

0007



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

APR 8-87

file

Norman H. Bangert, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

INSPECTION REPORT

INSPECTION DATE & TIME: July 7, 1987
1:00 to 3:00 p.m.

Permittee and/or Operators Name: Western States Minerals Corporation
Business Address: 4975 Van Gordon Street Wheat Ridge, CO 80033
Mine Name: J. B. King Permit Number: INA/015/002
Type of Mining Activity: Underground Surface Other
County: Emery
Company Official (s): None
State Official(s): Wm. J. Malencik, Harold Sandbeck
Partial: Complete: Date of Last Inspection: June 11, 1987
Weather Conditions: Clear/Warm
Acreage: Permitted 480 Disturbed 28.2 Regraded 28.2 Seeded 28.2 Bonded 28.2
Enforcement Action: None

COMPLIANCE WITH PERMITS AND PERFORMANCE STANDARDS

	YES	NO	N/A	COMMENTS
1. PERMITS	()	()	()	()
2. SIGNS AND MARKERS	(X)	()	()	()
3. TOPSOIL	()	()	(X)	()
4. HYDROLOGIC BALANCE:				
a. STREAM CHANNEL DIVERSIONS	()	()	()	()
b. DIVERSIONS	()	()	()	()
c. SEDIMENT PONDS AND IMPOUNDMENTS	(X)	()	()	(X)
d. OTHER SEDIMENT CONTROL MEASURES	()	()	()	()
e. SURFACE AND GROUNDWATER MONITORING	()	()	(X)	()
f. EFFLUENT LIMITATIONS	()	()	(X)	()
5. EXPLOSIVES	()	()	(X)	()
6. DISPOSAL OF DEVELOPMENT WASTE AND SPOIL	()	()	(X)	()
7. COAL PROCESSING WASTE	()	()	(X)	()
8. NONCOAL WASTE	()	()	(X)	()
9. PROTECTION OF FISH, WILDLIFE AND RELATED ENVIRONMENTAL VALUES	()	()	()	()
10. SLIDES AND OTHER DAMAGE	()	()	(X)	()
11. CONTEMPORANEOUS RECLAMATION	()	()	(X)	()
12. BACKFILLING AND GRADING	()	()	()	()
13. REVEGETATION	(X)	()	()	(X)
14. SUBSIDENCE CONTROL	()	()	(X)	()
15. CESSATION OF OPERATIONS	()	()	(X)	()
16. ROADS				
a. CONSTRUCTION	()	()	()	()
b. DRAINAGE CONTROLS	()	()	()	()
c. SURFACING	()	()	()	()
d. MAINTENANCE	()	()	()	()
17. OTHER TRANSPORTATION FACILITIES	()	()	(X)	()
18. SUPPORT FACILITIES				
UTILITY INSTALLATIONS	()	()	(X)	()

INSPECTION REPORT
(continuation sheet)

Page 2 of 2

PERMIT NUMBER: INA/015/002

DATE OF INSPECTION July 7, 1987

(Comments are Numbered to Correspond with Topics Listed Above)

GENERAL CONDITIONS:

The mine site was dry and no signs of recent runoff were observed in the general area including the mine site drainage channels. The gate was closed. No domestic animals were observed within the mine site reclaimed area.

4c. SEDIMENT PONDS:

Sediment pond was dry; no cracks were observed and appeared to be very stable.

13. REVEGETATION:

All the seeded and established grass species had seed heads. Most were still green. Volunteer forbs are also still green and in seed stage of development. Brouse species are also green and have made good growth. Some of the leaders on the four wing salt bush are a foot in length.

Copy of this Report:

Mailed to: Donna Griffin, OSM; Michael H. O'Donnell, WSM

Given to: Joe Helfrich, DOGM

Inspectors Signature and Number: *J. Malencik* Wm. J. Malencik #26 Date: July 13, 1987

9-10-87



UTAH
NATURAL RESOURCES
Oil, Gas & Mining

3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • (801) 538-5340

gd jr

inspection report

Permit No. INA/015/002
Inspection Date August 14, 1987

Permittee/Operator Name Western States Minerals Corp.
 Business Address 4975 Van Gordon Street
 City Wheat Ridge State Colo. Zip 80033
 Mine J.B. King Surface Underground Other
 County Emery State UT
 Company Official(s) None
 State Official(s) Harold G. Sandbeck and Bill Malencik
 Time of inspection 8:00 a.m. p.m. to 10:00 a.m. p.m. Partial Complete
 Date of last inspection 6/11/87 Weather conditions Clear/Warm
 Acreage 480 Permitted 282 Disturbed 282 Regraded 282 Seeded 282 Bonded
 Enforcement Action None

COMPLIANCE WITH PERMITS AND PERFORMANCE STANDARDS

	YES	NO	N/A	COMMENTS		YES	NO	N/A	COMMENTS
1. Permits	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. Protection of fish, wildlife, and related environmental values	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Signs and markers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10. Slides and other damage	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Topsoil	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. Contemporaneous reclamation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Hydrologic balance					12. Backfilling and grading	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a Stream channel diversions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13. Revegetation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Diversions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. Subsidence control	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c Sediment ponds and impoundments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15. Cessation of operations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d Other sediment control measures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16. Roads				
e Surface and groundwater monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	a Construction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Effluent limitations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	b Drainage controls	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Explosives	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	c Surfacing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Development waste and spoil disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	d Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Coal processing waste	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17. Other transportation facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Noncoal waste	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. Support facilities and utility installations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

WHITE - DOGM YELLOW - OSM PINK - PERMITTEE/OPERATOR GOLDENROD - NOV FILE

INSPECTION REPORT COMMENTS

Permit No. INA/015/002

Inspection Date August 14, 1987

Please number comments to correspond with topics on previous page.

General Comments: The mine site area was extremely wet indicating recent precipitation. Riprap has recently been installed above the pond and in the upper drainage area near the highwall pad. The undersigned inspector informed Tom Munson (the staff hydrologist) about the storm and hydrologic situations on the mine site. Concerning the overall hydrologic mine site design, Tom Munson intends to visit the site to determine if added improvements are needed.

2.) Signs and Markers: Entrance sign at gate was readable but due to normal weathering needs paint to maintain legibility. The operator informed the undersigned inspector that he will maintain the sign.

4.a.) Stream Channel Diversion: The riprap between the pond and the upper pad is stable. Minor preventive maintenance is required to prevent the potential for gullying and to maintain its functionality.

Copy of report mailed to Donna Griffin, OSM ; Mike O'Donnel, W.S.

Copy of report given to Joe Helfrich, DOGM

Inspector's signature Harold J. Sandberg 14 August 1987 No. 27

WHITE - DOGM YELLOW - OSM PINK - PERMITEE/OPERATOR GOLDENROD - NOV FILE

INSPECTION REPORT COMMENTS

Permit No. INA/015/002

Inspection Date August 14, 1987

Please number comments to correspond with topics on previous page.

4.c.) Sediment Ponds and Impoundments : The pond contained water and no discharge was evident. No obvious environmental harm was noted around the pond area, but the pond inlet and surrounding area needs minor erosion protection to maintain functionality.

4.d.) Straw Bails and Berms : Straw bails near the upper pad are marginally functional but still effective. The bails will require preventive maintenance in the near future. The berms around the small knoll looks good, but in areas preventive maintenance is required to prevent further gullying.

Copy of report mailed to Donna Griffin, OSM ; Mike O'Donnel, W.S.

Copy of report given to Joe Helfrich, DOFM

Inspector's signature Harold J. Stanbuh 14 August 1987 No. 27

WHITE - DOGM YELLOW - OSM PINK - PERMITEE/OPERATOR GOLDENROD - NOV FILE

Western States Minerals Corporation

4975 Van Gordon Street
Wheat Ridge, Colorado 80033
(303) 425-7042
TELEX NO. 450186 West States

November 23, 1987

Mr. John J. Whitehead
Permit Supervisor
Division of Oil, Gas & Mining
3 Triad Center, Suite 350
355 W. North Temple
Salt Lake City, Utah 84180-1203

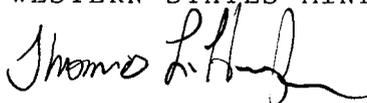
Dear Mr. Whitehead:

Attached is the Shrub Density Survey for the J.B. King Mine
(Permit INA/015/002).

If you have any questions please contact me.

Sincerely,

WESTERN STATES MINERALS CORPORATION



Thomas L. Hughes
Environmental Coordinator

TLH/prb

RECORDED
NOV 27 1987

OIL, GAS & MINING

SHRUB DENSITY SURVEY AT THE RECLAIMED
J. B. KING MINE, EMERY COUNTY, UTAH

Submitted to
WESTERN STATES MINERALS CORPORATION

By
Mary M. Boucek
RECLAMATION PROJECTS, Inc.
Salt Lake City, Utah

October 21, 1987



TABLE OF CONTENTS

	Page
INTRODUCTION.....	1
METHODS.....	1
Density Sampling Methodology.....	1
Sample Adequacy.....	3
RESULTS AND DISCUSSION.....	4
Shrub Density.....	4
Sample Adequacy.....	8
Qualitative Observations.....	8

TABLES

Table 1. In-plot Occurrence of Shrubs and Percent Frequency at the Reclaimed J.B. King Mine.....	5
Table 2. Shrub Density at the Reclaimed J.B. King Mine....	7
Table 3. Grass and Forb Species Observed in the Revegetated Area of the J.B. King Mine.....	9

INTRODUCTION

This shrub density monitoring survey was conducted in order to satisfy on-going revegetation monitoring obligations on Western States Minerals' reclaimed J. B. King Mine in Emery County, Utah. The study was designed and executed to fulfill the requirements of the Utah Coal Mining and Reclamation Permanent Program pursuant to UMC 784.13 (b)(5)(vi) and Western States Minerals' approved Permit Application Package (PAP).

The J. B. King Mine is a reclaimed coal mine located in Emery County in Range 6 East, Township 23 South, Section 32, SLBM, approximately 10 linear miles south of Emery, Utah. As per PAP approval, the site was reclaimed and revegetated during the fall of 1985, with supplemental shrub transplanting occurring during spring, 1986. This monitoring study represents Year 2 shrub-density monitoring and was conducted after the second full growing season following seeding and transplanting, during October, 1987.

METHODS

Density Sampling Methodology

As per UMC 784.13 of the approved permit, the same sampling methods were used for density monitoring as were used during the baseline inventory. Therefore, shrub density was sampled using 2 meter by 5 meter belt transects. Random placement of the 10

*This is done for
Year 1 requirement,
according to Thom.
Hughes.*

square meter plots along the transects was achieved by using a random numbers table wherein the last 2 digits of each number represented the number of paces from point of transect origin to plot number 1, from plot number 1 to plot number 2, etc. Orientation was randomized by tossing a pencil into the air and placing the same side of each plot in the direction of the pencil as it lay on the ground. A total of 7 transects were run on the reclaimed area in a grid maner, running in east-west and north-south directions, in order to provide full coverage of revegetated area. Samples were taken along each transect until the transect extended to the edge of the reclaimed area, at which point the next transect was begun.

Originally, the mine site was seeded with grasses, forbs and shrubs and then transplanted with shrub seedlings, placed in clumps, the following spring. A clear delineation between seeded and transplanted areas no longer exists. Therefore, seeded and transplanted areas were treated as one unit to examine whether or not the overall shrub density standard of 500 shrubs per acre is currently being achieved.

All viable shrubs whose bases occurred within the 2 x 5 meter plot were recorded by species.

Sample Adequacy

The number of samples required for estimating shrub density in the revegetated area was measured by use of the following formula:

$$n_{\min} = t^2 s^2 / (d\bar{x})^2 \quad \text{where,}$$

n_{\min} = minimum number of samples required

\bar{x} = sample mean

s = standard deviation of the sample

t = t value for a 2-tailed t test at 80% confidence

d = desired change in the mean (0.1)

For the purpose of this study in a desert shrub community, it was desired to detect a 10% change in the mean with 80% confidence. However, as evidenced in the Results and Discussion Section of this report, extreme variability in the data during this first quantitative density monitoring attempt dictated that at least a maximum (40) number of samples be taken.

RESULTS AND DISCUSSION

Shrub Density

According to the approved permit, the following shrubs were seeded and/or transplanted during reclamation of the site:

Species	Seeded (fall '85)	Transplanted (spring '86)
<u>Artemisia frigida</u> Fringed sage	X	X
<u>Atriplex canescens</u> Fourwing saltbush	X	X
<u>A. confertifolia</u> Shadscale	X	X
<u>A. gardneri</u> Gardner saltbush		X
<u>Ceratoides lanata</u> Winterfat	X	
<u>Chrysothamnus viscidiflorus</u> Low rabbitbrush	X	
<u>Ephedra</u> spp. Ephedra		X

Of these seven shrub species, three did not occur in the quantitative sampling (See Table 1); two additional species occurring within the plots which were not planted have begun to invade the reclaimed area. Therefore, a total of 6 species were represented in quantitative sampling. The most widely spread and well represented shrub is fourwing saltbush (Atriplex canescens) with an in-plot frequency of 82%, followed by shadscale (Atriplex confertifolia)

Table 1. In-Plot Occurrence of Shrubs and Percent Frequency
at the Reclaimed J. B. King Mine

Plot No.	Atriplex canescens	Atriplex confertifolia	Atriplex gardneri	Ceratoides lanata	Sarcobatus vermiculatus	Xanthocephalum sarothrae	TOTAL
1	7	4		3			14
2	5	3		1			9
3	6			2			8
4	1						1
5	3						3
6							0
7	1	2					3
8				1	2		3
9					1		1
10		1	3		1		5
11	2						2
12		1					1
13	2						2
14	1						1
15	2	1	1		1		5
16	2			1			3
17	5	3		2			10
18							0
19	5	1					6
20	14						14
21	7	2					9
22	3				1		4
23	7						7
24	1	1		1			3
25	2				3		5
26	1						1
27	6	1					7
28							0
29	2			1			3
30	3			1			4
31	2						2
32	2						2
33	1						1
34							0
35	6						6
36	3	1					4
37	12	1					13
38	16	3					19
39	1		1				2
40	2		2			1	5
41	2		2				4
42	5	1		5			11
43	5		1	2			8
44	3						3
45	5						5
Total Plants	153	26	10	20	9	1	219
Freq.*	82	33	13	24	13	2	-
	.70	.12	.04	.09	.04	.01	

tifolia), winterfat (Ceratoides lanata), gardner saltbush (Atriplex gardneri), greasewood (Sarcobatus vermiculatus), and broom snakeweed (Xanthocephalum sarothrae). The latter two species have begun to successfully invade the reclaimed area.

Shrub density as measured by quantitative sampling is presented in Table 2. Of the total shrub density of 1,970 shrubs per acre, fourwing saltbush comprises about 70%, followed in decreasing order by shadscale, winterfat, gardner saltbush, greasewood, and broom snakeweed.

Three additional shrub species were observed in the revegetated area but were not found within the sample plots. These species were fringed sage (Artemisia frigida), Castle Valley clover (Atriplex cuneata) and rubber rabbitbrush (Chrysothamnus nauseosus). The latter two species have invaded from adjacent areas but are not yet widespread. No evidence was found, either qualitative or quantitative, of the persistence of low rabbitbrush (Chrysothamnus viscidiflorus) or ephedra (Ephedra spp.) which were seeded and transplanted, respectively, during reclamation efforts.

As can be seen from these data, the shrub density standard of 500 shrubs per acre is being exceeded by about a factor of 4 at this point in time. Shrubs are fairly well represented in most revegetated areas and are quite dense in certain sites. These were probably originally transplanted sites but, as previously stated, clear delineation between seeded and transplanted

Table 2. Shrub Density at the Reclaimed J. B. King Mine

Species	Shrubs per 10 sq. meter Plot	Shrubs per hectare	Shrubs per Acre
<i>Atriplex canescens</i>	3.40	3400	1376
<i>Atriplex confertifolia</i>	0.58	578	234
<i>Atriplex gardneri</i>	0.22	222	90
<i>Ceratoides lanata</i>	0.44	444	180
<i>Sarcobatus vermiculatus</i>	0.20	200	81
<i>Xanthocephalum sarothrae</i>	0.20	22	9
=====			
TOTAL	4.87*	4867	1970
=====			

* s = 4.25

areas is no longer generally evident. Shrub density appears to be greatest in the areas of the main feeder ditch and sedimentation pond; density appears least in the area between the two ditches in the southeast section of the property as well as in the northeast quadrant.

Sample Adequacy

Quantitative data yielded significant variation as evidenced by the following:

$$\begin{aligned}\bar{x} &= 4.87 \\ s &= 4.25 \\ s^2 &= 18.1 \\ n &= 45 \\ n_{\min} &= 98\end{aligned}$$

Therefore, the recommended maximum number of 40 samples (baseline inventories) was exceeded but n_{\min} was not achieved. Obviously, additional samples would be needed to meet statistical adequacy but should not be required until bond release is being sought (monitoring years 9 and 10).

Qualitative Observations

In addition to the aforementioned shrub species, grass and forb species which were observed in the revegetated area are presented in Table 3. Due to the time of year this study was conducted most grasses and forbs were in a dessicated state and many were unidentifiable.

Table 3. Grass and Forb Species Observed in the Revegetated Area of the J. B. King Mine

Species	Seeded	Invaded
Grasses		
<u>Agropyron</u> spp Wheatgrass	X	
<u>Bouteloua</u> spp Grama grass	X	
<u>Bromus tectorum</u> Cheatgrass		X
<u>Hilaria jamesii</u> Galleta grass	X	
<u>Oryzopsis hymenoides</u> Indian ricegrass	X	
<u>Poa canbyi</u> Canby bluegrass	X	
Forbs		
<u>Halogeton glomeratus</u> Halogeton		X
<u>Melilotus officinalis</u> Yellow sweetclover	X	
<u>Salsola kali</u> Russian thistle		X