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UNITED STATES DEPARTMENT OF AGRICULTURE  
Soil Conservation Service  
Colorado

Technical Guide  
Section IV  
All Field Offices

STANDARD AND SPECIFICATIONS  
RANGE SEEDING (Acre) 550



STANDARD

Definition:

Establishing adapted plants by seeding on native grazing land (does not include pasture and hayland planting).

Purpose:

To: (1) prevent excessive soil and water loss and improve water quality; (2) produce more forage for grazing or browsing animals on rangeland or land converted to range from other uses; and (3) improve the visual quality of grazing land.

Conditions Where Practice Applies:

On rangeland, native pasture, grazeable woodland, and grazed wildlife land.

Planning Considerations:

1. Land to be seeded must have soil and climate that can support a satisfactory cover of adapted range forage plants.
2. Seed if grazing management alone cannot restore a satisfactory cover of desirable species within a reasonable period of time.
3. Species or cultivars selected for seeding must be compatible with the planned management of the entire operating unit.
4. Grazing management must be able to maintain the stand after the seeding is established unless grazing is prohibited by program restrictions. Other practices such as mowing, shredding and Prescribed Burning will be used to maintain the stand when grazing is not allowed.

## Practice Effects on Water Quantity and Quality

### **Water Quantity**

This practice is designed to reestablish and/or enhance vegetation on an area. Runoff may increase during the establishment period, but will be reduced when the vegetation becomes established. Vegetation will reduce evaporation by providing cover for the soil surface. Established and growing vegetation will utilize and transpire the increased soil moisture resulting from the increased infiltration and decreased evaporation. On many rangeland areas, an increase in the desirable grasses results in improved stream flow and aquifer recharge. In areas of snowfall, increased vegetation will catch more snow to be retained on the site. After establishment of a grass cover, it will act as a filter to trap sediment and sediment-attached substances and increase infiltration rates.

### **Water Quality**

Increased erosion and sediment yield may occur during the establishment of this practice. This is a temporary situation and sediment yields decrease when the seeded plants become established. If chemicals are used in the reestablishment process, chances of chemical runoff into downstream water courses are reduced if application is made according to label instructions. After establishment of the grass cover, grass sod slows runoff, acts as a filter to trap sediment, sediment-attached substances, increases infiltration, and decreases sediment yield.

## **SPECIFICATIONS**

### **A. Management:**

1. Range seeding will be undertaken only where grazing by domestic livestock will be controlled to permit plants to become well established.
2. Range seedings will be protected from extended periods of grazing by livestock from the date of seeding for at least two successive growing seasons, or until the seeded plants are well established. "Flash Grazing" as described under weed control on page 3 may be used if program restrictions do not prohibit grazing.

### 3. Weed Control for Establishment:

#### a. In Grass Seedings

- (1) Broadleaf weeds may be controlled with pre-plant, pre-emergent, post-plant or post-emergent herbicides applied according to label instructions 1/. It may be necessary to treat twice the first year and once the second year after planting.
- (2) Mowing or shredding may be used in place of herbicides. Mowing or shredding will be used prior to weeds reaching a height of 18 inches.
- (3) When perennial noxious weeds and winter annuals such as field bindweed, Canada thistle, jointed goatgrass, etc. are present, they will be controlled prior to seeding.
- (4) When foxtail, barnyardgrass, sandbur, crabgrass, and annual bromes are competitive to the planted grass, they will be mowed or shredded. Mowing or shredding should be discontinued in late July and August. The height and time of mowing or shredding must be such that more leaves are cut from weedy grasses than seeded grasses.

#### b. In Seedings with Forbs and Shrubs

When forbs (which includes legumes) and shrubs are used to supplement the grass seed mixture, the broadleaf and grassy weeds will be controlled only by mowing, shredding or "Flash Grazing."

#### c. Flash Grazing

"Flash Grazing" is defined as a weed control practice that uses livestock to reduce weed growth instead of mechanical equipment. On all seedings where weeds are a problem, "Flash Grazing" may be used to control weeds during the establishment period unless grazing is prohibited by program restrictions. "Flash Grazing" may be used in place of mowing for weed control if the operator has adequate livestock to obtain the desired benefits. The stocking rate is to be at least three Animal Unit Equivalents 2/ per acre, and the grazing period is limited to a maximum of three days.

If area to be grazed is too large, it should be subdivided with temporary fencing and livestock rotated to each field before returning to the home pasture or Planned Grazing System. If seeded species are being pulled up by the livestock, they will be removed immediately.

"Flash Grazing" is to begin when palatable immature weeds such as kochia, russian thistle, barnyardgrass, yellow bristlegrass, green bristlegrass, annual bromes, crabgrass, and other palatable annuals reach 6 to 12 inches in height. Area is to be grazed until the weeds are grazed uniformly to a 3 to 5 inch stubble. Grazing may be repeated as necessary until August 15. A minimum of 30 days rest is required before regrazing is permitted. No grazing is permitted after August 15 during the growing season, so that seedlings will have adequate time to store root reserves.

Livestock are to be grazed on seeded fields under dry soil conditions. If wet muddy conditions occur, livestock will be removed and not allowed to reenter until a firm surface is again present.

4. Grasshopper infestations and other harmful insect infestations will be controlled as necessary during the grass establishment period 1/

#### B. Seedbed Preparation:

##### 1. Cropland Conversion to Rangeland:

- a. Seedbeds for range sites in Major Land Resource Areas 67 (Central High Plains), 69A, 69B (Upper Arkansas Valley Rolling Plains), 70 (Pecos - Canadian Plains and Valleys), 72 (Central High Plains), and 77 (Southern High Plains) are required to have satisfactory protection from wind and water erosion by means of one of the following methods or conditions as selected and approved by the local conservationist.
- b. Fields or areas that are too gullied, hummocky, or in need of mechanical conservation measures should be shaped as necessary to plant and grow a suitable cover crop and to establish a stand of native plants.
- c. A preparatory dead litter stubble cover of forage sorghum, grain sorghum or sudan, will be left standing to give maximum protection from blowing. Short growing millets and grain from hybrid grain sorghum (milo) harvests should not be used. They rarely produce adequate cover for range seeding purposes.
  - (1) On sandy soils, drill forage sorghum, grain sorghum or sudangrass in rows not to exceed 20 inches, between May 15 and July 1. If more growth is produced than desirable, or if the cover crop will produce mature seed, the cover will be clipped to a 12-15 inch stubble height and should be removed from the field unless restricted by program regulations.

Seed at rates that will produce an adequate cover to prevent erosion for several years following grass seeding. Seed forage sorghum or grain sorghum at 6 to 8 lbs per acre on sandy soils. Seed sudangrass at 10 to 15 lbs per acre.

- (2) On loamy and heavy textured soils use the same procedures as listed above for sandy soils and maintain a minimum 12 inch stubble height. Seeding rates on these soils may vary from 4 to 8 lbs per acre for forage sorghum, or grain sorghum. Sudangrass may vary from 8-15 lbs per acre.
- (3) To have adequate cover for a minimum of two consecutive years after seeding the following actual residue amounts are required at seeding time. The "I" soil factor from the Wind Erodibility Index (Agron. Tech. Note 53) is used to determine minimum residue levels.

<u>"I" Soil Factor</u>	<u>Minimum lbs residue/acre at seeding time</u>
56 or lower	1750
86	2000
134	2250
220 and higher	2250*

\* If adequate residue cannot be produced, additional mulch may need to be applied and critical area treatment procedures used for mulching and seeding.

- (4) Use weed free seed of forage sorghum, grain sorghum or sudangrass that has a germination rate of 85% or higher to insure that adequate plant populations can be established.

d. Existing cover may be used in place of a cover crop in MLRA's 69A, 69B, 67, 70, 72, and 77 if one of the following situations is available.

- (1) Harvested sorghum with a stubble height of 12 inches or more may be used, providing there is adequate cover to protect the grass seedlings and the soil from wind and water erosion for several years following grass seeding. Weeds and volunteer sorghum will be controlled as needed to prevent competition with the grass seedlings.

- (2) Millet with a minimum stubble height of 12 inches may be used if adequate cover exists to protect the land from wind and water erosion. Weeds and volunteer millet will be controlled as needed to prevent competition with the grass seedlings.
  - (3) For mixtures containing warm-season grasses, mature small grain stubble other than cereal rye may be used. Mature cereal rye stubble will not be used for any range seeding. Delay grass seeding into wheat or barley stubble until the following dormant seeding season so that germination does not occur until the following spring. Herbicides 1/ will be used to control weeds between harvest and grass seeding as needed. If weeds are not controlled in the small grain stubble, tillage will be required and the area seeded to a warm season annual cover prior to grass seeding.
  - (4) When temporary small grain cover such as wheat or barley are used for winter protection these covers may be used under the following conditions. The cover will be clipped or killed with a contact herbicide a minimum of 30 days prior to maturity to prevent volunteer small grain. Seeding will be delayed until the following spring. Herbicides 1/ will be used for weed control.
  - (5) All existing covers will meet the same residue requirements for cover as shown in B.1.c.(3).
- e. In MLRA's 34A-B-C, 35, 37, 39, 47, 48A & B, 49A & B and 51, the following procedures may be used in preparing a seedbed where a temporary cover is needed to control erosion during the grass establishment period.
- (1) A firm, weed free, clean till seedbed may be prepared on slopes less than 6 percent. A sterile wheat or oat cover crop is preferred so that erosion is kept at a minimum.
  - (2) On fields with slopes averaging 6 percent or more, establish a sterile wheat or oat cover crop. After dormancy, seed directly into the standing residue.
  - (3) Seed the oats or sterile wheat during the normal planting period in the area. Clip the oats as needed to prevent seed formation.

- (4) Use appropriate herbicides 1/ to control weeds and volunteer prior to seeding and during establishment. Mowing, shredding or "Flash Grazing" may be used in place of herbicides. If seed mixture contains species susceptible to herbicides only mowing, shredding or "Flash Grazing" will be used.
- (5) Seeding into an existing wheat, oat or barley stubble harvested the previous growing season may be used. Use herbicides 1/ as needed to control weed growth prior to seeding. Tillage is not recommended so that a firm seedbed can be maintained.

2. Depleted Rangeland or "Go-Back" Fields (Abandoned Cropland)

a. Reseeding of depleted rangelands in very poor condition:

- (1) Where the existing plant cover can be controlled by use of herbicides 1/ or mechanical tillage methods that are practical for the range site and result in a satisfactory seedbed for planting adapted species.
- (2) All plant residue is to be left on the surface to prevent soil blowing. If the residue is inadequate, establish an appropriate annual cover adapted to the MLRA and range site before seeding.
- (3) Seedbeds having an annual weed cover are satisfactory if the seedbed is firm and if the stand of weeds is not dominated by cheatgrass, Russian thistle, sandbur, cocklebur, fetid marigold, marestail, kochia, or other seriously competitive weed species. Where competitive annual weeds and/or perennials exist, the labeled application of a non-selective broad spectrum contact herbicide 1/ can be used in lieu of tillage to prepare a satisfactory seedbed. Use mowing, shredding, "Flash Grazing" or herbicides 1/ to control weeds after seeding is completed.

b. Reseeding "go-back" fields (formerly cropland) or converting pastureland or hayland to rangeland.

- (1) To adequately reduce competition from biennials, short-lived perennials, and remnants of introduced grasses, it generally will be necessary to prepare a seedbed and grow an adapted crop two or more years. The application of a non-selective broad spectrum control herbicide 1/ can be used in place of tillage and cover crop if adequate amounts of residue are present to control erosion.

3. Dewatered or abandoned irrigated cropland conversion to Rangeland in MLRA 69:

- a. Due to chemical and physical changes that have occurred, special procedures are needed to effectively establish vegetation on these dewatered soils. Dryland planting attempts in this low precipitation zone along with the chemical and physical changes of these soils will usually result in failure of the seeded vegetation. Refer to Part G-2 a-b for additional requirements.
- b. Seedbed preparation is the same as previously described for seedbed preparation for MLRA's 67, 69A, 69B, 70, 72, and 77. However, row spacing can be changed to 36-40 inch spacing to accommodate irrigation furrows. Cover crops that can be used remain the same as listed previously for dryland seeding. Residue amounts required for grass seeding remain the same as required previously based on the soil "I" factor. Clipping and removal of excess material is permitted if not limited by program limitations. Irrigation will be required to establish an adequate cover crop. Weed control will be used as needed to obtain a weed free cover crop.
- c. Previously harvested crops of corn, grain sorghum, and forage sorghums may be used for cover if adequate residue is left. The residue remaining must meet the soil "I" factor requirements. Production in excess of 5,000 pounds residue per acre will be clipped and removed from the field to allow good seed soil contact during the drilling operation.

C. Methods of Grass Seed Planting:

1. Drill Method

- a. The best type of seeding equipment is a grass drill with 7-12 inch spacing and capable of planting fluffy seeds, equipped with a seedbox agitator, small seedbox, double disc furrow openers with depth bands, and packer wheels. Drills used will be capable of dropping the seed between the double disk openers and not behind them when planting light fluffy seed. Fluffy and free-flowing grass seeds will be planted directly into the cover crop residue without additional seedbed preparation. The grass drill should be operated as near to the contour as practical. To accurately maintain seeding depth, drilling speed is limited to 4 to 4.5 mph.
- b. Drag chains may be used in place of packer wheels only on deep sand and similar range sites to prevent seeding too deep.



- c. Any modified equipment such as air seeders and drills that control seeding depth with packer wheels must be able to insure proper seeding depth, uniform seed distribution, and firm seed-soil contact. Ground speed will not exceed 4 to 4.5 mph so that proper seeding depth can be maintained.
- d. Aerial seeding will not be used for any range seeding except broadcast seeding on Pinyon and Juniper sites that are to be chained.
- e. When seeding land that is to be irrigated with furrows or corrugations, the soil must be firmly compacted and in a condition to take irrigation water. In addition, the seeding must be drilled into the residue parallel to irrigation direction. In this seeding situation, the grass drill must have depth control bands on both disks and meet the other drill requirements listed in 1.a. Drill Method.

## 2. Range Interseeding Method

### a. Where applicable

The Range Interseeding Method is an exception to the seedbed preparation requirements specified previously. This method is for seeding sandy sites which are highly susceptible to wind erosion and where the introduction of seed can be done with a minimum disturbance of soils and existing cover or where desirable established grasses are found in a very thin stand or in patches, not uniformly throughout, but too abundant to destroy.

Where the cover is principally annuals and no more than a thin (1-5 percent density) or scattered stand of perennials, range interseeding will not apply. Such a condition is to be drilled rather than interseeded.

- (1) Range Interseeding will apply only to Deep Sand, Choppy Sands, and Sandy Bottomland range sites in Eastern Colorado and special soil and cover problem seedings on Sandy Plains.
- (2) Seedings with this method are to be performed with a Range Interseeder capable of making a furrow at least 14 inches wide and 3-4 inches deep.
- (3) Seeding rates are to be 1/2 to 2/3 the rate specified for the species under "seeding rate" in Agronomy Technical Note No. 61.

b. Equipment:

- (1) The interseeder shall make a furrow at least 14 inches wide, 3 to 4 inches deep, and shall be spaced not more than 42 inches apart. The interseeder shall be equipped to plant fluffy and free-flowing grass seeds at the proper depth in the furrow. The interseeder will be equipped with double disc furrow openers, depth bands, and packer wheels.
- (2) The operation shall be on the contour, where practical.

3. Broadcast Seeding on Pinyon and Juniper Sites to be Chained.

- a. These seeding specifications apply only to lands where pinyon and/or juniper is chained and pertains to the practice of broadcasting seed of adapted species in advance of the chaining operation.
- b. Seeding rates will be 2 times greater than the drilled rates specified under the "seeding rate" in Agronomy Technical Note No. 61.
- c. Time of seeding will coincide with the time specified for Range Seeding. Seeding will be performed prior to the operation but will not be more than one week before the chaining.
- d. Develop seed mixtures that are adapted to the appropriate Range Sites on the area involved in the chaining operation. Where Area specifications have been developed, follow these guidelines.

D. Planting Depths:

Grass drills and interseeders will be adjusted to plant the seed to a depth of not less than 1/2 inch and not more than 1 inch. An exception is Indian ricegrass, when seeded alone plant it 2 to 3 inches deep.

E. Planting Dates:

Grasses, legumes, and other seeded species shall be planted within the seeding periods specified in Table 1., with the provision that up to 10 days tolerance from the specified periods may be allowed for the purpose of adapting to local soil moisture conditions. Rocky Mountain penstemon, native legumes and Indian ricegrass should be planted in the fall so that freezing and thawing can break seed dormancy for spring germination.

Table 1. Seedling Dates for Range Plantings

MLRA*	Cool Season Plants		Warm Season Plants	
	Dormant-Spring	Summer	Dormant-Spring	Summer
D-34A, B, C	OCT 15-APR 30		OCT 15-APR 30	
D-35, D-37, D-39	OCT 15-APR 30	JUN 15-AUG 31	OCT 15-APR 30	JUN 15-JUL 15
E-48A, E-48B, E-47	OCT 1- APR 30	JUN 15-Jul 15 <u>1</u> / APR 30-AUG 12 <u>2</u> /	OCT 1- APR 30	JUN 15-JUL 15
E-49A, E-49B	OCT 15- MAY 1		OCT 15-MAY 31	
E-51	OCT 15-APR 15	APR 15-JUN 30	OCT 15-APR 15	JUN 15-JUL 15
G-67 S. COLO G-70, H-77	NOV 1- APR 30		NOV 1- MAY 20	
G-67 N. COLO H-72	NOV 1- APR 30		OCT 15-MAY 20	
G-69A, G-698	NOV 1- APR 30		NOV 1- MAY 20	

\* Major Land Resource Area

1/ Applicable to MLRA E-48A and E-48B on eastern slope of Rocky Mountains.

2/ Applicable to MLRA E-48A and E-48B on western slope of Rocky Mountains.

F. Seeding Rates:

For the seeding rate, refer to Colorado Agronomy Technical Note No. 61, "Seeding Rates," and enter data on CO-ECS-5.

G. Seeding Mixture:

1. To determine the best seeding mixture:

- a. Where available follow the Standards and Specifications developed by the Area Range Conservationist for the Area. In other areas determine the dominant range site or sites of the area to be seeded and select the species from the potential plant community that will be dominant for the site based on seed availability.
- b. Based on availability, native legumes, forbs, and shrubs should be added to the seeding mixes to enhance productivity on range sites where they are part of the plant community. The seeding rate should not exceed the percentage of forbs and shrubs shown for the range site. Introduced legumes and sweetclover will not be included in the seed mixture.

2. Seed mixtures on dewatered formerly irrigated land MIRA 69.

- a. Based on test results only the following species listed in Table 2. are recommended for use on dewatered areas according to soil type:

Table 2. Species For Use on Dewatered Land

<u>Species</u>	<u>Soil Type</u>		
	<u>Clays</u>	<u>Loams</u>	<u>Sandy</u>
Alkali sacaton	X	X	-
Blue grama	X	X	X
Galleta	X	X	-
Little Bluestem	-	X	X
Sand dropseed	-	X	X
Sand lovegrass	-	X	X
Sideoats grama	X	X	X
Switchgrass	X	X	X
Western wheatgrass	X	X	-

X = Recommended      - = Not Recommended

- b. Irrigation is required for the first year after seeding. The following irrigation schedule is recommended.
  - (1) Two shallow irrigations to a 12" soil depth within 10 days of each other at the end of April.
  - (2) One deep irrigation to a 24-36" soil depth in May, June, and July. An August irrigation is optional.
3. To enhance wildlife habitat and winter feed, add forb and shrub species adapted to the range site or sites being seeded. See Biology Technical Note No. 4 for the most preferred species.

#### H. Seed Source:

1. Adapted improved varieties and cultivars of native grasses, forbs, and shrubs will be used when available in the following order of preference.
  - a. Certified named varieties
  - b. Named varieties
  - c. Common seed
2. Certified named varieties will be required on all SCS cost shared programs. Exemptions will be granted only if "Certified Seed" is not available from a commercial source or a seed producer.
3. If "a" and "b" under 1 above are not available, native grass seed originating from the same general locality of the planting site may be used. As a general rule, the seed should originate not more than 200 to 250 miles south or 100 to 150 miles north and/or 200 miles east or west from where it will be planted.

#### I. Seed Analysis:

All seed used either purchased or grown for personal use will meet the following minimum standards if cost sharing is requested.

Seed labeling, quality, and seed testing will be in accordance with the Colorado Seed Law. This requires that seed be tested according to "Rules for Seed Testing" Association of Official Seed Analysts (AOSA) and Rules and Regulations under the Federal Seed Act.

A farmer-rancher who raises seed, for personal use in cost-share programs, must have it analyzed and furnish a copy of the current (within 12 months) analysis. In addition, a written statement must be provided certifying that the seed, that was produced is the same seed that was analyzed and seeded. The amount seeded must also be furnished on this statement.

#### J. Seed Quality:

SCS in Colorado in cooperation with the Colorado Seed Laboratory, Representatives of the Grass Seed Industry and Colorado Department of Agriculture agreed that "chaffy seeds" will meet the following minimum requirements (Table 3.) for seeding purposes in Colorado:

Table 3. Minimum Requirements For Chaffy Seed

Species*	Percent Weed Seed (Maximum)	Pure Live Seed Index**
Bluestem, big	3.0	15
Bluestem, little	3.0	12
Bluestem, sand	3.0	15
Buffalograss	0.50	30
Grama, blue	3.0	12
Grama, side-stats	3.0	15
Indiangrass, yellow	3.0	15

\* In determining purity and germination for these species, the seed unit shall be defined by AOSA (Association of Official Seed Analysts) rules. The TZ (tetrazolium) test will not be used as an official method to determine total viability but may be used as an estimator of viability of ungerminated seed, seed which is designated as dormant.

\*\* The pure live seed label shall bear the percent germination, firm seed, and purity. Pure live seed equals percent purity times percent germination divided by 100.

#### K. Stand Establishment:

To determine adequacy of grass stands follow guidelines in Plant Materials Technical Note 56. A minimum of two years should be allowed before declaring a stand a failure.

**Footnotes:**

- 1/ Follow recommendations in current Colorado Pesticide Guides in selection and application of appropriate herbicides for weed control and insecticides for insect control.
- 2/ An Animal Unit Equivalent is defined as the forage requirement for a 1,000 pound cow, make appropriate adjustments when using other kinds and or classes of livestock.

L. Optional for local field office with area office approval - use local climatic data where available.

(Check Next to Appropriate Range Site)

Range Sites	Range Sites Applicable to Conventional Drilling	Range Sites Applicable to Interseeding	Range Sites Applicable for Chaining	Planting Dates for each Range Site	Estimated Years Protection or Deferment Require for Establishment
				Warm      Cool	

Approved By: Area Range Conservationist





LOHF, SHAIMAN & JACOBS, P.C.

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June 16, 1993

John M. Evans, Esq.  
1120 Lincoln Street, Suite 1601  
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Re: Gutterson  
SW/4 21-5n-64w  
Weld County, Colorado

Dear John:

CFG Energy, Inc. asked that we respond to your letter of June 10, 1993, regarding its operations on the Elder lease.

- At the Elder #13-21 drill site, CFG removed the drilling mud; at the other two drill sites, the drilling mud (a bentonite based native mud, not a polymer mud) was mixed with the sandy subsoil by Ted Rothe of Ted's Dozer Service and backfilled into the pits before the topsoil was spread. A local farmer, Gary Campbell, handled the revegetation at each site, using a vibro-sizer to break up the compacted soil and seeding the area at a rate of 15 pounds per acre with a mixture of barley and native grasses recommended by the seed store. If Mr. Alldredge would like more specific information about the dirt work or the revegetation, we encourage him to contact Mr. Rothe or Mr. Campbell directly.
- CFG is unaware of any significant amount of topsoil lost to wind erosion. The topsoil was removed and segregated at each site during December 1992 and was replaced and reseeded in late March 1993.
- As you saw in your visit to the site, the topsoil at all of the originally reclaimed areas is now held in place by the barley which has germinated and grown nicely to date. At the Elder #13-21 drill site, however, CFG moved back on location after the initial reclamation was completed in order to perform further well completion work. At this site, a straw and manure mixture has been spread across the newly disturbed areas and smoothed with a spring tooth harrow.
- The soil contaminated by oil spills which you saw at the Elder #13-21 site has since been physically removed from the leased lands.

2--John M. Evans, Esq.

June 16, 1993

- CFG does not currently plan to take surface core samples.
- CFG does not currently propose to do any additional grass seeding in the Fall, except in respect to the newly disturbed areas of the Elder #13-21 site. CFG intends to seed these areas with the same mixture and in the same manner as the other areas.
- CFG does not believe its drilling sites are unusually large.
- The gathering lines were not installed using double trenching methods.

If any additional information would be helpful, we urge you to contact us again; in addition, we hope that Mr. Alldredge will contact the individual contractors with any specific questions which he may have as to the reclamation procedures.

For our part, we have not yet seen any evidence that Mr. Gutterson has acquired the property; we'd appreciate receiving copies of the deed by which he acquired ownership, the assignment of the surface damage rights, and a statement as to the consideration paid for the land, as well as any separate consideration paid for the surface damage rights. In addition, in considering whether the Fall seeding program for the Elder #13-21 disturbed areas should be changed from that used previously, we'd like to know whether Mr. Elder, Mr. Gutterson or any surface lessee ever seeded the property and, if so, the mixture and amount of seed which was used. Finally, in order to protect the restoration efforts which currently are underway, CFG may wish to fence the reclaimed areas if Mr. Gutterson plans on using the property for grazing; if CFG could be advised a week before animals are brought onto the land, this would be a big help.

CFG continues to offer \$1,000 for each drill site as compensation for any damages which Mr. Gutterson or his lessees may have suffered. At your convenience, we'd appreciate seeing the form of surface owner's agreement which you propose to use.

Very truly yours,

LOHF, SHAIMAN & JACOBS, P.C.



J. Michael Morgan

JMM:wld



LOHF, SHAIMAN & JACOBS, P.C.

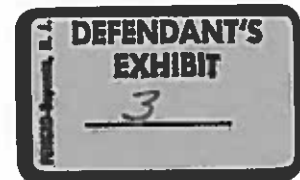
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J. MICHAEL MORGAN

July 2, 1993

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Re: Guttersen  
SW/4, Section 21, T5N, R64W, 6th. P.M.  
Weld County, Colorado  
Our File No. 1500.00



Dear John:

As a preliminary matter, my client informs me that his most recent telephone conversation with your client was not constructive. From my client's perspective, Mr. Guttersen's communication was threatening and abusive. Accordingly, I have instructed my client not to directly communicate with Mr. Guttersen, but that all communications should instead be directed through this office. We would appreciate having all communications with our client from Mr. Guttersen directed through your offices.

You have provided us with letters from Jerry Alldredge and Dwayne K. Newman regarding reclamation suggested for the sites. We understand that Mr. Guttersen also hired a third agronomist, Mr. Graves, to give an opinion concerning site reclamation. Please provide us with a copy of the opinion prepared by Mr. Graves, or if that opinion was oral, a summary of his recommendations.

In our letter to you of June 16, 1993, we asked to be provided with a copy of the deed by which Mr. Guttersen acquired ownership of the surface, the assignment of the surface damage rights, and a statement as to the consideration paid for the land, as well as any separate consideration paid for the surface damage rights. When the subject wells were drilled, and reclamation performed, the surface was owned by Lloyd E. Elder and Margaret J. Elder. Documentation as to change of surface ownership, and right to surface damages, is essential to ensure that CFG is negotiating with the proper party or parties.

We do have two concerns with the Alldredge and Newman reports. The Newman report indicates that soil samples were taken from the disturbed area. However, there is no indication that soil

John M. Evans  
July 2, 1993  
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samples were taken from undisturbed areas. In the absence of such sampling, what is the value of the samples taken? Were any samples taken from undisturbed areas?

Additionally, the recommendations of the Alldredge and Newman reports would appear to require that the successful reclamation already undertaken be destroyed in favor of new and substitute efforts. If additional reclamation is necessary, we wonder if other methods are available which will take advantage of, rather than destroy, the revegetation which has already been successful. For instance, cross drilling might supplement, without destroying, the existing vegetation. Other fertilization techniques might be available which would not require tilling and mixing, which itself would destroy existing growth. Does the Graves report address these possibilities?

In raising these questions, CFG is not refusing to perform additional reclamation. To the contrary, CFG intends to fully perform its reclamation obligations. To the extent that additional reclamation is necessary, it will be performed. CFG simply questions whether it is prudent to destroy reclamation efforts which had been conducted to date, which efforts appears to have been initially successful.

In any event, it may simply be too early to determine what additional reclamation, if any, will be necessary in the fall. I suggest we discuss this matter further, after you have provided us with the ownership information and the report of Mr. Graves. If you have questions or concerns, please call.

Very truly yours,

LOHE, SHAIMAN & JACOBS, P.C.



J. Michael Morgan

JMM:kal

cc: client



LOHF, SHAIMAN & JACOBS, P.C.

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J. MICHAEL MORGAN

VIA FACSIMILE AND REGULAR MAIL

October 7, 1993

John M. Evans, Esq.  
Attorney at Law  
6300 Syracuse Way  
Suite 555  
Englewood, Colorado 80111-6725

Re: Guttersen  
SW/4, Section 21, T5N, R64W, 6th. P.M.  
Weld County, Colorado  
Our File No. 1500.00



Dear John:

By our letter of September 13, 1993, we informed your clients, Michael and Pamela Guttersen, that CFG would be running tubing in the Elder 14-21 and Eldersub 11-21 wells sometime between 7 and 30 days from the date of that letter. Because of Ms. McCannon's letter request of the following day and our need to respond, CFG's schedule has been delayed. Please be advised that CFG intends to run the tubing within 14 days of the date of this letter, probably on October 11 and 12, 1993. This activity does not constitute drilling, recompletion or reworking of either well, and this notice is provided to your clients as a courtesy.

Depending upon the availability of contractors, within 10 days after completion of the work described above, CFG intends to perform supplemental reclamation. This supplemental reclamation will focus on the area around the Elder 14-21 well which was redisturbed this summer, any areas redisturbed by the running of tubing described above, and supplemental reclamation at all three sites where initial reclamation was not entirely successful.

To the extent that consultation requirements concerning proposed reclamation are applicable, CFG submits the following plan for supplemental reclamation:

1. The entire disturbed area was previously ripped in conjunction with initial reclamation. Redisturbed areas, and those areas of each drill site where the initial cover crop did not take or is thin, shall be double ripped to a depth of 1.5 times the depth of the compacted zone, but in no event less than 18 inches.

John M. Evans, Esq.  
October 7, 1993  
Page 2

2. Manure will be applied to the re-ripped areas at a rate of 20 tons per acre.

3. Re-ripped areas will be disked to incorporate the manure.

4. Re-ripped areas will be mulched and seeded with a cover crop appropriate for fall planting.

5. The entire disturbed area will be seeded with native grasses using a drill with depth bends, following U.S.D.A., Soil Conservation Service standards and specifications for range seeding and critical area treatment.

6. CFG is not aware of any significant oil spills at the sites. To the extent spills are found at the time of reclamation, they will be removed.

The goal of CFG's initial reclamation has been, and its supplemental reclamation will be, to reclaim the affected area to its productivity level prior to commencement of CFG's oil and gas operations. CFG requests that it be provided with any information which the Gutteresen's have on the productivity level of the property prior to commencement of operations.

If you have questions or concerns regarding the above, please advise.

Very truly yours,

LOHF, SHAIMAN & JACOBS, P.C.

J. Michael Morgan

JMM/elm

cc: client  
Ms. Susan McCannon



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J. MICHAEL MORGAN

September 13, 1993

John M. Evans, Esq.  
Attorney at Law  
6300 Syracuse Way  
Suite 555  
Englewood, Colorado 80111-6725

Re: Guttersen  
SW/4, Section 21, T5N, R64W, 6th. P.M.  
Weld County, Colorado  
Our File No. 1500.00



Dear John:

CFG wishes to inform your clients, Michael and Pamela Guttersen, that CFG will be running tubing in the Elder 14-21 and Elder sub-11-21 Wells sometime between 7 and 30 days from the date of this notice. This work will involve placing a production string inside the casing which is currently present in these two wells. This activity does not constitute drilling, recompletion or reworking of either Well and this notice is provided to your clients as a courtesy.

CFG is in the process of preparing a plan for supplemental reclamation of its three well sites in the above-referenced quarter section. We expect to submit this plan to you for your clients' review and comment and to consult with you concerning the plan, in approximately 10 days from the date of this letter. CFG anticipates that the supplemental reclamation proposed by the plan will take place after it has run the tubing described above.

If you have questions or concerns regarding the above, please advise.

Very truly yours,

LOHF, SHAIMAN & JACOBS, P.C.

  
J. Michael Morgan

JMM/elm

cc: client  
Ms. Susan McCannon, Acting Director, OGCC



NOTE: THIS IS A VERSION OF THE HANDWRITTEN REPORT OF TONY WALDRON.

MEMO

September , 1993

TO: Susan McCannon  
FROM: Tony Waldron



RE: Elder Wells, SW/4, Section 21, T5N, R64W, 6th P.M.  
Permit numbers 92-1807, 92-1806, 92-1456

Per your request, I conducted a site inspection of the three Elder Wells located in the SW/4 of Section 21, T5N, R64W for reclamation compliance. Due to the short notice and previous commitments, I was unable to arrange for the operator to accompany me on the inspection. The inspection was conducted on the morning of September 6, 1993. It was cloudy and raining lightly during the inspection. The inspection covered three well sites as presented below.

SE, SW, Section 21

The site appears to have been properly reclaimed and had been seeded to oats. There was a large area in the center of the site where no vegetation establishment had occurred. The area (approx 1/3 acre) was completely devoid of any vegetation including invasive annual weeds. As I moved to the outer areas of the disturbed area, the vegetation establishment became proportionately better and on the outer edges there was a good stand of oats and russian thistle. There were no perennial grasses observed at this site!

Due to the sandy nature of the soil, I was not able to determine if topsoil had been properly salvaged and replaced. Also, it was wet at the site making it difficult to determine color differences of the disturbed area soil verses adjacent undisturbed areas. The bare areas in the middle did feel compacted when compared to outer areas of the disturbance. It also appeared that there may have been some land application of drill fluid/mud. No oil stains were observed.

SW, SW, Section 21

About half of this site exhibited a thin stand of oats, thistle, kochia and milkweed. The other half had manure placed on the surface and did not exhibit vegetation establishment. In the area where the oats had established, a fairly large area exhibited a very thin stand. This area and the manured area both seem heavily compacted. Once again, no perennial grasses were observed. Also, no conclusions were reached about soil handling activities.



NE, SW, Section 21

Approximately 1/3 of this site exhibited little to no vegetation. Once again, it appeared to be compacted. I did observe a few perennial grasses. This site did appear to be quite a bit larger than the other two sites. It also appeared that drill mud/fluid had been surface applied.

General Observations:

All three sites exhibited basically the same vegetation establishment pattern. That is, little to no establishment in the middle of the site, grading out to fair to good cover on the outer edges of the sites. In my opinion it is one of two things: The bare areas are very compacted or this was the pit area and the soils have obviously been disrupted, thereby inhibiting vegetation establishment.

I recommend the following additional operations be conducted on the sites.

1. Deep rip the bare and thin stand areas to relieve compaction.

2. Incorporate manure into these areas.

3. Re-seed entire disturbed areas with appropriate range land seed mix using a rangeland drill with depth bends.

4. Mulch areas where oats and annual weeds were not established. Where there is good establishment of oats/weeds the grass seed should be sown directly without further preparation.

One final comment is that the adjacent undisturbed rangeland was not in good condition. One of the dominant plants is cactus, although there was one visually dominant grass which I was unable to identify. (Sand bluestem?). Overall, the condition is not the greatest.

If you have any questions, please contact me.

# SHARP BROS. SEED CO.

Amarillo TX 79108, Healy KS 67850, Greeley CO 80631

SHARP'S DRYLAND PASTURE MIX LOT NO.: PMD-7181  
\*37.44% INTERMEDIATE WHEATGRASS GERM: 80%  
\*19.01% SMOOTH BROMEGRASS GERM: 90%  
\* 9.36% PUBESCENT WHEATGRASS GERM: 82%  
\* 9.37% CRESTED WHEATGRASS GERM: 88%  
\* 9.72% ORCHARDGRASS GERM: 97%  
\* 9.97% PERENNIAL RYEGRASS GERM: 95%  
\* .04% OTHER CROP ORIGIN: KS/NE/OR  
\* .38% WEED SEED NO NOXIOUS WEEDS.  
\* 4.71% INERT NET WT. 50# TEST: 2/93

ACME TAG  
MPLS.

93

We warrant to the extent of the purchase price, that the seeds sold are as described on the container, within recognized tolerances. We give no other or further warranty, express or implied.  
(Void where Prohibited by Law.)

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