **20240828_10385810930_30_Range_Production_Favorable_Year.pdf**
  307K
- **20240828_10403410342_48_Range_Production_Normal_Year.pdf**
  307K
- **20240828_10411310305_30_Range_Production_Unfavorable_Year.pdf**
  304K
- **Official Series Description - PENROSE Series.pdf**
  122K
- **Official Series Description - WILEY Series.pdf**
  138K
- **20240828_10430510604_66_Gravel_Source.pdf**
  313K
- **Official Series Description - KANDRIX Series.pdf**
  136K

20240828_10415110410_30_Soil_Map.pdf
302K

Existing Conditions R1.pdf
855K

Rec Map.pdf
1258K

Mining Map.pdf
886K

Weed Control Plan 8.26.2024.pdf
838K

DRMS Permit Narrative 8.23.2024.pdf
569K

Updated Application Page 10.24.2024.pdf
100K

Updated gravel pit letter signed.pdf
229K

PFM Consulting LLC

Colorado Division of Reclamation, Mining and Safety
1313 Sherman Street
Suite 215
Denver, CO 80216

RE: Ghost River Gravel Pit M2024-029 Adequacy Review #1 Response

October 24th, 2024

Amber,

Please see the responses to the first Adequacy Review.

1. Please see the attached, corrected application page.
2. Please see the attached, corrected legal description.
3. Please see the updated Exhibit C map.
4. Please see the updated Exhibit C map.
5. Please see the updated Mining Plan with the notation, as well as the Exhibit C map.
6. The Applicant intends for all highwalls to be within the pit and away from the perimeter of the affected area against the permit boundary. No highwall will occur along the permit boundary and ensures that all side slopes will not be mined at a slope greater than 3H:1V.
7. For clarification, the maximum mining depth will be 20 feet.
8. Each phase is estimated to take 2-3 years to mine out, but is dependent on aggregate quality and local economic factors.
9. Phase I will be completed prior to moving into Phase II. Phase I reclamation will occur concurrently to mining operations, so that when mining is finished, all slopes will be graded to a 3H:1V slope, except for the highwall which will then migrate into Phase II. Processing and storage will remain in the reclaimed floor of Phase I while mining occurs in Phase II. As such, Phase I will be reclaimed except for topsoil and seeding while Phase II is being actively mined. This will constitute the maximum disturbance; Phase I being used for processing and storage while Phase II is being actively mined.

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pfmconsultingcompany@gmail.com
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10. Topsoil will account for the first 6" of the pit area, followed by 18"-8' of overburden. The target material will therefore be found between 2-10' deep and run 10-18' in thickness.
11. The Applicant has done exploratory excavation onsite and found such during their work.
12. There will be no secondary commodities, as indicated in the application page 1 question 5.
13. The Mine Plan has been updated to state that the interior haul road will remain. The cross-section on Exhibit D Map has been updated as well.
14. Please see the updated narratives.
15. The Applicant will prepare the gravel area outside the residential structures with a waste gravel material or a road base from the site that will reduce weeds and allow for ease of travel for the residents between structures.
16. There will be no material imported to be used as backfill.
17. The Applicant commits to seeding the topsoil piles if they are not used for greater than 180 days and that if the topsoil stockpiles are to be relocated, a Technical Revision will be sent to request that relocation.
18. Please see the enclosed Weed Control Plan for this site.
19. Please see the updated quantities:
    Western Wheatgrass-Arriba – 16 pls x 14.6 acres = 233.6 pounds
    Blue Grama – 1.2 pls x 14.6 acres = 17.52 pounds
    Galleta – 1.6 pls x 14.6 acres = 23.36 pounds
    Sand Dropseed – 0.1 pls x 14.6 acres = 1.46 pounds
    Winter Fat – 0.1 pls x 14.6 acres = 1.46 pounds
20. Expected times of planting would be spring or fall of any year.
21. Topsoil will be replaced at a depth of 6 inches during reclamation.
22. Please see the updated Exhibit F map.
23. See the updated Water Information.
24. Please see the updated statement from the Department of Wildlife. As for the other justifications for not negatively impacting wildlife, the additional acreage does not constitute a larger mining operation, increase in traffic, etc. from the last permitted operation. In fact, this site will be mined in two phases, which are smaller than the original permitted mine. Additionally, mining operations are controlled by the local demand for the product and not by the size of the permit boundary. If there is a local need for aggregate, the site will be used to that capacity. Since the site is in the same location with the same economic conditions and aggregate demand as the previous operation, the operator anticipates no increase in impact that could be extrapolated from the additional acreage in this permit package.

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25. Please see the updated Soil Survey.
26. There are two small trees onsite currently, with the rest of the acreage being covered by low shrubs and grasses. The Applicant believes that the carrying capacity for the rangeland area would be approximately 3 small grazing livestock per acre, such as goats.
27. Please see vegetation and soils data that was gathered through the USDA Web Soil Survey.
28. During the site inspection, it was found that no structures that are not already accounted for, are within 200' of the permit boundary, and thus no additional structure agreements are needed.

Warm Regards,

Jodi Schreiber

Jodi Schreiber, Owner
PFM Consulting LLC

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11. **Correspondence Information**:

APPLICANT/OPERATOR (name, address, and phone of name to be used on permit)

Contact's Name: **Patrick Steele** Title: Owner

Company Name: P B & S Sand and Gravel LLC

Street/P.O. Box: 8425 Park Road P.O. Box:

City: Rye

State: Colorado Zip Code: 81069

Telephone Number: (719) - 569-6297

Fax Number: ( ) -

PERMITTING CONTACT (if different from applicant/operator above)

Contact's Name: Jodi Schreiber Title:

Company Name: PFM Consulting LLC

Street/P.O. Box: 1774 N. Cougar Drive P.O. Box:

City: Pueblo West

State: CO Zip Code: 81007

Telephone Number: (719) - 529-0916

Fax Number: (719) - 766-8339

INSPECTION CONTACT

Contact's Name: Jordan Power Title:

Company Name: P B & S Sand and Gravel LLC

Street/P.O. Box: P.O. Box: 863

City: Rye

State: Colorado Zip Code: 81069

Telephone Number: (719) - 251-5677

Fax Number: ( ) -

CC: STATE OR FEDERAL LANDOWNER (if any)

Agency:

Street:

City:

State: Zip Code:

Telephone Number: ( ) -

CC: STATE OR FEDERAL LANDOWNER (if any)

Agency:

Street:

City:

State: Zip Code:

Telephone Number: ( ) -

Ghost River Gravel Pit

Construction Material

Regular 112 Operation

Reclamation Permit Application Package

Colorado Division of Reclamation, Mining and Safety

May 2024

6.4.1 Exhibit A

Legal Description

The Ghost River Gravel Pit is located 37.825628° 104.749247°. The pit will be accessed through Huerfano County Road 110 approximately 4 miles east of I-25 in Huerfano County. The site is approximately 21.6 acres and is described by the following legal description:

Location: Huerfano County, CO

SE ¼ of NW ¼ and NE ¼ of SW ¼ of S35 T25S R66W

Entrance: 37.825628°, -104.749247°

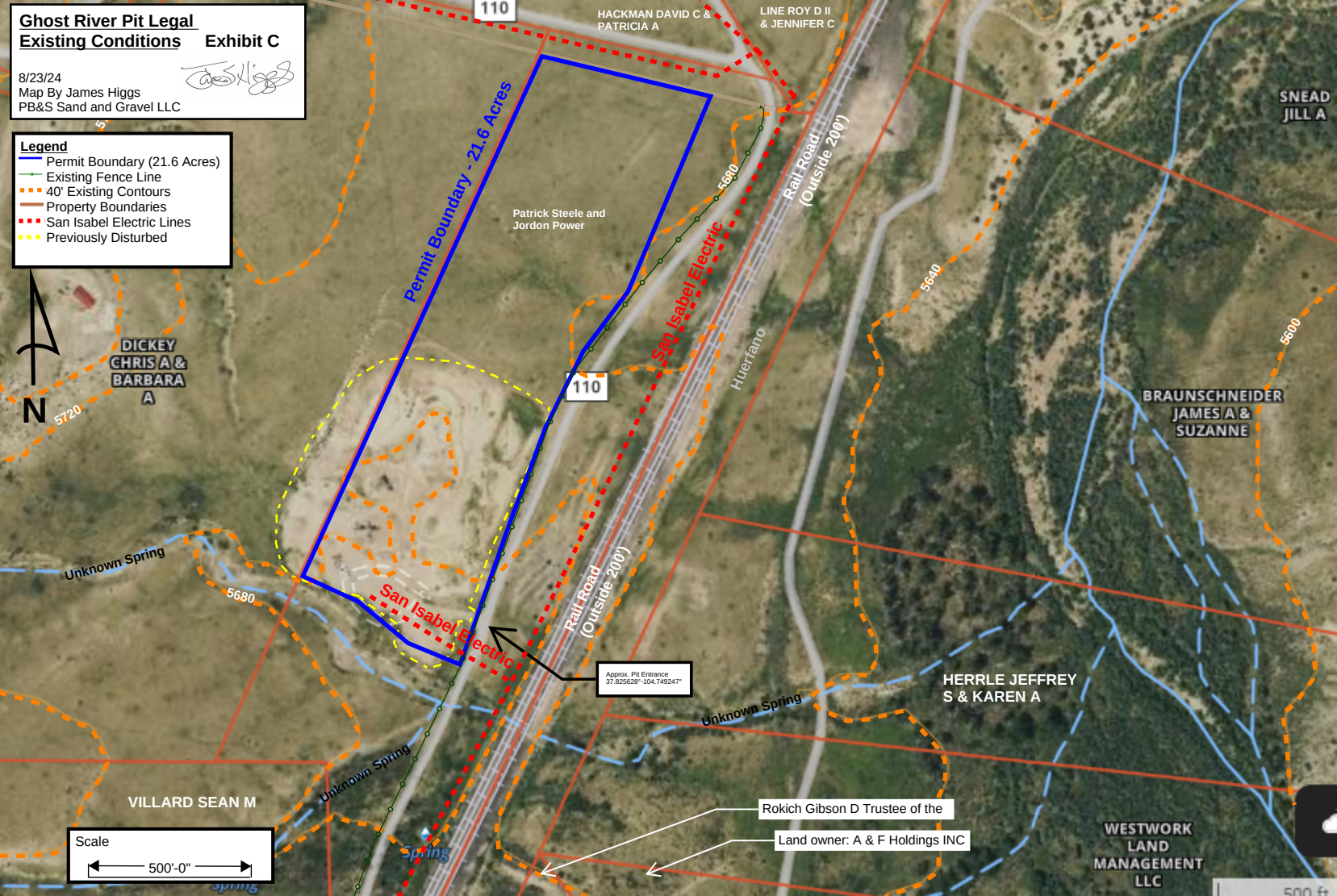
6.4.2 Exhibit B

Index Map

6.4.3 Exhibit C

Pre-Mining and Mining Plan Map

of Affected Lands

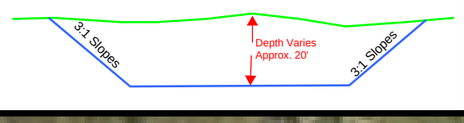

Ghost River Pit Legal Existing Conditions
Exhibit C
8/23/24
Map By James Higgs
PB&S Sand and Gravel LLC
Legend
Permit Boundary (21.6 Acres)
Existing Fence Line
40' Existing Contours
Property Boundaries
San Isabel Electric Lines
Previously Disturbed
N
Permit Boundary - 21.6 Acres
Patrick Steele and Jordon Power
110
HACKMAN DAVID C & PATRICIA A
LINE ROY D II & JENNIFER C
SNEAD JILL A
Rail Road (Outside 200')
San Isabel Electric
Huerfano
5690
5640
5600
5720
5680
DICKEY CHRIS A & BARBARA A
BRAUNSCHNEIDER JAMES A & SUZANNE
Unknown Spring
Approx. Pit Entrance
37.825628°-104.749247°
HERRLE JEFFREY S & KAREN A
VILLARD SEAN M
Rokich Gibson D Trustee of the
Land owner: A & F Holdings INC
WESTWORK LAND MANAGEMENT LLC
Scale
500'-0"

Ghost River Pit Legal Mining Map Exhibit D

8/23/24
Map By James Higgs
PB&S Sand and Gravel LLC

Legend
- Permit Boundary (21.6 Acres)
- Existing Fence Line
- 40' Existing Contours
- Property Boundaries
- Working Face
- Mining Direction
- Existing/Current Disturbed

Typical Section



Scale
500'-0"

N

Typical Section

Permit Boundary - 21.6 Acres

Phase 2
(11.6 Acres)

Phase 1
(10 Acres)

Approximate Processing and Storage Area

Haul Road

Approx. Pit Entrance
37.825628°-104.749247°

Note: All slopes shall be mined to a 3:1 or Flatter, except for the working face.

San Isabel Electric

Rail Road (Outside 200')

Huerfano

HACKMAN DAVID C & PATRICIA A

LINE ROY D II & JENNIFER C

SNEAD JILL A

DICKEY CHRIS A & BARBARA A

BRAUNSCHNEIDER JAMES A & SUZANNE

HERRLE JEFFREY S & KAREN A

VILLARD SEAN M

WESTWORK LAND MANAGEMENT LLC

Unknown Spring

Spring

110

5680

5640

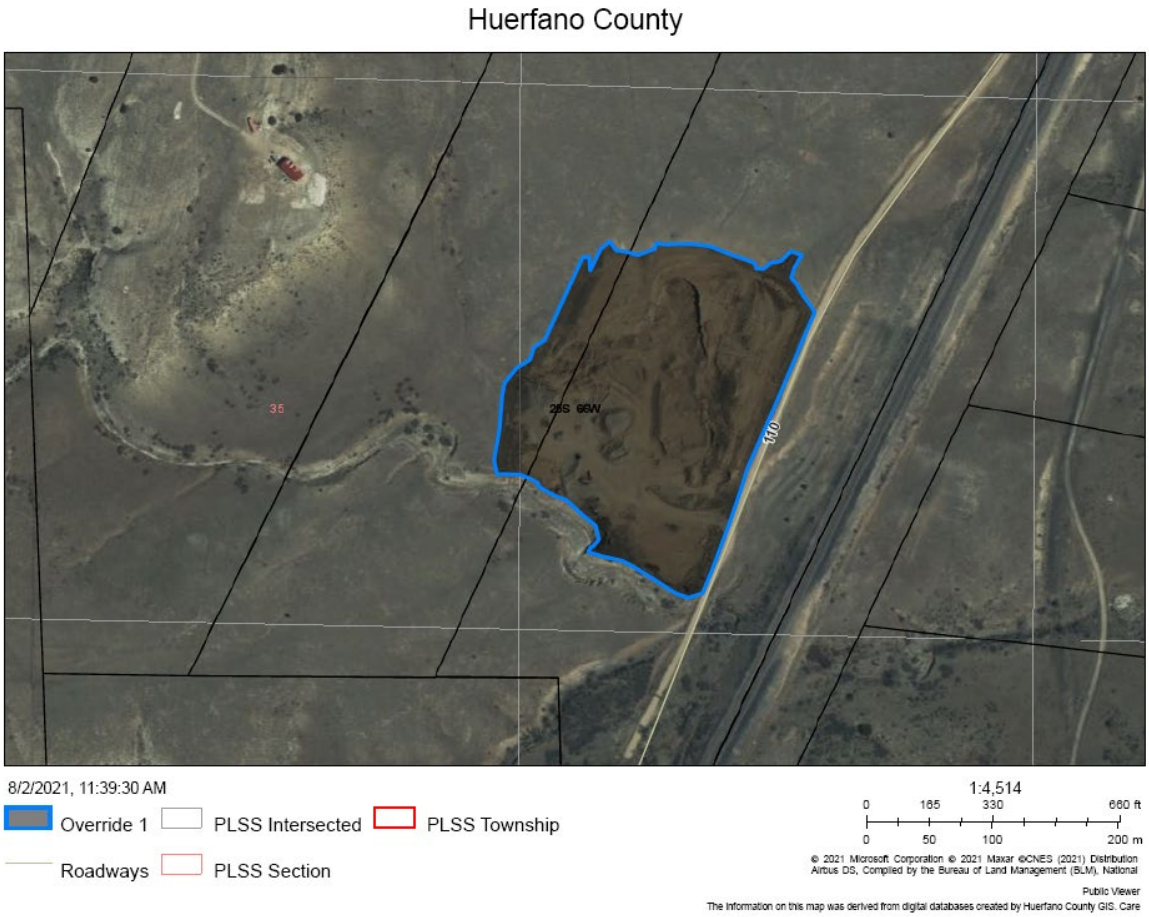
5600

5720

6.4.4 Exhibit D

Mining Plan

The Ghost River Gravel Pit was a construction aggregate site of 9.9 acres. The previous mining disturbed the following based upon DRMS' calculations on 8/2/2021 and encompassed approximately 11.3 acres. This is also outlined in the Exhibit C Existing Conditions Map to show the previously mined area, and the proposed new permit boundary.



This application package will re-permit the site with a new operator, P B & S Gravel LLC. In addition, 11.7 acres will be added to the permit to incorporate areas to the north of the previous permit boundary. Access to the site will be from Huerfano County Road 110 at the southeast corner of the site.

The site consists of the Manvel-Minnequa loams, 1 to 5 percent slopes, Kim fine sandy loam, 3 to 9 percent slopes, Penrose-Minnequa complex, 4 to 25 percent slopes and Penrose-

Rock outcrop complex, 4 to 25 percent slopes. It is anticipated that shale will be found immediately beneath the material to be mined. The target gravel source is located beneath limited topsoil of 0-6 inches and overburden of an additional 18 inches - 8 feet. Topsoil and overburden will be saved for reclamation of the mine site. The primary commodities of this site are landscape aggregate, gravel and road base. Incidental materials not used for construction material will be used to reconstruct the pit floor and lessen the pit slopes.

The life of the proposed operation is difficult to quantify due to the changing economic conditions in the construction industry and aggregate quality. Extraction will be limited to 70,000 tons per year. At this rate, the life of the mine would be approximately 3-5 years depending on local economic conditions.

Mining will proceed to the north of the processing area. Extracted material will be moved to the processing area that is anticipated to be in the central portion of the pit. Earthmoving will be accomplished using front end loaders. Aggregate will be processed and sized using a crusher and screens. Mining will stay at least 25 feet from the San Isabel Power Pole located within the permit boundary. All equipment will be portable. The highwall will be no greater than 500' in length.

All plant growth material and topsoil will be salvaged and stockpiled for reclamation use. These stockpiles will be located at the perimeter of the site and posted as reclamation topsoil. Waste rock and overburden will be stockpiled and used to rebuild the pit floor and slopes during reclamation. Established stockpiles will be stored onsite and seeded with the approved seed mix to reduce the chance of erosion. These stockpiles will be located separate from the landscape aggregate and gravel stockpiles.

Overburden perimeter stormwater berms will be constructed as excavation and reclamation progresses. These berms will serve to control erosion and keep sedimentation from reaching any drainage. Water for dust suppression will be purchased from a local source, such as Corey Transport, and hauled onsite.

There will be no storage of fuel or lubricants onsite. Fuel will be hauled onsite as needed by vendor trucks.

Mining will develop a gravel pit to a depth of approximately 20 feet. No groundwater is expected to be encountered during excavation and mining; therefore, no impact to the hydrologic balance is anticipated. No acid or toxic producing materials will be exposed during mining. No explosives will be used in conjunction with mining or reclamation. The interior haul road will remain following reclamation, per the landowner's request. The ranch road connecting the property to Huerfano County Road 110 will remain following reclamation, per the landowner's request. The current haul road is approximately 30 feet wide.

This is a privately owned site and does not require the State Historic Preservation Office requirements for a cultural or historic study. If the operator encounters any structure of note, the State Historic Preservation Office will be notified.

6.4.5 Exhibit E

Reclamation Plan

Reclamation of the site will be of two types, residential and rangeland. Reclamation to residential will occur first on the southern-most 7.0-acre portion of the site. Reclamation back to rangeland will occur for the remaining portions of the site. The land has historically been rangeland and is located within an HOA and will be returned to such uses following mining operations.

Slopes will be returned to a 3H:1V slope or flatter when mining has concluded, thus allowing for reclamation to immediately follow mining as the site progresses. As topsoil, waste rock and overburden are removed from the working face, they will be stockpiled for future reclamation use. Throughout mining, slopes will be maintained at a 3H:1V minimum, except for the active mine face. Waste rock and overburden will be placed on the pit floor as quantity allows. Three inches of topsoil will be replaced on affected surfaces. If necessary, surfaces will be roughened prior to seeding. All materials used for backfilling will be generated from onsite sources. Onsite topsoil will be adequate for reclamation purposes. No importation of materials for reclamation purposes will be necessary.

No trees, shrubs, or bushy-type vegetation will be planted in the rangeland area of the site. Only the appropriate grasses selected by the NRCS will be used. The operator will use the seed mix from the original permit application below. The seed will be broadcast at the rates below.

Western Wheatgrass- Arriba	32 pls @ 100%, % of mix 50%	16 pls/ac 10 acres =	**160 lbs req'd.**
Blue Grama	6 pls @ 100%, % of mix 20%	1.2 pls/ac 10 acres=	**12 lbs req'd.**
Galleta	8 pls @ 100%, % of mix 20%	1.6 pls/ac 10 acres =	**16 lbs req'd.**
Sand Dropseed	1 pls@ 100%, % of mix 5%	0.1 pls/ac 10 acres=	**1 lbs req'd.**
Winter Fat	1 pls@ 100%, % of mix 5%	0..1 pls/ac 10 acres =	**1 lbs req'd.**

40# available N & P is the recommended and will be applied with a commercial spreader.

Certified noxious weed free straw or grass hay will be applied at the rate of 4,000#/A.

All mining structures and stormwater diversion structures, will be reclaimed following all mining operations. All buildings are portable. The interior haul road will remain upon

reclamation. Upon commencement of reclamation, the area will be monitored for noxious weeds. The access road to the site from County Road 110 will remain following reclamation for use by the residential portion of the site.

Ghost River Pit Weed Management Plan

The Ghost River Pit is in Huerfano County, Colorado. This weed plan will out line the methods to be used onsite to mitigate noxious weeds. These methods are recommended by the Colorado Weed Management Association:

Control Methods

Species of noxious weeds grow or spread differently, and Colorado's Noxious Weed Act requires certain methods of control to be used depending on the level of control that is mandated.

Below are examples of Integrated Pest Management techniques.

- Biological control – Uses organisms to control noxious weeds. Since we are dealing with living things, a variety of circumstances come into play that impact the success of the establishment of the bio-control and ultimately the control of the noxious weed you are targeting. For example, an organism that works well on the plains may not work in the mountains. Although there has been some success on some noxious weeds, bio-control agents are not available for all species.
- Chemical control – The use of herbicides to control noxious weeds. All herbicides must be used in accordance with the registered label.
- Cultural control – The use of materials or techniques that reduce noxious weed populations. Examples include mulching, rotational grazing, establishing good vegetation cover.
- Mechanical – Cutting, mowing, disking.

Remember, not all techniques will work in all situations. Refer to the Colorado Department of Agriculture for required control levels. Consult with your local weed manager or Licensed Commercial Applicator for specific recommendations.

P B & S Sand and Gravel LLC will contact Huerfano County if noxious weeds are found onsite and are not responding to the above methods of eradication. They will illicit the suggestions from Huerfano County at that time for updated techniques that may be successful if a weed species does not respond to these proposed methods.

P B & S Sand and Gravel LLC will also monitor the site with periodic inspections to evaluate any new species onsite, and to evaluate the effectiveness of the weed control program. If management objectives are not met, weed control actions will be modified.

Below is a chart showing noxious weed types and possible control methods and timing for reference.

Integrated Pest Management Timeline

Weed	I.P.M.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Russian Thistle	Chemical	RangeStar herbicide can be applied at a rate of 2 pints/acre during the rosette stage. 2,4-D Amine can be applied at a rate of 2 to 4 pints/acre. (Always refer to the herbicide label).											
	Mechanical												
	Cultural												
Prickly Pear	Chemical	See herbicide label for rates.											
	Mechanical												
Tree of Heaven	Chemical	A foliar application of glyphosate (RoundUp) mixed at a 2% solution plus a non-ionic surfactant is used when controlling this weed.											
	Mechanical												
Kochia	Chemical	Vista herbicide used at the higher rate (1 1/3 pint/ acre) plus Methylated Seed Oil Surfactant (MSO) is recommended.											
	Mechanical												
	Cultural												
Puncture -vine	Chemical	2,4-D, glyphosate, and dicamba can be applied when plant is young and just emerging. RoundUp Pro is effective at a 5-10% solution. The Puncturevine weevil is effective in destroying the roots.											
	Biological												
	Mechanical												
	Cultural												
Rubber Rabbit Brush	Chemical	If stems are less than 6 inches in diameter, a basal treatment applied about 12 inches from the ground can be used. See herbicide label for rates and application methods.											
	Mechanical												
	Cultural												
Oak Brush	Chemical	Garlan 3A can be used at a 1% - 3% solution with a non-ionic surfactant. Remedy can also be used as a foliar application when mixed at a 2% - 4% solution or (when mixed with vegetable or mineral oil) as a basal treatment at a 2% - 3% solution.											
	Mechanical												
	Cultural												

LEGEND

	Garlon / tricolpyr		Pathfinder / triclopyr		Vista / fluroxypyr	2, 4-D Ester	2, 4-D Amine	
	Habitat/Imazapyr		Plateau / imazapic		Roundup / Glyphosate	Landmaster / glyphosate + 2,4-D		Remedy / triclopyr
	Transline / Clopyralid		Escort XP / metsulfuron		Telar XP / chlorsulfuron	Rangestar / Dicamba + 2,4-D		Milestone / aminopyralid
	Puncturevine Weevil "M. lypiformis"		Mowing		Hand-Pull	Curtial / clopyralid + 2,4-D		Rust Fungus: Puccinia punctiformis
	Leafy Spurge Flea Beetle: aphtona spp.		Tamarisk Beetle: Diorhabda spp.		Thistle Seed Head Beetle "rhinocyllus conicus"	Tilling		Prescribed Burn
	Bulldozers & Hydro-axes.		Aerial application for large areas of Tamarisk & Russian Olive.		Pull with weed wrench when small or with a tractor when larger.	Sever root below ground or uproot with a shovel or hoe.		Prevent seed formation by eliminating seed heads.
						Seed & sow grasses. Keep irrigated to promote competition. Don't overgraze.		Cut-Stump: 2" from ground & immediately apply herbicide.

Integrated Pest Management Timeline														
Weed	**I.P.M.**	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Leafy Spurge	Chemical	Apply herbicides in spring when true flowers emerge. Effective herbicide control may take several years.											
	Biological												
	Cultural												
Myrtle Spurge	Chemical	C.S.U. has suggested that RangeStar or 2,4-D Ester at 1 1/2 lbs./acre a.e. will control Myrtle Spurge. Also control by pulling or digging with gloves.											
	Mechanical												
Canada Thistle	Chemical	The most effective method is application of Milestone following flowering. Milestone can also be used one month after mowing. Curtail and Transline are effective when plants have emerged in the Spring.											
	Mechanical												
	Cultural/ Biological												
Musk Thistle	Chemical	Apply herbicides before bolting and no later than when developed terminal flowers open to dime size. With Musk Thistle, it is important to prevent seed formation as well.											
	Biological												
	Mechanical												
	Cultural												
Bull Thistle	Chemical	Apply herbicides before bolting and no later than when developed terminal flowers open to dime size.											
	Biological												
	Mechanical												
	Cultural												
Scotch Thistle	Chemical	Apply herbicides before bolting and no later than when developed terminal flowers open to dime size.											
	Biological												
	Mechanical												
	Cultural												
Perennial Sowthistle	Chemical	Tilling is best when plant is just emerging. Herbicides are best applied when plants are in seeding or early bud stage.											
	Mechanical												
Russian Knapweed	Chemical	RangeStar can be applied at any time during active growing. Telar and Milestone should be applied at bloom to post-bloom stages.											
	Mechanical												
	Cultural												
Spotted Knapweed	Chemical												
	Cultural												
Diffuse Knapweed	Chemical												
	Cultural												

Integrated Pest Management Timeline

Weed	I.P.M.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Yellow Toadflax	Chemical	A combination of mowing and chemical treatment applied at flowering over a period of several years is best for this weed.											
	Mechanical												
Dalmatian Toadflax	Chemical	Escort & Telar can be used in the fall. Due to the waxy leaves, a non-ionic surfactant is recommended.											
	Cultural												
Perennial Pepper-weed	Chemical	Mowing can be done periodically and controlled burning in the Spring. It is best to treat with Escort XP as soon as found.											
	Mech./Cult.												
Hounds-tongue	Chemical	Mowing 2nd year plants during flowering (before seed production) is useful. Chemical applications are best in Spring (rosettes to 10 inches tall).											
	Mechanical												
Hoary Cress or "White Top"	Chemical	Mowing several times a year is helpful and may make herbicide applications more effective. Telar or Escort are best, but may need several applications.											
	Mechanical												
Field Bindweed	Chemical	Grasses are a good competitor. Mowing and pulling are usually ineffective unless cut below the surface in the early seedling stage. Herbicides can be applied in Spring, at or just after full bloom, or in the fall.											
	Mechanical												
	Cultural												
Salt Cedar or Tamarisk	Chemical	Bulldozer & Hydro-axe methods must be followed by next-season herbicide treatment. It is best to treat in late summer or early fall. Cut-stump or foliar apps. are acceptable.											
	Biological												
	Mech./Cult.												
Russian Olive	Chemical	Remove (or pull) before seed production. Use cut-stump or foliar applications.											
	Mechanical												

LEGEND

							2, 4-D Ester		2, 4-D Amine
	Garlon / tricolpyr		Pathfinder / triclopyr		Vista / fluroxypyr		Landmaster / glyphosate + 2,4-D		Remedy / triclopyr
	Habitat/Imazapyr		Plateau / imazapic		Roundup / Glyphosate		Rangestar / Dicamba + 2,4-D		Milestone / aminopyralid
	Transline / Clopyralid		Escort XP / metsulfuron		Telar XP / chlorsulfuron		Curtial / clopyralid + 2,4-D		Rust Fungus: Puccinia punctiformis
	Puncturevine Weevil "M. lypiformis"		Mowing		Hand-Pull		Tilling		Prescribed Burn
	Leafy Spurge Flea Beetle: aphthona spp.		Tamarisk Beetle: Diorhabda spp.		Thistle Seed Head Beetle "rhinocyllus conicus"		Sever root below ground or uproot with a shovel or hoe.		Prevent seed formation by eliminating seed heads.
	Bulldozers & Hydro-axes.		Aerial application for large areas of Tamarisk & Russian Olive.		Pull with weed wrench when small or with a tractor when larger.		Seed & sow grasses. Keep irrigated to promote competition. Don't overgraze.		Cut-Stump: 2" from ground & immediately apply herbicide.

6.4.6 Exhibit F

Reclamation Plan Map

Ghost River Pit Legal
Reclamation Map Exhibit F

8/23/24
Map By James Higgs
PB&S Sand and Gravel LLC

Direction of Water Flow

7.0 Acres to be used for Residential

21.6 Acres Total Pit Boundaries

14.6 Acres to be Reclaimed for Range Land

140'x270' Roping arena

100'x40' Barn

Corrals

50'x40' Garage

3000 SF House

Gravel Area

30 ' Gravel Road Aprrox. 1,700 LF

39.4 acres Property Boundaries

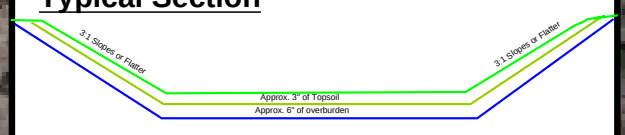
200' Buffer from RR

Lonesome Whistle Rd

Scale
610'-0"

N

Typical Section



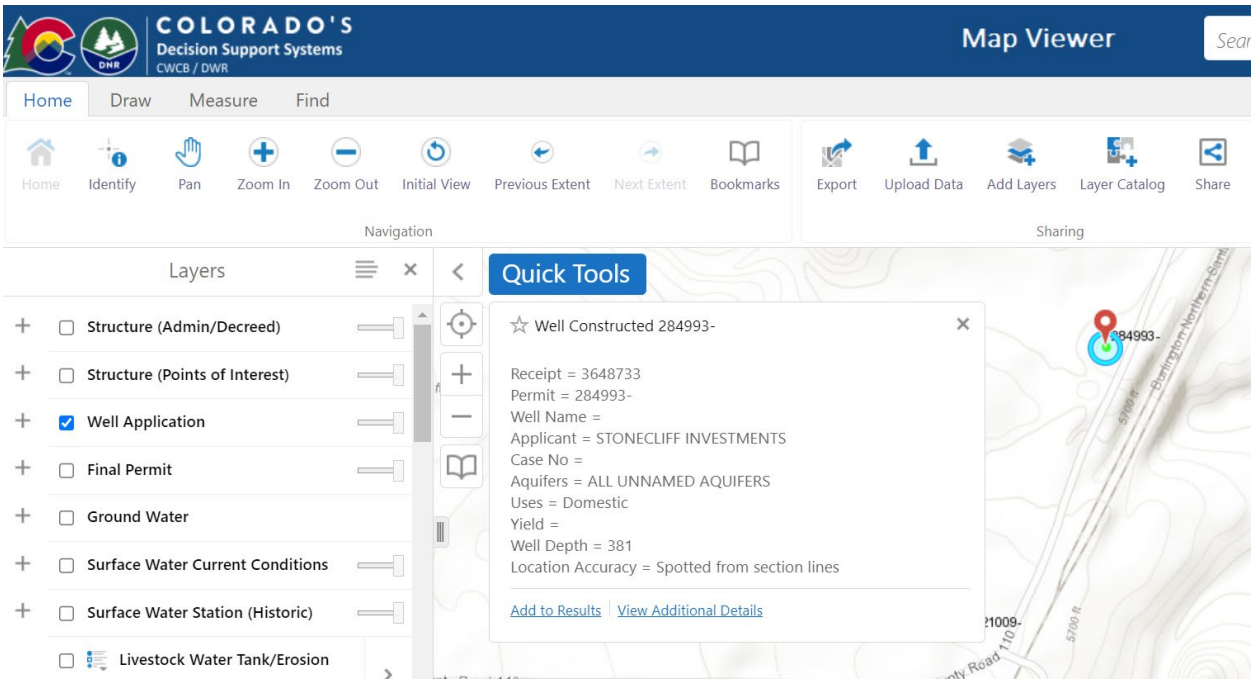
Notes:
All Buildings, Corrals, Arenas, and parking lots are approximate and will be sizes/locations will be determined in the field at the time of construction.

Finish Contours are approximate and are in 5' Intervals

6.4.7 Exhibit G

Water Information

Mining is expected to have no impact on the prevailing hydrologic balance. Groundwater will not be exposed, and stormwater will not leave the site. The site will not discharge stormwater or process water drainage. Water depth is anticipated to be greater than the 20 feet mining depth, as noted below with a nearby depth recorded at 381 feet.



Runoff occurs as overland flow to natural drainage ravines in the vicinity. Stormwater best management practices such as waddles, straw bales, and perimeter berms will be placed to effectively manage stormwater. Historic flow will be maintained during mining. No stormwater will be impounded for greater than 72 hours.

Consumptive use of water may occur as dust suppression on the haul road and affected areas. The operator will purchase the necessary volume of water from an appropriate supplier and transport to the site for use. It is anticipated that the site could use up to 10,000 gallons per day.

The permittee will complete a stormwater management plan. Diversionary berms and impoundments will be constructed as recommended by the Water Quality Division.

6.4.8 Exhibit H

Wildlife Information

The property is used for rangeland and in an HOA. The site will be returned to both residential and rangeland during reclamation. Colorado Parks and Wildlife was contacted for comment during the previous permit application process. The letter states that this project will not have any negative impacts to wildlife. It is attached for review.

Forage and cover for wildlife is very limited due to the arid climate. Small animals, including rabbits, foxes, etc. are found in the surrounding environment. The site is within range for white tail deer, antelope, prairie dog, various snakes, various lizards, and ring-necked pheasant. Impacts to wildlife will be mitigated through a weed management plan and reseeding all mined areas with a diverse and native rangeland seed mix.

6.4.9 Exhibit I

Soils Information

A Custom Soil Resource Report for Huerfano County, specific to this site, is attached for review. The site is made up of Midway clay loam and Midway-Chicosa complex, as well as Manzanst silty clay loam and Manzanola silty clay loam.

The Midway series consists of shallow, well drained soils that formed in residuum and slope alluvium from calcareous platy, clayey shale. Midway soils are on ridge crests, mesas, plains, and hills in shale bedrock uplands. Slopes range from 0 to 40 percent. Mean annual precipitation is about 13 inches and mean annual air temperature is about 50 degrees F.

The Chicosa series consists of very deep, somewhat excessively drained soils that formed in coarse alluvium on terraces, fans and fan remnants. Slopes range from 1 to 25 percent. Mean annual precipitation is about 14 inches and the mean annual temperature is about 50 degrees F.

Topsoil is found at a depth of 3-6 inches onsite, with overburden accounting for approximately 6 inches onsite. Mineable aggregate is then found up to a depth of approximately 20 feet.

COLORADO
Parks and Wildlife
Department of Natural Resources

Pueblo Service Center
600 Pueblo Reservoir Road
Pueblo, CO 81005
P 719.561.5300 | F 719.561.5321

September 30th, 2024

Jodi Schreiber
1774 N. Cougar Drive
Pueblo West, CO 81007

RE: Ghost River Gravel Pit Wildlife Review

Dear Ms. Schreiber,

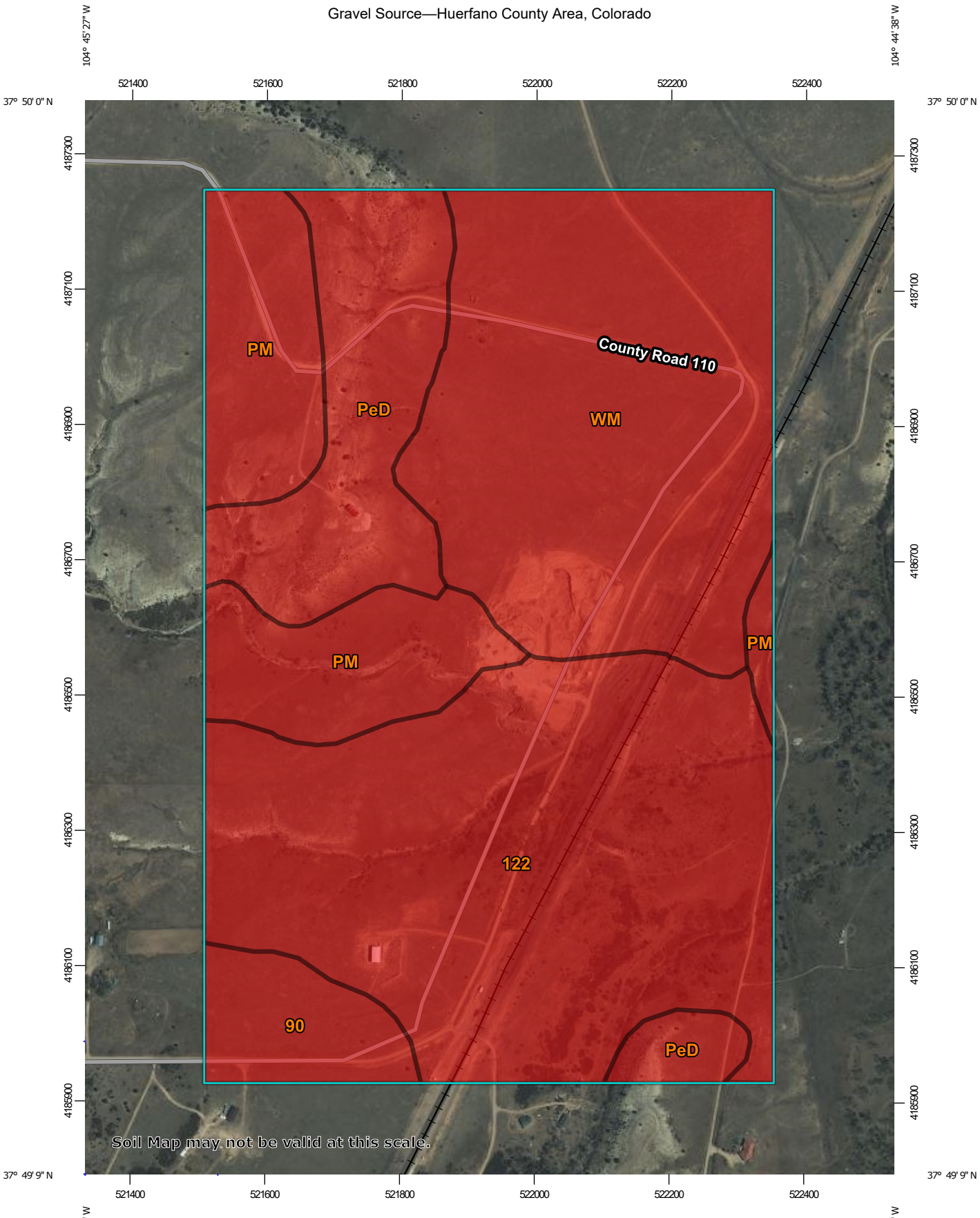
Thank you for allowing Colorado Parks & Wildlife (CPW) the opportunity to review this permit application and discuss any wildlife concerns. The Ghost River Gravel Pit is located in an area with diverse wildlife populations. CPW species activity maps indicate that nearly 50 different wildlife species are found in this general area. With potential impacts to this many different species, this application was carefully reviewed.

Under the new ownership, the size of the gravel pit will increase by 11.7 acres. After examining the area of expansion on the provided map and taking the reclamation plan into consideration, this project as proposed will not have any negative impacts to wildlife.

Sincerely,

Michael D Brown #122

Michael D Brown
Area Wildlife Manager
Area-11 Pueblo
Colorado Parks & Wildlife


104° 45' 27" W
104° 44' 38" W
37° 50' 0" N
37° 49' 9" N
521400
521600
521800
522000
522200
522400
4187300
4187100
4186900
4186700
4186500
4186300
4186100
4185900
PM
PeD
WM
County Road 110
PM
PM
122
90
PeD
Soil Map may not be valid at this scale.
Map Scale: 1:7,740 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 100 200 400 600
Feet
0 350 700 1400 2100
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Poor

Fair

Good

Not rated or not available

Soil Rating Lines

Poor

Fair

Good

Not rated or not available

Soil Rating Points

Poor

Fair

Good

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Huerfano County Area, Colorado
Survey Area Data: Version 20, Aug 24, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 31, 2020—May 18, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Gravel Source

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
90	Wiley silt loam, 0 to 3 percent slopes, cool	Poor	Wiley, cool (85%)	Bottom layer (0.00)	12.5	4.5%
				Thickest layer (0.00)		
			Baca, cool (10%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Kandrix, cool (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
122	Kandrix loam, cool, 0 to 3 percent slopes	Poor	Kandrix, cool (90%)	Bottom layer (0.00)	103.5	37.4%
				Thickest layer (0.00)		
			Otero, cool (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Travessilla, cool (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
PeD	Penrose channery loam, 1 to 15 percent slopes	Poor	Penrose (80%)	Bottom layer (0.00)	37.1	13.4%
				Thickest layer (0.00)		
			Minnequa (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Manvel (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
PM	Penrose-Minnequa complex, 1 to 15 percent slopes	Poor	Penrose (50%)	Bottom layer (0.00)	40.6	14.7%
				Thickest layer (0.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Minnequa (35%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Shingle (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Wilid (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
WM	Minnequa-Wilid silt loams, 1 to 6 percent slopes	Poor	Minnequa (45%)	Bottom layer (0.00)	83.3	30.1%
				Thickest layer (0.00)		
			Wilid (40%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Manzanola (8%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Penrose (5%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
			Shingle (2%)	Bottom layer (0.00)		
				Thickest layer (0.00)		
Totals for Area of Interest					**277.0**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Poor	277.0	100.0%
Totals for Area of Interest	**277.0**	**100.0%**

Description

ENG - Engineering

Gravel consists of natural aggregates (2 to 75 millimeters in diameter) suitable for commercial use with a minimum of processing. It is used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains gravel, the soil is considered a likely source regardless of thickness. The assumption is that the gravel layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be gravel.

The soils are rated "good," "fair," or "poor" as potential sources of gravel. A rating of "good" or "fair" means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Map Scale: 1:7,740 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Huerfano County Area, Colorado
Survey Area Data: Version 20, Aug 24, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 31, 2020—May 18, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
90	Wiley silt loam, 0 to 3 percent slopes, cool	12.5	4.5%
122	Kandrix loam, cool, 0 to 3 percent slopes	103.5	37.4%
PeD	Penrose channery loam, 1 to 15 percent slopes	37.1	13.4%
PM	Penrose-Minnequa complex, 1 to 15 percent slopes	40.6	14.7%
WM	Minnequa-Wilid silt loams, 1 to 6 percent slopes	83.3	30.1%
Totals for Area of Interest		**277.0**	**100.0%**

LOCATION WILEY CO+NE

Established Series
Rev. GB/JWB/LCC
06/2002

WILEY SERIES

The Wiley series consists of very deep, well drained, moderately slowly permeable soils formed in thick, calcareous loess. Wiley soils are on hills, plains, ridges, terraces, and valley side slopes. Slopes range from 0 to 20 percent. Mean annual precipitation is about 15 inches and mean annual temperature is about 52 degrees F.

TAXONOMIC CLASS: Fine-silty, mixed, superactive, mesic Aridic Haplustalfs

TYPICAL PEDON: Wiley silt loam - grassland. (Colors are for dry soil unless otherwise noted).

Ap--0 to 4 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; slightly effervescent; moderately alkaline; clear smooth boundary. (3 to 5 inches thick)

Bt--4 to 10 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; slightly effervescent; moderately alkaline; clear smooth boundary. (4 to 11 inches thick)

Btk--10 to 18 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard , firm, moderately sticky and moderately plastic; few faint clay films on faces of peds; few medium masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary. (8 to 24 inches thick)

BCk--18 to 23 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium masses of calcium carbonate; violently effervescent; strongly alkaline; clear smooth boundary. (5 to 10 inches thick)

C--23 to 60 inches; light yellowish brown (10YR 6/4) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; violently effervescent; strongly alkaline.

TYPE LOCATION: Lincoln County, Colorado; about 2050 feet east and 150 feet south of the NW corner of Sec. 22, T. 7 S., R. 56 W.

RANGE IN CHARACTERISTICS:
Mean annual soil temperature: 49 to 59 degrees F.
Mean summer soil temperature: 70 to 75 degrees F.
Depth to the base of the argillic horizon: 12 to 40 inches.
Depth to visible calcium carbonate: 7 to 24 inches.
Exchangeable sodium percentage ranges: 0 to 15 percent.
Rock fragment content: 0 to 5 percent.

Ap horizon: (A horizon in some pedons)
Hue: 7.5YR to 2.5Y
Value: 4 to 7 dry, 3 to 6 moist
Chroma: 1 to 4
Reaction: neutral to moderately alkaline.

Bt horizon:
Hue: 7.5YR to 2.5Y
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 1 to 6
Texture: silt loam or silty clay loam
Clay content: 20 to 35 percent
Reaction: moderately alkaline or strongly alkaline.

Btk horizon:
Hue: 7.5YR to 2.5Y
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 3 or 4
Texture: silt loam or silty clay loam
Clay content: 20 to 35 percent
Reaction: moderately alkaline or strongly alkaline
Calcium carbonate equivalent: 5 to 15 percent above 30 inches.

BCk horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 4
Texture: silt loam or silty clay loam
Reaction: moderately alkaline or strongly alkaline.

C horizon: (Bk horizon in some pedons)
Hue: 7.5YR or 10YR
Value: 6 or 7 dry, 4 to 6 moist
Chroma: , 2 to 4
Texture: silt loam, silty clay loam, loam
Reaction: moderately alkaline or strongly alkaline.

COMPETING SERIES: These include the Altega (NM), Amal (NM), Buick (CO), Chita (NM), Elpedro (NM), Keiser (MT), Klinedray (WY), Moncha (NM), Oshoto (WY), Pulpit (CO), Roubideau (CO), Sharps (CO), Verde (CO) and the Wetherill (NM) soils.
Altega and Amal soils: are dry in May and June.
Buick soils: formed in polylithologic material in which a younger soil is superimposed over a paleosol.
Chita soils: have calcic horizons above 40 inches and are dry in May and June.
Empedro and Wetherill soils: are greater than 40 inches to the base of the argillic horizon.
Keiser soils: have average clay content of 34 to 43 percent.
Klinedraw and Sharps soils: have a paralithic contact at depths of 20 to 40 inches.
Moncha soils: have hues of 5YR and redder.
Oshoto soils: have mean annual soil temperatures colder than 53 degrees F. and are moist March to June.
Pulpit, Roubideau, and Verde soils: have a lithic contact at depths of 20 to 40 inches.

GEOGRAPHIC SETTING:
Landform: plains, hills, ridges, terraces, and valley side slopes.
Slopes: range from 0 to 20 percent.
Parent material: thick, calcareous loess and eolian material.
Elevation: 4,000 to 6,500 feet.
Mean annual precipitation: 14 to 17 inches, with peak periods of precipitation in the spring and summer.
Mean annual temperature: 47 to 53 degrees F.
Mean summer temperature is 68 to 76 degrees F.
Frost free period: 120 to 175 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Baca and Colby soils. Baca soils have more than 35 percent clay in the argillic horizon. Colby soils do not have an argillic horizon.

DRAINAGE AND PERMEABILITY: Well drained; low or medium runoff; moderate through slow permeability.

USE AND VEGETATION: These soils are used as grazing land and as dry or irrigated cropland. Native vegetation is blue grama, western wheatgrass, green needlegrass, buffalo grass, and needleandthread.

DISTRIBUTION AND EXTENT: Eastern Colorado. LRR G, MLRA 67; The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES ESTABLISHED: Lincoln County, Colorado; about 2050 feet east and 150 feet south of the NW corner of Sec. 22, T.24S., R.56W.

REMARKS: Diagnostic features recognized in this pedon include:
Ochric epipedon: the zone from 0 to 4 inches. (A horizon)
Argillic horizon: the zone from 4 to 18 inches. (Bt and Btk horizons)

Remarks: The 3/94 revision documents a change in class from Ustollic Haplargids to Aridic Haplustalfs. The 12/99 revision reflects a change in type location to Lincoln County, Colorado in order to be in MLRA 67.

Modified in January 2002 by Lee Neve to update competing series and associated soils.

Taxonomic Version: Second Edition, 1999.

National Cooperative Soil Survey
U.S.A.

LOCATION KANDRIX CO

Established Series
LAN
07/2007

KANDRIX SERIES

The Kandrix series consists of very deep, well drained soils that formed in eolian sediments and alluvium derived from sedimentary deposits. Kandrix soils are on plains, ridges, and hills. Slopes range from 1 to 6 percent. Mean annual precipitation is about 15 inches and the mean annual temperature is about 52 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Aridic Calciustepts

TYPICAL PEDON: Kandrix loam, on a south facing, 3 percent slope in grass at an elevation of 5,290 feet. (Colors are for dry soil unless otherwise noted.) When described on April 5, 2002 the soil was dry throughout.

A--0 to 6 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky and weak very fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots throughout; strong effervescence (4 percent calcium carbonate equivalent); slightly alkaline (pH 7.6); abrupt smooth boundary. (4 to 6 inches thick)

Bw--6 to 14 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; violent effervescence (11 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); clear smooth boundary. (6 to 14 inches thick)

Bk1--14 to 26 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; 15 percent patchy distinct pressure faces on vertical faces of peds; violent effervescence (19 percent calcium carbonate equivalent); moderately alkaline (pH 8.3); clear smooth boundary.

Bk2--26 to 42 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few fine irregular carbonate masses; violent effervescence (15 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); clear smooth boundary.

Bk3--42 to 51 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine irregular carbonate masses; violent effervescence (16 percent calcium carbonate equivalent); strongly alkaline (pH 8.6); clear smooth boundary. (Combined thickness of the Bk1, Bk2 and Bk3 horizons is 30 to 42 inches)

Bk4--51 to 65 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine irregular carbonate masses in matrix; violent effervescence 10 percent calcium carbonate equivalent); moderately alkaline (pH 8.2).

TYPE LOCATION: Las Animas County, Colorado; about 3.5 miles north of Andrix, Colorado; located about 1750 feet east and 2000 feet south of the northwest corner of sec. 19, T. 31 S., R. 51 W.; Andrix USGS quad; lat. 37 degrees 19 minutes 54 seconds N. and long. 103 degrees 11 minutes 9 seconds W., NAD 27

RANGE IN CHARACTERISTICS:

Soil moisture: The soil moisture control section is moist intermittently May through August, driest December through February; ustic moisture regime bordering on aridic.

Mean annual soil temperature: 50 to 54 degrees F
Mean summer soil temperature: 68 to 74 degrees F
Depth to secondary calcium carbonate: 0 to 6 inches
Depth to calcic horizon: 10 to 30 inches
Thickness of the cambic horizon: 6 to 14 inches
Thickness of the calcic horizon: 30 to 42 inches

Particle-size control section (weighted average):
Clay content: 20 to 30 percent
Sand content: 25 to 55, with more than 15 percent fine sand to coarser sand
Rock fragments: 0 to 5 percent gravel

A horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 2 or 3
Clay content: 18 to 27 percent
Rock fragments: 0 to 5 percent gravel
Calcium carbonate equivalent: 1 to 5 percent
Reaction: slightly alkaline or moderately alkaline

Bw horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4
Texture: silt loam, loam, clay loam
Clay content: 20 to 30 percent
Rock fragments: 0 to 5 percent gravel
Calcium carbonate equivalent: 5 to 15 percent
Reaction: slightly alkaline or moderately alkaline

Bk1, Bk2 and Bk3 horizons:
Hue: 7.5YR or 10YR
Value: 6 to 8 dry, 4 to 6 moist
Chroma: 3 to 6
Texture: loam, silt loam, clay loam, sandy clay loam
Clay content: 20 to 35 percent
Rock fragments: 0 to 15 percent gravel
Calcium carbonate equivalent: 15 to 35 percent
Reaction: moderately alkaline or strongly alkaline

Bk4 horizon: (Bky is present in some pedons)
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 3 to 6
Texture: loam, sandy clay loam, fine sandy loam
Clay content: 15 to 27 percent
Calcium carbonate equivalent: 5 to 35 percent
Reaction: moderately alkaline or strongly alkaline

COMPETING SERIES: These are the Cibeque (AZ), Coconino (AZ), and Quartermaster (AZ) series.
Cibeque soils: average more than 15 percent rock fragments and are dry in May and June

Coconino soils: have a paralithic contact at depths of 20 to 40 inches
Quartermaster soils: have an identifiable hard pan and a petrocalcic horizon.

GEOGRAPHIC SETTING:
Parent material: eolian deposits and alluvium derived from sedimentary materials
Landform: plains, hills, ridges, fans
Slopes: 1 to 6 percent
Elevation: 4,700 to 6,000 feet
Mean annual temperature: 51 to 53 degrees F
Mean annual precipitation: 14 to 16 inches
Precipitation pattern: moist intermittently April through August, driest December through February
Frost-free period: 135 to 155 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Chicosa, Olnest, Otero, and Wiley series. The Chicosa soils average more than 35 percent rock fragments and are on fans and ridges. The Olnest and Wiley soils have argillic horizons and are on plains, fans, and hills. The Otero soils do not have a calcic horizon and are on hills and ridges.

DRAINAGE AND PERMEABILITY: well drained, low to moderate runoff, moderate permeability.

USE AND VEGETATION: rangeland, irrigated and nonirrigated cropland, and wildlife habitat; the native vegetation is mainly blue grama, western wheatgrass, buffalograss, sand dropseed, sideoats grama, yucca, and prickly pear cactus.

DISTRIBUTION AND EXTENT: southeastern Colorado; LRR G, MLRA 67; moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES PROPOSED: Las Animas County, Colorado, Las Animas County soil survey area, Colorado. The name is coined and taken from the town site of Andrix.

REMARKS:
Diagnostic horizons and features recognized in this pedon are:
Series control section: The zone from 10 to 40 inches.
Particle-size control section: The zone from 10 to 40 inches. (parts of Bw, Bk1 and Bk2 horizons)
Ochric epipedon: The zone from 0 to 6 inches. (A horizon)
Cambic horizon: The zone from 6 to 14 inches. (Bw horizons)
Calcic horizon: The zone from 14 to 51 inches. (Bk1, Bk2, and Bk3 horizons)
Other features: aridic ustic moisture regime.

Remarks: This soil was originally included with the Kimst series but was separated due to consistent identifiable carbonates and the presence of a calcic horizon.

The assignment of the cation-exchange activity class is supported by lab sample(s) numbers S03CO071002.

Taxonomic Version: Second Edition, 1999.

ADDITIONAL DATA:

National Cooperative Soil Survey
U.S.A.

LOCATION PENROSE CO+KS NE NM SD

Established Series
AJC/GB
06/2006

PENROSE SERIES

The Penrose series consists of shallow, well and somewhat excessively drained, moderate to slowly permeable soils formed in thin, calcareous, loamy materials weathered in place from limestone and interbedded limy materials. Penrose soils are on hills, plains, ridges, hogbacks, cuestas, and mesa tops. Slopes are 1 to 65 percent. Mean annual precipitation is about 13 inches and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Loamy, carbonatic, mesic Lithic Ustic Torriorthents

TYPICAL PEDON: Penrose channery loam - grassland. (Colors are for dry soil unless otherwise noted).

A--0 to 4 inches; light brownish gray (2.5Y 6/2) channery loam, dark grayish brown (2.5Y 4/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; 25 percent channers; calcareous; moderately alkaline; clear smooth boundary.

C--4 to 15 inches; light gray (2.5Y 7/2) channery loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; 20 percent limestone channers; calcareous; moderately alkaline; abrupt smooth boundary.

R--15 inches; limestone bedrock.

TYPE LOCATION: Fremont County, Colorado; about 0.1 mile east of "K" Street and about 125 feet north of Highway No. 115 six feet from fence in the southeast quarter of Sec. 21, T. 18 S., R. 68 W.

RANGE IN CHARACTERISTICS:

Soil moisture: The soil moisture control section is moist intermittently April through August; aridic moisture regime bordering on ustic.
Mean annual soil temperature: 52 to 59 degrees F.
Mean summer soil temperature: 68 to 76 degrees F.
Depth to lithic contact: 10 to 20 inches to limestone
Depth to secondary calcium carbonate: 0 to about 5 inches and is not more than 1/4 the thickness of the control section
Gypsum content: 0 to 1.5 percent by weight
Calcium carbonate equivalent: 40 to 75 percent
Electrical conductivity: 0 to 14 millimhos/cm in a major part of the control section
Continuous subhorizons of secondary calcium carbonate and/or sulfate do not occur within the control section although some visible accumulation occurs in some pedons

Particle-size control section (weighted average):
Clay content: 18 to 35 percent
Sand content: 15 to 70 percent
Rock fragments: 0 to 35 percent, dominantly to 10 inches in diameter.

A horizon:
Hue: 7.5YR through 2.5Y

Value: 5 through 8, 3 through 6 moist
Chroma: 1 through 4.
Calcium carbonate equivalent: 35 to 70 percent
Reaction: mildly alkaline or moderately alkaline.
Rock fragments: 0 to 35 percent

C horizon:
Hue: 7.5YR through 2.5Y
Textures of the fine earth fraction: loam, silt loam, clay loam
Clay content: 18 to 35 percent
Rock fragments: 0 to 35
Calcium carbonate equivalent: 40 to 75 percent
Reaction: moderately alkaline or strongly alkaline.

COMPETING SERIES: These are presently no competing series in this family. Welring is similar, but in the loamy-skeletal family.

GEOGRAPHIC SETTING:
Parent material: residuum and slope alluvium derived from limestone and interbedded limy materials.
Landform: hills, mesas, and ridges
Slopes: 1 to 65 percent
Elevation: 3,000 to 6,500 feet
Mean annual temperature: 50 to 53 degrees F
Mean annual precipitation: 11 to 15 inches
Precipitation pattern: peak periods between April and August, dries between November and February
Frost-free period: 125 to 165 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Manvel and Minnequa soils. Manvel soils have no bedrock above a depth of 40 inches. Minnequa soils have bedrock at a depth of 20 to 40 inches.

DRAINAGE AND PERMEABILITY: well or somewhat exessivly drained, low through very rapid runoff, moderate or moderately slow permeability.

USE AND VEGETATION: These soils are used principally as grazing land. Native vegetation is pinyon, juniper, blue grama, cactus, and western wheatgrass.

DISTRIBUTION AND EXTENT: Eastern Colorado and southern Wyoming; LRR E, MLRA 69 and 67; large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES ESTABLISHED: Arkansas Valley Area, 1936.

REMARKS:
Diagnostic horizons and features recognized in this pedon are:
Series control section: The zone from 0 to 15 inches.
Particle-size control section: The zone from 0 to 15 inches. (A and C horizons)
Ochric epipedon: The zone from 0 to 4 inches. (A horizon)
Lithic contact: The contact with limestone at 15 inches. (R horizons)
Other features: Carbonatic mineralogy

Remarks: This revision is a change to the semitabular format.

Taxonomic Version: Ninth Edition, 2003

ADDITIONAL DATA: Laboratory pedons sampled; 96CO071005, 96CO071011.

National Cooperative Soil Survey
U.S.A.

LOCATION WILID CO

Established Series
WSH/LC
08/2012

WILID SERIES

The Wilid series consists of very deep, well drained soils that formed in loess. Wilid soils are on plains and interfluves in MLRA 69. Slopes range from 0 to 12 percent. The mean annual precipitation is about 305 millimeters (12 inches). The mean annual temperature is about 11 degrees C (52 degrees F).

TAXONOMIC CLASS: Fine-silty, mixed, superactive, mesic Ustic Calciargids

TYPICAL PEDON: Wilid silt loam, nearly level slope in rangeland at an elevation of 1601 meters (5,250 feet). (Colors are for dry soil unless otherwise noted).

A--0 to 15 cm (0 to 6 inches); pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; slight effervescence; slightly alkaline (pH 7.8); clear smooth boundary. (5 to 15 cm thick)

Bt--15 to 25 cm (6 to 10 inches); pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; moderately hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; few very fine pores; 30 percent distinct clay films on all faces of peds; violent effervescence; 7 percent calcium carbonate equivalent; moderately alkaline (pH 8.2); clear smooth boundary.

Btk--25 to 76 cm (10 to 30 inches); pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; very hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine pores; 30 percent distinct clay films on all faces of peds; 1 percent medium distinct carbonate masses throughout; violent effervescence; 8 percent calcium carbonate equivalent; moderately alkaline (pH 8.2); clear smooth boundary. (Combined thickness of Bt and Btk horizons is 28 to 84 cm)

Bk1--76 to 112 cm (30 to 44 inches); pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine pores; 5 percent medium carbonate masses throughout; violent effervescence; 17 percent calcium carbonate equivalent; moderately alkaline (pH 8.2); clear wavy boundary. (25 to 50 cm thick)

Bk2--112 to 200 cm (44 to 79 inches); very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) moist; weak course subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine pores; 25 percent fine faint carbonate masses throughout; violent effervescence; 25 percent calcium carbonate equivalent; moderately alkaline (pH 8.2).

TYPE LOCATION: Las Animas County, Colorado; approximately 10 miles east and 2 miles north of Model; 900 feet east and 2,450 feet north of the southwest corner of Sec. 29, T. 29 S., R. 30 W.; Brown Sheep Camp, CO, USGS quad.; UTM zone 13 585004 E, 4139858 N; latitude 37 degrees, 24 minutes, 5.8 seconds N. and longitude 104 degrees, 2 minutes, 22.5 seconds W., NAD 83.

RANGE IN CHARACTERISTICS:
Soil moisture: Moist in some part March through May and intermittently moist June through October. It is driest December through February.

Moisture regime: aridic bordering on ustic.
Mean annual soil temperature: 9 to 12 degrees C. (49 to 54 degrees F.)
Depth to secondary calcium carbonate: 0 to 25 centimeters (0 to 10 inches)
Depth to calcic horizon: 66 to 127 cm (26 to 50 inches)
Thickness of the argillic horizon: 28 to 84 centimeters (11 to 33 inches)

Particle size control section:
Clay content: 24 to 35 percent
Silt content: 50 to 70 percent
Sand content: 5 to 20 percent, with less than 15 percent fine or coarser sand.

A horizon:
Hue: 10YR
Value: 4 through 6, 3 or 4 moist
Chroma: 2 or 3
Texture: silt loam, silty clay loam
Reaction: neutral through moderately alkaline

Btk and Bt horizons:
Hue: 10YR
Value: 5 or 6, 4 or 5 moist
Chroma: 3 or 4
Texture: silt loam or silty clay loam
Calcium carbonate equivalent: 5 to 15 percent (5 to 10 percent in Bt horizons)
Reaction: moderately alkaline or strongly alkaline

Bk horizons:
Hue: 10YR
Value: 6 through 8, 5 or 6 moist
Chroma: 2 through 4
Texture: silt loam, loam or silty clay loam
Calcium carbonate equivalent: 5 to 25 percent above 100 cm, 10 to 40 percent below 100 cm.
Reaction: moderately alkaline or strongly alkaline

COMPETING SERIES: These are the Almagre (CO), Monogram (CO), Snapill (NM), Tetilla (NM), Villedry (CO), and Witt (NM) series.
Almagre soils: have a lithic contact at depths of 100 to 150 cm, 40 to 60 inches.
Monogram soils: have calcium carbonate equivalent of 40 to 70 percent in the calcic horizon and a lithic contact at 168 cm, 66 inches.
Snapill soils: have a paralithic contact at depths of 50 to 100 cm, 40 to 60 inches.
Tetilla soils: have 10 to 25 percent rock fragments in the Bk2 horizon.
Villedry soils: have a lithic contact at depths of 50 to 100 cm, 40 to 60 inches.
Witt soils: the soil moisture control section is driest during May and June and have hues redder than 10YR.

GEOGRAPHIC SETTING:
Landform: plains and interfluves
Slopes: range from 0 to 12 percent
Parent material: loess
Mean annual precipitation: 254 to 356 millimeters (10 to 14 inches), most of which falls during the months of April through September. Driest period is December through February.
Mean annual air temperature: 9 to 12 degrees C. (49 to 53 degrees F.)
Average summer temperature: 20 to 23 degrees C. (68 to 74 degrees F.)
Frost-free season: 130 to 175 days
Elevation ranges from 1219 to 1981 meters (4,000 to 6,200 feet).

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Bacid, Manzanola, Minnequa and Fort soils. Bacid and Manzanola soils are in the fine family and are in depressions and drainageways. Minnequa soils are on pediments that have a thin loess cap over residuum. They have a paralithic contact at depths of 51 to 100 cm. Fort soils have a fine-loamy control section and are on side slopes of interfluves and ridges.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained; low or medium runoff; moderately high to high hydraulic conductivity.

USE AND VEGETATION: These soils are rangeland or nonirrigated cropland. Native vegetation is mainly blue grama, galleta, sand dropseed, and western wheatgrass. It is correlated to the Loamy Ecological Site Description.

DISTRIBUTION AND EXTENT: MLRA 69. This series is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES ESTABLISHED: Lincoln County, Colorado, 1996.

REMARKS: Diagnostic horizons and features in this pedon are:
Ochric epipedon: 0 to 15 centimeters (0 to 6 inches).
Argillic horizon: 15 to 76 centimeters (6 to 30 inches).
Calcic horizon: 76 to 200 centimeters (30 to 79 inches).

The Wilid series replaces Wiley in the Ustic-Aridic moisture regime. The Wiley series was reclassified from Ustic Haplargids to Aridic Haplustalfs. The name Wilid is coined from Wiley.
LC 11/2011 Revised horizon nomenclature, properties ranges, and updated to metric format based on reexamination of correlation samples, documentation, and field office laboratory measurements.

LAN 5/2012 This update moves the type location from Lincoln County, Colorado to Las Animas County, Colorado and changes the Taxonomic class to Fine-silty, mixed, superactive, mesic Ustic Calciargids.

Keys to Soil Taxonomy used: Eleventh Edition, 2010

National Cooperative Soil Survey
U.S.A.

6.4.10 Exhibit J

Vegetation Information

The Ghost River Pit is characterized by grazing land. Native vegetation includes blue grama, western wheatgrass, blue grama, galleta, cactus, yucca, and sagebrush.

6.4.11 Exhibit K

Climate

Climate data was pulled from the U.S Climate Data website for the Huerfano County, Colorado area.

Huerfano County Monthly Climate Averages

12 Month Climate Scroll °F °C

Month	January	February	March	April	May	June
Avg. Temperatures	Hi 34°F Lo 14°F	Hi 35°F Lo 15°F	Hi 45°F Lo 24°F	Hi 53°F Lo 29°F	Hi 63°F Lo 36°F	Hi 76
Avg. Wind Speed	7 mph	8 mph	8 mph	9 mph	8 mph	7 mpl
Avg. Precipitation	1.6 in	2.6 in	3.1 in	4 in	5.4 in	4.9 in
Average Humidity	76%	74%	60%	52%	48%	44%
Avg. Cloud Cover	26%	28%	24%	23%	21%	15%
Pressure Average	30.1 in	30.1 in	30.0 in	29.9 in	29.9 in	29.9 i
Average Dry Days	11	9	11	12	15	23
Avg. Precip. Days	7	5	5	5	8	7
Avg. Snow Days	14	14	16	13	9	0
Average Fog Days	1	2	0	0	0	0
Average UV Index	2	2	2	3	4	5
Avg. Hours of Sun	285	248	285	272	295	314

Huerfano County Monthly Climate Averages

12 Month Climate Scroll

°F °C

Month	July	August	September	October	November	Decem
Avg. Temperatures	Hi 78°F Lo 51°F	Hi 76°F Lo 49°F	Hi 70°F Lo 45°F	Hi 57°F Lo 33°F	Hi 45°F Lo 24°F	Hi 34°
Avg. Wind Speed	5 mph	5 mph	6 mph	7 mph	8 mph	8 mph
Avg. Precipitation	9.8 in	8.2 in	3.4 in	2.2 in	1.4 in	1.5 in
Average Humidity	56%	54%	52%	51%	56%	70%
Avg. Cloud Cover	23%	18%	16%	15%	15%	25%
Pressure Average	30.0 in	30.0 in	30.0 in	30.0 in	30.1 in	30.1 ir
Average Dry Days	19	22	23	22	20	13
Avg. Precip. Days	12	9	5	3	2	6
Avg. Snow Days	0	0	1	6	8	12
Average Fog Days	0	0	0	0	0	1
Average UV Index	5	5	4	2	2	1
Avg. Hours of Sun	303	325	313	319	311	281

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition

In areas that have similar climate and topography, differences in the kind and amount of rangeland or forest understory vegetation are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

This table shows, for each soil that supports vegetation, the ecological site, plant association, or habitat type; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in the table follows.

An *ecological site, plant association, or habitat type* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site, plant association, or habitat type is typified by an association of species that differs from that of other ecological sites, plant associations, or habitat types in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service (NRCS). Descriptions of plant associations or habitat types are available from local U.S. Forest Service offices.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic vegetation (the grasses, forbs, shrubs, and understory trees that make up most of the potential natural plant community on each soil) is listed by common name. Under *rangeland composition and forest understory*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The percentages are by dry weight for rangeland. Percentages for forest understory are by either dry weight or canopy cover. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in the "National Range and Pasture Handbook," which is available in local offices of NRCS or on the Internet.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service, National range and pasture handbook.

Report—Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–Huerfano County Area, Colorado								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
90—Wiley silt loam, 0 to 3 percent slopes, cool								
Wiley, cool	Loamy Plains (R069XY006CO); Loamy Plains #6 (069XY006CO_2)	1,300	900	450	blue grama	35		
					western wheatgrass	25		
					green needlegrass	10		
					bottlebrush squirreltail	5		
					galleta	5		
					winterfat	5		
					American vetch	3		
					plains pricklypear	3		
					sand dropseed	2		
					sun sedge	2		
					scarlet globemallow	1		
					tree cholla	1		

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–Huerfano County Area, Colorado								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
122—Kandrix loam, cool, 0 to 3 percent slopes								
Kandrix, cool	Loamy Plains (R069XY006CO)	1,600	1,100	500	blue grama	30		
					galleta	20		
					western wheatgrass	20		
					buffalograss	6		
					ring muhly	6		
					sand dropseed	4		
					American vetch	2		
					bottlebrush squirreltail	2		
					dotted blazing star	2		
					fourwing saltbush	2		
					green needlegrass	2		
					sideoats grama	2		
					winterfat	2		

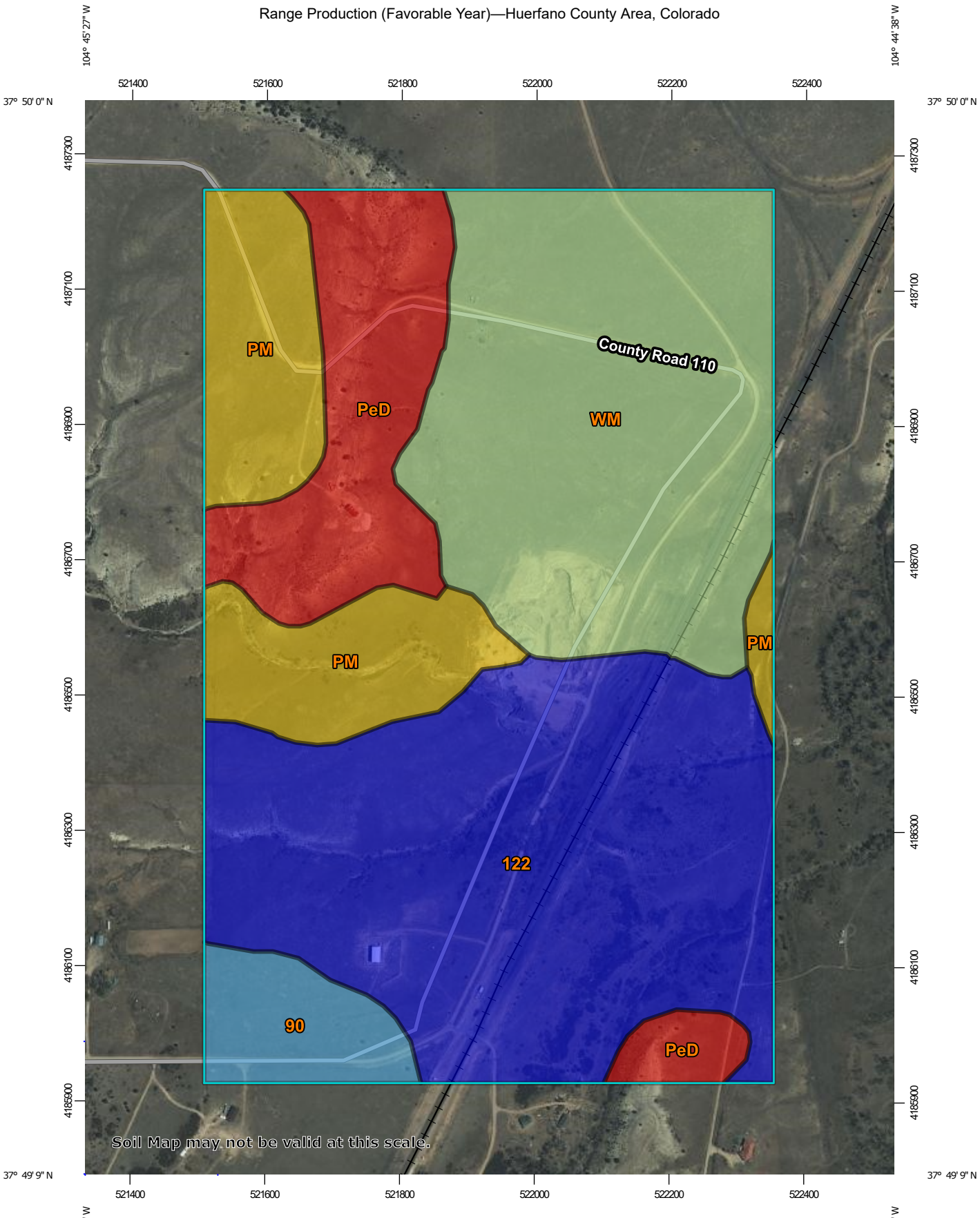
Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–Huerfano County Area, Colorado								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
PeD—Penrose channery loam, 1 to 15 percent slopes								
Penrose	Limestone Breaks (R069XY058CO)	800	600	300	sideoats grama	25		
					blue grama	20		
					Indian ricegrass	10		
					New Mexico Feathergrass	10		
					Scribner needlegrass	10		
					galleta	5		
					little bluestem	5		
					oneseed juniper	5		

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–Huerfano County Area, Colorado								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
PM—Penrose-Minnequa complex, 1 to 15 percent slopes								
Penrose	Limestone Breaks (R069XY058CO); Limestone Breaks #58 (069XY058CO_2)	800	600	300	sideoats grama	25		
					blue grama	20		
					Indian ricegrass	10		
					New Mexico Feathergrass	10		
					Scribner needlegrass	10		
					galleta	5		
					little bluestem	5		
					oneseed juniper	5		
Minnequa	Loamy Plains (R069XY006CO)	1,200	650	450	blue grama	35		
					western wheatgrass	20		
					galleta	10		
					fourwing saltbush	5		
					sand dropseed	5		
					sideoats grama	5		
					winterfat	5		
					green needlegrass	4		

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–Huerfano County Area, Colorado								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
WM—Minnequa-Wilid silt loams, 1 to 6 percent slopes								
Minnequa	Loamy Plains (R069XY006CO)	1,200	650	450	blue grama	35		
					western wheatgrass	20		
					galleta	10		
					fourwing saltbush	5		
					sand dropseed	5		
					sideoats grama	5		
					winterfat	5		
					green needlegrass	4		
Wilid	Loamy Plains (R069XY006CO); Loamy Plains #6 (069XY006CO_2)	1,200	800	350	blue grama	35		
					western wheatgrass	20		
					galleta	10		
					fourwing saltbush	5		
					sand dropseed	5		
					sideoats grama	5		
					winterfat	5		
					green needlegrass	4		

Data Source Information

Soil Survey Area: Huerfano County Area, Colorado
Survey Area Data: Version 20, Aug 24, 2023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104° 44' 38" W
37° 50' 0" N
37° 49' 9" N
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521600
521800
522000
522200
522400
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4187100
4186900
4186700
4186500
4186300
4186100
4185900
PM
PeD
WM
County Road 110
PM
PM
122
90
PeD
Soil Map may not be valid at this scale.
Map Scale: 1:7,740 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 100 200 400 600
Feet
0 350 700 1400 2100
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

<= 760

> 760 and <= 918

> 918 and <= 1171

> 1171 and <= 1300

> 1300 and <= 1620

Not rated or not available

Soil Rating Lines

<= 760

> 760 and <= 918

> 918 and <= 1171

> 1171 and <= 1300

> 1300 and <= 1620

Not rated or not available

Soil Rating Points

<= 760

> 760 and <= 918

> 918 and <= 1171

> 1171 and <= 1300

> 1300 and <= 1620

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Huerfano County Area, Colorado
Survey Area Data: Version 20, Aug 24, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 31, 2020—May 18, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Range Production (Favorable Year)

Map unit symbol	Map unit name	Rating (pounds per acre per year)	Acres in AOI	Percent of AOI
90	Wiley silt loam, 0 to 3 percent slopes, cool	1300	12.5	4.5%
122	Kandrix loam, cool, 0 to 3 percent slopes	1620	103.5	37.4%
PeD	Penrose channery loam, 1 to 15 percent slopes	760	37.1	13.4%
PM	Penrose-Minnequa complex, 1 to 15 percent slopes	918	40.6	14.7%
WM	Minnequa-Wilid silt loams, 1 to 6 percent slopes	1171	83.3	30.1%
Totals for Area of Interest			**277.0**	**100.0%**

Description

Total range production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. Yields are adjusted to a common percent of air-dry moisture content.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Rating Options

Units of Measure: pounds per acre per year

Aggregation Method: Weighted Average

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Weighted Average" computes a weighted average value for all components in the map unit. Percent composition is the weighting factor. The result returned by this aggregation method represents a weighted average value of the corresponding attribute throughout the map unit.

Component Percent Cutoff: None Specified

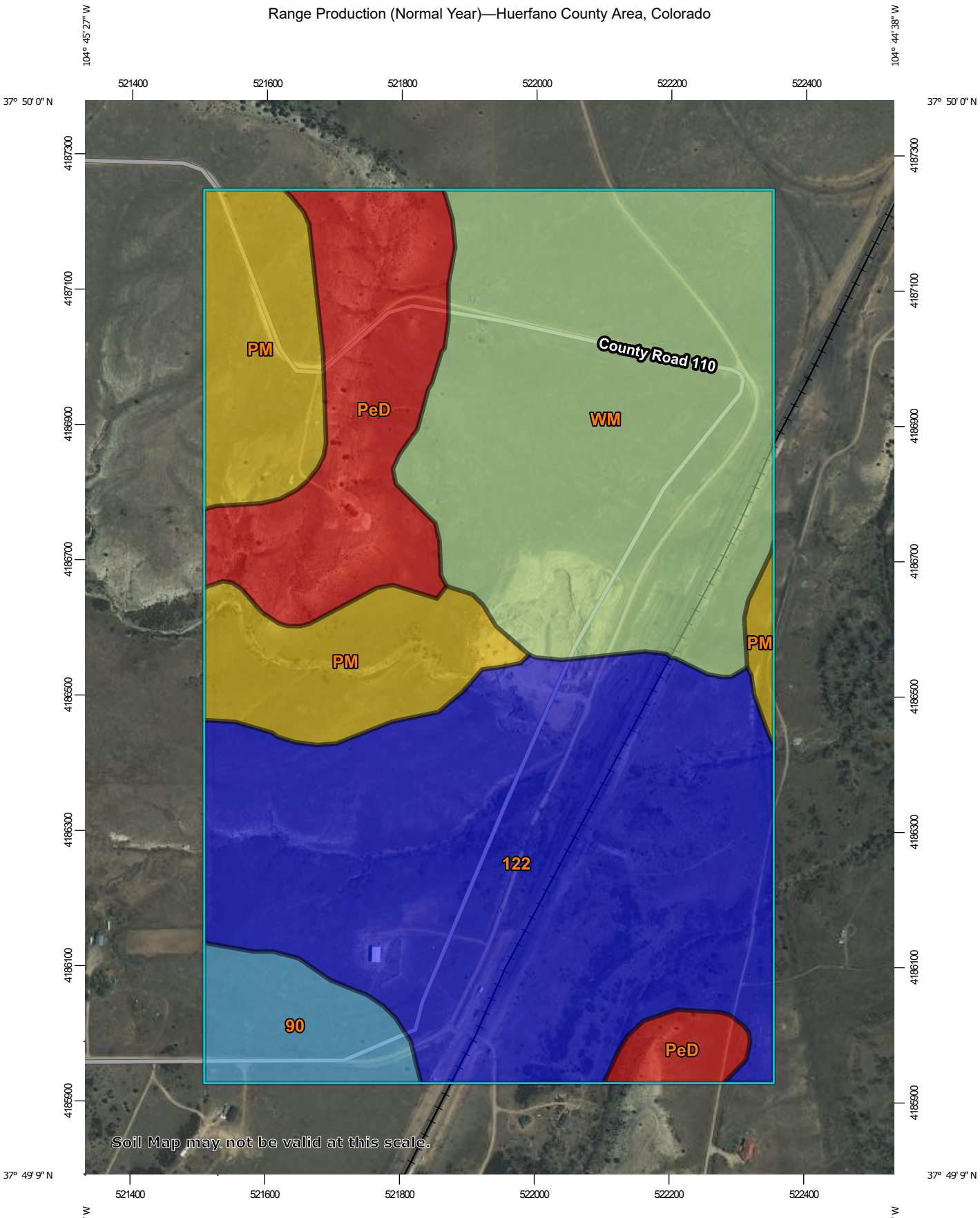
Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: Yes

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.


104° 45' 27" W
104° 44' 38" W
37° 50' 0" N
37° 49' 9" N
521400
521600
521800
522000
522200
522400
4187300
4187100
4186900
4186700
4186500
4186300
4186100
4185900
PM
PeD
WM
County Road 110
PM
PM
122
90
PeD
Soil Map may not be valid at this scale.
Map Scale: 1:7,740 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 100 200 400 600
Feet
0 350 700 1400 2100
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

<= 550

> 550 and <= 595

> 595 and <= 718

> 718 and <= 900

> 900 and <= 1115

Not rated or not available

Soil Rating Lines

<= 550

> 550 and <= 595

> 595 and <= 718

> 718 and <= 900

> 900 and <= 1115

Not rated or not available

Soil Rating Points

<= 550

> 550 and <= 595

> 595 and <= 718

> 718 and <= 900

> 900 and <= 1115

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil Survey Area: Huerfano County Area, Colorado
Survey Area Data: Version 20, Aug 24, 2023

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Date(s) aerial images were photographed: Mar 31, 2020—May 18, 2020

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Range Production (Normal Year)

Map unit symbol	Map unit name	Rating (pounds per acre per year)	Acres in AOI	Percent of AOI
90	Wiley silt loam, 0 to 3 percent slopes, cool	900	12.5	4.5%
122	Kandrix loam, cool, 0 to 3 percent slopes	1115	103.5	37.4%
PeD	Penrose channery loam, 1 to 15 percent slopes	550	37.1	13.4%
PM	Penrose-Minnequa complex, 1 to 15 percent slopes	595	40.6	14.7%
WM	Minnequa-Wilid silt loams, 1 to 6 percent slopes	718	83.3	30.1%
Totals for Area of Interest			**277.0**	**100.0%**

Description

Total range production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation. In a normal year, growing conditions are about average. Yields are adjusted to a common percent of air-dry moisture content.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Rating Options

Units of Measure: pounds per acre per year

Aggregation Method: Weighted Average

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Weighted Average" computes a weighted average value for all components in the map unit. Percent composition is the weighting factor. The result returned by this aggregation method represents a weighted average value of the corresponding attribute throughout the map unit.

Component Percent Cutoff: None Specified

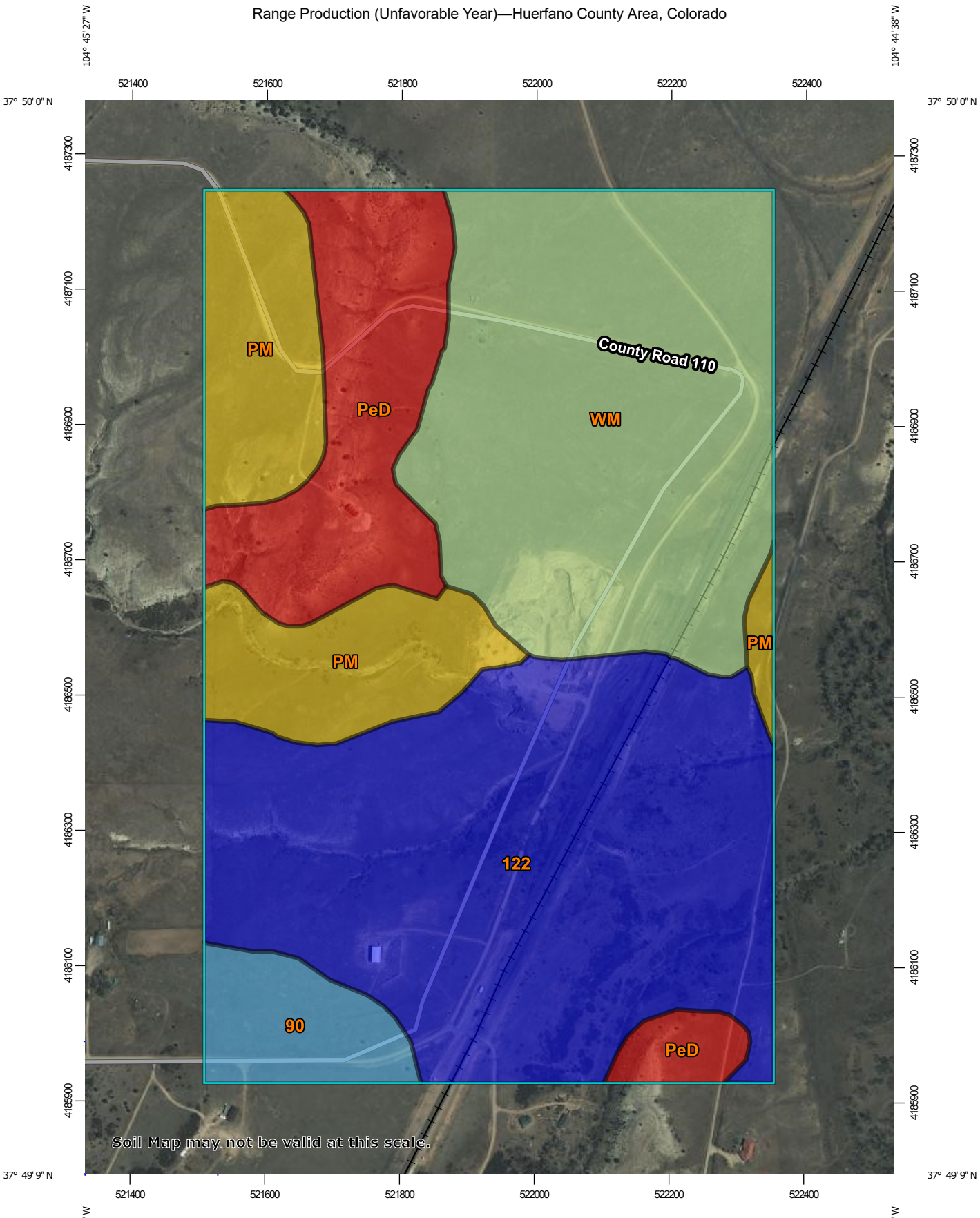
Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: Yes

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.


104° 45' 27" W
104° 44' 38" W
37° 50' 0" N
37° 49' 9" N
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522200
522400
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4187100
4186900
4186700
4186500
4186300
4186100
4185900
PM
PeD
WM
County Road 110
PM
PM
122
90
PeD
Soil Map may not be valid at this scale.
Map Scale: 1:7,740 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 100 200 400 600
Feet
0 350 700 1400 2100
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- <= 288
- > 288 and <= 340
- > 340 and <= 412
- > 412 and <= 450
- > 450 and <= 528
- Not rated or not available

Soil Rating Lines

- <= 288
- > 288 and <= 340
- > 340 and <= 412
- > 412 and <= 450
- > 450 and <= 528
- Not rated or not available

Soil Rating Points

- <= 288
- > 288 and <= 340
- > 340 and <= 412
- > 412 and <= 450
- > 450 and <= 528
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Survey Area Data: Version 20, Aug 24, 2023

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Date(s) aerial images were photographed: Mar 31, 2020—May 18, 2020

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Range Production (Unfavorable Year)

Map unit symbol	Map unit name	Rating (pounds per acre per year)	Acres in AOI	Percent of AOI
90	Wiley silt loam, 0 to 3 percent slopes, cool	450	12.5	4.5%
122	Kandrix loam, cool, 0 to 3 percent slopes	528	103.5	37.4%
PeD	Penrose channery loam, 1 to 15 percent slopes	288	37.1	13.4%
PM	Penrose-Minnequa complex, 1 to 15 percent slopes	340	40.6	14.7%
WM	Minnequa-Wilid silt loams, 1 to 6 percent slopes	412	83.3	30.1%
Totals for Area of Interest			**277.0**	**100.0%**

Description

Total range production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Rating Options

Units of Measure: pounds per acre per year

Aggregation Method: Weighted Average

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: Yes

6.4.12 Exhibit L

Reclamation Costs

Reclamation cost estimates were calculated on a per acre basis and applied to maximum active mining area of 21.6 acres.

Direct Tasks	Unit	Quantity	Cost	Total Cost
Grading Highwalls				
3H:1V Pushdown Dozer	Hours	35		$7700.00
Placing Topsoil/Fines				
Bull Dozer	Hours	6	$145.00	$870.00
Loader	Hours	6	$145.00	$870.00
Seeding				
Broadcasting	Hours	3	$300.00	$900.00
Seed Mix	Acre	1	$1200.00	$1200.00
Mulch	Acre	1	$187.50	$187.50
Tracking seed/mulch				
Dozer	Hours	0.33	$154.00	$50.82
Area Reclaimed	Acre	14.7		$34,375.00
Mobilization Fee	Hours	1	$100	$100
Indirect Tasks				
Liability Insurance			0.0155	$635.00
Performance Bond			0.015	$615.00
Profit			0.1	$4,099.00
Job Superintendent	Hours	20	$88.00	$1,760.00
Miscellaneous Indirect			0.0925	$920.00
Total Bond				$51,945.00

6.4.13 Exhibit M

Other Permits and Licenses

- Huerfano County Special Use Permit.

6.4.14 Exhibit N

Source of Legal Right to Enter

Please see enclosed the agreement between the landowner and the permittee.

6.4.15 Exhibit O

Owner of Record of Affected Land

Surface Area and Substance to be Mined

See enclosed deed.

6.4.16 Exhibit P

Municipalities Within Two Miles

There are no towns within two miles of the proposed mining operation.

6.4.17 Exhibit Q

Proof of Mailing Notices to Board of County Commissioners and Soil Conservation District

6.4.18 Exhibit R

Proof of Filing with County Clerk and Recorder

6.4.14 Exhibit S

Permanent Man-made Structures

Huerfano County Road 110 and a San Isabel Power Association Power Pole are within 200 feet of the site. Structure agreements for both are enclosed for review.