

# EVALUATION OF VEGETATION ESTABLISHMENT ALONG THE S3 SECTION OF THE SDS PIPELINE ROUTE IN PUEBLO COUNTY, COLORADO: INITIAL REPORT

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Prepared for:

Pueblo County Department of Planning and Development  
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## INTRODUCTION

This report presents the results of the initial evaluation of the S3 section of the SDS Pipeline Route located in Pueblo County. Field observations were made on April 30, 2013. Field work consisted of walking the entire S3 section of the SDS Pipeline Route in Pueblo County.

## GENERAL OBSERVATIONS

In general, the vegetation both along and adjacent to the SDS route was just initiating growth at the time of the field observations. Small, new leaves were noted on some of the shrubs and several species of wildflowers were in bloom. Some seedlings of seeded species were noted in limited patches in the disturbed areas, but overall few seedlings were noted at this early date. The general character of the site can be seen in Photos 1, 3, 4, and 6-9. Note that none of the sections of the route show obvious vegetation development at this date.

While the entire width of the SDS route was disturbed, the disturbance was not all of the same type. The centerline of the route, where the water line was installed, was completely disturbed by excavation. The east side of the route, where topsoil was stockpiled, appears to have been less disturbed. The west side of the route, where excavated material was placed appears to have been more disturbed than the topsoil stockpiled areas, but was less disturbed the excavated areas. These

disturbance differences will affect the rates of vegetation recovery along the pipeline route. In the disturbed areas where materials were stockpiled, the root systems of some plants were not destroyed which has allowed those plants to re-sprout. Re-growth of several species of grasses, forbs and some shrubs was noted, especially along the east side of the pipeline route and to some extent along the west side of the route.

No noxious weeds were noted along the pipeline route. It is likely that some noxious weeds will become apparent as the growing season progresses. Salt cedar (*Tamarix ramosissima*) was noted in the drainage on either side of the Steele Hollow crossing, but none were noted on the pipeline route.

At this early time in the field season, species identification can be somewhat difficult. Also, few species had begun to grow along the pipeline route. In spite of the early date, 18 species were noted (Table 1). Some of the species that were observed were species that were included in the seed mix, and they occurred on the site as seedlings. Other species had re-grown from existing root systems, especially along the eastern site of the route. Overall pre-construction species richness included approximately 100 species in various life form groups.

#### COMMENTS REGARDING REVEGETATION WORK

Overall Implementation. Based on field observations, it appears that the disturbed areas were revegetated according to the design specifications. There may be some limited areas where small problems may develop, but in general, the disturbed areas were graded and smoothed so that they blended well with adjacent native areas. Evidence of drill seeding could be seen in most of the re-seeded areas. In some places the marks from the seed drill could not be seen, but this was likely related to the nature of the substrate rather than suggesting that the areas had been missed.

Mulch. Native hay mulch was applied throughout the pipeline route. The specification was for an application rate of 3000 pounds/acre. Following application, the mulch was to be crimped in. Currently, the distribution of the applied mulch is very uneven. Bare patches with no mulch are commonly seen and in some places thick accumulations of mulch occur. This has probably occurred as a result of wind re-distribution of the mulch. Issues related to mulch will likely become clearer as the growing season continues. Irrigation may reduce the importance of mulch relative to aiding in reducing loss of soil moisture. Our initial observations suggest that, in general, more seedlings were noted in areas with a light mulch cover compared with sites having no mulch or having thick accumulations of mulch.

Erosion Control Blankets. Erosion control blankets were installed at various locations along the pipeline route. Where small drainages crossed the route, the blankets were installed to protect the surface from occasional limited flows (Photo 2). The small channels that were created blended well with the adjacent topography and the surfaces were protected by the blankets. The blankets were well-secured with wooden stakes. Erosion control blankets were also installed on some of the steeper slopes, especially those that occur at the Steele Hollow crossing (Photo 5). Seedlings of seeded species were frequently seen growing up through the erosion control blankets.

Irrigation. Irrigation pipes and heads were installed along the entire length of the S3 section. Prior to the field observations, it did not appear that any water had been applied in spring 2013. There was some evidence of water application in the portion of S3 located north of Antelope Road, but it appeared that the irrigation occurred last fall. Seedlings of seeded species were noted in the irrigated

sections, especially in places where moderate amounts of mulch were on the surface. Both cool and warm season grasses were noted. In a few places, some erosion was noted adjacent to and downslope from some of the irrigation heads suggest a few small problems with leakages. Also, some broken distribution pipes were noted in several places. These will probably be repaired in conjunction with the start-up of the full scale irrigation of the pipeline route. The field observations suggest that irrigation should greatly enhance germination and establishment of the seeded species.

Access Road. The access/service road along most of the S3 section had been ripped in anticipation of revegetation work. It appeared that a single pass had been used to eliminate the compaction caused by vehicle traffic. In general, it appeared that one pass is not likely to be adequate to prepare the surface for seeding even if it is disked. A second pass that would loosen the soil to a depth of 8-12 inches would increase the rate of vegetation establishment on the abandoned roadway.

#### SUMMARY

- Field observations suggest that the revegetation work was conducted according to the project design. The only issue relates to the abundance and distribution of the hay mulch.
- Some seedlings were noted along the pipeline route, but at this date (late April) the seedling density is less than the “stand establishment” performance criterion of four seedlings per square foot.
- Irrigation should greatly enhance seed germination and seedling establishment. Portions of the area (far north section) that were irrigated in fall 2012 had somewhat higher seedling density than other sections of the pipeline route.
- At this date, it is too early to develop any conclusions relative to meeting the cover performance standard.

Table 1. List of Species Observed along the S3 Section of the SDS Pipeline in Pueblo County. “(?)” indicates uncertain identification.

		Observation Date			
Scientific Name	Common Name	04/30/13			
COOL SEASON PERENNIAL GRASSES					
<i>Pascopyrum smithii</i>	Western Wheatgrass	x			
WARM SEASON PERENNIAL GRASSES					
<i>Bouteloua curtipendula</i>	Side-oats Grama	x			
<i>Chondrosium gracile</i>	Blue Grama	x			
<i>Sporobolus airoides</i>	Alkali Sacaton	x			
NATIVE PERENNIAL FORBS					
<i>Astragalus bisulcatus</i> (?)	Two-grooved Milkvetch	x			
<i>Astragalus</i> sp.	Milkvetch	x			
<i>Cirsium</i> sp.	Thistle	x			
<i>Glandularia bipinnatifida</i>	Showy Vervain	x			
<i>Lesquerella</i> sp.	Bladderpod	x			
<i>Lomatium orientale</i> (?)	Biscuitroot	x			
<i>Sphaeralcea coccinea</i>	Scarlet Globemallow	x			
NATIVE ANNUAL FORBS					
<i>Chenopodium leptophyllum</i>	Narrowleaved Goosefoot	x			
<i>Dyssodia aurea</i>	Fetid Marigold	x			
INTRODUCED ANNUAL FORBS					
<i>Chenopodium</i> sp.	Goosefoot	x			
<i>Descurainia</i> sp.	Tansy Mustard	x			
SHRUBS					
<i>Atriplex canescens</i>	Four-wing Saltbush	x			
CACTI AND SUCCULENTS					
<i>Opuntia polyacantha</i>	Plains Prickly-pear Cactus	x			
<i>Yucca glauca</i>	Spanish Bayonet	x			

## SITE PHOTOGRAPHS



Photo 1. South end of S3 Section of the SDS Pipeline Route. Photo taken at N38° 24' 38.6"; W104° 41' 23.9", looking north. April 30, 2013.



Photo 2. Erosion Control Blanket Installation near the South end of S3 Section of the SDS Pipeline Route. Photo taken at N38° 25' 13.5"; W104° 41' 25.1", looking southeast. April 30, 2013.





Photo 3. Central Section of S3 Section of the SDS Pipeline Route. Photo taken at southern high point at N38° 26' 54.8"; W104° 41' 24.6", looking south. April 30, 2013.



Photo 4. Central Section of S3 Section of the SDS Pipeline Route. Photo taken at southern high point at N38° 26' 54.8"; W104° 41' 24.6", looking north. April 30, 2013.





Photo 5. Steele Hollow Crossing along S3 Section of the SDS Pipeline Route. Photo taken at N38° 28' 11.2"; W104° 41' 24.9", looking southeast. April 30, 2013.



Photo 6. Northern portion of S3 Section of the SDS Pipeline Route located south of Antelope Road. Photo taken at N38° 29' 04.2"; W104° 41' 24.5", looking south. April 30, 2013.



Photo 7. Portion of S3 Section of the SDS Pipeline Route located north of Antelope Road. Photo taken at N38° 29' 51.2"; W104° 41' 19.6", looking south. April 30, 2013.



Photo 8. Portion of S3 Section of the SDS Pipeline Route located north of Antelope Road. Photo taken at N38° 29' 51.2"; W104° 41' 19.6", looking north. April 30, 2013.





Photo 9. Portion of S3 Section of the SDS Pipeline Route located north of Antelope Road at the north end of the route. Photo taken at N38° 31' 00.9"; W104° 41' 20.7", looking south. April 30, 2013.