ENERGY WEST Mining Co.

PACIFICORP

File in:
☐ Confidential
☐ Shelf
☒ Expandable
Refer to Record No. 0043 Date 033006
In C/0150018 Incoming
For additional information

2005 ANNUAL REPORT

COTTONWOOD MINE C/015/019

DES-BEE-DOVE MINES C/015/017

DEER CREEK MINE C/015/018

TRAIL MOUNTAIN MINE C/015/009

*To enter text, click in the box and type your response. If a box already contains an entry select the entry and type the replacement. You can use the **tab** key to move from one field to the next. To select a check box, click in the box or type an x.*

GENERAL INFORMATION

Permitte Name	PacifiCorp
Mine Name	Cottonwood Mine
Operator Name (If other then permittee)	Energy West Mining Company
Permit Expiration Date	July 6, 2009
Permit Number	C/015/0019
Authorized Representative Title	Manager of Geology and Permitting
Phone Number	435-687-4720
Fax Number	435-687-2695
E-mail Address	
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Chuck Semborski
Resident Agent	Chuck Semborski
Resident Agent Mailing Address	P.O. Box 310 Huntington, Utah 84528
Number of Binders Submitted	3

IDENTIFICATION OF OTHER PERMITS

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	42-01221	Cottonwood Mine	None
MSHA Impoundment(s)	1211-UT-09-02052-02	North Sediment Pond	None
	1211-UT-09-02052-02	South Sediment Pond	None
NPDES/UPDES Permit(s)	UT0022896	Site 001, 003, 004, 005 consisting of	10/31/07
		mine discharge and sediment ponds	
PSD Permit(s) (Air)	DAQE-694-95	Issued 8/9/95, Includes Trail Mtn Mine	None
	DAQE-835-91	Issued 12/16/91, WRS	None

Other

CERTIFIED REPORTS

List the certified inspection reports as required by the rules and udder the approved plan that must be periodically submitted t the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

Certified Reports:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On File	
Excess Spoil Piles	☐	☒	☐	☐	
Refuse Piles	☒	☐	☒	☐	
Impoundments	☒	☐	☒	☐	No discharge from sediment ponds in 2005
Other					
	☐	☐	☐	☐	
	☐	☐	☐	☐	

REPORTING OF OTHER TECHNICAL DATA

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

Technical Data:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On file	
Climatological	☐	☒	☒	☐	Included in Separate Hydrologic Report
Subsidence Monitoring	☒	☐	☒	☐	Included in Separate Subsidence Report
Vegetation Monitoring	☒	☐	☒	☐	Refer to Appendix B
Raptor Survey	☒	☐	☐	☒	Filed in DOGM's Confidental File
Soils Monitoring	☐	☒	☐	☐	
Water Monitoring	☐	☐	☐	☐	
First quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Second quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Third quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Fourth quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Geological / Geophysical	☐	☒	☐	☐	
Engineering	☐	☒	☐	☐	
Non Coal Waste / Abandoned Underground Equipment*	☐	☒	☐	☐	
Other Data					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

*Reminder: If equipment has been abandoned during 2004, an amendment must be submitted that includes a map showing its location, a description of what was abandoned, whether there were any hazardous or toxic materials and any revision to the PHC as necessary.

LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION

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Legal / Financial Update	**Required**		**Included or on File with DOGM**		**Comments**
	Yes	No	Included	On file	
Department of Commerce, Annual Report Officers	☒	☐	☐	☒	
Other					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

MINE MAPS

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Map Number(s)	**Map Title/ Description**	**Confidential** Yes	No
None	See previous annual reports (mine is currently in cessation)	☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
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		☐	☐
		☐	☐

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GENERAL INFORMATION

Permitte Name	PacifiCorp
Mine Name	Deer Creek Mine
Operator Name (If other then permittee)	Energy West Mining Company
Permit Expiration Date	February 7, 2006
Permit Number	C/015/0018
Authorized Representative Title	Manager of Geology and Permitting
Phone Number	435-687-4720
Fax Number	435-687-2695
E-mail Address	
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Chuck Semborski
Resident Agent	Chuck Semborski
Resident Agent Mailing Address	P.O. Box 310 Huntington, Utah 84528
Number of Binders Submitted	3

IDENTIFICATION OF OTHER PERMITS

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	42-00221	Deer Creek Mine	None
MSHA Impoundment(s)	None		
NPDES/UPDES Permit(s)	UT0023604	Site 001: Sediment Pond	11/30/07
		Site 002: Mine Discharge	
PSD Permit(s) (Air)	DAQE-926-96	Issued 10/4/96, Mine Tipple	None
	DAQE-926-91	Issued 12/5/91, WRS	None

Other

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	Yes	No	Included	On File	
Excess Spoil Piles	☐	☒	☐	☐	
Refuse Piles	☒	☐	☒	☐	
Impoundments	☒	☐	☒	☐	Site 001: Sediment Pond
Other					
	☐	☐	☐	☐	
	☐	☐	☐	☐	

REPORTING OF OTHER TECHNICAL DATA

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Technical Data:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On file	
Climatological	☐	☒	☒	☐	Included in Separate Hydrologic Report
Subsidence Monitoring	☒	☐	☒	☐	Included in Separate Subsidence Report
Vegetation Monitoring	☒	☐	☒	☐	Refer to Appendix B
Raptor Survey	☒	☐	☐	☒	Filed in DOGM's Confidental File
Soils Monitoring	☐	☒	☐	☐	
Water Monitoring	☐	☐	☐	☐	
First quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Second quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Third quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Fourth quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Geological / Geophysical	☐	☒	☐	☐	
Engineering	☐	☒	☐	☐	
Non Coal Waste / Abandoned Underground Equipment*	☐	☒	☐	☐	
Other Data					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

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Legal / Financial Update	**Required**		**Included or on File with DOGM**		**Comments**
	Yes	No	Included	On file	
Department of Commerce, Annual Report Officers	☒	☐	☐	☒	
Other					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

MINE MAPS

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Map Number(s)	**Map Title/ Description**	**Confidential** Yes	No
None	Deer Creek Mine Production Map (Current as of March, 2006)	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
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		☐	☐

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GENERAL INFORMATION

Permitte Name	PacifiCorp
Mine Name	Des Bee Dove Mine
Operator Name (If other then permittee)	Energy West Mining Company
Permit Expiration Date	August 30, 2010 (Mine reclaimed in 2003)
Permit Number	C/015/0017
Authorized Representative Title	Manager of Geology and Permitting
Phone Number	435-687-4720
Fax Number	435-687-2695
E-mail Address	
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Chuck Semborski
Resident Agent	Chuck Semborski
Resident Agent Mailing Address	P.O. Box 310 Huntington, Utah 84528
Number of Binders Submitted	3

IDENTIFICATION OF OTHER PERMITS

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	None	Records abandond by MSHA March 27, 1987	
MSHA Impoundment(s)	None		
NPDES/UPDES Permit(s)	UTG040022	Site 001: Sediment Pond	4/30/08
PSD Permit(s) (Air)	N/A		

Other

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Excess Spoil Piles	☐	☒	☐	☐	
Refuse Piles	☒	☐	☒	☐	
Impoundments	☒	☐	☒	☐	Sediment Pond: Site 001
Other					
	☐	☐	☐	☐	
	☐	☐	☐	☐	

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Climatological	☐	☒	☒	☐	Included in Separate Hydrologic Report
Subsidence Monitoring	☒	☐	☒	☐	Included in Separate Subsidence Report
Vegetation Monitoring	☒	☐	☒	☐	Refer to Appendix B
Raptor Survey	☒	☐	☐	☒	Filed in DOGM's Confidental File
Soils Monitoring	☐	☒	☐	☐	
Water Monitoring	☐	☐	☐	☐	
First quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Second quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Third quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Fourth quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Geological / Geophysical	☐	☒	☐	☐	
Engineering	☐	☒	☐	☐	
Non Coal Waste / Abandoned Underground Equipment*	☐	☒	☐	☐	
Other Data					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

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Department of Commerce, Annual Report Officers	☒	☐	☐	☒	
Other					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
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Map Number(s)	**Map Title/ Description**	**Confidential** Yes	No
None	See previous annual reports (mine reclaimed in 2003)	☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
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GENERAL INFORMATION

Permitte Name	PacifiCorp
Mine Name	Trail Mountain Mine
Operator Name (If other then permittee)	Energy West Mining Company
Permit Expiration Date	February 10, 2010
Permit Number	C/015/0009
Authorized Representative Title	Manager of Geology and Permitting
Phone Number	435-687-4720
Fax Number	435-687-2695
E-mail Address	
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Chuck Semborski
Resident Agent	Chuck Semborski
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Number of Binders Submitted	3

IDENTIFICATION OF OTHER PERMITS

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Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	42-01211	Trail Mountain Mine	None
MSHA Impoundment(s)	None		
NPDES/UPDES Permit(s)	UT0023728	Site 001: Sediment Pond	12/31/07
		Site 002: Mine Discharge	
PSD Permit(s) (Air)	DAQE-694-95	Issued 8/9/95	None

Other

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Other					
	☐	☐	☐	☐	
	☐	☐	☐	☐	

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Soils Monitoring	☐	☒	☐	☐	
Water Monitoring	☐	☐	☐	☐	
First quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
Second quarter	☒	☐	☒	☒	Included in Separate Hydrologic Report
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Geological / Geophysical	☐	☒	☐	☐	
Engineering	☐	☒	☐	☐	
Non Coal Waste / Abandoned Underground Equipment*	☐	☒	☐	☐	
Other Data					
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	☐	☐	☐	☐	
	☐	☐	☐	☐	
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Map Number(s)	**Map Title/ Description**	**Confidential** Yes	No
None	See previous annual reports (mine is currently in cessation)	☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
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APPENDIX A

Certified Reports

Excess Spoil Piles
Refuse Piles
Impoundments

As required under R645-301-514

CONTENTS

Impoundment and Refuse Pile Reports

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/019	Report Date	DEC. 29, 2005
Mine Name	Cottonwood/Wilberg		
Company Name	PacifiCorp		
Impoundment Name...	North Pond	South Pond	Waste Rock Pond
Impoundment Number.			
UPDES Permit Number		UT 0022896-003A	UT 0022896-005
MSHA ID NUMBER.....	1211-UT-09-02052-02	1211-UT-09-02052-03	

IMPOUNDMENT INSPECTION	
Inspection Date	DEC. 20, 2005
Inspected By	Rick Cullum/ John Christensen
	4TH Quarter Inspection 2005

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

North Pond: No instabilities or weaknesses observed.

South Pond: No instabilities or weaknesses observed.

Waste Rock Site Pond: No instabilities observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

Pond	North Pond	South Pond	Waste Rock
60% Design Storage Capacity	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.
100% Sediment Capacity	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.

Principle and emergency spillway elevations.

	North Pond	South Pond	Waste Rock Pond
Principal Spillway Elevation	7354.83	7325.33	6766.3
Emergency Spillway Elevation	7363.33	7334.2	6770.0

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	North Pond	South Pond	Waste Rock Pond
Water Elevation	7354.02	DRY	6761.47
Discharging	NO	NO	No
Inlet/Outlet Condition	Good	Good	Good
Slope conditions	Good	Good	Good

*See "Hydrologic Monitoring Data" report submitted to DOGM quarterly for monitoring information.

Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

	North Pond	South Pond	Waste Rock Pond
Sediment Volume	0.18 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.38 AF	0.32 AF	2.23 AF
Water Impounded	0.26 AF	0.0 AF	0.11 AF

Changes, Comments,

THE COTTONWOOD MINE WAS IDLED IN 2001, SO THE ONLY WATER THAT REPORTS TO THE PONDS are RUN-OFF DURING A STORM EVENT. SNOW WAS PRESENT AT THE TIME OF THE INSPECTION.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen Date: 1/6/06

Signature: _____ Date: _____

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/019	**Report Date**	SEPT. 29, 2005
Mine Name	Cottonwood/Wilberg		
Company Name	PacifiCorp		
Impoundment Name...	**North Pond**	**South Pond**	**Waste Rock Pond**
Impoundment Number.			
UPDES Permit Number		UT 0022896-003A	UT 0022896-005
MSHA ID NUMBER.....	1211-UT-09-02052-02	1211-UT-09-02052-03	

IMPOUNDMENT INSPECTION

Inspection Date	SEPT. 20, 2005	
Inspected By	Rick Cullum/ John Christensen	
		3RD Quarter Inspection 2005

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

North Pond: No instabilities or weaknesses observed.

South Pond: No instabilities or weaknesses observed.

Waste Rock Site Pond: No instabilities observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	North Pond	South Pond	Waste Rock Pond
60% Design Storage Capacity	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.
100% Sediment Capacity	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.

Principle and emergency spillway elevations.

	North Pond	South Pond	Waste Rock Pond
Principal Spillway Elevation	7354.83	7325.33	6766.3
Emergency Spillway Elevation	7363.33	7334.2	6770.0

Field Information. Provide current water elevation, whether pond is discharging, type and number of

samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	North Pond	South Pond	Waste Rock Pond
Water Elevation	7353.91	DRY	DRY
Discharging	NO	NO	No
Inlet/Outlet Condition	Good	Good	Good
Slope conditions	Good	Good	Good

*See "Hydrologic Monitoring Data" report submitted to DOGM quarterly for monitoring information.

Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

	North Pond	South Pond	Waste Rock Pond
Sediment Volume	0.18 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.38 AF	0.32 AF	2.23 AF
Water Impounded	0.25 AF	0.0 AF	0.00 AF

Changes, Comments,

THE COTTONWOOD MINE WAS IDLED IN 2001, SO THE ONLY WATER THAT REPORTS TO THE PONDS are RUN-OFF DURING A STORM EVENT.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER JOHN CHRISTENSEN No. 165651 STATE OF UT

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 10/14/05

Signature: Richard Cullum **Date:** 10-18-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/019	**Report Date**	JULY 7, 2005
Mine Name	Cottonwood/Wilberg		
Company Name	PacifiCorp		
Impoundment Name...	**North Pond**	**South Pond**	**Waste Rock Pond**
Impoundment Number.			
UPDES Permit Number		UT 0022896-003A	UT 0022896-005
MSHA ID NUMBER.....	1211-UT-09-02052-02	1211-UT-09-02052-03	

IMPOUNDMENT INSPECTION

Inspection Date	JUNE 30, 2005	
Inspected By	Rick Cullum/ John Christensen	
		2nd Quarter Inspection 2005

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

North Pond: No instabilities or weaknesses observed.

South Pond: No instabilities or weaknesses observed.

Waste Rock Site Pond: No instabilities observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	North Pond	South Pond	Waste Rock Pond
60% Design Storage Capacity	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.
100% Sediment Capacity	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.

Principle and emergency spillway elevations.

	North Pond	South Pond	Waste Rock Pond
Principal Spillway Elevation	7354.83	7325.33	6766.3
Emergency Spillway Elevation	7363.33	7334.2	6770.0

Field Information. Provide current water elevation, whether pond is discharging, type and number of

samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	North Pond	South Pond	Waste Rock Pond
Water Elevation	7353.47	DRY	DRY
Discharging	NO	NO	No
Inlet/Outlet Condition	Good	Good	Good
Slope conditions	Good	Good	Good

*See "Hydrologic Monitoring Data" report submitted to DOGM quarterly for monitoring information.

Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

	North Pond	South Pond	Waste Rock Pond
Sediment Volume	0.18 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.38 AF	0.32 AF	2.23 AF
Water Impounded	0.22 AF	0.0 AF	0.00 AF

Changes, Comments,

THE COTTONWOOD MINE WAS IDLED IN 2001, SO THE ONLY WATER THAT REPORTS TO THE PONDS are RUN-OFF DURING A STORM EVENT.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER JOHN CHRISTENSEN No. 165651 STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 7/8/05

Signature: Richard Cullum **Date:** 7-12-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/019	**Report Date**	March 28, 2005
Mine Name	Cottonwood/Wilberg		
Company Name	PacifiCorp		
Impoundment Name...	**North Pond**	**South Pond**	**Waste Rock Pond**
Impoundment Number.			
UPDES Permit Number		UT 0022896-003A	UT 0022896-005
MSHA ID NUMBER.....	1211-UT-09-02052-02	1211-UT-09-02052-03	

IMPOUNDMENT INSPECTION

Inspection Date	MARCH 14, 2005	
Inspected By	Rick Cullum/ John Christensen	
		1ST Quarter Inspection 2005

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

North Pond: No instabilities or weaknesses observed.

South Pond: No instabilities or weaknesses observed.

Waste Rock Site Pond: No instabilities observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	North Pond	South Pond	Waste Rock Pond
60% Design Storage Capacity	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.
100% Sediment Capacity	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.

Principle and emergency spillway elevations.

	North Pond	South Pond	Waste Rock Pond
Principal Spillway Elevation	7354.83	7325.33	6766.3
Emergency Spillway Elevation	7363.33	7334.2	6770.0

Field Information. Provide current water elevation, whether pond is discharging, type and number of

samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	North Pond	South Pond	Waste Rock Pond
Water Elevation	7354.22 Frozen	DRY	6762.23
Discharging	NO	NO	No
Inlet/Outlet Condition	Good	Good	Good
Slope conditions	Good	Good	Good

*See "Hydrologic Monitoring Data" report submitted to DOGM quarterly for monitoring information.

Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

	North Pond	South Pond	Waste Rock Pond
Sediment Volume	0.16 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.38 AF	0.32 AF	2.23 AF
Water Impounded	0.28 AF	0.0 AF	0.34 AF

Changes, Comments, Ponds were partially frozen at the time of the inspections.

THE COTTONWOOD MINE WAS IDLED IN 2001, SO THE ONLY WATER THAT REPORTS TO THE PONDS are RUN-OFF DURING A STORM EVENT.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 4/8/05

Signature: Richard Callum **Date:** 4-11-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/018	Report Date	DEC. 29, 2005
Mine Name	Deer Creek Mine		
Company Name	Energy West Mining		
Impoundment Identification	Impoundment Name	Mine Site Pond:	Waste Rock Pond:
	Impoundment Number		
	UPDES Permit Number	UT-0023604-001	
	MSHA ID Number	N/A	N/A

IMPOUNDMENT INSPECTION

Inspection Date	Mine Site: 12/19/05	Waste Rock Pond 12/19/05
Inspected By	Rick Cullum / John Christensen	
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	4th Quarter 2005 Inspection	

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

	Mine Site Pond	Waste Rock Pond
Conditions, Comments Etc.	No hazards observed.	No hazards observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	Mine Site Pond:	Waste Rock Pond:
60% Design Storage Capacity	1.87 A.F. at 7213.1 ft.	.59 A.F. at 6312.7 ft.
100% Sediment Capacity	3.12 A.F. at 7216.0 ft.	.98 A.F. at 6313.45 ft.

Principle and emergency spillway elevations.

	Mine Site Pond	Waste Rock Pond
Principle Spillway Elevation (F.A.S.L.):	7218.64	6318.0
Emergency Spillway Elevation	7232.03	6318.0

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	Mine Site Pond	Waste Rock Pond
Water Elevation	7222.43	None
Discharging	Yes	Never
Inlet, Outlet, Spillway Conditions	Good	Good
Out slope Conditions	No Change	No Change

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

	Mine Site Pond	Waste Rock Pond
Sediment Volume	2.36 A.F.	None
Remaining Sediment Storage Capacity	0.76 A.F.	0.98 A.F.
Water impounded	4.1 A.F.	NONE
Changes, Comments, etc.	The pond was partially cleaned in the fourth quarter of 2005.	No change from last inspection.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 1/6/06

Signature: Richard Cullum **Date:** 1-7-06

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	SEPT. 30, 2005
Mine Name	Deer Creek Mine		
Company Name	Energy West Mining		
Impoundment Identification	**Impoundment Name**	**Mine Site Pond:**	**Waste Rock Pond:**
	Impoundment Number		
	UPDES Permit Number	UT-0023604-001	
	MSHA ID Number	N/A	N/A

IMPOUNDMENT INSPECTION

Inspection Date	**Mine Site:** 9/21/05	**Waste Rock Pond** 9/21/05
Inspected By	Rick Cullum / John Christensen	
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	3RD Quarter 2005 Inspection	

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

	Mine Site Pond	Waste Rock Pond
Conditions, Comments Etc.	No hazards observed.	No hazards observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	Mine Site Pond:	Waste Rock Pond:
60% Design Storage Capacity	1.87 A.F. at 7213.1 ft.	.59 A.F. at 6312.7 ft.
100% Sediment Capacity	3.12 A.F. at 7216.0 ft.	.98 A.F. at 6313.45 ft.

Principle and emergency spillway elevations.

	Mine Site Pond	Waste Rock Pond
Principle Spillway Elevation (F.A.S.L.):	7218.64	6318.0
Emergency Spillway Elevation	7232.03	6318.0

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	Mine Site Pond	Waste Rock Pond
Water Elevation	7225.06	None
Discharging	Yes	Never
Inlet, Outlet, Spillway Conditions	Good	Good
Out slope Conditions	No Change	No Change

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

	Mine Site Pond	Waste Rock Pond
Sediment Volume	2.73 A.F.	None
Remaining Sediment Storage Capacity	0.39 A.F.	0.98 A.F.
Water impounded	5.27 A.F.	NONE
Changes, Comments, etc.	The pond was cleaned in the fourth quarter of 2002.	No change from last inspection.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 10/14/05

Signature: Richard Cullum **Date:** 10-18-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	JUNE 30, 2005
Mine Name	Deer Creek Mine		
Company Name	Energy West Mining		
Impoundment Identification	**Impoundment Name**	**Mine Site Pond:**	**Waste Rock Pond:**
	Impoundment Number		
	UPDES Permit Number	UT-0023604-001	
	MSHA ID Number	N/A	N/A

IMPOUNDMENT INSPECTION

Inspection Date	**Mine Site:** 6/21/05	**Waste Rock Pond** 6/13/05
Inspected By	Rick Cullum / John Christensen	
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2ND Quarter 2005 Inspection	

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

	Mine Site Pond	Waste Rock Pond
Conditions, Comments Etc.	No hazards observed.	No hazards observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	Mine Site Pond:	Waste Rock Pond:
60% Design Storage Capacity	1.87 A.F. at 7213.1 ft.	.59 A.F. at 6312.7 ft.
100% Sediment Capacity	3.12 A.F. at 7216.0 ft.	.98 A.F. at 6313.45 ft.

Principle and emergency spillway elevations.

	Mine Site Pond	Waste Rock Pond
Principle Spillway Elevation (F.A.S.L.):	7218.64	6318.0
Emergency Spillway Elevation	7232.03	6318.0

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	Mine Site Pond	Waste Rock Pond
Water Elevation	7223.01	None
Discharging	Yes	Never
Inlet, Outlet, Spillway Conditions	Good	Good
Out slope Conditions	No Change	No Change

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

	Mine Site Pond	Waste Rock Pond
Sediment Volume	2.73 A.F.	None
Remaining Sediment Storage Capacity	0.39 A.F.	0.98 A.F.
Water impounded	3.97 A.F.	NONE
Changes, Comments, etc.	The pond was cleaned in the fourth quarter of 2002.	No change from last inspection.

The pond was floated for water and sediment volumes.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 7/8/05

Signature: Richard Cullum **Date:** 7-12-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	March 30, 2005
Mine Name	Deer Creek Mine		
Company Name	Energy West Mining		
Impoundment Identification	**Impoundment Name**	**Mine Site Pond:**	**Waste Rock Pond:**
	Impoundment Number		
	UPDES Permit Number	UT-0023604-001	
	MSHA ID Number	N/A	N/A

IMPOUNDMENT INSPECTION

Inspection Date	**Mine Site:** 2/28/05	**Waste Rock Pond** 2/28/05
Inspected By	Rick Cullum / John Christensen	
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	1ST Quarter 2005 Inspection	

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

	Mine Site Pond	Waste Rock Pond
Conditions, Comments Etc.	No hazards observed.	No hazards observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	Mine Site Pond:	Waste Rock Pond:
60% Design Storage Capacity	1.87 A.F. at 7213.1 ft.	.59 A.F. at 6312.7 ft.
100% Sediment Capacity	3.12 A.F. at 7216.0 ft.	.98 A.F. at 6313.45 ft.

Principle and emergency spillway elevations.

	Mine Site Pond	Waste Rock Pond
Principle Spillway Elevation (F.A.S.L.):	7218.64	6318.0
Emergency Spillway Elevation	7232.03	6318.0

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	Mine Site Pond	Waste Rock Pond
Water Elevation	7224.44	None
Discharging	Yes	Never
Inlet, Outlet, Spillway Conditions	Good	Good
Out slope Conditions	No Change	No Change

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

	Mine Site Pond	Waste Rock Pond
Sediment Volume	1.66 A.F.	None
Remaining Sediment Storage Capacity	1.46 A.F.	0.98 A.F.
Water impounded	6.09 A.F.	NONE
Changes, Comments, etc.	The pond was cleaned in the fourth quarter of 2002.	No change from last inspection.

The pond was frozen at time of inspection. No depth measurements were taken.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 4/8/05

Signature: _____ **Date:** _____

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/017	**Report Date**	DEC. 29, 2005
Mine Name	Des Bee Dove		
Company Name	Energy West Mining Company		
Impoundment Identification	**Impoundment Name**	**Mine Site Pond**	
	Impoundment Number		
	UPDES Permit Number	UT-0023591	
	MSHA ID Number		

IMPOUNDMENT INSPECTION

Inspection Date	DEC. 20, 2005
Inspected By	Rick Cullum/John Christensen
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	4TH Quarter 2005 Inspection

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

There are no visible signs of weakness or instability.

Required for an impoundment which functions as a SEDIMENTATION POND.	**Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.** **60% Design Storage Capacity** 1.2 A.F. at 6756 **100% Sediment Capacity** 2.0 A.F. at 6757
	Principle and emergency spillway elevations. **Principle Spillway Elevation (F.A.S.L.):** 6757.0 **Emergency Spillway Elevation:(F.A.S.L.):** 6771.8

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation 0

Discharging No

Inlet, Outlet Conditions Good

Slope conditions Good

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume: N. A.

Remaining Sediment Storage Capacity N. A.

Water Impoundment:

Changes or Comments Reclamation of the pond started in late November 2005.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 1/6/06

Signature: Richard Cullum **Date:** 1-7-06

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/017	**Report Date**	SEPT. 29, 2005
Mine Name	Des Bee Dove		
Company Name	Energy West Mining Company		
Impoundment Identification	**Impoundment Name**	**Mine Site Pond**	
	Impoundment Number		
	UPDES Permit Number	UT-0023591	
	MSHA ID Number		

IMPOUNDMENT INSPECTION

Inspection Date	SEPT. 20, 2005
Inspected By	Rick Cullum/John Christensen
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	3RD Quarter 2005 Inspection

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

There are no visible signs of weakness or instability.

Required for an impoundment which functions as a SEDIMENTATION POND.	**Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.** **60% Design Storage Capacity** 1.2 A.F. at 6756 **100% Sediment Capacity** 2.0 A.F. at 6757
	Principle and emergency spillway elevations. **Principle Spillway Elevation (F.A.S.L.):** 6757.0 **Emergency Spillway Elevation:(F.A.S.L.):** 6771.8

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation ?

Discharging No

Inlet, Outlet Conditions Good

Slope conditions Good

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume: 1.60

Remaining Sediment Storage Capacity .40

Water Impoundment:

Changes or Comments The pond was partially cleaned of sediment. It is scheduled to be reclaimed in '05.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 10/14/05

Signature: Richard Cullum **Date:** 10-18-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/017	**Report Date**	July 7, 2005
Mine Name	Des Bee Dove		
Company Name	Energy West Mining Company		
Impoundment Identification	**Impoundment Name**	**Mine Site Pond**	
	Impoundment Number		
	UPDES Permit Number	UT-0023591	
	MSHA ID Number		

IMPOUNDMENT INSPECTION

Inspection Date	June 30, 2005
Inspected By	Rick Cullum/John Christensen
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2ND Quarter 2005 Inspection

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

There are no visible signs of weakness or instability.

Required for an impoundment which functions as a SEDIMENTATION POND.	**Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.** **60% Design Storage Capacity** 1.2 A.F. at 6756 **100% Sediment Capacity** 2.0 A.F. at 6757
	Principle and emergency spillway elevations. **Principle Spillway Elevation (F.A.S.L.):** 6757.0 **Emergency Spillway Elevation:(F.A.S.L.):** 6771.8

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation	6756.84
Discharging	No
Inlet, Outlet Conditions	Good
Slope conditions	Good

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume:	1.60
Remaining Sediment Storage Capacity	.40
Water Impoundment:	
Changes or Comments	The pond was partially cleaned of sediment.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 7/8/05

Signature: Richard Cullum **Date:** 7-12-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/017	**Report Date**	MARCH 30, 2005
Mine Name	Des Bee Dove		
Company Name	Energy West Mining Company		
Impoundment Identification	**Impoundment Name**	**Mine Site Pond**	
	Impoundment Number		
	UPDES Permit Number	UT-0023591	
	MSHA ID Number		

IMPOUNDMENT INSPECTION

Inspection Date	MARCH 14, 2005	
Inspected By	Rick Cullum/John Christensen	
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		1ST Quarter 2005 Inspection

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

There are no visible signs of weakness or instability.

Required for an impoundment which functions as a SEDIMENTATION POND.	**Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.** **60% Design Storage Capacity** 1.2 A.F. at 6756 **100% Sediment Capacity** 2.0 A.F. at 6757
	Principle and emergency spillway elevations. **Principle Spillway Elevation (F.A.S.L.):** 6757.0 **Emergency Spillway Elevation:(F.A.S.L.):** 6771.8

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2

Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation	6758.09
Discharging	No
Inlet, Outlet Conditions	Good
Slope conditions	Good

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume:	1.60
Remaining Sediment Storage Capacity	.40
Water Impoundment:	Partially frozen.
Changes or Comments	The pond was partially cleaned of sediment.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER JOHN CHRISTENSEN No. 165651 STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 4/8/05

Signature: Richard Collum **Date:** 4-11-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/009	**Report Date**	DEC. 29, 2005
Mine Name	Trail Mountain Mine		
Company Name	Energy West Mining Company		
Impoundment Identification	**Impoundment Name**	**Trail Mountain Mine Pond:**	
	Impoundment Number		
	UPDES Permit Number	UT-G04003-001	
	MSHA ID Number	N/A	

IMPOUNDMENT INSPECTION

Inspection Date	DEC. 5, 2005
Inspected By	John Christensen / Rick Cullum
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	4TH Quarter 2005 Inspection

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

No unstable or structural weaknesses found.

Required for an impoundment which functions as a SEDIMENTATION POND.

2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

60% Design Storage Capacity 0.282 A.F. at 7182

100% Sediment Capacity 0.47 A.F. at 7183.6

3. Principle and emergency spillway elevations.

Principle Spillway Elevation (F.A.S.L.): 7186.6

Emergency Spillway Elevation:(F.A.S.L.): 7194.6

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation	DRY
Discharging	No
Inlet, Outlet Conditions	Good
Slope conditions	Good

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume	0.08 A.F.
Remaining Sediment Storage Capacity	0.39 A.F.
Water Impounded	0.00 A.F.
Changes, comments, etc.	Mining has seized at Trail Mtn. operations, only storm run off will run into the pond. The pond was cleaned in 4th Quarter 2005.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 1/6/06
Signature: Richard Cullum **Date:** 1-7-06

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/009	**Report Date**	SEPT. 29, 2005
Mine Name	Trail Mountain Mine		
Company Name	Energy West Mining Company		
Impoundment Identification	**Impoundment Name**	**Trail Mountain Mine Pond:**	
	Impoundment Number		
	UPDES Permit Number	UT-G04003-001	
	MSHA ID Number	N/A	

IMPOUNDMENT INSPECTION

Inspection Date	SEPT. 20, 2005
Inspected By	John Christensen / Rick Cullum
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	3RD Quarter 2005 Inspection

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

No unstable or structural weaknesses found.

Required for an impoundment which functions as a SEDIMENTATION POND.

2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

60% Design Storage Capacity 0.282 A.F. at 7182

100% Sediment Capacity 0.47 A.F. at 7183.6

3. Principle and emergency spillway elevations.

Principle Spillway Elevation (F.A.S.L.): 7186.6

Emergency Spillway Elevation:(F.A.S.L.): 7194.6

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation	7181.03
Discharging	No
Inlet, Outlet Conditions	Good
Slope conditions	Good

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume	0.34 A.F.
Remaining Sediment Storage Capacity	0.13 A.F.
Water Impounded	0.00 A.F.
Changes, comments, etc.	Mining has seized at Trail Mtn. operations, only storm run off will run into the pond. The pond will be partially cleaned in 4th Quarter 2005.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen Date: 10/14/05
Signature: Richard Cullum Date: 10-18-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/009	**Report Date**	July 7, 2005
Mine Name	Trail Mountain Mine		
Company Name	Energy West Mining Company		
Impoundment Identification	**Impoundment Name**	**Trail Mountain Mine Pond:**	
	Impoundment Number		
	UPDES Permit Number	UT-G04003-001	
	MSHA ID Number	N/A	

IMPOUNDMENT INSPECTION

Inspection Date	June 30, 2005
Inspected By	John Christensen / Rick Cullum
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2nd Quarter 2005 Inspection

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

No unstable or structural weaknesses found.

Required for an impoundment which functions as a SEDIMENTATION POND.

2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

60% Design Storage Capacity 0.282 A.F. at 7182

100% Sediment Capacity 0.47 A.F. at 7183.6

3. Principle and emergency spillway elevations.

Principle Spillway Elevation (F.A.S.L.): 7186.6

Emergency Spillway Elevation:(F.A.S.L.): 7194.6

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation	7183.13
Discharging	No
Inlet, Outlet Conditions	Good
Slope conditions	Good

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume	0.34 A.F.
Remaining Sediment Storage Capacity	0.13 A.F.
Water Impounded	0.02 A.F.

Changes, comments, etc. Mining has seized at Trail Mtn. operations, only storm run off will run into the pond. The pond will be partially cleaned in 3rd Quarter 2005.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: _____ Date: 7/8/05

Signature: Richard Cullum Date: 7-12-05

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/009	**Report Date**	MARCH 30, 2005
Mine Name	Trail Mountain Mine		
Company Name	Energy West Mining Company		
Impoundment Identification	**Impoundment Name**	**Trail Mountain Mine Pond:**	
	Impoundment Number		
	UPDES Permit Number	UT-G04003-001	
	MSHA ID Number	N/A	

IMPOUNDMENT INSPECTION

Inspection Date	MARCH 14, 2005
Inspected By	John Christensen / Rick Cullum
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	1ST Quarter 2005 Inspection

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

No unstable or structural weaknesses found.

Required for an impoundment which functions as a SEDIMENTATION POND.

2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

60% Design Storage Capacity 0.282 A.F. at 7182

100% Sediment Capacity 0.47 A.F. at 7183.6

3. Principle and emergency spillway elevations.

Principle Spillway Elevation (F.A.S.L.): 7186.6

Emergency Spillway Elevation:(F.A.S.L.): 7194.6

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation	7185.53
Discharging	No
Inlet, Outlet Conditions	Good
Slope conditions	Good

*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume	0.25 A.F.
Remaining Sediment Storage Capacity	0.22 A.F.
Water Impounded	0.35 A.F.
Changes, comments, etc.	Mining has seized at Trail Mtn. operations, only storm run off will run into the pond. The pond was partially frozen at the time of the inspection, no depth measurement were taken.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen **Date:** 4/8/05
Signature: Richard Cullum **Date:** 4-11-05

APPENDIX B

Reporting of Technical Data

Including monitoring data, reports, maps, and other information
As required under the approved plan or as required by the Division

In accordance with the requirement of R645-310-130 and R645-301-140

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2005 Vegetation Monitoring Report - Mt Nebo Scientific
Raptor Monitoring Reports are held in the Confidencial File at the Division of Oil Gas and Mining, Salt Lake City, Utah
The 2005 Raptor Monitoring Report is included with the supplied "Confidential CD"

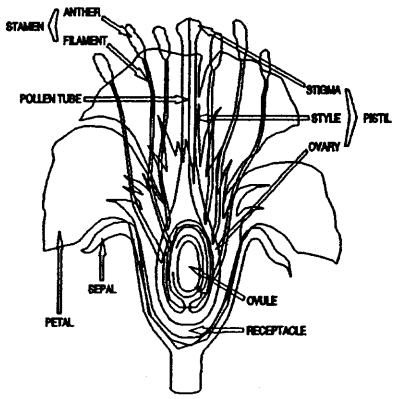
CONFIDENTIAL

ENERGY WEST MINING COMPANY
VEGETATION MONITORING

2005

VEGETATION MONITORING REPORTS
FOR AREAS LOCATED WITHIN THE FOLLOWING AREAS:

RILDA CANYON
DEER CREEK MINE
COTTONWOOD FAN PORTAL
TRAIL MOUNTAIN MINE
DES-BEE-DOVE
COTTONWOOD MINE



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- Aspen/Fir/Dogwood Reference Area 17

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- New Waste Rock Site: Pinyon-Juniper Reference Area 51
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Prepared by

MT. NEBO SCIENTIFIC, INC.
330 East 400 South, Suite 6
P.O. Box 337
Springville, Utah 84663
(801) 489-6937

Patrick D. Collins, Ph.D.

for

ENERGY WEST MINING COMPANY
P.O. Box 310
Huntington, Utah 84528

March 2006

INTRODUCTION

The following document addresses the results of vegetation monitoring areas for the year 2005. Listed below are the areas monitored and reported within this document.

RILDA CANYON
- Sagebrush/Grass Reference Area
- Pinyon-Juniper/Mountain Brush Reference Area
- Riparian Reference Area
- Pinyon-Juniper/Mountain Brush Reference Area (AMR)
- White Fir/Aspen Reference Area
- Mountain Brush/Salina Wildrye Reference Area
- Aspen/Fir/Dogwood Reference Area

DEER CREEK MINE
- Mixed Conifer Reference Area
- Pinyon-Juniper Reference Area
- Riparian Reference Area
- Waste Rock Site: Saltbush Reference Area

COTTONWOOD FAN PORTAL AREA
- Pinyon-Juniper Reference Area
- Reclaimed Slope 1998
- Reclaimed Slope 1981

TRAIL MOUNTAIN MINE
- Reference Area

DES-BEE-DOVE MINE
- Pumphouse
- Phase 1 Reclamation 2002
- Phase 2 Reclamation 2003
- Pinyon-Juniper Reference Area
- Salt Desert Reference Area

COTTONWOOD MINE
- New Waste Rock Site: Black Sagebrush Reference Area
- New Waste Rock Site: Pinyon-Juniper Reference Area
- New Waste Rock Site: Gardner Saltbush Reference Area
- Ninth East Breakout
- Pinyon-Juniper Reference Area

METHODS

Vegetation monitoring was conducted on revegetated sites within mine permit areas for the *Energy West Mining Company.* Quantitative data were taken at each site in the growing season of 2005. For previous monitoring years, quantitative data were recorded depending on the sample schedule provided by *Energy West Mining Company*. The data recorded in 2005 is briefly described below.

QUALITATIVE DATA

Qualitative data were recorded on all sites. A qualitative data sheet for each site is included in this report and provides the following information: site name, general area, sample date, observers, slope, exposure, acreage, animal disturbance, erosion damage, cover, dominant plant species observed, and other pertinent notes.

When quantitative data were recorded, results are shown on these data sheets or reference to where the data is located.

Site Name

The site name that is given correlates with *Energy West's* maps of the area and can be used for future reference and sampling.

Area

The "Area" on the data sheets is a reference to the general mine area, GPS coordinates, or property areas for quick reference and general use.

Date

Sample dates are also provided. All sample dates are within the 2005 growing season.

Workers

Lists of the names of the individuals who recorded the data.

Exposure

Exposure was recorded on each site. Often the site had several different exposures. In those cases, "variable" was written for the exposure on the data sheet.

Animal Disturbance

Values were given to the relative use by animal species at each site. The values and a brief explanation are given below.

None -	(or negligible), no animal use was observed.
Slight -	only little animal use was observed by droppings, tracks, or cropped vegetation.
Moderate -	a fair degree of use was observed, mostly by the cropped vegetation. Several inches of production still remained available for use by the animals.
Severe -	animal use had taken nearly all of the available current year's production.

Cover

Cover differences or notes may be given on the data sheet or references to the quantitative data.

Dominant Plant Species Observed

Sometimes plant species that were observed, but were not encountered in the quadrats when sampling. Many of these species were recorded here. However, some of the species were also encountered in the quadrats. Therefore, for a list of all species on a given site, one should refer to both quantitative and qualitative data sheets.

Notes

Site-specific, pertinent notes about each area were also taken i.e. identification of special considerations, areas of differential growth patterns, etc. Notes on specific methodologies on each site were also described here.

Photographs

Color photographs were taken for each site and are included in this report for documentation.

RESULTS

To be consistent with previous years, data sheets for qualitative sampling have been included in this report. For results of the above parameters, refer to the site-specific data sheets.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Sagebrush/Grass Reference Area

AREA: Rilda Canyon (lower area)

LOCATION: GPS Name: EWRSGR
UTM Zone 12S
E. 0487875
N. 4361300

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 8 deg.

EXPOSURE: SSE

ANIMAL USE/DISTURBANCE: Moderate

COVER: (no quantitative data this year).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Artemisia tridentata
Chrysothamnus nauseosus
Gutierrezia sarothrae
Opuntia polyacantha
Rhus simplicifolia
Rosa woodsii

FORBS
Antennaria neglecta
Artemisia dracunculus
Aster sp.
Circium sp.
Erigeron sp.
Lepidium perfoliatum
Taraxacum officinale
Tragopogon dubius

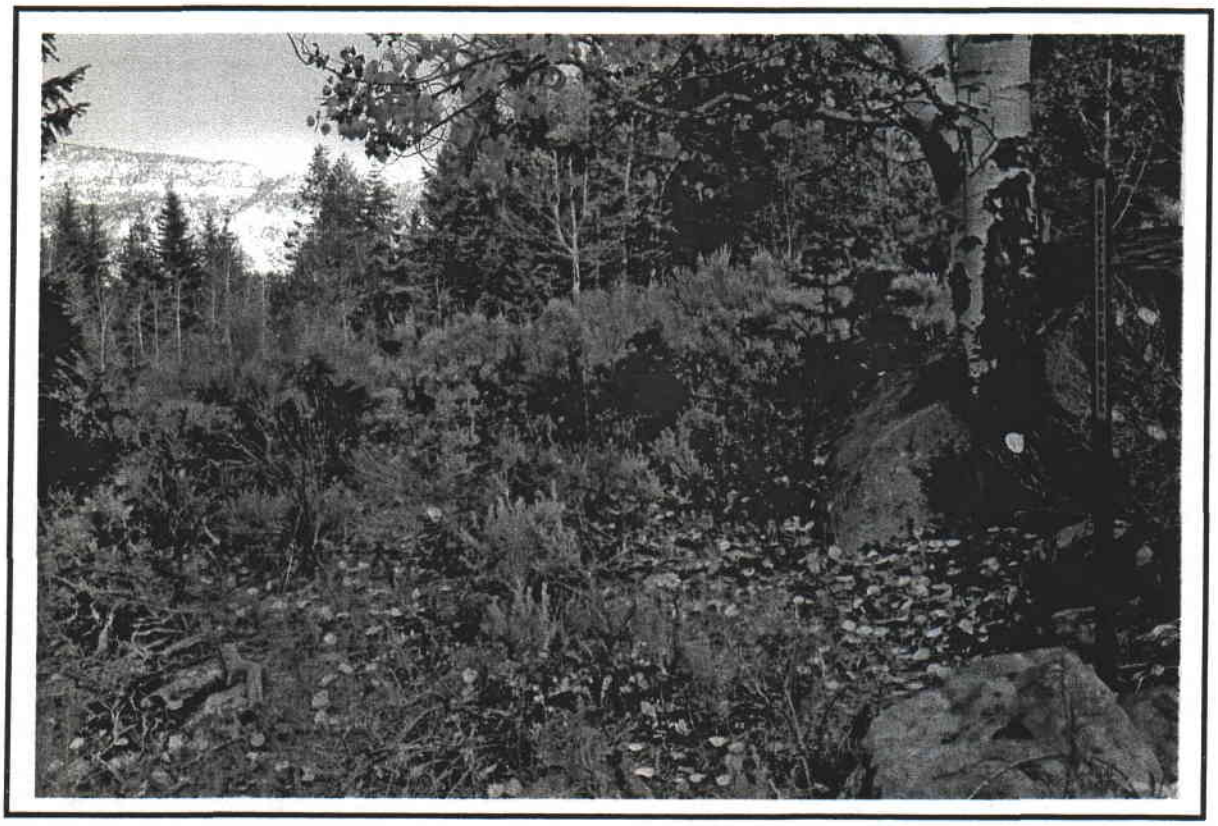
GRASSES
Bouteloua gracilis
Bromus tectorum
Elymus salinus
Poa secunda
Stipa comata

NOTES:

1) This reference area was chosen in 2003 for the lower Rilda Canyon site in the "Leachfield Area".

2) I saw red markers onsite.

3) Reference area in good condition; no change since the study in 2003.



Sagebrush Grass Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Pinyon-Juniper/Mountain Brush Reference Area

AREA: Rilda Canyon (lower area)

LOCATION: GPS Name: EWRPJR
UTM Zone 12S
E. 0487872
N. 4361383

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 35 deg.

EXPOSURE: S.

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Cercocarpus ledifolius
Eriogonum corymbosum
Euphorbia fendleri
Gutierrezia sarothrae
Juniperus osteosperma
Mahonia repens
Pinus edulis
Rhus simplicifolia

FORBS
Artemisia dracunculus
Erigeron sp.
Phlox sp.

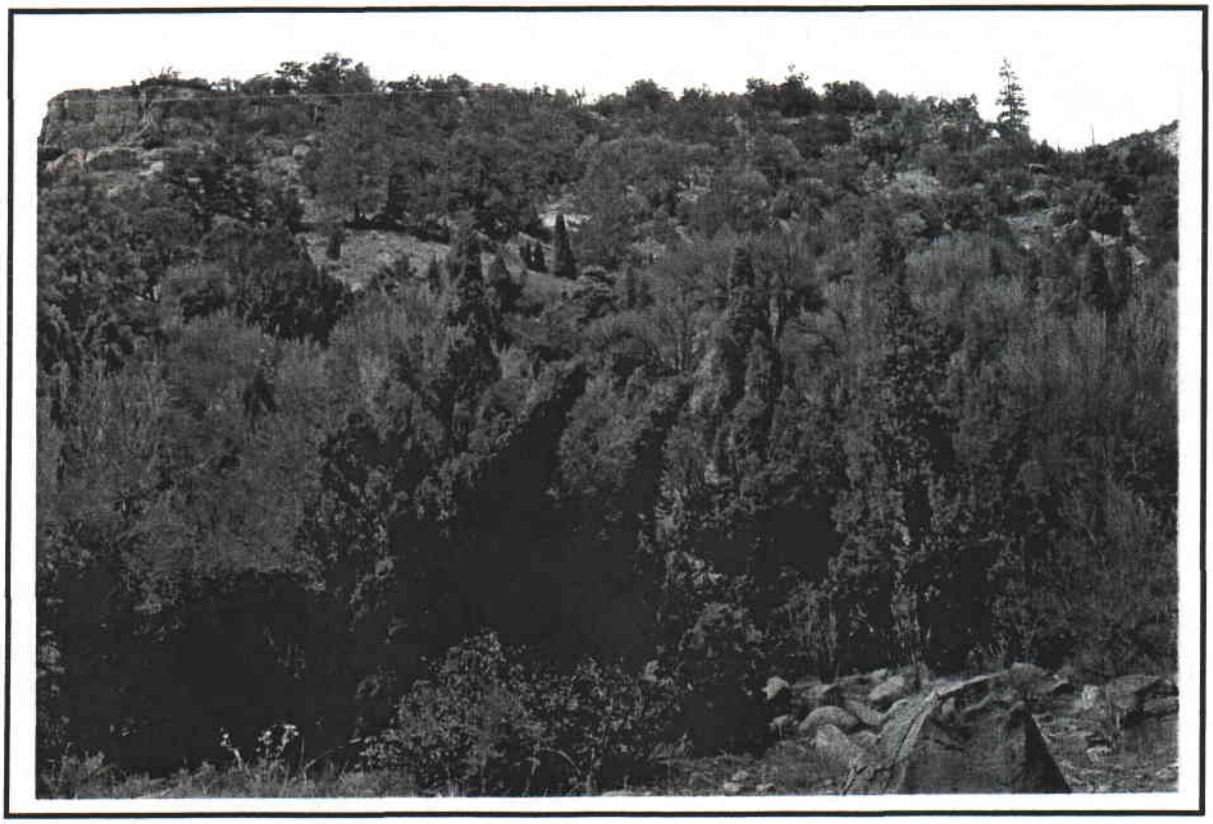
GRASSES
Elymus salinus
Poa secunda
Stipa hymenoides

NOTES:

1) This reference area was chosen in 2003 for the lower Rilda Canyon site for an undisturbed reference area in the "Main Facilities Area".

2) Site was in good shape.

3) I did not notice red markers to delineate the site, but I had coordinates, so I did not take a lot of time to look for them.



Pinyon-Juniper/Mtn. Brush Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Riparian Reference Area

AREA: Rilda Canyon (lower area)

LOCATION: GPS Name: EWRRRI
UTM Zone 12S
E. 0487614
N. 4361309

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: moderate use

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Abies concolor
Acer glabrum
Cornus sericea
Mahonia repens
Picea pungens
Populus angustifolia
Populus tremuloides
Rosa woodsii
Symphoricarpos oreophilus

FORBS
Achillea millefolium
Circium sp.
Cynoglossum officinale
Equisetum arvensis
Galium boreale
Geranium richardsoni
Rubus idaeus
Taraxacum officinale
Tragopogon dubius

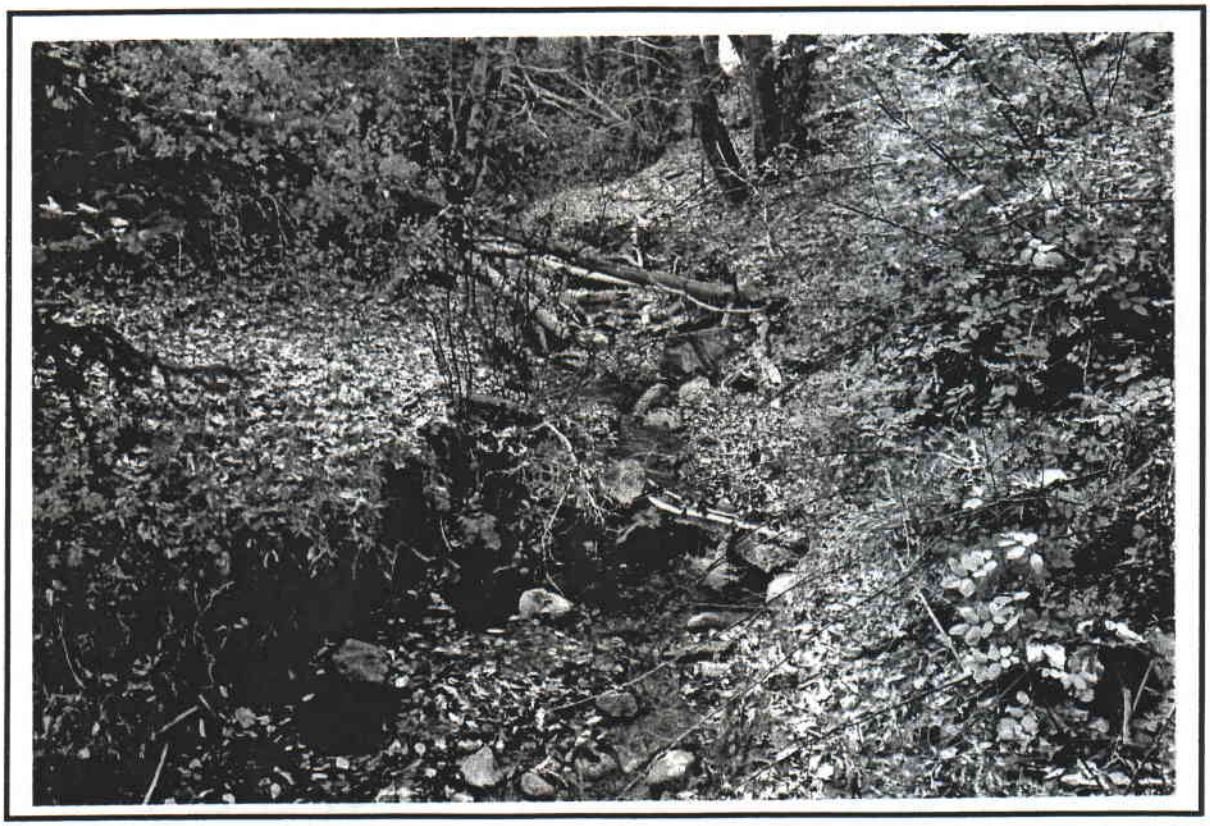
GRASSES
Agrostis stolonifera
Juncus sp.
Poa fendleriana
Poa pratensis

NOTES:

1) This reference area was chosen in 2003 for the first-proposed *lower* Rilda Canyon site for an undisturbed reference area in the "Main Facilities Area" (Facilities Area was later moved up canyon).

2) Site was in good shape.

3) I did not notice red markers to delineate the site, but I had coordinates, so I did not take a lot of time to look for them.



Riparian Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Pinyon-Juniper/Mtn. Brush Reference Area (AMR)

AREA: Rilda Canyon (lower area)

LOCATION: GPS Name: EWRRPJ
UTM Zone 12S
E. 0487091
N. 4361212

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 10 deg.

EXPOSURE: NNE

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Artemisia tridentata
Chrysothamnus nauseosus

FORBS
Aster foliaceous
Chenopodium sp.
Descurainia pinnata
Lepidium perfoliatum
Medicago sativa

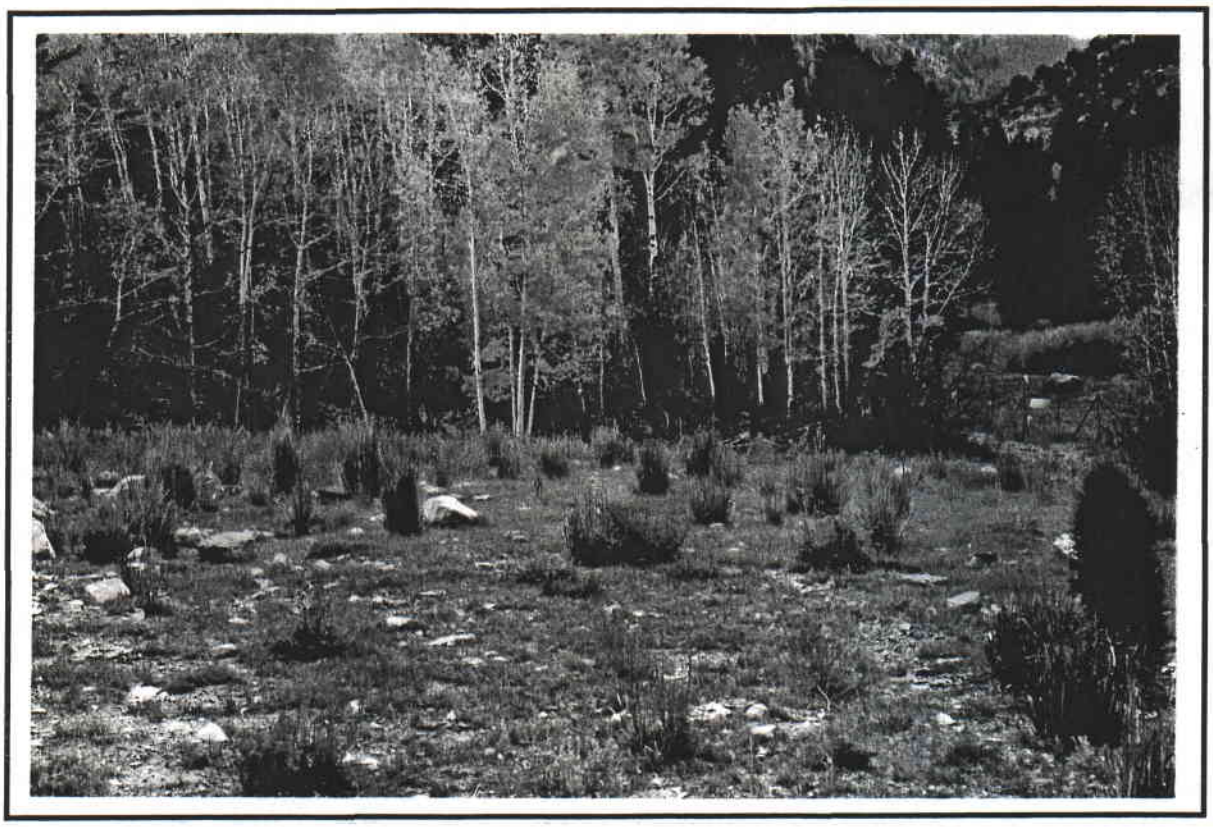
GRASSES
Agropyron cristatum
Bromus carinatus
Elymus cinereus
Elymus lanceolatus
Elymus smithii

NOTES:

1) This reference area was chosen in 2003 for the lower Rilda Canyon site for a *disturbed* (AMR) reference area in the "Main Facilities Area" (proposed Facilities Area was later moved up-canyon).

2) I did not notice red markers to delineate the site, but I had coordinates, so I did not take a lot of time to look for them.

3) Site has not changed from previous studies.



Pinyon-Juniper/Mtn. Brush Reference Area (AMR)

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: White Fir/Aspen Reference Ara

AREA: Rilda Canyon (up-canyon area)

LOCATION: GPS Name: EWRWFR
UTM Zone 12S
E. 0486389
N. 4361288

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 6 deg.

EXPOSURE: N.

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

SHRUBS

Abies concolor
Acer glabrum
Amelanchier utahensis
Artemisia tridentata
Juniperus scopulorum
Mahonia repens
Pachistima myrsinites
Picea pungens
Populus tremuloides
Ribes aureum
Rosa woodsii
Rubus idaeus
Symphoricarpos oreophilus

FORBS

Achillea millefolium
Galium bifolium
Lathrus lanszwertii
Osmorhiza depauperata
Viola adunca

GRASSES

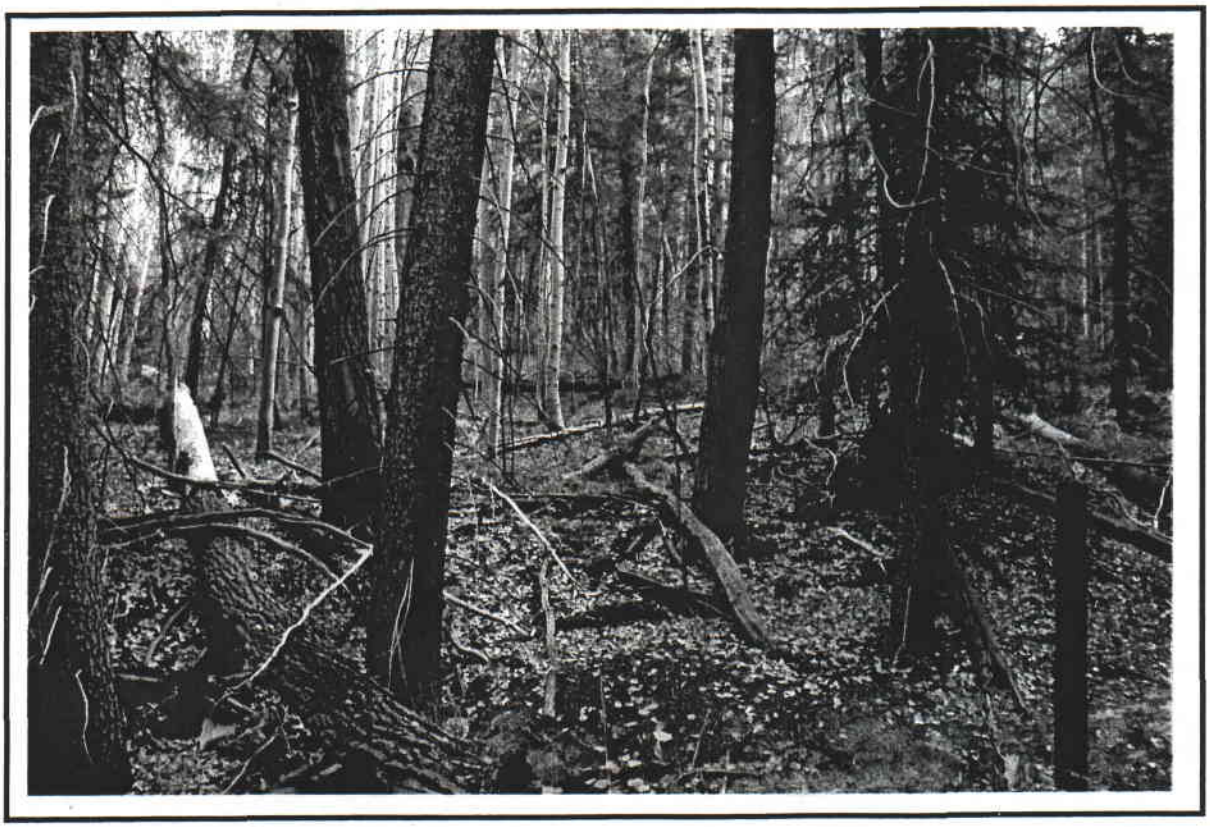
Poa fendleriana
Elymus trachycaulus
Poa pratensis

NOTES:

1) This was an undisturbed reference area chosen in 2004 in the upper Rilda Canyon area.

2) I found red markers delineating the site.

3) Site in good shape; no change from previous studies.



White Fir/Aspen Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Mtn. Brush/Salina Wildrye Reference Area

AREA: Rilda Canyon

LOCATION: GPS Name: EWRMSR
UTM Zone 12S
E. 0486170
N. 4361249

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: ~38 deg

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Moderate use

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Abies concolor
Artemisia tridentata
Cercocarpus ledifolius
Chrysothamnus nauseosus
Juniperus scopulorum
Mahonia repens
Rosa woodsii
Symphoricarpos oreophilus

FORBS
Antennaria sp.

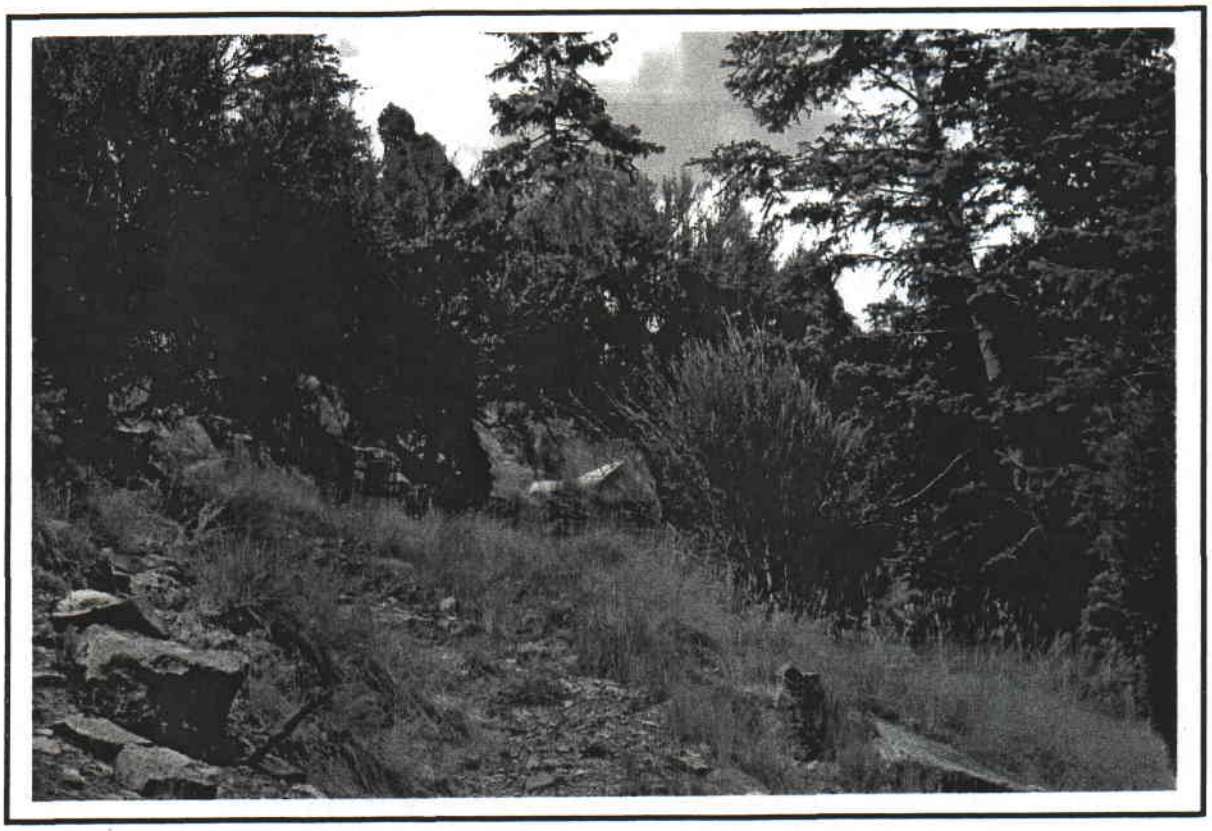
GRASSES
Elymus salinus

NOTES:

1) This site was from an old study when the fan area was first proposed for construction.

2) I had a difficult time getting to the site. For an easier access, begin hike at boulders (GPS, UTM: E.0486182, N.4361055) that area blocking an old reclaimed road; take reclaimed road to red marker.

3) Reference area remains virtually unchanged and in good condition.



Mtn. Brush/Saline Wildrye Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Aspen/Fir/Dogwood Reference Area

AREA: Rilda Canyon

LOCATION: GPS Name: EWRADR
UTM Zone 12S
E. 0485982
N. 4360955

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: .

EXPOSURE:

ANIMAL USE/DISTURBANCE:

COVER: (no quantitative data this year).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Abies concolor
Chrysothamnus nauseosus
Cornus stolonifera
Juniperus communis
Mahonia repens
Pachistima myrsinites
Populus tremuloides
Rosa woodsii
Symphoricarpos oreophilus

FORBS

GRASSES
Poa sp.

NOTES:

1) This site was from an old study when the portal area was first proposed for construction.

2) I found red markers that delineate the site.

3) The reference area's condition was good and could be used for future standards of success for appropriate areas.

Aspen/Fir/Dogwood Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Mixed Conifer Reference Area

AREA: Deer Creek Mine

LOCATION: Deer Creek Canyon

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 15-25 deg.

EXPOSURE: WSW

ANIMAL USE/DISTURBANCE:

COVER: (no quantitative data this year).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Abies lasiocarpa
Amelanchier utahensis
Brickellia microphylla
Chrysothamnus depressus
Chrysothamnus viscidiflorus
Chrysothamnus nauseosus
Eriogonum corymbosum
Juniperus scopulorum
Mahonia repens
Pachystima myrsinites
Pinus edulis
Pseudotsuga menziesii
Symphoricarpos oreophilus

FORBS
Aster foliaceous
Linum lewisii
Castilleja sp.

GRASSES
Elymus salinus
Elymus spicatus
Poa fendleriana

NOTES:

1) I found t-posts that marked the reference area.

2) The reference area's condition was good and could be used for future standards of success for appropriate areas.

Mixed Conifer Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Pinyon-Juniper Reference Area

AREA: Deer Creek Mine

LOCATION: Deer Creek Canyon

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: ~ 25 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Moderate use

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Amelanchier utahesis
Ephedra viridis
Eriogonum corymbosum
Juniperus osteosperma
Pinus edulis
Symphoricarpos oreophilus

FORBS

GRASSES
Elymus salinus
Stipa hymenoides

NOTES:

1) I did not find t-posts or markers in the field, but I did have a map of the location. I also used binoculars from the other side of the canyon to look for the markers. Using the map, I feel I was in the correct area. It's about directly upslope from the fan. The markers may be there, I just did not see them.

2) The reference area's condition was good and could be used for future standards of success for appropriate areas.

Pinyon-Juniper Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Riparian Reference Area

AREA: Deer Creek Mine

LOCATION: Deer Creek Canyon

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 2-3 deg.

EXPOSURE: variable

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Abies concolor
Acer glabrum
Cornus stolonifera
Juniperus scopulorum
Picea pungens
Populus angustifolia
Pseudotsuga menziesii
Rosa woodsii
Salix spp.
Symphoricarpos oreophilus

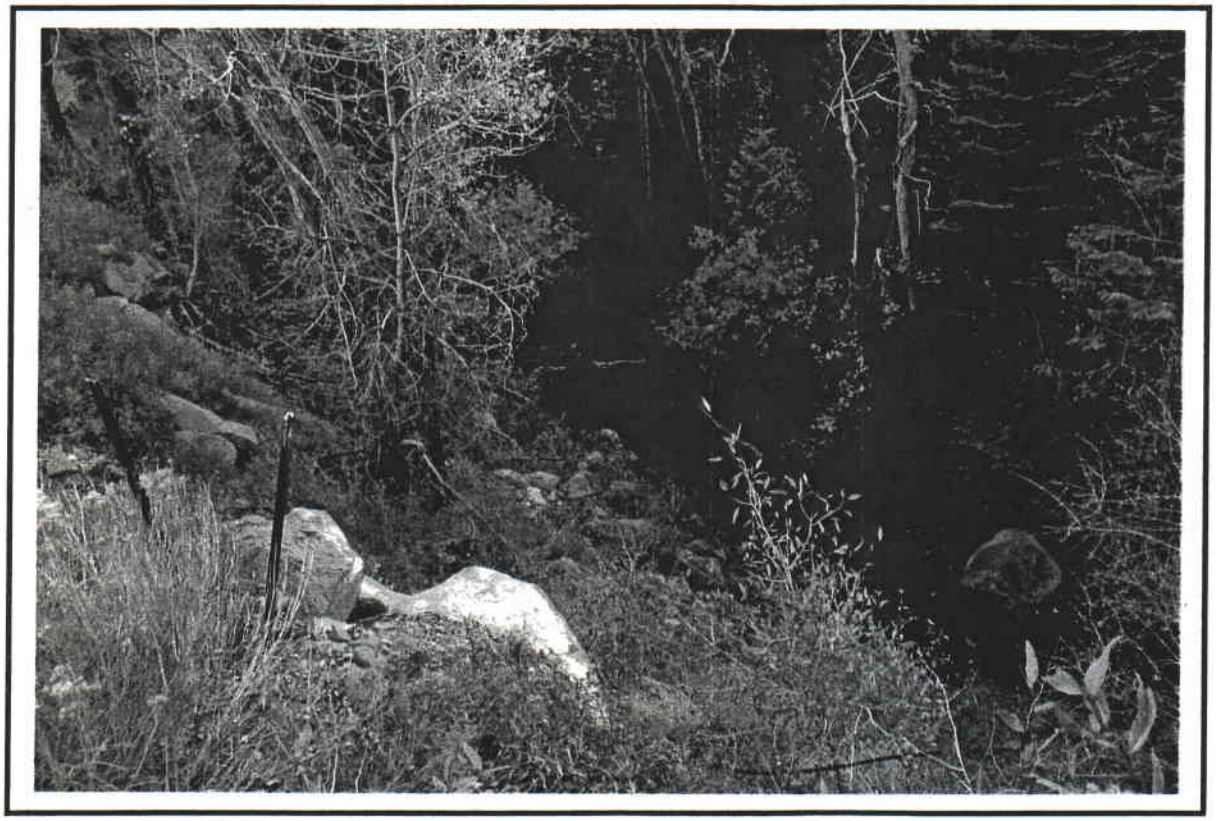
FORBS
Aster foliaceous
Cirsium

GRASSES
Agrostis stolonifera
Elymus salinus
Juncus sp.

NOTES:

1) The reference area's condition was good and could be used for future standards of success for appropriate areas.

2) No change from previous years' observations



Riparian Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Saltbush Reference Area

AREA: Deer Creek Waste Rock Site

LOCATION: Near Huntington Canyon

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 5-25 deg.

EXPOSURE: variable, mostly south

ANIMAL USE/DISTURBANCE: Some use.

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Artemisia nova
Atriplex gardneri
Atriplex corrugata
Juniperus osteosperma
Sarcobatus vermiculatus

FORBS
Eriogonum sp.

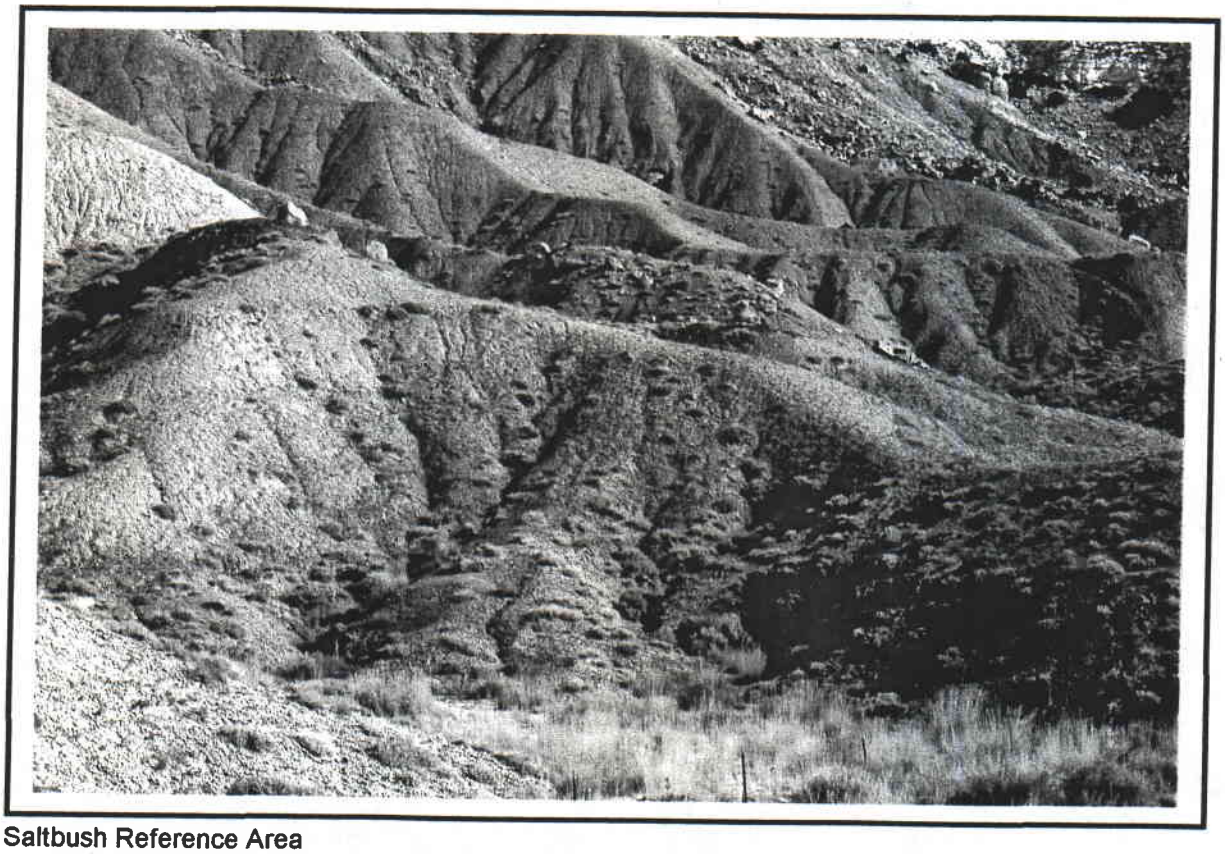
GRASSES
Elymus salinus
Stipa hymenoides

NOTES:

1) I found some markers; they were t-posts (not red markers like other sites).

2) I used a map from a previous report to locate the site.

3) The reference area was in good condition and unchanged from when the study was first conducted by *Mt. Nebo Scientific* when the reference area was established.



Saltbush Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Pinyon-Juniper Reference Area

AREA: Cottonwood Fan Portal Area

LOCATION: Cottonwood Canyon

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 33 deg.

EXPOSURE: W

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Amelanchier utahensis
Chrysothamnus nauseosus
Ephedra viridis
Juniperus osteosperma
Pinus edulis

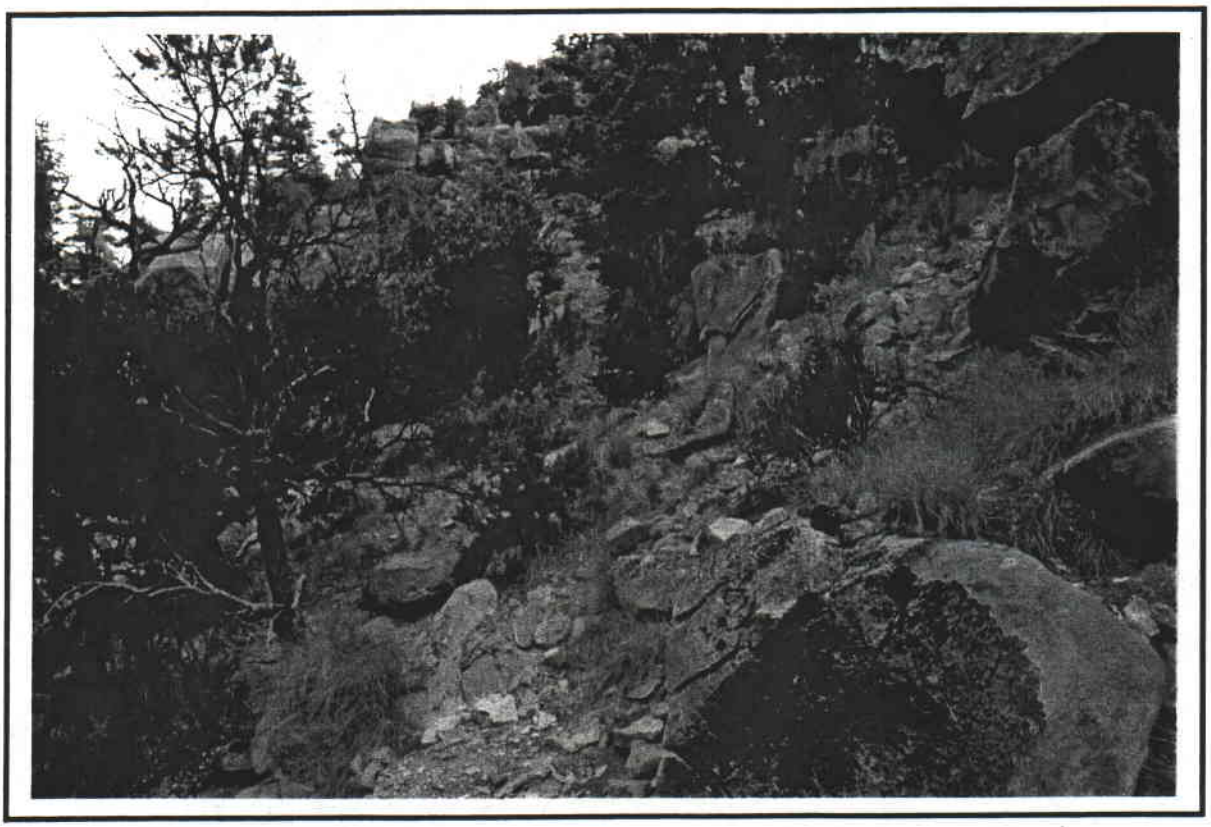
FORBS
Cirsium sp.
Stanleya pinnata

GRASSES
Elymus salinus
Stipa hymenoides

NOTES:

1) Reference area was in good condition and unchanged from other years of observation.

2) Therefore, it remains a good area for future standards of appropriate areas.



Pinyon-Juniper Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Reclaimed Slope 1998

AREA: Cottonwood Fan Portal Area

LOCATION: Cottonwood Canyon

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: variable

EXPOSURE: SW

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Atriplex canescens
Chrysothamnus nauseosus

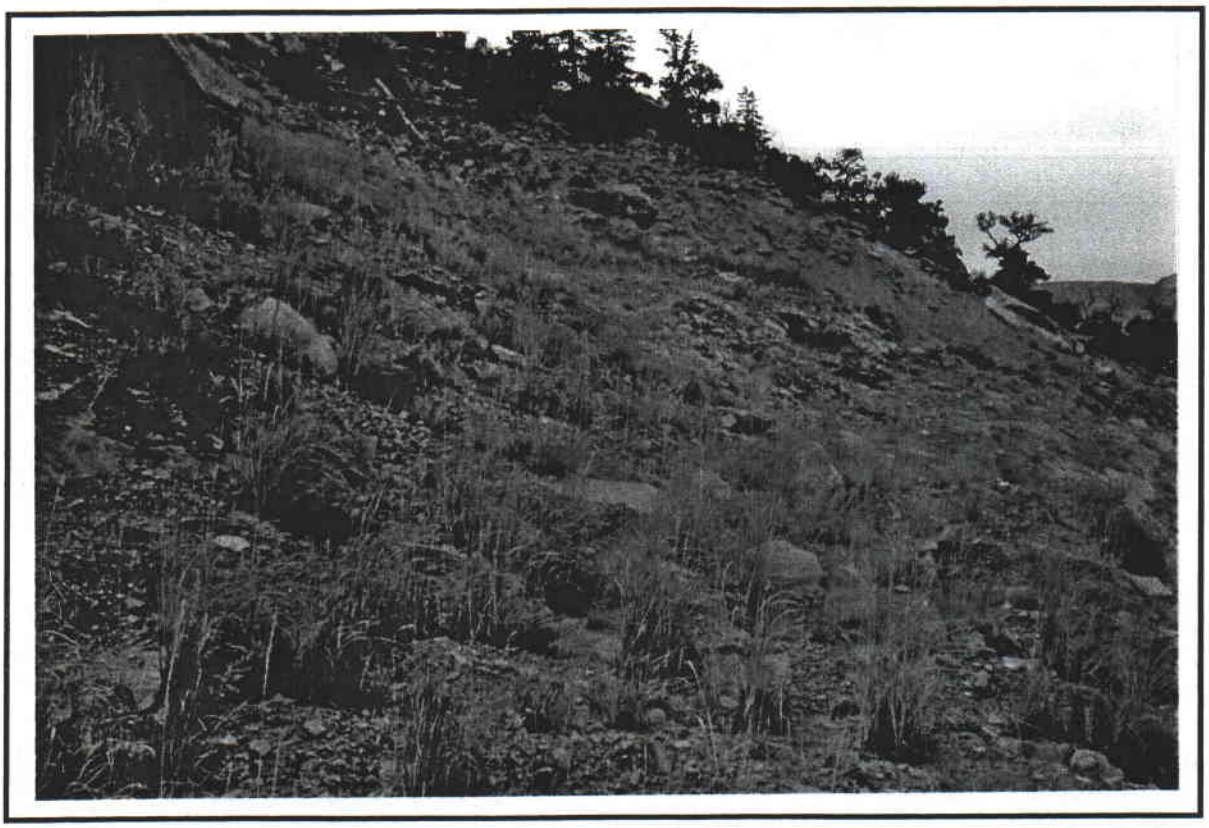
FORBS
Aster glaucodes
Linum lewisii
Melilotus officinalis

GRASSES
Dactylis glomeratus
Elymus cinereus
Elymus smithii
Elymus lanceolatus
Stipa hymenoides

NOTES:

1) Establishment of plant species was progressing well from the seeding done in 1998.

2) No areas of special concern were noted.



Reclaimed Slope 1998

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Reclaimed Slope 1981

AREA: Cottonwood Fan Portal Area

LOCATION: Cottonwood Canyon

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 35-40 deg.

EXPOSURE: W

ANIMAL USE/DISTURBANCE: Moderate use.

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Artemisia tridentata
Atriplex confertifolia
Atriplex canescens
Chrysothamnus nauseosus
Pinus edulis

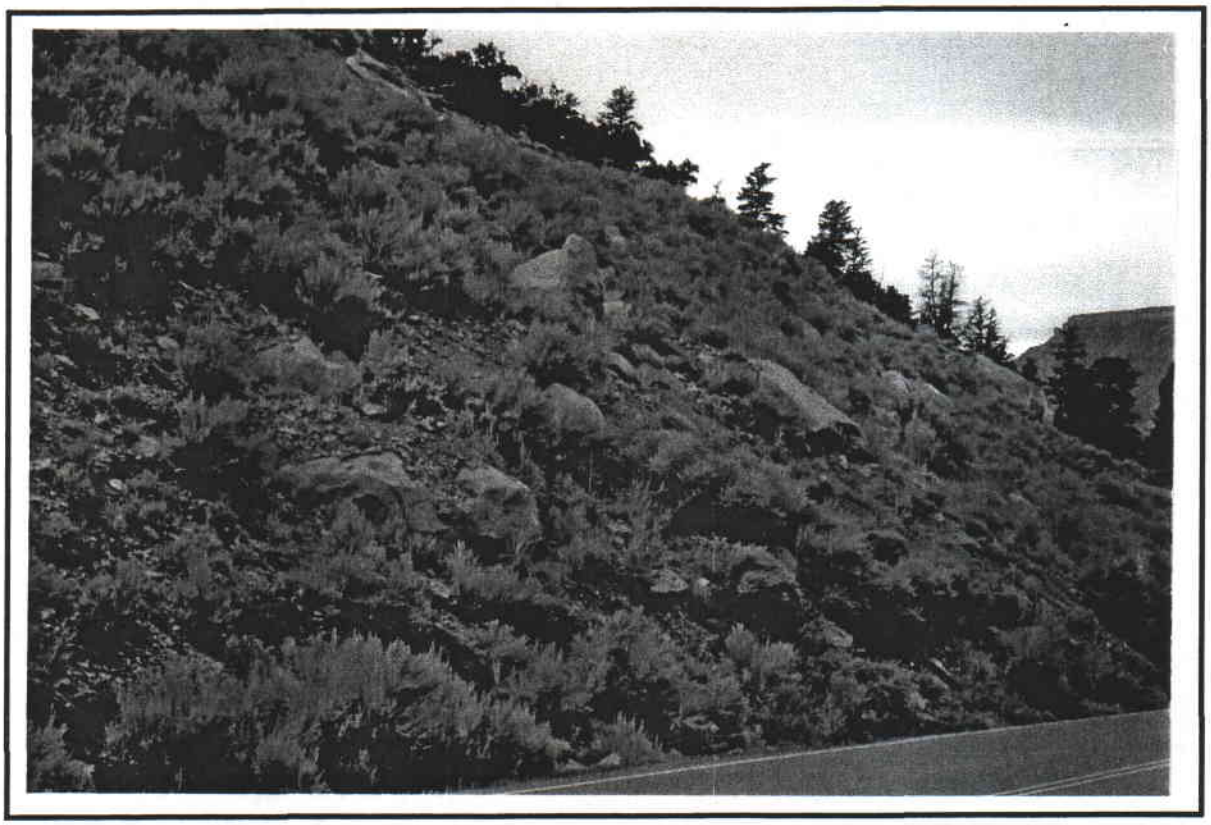
FORBS
Aster foliaceous

GRASSES
Agropyron cristatum
Elymus lanceolatus
Elymus cinereus
Elymus smithii
Stipa hymenoides

NOTES:

1) Reclaimed slope was in excellent shape, especially considering the steepness of slope angle

2) Plant establishment was excellent too.



Reclaimed Slope 1981

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Reference Area

AREA: Trail Mountain Mine

LOCATION: Cottonwood Canyon

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 35 deg

EXPOSURE: E

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Amelanchier utahensis
Artemisia tridentata
Atriplex confertifolia
Chrysothamnus nauseosus
Ephedra viridis

FORBS

GRASSES
Elymus salinus
Stipa hymenoides

NOTES:

1) I could not get above the rock cliff outcrop, but I could see most of the species from the dirt road near it.

2) I did not see red markers that delineate the area; perhaps it was not marked that way.

3) The plant community there was a Big Sagebrush/Shadscale/Salina Wildrye with some scattered PJ and Mtn Brush areas throughout it.

4) The reference area was in good condition and would be good for standards of success for appropriate areas.

Trail Mtn. Mine Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Pumphouse

AREA: Des-Bee-Dove Mine

LOCATION: Des-Bee-Dove Area

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 2 - 8 deg.

EXPOSURE: E.

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Artemisia tridentata
Atriplex confertifolia
Chrysothamnus nauseosus
Ephedra viridis
Gutierrezia sarothrae

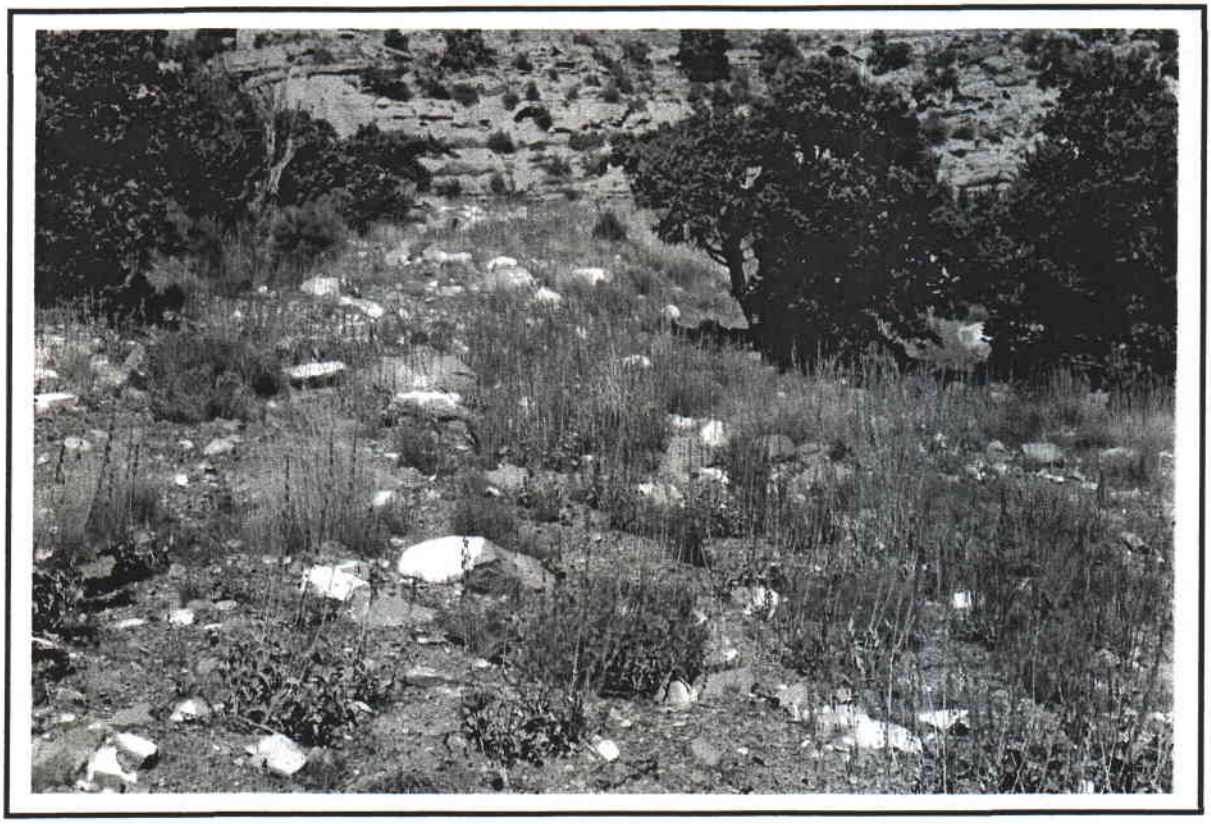
FORBS
Malcomia africana
Penstemon palmeri

GRASSES
Elymus salinus
Elymus lanceolatus
Elymus trachycaulus
Elymus cinereus
Elymus spicatus
Stipa hymenoides

NOTES:

1) Revegetation looking very good for cover, density, and species diversity.

2) Very few weedy species present.



Pumphouse

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Phase 1 Reclamation 2002

AREA: Des-Bee-Dove Mine

LOCATION: Des-Bee-Dove Area

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: ~ 25%

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: Slight use

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Atriplex canescens
Atriplex confertifolia

FORBS
Salsola pestifer

GRASSES
Agropyron cristatum
Bromus carinatus
Elymus lanceolatus
Elymus smithii

NOTES:

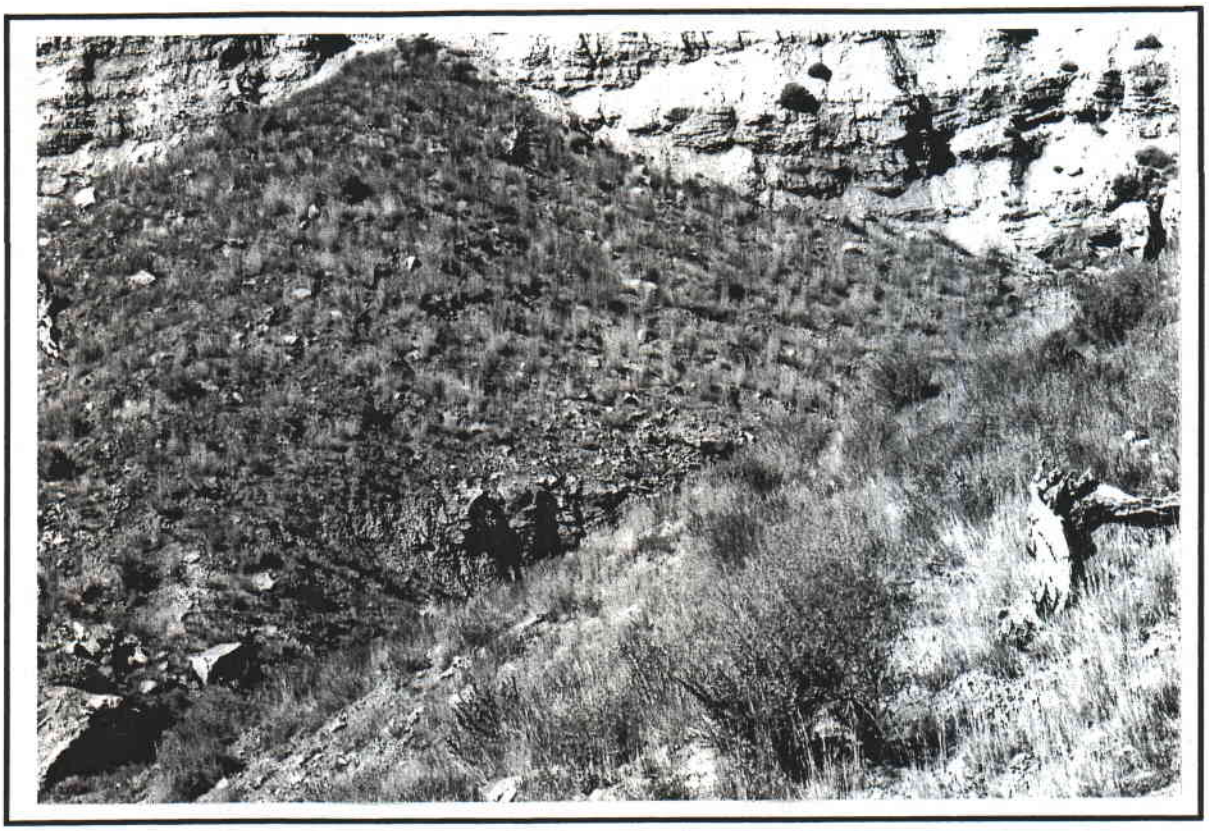
1) Excellent grass and shrub cover on site.

2) Cover was dominated by fourwing saltbush.

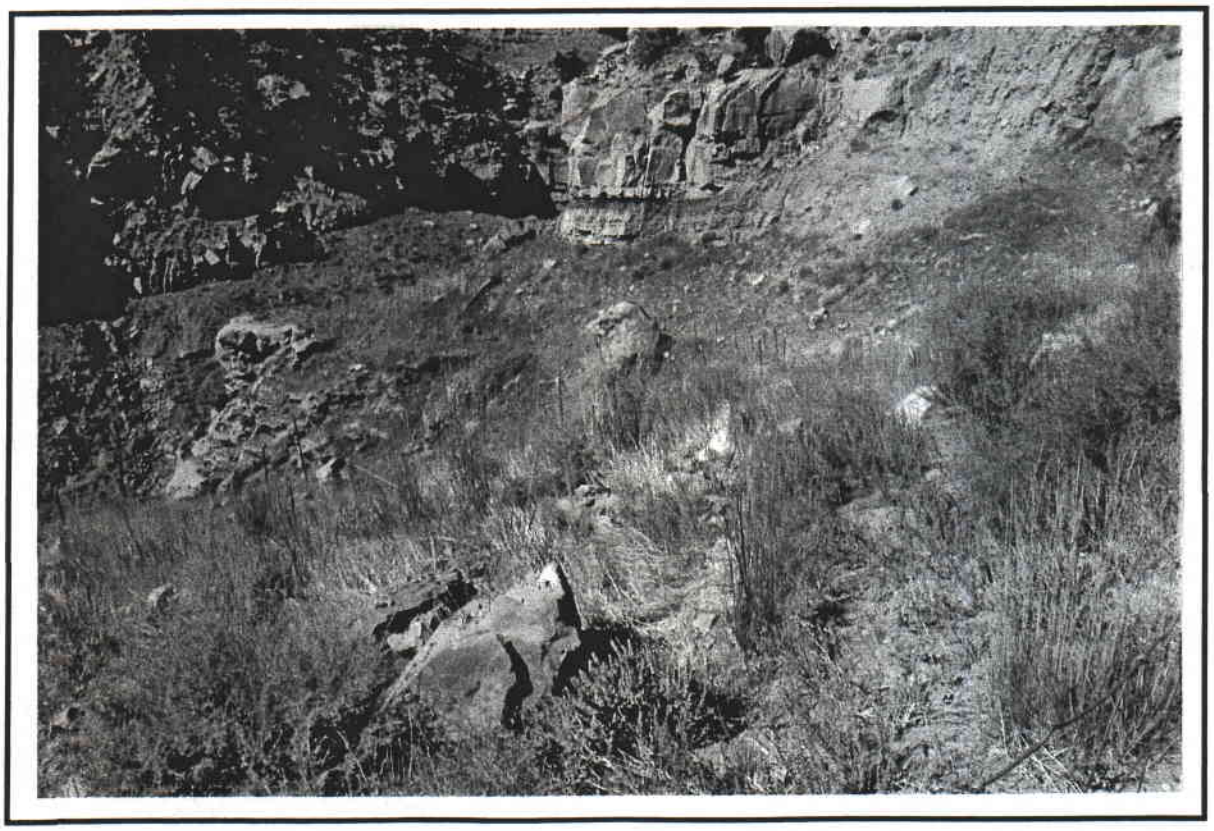
3) Both weedy and desirable species were present.

4) The fourwing plants were quite large for their age.

5) Some of the areas were dominated by grasses, whereas others were dominated by shrubs.



Phase 1 Reclamation 2002: Beehive/Little Dove Area



Phase 1 Reclamation 2002: Switchback Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Phase 2 Reclamation 2003

AREA: Des-Bee-Dove Mine

LOCATION: Des-Bee-Dove Area

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE:

DOMINANT PLANT SPECIES OBSERVED:

SPECIES	ACCESS TRAIL	DESERET MINE	BATH HOUSE SLOPE	EAST SLOPE
SHRUBS				
Atriplex canescens	X	X	X	X
Atriplex confertifolia	X	X	X	X
Ceratoides lanata	X	X	X	
Cercocarpus ledifolius	x			
Chrysothamnus nauseosus	X	X	X	X
FORBS				
Bassia hyssopifolia			x	x
Halogeton glomeratus	X	X		
Malcomia africana	X			
Melilotus officinalis	X			X
Penstemon palmeri	X	X	X	X
Salsola pestifer	X	X	X	X
Cirsium sp.		X		
GRASSES				
Agropyron cristatum		X		X
Elymus lanceolatus	X			
Elymus cinereus	X	X	X	X
Elymus smithii	X	X	X	X
Elymus spicatus		X	X	
Stipa hymenoides	X	X	X	X

NOTES:

1) Excellent cover and diversity considering the year this area was seeded.

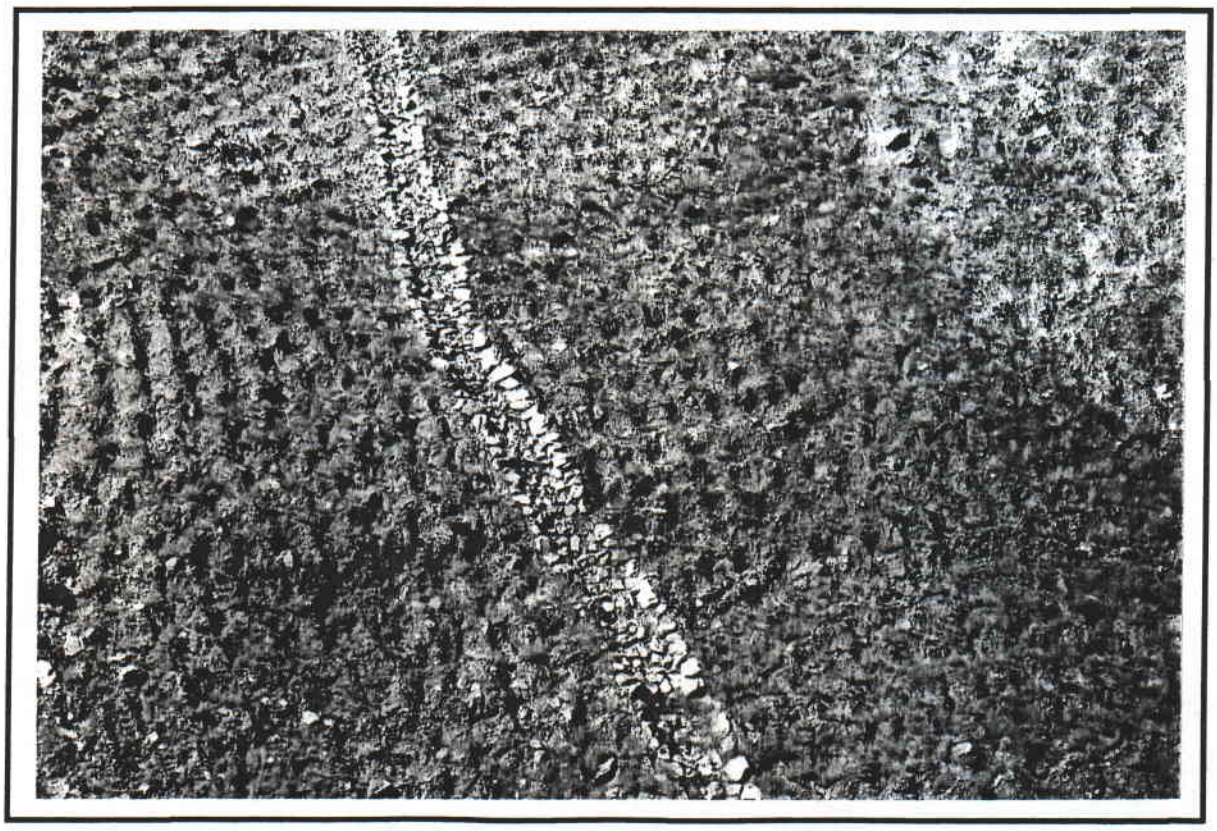
2) There were weedy patches in some areas, but more desirable species were present in most areas. The Access Trail area was about 1:1 ratio of weedy:desirable species. This trail was well used.

3) The gouges looked good and appeared to be harvesting water.

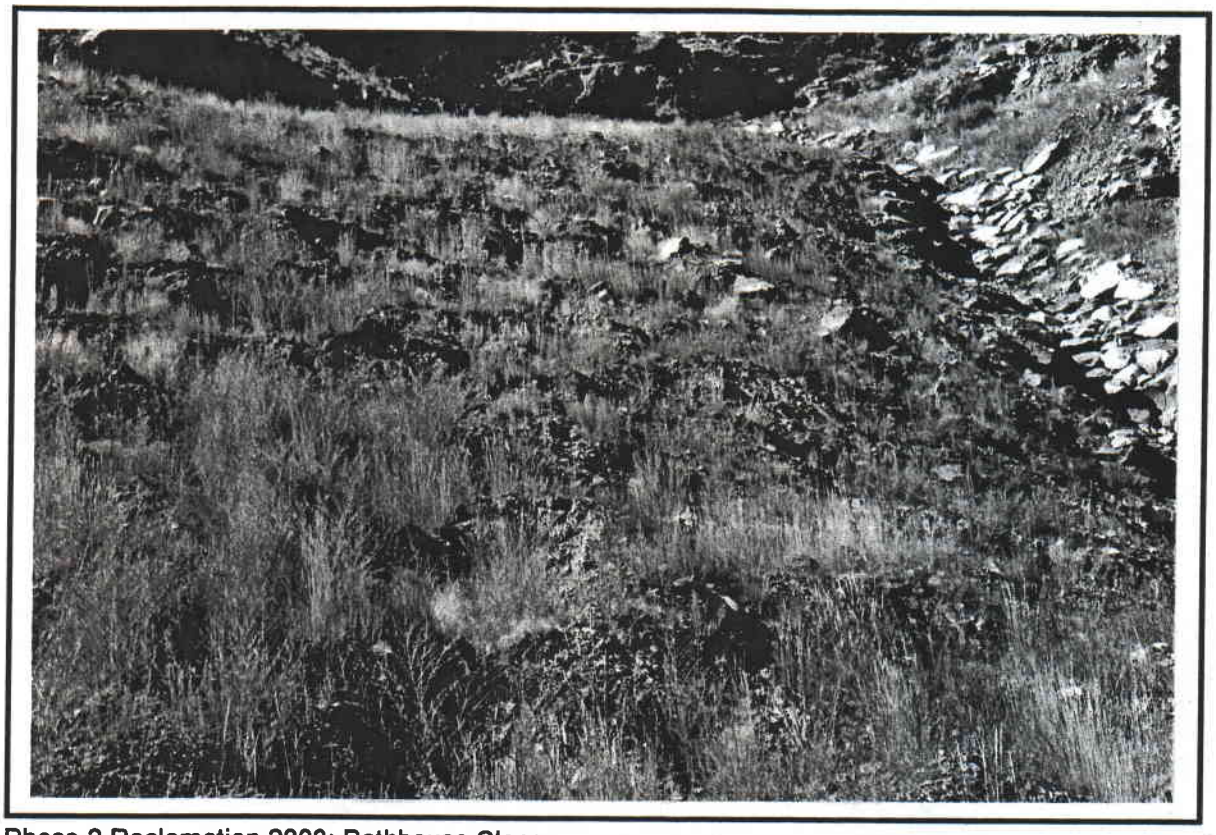
4) I walked all areas to record the data

Phase 2 Reclamation 2003: Access Trail

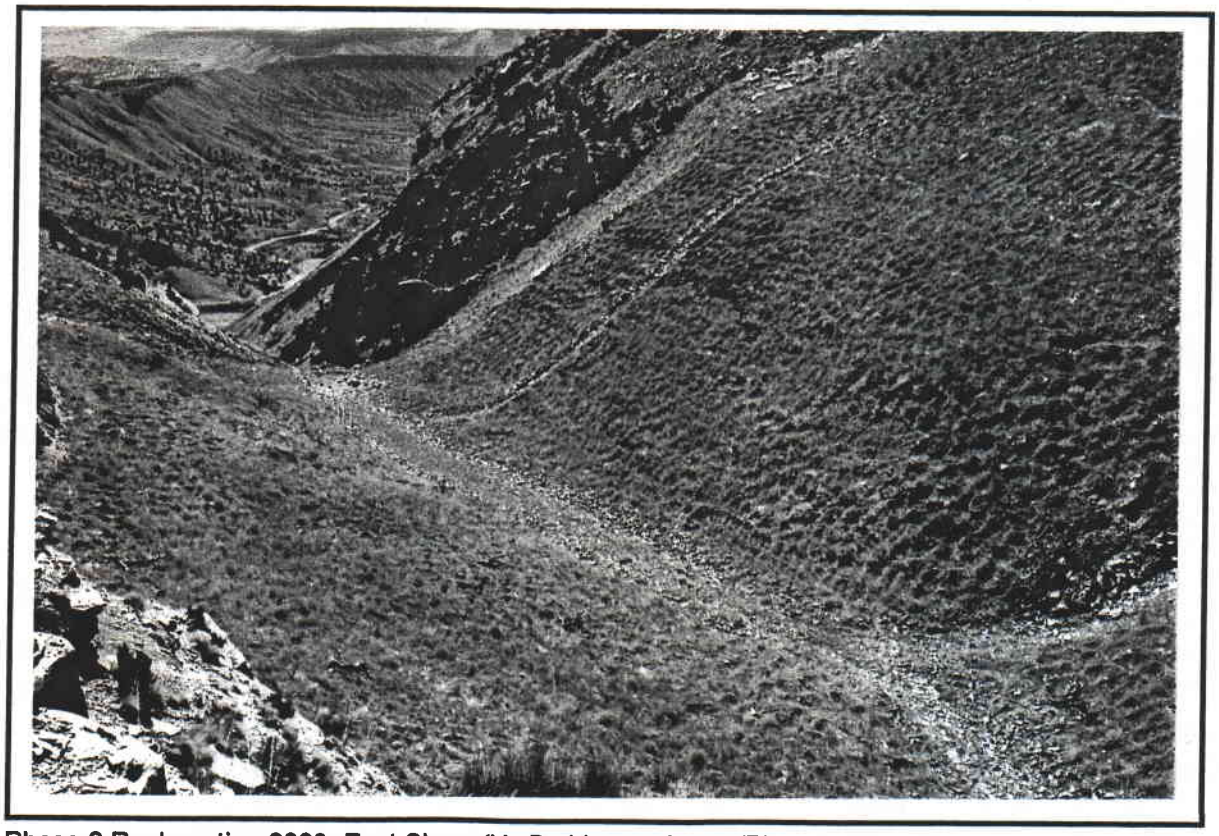
Phase 2 Reclamation 2003: Deseret Mine Area



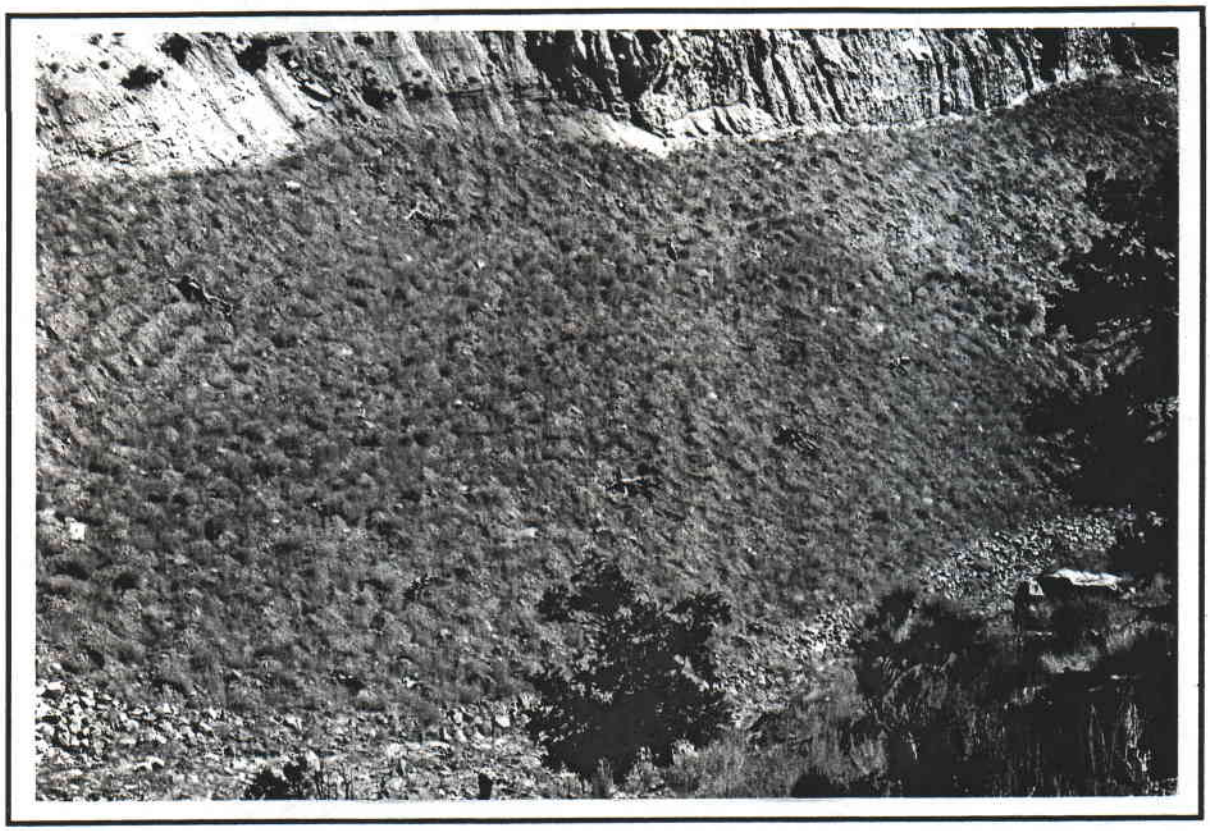
Phase 2 Reclamation 2003: Bathhouse Slope



Phase 2 Reclamation 2003: Bathhouse Slope



Phase 2 Reclamation 2003: East Slope (L); Bathhouse Slope (R)



Phase 2 Reclamation 2003: East Slope

Phase 2 Reclamation 2003: Substation Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Pinyon-Juniper Reference Area

AREA: Des-Bee-Dove Mine

LOCATION: Des-Bee-Dove Area; upper area; near substation

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: ~ 35 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Slight

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Ceratoides lanata
Ephedra viridis
Juniperus osteosperma
Pinus edulis

FORBS

GRASSES
Elymus salinus

NOTES:

1) This is an appropriate reference area for most reclaimed sites here.

2) It was steep and rocky.

3) I found red markers that delineate the area.

4) Site had good grass and shrub cover.

Pinyon-Juniper Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Salt Desert Shrub Reference Area

AREA: Des-Bee-Dove

LOCATION: Des-Bee-Dove; lower area; near sediment pond

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: slight

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
*Atriplex gardneri**
Chrysothamnus nauseosus
Eriogonum corymbosum
Juniperus osteosperma
Sarcobatus vermiculatus

FORBS

GRASSES
Elymus salinus

NOTES:

1) Located on Mancos Shale

2) *Reference area was dominated by Gardneri saltbush.

Salt Desert Shrub Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Black Sagebrush Reference Area

AREA: New Waste Rock Site

LOCATION: Cottonwood Mine

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Artemisia nova
Atriplex gardneri
Cercocarpus montanus
Ephedra viridis
Juniperus osteosperma
Pinus edulis

FORBS
Descurainia pinnata
Penstemon sp.

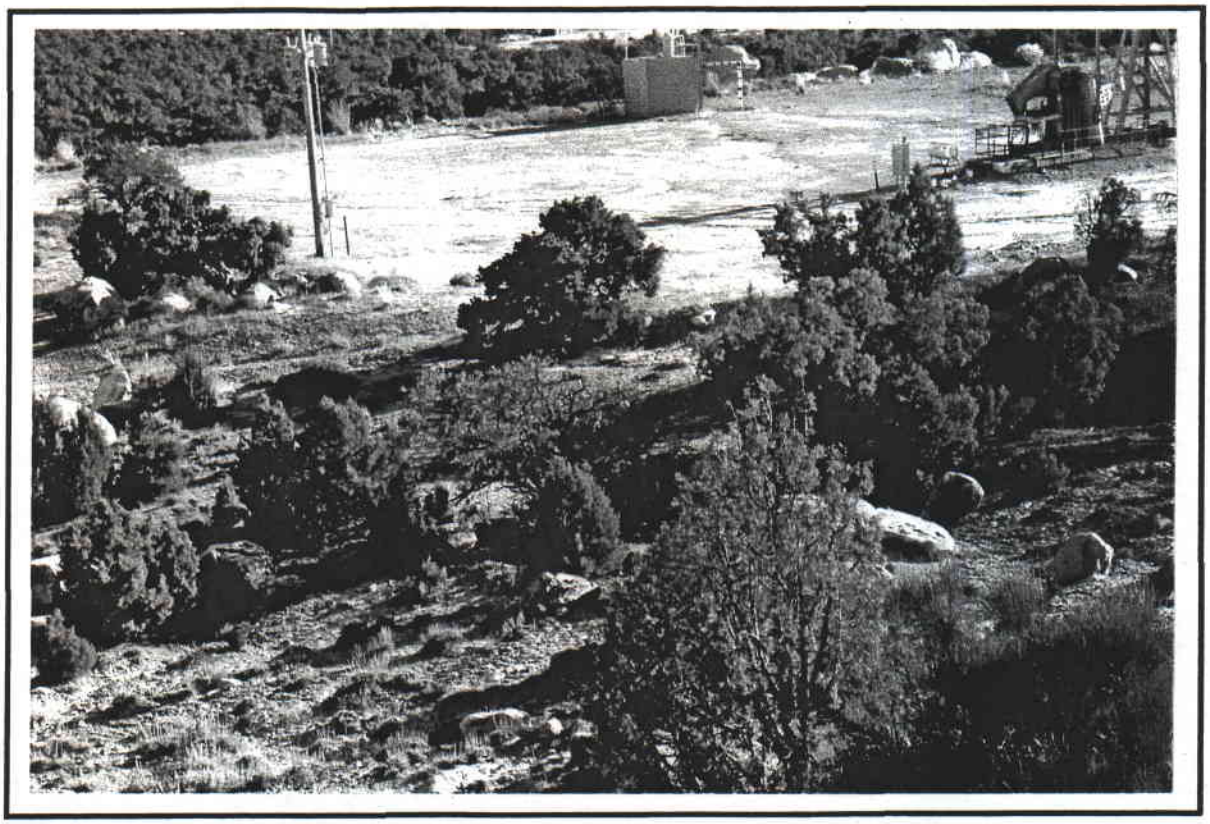
GRASSES
Elymus salinus
Stipa hymenoides

NOTES:

1) Much of this reference area has been disturbed by a gas well and power lines. A black sagebrush community is still present, but it is much reduced in size (see photograph).

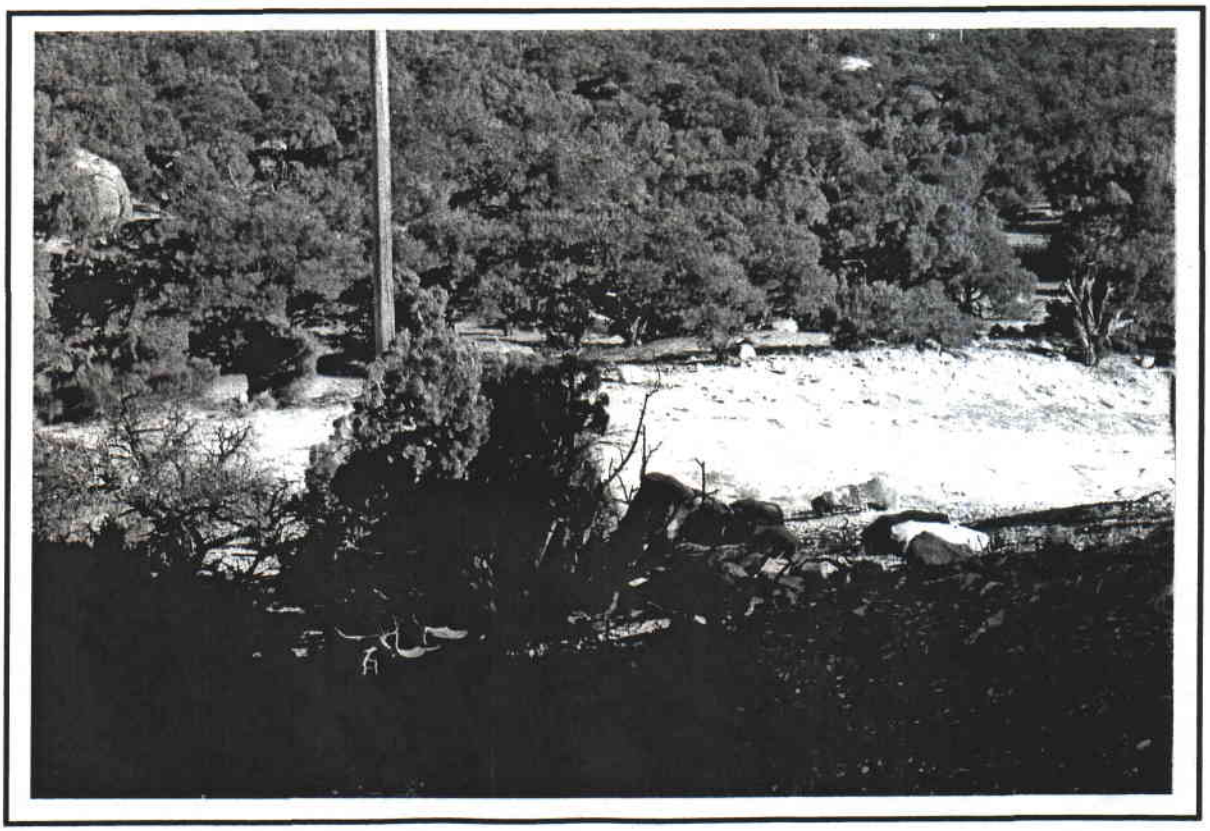
2) Another site may be recommended.

3) We could look at data from this type and compare it with other reference areas.



Black Sagebrush Reference Area

Black Sagebrush Reference Area



Black Sagebrush Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Pinyon-Juniper Reference Area

AREA: New Waste Rock Site

LOCATION: Cottonwood Mine

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 3 - 8 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

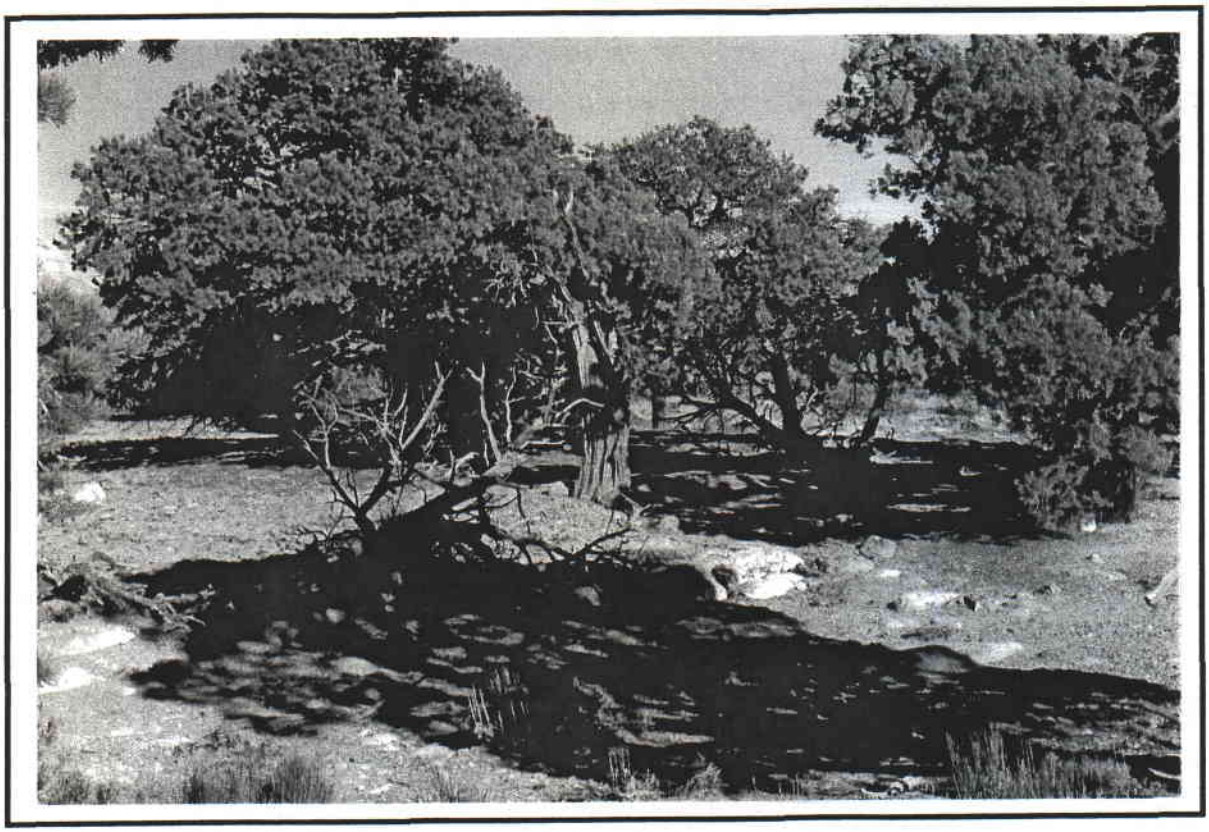
TREES & SHRUBS
Artemisia nova
Cercocarpus montanus
Ephedra viridis
Juniperus osteosperma
Opuntia polyacantha
Pinus edulis
Yucca harrimaniae

FORBS
Chamaesyce fendleri
Cryptantha flavoculata
Descurainia pinnata
Eriogonum bicolor

GRASSES

NOTES:

1) Site was in good condition.



PJ Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Gardner Saltbush Reference Area

AREA: New Waste Rock Site

LOCATION: Cottonwood Mine

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 35 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Artemisia nova
Atriplex gardneri
Ephedra viridis
Gutierrezia sarothrae
Juniperus osteosperma
Pinus edulis

FORBS
Eriogonum sp.
Stanleya pinnata

GRASSES
Elymus salinus

NOTES:

1) Site was in good condition.

2) Red markers delineating the area were found.

3) There was some moderate erosion caused by natural conditions on this Mancos Shale slope.

Gardner Saltbush Reference Area

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: 9th East Breakout

AREA: Cottonwood Mine Site

LOCATION: Cottonwood Mine Area

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: variable

EXPOSURE: variable

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

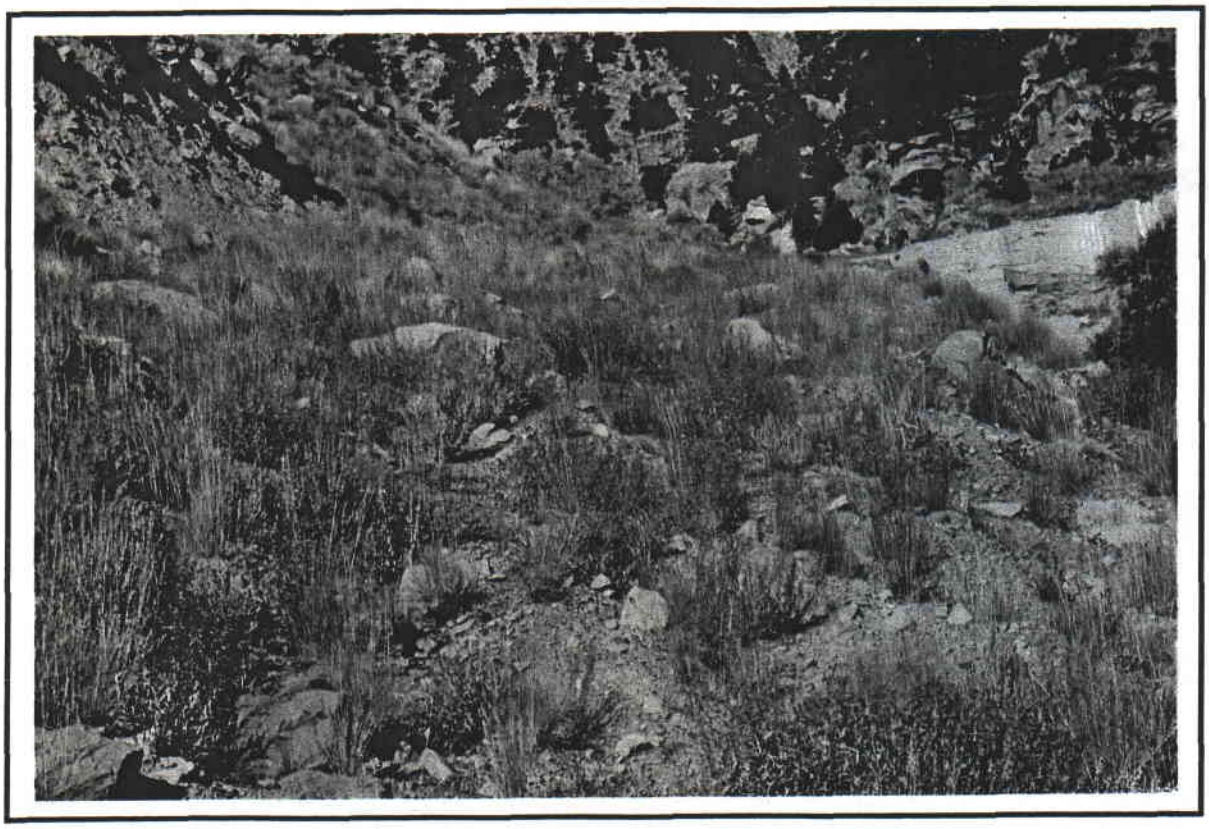
TREES & SHRUBS
Artemisia tridentata
Atriplex canescens
Chrysothamnus nauseosus

FORBS
Aster chilensis
Linum lewisii
Penstemon palmeri

GRASSES
Bromus tectorum
Elymus smithii
Elymus cinereus
Elymus lanceolatus
Elymus spicatus
Stipa hymenoides

NOTES:

1) Site had good cover, density and diversity.



9th East Breakout

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET
2005

SITE NAME: Pinyon-Juniper Reference Area

AREA: Cottonwood Mine Site

LOCATION: Cottonwood Mine Site

DATE: October 10-13, 2005

WORKERS: P. Collins

SLOPE: 36 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE:

COVER: (*no quantitative data this year*).

DOMINANT PLANT SPECIES OBSERVED:

TREES & SHRUBS
Chrysothamnus nauseosus
Pinus edulis
Juniperus osteosperma
Amelanchier utahensis
Gutierrezia sarothrae
Artemisia tridentata
Eriogonum corymbosum
Atriplex confertifolia
Pseudotsuga menziesii

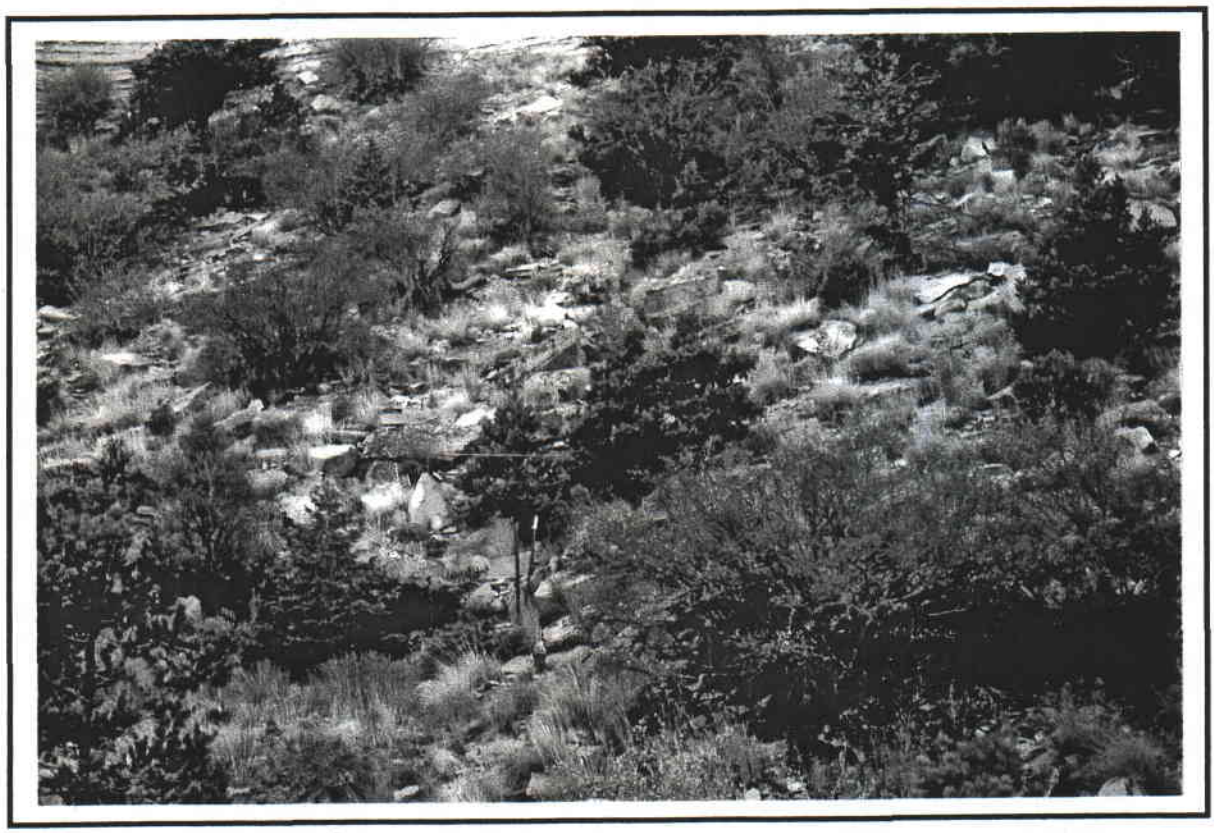
FORBS
Hedysarum occidentalis var canone
Crepis sp.
Machaeranthera grindelioides
Penstemon sp.

GRASSES
Elymus salinus
Stipa hymenoides

NOTES:

1) Site was in good condition and well suited to represent future standards for revegetation.

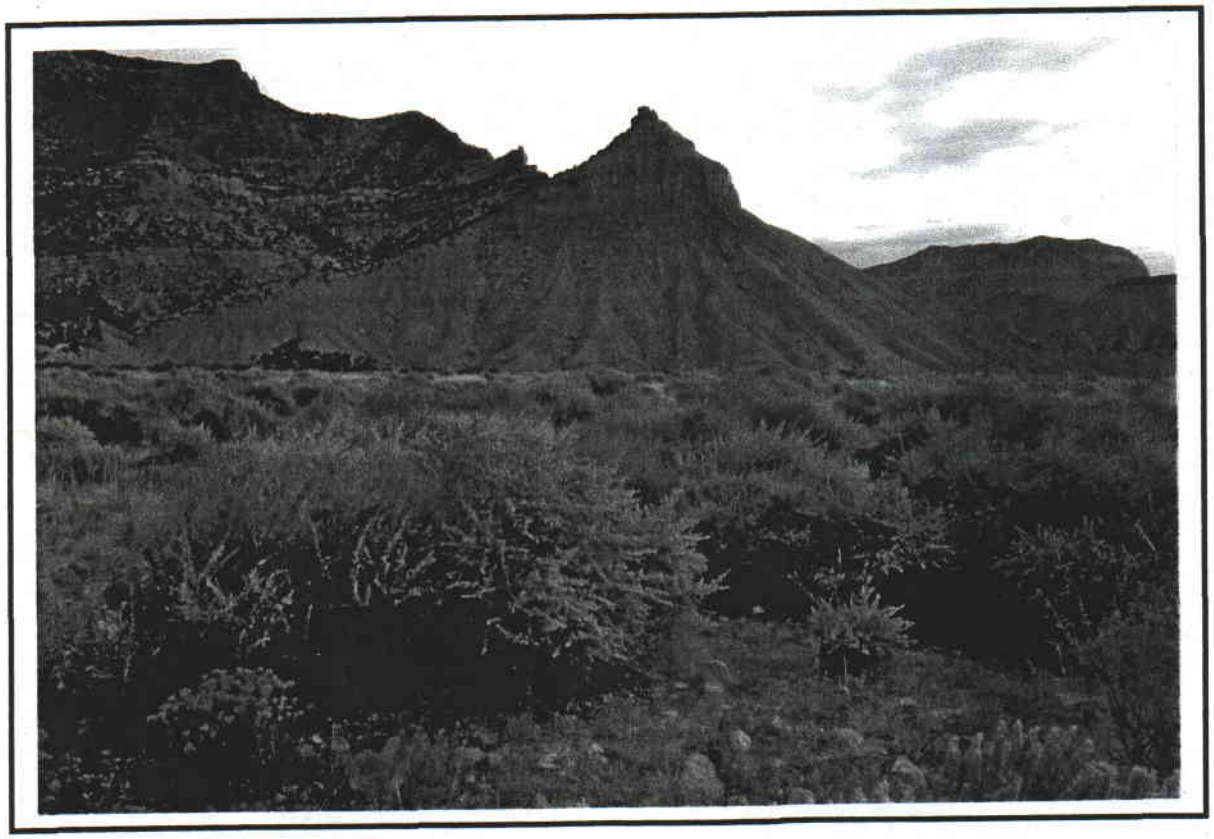
2) Canyon vetch, a sensitive species, is located on the site.



Pinyon-Juniper Reference Area

VEGETATION MONITORING
FOR PHASE III BOND RELEASE
OLD WASTE ROCK SITE
YEAR ONE: 2005

COTTONWOOD MINE WASTE ROCK SITE



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March 2006

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VEGETATION MONITORING FOR PHASE III BOND RELEASE OLD WASTE ROCK SITE

YEAR ONE: 2005

INTRODUCTION

In the past, several waste rock "cells" bounded by "berms" were constructed as disposal areas for waste rock products from the Cottonwood Mine. The total waste rock site is less than 15 acres in size. Since the time that the cells were constructed, they have been filled to the engineered capacity with the waste rock material created by coal mining operations. The waste material was then covered with topsoil or substitute topsoil and revegetated to a condition that should ultimately support the post-mining land use. In order to support the wildlife that exist on this reclaimed range land, specific vegetation standards have been set by designating a **reference area**, or an area previously chosen to be protected from unnatural disturbances that could represent vegetation standards for final revegetation success. The area designated as a reference area lies adjacent to the **Old Waste Rock Site**. The plant community supported on the reference area is Pinyon-Juniper, the same community that was disturbed to create the waste rock site for the mine. Because the reference area is located in such close proximity, other environmental variables were also similar to the reclaimed waste rock site (e.g. soils, elevation, exposure, precipitation, etc.).

Because the cells were filled to capacity at different times, reclamation also sometimes occurred at

different time periods. Or, because all cells and berms were *not* reseeded at the same time, completion of the operator's *Responsibility Period* for some cells and berms are different. The Responsibility Period is the specific time period required for vegetation establishment on reclaimed lands before the final bond release application can be submitted. This means that for some cells and berms, Phase III Bond Release applications could have been submitted before others. However, previous vegetation studies of the site suggested that it would be most prudent to attempt bond release for all cells and berms at the same time. Therefore, the first of the two consecutive years required to monitor the vegetation on reclaimed lands for Phase III Bond Release has been initiated with quantitative data recorded in 2005 and summarized in this report.

METHODS

Sample Areas

The following sites were sampled on the Cottonwood Mine Old Waste Rock Site:

Cell 1	Berm 1
Cell 2	Berm 2
Cell 3	Berm 3
Cell 4	Berm 4
Cell 5	
Cell 6	CTW Reference Area
Cell 7	

All field work to record cover, frequency, composition, and production for the reclaimed and reference areas was accomplished in August 2005. Woody species density measurements for the areas were recorded in September 2005. Data from each of the above areas were first summed

separately to identify differences between sites, but the mean combined totals of all areas were the values used for final bond release. The number of samples taken was a function of both the size of each area and employment sample adequacy formulas. In other words, in larger areas more samples were taken than the smaller areas, but the total number of samples were subject to the rigors of statistical sample adequacy.

Cover, Frequency and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "A Utah Flora" (Welsh et al. 2003).

Woody Species Density

Density of woody plant species of the reclaimed and reference areas were recorded using a distance method called the point-quarter. In this method, random points were placed on the sample sites and measured into four quarters. The distances to the nearest woody plant species were then recorded in each quarter. The average point-to-individual distance was equal to the square root of the mean area per individual.

Production

Total annual biomass production was estimated by clipping, drying and weighing current annual growth in each sample quadrat. "Double sampling" using four quadrats were estimated around the clipped quadrat. Herbaceous and woody species production were recorded separately.

Diversity

There are several good methods to assess diversity in plant communities. Three diversity indices have been reported in this document for the reclaimed areas and the reference area. To begin, **MacArthur's Diversity Index** was calculated. This index is an effective diversity measurement and is computed using the equation $1/\sum pi^2$ (MacArthur and Wilson 1976, *The Theory of Island Biogeography,* Princeton: Princeton University Press). In this equation pi is the proportion of sum frequency contributed by the ith species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species. In other words, this index provides greater weight to those species that are present more often (with greater frequency) than those that are merely "present" in one or two quadrats. The **average number of species** per sample quadrat is another measure of species diversity provided from the data in this report. Finally, the *total number of species present* in the sample quadrats, or "**Richness**", was calculated for the sample areas.

Sample Sizes

Sample sizes for cover, woody species density and productivity of each area are given below.

Sample Sizes for Vegetation Monitoring in the Old Cottonwood Waste Rock Site (2005)			
Reclaimed Area			
	COVER	DENSITY	PRODUCTION
Cell 1	15	30	20
Cell 2	15	30	20
Cell 3	20	40	25
Cell 4	20	50	30
Cell 5	20	50	30
Cell 6	20	50	30
Cell 7	30	60	40
Berm 1	10	15	10
Berm 2	10	15	10
Berm 3	20	30	20
Berm 4	10	15	10
TOTAL	**190**	**385**	**245**
Reference Area			
	COVER	DENSITY	PRODUCTION
TOTAL	**140**	**90**	**200**

Sample Adequacy & Statistical Comparisons

As recommended by the State of Utah, Department of Natural Resources, Division of Oil, Gas &

Mining (DOGM) guidelines, sampling adequacy was calculated. The goal for the parameters of this study was 90% confidence level with a 10% change in mean (one-tailed t-value was used). The sample adequacy formula used is given below.

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

nMIN	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

Student's t-tests were employed to compare the reclaimed areas with the reference area for living cover, density and productivity. All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to check or apply further statistical tests if desired.

Photographs

Color photographs of each cell, berm and the reference area were taken during the sample period and have been included with this report.

Raw Data

The raw cover, composition, and frequency data have been summarized on spreadsheets and have been included in the Appendix.

RESULTS

Reclaimed Areas

The mean total living cover for the cells and berms combined was 51.89% (Table 1-A). This living cover was comprised of 57.82% grasses, 37.21% shrubs, and 4.97% forbs (Table 1-B). A total of 21 plant species were present in the sample quadrats (Table 1-C).

The dominant plant species by cover and frequency were fourwing saltbush (*Atriplex canescens*), needle-and-thread grass (*Stipa comata*), cheatgrass (Bromus tectorum), crested wheatgrass (*Agropyron cristatum*), and broom snakeweed (*Gutierrezia sarothrae*). The cover and frequency values for each species present in the quadrats are shown in Table 2.

The mean total woody species density for the combined cells and berms was estimated at 4,382 individuals per acre (Table 3-A). The density in these areas were dominated by broom snakeweed and fourwing saltbush.

For production of the site, the total annual biomass was estimated at 1,938.85 pounds per acre, 804.40 of which was from the herbaceous component and 1,134.45 from woody plants (Table 3-B).

Reference Area

The total living cover (overstory plus understory) of the reference area, a pinyon-juniper plant community, was 30.16% (Table 4). The overstory and understory cover were nearly equally represented at 14.00% and 16.16%, respectively. The understory cover was comprised of 69.75% woody species, 29.54% forbs, and 0.71% grasses (Table 4-B). A total of 14 plant species were present in the sample quadrats (Table 4-C).

As depicted in the cover and frequency values of the reference area, the dominate plant species were pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). For a list of all species with their cover and frequency values, refer to Table 5.

Woody species density for the reference area was estimated at 799 plants per acre and was dominated by the same two species as in the cover measurements above, however, Mormon tea (*Ephedra viridis*) was also an important component here (Table 6-A).

Total annual biomass for the reference area was estimated at 355.47 pounds per acre, nearly all of it consisted of woody species (Table 6-B).

Comparisons Between Areas

Statistical analyses using Student's t-tests were employed to compare the total living cover,

woody species density and productivity of the reclaimed area with the reference area. These parameters are some of the most important subject fields in applying for Phase III Bond Release. For all of these parameters, the reclaimed areas (cells and berms) were significantly greater than the reference area (Table 7).

DISCUSSION

The tables referenced in the RESULTS section above provide a good summary of the quantitative sampling results for the reclaimed cells and berms as well as the reference area chosen for revegetation success standards. Statistical analyses have also been employed to compare the two areas with results strongly suggesting that the reclaimed areas have met specific revegetation standards. The summaries and statistical analyses have reported the data of the reclaimed areas (cells and berms combined) for total living cover, frequency, composition, woody species density, and annual productivity. To provide an even more clear assessment of the quantitative data at the Old Waste Rock Site, charts can graphically illustrate the values of each parameter on a site-by-site basis.

Total Living Cover

The mean combined total living cover of all cells, berms, and reference area have been discussed and compared previously in this report. To provide greater detail and to elaborate on this parameter, a graph comparing the cover of: 1) all cells individually, 2) all cells combined, and 3)

the reference area has been prepared (Fig. 1). As one can note by the graph, each cell exceeds the total living cover of the reference area.

Along this same premise, another graph (Fig. 2) compares the total living cover of: 1) each individual berm, 2) all berms combined, and 3) the reference area. The total living cover of each berm also exceeds that of the reference area.

Finally, Fig. 3 shows the mean of the all cells and berms compared to the reference area. This illustration shows the Phase III Bond Release parameters used in the statistical analyses reported in the RESULTS section of this report.

Woody Species Density

The same areas as explained above for the total living cover have been illustrated graphically for woody species densities. Consequently, Fig. 4 shows the densities for: 1) all cells individually, 2) all cells combined, and 3) the reference area. Again, each cell exceeds the woody species density of the reference area.

Fig. 5 presents the densities for: 1) each individual berm, 2) all berms combined, and 3) the reference area. The reclaimed berm densities also exceed those of the reference area.

Finally, Fig. 6 shows the densities of all cells and berms combined and compares this value to the

reference area, or an illustration that shows the parameters used in the statistical analyses employed in the RESULTS section of this report.

Biomass Production

Similarly, productivity has been compared graphically for each of the cells, berms and reference area. Fig. 7 shows the biomass production of: 1) each cell individually, 2) cells combined, and 4) the reference area.

Fig. 8 shows the same comparisons for each berm, combined berms, and reference area. In both cases, each cell or berm production estimate exceeds that of the reference area. Finally, the production of all cells and berms combined are compared with the reference area in Fig. 9.

Composition

Lifeform composition of the combined total living cover for the reclaimed areas and reference area was described and summarized in the tables of the RESULTS section in this report. Fig. 10 graphically illustrates the proportions of woody, forb and grass species for the reclaimed areas, whereas, Fig. 11 shows these proportions for the reference area.

Species Diversity

Three diversity indices have been used to compare the reclaimed areas with the reference area. They were the following: 1) the Average Number of Species per Quadrat, 2) MacArthur's Index, and 3) Richness. These indices are shown graphically in Fig. 12 and numerically in Fig. 13. The indices suggest that the reclaimed areas are more diverse than the reference area.

SUMMARY & CONCLUSIONS

The appropriate time period required for vegetation establishment on the reclaimed Old Waste Rock Site has passed. This means that an application for *final* or Phase III Bond Release can be submitted to the State of Utah. To receive Phase III Bond Release, the reestablished vegetation of the reclaimed land must meet specific state and federal requirements as specified by the State of Utah, Division of Oil, Gas & Mining. As dictated by the rules, vegetative cover must be "diverse, effective and permanent". Accordingly, there are specific requirements associated with cover, density, production and diversity of reclaimed lands.

Data summaries from quantitatively monitoring the reclaimed vegetation of the Cottonwood Mine Old Waste Rock Site along with those of a pinyon-juniper reference area, chosen to provide standards of revegetation success, have been submitted. More specifically, the total living cover, woody species density, and biomass productivity of the reclaimed areas have been statistically compared to the reference area. Additionally, lifeform composition and species frequencies have

been summarized for comparisons with the reference area. Finally, the data of individual cells and berms were separated and plotted to graphically compare the parameters of each site.

The Year 1 results of statistical analyses, quantitative data summaries, and illustrations for cover, density, frequency, composition, productivity and diversity provided in this report strongly suggest that the vegetation of the Cottonwood Mine Old Waste Rock Site meets or exceeds those revegetation success standards set by the pinyon-juniper reference area. If the Year 2 (2006) sampling results show the same outcome, an application for Phase III Bond Release by Energy West through the State of Utah would be warranted.

TABLE 1: Total cover (A), composition (B), and species present (C), summary for the reclaimed cells and berms at Cottonwood Mine's Old Waste Rock Site (2005).

A.

TOTAL COVER	% MEAN COVER
Living Cover	**51.89**
Litter	12.62
Bareground	11.11
Rock	24.37
STANDARD DEVIATION (*s*)	14.69
SAMPLE SIZE (*n*)	190.00
MINIMUM ADEQUATE SAMPLE (*nMIN*)	21.69

B.

COMPOSITION	PERCENT COMPOSITION	STANDARD DEVIATION
Shrubs	37.21	30.43
Forbs	4.97	15.99
Grasses	57.82	32.47
SAMPLE SIZE (*n*)	190.00	

C.

SPECIES PRESENT

Agropyron cristatum
Artemisia tridentata
Atriplex canescens
Atriplex confertifolia
Bromus tectorum
Ceratoides lanata
Chrysothamnus nauseosus
Descurainia pinnata
Elymus cinereus
Elymus lanceolatus
Elymus smithii
Elymus spicatus
Ephedra viridis
Gutierrezia sarothrae
Halogeton glomeratus
Hilaria jamesii
Machaeranthera canescens
Malcomia africana
Sphaeralcea coccinea
Stipa comata
Stipa hymenoides

TABLE 2 : Cover and frequency values for each plant species in the reclaimed cells and berms at Cottonwood Mine's Old Waste Rock Site (2005).

	MEAN	FREQUENCY
TREES & SHRUBS		
Artemisia tridentata	0.26	2.11
Atriplex confertifolia	0.13	0.53
Atriplex canescens	13.23	48.95
Ceratoides lanata	0.11	1.05
Chrysothamnus nauseosus	0.74	3.16
Ephedra viridis	0.28	3.68
Gutierrezia sarothrae	5.83	51.58
FORBS		
Descurainia pinnata	0.05	0.53
Halogeton glomeratus	0.32	2.63
Machaeranthera canescens	0.18	2.11
Malcomia africana	0.34	3.16
Sphaeralcea coccinea	0.18	0.53
GRASSES		
Agropyron cristatum	6.11	47.37
Bromus tectorum	6.88	41.05
Elymus lanceolatus	2.26	12.63
Elymus smithii	2.74	12.11
Elymus cinereus	0.08	1.05
Elymus spicatus	0.03	0.53
Hilaria jamesii	1.75	7.89
Stipa comata	9.95	53.68
Stipa hymenoides	0.45	2.63

SAMPLE SIZE (*n*) = 190.00

TABLE 3 : Woody species densities (A) and productivity (B) for the reclaimed cells and berms at Cottonwood Mine's Old Waste Rock Site (2005).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	28.45
Atriplex corrugata	28.45
Atriplex confertifolia	14.23
Atriplex canescens	1658.75
Ceratoides lanata	79.67
Cercocarpus montanus	2.85
Chrysothamnus nauseosus	99.58
Chrysothamnus viscidiflorus	2.85
Ephedra viridis	204.85
Gutierrezia sarothrae	2261.93
MEAN TOTAL ($\bar{X}$)	4381.61
STANDARD DEVIATION (*s*)	3941.04
SAMPLE SIZE (*n*)	385.00
MINIMUM ADEQUATE SAMPLE (*nMIN*)	219.00

B.

PRODUCTION	POUNDS/ACRE
Herbaceous	804.40
Woody	1134.45
MEAN TOTAL ($\bar{X}$)	1938.85
STANDARD DEVIATION (*s*)	1225.31
SAMPLE SIZE (*n*)	245.00
MINIMUM ADEQUATE SAMPLE (*nMIN*)	108.80

TABLE 4: Total cover (A), composition (B), and species present (C), summary for the CTW Reference Area at Cottonwood Mine's Old Waste Rock Site (2005).

A.

TOTAL COVER	% MEAN COVER
Overstory Cover	14.00
Understory Cover	16.16
Total Living Cover	**30.16**
Litter	29.19
Bareground	33.54
Rock	21.11
STANDARD DEVIATION (*s*)	20.94
SAMPLE SIZE (*n*)	140.00
MINIMUM ADEQUATE SAMPLE (*nMIN*)	130.00

B.

COMPOSITION	PERCENT COMPOSITION	STANDARD DEVIATION
Trees & Shrubs	69.75	43.29
Forbs	29.54	42.96
Grasses	0.71	8.42
SAMPLE SIZE (*n*)	140.00	

C.

SPECIES PRESENT

Cercocarpus montanus
Chenopodium sp.
Cryptantha sp.
Elymus salinus
Ephedra viridis
Eriogonum bicolor
Chamaesyce fendleri
Gutierrezia sarothrae
Juniperus osteosperma
Lepidium montanum
Opuntia polyacantha
Penstemon sp.
Pinus edulis
Yucca harrimaniae

TABLE 5 : Cover and frequency values for each plant species in the CTW Reference Area at Cottonwood Mine's Old Waste Rock Site (2005).

	MEAN	FREQUENCY
OVERSTORY		
Juniperus osteosperma	7.00	22.14
Pinus edulis	7.00	25.71
TREES & SHRUBS		
Cercocarpus montanus	1.26	9.29
Ephedra viridis	2.10	12.14
Gutierrezia sarothrae	0.16	2.14
Juniperus osteosperma	2.53	18.57
Pinus edulis	7.82	42.14
Opuntia polyacantha	0.11	2.86
Yucca harrimaniae	0.11	2.14
FORBS		
Chamaesyce fendleri	0.41	15.00
Chenopodium sp.	0.31	4.29
Cryptantha flavoculata	0.21	6.43
Eriogonum bicolor	0.81	17.86
Lepidium montanum	0.08	2.86
Penstemon sp.	0.19	9.29
GRASSES		
Elymus salinus	0.07	0.71

SAMPLE SIZE (*n*) =140.00

TABLE 6: Woody species densities (A) and productivity (B) for the CTW Reference Area at Cottonwood Mine's Old Waste Rock Site (2005).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Cercocarpus montanus	66.59
Echinocereus whipplei	2.22
Ephedra viridis	184.25
Gutierrezia sarothrae	22.20
Juniperus osteosperma	166.49
Opuntia polyacantha	33.30
Pinus edulis	295.24
Yucca harrimaniae	28.86
MEAN TOTAL ($\bar{X}$)	799.14
STANDARD DEVIATION (*s*)	417.34
SAMPLE SIZE (*n*)	90.00
MINIMUM ADEQUATE SAMPLE (*nMIN*)	73.80

B.

PRODUCTION	POUNDS/ACRE
Herbaceous	7.22
Woody	328.25
MEAN TOTAL ($\bar{X}$)	335.47
STANDARD DEVIATION (*s*)	311.91
SAMPLE SIZE (*n*)	200.00
MINIMUM ADEQUATE SAMPLE (*nMIN*)	233.93

TABLE 7: Statistical summary sheet for the reclaimed cells and berms and the CTW Reference Area at Cottonwood Mine's Old Waste Rock Site (2005).

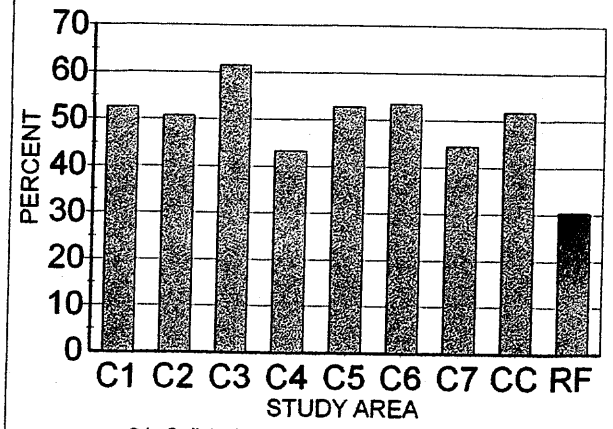
RECLAIMED AREAS			
Total Living Cover	$\bar{x}$=51.89	s=14.69	n=190
Density	$\bar{x}$=4381.61	s=3941.04	n=385
Productivity	$\bar{x}$=1938.85	s=1225.31	n=245
REFERENCE AREA			
Total Living Cover*	$\bar{x}$=30.16	s=20.94	n=140
Density	$\bar{x}$=799.14	s=417.34	n=90
Productivity	$\bar{x}$=335.47	s=311.91	n=200
STATISTICAL ANALYSES			
Total Living Cover	t=11.078	df=328	SL=p<.001
Density	t=8.606	df=473	SL=p<.001
Productivity	t=18.032	df=443	SL=p<.001

$\bar{x}$ = sample mean,
s = sample standard deviation,
n = sample size,
t = Student's t-value,
p=probability level
df = degrees of freedom,
SL = significance level,
* represents understory and overstory cover combined.

FIGURES

FIG. 1: LIVING COVER: CELLS & REFERENCE AREA

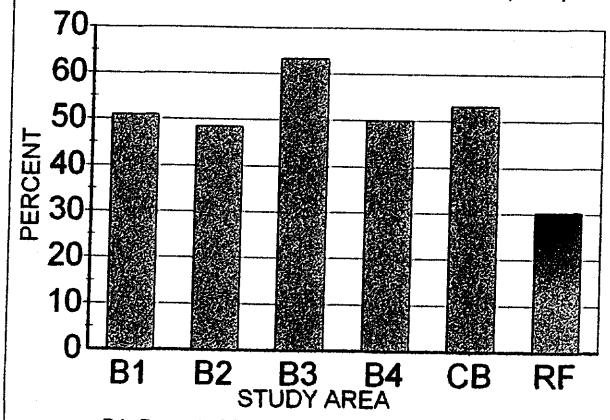
COTTONWOOD OLD WASTE ROCK SITE (2005)



C1=Cell 1; CC=Combined Cells; RF=Ref.Area

FIG. 2: COVER: BERMS AND REFERENCE AREA

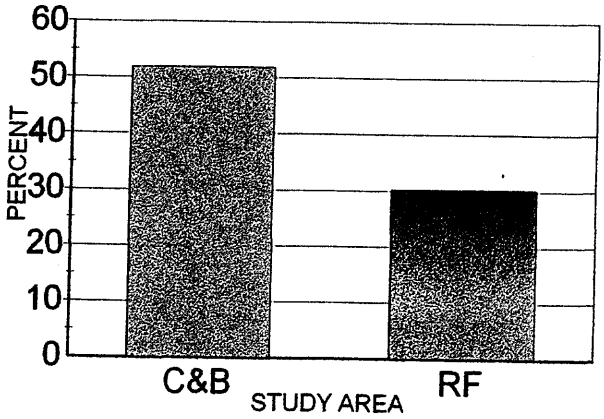
COTTONWOOD OLD WASTE ROCK SITE (2005)



B1=Berm 1; CB=Combined Berms; RF= Ref.Area

FIG. 3: LIVING COVER

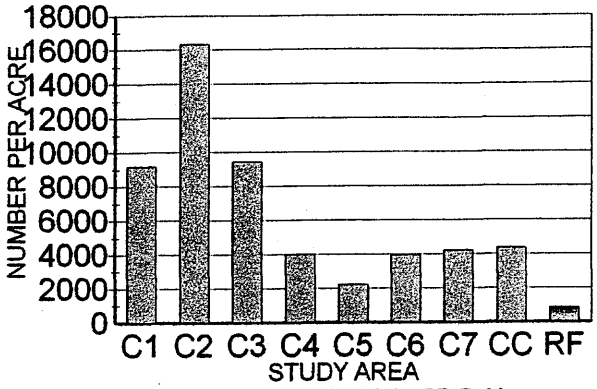
COTTONWOOD OLD WASTE: ROCK SITE (2005)



C=Cells; B=Berms; RF=Ref.Area

FIG. 4: DENSITY: CELLS & REFERENCE AREA

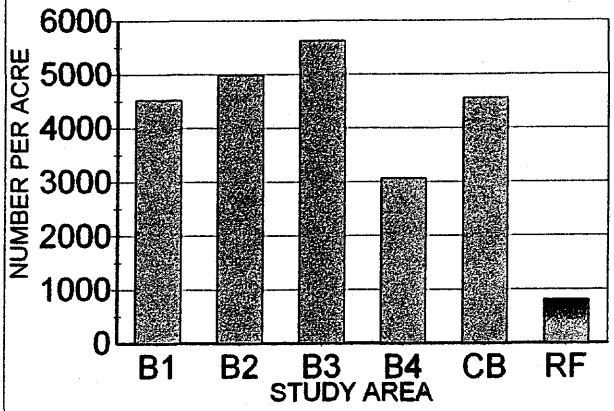
COTTONWOOD OLD WASTE ROCK SITE (2005)



C1=Cell 1; CC=Combined Cells; RF=Ref.Area

FIG. 5: DENSITY: BERMS & REFERENCE AREA

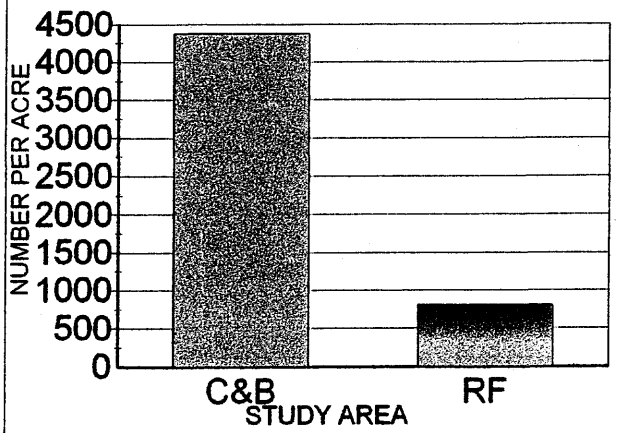
COTTONWOOD OLD WASTE ROCK SITE (2005)



B1=Berm 1; CB=Combined Berms; RF=Ref.Area

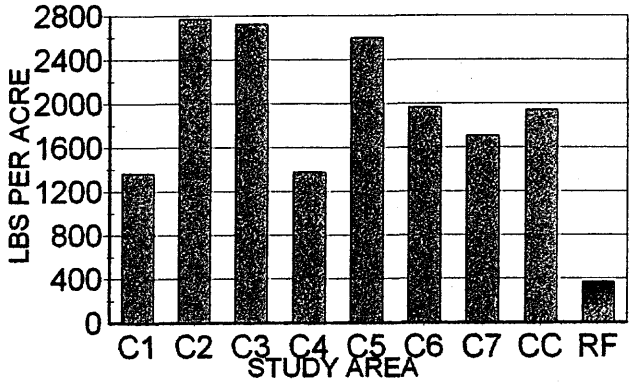
FIG. 6: WOODY SPECIES DENSITY

COTTONWOOD OLD WASTE ROCK SITE (2005)



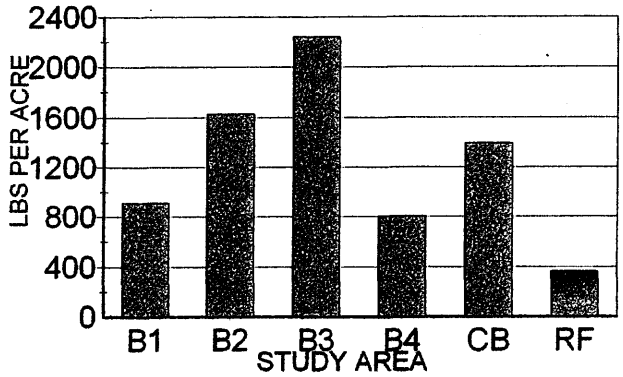
C=Cells; B=Berms; RF=Ref.Area

FIG. 7: PRODUCTION: CELLS & REFERENCE AREA
COTTONWOOD OLD WASTE ROCK SITE (2005)



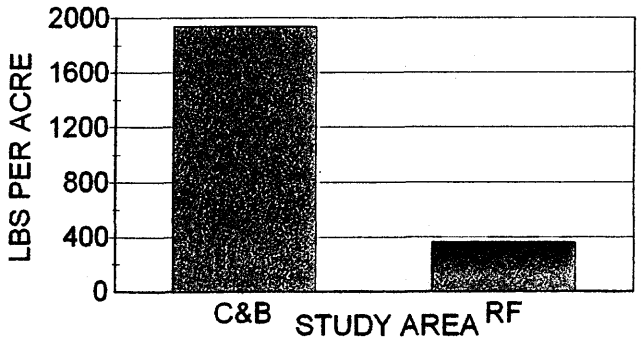
C1=Cell 1; CC=Combined Cells; RF=Ref.Area

FIG. 8: PRODUCTION: BERMS AND REFERENCE AREA
COTTONWOOD OLD WASTE ROCK SITE (2005)



B1=Berm 1; CB=Combined Berms; RF=Ref.Area

FIG. 9: ANNUAL PRODUCTION
COTTONWOOD OLD WASTE ROCK SITE (2005)



C=Cells; B=Berms; RF=Ref.Area

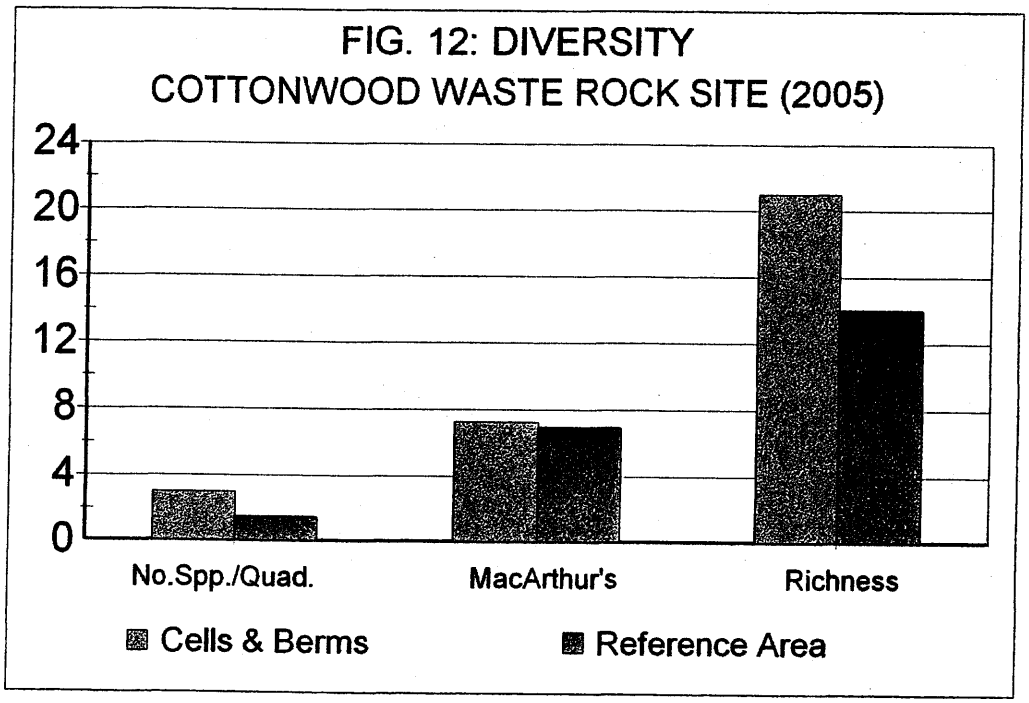


FIG. 12: DIVERSITY
COTTONWOOD WASTE ROCK SITE (2005)
24
20
16
12
8
4
0
No.Spp./Quad.
MacArthur's
Richness
Cells & Berms
Reference Area

FIG. 10: COMPOSITION - CELLS & BERMS COMBINED
Cottonwood Old Waste Rock Site (2005)

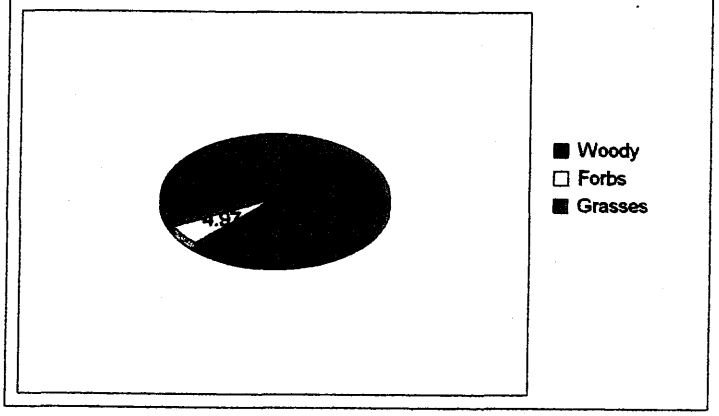


FIG. 11: COMPOSITION - REFERENCE AREA
COTTONWOOD OLD WASTE ROCK SITE (2005)

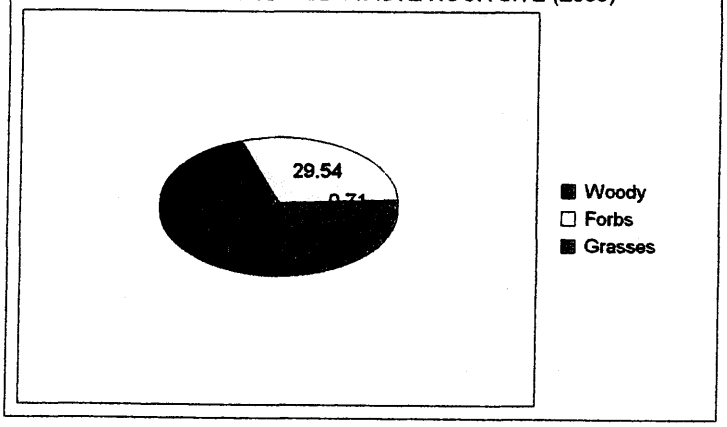


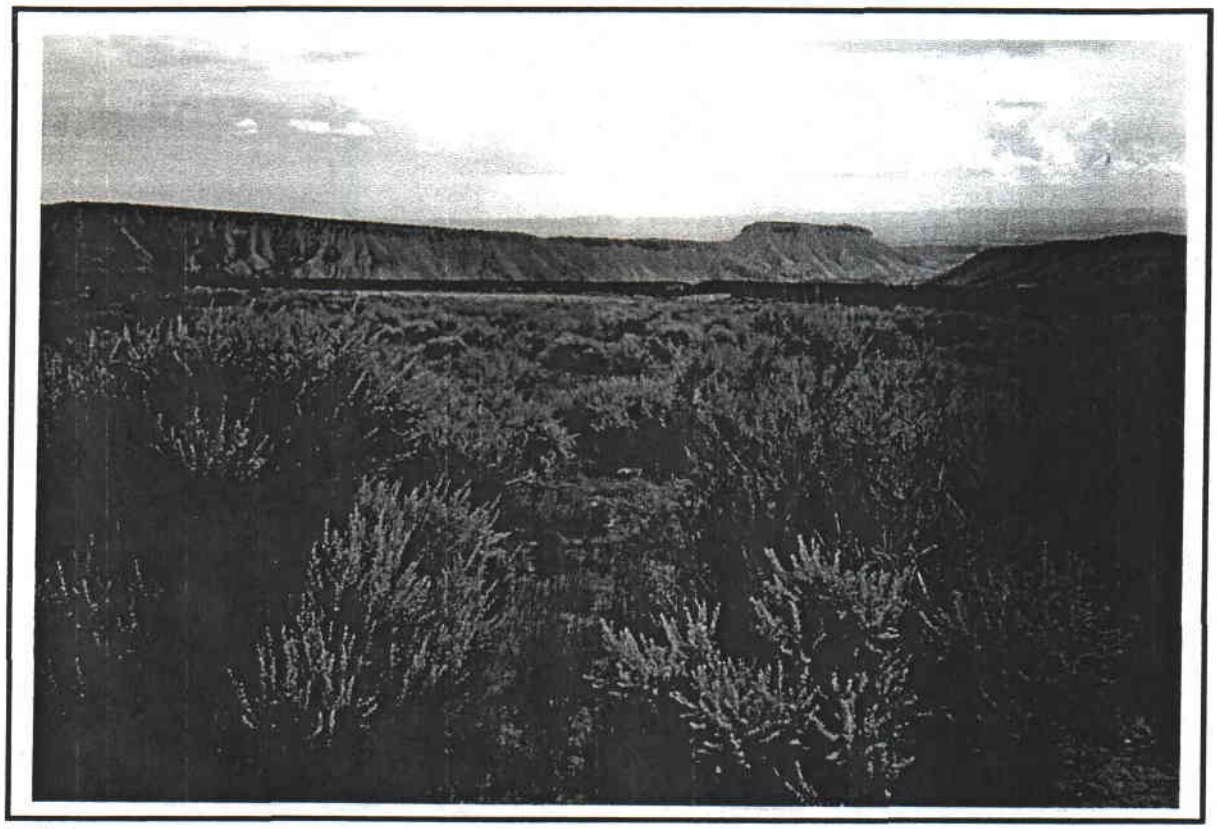
FIG. 13. Diversity at the Cottonwood Mine Old Waste Rock Site (2005)

A.
MacArthur's Index ($1/\sum p^2$) =
Reclaimed Cells & Berms: 7.269
Reference Area: 6.916

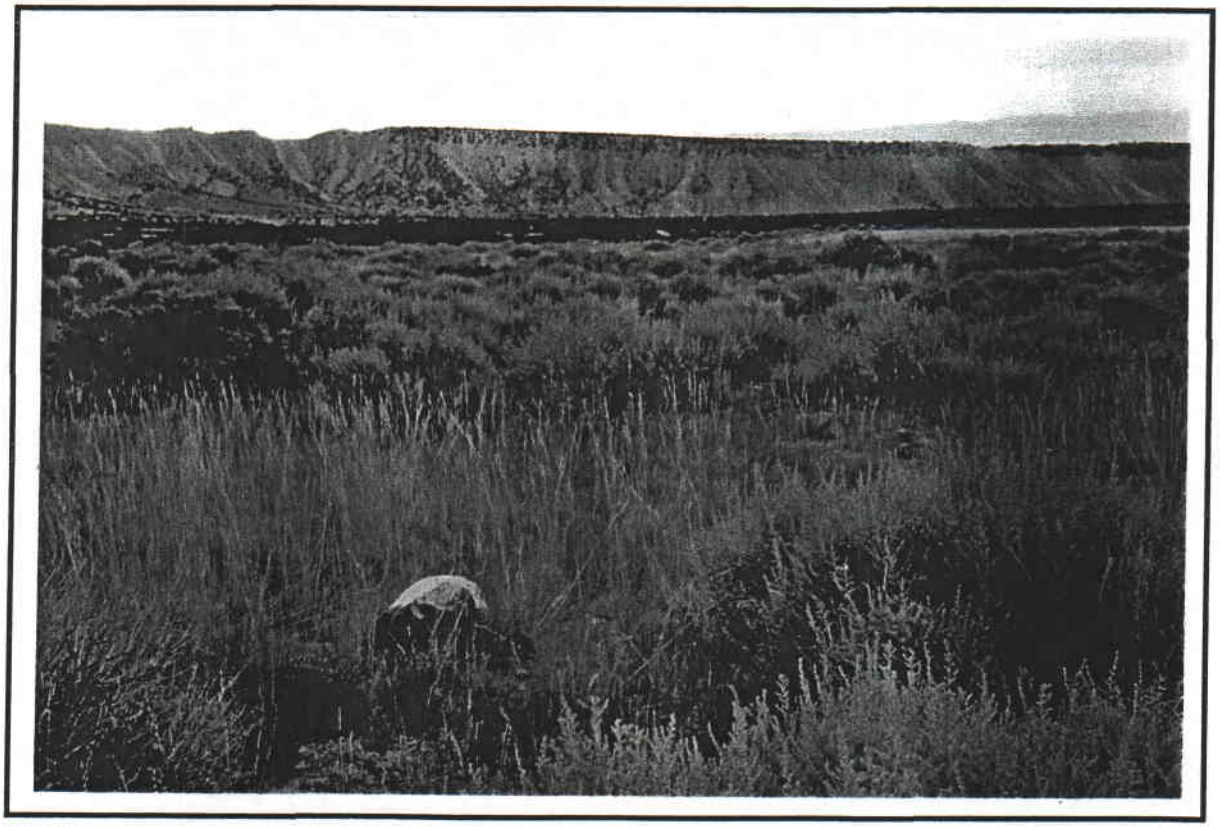
B.
Average No. Species/Quadrat =
Reclaimed Cells & Berms: 2.99
Reference Area: 1.460

C.
Richness =
Reclaimed Cells & Berms: 21.0
Reference Area: 14.0

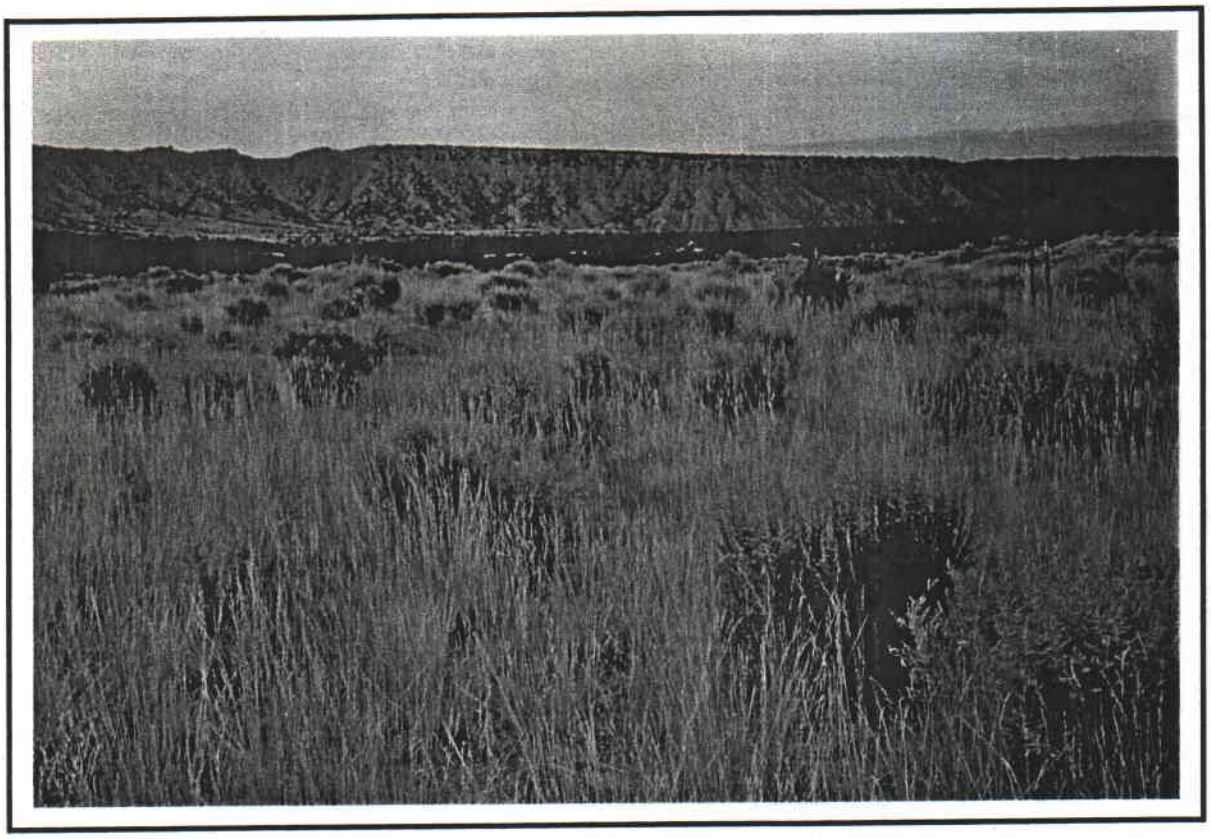
COLOR PHOTOGRAPHS OF THE SAMPLE AREAS



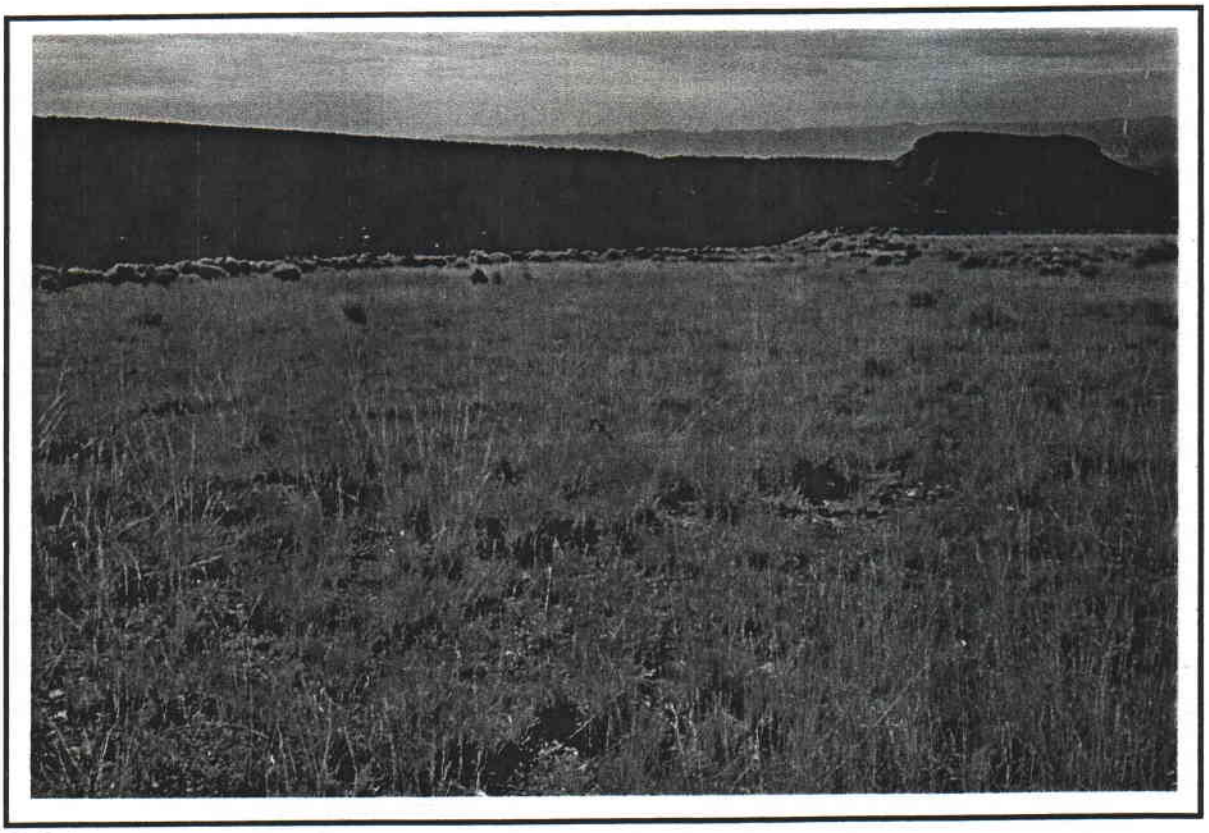
Cell 1



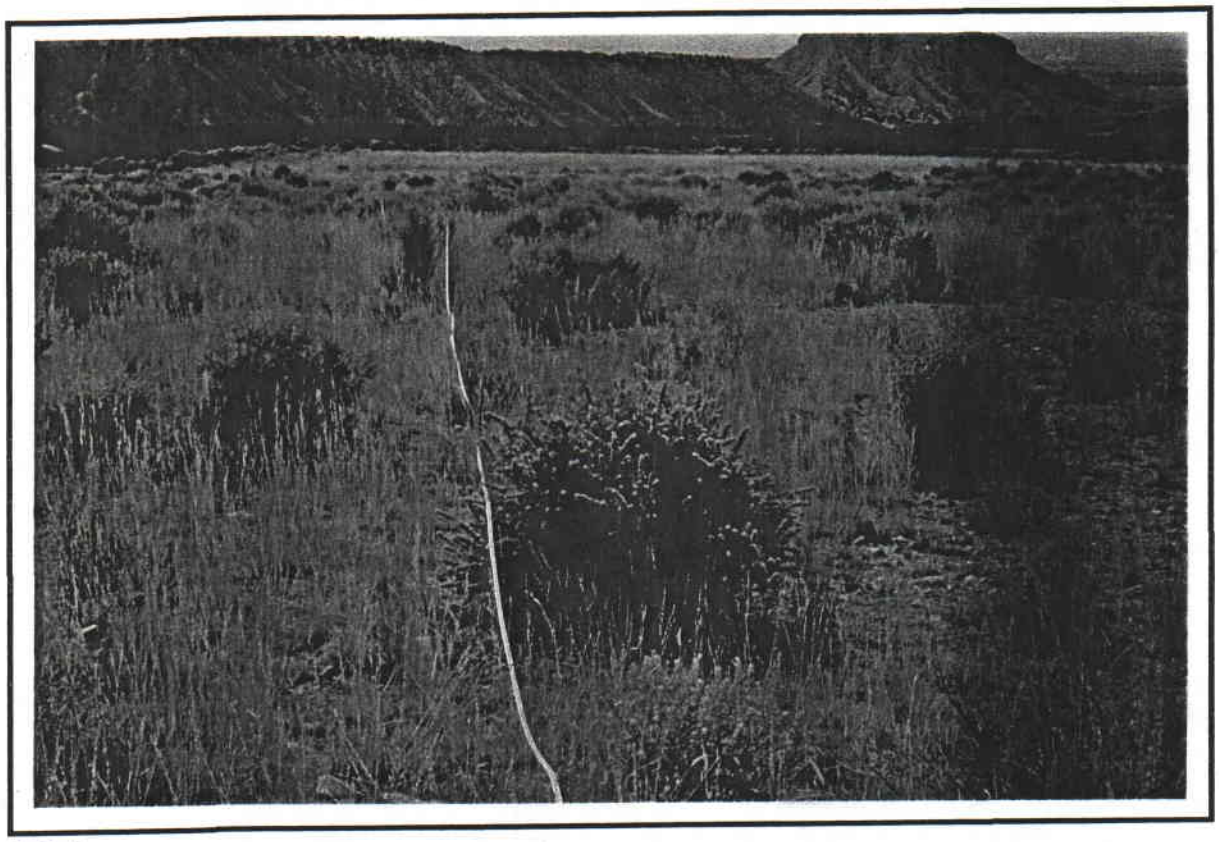
Cell 2



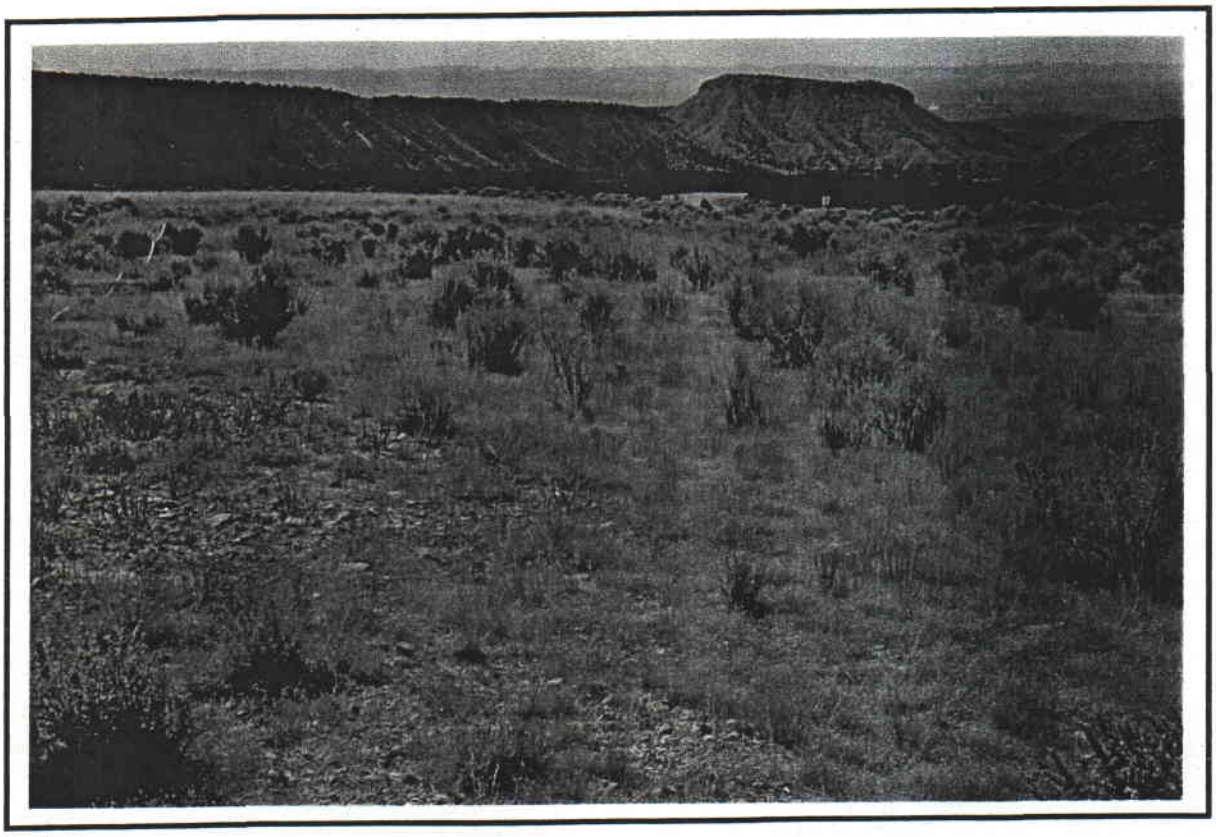
Cell 3



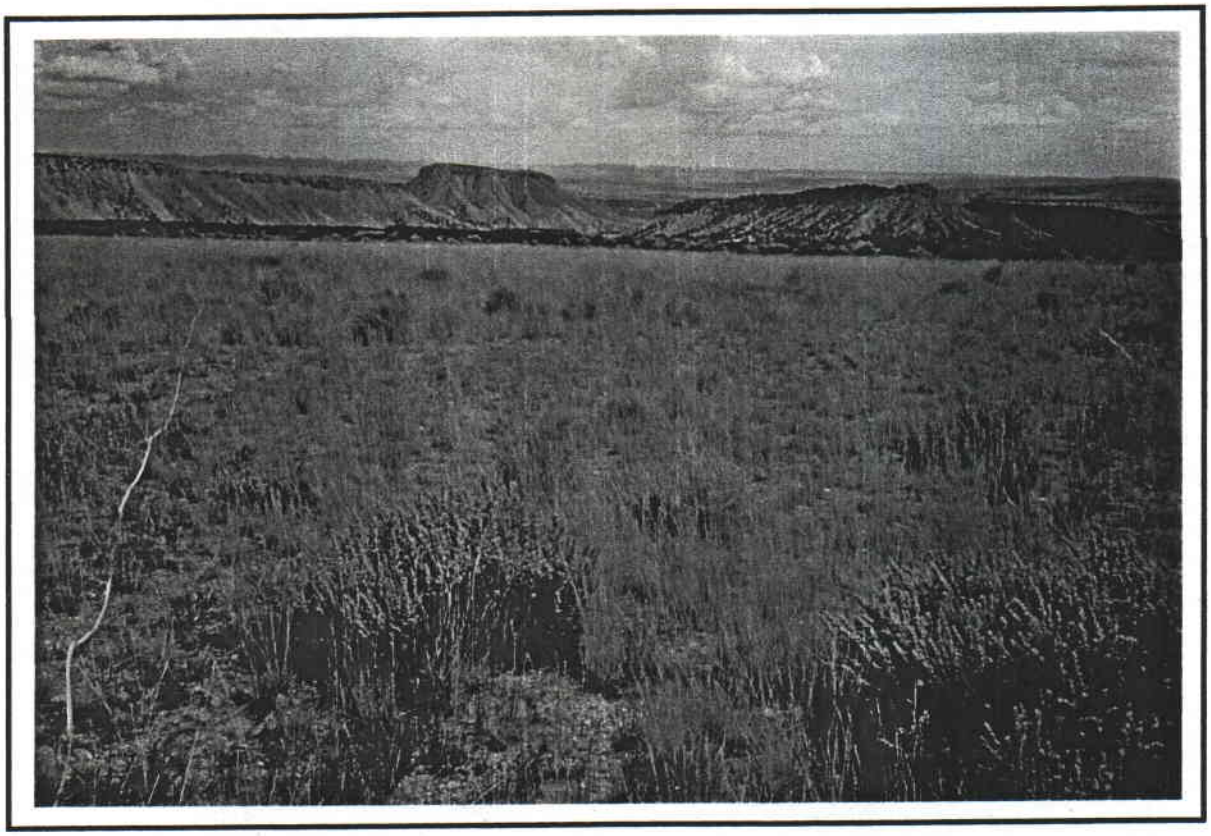
Cell 4



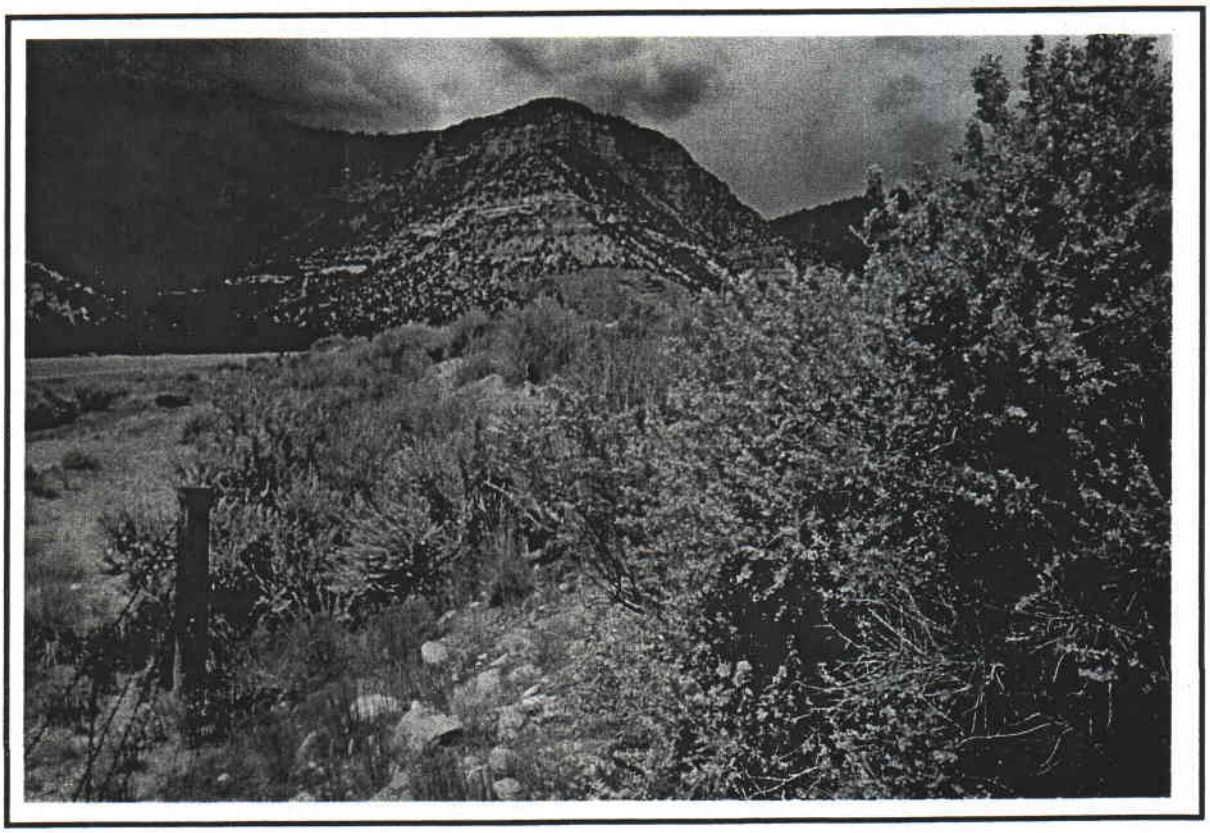
Cell 5



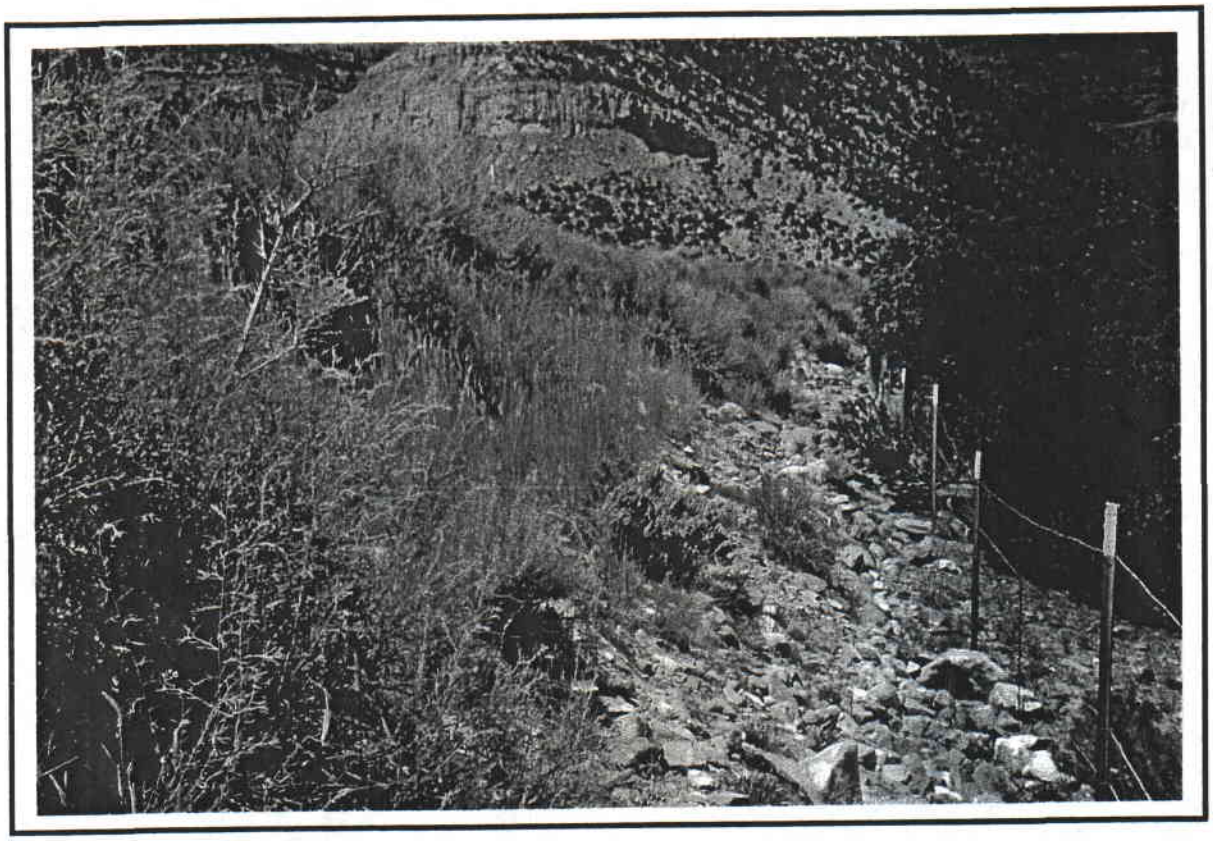
Cell 6



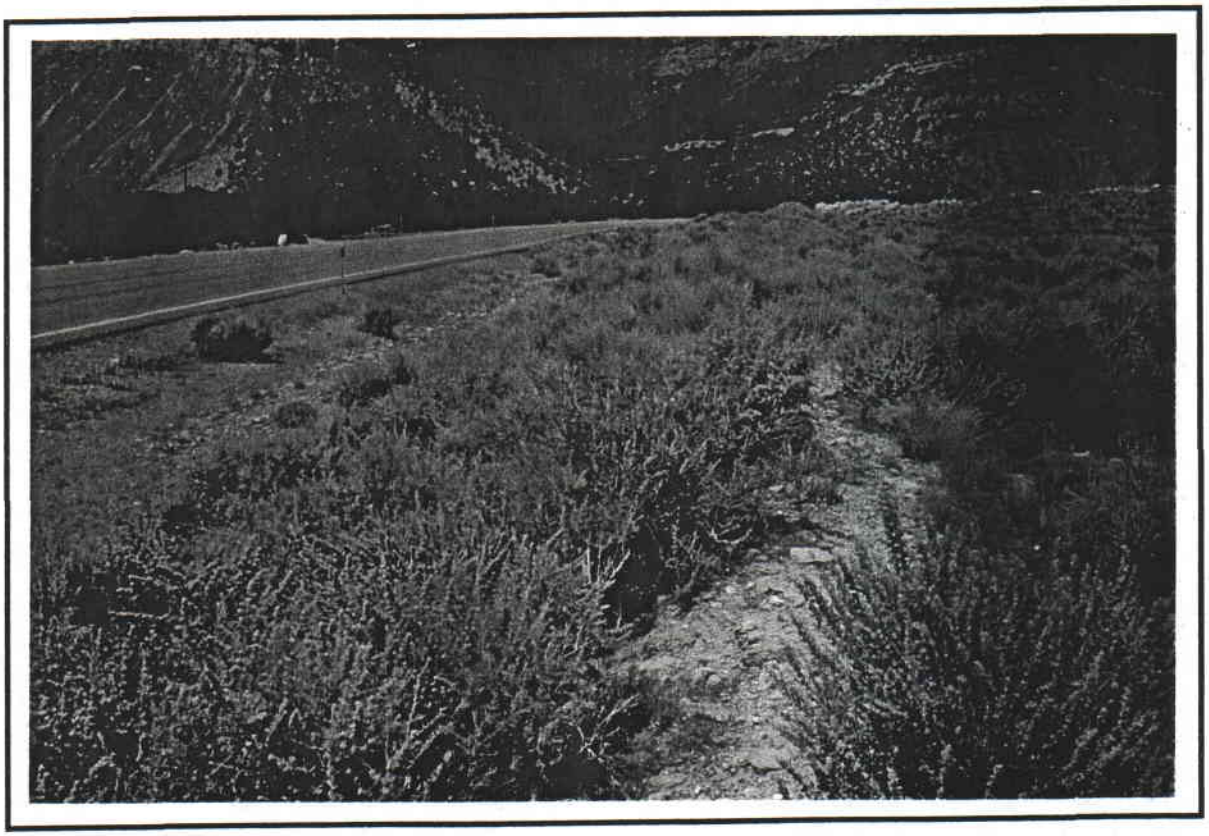
Cell 7



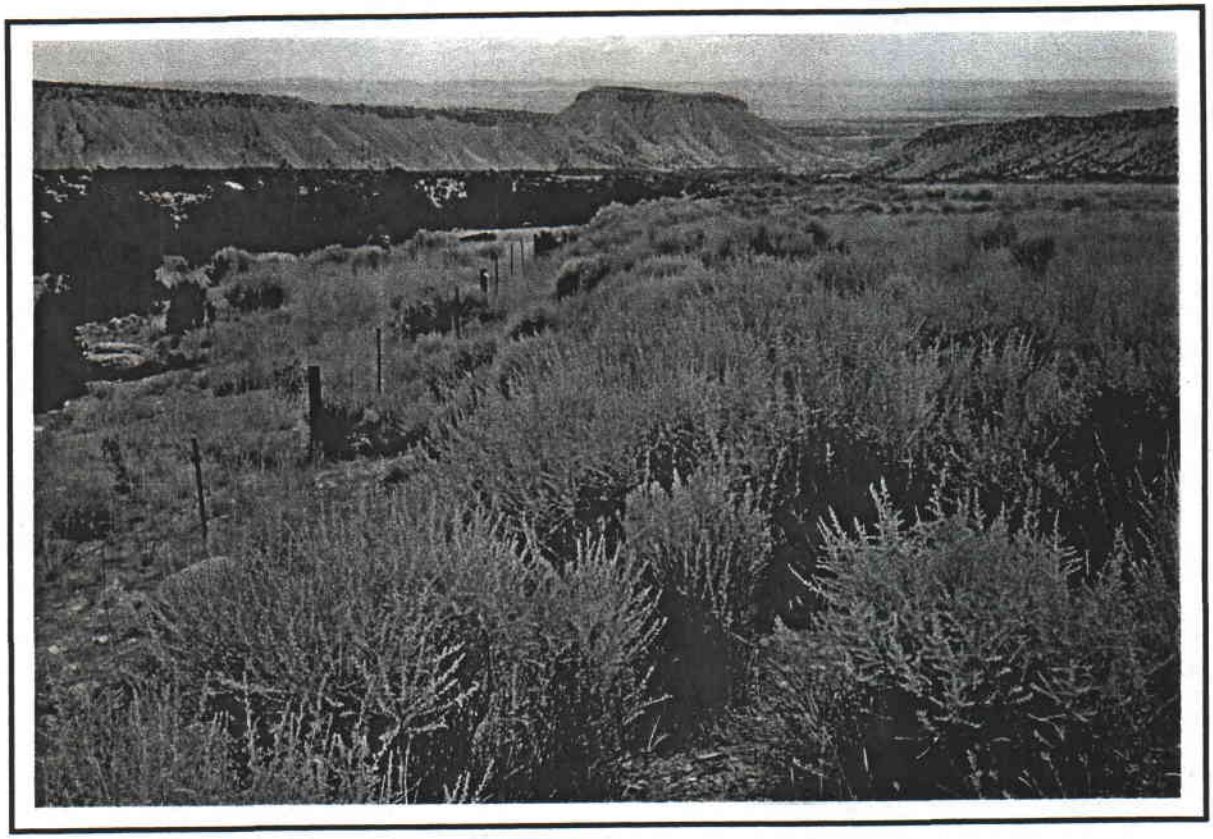
Berm 1



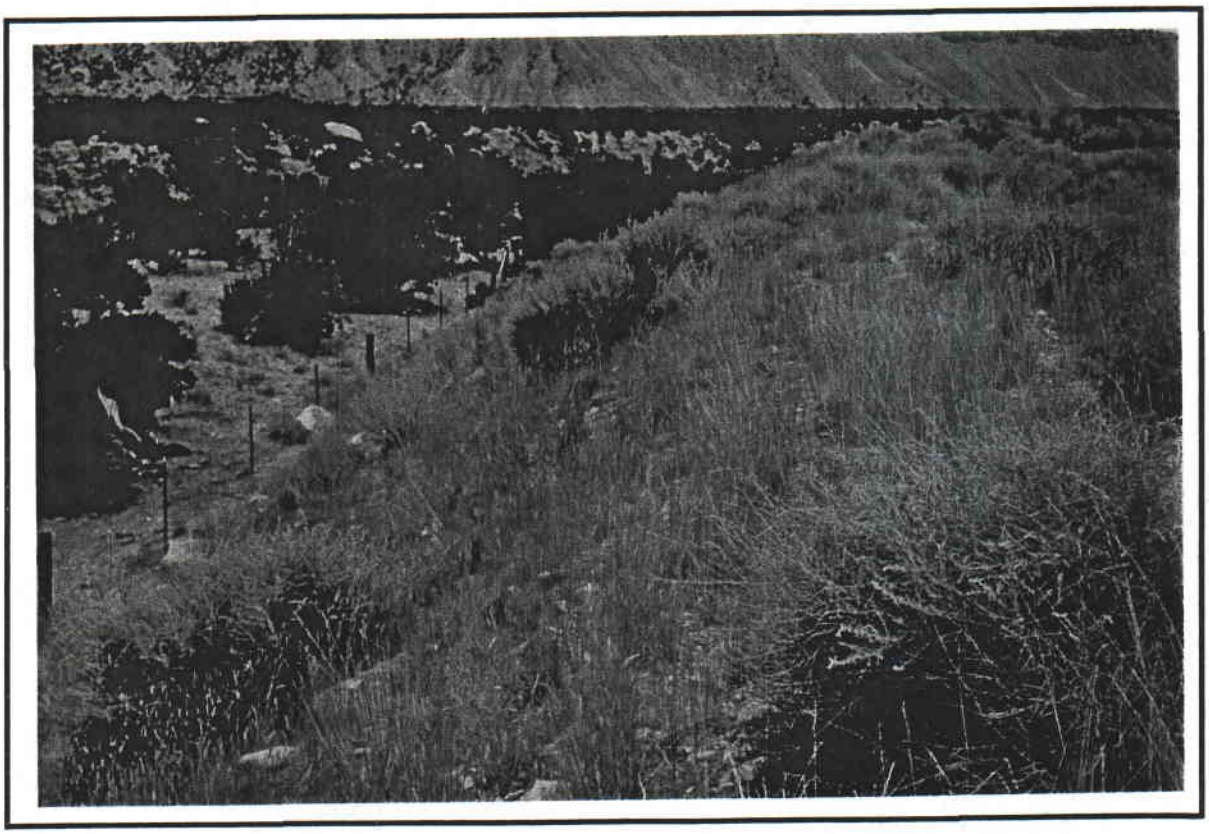
Berm 2



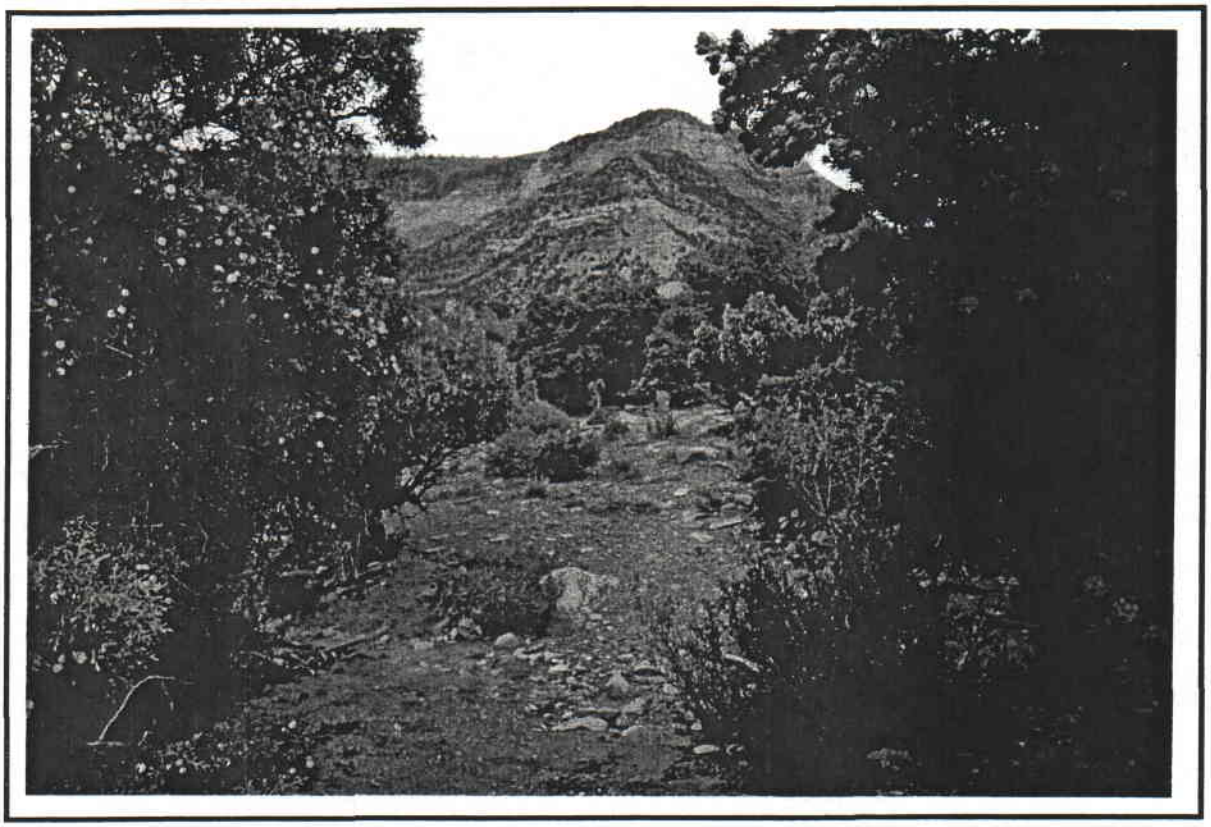
Berm 3 (1 of 2)



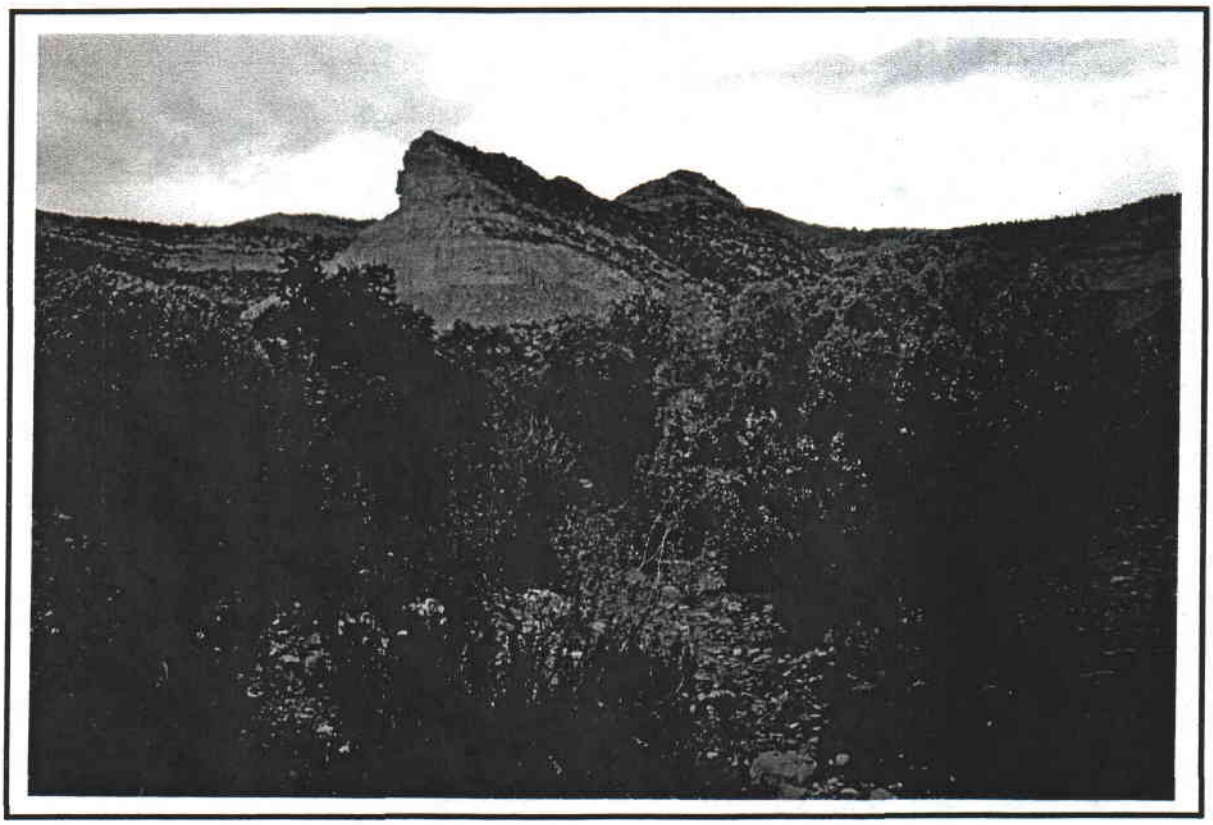
Berm 3 (2 of 2)



Berm 4



Pinyon-Juniper CTW Reference Area (1 of 2)



Pinyon-Juniper CTW Reference Area (2 of 2)

APPENDIX

Summarized Raw Data

ENERGY WEST MINING
Cells & Berms Combined Cell 1
Cottonwood Mine Old Waste Rock
Exposure: E
Slope: 0 -1 deg.

Sample Date: Aug 2005	1.00	2.00	3.00	4.00	5.00	6.00	7.00
TREES & SHRUBS							
Artemisia tridentata	0.00	0.00	0.00	0.00	0.00	20.00	0.00
Atriplex canescens	0.00	15.00	0.00	25.00	0.00	0.00	0.00
Atriplex confertifolia	25.00	0.00	0.00	0.00	0.00	0.00	0.00
Ephedra viridis	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gutierrezia sarothrae	15.00	0.00	25.00	5.00	25.00	5.00	25.00
Ceratoides lanata	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS							
Descurainia pinnata	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halogeton glomeratus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machaeranthera canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Malcomia africana	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sphaeralcea coccinea	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES							
Agropyron cristatum	10.00	5.00	5.00	0.00	0.00	10.00	0.00
Bromus tectorum	0.00	10.00	5.00	5.00	30.00	0.00	0.00
Elymus lanceolatus	0.00	5.00	0.00	0.00	0.00	0.00	0.00
Elymus smithii	0.00	0.00	5.00	0.00	0.00	0.00	20.00
Stipa comata	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Hilaria jamesii	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus spicatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus cinereus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER							
Total Living Cover	50.00	35.00	40.00	35.00	60.00	35.00	45.00
Litter	15.00	15.00	10.00	10.00	5.00	10.00	8.00
Bareground	15.00	40.00	5.00	10.00	10.00	15.00	7.00
Rock	20.00	10.00	45.00	45.00	25.00	40.00	40.00
% COMPOSITION							
Shrubs	80.00	42.86	62.50	85.71	41.67	71.43	55.56
Forbs	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grasses	20.00	57.14	37.50	14.29	58.33	28.57	44.44

Cell 2

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	1.00	2.00
0.00	0.00	0.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00
0.00	0.00	35.00	30.00	40.00	20.00	10.00	15.00	20.00	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00
5.00	20.00	5.00	10.00	10.00	10.00	15.00	8.00	7.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	10.00	10.00	0.00	5.00	15.00	5.00	5.00
0.00	35.00	0.00	20.00	10.00	25.00	5.00	15.00	8.00	20.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	55.00	65.00	70.00	70.00	65.00	45.00	65.00	40.00	70.00
15.00	5.00	10.00	5.00	5.00	10.00	10.00	15.00	10.00	15.00
15.00	10.00	10.00	5.00	5.00	5.00	15.00	5.00	35.00	5.00
20.00	30.00	15.00	20.00	20.00	20.00	30.00	15.00	15.00	10.00
10.00	36.36	69.23	57.14	71.43	61.54	77.78	46.15	67.50	64.29
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.00	63.64	30.77	42.86	28.57	38.46	22.22	53.85	32.50	35.71

3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	20.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	20.00	45.00	25.00	15.00	25.00	15.00	15.00	25.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00	10.00
15.00	15.00	5.00	0.00	20.00	15.00	10.00	15.00	10.00	5.00
0.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	15.00	5.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	45.00	60.00	25.00	70.00	50.00	30.00	50.00	40.00	45.00
15.00	10.00	10.00	5.00	5.00	10.00	10.00	15.00	10.00	10.00
5.00	10.00	10.00	55.00	5.00	20.00	40.00	10.00	40.00	15.00
30.00	35.00	20.00	15.00	20.00	20.00	20.00	25.00	10.00	30.00
50.00	66.67	75.00	100.00	50.00	70.00	50.00	30.00	62.50	11.11
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	33.33	25.00	0.00	50.00	30.00	50.00	70.00	37.50	88.89

Cell 3

13.00	14.00	15.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	25.00	35.00	0.00	0.00	15.00	0.00	0.00	15.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00	0.00
15.00	15.00	10.00	15.00	5.00	5.00	8.00	20.00	15.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	10.00	10.00	5.00	0.00	0.00	0.00	10.00	0.00	0.00
5.00	20.00	0.00	0.00	0.00	50.00	0.00	25.00	25.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00
0.00	0.00	10.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	5.00	25.00	5.00	5.00	10.00	15.00	5.00
0.00	0.00	5.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.00	70.00	70.00	35.00	40.00	75.00	70.00	65.00	70.00	70.00
45.00	5.00	5.00	15.00	15.00	5.00	5.00	10.00	10.00	5.00
5.00	5.00	5.00	5.00	5.00	5.00	5.00	10.00	5.00	5.00
5.00	20.00	20.00	45.00	40.00	15.00	20.00	15.00	15.00	20.00
33.33	57.14	64.29	42.86	12.50	26.67	21.43	30.77	42.86	21.43
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66.67	42.86	35.71	57.14	87.50	73.33	78.57	69.23	57.14	78.57

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	50.00	30.00	15.00	45.00	35.00	0.00	0.00	15.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35.00	5.00	15.00	20.00	0.00	5.00	5.00	15.00	10.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	15.00	15.00	10.00	15.00	0.00	0.00	5.00
5.00	0.00	20.00	0.00	0.00	25.00	15.00	10.00	35.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	5.00	0.00	10.00	10.00	5.00	15.00	35.00	15.00	35.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.00	75.00	65.00	60.00	70.00	80.00	65.00	60.00	75.00	65.00
10.00	5.00	25.00	25.00	10.00	5.00	5.00	15.00	10.00	15.00
5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
40.00	15.00	5.00	10.00	15.00	10.00	25.00	20.00	10.00	15.00
77.78	73.33	69.23	58.33	64.29	50.00	30.77	25.00	33.33	7.69
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69
22.22	26.67	30.77	41.67	35.71	50.00	69.23	75.00	66.67	84.62

Cell 4

18.00	19.00	20.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	5.00	0.00	5.00	0.00	1.00	0.00	25.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	20.00	0.00	35.00	0.00	0.00
0.00	0.00	0.00	0.00	35.00	0.00	25.00	0.00	0.00	0.00
10.00	45.00	0.00	5.00	5.00	10.00	5.00	9.00	10.00	15.00
0.00	0.00	0.00	35.00	10.00	10.00	0.00	0.00	30.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
60.00	50.00	35.00	50.00	50.00	45.00	30.00	45.00	40.00	50.00
25.00	5.00	5.00	5.00	15.00	15.00	5.00	10.00	10.00	15.00
5.00	40.00	10.00	15.00	5.00	10.00	10.00	10.00	5.00	10.00
10.00	5.00	50.00	30.00	30.00	30.00	55.00	35.00	45.00	25.00
33.33	0.00	57.14	10.00	0.00	11.11	0.00	2.22	0.00	50.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66.67	100.00	42.86	90.00	100.00	88.89	100.00	97.78	100.00	50.00

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00	20.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	5.00	0.00	10.00	0.00	7.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	0.00
0.00	0.00	0.00	20.00	0.00	35.00	0.00	35.00	0.00	0.00
10.00	20.00	20.00	0.00	10.00	0.00	15.00	0.00	0.00	0.00
0.00	10.00	10.00	25.00	35.00	0.00	30.00	0.00	0.00	15.00
50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65.00	40.00	35.00	55.00	60.00	35.00	55.00	35.00	35.00	35.00
10.00	5.00	15.00	25.00	20.00	10.00	15.00	10.00	30.00	10.00
10.00	5.00	5.00	10.00	5.00	20.00	10.00	10.00	5.00	30.00
15.00	50.00	45.00	10.00	15.00	35.00	20.00	45.00	30.00	25.00
7.69	0.00	14.29	18.18	16.67	0.00	0.00	0.00	57.14	14.29
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92.31	100.00	85.71	81.82	83.33	100.00	100.00	100.00	42.86	85.71

Cell 5

18.00	19.00	20.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	15.00	15.00	5.00	0.00	10.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	5.00	5.00	10.00	10.00	5.00	2.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	10.00	0.00	0.00	10.00	0.00	8.00	10.00	5.00	10.00
0.00	0.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00	20.00
0.00	0.00	10.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	25.00	0.00	50.00	5.00	20.00	20.00	20.00	25.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.00	40.00	25.00	60.00	65.00	70.00	35.00	35.00	40.00	50.00
10.00	15.00	20.00	5.00	10.00	10.00	10.00	10.00	10.00	15.00
35.00	10.00	20.00	15.00	10.00	5.00	15.00	15.00	15.00	5.00
15.00	35.00	35.00	20.00	15.00	15.00	40.00	40.00	35.00	30.00
75.00	12.50	60.00	16.67	38.46	28.57	20.00	14.29	25.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	87.50	40.00	83.33	61.54	71.43	80.00	85.71	75.00	80.00

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	40.00	0.00	30.00	35.00	5.00	0.00	0.00	0.00	25.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	10.00	5.00	15.00	25.00	10.00	5.00	0.00
0.00	25.00	0.00	20.00	0.00	5.00	0.00	15.00	20.00	8.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.00	10.00	65.00	10.00	25.00	45.00	20.00	25.00	20.00	2.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	75.00	65.00	70.00	65.00	70.00	50.00	50.00	50.00	35.00
15.00	5.00	15.00	10.00	20.00	15.00	10.00	10.00	10.00	10.00
10.00	5.00	5.00	10.00	5.00	5.00	5.00	5.00	10.00	10.00
25.00	15.00	15.00	10.00	10.00	10.00	35.00	35.00	30.00	45.00
0.00	53.33	0.00	42.86	53.85	7.14	10.00	0.00	10.00	71.43
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	46.67	100.00	57.14	46.15	92.86	90.00	100.00	90.00	28.57

Cell 6

18.00	19.00	20.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	5.00	0.00	15.00	0.00	0.00	15.00	15.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
5.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	0.00	0.00	20.00	15.00	0.00	0.00	5.00	5.00	0.00
0.00	5.00	5.00	5.00	15.00	35.00	50.00	25.00	40.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	30.00	5.00	10.00	10.00	15.00	0.00	10.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.00	35.00	30.00	45.00	65.00	50.00	55.00	60.00	65.00	40.00
15.00	10.00	5.00	15.00	10.00	20.00	15.00	15.00	15.00	10.00
5.00	15.00	20.00	5.00	5.00	5.00	5.00	10.00	5.00	5.00
25.00	40.00	45.00	35.00	20.00	25.00	25.00	15.00	15.00	45.00
54.55	0.00	16.67	22.22	38.46	0.00	0.00	33.33	23.08	0.00
0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	50.00
45.45	100.00	83.33	77.78	61.54	100.00	90.91	66.67	76.92	50.00

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
10.00	5.00	35.00	5.00	15.00	0.00	5.00	0.00	25.00	55.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	10.00	10.00	0.00	0.00	5.00	10.00	2.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	20.00	0.00	0.00	65.00	10.00	0.00	10.00	10.00
55.00	45.00	15.00	25.00	5.00	0.00	20.00	0.00	10.00	8.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	15.00	0.00	15.00	10.00	0.00	10.00	15.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
70.00	70.00	70.00	55.00	45.00	65.00	45.00	40.00	65.00	75.00
10.00	5.00	10.00	20.00	20.00	15.00	5.00	20.00	15.00	5.00
5.00	10.00	15.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
15.00	15.00	5.00	20.00	30.00	15.00	45.00	35.00	15.00	15.00
21.43	7.14	50.00	27.27	55.56	0.00	11.11	62.50	69.23	76.00
0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78.57	85.71	50.00	72.73	44.44	100.00	88.89	37.50	30.77	24.00

Cell 7

18.00	19.00	20.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13.00	0.00	5.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12.00	5.00	5.00	7.00	0.00	0.00	10.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	35.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	5.00
0.00	0.00	5.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00
0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	25.00	20.00	35.00	35.00	35.00
0.00	0.00	0.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	40.00	25.00	65.00	50.00	35.00	45.00	45.00	45.00	40.00
10.00	10.00	10.00	25.00	10.00	10.00	10.00	10.00	10.00	25.00
20.00	15.00	25.00	9.00	10.00	10.00	15.00	10.00	15.00	10.00
45.00	35.00	40.00	1.00	30.00	45.00	30.00	35.00	30.00	25.00
100.00	12.50	40.00	10.77	100.00	0.00	22.22	22.22	22.22	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	87.50	60.00	89.23	0.00	100.00	77.78	77.78	77.78	100.00

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	25.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00
0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
30.00	30.00	5.00	20.00	25.00	45.00	25.00	25.00	10.00	10.00
0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30.00	30.00	20.00	45.00	45.00	50.00	35.00	30.00	40.00	45.00
30.00	15.00	5.00	15.00	25.00	20.00	25.00	30.00	25.00	10.00
5.00	15.00	20.00	10.00	10.00	10.00	10.00	10.00	5.00	10.00
35.00	40.00	55.00	30.00	20.00	20.00	30.00	30.00	30.00	35.00
0.00	0.00	0.00	0.00	0.00	10.00	0.00	16.67	0.00	55.56
0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	100.00	75.00	100.00	100.00	90.00	100.00	83.33	100.00	44.44

18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	30.00	0.00	0.00	30.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	5.00	5.00	0.00	15.00	25.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00	10.00
0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	25.00	55.00	10.00	40.00	40.00	20.00	20.00	35.00	25.00
25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.00	35.00	55.00	65.00	50.00	45.00	65.00	50.00	45.00	45.00
10.00	10.00	25.00	20.00	20.00	20.00	25.00	15.00	15.00	25.00
15.00	15.00	10.00	5.00	20.00	10.00	5.00	15.00	15.00	5.00
35.00	40.00	10.00	10.00	10.00	25.00	5.00	20.00	25.00	25.00
12.50	0.00	0.00	53.85	10.00	0.00	69.23	50.00	22.22	22.22
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87.50	100.00	100.00	46.15	90.00	100.00	30.77	50.00	77.78	77.78

Berm 1

28.00	29.00	30.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	15.00	10.00	0.00	0.00	55.00	35.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	5.00	10.00	0.00	0.00	15.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	25.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	25.00	10.00	0.00	10.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	5.00	0.00	35.00	0.00	0.00	10.00	0.00	10.00	10.00
0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30.00	20.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	35.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.00	30.00	75.00	65.00	45.00	35.00	45.00	35.00	75.00	50.00
10.00	5.00	15.00	10.00	5.00	5.00	5.00	5.00	10.00	10.00
15.00	25.00	5.00	15.00	25.00	10.00	10.00	15.00	10.00	15.00
35.00	40.00	5.00	10.00	25.00	50.00	40.00	45.00	5.00	25.00
12.50	16.67	13.33	0.00	33.33	71.43	0.00	71.43	86.67	70.00
0.00	0.00	0.00	46.15	66.67	28.57	0.00	28.57	0.00	10.00
87.50	83.33	86.67	53.85	0.00	0.00	100.00	0.00	13.33	20.00

Berm 2

8.00	9.00	10.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30.00	0.00	45.00	5.00	25.00	25.00	20.00	10.00	50.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	25.00	25.00	35.00	25.00	10.00	20.00	25.00	10.00	0.00
35.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65.00	25.00	70.00	40.00	50.00	40.00	40.00	35.00	70.00	25.00
15.00	5.00	5.00	15.00	10.00	10.00	10.00	10.00	5.00	5.00
5.00	20.00	15.00	10.00	20.00	20.00	20.00	10.00	10.00	10.00
15.00	50.00	10.00	35.00	20.00	30.00	30.00	45.00	15.00	60.00
46.15	0.00	64.29	12.50	50.00	75.00	50.00	28.57	78.57	60.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53.85	100.00	35.71	87.50	50.00	25.00	50.00	71.43	21.43	40.00

Berm 3

8.00	9.00	10.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	30.00	45.00	25.00	0.00	65.00	55.00	30.00	70.00	80.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	10.00	0.00	10.00	5.00	10.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	35.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65.00	45.00	75.00	55.00	55.00	70.00	65.00	40.00	80.00	80.00
10.00	15.00	10.00	20.00	10.00	10.00	5.00	10.00	10.00	5.00
10.00	15.00	10.00	5.00	25.00	10.00	20.00	35.00	5.00	5.00
15.00	25.00	5.00	20.00	10.00	10.00	10.00	15.00	5.00	10.00
76.92	88.89	86.67	45.45	18.18	92.86	84.62	75.00	87.50	100.00
0.00	0.00	0.00	0.00	18.18	7.14	15.38	25.00	0.00	0.00
23.08	11.11	13.33	54.55	63.64	0.00	0.00	0.00	12.50	0.00

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.00	0.00	40.00	10.00	25.00	25.00	80.00	55.00	50.00	70.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	50.00	25.00	5.00	10.00	40.00	0.00	0.00	5.00	10.00
0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.00	50.00	65.00	45.00	55.00	65.00	80.00	65.00	65.00	80.00
15.00	40.00	15.00	10.00	15.00	20.00	5.00	25.00	20.00	10.00
20.00	5.00	5.00	10.00	5.00	10.00	5.00	5.00	5.00	5.00
10.00	5.00	15.00	35.00	25.00	5.00	10.00	5.00	10.00	5.00
90.91	0.00	61.54	22.22	45.45	38.46	100.00	84.62	92.31	87.50
0.00	100.00	38.46	22.22	18.18	61.54	0.00	7.69	7.69	12.50
9.09	0.00	0.00	55.56	36.36	0.00	0.00	7.69	0.00	0.00

Berm 4

18.00	19.00	20.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80.00	20.00	60.00	10.00	0.00	0.00	10.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	30.00	0.00	5.00	25.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	10.00	55.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	35.00	0.00	0.00	50.00	50.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80.00	35.00	80.00	70.00	40.00	50.00	35.00	50.00	50.00	65.00
5.00	5.00	5.00	15.00	15.00	15.00	5.00	10.00	15.00	20.00
5.00	45.00	5.00	5.00	10.00	15.00	15.00	10.00	5.00	5.00
10.00	15.00	10.00	10.00	35.00	20.00	45.00	30.00	30.00	10.00
100.00	57.14	75.00	14.29	0.00	30.00	42.86	50.00	0.00	0.00
0.00	0.00	0.00	7.14	100.00	0.00	14.29	50.00	0.00	23.08
0.00	42.86	25.00	78.57	0.00	70.00	42.86	0.00	100.00	76.92

ENERGY WEST MINING
Cell #1
Cottonwood Mine Old Waste Rock
Exposure: E
Slope: 0 -1 deg.
Sample Date: Aug 2005

8.00	9.00	10.00	Mean	SDev	Freq	
						TREES & SHRUBS
0.00	0.00	0.00	0.26	1.90	2.11	*Artemisia tridentata*
0.00	0.00	0.00	13.23	18.96	48.95	*Atriplex canescens*
0.00	0.00	0.00	0.13	1.81	0.53	*Atriplex confertifolia*
0.00	0.00	0.00	0.28	1.59	3.68	*Ephedra viridis*
0.00	0.00	0.00	5.83	7.97	51.58	*Gutierrezia sarothrae*
0.00	0.00	0.00	0.11	1.14	1.05	*Ceratoides lanata*
0.00	0.00	0.00	0.74	4.73	3.16	*Chrysothamnus nauseosus*
						FORBS
0.00	0.00	0.00	0.05	0.51	0.53	*Descurainia pinnata*
0.00	0.00	0.00	0.32	2.39	2.63	*Halogeton glomeratus*
5.00	0.00	0.00	0.18	1.19	2.11	*Machaeranthera canescens*
0.00	0.00	0.00	0.34	2.24	3.16	*Malcomia africana*
0.00	0.00	35.00	0.18	2.53	0.53	*Sphaeralcea coccinea*
						GRASSES
5.00	5.00	20.00	6.11	9.53	47.37	*Agropyron cristatum*
0.00	0.00	0.00	6.88	11.32	41.05	*Bromus tectorum*
0.00	0.00	0.00	2.26	7.87	12.63	*Elymus lanceolatus*
30.00	40.00	0.00	2.74	9.05	12.11	*Elymus smithii*
0.00	0.00	0.00	9.95	13.33	53.68	*Stipa comata*
0.00	0.00	0.00	1.75	7.13	7.89	*Hilaria jamesii*
0.00	0.00	0.00	0.03	0.36	0.53	*Elymus spicatus*
0.00	0.00	0.00	0.45	3.07	2.63	*Stipa hymenoides*
0.00	0.00	0.00	0.08	0.81	1.05	*Elymus cinereus*
						COVER
40.00	45.00	55.00	51.89	14.69		Total Living Cover
10.00	25.00	20.00	12.62	6.84		Litter
5.00	5.00	5.00	11.11	8.54		Bareground
45.00	25.00	20.00	24.37	13.07		Rock
						% COMPOSITION
0.00	0.00	0.00	37.21	30.43		Shrubs
25.00	11.11	100.00	4.97	15.99		Forbs
75.00	88.89	0.00	57.82	32.47		Grasses

ENERGY WEST MINING
Cell #1
Cottonwood Mine Old Waste Rock
Exposure: E
Slope: 0 -1 deg.
Sample Date: Aug 2005

No. Present in Quads n=190	
	TREES & SHRUBS
4.0	*Artemisia tridentata*
93.0	*Atriplex canescens*
1.0	*Atriplex confertifolia*
7.0	*Ephedra viridis*
98.0	*Gutierrezia sarothrae*
2.0	*Ceratoides lanata*
6.0	*Chrysothamnus nauseosus*
	FORBS
1.0	*Descurainia pinnata*
5.0	*Halogeton glomeratus*
4.0	*Machaeranthera canescens*
6.0	*Malcomia africana*
1.0	*Sphaeralcea coccinea*
	GRASSES
90.0	*Agropyron cristatum*
78.0	*Bromus tectorum*
24.0	*Elymus lanceolatus*
23.0	*Elymus smithii*
102.0	*Stipa comata*
15.0	*Hilaria jamesii*
1.0	*Elymus spicatus*
5.0	*Stipa hymenoides*
2.0	*Elymus cinereus*

COVER
Total Living Cover
Litter
Bareground
Rock

% COMPOSITION
Shrubs
Forbs
Grasses

ENERGY WEST MINING
CTW Reference Area
Cottonwood Mine Old Waste Rock
Exposure: E
Slope: 1 - 5 deg.

Sample Date: 8-10 Aug 2005	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
OVERSTORY								
Juniperus osteosperma	50.00	0.00	0.00	0.00	0.00	0.00	65.00	10.00
Pinus edulis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNDERSTORY								
SHRUBS								
Cercocarpus montanus	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
Ephedra viridis	0.00	0.00	0.00	0.00	25.00	40.00	0.00	1.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Juniperus osteosperma	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00
Opuntia polyacantha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pinus edulis	0.00	0.00	60.00	20.00	10.00	0.00	0.00	0.00
Yucca harrimaniae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS								
Chamaesyce fendleri	0.00	3.00	5.00	0.00	0.00	0.00	0.00	0.00
Chenopodium sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cryptantha sp.	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eriogonum bicolor	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00
Lepidium montanum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Penstemon sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES								
Elymus salinus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER								
Overstory	50.00	0.00	0.00	0.00	0.00	0.00	65.00	10.00
Understory	5.00	6.00	65.00	35.00	35.00	40.00	1.00	1.00
Litter	30.00	5.00	15.00	15.00	15.00	40.00	20.00	35.00
Bareground	60.00	85.00	15.00	40.00	15.00	10.00	64.00	49.00
Rock	5.00	4.00	5.00	10.00	35.00	10.00	15.00	15.00
% COMPOSITION								
Shrubs	0.00	0.00	92.31	100.00	100.00	100.00	100.00	100.00
Forbs	100.00	100.00	7.69	0.00	0.00	0.00	0.00	0.00
Grasses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Overstory + Understory	55.00	6.00	65.00	35.00	35.00	40.00	66.00	11.00

9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00
0.00	35.00	0.00	0.00	0.00	65.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	35.00	40.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
10.00	5.00	9.00	39.00	0.00	0.00	0.00	0.00	0.00	43.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	3.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	2.00	0.00
0.00	2.00	0.00	0.00	0.00	1.00	0.00	3.00	0.00	0.00	0.00
0.00	0.00	1.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00	18.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	35.00	0.00	0.00	0.00	65.00	35.00	40.00	0.00	0.00	0.00
10.00	10.00	10.00	40.00	5.00	1.00	5.00	5.00	5.00	45.00	20.00
20.00	25.00	15.00	15.00	5.00	94.00	24.00	15.00	10.00	40.00	7.00
15.00	60.00	50.00	25.00	80.00	4.00	70.00	79.00	75.00	10.00	70.00
55.00	5.00	25.00	20.00	10.00	1.00	1.00	1.00	10.00	5.00	3.00
100.00	50.00	90.00	100.00	0.00	0.00	0.00	0.00	0.00	95.56	10.00
0.00	50.00	10.00	0.00	100.00	100.00	100.00	100.00	100.00	4.44	90.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	45.00	10.00	40.00	5.00	66.00	40.00	45.00	5.00	45.00	20.00

20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
0.00	0.00	0.00	0.00	25.00	15.00	0.00	25.00	0.00	0.00	25.00
0.00	10.00	10.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00
45.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	30.00	8.00	0.00	0.00	10.00	19.00	7.00	0.00	0.00	35.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	40.00	0.00	0.00	0.00	8.00	8.00	20.00	0.00
0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	10.00	20.00	25.00	15.00	0.00	25.00	0.00	0.00	25.00
45.00	35.00	15.00	40.00	5.00	10.00	20.00	20.00	15.00	20.00	40.00
40.00	15.00	50.00	30.00	65.00	25.00	20.00	75.00	25.00	10.00	50.00
10.00	15.00	10.00	5.00	15.00	60.00	35.00	1.00	20.00	45.00	5.00
5.00	35.00	25.00	25.00	15.00	5.00	25.00	4.00	40.00	25.00	5.00
100.00	94.29	100.00	100.00	0.00	100.00	95.00	100.00	100.00	100.00	100.00
0.00	5.71	0.00	0.00	100.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.00	45.00	25.00	60.00	30.00	25.00	20.00	45.00	15.00	20.00	65.00

31.00	32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00
35.00	35.00	10.00	30.00	65.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	7.00	0.00	13.00	0.00	0	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	3.00	0.00	0.00
1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	2.00	5.00	0	0.00	0.00	0.00
4.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35.00	35.00	10.00	30.00	65.00	0.00	0.00	0.00	65.00	0.00	0.00
25.00	1.00	1.00	7.00	5.00	15.00	5.00	7.00	3.00	10.00	5.00
30.00	69.00	20.00	23.00	90.00	10.00	30.00	20.00	94.00	25.00	10.00
40.00	25.00	70.00	10.00	4.00	55.00	50.00	70.00	1.00	60.00	65.00
5.00	5.00	9.00	60.00	1.00	20.00	15.00	3.00	2.00	5.00	20.00
80.00	0.00	100.00	100.00	0.00	86.67	0.00	100	0.00	100.00	100.00
20.00	100.00	0.00	0.00	100.00	13.33	100.00	0	100.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00
60.00	36.00	11.00	37.00	70.00	15.00	5.00	7	68.00	10.00	5.00

42.00	43.00	44.00	45.00	46.00	47.00	48.00	49.00	50.00	51.00	52.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	40.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	10.00	25.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	15.00	2.00	30.00	25.00	15.00	25.00	35.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	40.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00
12.00	25.00	35.00	30.00	25.00	15.00	25.00	35.00	25.00	20.00	30.00
5.00	10.00	20.00	10.00	15.00	20.00	15.00	60.00	15.00	20.00	15.00
13.00	10.00	5.00	10.00	15.00	40.00	10.00	4.00	30.00	50.00	45.00
70.00	55.00	40.00	50.00	45.00	25.00	50.00	1.00	30.00	10.00	10.00
83.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12.00	35.00	35.00	70.00	25.00	30.00	25.00	35.00	25.00	20.00	30.00

53.00	54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00	62.00	63.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.00	15.00	0.00	30.00	5.00	0.00	25.00	50.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00	0.00	0.00	15.00	70.00	0.00	0.00	20.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	0.00	0.00	4.00	0.00	5.00	0.00	0.00	5.00	2.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.00	15.00	0.00	30.00	5.00	0.00	25.00	50.00	0.00	0.00	0.00
10.00	5.00	5.00	20.00	70.00	5.00	1.00	20.00	5.00	5.00	5.00
85.00	35.00	15.00	25.00	25.00	25.00	85.00	75.00	5.00	5.00	5.00
1.00	50.00	65.00	15.00	4.00	50.00	4.00	4.00	20.00	65.00	60.00
4.00	10.00	15.00	40.00	1.00	20.00	10.00	1.00	70.00	25.00	30.00
90.00	100.00	0.00	75.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00
10.00	0.00	100.00	25.00	0.00	100.00	100.00	0.00	100.00	100.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70.00	20.00	5.00	50.00	75.00	5.00	26.00	70.00	5.00	5.00	5.00

64.00	65.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	73.00	74.00
0.00	0.00	0.00	45.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00
0.00	15.00	0.00	0.00	0.00	35.00	25.00	50.00	0.00	0.00	0.00
35.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	35.00	0.00	0.00	15.00	0.00	20.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	15.00	0.00	45.00	0.00	35.00	25.00	50.00	0.00	15.00	0.00
50.00	1.00	35.00	5.00	5.00	15.00	7.00	20.00	5.00	5.00	5.00
5.00	50.00	35.00	20.00	10.00	70.00	5.00	70.00	45.00	15.00	20.00
35.00	45.00	20.00	60.00	20.00	5.00	3.00	5.00	25.00	20.00	60.00
10.00	4.00	10.00	15.00	65.00	10.00	85.00	5.00	25.00	60.00	15.00
100.00	0.00	100.00	100.00	0.00	100.00	100.00	100.00	0.00	100.00	80.00
0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	100.00	0.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	16.00	35.00	50.00	5.00	50.00	32.00	70.00	5.00	20.00	5.00

75.00	76.00	77.00	78.00	79.00	80.00	81.00	82.00	83.00	84.00	85.00
0.00	0.00	0.00	0.00	0.00	40.00	40.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
0.00	7.00	0.00	0.00	0.00	0.00	10.00	0.00	40.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	20.00	0.00	10.00	0.00	0.00	35.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00	1.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	40.00	40.00	0.00	0.00	0.00	0.00
5.00	15.00	40.00	5.00	20.00	10.00	30.00	7.00	50.00	35.00	10.00
15.00	20.00	10.00	20.00	15.00	50.00	60.00	20.00	15.00	20.00	65.00
20.00	45.00	30.00	60.00	55.00	35.00	9.00	60.00	25.00	35.00	20.00
60.00	20.00	20.00	15.00	10.00	5.00	1.00	13.00	10.00	10.00	5.00
0.00	80.00	100.00	80.00	100.00	100.00	100.00	0.00	100.00	100.00	0.00
100.00	20.00	0.00	20.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
5.00	15.00	40.00	5.00	20.00	50.00	70.00	7.00	50.00	35.00	10.00

86.00	87.00	88.00	89.00	90.00	91.00	92.00	93.00	94.00	95.00	96.00
0.00	20.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	10.00	20.00
35.00	20.00	5	0.00	0.00	25.00	0.00	0.00	30.00	0.00	0.00
0.00	0.00	0.00	0.00	15.00	0.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	15.00	5	0.00	15.00	1.00	0.00	20.00	20.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35.00	40.00	5.00	0.00	0.00	25.00	50.00	0.00	30.00	10.00	20.00
5.00	15.00	5.00	5.00	30.00	1.00	15.00	25.00	20.00	10.00	5.00
85.00	20.00	30.00	25.00	25.00	45.00	20.00	5.00	25.00	20.00	10.00
5.00	40.00	45.00	45.00	25.00	19.00	40.00	5.00	10.00	25.00	40.00
5.00	25.00	20.00	25.00	20.00	35.00	25.00	65.00	45.00	45.00	45.00
0.00	100.00	100.00	0.00	100.00	100.00	100.00	80.00	100.00	100.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	20.00	0.00	0.00	100.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.00	55.00	10.00	5.00	30.00	26.00	65.00	25.00	50.00	20.00	25.00

97.00	98.00	99.00	100.00	101.00	102.00	103.00	104.00	105.00	106.00	107.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.00	35.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.00	0.00
0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	15.00	10.00	0.00	0.00	33.00	0.00	0.00	10.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	3.00	1.00	5.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.00	35.00
5.00	15.00	10.00	30.00	7.00	35.00	5.00	5.00	10.00	35.00	10.00
10.00	25.00	25.00	10.00	3.00	25.00	15.00	15.00	25.00	55.00	70.00
50.00	25.00	20.00	15.00	80.00	30.00	45.00	35.00	30.00	5.00	15.00
35.00	35.00	45.00	45.00	10.00	10.00	35.00	45.00	35.00	5.00	5.00
100.00	100.00	100.00	100.00	57.14	94.29	0.00	0.00	100.00	100.00	0.00
0.00	0.00	0.00	0.00	42.86	5.71	100.00	100.00	0.00	0.00	100.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	15.00	10.00	30.00	7.00	35.00	5.00	5.00	10.00	70.00	45.00

108.00	109.00	110.00	111.00	112.00	113.00	114.00	115.00	116.00	117.00	118.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00
60.00	30.00	5.00	0.00	0.00	0.00	40.00	0.00	0.00	0.00	0.00
0.00	7.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00
0.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	8.00	0.00	0.00	5.00	0.00	65.00	3.00	7.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	2.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	3.00	0.00	1.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.00	30.00	5.00	0.00	0.00	0.00	40.00	25.00	0.00	0.00	0.00
5.00	15.00	5.00	10.00	5.00	5.00	5.00	5.00	65.00	5.00	7.00
85.00	75.00	5.00	5.00	10.00	15.00	85.00	25.00	10.00	25.00	18.00
5.00	5.00	50.00	45.00	35.00	50.00	5.00	50.00	10.00	50.00	35.00
5.00	5.00	40.00	40.00	50.00	30.00	5.00	20.00	15.00	20.00	40.00
100.00	100.00	0.00	80.00	0.00	0.00	100.00	80.00	100.00	60.00	100.00
0.00	0.00	100.00	20.00	100.00	100.00	0.00	20.00	0.00	40.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65.00	45.00	10.00	10.00	5.00	5.00	45.00	30.00	65.00	5.00	7.00

119.00	120.00	121.00	122.00	123.00	124.00	125.00	126.00	127.00	128.00	129.00
45.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00
0.00	5.00	0.00	0.00	0.00	20.00	10.00	0.00	15.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	20.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	17.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	30.00	0.00	0.00	0.00	20.00	10.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.00	5.00	0.00	0.00	0.00	20.00	20.00	0.00	15.00	5.00	0.00
5.00	20.00	30.00	10.00	10.00	20.00	20.00	10.00	1.00	20.00	5.00
90.00	25.00	25.00	25.00	25.00	5.00	15.00	10.00	15.00	35.00	20.00
4.00	50.00	35.00	60.00	60.00	70.00	55.00	55.00	55.00	25.00	50.00
1.00	5.00	10.00	5.00	5.00	5.00	10.00	25.00	29.00	20.00	25.00
100.00	100.00	100.00	90.00	100.00	0.00	100.00	100.00	0.00	85.00	0.00
0.00	0.00	0.00	10.00	0.00	100.00	0.00	0.00	100.00	15.00	100.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	25.00	30.00	10.00	10.00	40.00	40.00	10.00	16.00	25.00	5.00

130.00	131.00	132.00	133.00	134.00	135.00	136.00	137.00	138.00	139.00	140.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.00	60	0.00	0.00
0.00	50.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	40.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	10.00	0.00	0.00	14.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	25.00	10.00	0.00	0.00	0.00	10.00	25.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	50.00	0.00	0.00	0.00	20.00	0.00	35.00	60.00	40.00	15.00
15.00	10.00	20.00	10.00	25.00	10.00	25.00	10.00	5.00	20.00	25.00
10.00	40.00	25.00	25.00	30.00	55.00	20.00	10.00	20.00	30.00	70.00
25.00	5.00	40.00	40.00	40.00	25.00	20.00	65.00	70.00	45.00	3.00
50.00	45.00	15.00	25.00	5.00	10.00	35.00	15.00	5.00	5.00	2.00
0.00	100.00	100.00	100.00	100.00	100.00	56.00	0.00	100.00	100.00	100.00
100.00	0.00	0.00	0.00	0.00	0.00	44.00	100.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	60.00	20.00	10.00	25.00	30.00	25.00	45.00	65.00	60.00	40.00

ENERGY WEST MINING
CTW Reference Area
Cottonwood Mine Old Waste Rock
Exposure: E
Slope: 1 - 5 deg.
Sample Date: 8-10 Aug 2005

Mean	SDev	Freq		No. Present in Quads n=140
			OVERSTORY	
7.00	15.60	22.14	*Juniperus osteosperma*	31.0
7.00	14.62	25.71	*Pinus edulis*	36.0
			UNDERSTORY	
			SHRUBS	
1.26	5.45	9.29	*Cercocarpus montanus*	13.0
2.10	7.34	12.14	*Ephedra viridis*	17.0
0.16	1.10	2.14	*Gutierrezia sarothrae*	3.0
2.53	6.65	18.57	*Juniperus osteosperma*	26.0
0.11	0.65	2.86	*Opuntia polyacantha*	4.0
7.82	13.34	42.14	*Pinus edulis*	59.0
0.11	0.76	2.14	*Yucca harrimaniae*	3.0
			FORBS	
0.41	1.12	15.00	*Chamaesyce fendleri*	21.0
0.31	1.95	4.29	*Chenopodium sp.*	6.0
0.21	0.90	6.43	*Cryptantha sp.*	9.0
0.81	2.32	17.86	*Eriogonum bicolor*	25.0
0.08	0.55	2.86	*Lepidium montanum*	4.0
0.19	0.75	9.29	*Penstemon sp.*	13.0
			GRASSES	
0.07	0.84	0.71	*Elymus salinus*	1.0

			COVER
14.00	19.14		Overstory
16.16	14.20		Understory
29.19	23.17		Litter
33.54	22.66		Bareground
21.11	18.43		Rock
			% COMPOSITION
69.75	43.29		Shrubs
29.54	42.96		Forbs
0.71	8.42		Grasses
30.16	20.94		Overstory + Understory

APPENDIX C

Legal Financial, Compliance and Related Information

Annual Report of Officers
As submitted to the Utah Department of Commerce

Other change in ownership and control information
As required under R645-301-110

CONTENTS

Legal and Financial Information is Located in the MRP of each Mine Permit
as Supplemental Volume - Legal and Financial Information

APPENDIX D

Mine Maps

As required under R645-302-525-270

CONTENTS

Deer Creek Mine, Blind Canyon Seam, 2005 Production Map
Deer Creek Mine, Hiawatha Seam, 2005 Production Map
Maps are included with the supplied "Confidential CD"

CONFIDENTIAL

APPENDIX E

Other Information

In accordance with the requirements of R645-301 and R645-302

CONTENTS

No Information Reported