Annual Report 2007

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

ottonwood Coal Mine
C/015/019

Deer Creek Mine
C/015/018

Des-Bee-Dove Mines
C/015/017

Trail Mountain Mine
C/015/009

☐ Confidential
☒ Shelf
☐ Expandable
Refer to Record No 0058 Date 9022008
In C/015/0018, 2008, Incoming
For additional information

BINDER # 1

PacifiCorp
Energy West Mining Company
Cottonwood/Wilberg Mine
Division of Oil, Gas, and Mining Permit Number:
C/015/0019
2007 Annual Report

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

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DIV. OF OIL, GAS & MINING

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GENERAL INFORMATION

Permittee Name	PacifiCorp
Mine Name	Cottonwood/Wilberg 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	Geological and Environmental Affairs Manager
Phone Number	(435) 687-4712
Fax Number	(435) 687-2695
E-mail Address	ken.fleck@pacificorp.com
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Ken Fleck
Resident Agent	Ken Fleck
Resident Agent Mailing Address	Same as above
Number of Binders Submitted	2

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/Wilberg 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	Sites 001, 003, 004, and 005 consisting of mine discharge and sediment ponds.	10/31/2012
PSD Permit(s) (Air)	DAQE-694-95	Issued 8/9/95, includes Trail Mtn Mine	None
	DAQE-835-91	Issued 12/16/91, includes WRS	None

Other

CERTIFIED REPORTS

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Excess Spoil Piles	☐	☐	☐		
Refuse Piles	☒	☐	☒		DOGM receives these reports quarterly. Refer to Appendix A
Impoundments	☒	☐	☒		DOGM receives these reports quarterly. Refer to Appendix A
Other					
	☐	☐	☐		
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Department of Commerce, Annual Report Officers	☐	☒	☒	☒ Legal/Financial Volume	Amendment pending approval. See Appendix C

Other					
	☐	☐	☐	☐	

MINE MAPS

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Map Number(s)	Map Title/ Description	Confidential Yes	Confidential No
Mine Workings Map	See previous annual reports (mine is currently in cessation)	☒	☐
		☐	☐
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Subsidence Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)
Hydrology Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)

PacifiCorp
Energy West Mining Company
Des Bee Dove Mine
Division of Oil, Gas, and Mining Permit Number:
C/015/0018
2007 Annual Report

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GENERAL INFORMATION

Permittee Name	PacifiCorp
Mine Name	Des Bee Dove Mines
Operator Name (If other then permittee)	Energy West Mining Company
Permit Expiration Date	August 30, 2010
Permit Number	C/015/0017
Authorized Representative Title	Geological and Environmental Affairs Manager
Phone Number	(435) 687-4712
Fax Number	(435) 687-2695
E-mail Address	Ken.fleck@pacificorp.com
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Ken Fleck
Resident Agent	Ken Fleck
Resident Agent Mailing Address	Same as above
Number of Binders Submitted	2

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)	N/A	Record abandoned by MSHA March 27, 1987	
MSHA Impoundment(s)	None		
NPDES/UPDES Permit(s)	UTG040022	Site 001, Sediment Pond site reclaimed January 31, 2006.	April 30, 2013
PSD Permit(s) (Air)	None		

Other

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Excess Spoil Piles	☐	☐	☐		
Refuse Piles	☒	☐	☒		DOGM receives these reports quarterly. Refer to Appendix A
Impoundments	☐	☐	☐		Reclaimed January 2006
Other					
	☐	☐	☐		
	☐	☐	☐		

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		☐	☐
		☐	☐
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Subsidence Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)
Hydrology Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)

PacifiCorp
Energy West Mining Company
Deer Creek Mine
Division of Oil, Gas, and Mining Permit Number:
C/015/0018
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GENERAL INFORMATION

Permittee Name	PacifiCorp
Mine Name	**Deer Creek Mine**
Operator Name (If other then permittee)	Energy West Mining
Permit Expiration Date	July 6, 2009
Permit Number	C/015/0018
Authorized Representative Title	Geological and Environmental Affairs Manager
Phone Number	(435) 687-4712
Fax Number	(435) 687-2695
E-mail Address	Ken.fleck@pacificorp.com
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Ken Fleck
Resident Agent	Ken Fleck
Resident Agent Mailing Address	Same as above
Number of Binders Submitted	2

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)	42-00121	Deer Creek Mine	None
MSHA Impoundment(s)			
NPDES/UPDES Permit(s)	UT0023604	Outfalls 001 and 002, consisting of mine and sediment pond discharges	11/30/2012
PSD Permit(s) (Air)	DAQE-AN239003-02	Issued 6/14/02, Deer Creek Mine Tipple	None
	DAQE-694-91	Issued 12/5/91, Waste Rock Site	None

Other

CERTIFIED REPORTS

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Certified Reports:	Required Yes	Required No	Included or DOGM file location Included	Vol, Chapter, Page	Comments
Excess Spoil Piles	☐	☐	☐		
Refuse Piles	☐	☒	☒		DOGM receives these reports quarterly. Refer to Appendix A
Impoundments	☐	☒	☒		DOGM receives these reports quarterly. Refer to Appendix A
Other					
	☐	☐	☐		
	☐	☐	☐		

COMMITMENTS AND CONDITIONS

The Permittee is responsible for ensuring annual technical commitments in the MRP and conditions accepted with the permit are completed throughout the year. The Division has identified these commitments below and has provided space for you to report what you have done during the past year for each commitment. If the particular section is blank, no commitment has been identified and no response is required for this report. If a written response is required, it should be filed under Appendix B to this report.

Admin R645-301-100	
Has this commitment been acted on this year? Yes ☒ No ☐ Not Required for this year. ☐	**Title:** TRAIL **Objective:** Construct a new trailhead and parking pad at the east end of the facilities site. **Frequency:** Once. **Status:** Pending Rilda portal construction in 2005. **Reports:** Annual report. **Citation:** MRP, Sec. 526.116.2, p. 34. Note: Trail head and parking was completed in 2007. Trail will be completed in 3rd qtr. 2008.

Soils R645-301-200	
Has this commitment been acted on this year? Yes ☒ No ☐ Not Required for this year. ☐	· **Title: REVEGETATION** · **Objective:** Revegetate previously disturbed areas to nondisturbed standards. · **Frequency:** Annual. · **Status:** Pending Rilda portal construction in 2005 and reclamation. · **Reports:** Annual report. · **Citation:** MRP, Sec. 330, p. 16, #1 of list. Note: All areas except sediment pond area have been completed. Sediment pond construction will be completed in 3rd qtr. 2008.

Has this commitment been acted on this year? Yes ☒ No ☐ Not Required for this year. ☐	**Title: RILDA SOIL SALVAGE PLAN** **Objective**: The Permittee will have a qualified person (familiar with the soil survey and salvage plan) on site to monitor the soil salvage operations (Section R645-301-231.100). **Frequency**: During any construction. **Status**: Ongoing. **Reports**: As-built volumes of salvaged soil. **Citation**: Vol. 11. Section R645-301-231.100. Note: As-Built volumes have not yet been reported.
Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☐	**Title: RILDA TOPSOIL PILE CONSTRUCTION** **Objective**: After construction, the stockpile will be surveyed and the volume of topsoil stockpiled will be documented. **Frequency**: After construction. **Status**: Ongoing. **Reports**: As-built of topsoil stockpile. **Citation**: Vol. 11. R645-301-232. Note: See above notation.
Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☒	**Title: SUBSOIL TESTING** **Objective**: Regraded subsoil will be sampled on 500 ft intervals to a depth of four ft (three or four samples for the 2,000 linear ft in the facilities area). The samples will be analyzed on site for pH and EC. Problem areas will be further sampled and sent to a laboratory for analysis. **Frequency**: Final regrading. **Status**: Ongoing . **Reports**: Laboratory analysis to be provided to the Division. **Citation**: Vol. 11. Section R645-301-231.300.
Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☒	**Title: TOPSOIL HANDLING TESTING PLAN** **Objective**: Three composite samples will be taken from the facilities area and sediment pond. Samples will be analyzed for parameters to be compared with baseline information and to determine the need for amendments, including fertilizer **Frequency**: Final Reclamation **Status**: Ongoing. **Reports**: Annual. **Citation**: Vol. 11. Section R645-301-242.

Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☒	**Title: BULK DENSITY TESTING** **Objective**: The experimental practice will provide an indication of the degree of compaction related to the loading of the in place soil through measurements of the bulk density of the in-place soil before and after burial. Bulk density of the Rominger Mine soils will occur to a depth of 6 ft. (or lithic contact) prior to and after disturbance. **Frequency**: Prior to subsoil pile construction and again during reclamation, using a split spoon. **Status**: once before construction and once again during reclamation **Reports**: Analysis to be provided to the Division. A [bulk] change greater than 10% from an undisturbed state will require that the Permittee increase the gouging depth by one foot. **Citation**: Vol. 11. Chapter 2 R645-301-242 and R645-302-216 and Experimental Practice pgs.36 and 40. Note: No subsoil has been placed at the Romminger Mine area to date.
Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☒	**Title: POLYACRYLAMIDE APPLICATION** **Objective**: Reduce erosion from 1.6 acres undisturbed soil on 60 degree slopes buried by subsoil and unearthed at reclamation. Fill removal will be done by small earth moving equipment and/or by hand labor to minimize disturbance of the topsoil. The soil will be re-exposed in 5-10 foot horizontal zones that can and worked by hand from the adjacent pad fill level. (After the pad fill has been removed, the backfilled culvert will serve as the primary access way for machinery and materials associated with the remaining reclamation efforts.) Slopes steeper than 50% will be treated with an anionic polyacrylamide (PAM) during seeding to increase cohesion and infiltration of water without disrupting soil structure. Bareroot or containerized plant stock will be pre-treated with PAM and used as enhancement plantings on the re-exposed, steep slopes. **Frequency**: Final Reclamation **Status**: during reclamation **Reports**: During reclamation. **Citation**: Vol. 11. Chapter 2 Section R645-302-216 and Experimental Practice Plan pg.40.
Biology R645-301-300	
Has this commitment been acted on this year? Yes ☒ No ☐ Not Required for this year. ☐	**Title: WILDLIFE** · **Objective**: Adhere to wildlife exclusionary periods. · **Frequency**: Annual · **Status**: Ongoing during Rilda portal construction in 2005 and reclamation. · **Reports**: Annual Report. · **Citation**: MRP, Sec. 322, p. 10; Sec. 330, p.16, #14 in list; Sec. 342, p. 32, #7 in list. Note: No activity in Left Fork except for one access for emergency purposes. Roof fall inby Rilda escapeway portal.
Has this commitment been acted on this year? Yes ☒ No ☐ Not Required for this year. ☐	**Title MACROINVERTEBRATES "AQUATIC".** **Objective**: Monitor macroinvertebrates in Rilda Creek. **Frequency**: Spring/fall two years prior to and spring/fall one year immediately following start of construction. Spring every three years during operations and reclamation. **Status**: On going. Spring/fall 2006 is the anticipated date for the year following construction. Spring 2009 is the anticipated date for the first of the three-year monitoring surveys. **Reports**: Division Annual Report. **Citation**: MRP, Sec. 330, p. 26. Note: Construction activities still occurring to date.

Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☐	**Title: FISH "AQUATIC".** **Objective**: DWR will monitor fish in Rilda Creek as part of annual surveys. **Frequency**: Spring/fall two years prior to and spring/fall one year immediately following start of construction. Spring every three years during operations and reclamation. **Status**: On going. Spring/fall 2006 is the anticipated date for the year following construction. Spring 2009 is the anticipated date for the first of the three-year monitoring surveys. **Reports**: Division Annual Report. **Citation**: MRP, Sec. 330, p. 26. Note: Construction activities still occurring to date.
Has this commitment been acted on this year? Yes ☒ No ☐ Not Required for this year. ☐	**Title: RAPTORS.** **Objective**: Over-flight surveys. **Frequency**: Yearly. **Status**: On going for life of mine. **Reports**: Upon request. **Citation**: MRP, Sec. 322, Subsec. Terrestrial Species. Note: Raptor survey report included in confidential file.
Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☒	**Title: BATS.** **Objective**: Install a "stay-out" sign near a large cavern. **Frequency**: Once. **Status**: Prior to Rilda portal construction in 2005. **Reports**: Not required. **Citation**: MRP, Sec. 330, p. 16, #15 in list. Note: Typo in permit. Commitment #15 should say (Romminger Mine). No subsoil to date has been stored at the Romminger Mine area.
Has this commitment been acted on this year? Yes ☒ No ☐ Not Required for this year. ☐	**Title: RILDA CREEK.** **Objective**: Enhance riparian corridor along the Rilda Creek. **Frequency**: As necessary. **Status**: Initiate 180 days after Rilda portal construction begins in 2005. **Reports**: Not required. **Citation**: MRP, Sec. 330, Tab. 300-5. Note: Sediment contributions from Rilda Road have been limited through asphalt paving of the road. Reconstruction activities included revegetation and streambank repairs.
Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☒	**Title: RAT MIDDEN.** **Objective**: Install a fence around a rat midden in Rilda Canyon. **Frequency**: Once with annual repairs. **Status**: Prior to Rilda portal construction in 2005. **Reports**: Annual Report. **Citation**: MRP, Sec. 322. Note: Fence and signs installed at on-set of construction activities.

Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☐	**Title: MITIGATION.** **Objective**: Several projects to enhance and mitigate potential impacts associated with Rilda portal facilities. **Frequency**: Annual. **Status**: Pending approval or Rilda portal construction in 2005. **Reports**: Annual Report. **Citation**: MRP, Sec. 330, Tab. 300-5. Note: Interagency problems with conforming to commitments. Meetings are scheduled to discuss revision of commitments.
Landuse, Cultural Resources, Air Quality R645-301- 400	
Engineering R645-301-500	
Has this commitment been acted on this year? Yes ☐ No ☒ Not Required for this year. ☒	**Title: SPECIAL MONITORING - CASTLEGATE CLIFF ESCARPMENT** **Objective**: Monitor Cliff Escarpments **Frequency**: Daily measuring during mining. **Status**: Ongoing. **Reports**: Annual. **Citation**: Volume 11 p 28. Note: No longer mining in this area.
Geology R645-301-600	
Hydrology R645-301-700	
Bonding & Insurance R645-301-800	
Other Commitments	

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Permittee Name	PacifiCorp
Mine Name	Trail Mountain Mine
Operator Name (If other then permittee)	Energy West Mining Company
Permit Expiration Date	February 21, 2010
Permit Number	C/015/0009
Authorized Representative Title	Geological and Environmental Affairs Manager
Phone Number	(435) 687-4712
Fax Number	(435) 687-2695
E-mail Address	Ken.fleck@pacificorp.com
Mailing Address	P.O. Box 310 Huntington, Utah 84528
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MSHA Mine ID(s)	42-01211	Trail Mountain Mine	None
MSHA Impoundment(s)	None		
NPDES/UPDES Permit(s)	UT0023728	Site 001, Sediment Pond	December 31, 2012
		Site 002, Mine Discharge	
PSD Permit(s) (Air)	DAQE-694-95	Issued 8/9/95, includes Cottonwood/Wilberg Mine.	None

Other

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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.

-The annual Vegetation Monitoring Report is included in Appendix B-

*Reminder: If equipment has been abandoned during 2007, 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

Change in administration or corporate structure can often bring about necessary changes to information found in the mining and reclamation plan. The Division is Requesting that each permittee review and update the legal, financial, compliance and related information in the plan as part of the annual report. Please provide the Department of Commerce, Annual Report of Officers, or other equivalent information as necessary to ensure that the information provided in the plan is current. Provide any other change as necessary regarding land ownership, lease acquisitions, legal results from appeals of violations, or other changes as necessary to update information required in the mining and reclamation plan. Include certified financial statements, audits or worksheets, which may be required to meet bonding requirements. Specify whether the information is currently on file with the Division or included as Appendix C to the report.

Legal / Financial Update	Required Yes	Required No	Included or DOGM File location Included	Vol, Chapter, Page	Comments
Department of Commerce, Annual Report Officers	☐	☒	☒	☒Legal/Financial Volume	Amendment pending approval. See Appendix C
Other					

MINE MAPS

Copies of mine maps, current and up-to-date through at least December 31, 2007, are to be provided to the Division as Appendix D to this report in accordance with the requirements of R 645-301-525.240. These map copies shall be made in accordance with 30 CFR 75.1200 as required by MSHA. Upon request, the Division shall keep mine maps confidential. Please provide a CD.

Map Number(s)	Map Title/ Description	Confidential Yes	Confidential No
Mine Workings Map	See previous annual reports (mine is in temporary cessation)	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

OTHER INFORMATION

Please provide any comments of further information to be included as part of the Annual Report. Any other attachments are to be provided as Appendix E to this report. If information is submitted as a group rather then by individual mine, please identify each of the mine's data in the list below.

Additional attachment to this report? **Yes** ☒ **No** ☐

Annual Raptor Survey Report (Confidential Report, submitted separately)
Subsidence Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)
Hydrology Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)

APPENDIX A

Certified Reports

Excess Spoil Piles
Refuse Piles
Impoundments

As required under R645-301-514

CONTENTS

Quarterly Reports for:
Deer Creek Waste Rock Site
Deer Creek Sediment Pond
Cottonwood/Trail Mountain Waste Rock Site
Cottonwood Sediment Pond
Trail Mountain Sediment Pond

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, UT 84528

April 10, 2007

Ms. Pamela Grubaugh-Littig
Permit Supervisor
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Ms. Grubaugh-Littig:

I am enclosing for submittal the 1st Quarter Engineering Inspection Reports for Cottonwood/Wilberg/Des Bee Dove Waste Rock Site and the old Waste Rock Site. Also, the Deer Creek Waste Rock Site and Elk Canyon/Original Site are enclosed.

Sincerely,

John Christensen, P.E.
Sr. Construction Engineer

Encls.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/0017/ACT/015/019	**Report Date**	MARCH 30, 2007
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Old Waste Rock Site	
	Pile Number		
	MSHA ID Number		
Inspection Date	MARCH 30, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2007 First Quarter Inspection	
		Attachments to Report?	**x No** **Yes**

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

Constructed according to plan.

Placement of underdrains and protective filter systems.

Not applicable.

Installation of final surface drainage systems.

All surfaces are at their final configuration and drainage established.

Placement and compaction of fill materials.

This site is complete and at capacity.

Final grading and revegetation of fill.

Site is complete and vegetation has been established.

Appearances of instability, structural weakness, and other hazardous conditions.

None observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There haven't been any changes at the site since the last inspection.

Certification Statement I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: John Christensen **Date:** 4/10/07

P.E. Number & State: 165651, Utah

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/017/ACT/015/019	**Report Date**	MARCH 30, 2007
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove/Trail Mountain		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Cottonwood Waste Rock Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-01211-03	
Inspection Date	MARCH 30, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 1ST Quarter Inspection		
	Attachments to Report? x No Yes		

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

Foundation was prepared according to the approved plan.

Placement of underdrains and protective filter systems.

Not applicable.

Installation of final surface drainage systems.

The out slopes of the containment berms are at their final configuration and have been revegetated. The inlet ditch to the pond has been lined with rip rap and is extended as the pile changes elevation.

Placement and compaction of fill materials.

The Trail Mountain Mine has ceased production. Mine refuse will no longer be haul to this site. The site will remain active to accommodate future pond cleanings at Trail Mountain, Cottonwood and Des-Bee-Dove Mines. Trail Mountain pond cleaning material from the 4th Qtr. 2005 was placed and partially spread over the site.

Final grading and revegetation of fill.

The outslopes of each containment/lift berm have had final grading and vegetation completed.

INSPECTION AND CERTIFIED REPORT
ON EXCESS SPOIL PILE OR REFUSE PILE

Appearances of instability, structural weakness, and other hazardous conditions.

None seen.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the site is a 784,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift is 6,803.31 ft. The final design elevation will be 6,850 ft. The entire site is approximately 36% capacity. The useable area of the present lift is approximately 97%.

Certification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer
(Full Name and Title)

Signature: John Christensen **Date:** 4/10/07

P.E. Number & State: 165651, Utah

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, UT 84528

July 20, 2007

Ms. Pamela Grubaugh-Littig
Permit Supervisor
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Ms. Grubaugh-Littig:

I am enclosing for submittal the 2nd Quarter Engineering Inspection Reports for Cottonwood/Wilberg/Des Bee Dove Waste Rock Site and the old Waste Rock Site. Also, the Deer Creek Waste Rock Site and Elk Canyon/Original Site are enclosed.

Sincerely,

John Christensen, P.E.
Sr. Construction Engineer

Encls.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/017/ACT/015/019	Report Date	JUNE 26, 2007
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove/Trail Mountain		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	Cottonwood Waste Rock Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-01211-03	
Inspection Date	JUNE 18, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2007 2ND Quarter Inspection	
		Attachments to Report? x No Yes	

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

Foundation was prepared according to the approved plan.

Placement of underdrains and protective filter systems.

Not applicable.

Installation of final surface drainage systems.

The out slopes of the containment berms are at their final configuration and have been revegetated. The inlet ditch to the pond has been lined with rip rap and is extended as the pile changes elevation.

Placement and compaction of fill materials.

The Trail Mountain Mine has ceased production. Mine refuse will no longer be haul to this site. The site will remain active to accommodate future pond cleanings at Trail Mountain, Cottonwood and Des-Bee-Dove Mines. Trail Mountain pond cleaning material from the 4th Qtr. 2005 was placed and partially spread over the site. Also sediment from the North Pond at Cottonwood was placed on the site.

Final grading and revegetation of fill.

The outslopes of each containment/lift berm have had final grading and vegetation completed.

INSPECTION AND CERTIFIED REPORT
ON EXCESS SPOIL PILE OR REFUSE PILE

Appearances of instability, structural weakness, and other hazardous conditions.

None seen.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the site is a 784,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift is 6,803.31 ft. The final design elevation will be 6,850 ft. The entire site is approximately 36% capacity. The useable area of the present lift is approximately 97%.

Certification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
7/19/07
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer
(Full Name and Title)

Signature: _____ **Date:**

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/0017/ACT/015/019	**Report Date**	JUNE 26, 2007
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Old Waste Rock Site	
	Pile Number		
	MSHA ID Number		
Inspection Date	JUNE 18, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2007 Second Quarter Inspection	
		Attachments to Report? x No Yes	

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

Constructed according to plan.

Placement of underdrains and protective filter systems.

Not applicable.

Installation of final surface drainage systems.

All surfaces are at their final configuration and drainage established.

Placement and compaction of fill materials.

This site is complete and at capacity.

Final grading and revegetation of fill.

Site is complete and vegetation has been established.

Appearances of instability, structural weakness, and other hazardous conditions.

None observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There haven't been any changes at the site since the last inspection.

Certification Statement I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: John Christensen **Date:** 7/20/07

P.E. Number & State: 165651, Utah

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, UT 84528

October 31, 2007

Ms. Pamela Grubaugh-Littig
Permit Supervisor
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Ms. Grubaugh-Littig:

I am enclosing for submittal the 3rd. Quarter Engineering Inspection Reports for Cottonwood/Wilberg/Des Bee Dove Waste Rock Site and the old Waste Rock Site. Also, the Deer Creek Waste Rock Site and Elk Canyon/Original Site are enclosed.

Sincerely,

John Christensen, P.E.
Sr. Construction Engineer

Encls.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/017/ACT/015/019	Report Date	Sept. 26, 2007
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove/Trail Mountain		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	Cottonwood Waste Rock Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-01211-03	
Inspection Date	Sept. 10, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2007 3rd Quarter Inspection	
		Attachments to Report? x No Yes	

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

Foundation was prepared according to the approved plan.

Placement of underdrains and protective filter systems.

Not applicable.

Installation of final surface drainage systems.

The out slopes of the containment berms are at their final configuration and have been revegetated. The inlet ditch to the pond has been lined with rip rap and is extended as the pile changes elevation.

Placement and compaction of fill materials.

The Trail Mountain Mine has ceased production. Mine refuse will no longer be haul to this site. The site will remain active to accommodate future pond cleanings at Trail Mountain, Cottonwood and Des-Bee-Dove Mines. Trail Mountain pond cleaning material from the 4th Qtr. 2005 was placed and partially spread over the site. Also sediment from the North Pond at Cottonwood was placed on the site during repairs made in 2nd Quarter of 2007.

Final grading and revegetation of fill.

The outslopes of each containment/lift berm have had final grading and vegetation completed.

INSPECTION AND CERTIFIED REPORT
ON EXCESS SPOIL PILE OR REFUSE PILE

Appearances of instability, structural weakness, and other hazardous conditions.

None seen.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the site is a 784,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift is 6,803.31 ft. The final design elevation will be 6,850 ft. The entire site is approximately 36% capacity. The useable area of the present lift is approximately 97%.

Certification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer
(Full Name and Title)

Signature: John Christensen Date: 10/31/07

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/0017/ACT/015/019	**Report Date**	Sept. 26, 2007
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Old Waste Rock Site	
	Pile Number		
	MSHA ID Number		
Inspection Date	Sept. 10, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2007 Third Quarter Inspection	
		Attachments to Report? x No Yes	

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

Constructed according to plan.

Placement of underdrains and protective filter systems.

Not applicable.

Installation of final surface drainage systems.

All surfaces are at their final configuration and drainage established.

Placement and compaction of fill materials.

This site is complete and at capacity.

Final grading and revegetation of fill.

Site is complete and vegetation has been established.

Appearances of instability, structural weakness, and other hazardous conditions.

None observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There haven't been any changes at the site since the last inspection.

Certification Statement I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: John Christensen **Date:** 10/31/07

P.E. Number & State: 165651, Utah

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, UT 84528

January 14, 2008

Ms. Pamela Grubaugh-Littig
Permit Supervisor
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Ms. Grubaugh-Littig:

I am enclosing for submittal the 4th. Quarter Engineering Inspection Reports for Cottonwood/Wilberg/Des Bee Dove Waste Rock Site and the old Waste Rock Site. Also, the Deer Creek Waste Rock Site and Elk Canyon/Original Site are enclosed.

Sincerely,

John Christensen

John Christensen, P.E.
Sr. Construction Engineer

Encls.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/017/ACT/015/019	**Report Date**	Dec. 21, 2007
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove/Trail Mountain		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Cottonwood Waste Rock Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-01211-03	
Inspection Date	Dec. 10, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 4th Quarter Inspection		
	Attachments to Report? x **No** **Yes**		

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

Foundation was prepared according to the approved plan.

Placement of underdrains and protective filter systems.

Not applicable.

Installation of final surface drainage systems.

The out slopes of the containment berms are at their final configuration and have been revegetated. The inlet ditch to the pond has been lined with rip rap and is extended as the pile changes elevation.

Placement and compaction of fill materials.

The Trail Mountain Mine has ceased production. Mine refuse will no longer be haul to this site. The site will remain active to accommodate future pond cleanings at Trail Mountain, Cottonwood and Des-Bee-Dove Mines. Trail Mountain pond cleaning material from the 4th Qtr. 2005 was placed and partially spread over the site. Also sediment from the North Pond at Cottonwood was placed on the site during repairs made in 2nd Quarter of 2007.

Final grading and revegetation of fill.

The outslopes of each containment/lift berm have had final grading and vegetation completed.

INSPECTION AND CERTIFIED REPORT
ON EXCESS SPOIL PILE OR REFUSE PILE

Appearances of instability, structural weakness, and other hazardous conditions.

None seen.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the site is a 784,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift is 6,803.31 ft. The final design elevation will be 6,850 ft. The entire site is approximately 36% capacity. The useable area of the present lift is approximately 97%. Snow covered the site at the time of the inspection.

Certification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
1/10/06
No. 165651
STATE OF UTAH

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer
(Full Name and Title)

Signature: _____ **Date:**

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/0017/ACT/015/019	**Report Date**	Dec. 21, 2007
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Old Waste Rock Site	
	Pile Number		
	MSHA ID Number		
Inspection Date	Dec. 10, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2007 Fourth Quarter Inspection	
		Attachments to Report? x No Yes	

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

Constructed according to plan.

Placement of underdrains and protective filter systems.

Not applicable.

Installation of final surface drainage systems.

All surfaces are at their final configuration and drainage established.

Placement and compaction of fill materials.

This site is complete and at capacity.

Final grading and revegetation of fill.

Site is complete and vegetation has been established.

Appearances of instability, structural weakness, and other hazardous conditions.

None observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There haven't been any changes at the site since the last inspection, except for the snow covering the area.

Certification Statement I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: _____ **Date:** _____

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
1/18/08
No. 165651
STATE OF UTAH

P.E. Number & State: 165651, Utah

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, UT 84528

April 10, 2007

Ms. Pamela Grubaugh-Littig
Permit Supervisor
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Ms. Grubaugh-Littig:

I am enclosing for submittal the 1st Quarter Engineering Inspection Reports for Cottonwood/Wilberg/Des Bee Dove Waste Rock Site and the old Waste Rock Site. Also, the Deer Creek Waste Rock Site and Elk Canyon/Original Site are enclosed.

Sincerely,

John Christensen, P.E.
Sr. Construction Engineer

Encls.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	MARCH 30, 2007
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Waste Rock Disposal Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-02	
Inspection Date	MARCH 30, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 First Quarter Inspection		
	Attachments to Report? X No Yes		

Field Evaluation

1. Foundation preparation, including the removal of all organic material and topsoil.

All construction was done according to the permitted, professional engineered design specifications.

2. Placement of underdrains and protective filter systems.

An underdrain was installed when the site was constructed in 1989. The drain had a small amount of flow coming through it at the time of the inspection.

3. Installation of final surface drainage systems.

All interim slopes are maintained at their proper grade. The final slopes are surveyed to assure they are correct. Also the two final designed rip-rap ditches were installed as per the permitted plan and are extended as more lifts are added.

4. Placement and compaction of fill materials.

The lower site (area 2) was leveled in Sept. 2006. Trash and extraneous material were removed. Lift was sampled as required. The containment trench in the upper cell for sediment pond cleanings was spread out and leveled.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	MARCH 30, 2007
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	ELK CANYON/ORIGINAL SITE	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-01	
Inspection Date	March 30, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2007 1ST Quarter Inspection	
		Attachments to Report? **XNo** **Yes**	

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

The construction of both sites have been complete for some time in excess of 18 years. The foundations appear to be stable.

Placement of underdrains and protective filter systems.

None

Installation of final surface drainage systems.

The slopes of both sites have no rills, gullies or sloughage present.

Placement and compaction of fill materials.

No fill material is being placed at either site, since both are at their designed capacity. The Elk Canyon site contains approximately 24,000 cubic original site 90,000 cubic yards of fill material.

Final grading and revegetation of fill.

The sites are at capacity. The final grades are established and are revegetated.

Appearances of instability, structural weakness, and other hazardous conditions.

None were observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There was approximately 1,000 tons of coal stored at the Elk Canyon pad at the time of inspection.

Certification Statement I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: John Christensen **Date:** 4/10/07

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

P.E. Number & State: 165651, Utah

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, UT 84528

July 20, 2007

Ms. Pamela Grubaugh-Littig
Permit Supervisor
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Ms. Grubaugh-Littig:

I am enclosing for submittal the 2nd Quarter Engineering Inspection Reports for Cottonwood/Wilberg/Des Bee Dove Waste Rock Site and the old Waste Rock Site. Also, the Deer Creek Waste Rock Site and Elk Canyon/Original Site are enclosed.

Sincerely,

John Christensen, P.E.
Sr. Construction Engineer

Encls.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	JUNE 26, 2007
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Waste Rock Disposal Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-02	
Inspection Date	JUNE 21, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 Second Quarter Inspection		
	Attachments to Report? x No Yes		

Field Evaluation

1.Foundation preparation, including the removal of all organic material and topsoil.

All construction was done according to the permitted, professional engineered design specifications.

2.Placement of underdrains and protective filter systems.

An underdrain was installed when the site was constructed in 1989. The drain had a small amount of flow coming through it at the time of the inspection.

3.Installation of final surface drainage systems.

All interim slopes are maintained at their proper grade. The final slopes are surveyed to assure they are correct. Also the two final designed rip-rap ditches were installed as per the permitted plan and are extended as more lifts are added.

4.Placement and compaction of fill materials.

The lower site (area 2) was leveled in Sept. 2006. Trash and extraneous material were removed. Lift was sampled as required. The containment trench in the upper cell for sediment pond cleanings was spread out and leveled.

5.Final grading and revegetation of fill.

See No. 3.
The sub-soil berm surrounding the site was seeded shortly after construction.

6.Appearances of instability, structural weakness, and other hazardous conditions.

No weakness or instabilities are evident at this time.

ther Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the Area No. 1 cell is 460,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift in cell 1 is 6359.00 ft and cell 2 is 6329.35 The final design elevation will be 6,369 ft. The volume remaining in cell 1 is approximately 10% capacity. The Lower Cell 2 was at approximately 60% capacity.
As of JUNE 1, 2007, 11,733.27 cubic yards of material was hauled in 2007.

Certification Statement

LICENSED PROFESSIONAL ENGINEER JOHN CHRISTENSEN No. 165651 STATE OF UTAH

(Cert. Stamp)

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer
(Full Name and Title)

Signature: John Christensen **Date:** 7/20/07

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	JUNE 26, 2007
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	ELK CANYON/ORIGINAL SITE	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-01	
Inspection Date	JUNE 18, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 2ND Quarter Inspection		
	Attachments to Report? XNo Yes		

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

The construction of both sites have been complete for some time in excess of 18 years. The foundations appear to be stable.

Placement of underdrains and protective filter systems.

None

Installation of final surface drainage systems.

The slopes of both sites have no rills, gullies or sloughage present.

Placement and compaction of fill materials.

No fill material is being placed at either site, since both are at their designed capacity. The Elk Canyon site contains approximately 24,000 cubic original site 90,000 cubic yards of fill material.

Final grading and revegetation of fill.

The sites are at capacity. The final grades are established and are revegetated.

Appearances of instability, structural weakness, and other hazardous conditions.

None were observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There was approximately 1,000 tons of coal stored at the Elk Canyon pad at the time of inspection.

Certification Statement I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: _____ **Date:**

P.E. Number & State: 165651, Utah

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
7/2/07
No. 165651
STATE OF UTAH

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, UT 84528

October 31, 2007

Ms. Pamela Grubaugh-Littig
Permit Supervisor
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Ms. Grubaugh-Littig:

I am enclosing for submittal the 3rd. Quarter Engineering Inspection Reports for Cottonwood/Wilberg/Des Bee Dove Waste Rock Site and the old Waste Rock Site. Also, the Deer Creek Waste Rock Site and Elk Canyon/Original Site are enclosed.

Sincerely,

John Christensen, P.E.
Sr. Construction Engineer

Encls.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	Sept. 26, 2007
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Waste Rock Disposal Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-02	
Inspection Date	Sept. 10, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 Third Quarter Inspection		
	Attachments to Report? x No Yes		

Field Evaluation

1.Foundation preparation, including the removal of all organic material and topsoil.

All construction was done according to the permitted, professional engineered design specifications.

2.Placement of underdrains and protective filter systems.

An underdrain was installed when the site was constructed in 1989. The drain had a small amount of flow coming through it at the time of the inspection.

3.Installation of final surface drainage systems.

All interim slopes are maintained at their proper grade. The final slopes are surveyed to assure they are correct. Also the two final designed rip-rap ditches were installed as per the permitted plan and are extended as more lifts are added.

4.Placement and compaction of fill materials.

The lower site (area 2) was leveled in Sept. 2006. Trash and extraneous material were removed. Lift was sampled as required. The containment trench in the upper cell for sediment pond cleanings was spread out and leveled.

5.Final grading and revegetation of fill.

See No. 3.
The sub-soil berm surrounding the site was seeded shortly after construction.

6.Appearances of instability, structural weakness, and other hazardous conditions.

No weakness or instabilities are evident at this time.

her Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the Area No. 1 cell is 460,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift in cell 1 is 6359.00 ft and cell 2 is 6328.62 The final design elevation will be 6,369 ft. The volume remaining in cell 1 is approximately 9% capacity. The Lower Cell 2 was at approximately 93% capacity.
As of Sept. 1, 2007, 14,398.2 cubic yards of material was hauled in 2007.

Certification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

Cert Stamp

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer
(Full Name and Title)

Signature: John Christensen **Date:** 10/31/07

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	Sept. 26, 2007
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	ELK CANYON/ORIGINAL SITE	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-01	
Inspection Date	Sept. 10, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 3rd Quarter Inspection		
	Attachments to Report? XNo Yes		

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

The construction of both sites have been complete for some time in excess of 18 years. The foundations appear to be stable.

Placement of underdrains and protective filter systems.

None

Installation of final surface drainage systems.

The slopes of both sites have no rills, gullies or sloughage present.

Placement and compaction of fill materials.

No fill material is being placed at either site, since both are at their designed capacity. The Elk Canyon site contains approximately 24,000 cubic original site 90,000 cubic yards of fill material.

Final grading and revegetation of fill.

The sites are at capacity. The final grades are established and are revegetated.

Appearances of instability, structural weakness, and other hazardous conditions.

None were observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There was minimal coal stored at the Elk Canyon pad at the time of inspection.

Certification Statement **I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.**

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: John Christensen **Date:** 10/31/07

LICENSED PROFESSIONAL ENGINEER JOHN CHRISTENSEN No. 165651 STATE OF UTAH

P.E. Number & State: 165651, Utah

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, UT 84528

January 14, 2008

Ms. Pamela Grubaugh-Littig
Permit Supervisor
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Dear Ms. Grubaugh-Littig:

I am enclosing for submittal the 4th. Quarter Engineering Inspection Reports for Cottonwood/Wilberg/Des Bee Dove Waste Rock Site and the old Waste Rock Site. Also, the Deer Creek Waste Rock Site and Elk Canyon/Original Site are enclosed.

Sincerely,

John Christensen, P.E.
Sr. Construction Engineer

Encls.

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	Dec. 21, 2007
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	Waste Rock Disposal Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-02	
Inspection Date	Dec. 10, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 Fourth Quarter Inspection		
	Attachments to Report? x No Yes		

Field Evaluation

1.Foundation preparation, including the removal of all organic material and topsoil.

All construction was done according to the permitted, professional engineered design specifications.

2.Placement of underdrains and protective filter systems.

An underdrain was installed when the site was constructed in 1989. The drain had a small amount of flow coming through it at the time of the inspection.

3.Installation of final surface drainage systems.

All interim slopes are maintained at their proper grade. The final slopes are surveyed to assure they are correct. Also the two final designed rip-rap ditches were installed as per the permitted plan and are extended as more lifts are added.

4.Placement and compaction of fill materials.

The lower site (area 2) was leveled in Sept. 2006. Trash and extraneous material were removed. Lift was sampled as required. The containment trench in the upper cell for sediment pond cleanings was spread out and leveled.

5.Final grading and revegetation of fill.

See No. 3.
The sub-soil berm surrounding the site was seeded shortly after construction.

6.Appearances of instability, structural weakness, and other hazardous conditions.

No weakness or instabilities are evident at this time.

her Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the Area No. 1 cell is 460,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift in cell 1 is 6359.67 ft and cell 2 is 6328.62 The final design elevation will be 6,369 ft. The volume remaining in cell 1 is approximately 9% capacity. The Lower Cell 2 was at approximately 98% capacity.
As of Dec. 1, 2007, 17,037.9 cubic yards of material was hauled in 2007.

Certification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

[Cert. Stamp]

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer
(Full Name and Title)

Signature: John Christensen **Date:** 1/10/08

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	Dec. 21, 2007
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	**Pile Name**	ELK CANYON/ORIGINAL SITE	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-01	
Inspection Date	Dec. 10, 2007		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2007 4th Quarter Inspection		
	Attachments to Report? XNo Yes		

Field Evaluation

Foundation preparation, including the removal of all organic material and topsoil.

The construction of both sites have been complete for some time in excess of 18 years. The foundations appear to be stable.

Placement of underdrains and protective filter systems.

None

Installation of final surface drainage systems.

The slopes of both sites have no rills, gullies or sloughage present.

Placement and compaction of fill materials.

No fill material is being placed at either site, since both are at their designed capacity. The Elk Canyon site contains approximately 24,000 cubic original site 90,000 cubic yards of fill material.

Final grading and revegetation of rill.

The sites are at capacity. The final grades are established and are revegetated.

Appearances of instability, structural weakness, and other hazardous conditions.

None were observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There was minimal coal stored at the Elk Canyon pad at the time of inspection. Snow covered the site at the time of the inspection.

Certification Statement I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure 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.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: _____ **Date:**

P.E. Number & State: 165651, Utah

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
1/10/08
No. 165651
STATE OF UTAH

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/019	**Report Date**	MARCH 30, 2007
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 30, 2007
Inspected By	Rick Cullum/ John Christensen
	1ST Quarter Inspection 2007

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

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/019	Report Date	June 26, 2007
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 18, 2007
Inspected By	Rick Cullum/ John Christensen
	2nd Quarter Inspection 2007

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

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

Elevation

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	7347.25 Small amount From rain	small amount From rain	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	0.10 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.24 AF	0.19 AF	.26 AF
Water Impounded	0.0 AF	0.0 AF	0.12 AF

Changes, Comments,

The repairs to the North and South Ponds were completed in April and May 2007. During the repairs the remaining sediment was cleaned and hauled to the waste rock site.

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:** 10/31/07

Signature: Richard Cullum **Date:** 10-31-07

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/019	Report Date	Dec 21, 2007
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. 10, 2007
Inspected By	Rick Cullum/ John Christensen
	4th Quarter Inspection 2007

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	7363.33	7334.2	6770.0

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

Elevation

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	DRY 7" SNOW	DRY 7" SNOW	DRY 7" SNOW
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	0.10 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.24 AF	0.19 AF	.26 AF
Water Impounded	0.0 AF	0.0 AF	0.12 AF

Changes, Comments,

The repairs to the North and South Ponds were completed in April and May 2007. During the repairs the remaining sediment was cleaned and hauled to the waste rock site.

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

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Signature: John Christensen **Date:** 1/10/08

Signature: Richard Cullen **Date:**

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	MARCH. 30, 2007
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
3			
Inspection Date	3/30/07 **Waste Rock Pond** 3/30/07		
Inspected By	Rick Cullum / John Christensen		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	1ST Quarter 2007 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

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	7227.73 few ice chunks.	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	2.76 A.F. 88% at 7215.1 ft.	None
Remaining Sediment Storage Capacity	0.36 A.F.	0.98 A.F.
Water impounded	6.80 A.F.	NONE
Changes, Comments, etc.	The pond was partially cleaned in the fourth quarter of 2005. The pond is being decanted in preparation for cleaning.	No change from last inspection.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER JOHN CHRISTENSEN No. 165651 STATE OF UTAH

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Signature: John Christensen **Date:** 4/10/07

Signature: Richard Cullum **Date:** 4-11-07

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	JUNE 26, 2007
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

3

Inspection Date	6/25/07 **Waste Rock Pond** 6/15/07
Inspected By	Rick Cullum / John Christensen
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2ND Quarter 2007 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		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.

	Mine Site Pond	Waste Rock Pond
Water Elevation	7222.88	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	1.25 A.F. @ 7211.6	None
Remaining Sediment Storage Capacity	.62 A.F.	0.59 A.F.
Water impounded	5.60 A.F.	NONE
Changes, Comments, etc.	The pond was cleaned in the second quarter of 2007.	No change from last inspection.

Qualification Statement

LICENSED PROFESSIONAL ENGINEER
JOHN CHRISTENSEN
No. 165651
STATE OF UTAH

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Signature: John Christensen **Date:** 7/20/07

Signature: Richard Cullum **Date:** 7-23-07

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	Sept. 26, 2007
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

3

Inspection Date	9/12/07 **Waste Rock Pond** 9/10/07
Inspected By	Rick Cullum / John Christensen
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	3rd Quarter 2007 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	7224.62	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	1.25 A.F. @ 7211.6	None
Remaining Sediment Storage Capacity	.62 A.F.	0.59 A.F.
Water impounded	6.53 A.F.	NONE
Changes, Comments, etc.	The pond was cleaned in the second quarter of 2007.	No change from last inspection.

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LICENSED PROFESSIONAL ENGINEER
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STATE OF UTAH

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Signature: John Christensen **Date:** 10/31/07

Signature: Richard Cullum **Date:** 10-31-07

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/018	**Report Date**	Dec. 21, 2007
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

3

Inspection Date	12/13/07 **Waste Rock Pond** 12/10/07	
Inspected By	Rick Cullum / John Christensen	
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	4th Quarter 2007 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

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	7227.47	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	1.25 A.F. @ 7211.6	None
Remaining Sediment Storage Capacity	.62 A.F.	0.59 A.F.
Water impounded	8.30 A.F.	NONE
Changes, Comments, etc.	The pond was cleaned in the second quarter of 2007. The pond was frozen at time of the inspection.	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:** 1/10/08
Signature: Richard Cullum **Date:**

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/009	**Report Date**	MARCH 30, 2007
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 30, 2007
Inspected By	John Christensen / Rick Cullum
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	1ST Quarter 2007 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
Permit Number	ACT/015/009	**Report Date**	JUNE 26, 2007
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 18, 2007
Inspected By	John Christensen / Rick Cullum
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2ND Quarter 2007 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	7181.16
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	0.16 A.F.
Remaining Sediment Storage Capacity	0.122 A.F.
Water Impounded	0.04 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

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Signature: John Christensen **Date:** 7/20/07

Signature: Richard Cullen **Date:** 7-23-07

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/009	**Report Date**	Sept. 26, 2007
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. 10, 2007
Inspected By	John Christensen / Rick Cullum
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	3rd Quarter 2007 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	7184.59
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	0.16 A.F.
Remaining Sediment Storage Capacity	0.122 A.F.
Water Impounded	0.33 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

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Signature: John Christensen **Date:** 10/31/07
Signature: Richard Cullum **Date:** 10-31-07

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	ACT/015/009	**Report Date**	Dec. 21, 2007
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. 10, 2007
Inspected By	John Christensen / Rick Cullum
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	4th Quarter 2007 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	7182.84 (Pond was frozen at the time of inspection)
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	0.16 A.F.
Remaining Sediment Storage Capacity	0.122 A.F.
Water Impounded	0.18 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

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Signature: John Christensen **Date:** 1/10/08
Signature: Richard Cullum **Date:**

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

CONTENTS

Vegetation Monitoring Report (Reported for Cottonwood, Des Bee Dove, Deer Creek, and Trail Mountain mines)

MT NEBO SCIENTIFIC, INC.
research & consulting

March 17, 2008

Dennis Oakley
Energy West Mining Company
P.O. Box 310
15 North Main Street
Huntington, Utah 84528

Dear Mr. Oakley:

Enclosed please find three (3) hard copies (1 bound, 2 unbound) and a CD with electronic files of the following vegetation monitoring reports:

VEGETATION MONITORING
FOR PHASE III BOND RELEASE: YEAR 1
AT THE
COTTONWOOD FAN PORTAL AREA
2007

REVEGETATION MONITORING
DES-BEE-DOVE MINE SITE
YEAR FOUR
2007

VEGETATION MONITORING:
REFERENCE AREAS
2007

Please call or write if you have questions or comments. Your business is much appreciated.

Sincerely,

(Transmitted Electronically)

Patrick Collins, Ph.D.
Biologist/Environmental Consultant

Enclosures

330 East 400 South, Ste. 6, P.O. Box 337, Springville, Utah 84663
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VEGETATION MONITORING
FOR PHASE III BOND RELEASE: YEAR 1
AT THE
COTTONWOOD FAN PORTAL AREA
2007

RECLAIMED SLOPE '81
RECLAIMED SLOPE '98
AND THE
PINYON-JUNIPER REFERENCE AREA

Prepared by

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March 2008

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VEGETATION MONITORING
FOR PHASE III BOND RELEASE: YEAR 1
AT THE
COTTONWOOD FAN PORTAL AREA
2007

INTRODUCTION

Following final reclamation and revegetation of a mine site, a "*responsibility period*" for at least 10 years is required before the mine operator can submit a request for *Final or Phase III Bond Release* through the State of Utah, Division of Oil, Gas & Mining (DOGM). This period of time is thought to be long enough to determine whether or not adequate re-establishment of the reclaimed plant community has occurred on the site. The vegetation is usually monitored throughout this time period, but beginning at year 9 of the 10-year period, intensive sampling can be initiated for two consecutive years to determine whether or not the reclaimed site has met pre-determined revegetation success standards. The re-established 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 often specific requirements associated with cover, density, production and diversity of reclaimed lands. Success standards for two reclaimed slopes within the Cottonwood Fan Portal Area, the **Reclaimed Slope '81** and the **Reclaimed Slope '98**, had pre-determined specific parameters to be compared from a native, undisturbed plant community located nearby called the **Pinyon-Juniper Reference Area**.

The purpose of this document was to compare results of the quantitative data and indices formulated from it, of the reclaimed slopes to that of the reference area. The contents of this report provide **Year 1** results of the two consecutive years of sampling required prior to submittal of an application for Phase III Bond Release by the mine operator through DOGM.

General Site Description

The Cottonwood Fan Portal Area is located in Cottonwood Canyon, approximately 12 miles northwest of Orangeville, Utah. Elevation of the study sites ranged between 7,100 ft and 7,600 ft above sea level. Slopes of the study areas were relatively steep at approximately 35 degrees with exposures primarily to the west-southwest.

The descriptive name provided for the "Reclaimed Slope '81" implies the slope's general history – it is a reclaimed slope where the plant communities that once existed in the area were disturbed by previous mining activities, then were reclaimed and re-seeded in 1981.

Prior to disturbance, the native vegetation was most likely dominated by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osterosperma*), with Salina wildrye (*Elymus salinus*) as the dominant understory species.

Similarly named, the "Reclaimed Slope '98" was also the site of previous disturbance and was reclaimed and re-seeded in 1998. With similar slopes and exposures as the Reclaimed Slope '81,

this area was also likely dominated by the same plant species before it was disturbed by mining activities.

A Pinyon-Juniper Reference Area was chosen earlier to be used to create standards for revegetation success following final reclamation. The reference area was dominated by the same plant species as those listed above for the reclaimed slopes (before they were disturbed). The reference area was chosen earlier to comply with guidelines provided by the State of Utah, Division of Oil, Gas & Mining (DOGM) and was thought to have similar slopes, soils, exposure, species composition, precipitation, elevation and other environmental variables.

METHODS

Vegetation establishment on the reclaimed slopes has been monitored for several years following slope reclamation. Sampling methods have remained consistent for all monitoring years and follow those methods suggested in guidelines provided by DOGM.

Transect Placement

Transect lines for quantitative sampling were randomly placed the length of the reclaimed slopes and reference areas to adequately represent each sample area as a whole. From these transect lines, sample locations were chosen using random numbers at right angles to them.

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).

Density

Density estimates for the woody plant species on the reclaimed slopes and reference area were made using a distance method called the point-quarter method. 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" methods were employed by placing four additional quadrats around the clipped quadrat, then estimating the production of them relative to the clipped plot. Herbaceous and woody species production were recorded separately.

Sample Adequacy

Sample adequacy for cover and density was attempted with the goal that 90% of the samples were within 10% of the true mean for the plant communities in the area. The following formula was used:

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

where,

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

Diversity

Two diversity indices have been reported in this document for the reclaimed area 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 *i*th 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.

Photographs

Color photographs were taken of the sample areas and are included in this report.

RESULTS

Reclaimed Slope '81

Quantitative sampling the vegetation on the Reclaimed Slope '81 showed that the area was dominated by sagebrush (*Artemisia tridentata*), Great Basin wildrye (*Elymus cinereus*), fourwing saltbush (*Atriplex canescens*) and rubber rabbitbrush (*Chrysothamnus nauseosus*). For a list of all plant species present in sample quadrats along with the cover and frequency values, refer to Table 1.

The total living cover of this reclaimed slope was estimated at 48.30% (Table 2-A). Of that living cover, shrubs comprised 60.45% of it, grasses 31.44% and forbs 8.10% (Table 2-B). The total woody species density was estimated at 4,360 individuals per acre and was dominated by

sagebrush, rubber rabbitbrush and fourwing saltbush (Table 3). Total annual biomass production of the slope was estimated to be 1,395 pounds per acre, with 799 pounds coming from herbaceous species and 596 pounds from woody plants (Table 4).

Reclaimed Slope '98

The Reclaimed Slope '98 was dominated by Gt. Basin wildrye, Pacific aster (*Aster ascendens*), western wheatgrass (*Elymus smithii*) and Lewis flax (*Linum perenne* ssp. *lewisii*). For a list of all plant species present in sample quadrats along with their cover and frequency values, refer to Table 5.

The total living cover for this reclaimed slope was estimated to be 45.25% (Table 6-A). The composition of the cover by lifeform was 55.89% grasses, 25.18% forbs and 18.93% grasses (Table 6-B). Woody species density in this area consisted of 2,888 individuals per acre with the dominants for this parameter consisting of fourwing saltbush, rubber rabbitbrush sagebrush (Table 7). Productivity for the slope estimated at 1373 pounds per acre with 1035 pounds coming from herbaceous and 338 pounds from woody species (Table 8).

Pinyon-Juniper Reference Area

The reference area chosen earlier to be used for final revegetation success standard was located up-slope from the two reclaimed slopes in an undisturbed pinyon-juniper plant community. This

community was also sampled during the same period to enable the results to be compared to the results of the reclaimed slopes.

Overstory cover of the reference area was estimated at 4.08%, all from pinyon pine *(Pinus edulis)*. The understory living cover was dominated by Salina wildrye, rubber rabbitbrush, pinyon pine, Utah juniper (*Juniperus osteosperma*) and Mormon tea (*Ephedra viridis*). For a cover and frequency listing of all species present in the sample quadrats refer to Table 9.

The total living cover of the Pinyon-Juniper Reference Area was estimated at 33.67%, of which 29.58% was from understory cover and 4.08% from overstory (Table 10-A). The composition of this cover consisted of 60.37% grasses, 34.26% shrubs and 5.37% forbs (Table 10-B). Woody species density of this area consisted of 895 individuals per acre with the most common plants for this parameter consisting of pinyon-pine, rubber rabbitbrush, Mormon tea, Utah serviceberry (*Amelanchier utahensis*) and Utah juniper (Table 11). Total annual biomass production was estimated at 449 pounds per acre and was about equally represented by woody and herbaceous plants (Table 12).

Comparisons Between Areas

Statistical tests on the mean living covers, densities and productivity measurements were employed to compare the reclaimed slopes with the reference area. Additionally, diversity indices of all areas were also calculated so that comparisons of these parameters could also be

made.

Reclaimed Slope '81 *vs.* the P-J Reference Area

When a Student's t-test analysis was employed to compare the mean total living **cover** of the Reclaimed Slope '81 with the Pinyon-Juniper Reference Area, the test suggested that the reclaimed slope was significantly greater than the reference area (Table 13-A). Moreover, when woody species **density** of the two areas were compared by the same statistical analysis, results here also suggested that the number of woody plants per acre for reclaimed slope was greater than that of the reference area. Next, the mean total annual biomass **production** of the two areas were compared and results were consistent – the reclaimed slope had more the 3 times the production of the reference area. This difference was, of course, statistically significant. Finally, two **diversity** indices, *MacArthur's Index* and the *Average Number of Species per Quadrat* of the two areas were compared. The MacArthur's Index of the two areas were very similar (the reference area index was slightly higher); the Average Number of Species per Quadrat was greater for the reclaimed slope (Table 14).

Reclaimed Slope '98 *vs.* the P-J Reference Area

When the total living **cover** of the Reclaimed Slope '98 was compared with the cover of the Pinyon-Juniper Reference Area, Student's t-test suggested that the difference was significant – or the total living cover of the reclaimed slope was significantly greater than the reference area

(Table 13-B). Woody species **density** was also compared of these two areas with the same results – the density of the reclaimed slope was greater. **Production** of the Reclaimed Slope '98 was also significantly greater than the Pinyon-Juniper Reference Area according to a t-test. Finally, when **diversity** indices were compared between the reclaimed slope and reference area, both diversity indices used were greater for the reclaimed slope (Table 14).

DISCUSSION & SUMMARY

Quantitative sampling was conducted in three different plant communities at the Cottonwood Fan Portal Area in Cottonwood Canyon, Emery County, Utah. The sampling was conducted to provide Year 1 of two consecutive sample years required prior to submittal of an application for Phase III Bond Release of the reclaimed areas. The reclaimed areas studied were the Reclaimed Slope '81 and Reclaimed Slope '98. The data from these re-established plant communities have been compared to a Pinyon-Juniper Reference Area, or an area chosen previously to be used to provide revegetation success standards following final reclamation.

Statistical comparison and other indices suggest that the reclaimed areas in the Cottonwood Fan Portal Area have met or exceeded those standards that were pre-determined to be used at the time of final reclamation. The parameters of the reclaimed area that were compared statistically with the reference area were: total living cover, woody species density and annual biomass production. Other parameters that can be compared by a review of the summary tables include: cover by individual plant species and lifeform composition. Finally, diversity of the reclaimed slopes was greater (or nearly equal to) than that of the reference area.

DATA SUMMARY TABLES

Reclaimed Slope '81

Table 1: Cover and frequency by plant species at the Cottonwood Fan Portal area.

RECLAIMED SLOPE '81	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Artemisia tridentata	17.04	17.55	74.00
Atriplex canescens	6.60	15.73	22.00
Atriplex confertifolia	0.50	3.50	2.00
Chrysothamnus nauseosus	5.20	9.90	32.00
FORBS			
Aster foliaceus	3.60	7.42	24.00
GRASSES			
Bromus inermis	0.80	4.04	4.00
Elymus cinereus	8.46	13.39	42.00
Elymus junceus	4.10	6.71	32.00
Elymus lanceolatus	0.80	2.71	10.00
Elymus smithii	1.20	2.93	16.00

Table 2: Total cover and composition at the Cottonwood Fan Portal area.

RECLAIMED SLOPE ' 81	MEAN	STD. DEV.
A. COVER		
Total Living Cover	48.30	12.91
Litter	12.10	6.01
Bareground	15.50	7.16
Rock	24.10	11.43
B. % COMPOSITION		
Shrubs	60.45	27.35
Forbs	8.10	16.65
Grasses	31.44	24.90

Reclaimed Slope '81 (continued)

Table 3: Woody species density at the Cottonwood Fan Portal area.

RECLAIMED SLOPE '81	*No/Ac*
Artemisia tridentata	3124.74
Atriplex canescens	363.34
Atriplex confertifolia	54.50
Chrysothamnus nauseosus	817.52
TOTAL	**4360.10**

Table 4: Production at the Cottonwood Fan Portal area.

RECLAIMED SLOPE '81

	Pounds/Acre	
LIFEFORM	MEAN	STD. DEV.
Herbaceous	798.60	596.68
Woody	596.29	551.34
TOTAL	**1394.89**	448.20

Reclaimed Slope '98

Table 5: Cover and frequency by plant species at the Cottonwood Fan Portal area.

RECLAIMED SLOPE '98	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Artemisia nova	0.13	1.02	1.67
Artemisia tridentata	2.25	6.35	15.00
Atriplex canescens	3.58	8.32	26.67
Atriplex confertifolia	0.75	4.06	3.33
Chrysothamnus nauseosus	1.72	4.85	13.33
FORBS			
Achillea millefolium	0.17	1.28	1.67
Aster ascendens	5.83	6.05	60.00
Linus perenne ssp. lewisii	4.40	4.98	53.33
Penstemon palmeri	0.70	2.40	10.00
GRASSES			
Bromus carinatus	0.33	1.55	5.00
Elymus cinereus	13.22	13.51	66.67
Elymus lanceolatus	2.83	5.58	25.00
Elymus salinus	1.25	4.34	8.33
Elymus smithii	5.00	7.07	41.67
Elymus spicatus	1.67	5.22	11.67
Hilaria jamesii	0.08	0.64	1.67
Poa pratensis	0.17	1.28	1.67
Stipa hymenoides	1.17	5.80	5.00

Table 6: Total cover and composition at the Cottonwood Fan Portal area.

RECLAIMED SLOPE '98		
A. COVER	MEAN	STD. DEV.
Total Living Cover	45.25	11.49
Litter	10.33	3.97
Bareground	20.50	8.45
Rock	23.92	11.18
B. % COMPOSITION		
Shrubs	18.93	25.29
Forbs	25.18	19.31
Grasses	55.89	24.12

Reclaimed Slope '98 (continued)

Table 7: Woody species density at the Cottonwood Fan Portal area.

RECLAIMED SLOPE '98	*No/Ac*
Amelanchier utahensis	10.32
Artemisia nova	185.67
Artemisia tridentata	546.70
Atriplex canescens	1371.90
Atriplex confertifolia	30.95
Cercocarpus ledifolius	10.32
Chrysothamnus nauseosus	660.16
Eriogonum corymbosum	10.32
Rhus aromatica	10.32
Rosa woodsii	30.95
Salix exigua	10.32
Symphoricarpos oreophilus	10.32
TOTAL	**2888.20**

Table 8: Production at the Cottonwood Fan Portal area.

RECLAIMED SLOPE '98	Pounds/Acre	
LIFEFORM	MEAN	STD. DEV.
Herbaceous	1035.33	620.59
Woody	337.62	524.27
TOTAL	**1372.95**	615.37

Pinyon-Juniper Reference Area

Table 9: Cover and frequency by plant species at the Cottonwood Fan Portal area.

PINYON-JUNIPER REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
Pinus edulis	4.08	9.81	16.67
UNDERSTORY			
SHRUBS			
Amelanchier utahensis	0.50	2.69	5.00
Atriplex confertifolia	1.08	4.19	6.67
Chrysothamnus nauseosus	2.17	7.55	10.00
Ephedra viridis	1.58	5.51	10.00
Juniperus osteosperma	1.58	5.51	8.33
Mahonia repens	1.30	4.85	10.00
Pinus edulis	2.00	5.10	16.67
FORBS			
Cryptantha sp.	0.58	1.61	11.67
Descurainia pinnata	0.25	1.09	5.00
Stanleya pinnata	0.62	2.33	8.33
GRASSES			
Elymus salinus	16.25	12.06	53.33
Stipa hymenoides	1.67	4.35	13.33

Table 10: Total cover and composition at the Cottonwood Fan Portal area.

PINYON-JUNIPER REFERENCE AREA

A. COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	4.08	9.81
Understory Living Cover (u)	29.58	8.48
Litter	22.33	12.50
Bareground	14.75	8.96
Rock	33.33	12.67
o + u	33.67	8.84
B. % COMPOSITION		
Shrubs	34.26	37.90
Forbs	5.37	11.25
Grasses	60.37	35.89

Pinyon-Juniper Reference Area (continued)

Table 11: Woody species density at the Cottonwood Fan Portal area.

PINYON-JUNIPER REFERENCE AREA

	No/Ac
Amelanchier utahensis	82.00
Atriplex canescens	3.73
Atriplex confertifolia	44.73
Cercocarpus montanus	14.91
Chrysothamnus nauseosus	149.09
Ephedra viridis	126.73
Eriogonum corymbosum	22.36
Juniperus osteosperma	82.00
Pied Pinus edulis	365.28
Pseudotsuga menziesii	3.73
TOTAL	**894.56**

Table 12: Production at the Cottonwood Fan Portal area.

PINYON-JUNIPER REFERENCE AREA

	Pounds/Acre	
LIFEFORM	MEAN	STD. DEV.
Herbaceous	237.16	148.89
Woody	212.01	291.75
TOTAL	**449.16**	232.97

TABLE 13: Statistical summary sheet for the reclaimed slopes and reference areas at the Cottonwood Fan Portal Area (2007).

A.				
RECLAIMED '81 SLOPE				
Total Living Cover	$\bar{x}$=48.30	s=12.91	n=50	nMIN=19.33
Density	$\bar{x}$=4360.10	s=1952.10	n=60	nMIN=54.24
Production	$\bar{x}$=1394.89	s=448.20	n=100	nMIN=27.94
P-J REFERENCE AREA				
Total Living Cover	$\bar{x}$=33.67	s=8.84	n=60	nMIN=18.65
Density	$\bar{x}$=894.56	s=248.06	n=60	nMIN=20.81
Production	$\bar{x}$=449.16	s=232.97	n=60	nMIN=72.80
STATISTICAL ANALYSES				
Total Living Cover	t=7.024	df=108	SL=p<.001	
Density	t=13.642	df=118	SL=p<.001	
Production	t=15.150	df=158	SL=p<.001	
B.				
RECLAIMED '98 SLOPE				
Total Living Cover	$\bar{x}$=45.25	s=11.49	n=60	nMIN=17.45
Density	$\bar{x}$=2888.20	s=1062.81	n=70	nMIN=36.64
Production	$\bar{x}$=1372.95	s=615.37	n=100	nMIN=54.36
P-J REFERENCE AREA				
Total Living Cover	$\bar{x}$=33.67	s=8.84	n=60	nMIN=18.65
Density	$\bar{x}$=894.56	s=248.06	n=60	nMIN=20.81
Production	$\bar{x}$=449.16	s=232.97	n=60	nMIN=72.80
STATISTICAL ANALYSES				
Total Living Cover	t=6.187	df=118	SL=p<.001	
Density	t=14.195	df=128	SL=p<.001	
Production	t=11.147	df=158	SL=p<.001	

$\bar{x}$= sample mean, s = sample standard deviation, n = sample size,
nMIN= minimum adequate sample (@ 90% ± .10)
NS = non-significant, t = Student's t-value, df = degrees of freedom,
SL = significance level, p = probability level

TABLE 14: Diversity of the Cottonwood Fan Portal Area (2007).

A.
MacArthur's Index ($1/\sum p_i^2$) =

_____Reclaimed Slope '81: 6.207

_____Reclaimed Slope '98: 8.389

_____P-J Reference Area: 6.316

B.
Average No. Species/Quadrat =

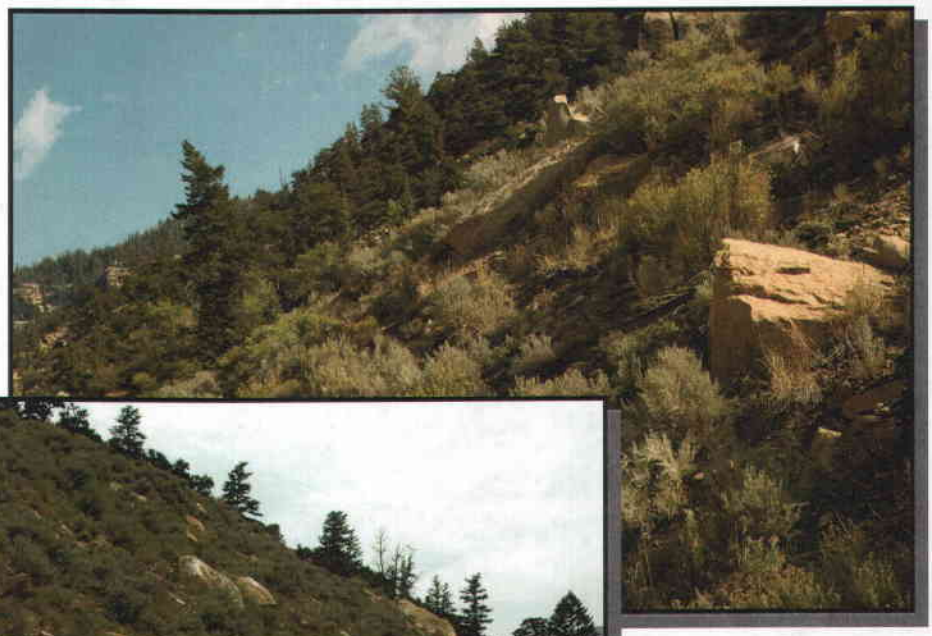
_____Reclaimed Slope '81: 2.58

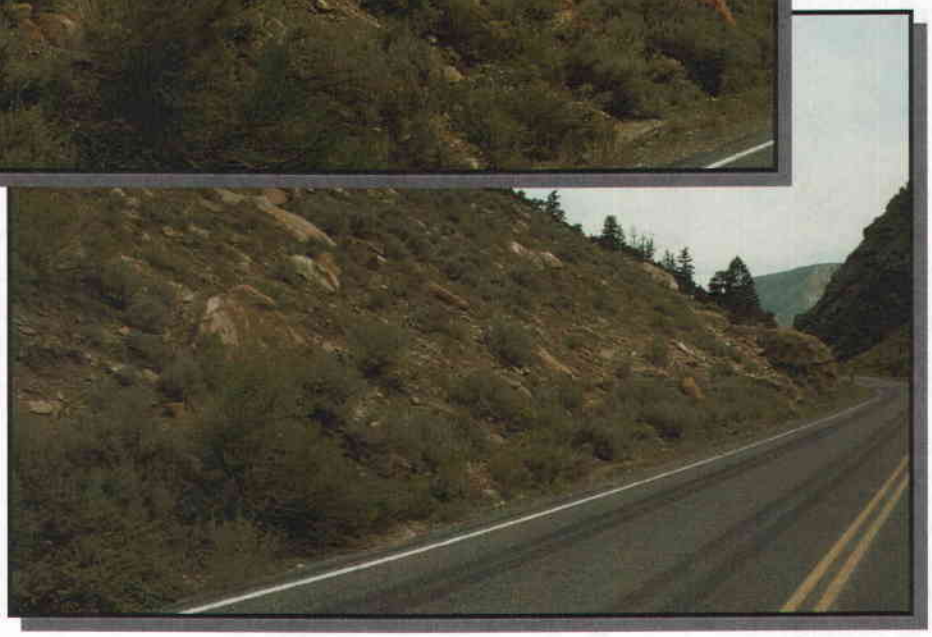
_____Reclaimed Slope '98: 3.52

_____P-J Reference Area: 1.58

COLOR PHOTOGRAPHS OF THE SAMPLE AREAS

RECLAIMED SLOPE '81





RECLAIMED SLOPE '98

PINYON-JUNIPER REFERENCE AREA

REVEGETATION MONITORING
DES-BEE-DOVE MINE SITE

YEAR FOUR
2007

The Des-Bee-Dove Reclaimed Mine Site

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March 2008

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REVEGETATION MONITORING
DES-BEE-DOVE MINE SITE
2007

INTRODUCTION

Purpose of Study

The Des-Bee-Dove mine site is an area with a coal mining history. The disturbed areas of the mine site have been reclaimed. Vegetation is becoming established on the reclaimed areas. The purpose of this study is to provide revegetation monitoring for **Year 4** of the *10-Year Responsibility Period*, or the period of time required following final revegetation of all reclaimed coal mines before mine operators may apply for *Phase III* or *Final Bond Release* through State of Utah, Division of Oil, Gas & Mining (DOGM) . In order to achieve approval for Phase III Bond Release, vegetation of the reclaimed site must meet specific standards for revegetation success.

Brief Mine Site History

State of Utah on-line information provides a brief history of the Des-Dee-Dove Mine site. Their description follows below:

> *The Des-Bee-Dove Mine complex (the Deseret, Beehive and Little Dove Mines) was acquired by Utah Power and Light in 1972 from Deseret Coal Company, an LDS Church enterprise. Two coal seams, the Hiawatha and Blind Canyon, were mined using the room and pillar method. The LDS Church and the Castle Valley Fuel Company mined the property from 1938 to 1947. Prior to this, from 1936 to 1938, the mine workings were operated by two men, Edward and Broderick. Mining first occurred in the canyon in 1898 when the Griffith Mine was started.*
>
> *The Des-Bee-Dove mines were operated by Utah Power and Light Company until 1989 when the*

merging between PacifiCorp and UP&L took place. In 1990, Energy West Mining Company, a wholly owned subsidiary of PacifiCorp replaced the UP&L Mining Division as operator of its mines: Cottonwood/Wilberg, Deer Creek, Des-Bee-Dove, and Trail Mountain. The Des-Bee-Dove Mine permit area encompassed over 2,800 acres, a combination of fee land, and state and federal leases. Leases have been relinquished and the permit area has been reduced to 154 acres. The mine complex has been in temporary cessation since 1987 and was reclaimed in 2003.

Site Description

The Des-Bee-Dove mine site is located approximately 10 miles northwest of the town of Castle Dale, Utah. Elevation of the study sites ranged between 7,200 ft and 8,000 ft above sea level. Slopes of the study area were variable, but were often relatively steep and had various exposures to the sun.

Prior to disturbance by mining, the native vegetation was most likely dominated by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osterosperma*), with Salina wildrye (*Elymus salinus*) as the dominant understory species.

METHODS

Quadrat Placement

Sample quadrats for quantitative sampling the vegetation were randomly placed throughout the reclaimed areas to adequately represent each site as a whole.

Cover, Frequency & 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).

Sample Size & Adequacy

Sampling adequacy was calculated using formula 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

However, sample size was also based on the size of each subdivision within the reclaimed areas resulting in more samples taken in larger areas.

Vegetation Sample Area Map

The locations of the general base map was prepared by Energy West Mining Company. A Vegetation Sample Area Map using this base map has been included in this report.

Photographs

Representative color photographs were taken of the sample areas and have been included in this report.

RESULTS

Reclaimed Areas

The reclaimed Des-Bee-Dove mine site was subdivided into separate areas (Table 1). These areas were sampled and reported independently to allow closer scrutiny of individual sites. The sample areas are shown on the vegetation sample area map and color photographs later in this report.

Table 1: Sample areas, acreage and sample sizes of the reclaimed Des-Bee-Dove mine site.

Sample Area	Acres	Cover (n)	Density (n)
Access Trail	3.5	10	10
East Slope	5.0	50	50
Bathhouse Slope	7.6	75	75
Deseret Mine Area	2.7	25	25
Switchbacks	1.1	10	10
Substation Area	0.4	5	5
Beehive/Little Dove Mine Area	2.1	20	20
Pinyon-Juniper Reference Area	1.0	20	20
TOTALS	**23.4**	**215**	**215**

Reference Area

A pinyon-juniper reference area previously chosen to represent revegetation success standards was also sampled in 2007 to make preliminary Year 4 data comparisons with the reclaimed areas.

Summarized Data Tables

Results of quantitatively sampling the reclaimed areas at the Des-Bee-Dove mine site have been provided in summary tables of this report. To facilitate access to the summarized cover, composition and density data for each sample area in this report refer to Table 2. The data summaries are shown on Table 3 *through* Table 26. A list of the common plant names found in the summary tables is shown on Table 27.

Table 2: Data Locator.

SAMPLE AREA	Cover by Species	Total Cover	Compos-ition	Woody Species Density
Access Trail	Table 3	Table 4 (A)	Table 4 (B)	Table 5
East Slope	Table 6	Table 7 (A)	Table 7 (B)	Table 8
Bathhouse Slope	Table 9	Table 10 (A)	Table 10 (B)	Table 11
Deseret Mine Area	Table 12	Table 13 (A)	Table 13 (B)	Table 14
Switchbacks	Table 15	Table 16 (A)	Table 16 (B)	Table 17
Substation Area	Table 18	Table 19 (A)	Table 19 (B)	Table 20
Beehive/Little Dove Mine Area	Table 21	Table 22 (A)	Table 22 (B)	Table 23
P-J Reference Area	Table 24	Table 25 (A)	Table 25 (B)	Table 26

SUMMARY & CONCLUSIONS

The **total living cover** of the pinyon-juniper reference area was estimated at nearly 30 percent. As one can easily observe from Figure 1, most of the reclaimed areas have met or exceeded the total living cover of the reference area standard. The only exception to this statement was the Access Trail, but it approached the cover of the reference area with a value of nearly 26 percent. The highest total living cover for all study areas was the Substation Area with a value of 44 percent.

Also notable from the summary tables is that most all species present in the sample

quadrats were "desirable" plant species as opposed to "weedy" exotics that sometimes invade disturbed lands.

Woody species density of all reclaimed areas exceeded 710 individuals per acre, or the total density of the reference area. Figure 2 provides a graphic representation of the density values for all reclaimed and reference areas. Most of the woody species present in the density measurements were those that were seeded or planted during revegetation procedures. The highest density value was on the Bathhouse Slope which had a total density of 2,936 individuals per acre.

MacArthur's Index that represent a **diversity** index for all sample areas suggested that the reclaimed areas had greater diversity than that of the reference area (Figure 3). The highest diversity value was the Bathhouse Slope.

In conclusion, Year 4 quantitative sampling suggests that revegetation of the Dee-Bee-Dove mine site is progressing well for total living cover, woody species density and diversity when compared to the Pinyon-Juniper Reference Area – the area chosen to be used for revegetation success standards.

DATA SUMMARY TABLES

Following are the summarized data for all sample areas. As mentioned, Figures 1 through 3 have also been prepared for specific parameters in these tables and have been included later in this report.

Access Trail

Table 3: Cover and frequency by plant species at the Des-Bee-Dove mine site.

ACCESS TRAIL	MEAN	STD. DEV.	FREQUENCY
TREES & SHRUBS			
Atriplex canescens	5.50	12.34	20.00
Atriplex confertifolia	4.00	6.24	30.00
Atriplex gardneri	0.50	1.50	10.00
Ceratoides lanata	0.50	1.50	10.00
Chrysothamnus nauseosus	0.70	2.10	10.00
FORBS			
Malcomia africana	0.50	1.50	10.00
Penstemon palmeri	2.90	3.45	50.00
GRASSES			
Elymus lanceolatus			40.00
Elymus salinus	1.30	3.03	20.00
Elymus smithii	1.60	2.69	30.00
Elymus spicatus	5.50	8.20	40.00

Table 4: Total cover and composition at the Des-Bee-Dove mine site.

ACCESS TRAIL

A. COVER	MEAN	STD. DEV.
Total Living Cover	25.50	16.35
Litter	7.50	3.35
Bareground	29.00	12.61
Rock	38.00	13.45
B. % COMPOSITION		
Shrubs	35.82	29.83
Forbs	15.67	21.24
Grasses	48.51	30.68

Table 5: Woody species density at the Des-Bee-Dove mine site.

ACCESS TRAIL	*No/Ac*
Atriplex canescens	799.92
Atriplex confertifolia	611.70
Cercocarpus ledifolius	47.05
Chrysothamnus nauseosus	329.38
Ephedra viridis	94.11
TOTAL	**1882.16**

East Slope

Table 6: Cover and frequency by plant species at the Des-Bee-Dove mine site.

EAST SLOPE	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Atriplex canescens	9.74	11.62	56.00
Atriplex confertifolia	1.90	3.86	22.00
Cercocarpus ledifolius	0.24	1.19	4.00
Chrysothamnus nauseosus	1.20	3.05	14.00
Eriogonum corymbosum	0.40	2.20	4.00
Juniperus osteosperma	0.10	0.70	2.00
FORBS			
Penstemon palmeri	2.80	5.49	28.00
Malcomia africana	1.00	4.00	8.00
Salsola tragus	0.20	1.40	2.00
GRASSES			
Elymus cinereus	1.10	4.39	6.00
Elymus junceus	2.00	7.28	10.00
Elymus lanceolatus	2.10	4.91	20.00
Elymus smithii	3.16	7.44	22.00
Elymus spicatus	3.10	6.24	22.00
Stipa hymenoides	3.50	5.41	34.00

Table 7: Total cover and composition at the Des-Bee-Dove mine site.

EAST SLOPE

A. COVER	MEAN	STD. DEV.
Total Living Cover	32.54	14.60
Litter	7.96	3.68
Bareground	28.90	15.24
Rock	30.60	15.29
B. % COMPOSITION		
Shrubs	41.07	31.75
Forbs	16.76	26.52
Grasses	42.17	33.42

Table 8: Woody species density at the Des-Bee-Dove mine site.

EAST SLOPE	*No/Ac*
Atriplex canescens	1075.74
Atriplex confertifolia	437.39
Atriplex gardneri	11.82
Ceratoides lanata	47.29
Chrysothamnus nauseosus	591.06
Eriogonum corymbosum	165.50
Juniperus osteosperma	35.46
TOTAL	**2364.26**

Bathhouse Slope

Table 9: Cover and frequency by plant species at the Des-Bee-Dove mine site.

BATHHOUSE SLOPE	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Atriplex canescens	4.28	9.35	26.67
Atriplex confertifolia	3.47	6.62	26.67
Cercocarpus ledifolius	0.27	1.62	2.67
Chrysothamnus nauseosus	8.42	11.16	53.33
Eriogonum corymbosum	0.14	1.15	1.33
FORBS			
Aster abscendens	0.07	0.58	1.33
Penstemon palmeri	4.35	6.55	36.00
GRASSES			
Agropyron cristatum	0.47	3.09	2.67
Elymus cinereus	3.04	7.68	24.00
Elymus junceus	0.88	3.00	8.00
Elymus lanceolatus	2.47	4.98	22.67
Elymus salinus	0.88	2.89	9.33
Elymus smithii	2.88	5.03	30.67
Elymus spicatus	2.77	5.82	22.67
Stipa hymenoides	2.84	6.10	22.67

Table 10: Total cover and composition at the Des-Bee-Dove mine site.

BATHHOUSE SLOPE

A. COVER	MEAN	STD. DEV.
Total Living Cover	37.23	14.05
Litter	10.14	5.36
Bareground	19.05	8.04
Rock	33.58	16.30
B. % COMPOSITION		
Shrubs	41.91	29.82
Forbs	11.80	18.78
Grasses	46.29	30.59

Table 11: Woody species density at the Des-Bee-Dove mine site.

BATHHOUSE SLOPE	*No/Ac*
Atriplex canescens	460.04
Atriplex confertifolia	969.01
Cercocarpus ledifolius	39.15
Chrysothamnus nauseosus	1419.26
Eriogonum corymbosum	48.94
TOTAL	**2936.40**

Deseret Mine Area

Table 12: Cover and frequency by plant species at the Des-Bee-Dove mine site.

DESERET MINE AREA	MEAN	STD. DEV.	FREQUENCY
TREES & SHRUBS			
Atriplex canescens	4.60	7.99	28.00
Atriplex confertifolia	1.60	5.24	12.00
Atriplex gardneri	1.00	4.90	4.00
Cercocarpus ledifolius	2.80	6.18	20.00
Chrysothamnus nauseosus	1.00	3.46	8.00
FORBS			
Penstemon palmeri	3.20	6.14	28.00
GRASSES			
Elymus cinereus	14.60	15.16	64.00
Elymus lanceolatus	2.40	4.72	24.00
Elymus salinus	0.40	1.96	4.00
Elymus smithii	4.00	8.37	24.00
Elymus spicatus	1.60	6.12	8.00
Stipa hymenoides	3.60	7.81	20.00

Table 13: Total cover and composition at the Des-Bee-Dove mine site.

DESERET MINE AREA

A. COVER	MEAN	STD. DEV.
Total Living Cover	40.80	14.61
Litter	17.80	7.36
Bareground	17.20	8.49
Rock	24.20	8.57
B. % COMPOSITION		
Shrubs	28.30	27.18
Forbs	6.39	11.07
Grasses	65.31	26.33

Table 14: Woody species density at the Des-Bee-Dove mine site.

DESERET MINE AREA	*No/Ac*
Atriplex canescens	1046.40
Atriplex confertifolia	316.35
Atriplex gardneri	24.33
Ceratoides lanata	730.05
Chrysothamnus nauseosus	316.35
TOTAL	**2433.50**

Switchbacks

Table 15: Cover and frequency by plant species at the Des-Bee-Dove mine site.

SWITCHBACKS	MEAN	STD. DEV.	FREQUENCY
TREES & SHRUBS			
Atriplex canescens	10.70	12.35	50.00
Atriplex confertifolia	3.70	7.50	30.00
FORBS			
GRASSES			
Elymus cinereus	8.00	8.72	50.00
Elymus lanceolatus	4.00	6.24	30.00
Elymus salinus	1.50	4.50	10.00
Elymus smithii	3.60	4.78	40.00
Elymus spicatus	1.00	3.00	10.00
Stipa hymenoides	2.00	4.58	20.00

Table 16: Total cover and composition at the Des-Bee-Dove mine site.

SWITCHBACKS

A. COVER	MEAN	STD. DEV.
Total Living Cover	34.50	8.20
Litter	15.00	8.66
Bareground	25.00	12.04
Rock	25.50	13.12
B. % COMPOSITION		
Shrubs	38.38	29.70
Forbs	0.00	0.00
Grasses	61.62	29.70

Table 17: Woody species density at the Des-Bee-Dove mine site.

SWITCHBACKS	*No/Ac*
Atriplex canescens	644.49
Atriplex confertifolia	448.34
Ceratoides lanata	28.02
TOTAL	**1120.85**

Substation Slope

Table 18: Cover and frequency by plant species at the Des-Bee-Dove mine site.

SUBSTATION SLOPE	MEAN	STD. DEV.	FREQUENCY
TREES & SHRUBS			
Atriplex canescens	5.00	5.00	40.00
Atriplex confertifolia	6.00	6.00	60.00
FORBS			
Penstemon palmeri	1.00	1.00	20.00
GRASSES			
Elymus cinereus	8.00	8.00	80.00
Elymus lanceolatus	8.00	8.00	60.00
Elymus smithii	15.00	15.00	80.00
Stipa hymenoides	1.00	1.00	20.00

Table 19: Total cover and composition at the Des-Bee-Dove mine site.

SUBSTATION SLOPE

A. COVER	MEAN	STD. DEV.
Total Living Cover	44.00	44.00
Litter	11.00	11.00
Bareground	18.00	18.00
Rock	27.00	27.00
B. % COMPOSITION		
Shrubs	23.38	23.38
Forbs	2.22	2.22
Grasses	74.39	74.39

Table 20: Woody species density at the Des-Bee-Dove mine site.

SUBSTATION SLOPE	*No/Ac*
Atriplex canescens	474.91
Atriplex confertifolia	791.52
Chrysothamnus nauseosus	158.30
Eriogonum corymbosum	158.30
TOTAL	**1583.03**

Beehive Little Dove Mine Area

Table 21: Cover and frequency by plant species at the Des-Bee-Dove mine site.

BEEHIVE LITTLE DOVE MINE AREA	MEAN	STD. DEV.	FREQUENCY
TREES & SHRUBS			
Atriplex canescens	19.50	18.70	70.00
Atriplex confertifolia	2.25	4.02	25.00
Chrysothamnus nauseosus	0.75	3.27	5.00
FORBS			
GRASSES			
Agropyron cristatum	7.00	9.41	45.00
Elymus cinereus	3.00	9.14	10.00
Elymus lanceolatus	1.00	4.36	5.00
Elymus smithii	4.75	8.58	30.00
Stipa hymenoides	2.25	6.02	15.00

Table 22: Total cover and composition at the Des-Bee-Dove mine site.

BEEHIVE LITTLE DOVE MINE AREA

A. COVER	MEAN	STD. DEV.
Total Living Cover	40.50	13.12
Litter	13.25	6.38
Bareground	26.00	9.95
Rock	20.25	6.22
B. % COMPOSITION		
Shrubs	50.60	33.69
Forbs	0.00	0.00
Grasses	49.40	33.69

Table 23: Woody species density at the Des-Bee-Dove mine site.

BEEHIVE LITTLE DOVE MINE AREA	*No/Ac*
Atriplex canescens	1910.97
Atriplex confertifolia	541.44
Chrysothamnus nauseosus	95.55
TOTAL	**2547.96**

Pinyon-Juniper Reference Area

Table 24: Cover and frequency by plant species at the Des-Bee-Dove mine site.

PINYON-JUNIPER REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
TREES & SHRUBS			
Cercocarpus ledifolius	0.50	2.18	5.00
Juniperus osteosperma	0.75	3.27	5.00
Pinus edulis	4.25	12.77	10.00
UNDERSTORY			
SHRUBS			
Juniperus osteosperma	3.75	9.07	25.00
Cercocarpus ledifolius	1.75	4.55	20.00
Pinus edulis	2.00	6.78	10.00
FORBS			
GRASSES			
Elymus salinus	16.75	11.65	90.00

Table 25: Total cover and composition at the at the Des-Bee-Dove mine site.

PINYON-JUNIPER REFERENCE AREA

A. COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	5.50	12.93
Understory Living Cover (u)	24.25	9.65
Litter	13.50	14.59
Bareground	15.75	9.26
Rock	46.50	13.24
o + u	29.75	11.12
B. % COMPOSITION		
Shrubs	28.12	37.17
Forbs	0.00	0.00
Grasses	71.88	37.17

Table 26: Woody species density at the Des-Bee-Dove mine site.

PJ REFERENCE AREA	*No/Ac*
Cercocarpus ledifolius	212.88
Chrysothamnus nauseosus	35.48
Ephedra viridis	195.14
Juniperus osteosperma	97.57
Pinus edulis	168.53
TOTAL	**709.61**

Plant Names

Table 27: Scientific and common plant names of species listed in the summary tables.

SCIENTIFIC NAME	COMMON NAME
Agropyron cristatum	Crested wheatgrass
Aster ascendens	Pacific aster
Atriplex canescens	Fourwing saltbush
Atriplex confertifolia	Shadscale
Atriplex gardneri	Gardner saltbush
Ceratoides lanata	Winterfat
Cercocarpus ledifolius	Curl-leaf mountain-mahogany
Chrysothamnus nauseosus	Rubber rabbitbrush
Elymus cinereus	Gt. Basin wildrye
Elymus junceus	Russian wildrye
Elymus lanceolatus	Thickspike wheatgrass
Elymus salinus	Salina wildrye
Elymus smithii	Western wheatgrass
Elymus spicatus	Bluebunch wheatgrass
Eriogonum corymbosum	Corymb buckwheat
Juniperus osteosperma	Utah juniper
Malcomia africana	African mustard
Penstemon palmeri	Palmer penstemon
Pinus edulis	Pinyon pine
Salsola tragus	Russian thistle
Stipa hymenoides	Indian ricegrass

FIG 1. LIVING COVER: RECLAIMED & REFERENCE AREAS

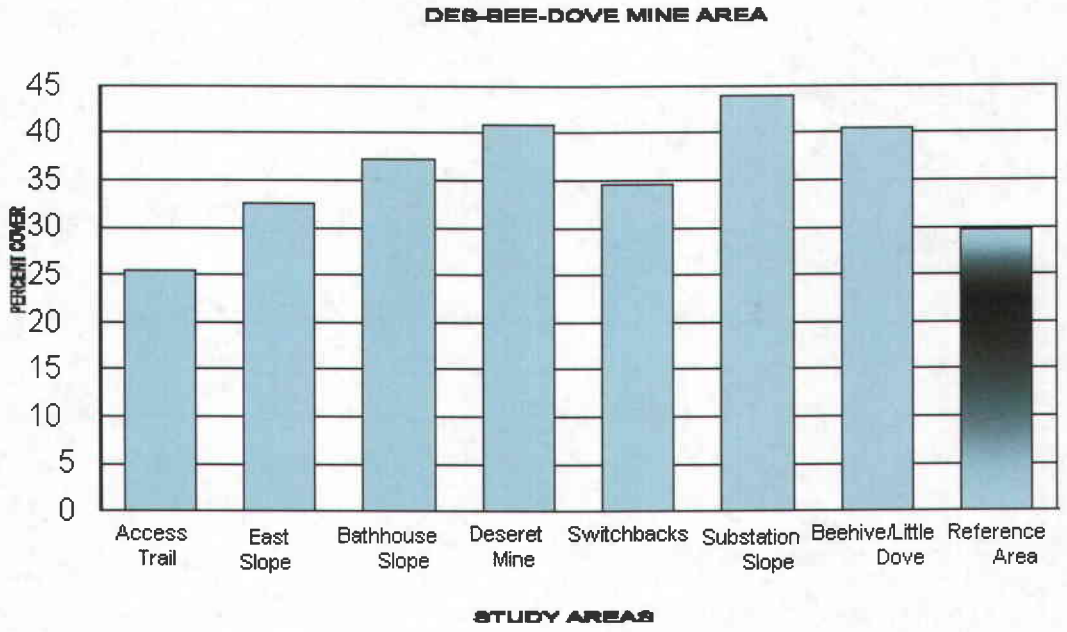


FIG 2. WOODY SPECIES DENSITY: RECLAIMED & REFERENCE AREAS

DES-BEE-DOVE MINE AREA

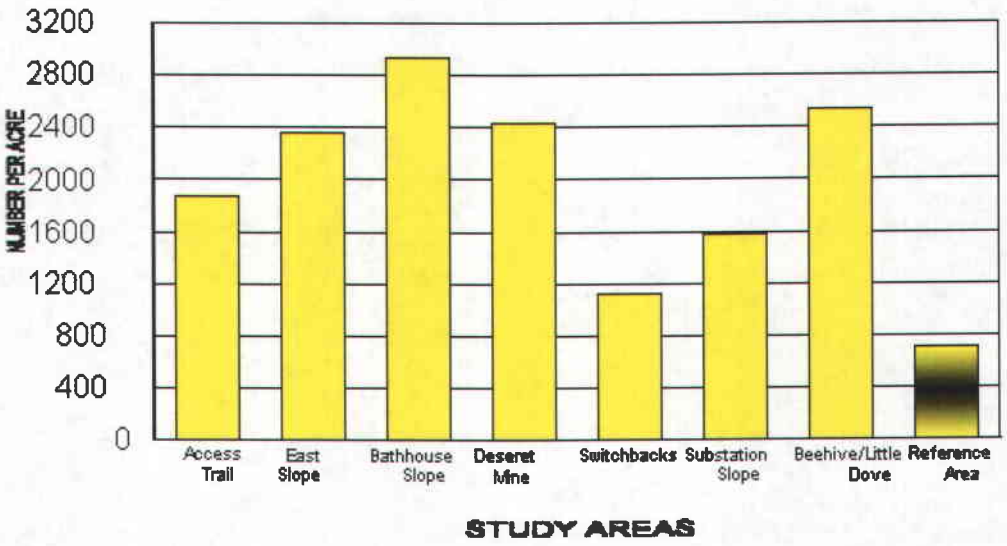
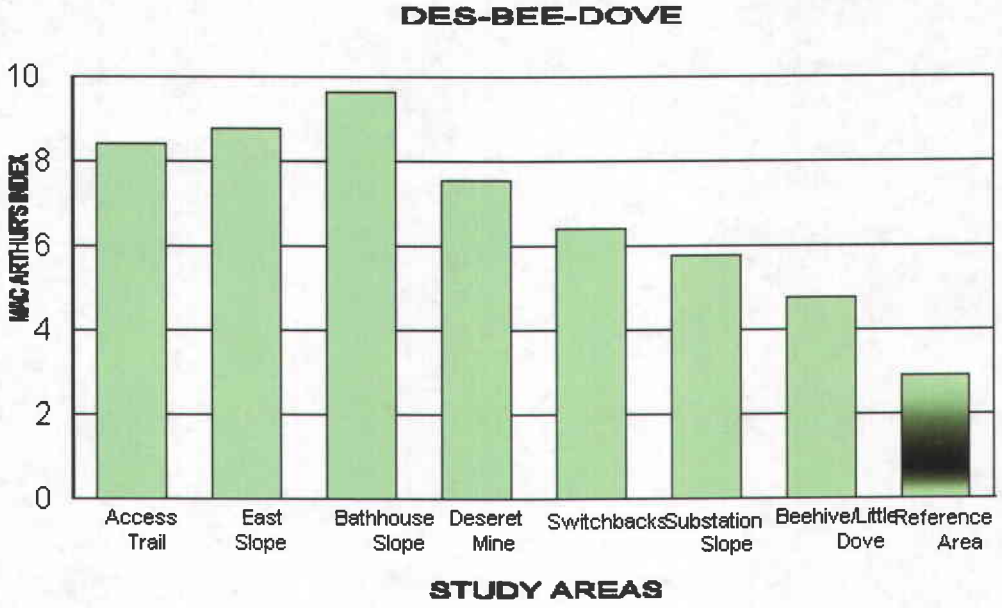


FIG 3. DIVERSITY: RECLAIMED & REFERENCE AREAS



COLOR PHOTOGRAPHS OF THE SAMPLE AREAS

Photo 1: Des-Bee-Dove Mine Site - Access Trail

Photo 2: Des-Bee-Dove Mine Site - Access Trail

Photo 3: Des-Bee-Dove Mine Site - East Slope

Photo 4: Des-Bee-Dove Mine Site - East Slope

Photo 5: Des-Bee-Dove Mine Site - East Slope

Photo 6: Des-Bee-Dove Mine Site - Bathhouse Slope

Photo 7: Des-Bee-Dove Mine Site - Bathhouse Slope

Photo 8: Des-Bee-Dove Mine Site - Bathhouse Slope

Photo 9: Des-Bee-Dove Mine Site - Deseret Mine Area

Photo 10: Des-Bee-Dove Mine Site - Switchbacks

Photo 11: Des-Bee-Dove Mine Site - Switchbacks

Photo 12: Des-Bee-Dove Mine Site - Substation Area

Photo 13: Des-Bee-Dove Mine Site - Beehive-Little Dove Area

Photo 14: Des-Bee-Dove Mine Site - P-J Reference Area

VEGETATION MONITORING: REFERENCE AREAS

2007

ENERGY WEST MINE AREAS

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VEGETATION MONITORING
REFERENCE AREAS
2007

INTRODUCTION

Vegetation reference areas are plant communities that have been chosen to represent standards for future revegetation success. Often the reference areas were chosen prior to any land disturbance proposed by a mine operator. In choosing a reference area for a proposed new disturbance site, attempts are made to select a plant community that has similar environmental variables as the site that will be disturbed and ultimately be reclaimed. The environmental considerations include variables such as soil type, exposure, elevation, plant species, slope, etc. Both the proposed disturbed and reference areas are then quantitative sampled. The datasets are summarized and compared statistically to determine if they are similar enough for the reference area to be used for future revegetation success standards. If the reference area meets the criteria, it is set aside to remain undisturbed until final reclamation and revegetation has occurred. At that time the reference area is used to make comparisons with the reclaimed plant community during the "responsibility period". At the end of this period (usually ten years are required), if the revegetated land meets those standards set by the reference area, final bond release can be obtained by the mine operator through the State of Utah, Division of Oil, Gas & Mining (DOGM).

The purpose of the vegetation monitoring study in 2007 is to provide recent quantitative data for

total cover, cover by plant species, species frequency and lifeform composition information for all reference areas previously chosen to represent future revegetation success standards for disturbed lands on the properties of the Energy West Mining Company. Upon review of the summarized monitoring data, determinations can be made as to whether or not the reference areas continue to be viable for future success standards. The following sites along with their respective reference areas including sample sizes have been studied for this report:

STUDY AREAS AND SAMPLE SIZES FOR THE REFERENCE AREA MONITORING STUDY (2007)

		Sample Sizes (n)
1.	**COTTONWOOD MINE NEW WASTE ROCK SITE**	
	a. Black Sagebrush Reference Area	20
	b. Pinyon-Juniper Reference Area	20
	c. Gardner Saltbush Reference Area	20
2.	**COTTONWOOD MINE SITE**	
	a. Pinyon-Juniper Reference Area	20
3.	**DEER CREEK MINE SITE**	
	a. Riparian Reference Area	20
	b. Saltbush Reference Area	20
	c. Pinyon-Juniper Reference Area	20
	d. Mixed Conifer Reference Area	20
4.	**RILDA CANYON**	
	a. Pinyon-Juniper/Mountain Brush Reference Area (Lower Area)	20
	b. Sagebrush/Grass Reference Area (Undisturbed; Lower Area)	20
	c. Riparian Reference Area (Lower Area)	20
	d. Pinyon-Juniper/Mountain Brush Reference Area (AMR)	0
	e. White Fir/Aspen Reference Area	20
	f. Mountain Brush/Salina Wildrye Reference Area	20
	g. Aspen/Fir/Dogwood Reference Area	20
5.	**DES-BEE-DOVE MINE SITE**	
	a. Pinyon-Juniper Reference Area	20
	b. Salt Desert Reference Area	20
6.	**TRAIL MOUNTAIN MINE SITE**	
	a. Trail Mountain Reference Area	20
7.	**COTTONWOOD FAN PORTAL AREA**	
	a. Pinyon-Juniper Reference Area	60

METHODS

Transect & Quadrat Placement

Transect lines for quantitative sampling the vegetation were randomly placed throughout the reference areas to adequately represent each site as a whole. Sample quadrats were then randomly placed along the transect lines for sampling.

Cover, Frequency & 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).

Sample Size & Adequacy

Sampling adequacy was calculated using formula 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

Photographs

Representative color photographs were taken of the sample areas and have been included in this report.

RESULTS & DISCUSSION

Because this report was intended to provide current cover, frequency and composition information only, the results section is made up primarily of the summarized tables and photographs showing each reference area.

A review of the reference area data with respect to parameters sampled revealed that most of the reference areas had respectable values for native plant communities in the area. Consequently, most of them should be adequate for revegetation success standards at the time of final reclamation, provided they are compared with reclaimed areas that once supported a similar plant community prior to its disturbance by mining and reclamation activities.

There are two exceptions to the statement above about the appropriateness of the reference areas as final revegetation success standards. Firstly, the **Black Sagebrush Reference Area** at the Cottonwood New Waste Rock Site has been disturbed by a recently constructed gas well and supporting powerlines. *At present, it would not be an appropriate candidate to represent revegetation success standards at final reclamation.* Secondly, as described in the verbiage written below about the **Pinyon-Juniper/Mountain Brush Reference Area** (AMR) in Rilda Canyon, this reference area was covered by material from construction activities creating soil storage piles. *Consequently, the area should not be considered as reference area for revegetation success standards.*

COTTONWOOD MINE NEW WASTE ROCK SITE

Black Sagebrush Reference Area

Table 1: Cover and frequency by plant species at the Cottonwood Mine New Waste Rock site.

BLACK SAGEBRUSH REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Pinus edulis	2.50	7.66	10.00
UNDERSTORY			
SHRUBS			
Artemisia nova	9.75	8.49	70.00
Cercocarpus montanus	0.60	2.62	5.00
Ephedra viridis	2.75	9.15	10.00
Juniperus osteosperma	2.25	5.80	20.00
Pinus edulis	3.25	6.38	20.00
FORBS			
GRASSES			
Elymus salinus	1.25	3.83	10.00

Table 2: Total cover and composition at the at the Cottonwood Mine New Waste Rock site.

BLACK SAGEBRUSH REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	2.50	7.66
Understory Living Cover (u)	19.85	9.92
Litter	15.65	8.83
Bareground	34.75	17.99
Rock	29.75	19.90
o + u	22.35	11.31
% COMPOSITION		
Shrubs	96.07	12.26
Forbs	0.00	0.00
Grasses	3.93	12.26

Cottonwood Mine New Waste Rock Site: Black Sagebrush Reference Area

Pinyon-Juniper Reference Area

Table 3: Cover and frequency by plant species at the Cottonwood Mine New Waste Rock site.

PINYON-JUNIPER REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Juniperus osteosperma	1.50	6.54	5.00
Pinus edulis	6.00	12.10	20.00
UNDERSTORY			
SHRUBS			
Artemisia nova	2.00	6.20	10.00
Cercocarpus montanus	1.35	4.54	10.00
Ephedra viridis	6.75	10.52	35.00
Juniperus osteosperma	1.50	4.77	10.00
Pinus edulis	4.50	9.34	25.00
Yucca harrimaniae	2.00	4.30	20.00
FORBS			
Cryptantha sp.	0.05	0.22	5.00
GRASSES			

Table 4: Total cover and composition at the at the Cottonwood Mine New Waste Rock site

PINYON-JUNIPER REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	7.50	13.09
Understory Living Cover (u)	18.15	12.01
Litter	23.45	10.61
Bareground	23.50	18.31
Rock	34.90	14.89
o + u	25.65	13.72
% COMPOSITION		
Shrubs	95.00	21.79
Forbs	5.00	21.79
Grasses	0.00	0.00

Cottonwood Mine New Waste Rock Site: Pinyon-Juniper Reference Area

Gardner Saltbrush Reference Area

Table 5: Cover and frequency by plant species at the Cottonwood Mine New Waste Rock site.

GARDNER SALTBRUSH REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Atriplex confertifolia	2.50	5.59	20.00
Atriplex gardneri	16.50	13.88	70.00
Ephedra viridis	0.35	1.53	5.00
Gutierrezia sarothrae	0.25	1.09	5.00
FORBS			
GRASSES			
Elymus salinus	5.65	7.75	40.00

Table 6: Total cover and composition at the at the Cottonwood Mine New Waste Rock site.

GARDNER SALTBRUSH REFERENCE AREA

COVER	MEAN	STD. DEV.
Total Living Cover	25.25	9.28
Litter	11.95	4.72
Bareground	43.40	20.03
Rock	19.40	16.02
% COMPOSITION		
Shrubs	77.92	29.28
Forbs	0.00	0.00
Grasses	22.08	29.28

Cottonwood Mine New Waste Rock Site: Gardner Saltbush Reference Area

COTTONWOOD MINE SITE

Pinyon-Juniper Reference Area

Table 7: Cover and frequency by plant species at the Cottonwood Mine site.

PINYON-JUNIPER REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Pseudotsuga menziesii	1.00	4.36	5.00
UNDERSTORY			
SHRUBS			
Abies concolor	0.35	1.53	5.00
Amelanchier utahensis	3.50	7.09	20.00
Artemisia tridentata	1.00	3.00	10.00
Chrysothamnus nauseosus	0.85	2.59	10.00
Ephedra viridis	0.50	2.18	5.00
Eriogonum corymbosum	1.25	4.44	10.00
Gutierrezia sarothrae	0.40	1.74	5.00
Juniperus osteosperma	1.25	5.45	5.00
Pinus edulis	3.00	7.65	15.00
Pseudotsuga menziesii	0.50	2.18	5.00
FORBS			
Hedysarum occidentalis canone	0.50	2.18	5.00
GRASSES			
Elymus salinus	18.00	8.12	95.00
Stipa hymenoides	2.90	5.22	25.00

Table 8: Total cover and composition at the at the Cottonwood Mine site.

PINYON-JUNIPER REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	1.00	4.36
Understory Living Cover (u)	34.00	5.61
Litter	10.25	3.70
Bareground	14.00	7.18
Rock	41.75	11.54
o + u	35.00	6.52
% COMPOSITION		
Shrubs	35.62	24.88
Forbs	2.00	8.72
Grasses	62.38	23.51

Cottonwood Mine Site: Pinyon-Juniper Reference Area

DEER CREEK MINE SITE

Riparian Reference Area

Table 9: Cover and frequency by plant species at the Deer Creek Mine site.

RIPARIAN REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Abies concolor	3.25	10.03	10.00
Acer glabrum	6.25	14.04	20.00
Cornus sericea	1.00	4.36	5.00
Populus angustifolia	11.50	17.76	35.00
Pseudotsuga menziesii	1.00	4.36	5.00
UNDERSTORY			
SHRUBS			
Abies concolor	3.25	8.70	15.00
Acer glabrum	2.25	6.80	10.00
Cornus sericea	2.00	8.72	5.00
Holodiscus dumosa	1.00	4.36	5.00
Mahonia repens	0.25	1.09	5.00
Populus angustifolia	0.25	1.09	5.00
Pseudotsuga menziesii	1.00	3.39	10.00
Rosa woodsii	7.75	16.92	25.00
Symphoricarpos oreophilus	2.25	9.81	5.00
FORBS			
Cirsium sp.	0.50	1.50	10.00
Erigeron engelmannii	9.25	12.58	45.00
GRASSES			
Agrostis stolonifera	4.75	12.30	15.00
Bromus carinatus	0.25	1.09	5.00
Dactylis glomeratus	1.00	4.36	5.00
Stipa hymenoides	0.50	2.18	5.00

Table 10: Total cover and composition at the at the Deer Creek Mine site.

RIPARIAN REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	23.00	17.49
Understory Living Cover (u)	36.25	18.02
Litter	37.50	21.82
Bareground	12.25	12.89
Rock	14.00	13.10
o + u	59.25	11.32
% COMPOSITION		
Shrubs	66.08	41.26
Forbs	22.22	29.68
Grasses	11.70	25.36

Deer Creek Mine: Riparian Reference Area

Saltbrush Reference Area

Table 11: Cover and frequency by plant species at the Deer Creek Mine Waste Rock site.

SALTBRUSH REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Artemisia nova	0.25	1.09	5.00
Atriplex confertifolia	4.25	6.94	30.00
Atriplex corrugata	4.10	8.83	20.00
Atriplex gardneri	8.50	9.10	55.00
Chrysothamnus nauseosus	0.75	2.38	10.00
Eriogonum corymbosum	2.00	6.78	10.00
Tetradymia spinescens	0.25	1.09	5.00
FORBS			
GRASSES			
Elymus salinus	3.50	7.26	25.00

Table 12: Total cover and composition at the at the Deer Creek Mine Waste Rock site.

SALTBRUSH REFERENCE AREA

COVER	MEAN	STD. DEV.
Total Living Cover	23.60	10.01
Litter	7.55	2.69
Bareground	58.25	14.86
Rock	10.60	8.48
% COMPOSITION		
Shrubs	85.17	28.76
Forbs	0.00	0.00
Grasses	14.83	28.76

Deer Creek Mine: Saltbush Reference Area

Pinyon-Juniper Reference Area

Table 13: Cover and frequency by plant species at the Deer Creek Mine site.

PINYON-JUNIPER REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Amelanchier utahensis	1.50	6.54	5.00
Juniperus osteosperma	3.25	7.79	15.00
Pseudotsuga menziesii	0.50	2.18	5.00
UNDERSTORY			
SHRUBS			
Amelanchier utahensis	7.75	13.37	30.00
Ephedra viridis	6.00	10.68	30.00
Eriogonum corymbosum	1.50	3.91	15.00
Juniperus osteosperma	1.50	4.77	10.00
Pseudotsuga menziesii	1.50	6.54	5.00
FORBS			
Penstemon palmeri	0.25	1.09	5.00
GRASSES			
Elymus salinus	20.00	10.72	90.00

Table 14: Total cover and composition at the at the Deer Creek Mine site.

PINYON-JUNIPER REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	5.25	9.68
Understory Living Cover (u)	38.50	14.24
Litter	15.50	5.68
Bareground	15.25	7.66
Rock	30.75	12.17
o + u	43.75	13.03
% COMPOSITION		
Shrubs	43.66	28.00
Forbs	1.67	7.26
Grasses	54.67	26.29

Deer Creek Mine: Pinyon-Juniper Reference Area

Mixed Conifer Reference Area

Table 15: Cover and frequency by plant species at the Deer Creek Mine site.

MIXED CONIFER REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Abies concolor	0.25	1.09	5.00
Amelanchier utahensis	1.00	4.36	5.00
Pinus edulis	1.25	5.45	5.00
Pinus flexilis	1.25	5.45	5.00
Pseudotsuga menziesii	2.25	6.80	10.00
UNDERSTORY			
SHRUBS			
Abies concolor	5.25	10.78	25.00
Amelanchier utahensis	0.50	2.18	5.00
Eriogonum corymbosum	3.50	10.97	10.00
Juniperus communis	0.75	3.27	5.00
Juniperus scopulorum	0.75	2.38	10.00
Mahonia repens	0.85	2.06	15.00
Pachistima myrsinites	1.00	2.55	15.00
Pinus edulis	1.75	7.63	5.00
Pseudotsuga menziesii	6.50	7.43	55.00
Symphoricarpos oreophilus	6.40	7.89	55.00
FORBS			
Antennaria sp.	0.25	1.09	5.00
Erigeron engelmannii	1.50	2.78	25.00
Galium biflorum	1.25	2.68	20.00
Machaeranthera grindelioides	0.25	1.09	5.00
Petradoria pumila	0.25	1.09	5.00
GRASSES			
Elymus salinus	6.50	7.43	50.00
Thalictrum fendleri	0.75	1.79	15.00

Table 16: Total cover and composition at the at the Deer Creek Mine site.

MIXED CONIFER REFERENCE AREA COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	6.00	9.95
Understory Living Cover (u)	38.00	8.12
Litter	22.00	13.08
Bareground	13.25	7.12
Rock	26.75	9.26
o + u	44.00	10.91
% COMPOSITION		
Shrubs	70.82	25.26
Forbs	9.34	12.07
Grasses	19.84	20.06

Deer Creek Mine: Mixed Conifer Reference Area

RILDA CANYON

Pinyon-Juniper/Mountain Brush Reference Area (Lower Area)

Table 17: Cover and frequency by plant species at the Rilda Canyon area.

PINYON-JUNIPER/MOUNTAIN BRUSH REFERENCE AREA (LOWER AREA)	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Cercocarpus ledifolius	7.75	15.85	20.00
Juniperus scopulorum	2.75	8.29	10.00
Pinus edulis	2.50	10.90	5.00
UNDERSTORY			
SHRUBS			
Cercocarpus ledifolius	11.50	14.92	40.00
Gutierrezia sarothrae	2.00	3.67	25.00
Juniperus osteosperma	1.50	6.54	5.00
Juniperus scopulorum	1.00	4.36	5.00
Mahonia repens	0.25	1.09	5.00
Pinus edulis	2.00	8.72	5.00
Rhus aromatica	0.50	2.18	5.00
FORBS			
Artemisia dracunculus	0.50	1.50	10.00
GRASSES			
Elymus salinus	17.00	12.29	85.00
Elymus spicatus	1.25	5.45	5.00

Table 18: Total cover and composition at the at the Rilda Canyon Area.

PINYON-JUNIPER/MOUNTAIN BRUSH REFERENCE AREA (LOWER AREA)

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	13.00	18.53
Understory Living Cover (u)	37.50	12.50
Litter	11.00	7.35
Bareground	17.75	8.44
Rock	33.75	14.13
Overstory + Understory	50.50	20.12
% COMPOSITION		
Shrubs	43.65	37.76
Forbs	1.56	4.87
Grasses	54.79	37.13

Rilda Canyon: Pinyon-Juniper Reference Area (Lower Area)

Sagebrush/Grass Reference Area (Undisturbed; Lower Area)

Table 19: Cover and frequency by plant species at the Rilda Canyon area.

SAGEBRUSH/GRASS REFERENCE AREA (UNDISTURBED; LOWER AREA)	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Artemisia tridentata	14.50	10.59	75.00
Chrysothamnus nauseosus	10.00	12.14	55.00
Rosa woodsii	0.25	1.09	5.00
Symphoricarpos oreophilus	3.75	11.92	10.00
FORBS			
Antennaria sp.	3.00	9.14	10.00
Aster sp.	1.00	4.36	5.00
Cirsium sp.	0.25	1.09	5.00
Cynoglossum officinalis	5.75	6.38	50.00
GRASSES			
Elymus smithii	1.00	4.36	5.00
Elymus spicatus	2.00	5.10	15.00
Poa pratensis	20.75	13.44	80.00
Stipa comata	0.75	3.27	5.00

Table 20: Total cover and composition at the at the Rilda Canyon Area.

SAGEBRUSH/GRASS REFERENCE AREA (UNDISTURBED; LOWER AREA)

COVER	MEAN	STD. DEV.
Total Living Cover	63.00	4.85
Litter	25.75	6.38
Bareground	6.45	2.99
Rock	4.80	6.02
% COMPOSITION		
Shrubs	44.96	14.95
Forbs	15.88	17.52
Grasses	39.16	20.72

Rilda Canyon: Sagebrush/Grass Reference Area (Undisturbed; Lower Area)

Riparian Reference Area (Lower Area)

Table 21: Cover and frequency by plant species at the Rilda Canyon area.

RIPARIAN REFERENCE AREA (LOWER AREA)	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Acer glabrum	5.50	17.67	10.00
Alnus incana	3.50	10.62	10.00
Picea pungens	23.00	36.38	35.00
Populus angustifolia	8.75	18.97	20.00
UNDERSTORY			
SHRUBS			
Acer glabrum	1.50	6.54	5.00
Picea pungens	5.75	11.43	25.00
Populus angustifolia	4.65	7.77	35.00
Populus tremuloides	0.35	1.53	5.00
Rosa woodsii	12.75	17.92	50.00
Salix sp.	0.25	1.09	5.00
FORBS			
Achillea millefolium	1.75	3.96	20.00
Artemisia dracunculus	0.75	2.38	10.00
Cynoglossum officinalis	0.25	1.09	5.00
Equisetum arvense	5.75	11.10	45.00
Erigeron engelmannii	0.25	1.09	5.00
Geranium richardsonii	1.00	2.00	20.00
Viola adunca	1.25	5.45	5.00
GRASSES			
Agrostis stolonifera	6.50	13.33	25.00
Bromus carinatus	1.25	3.83	10.00
Carex microptera	1.50	6.54	5.00
Poa pratensis	2.00	6.78	10.00
Poa secunda	0.50	1.50	10.00

Table 22: Total cover and composition at the at the Rilda Canyon Area.

RIPARIAN REFERENCE AREA (LOWER AREA)

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	40.75	33.10
Understory Living Cover (u)	48.00	20.58
Litter	33.70	20.40
Bareground	16.10	17.60
Rock	2.20	1.83
o + u	88.75	19.23
% COMPOSITION		
Shrubs	57.31	35.08
Forbs	24.22	33.17
Grasses	18.47	23.39

Rilda Canyon: Riparian Reference Area (Lower Area)

Pinyon-Juniper/Mountain Brush Reference Area (AMR)

The Pinyon-Juniper/Mountain Brush Reference Area (AMR) was an old mine site that was later reclaimed by the State of Utah, Division of Oil, Gas & Mining Abandoned Mine Reclamation Program (AMR). More recently, the site was chosen as a reference area to represent other reclaimed sites in Rilda Canyon that were once again proposed for re-disturbance by the Energy West Mining Company for some new surface facilities in the canyon. Construction plans changed as did the location of the surface facilities (the site was moved up-canyon a short distance). New reference areas were chosen to represent plant communities for the new site. Since data were recorded for all reference areas, the reference areas for the first surface facilities location remain as options for future standards of revegetation success. Therefore, all reference areas were sampled for this document.

The Pinyon-Juniper/Mountain Brush Reference Area here, however, was covered by material from construction to create soil piles (see photograph below). *Consequently, the area cannot be considered a reference area for future use and no quantitative data were recorded for this document.*

Rilda Canyon: Pinyon-Juniper/Mountain Brush Reference Area (AMR)

White Fir Aspen Reference Area

Table 23: Cover and frequency by plant species at the Rilda Canyon area.

WHITE FIR/ASPEN REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Abies concolor	4.25	12.77	10.00
Acer glabrum	1.25	5.45	5.00
Picea pungens	11.50	23.72	20.00
Populus angustifolia	2.00	8.72	5.00
Populus tremuloides	18.00	18.06	55.00
UNDERSTORY			
SHRUBS			
Abies concolor	5.50	9.60	30.00
Acer glabrum	0.25	1.09	5.00
Cornus sericea	0.75	2.38	10.00
Juniperus communis	0.75	3.27	5.00
Mahonia repens	18.00	10.89	95.00
Pachistima myrsinites	2.75	4.60	30.00
Picea pungens	1.25	5.45	5.00
Populus tremuloides	2.50	4.61	25.00
Pseudotsuga menziesii	2.00	6.20	10.00
Ribes sp.	0.25	1.09	5.00
Rosa woodsii	2.75	6.02	25.00
Symphoricarpos oreophilus	3.25	5.07	35.00
FORBS			
GRASSES			
Bromus carinatus	0.50	2.18	5.00
Elymus trachycaulus	3.00	6.20	25.00
Poa pratensis	2.50	5.36	20.00
Poa secunda	1.00	3.00	10.00
Thalictrum fendleri	0.75	2.38	10.00

Table 24: Total cover and composition at the at the Rilda Canyon Area.

WHITE FIR/ASPEN REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	37.00	16.39
Understory Living Cover (u)	47.75	11.56
Litter	39.45	12.72
Bareground	9.80	8.39
Rock	3.00	6.31
o + u	84.75	14.27
% COMPOSITION		
Shrubs	84.07	13.41
Forbs	0.00	0.00
Grasses	15.93	13.41

Rilda Canyon: White Fir/Aspen Reference Area

Mountain Brush/Salina WildRye Reference Area

Table 25: Cover and frequency by plant species at the Rilda Canyon area.

MOUNTAIN BRUSH/SALINA WILDRYE REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Abies concolor	0.75	3.27	5.00
Cercocarpus ledifolius	6.00	14.63	15.00
Juniperus scopulorum	5.00	11.40	20.00
Pinus edulis	0.50	2.18	5.00
UNDERSTORY			
SHRUBS			
Abies concolor	0.75	3.27	5.00
Cercocarpus ledifolius	4.25	8.98	25.00
Juniperus communis	2.15	5.46	15.00
Mahonia repens	1.00	2.55	15.00
Pinus edulis	1.00	4.36	5.00
Symphoricarpos oreophilus	0.50	1.50	10.00
FORBS			
Erigeron engelmannii	0.25	1.09	5.00
GRASSES			
Elymus salinus	23.60	10.09	100.00

Table 26: Total cover and composition at the at the Rilda Canyon Area.

MOUNTAIN BRUSH/SALINA WILDRYE REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	12.25	16.47
Understory Living Cover (u)	33.50	11.41
Litter	12.75	11.45
Bareground	22.50	17.21
Rock	31.25	18.70
o + u	45.75	12.87
% COMPOSITION		
Shrubs	29.23	22.46
Forbs	0.63	2.72
Grasses	70.14	21.80

Rilda Canyon: Mountain Brush/Salina Wildrye Reference Area

Aspen/Fir/Dogwood Reference Area

Table 27: Cover and frequency by plant species at the Rilda Canyon area.

ASPEN/FIR/DOGWOOD REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Abies concolor	1.25	3.83	10.00
Acer glabrum	0.75	3.27	5.00
Cornus sericea	4.00	9.70	15.00
Populus angustifolia	4.50	13.59	10.00
Populus tremuloides	19.50	23.82	45.00
Pseudotsuga menziesii	2.50	10.90	5.00
UNDERSTORY			
SHRUBS			
Abies concolor	1.25	4.44	10.00
Acer glabrum	1.00	2.55	15.00
Cornus sericea	8.50	12.76	35.00
Mahonia repens	4.75	7.50	35.00
Pachistima myrsinites	8.75	9.07	70.00
Populus tremuloides	1.75	5.54	15.00
Ribes sp.	2.00	3.67	25.00
Rosa woodsii	2.50	4.87	25.00
Symphoricarpos oreophilus	0.50	2.18	5.00
FORBS			
Thalictrum fendleri	0.25	1.09	5.00
GRASSES			

Table 28: Total cover and composition at the at the Rilda Canyon Area.

ASPEN/FIR/DOGWOOD REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	32.50	18.94
Understory Living Cover (u)	31.25	14.13
Litter	54.25	16.98
Bareground	13.15	17.01
Rock	1.35	0.91
o + u	63.75	15.32
% COMPOSITION		
Shrubs	99.17	3.63
Forbs	0.83	3.63
Grasses	0.00	0.00

Rilda Canyon: Aspen/Fir/Dogwood Reference Area

DES-BEE-DOVE MINE SITE

Pinyon-Juniper Reference Area

Table 29: Cover and frequency by plant species at the Des-Bee-Dove Mine site.

PINYON-JUNIPER REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
SHRUBS			
Cercocarpus ledifolius	0.50	2.18	5.00
Juniperus osteosperma	0.75	3.27	5.00
Pinus edulis	4.25	12.77	10.00
UNDERSTORY			
SHRUBS			
Juniperus osteosperma	3.75	9.07	25.00
Cercocarpus ledifolius	1.75	4.55	20.00
Pinus edulis	2.00	6.78	10.00
FORBS			
GRASSES			
Elymus salinus	16.75	11.65	90.00

Table 30: Total cover and composition at the at the Des-Bee-Dove Mine site.

PINYON-JUNIPER REFERENCE AREA

COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	5.50	12.93
Understory Living Cover (u)	24.25	9.65
Litter	13.50	14.59
Bareground	15.75	9.26
Rock	46.50	13.24
o + u	29.75	11.12
% COMPOSITION		
Shrubs	28.12	37.17
Forbs	0.00	0.00
Grasses	71.88	37.17

Des-Bee-Dove Mine Site: Pinyon-Juniper Reference Area

Salt Desert Reference Area

Table 31: Cover and frequency by plant species at the Des-Bee-Dove Mine site.

SALT DESERT REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Atriplex confertifolia	3.25	6.76	20.00
Atriplex gardneri	16.05	18.22	55.00
Chrysothamnus viscidiflorus	0.25	1.09	5.00
Eriogonum corymbosum	1.25	4.44	10.00
FORBS			
GRASSES			
Elymus salinus	13.95	12.92	65.00

Table 32: Total cover and composition at the at the Des-Bee-Dove Mine site.

SALT DESERT REFERENCE AREA		
COVER	MEAN	STD. DEV.
Total Living Cover	34.75	14.01
Litter	9.70	7.86
Bareground	37.00	20.94
Rock	18.55	15.44
% COMPOSITION		
Shrubs	59.59	37.19
Forbs	0.00	0.00
Grasses	40.41	37.19

Des-Bee-Dove Mine Site: Salt Desert Reference Area

TRAIL MOUNTAIN MINE SITE

Trail Mountain Reference Area

Table 33: Cover and frequency by plant species at the Trail Mountain Mine site.

TRAIL MTN. REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
SHRUBS			
Amelanchier utahensis	2.50	7.16	15.00
Atriplex confertifolia	2.25	7.82	10.00
Chrysothamnus nauseosus	2.25	4.87	20.00
Ephedra viridis	0.75	3.27	15.00
Eriogonum corymbosum	1.00	4.36	50.00
FORBS			
Machaeranthera grindelioides	0.25	1.09	5.00
Stanleya pinnata	0.25	1.09	5.00
GRASSES			
Elymus salinus	20.50	12.44	85.00

Table 34: Total cover and composition at the at the Trail Mountain Mine site.

TRAIL MTN. REFERENCE AREA		
COVER	MEAN	STD. DEV.
Total Living Cover	29.75	8.14
Litter	9.25	4.26
Bareground	11.00	6.04
Rock	50.00	12.65
% COMPOSITION		
Shrubs	30.23	35.01
Forbs	1.71	5.22
Grasses	68.06	33.90

Trail Mountain Reference Area

COTTONWOOD FAN PORTAL AREA

Pinyon-Juniper Reference Area

Table 35: Cover and frequency by plant species at the Cottonwood Fan Portal area.

PINYON-JUNIPER REFERENCE AREA	MEAN	STD. DEV.	FREQUENCY
OVERSTORY			
Pinus edulis	4.08	9.81	16.67
UNDERSTORY			
SHRUBS			
Amelanchier utahensis	0.50	2.69	5.00
Atriplex confertifolia	1.08	4.19	6.67
Chrysothamnus nauseosus	2.17	7.55	10.00
Ephedra viridis	1.58	5.51	10.00
Juniperus osteosperma	1.58	5.51	8.33
Mahonia repens	1.30	4.85	10.00
Pinus edulis	2.00	5.10	16.67
FORBS			
Cryptantha sp.	0.58	1.61	11.67
Descurainia pinnata	0.25	1.09	5.00
Stanleya pinnata	0.62	2.33	8.33
GRASSES			
Elymus salinus	16.25	12.06	53.33
Stipa hymenoides	1.67	4.35	13.33

Table 36: Total cover and composition at the Cottonwood Fan Portal area.
PINYON-JUNIPER REFERENCE AREA

A. COVER	MEAN	STD. DEV.
Overstory Living Cover (o)	4.08	9.81
Understory Living Cover (u)	29.58	8.48
Litter	22.33	12.50
Bareground	14.75	8.96
Rock	33.33	12.67
o + u	33.67	8.84
B. % COMPOSITION		
Shrubs	34.26	37.90
Forbs	5.37	11.25
Grasses	60.37	35.89

Cottonwood Fan Portal Area: Pinyon-Juniper Reference Area

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

Copy of the Submitted Amendment for Updated Officers and Directors (Submitted 5/22/2008)

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Energy West Mining Company
P. O. Box 310
15 No Main Street
Huntington, Utah 84528

May 22, 2008

Utah Coal Program
Utah Division of Oil, Gas, and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Subj: Amendment to Update the Legal and Financial Information, Officer and Director List for the Cottonwood/Wilberg Mine, C/015/0019, Deer Creek Mine, C/015/0018, and Des Bee Dove Mine C/015/0017, and Trail Mountain Mine C/015/0009, Emery County, Utah.

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company ("Energy West") as mine operator, hereby submits an updated Appendix A (Officer and Director List) of the supplemental volume entitled "Supplemental Volume, Legal and Financial Information" for Division review.

Included with this submittal are five (5) clean copies of Appendix A for Division review. C1/C2 forms are also included. If the Division finds this format acceptable, please stamp "Incorporated" and return one copy to Energy West for placement into our Supplemental Legal and Financial Volume. If there are any questions or concerns regarding the submitted information, please feel free to contact Dennis Oakley at (435) 687-4825.

Sincerely,

Dennis Oakley

for Kenneth Fleck
Geology and Environmental Affairs Manager

cc Scott Child (IMC)
File

APPLIC...ION FOR COAL PERMIT PROCE 'NG

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: PacifiCorp

Mine: Cottonwood Mine, Deer Creek Mine, Des Bee Dove Mine, Trail Mountain Mine

Permit Number: C/015/0019, C/015/0018, C/015/0017, C/015/0009

Title: Amendment to Update the Legal and Financial Information, Officer and Director List for the Cottonwood/Wilberg Mine, C/015/0019, Deer Creek Mine, C/015/0018, and Des Bee Dove Mine C/015/0017, and Trail Mountain Mine C/015/0009, Emery County, Utah.

Description, Include reason for application and timing required to implement:

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: _____ ☐ increase ☐ decrease.
☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# _____
☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes ☒ No 6. Does the application require or include public notice publication?
☒ Yes ☐ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV # _____
☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
Explain: _____
☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes ☒ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
☐ Yes ☒ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
☐ Yes ☒ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
☐ Yes ☒ No 19. Does the application require or include certified designs, maps or calculation?
☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
☐ Yes ☒ No 21. Have reclamation costs for bonding been provided?
☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Kenneth Fleck
Print Name

Sign Name, Position, Date — Manager of Environmental Affairs 5/22/08

Subscribed and sworn to before me this 22nd day of May, 2008

Notary Public

My commission Expires: 11-23, 2008

Attest: State of UTAH } ss:
County of Emery

DON CHILDS
NOTARY PUBLIC • STATE of UTAH
31 NORTH MAIN STREET
HUNTINGTON, UT 84528
COMM. EXPIRES 11-23-2008

For Office Use Only:	Assigned Tracki. Number:	Received by Oil, Gas & Mining

Form DOGM- C1 (Revised March 12, 2002)

APPLICATION FOR COAL PERMIT PROCESSING
Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: PacifiCorp

Mine: Cottonwood Mine, Deer Creek Mine, Des Bee Dove Mine, Trail Mountain Mine

Permit Number: C/015/0019, C/015/0018, C/015/0017, C/015/0009

Title: Amendment to Update the Legal and Financial Information, Officer and Director List for the Cottonwood/Wilberg Mine, C/015/0019, Deer Creek Mine, C/015/0018, and Des Bee Dove Mine C/015/0017, and Trail Mountain Mine C/015/0009, Emery County, Utah.

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
☐ Add	☒ Replace	☐ Remove	Legal and Financial Volume, Appendix A, Entire Appendix (Replace current and summary list of officers and directors)
☐ Add	☐ Replace	☐ Remove	
☐ Add	☐ Replace	☐ Remove	
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Any other specific or special instructio uired for insertion of this proposal into the Mining and Reclamation Plan.	**Received by Oil, Gas & Mining**

Form DOGM - C2 (Revised March 12, 2002)

Current Listing of Officers and Directors

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

BERKSHIRE HATHAWAY, INC. OFFICERS (as of March 26, 2008)			
Name	**Position**	**Address**	**Effective Date***
Warren E. Buffett	Chairman of the Board Chief Executive Officer	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Charles T. Munger	Vice Chairman of the Board of Directors	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Marc D. Hamburg	Vice President, Principal Financial Officer	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

BERKSHIRE HATHAWAY, INC. DIRECTORS (as of March 26, 2008)			
Name	**Position**	**Address**	**Effective Date***
Warren E. Buffett	Chairman of the Board Chief Executive Officer	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Charles T. Munger	Vice Chairman of the Board of Directors	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Howard G. Buffett	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Susan L. Decker	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	5/5/07
William H. Gates, III	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
David S. Gottesman	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Charlotte Guyman	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Donald R. Keough	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Thomas S. Murphy	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Ronald L. Olson	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Walter Scott, Jr.	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

MIDAMERICAN ENERGY HOLDINGS COMPANY'S OFFICERS (as of April 18, 2008)			
Name	**Position**	**Address**	**Effective Date***
Gregory E. Abel	Chief Executive Officer and President and Chief Operating Officer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	4/16/08
Douglas L. Anderson	Senior Vice President, General Counsel	1111 So. 103rd St. Omaha, NE 68214 (402) 231-1581	3/21/06
Patrick J. Goodman	Senior Vice President and Chief Financial Officer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Brent E. Gale	Senior Vice President , Regulation and Legislation	825 NE Multnomah, Suite 2000 Portland, Oregon 97232 (503) 813-5000	3/21/06
Maureen E. Sammon	Senior Vice President and Chief Administrative Officer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Cathy S. Woollums	Vice President Senior Vice President, Environmental Services and Chief Environmental Counsel	106 E. Second Street PO Box 4350 Davenport, Iowa 52808 (563)333-8009	3/21/06 2/12/07
John "Jack" Diesing, Jr.	Vice President, Corporate Insurance AON Risk Services	P.O. Box 3307 Omaha, Nebraska 68103-3307 (402) 697-1400	3/21/06
Steven R. Evans	Vice President Taxation	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Brian K. Hankel	Vice President and Treasurer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Wayne F. Irmiter	Vice President and Controller	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Paul J. Leighton	Vice President Corporate Law, Assistant General Counsel & Assistant Corporate Secretary	4299 Northwest Urbandale Drive Urbandale, Iowa 50322-7916 (515) 281-2201	3/21/06
Jonathan M. Weisgall	Vice President Federal Regulation/IPP	1200 New Hampshire Ave. NW, Suite 300 Washington, DC 20036-6812 (202) 828-1378	3/21/06
Russell H. White	Vice President, General Services	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Mitchell L. Pirnie	Vice President and Chief Litigation Counsel	1111 So. 103rd St. Omaha, NE 68214 (402) 231-1527	2/12/07

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

MIDAMERICAN ENERGY HOLDINGS COMPANY'S DIRECTORS (as of September 20, 2007)			
Name	**Position**	**Address**	**Effective Date**
Gregory E. Abel	Director	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Warren E. Buffett	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Marc D. Hamburg	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Walter Scott, Jr.	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
David L. Sokol	Director	1111 So. 103rd St. Omaha, NE 68214 (402) 231-1400	3/21/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PPW HOLDINGS LLC OFFICERS (as of December 1, 2006)			
Name	**Position**	**Address**	**Effective Date***
Gregory E. Abel	President	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/23/05
Steven R. Evans	Vice President Taxation	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/18/06
Brian K. Hankel	Vice President and Treasurer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/23/05
Wayne F. Irmiter	Vice President and Controller	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/18/06
Mitchell F. Ludwin	Vice President and Secretary	302 South 36th Street Omaha, Nebraska 68131 (402) 231-1587	5/18/06
James C. Galt	Assistant Treasurer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/18/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PACIFICORP'S OFFICERS (as of March 26, 2008)			
Name	**Position**	**Address**	**Effective Date***
Gregory E. Abel	Chairman of Board and Chief Executive Officer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Dean S. Brockbank	Vice President and General Counsel, PacifiCorp Energy	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	8/30/07
Jeffery B. Erb	Assistant Secretary	825 NE Multnomah, Suite 600 Portland, Oregon 97232 (503) 813-5000	3/13/02
Natalie L. Hocken	Vice President and General Counsel, Pacific Power	825 NE Multnomah, Suite 1800 Portland, Oregon 97232 (503) 813-5000	1/1/07
A. Robert Lasich	President, PacifiCorp Energy	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	8/30/07
Mark C. Moench	Secretary	201 So. Main St. Suite 2400 Salt Lake City, UT 84111 (801) 220-2000	5/31/07
Patrick J. Reiten	President, Pacific Power	825 NE Multnomah, Suite 1900 Portland, Oregon 97232 (503) 813-5000	9/15/06
Douglas K. Stuver	Senior Vice President and Chief Finanial Officer	825 NE Multnomah, Suite 1900 Portland, Oregon 97232 (503) 813-5000	3/1/08
A. Richard Walje	President, Rocky Mountain Power	201 So. Main St. Suite 2400 Salt Lake City, UT 84111 (801) 220-2000	3/21/06
Bruce N. Williams	Vice President Treasurer	825 NE Multnomah Suite 1900 Portland, OR 97232 (503) 813-5000	5/17/06 2/16/00

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PACIFICORP'S DIRECTORS (as of March 26, 2008)			
Name	**Position**	**Address**	**Effective Date***
Gregory E. Abel	Director	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Douglas L. Anderson	Director	302 South 36th Street Omaha, Nebraska 68131 (402) 231-1642	3/21/06
Brent E. Gale	Director	825 NE Multnomah, Suite 2000 Portland, Oregon 97232 (503) 813-5000	3/21/06
Patrick J. Goodman	Director	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Natalie L. Hocken	Director	825 NE Multnomah, Suite 2000 Portland, Oregon 97232 (503) 813-5000	8/30/07
A. Robert Lasich	Director	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	3/21/06
Mark Moench	Director	201 So. Main St. Suite 2400 Salt Lake City, UT 84111 (801) 220-2000	3/21/06
Patrick J. Reiten	Director	825 NE Multnomah, Suite 2000 Portland, Oregon 97232 (503) 813-5000	9/15/06
A. Richard Walje	Director	201 So. Main St. Suite 2400 Salt Lake City, UT 84111 (801) 220-2000	7/2/01

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

ENERGY WEST MINING COMPANY'S OFFICERS (as of May 1, 2008)			
Name	**Position**	**Address**	**Effective Date***
A. Robert Lasich	President	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	5/1/08
Dean S. Brockbank	Vice President and General Counsel and Secretary	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	5/1/08
Jeffery B. Erb	Assistant Secretary	825 NE Multnomah, Suite 1800 Portland, OR 97232 (503) 813-5000	10/1/02
Bruce N. Williams	Treasurer	825 NE Multnomah, Suite 1900 Portland, OR 97232 (503) 813-5000	1/1/92
Tanya S. Sacks	Assistant Treasurer	825 NE Multnomah, Suite 1900 Portland, OR 97232 (503) 813-5000	2/1/01

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

ENERGY WEST MINING COMPANY'S DIRECTORS (as of May 1, 2008)			
Name	**Position**	**Address**	**Effective Date***
A. Robert Lasich	Director	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	5/1/08

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

BERKSHIRE HATHAWAY, INC. OFFICERS (as of March 26, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Warren E. Buffett	Chairman of the Board Chief Executive Officer	3/21/06	Current
Charles T. Munger	Vice Chairman of the Board of Directors	3/21/06	Current
Marc D. Hamburg	Vice President, Principal Financial Officer	3/21/06	Current

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

Summary Listing of Officers and Directors (Past and Present)

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

BERKSHIRE HATHAWAY, INC. DIRECTORS (as of March 26, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Warren E. Buffett	Chairman of the Board Chief Executive Officer	3/21/06	Current
Charles T. Munger	Vice Chairman of the Board of Directors	3/21/06	Current
Howard G. Buffett	Director	3/21/06	Current
Susan Decker	Director	5/5/07	Current
William H. Gates, III	Director	3/21/06	Current
David S. Gottesman	Director	3/21/06	Current
Charlotte Guyman	Director	3/21/06	Current
Donald R. Keough	Director	3/21/06	Current
Thomas S. Murphy	Director	3/21/06	Current
Ronald L. Olson	Director	3/21/06	Current
Walter Scott, Jr.	Director	3/21/06	Current
Malcolm G. Chace	Director	3/21/06	5/5/07
Daniel J. Jaksich	Controller	3/21/06	9/26/07

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

MIDAMERICAN ENERGY HOLDINGS COMPANY'S OFFICERS (as of April 18, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	Chief Executive Officer and President and Chief Operating Officer	4/16/08	Current
Douglas L. Anderson	Senior Vice President, General Counsel	3/21/06	Current
Patrick J. Goodman	Senior Vice President and Chief Financial Officer	3/21/06	Current
Brent E. Gale	Senior Vice President , Regulation and Legislation	3/21/06	Current
Maureen E. Sammon	Senior Vice President and Chief Administrative Officer	3/21/06	Current
Cathy S. Woollums	Vice President Senior Vice President, Environmental Services and Chief Environmental Counsel	3/21/06 2/12/07	Current
John "Jack" Diesing, Jr.	Vice President, Corporate Insurance AON Risk Services	3/21/06	Current
Steven R. Evans	Vice President Taxation	3/21/06	Current
Brian K. Hankel	Vice President and Treasurer	3/21/06	Current
Wayne F. Irmiter	Vice President and Controller	3/21/06	Current
Paul J. Leighton	Vice President Corporate Law, Assistant General Counsel & Assistant Corporate Secretary	3/21/06	Current
Jonathan M. Weisgall	Vice President Federal Regulation/IPP	3/21/06	Current
Russell H. White	Vice President, General Services	3/21/06	Current
Mitchell L. Pirnie	Vice President and Chief Litigation Counsel	2/12/07	Current

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

MIDAMERICAN ENERGY HOLDINGS COMPANY'S OFFICERS (as of April 18, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
[illegible]	[illegible]	[illegible]	[illegible]
William J. Fehrman	Senior Vice President, Regulation and Legislation	3/21/06	3/21/06
Keith D. Hartje	Senior Vice President	3/21/06	5/15/07
Mark C. Moench	Senior Vice President	3/21/06	3/21/06
David L. Sokol	Chairman and Chief Executive Officer	3/21/06	4/18/08

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

MIDAMERICAN ENERGY HOLDINGS COMPANY'S DIRECTORS (as of September 20, 2007)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	Director	3/21/06	Current
Warren E. Buffett	Director	3/21/06	Current
Marc D. Hamburg	Director	3/21/06	Current
Walter Scott, Jr.	Director	3/21/06	Current
David L. Sokol	Director	3/21/06	Current

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PPW HOLDINGS LLC OFFICERS (as of December 1, 2006)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	President	5/23/05	Current
Steven R. Evans	Vice President Taxation	5/18/06	Current
Brian K. Hankel	Vice President and Treasurer	5/23/05	Current
Wayne F. Irmiter	Vice President and Controller	5/18/06	Current
Mitchell F. Ludwin	Vice President and Secretary	5/18/06	Current
James C. Galt	Assistant Treasurer	5/18/06	Current

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PACIFICORP'S OFFICERS (as of May 1, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	Chairman of Board and Chief Executive Officer	3/21/06	Current
Dean S. Brockbank	Vice President and General Counsel, PacifiCorp Energy	8/30/07	Current
Jeffery B. Erb	Assistant Secretary	3/13/02	Current
Natalie L. Hocken	Vice President and General Counsel, Pacific Power	1/1/07	Current
A. Robert Lasich	President, PacifiCorp Energy	8/30/07	Current
Mark C. Moench	Secretary	5/31/07	Current
Patrick J. Reiten	President, Pacific Power	9/15/06	Current
Douglas K. Stuver	Senior Vice President and Chief Finanial Officer	3/1/08	Current
A. Richard Walje	President, Rocky Mountain Power	3/21/06	Current
Bruce N. Williams	Vice President	5/17/06	Current
Barry G Cunningham	Sr. Vice President	2/11/02	5/23/06
William Fehrman	President, PacifiCorp Energy	3/21/06	8/30/07
Donald A. Furman	Sr. Vice President	7/2/01	6/3/05
Andrew P. Haller	Sr. V.P., General Counsel and Corporate Secretary	06/04/01 12/11/00	12/31/06
Michael G. Jenkins	Assistant Secretary	5/12/99	5/17/2006
Judth Johansen	President and Chief Executive Officer	6/4/01	3/20/06
Robert A. Klein	Sr. Vice President	8/6/01	12/26/05
Douglas A. Kusyk	Assistant Secretary	4/1/05	5/17/06
William D. Landels	Executive Vice President	11/29/99	3/31/04
Jeffery K. Larsen	Vice President	8/22/02	9/10/04
Donald (Doug) Larson	Vice President	7/2/01	5/17/06
Andrew N. MacRitchie	Executive Vice President	6/4/01	3/20/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PACIFICORP'S OFFICERS CONTINUED (as of May 1, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Larry O. Martin	Assistant Secretary	6/4/01	5/14/06
David J. Mendez	Sr. V.P. and Chief Financial Officer	8/22/06	2/29/08
Robert A. Moir	Sr. Vice President	1/11/02	3/31/04
Richard D. Peach	Sr. V.P. and Chief Financial Officer	8/22/06 3/21/2006	11/22/06
Michael J. Pittman	Sr. Vice President	5/19/93	7/7/05
Tanya S. Sacks	Assistant Treasurer	6/4/01	5/17/06
Alexander D. Tait	Assistant Secretary	6/4/01	4/1/04
Stan K. Watters	Sr. Vice President	9/15/06 3/21/06 6/3/03	3/16/07 9/15/06 3/20/06
Ernest E. Wessman	Vice President	3/21/06	5/17/06
Matthew R. Wright	Executive Vice President	1/1/02	3/20/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PACIFICORP'S DIRECTORS (as of March 26, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	Director	3/21/06	Current
Douglas L. Anderson	Director	3/21/06	Current
Brent E. Gale	Director	3/21/06	Current
Patrick J. Goodman	Director	3/21/06	Current
Natalie L. Hocken	Director	8/30/07	Current
A. Robert Lasich	Director	3/21/06	Current
Mark Moench	Director	3/21/06	Current
Patrick J. Reiten	Director	9/15/06	Current
A. Richard Walje	Director	7/2/01	Current
Barry C. Cunningham	Director	4/02	03/20/2006
Stephen Dunn	Director	11/05	03/20/2006
William J. Fehrman	Director	03/21/06	08/30/2007
Andrew P. Haller	Director	5/03	12/31/2006
Judith A. Johansen	Director	12/00	03/20/2006
Nolan E. Karras	Director	2/93	7/25/07
William D. Landels	Director	11/99	3/31/04
Andrew N. MacRitchie	Director	5/00	3/20/06
David J. Mendez	Director	8/30/07	2/29/08
Richard D. Peach	Director	5/03	11/22/06
Michael J. Pittman	Director	5/00	7/05
Ian M. Russell	Director	1/2/08	1/16/06
Stan K. Watters	Director	3/21/06	3/16/07
Matthew R. Wright	Director	7/01	3/20/06

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ENERGY WEST MINING COMPANY'S OFFICERS (as of May 1, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
A. Robert Lasich	President Vice President, General Counsel and Secretary	5/1/2008 12/1/06	Current 4/30/08
Dean S. Brockbank	Vice President, General Counsel and Secretary	05/01/08	Current
Jeffery B. Erb	Assistant Secretary	10/01/02	Current
Bruce N. Williams	Treasurer	01/01/92	Current
Tanya S. Sacks	Assistant Treasurer	02/01/01	Current
Robert R. Dalley	Secretary	10/00	2/01
Niel L. Getzelman	President	12/01/06	04/30/2008
Andrew P. Haller	Senior Vice President, General Counsel and Secretary	2/01	11/30/2006
Dee W. Jense	President	10/02	11/30/2006
Robert P. King	Vice President	2/01	08/15/2006
Larry O. Martin	Assistant Secretary	2/01	06/15/2006
George C. Schreck	Assistant Secretary	10/00	2/01

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

ENERGY WEST MINING COMPANY'S DIRECTORS (as of May 1, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
A. Robert Lasich	Director	05/01/08	Current
Niel L. Getzelman	Director	12/01/06	04/30/2008
Terry F. Hudgens	Director	10/00	9/01
Dee W. Jense	Director	10/02	11/30/2006
Judth Johansen	Director	9/01	10/02
Robert P. King	Director	2/01	08/15/2006

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Current Listing of Officers and Directors

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

BERKSHIRE HATHAWAY, INC. OFFICERS (as of March 26, 2008)			
Name	**Position**	**Address**	**Effective Date***
Warren E. Buffett	Chairman of the Board Chief Executive Officer	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Charles T. Munger	Vice Chairman of the Board of Directors	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Marc D. Hamburg	Vice President, Principal Financial Officer	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06

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BERKSHIRE HATHAWAY, INC. DIRECTORS (as of March 26, 2008)			
Name	**Position**	**Address**	**Effective Date***
Warren E. Buffett	Chairman of the Board Chief Executive Officer	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Charles T. Munger	Vice Chairman of the Board of Directors	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Howard G. Buffett	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Susan L. Decker	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	5/5/07
William H. Gates, III	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
David S. Gottesman	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Charlotte Guyman	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Donald R. Keough	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Thomas S. Murphy	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Ronald L. Olson	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Walter Scott, Jr.	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

MIDAMERICAN ENERGY HOLDINGS COMPANY'S OFFICERS (as of April 18, 2008)			
Name	**Position**	**Address**	**Effective Date***
Gregory E. Abel	Chief Executive Officer and President and Chief Operating Officer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	4/16/08
Douglas L. Anderson	Senior Vice President, General Counsel	1111 So. 103rd St. Omaha, NE 68214 (402) 231-1581	3/21/06
Patrick J. Goodman	Senior Vice President and Chief Financial Officer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Brent E. Gale	Senior Vice President , Regulation and Legislation	825 NE Multnomah, Suite 2000 Portland, Oregon 97232 (503) 813-5000	3/21/06
Maureen E. Sammon	Senior Vice President and Chief Administrative Officer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Cathy S. Woollums	Vice President Senior Vice President, Environmental Services and Chief Environmental Counsel	106 E. Second Street PO Box 4350 Davenport, Iowa 52808 (563)333-8009	3/21/06 2/12/07
John "Jack" Diesing, Jr.	Vice President, Corporate Insurance AON Risk Services	P.O. Box 3307 Omaha, Nebraska 68103-3307 (402) 697-1400	3/21/06
Steven R. Evans	Vice President Taxation	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Brian K. Hankel	Vice President and Treasurer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Wayne F. Irmiter	Vice President and Controller	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Paul J. Leighton	Vice President Corporate Law, Assistant General Counsel & Assistant Corporate Secretary	4299 Northwest Urbandale Drive Urbandale, Iowa 50322-7916 (515) 281-2201	3/21/06
Jonathan M. Weisgall	Vice President Federal Regulation/IPP	1200 New Hampshire Ave. NW, Suite 300 Washington, DC 20036-6812 (202) 828-1378	3/21/06
Russell H. White	Vice President, General Services	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Mitchell L. Pirnie	Vice President and Chief Litigation Counsel	1111 So. 103rd St. Omaha, NE 68214 (402) 231-1527	2/12/07

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MIDAMERICAN ENERGY HOLDINGS COMPANY'S DIRECTORS (as of September 20, 2007)			
Name	**Position**	**Address**	**Effective Date**
Gregory E. Abel	Director	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Warren E. Buffett	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Marc D. Hamburg	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
Walter Scott, Jr.	Director	1440 Kiewit Plaza Omaha, Nebraska 68131	3/21/06
David L. Sokol	Director	1111 So. 103rd St. Omaha, NE 68214 (402) 231-1400	3/21/06

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PPW HOLDINGS LLC OFFICERS (as of December 1, 2006)			
Name	**Position**	**Address**	**Effective Date***
Gregory E. Abel	President	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/23/05
Steven R. Evans	Vice President Taxation	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/18/06
Brian K. Hankel	Vice President and Treasurer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/23/05
Wayne F. Irmiter	Vice President and Controller	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/18/06
Mitchell F. Ludwin	Vice President and Secretary	302 South 36th Street Omaha, Nebraska 68131 (402) 231-1587	5/18/06
James C. Galt	Assistant Treasurer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	5/18/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PACIFICORP'S OFFICERS (as of March 26, 2008)			
Name	**Position**	**Address**	**Effective Date***
Gregory E. Abel	Chairman of Board and Chief Executive Officer	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Dean S. Brockbank	Vice President and General Counsel, PacifiCorp Energy	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	8/30/07
Jeffery B. Erb	Assistant Secretary	825 NE Multnomah, Suite 600 Portland, Oregon 97232 (503) 813-5000	3/13/02
Natalie L. Hocken	Vice President and General Counsel, Pacific Power	825 NE Multnomah, Suite 1800 Portland, Oregon 97232 (503) 813-5000	1/1/07
A. Robert Lasich	President, PacifiCorp Energy	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	8/30/07
Mark C. Moench	Secretary	201 So. Main St. Suite 2400 Salt Lake City, UT 84111 (801) 220-2000	5/31/07
Patrick J. Reiten	President, Pacific Power	825 NE Multnomah, Suite 1900 Portland, Oregon 97232 (503) 813-5000	9/15/06
Douglas K. Stuver	Senior Vice President and Chief Finanial Officer	825 NE Multnomah, Suite 1900 Portland, Oregon 97232 (503) 813-5000	3/1/08
A. Richard Walje	President, Rocky Mountain Power	201 So. Main St. Suite 2400 Salt Lake City, UT 84111 (801) 220-2000	3/21/06
Bruce N. Williams	Vice President Treasurer	825 NE Multnomah Suite 1900 Portland, OR 97232 (503) 813-5000	5/17/06 2/16/00

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PACIFICORP'S DIRECTORS (as of March 26, 2008)			
Name	**Position**	**Address**	**Effective Date***
Gregory E. Abel	Director	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Douglas L. Anderson	Director	302 South 36th Street Omaha, Nebraska 68131 (402) 231-1642	3/21/06
Brent E. Gale	Director	825 NE Multnomah, Suite 2000 Portland, Oregon 97232 (503) 813-5000	3/21/06
Patrick J. Goodman	Director	666 Grand Avenue Des Moines, Iowa 50309 (515) 242-4300	3/21/06
Natalie L. Hocken	Director	825 NE Multnomah, Suite 2000 Portland, Oregon 97232 (503) 813-5000	8/30/07
A. Robert Lasich	Director	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	3/21/06
Mark Moench	Director	201 So. Main St. Suite 2400 Salt Lake City, UT 84111 (801) 220-2000	3/21/06
Patrick J. Reiten	Director	825 NE Multnomah, Suite 2000 Portland, Oregon 97232 (503) 813-5000	9/15/06
A. Richard Walje	Director	201 So. Main St. Suite 2400 Salt Lake City, UT 84111 (801) 220-2000	7/2/01

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ENERGY WEST MINING COMPANY'S OFFICERS (as of May 1, 2008)			
Name	**Position**	**Address**	**Effective Date***
A. Robert Lasich	President	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	5/1/08
Dean S. Brockbank	Vice President and General Counsel and Secretary	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	5/1/08
Jeffery B. Erb	Assistant Secretary	825 NE Multnomah, Suite 1800 Portland, OR 97232 (503) 813-5000	10/1/02
Bruce N. Williams	Treasurer	825 NE Multnomah, Suite 1900 Portland, OR 97232 (503) 813-5000	1/1/92
Tanya S. Sacks	Assistant Treasurer	825 NE Multnomah, Suite 1900 Portland, OR 97232 (503) 813-5000	2/1/01

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ENERGY WEST MINING COMPANY'S DIRECTORS (as of May 1, 2008)			
Name	**Position**	**Address**	**Effective Date***
A. Robert Lasich	Director	1407 West North Temple Suite 320 Salt Lake City, Utah 84116 (801) 220-2000	5/1/08

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BERKSHIRE HATHAWAY, INC. OFFICERS (as of March 26, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Warren E. Buffett	Chairman of the Board Chief Executive Officer	3/21/06	Current
Charles T. Munger	Vice Chairman of the Board of Directors	3/21/06	Current
Marc D. Hamburg	Vice President, Principal Financial Officer	3/21/06	Current

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

Summary Listing of Officers and Directors (Past and Present)

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

BERKSHIRE HATHAWAY, INC. DIRECTORS (as of March 26, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Warren E. Buffett	Chairman of the Board Chief Executive Officer	3/21/06	Current
Charles T. Munger	Vice Chairman of the Board of Directors	3/21/06	Current
Howard G. Buffett	Director	3/21/06	Current
Susan Decker	Director	5/5/07	Current
William H. Gates, III	Director	3/21/06	Current
David S. Gottesman	Director	3/21/06	Current
Charlotte Guyman	Director	3/21/06	Current
Donald R. Keough	Director	3/21/06	Current
Thomas S. Murphy	Director	3/21/06	Current
Ronald L. Olson	Director	3/21/06	Current
Walter Scott, Jr.	Director	3/21/06	Current
Malcolm G. Chace	Director	3/21/06	5/5/07
Daniel J. Jaksich	Controller	3/21/06	9/26/07

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MIDAMERICAN ENERGY HOLDINGS COMPANY'S OFFICERS (as of April 18, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	Chief Executive Officer and President and Chief Operating Officer	4/16/08	Current
Douglas L. Anderson	Senior Vice President, General Counsel	3/21/06	Current
Patrick J. Goodman	Senior Vice President and Chief Financial Officer	3/21/06	Current
Brent E. Gale	Senior Vice President , Regulation and Legislation	3/21/06	Current
Maureen E. Sammon	Senior Vice President and Chief Administrative Officer	3/21/06	Current
Cathy S. Woollums	Vice President Senior Vice President, Environmental Services and Chief Environmental Counsel	3/21/06 2/12/07	Current
John "Jack" Diesing, Jr.	Vice President, Corporate Insurance AON Risk Services	3/21/06	Current
Steven R. Evans	Vice President Taxation	3/21/06	Current
Brian K. Hankel	Vice President and Treasurer	3/21/06	Current
Wayne F. Irmiter	Vice President and Controller	3/21/06	Current
Paul J. Leighton	Vice President Corporate Law, Assistant General Counsel & Assistant Corporate Secretary	3/21/06	Current
Jonathan M. Weisgall	Vice President Federal Regulation/IPP	3/21/06	Current
Russell H. White	Vice President, General Services	3/21/06	Current
Mitchell L. Pirnie	Vice President and Chief Litigation Counsel	2/12/07	Current

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MIDAMERICAN ENERGY HOLDINGS COMPANY'S OFFICERS (as of April 18, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
William J. Fehrman	Senior Vice President, Regulation and Legislation	3/21/06	3/21/06
Keith D. Hartje	Senior Vice President	3/21/06	5/15/07
Mark C. Moench	Senior Vice President	3/21/06	3/21/06
David L. Sokol	Chairman and Chief Executive Officer	3/21/06	4/18/08

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MIDAMERICAN ENERGY HOLDINGS COMPANY'S DIRECTORS (as of September 20, 2007)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	Director	3/21/06	Current
Warren E. Buffett	Director	3/21/06	Current
Marc D. Hamburg	Director	3/21/06	Current
Walter Scott, Jr.	Director	3/21/06	Current
David L. Sokol	Director	3/21/06	Current

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PPW HOLDINGS LLC OFFICERS (as of December 1, 2006)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	President	5/23/05	Current
Steven R. Evans	Vice President Taxation	5/18/06	Current
Brian K. Hankel	Vice President and Treasurer	5/23/05	Current
Wayne F. Irmiter	Vice President and Controller	5/18/06	Current
Mitchell F. Ludwin	Vice President and Secretary	5/18/06	Current
James C. Galt	Assistant Treasurer	5/18/06	Current

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PACIFICORP'S OFFICERS (as of May 1, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Gregory E. Abel	Chairman of Board and Chief Executive Officer	3/21/06	Current
Dean S. Brockbank	Vice President and General Counsel, PacifiCorp Energy	8/30/07	Current
Jeffery B. Erb	Assistant Secretary	3/13/02	Current
Natalie L. Hocken	Vice President and General Counsel, Pacific Power	1/1/07	Current
A. Robert Lasich	President, PacifiCorp Energy	8/30/07	Current
Mark C. Moench	Secretary	5/31/07	Current
Patrick J. Reiten	President, Pacific Power	9/15/06	Current
Douglas K. Stuver	Senior Vice President and Chief Finanial Officer	3/1/08	Current
A. Richard Walje	President, Rocky Mountain Power	3/21/06	Current
Bruce N. Williams	Vice President	5/17/06	Current
Barry G Cunningham	Sr. Vice President	2/11/02	5/23/06
William Fehrman	President, PacifiCorp Energy	3/21/06	8/30/07
Donald A. Furman	Sr. Vice President	7/2/01	6/3/05
Andrew P. Haller	Sr. V.P., General Counsel and Corporate Secretary	06/04/01 12/11/00	12/31/06
Michael G. Jenkins	Assistant Secretary	5/12/99	5/17/2006
Judth Johansen	President and Chief Executive Officer	6/4/01	3/20/06
Robert A. Klein	Sr. Vice President	8/6/01	12/26/05
Douglas A. Kusyk	Assistant Secretary	4/1/05	5/17/06
William D. Landels	Executive Vice President	11/29/99	3/31/04
Jeffery K. Larsen	Vice President	8/22/02	9/10/04
Donald (Doug) Larson	Vice President	7/2/01	5/17/06
Andrew N. MacRitchie	Executive Vice President	6/4/01	3/20/06

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PACIFICORP'S OFFICERS CONTINUED (as of May 1, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
Larry O. Martin	Assistant Secretary	6/4/01	5/14/06
David J. Mendez	Sr. V.P. and Chief Financial Officer	8/22/06	2/29/08
Robert A. Moir	Sr. Vice President	1/11/02	3/31/04
Richard D. Peach	Sr. V.P. and Chief Financial Officer	8/22/06 3/21/2006	11/22/06
Michael J. Pittman	Sr. Vice President	5/19/93	7/7/05
Tanya S. Sacks	Assistant Treasurer	6/4/01	5/17/06
Alexander D. Tait	Assistant Secretary	6/4/01	4/1/04
Stan K. Watters	Sr. Vice President	9/15/06 3/21/06 6/3/03	3/16/07 9/15/06 3/20/06
Ernest E. Wessman	Vice President	3/21/06	5/17/06
Matthew R. Wright	Executive Vice President	1/1/02	3/20/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

PACIFICORP'S DIRECTORS (as of March 26, 2008)			
Name	Position	Effective Date*	Departure Date
Gregory E. Abel	Director	3/21/06	Current
Douglas L. Anderson	Director	3/21/06	Current
Brent E. Gale	Director	3/21/06	Current
Patrick J. Goodman	Director	3/21/06	Current
Natalie L. Hocken	Director	8/30/07	Current
A. Robert Lasich	Director	3/21/06	Current
Mark Moench	Director	3/21/06	Current
Patrick J. Reiten	Director	9/15/06	Current
A. Richard Walje	Director	7/2/01	Current
Barry C. Cunningham	Director	4/02	03/20/2006
Stephen Dunn	Director	11/05	03/20/2006
William J. Fehrman	Director	03/21/06	08/30/2007
Andrew P. Haller	Director	5/03	12/31/2006
Judith A. Johansen	Director	12/00	03/20/2006
Nolan E. Karras	Director	2/93	7/25/07
William D. Landels	Director	11/99	3/31/04
Andrew N. MacRitchie	Director	5/00	3/20/06
David J. Mendez	Director	8/30/07	2/29/08
Richard D. Peach	Director	5/03	11/22/06
Michael J. Pittman	Director	5/00	7/05
Ian M. Russell	Director	1/2/08	1/16/06
Stan K. Watters	Director	3/21/06	3/16/07
Matthew R. Wright	Director	7/01	3/20/06

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

ENERGY WEST MINING COMPANY'S OFFICERS (as of May 1, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
A. Robert Lasich	President Vice President, General Counsel and Secretary	5/1/2008 12/1/06	Current 4/30/08
Dean S. Brockbank	Vice President, General Counsel and Secretary	05/01/08	Current
Jeffery B. Erb	Assistant Secretary	10/01/02	Current
Bruce N. Williams	Treasurer	01/01/92	Current
Tanya S. Sacks	Assistant Treasurer	02/01/01	Current
Robert R. Dalley	Secretary	10/00	2/01
Niel L. Getzelman	President	12/01/06	04/30/2008
Andrew P. Haller	Senior Vice President, General Counsel and Secretary	2/01	11/30/2006
Dee W. Jense	President	10/02	11/30/2006
Robert P. King	Vice President	2/01	08/15/2006
Larry O. Martin	Assistant Secretary	2/01	06/15/2006
George C. Schreck	Assistant Secretary	10/00	2/01

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

ENERGY WEST MINING COMPANY'S DIRECTORS (as of May 1, 2008)			
Name	**Position**	**Effective Date***	**Departure Date**
A. Robert Lasich	Director	05/01/08	Current
Niel L. Getzelman	Director	12/01/06	04/30/2008
Terry F. Hudgens	Director	10/00	9/01
Dee W. Jense	Director	10/02	11/30/2006
Judth Johansen	Director	9/01	10/02
Robert P. King	Director	2/01	08/15/2006

*In place on date of MidAmerican Energy Holdings Company acquisition of PacifiCorp effective March 21, 2006, unless noted otherwise.

APPENDIX D

Mine Maps

As required under R645-302-525-270

CONTENTS

This information is considered "Confidential". A separate CD is provided for DOGM records.

APPENDIX E

Other Information

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

CONTENTS

2007 Raptor Report – This report is considered "Confidential" and is not included here. A separated CD is included for DOGM records.

Subsidence Report (See Accompanying Volume)

Hydrology Report (See Accompanying Volume)

Annual Hydrology Report
2007

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

Cottonwood Coal Mine
C/015/019

Deer Creek Mine
C/015/018

Des-Bee-Dove Mines
C/015/017

Trail Mountain Mine
C/015/009

☐ Confidential
☒ Shelf
☐ Expandable
Refer to Record No 0058 Date 09022008
In C/015/0018, 2008, Incoming
For additional information

BINDER # 2

PACIFICORP – ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING PROGRAM
ANNUAL REPORT FOR 2007

AUGUST 2008

Submitted to:
United States Department of the Interior Bureau of Land Management
U.S.D.A. - Forest Services Manti-LaSal National Forest
Utah Division of Oil, Gas and Mining

Prepared and submitted for PacifiCorp by:

HydroResources Division

and

Energy West Mining Company

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DIV. OF OIL, GAS & MINING

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MFS1851D	Mill Fork Lease Hydrologic Monitoring

I. INTRODUCTION

The 2007 Hydrologic Monitoring Report is hereby submitted in accordance with the U.S. Department of Interior, Office of Surface Mining requirements and the Utah State Division of Oil, Gas and Mining guidelines for hydrologic monitoring in areas of and adjacent to coal mining operations.

This is the thirtieth annual hydrologic report submitted by PacifiCorp since the report entitled "Monitoring of the Water Resources in the Mining Areas of East/Trail Mountain, Emery County, Utah" was submitted to the U. S. Geological Survey and the Utah Division of Oil, Gas and Mining in December 1977. It addresses flow observations and water quality characteristics of the water resources adjacent to PacifiCorp's mining areas in Emery County. (See Figure 1, A & B.)

Information was compiled the past year from in-house as well as from state and federal agencies and private sources as follow:

U. S. Geological Survey
U. S. Forest Service
U. S. Department of Commerce, National Weather Service
Utah Division of Oil, Gas and Mining
Utah Division of Environmental Health
Huntington-Cleveland Irrigation Company
Emery Water Conservancy District
Cottonwood Creek Consolidated Irrigation Company

Information from outside agencies will continue to be utilized each year for as long as their data gathering programs continue. As a result, cooperative effort is realized and duplication of effort and expense is substantially reduced.

II. CLIMATIC OBSERVATIONS

In general, runoff and subsequent water supplies are a direct function of the climatic conditions in any given area. Furthermore, the significance of the weather affecting the flow characteristics of the East/Trail Mountain springs cannot be over-emphasized.

Most of the water supply in the Western United States originates in the high mountain ranges as snowfall during winter periods. Snowmelt augmented by spring precipitation produces runoff which is utilized downstream. Fall precipitation influences soil moisture conditions prior to snowpack accumulation and has a bearing upon runoff the following year.

A. Regional Climatology

From 1982 to 1984 the Western United States, especially Utah, experienced an unprecedented wet cycle of precipitation. The pattern changed in 1985 with conditions returning to slightly above normal. During the 1986 water year, the extremely wet trend returned, and the upper Colorado River Basin experienced above average precipitation. The 1987 weather pattern changed dramatically with near normal valley precipitation and mountain snowfall much below normal. The resulting 1987 runoff was substantially below normal. The drought continued from 1988 through 1992 with runoff amounts much below normal for six consecutive years. 1993 runoff improved substantially with above average flow conditions occurring in most river basins. 1994 brought the return of drought conditions throughout the West. The 1995 through 1999 water supplies were much improved with above average runoff in Emery County. In 2000, weather conditions changed dramatically and the resulting runoff was much lower than normal. Precipitation was variable during 2001 and runoff values continued below normal though 2001. The drought continued into 2002 with much lower precipitation and runoff was near-record low levels for most streams in Emery County. The 2003 water year was nearly as severe as 2002 with flows less than 40%. The extreme dry trend continued through 2004 with precipitation and runoff much below average below average although 2004 was much improved over the previous 4 years. Finally, in 2005 wet conditions returned to the West and water supplies were much improved in the Huntington Creek drainage. Water supplies continued to improve and runoff in 2006 was substantially higher than in 2005. Most local reservoirs filled to capacity. Extreme drought returned to the region in 2007. Below average precipitation and snowfall coupled with dry and hot conditions in March and April resulted in greatly reduced water supplies which, in turn, severely restricted irrigation water supplies during August and September.

B. Local Climatology

1. Precipitation

Precipitation amounts recorded at Castle Dale, Huntington, East Mountain and Electric Lake for the 2007 water year (October 2006 to September 2007) will be presented since these sites include low elevation, intermediate elevation and two high elevation observation sites in the immediate vicinity of mining activities. The values are shown in Table 1.

Precipitation in Emery County during 2007 was variable depending on the location. Due to a lack of complete weather data at Hunter Plant, the Castle Dale weather station was used as an alternative for 2007. Precipitation at the valley reporting station at Castle Dale was 130% of average while precipitation at Huntington Plant was 129%. It should be noted that record keeping at Huntington resumed in 2006 following 4 years without weather records. East Mountain precipitation was only 75% of average while precipitation at the Electric Lake station was 118% of average but was only 75% of 2006. It is interesting to note that a major storm event occurred on October 6-7, 2006 which resulted in about one third of the entire year precipitation for Castle Dale and East Mountain and nearly one half of the total year precipitation at Huntington from that single storm event.

A comparison of precipitation for 2006 and 2007 merits consideration in this study. The intent is to develop a correlation between yearly precipitation and spring discharges on East and Trail Mountains. Table 2 is a comparison of the 2006 and 2007 precipitation levels recorded at the four locations.

Tables 3, 4, 5, and 6 indicate monthly precipitation values at Castle Dale, Huntington, Electric Lake, and East Mountain from the beginning of operation at each site. The tables indicate monthly trends as well as the great fluctuation in yearly totals. Figure 2 shows monthly precipitation at the East Mountain site for the 2007 water year.

The correlation of precipitation levels with spring discharges will be discussed in the East/Trail Mountain Springs section of this report.

2. Temperatures

During the 2007 water year, temperatures were much above normal at Castle Dale, East Mountain, Huntington Plant and Electric Lake. Temperatures at Castle Dale were above normal to much above normal for every month during the year except for October and November which were slightly below normal. Castle Dale spring and summer temperatures from April to September varied from 0.4 to 7.1 degrees above normal. For the year, the average temperature averaged 2.4 degrees above normal at Castle Dale. At Huntington, with the exception of October, temperatures were much above normal throughout the entire year

with the annual average departure from normal being 2.9 degrees above normal. At the East Mountain station, temperatures were above normal for every month during the year. For the year, the temperature at East Mountain averaged 5.1 degrees above normal. Temperatures at the Electric Lake station were below normal for October and November and were above normal for the rest of the year. For the year, the temperature at Electric Lake averaged 36.1 degrees with an annual average departure from normal of +2.2 degrees. (See Table 7 for temperature data at the 4 stations.)

A comparison of 2006 and 2007 temperatures for the four stations is addressed since temperatures also influence water supplies from year to year. Table 8 depicts the variation and compares 2006 to 2007.

III. DRAINAGE SYSTEMS

The surface drainage system on East Mountain is divided into two major drainages; the southwest portion forms part of the Cottonwood Creek drainage, and the northeast portion contributes to the Huntington Creek drainage. (See Map HM-1 in pocket.) The drainage boundaries, including minor subdivisions to Cottonwood and Huntington creeks, are designated on the accompanying map. The surface drainage system on Trail Mountain is totally contained within the Cottonwood Creek drainage system, with minor subdivisions flowing to Indian and Cottonwood Canyon creeks. (See Plate 7-2 in pocket.) Both Huntington and Cottonwood creeks flow out of the Wasatch Plateau in a southeasterly direction. The creeks merge with Ferron Creek to form the San Rafael River, which is a tributary of the Green River.

A. Huntington Creek Drainage System

Huntington Creek is comprised of many smaller tributary streams that feed the main stream. Deer Creek, Meetinghouse Canyon, Mill Fork Canyon, and Rilda Canyon creeks are the only tributaries to Huntington Creek that emanate from within PacifiCorp's coal mine permitted area.

1. Huntington Creek

Flow data are recorded on a continuous basis by PacifiCorp at four locations; stations are located near on Huntington Creek near PacifiCorp's Huntington Plant, Huntington Plant Diversion, Huntington Creek below Electric Lake about 22 miles upstream from the Huntington Plant and Electric Lake elevations and contents. Flow records are maintained by PacifiCorp in order to determine water entitlements and reservoir storage allocation for the various users on the river.

Table 9 shows a summary of actual recorded Huntington Creek flows below Electric

Lake and at Huntington Plant, and calculated natural flow at Huntington Plant. The calculated natural flow considers actual flow recorded at the plant, plant diversions, Electric Lake storage change, and lake evaporation. The calculation does not include Left Fork Reservoir regulation since new reservoir monitoring equipment was not operational during part of the year. The average daily discharges for the 2007 water year (October 2006 - September 2007) at the two stations and Electric Lake storage are found in Appendix A.

During the 2007 spring runoff period (April through June) only 2,982 acre feet was stored in Electric Lake which was 21% the 2006 stored volume and only 33% of the average annual stored flow. During spring runoff the impoundment reached its highest level on June 3 at an elevation of 8567.99 feet. Total storage on that date amounted to 27,356 acre feet, which is 2,644 acre feet below full capacity. Continued lake losses to the groundwater system required much reduced releases for fishery, irrigation, flood control and Huntington Plant needs. Total release for the year amounted to 12,248 acre feet, or an average of 17 CFS. The total flow of Huntington Creek at the Huntington Plant was 38,429 acre feet or only 57% of average. A comparison of runoff values from 2006 and 2007 is presented in Table 10.

During 2007 water quality information on Huntington Creek near the Deer Creek confluence was compiled on a quarterly basis. Locations of water quality sampling stations monitored by PacifiCorp-Energy West Mining Company are listed below (refer to Map HM-1).

a. HCC01 - Above Power Plant Bridge
b. HCC02 - Below Deer Creek Confluence
c. HCC04 - Below Bridge @ Research Farm Bridge[+]

[+] Not listed on map due to scale.

Specific water quality constituents analyzed are shown in Tables 11, 12, and 13. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office. In general, the water shows a gradual increase in concentration of dissolved minerals as the flow proceeds down Huntington Canyon.

2. <u>Deer Creek</u>

Deer Creek is an ephemeral tributary of Huntington Creek and flows from the same canyon in which the Deer Creek Mine is located. PacifiCorp monitors the characteristics of Deer Creek according to the following flow and sampling schedule (see Hydrologic Monitoring Schedule Appendix L).

a. Flow and Sampling Schedule
   (1) Locations:
      (a) Above the Mine - DCR01
      (b) @ Permit Boundary - DCR04

(c) Below the Mine - DCR06
(See Map HM-1 in pocket)

(2) Flow: Information is collected during the first or second week of each month.

(3) Water Quality Sampling:
Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L.) The program was initiated in March 1988 and will continue through 2008; i.e., June, September, and December. Field measurements including pH, specific conductivity, and temperature will be performed in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

As stated above, flow information is collected monthly throughout the year with the use of two Parshall flumes. (See Map HM-1 for flume locations.) A hydrograph showing all the data collected for 2007 and 1984-2006 has been generated for each location. (See Appendix B.) The hydrographs show that the only flow which occurred in the Deer Creek drainage was the result mine water discharge from Deer Creek Mine. For location DCR01 flow occurred only during the month of May with a peak flow estimated at 45 gpm. Flow at the lower two locations occurred throughout the year as the result of Deer Creek Mine discharge with peak flow occurring in October (DCR04 - 2,677 Gpm, DCR06 - 2,600 Gpm).

c. Quality Information

In accordance with the Hydrologic Monitoring Plan, baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. The results of the historical operational quality analysis are listed in Tables 14 and 15. The minimum, maximum, and mean values are given for a five-year period along with the historical results. Values are in milligrams per liter unless otherwise noted. It is apparent from historical information in the tables that the quality of the Deer Creek runoff degrades slightly from the upper to the lower sampling point. The quality of the lower sampling point is thought to be affected by the Mancos Shale which outcrops above the lower sampling location. Raw data is on file at the Energy West Main Office.

3. Meetinghouse Canyon Creek

Meetinghouse Canyon Creek is an ephemeral tributary of Huntington Creek and is monitored according to the following schedule (see Hydrologic Monitoring Schedule in Appendix L).

a. Flow and Sampling Schedule

(1) Location: South Fork of Meetinghouse Canyon (See Map HM-1 in pocket.)

(2) Flow: Information is collected during the first or second week of each month.

(3) Water Quality Sampling:
Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed will be those stated in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L.) The program was initiated in March 1984 and will continue through 2008, i.e., June, September, and December. Field measurements including pH, specific conductivity, and temperature will be performed monthly in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

A hydrograph comparing 2007 and 1984-2005 can be found in Appendix C. For location MHC01 flow occurred only during the months of April through November with a peak flow estimated at 61 gpm in August.

c. Quality Information

In accordance with the Hydrologic Monitoring Plan, baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. Quality sampling was initiated in 1986. Table 16 lists the minimum, maximum, and mean values for 2007 along with historical results. Raw data is on file at the Energy West Main Office.

4. Mill Fork Canyon

Mill Fork Canyon is a tributary of Huntington Creek and was included in PacifiCorp's monitoring program starting in 1997. Monitoring of Mill Fork is conducted according to the following schedule (see Appendix L). Mill Fork Canyon is ephemeral from its headwaters to the western border of Section 21, Township 16 South, Range 7 East, and intermittent from that point to the confluence of Huntington Creek.

a. Flow and Sampling Schedule

(1) Locations:

(a) Above Mill Fork Fault - MFU3

(b) Above Old Mines - MFA1

(c) Mill Fork Canyon Culvert – MFB2

(See Map HM-1.)

(2) Flow: Information is collected during the first or second week of each month.

(3) Water Quality Sampling:
Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L.) The program was initiated in 1997, and will continue through 2008 on a quarterly basis, i.e., March, June, September, December. Field measurements, including pH, specific conductivity, temperature will be performed quarterly in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

Flow information is collected monthly throughout the year (See Map HM-1 for locations.) A hydrograph has been generated for each location. (See Appendix D.) Locations MFU3 and MFA1 remained dry throughout the year. For location MFB2 flow occurred during the months of May through November with a peak flow estimated at 150 gpm in September.

c. Quality Information

Historical monitoring data collected by Beaver Creek Coal Company - No. 4 Mine and the United States Geological Survey (site No. 76: Open File Report 81-539) has been incorporated in PacifiCorp's hydrologic database. Operational water quality monitoring was conducted during 1997 and 1998 (refer to the Quarterly Hydrologic submittals). Baseline quality analysis was initiated in November 1998 (2002 for MFU03). In accordance with the Hydrologic Monitoring Plan, baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. Thereafter, baseline analysis will be repeated once every five (5) years.

Results of the samples collected in 2007 are presented in Tables 17,18 and 19. It is apparent from the data that the quality of the water degrades slightly from the upper reaches of Mill Fork, i.e., MFU3 to the mouth of the canyon, i.e., MFB2. Water quality has remained relatively consistent from year to year. (See Tables 17, 18 and 19). Raw data is on file at the Energy West Main Office.

5. Rilda Canyon Creek

Rilda Canyon Creek is a tributary of Huntington Creek and is monitored according to the following schedule (see Appendix L). Rilda Canyon Creek is ephemeral from its headwaters to the western border of Section 28, Township 16 South, Range 7 East, and perennial from that point to the confluence of Huntington Creek.

a. Flow and Sampling Schedule

(1) Locations:

(a) Right Fork of Rilda - RCF1*
(b) Left Fork of Rilda - RCLF1**
(c) Left Fork of Rilda - RCLF2**
(d) Rilda Canyon - RCF2*
(e) Rilda Canyon - RCF3
(f) Rilda Canyon - RCW4 (See Map HM-1.)

* During mining of the North Rilda leases, an additional site was added in 1999 upstream of RCF1 (adjacent to EM-163) to monitor surface/groundwater relationships. Flow will be measured yearly during base flow conditions.

** Flow and field parameters only.

(2) Flow: Information is collected during the first or second week of each month.

(3) Water Quality Sampling:
Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L.) The program was initiated in June 1989 except for RCLF1 and RCLF2, which were initiated in 1990 and 1995, respectively, and will continue through 2007 on a quarterly basis, i.e., March, June, September, December. Field measurements, including pH, specific conductivity, temperature, and dissolved oxygen, will be performed at the perennial stream locations, i.e., RCF3 and RCW4, monthly in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

Flow information is collected monthly throughout the year with the use of three Parshall flumes and one V-notch weir. (See Map HM-1 for locations.) A hydrograph has been generated for each flume-weir location. (See Appendix E.) Springs utilized by North Emery Water Users Association (NEWUA) for culinary purposes are situated between

monitoring locations RCF2 and RCF3. Flow above the spring area is ephemeral and below the stream is perennial. For location RCF1 flow occurred only during the months of April through October with a peak flow estimated at 9,00 gpm in May. Locations RCLF1 and RCLF2 flow occurred during the months of April through May with a peak flow of 30 in May. For location RCF2 flow occurred only during the months of May through June with a peak flow estimated at 927 gpm in May. Below the spring area the stream is perennial and increases in flow from RCF3 to RCW4. During 2007 the peak flow for RCF3 was estimated at 1,100 Gpm (May); for RCW4, 1,60 Gpm (May). Baseline flow for 2007 at RCF3 and RCW4 was approximately 100 and 275 Gpm, respectively. Data suggest that above the NEWUA springs the stream loses water to the alluvium and below the spring area the alluvium recharges the stream causing the flow to increase.

c. Quality Information

In accordance with the Hydrologic Monitoring Plan baseline quality analysis was performed in 2006. Thereafter, baseline analysis will be repeated once every five (5) years. Quality sampling was initiated in 1989; results of the samples collected are presented in Tables 20, 21, and 22. It is apparent from the data that the quality of the water degrades from the upper reaches of Rilda Canyon, i.e., RCF1, to the NEWUA spring area, and from that point to the mouth of the canyon, i.e., RCW4. Water quality has remained relatively consistent from year to year. (See Tables 20, 21, and 22) Raw data is on file at the Energy West Main Office.

B. Cottonwood Creek Drainage System

The southern portion of East Mountain and the entire Trail Mountain is intersected by Cottonwood Creek and its associated tributaries, including Cottonwood Canyon Creek and Grimes Wash. The Cottonwood Creek drainage is about equal in size to the Huntington drainage, with total discharge from each drainage about 70,000 acre feet per year. The major cultural feature on Cottonwood Creek is Joe's Valley Reservoir, located about twelve miles west of the town of Orangeville. The 63,000 acre foot reservoir was constructed by the U. S. Bureau of Reclamation and provides storage water for irrigation, industrial, and municipal needs in the Emery County area.

PacifiCorp monitors three of the tributaries of the Cottonwood Creek drainage system, Cottonwood Canyon Creek, Grimes Wash and Indian Creek. (See Maps HM-1 and MFS1851D in pocket.)

1. Cottonwood Canyon Creek

Based on data collected by PacifiCorp, Cottonwood Canyon Creek is an ephemeral stream from its headwaters to Section 24, Township 17 South, Range 6 East and intermittent from that point to its confluence with Cottonwood Creek. The majority of water moving

through Cottonwood Canyon Creek appears to be through the colluvial valley deposits. An extensive hydrogeologic investigation was conducted in Cottonwood Canyon Creek during 1992. Results can be found in Appendix C of the PAP. Four (4) permanent runoff sampling sites have been established along Cottonwood Canyon Creek and sampled as listed below. (See Hydrologic Monitoring Plan in Appendix L).

a. Flow and Sampling Schedule

(1) Locations: (See Map HM-1 in pocket.)

(a) Above Mine - SW-1

(b) Below Mine - SW-2

(c) @ USGS Flume - CCC01 (Flow and field parameters only)

(d) Above Straight Canyon - SW-3

(2) Flow: Information is collected during the first or second week of each month.

(3) Water Quality Sampling:
Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed will be those stated in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L.) The program was initiated in December 1992 and will continue through 2008, i.e., June, September, and December. Field measurements including pH, specific conductivity, and temperature will be performed monthly in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

As stated above, flow information is collected monthly throughout the year. (See Map HM-1 for flume locations.) A hydrograph for 2007 has been generated for each sampling location. (See Appendix F.) The hydrographs show the intermittent nature of Cottonwood Canyon Creek. Flow at SW-1, occurred from January through August with a peak of 10 gpm in May. Flow at SW-2 occurred from January through December with a peak and average base flow estimated at 45 gpm (June) and 15 gpm, respectively. Flow at SW-3 occurred from April through November with a peak of 43 gpm in May. Flows recorded at SW-2 was influenced by discharge from the Cottonwood Mine.

c. Quality Information

In accordance with the Hydrologic Monitoring Plan, baseline quality analysis was performed in 2007. Thereafter, baseline analysis will be repeated once every five (5) years. The results of the historical operational quality analysis are listed in Tables 23, 24, and 25.

The minimum, maximum, and mean values are given for a five-year period along with the historical results. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office.

The Cottonwood Canyon Creek drainage quality is influenced by the following factors: 1) A relatively high amount of suspended solids during spring runoff from Indian, Roans, Mill, and Marines canyons; 2) Alluvial/colluvial deposit recharge and discharge areas.

2. Grimes Wash

Grimes is an ephemeral tributary of Cottonwood Creek and flows in the same canyon in which the Wilberg/Cottonwood Mine is located. Three permanent runoff sampling sites were established in 1980 and are sampled as listed below (see Hydrologic Monitoring Plan in Appendix L).

a. Flow and Sampling Schedule

(1) Locations: (See Map HM-1 in pocket.)

(a) Right Fork - GWR01

(b) Left Fork - GWR02

(c) Below the Mine - GWR03

(2) Flow: Information is collected during the first or second week of each month.

(3) Water Quality Sampling:
Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed will be those stated in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L.) The program was initiated in March 1988 and will continue through 2008 i.e., June, September, and December. Field measurements including pH, specific conductivity, and temperature will be performed in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

As stated above, flow information is collected monthly throughout the year with the use of two Parshall flumes. (See Map HM-1 for flume locations.) A hydrograph comparing 2007 to the data collected from 1984 through 2006 has been generated for each flume location. (See Appendix G.) Right fork monitoring site remained dry throughout the year. Flow at the left fork occurred from May through July with a peak flow estimated at 19 gpm during the month of July. Below the mine (GWR03), flow occurred from March through

November with a peak of 29 gpm in July. Flow at the Below the Mine location continued throughout most part of the year due to the influence of the springs emanating from the Starpoint Sandstone/Mancos Shale formational contact. Base flow at GWR03 average approximately 10 Gpm.

c. Quality Information

In accordance with the Hydrologic Monitoring Plan baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. The results of the 2007 operational quality analysis are listed in Tables 26, 27, and 28. The minimum, maximum, and mean values are given for a five-year period along with the historical results. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office.

The Grimes Wash drainage quality is influenced by two factors: 1) Under normal conditions the Right Fork contributes a relatively high amount of suspended solids during spring runoff due to the fact that it is a south facing canyon dominated by argillaceous sediments; 2) Mancos Shale/Starpoint Sandstone interface seeps and springs elevate the TDS at the Below the Mine location.

3. Indian Creek

Indian Creek is an perennial tributary of Cottonwood Creek and flows in Upper Joes Valley and merges with Lowry Water near the Joes Valley Reservior. Four permanent runoff sampling sites were established in 2001 and are sampled as listed below (see Hydrologic Monitoring Plan in Appendix L).

a. Flow and Sampling Schedule

(1) Locations: (See Map MFS1851D in pocket.)

(a) Above Camp Ground - ICA
(b) Indian Creek Flume - ICF
(c) Indian Creek Ditch - ICD
(d) Below Cross-Over Road - ICB

(2) Flow: Information is collected during base flow only (October)

(3) Water Quality Sampling:
Water samples will be collected and analyzed during base flow monitoring. Parameters analyzed will be those stated in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L.) The program was initiated in October 2001 and will continue through 2008. Field measurements including pH, specific conductivity, and temperature will be performed in conjunction with quality measurements.

b. Flow Information

As stated above, flow information is collected during base flow only with the use of portable 90° v-notch weir and one permeant Parshall flume. (See Map MFS1851D for monitoring locations.)

c. Quality Information

In accordance with the Hydrologic Monitoring Plan baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. The results of the 2007 quality analysis are tabulated in Appendix F. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office.

IV. SPRINGS

A. East Mountain

Between the time PacifiCorp began monitoring springs on East Mountain and 1986 the number of springs measured increased from less than fifty (50) to nearly eighty (80). PacifiCorp believed that more benefit could be realized by concentrating its monitoring to selective springs in the areas that will be undermined within the next five years. (See Map HM-5 in pocket.) A meeting was held on March 25, 1987 with the U. S. Forest Service and the Utah State Division of Oil, Gas and Mining to determine the most effective plan for PacifiCorp's monitoring. A subsequent meeting was held on April 15, 1987 with the State Division of Oil, Gas and Mining to finalize the monitoring plan revisions. In addition to major revisions made in 1987, each year State and Federal agencies are invited participate to adjusting the monitoring schedule based on field investigations.

During the meetings it was resolved that the following springs will be monitored. Eight additional springs (denoted with a plus [+] symbol below) were added in 1989 after the annual field verification process jointly conducted by DOGM and PacifiCorp.

*	Burnt Tree Springs		79-40
*	Elk Spring		80-41
*	Sheba Springs		80-43
	Ted's Tub	*	80-44
	79-2	*	80-46
*	79-10		80-47
	79-15	+	80-48
*	79-23		80-50
	79-24		82-51
*	79-26	*	82-52
+	79-28	*	84-56

* 79-29	+ 89-60 (Alpine Spring)
79-32	+ 89-61
79-34	+ 89-65
* 79-35	+ 89-66
79-38	+ 89-67
	+ 89-68

Of these springs, twelve will be monitored on a monthly basis, weather permitting, and have been denoted on the above list with asterisks (*).

Mill Fork Springs:

EM-216	EMPOND
GRANTS SPRING	LITTLE BEAR
JV-9	JV-34
MF-7	MF-10
MF-19B	MF-213
MF-219	MFR-10
MFR-30	RR-5
RR-15	RR-23A
SP1-26	SP1-29
UJV-101	UJV-206

1. Flow and Sampling Schedule

a. Flow

All springs on the preceding lists are measured during the months of July and October. In addition, a minimum of twelve springs are monitored to establish a discharge recession curve (denoted with an * above). Generally, measurements are made on a monthly basis during the months of July through October if weather and reasonable access permit; but when historical data indicate that a spring is short-lived, all efforts are made to measure discharge from that spring at least three times, equally spaced, within its flow period.

b. Quality Samples

All springs listed above are sampled for water quality characteristics during the months of July and October. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Operational Quality. (See Appendix L.)

2. Spring Flow

Precipitation decrease from 2005 to 2006, spring discharge rates were mixed with East Mountain -Southern area slightly lower in 2006, Mill Fork and Trail Mountain slightly higher in 2006. Extreme drought returned to the region in 2007. Below average precipitation and snowfall coupled with dry and hot conditions in March and April resulted in greatly reduced water supplies which, in turn, severely restricted irrigation water supplies during August and September. Temperature, a critical factor on spring discharge rates, was 5.3 degrees higher in 2007 than the historical average. Precipitation received at East Mountain weather station and spring discharge rates set a all time lows for the 2002 water year and only improved slightly in 2003 and 2004. Table 29, is a tabulation of the flow data collected during the 2007 monitoring season. To record the season variation, all springs measured in July are measured again in October. The seasonal variation is represented in Table 29, under the column heading "Seasonal Net Change." The percentage figures represent the amount of change, either positive or negative. The average change reveals a forty-three percent (43%) [fifty-nine percent (59%) by volume] decrease from the July to the October measurements for Southern East Mountain and a fifty-one percent (51%) [thirty-nine percent (39%) by volume] decrease from the July to the October measurements for the Mill Fork Area.

A twenty-six year comparison of spring discharge is shown in Table 30. The table includes a year by year comparison of springs identified from each mode of occurrence (Table 31). The springs utilized in the comparison are underlined in Table 31. The flow values for the individual springs represent the July measurements. October measurements were not utilized because winter weather conditions caused some springs to become inaccessible.

Table 30 has been compared to East Mountain climatology to see how closely spring discharge rates follow local annual precipitation. Figure 3 reveals good correlation between spring discharge and precipitation. Along with precipitation, temperature plays a critical role in yearly discharge variations, especially during the early stages of the runoff period. Listed in Table 32 is a comparison of January through June temperature data from surrounding weather stations for the period 1982-2007 versus departure from normal. The comparison is vital in determining mining effects on spring discharge versus general changes in annual precipitation.

Table 32 clearly demonstrates near average temperatures between 1982 and 1984, but starting in 1985 and continuing through 2000 (except for 1991 and 2001) positive departure from normal has been significant. In 2007 the temperatures were 5.3 degrees above average. Comparison between spring discharge rate and general changes in annual precipitation patterns correlated well in the past due to relatively normal temperatures experienced during the early runoff period (January through June). Figure 3 not only includes a comparison of spring discharge rate and precipitation as in the past but also temperature departure due to critical influence temperature has on peak discharge occurrence.

An additional flow information study was initiated during the summer of 1985. The purpose of the program is to establish flow recession curves for the following springs: (1) Burnt Tree, (2) Elk Springs, (3) Sheba, (4) 79-10, (5) 79-23, (6) 79-26, (7) 79-29, (8) 79-35, (9) 80-44, (10) 80-46, (11) 82-52, (12) 84-56. The flow information collected during 2005 is shown in Table 33; corresponding spring recession curves comparing 2007 to 1984-2005 are located in Appendix H.

3. Quality

To more closely identify springs which are related one with another, water samples were analyzed to determine the percentage of cations and anions in solution. The percentages have been graphically represented as cation-anion diagrams. (See Appendix H.) The purpose of the cation-anion diagrams is to identify groups of related springs by water chemistry. To better visualize the concept, the cation-anion diagrams are presented by the geologic formation in which the spring originates. A general pattern for the Flagstaff and Price River formations can be recognized for each year in which the cations/anions were analyzed. A consistent pattern for the North Horn is less obvious due to the complex geology of the formation itself. One aspect the cation-anion diagrams demonstrate is that, even though the quality varies slightly from individual sites as well as from different formations, seasonal variations do not exist.

The quality of the springs sampled in 2007 reveals an excellent correlation with historical averages. A summary of the water quality analysis for a representative group of East Mountain Springs is presented in Table 34. In the table, the mean values for 2007 are compared to the historical results for each respective spring. Raw data is on file at the Energy West Main Office.

B. Rilda Canyon - North Emery Water Users Association (NEWUA)

Of concern to PacifiCorp Energy West is the proximity of proposed mining activities in Rilda Canyon to the Rilda Canyon Springs which currently serve as a culinary water source to the North Emery Water Users Association (NEWUA). The NEWUA spring system consists of a series of collection lines extending westward up Rilda Canyon and southward up a small side drainage (shown on Map HM-8 in Volume 9 of the PAP). The NEWUA spring system is metered at four locations. Meter 1 (Side Canyon Spring) is located at the downstream end of a collection line which enters Rilda Canyon from the South. Meter 2 (Side Canyon Spring plus South Spring) is located near the bottom of the main east-west trending collection line which lies to the south of Rilda Canyon Creek at a point just upstream (west) of the main spring collection box. Meter 2 records combined flows from both the Side Canyon (Meter 1) as well as additional inflows known as South Spring which enter the system below Meter 1. Meter 3 (North Spring) records flows for the east-west central collection line which was constructed through the central portions of the valley near Rilda Canyon Creek. Meter 4 (North Spring) collects data from the north collection line

located on the north side of Rilda Canyon Creek. During 1995 flow from the north collection line was combined with the central collection system. As a result Meter 4 was terminated.

1. Spring Flow

Through the cooperative efforts of PacifiCorp and NEWUA, flow meters were installed in September 1990 to isolate individual spring areas for quantity and quality (see Map HM-8 in Volume 9 of the PAP). Table 34 lists the individual flow rates for meters 2 and 3 (flow from Meter 1 is included in Meter 2). Accurate data for the past two years has been hampered by operational problems with the diversion valves and meters.

The seasonal variation of the monthly average flow from NEWUA's Rilda Canyon Springs is shown in Figure 4. With the installation of flow meters, individual spring contribution to the total flow can be plotted over time.

2. Quality

Baseline quality sampling of the individual springs was performed in 2007. The minimum, maximum, and mean results of the 2007 spring flow compared to historical quality analysis are listed in Table 36. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office. As stated in Volume 9 of the PAP, differences in the groundwater quality data reflect differences in the groundwater source or the origin of groundwater for the various springs issuing within the Rilda Springs area. The higher sulfate and TDS concentrations from the Meter 2 samples are characteristic of waters associated with the Blackhawk Formation. Waters issuing from the North Spring collection system (Meters 3 and 4) area are of a better quality than waters from the Side Canyon and South Spring collection areas. Water issuing from the North Spring originates primarily from water moving within the alluvial valley sediments and fracture systems of the Starpoint Sandstone and is not derived from the Blackhawk Formation.

C. Trail Mountain

PacifiCorp began monitoring springs on Trail Mountain in 1993. Monitoring prior to 1993 was completed by the previous lease holders. The nine (9) springs listed below are monitored.

T-6 (18-2-1)	T-14 (17-25-1)
T-8 (17-21-1)	T-14A (17-26-5)
T-9 (17-22-1)	T-15 (17-35-1)
T-10 (17-26-4)	T-16 (17-35-2)
TM-23 (17-14-4)	

1. Flow and Sampling Schedule

a. Flow

All springs on the preceding list are measured during the months of July through October if weather and reasonable access permit.

b. Quality Samples

All springs listed above are sampled for water quality characteristics during the months of July and October. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Operational Quality. (See Appendix L.)

2. Spring Flow

As indicated earlier, precipitation and spring flow rates decreased significantly from 2006 to 2007. Table 37 is a tabulation of the flow data collected during the 2007 monitoring season. The seasonal variation is represented in Table 37 under the column heading "Seasonal Net Change %." The percentage figures represent the amount of change, either positive or negative. The average change reveals a forty-five percent (45%) [three percent (3%) by volume] decrease from July to the October measurements.

A twenty-year comparison of spring discharge is shown in Table 38. The flow values for the individual springs represent the July measurements. October measurements were not utilized because winter weather conditions caused some springs to become inaccessible.

Cottonwood Spring (TM-23) Data:

On July 31, 1991 a citizen complaint claiming that the mining in the Deer Creek Mine dried up a spring known as Cottonwood Spring was filed by Jim Peacock. According to Mr. Peacock, Cottonwood Spring produced approximately one to three cubic feet/second and was the main source of flow for Cottonwood Canyon Creek (conversation during an on site visit with Utah State Division of Water Rights, Cottonwood Irrigation Company, United States Forest Service, Utah State Division of Oil, Gas & Mining [DOGM], and PacifiCorp held on August 1, 1991). Mr. Peacock indicated that production from the spring had been decreasing over the past several years and that he was unable to irrigate approximately twenty-two acres located on the north side of Highway 31 at the junction of Cottonwood Canyon Creek and Straight Canyon. Discussions during the on site visit centered around the location and extent of mining in the Deer Creek Mine, the drought which has had a major impact on the hydrologic resources of the area, and the hydrogeology of Cottonwood Spring.

As a result of the on site visit DOGM reviewed the available historical data on the flow and quality of Cottonwood Spring. In addition to historical review, DOGM requested that PacifiCorp update the Probable Hydrologic Consequences (PHC) in the Deer Creek

Mine Permit Application Package (PAP). The Deer Creek PHC was updated and submitted on three separate occasions: December 19, 1991; March 23, 1992; and again on July 15, 1992. As part of the March 23, 1992 submittal PacifiCorp committed to drilling a series of wells and conducting a resistivity survey in Cottonwood Canyon Creek during the 1992 field season to determine the hydrologic significance of the alluvial deposits and the interrelationship of the surrounding strata. In addition to the work completed in 1992, PacifiCorp contracted Mayo & Associates during 1996 to complete a comprehensive hydrologic investigation of surface and groundwater systems in the East & Trail Mountain areas (refer to Appendix C in Volume 9 and Mayo & Associates Study in Volume 9: Hydrologic Support Information). During the investigation, Mayo & Associates analyzed 1) solute and isotopic compositions of surface waters and groundwaters, 2) surface water and groundwater discharge data, 3) piezometric data, and 4) geologic information. From the fall of 1998 through early 2001, Energy West Mining conducted gain/loss surveys of Cottonwood Canyon Creek to compare historical studies conducted by the USGS.

The United States Geological Survey (USGS) collected quality and quantity data at the Cottonwood Spring site from 1978 through 1982 (Open File Report 81-539 and 84-067). Monitoring of Cottonwood Spring was included in the Trail Mountain MRP in 1986 following a spring and seep survey conducted by JBR in 1985.

The following is a list of sources and the time frame in which data was collected:

USGS	1978-1982
JBR	1985
Trail Mountain Coal Co.	1986-1987
Mountain Coal Co.	1987-1992
Energy West Mining	1992-Present

As document in Volume 9, Cottonwood Canyon Creek is a major drainage system which borders the western limit of the East Mountain Permit area. Based on data collected by PacifiCorp, Cottonwood Canyon Creek is an ephemeral stream from its headwaters to Section 24, Township 17 South, Range 6 East and intermittent from that point to its confluence with Cottonwood Creek at Straight Canyon. During periods of drought flow in Cottonwood Canyon Creek is limited to flow emanating from the alluvial deposits at the intersection of Roans Canyon. From the intersection of Roans Canyon to Section 36 the stream loses water to the alluvial deposits. The drainage is dry from Section 36 to Section 6 except during spring runoff which occurs normally from late April through June or during precipitation events. Flow in the channel reemerges in Section 6 and continues to the confluence with Cottonwood Canyon at Straight Canyon.

It is evident in reviewing all of the data including; drilling results, resistivity surveys, well hydrographs and isotope information that the source of groundwater for Cottonwood Spring is the alluvial system of Cottonwood Canyon. Groundwater production from

Cottonwood Spring area is function of precipitation and groundwater recharge. In reviewing the well hydrographs for wells CCCW1-3, groundwater levels in the alluvial wells have been increasing since mid 1995 in direct response to normal precipitation patterns (refer to Appendix F for hydrograph information). Groundwater trends in the Star Point Sandstone in wells CCCW-1 and CCCW-3 have been relatively constant or decreasing slightly. As stated previously, data collected during the development of the wells indicated that the alluvial system is not hydrologically connected to lower Blackhawk/Star Point formations. Monitoring data from the wells supports this conclusion.

Data collected during gain/loss surveys conducted from November 1998 through October 2000, compares directly to the measurements reported by the USGS in 1979 (Open File Report 81-539). Cottonwood Spring flow data reported by the USGS was not from a individual source, but was the difference in flow measurements above and below the spring area (refer to the 2000 Annual Hydrologic Report Appendix I for gain/loss survey results). Included in Appendix I is a hydrograph comparing the Palmer Drought Index (average of Regions 4 & 5) to Cottonwood Spring area flow. In reviewing the hydrograph, flow from the Cottonwood Spring area fluctuates in direct response to precipitation patterns and was not influence by mining in the Deer Creek Mine.

3. Quality

To more closely identify springs which are related one with another, water samples were analyzed to determine the percentage of cations and anions in solution. The percentages have been graphically represented as cation-anion diagrams. (See Appendix I.) The purpose of the cation-anion diagram is to identify groups of related springs by water chemistry. To better visualize the concept, the cation-anion diagrams are presented by the geologic formation in which the spring originates. A general pattern for the geologic formations can be recognized for each year in which the cations/anions were analyzed. A consistent pattern for the North Horn Formation is less obvious due to the complex geology of the formation itself. One aspect the cation-anion diagrams demonstrate, is that, even though the quality varies slightly from individual sites as well as from different formations, seasonal variations do not exist.

The quality of the springs sampled in 2007 reveals an excellent correlation with historical averages. A summary of the water quality analysis for springs monitored on Trail Mountain is presented in Table 39. In the table, the mean values for 2007 are compared to the historical results for each respective spring. Raw data is on file at the Energy West Main Office.

V. MINE HYDROLOGY

A. Groundwater and Surface Water Sources in Relation to Mine Workings

The relationship of the Deer Creek, Cottonwood/Wilberg, and Trail Mountain mine workings with the overlying springs is shown in Map HM-5 (in pocket). Beginning in 1979 (Trail Mountain - 1992), PacifiCorp has developed an ambitious spring monitoring program with emphasis to detect changes in the East and Trail Mountain hydrologic regime as a result of mining. The data collected to date reveal no indication of any mine-related effects on spring discharge or surface flow rates. As expected, there is a direct relationship between annual precipitation, temperature, and spring discharge rates as previously discussed in the SPRING SECTION and shown in Figure 3.

B. Groundwater Quality and Collection Procedures

PacifiCorp began in-mine quality and quantity measurement in 1977 and has continued the measurement through 2007 With the collection of numerous samples throughout the extent of the mine workings, the quality has remained relatively constant. (Refer to Cation/Anion diagrams in Appendices J). In-mine monitoring was discontinued at Cottonwood and Trail Mountain during 2001 due mine sealing/temporary cessation of operations.

Collection procedures for groundwater quality consist of two grab samples collected and analyzed per quarter at each of the mines which produces measurable quantities of water. Sampling according to this established plan began in the first quarter of 1982. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Operational Quality except when new sites are established. In that case, baseline information will be collected for two (2) years. (See Appendix L.)

Long-term monitoring locations have been established at each of the mines which produces measurable quantities of water, i.e., Deer Creek, Cottonwood/Wilberg, and Trail Mountain mines. (See Maps HM-2, HM-3, and Plate 7-3 in pocket.) As stated earlier, in-mine monitoring at Cottonwood and Trail Mountain during 2001 was discontinued due mine sealing/temporary cessation of operations. Four types of occurrences have been recognized to exist within the current mine workings. (Refer to Figure 5.)

1. Structural rolls with overlying fluvial channels,
2. Fault systems (Pleasant Valley and Roans Canyon),
3. Fractures and joints (lineaments),
4. Roof bolt and in-mine drill holes.

A collection device was installed at each long-term monitoring location. Flow and temperatures collected on a quarterly basis from the long-term sites in both mines were fairly consistent. (See appendix J for the Deer Creek In-Mine hydrographs.)

C. Mine Water

1. Deer Creek Mine

a. In-Mine Water Production

The best estimate of in-mine water production was arrived at by combining the following values:

Deer Creek Discharge	165.1 Million Gallons
Estimated Evaporation*	37.8 Million Gallons
Domestic Usage	9.6 Million Gallons
Total Discharge	212.5 Million Gallons

*See 1981 Hydrologic Monitoring Report (revised for two mine fans)

b. In-Mine Quality

Eight samples were collected in the Deer Creek Mine in 2007 (See Map HM-2 in pocket for locations.) Parameters analyzed in 2007 are those listed in the DOGM Guidelines for Groundwater Baseline or Operational Quality. (See Appendix L.)

Table 40 lists the characteristics of the samples collected and compares the mean, minimum, and maximum results of 2007 to the historical values for each location. It is apparent from Table 40 that the average quality of the in-mine water has remained relatively constant. (Refer to Cation/Anion diagrams in Appendix J.) Raw data is on file at the Energy West Main Office.

c. Discharge Quantity

Excess water not utilized in the mining operation or for domestic use was either pumped to storage areas or discharged from the mine. The locations of the main sump areas within the mine are shown in Figure 6. The largest volume of water is stored in the western part of Main West, which has not been actively mined for several years.

In-line flow meters are utilized to record the amount of water discharged from the mine, after which it passes through underground sedimentation sumps. Discharge from Deer

Creek is either shipped directly to Huntington Power Plant or to the Deer Creek drainage in accordance with stipulations of the Deer Creek UPDES Discharge Permit UT-0023604-002.

The total water discharged from the Deer Creek Mine during 2007 was estimated at 485.6 feet, or 165.1 million gallons. The recorded flow of 485.6 acre feet during 2007 is a seventeen percent (17%) increase from the 2006 discharge of 415.8 acre feet. The average monthly discharges are shown in Figure 7.

A graph displaying the historical discharge rates is included as Figure 8. The volume of water discharged from the mine has increased at a significant rate from 1988 through 1991 due to at least five factors. First, in previous years water discharged was measured with a Stevens Recorder installed in a Parshall flume. It was difficult to maintain calibration of the recorder and, in 1985, in-line flow meters (totalizer and instantaneous flow) were installed, allowing for a more accurate measurement of discharge. Second, mining has progressed into areas largely dominated by sandstone roof. The inflow from those areas is greater per acre of exposed area than areas of mudstone top. Third, mining has progressed into the bottom of the Straight Canyon Syncline, the lowest part of the mine, where a significant amount of water has been intersected. Fourth, mining has intersected the Roans Canyon Fault Graben which has released additional water into the mine workings. Last, prior to 1985, water used in mining was pumped directly from the in-mine sumps. Since that time, all water has been pumped from the mine through the metering system. Mining water is then pumped back into the mine through a high-pressure steel line to the mining faces where it is utilized. Water production decreased significantly in 1992 with the sealing of the 4th South area. The decrease flow recorded during 2002 was related to two factors; 1) replacement of the main discharge flow meter suspect of inaccurate readings (reduction of approximately 50%), and 2) development of a new in-mine sump.

d. Discharge Quality

Monthly water quality samples were collected for 2007. Table 41 compares the minimum, maximum, and mean values from an historical standpoint to 2007. An examination of Table 41 reveals excellent correlation with historical results. Raw data is on file at the Energy West Main Office.

2. Des-Bee-Dove Mine

Production at the Des-Bee-Dove Mine was terminated indefinitely as of February 14, 1987. The portals were sealed and underground hydrologic monitoring was discontinued. The entire mine site has been reclaimed and no longer requires hydrologic monitoring.

3. Wilberg/Cottonwood Mine

The mine fire which occurred in late 1984 altered normal hydrologic monitoring at the Wilberg Mine. Normal hydrologic monitoring was reinstated in late 1985 and continued

through May 2001. Energy West Mining Company notified the Division of temporary cessation of coal mining operations at the Cottonwood/Wilberg Mine effective May 29, 2001. Coal mining at the Trail Mountain Mine/coal transfer to Cottonwood Tipple ceased as of March 15, 2001. In preparation of temporary cessation, all associated mining equipment including; belt haulage (drives and headrollers), dewatering (pumps and control boxes) and electrical (transformers/rectifiers) were removed from the mine. Verification of equipment removal was conducted on May 4, 2001 Division of Oil, Gas and Mining (Pete Hess) participating in the review. Bureau of Land Management was notified but was unable to attend. A plan to construct permanent seals was submitted to and approved by Mine Safety Health Administration. Sealing of the mine portals was completed on May 28, 2001.

a. In-Mine Water Production

In previous reports, the in-mine water production was arrived at by combining mine discharge, domestic use, and evaporation. Due to the fire, normal coal production and usage were not experienced. Pre-fire coal production resumed during late 1985. A large part of the mine workings have been sealed since the fire. The locations of the sealed areas and sumps are shown on Figure 9. As reported in the 1984 Annual Report, water discharged from the Wilberg Mine complex includes the area designated as the Cottonwood Mine. (See Figure 10.) Consistent with previous years, the following table lists the factors involved in estimating in-mine water production.

Wilberg/Cottonwood Discharge

Grimes Wash*	0.0 Million Gallons
TMA	11.4 Million Gallons
Miller Canyon**	0.0 Million Gallons
Estimated Evaporation***	0.0 Million Gallons
Domestic Usage	0.0 Million Gallons
Total Discharge	11.4 Million Gallons

* Discharge Outfall 001 re-located from Grimes Wash to Cottonwood Canyon Creek TMA Portal - July 2001
** Sealed ventilation breakout which intermittently discharges.
*** See 1981 Hydrologic Monitoring Report.

b. In-Mine Quality

In-mine monitoring was discontinued during 2001 due sealing of the mine. Refer to previous Annual Hydrologic Reports for comparison of samples collected to the historical values.

c. Discharge Quantity

Prior to temporary cessation, water produced in the Wilberg Mine gravity flowed to the northern area of 1st North. At that point it can either be pumped by a vertical turbine located in the Deer Creek Mine which picks up the water and pumps it back to the south and down to the Wilberg Mine main sump or pumped directly to the main sump utilizing submersible pumps. Water produced in the Cottonwood Mine (2nd North area) is transferred to the Wilberg Mine sump. The sump, which functioned as a settling basin, effectively removes settleable solids from the water. A portion of the water was redistributed to various areas of the mine to be utilized in the mining operations. A total of 11.4 million gallons was discharged to Cottonwood Canyon Creek (TMA portal) during 2007. No discharge occurred in 2007 at the Miller Canyon breakouts, which were developed for ventilation purposes but sealed in 1987. (See Figure 11.) The portal breakouts at Miller Canyon were reclaimed in 1999. Minor seeps occur through a french drain system installed at each portal, but groundwater production is insufficient for measurement. Discharge from Cottonwood Mine is monitored in accordance with stipulations of the Wilberg Mine Discharge UPDES Permit UT-0022896.

d. Discharge Quality

Samples are collected each month from the TMA Portals and Miller Canyon breakouts whenever discharge occurs. Monthly samples were collected from TMA during 2007. Table 43 compares the minimum, maximum, and mean values from 2007 to the historical values.

4. Trail Mountain Mine

Energy West Mining Company notified the Division of temporary cessation of coal mining operations at the Trail Mountain Mine effective May 4, 2001. Coal mining at the Trail Mountain Mine ceased as of March 15, 2001. In preparation of temporary cessation, all mining equipment including; production (longwall and continuous miner), belt haulage and electrical were removed from the mine. Verification of equipment removal was conducted on April 6, 2001 with Bureau of Land Management (Steve Falk) and Division of Oil, Gas and Mining (Pete Hess) participating in the review. A plan to construct permanent seals was submitted to and approved by Mine Safety Health Administration. Sealing of the mine portals was completed on May 2, 2001.

a. In-Mine Water Production

The best estimate of in-mine water production was arrived at by combining the following values:

Trail Mountain Discharge	0.0 Million Gallons
Estimated Evaporation*	0.0 Million Gallons
Domestic Usage	0.0 Million Gallons
Total Discharge	0.0 Million Gallons

* See 1981 Hydrologic Monitoring Report

b. In-Mine Quality

In-mine monitoring was discontinued during 2001 due sealing of the mine. Refer to previous Annual Hydrologic Reports for comparison of samples collected to the historical values.

c. Discharge Quantity

Prior to cessation, water produced in the Trail Mountain Mine either is pumped or gravity flows to a sump located in 4th Left, 5th Left, and 3rd South. (See Figure 12.) A portion of the water is redistributed to various areas of the mine to be utilized in the mining operations. Excess water not used in the mining operations is stored in sealed areas of the mine or discharged to Cottonwood Canyon Creek. No water was discharged to Cottonwood Canyon Creek during 2007. (See Figure 13.) Discharge from Trail Mountain is monitored in accordance with stipulations of the Trail Mountain Mine UPDES Discharge Permit UTG040003-002.

d. Discharge Quality

No water was discharged to Cottonwood Canyon Creek during 2007.

VI. PIEZOMETRIC GRADIENT INFORMATION

A. Surface

1. Cottonwood Canyon Creek

Eight (8) wells located along the extent of Cottonwood Canyon Creek are monitored monthly. The following table lists the zone isolated with each well.

Well I.D.	Monitoring Zone
CCCW-1A	Alluvial Deposits
CCCW-1S	Starpoint Sandstone
CCCW-2A	Alluvial Deposits
CCCW-3A	Alluvial Deposits
CCCW-3S U	Blackhawk - Fluvial Sandstone
CCCW-3S L	Starpoint Sandstone
EM-31	Lower Blackhawk/Starpoint Sandstone
TM-1B	Starpoint Sandstone
TM-3	Starpoint Sandstone (Straight Canyon)

2. Rilda Canyon

Six (6) wells located in Rilda Canyon are monitored monthly when accessible. The following table lists the zone isolated with each well.

Well I.D.	Monitoring Zone
P-1	Alluvial Deposits
P-4	Alluvial Deposits
P-5	Alluvial Deposits
P-6	Alluvial Deposits
P-7	Alluvial Deposits
EM-47	Lower Blackhawk/Starpoint Sandstone

Information collected during 2007 correlated well with historical information. As a result of mining in the western portion of the Trail Mountain Mine Well TM-3 in Straight Canyon decreased in level due to depressurization of the Star Point Sandstone. As mining proceeded north and the southern portion of the mine was sealed, the aquifer began to recharge (see chart in Appendix F). Hydrographs for the individual wells can be found in Appendix E - Rilda Canyon, Appendix F - Cottonwood Canyon.

B. In-Mine

1. Deer Creek

Four (4) long-term monitoring wells were completed during 1989. (See Map HM-2 for well locations.) Due to changes in the mine layout the last of the remaining wells was destroyed by mining activity during the fourth quarter 2003.

2. Cottonwood Mine

During 1989 four holes were drilled in the Cottonwood Mine. Monitoring of the long-term wells, WCP 1-3, was discontinued in 1992 due to the sealing of the 3rd South area.

VII. WASTE ROCK WELLS

A. Deer Creek Mine - Waste Rock Storage Facility

The Deer Creek Waste Rock Storage Facility is located on the northeast side of State Highway 31 approximately six (6) miles west of Huntington, Utah.

The geology of the Deer Creek Waste Rock Storage Facility is fairly simple and straightforward. The site is located on the southern flanks of Gentry Mountain in the area just south of Wild Horse Ridge. Rocks exposed in the area are marine-derived mudstones in the lower portion of the Masuk member of the Mancos Shale. The Masuk Shale on the bench which adjoins the proposed site on the east and west is covered by a five- to twenty-foot thick layer of terrace gravel of Quaternary age. North-south trending normal faults have disrupted the strata in the region; however, no faults are known to exist within the area of the Deer Creek Waste Rock Storage Facility.

The test wells completed prior to construction identified the existence of a limited quantity of groundwater locally in the Masuk Shale. The water is most likely flowing along fractures in the strata. The rate of water migration has been shown to be extremely slow (<100 feet per year); therefore, the operations to be conducted at the waste rock site should not impact the hydrology of the area. The weathered Masuk Shale present on and near the ground surface will act as an effective barrier to prevent the surface waters from migrating to depths and intersecting groundwater.

The groundwater present in the terrace gravels should not be impacted by the waste rock site because it is located at a higher elevation than the proposed site.

In order to identify the groundwater quality characteristics of the waste rock storage facility one of the test wells completed prior to the construction of the site was developed into a long-term water monitoring well. (See Map HM-1 for location.)

Four samples were collected in 2007. The analysis, along with water depth, is listed in Table 46. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office. It is a well known fact that the Mancos Shale typically contains large quantities of soluble minerals such as gypsum; therefore, any water passing through it will be naturally high in dissolved solids. Samples at the waste rock well verify this condition.

B. Cottonwood/Wilberg Mines - Waste Rock Storage Facility

The Cottonwood/Wilberg Waste Rock Storage Facility is located on the west side of the Wilberg Mine road approximately 1.5 miles south of the Wilberg Mine.

The geology of the proposed waste rock site is fairly simple and straightforward. The site is located on the southern flank of East Mountain to the south of Newberry Canyon. Rocks exposed in the area are marine-derived mudstones in the lower portion of the Masuk member of the Mancos Shale. The Masuk Shale on the bench which adjoins the proposed site on the north and east is covered by a five- to twenty-foot thick layer of terrace gravel of Quaternary age. North-south trending normal faults have disrupted the strata in the region; however, no faults are known to exist within the area of the waste rock site.

In order to identify the groundwater quality characteristics of the waste rock storage facility one of the test wells completed prior to the construction of the site was developed into a long-term water monitoring well. (See Map HM-1 for location.)

Four samples were collected in 2007. The analysis, along with water depth, is listed in Table 46. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office. It is a well known fact that the Mancos Shale typically contains large quantities of soluble minerals such as gypsum; therefore, any water passing through it will be naturally high in dissolved solids. Samples at the waste rock well verify this condition.

VIII. EFFECTS OF MINING AND SUBSIDENCE ON HYDROLOGY

Since the development of the PacifiCorp mining complex on East and Trail mountains, coal has been extracted causing the partial collapse of the immediate overburden strata and, ultimately, surface subsidence. This occurs in areas of retreat mining in room and pillar sections and in areas of longwall mining. All areas with potential for subsidence are monitored annually. (See annual Subsidence Monitoring reports.)

The springs and surface waters above all areas of mine workings are being monitored closely to measure the effects of mining. No mining-related changes to the springs or surface waters have been identified in the data collected. The water flowing into the mine workings, although temporarily diverted or detained, has not had an impact on the surface waters of East and Trail mountains or the surrounding area.

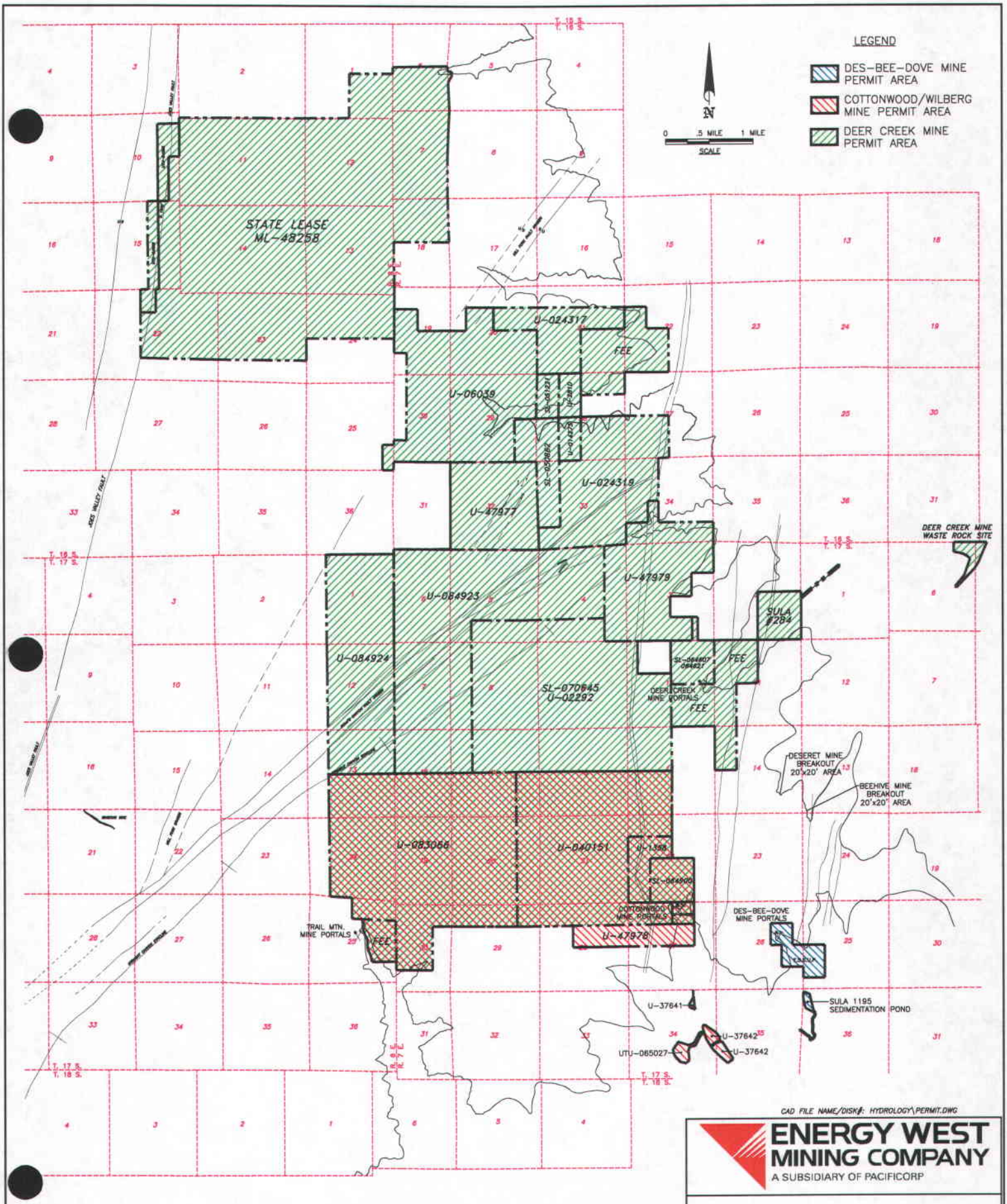
IX. SUMMARY

PacifiCorp has been conducting a water monitoring program in the area of its underground coal mines in Emery County, Utah in accordance with federal and state regulations. The program has been in existence since 1977, and this is the twenty-seventh annual report submitted concerning the hydrology.

From 1982 to 1984 the Western United States, especially Utah, experienced an unprecedented wet cycle of precipitation. The pattern changed in 1985 with conditions

returning to slightly above normal. During the 1986 water year the extremely wet trend returned, and the upper Colorado River Basin experienced above average precipitation. The 1987 weather pattern changed dramatically with near normal valley precipitation and mountain snowfall much below normal. The resulting 1987 runoff was substantially below normal. The drought continued from 1988 through 1992 and returned in 1994. Runoff improved substantially in 1993 and 1995 through 1998 with above average flow conditions occurring in most drainages. In 1999 runoff was higher than normal although not as high as 1998. In 2000, weather conditions changed dramatically and the resulting runoff and groundwater production was much lower than normal. Precipitation was higher in 2001 but the runoff values remained much below normal. The drought continued into 2002 with much lower precipitation and runoff was near-record low levels for most streams in Emery County. The 2004 water year was nearly as severe as 2003 with flows less than 60%. This extended 5 year drought has severely depleted reservoir supplies for all water users within the Huntington River system. Finally, in 2005 wet conditions returned to the West and water supplies were much improved in the Huntington Creek and Cottonwood Creek drainage systems. Water supplies continued to improve and runoff in 2006 was substantially higher than in 2005. Most local reservoirs filled to capacity. Extreme drought returned to the region in 2007. Below average precipitation and snowfall coupled with dry and hot conditions in March and April resulted in greatly reduced water supplies which, in turn, severely restricted irrigation water supplies during August and September.

The data collected in 2007 continued to show the relationship between the variation in surface water quantity and precipitation, but the hydrologic monitoring completed on East and Trail mountains to date has failed to identify any change in the quantity or quality of ground or surface water which can be attributed to mining on the East and Trail Mountain properties.

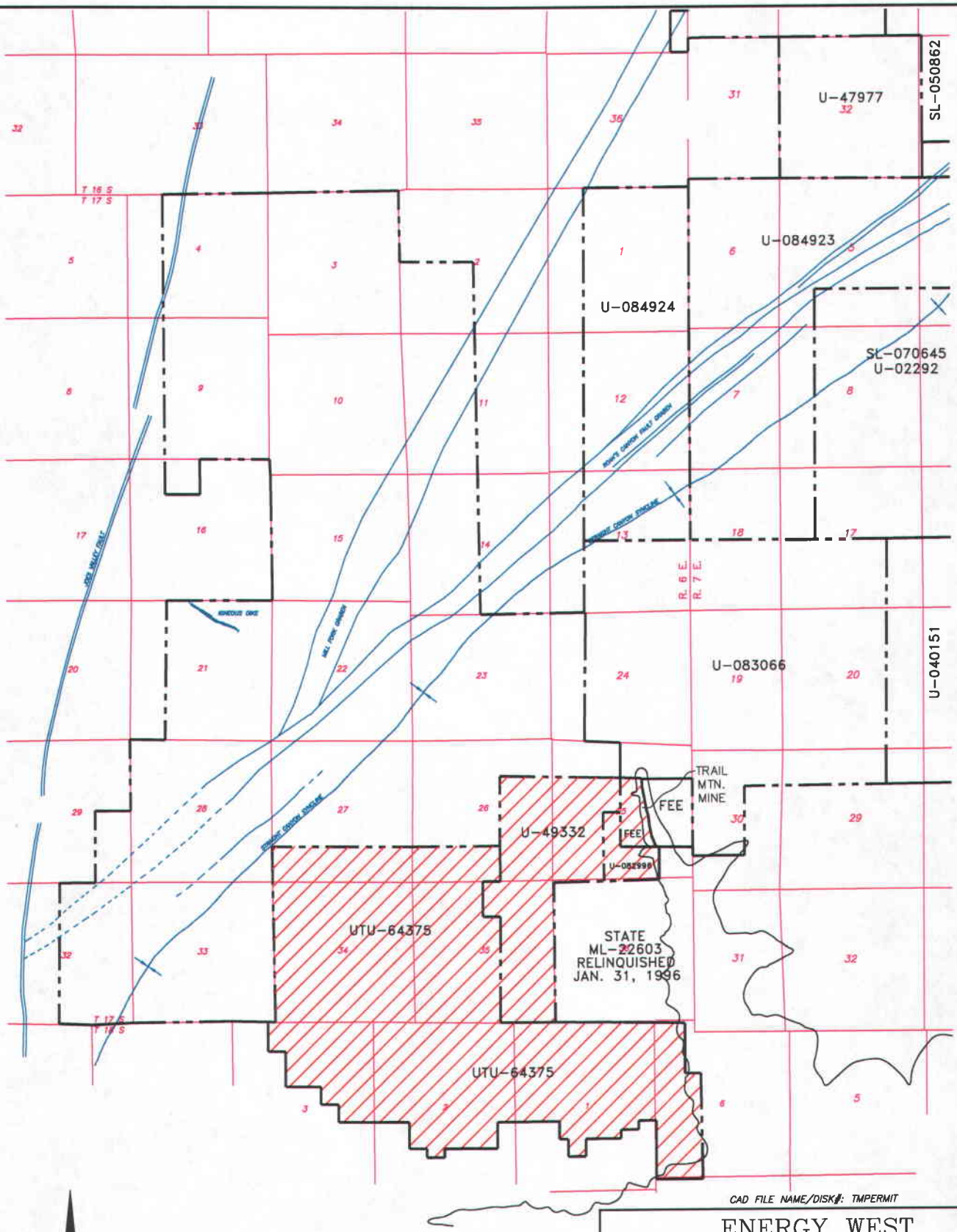


CAD FILE NAME/DISK#: HYDROLOGY\PERMIT.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

MINE PERMIT BOUNDARIES

DRAWN BY:	K. LARSEN	FIGURE 1
SCALE:	AS NOTED	DRAWING #:
DATE:	JUNE 16, 2008	SHEET 1 OF 1 REV.



N

SCALE: 1"=1 MILE

TRAIL MOUNTAIN MINE PERMIT AREA

CAD FILE NAME/DISK#: TMPERMIT

ENERGY WEST
MINING COMPANY
HUNTINGTON, UTAH 84528

TRAIL MOUNTAIN MINE
MINE PERMIT BOUNDARY

DRAWN BY:	*K. LARSEN*	*FIGURE 1B*
SCALE:	*1" = 1 MILE*	DRAWING #:
DATE:	*JUNE 16, 2008*	SHEET 1 OF 1 REV.

FIGURE 2

EAST MOUNTAIN PRECIPITATION

2007 WATER YEAR

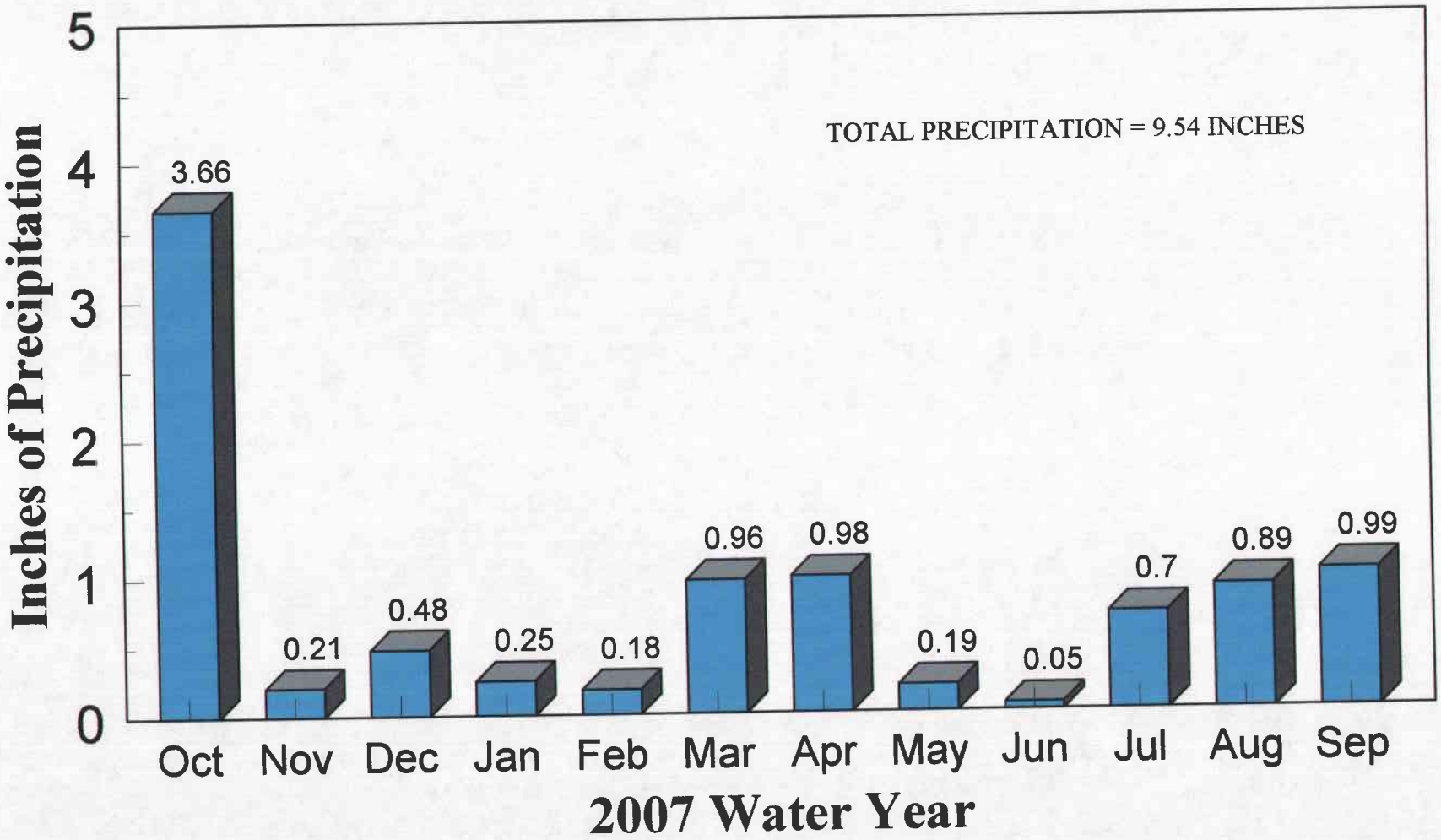
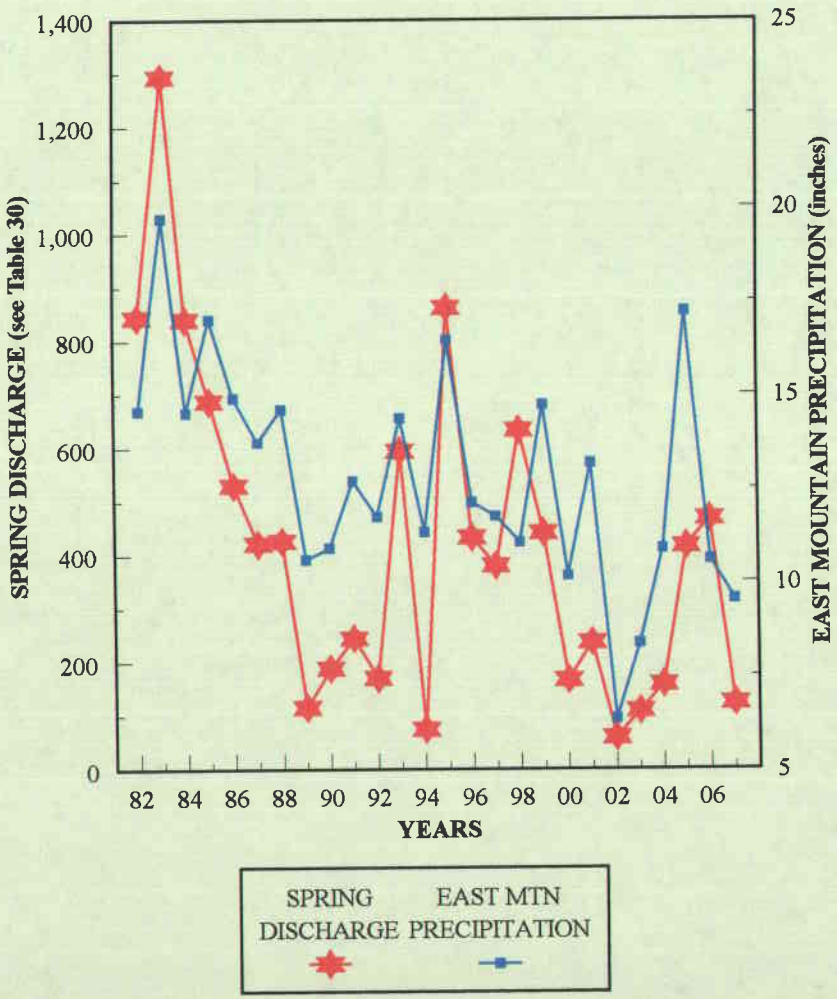


FIGURE 3a
EAST MOUNTAIN
SPRING DISCHARGE vs. PRECIPITATION & TEMPERATURE



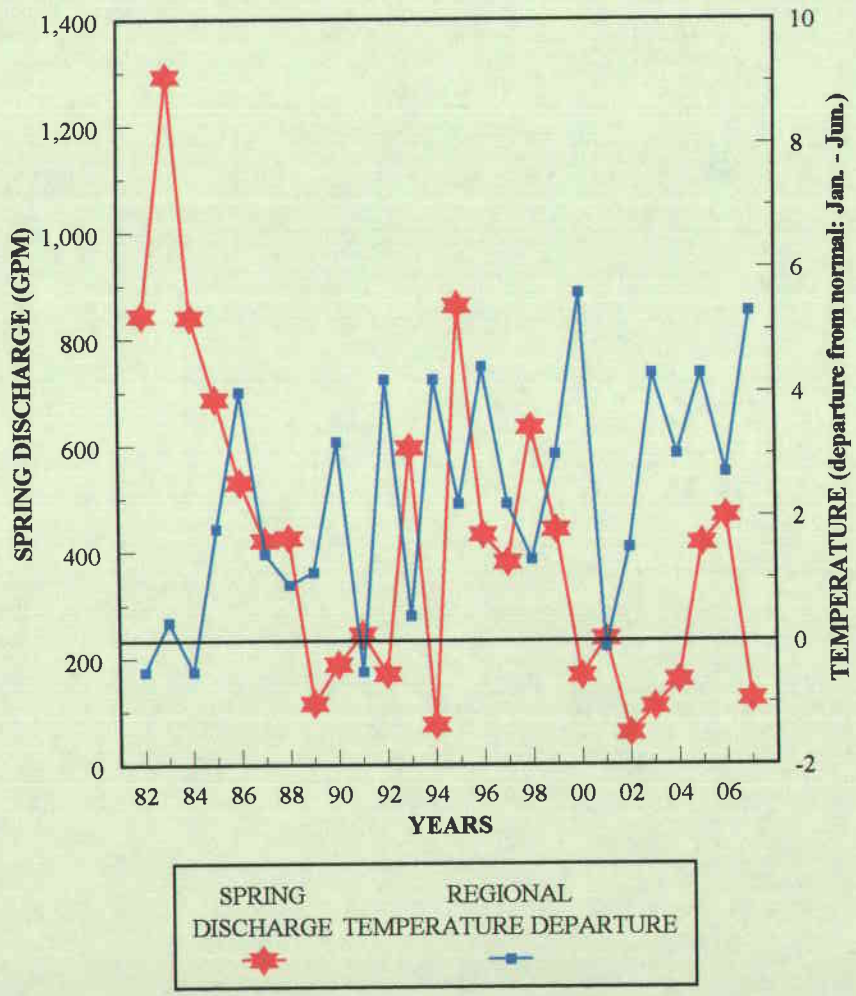


FIGURE 3b
EAST MOUNTAIN
SPRING DISCHARGE vs. PALMER DROUGHT INDEX
(Palmer Data - Average of Region 4 & 5)

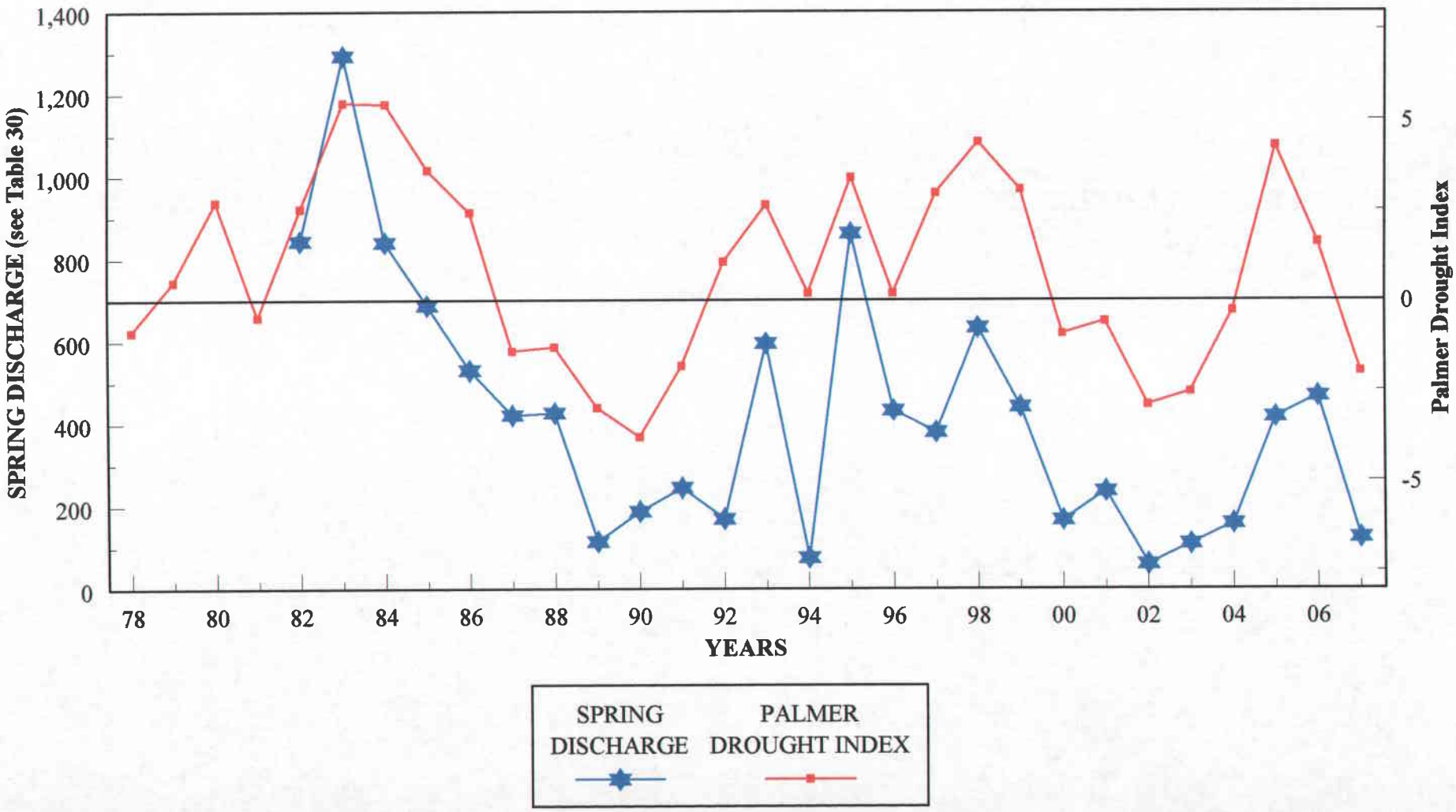


FIGURE 3c
TRAIL MOUNTAIN
SPRING DISCHARGE vs. PALMER DROUGHT INDEX
(Palmer Data - Average of Region 4 & 5)

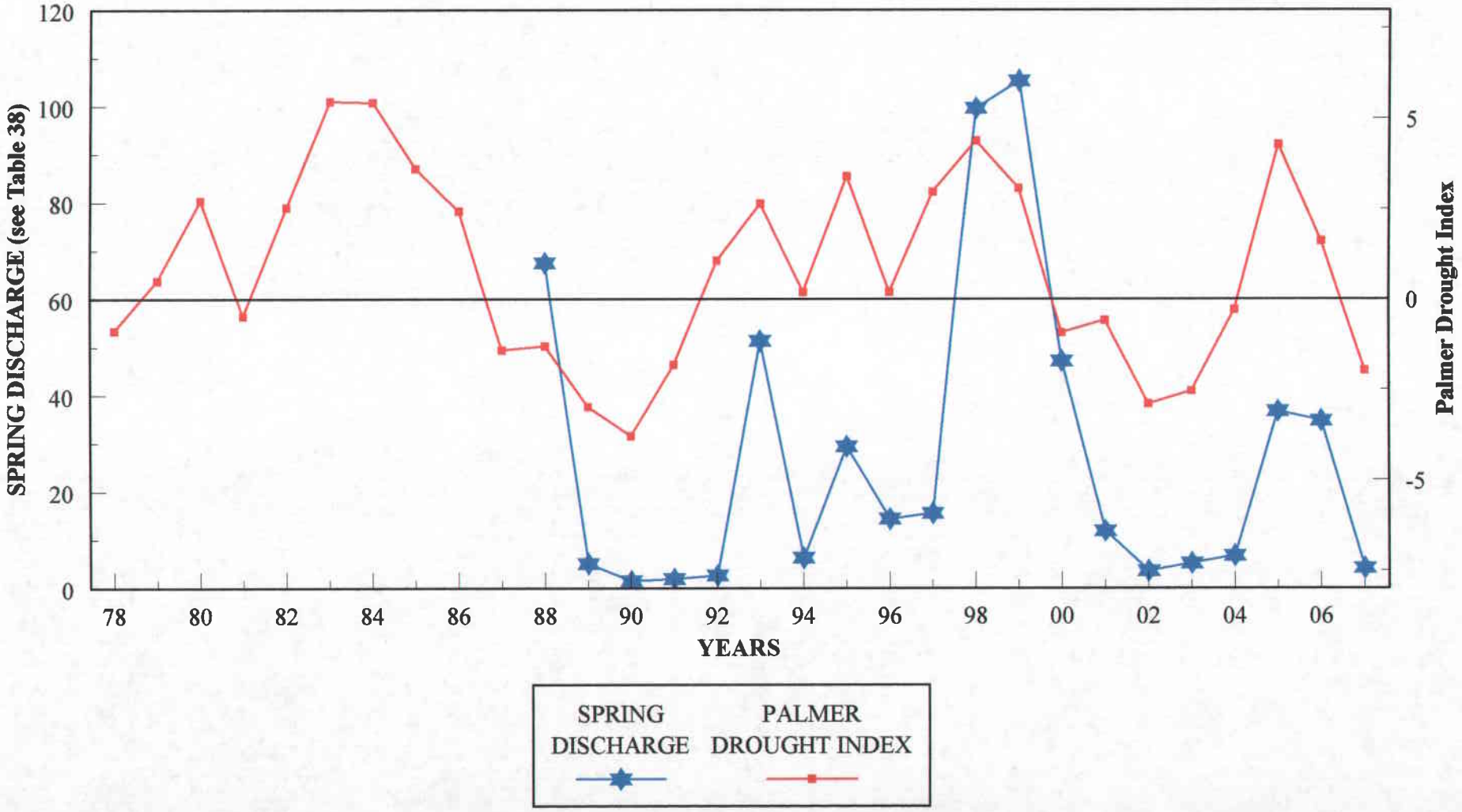


FIGURE 4 (a)

NORTH EMERY WATER USERS ASSOCIATION
RILDA CANYON SPRINGS

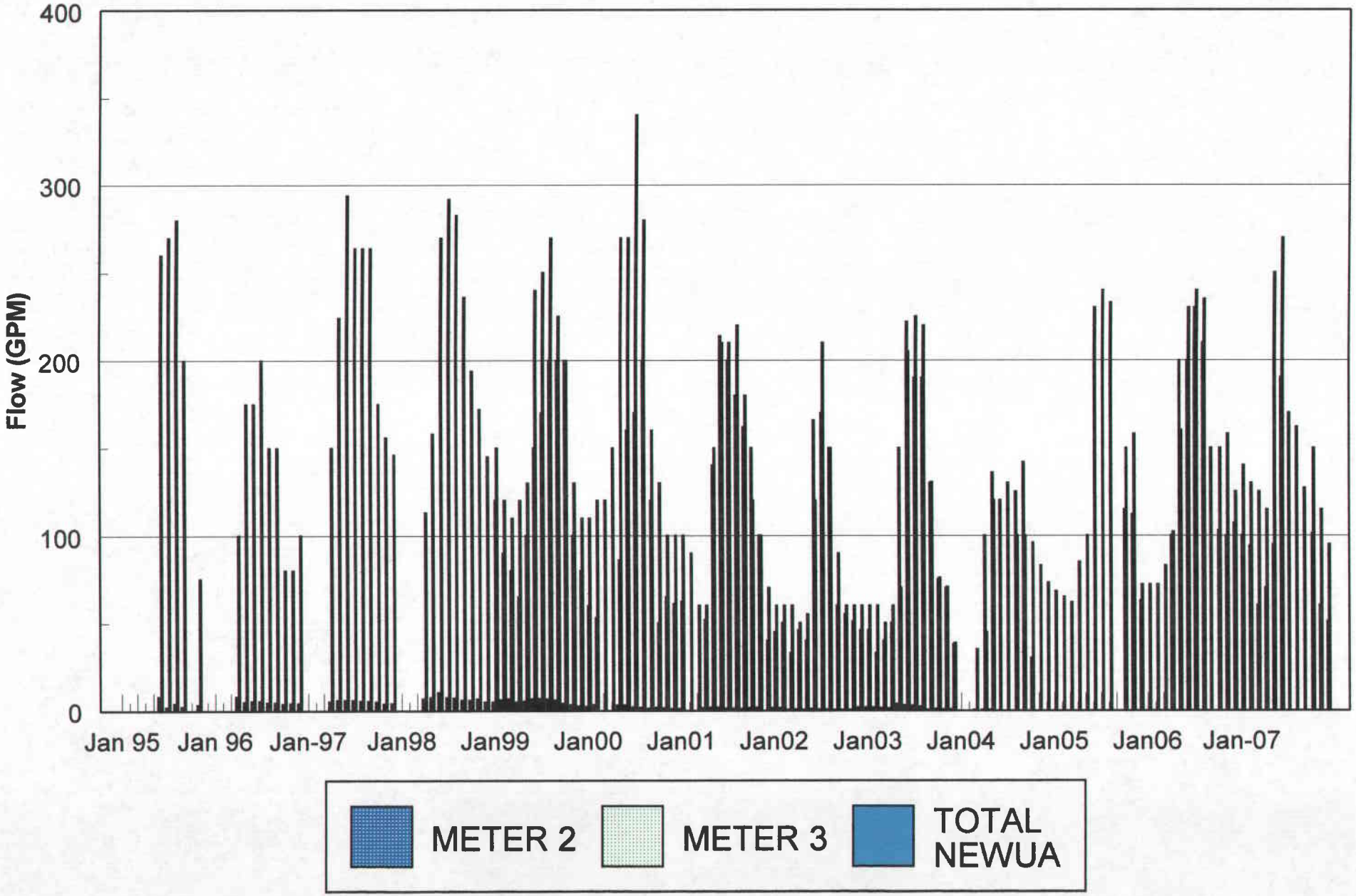
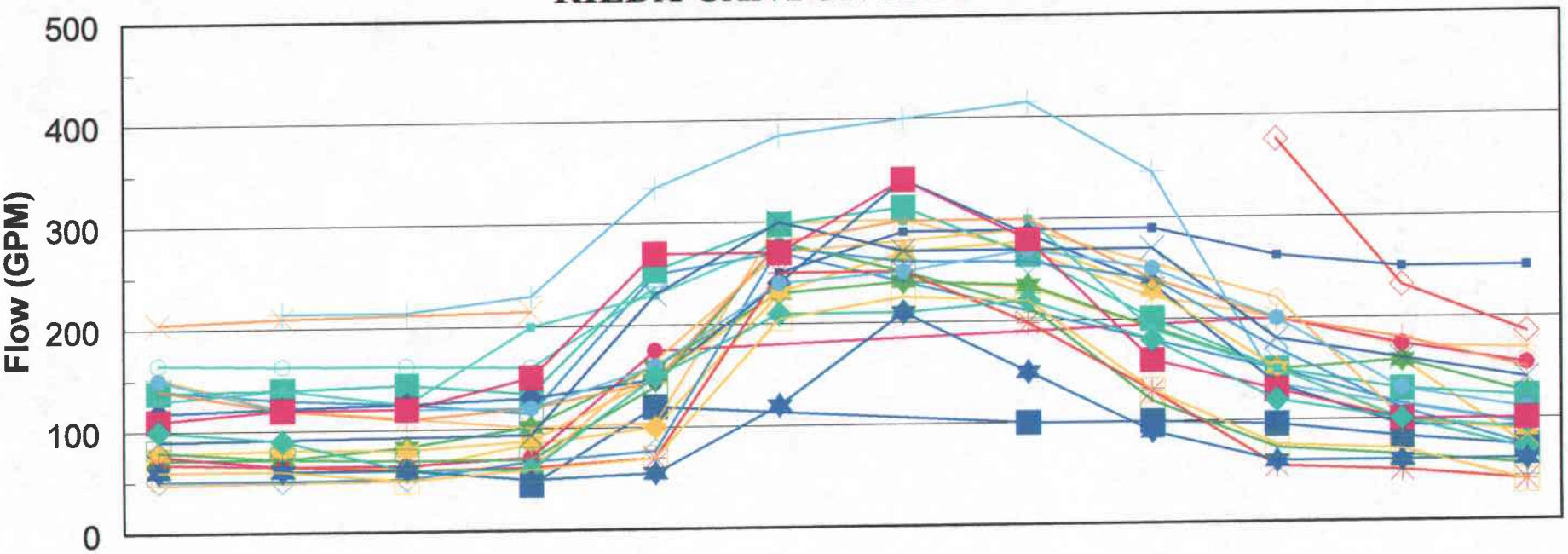


FIGURE 4 (b)

NORTH EMERY WATER USERS ASSOCIATION

RILDA CANYON SPRINGS

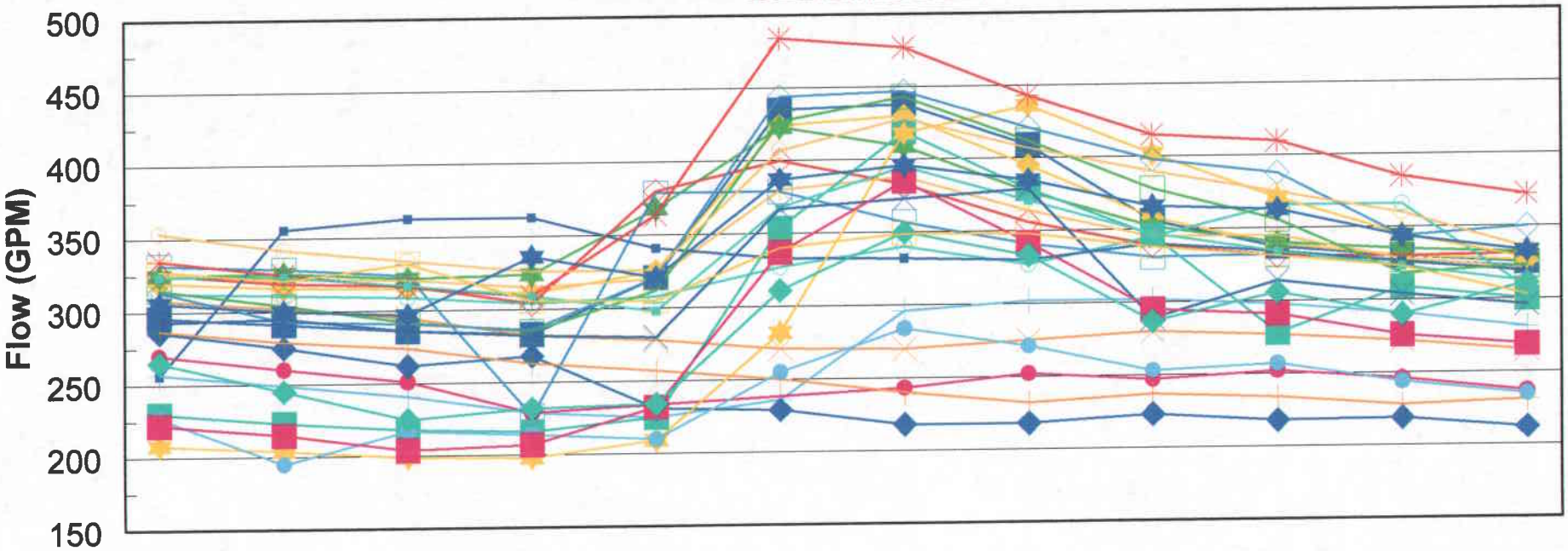


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004				45.0	120.0			100.0	100.0	96.0	83.0	73.0
2005	68.0	65.0	62.0	85.0	100.0	230.0	240.0	233.0		150.0	158.0	72.0
2006	72.0	72.0	83.0	102.0	160.0	230.0	240.0	235.0		150.0	158.0	125.0
2007	140.0	130.0	125.0	115.0	250.0	270.0				150.0	115.0	95.0
1980										376.0	232.0	185.0
1981	152.0	121.0	111.0	101.0	104.0	299.0	301.0	269.0	222.0	201.0	172.0	169.0
1982	165.0	163.0	162.0	160.0	237.0							
1983						250.0	289.0		290.0	262.0	250.0	250.0
1984	205.0	210.0		215.0								
1987		215.0	215.0	230.0	335.0	385.0	400.0	415.0	345.0	135.0	114.0	94.0
1988	76.0	65.0	65.0	72.0	175.0					200.0	174.0	154.0
1989	138.0	140.0	144.0	134.0	254.0	298.0	313.0	265.0	201.0	150.0	130.0	122.0
1990	118.0	122.0	125.0	130.0	147.0	240.0	340.0	285.0	235.0	135.0	94.0	92.0
1991	78.0	81.0	80.0	88.0	148.0	231.0	269.0	278.0	229.0	151.0	98.0	88.0
1992	80.0	72.0	70.0	70.0	140.0	280.0	250.0	215.0	120.0	73.0	65.0	55.0
1993	51.0	51.0	52.0	68.0	77.0	275.0	260.0	258.0	240.0	170.0	110.0	73.0
1994	68.0	65.0	60.0	62.0	70.0	250.0	250.0	198.0	130.0	55.0	50.0	40.0
1995	48.0		50.0	60.0		270.0	280.0	290.0		220.0	100.0	100.0
1996	130.0	140.0	125.0	200.0	230.0	280.0	300.0	300.0	190.0	150.0	100.0	90.0
1997	90.0			94.0	230.0	300.0	270.0	270.0	270.0	180.0	160.0	140.0
1998	140.0	120.0	110.0	120.0	145.0	280.0	300.0	300.0	240.0	200.0	180.0	150.0
1999	150.0	120.0	120.0	120.0	160.0	240.0	250.0	270.0	250.0	200.0	130.0	110.0
2000	110.0	120.0	120.0	150.0	270.0	270.0	340.0	280.0	160.0	130.0	100.0	100.0
2001	100.0	90.0	60.0	60.0	150.0	210.0	210.0	220.0	180.0	120.0	100.0	70.0
2002	60.0	60.0	60.0	50.0	55.0	120.0	210.0	150.0	90.0	60.0	60.0	60.0
2003	60.0	60.0	50.0	60.0	70.0	205.0	225.0	220.0	130.4	76.0	70.8	38.8

FIGURE 4 (c)

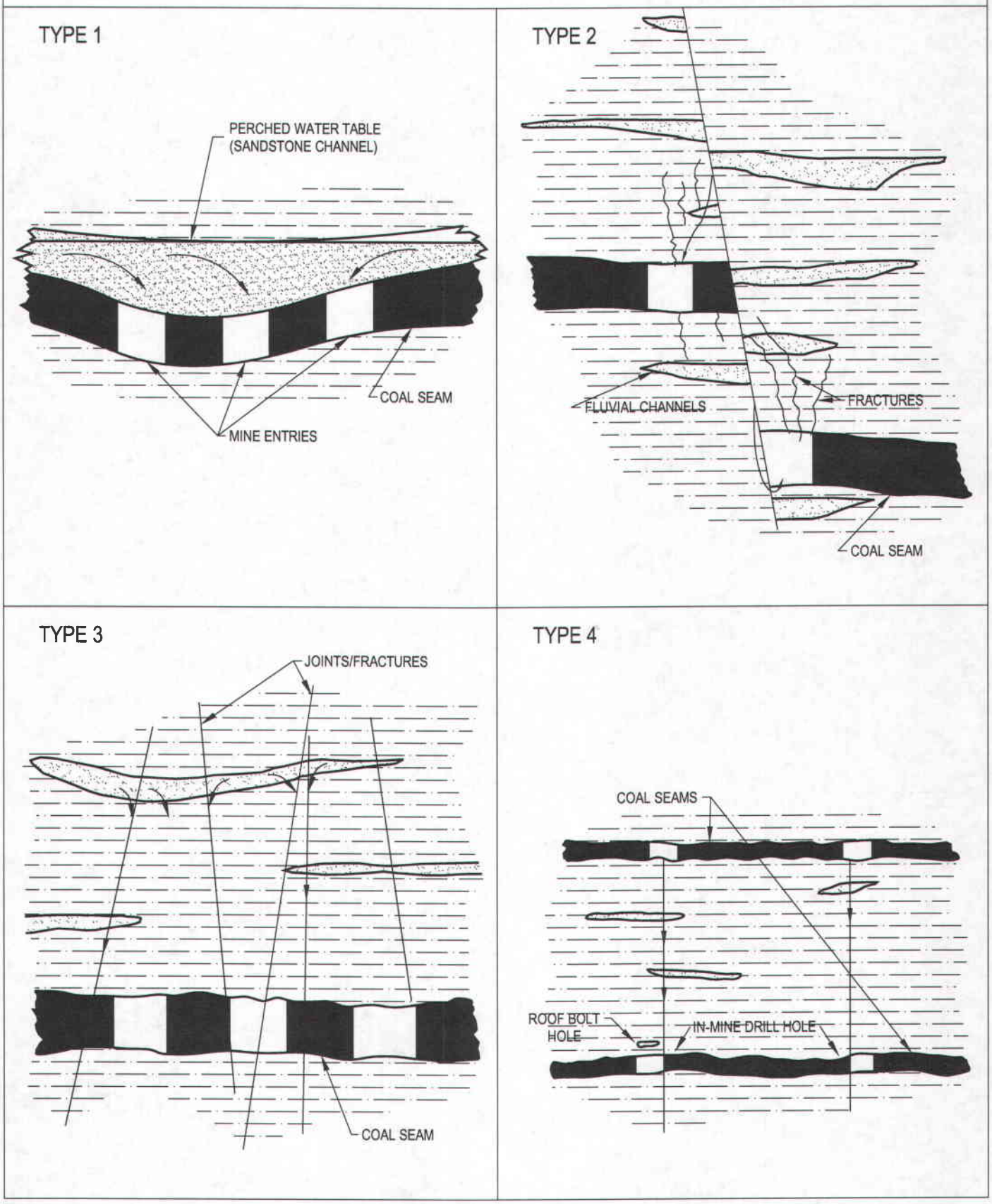
CASTLE VALLEY SPECIAL SERVICE DISTRICT

LITTLE BEAR SPRING



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1982	296	291	286	283	321	435	438	409	356	337	330	325
1983	320	316	315	311	325	424	430	395	358	339	330	326
1984	325	326	322	324	368	423	409	377	352	340	335	332
1985	332	329	324	227	379	379	357	341	331	332	327	322
1986	326	319	317	304	380	400	383	356	339	331	330	331
1987	326	322	321	315	320	380	388	364	345	345	328	321
1988	313	311	309	304	308	327	340	327	345	366	366	307
1989	256	356	363	363	341	333	332	330	340	334	326	319
1990	308	302	295	282	278	271	270	275	280	277	272	265
1991	257	249	241	229	225	236	296	302	302	298	291	281
1992	270	260	251	229			243	252	247	252	246	237
1993	230	223	218	216	225	354	419	379	346	278	309	300
1994	286	275	262	268	231	229	218	218	223	218	219	212
1995	208	204	199	198	209	282	418	436	402	371	345	328
1996	315	304	292	285	312	427	443	412	378	356	318	323
1997	314	293	291	286	321	444	447	421	398	388	344	350
1998	335	325	316	309	364	484	477	443	415	410	385	372
1999	354	342	334	326	326	407	428	407	390	375	360	335
2000	324	324	317	309	298	368	395	371	347	334	323	312
2001	293	295	286	282	280	367	373	379	289	314	304	296
2002	287	279	274	263	257	250	240	232	237	234	228	231
2003	227	195	217	214	210	255	284	271	253	257	244	235
2004	222	215	204	207	232	337	385	342	295	291	276	269
2005	265	245	225	232	234	311	350	333	287	306	290	311
2006	306	300	297	336	321	387	396	385	366	363	344	333
2007	328	321	332	306	305	340	349	348	338	331	323	303

FIGURE 5
LONG TERM WATER SOURCES



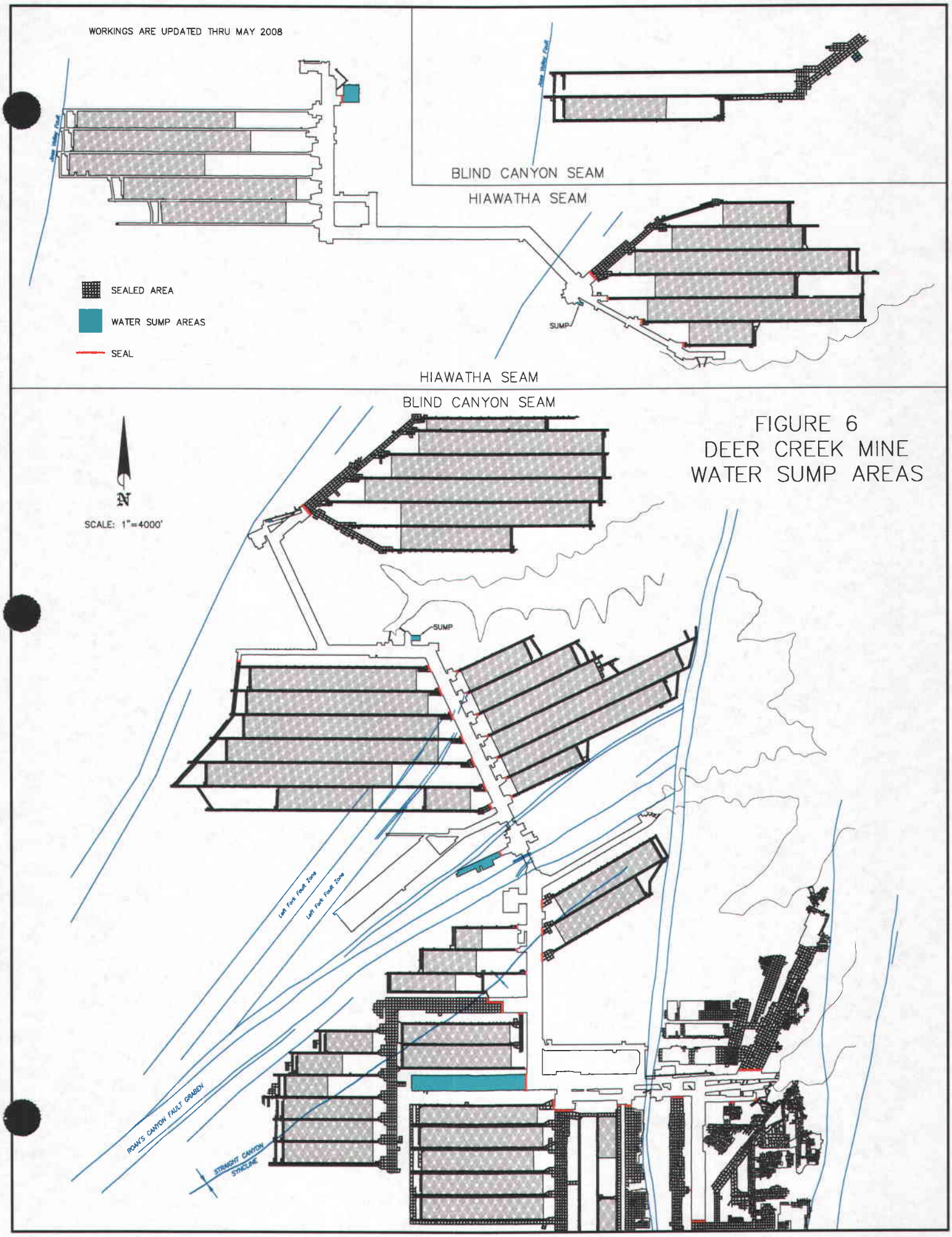


FIGURE 6
DEER CREEK MINE
WATER SUMP AREAS

FIGURE 7

DEER CREEK MINE

2007 MINE WATER DISCHARGE

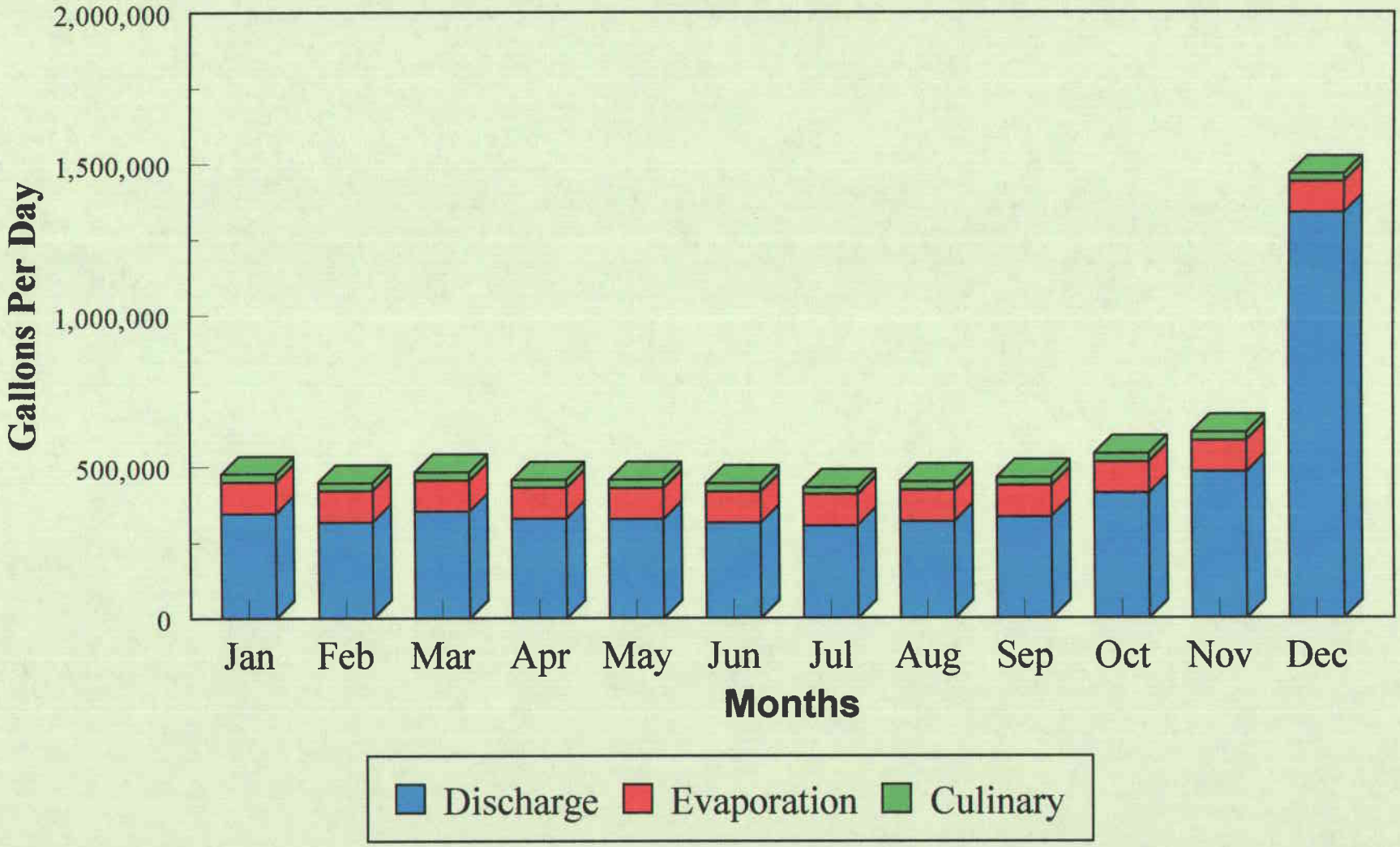
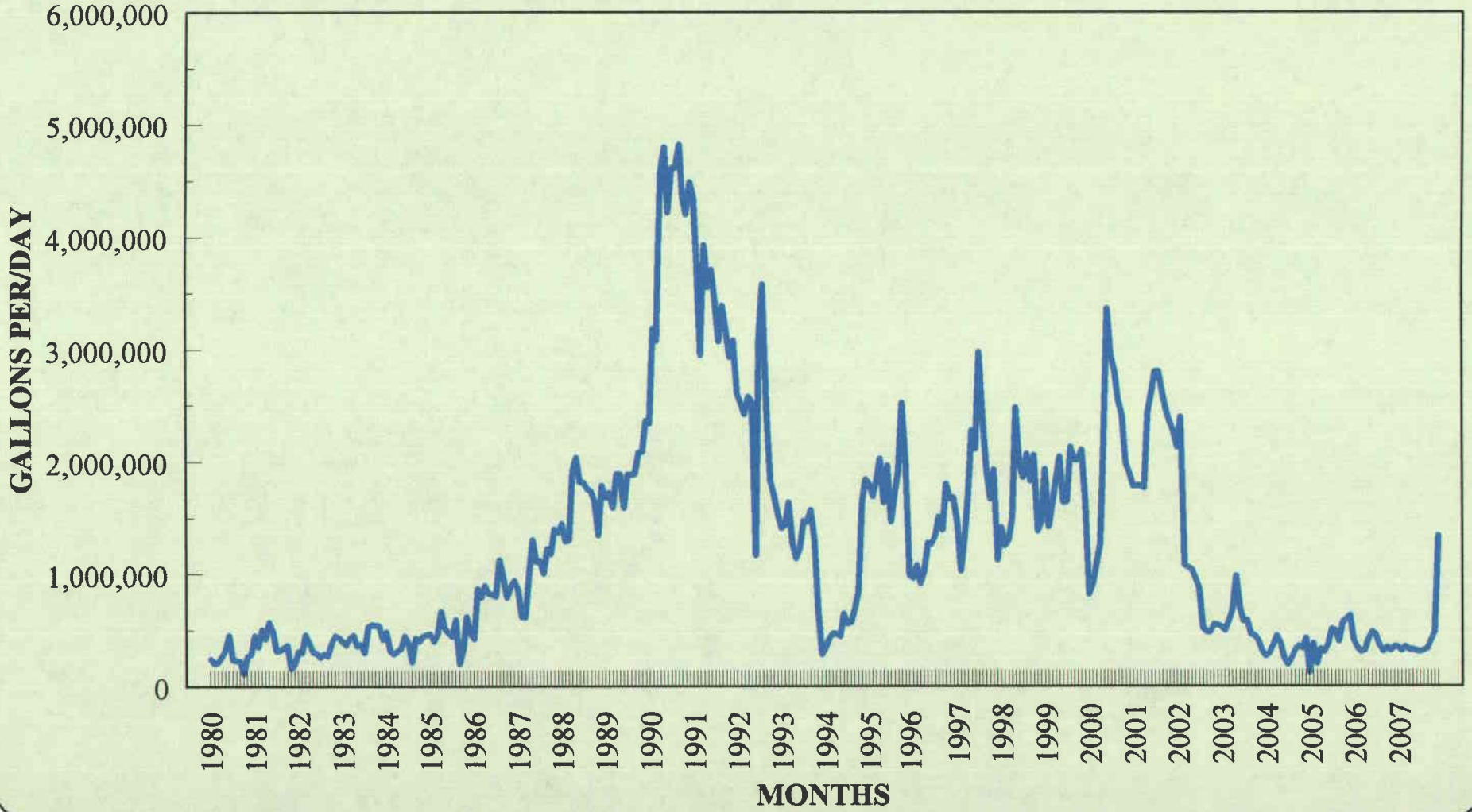


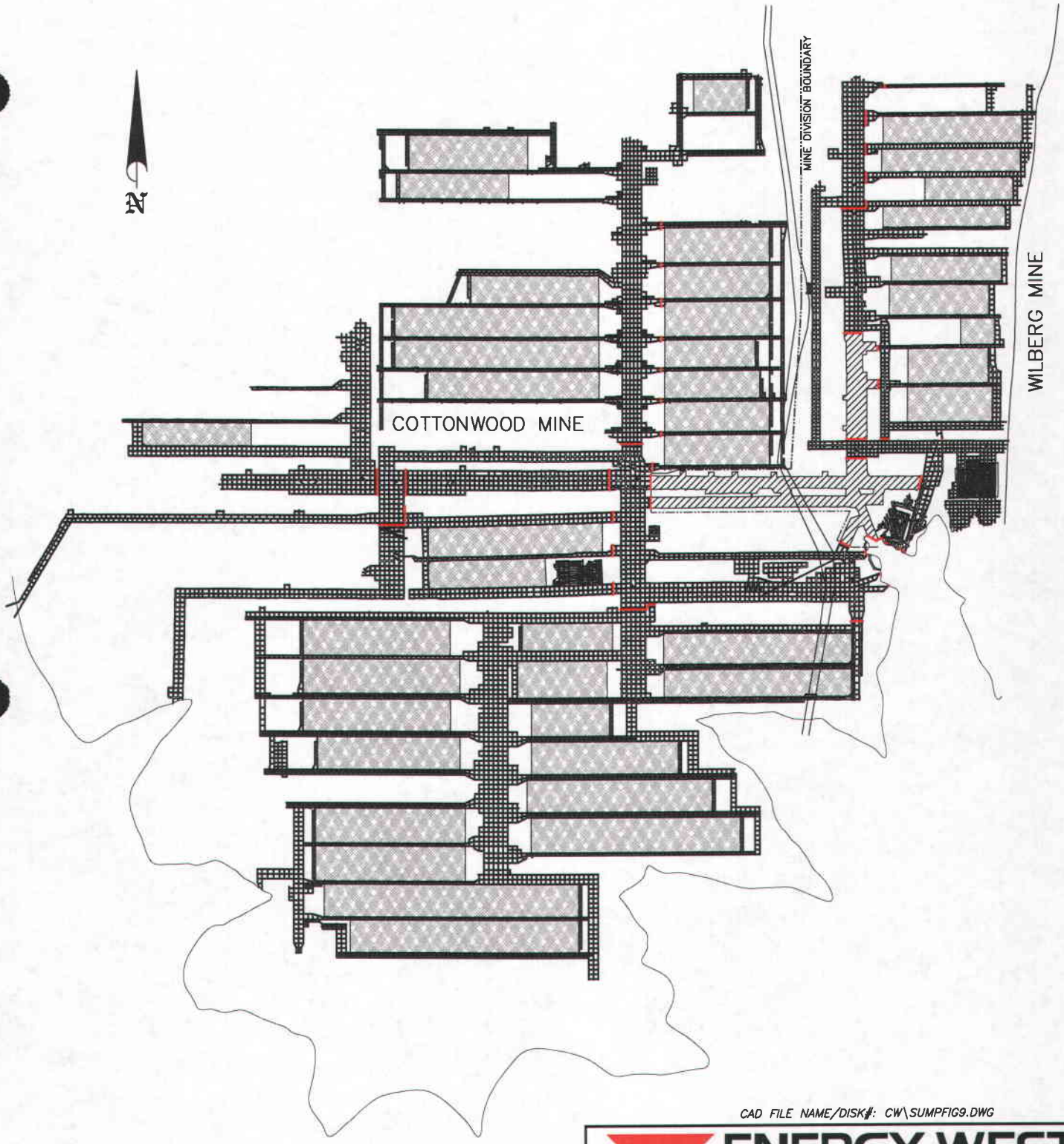
FIGURE 8

DEER CREEK MINE DISCHARGE

@ Deer Creek (UPDES UT-0023604)

January 1980 through December 2007





CAD FILE NAME/DISK#: CW\SUMPFIG9.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

SEALED AREA

SEAL

SEALED AREA DUE TO THE FIRE

MINE SEALED MAY 2001
WORKINGS ARE UPDATED TO MARCH 1, 1997

COTTONWOOD/WILBERG MINE
WATER SUMP AREAS

DRAWN BY:	K. LARSEN	FIGURE 9	
SCALE:	1"=3000'	DRAWING #:	
DATE:	JUNE 18, 2008	SHEET 1 OF 1	REV. ___

FIGURE 10

WILBERG/COTTONWOOD MINE DISCHARGE

@ Grimes Wash/TMA (UPDES UT-0022986)

April 1979 through December 2007

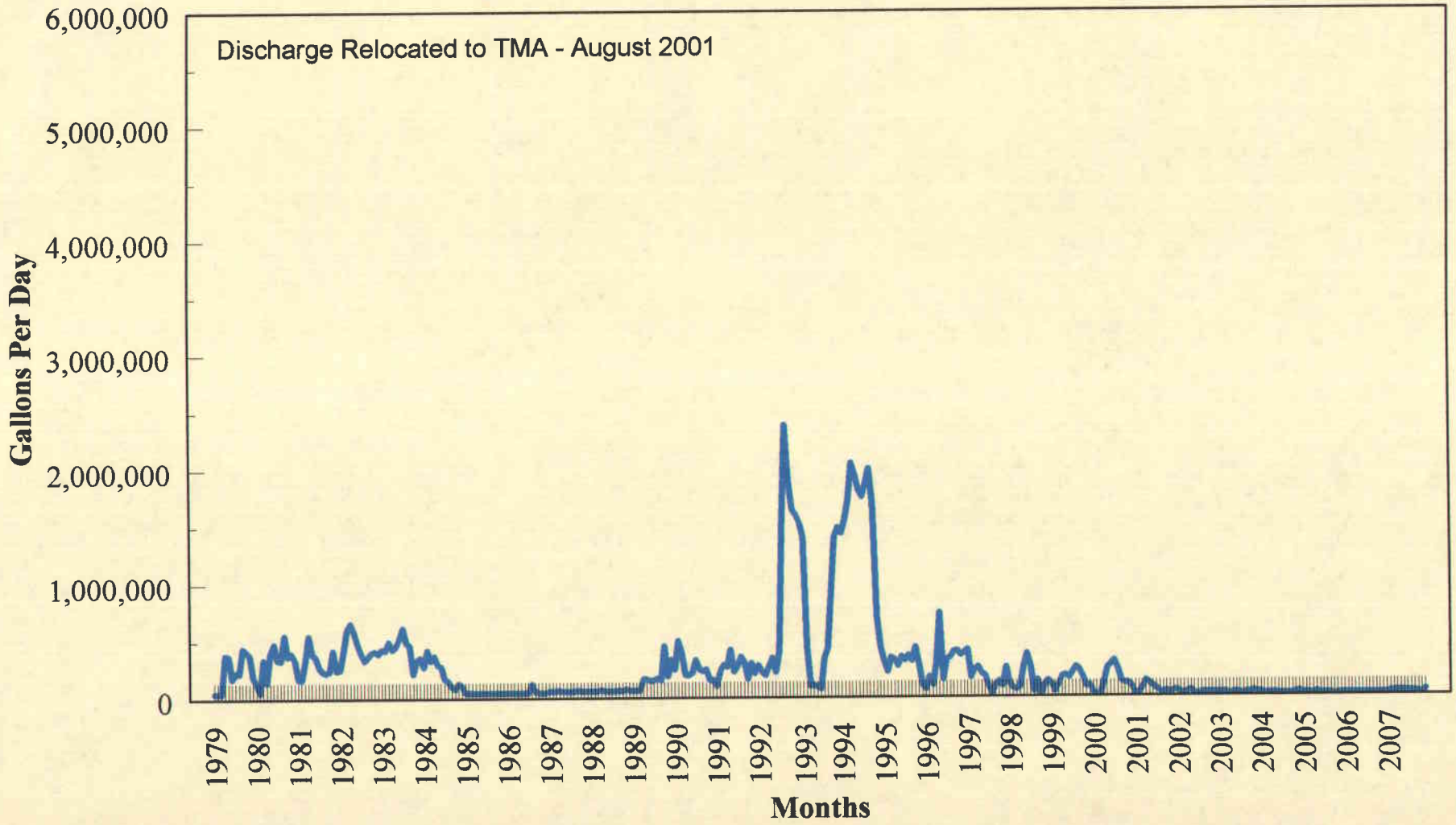
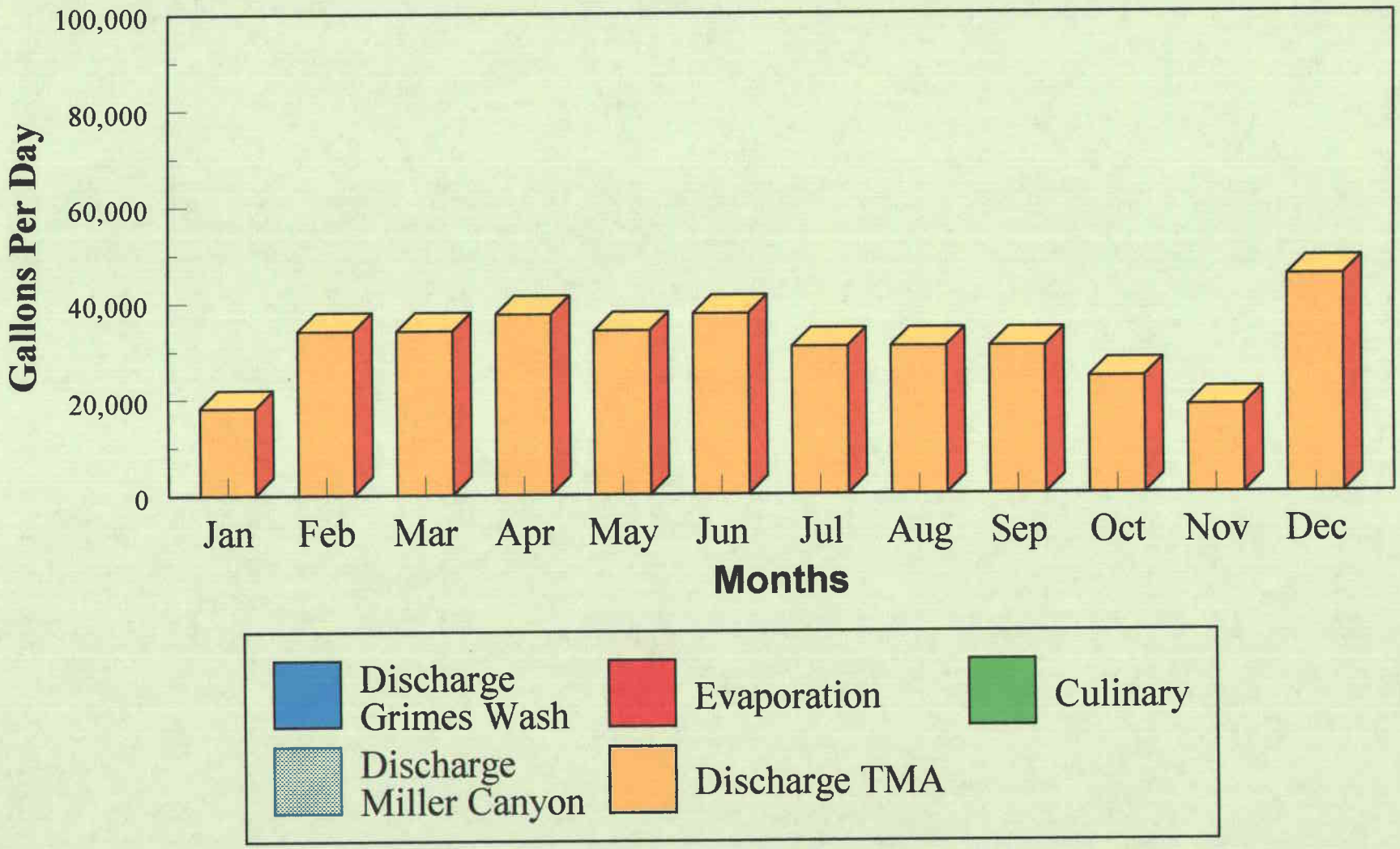
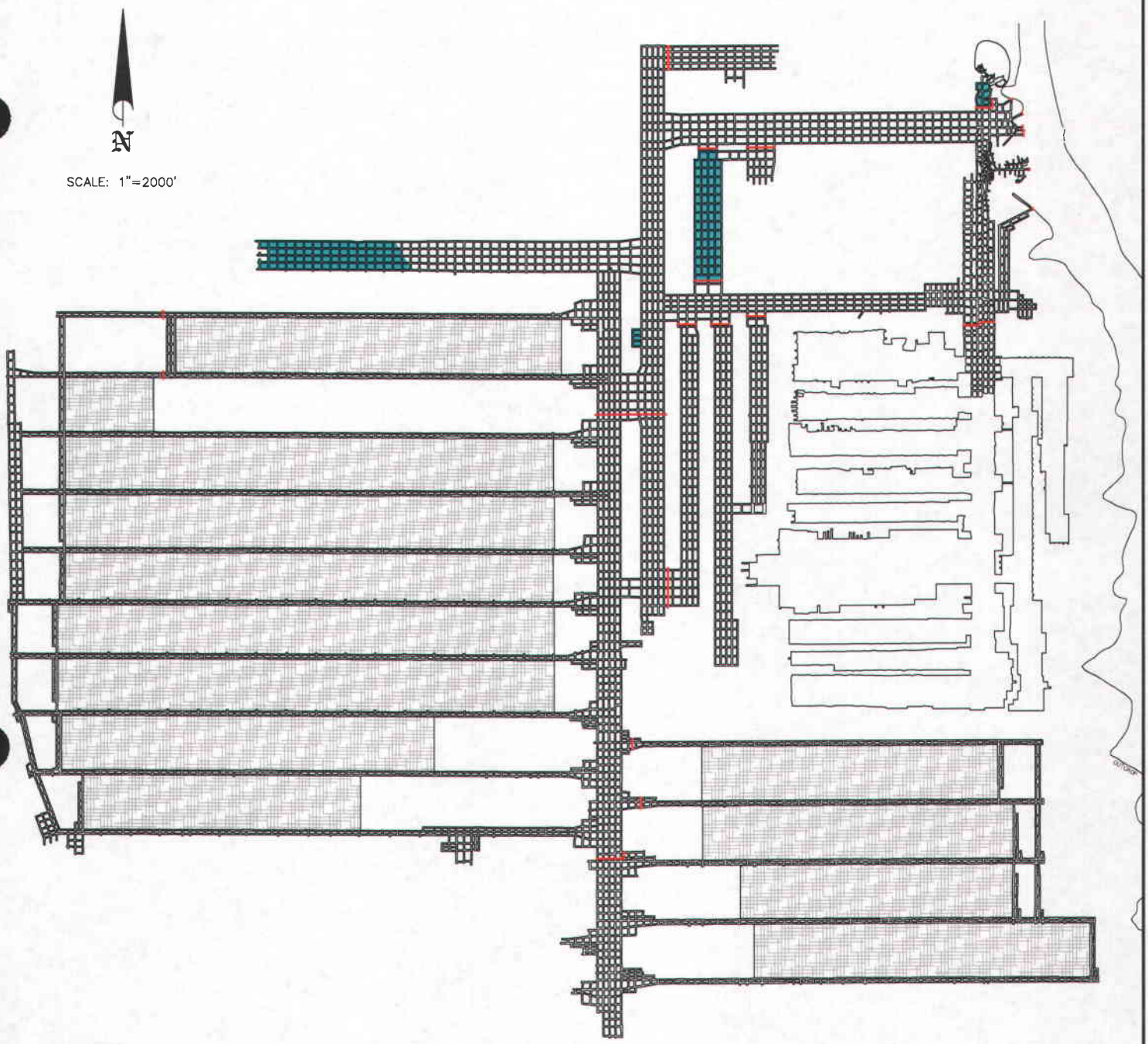


FIGURE 11

WILBERG/COTTONWOOD
2007 MINE WATER DISCHARGE





SEALED AREA

WATER SUMP AREAS

SEAL

MINE SEALED APRIL 2001
WORKINGS ARE UPDATED TO APRIL 2001

CAD FILE NAME/DISK#: SUMP12.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

TRAIL MOUNTAIN MINE
WATER SUMP AREAS

DRAWN BY:	K. LARSEN	FIGURE 12	
SCALE:	1"=2000'	DRAWING #:	
DATE:	JUNE 18, 2008	SHEET 1 OF 1	REV. ___

FIGURE 13

Trail Mountain Mine

@ Cottonwood Canyon Creek (UPDES UT-0023728)

January 1997 through December 2007

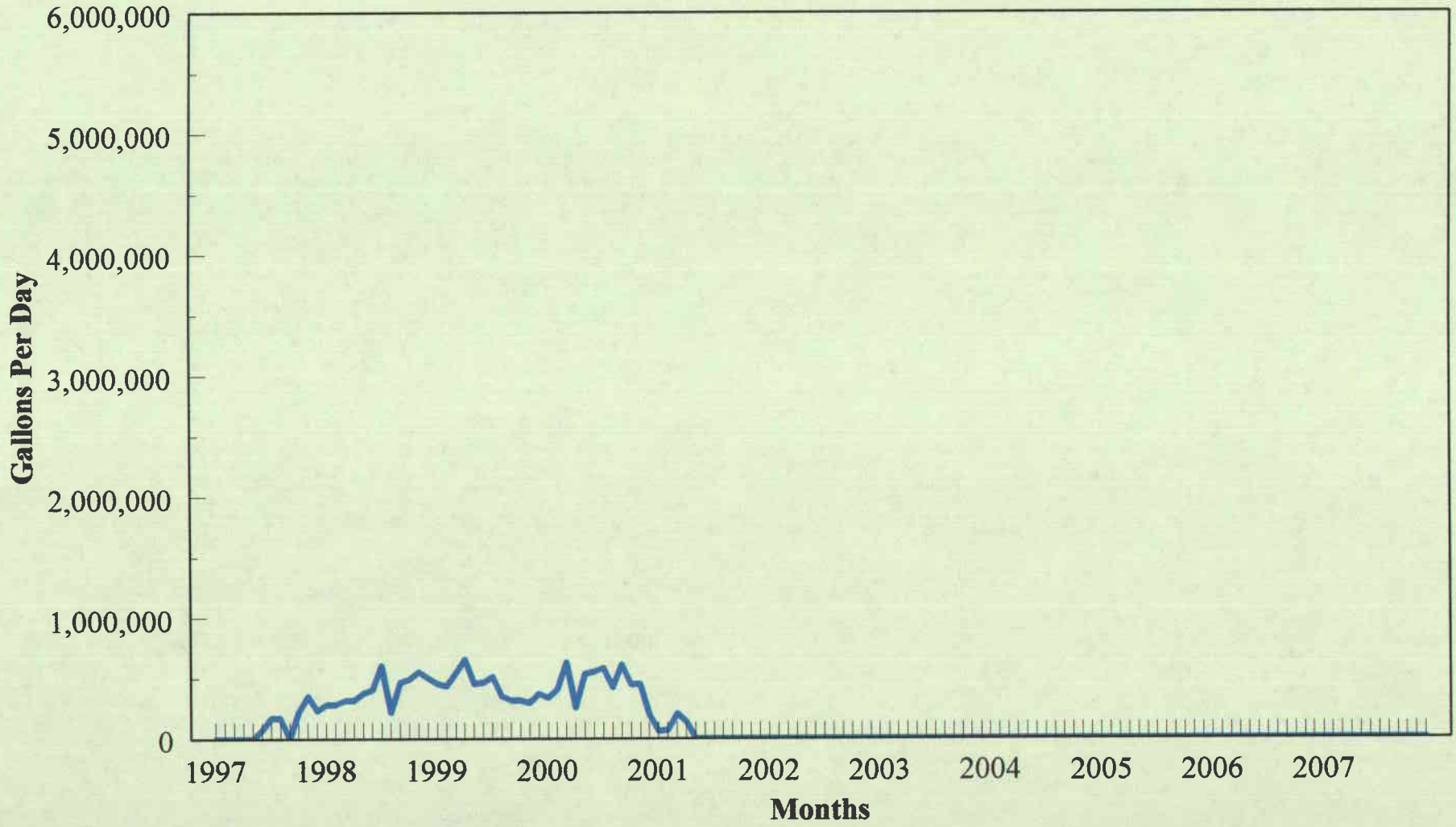


FIGURE 14

TRAIL MOUNTAIN
2007 MINE WATER DISCHARGE

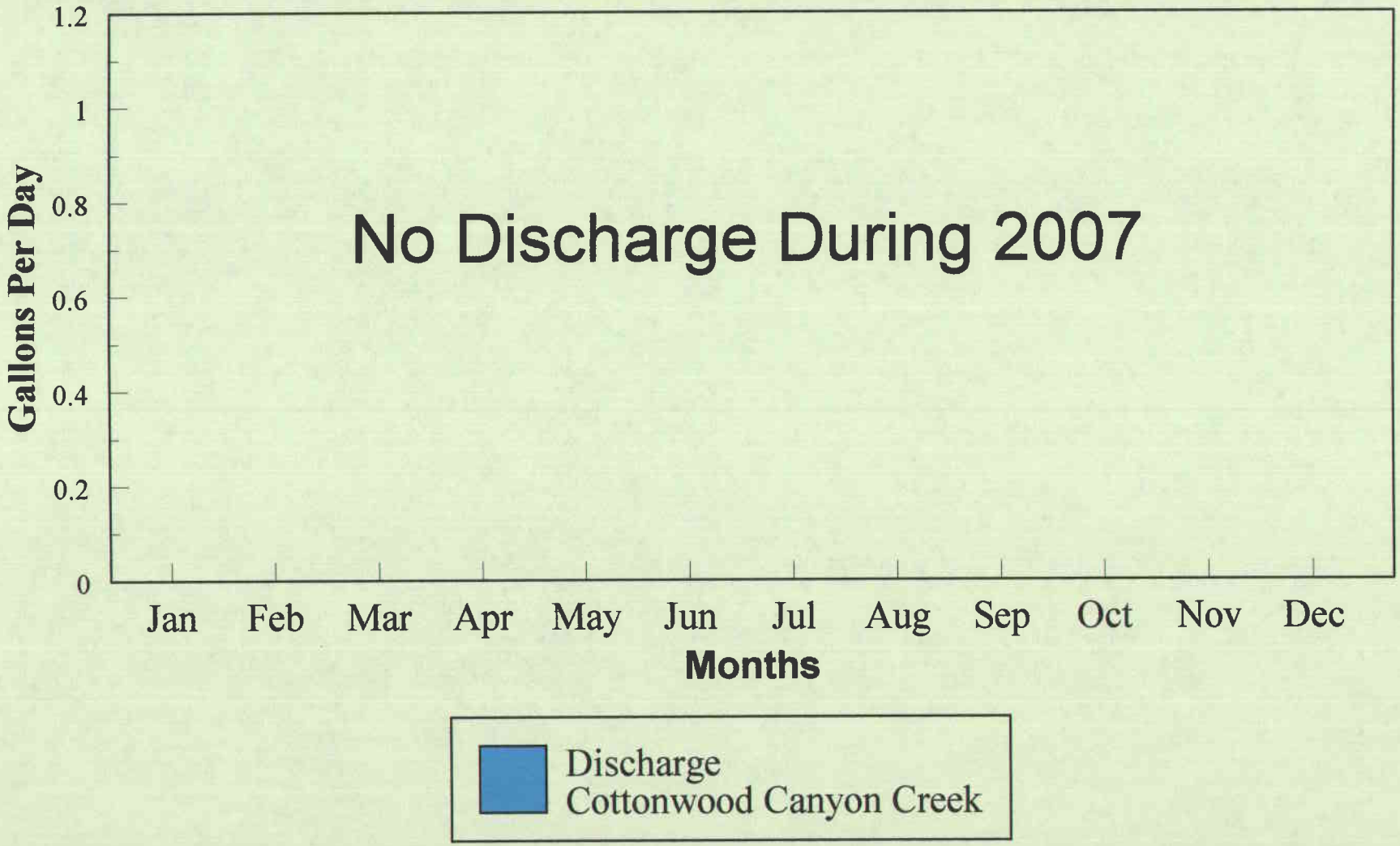


TABLE 1: PRECIPITATION IN EMERY COUNTY, UTAH (2007 Water Year)

	Castle Dale* (Elev. 5800')		Huntington Plant (Elev. 6500')		Electric Lake (Elev. 8350')		East Mountain (Elev. 8985')	
	Precip. (inches)	*% of Normal*	*Precip. (inches)*	*% of Normal*	*Precip. (inches)*	*% of Normal*	*Precip. (inches)*	*% of Normal*
2006								
October	3.80	447	4.47	358	3.49	165	3.66	261
November	0.01	2	0.09	15	2.52	135	0.21	21
December	0.43	80	0.32	70	1.06	97	0.48	58
2007								
January	0.40	62	0.35	67	0.43	22	0.25	22
February	0.01	2	0.25	74	2.48	143	0.18	15
March	0.24	44	0.58	94	1.80	95	0.96	71
April	0.52	98	0.40	73	1.40	83	0.98	96
May	0.40	65	0.64	112	1.44	97	0.19	23
June	0.05	10	1.07	282	0.73	88	0.05	9
July	0.43	55	0.71	76	1.70	144	0.7	82
August	3.04	279	0.32	47	2.18	263	0.89	69
September	1.22	134	0.35	66	1.62	154	0.99	70
TOTALS	**10.55**	**130**	**9.55**	**129**	**20.85**	**118**	**9.54**	**75**
Mean Monthly	0.88	---	0.80		1.74	---	0.80	---

NR - No Record

* Tranferred Site from Hunter Plant to Castle Dale

TABLE 2: COMPARISON OF 2006 AND 2007 PRECIPITATION (Inches)

	2006		*2007*		*2007 As*
Station	***Amount***	***% of Normal***	***Amount***	***% of Normal***	***% of 2006***
Castle Dale	5.89	73	10.55	130	179
Huntington Plant	8.49	136	9.55	129	112
Electric Lake	27.9	158	20.85	118	75
East Mountain	10.59	82	9.54	75	90

IR - Incomplete Record

TABLE 3: CASTLE DALE PRECIPITATION

Elevation - 5,800 Feet

YEAR	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*OCT*	*NOV*	*DEC*	*ANNUAL*
1899	-	-	0.38	0.00	0.00	0.00	1.41	1.24	0.25	0.25	0.45	0.27	4.25
1900	-	0.00	-	1.38	0.05	0.25	0.00	0.23	2.18	0.00	0.40	0.00	4.49
1901	0.24	0.93	-	-	0.11	0.10	0.00	1.83	0.00	0.40	0.00	0.00	3.61
1902	0.20	0.11	0.62	-	0.45	0.00	0.15	0.23	0.29	0.00	1.72	0.10	3.87
1903	0.08	0.28	0.57	0.10	0.13	1.01	0.74	0.15	0.49	0.78	0.00	-	4.33
1904	1.00	-	0.45	-	1.00	0.69	0.09	0.35	0.30	1.35	-	-	5.23
1905	0.50	2.00	1.03	-	0.40	-	0.45	0.98	2.23	0.80	2.55	0.25	11.19
1906	1.59	0.00	0.97	2.71	0.60	0.00	0.77	0.89	0.60	0.40	1.40	1.88	11.81
1907	-	0.40	0.00	0.40	1.03	1.16	0.07	2.91	0.62	1.63	0.47	0.70	9.39
1908	0.70	1.50	-	0.86	1.25	0.15	1.30	0.00	1.25	0.70	0.55	0.80	9.06
1909	1.44	1.66	0.00	0.80	0.05	0.41	0.00	3.00	1.60	0.00	2.28	2.08	13.32
1910	0.92	0.70	0.50	-	-	2.25	0.65	0.66	1.06	0.85	0.95	1.15	9.69
1911	1.73	0.75	0.00	-	-	1.87	1.72	0.70	1.75	0.95	0.10	0.80	10.37
1912	0.40	0.60	1.18	0.00	0.15	0.20	2.00	1.50	1.00	3.15	0.30	0.50	10.98
1913	0.40	1.24	-	0.25	0.05	0.35	1.08	0.75	1.75	0.43	1.43	2.55	10.28
1914	3.00	0.10	0.30	0.75	0.35	2.55	-	0.40	0.30	1.05	-	0.65	9.45
1915	1.80	2.75	-	1.20	0.90	0.55	0.20	0.19	0.54	0.05	0.47	1.45	10.10
1916	4.20	0.55	1.70	0.05	-	0.00	0.75	3.05	0.15	2.46	0.00	0.65	13.56
1917	0.30	0.00	0.00	1.97	1.33	0.12	0.32	0.68	1.63	-	0.10	-	6.45
1918	0.06	0.00	0.33	0.49	0.29	0.48	1.84	1.18	0.85	1.54	0.75	0.82	8.63
1919	0.00	0.76	0.36	0.33	0.46	-	0.37	1.59	0.86	0.05	0.55	0.10	5.43
1920	0.57	0.70	0.52	0.44	0.57	0.32	0.19	0.98	0.13	2.00	0.24	0.50	7.16
1921	0.73	0.24	0.15	0.31	1.13	0.78	1.67	5.02	0.30	0.30	0.00	0.58	11.21
1922	0.47	1.03	0.95	0.82	1.42	0.06	0.28	1.48	0.12	0.35	1.25	0.37	8.60
1923	0.40	0.77	0.00	1.00	0.37	-	1.95	2.00	0.23	0.66	0.62	0.54	8.54
1924	0.22	0.07	1.09	0.12	0.59	0.08	1.45	0.27	0.59	0.52	0.06	1.00	6.06
1925	0.00	0.60	0.16	0.27	0.00	1.55	0.85	0.87	2.13	1.94	0.08	0.10	8.55
1926	0.00	0.52	1.53	1.10	0.00	0.24	0.73	1.29	2.02	0.15	0.28	1.16	9.02
1927	0.18	1.22	1.15	0.08	-	1.91	1.31	2.35	2.38	0.94	0.12	0.00	11.64
1928	0.30	0.70	0.94	0.00	2.04	0.18	0.00	1.20	0.56	1.70	0.70	0.30	8.62
1929	0.48	0.51	0.83	0.47	0.33	0.22	1.25	1.55	1.87	0.67	0.00	0.26	8.44
1930	1.26	0.25	0.18	0.88	0.65	0.61	1.73	2.77	1.60	0.25	0.16	0.00	10.34
1931	0.00	0.66	0.24	0.72	0.04	0.35	0.36	1.18	0.04	0.66	0.55	0.86	5.66
1932	0.42	1.00	0.06	0.26	0.08	0.66	1.82	2.58	0.25	0.20	0.00	0.96	8.29
1933	1.60	0.15	0.40	0.00	0.88	0.00	2.27	0.37	1.26	0.32	0.85	0.58	8.68
1934	0.38	0.30	0.00	0.18	0.54	0.01	0.53	0.41	0.15	0.00	0.23	0.56	3.29
1935	0.33	0.66	1.07	1.41	0.73	0.00	0.88	0.52	0.00	0.00	0.11	0.48	6.19

TABLE 3: CASTLE DALE PRECIPITATION

Elevation - 5,800 Feet

YEAR	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*OCT*	*NOV*	*DEC*	*ANNUAL*
1936	0.42	0.68	0.92	0.02	0.68	0.62	3.21	0.64	0.55	0.85	0.05	1.65	10.29
1937	1.12	0.61	0.90	0.04	0.97	0.50	2.04	1.61	0.91	0.46	0.08	0.70	9.94
1938	0.65	0.44	1.02	0.16	0.72	0.83	0.52	0.88	1.84	1.14	0.00	0.15	8.35
1939	1.44	0.84	0.24	0.50	0.58	0.00	0.00	1.07	2.24	0.47	0.40	0.12	7.90
1940	0.75	0.70	0.07	0.10	0.00	1.08	0.37	0.00	2.11	1.00	-	-	6.18
1941	-	-	0.07	1.86	2.73	1.10	0.44	1.95	0.73	3.65	0.30	0.42	13.25
1942	0.08	0.08	0.21	0.83	0.03	0.00	0.09	0.15	0.77	0.00	0.15	0.00	2.39
1943	0.08	0.00	-	0.59	-	-	-	-	-	-	-	-	0.67
1944	-	-	-	-	-	-	-	-	-	-	-	-	-
1945	-	-	-	-	-	-	-	-	-	-	0.10	0.35	0.45
1946	0.50	-	0.00	0.00	0.55	0.00	0.62	-	-	-	-	-	1.67
1947	-	-	-	-	-	-	-	-	-	-	-	-	-
1948	-	-	-	-	-	-	-	-	-	-	-	1.27	1.27
1949	1.13	0.31	-	-	-	0.60	1.12	0.00	0.50	1.02	0.05	1.05	5.78
1950	0.36	0.00	0.18	0.00	0.24	0.00	1.64	0.47	0.52	0.00	0.34	0.20	3.95
1951	0.13	0.10	-	0.45	0.95	0.09	0.34	2.24	0.08	1.50	1.17	0.96	8.01
1952	0.85	0.20	0.93	0.40	0.13	1.44	0.09	0.61	0.65	0.00	0.60	1.10	7.00
1953	0.15	0.00	0.50	0.32	0.40	0.20	0.75	1.62	0.00	1.48	0.65	0.12	6.19
1954	0.74	0.00	0.95	-	-	0.14	0.37	0.39	1.36	0.45	0.54	0.65	5.59
1955	0.87	-	0.00	0.00	0.01	0.10	-	-	-	-	-	-	0.98
1956	1.11	0.08	0.00	0.62	0.81	0.00	0.23	0.03	0.43	0.41	0.00	0.15	3.87
1957	0.90	0.34	0.10	1.48	2.23	0.74	1.34	1.77	0.00	2.07	2.45	0.35	13.77
1958	0.13	0.54	0.65	0.39	0.86	0.00	0.21	0.60	1.26	0.22	0.65	0.00	5.51
1959	0.02	1.07	0.00	0.42	0.18	0.12	0.43	0.76	1.60	0.36	0.31	0.69	5.96
1960	0.68	1.20	0.09	0.53	0.33	0.39	0.05	0.21	1.49	2.45	0.44	0.00	7.86
1961	0.00	0.00	1.17	0.77	0.33	0.08	0.89	3.27	3.68	0.56	0.41	0.37	11.53
1962	0.26	1.53	0.14	0.00	0.27	0.40	0.87	0.18	0.65	0.89	0.05	0.00	5.24
1963	0.13	0.00	0.26	0.28	0.06	0.28	0.02	1.65	1.12	0.23	0.18	0.00	4.21
1964	0.00	0.00	0.31	0.59	1.88	0.58	0.52	0.18	0.24	0.00	0.75	0.76	5.81
1965	0.08	1.16	0.59	1.32	1.32	2.01	2.47	1.43	1.14	0.23	1.28	1.25	14.28
1966	0.00	0.50	0.00	0.00	0.47	0.17	1.41	0.95	0.24	0.49	0.15	1.74	6.12
1967	0.53	-	0.03	-	1.79	1.46	0.49	0.28	0.85	-	0.09	1.60	7.12
1968	0.00	0.38	0.40	0.53	1.08	0.58	0.82	1.47	0.30	0.51	0.00	0.63	6.70
1969	1.72	0.96	0.13	0.14	1.32	1.30	0.16	2.06	0.52	0.63	-	-	8.94
1970	-	0.00	0.47	0.57	0.00	1.31	0.58	0.96	0.33	0.41	0.32	0.22	5.17
1971	0.31	0.62	0.00	0.21	0.76	0.16	0.19	0.54	0.05	1.63	0.21	0.94	5.62
1972	0.00	0.00	0.00	0.47	0.00	0.92	0.17	0.67	0.85	2.65	1.17	0.27	7.17

TABLE 3: CASTLE DALE PRECIPITATION

Elevation - 5,800 Feet

YEAR	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*OCT*	*NOV*	*DEC*	*ANNUAL*
1973	0.42	0.71	0.97	1.18	0.23	0.54	0.91	0.42	0.07	0.17	0.19	0.14	5.95
1974	0.94	0.08	0.09	0.00	0.00	0.05	1.41	0.11	0.25	1.89	0.63	0.18	5.63
1975	0.29	0.23	0.85	0.06	0.21	1.01	1.34	0.11	0.31	0.13	0.36	0.02	4.92
1976	0.08	0.42	0.01	1.21	0.86	0.04	0.43	0.13	0.66	0.10	0.00	0.00	3.94
1977	0.37	0.00	0.00	0.06	1.41	0.09	2.16	0.84	0.36	0.31	0.16	0.44	6.20
1978	1.39	1.69	1.36	0.60	0.53	0.00	0.15	0.11	0.10	0.13	2.68	0.47	9.21
1979	1.52	0.66	1.64	0.05	0.74	0.04	0.00	1.50	0.00	0.01	0.11	0.26	6.53
1980	1.96	1.58	1.12	0.67	1.72	0.04	0.41	1.58	2.63	1.23	0.25	0.00	13.19
1981	0.01	0.08	1.93	0.15	0.53	0.21	0.74	0.57	1.56	1.44	0.31	0.20	7.73
1982	1.13	0.09	0.91	0.00	0.12	0.15	0.97	2.16	1.17	0.16	0.79	1.06	8.71
1983	1.07	0.46	0.96	0.25	0.23	0.30	1.25	0.40	0.74	0.49	1.24	1.07	8.46
1984	0.22	0.22	0.33	0.36	0.08	0.78	0.95	1.38	0.34	1.69	0.21	1.18	7.74
1985	0.34	0.16	0.96	1.02	0.72	0.19	1.78	0.11	0.88	0.98	1.54	0.55	9.23
1986	0.07	0.63	0.55	0.44	0.08	0.26	0.72	1.47	0.78	1.08	0.10	0.07	6.25
1987	0.48	0.45	0.74	0.53	1.03	0.80	2.50	1.65	0.09	1.54	1.02	0.66	11.49
1988	1.29	0.00	0.63	1.96	0.82	0.30	0.32	0.71	0.66	0.70	0.02	0.49	7.90
1989	0.45	0.22	0.42	0.02	0.33	0.42	0.70	2.11	0.56	0.17	0.03	0.03	5.46
1990	0.23	0.72	0.61	0.38	0.09	0.44	0.68	0.81	1.54	0.72	0.00	0.27	6.49
1991	0.18	0.12	0.85	0.13	0.92	0.90	0.89	1.01	2.13	0.20	0.60	0.13	8.06
1992	0.43	1.48	1.11	0.31	1.66	0.26	0.04	0.79	0.92	0.62	0.37	0.81	8.80
1993	2.32	1.77	1.44	0.45	1.85	0.19	0.03	0.54	0.20	1.46	0.68	0.18	11.11
1994	0.04	0.40	0.07	0.68	0.35	0.03	0.13	0.91	1.30	1.70	0.21	-	5.82
1995	0.96	0.24	0.80	1.42	1.69	0.61	0.87	1.42	0.47	0.00	0.16	0.19	8.83
1996	0.71	0.40	1.47	0.02	0.86	0.44	0.51	0.01	2.06	0.73	1.30	0.54	9.05
1997	1.17	0.18	0.00	0.91	0.59	1.61	1.13	2.77	2.50	0.43	0.38	0.05	11.72
1998	0.35	2.04	0.04	0.29	0.13	0.55	1.54	0.86	1.16	1.71	0.76	0.00	9.43
1999	0.17	0.28	0.00	1.64	0.19	0.54	1.15	2.50	1.14	0.00	0.00	0.12	7.73
2000	0.41	1.19	0.50	0.03	0.76	0.40	0.28	1.00	0.39	2.89	0.09	0.10	8.04
2001	1.14	1.03	0.47	0.23	0.53	0.23	0.81	0.82	0.76	0.16	0.75	0.17	7.10
2002	0.00	0.05	0.02	0.16	0.00	0.26	0.18	0.18	2.55	0.78	0.74	0.28	5.20
2003	0.02	0.37	1.22	0.08	0.56	0.12	0.00	0.87	0.30	0.29	0.56	0.91	5.30
2004	0.30	1.84	0.00	2.02	0.10	0.82	0.41	0.39	1.03	2.14	1.67	0.51	11.23
2005	2.01	1.11	0.17	0.19	0.40	2.11	0.15	0.58	1.00	1.37	0.26	0.06	9.41
2006	0.61	0.16	1.51	0.13	0.03	0.19	0.32	0.83	0.42	3.80	0.01	0.43	8.44
2007	0.40	0.01	0.24	0.52	0.40	0.05	0.43	3.04	1.22	0.43	0.03	-	6.77
Average	**0.65**	**0.58**	**0.54**	**0.53**	**0.62**	**0.51**	**0.78**	**1.09**	**0.91**	**0.85**	**0.51**	**0.54**	**7.55**

TABLE 4: HUNTINGTON PLANT PRECIPITATION

Elevation - 6,500 Feet

Water Year	*OCT*	*NOV*	*DEC*	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*TOTAL*
70-71	---	---	---	---	---	0.08	0.29	0.16	0.11	0.57	0.63	0.43	2.27
71-72	2.26	0.59	1.62	0.04	0.00	0.32	0.28	0.16	0.77	0.40	0.66	1.07	8.17
72-73	4.27	1.28	0.34	0.49	0.80	2.42	0.50	0.17	0.97	1.09	1.94	0.12	14.39
73-74	0.08	0.02	0.37	0.20	0.03	0.01	0.00	0.00	0.00	0.09	0.00	0.07	0.87
74-75	0.68	1.19	1.13	1.01	0.30	0.80	0.03	0.75	1.44	2.62	0.31	0.24	9.50
75-76	0.23	0.95	0.03	0.20	0.23	0.00	2.34	0.86	0.02	0.73	0.19	0.85	6.63
76-77	0.56	0.00	0.00	0.35	0.00	0.00	0.00	1.76	0.00	2.08	0.96	0.70	6.41
77-78	0.66	0.12	0.82	1.45	1.00	1.36	0.94	0.72	0.12	0.05	0.72	0.77	8.73
78-79	0.02	2.65	0.25	1.21	0.52	2.50	0.00	0.84	0.05	0.09	3.32	0.20	11.65
79-80	0.17	0.14	0.15	2.88	3.63	0.68	1.13	1.88	0.65	0.18	0.38	2.22	14.09
80-81	1.20	0.06	0.00	0.00	0.00	0.62	0.08	1.75	0.48	0.00	0.58	1.53	6.30
81-82	1.12	0.25	1.30	1.63	0.20	0.73	0.00	0.17	0.00	0.08	0.71	1.91	8.10
82-83	0.20	0.60	0.67	0.16	0.65	1.87	0.08	0.40	0.00	1.61	0.39	1.15	7.78
83-84	0.76	0.76	2.13	0.10	0.15	1.18	0.72	0.17	1.04	0.74	1.39	0.46	9.60
84-85	2.07	0.34	1.74	0.49	0.27	0.53	0.44	1.08	0.42	3.21	0.04	0.81	11.44
85-86	0.77	1.28	0.64	0.01	0.98	0.28	0.43	0.10	0.17	0.42	0.55	1.08	6.71
86-87	0.38	0.15	0.05	0.81	0.66	0.13	1.22	1.48	1.01	2.14	0.65	0.00	8.68
87-88	1.36	1.35	0.51	1.77	0.00	0.10	1.35	0.94	0.83	0.04	0.13	0.92	9.30
88-89	0.31	0.13	0.83	0.68	0.28	0.21	0.20	0.22	1.28	0.78	1.72	0.74	7.38
89-90	0.21	0.28	0.42	0.51	1.18	0.94	1.30	1.35	0.65	1.30	1.27	2.35	11.76
90-91	0.45	0.03	0.43	0.44	0.37	0.68	0.13	3.13	0.60	1.14	1.87	2.38	11.61
91-92	0.21	0.99	0.37	1.20	1.98	1.55	0.47	1.92	1.97	2.99	1.53	0.60	15.78
92-93	1.93	1.02	1.67	2.32	1.71	1.87	0.46	0.65	0.31	0.08	1.68	0.46	14.16
93-94	2.11	0.88	0.23	0.12	0.88	1.17	1.69	0.53	0.05	Tr.	2.14	1.69	11.49
94-95	1.33	0.26	0.33	1.10	0.26	1.05	2.65	2.67	1.17	0.32	2.81	1.48	15.42
95-96	NA	NA	0.90	1.10	0.86	1.52	0.46	1.41	0.72	1.15	0.19	2.18	-----
96-97	0.69	1.31	0.63	1.61	0.05	0.00	0.90	1.11	1.20	2.31	3.28	2.49	15.58
97-98	1.92	0.53	0.00	1.27	1.89	0.15	1.13	1.28	0.90	1.27	1.17	1.60	13.11
98-99	2.59	2.29	0.00	0.48	0.37	0.00	2.11	0.29	0.74	1.91	3.41	1.47	15.66
99-00	0.00	0.05	0.10	0.33	1.06	0.88	0.13	0.89	1.83	0.86	2.19	0.80	9.12
00-01	3.04	0.07	0.26	1.69	1.09	0.85	0.46	NR	NR	NR	NR	NR	
01-02	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
02-03	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
03-04	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
04-05	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
05-06	0.82	0.74	0.80	1.40	0.39	0.00	0.00	0.67	0.22	0.62	2.11	0.72	8.49
06-07	4.47	0.09	0.32	0.35	0.25	0.58	0.40	0.64	1.07	0.71	0.32	0.35	9.55

TABLE 5: ELECTRIC LAKE PRECIPITATION

Elevation - 8,350 Feet

Water Year	*OCT*	*NOV*	*DEC*	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*TOTAL*
70-71	2.46	2.35	6.41	1.13	1.66	0.36	1.05	0.66	0.47	0.40	2.15	0.78	19.88
71-72	3.49	1.69	4.07	3.35	0.58	0.70	1.02	0.28	1.49	0.70	0.80	2.91	21.08
72-73	4.18	3.43	3.27	0.97	2.09	2.74	3.67	1.42	0.85	0.82	1.23	1.15	25.82
73-74	0.79	1.90	3.52	2.70	1.12	1.52	2.49	0.20	0.13	2.09	0.06	0.09	16.61
74-75	2.27	0.62	1.73	2.10	2.37	3.42	1.23	3.21	1.08	1.93	0.49	0.25	20.70
75-76	1.31	2.57	0.82	1.44	2.23	1.35	1.47	2.00	1.23	1.07	0.54	1.19	17.22
76-77	1.00	0.25	0.14	0.76	1.14	2.00	0.05	3.00	0.90	2.28	1.31	1.26	14.09
77-78	1.47	2.10	3.20	3.68	2.74	3.16	2.46	1.18	0.30	0.10	0.24	0.77	21.40
78-79	0.40	3.18	2.66	2.90	2.18	2.53	0.72	1.67	0.19	0.96	2.29	0.32	20.00
79-80	1.55	2.23	0.37	4.95	6.01	3.34	1.27	3.09	0.12	0.37	0.38	1.80	25.48
10-Year	1.89	2.03	2.62	2.40	2.21	2.11	1.54	1.67	0.67	1.07	0.95	1.05	20.22
80-81	1.45	0.98	0.32	1.30	1.04	3.20	1.45	3.06	0.39	1.61	2.73	1.44	18.97
81-82	4.18	1.44	4.79	5.26	1.66	5.06	1.11	1.40	0.59	1.26	2.29	5.38	34.42
82-83	1.88	3.68	2.76	2.41	4.00	4.30	2.35	2.81	1.35	1.34	1.50	2.88	31.26
83-84	2.15	4.81	7.43	1.27	1.56	2.77	3.23	1.73	3.41	2.55	2.26	1.47	34.64
84-85	2.92	2.63	3.24	1.54	1.09	3.54	1.95	1.19	0.89	3.04	0.03	4.35	26.41
85-86	4.40	6.62	1.99	1.81	8.54	2.48	3.79	1.62	0.26	1.01	1.68	2.73	36.93
86-87	1.86	1.98	0.55	2.14	2.07	2.47	1.03	2.93	0.79	2.12	1.22	0.49	19.65
87-88	1.39	1.68	3.50	3.06	0.72	3.32	2.14	1.60	0.86	1.04	2.23	1.16	22.70
88-89	1.20	2.68	1.91	1.52	1.99	3.55	0.35	0.06	1.54	1.43	1.37	1.19	18.79
89-90	1.21	1.88	0.70	2.00	4.06	2.30	2.00	0.81	1.87	1.08	0.62	1.87	20.40
90-91	1.32	0.90	1.64	1.49	1.64	4.24	3.06	2.60	0.57	1.04	1.39	2.70	22.56
91-92	1.43	2.10	0.87	0.72	2.21	1.95	0.54	1.55	1.01	0.59	1.64	1.02	15.63
92-93	1.51	1.33	3.60	5.01	4.76	2.25	2.49	2.40	1.57	0.48	1.32	0.60	27.32
93-94	2.10	2.19	0.90	1.00	4.00	1.10	2.81	0.99	0.10	0.25	0.75	2.32	18.51
94-95	2.40	4.26	1.60	3.25	1.90	3.84	3.94	5.07	2.04	1.00	2.53	1.95	33.78
95-96	1.54	1.38	3.54	5.84	3.25	3.23	1.75	1.73	0.90	1.09	0.45	2.20	26.90
96-97	1.43	2.35	3.90	4.00	1.31	0.77	1.97	2.03	1.03	0.64	1.98	4.45	25.86
97-98	2.30	1.88	2.00	3.65	3.60	2.86	1.80	1.82	2.30	2.01	1.86	1.68	27.76
98-99	3.65	2.98	1.15	4.05	1.70	1.44	4.95	2.03	1.28	2.90	3.54	1.20	30.87
99-00	0.15	0.38	1.61	4.19	4.45	1.98	0.66	2.12	2.32	0.00	2.60	1.65	22.11
00-01	3.47	1.21	2.19	1.54	2.80	0.79	2.41	1.49	0.37	1.56	3.40	1.01	22.24
01-02	1.35	3.40	1.12	1.08	0.82	2.31	1.68	0.40	0.35	0.58	0.20	3.60	16.89
02-03	2.64	2.08	2.69	0.25	2.07	2.89	2.72	1.47	0.80	0.33	2.24	0.59	20.77
03-04	0.66	2.49	3.71	2.12	2.69	0.66	2.19	0.12	1.30	0.72	0.39	0.45	17.50
04-05	4.35	2.59	2.05	3.94	2.53	2.01	1.41	1.90	1.26	0.65	1.23	1.40	25.32
05-06	1.53	2.26	3.92	2.92	1.70	5.59	4.72	0.50	0.95	0.90	1.03	1.88	27.90
06-07	3.49	2.52	1.06	0.43	2.48	1.80	1.40	1.44	0.73	1.70	2.18	1.62	20.85

NOTE: ***Climatic Station was moved from a point one mile above the dam site to a point 500 feet below dam site on November 15, 1973. October, November, and December 70-71 were estimated by correlation with Clear Creek Weather Station.***

TABLE 6: EAST MOUNTAIN PRECIPITATION

Elevation - 8,985 Feet

Water Year	*OCT*	*NOV*	*DEC*	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*TOTAL*
80-81	1.28	0.39	0.05	0.29	0.52	2.77	0.64	0.87	0.11	0.57	0.85	2.55	10.90
81-82	1.93	0.53	0.97	3.22	0.14	1.67	0.00	0.45	0.09	1.86	1.10	2.61	14.57
82-83	0.38	2.90	1.39	1.30	1.81	1.98	0.92	0.71	0.61	1.27	4.83	1.62	19.71
83-84	0.76	2.43	2.42	0.27	0.65	1.22	0.50	0.22	1.18	1.90	2.33	0.64	14.53
84-85	3.27	0.97	1.67	0.49	0.59	1.77	1.35	1.73	0.28	2.47	0.12	2.31	17.02
85-86	1.15	2.38	0.87	0.30	2.10	1.43	1.05	0.38	0.53	0.87	2.24	1.63	14.92
86-87	1.57	0.39	0.16	1.37	1.37	1.65	1.16	1.77	0.58	2.49	1.16	0.06	13.73
87-88	2.77	1.91	1.29	1.42	0.00	0.99	2.08	1.03	0.81	0.45	0.96	0.91	14.61
88-89	0.61	0.43	1.56	1.00	0.68	1.03	0.26	0.47	0.43	1.19	2.44	0.49	10.59
89-90	0.28	0.39	0.16	0.74	2.08	1.75	1.03	0.26	0.67	0.88	1.03	1.62	10.90
10-Year	1.40	1.27	1.05	1.04	0.99	1.63	0.90	0.79	0.53	1.40	1.71	1.44	14.15
90-91	0.48	0.26	0.66	0.34	0.39	2.34	0.59	1.83	0.21	1.01	1.48	3.11	12.69
91-92	0.49	1.07	0.07	0.61	1.73	2.39	0.56	2.19	0.95	0.85	0.48	0.35	11.74
92-93	1.57	0.57	1.53	4.10	2.34	2.01	0.33	0.72	0.19	0.04	0.82	0.14	14.37
93-94	2.23	1.12	0.14	0.32	1.35	0.34	2.65	0.36	0.39	0.10	0.83	1.49	11.33
94-95	1.86	1.42	0.65	1.37	0.66	0.79	3.75	2.29	1.19	0.34	1.52	0.62	16.46
95-96	0.18	0.46	0.64	1.39	1.18	2.23	0.21	1.14	0.30	0.58	0.35	3.46	12.12
96-97	1.50	1.63	1.66	2.49	1.56	0.00	0.40	0.91	0.15	0.15	1.30	2.43	11.75
97-98	0.24	0.84	0.23	0.97	3.34	0.71	0.81	0.37	0.04	0.78	0.57	2.16	11.06
98-99	3.01	1.08	0.00	0.75	0.34	0.07	2.82	0.36	1.21	2.08	2.24	0.78	14.73
99-00	0.04	0.05	0.28	0.48	3.27	1.56	0.15	0.72	0.59	0.03	2.03	0.96	10.16
20-Year	1.28	1.06	0.82	1.16	1.30	1.43	1.06	0.94	0.53	1.00	1.43	1.50	13.39
00-01	3.48	0.62	0.39	1.96	1.21	1.03	1.12	1.39	0.19	0.58	1.09	0.12	13.17
01-02	0.11	0.40	0.18	0.03	0.19	0.10	0.16	0.00	0.06	0.26	0.69	4.15	6.34
02-03	0.73	0.82	0.75	0.01	0.96	1.20	0.37	0.57	0.37	0.06	1.59	0.94	8.36
03-04	0.27	0.86	1.95	0.21	2.73	0.00	1.94	0.12	1.27	0.49	0.67	0.38	10.89
04-05	2.56	2.06	1.16	3.47	1.41	0.63	1.19	1.04	1.36	0.44	0.83	1.07	17.22
05-06	1.44	0.64	0.98	0.87	0.41	3.67	0.44	0.03	0.55	0.58	0.50	0.48	10.59
06-07	3.66	0.21	0.48	0.25	0.18	0.96	0.98	0.19	0.05	0.70	0.89	0.99	9.54

TABLE 7: TEMPERATURES IN EMERY COUNTY, UTAH (2007 Water Year)

	Castle Dale**		Huntington Plant		Electric Lake		East Mountain	
2006	*Average Temperature**	*Departure From Normal*	*Average Temperature**	*Departure From Normal*	*Average Temperature**	*Departure From Normal*	*Average Temperature**	*Departure From Normal*
October	47.6	-0.3	45.5	-3.9	31.0	-6.5	42.3	1.3
November	37.1	-1.5	36.2	0.2	22.0	-3.7	32.5	3.6
December	26.7	2.3	27.7	0.3	16.1	0.3	32.8	10.4
2007								
January	21.9	1.1	24.9	1.3	24.0	9.4	31.7	8.0
February	35.0	7.1	36.1	5.9	19.2	-0.1	31.7	6.9
March	43.1	4.8	48.9	11.2	27.4	6.6	45.8	14.4
April	48.9	2.4	47.9	2.8	34.0	5.3	43.3	5.6
May	57.2	1.7	56.9	2.0	42.3	3.3	53.8	7.1
June	67.1	2.6	70.2	4.4	52.8	4.2	67.2	9.9
July	75.2	4.4	75.1	3.4	60.2	4.5	73.5	8.8
August	72.4	3.9	76.2	6.8	57.7	3.9	68.9	6.2
September	60.2	0.4	60.6	0.2	46.5	-1.0	53.9	0.9
AVERAGE	49.4	2.4	50.5	2.9	36.1	2.2	48.1	5.1

* Temperatures reported in degrees Fahrenheit.
** Tranferred Site from Hunter Plant to Castle Dale

TABLE 8: COMPARISON OF 2006 AND 2007 TEMPERATURES*

	2006		*2007*		*2007*
Station	***Average Temperature***	***Departure From Normal***	***Average Temperature***	***Departure From Normal***	***Departure From 2006***
Castle Dale	49.1	2.1	49.4	2.4	0.3
Huntington Plant	44.0	-3.6	50.5	2.9	6.5
Electric Lake	32.5	-0.1	36.1	2.2	2.3
East Mountain	44.9	4.6	48.1	5.1	0.5
Average Departure From Normal		0.8		3.2	2.4

* Temperatures reported in degrees Fahrenheit.

TABLE 9: HUNTINGTON CREEK WATER FLOWS (2007 Water Year)

	*Huntington Creek Below Electric Lake**	*Huntington Creek At Plant**	*Calc. Natural Flow at Plant*
Total Yearly Flow (Acre Feet)	12,248	38,429	44,211
% of Normal	56	55	62
Mean Discharge in Cubic Feet Per Second (CFS)	17	53	
Maximum Discharge (CFS)	62	137	
Date of Maximum Discharge	Sept. 22,2007	06-Jun-07	
Minimum Discharge (CFS)	5	6	
Date of Minimum Discharge	Oct. 4, 2006	06-Jan-07	

*Influenced by upstream storage in Electric Lake.
** Does not include Left Fork Reservoir regulation

TABLE 10: COMPARISON OF 2006 AND 2007 RUNOFF VALUES

	2006		2007		
	Amount	*% of Normal*	*Amount*	*% of Normal*	*2007 as a % of 2006*
Spring Runoff Stored in Electric Lake (Acre Feet)	14,534	160	2,982	33	21
Calculated Natural Flow at Plant (Acre Feet)	90,236	127	44,221	62	49

TABLE 11: HUNTINGTON CREEK WATER QUALITY *

HCC01 - ABOVE POWER PLANT

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070327		207	61		12	522	10.89	259	0.30		26	0.01		8.23	1.66	10	51	13	291
20070629		163	53		5	421	10.89	195	0.25		16	0.03		8.47	0.70	4	18	13	216
20070920		152	49	8	7	401	13.12	188	0.22		16	0.02		8.37	1.53	5	20	19	193
20071205		203	60	8	11	599	12.31	260	0.13		27	0.01		8.51	1.68	11	54		301
2007**																			
MIN		152	49	8	5	401	10.89	188	0.13		15.60	0.01		8.23	0.70	4	18	13	193
MAX		207	61	8	12	599	13.12	260	0.30		26.56	0.03		8.51	1.68	11	54	19	301
MEAN		181	56	8	9	486	11.80	226	0.23		21.07	0.02		8.40	1.39	7	36	15	250
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2006**																			
MIN		157	47		5	387	11.61	177	0.12		14	0.00		7.99	0.75	4	19	8	209
MAX		233	73		20	701	14.32	324	8.77		35	0.02		8.43	1.93	18	85	969	467
MEAN		198	61		11	531	13.17	252	2.34		24	0.01		8.19	1.32	10	47	251	306
2005**																			
MIN		161	49		3	362	9.42	178	0.08		14	0.01		8.28	0.69	3	15	14	204
MAX		221	65		21	641	12.43	291	0.49		31	0.05		8.45	2.36	18	66	38	366
MEAN		193	58		10	484	10.87	232	0.27		21	0.02		8.34	1.46	10	38	28	280
2004**																			
MIN		154	44	6	5	332	5.27	173	0.12		15	0.01		8.41	0.84	5	17	13	153
MAX		245	59	6	15	485	14.66	245	0.28		24	0.09		8.63	1.74	13	45	37	287
MEAN		196	53	6	9	425	10.27	215	0.22		20	0.05		8.48	1.25	8	33	23	237
2003**																			
MIN		193	46	5	6	222	4.73	206	0.11		19	0.01		8.25	1.16	7	27	6	200
MAX		237	58	5	14	525	7.01	250	0.70		26	0.03		8.56	1.96	13	51	17	321
MEAN		216	53	5	9	395	6.20	221	0.29		22	0.02		8.42	1.54	10	37	11	250
2002**																			
MIN		195	45	8	5	358	10.65	178	0.20		16			8.40	1	7	20	17	153
MAX		232	52	8	11	461	13.62	216	2.10		21			8.58	1	10	38	143	276
MEAN		217	49	8	8	413	11.86	199	0.83		19			8.46	1	9	30	63	230
2001**																			
MIN		170	43	5	5	348	8.20	153	0.10		11			8.43	1	5	14	7	196
MAX		265	58	5	15	574	8.20	248	0.50		25			8.61	2	15	45	37	290
MEAN		220	50	5	10	459	8.20	201	0.30		19			8.52	2	9	30	21	243
2000**																			
MIN		176	41	6	3	304	5.40	148	0.20		11			8.28	1	2	10	10	168
MAX		254	57	6	18	490	12.00	233	0.20		22			8.53	1	13	36	27	285
MEAN		216	50	6	9	398	9.58	193	0.20		17			8.39	1	7	22	19	229
HISTORICAL 1991-2006																			
MIN	0.1	126	32.7	0.1	1.0	210	3.8	118	0.01	0.01	9.00	0.00	0.1	7.10	0.01	1.00	2.0	1.00	134
MAX	25.0	400	102.6	38.0	45.0	701	14.7	392	13.30	0.25	44.70	0.30	7.0	8.90	5.00	55.00	130.0	969.00	467
MEAN	5.1	220	56.5	4.4	12.3	404	8.3	220	0.51	0.10	19.10	0.06	2.6	8.38	1.33	8.02	30.9	32.70	236
No. of Analysis	61	103	103	67	102	113	109	103	103	58	103	67	55	113	85	102	103	107	113

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 12: HUNTI[illegible]N CREEK WATER QUALITY *

HCC02 - @ POWER PLANT (BELOW DEER CREEK CONFLUENCE)

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070327		212	61		14	537	10	263	0		27	0.01		8.27	1.85	12	53	8	302
20070629		162	53		5	429	11	196	0		16	0.03		8.38	0.81	4	19	15	219
20070920		158	48		7	412	12	185	0		16	0.02		8.42	1.21	5	20	11	192
20071205		215	60	10	22	681	14	270	0		29	0.01		8.56	2.47	19	66		330
2007**																			
MIN		158	48	10	5	412	10.15	185	0.14		16	0.01		8.27	0.81	4	19	8	192
MAX		215	61	10	22	681	14.04	270	0.24		29	0.03		8.56	2.47	19	66	15	330
MEAN		187	55	10	12	514.75	11.83	228.5	0.19		22	0.02		8.41	1.59	10	40	11	261
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2006**																			
MIN		157	47		6	400	11.50	179	0.10		15	0.00		8.07	1	5	20	8	215
MAX		235	73		76	899	14.31	332	11.93		36	0.01		8.48	2	51	86	1420	498
MEAN		200	61		27	596.5	13.31	258.25	3.10		25	0.01		8.31	1	20	48	363	318
2005**																			
MIN		164	48	5	4	372	9.49	182	0.08		15	0.01		8.34	1	5	17	8	223
MAX		220	63	5	32	674	14.78	284	0.38		31	0.05		8.48	2	29	73	37	389
MEAN		194	56	5	14	498	11.79	229.75	0.23		22	0.02		8.40	2	14	41	26	289
2004**																			
MIN		153	45	6	6	336	5.61	177	0.15		16			8.29	1	5	18	12	166
MAX		226	58	6	51	609	14.61	248	0.57		25			8.59	2	32	47	41	368
MEAN		192	53	6	20	463.5	10.25	217.25	0.34		20			8.42	1	15	35	26	265
2003**																			
MIN		221	47	5	7	422	4.70	212	0.11		19			8.16	1	8	28	7	213
MAX		251	56	7	19	634	6.96	250	0.78		26			8.57	2	16	53	50	318
MEAN		234	53	6	13	511.25	6.22	226.5	0.31		23			8.44	2	12	39	21	258
2002**																			
MIN		198	44	5	6	369	10.08	180	0.20		17			8.42	1	8	22	16	172
MAX		248	53	6	16	569	13.84	227	1.60		23			8.58	2	14	43	128	300
MEAN		226	49	6	11	457.25	11.88	204.75	0.75		20			8.48	1	11	33	79	251
2001**																			
MIN		172	44	8	6	364	8.20	159	0.10		12	0.05		8.30	2	6	16	9	200
MAX		284	59	8	32	642	8.20	259	0.60		27	0.05		8.65	2	23	52	33	338
MEAN		226	50	8	19	507	8.20	207.75	0.37		20	0.05		8.50	2	14	35	21	268
2000**																			
MIN		175	41	5	5	316	5.90	148	0.10		11			8.27	1	3	14	15	169
MAX		279	60	5	34	587	11.90	261	0.20		27			8.52	2	22	65	27	339
MEAN		226	50	5	17	456	10.03	206.5	0.17		20			8.36	2	12	36	21	257
HISTORICAL 1991-2006																			
MIN	0.1	151	32.0	0.1	1.0	210	3.8	129	0.01	0.01	8.00	0.002	0.1	7.14	0.01	1.00	4.0	1.00	161
MAX	33.0	310	91.7	37.0	76.0	899	14.8	448	11.90	0.21	39.90	1.00	5.1	8.98	5.00	51.20	150.0	490.00	425
MEAN	5.6	223	58.1	4.5	15.4	443	8.4	232	0.53	0.09	20.70	0.08	2.4	8.40	1.66	10.64	39.1	38.60	261
No. of Analysis	59	102	102	73	101	112	108	102	94	58	102	66	55	112	83	102	102	107	112

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 13: HUNTINGTON CREEK WATER QUALITY *

HCC04 - @ RESEARCH FARM

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070327		210	62		20	575	10	271	0		28	0.01		8.31	1.83	16	64	8	325
20070629		163	54		7	442	11	204	0		17	0.03		8.47	0.73	6	23	14	230
20070920		161	49		8	428	13	189	0		16	0.02		8.39	1.34	6	23	16	208
20071205		212	61	10	25	700	14	279	0		31	0.01		8.59	2.50	22	73	38	370
2007**																			
MIN		161	49		7	428	10.18	189	0.15		16	0.01		8.31	0.73	6	23	8	208
MAX		212	62		25	700	13.79	279	0.26		31	0.03		8.59	2.50	22	73	38	370
MEAN		187	57		15	536.25	11.99	235.75	0.20		23	0.02		8.44	1.60	12	46	19	283
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2006**																			
MIN		159	48		8	420	11.58	184	0.12		16	0.01		8.02	1	7	25	6	215
MAX		235	78		104	1036	14.59	366	16.43		42	0.01		8.50	3	70	109	1370	589
MEAN		199	63		38	663	13.52	274	4.46		28	0.01		8.33	2	27	61	358	351
2005**																			
MIN		163	48		4	378	9.07	186	0.10		15	0.00		8.06	1	5	19	38	225
MAX		215	68		48	784	12.69	312	0.42		35	0.05		8.47	2	34	97	57	459
MEAN		191	59		21	545	10.34	244	0.26		24	0.02		8.32	1	16	53	45	323
2004**																			
MIN		153	45	6	7	360	5.46	179	0.11		16	0.02		8.41	1	7	22	15	205
MAX		248	60	7	54	640	14.64	262	0.46		27	0.03		8.61	2	33	65	40	384
MEAN		198	55	7	23	493	10.25	226	0.25		22	0.02		8.49	1	16	44	24	287
2003**																			
MIN		211	49	5	11	444	4.65	218	0.11	0.01	20	0.01		8.34	1	10	34	7	282
MAX		251	61	6	38	658	7.07	282	0.84	0.01	32	0.03		8.57	2	26	79	56	377
MEAN		233	56	6	24	530	6.28	244	0.34	0.01	26	0.02		8.49	2	18	56	25	307
2002**																			
MIN		196	44	6	8	397	10.24	184	0.20		18			8.41	1	10	25	17	197
MAX		240	57	8	27	722	13.60	254	1.60		27			8.59	2	21	70	103	343
MEAN		224	51	7	18	524	11.89	220	0.63		23			8.50	1	15	47	55	289
2001**																			
MIN		181	46	5	8	382	8.30	168	0.10		13			8.36	2	8	20	8	197
MAX		294	67	5	51	727	8.30	303	0.30		33			8.59	2	35	87	29	432
MEAN		232	54	5	27	556	8.30	227	0.20		23			8.46	2	20	50	18	298
2000**																			
MIN		175	42	8	7	328	6.50	4	0.20		12			8.35	2	3	17	10	187
MAX		268	61	8	32	640	11.80	268	0.20		29			8.45	2	23	74	31	371
MEAN		225	52	8	20	484	9.80	173	0.20		21			8.38	2	13	45	21	276
HISTORICAL 1991-2006																			
MIN	0.1	96	35.3	0.1	2.0	220	4.2	145	0.01	0.01	9.90	0.005	0.1	7.35	0.01	2.00	9.0	1.00	170
MAX	25.0	326	108.1	44.0	104.0	1036	14.6	397	16.40	0.37	42.00	0.30	5.0	8.94	10.70	69.70	170.0	1370.00	589
MEAN	5.1	225	59.9	4.9	19.8	479	8.3	244	0.62	0.10	22.80	0.06	2.4	8.41	1.75	14.20	54.4	40.10	292
No. of Analysis	59	102	102	70	102	111	108	101	90	57	102	63	49	112	85	102	102	106	112

* Quality parameters are reported as mg/l unless otherwise noted.

**Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 14: DEER CREEK SURFACE WATER QUALITY *

DCR01 - ABOVE THE MINE

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
	NO SAMPLES DURING 2007																	
2007**																		
MIN																		
MAX																		
MEAN																		
No. of Analysis																		
2006**																		
MIN		238	43		6	538	223	0.06		28			8.39	1	30	35	15	279
MAX		283	49		8	720	259	0.06		33			8.59	1	47	68	15	406
MEAN		261	46		7	629	241	0.06		31			8.49	1	39	52	15	343
2005**																		
MIN		258	49	5	5	567	268	0.23		31	0		8.18	1	30	37	27	328
MAX		278	56	5	7	702	268	0.23		35	0		8.46	1	61	63	27	403
MEAN		268	53	5	6	635	268	0.23		33	0		8.32	1	45	50	27	366
2004**																		
MIN		244	43		4	505	213			26				1	33	34	11	314
MAX		244	43		4	505	213			26				1	33	34	11	314
MEAN		244	43		4	505	213			26				1	33	34	11	314
2003**	NO FLOW DURING 2003																	
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		317	41	8	5	620	222	0.20		26			8.30		31	41	35	307
MAX		321	46	8	7	662	226	0.20		30			8.72		45	63	35	366
MEAN		319	44	8	6	641	224	0.20		28			8.51		38	52	35	337
2000**																		
MIN		307	39		4	547	218			28			8.45		42	46	6	329
MAX		325	41		6	615	233			33			8.48		48	74	6	378
MEAN		316	40		5	581	226			31			8.47		45	60	6	354
HISTORICAL 1978-2006																		
MIN	0.1	238	2.2	0.1	3.5	360	193	0.01	0.01	19.30	0.01	0.1	6.97	0.01	13.40	10.0	0.50	231
MAX	137.0	397	107.2	19.0	176.0	1580	599	40.10	0.35	83.90	0.24	5.0	8.81	4.33	111.60	255.0	3592.00	897
MEAN	11.3	306	54.0	5.5	17.0	595	277	0.81	0.09	3402.00	0.04	1.2	8.03	1.21	33.80	60.9	91.80	347
No. of Analysis	27	44	44	32	45	84	44	74	20	44	66	25	85	34	44	46	78	85

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 15: DEER CREEK SURFACE WATER QUALITY *

DCR06 - BELOW THE MINE

2007* SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070327		275	64.6	27	79	980	356			47.3	0.00		8.42	5.30	64	99		540
20070629		276	66.3		58	988	371	0.05		49.9	0.00		8.40	4.92	45	74		473
20070920		243	54.0	26	36	871	332			47.8	0.01		8.25	5.04	39	84		431
20071205		267	64.7	6	30	963	351	1.20	0.06	46.1	0.03		8.56	7.28	42	126	71	499
2007**																		
MIN		243	54.0		30	871	332	0.05		46.1	0.00			4.92	39	74	71	431
MAX		276	66.3		79	988	371	1.20		49.9	0.03			7.28	64	126	71	540
MEAN		265	62.4		51	951	353	0.63		47.8	0.01			5.64	47	96	71	486
Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2006**																		
MIN		235	49		65	937	281	0		39	0			2	62	71	5	510
MAX		289	75		409	2255	406	0		57	0			6	275	113	25	1172
MEAN		267	60		179	1344	350	0		48	0			4	127	96	12	703
2005**																		
MIN		246	43		45	720	278	0		37	0			2	46	59	32	429
MAX		267	65		209	1472	375	0		51	0			6	136	109	56	791
MEAN		257	53		89	969	315	0		45	0			4	70	85	44	543
2004**																		
MIN		247	48	6	62	799	307	0			0			4	49	85	102	445
MAX		343	63	7	431	1876	351	4			0			6	254	101	216	1042
MEAN		278	54	7	196	1196	326	1			0			5	122	92	159	662
2003**																		
MIN	10	256	52.8	6	94	435	340	0.03		48			8.46	5.01	69	102	12	511
MAX	10	371	57.8	17	136	969	358	0.12		52			8.63	5.63	91	110	12	602
MEAN	10	316	55.8	10	109	780	348	0.07		51			8.57	5.35	77	106	12	563
2002**																		
MIN		266	41.0		49	735	279	0.20		43			8.50	5.00	48	87	6	400
MAX		338	53.0		93	932	322	0.20		46			8.66	5.00	68	112	6	559
MEAN		303	49.0		73	860	306	0.20		45			8.56	5.00	59	98	6	501
2001**																		
MIN		298	47.0		39	777	261	0.10		35			8.40	2.00	36	77	6	452
MAX		327	68.0		177	1364	396	0.10		55			8.65	5.00	137	136	9	779
MEAN		309	55.0		101	1015	320	0.10		44			8.50	4.00	80	108	8	565
2000**																		
MIN		286	51.0		59	858	309	0.10		44			8.19	5.00	50	99	5	494
MAX		332	65.0		77	945	389	0.70		55			8.41	6.00	57	161	63	551
MEAN		313	56.3	6	68	889	341	0.40		49			8.31	5.33	53	128	25	520
HISTORICAL 1978-2006																		
MIN	0.1	162	2.4	0.1	5.0	420	243	0.01	0.01	27.14	0.002	0.1	6.92	1.00	28.13	59.0	0.50	273
MAX	90.0	456	191.9	38.0	1112.0	4590	990	170.00	1.22	124.00	0.27	9.0	8.94	10.30	758.00	610.0	20540	2460
MEAN	6.3	310	74.7	4.3	105.1	1032	408	1.72	0.12	52.80	0.04	1.5	8.26	4.77	84.30	166.8	202.80	633
No. of Analysis	62	100	100	73	101	146	100	123	52	100	98	59	147	100	100	102	133	147

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 16: MEETINGHOUSE CANYON WATER QUALITY *

MHC01 - LEFT FORK

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070629		191	36.50		4.0	485	221	0.33		31.60	0.007		8.39	0.90	10.0	28	31	223
2007**																		
MIN		191	36.50		4.0	485	221	0.33		31.60			8.39	0.90	10.0	28	31	223
MAX		191	36.50		4.0	485	221	0.33		31.60			8.39	0.90	10.0	28	31	223
MEAN		191	36.50		4.0	485	221	0.33		31.60			8.39	0.90	10.0	28	31	223
No. of Analysis	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2006**																		
MIN		199	42		5.0	437	219	0.07		27.40			8.37	0.93	8.2	26	22	222
MAX		207	43		5.0	498	229	0.14		29.41			8.59	1.05	10.5	30	22	262
MEAN		203	43		5.0	468	224	0.11		28.41			8.48	0.99	9.4	28	22	242
2005**																		
MIN		204	41		4.0	446	237	0.40		30.80	0.006		8.41	0.94	8.9	33		261
MAX		215	51		5.0	532	255	0.56		32.80	0.012		8.56	1.21	11.6	42		301
MEAN		210	46		4.5	489	246	0.48		31.80	0.009		8.49	1.08	10.2	38		281
2004**																		
MIN		210	49		3.0	420	221	0.10		23.90	0.007		8.40	0.71	6.5	18		264
MAX		210	49		3.0	420	221	0.10		23.90	0.007		8.40	0.71	6.5	18		264
MEAN		210	49		3.0	420	221	0.10		23.90	0.007		8.40	0.71	6.5	18		264
2003**	NO FLOW DURING 2003																	
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		236	34	5	3.2	438	200	0.30		27.00			8.56		9.0	28	7	257
MAX		240	40	8	3.6	517	211	0.30		28.00			8.71		11.0	31	29	265
MEAN		238	37	7	3.4	478	206	0.30		27.50			8.64		10.0	30	18	261
2000**																		
MIN		241	34	5	3.0	395	199	0.40		26.00			8.29	1.00	7.0	20	50	212
MAX		262	37	5	3.0	398	204	1.20		29.00			8.47	1.00	11.0	24	66	239
MEAN		252	36	5	3.0	397	202	0.80		27.50			8.38	1.00	9.0	22	58	226
HISTORICAL 1986-2006																		
MIN	0.1	195	2.2	0.1	1.0	300	175	0.02	0.01	17.20	0.002	0.1	7.03	0.01	3.80	8.0	0.10	183
MAX	49.0	307	80.4	34.0	47.5	557	350	1.20	0.30	36.50	0.10	10.9	8.81	1.62	14.00	100.0	175.00	304
MEAN	7.2	238	45.0	6.1	7.1	422	230	0.27	0.09	27.24	0.03	1.7	8.24	0.94	8.53	31.8	31.91	245
No. of Analysis	20	39	39	32	39	39	39	36	21	39	22	20	39	30	39	39	36	39

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 17: MILL FORK CANYON WATER QUALITY *

MFU3 - ABOVE MILL FORK FAULT

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
	No Flow During 2007																	
2007**																		
MIN																		
MAX																		
MEAN																		
No. of Analysis																		
2006**																		
MIN		221	61.80		3	468	246	0.08		22.30			8.33	1	4.72	20	9	275
MAX		221	61.80		3	468	246	0.08		22.30			8.33	1	4.72	20	9	275
MEAN		221	61.80		3	468	246	0.08		22.30			8.33	1	4.72	20	9	275
2005**																		
MIN		187	64.20	20	2	431	240	0.22		19.40	0		8.46	1	4.35	17	50	247
MAX		187	64.20	20	2	431	240	0.22		19.40	0		8.46	1	4.35	17	50	247
MEAN		187	64.20	20	2	431	240	0.22		19.40	0		8.46	1	4.35	17	50	247
2004**																		
MIN		222	54.20		2	436	224	0.11		21.60			8.35	1	4.67	22		227
MAX		222	54.20		2	436	224	0.11		21.60			8.35	1	4.67	22		227
MEAN		222	54.20		2	436	224	0.11		21.60			8.35	1	4.67	22		227
2003**																		
MIN		251	61.40	7	3	455	241	0.10		21.40			8.38	1	4.79	23		272
MAX		251	61.40	7	3	455	241	0.10		21.40			8.38	1	4.79	23		272
MEAN		251	61.40	7	3	455	241	0.10		21.40			8.38	1	4.79	23		272
2002**	NO FLOW DURING 2002																	
2001**	NO FLOW DURING 2001																	
2000**	NO FLOW DURING 2000																	
HISTORICAL 1986-2006																		
MIN		187	54.2	7.0	2.0	431	224	0.08		19.40	0.002		8.33	0.81	4.35	17	9	227
MAX		251	64.2	20.0	3.0	468	246	0.22		22.30	0.002		8.46	0.88	4.79	23	50	275
MEAN		220	60.4	13.5	2.5	478	238	0.13		21.18	0.002		8.38	0.86	4.63	20.5	29.50	255
No. of Analysis		4	4	2	4	4	4	4		4	1		4	4	4	4	2	4

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 18: MILL FORK CANYON WATER QUALITY *

MFA1 - ABOVE MINE

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
	No Flow During 2007																	
2007**																		
MIN																		
MAX																		
MEAN																		
No. of Analysis																		
2006**																		
MIN		220	63		3	463	251	0.08		23			8.47	1	4.84	20	12	265
MAX		220	63		3	463	251	0.08		23			8.47	1	4.84	20	12	265
MEAN		220	63		3	463	251	0.08		23			8.47	1	4.84	20	12	265
2005**																		
MIN		190	62	17	2	429	239	0.54		21	0		8.51	1	4.51	17	43	245
MAX		190	62	17	2	429	239	0.54		21	0		8.51	1	4.51	17	43	245
MEAN		190	62	17	2	429	239	0.54		21	0		8.51	1	4.51	17	43	245
2004**																		
MIN		215	54		2	436	223			22			8.54	1	4.77	23	5	219
MAX		215	54		2	436	223			22			8.54	1	4.77	23	5	219
MEAN		215	54		2	436	223			22			8.54	1	4.77	23	5	219
2003**																		
MIN		275	61	6	3	451	243	0.07		22			8.45	1	4.60	23	4	262
MAX		275	61	6	3	451	243	0.07		22			8.45	1	4.60	23	4	262
MEAN		275	61	6	3	451	243	0.07		22			8.45	1	4.60	23	4	262
2002**	NO FLOW DURING 2002																	
2001**	NO FLOW DURING 2001																	
2000**	NO FLOW DURING 2000																	
HISTORICAL 1986-2006																		
MIN		153	32.0	5.0	2.0	180	208	0.06	0.48	13			8.00	0.83	1.00	12	1	176
MAX		400	82.0	17.0	24.0	813	462	3.03	0.50	73			8.54	3.00	24.00	223	342	710
MEAN		280	57.2	9.0	10.1	521	303	0.63	0.49	38.80			8.18	1.74	10.11	65.1	47.05	342
No. of Analysis		23	24	4	23	24	24	18	2	24			25	21	24	24	22	24

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 19: MILL FORK CANYON WATER QUALITY *

MFB2 - BELOW MINE

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070327		351	80		14	956	503			74			8.13	2.90	20.40	177		579
20070629		315	70		11	957	438			64			8.24	2.32	17.40	124	7	574
20070920		343	82		12	1040	519			77	0.003		8	4	19.90	161		561
2007**																		
MIN		315	70		11	956	438			64	0.003		8.13	2.32	17.40	124	7	561
MAX		351	82		14	1040	519			77	0.003		8.33	3.60	20.40	177	7	579
MEAN		336	77		12	984	487			71	0.003		8.23	2.94	19.23	154	7	571
No. of Analysis	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2006**																		
MIN		251	66		5	564	296	0		32	0.002		8.41	1.29	7.06	39	17	324
MAX		332	77		12	924	447	0		62	0.002		8.43	2.58	16.98	132	17	497
MEAN		292	71		9	744	372	0		47	0.002		8.42	1.94	12.02	86	17	411
2005**																		
MIN		200	56	16	3	461	258	1		23	0.018		8.46	0.97	5.12	22	54	280
MAX		274	66	22	9	730	350	1		51	0.018		8.48	2.33	12.90	77	54	415
MEAN		237	61	19	6	596	304	1		37	0.018		8.47	1.65	9.01	50	54	348
2004**																		
MIN		279	58	10	10	654	327	0		44	0.027		8.49	1.88	10.60	67		338
MAX		297	59	10	12	684	357	0		51	0.027		8.52	2.52	13.90	93		415
MEAN		288	59	10	11	669	342	0		47	0.027		8.51	2.20	12.25	80		377
2003**																		
MIN		354	71	9	14	715	375			48			8.41	2.20	12.20	86		415
MAX		354	71	9	14	715	375			48			8.41	2.20	12.20	86		415
MEAN		354	71	9	14	715	375			48			8.41	2.20	12.20	86		415
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		318	52	7	11	746	330			45			8.46	2	12	76	5	382
MAX		338	58	8	14	763	340			51			8.59	3	14	106	5	433
MEAN		328	55	8	13	755	335			48			8.53	3	13	91	5	408
2000**	NO FLOW DURING 2000																	
HISTORICAL 1986-2006																		
MIN		186	1.0	7.0	2.0	240	227	0.05	0.10	14	0.002		7.27	0.70	5.00	16	0	204
MAX		412	76.9	22.0	17.0	924	447	0.97	10.00	81	0.002		8.90	5.20	16.98	132	64	504
MEAN		311	56.2	12.2	8.9	547	316	0.31	3.32	43.56	0.002		8.22	1.95	10.18	61.0	19.40	353
No. of Analysis		34	34	12	35	36	35	18	5	35	2		36	34	35	35	23	34

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 20: RILDA CANYON SURFACE WATER QUALITY *

RCF1 - RILDA CANYON FLUME - RIGHT FORK

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070629		199	51		2	484	217	0.05		21.6			8.32	0.74	7.36	19		263
20070920		186	53	25	3	513	240			26.0			8.05	1.24	8.93	27		242
2007**																		
MIN		186	51		2	484	217	0.05		21.6	0.000		8.05	0.74	7.36	19	0	242
MAX		199	53		3	513	240	0.05		26.0	0.000		8.32	1.24	8.93	27	0	263
MEAN		193	52		3	499	229	0.05		23.8	#DIV/0!		8.19	0.99	8.15	23	#####	253
No. of Analysis	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2006**																		
MIN		207	56		3	434	228	0.25		19.7	0		8.46	0.86	5.00	15	16	240
MAX		213	59		3	488	231	0.25		22.1	0		8.49	1.01	8.06	23	16	259
MEAN		210	58		3	461	230	0.25		20.9	0		8.48	0.94	6.53	19	16	250
2005**																		
MIN		199	56		2	420	236	0.31		19.1	0		8.30	0.80	4.86	13	73	268
MAX		208	65		3	485	240	0.31		23.5	0		8.61	1.14	8.74	22	73	280
MEAN		204	60		3	453	238	0.31		21.3	0		8.46	0.97	6.80	18	73	274
2004**																		
MIN		195	46		2	394	193	0.06		18.7	0		8.44	0.77	5.36	16	6	145
MAX		204	51		3	433	220	0.06		22.9	0		8.60	1.02	8.02	25	6	233
MEAN		200	48		3	414	207	0.06		20.8	0		8.52	0.90	6.69	21	6	189
2003**																		
MIN	5	224	49	5	2	416	218	0.04		20.4			8.56	0.74	5.92	16	5	215
MAX	5	245	56	8	2	421	223	0.56		23.3			8.58	1.21	8.40	24	5	248
MEAN	5	235	52	7	2	419	221	0.30		21.9			8.57	0.98	7.16	20	5	232
2002**																		
MIN		269	50		2	430	215			22.0			8.62		9.00	22		229
MAX		269	50		2	430	215			22.0			8.62		9.00	22		229
MEAN		269	50		2	430	215			22.0			8.62		9.00	22		229
2001**																		
MIN		244	46	6	2	468	205	0.10		19.0			8.55		5.00	15	17	242
MAX		261	58	6	2	508	223	0.10		22.0			8.62		9.00	26	17	273
MEAN		253	52	6	2	488	214	0.10		20.5			8.59		7.00	21	17	258
2000**																		
MIN		252	53		2	420	223			22.0			8		6.00	20	13	266
MAX		252	53		2	420	223			22.0			8		6.00	20	13	266
MEAN		252	53		2	420	223			22.0			8		6.00	20	13	266
HISTORICAL 1989-2006																		
MIN	0.1	195	46.0	0.1	1.0	300	193	0.02	0.02	18.00	0.002	0.7	7.78	0.01	3.78	1.0	2.0	145
MAX	10.0	329	108.6	26.0	15.0	508	384	2.50	1.20	30.00	0.14	5.0	8.88	10.00	24.00	80.0	240.0	292
MEAN	4.2	244	59.1	8.0	4.7	423	239	0.51	0.18	22.16	0.06	2.8	8.46	1.57	7.93	21.8	49.7	249
No. of Analysis	9	30	30	23	30	30	30	20	10	30	10	9	30	23	30	29	20	30

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 21: RILDA CANYON SURFACE WATER QUALITY *

RCF3 - RILDA CANYON FLUME - ABOVE NEWUA SPRINGS

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070327		388	111		12	1051	12.5	550	0.25		66.2	0.03		7.86	3.41	26.3	195		652
20070629		285	78		6	834	10.1	378	0.20		44.7	0.02		7.88	1.86	15.6	90	6	438
20070920		378	132		11	1304	10.1	614	0.42		69.1	0.06		7.54	3.45	29.2	255	5	746
20071019	9	400	122		11	1187		579	1.17		66.7	0.09		7.62	3.49	29.4	232		741
20071205	30	399	114		11	1265	12.3	560	0.46		67.0	0.05		8.04	3.51	30.1	208		686
2007**																			
MIN		285	77.6		6.0	834	10.09	378	0.20		44.70	0.02		7.54	1.86	15.60	90.0	5.0	438
MAX		400	132.0		12.0	1304	12.48	614	1.17		69.10	0.09		8.04	3.51	30.06	255.0	6.0	746
MEAN		370	111.2		10.2	1128	11.26	536	0.50		62.75	0.05		7.79	3.14	26.11	196.0	5.5	653
No. of Analysis	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2006**																			
MIN		220	62		3.0	487	10.3	252	0.16		23.8	0		7.78	0.98	6.4	25	6	278
MAX		376	112		12.0	1073	12.5	563	0.30		69.0	0		8.18	3.32	26.8	185	18	626
MEAN		328	94		8.8	906	11.7	454	0.25		53.3	0		7.97	2.57	20.9	135	10	517
2005**																			
MIN		206	61	13.0	2.0	437	9.1	239	0.15		21.2	0		7.94	0.94	5.8	19	109	273
MAX		353	95	13.0	11.0	974	14.2	467	2.16		56.0	0		8.53	3.16	27.4	155	109	586
MEAN		310	83	13.0	7.8	805	11.6	392	0.68		44.8	0		8.13	2.32	19.9	111	109	486
2004**																			
MIN	8	217	53		3.0	450	6.0	225	0.17		22.6	0		7.92	0.94	7.1	29	19	217
MAX	15	448	102		12.0	948	13.3	505	0.27		60.7	0		8.31	2.82	27.3	176	19	613
MEAN	12	341	85		8.0	791	10.1	408	0.21		47.5	0		8.08	2.29	20.8	128	19	478
2003**																			
MIN	7	280	62		3.0	505	5.1	263	0.12		21.8			7.73	1.02	8.9	36	11	319
MAX	16	458	100		12.0	948	6.5	497	0.27		58.2			8.26	2.90	27.4	176	11	605
MEAN	12	406	89		8.5	823	6.0	430	0.20		40.9			8.05	2.40	22.3	133	11	512
2002**																			
MIN		423	90		8.0	885	9.2	447	0.10		54.0		2	8.02	2.00	25	151	8	563
MAX		433	94		9.0	936	12.8	474	0.30		58.0		4	8.12	3.00	27	172	8	624
MEAN		429	92		8.8	912	10.7	460	0.18		56.0		3	8.07	2.75	26	163	8	584
2001**																			
MIN		287	55		3.4	564		244	0.10		26.0			7.97	1.00	10	43	5	302
MAX		431	92		8.5	908		456	1.30		55.0			8.19	3.00	23	159	16	569
MEAN		380	78		6.7	792		377	0.53		44.0			8.10	2.33	18	116	11	474
2000**																			
MIN	38.0	281	56		3.0	500	9.9	251	0.10		27.0			7.88	2.00	8	44	5	199
MAX	38.0	418	87		8.0	882	10.8	431	0.10		52.0			8.17	3.00	24	140	14	570
MEAN	38.0	367	76		6.0	740	10.4	370	0.10		43.7			8.07	2.50	18	106	8	436
HISTORICAL 1989-2006																			
MIN	0.1	206	52.7	0.1	2.0	380	4.4	225	0.02	0.01	21.20	0.003	0.4	7.50	0.01	5.40	7.0	1.0	199
MAX	38.0	500	112.2	28.0	50.0	1073	14.2	748	3.00	0.41	68.97	0.20	5.0	8.83	5.00	27.40	185.0	250.0	626
MEAN	8.4	365	82.5	5.4	9.4	707	8.3	391.7	0.45	0.13	43.10	0.05	2.6	8.10	2.13	15.81	95.4	37.5	436
No. of Analysis	29	62	62	27	62	63	59	62	60	21	62	34	25	63	59	62	62	42	62

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 22: RILDA CANYON SURFACE WATER QUALITY *

RCW4 - RILDA CANYON FLUME - NEAR HIGHWAY 31

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070327		364	169		25	1760	10.12	1011			143.0			8.07	4.57	37	646		1353
20070629		296	115		12	1392	10.73	678	0.07		94.8	0.00		8.26	2.99	24	349	5	868
20070920		307	157		17	1961	11.07	1030			155.0	0.00		7.98	5.01	36	674		1393
20071019	10	373	172		20	1888		1060			153.0	0.00		8.07	5.25	37	665		1420
20071205		356	154		20	2050	13.47	957		0.04	139			8.37	4.74	35	698		1429
2007**																			
MIN		296	115.0		12.0	1392	10.12	678	0.07		94.80	0.00		7.98	2.99	24.10	349.0	5.0	868
MAX		373	172.0		25.0	2050	13.47	1060	0.07		155.00	0.00		8.37	5.25	37.10	698.0	5.0	1429
MEAN		339	153.4		18.8	1810	11.35	947	0.07		136.95	0.00		8.15	4.51	33.70	606.4	5.0	1293
No. of Analysis	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2006**																			
MIN		242	70.2		5.0	592	10.41	313	0.35		33.40	0.00		8.20	1.45	9.65	61.0	26.0	351
MAX		337	114.0		16.0	1272	13.50	659	0.35		90.80	0.00		8.41	3.78	28.40	309.0	26.0	825
MEAN		305	96.1		12.0	1038	11.96	529	0.35		70.00	0.00		8.31	2.95	21.57	222.3	26.0	663.33
2005**																			
MIN		222	65.5		3.0	421	9.38	270	2.96		25.90	0.06		8.28	1.02	7.44	35.0	188.0	302
MAX		339	99.7		15.0	1129	15.87	550	2.96		73.00	0.06		8.55	3.13	27.50	239.0	188.0	729
MEAN		298	83.2		11.0	846	12.25	442	2.96		56.80	0.06		8.38	2.40	20.48	164.7	188.0	564.67
2004**																			
MIN	10	252	60.9		5.0	585	4.46	297	0.65		35.10	0.02	3.0	8.27	1.53	11.80	75.0	35.0	348
MAX	10	421	90.0		16.0	979	10.57	529	0.65		73.90	0.02	3.0	8.45	3.19	27.20	210.0	35.0	666
MEAN	10	325	74.3		10.3	796	8.19	415	0.65		55.77	0.02	3.0	8.33	2.45	20.47	147.3	35.0	511
2003**																			
MIN	22	326	73.9	10	8.0	662	5.38	361	0.07		42.80	0.01		8.23	1.84	15.60	102.0	5.0	451
MAX	22	448	94.3	10	17.0	1058	6.66	538	0.54		73.50	0.01		8.54	3.34	27.50	255.0	24.0	701
MEAN	22	394	84.4	10	13.8	906	6.22	476	0.24		64.28	0.01		8.38	2.85	24.23	194.5	14.5	584.25
2002**																			
MIN		389	81.0		17.0	970	9.17	495			67.00			8.23	3.00	26.00	179.0		616
MAX		421	87.0		19.0	1058	12.92	505			71.00			8.40	3.00	30.00	230.0		717
MEAN		398	84.8		18.5	995	10.70	501			69.75			8.30	3.00	28.25	207.8		652.5
2001**																			
MIN		311	62.0		8.4	724	8.20	307	0.20		37.00			8.23	2.00	15.00	97.0	17.0	386
MAX		426	85.0		19.0	1046	8.20	476	0.20		64.00			8.47	3.00	27.00	190.0	17.0	603
MEAN		385	76.3		14.8	907	8.20	419	0.20		55.50			8.34	2.75	23.00	156.8	17.0	536.5
2000**																			
MIN		325	63.0		6.0	630	6.20	318	0.10		39.00			8.19	2.00	14.00	83.0	5.0	376
MAX		420	76.0		16.0	907	14.00	415	0.10		59.00			8.32	3.00	26.00	157.0	7.0	572
MEAN		382	69.3		12.0	802	10.50	387	0.10		52.00			8.24	2.50	22.25	130.0	6.0	492
HISTORICAL 1989-2006																			
MIN	0.1	209	59.0	0.1	2.0	400	3.9	254	0.01	0.01	24.00	0.003	0.1	7.27	0.01	7.00	15.0	1.0	260
MAX	40.0	461	132.7	51.0	700.0	1272	15.9	659	3.80	0.28	90.80	0.20	5.0	8.86	10.00	52.00	309.0	505.0	825
MEAN	7.9	368	78.8	7.8	25.9	767	8.3	414.5	0.64	0.09	52.86	0.06	2.5	8.30	2.63	20.15	126.7	58.2	488
No. of Analysis	24	61	61	31	61	62	58	61	34	19	61	22	25	62	59	61	61	38	61

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 23: COTTONWOOD CANYON CREEK WATER QUALITY *

SW-1

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070321		355	84.5		16	924	457			59.8	0.01		7.80	1.65	26.5	131		560
20070629	9	389	88.1		20	1026	513	0.39		71.2	0.04		8.12	2.19	34.4	149	35	630
2007**																		
MIN		355	84.5		16.0	924.0	457.0	0.39		59.8	0.01		7.80	1.65	26.5	131.0	35.0	560
MAX		389	88.1		20.0	1026.0	513.0	0.39		71.2	0.04		8.12	2.19	34.4	149.0	35.0	630
MEAN		372	86.3		18.0	975.0	485.0	0.39		65.5	0.03		7.96	1.92	30.5	140.0	35.0	595
No. of Analysis	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2006**																		
MIN		245	60		6	583	284	0		32	0		8	1	10	35	7	318
MAX		335	81		13	858	425	0		54	0		8	1	22	96	28	452
MEAN		302	72		10	755	369	0		46	0		8	1	17	71	14	405
2005**																		
MIN		237	60		5	535	281	0		31	0		8	1	11	37	9	336
MAX		372	83		14	968	456	0		60	0		8	2	25	125	17	565
MEAN		305	72		10	752	369	0		46	0		8	1	18	81	13	451
2004**																		
MIN		331	86		14	858	443			56			8	2	23	165	5	575
MAX		331	86		14	858	443			56			8	2	23	165	5	575
MEAN		331	86		14	858	443			56			8	2	23	165	5	575
2003**																		
MIN		442	95		20	1015	541	0		74	0		8	2	34	206	7	657
MAX		442	95		20	1015	541	0		74	0		8	2	34	206	7	657
MEAN		442	95		20	1015	541	0		74	0		8	2	34	206	7	657
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		289	43		8	521	239	0		32			8.10	3.0	12.0	38	25	304
MAX		299	49		9	531	262	0		34			8.24	3.0	13.0	43	29	319
MEAN		294	46		9	526	251	0		33			8.17	3.0	12.5	41	27	312
2000**																		
MIN		289	43		8	521	239	0		32			8.10	3.0	12.0	38	25	304
MAX		299	49		9	531	262	0		34			8.24	3.0	13.0	43	29	319
MEAN		294	46		9	526	251	0		33			8.17	3.0	12.5	41	27	312
HISTORICAL 1977-2006																		
MIN	1.0	231	6.0	1.0	0.7	380.0	210.0	0.02	0.05	2.4	0.002	0.5	7.10	1.0	6.0	20.0	0.5	226
MAX	27.0	442	152.3	20.0	27.0	1015.0	541.0	15.9	0.43	78.0	1.31	358.0	8.72	21.0	60.0	238.7	1298.0	690
MEAN	5.8	337	66.6	5.9	12.4	678.1	337.1	0.8	0.13	39.3	0.08	11.1	7.96	2.8	20.0	74.2	65.1	382
No. of Analysis	44	88	87	20	88	49	55	79	18	88	61	41	83	84	87	88	80	88

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 24: COTTONWOOD CANYON CREEK WATER QUALITY *

SW-2

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070321		308	78.2	26	22	995	464			65.3	0.00		8.26	3.59	34.30	170		597
20070629		298	89.6		15	1042	510	0.06		69.6	0.01		8.31	6.47	36.90	257		710
20070921		287	89.6		16	1156	515	0.23		70.8	0.01		8.02	6.94	38.10	244	16	696
20071210	8	326	92.3	5	14	1079	512	0.11		68.2	0.01		8.12	7.23	40.52	254		716
2007**																		
MIN	8	287	78.2	5.0	14	995	464	0.06		65.3	0.00		8.02	3.59	34.3	170	16	597
MAX	8	326	92.3	26.0	22	1156	515	0.23		70.8	0.01		8.31	7.23	40.5	257	16	716
MEAN	8	305	87.4	15.5	17	1068	500	0.13		68.5	0.01		8.18	6.06	37.5	231	16	680
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2006**																		
MIN		244	57		8	597	289	0		35	0		8	1.39	12	45	5	331
MAX		327	86		23	1057	503	0		70	0		8	4.16	34	183	35	628
MEAN		298	75		17	905	432	0		59	0		8	3.19	28	138	20	520
2005**																		
MIN		233	58	9	7	558	282	0		34	0		8	1.46	12	46	5	333
MAX		331	92	9	42	1283	546	0		77	0		9	5.53	46	250	38	768
MEAN		303	75	9	22	971	446	0		63	0		8	4.03	32	174	18	593
2004**																		
MIN		287	73	8	16	908	448	1		60	0		8	3.51	33	214	10	602
MAX		345	87	8	45	1097	510	1		71	0		8	6.94	49	289	49	692
MEAN		310	81	8	28	1001	472	1		66	0		8	5.6825	41	243	30	659
2003**																		
MIN		356	78.0	6	16	993	479			69			8.26	5.01	38.9	238	6	630
MAX		391	91.2	7	25	1079	535			77			8.49	7.47	46.0	274	6	738
MEAN		372	85.1	7	22	1035	510			72			8.41	6.33	42.2	258	6	696
2002**																		
MIN		361	76.0	5	19	1021	474			68			8.25	6.00	43.0	249	15	702
MAX		398	87.0	8	28	1096	505			70			8.42	8.00	46.0	273	15	758
MEAN		375	80.0	7	24	1064	484			69			8.36	6.75	44.5	259	15	730
2001**																		
MIN		288	19.0	5	13	563	113	0.10		16			8.36	1.00	25.0	57	6	335
MAX		627	46.0	20	92	1251	271	0.50		38			8.62	5.00	268.0	103	29	786
MEAN		489	31.5	12	39	1037	192	0.30		28			8.50	3.50	171.8	87	14	642
2000**																		
MIN		288	19.0	5	13	563	113	0.10		16			8.36	1.00	25.0	57	6	335
MAX		627	46.0	20	92	1251	271	0.50		38			8.62	5.00	268.0	103	29	786
MEAN		489	31.5	12	39	1037	192	0.30		28			8.50	3.50	171.8	87	14	642
HISTORICAL 1977-2006																		
MIN	0.10	233	11.1	1.0	1.5	410	113	0.02	0.03	2.40	0.002	0.1	7.00	1.00	8	19.5	1.0	267
MAX	25.00	642	136.9	85.0	179.0	1709	631	16.20	1.25	109.00	1.37	39.0	8.93	25.60	268	289.0	1004.0	1170
MEAN	5.24	355	65.60	11.97	23.15	914	368	1.10	0.17	45.76	0.09	3.23	8.15	4.60	47.75	120.51	71.2	494
No. of Analysis	42	103	103	35	103	64	70	85	23	103	62	52	98	102	102	103	88	103

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 25: COTTONWOOD CANYON CREEK WATER QUALITY *

SW-3

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070629		375	110.0		330	2390	748	0.08		115.0	0.003		8.18	5.60	220.00	382		1544
20070921	6	352	116.8		336	2380	778	0.11		118.2	0.04		8.00	4.96	228.00	401	9	1515
2007**																		
MIN	6	352	110		330	2380	748	0.08		115	0.003		8.00	4.96	220	382	9	1515
MAX	6	375	117		336	2390	778	0.11		118	0.044		8.18	5.60	228	401	9	1544
MEAN	6	364	113		333	2385	763	0.10		117	0.024		8.09	5.28	224	392	9	1530
No. of Analysis	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2006**																		
MIN		246	58		33	738	312	0		41	0		8	2	27	69	37	409
MAX		346	105		215	1914	668	0		99	0		8	4	140	279	37	1120
MEAN		296	81		124	1326	490	0		70	0		8	3	83	174	37	765
2005**																		
MIN		228	57	10	10	566	301	0		39	0		9	1	15	51	14	332
MAX		433	153	10	447	3070	913	0		129	0		9	5	221	444	23	1835
MEAN		331	105	10	229	1818	607	0		84	0		9	3	118	248	19	1084
2004**	NO FLOW DURING 2004																	
2003**	NO FLOW DURING 2003																	
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		485	15	18	31	1230	99	0.30		15.0			8.52	4.00	233	112	12	774
MAX		602	32	48	607	2800	216	0.30		33.0			9.00	5.00	531	147	18	1563
MEAN		552	23	30	181	1652	159	0.30		24.8			8.75	4.50	325	130	15	988
2000**																		
MIN		485	15	18	31	1230	99	0.30		15.0			8.52	4.00	233	112	12	774
MAX		602	32	48	607	2800	216	0.30		33.0			9.00	5.00	531	147	18	1563
MEAN		552	23	30	181	1652	159	0.30		24.8			8.75	4.50	325	130	15	988
HISTORICAL 1977-2006																		
MIN	0.1	228	14.3	0.1	1.7	506	99	0.04	0.05	2.40	0.002	0.2	7.20	1.00	3	22	1.0	40
MAX	27.0	633	159.0	70.0	607.0	3070	913	19.00	0.43	129.00	2.48	114.0	9.00	30.00	531	444	5024.0	1835
MEAN	5.2	370	69.8	13.3	45.2	1217	401	1.11	0.14	48.30	0.13	4.9	8.14	4.24	77.80	160.4	137.2	599
No. of Analysis	44	91	90	35	90	52	58	80	22	91	56	59	86	89	90	91	77	89

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 26: GRIMES WASH WATER QUALITY *

GWR01 - RIGHT FORK

2007 **SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
2007**	NO SAMPLES COLLECTED DURING 2007 -NO FLOW																	
2006**	NO SAMPLES COLLECTED DURING 2006 -NO FLOW																	
2005**	NO SAMPLES COLLECTED DURING 2005 -NO FLOW																	
2004**	NO SAMPLES COLLECTED DURING 2004 -NO FLOW																	
2003**	NO SAMPLES COLLECTED DURING 2003 -NO FLOW																	
2002**	NO SAMPLES COLLECTED DURING 2002 -NO FLOW																	
2001**	NO SAMPLES COLLECTED DURING 2001 -NO FLOW																	
2000**	NO SAMPLES COLLECTED DURING 2000 -NO FLOW																	
HISTORICAL 1979-2006																		
MIN	0.1	104	30.0	1.0	3.0	190	112	0.01	0.05	6.30	0.01	0.5	7.20	1.60	1.85	20.0	0.5	115
MAX	39.0	320	57.0	1.0	26.4	750	320	20.60	3.31	46.20	0.30	9.0	8.70	7.64	20.44	161.7	7116.0	700
MEAN	5.5	238	42.6	1.0	10.8	557	238	1.38	0.47	31.96	0.06	1.8	8.09	3.21	13.20	63.7	370.2	338
No. of Analysis	11	10	10	9	12	43	10	47	9	9	42	12	47	10	10	14	47	47

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 27: GRIMES WASH WATER QUALITY *

GWR02 - LEFT FORK

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070629		297	56.2		11	810	359			53.0			8.33	1.11	40.40	129		527
2007**																		
MIN		297	56.2		11.0	810	359			53.00			8.33	1.11	40.40	129.0		527
MAX		297	56.2		11.0	810	359			53.00			8.33	1.11	40.40	129.0		527
MEAN		297	56.2		11.0	810	359			53.00			8.33	1.11	40.40	129.0		527
No. of Analysis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2006**																		
MIN		263	51	16	9	732	305	1		43	0		8	1	34	82	9	391
MAX		303	71	16	9	838	369	1		47	0		9	1	39	112	25	497
MEAN		283	61	16	9	785	337	1		45	#DIV/0!		8	1	37	97	17	444
2005**																		
MIN		286	55	9	9	803	330	0		47	0		8	1	38	101	5	450
MAX		304	69	25	9	818	380	0		50	0		9	2	40	117	53	491
MEAN		295	62	17	9	811	355	0		49	0		9	2	39	109	29	471
2004**	No flow during 2004																	
2003**	No flow during 2003																	
2002**	No flow during 2002																	
2001**																		
MIN		329	44.0	7.0	8.0	806	303	0.10		44.00			8.40	1.00	35.00	109.2	10.0	451
MAX		370	72.0	7.0	9.8	917	361	0.10		47.00			8.66	1.00	42.00	122.0	10.0	460
MEAN		350	58.0	7.0	8.9	861.5	332	0.10		45.50			8.53	1.00	38.50	115.6	10.0	455.5
2000**																		
MIN		296	40.0		10.0	691	302			49.00			8.48	2.00	42.00	136.0	17.0	423
MAX		296	40.0		10.0	691	302			49.00			8.48	2.00	42.00	136.0	17.0	423
MEAN		296	40.0		10.0	691	302			49.00			8.48	2.00	42.00	136.0	17.0	423
HISTORICAL 1979-2006																		
MIN	1.0	188	2.3	1.0	6.0	410	196	0.02	0.02	23.80	0.01	0.1	7.30	1.00	11.10	30.4	0.5	212
MAX	34.0	482	88.9	26.0	156.0	917	460	2.52	0.22	68.50	0.15	3.5	8.85	3.00	42.00	212.0	1428.0	570
MEAN	4.2	312	51.5	6.4	14.6	652	308	0.22	0.08	42.54	0.03	1.0	8.08	1.50	31.30	91.4	51.8	380
No. of Analysis	16	28	28	21	28	63	28	59	7	28	51	15	65	28	28	29	62	65

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 28: GRIMES WASH WATER QUALITY *

GWR03 - RIGHT FORK

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070321		340	157		469	3060	977	0.09		142.0	0.008		8.24	7.59	256	536	6	1902
20070629		275	80		204	1689	564			88.3	0.002		8.50	4.08	143	300		1082
20070921		318	155		517	3210	1049	0.08		160.8	0.006		8.11	8.66	294	622		2071
2007**																		
MIN		275	80		204	1689	564	0.08		88.3	0.002		8.11	4.08	143	300	6	1082
MAX		340	157		517	3210	1049	0.09		160.8	0.008		8.50	8.66	294	622	6	2071
MEAN		311	131		397	2653	863	0.09		130.4	0.005		8.28	6.78	231	486	6	1685
No. of Analysis	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2006**																		
MIN		277	64	15	29	900	363	0.07		48	0.00		8.40	1.66	45	122	10	512
MAX		282	66	15	73	1081	388	0.50		56	0.00		8.47	2.14	70	142	16	619
MEAN		280	65	15	51	991	376	0.29		52	0.00		8.44	1.90	57	132	13	565.5
2005**																		
MIN		257	70	7	35	856	373	0.07		48	0.00		8.34	2.09	48	134	11	581
MAX		308	145	16	360	2760	799	0.74		106	0.02		8.50	5.77	215	427	56	1620
MEAN		282	97	12	165	1622	537	0.50		71	0.01		8.44	3.57	116	244	34	974.3
2004**																		
MIN		311	122		183	1657	674	0.09	1.18	90	0.00		7.68	5.74	118	434	7	1159
MAX		394	192		539	3020	1048	2.62	1.18	144	0.04		8.21	7.73	252	653	134	2006
MEAN		349	167		433	2629	945	0.94	1.18	129	0.02		8.04	7.19	213	582	49	1758
2003**																		
MIN	10	356	133	7	182	1781	756	0.03	0.02	101	0.01	2	8.01	6.41	113	460		1242
MAX	12	447	163	7	294	2290	909	0.62	0.02	124	0.02	2	8.43	7.08	165	549		1579
MEAN	11	395	145	7	221	2006	842	0.19	0.02	116	0.01	2	8.26	6.75	136	517		1421
2002**																		
MIN		318	146		296	2250	859			118			7.84	7.00	171	538		1584
MAX		438	166		708	3650	1065			158			8.49	9.00	397	783		2449
MEAN		390	155		433	2737	930			132			8.07	7.67	248	631		1894
2001**																		
MIN		346	80		60	1169	418	0.80		53			7.87	2.00	59	172	6	601
MAX		423	143		651	3640	843	0.80		118			8.43	6.00	429	551	37	1985
MEAN		372	108		239	2151	623	0.80		86			8.24	4.50	194	361	22	1272
2000**																		
MIN		298	105		223	1895	563	0.50		73			8.15	5.00	150	392	10	1347
MAX		323	132		3226	9960	696	1.00		101			8.22	6.00	1870	464	70	5862
MEAN		311	116		1030	4136	650	0.75		88			8.20	5.25	630	432	43	2568
HISTORICAL 1979-2006																		
MIN	0.1	117	5.1	0.1	10.0	220	146	0.01	0.01	10.70	0.003	0.1	7.10	0.01	9.00	46.0	0.5	152
MAX	127.0	486	274.0	16.0	4531.0	12000	1165	22.60	2.26	158.00	0.90	27.0	8.81	12.80	3181.00	783.0	9702.0	7160
MEAN	12.0	343	125.6	2.7	292.7	1689	650	0.80	0.20	80.99	0.06	2.9	8.06	5.77	203.50	351.3	162.7	1070
No. of Analysis	58	90	90	52	92	130	90	118	54	90	97	54	134	89	90	93	114	132

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

Table 29

EAST MOUNTAIN SPRINGS DISCHARGE

2007

Spring	Date Sampled	Flow (GPM)	Temp. C	Date Sampled	Flow (GPM)	Temp. C	Seasonal Net Change %
Sheba	07/11/2007	1.3	12.6	10/16/2007	0.0		-99.23
Elk Spring	07/10/2007	91.0	8.8	10/15/2007	41.0	4.7	-54.95
Burnt Tree	07/11/2007	3.6	7.5	10/15/2007	3.5	7.5	-2.78
Jerk Water							
Pine Springs							
Pine Sp. Trough							
Ted's Tub	07/10/2007	11.9	10.4	10/15/2007	2.0	6.2	-83.19
79-1							
79-2	07/11/2007	1.2	2.6	10/15/2007	0.4	5.8	-65.00
79-3							
79-4							
79-5							
79-6							
79-7							
79-8							
79-9							
79-10	07/11/2007	3.2	11.8	10/16/2007	1.4	6.7	-56.25
79-11							
79-12	07/10/2007	Dry		10/15/2007	Dry		
79-13							
79-14							
79-15	07/10/2007	3.9	12.3	10/15/2007	1.8	6.1	-53.85
79-16							
79-17							
79-18							
79-19							
79-20							
79-21							
79-22							
79-23	07/11/2007	Dry		10/15/2007	Dry		
79-24	07/11/2007	Dry		10/15/2007	Dry		
79-25							
79-26	07/11/2007	0.0		10/16/2007	0.0		-100.00
79-27							
79-28	07/11/2007	0.5	12.6	10/16/2007	1.2	6.7	126.42
79-29	07/11/2007	0.2		10/16/2007	0.1		-50.00
79-30							
79-31							
79-32	07/11/2007	Seep		10/16/2007	Seep		
79-33							
79-34	07/10/2007	0.5	11.6	10/15/2007	0.0		-97.83
79-35	07/10/2007	1.0	9.5	10/15/2007	0.4	8.0	-57.00
79-36							
79-37							
79-38	07/11/2007	0.5	15.7	10/15/2007	0.0		-98.11
79-39							
79-40	07/11/2007	Dry		10/16/2007	Dry		
80-41	07/11/2007	SEEP		10/16/2007	Seep		
80-42							
80-43	07/11/2007	Dry		10/15/2007	Dry		
80-44	07/11/2007	Damp		10/16/2007	DAMP		
80-45							
80-46	07/11/2007	Dry		10/16/2007	Dry		
80-47	07/11/2007	2.4	4.5	10/16/2007	2.2	5.9	-8.33
80-48	07/10/2007	0.0		10/15/2007	0.0		0.00
80-49							
80-50	07/25/2007	0.0		10/26/2007	0.0		0.00
82-51	07/11/2007	Dry		10/15/2007	Dry		
82-52	07/11/2007	2.9	7.8	10/15/2007	1.5	4.8	-48.28
84-53							
84-54							
84-55							
84-56	07/11/2007	0.0		10/16/2007	0.0		0.00
85-57							
86-58							
86-59							
89-60	07/11/2007	0.0		10/15/2007	0.0		-100.00
89-61	07/10/2007	56.6	6.2	10/15/2007	17.0	4.5	-69.96

Table 29

EAST MOUNTAIN SPRINGS DISCHARGE

2007

Spring	Date Sampled	Flow (GPM)	Temp. C	Date Sampled	Flow (GPM)	Temp. C	Seasonal Net Change %
89-62							
89-63							
89-64							
89-65	07/10/2007	<.1		10/15/2007	<.1		
89-66	07/10/2007	Seep		10/15/2007	Seep		
89-67	07/10/2007	5.0	6.5	10/15/2007	2.7	4.6	-46.00
89-68	07/10/2007	<.1		10/15/2007	Seep		
89-69							
89-70							
89-71							
91-72	07/12/2007	3.2	9.7	10/16/2007	3.6	10.0	12.50
91-73	07/12/2007	Dry		10/16/2007	Dry		
TOTAL FLOW FOR JULY (W\OUT 80-50, 91-72 & 73)		185.8			75.3		
				Net Change - Average			-43.27
				Net Change - By Volume			-59.46

TOTAL FOR JULY 2006 = 583.8 GPM
JULY 2007 68 % LOWER THAN JULY 2006

EAST MOUNTAIN SPRINGS DISCHARGE

MILL FORK

2006

Spring	Date Sampled	Flow (GPM)	Temp. C	Date Sampled	Flow (GPM)	Temp. C	Seasonal Net Change %
EM-216	07/08/2006	1.8	9.3	10/10/2006	Seep		
EMPOND	07/08/2006	4.3	6.4	10/10/2006	1.5	4.9	-65.12
GRANTS SPRING	07/08/2006	2.3	6.0	10/10/2006	0.8	5.6	-67.39
LITTLE BEAR	07/26/2006	387.0	10.6	10/12/2006	363.0	9.2	-6.20
JV-9	07/08/2006	2.2	6.9	10/10/2006	2.1	8.9	-4.55
JV-34	07/08/2006	80.0	13.2	10/10/2006	12.0	9.2	-85.00
MF-7	07/06/2006	30.0	5.8	10/11/2006	21.4	4.9	-28.67
MF-10	07/09/2006	54.0	5.0	10/11/2006	7.3	2.8	-86.48
MF-19B	07/09/2006	1.4	9.1	10/11/2006	1.1	3.7	-21.43
MF-213	07/06/2006	55.0	9.7	10/11/2006	18.8	9.5	-65.82
MF-219	07/09/2006	2.3	8.7	10/11/2006	3.6	5.6	56.52
MFR-10	07/06/2006	19.4	9.3	10/11/2006	4.0	7.5	-79.38
MFR-30	07/06/2006	2.3	10.2	10/11/2006	Seep		
RR-5	07/09/2006	13.8	5.3	10/10/2006	1.5	5.1	-89.13
RR-15	07/06/2006	37.0	6.0	10/10/2006	10.0	4.4	-72.97
RR-23A	07/06/2006	32.0	6.9	10/10/2006	10.0	5.5	-68.75
SPI-26	07/09/2006	23.5	5.5	10/10/2006	4.3	4.7	-81.70
SPI-29	07/09/2006	0.8	5.1	10/10/2006	Seep		
UJV-101	07/08/2006	0.8	9.0	10/10/2006	Seep		
UJV-206	07/08/2006	7.9	6.8	10/10/2006	3.4	4.8	-56.96
UJV-213				10/10/2006	0.8	7.6	
TOTAL FLOW FOR JULY		757.8			465.6		
				Net Change - Average			-51.44
				Net Change - By Volume			-38.57

TOTAL FOR JULY 2005 = 664 GPM
JULY 2006 14 % HIGHER THAN JULY 2005

Table 30: East Mountain Yearly Spring Discharge Variations (GPM)

SOUTHERN AREA

July Flow Data

Spring	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Burnt Tree	30.5	26.6	26.1	17.5	10.2	12.0	6.4	4.1	2.0	4.0	8.6	7.5	7.5	5.5	8.5	6.8	5.0	3.3	5.6	3.4	2.2	2.0	6.0
Elk Spring	642.3	427.9	390.5	309.7	217.0	217.4	78.5	130.8	176.0	116.8	369.9	46.2	599.3	309.0	235.0	413.0	309.0	107.0	131.0	46.0	73.0	110.0	280.0
Sheba	22.9	19.7	14.4	8.6	11.4	10.4	1.1	8.1	10.1	6.3	11.0	0.9	10.6	14.9	4.8	7.2	6.1	2.6	2.9	0.4	3.0	3.1	6.5
Ted's Tub	89.0	48.0	39.1	31.6	69.0	60.0	5.0	13.0	21.0	13.6	51.0	6.0	76.2	36.7	42.9	83.2	30.0	20.0	24.0	3.0	10.7	15.0	32.0
79-2	9.1	9.7	5.5	2.9	4.0	2.1	2.7	3.9	2.4	2.3	7.5	1.7	2.6	2.0	2.1	2.1	2.2	1.9	1.9	0.1	1.2	2.0	2.0
79-10	37.1	20.0	33.3	26.1	26.1	25.0	7.0	10.2	12.5	10.5	30.0	4.0	30.0	17.6	14.0	24.0	20.0	5.2	10.3	1.3	5.5	5.7	16.0
79-15	42.9	26.1	18.2	18.2	14.6	12.7	2.9	3.0	5.0	4.1	20.7	2.0	33.3	11.0	13.6	18.3	15.0	6.3	10.5	0.1	4.8	7.6	12.0
79-23	20.0	3.6	6.8	0.6	damp	damp	dry	dry	damp	dry	damp	dry	no flow	dry	dry	0.2	dry	dry	dry	dry	dry	dry	Dry
79-24	9.3	6.1	5.0	4.3	damp	0.8	dry	dry	dry	dry	damp	dry	0.1	dry	dry	1.0	dry	dry	dry	dry	dry	dry	Dry
79-26	20.7	20.0	10.9	8.7	1.5	3.3	0.3	dry	damp	damp	10.0	dry	10.0	0.8	5.0	7.9	2.7	1.4	4.3	0.1	dry	dry	5.6
79-29	10.0	6.2	6.0	4.7	2.5	2.6	1.1	1.3	1.7	0.8	2.9	0.7	3.1	1.2	1.0	3.0	1.7	1.3	1.5	0.1	0.6	seep	1.0
79-32	3.3	3.1	2.7	1.3	1.0	0.6	0.5	damp	no flow	no flow	1.3	damp	1.0	0.6	1.0	2.2	1.0	0.4	0.6	0.1	0.1	seep	0.3
79-34	56.7	42.9	18.5	16.7	10.5	13.3	dry	dry	0.3	damp	13.0	dry	30.0	7.5	5.5	13.2	8.6	0.4	8.4	dry	1.8	2.0	13.5
79-35	15.0	10.5	10.5	7.8	6.3	2.7	dry	1.9	4.3	4.4	8.9	0.5	3.0	4.5	8.6	4.6	5.0	2.7	4.5	0.8	1.3	2.3	3.5
79-38	10.9	9.2	4.7	3.6	8.3	10.0	1.1	7.8	6.5	2.3	6.4	0.5	10.0	7.5	4.0	7.5	5.0	4.0	3.3	0.1	2.3	2.4	4.0
79-40	15.0	8.3	5.6	4.7	2.0	5.4	dry	dry	dry	dry	4.0	dry	2.0	0.5	1.4	2.0	1.7	dry	1.3	dry	dry	dry	1.0
80-41	10.9	15.0	5.8	4.1	2.5	3.9	dry	dry	dry	dry	4.0	dry	2.4	0.5	4.5	5.4	3.7	1.3	4.8	dry	dry	1.4	5.4
80-43	24.0	20.0	6.6	3.1	0.4	1.8	dry	dry	dry	dry	2.7	dry	1.5	damp	damp	0.5	0.1	dry	dry	dry	dry	dry	Seep
80-44	24.0	13.1	5.5	2.2	dry	0.5	dry	dry	dry	dry	1.4	dry	3.0	damp	0.2	0.5	0.1	0.5	0.5	dry	dry	damp	Damp
80-46	60.0	28.3	18.2	12.0	4.0	6.7	dry	dry	dry	dry	7.5	dry	5.0	damp	4.0	4.6	2.5	damp	2.1	dry	dry	seep	2.9
80-47	20.0	15.0	12.5	12.2	7.4	9.9	4.6	2.0	1.3	3.3	13.3	2.2	12.6	5.0	9.2	10.5	8.6	5.0	9.4	2.0	1.5	4.4	7.8
82-51	10.0	5.9	3.8	2.6	damp	damp	dry	dry	0.1	damp	3.2	damp	3.0	0.5	2.0	2.1	0.7	0.1	1.3	dry	0.1	seep	1.0
82-52	80.0	48.0	32.1	23.3	20.1	21.5	2.6	1.3	1.0	1.0	16.7	2.0	15.0	7.0	12.0	12.0	12.0	3.4	8.0	1.8	1.0	1.0	16.0
84-56	9.6	6.3	4.7	3.7	2.5	2.9	1.6	1.0	0.5	0.6	1.0	0.3	1.0	0.3	0.7	1.7	0.9	0.2	0.8	0.1	dry	seep	Seep
Totals	1263.6	839.5	687.0	530.2	421.3	425.5	115.4	188.4	244.7	170.0	595.0	74.5	862.2	432.6	379.9	633.5	441.6	167.0	237.0	59.4	109.1	158.9	416.5

xx No measurement - utilized yearly comparison.

MILL FORK AREA

Spring	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
EM-216												0.3	0					0	0.5	0	Seep	Dry	Dry
EMPOND											3	6	0.5					0.8	2.3	1.3	3.3	3.5	6.7
GRANTS SPRING																				0.4	1.32	1.6	2.3
LITTLE BEAR	430	409	357	383	388	340	332	270	296	243	419	218	418	443	447	477	428	395	373	240	284	385.0	350.0
JV-9																		1.5	1.8	0.8	1.6	1.4	1.7
JV-34																		3.6	47.2	0	4.3	9.5	37.0
MF-7											20	10						9.2	30	13.3	21.1	23.7	42.0
MF-10											0.5	0.25	10					6.8	27.3	14.3	60	35.3	40.0
MF-19B												0.25	0.5					0.4	0	1.3	1.3	1.9	2.3
MF-213																		17.6	26.1	20.1	27	33.0	68.0
MF-219																		2.1	5.6	2.4	2.7	3.1	5.0
MFR-10																			151	4.9	11.81	11.6	12.9
MFR-30																			26.6	0	0.75	1.0	1.2
RR-5												2	0					0	1.6	1.1	8.66	8.7	15.0
RR-15												20	10					8	13.9	12	24	26.0	10.6
RR-23A													5					10	15	11	26.6	42.0	34.0
SPI-26																		4.4	4.3	5.8	18.6	14.0	26.7
SPI-29																			0.5	0.4	1.6	1.7	1.0
UJV-101											0	0	0.3					0.8	3.9	0	1.1	1.5	1.6
UJV-206											0	0.5	0					2.1	2.6	1.5	1.1	2.4	6.0
Totals											442.5	257.3	444.3					462.3	733.2	330.6	500.8	606.9	664.0

Table 31

Mode of Occurrence – East Mountain Springs – Southern Area

Occurrences

Stratigraphic Location	Permeable fluvial channels that intersect the land surface	Flow along permeable strata underlain by impermeable mudstone which intersects he land surface	Contact of permeable beds and the Roans Canyon Fault zone	Mode of Occurrence not identified
Base of Flagstaff		79-6, 79-7, 79-35, 86-58, 89-69	Sheba Springs, 79-1	
North Horn Formation	Ted's Tub, Burnt Tree 79-2, 79-3, 79-8, 79-9, 79-11, 79-12, 79-13, 79-14, 79-15, 79-16, 79-17, 79-21, 79-22, 79-26, 79-27, 79-28, 79-29, 79-34, 79-39, 80-42, 80-43, 80-46, 80-47, 80-48, 80-53, 84-56, 86-59, 89-62, 89-63, 89-64, 89-65, 89-66, 89-67, 89-68, 89-71		Elk Springs, 79-10, 79-18, 79-19, 79-20, 84-54, 89-61, 89-70	
Base of North Horn Formation		79-23, 79-25, 79-32, 79-36, 79-37, 79-38, 84-55	79-30, 79-31	
Other Stratigraphic Horizons	Blackhawk Formation 80-50, 84-57, 91-73 Price River Formation Bear Canyon Fault Zone 82-51		Price River 80-49, Blackhawk 91-72	Flagstaff Limestone 79-4, 79-5, Pine Springs Trough Price River Formation 79-24, 79-33, 79-40, 80-41, 80-44, 80-45, 82-52, Jerk Water, 89-60 (Alpine)

TABLE 32: TEMPERATURE COMPARISON

	EAST MOUNTAIN DEPARTURE FROM NORMAL	*ELECTRIC LAKE DEPARTURE FROM NORMAL*	*CASTLE DALE DEPARTURE FROM NORMAL*	*HUNTINGTON PLANT DEPARTURE FROM NORMAL*
1993				
JAN	-3.8	2.7	0.9	-0.8
FEB	-3.5	-2.9	0.5	-4.3
MAR	4.2	-3.6	7.2	-0.5
APR	-2.2	0.1	4.4	-2.0
MAY	4.1	2.8	8.9	1.6
JUN	-3.9	-2.2	5.8	-4.1
1994				
JAN	0.8	2.3	-1.2	6.3
FEB	-3.5	3.2	1.6	-3.5
MAR	6.1	6.6	10.1	5.0
APR	0.0	6.0	4.7	0.2
MAY	4.6	7.2	8.9	2.7
JUN	9.1	4.8	13.4	5.4
1995				
JAN	1.4	1.6	3.9	1.5
FEB	10.3	5.2	11.8	7.4
MAR	3.1	2.4	7.6	0.1
APR	3.4	-0.1	3.4	-2.0
MAY	2.2	-3.9	3.4	-5.5
JUN	1.1	-2.2	2.5	-6.6
1996				
JAN	5.1	2.1	3.5	2.4
FEB	7.7	-0.9	8.4	1.6
MAR	7.5	0.6	7.8	1.5
APR	3.0	2.6	5.4	1.1
MAY	8.5	3.6	8.0	2.2
JUN	8.5	5.2	9.6	1.2
1997				
JAN	-0.9	1.6	0.1	0.3
FEB	0.8	-5.7	-2.3	-4.2
MAR	8.8	6.2	8.1	2.2
APR	1.4	-0.7	3.2	-3.1
MAY	0.0	4.2	10.5	3.5
JUN	4.6	4.9	8.9	-0.6
1998				
JAN	4.2	2.0	6.9	5.4
FEB	-1.5	-3.1	4.6	-2.8
MAR	6.4	2.1	5.7	1.0
APR	0.6	-2.0	0.8	-2.9
MAY	5.0	0.3	5.3	-0.5
JUN	-2.3	-1.1	3.0	-6.1
1999				
JAN	7.8	5.4	8.9	8.0
FEB	4.7	-0.5	7.6	2.1
MAR	7.4	4.1	8.6	6.7
APR	-0.9	-3.7	-1.8	-1.9
MAY	-0.4	-1.0	4.9	-0.1
JUN	1.8	0.2	6.3	-3.1
2000				
JAN	2.5	3.6	10.0	4.0
FEB	4.4	-0.9	9.8	5.0
MAR	1.8	1.0	6.8	2.0
APR	8.6	7.2	7.0	6.0
MAY	9.2	7.4	11.0	5.9
JUN	5.8	3.3	8.8	2.8
2001				
JAN	-9.2	-2.6	1.3	1.0
FEB	-11.5	-2.0	1.0	-4.0
MAR	-7.8	4.4	9.0	1.9
APR	-8.5	3.0	2.2	-1.1
MAY	-3.9	6.5	9.5	
JUN	-6.0	3.7	9.0	
2002				
JAN	-4.7	-4.0	1.9	
FEB	-6.4	-8.1	2.0	
MAR	-1.0	-1.8	2.2	
APR	3.5	5.6	7.4	

TABLE 32: TEMPERATURE COMPARISON

	EAST MOUNTAIN DEPARTURE FROM NORMAL	ELECTRIC LAKE DEPARTURE FROM NORMAL	CASTLE DALE DEPARTURE FROM NORMAL	HUNTINGTON PLANT DEPARTURE FROM NORMAL
MAY		3.0	7.8	
JUN	6.0	4.4	10.5	
2003				
JAN	12.6	1.9	10.1	
FEB	-1.8	-4.3	4.0	
MAR	3.4	1.7	6.2	
APR	3.1	0.3	3.9	
MAY	10.0	3.0	10.2	
JUN	2.7	1.9	8.0	
2004				
JAN	1.0	-3.8	-5.3	
FEB	-2.5	-6.4	0.4	
MAR	9.1	9.0	10.5	
APR	0.5	6.6	6.7	
MAY	5.7	3.0	8.1	
JUN	1.7	2.0	7.5	
2005				
JAN	14.1	8.9	6.1	
FEB	6.3	-6.1	4.4	
MAR	7.2	-0.3	10.8	
APR	7.1	-2.0	2.6	
MAY	8.8	-0.1	8.7	
JUN	3.7	-3.5	0.2	
2006				
JAN	5.6	-7.2	2.3	3.9
FEB	2.3	-14.1	2.2	0.0
MAR	2.3	-3.4	0.3	-4.1
APR	7.3	3.0	6.5	2.6
MAY	11.2	6.0	12.1	3.7
JUN	4.3	5.2	9.8	2.2
2007				
JAN	8.0	9.4	1.1	1.3
FEB	6.9	-0.1	7.1	5.9
MAR	14.4	6.6	4.8	11.2
APR	5.6	5.3	2.4	2.8
MAY	7.1	3.3	1.7	2.0
JUN	9.9	4.2	2.6	4.4

YEAR	EAST MOUNTAIN	ELECTRIC LAKE	HUNTER PLANT	HUNTINGTON PLANT	TOTAL
1982		-2.8	0.0	1.2	-0.5
1983		-2.7	2.5	1.0	0.3
1984		-2.2	0.5	0.1	-0.5
1985	3.1	0.3	3.0	0.9	1.8
1986	2.9	3.4	6.3	3.2	4.0
1987	1.7	-0.5	3.2	1.1	1.4
1988	-0.2	-0.1	3.5	0.5	0.9
1989	0.0	-0.1	4.1	0.3	1.1
1990	2.3	1.8	7.3	1.2	3.2
1991	-1.9	-1.4	3.8	-2.5	-0.5
1992	1.9	6.5	6.6	1.8	4.2
1993	-0.9	-0.5	4.6	-1.7	0.4
1994	2.9	5.0	6.3	2.7	4.2
1995	3.6	0.5	5.4	-0.9	2.2
1996	6.7	2.2	7.1	1.7	4.4
1997	2.5	1.8	4.8	-0.3	2.2
1998	2.1	-0.3	4.4	-1.0	1.3
1999	3.4	0.8	5.8	2.0	3.0
2000	5.4	3.6	8.9	4.3	5.6
2001	-7.8	2.2	5.3		-0.1
2002	-0.5	-0.2	5.3		1.5
2003	5.0	0.8	7.1		4.3
2004	2.6	1.7	4.7		3.0
2005	7.9	-0.5	5.5		4.3
2006	5.5	-1.8	5.5	1.4	2.7
2007	8.6	4.8	3.3	4.6	5.3

Table 33
EAST MOUNTAIN
SPRING DISCHARGE RECESSION STUDY
YEAR 2007

SPRING		JUL	AUG	SEP	OCT
79-10	Flow (GPM)	3.2	2.4	2.0	1.4
	Temp. (C)	11.8	6.6	5.8	6.7
SHEBA SPRINGS	Flow (GPM)	1.3	1.2	Seep	Seep
	Temp. (C)	12.6	8.4		
ELK SPRING	Flow (GPM)	91.0	56.0	24.0	41.0
	Temp. (C)	8.8	4.7	4.3	4.7
79-35	Flow (GPM)	1.0	1.0	1.0	0.4
	Temp. (C)	9.5	6.5	6.2	8.0
79-26	Flow (GPM)	Damp	Damp	Dry	1.7
	Temp. (C)				6.4
79-29	Flow (GPM)	<.2	<.2	<.1	<.1
	Temp. (C)				
84-56	Flow (GPM)	<.1	<.1	<.1	<.1
	Temp. (C)				
80-44	Flow (GPM)	Damp	Damp	Damp	Damp
	Temp. (C)				
80-46	Flow (GPM)	Dry	Dry	Dry	Dry
	Temp. (C)				
BURNT TREE	Flow (GPM)	3.6	3.7	3.6	3.5
	Temp. (C)	7.5	7.5	7.3	7.5
79-23	Flow (GPM)	Dry	Dry	Dry	Dry
	Temp. (C)				
82-52	Flow (GPM)	2.9	2.0	1.6	1.5
	Temp. (C)	7.8	5.6	5.0	5.0

Table 34a: East Mountain Springs Water Quality (Historical vs. 2007) *

Southern Area

PARAMETER	Burnt Tree Historical	Burnt Tree 2007	Elk Spring Historical	Elk Spring 2007	Sheba Spring Historical	Sheba Spring 2007	79-10 Historical	79-10 2007	79-23 Historical	79-23 2007	79-26 Historical	79-26 2007
Elevation	9260		9350		9740		9350		9035		9310	
Geologic Formation	TKn		TKn		Tf		Kpr		TKn		TKn	
Bicarbonate	331	264	288	240	290	256	316	257	413	no	325	no
Calcium	59.5	53.6	62.6	58.6	83.6	86.0	72.1	70.9	79.6	flow	54.7	flow
Carbonate	1.70		1.78		1.43		1.53	18.00	1.00	during	5.50	during
Chloride	5.7	4.0	4.8	2.5	4.9	2.00	5.3	3.0	11.3	2007	6.6	2007
Cond.(umhos/cm)	508	569	444	497	445	528	480	546	691		522	
Hardness	260	251	247	248	247	260	273	273			266	
Iron	0.18		0.15		0.17		0.21		0.09		0.48	
Magnesium	27.70	28.45	22.74	24.60	10.62	11.00	22.20	23.20	38.28		30.90	
Mangenese	0.05		0.05		0.05		0.05		0.01		0.05	
pH(units)	7.54	7.39	7.83	7.88	7.51	7.32	7.64	7.51	7.72		8.09	
Potassium	1.35	0.68	2.00	0.71	2.29		2.13	0.50	1.54		1.60	
Sodium	15.44	19.25	7.53	7.03	4.10	2.77	4.82	4.51	14.87		15.50	
Sulfate	19.3	12.0	17.5	7.5	16.2	4.0	12.0	6.5	27.2		20.5	
TDS	286	273	252	250	259	267	273	284	364		294	

PARAMETER	79-29 Historical	79-29 2007	79-35 Historical	79-35 2007	80-44 Historical	80-44 2007	80-46 Historical	80-46 2007	82-52 Historical	82-52 2007	84-56 Historical	84-56 2007
Elevation	9410		9585		8980		9350		8995		9335	
Geologic Formation	TKn		Tf		Kpr		TKn		Kpr		TKn	
Bicarbonate	324	seep	300	249	443	no	348	no	417	351	345	seep
Calcium	45.0	flow	80.8	73.7	98.0	flow	61.3	flow	74.4	73.5	61.4	flow
Carbonate	1.70	during	1.64		1.00	during	1.80	during	1.83		1.70	during
Chloride	18.20	2007	4.40	2.00	10.86	2007	4.60	2007	10.21	8.50	9.75	2007
Cond.(umhos/cm)	556		4501	520	863		549		675	810	552	
Hardness	254		265	260	374		281		329	346	291	
Iron	0.50		0.43	0.26	0.11		0.10		0.21	0.11	0.69	
Magnesium	35.10		16.00	18.35	41.10		29.00		35.65	39.35	32.90	
Mangenese	1.14		0.05	0.01	0.02		0.03		0.05	0.00	0.05	
pH(units)	7.71		7.79	7.73	7.83		7.40		7.65	7.51	7.47	
Potassium	2.23		1.18	0.34	3.90		0.80		1.55	1.05	1.45	
Sodium	32.40		4.56	3.11	35.01		9.84		28.44	34.95	16.79	
Sulfate	38.3		17.9	4.0	136.0		16.3		43.8	47.0	27.8	
TDS	326		266	255	530		310		397	424	323	

* Quality parameters reported as mg/l unless otherwise noted

Table 34b: East Mountain Springs Water Quality (Historical vs. 2007) *

Mill Fork Area

PARAMETER	EM POND Historical	EM POND 2007	EMS JV34 Historical	EMS JV34 2007	EMS JV9 Historical	EMS JV9 2007	EMS MF 7 Historical	EMS MF 7 2007	EMS MF10 Historical	EMS MF10 2007	EMS MF19B Historical	EMS MF19B 2007
Elevation	10,280		8,692		8,618		8,580		10,250		10,111	
Geologic Formation	TKn		Alluvium		Alluvium		Kbh		TKn		TKn	
Bicarbonate	261.1	232.5	327.0	319.0	354.0	296.5	290.2	258.0	225.6	198.0	238.7	215.0
Calcium	59.9	60.2	83.0	87.7	87.3	87.9	72.1	75.2	55.6	56.3	64.8	63.3
Carbonate									5.0		9.0	
Chloride	1.4	2.0	2.9	3.5	4.9	5.0	2.7	3.0	1.8	2.0	1.5	2.5
Cond.(umhos/cm)	472.0	479.0	597.5	649.0	689.5	709.5	585.8	624.5	421.4	429.5	439.2	459.5
Hardness	242.0	247.0	304.9	333.5	351.8	362.5	299.1	315.0	218.4	223.0	238.9	243.5
Iron - Total	0.6	0.6	0.7	0.3	0.2	0.1	0.1				1.0	0.1
Magnesium	22.5	23.5	23.9	27.8	34.3	34.8	28.9	31.0	19.3	20.0	18.7	20.9
Manganese - Total	0.016	0.023	0.045	0.056	0.013	0.002				0.006	0.022	
pH (units)	8.0	7.9	8.1	8.0	7.3	7.0	7.8	7.7	8.2	7.9	8.2	8.1
Potassium	0.6	0.7	1.2	2.8	1.3	1.4	1.1	1.3	1.0	0.8	0.7	1.5
Sodium	2.3	2.1	7.3	8.1	7.1	7.1	6.0	6.2	2.3	2.2	1.8	1.6
Sulfate	5.5	4.0	18.3	14.0	51.2	49.5	46.1	45.5	7.8	7.0	6.8	10.5
TDS	251	257	321	350	382	393	325	318	227	234	233	232

PARAMETER	EMS MF213 Historical	EMS MF213 2007	EMS MF219 Historical	EMS MF219 2007	EMS MFR-10 Historical	EMS MFR-10 2007	EMS MFR-30 Historical	EMS MFR-30 2007	EMS RR-15 Historical	EMS RR-15 2007	EMS RR-23A Historical	EMS RR-23A 2007
Elevation	8,030		10,220		9,900		9,680		10,350		10,023	
Geologic Formation	Kbh		TKn		TKn		Kpr		TKn		TKn	
Bicarbonate	292.0	252.0	250.6	221.0	277.6	245.0	317.3	281.0	247.0	210.0	270.3	238.0
Calcium	65.1	66.8	65.7	68.7	72.2	74.9	83.5	81.4	59.2	58.7	69.3	71.6
Carbonate	9.0	9.0			6.0	6.0						
Chloride	2.6	3.5	2.0	3.0	2.7	3.5	2.2	3.0	1.3	2.0	1.8	3.0
Cond.(umhos/cm)	563.9	562.5	496.3	528.0	519.8	550.0	615.0	602.0	443.2	460.5	498.5	527.5
Hardness	281.5	285.5	259.0	267.0	275.8	283.5	306.3	302.0	229.4	228.0	256.9	263.5
Iron - Total	0.2		0.4	0.2	0.3	0.4	0.6		0.3		0.6	
Magnesium	28.9	28.9	23.1	23.5	23.2	23.4	23.8	23.9	19.8	19.8	20.4	20.6
Manganese - Total	0.004		0.029	0.008		0.0	0.012		0.058		0.139	
pH (units)	7.9	7.8	7.8	7.6	8.1	8.2	7.9	8.0	8.0	7.6	7.7	7.4
Potassium	1.0	1.1	1.1	1.1	0.8	0.8	0.8	0.7	0.6	0.7	0.6	0.6
Sodium	5.6	5.1	2.4	2.3	3.9	3.6	12.0	10.3	2.8	2.6	2.8	2.5
Sulfate	25.7	23.5	26.7	26.5	22.8	23.0	30.5	30.0	6.3	7.5	11.9	12.0
TDS	294	282	264	262	289	298	340	326	239	248	273	280

PARAMETER	EMS RR-5 Historical	EMS RR-5 2007	EMS SP1-26 Historical	EMS SP1-26 2007	EMS SP1-29 Historical	EMS SP1-29 2007	EMS UJV101 Historical	EMS UJV101 2007	EMS UJV206 Historical	EMS UJV206 2007	GRANTS SPRING Historical	GRANTS SPRING 2007	LITTLE BEAR Historical	LITTLE BEAR 2007
Elevation	10,160		10,340		10,360		8,960		9,200		10,280		7,540	
Geologic Formation	TKn		TKn		TKn		Kcg		Kpr		TKn		Ksp	
Bicarbonate	221.3	209.0	221.2	205.0	290.9	253.0	249.2	212.0	267.2	234.0	246.9	231.5	297.3	278.0
Calcium	64.9	64.6	59.6	64.9	69.5	70.9	69.1	69.1	67.0	68.8	55.5	55.4	65.8	67.8
Carbonate														
Chloride	1.6	2.0	2.5	3.0	2.2	3.0	4.6	5.0	4.6	5.0	3.7	5.5	4.0	4.0
Cond.(umhos/cm)	442.5	473.0	429.9	465.5	508.0	555.0	538.6	553.0	527.5	520.0	479.8	485.0	593.6	621.5
Hardness	229.9	233.0	210.7	232.5	266.8	274.0	266.6	271.0	263.5	272.0	247.4	252.0	312.3	323.5
Iron - Total	0.3	0.1	0.1	1.6			0.610		0.090				0.092	
Magnesium	16.5	17.3	15.1	17.1	22.6	23.5	22.8	23.8	23.3	24.4	26.5	27.7	35.9	37.4
Manganese - Total	0.008	0.006	0.006	0.070			0.011						0.007	
pH (units)	7.8	7.5	7.7	7.7	7.6	7.4	8.1	8.3	8.0	7.6	7.7	7.5	7.4	7.2
Potassium	0.5	0.4	0.6	0.8	1.3	1.3	1.3	1.1	1.5	1.9	1.3	3.4	1.8	1.5
Sodium	1.9	1.7	2.2	2.3	3.2	2.7	5.6	5.5	6.4	6.5	3.5	3.6	7.3	6.9
Sulfate	8.8	9.0	7.2	7.5	7.5	7.0	38.9	37.0	30.6	39.0	12.7	11.5	34.4	37.5
TDS	240.5	222.0	228.4	237.0	263.6	269.0	298.1	281.0	285.8	300.0	249.2	252.0	319.3	341.5

* Quality parameters reported as mg/l unless otherwise noted

TABLE 35: NEWUA - RILDA CANYON SPRING FLOW (GPM)
MONTHLY MEASUREMENTS

DATE	METER 2	METER 3	METER 4	TOTAL
09/06/1990	20	75	120	215
09/18/1990	15.8	78.9	91	186
11/07/1990	13.3	37.5*	20	71
11/14/1990	14.5	67.4	9.3	91
11-19-90**	13.6	57.7	6.3	78
04/08/1991	10.9	56.5	4.7	72
06/11/1991	10.9	107	136	253.9
07/17/1991	12.5	95	160	267.5
08/19/1991	9.3	95	160	264.3
09/10/1991	9.2	105	140	254.2
10/21/1991	7.5	85	55	147.5
11/20/1991	8	80	16.2	104.2
04/07/1992	8	46	7.7	61.7
05/18/1992	7.5	110	140	257.5
06/12/1992	7	100	180	287
07/20/1992	7	80	150	237
08/14/1992	7.1	90	110	207.1
09/03/1992	6	35	75	116
10/30/1992	5.5	45	2.6	53.1
05/13/1993	6	25	13	44
06/11/1993	8.6	90	150	248.6
07/29/1993	6	110	170	286
08/27/1993	4	96	170	270
09/28/1993	2	60	110	172
10/22/1993	3	30	55	88
05/24/1994	4.6	65	75	144.6
06/16/1994	5	100	160	265
07/18/1994	5.5	100	130	235.5
08/24/1994	2	70	80	152
09/13/1994	2.7	30	20	52.7
10/23/1994	2	30	1.5	33.5
12/14/1995	2	38	***	40
06/28/1995	8	over capacity	***	
07/21/1995	2	over capacity	***	
08/24/1995	4	over capacity		
09/15/1995	2.3	150	***	157.3
10/31/1995			NEWUA conducting maintenance	
11/30/1995	3.3	75	***	78.3
04/02/1996	8	100	***	108
05/17/1996	5	175	***	180
06/11/1996	5.5	175.0'	***	180
07/23/1996	5.5	200.0'	***	205
08/21/1996	4.5	150.0'	***	154.5
09/16/1996	4.5	150.0'	***	154.5
10/23/1996	3.8	80	***	83.8
11/14/1996	4	80	***	84
12/12/1996	4	100	***	104

1996 problems: Valve seating affected flow measurements

	METER 2	METER 3	TOTAL	NEWUA METER
04/28/1997	5.2	150	+ 150 ****	94.0 *****
05/29/1997	6	150	+ 150 ****	230
06/25/1997	6	150	+ 150 ****	300
07/17/1997	6	150	+ 150 ****	270
08/26/1997	5.5	150	+ 150 ****	270
09/15/1997	5.5	150	+ 150 ****	270
10/13/1997	5	150	+ 150 ****	180
11/18/1997	3.9	100	+100.0 ****	160
12/04/1997	4	100	+100.0 ****	150

	METER 2	METER 3	TOTAL	NEWUA METER
04/14/1998	6.7	100		120
05/27/1998	7.5	158		145
06/08/1998	10.3	+100.0 ****		280
07/06/1998	7.5	+100.0 ****		300
08/10/1998	7.1	+100.0 ****		300
09/14/1998	6.0	+100.0 ****		240
10/05/1998	6.0	+100.0 ****		200
11/09/1998	6.7	172		180
12/09/1998	5.0	95		150

	METER 2	METER 3	TOTAL	NEWUA METER
01/12/1999	5.0	120	125+	150
02/02/1999	6.3	90	96+	120
03/03/1999	6.6	80	87+	110
04/13/1999	5.0	65	70+	120
05/11/1999	5.5	100	106+	130
06/15/1999	6.6	150	157+	240
07/26/1999	6.9	170	177+	250
08/12/1999	6.7	200	207+	270
09/16/1999	6.0	200	206+	225
10/05/1999	4.0	200	204	200
11/17/1999	3.2	100	103	130
12/09/1999	2.5	80	83	110
01/12/2000	2.2	60	62.2+	110
02/03/2000	3.4	53	56.4+	120
03/09/2000	++	++	++	120
04/05/2000	++	++	++	150
05/05/2000	3	86	89+	270
06/22/2000	3	160	163+	270
07/06/2000	2.1	170	172.1+	340
08/09/2000	1.6	200	201.6*	280
09/13/2000	1.2	120	121.2*	160
10/10/2000	1.7	50	51.7*	130
11/28/2000	1.4	65	66.4*	100
12/05/2000	1.07	61	62.1*	100
01/05/2001	1.02	62.5	63.52*	100
02/05/2001	*Inaccessible*			90
03/13/2001	*Inaccessible*			60
04/23/2001	1.5	52	53.5	60
05/21/2001	1.9	140	141.9	150

TABLE 35: NEWUA - RILDA CANYON SPRING FLOW (GPM)
MONTHLY MEASUREMENTS

DATE	*METER 2*	*METER 3*	*METER 4*	*TOTAL*	
06/29/2001	1.6	214	215.6	210	
07/03/2001	1.2	200	201.2	210	
08/14/2001	1.1	180	181.1	220	
09/17/2001	1	162	163	180	
10/17/2001	1.5	150	151.5	120	
11/27/2001	1.6	100	101.6	100	
12/12/2001	*Lid Frozen*	40	40*	70	
01/17/2002	1.5	45	47	60	
02/11/2002	1.4	50	51	60	
03/26/2002	0.5	33	34	60	
04/11/2002	0.6	46	47	50	
05/08/2002	0.5	40	41	55	
06/25/2002	1.0	166	167	120	
07/22/2002	0.7	170	171	210	
08/16/2002	0.7	150	151	150	
09/18/2002	0.5	60	61	90	
10/16/2002	0.4	55	55	60	
11/12/2002	0.4	51	51	60	
12/15/2002	1.8	46	48	60	
01/17/2003	1.6	46	48	60	
02/26/2003	1.6	33	35	60	
03/12/2003	1.5	40	42	50	
04/21/2003	1.3	50	51	60	
05/22/2003	3.7	150	154	70	
06/26/2003	3	222	225	205	
07/10/2003	2.8	190	193	225	
08/26/2003	2.2	190	192	220	
09/24/2003	0.4	130	130	130.4	+++
10/13/2003	1	75	76	76	+++
11/17/2003	0.8	70	71	70.8	+++
12/09/2003	0.8	38	39	38.8	+++
01/27/2004					
02/27/2004					
03/15/2004	0.4	35.2	36	*****	
04/26/2004	0.5	100	101	45	
05/25/2004	0.4	136	136	120	
06/29/2004	*****	120	120	*****	
07/26/2004	*****	130	130	*****	
08/06/2004	*****	125	125	100	
09/09/2004	*****	142	142	100	
10/12/2004	*****	30	30	96	
11/30/2004	*****	*****	*****	83	
12/14/2004	*****	*****	*****	73	
01/13/2005	*****	*****	68	68	
02/16/2005	*****	*****	65	65	
03/11/2005	*****	*****	62	62	
04/29/2005	*****	*****	85	85	
05/10/2005	*****	*****	100	100	
06/09/2005	*****	*****	230	230	
07/06/2005	*****	*****	240	240	
08/25/2005	*****	*****	233	233	
09/22/2005	*****	*****	*****	*****	
10/24/2005	*****	115	150	150	
11/30/2005	*****	112	158	158	
01/05/2006	*****	63	72	72	
01/20/2006	*****	*Inaccessible*	72	72	
02/23/2006	*****	*Inaccessible*	72	72	
03/14/2006	*****	*Inaccessible*	83	83	
04/25/2006	*****	100	102	102	
05/23/2006	*****	200	160	160	
06/20/2006	*****	200	230	230	
07/26/2006	*****	230	240	240	
08/09/2006	*****	210	235	235	
09/27/2006	*****	150	*****	*****	
10/26/2006	*****	103	150	150	
11/17/2006	*****	100	158	158	
12/07/2006	*****	107	125	125	
01/10/2007	*****	*100*	140	140	
02/20/2007	*****	*94*	130	130	
03/26/2007	*****	*60*	125	125	
04/17/2007	*****	70	115	115	
05/10/2007	*****	95	250	250	
06/29/2007	*****	190	270	270	
07/17/2007	*****	170	++++		
08/20/2007	*****	162	++++		
09/20/2007	*****	127	++++		
10/26/2007	*****	60	150	150	
11/14/2007	*****	60	115	115	
12/05/2007	*****	50.8	95	95	

* Flow not stabilized.
** Data collected during pump test.
*** Diverted through Meter 3.
**** Over capacity
***** Meter/Valve problems
\+ Meter 3 - Valve would not seat
++ Canyon Accessible
+++ Main Meter Not Working - Used Total of Meter 2 & 3
++++ Line Replacement

TABLE 36
NEWUA - RILDA CANYON SPRINGS
AVERAGE WATER QUALITY*

PARAMETER **	METER 2		METER 3		METER 4
	Historical	2007	Historical	2007	Historical
					Combined with Meter 3 in 1995
Bicarbonate	433.2	No Samples	386	315.8	356
Calcium	88.4	During	77.6	82.7	70.3
Carbonate	1.9	2007	2.1		0.7
Chloride	10.5	Problem	9.4	7.8	13.1
Cond.(umhos/cm)	792	With	711.4	865.3	535
Hardness	433	Valve	384.6	409.3	348
Iron - Total	0.46		0.23	0.14	0.13
Iron - Dissolved	0.11		0.10		
Magnesium	51.47		46.30	49.20	41.90
Mangenese - Total	0.10		0.055	0.005	0.08
Mangenese -Dissolved	0.04		0.005	0.0055	
pH(units)	7.28		7.40	7.22	7.40
Potassium	2.68		2.00	2.05	2.13
Sodium	16.70		15.60	16.91	12.96
Sulfate	104.5		86.3	96.8	55.4
TDS	498		436	456	365

* Quality parameters reported as mg/l unless otherwise noted
** Data: Database input restricted to values greater then laboratory minimum detection limit.
Flow through Meter 4 was combined with Meter 3 in 1995

Table 37
TRAIL MOUNTAIN
SPRING DISCHARGE RECESSION STUDY
YEAR 2007

SPRING		JUL	AUG	SEP	OCT	Seasonal Net Change %
T-6	Flow (GPM)	0.3	0.0	0.0	0.0	-100.0
18-2-1	Temp. (C)	11				
T-8	Flow (GPM)	0.0	0.0	0.0	0.0	
17-21-1	Temp. (C)					
T-9	Flow (GPM)	3.9	4.0	3.5	4.3	10.3
17-22-1	Temp. (C)	6	8	8	7	
T-10	Flow (GPM)	0.0	<.1	<.1	0.0	
17-26-4	Temp. (C)					
T-14	Flow (GPM)	0.0	0.0	0.0	0.0	
17-25-1	Temp. (C)					
T-14A	Flow (GPM)	0.0	0.0	0.0	0.0	
17-26-5	Temp. (C)					
T-15	Flow (GPM)	0.0	0.0	0.0	0.0	
17-35-1	Temp. (C)					
T-16	Flow (GPM)	0.0	0.0	0.0	0.0	
17-35-2	Temp. (C)					
TM-23*	Flow (GPM)	0.0	0.0	0.0	0.0	
	Temp. (C)					

JULY TOTAL **4.18**

OCTOBER TOTAL **4.31**

Net Change - Average -44.87

Net Change - By Volume 3.11

TOTAL FOR JULY 2006 = 34.8

JULY 2007 88% LOWER THAN JULY 2006

TABLE 38: TRAIL MOUNTAIN YEARLY SPRING DISCHARGE VARIATIONS (GPM)

JULY FLOW DATA

Spring	*1988*	*1989*	*1990*	*1991*	*1992*	*1993* ***	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*
T-6 (18-2-1)	11	0.5	0.5	1.2	0.03	6	1.6	4.1	3.3	7.5	9.8	3.5	3	4.8	1.0	0.0	0.0	1.8	3.6	0.3
T-8 (17-21-1)	4.7	0.2	0.25	Dry	0.14	1.7	0.2	1.7	0.6	0.9	2.1	1.4	0.4	0.4	<0.1	<0.1	0	0.26	0.52	Dry
T-9 (17-22-1)	8	0.2	0.1	Dry	2.5	40	4	20	8.6	4.8	24	10.9	2.7	6	2.6	5.2	6.8	17	6	3.9
T-10 (17-26-4)	4.7	Dry	0.15	Dry	Dry	0.4	Damp	0.4	0.2	0.4	0.5	0.7	0.3	0.2	Seep	Seep	Seep	Seep	0.25	Seep
T-14 (17-25-1)	5	Dry	Dry	Dry	Dry	1.6	Damp	2	0.9	1	2.1	2.1	0.3	0.5	Seep	Dry	Dry	0	Damp	Dry
T-14A (17-26-5)	10	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Damp	Dry	0	0.0	0.0	0.0	0.0	0.0	Dry
T-15 (17-35-1)	2.1	0.2	0.5	0.75	0.33	1.6	0.5	1.2	0.8	1	3.3	2.3	0.9	0	0.0	0.0	0.0	0.0	0.0	Dry
T-16 (17-35-2)	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Damp	Damp	Dry	0	0.0	0.0	0.0	0.0	0.0	Dry
T-23 (17-14-4)	22**	4.0*	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	57.8****	84.4****	39.7****	0	0.0	0.0	0.0	17.7****	24.4****	Dry
TOTAL	67.5	5.1	1.5	1.95	2.67	51.3	6.3	29.4	14.4	15.6	99.6	105.3	47.2	11.9	3.6	5.2	6.8	36.76	46.6	Dry

* August measurement
** September measurement
*** First year monitored by PacifiCorp
**** Cottonwood Creek Gain/Loss Surveys

Table 39: Trail Mountain Springs Water Quality (Historical vs. 2007) *

PARAMETER	18-2-1 Historical	18-2-1 2007	17-21-1 Historical	17-21-1 2007	17-22-1 Historical	17-22-1 2007	17-26-4 Historical	17-26-4 2007	17-25-1 Historical	17-25-1 2007	17-26-5 ** Historical	17-26-5 ** 2007
Elevation	8395		9320		9210		8880		8155		9080	
Geologic Formation	TKn		TKn		TKn		TKn		Kcg		TKn	
Bicarbonate	398	326	392	No	320	252	396	Seep	546	No	404	no
Calcium	61.5	65.9	52.9	Flow	46.8	44.1	54.9	During	89.6	Flow	78.6	flow
Carbonate	1.48		1.53	During	3.41	14.00	8.33	2007	3.50	During	<.5	during
Chloride	45.7	38.0	30.8	2007	9.9	8.5	28.8		31.5	2007	20.8	2007
Cond.(umhos/cm)	969	1088	719		544	554	716		1169		860	
Hardness	388	422	244		257	247	333		486		442	
Iron	0.18		0.11		0.33	0.11	1.17		6.80		0.30	
Magnesium	56.80	62.60	27.90		34.30	33.20	47.48		59.30		59.75	
Mangenese	0.05		0.06		0.06	0.01	0.11		0.50		0.02	
pH(units)	7.71	7.50	7.57		7.75	8.04	8.03		7.85		7.75	
Potassium	1.61	1.11	2.07		1.50	1.06	1.81		2.29		1.93	
Sodium	66.57	66.60	61.30		20.51	16.70	33.28		66.70		31.07	
Sulfate	139.5	156.0	18.0		18.4	12.0	32.9		217.0		142.8	
TDS	582	624	394		295	292	398		723		515	

PARAMETER	17-35-1 Historical	17-35-1 2007	17-35-2 Historical	17-35-2 2007	17-14-4 Historical	17-14-4 2007
Elevation	8880		9000		7880	
Geologic Formation	TKn		TKn		Alluvium	
Bicarbonate	388	No	No	No	362	No
Calcium	41.6	Flow	Historical	Flow	65.9	Sample
Carbonate	5.71	During	Flow	During		During
Chloride	42.80	2007		2007	13.91	2007
Cond.(umhos/cm)	770				641	
Hardness	251				346	
Iron	0.67				0.19	
Magnesium	36.40				43.95	
Mangenese	0.08				0.02	
pH(units)	8.00				7.77	
Potassium	1.55				1.95	
Sodium	78.00				15.83	
Sulfate	45.2				61.8	
TDS	441				385	

TRAIL MOUNTAIN SPRINGS
CROSS REFERENCE

ARCO'S	ENERGY WEST
T-6	18-2-1
T-8	17-21-1
T-9	17-22-1
T-10	17-26-4
T-14	17-25-1
T-14A	17-26-5
T-15	17-35-1
T-16	17-35-2
TM-23	17-14-4

* Quality parameters reported as mg/l unless otherwise noted
** High TSS, Elevated Total Iron

TABLE 40: DEER CREEK IN-MINE WATER QUALITY *

2007*** SAMPLE DATES	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON DISSOLVED	MAGNESIUM	MANGANESE	PH (units)	POTASSIUM	SODIUM	SULFATE	TDS
TW-10														
20070327	311	74.5		5	684	339		37.2		6.98	1.4	378	43	379
20070626	297	74.6		5	718	342		37.9		7.24	1.11	361	43	370
20070920	309	75.3		5	752	345		38.1		7.16	1.32	364	44	378
20071213	309	72.1		5	686	335		37.65		7.45	1.23	382	45	392
2007* **														
MIN	297	72.1		5	684	335		37.2		6.98	1.11	361	43	370
MAX	311	75.3		5	752	345		38.1		7.45	1.40	382	45	392
MEAN	307	74.13		5	710	340		37.7125		7.21	1.27	371.25	44	380
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1988-2006														
MIN	279	61.3	0.1	0.4	450	279	0.02	18.70	0.003	6.60	0.01	9.81	27.00	313
MAX	714	211.0	5.0	30.0	950	732	0.02	77.10	0.003	8.40	5.00	55.03	350.00	505
MEAN	373	77.5	1.6	7.2	629	349	0.02	36.46	0.003	7.39	1.38	15.49	51.03	376
MN-ME**														
20070327	359	106.0		7	951	505		58.3	0.002	7.85	3.16	577	132	527
20070626	294	82.1		7	1025	450		59.6		7.96	2.71	566	141	563
20070920	326	110.0		7	1139	539		64.3	0.002	7.94	3.04	625	141	559
20071213	356	103.4		7	1004	510		61.2		8.15	3.06	620	163	610
2007* **														
MIN	294	82.1		7	951	450		58.3	0.002	7.85	2.71	566.0	132	527
MAX	359	110.0		7	1139	539		64.3	0.002	8.15	3.16	625.0	163	610
MEAN	334	100.4		7	1030	501		60.8	0.002	7.98	2.99	597.0	144.25	564.75
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1991-2006														
MIN	306	69.0	0.1	4	500	329	0.04	37.60	0.002	6.90	0.74	14.9	40	240
MAX	475	109.7	23.0	25.0	1013	515	0.16	58.65	0.007	8.23	14.00	37.16	163.0	610
MEAN	412	89.1	3.3	7.9	796	415	0.10	46.61	0.003	7.70	3.07	18.64	102.3	485

* Quality parameters are reported as mg/l unless otherwise noted.

** Sample site intiated during 1991.

*** 1997 Data: Database input restricted to values greater than laboratory minimum detection limit.

TABLE 41: DEER CREEK MINE - DISCHARGE WATER QUALITY*

	2007**				Historical - (1976-2006)			
Parameters	*Minimum*	*Maximum*	*Mean*	*No. of Analysis*	*Minimum*	*Maximum*	*Mean*	*No. of Analysis*
pH (units)	6.95	8.08	7.3	12	6.52	8.51	7.49	372
Acidity				ND	0.1	97	13.3	266
Chloride	7	96	17.3	12	0.7	285	18.06	370
Conductivity (umhos/cm)	769	1132	863.3	12	480	1900	898.7	384
Iron - Total	0.4	1.39	0.69	12	0.01	7.53	0.63	380
Oil & Grease	Visal Observation - No Samples During 2007				0.1	48.8	3.21	238
Sulfate	62	154	76.83	12	13	518	180.6	378
TDS	424	579	467.8	12	289	1111	577.4	390
TSS	5	7	6	2	0.1	2784	53.884	332

* Quality parameters reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater than laboratory minimum detection limit.

TABLE 42: WILBERG/COTTONWOOD IN-MINE WATER QUALITY *

2007** SAMPLE DATES	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON DISSOLVED	MAGNESIUM	MANGANESE	PH (units)	POTASSIUM	SODIUM	SULFATE	TDS
2S XC-11	Mine Sealed May 2001 - In-Mine Monitoring Discontinued													
2006**														
MIN														
MAX														
MEAN														
No. of Analysis														
HISTORICAL 1983-2006														
MIN	403	116.0	0.1	6.0	1000	725	0.01	5.40	0.01	6.50	0.30	5.80	250.0	664
MAX	676	330.0	5.0	160.0	2600	1022	0.30	134.40	0.20	8.07	7.40	36.90	690.0	1328
MEAN	565	171.0	1.6	20.3	1495.0	868.0	0.13	105.50	0.05	7.23	4.22	22.56	412.0	1050
TMA XC-32	Mine Sealed May 2001 - In-Mine Monitoring Discontinued													
2007**														
MIN														
MAX														
MEAN														
No. of Analysis														
HISTORICAL 1983-2006														
MIN	379	114	1	7	1171	581	0.10	72	0.10	7.03	6	33	256	816
MAX	467	133	5	17	1352	688	0.70	90	0.20	8.20	10	44	491	993
MEAN	441.0	119.0	3.5	12.3	1259.0	609.0	0.2	75.7	0.1	7.27	7.5	39.2	338.5	868.4

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** 1997 Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 43 : WILBERG/COTTONWOOD - DISCHARGE WATER QUALITY

* GRIMES WASH

	2007				Historical - (1976-2006)			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH					6.9	8.47	7.7	273
Acidity					0.1	62	10.61	193
Bicarb. Alkalinity					190	539	364	173
Chloride					0.6	80	17.5	247
Conductivity					490	1611	1041	205
Iron					0.01	3	0.33	233
Oil & Grease					0.1	23.8	2.3	193
Sulfate					29.2	600	264	249
TDS					407	1287	672	273
TSS					0.1	222	7.8	262

MILLER CANYON

	2007				Historical - (1984-2006)			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	No Discharge During 2006				6.4	8.83	7.3	81
Acidity					0.1	100	22.45	72
Bicarb. Alkalinity					267	543	408.7	79
Chloride					10	155	22.14	77
Conductivity					480	1900	1216	81
Iron - Total					0.01	1.38	0.24	79
Oil & Grease					0.1	7.2	2.1	71
Sulfate					200	680	419.3	79
TDS					413	1182	926	81
TSS					0.1	32	4.8	109

TMA001*

	2007				Historical - (2001-2006)			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	6.97	7.65	7.28	12	6.20	8.08	7.4	67
Acidity				ND	6	6	6	1
Bicarb. Alkalinity	368	384	376.4	12	344	456	389.3	68
Chloride	15	41	17.7	12	6	34.2	18.09	68
Conductivity	1156	1371	1249.1	12	1077	1436	1164	68
Iron - Total				12	0.012	0.4	0.1	10
Oil & Grease	Visal Observation - No Samples During 2007							ND
Sulfate	242	266	252.8	12	215	322	272.7	68
TDS	754	792	771.6	12	696	803	756.7	68
TSS				12	8	14	8.83	6

* Discharge Re-located From Grimes Wash to TMA July 2001
ND - Not Detected

TABLE 44: TRAIL MOUNTAIN IN-MINE WATER QUALITY *

2007** SAMPLE DATES	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON DISSOLVED	MAGNESIUM	MANGANESE	PH (units)	POTASSIUM	SODIUM	SULFATE	TDS
UG-3	Mine Sealed April 2001 - In-Mine Monitoring Discontinued													
2007**														
MIN														
MAX														
MEAN														
No. of Analysis														
HISTORICAL 1985 - 2006														
MIN	260	26.0	0.1	2	380	151	0.03	19.6	0.03	7.41	2.1	33.0	15.0	252
MAX	344	49.3	25.0	16	696	222	0.20	29.0	0.20	8.48	5.0	61.0	130.0	424
MEAN	305	34.2	7.3	8.80	542	189	0.15	25.3	0.10	8.09	3.6	46.1	33.7	308

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 45 : TRAIL MOUNTAIN - DISCHARGE WATER QUALITY

@ COTTONWOOD CANYON PORTALS

	2007				Historical			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	Mine Sealed April 2001 - No Discharge				7.8	8.53	8.26	67
Acidity					12	58	35	2
Bicarb. Alkalinity					341	922	753	48
Chloride					10	410	36.5	49
Conductivity					1116	1655	1464	55
Iron					0.3	2.3	0.55	71
Oil & Grease					2	2	2	2
Sulfate					50	292	152	48
TDS					671	1072	936	70
TSS					5	42	109	36

OLIPHANT PORTALS

	2007				Historical			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	Seep During 2007				7.54	8.91	8.1	45
Acidity					1	19	7.73	15
Bicarb. Alkalinity					214	327	282	45
Chloride					4	21	8.3	45
Conductivity					482	925	663	42
Iron					0.01	0.7	0.16	23
Oil & Grease					0.4	5	4.4	8
Sulfate					90	330	123	45
TDS					354	584	410	45
TSS					1	90	22.6	23

TABLE 46: WELLS - WATER QUALITY *

2007** SAMPLE DATES	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON DISSOLVED	MAGNESIUM	MANGANESE	PH (units)	POTASSIUM	SODIUM	SULFATE	TDS
DEER CREEK - DCWR-1														
20070327	645	120		757	19810	318		4.5	0.02	7.64	7.7	5260	10807	16844
20070629	643	123		741	21200	999	0.16	168.0	0.018	7.55	11.7	4840	10298	17065
20070920	644	111		745	22000	1055		189.0	0.016	7.7	18.2	4890	9988	16739
20071205	653	102		798	22200	915		160.1	0.039	7.73	16.5	5278.8	10459	16768
2007**														
MIN	643	102		741	19,810	318		4.5	0.016	7.55	7.7	4,840	9,988	16,739
MAX	653	123		798	22,200	1055		189.0	0.039	7.73	18.2	5,279	10,807	17,065
MEAN	646	114		760	21,303	822		130.4	0.023	7.66	13.5	5,067	10,388	16,854
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1989-2006:														
MIN	624	95	0	17	17,300	546	0.01	47	0.009	7.34	6.12	4,500	6,000	11,466
MAX	935	880	15	1140	45,000	3351	1.74	351	0.207	8.47	43.8	9,978	18,000	24,189
MEAN	763	169	1.9	758	22,651	1230	0.27	196	0.036	7.76	18.0	6,186	12,216	19,611
WILBERG/COTTONWOOD - CWRW-1														
20070321	360	390		1926	14570	3453		602.0	0.116	7.46	23.8	2510	5424	11622
20070629	500	378		2310	17540	3666		661.0	0.112	7.4	30.3	3240	6816	15135
20070921	483	420		2446	18070	4153		754.0	0.253	7.27	30.4	3360	7260	15514
20071210	464	390		2487	17940	3870		703.2	0.32	7.28	40.7	3624.2	7416	15489
2007**														
MIN	360	378		1926	14,570	3453		602	0.112	7.27	23.8	2,510	5,424	11,622
MAX	500	420		2487	18,070	4153		754	0.320	7.46	40.7	3,624	7,416	15,514
MEAN	452	395		2292	17,030	3786		680	0.200	7.35	31.3	3,184	6,729	14,440
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1989-2006:														
MIN	233	132	0.01	280	10,666	1629	0.03	137.7	0.003	6.90	8.0	851	750	5,231
MAX	864	1135	10	4020	120,000	8327	9.00	1717	2.480	8.33	122.0	8,812	24,000	30,440
MEAN	400	365	1.7	2278	22,303	3748	0.68	682	0.301	7.62	35.8	3,988	8,601	15,881
TRAIL MOUNTAIN TM-1B														
20070321	391	9.36	14	44	934	61		9.2	0.016	8.21	2.12	184		538
20070629	389	9.18	19	43	894	59	0.03	8.88	0.021	8.28	2.15	187		535
20070921	361	9.5	50	45	975	62		9.22	0.02	8.06	2.24	189.8	1	510
20071210	388	8.62	24	46	928	56		8.49	0.017	8.42	2.3	202		547
2007**														
MIN	361	8.62		43	894	56		8.5	0.016	8.06	2.1	184	1	510
MAX	391	9.5		46	975	62		9.2	0.021	8.42	2.3	202	1	547
MEAN	382	9.17		45	933	60		8.9	0.02	8.24	2.2	191	1	533
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1985-2006:														
MIN	304	2.4	1	16	783	7	0.005	1.0	0.002	8.20	1.0	5	0	402
MAX	1015	14.0	164	717	4,580	72	0.200	10.7	0.023	9.55	15.7	1,316	664	3,290
MEAN	522	8.6	29.1	71	1,123	54	0.097	8.0	0.027	8.48	2.7	248	30	662

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater than laboratory minimum detection limit.**

APPENDIX A
2007

PacifiC[illegible] Energy
Reservoir Records
Electric Lake 2006 - 2007
Daily Active Contents (Acre Feet)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	26544	26158	25793	25372	24885	24538	24472	25634	27322	26661	24735	23057	1
2	26511	26141	25777	25356	24869	24526	24476	25748	27339	26623	24699	23001	2
3	26481	26125	25760	25344	24853	24515	24542	25854	27356	26582	24664	22945	3
4	26465	26113	25744	25332	24833	24499	24558	25932	27296	26536	24625	22904	4
5	26461	26100	25728	25320	24818	24483	24585	25965	27254	26486	24585	22863	5
6	26465	26084	25716	25304	24790	24472	24625	25981	27241	26436	24538	22815	6
7	26465	26071	25699	25292	24774	24460	24668	25993	27236	26386	24491	22760	7
8	26461	26055	25683	25275	24758	24448	24719	26006	27241	26336	24440	22708	8
9	26452	26039	25671	25263	24743	24437	24762	26018	27245	26278	24394	22656	9
10	26440	26022	25663	25251	24735	24421	24794	26034	27241	26199	24339	22597	10
11	26427	26014	25651	25235	24731	24413	24826	26076	27236	26121	24292	22516	11
12	26411	26002	25643	25219	24723	24401	24841	26133	27232	26051	24242	22413	12
13	26394	26006	25630	25203	24711	24394	24857	26199	27228	25973	24191	22311	13
14	26382	26002	25618	25187	24695	24386	24877	26265	27215	25891	24133	22213	14
15	26373	25989	25602	25187	24684	24386	24897	26373	27194	25813	24079	22111	15
16	26373	25977	25594	25159	24668	24378	24913	26494	27168	25736	24033	22006	16
17	26373	25965	25586	25147	24652	24374	24917	26611	27138	25667	23987	21905	17
18	26361	25948	25570	25143	24640	24374	24921	26716	27113	25602	23933	21797	18
19	26352	25936	25557	25115	24628	24374	24929	26808	27092	25529	23875	21690	19
20	26336	25920	25549	25100	24617	24378	24944	26897	27066	25456	23814	21582	20
21	26319	25903	25537	25080	24601	24382	24960	26981	27041	25384	23749	21483	21
22	26303	25891	25521	25060	24593	24390	24984	27053	27015	25320	23680	21398	22
23	26286	25875	25505	25040	24581	24394	25004	27104	26994	25251	23612	21309	23
24	26274	25858	25489	25020	24574	24398	25024	27134	26964	25195	23543	21211	24
25	26265	25842	25469	25000	24570	24405	25056	27160	26935	25139	23475	21116	25
26	26249	25830	25452	24984	24562	24413	25096	27189	26850	25084	23407	21025	26
27	26236	25830	25444	24968	24550	24425	25155	27207	26812	25020	23346	20930	27
28	26224	25830	25432	24948	24546	24440	25239	27232	26779	24956	23286	20843	28
29	26212	25822	25420	24932		24448	25356	27258	26741	24897	23226	20753	29
30	26191	25809	25404	24913		24456	25481	27279	26703	24837	23170	20667	30
31	26174		25388	24897		24464		27301		24778	23113		31

	Monthly Totals												Yearly Totals
Mean	26,363	25,972	25,590	25,150	24,692	24,428	24,883	26,537	27,110	25,749	23,990	21,986	25,204
Min	26,174	25,809	25,388	24,897	24,546	24,374	24,472	25,634	26,703	24,778	23,113	20,667	20,667
Max	26,544	26,158	25,793	25,372	24,885	24,538	25,481	27,301	27,356	26,661	24,735	23,057	27,356
Change	-408	-365	-421	-491	-351	-82	1,017	1,820	-598	-1,925	-1,665	-2,446	-5,915

Notes:

PacifiC[illegible] Energy
Reservoir Level Records
Electric Lake 2006 - 2007
End of Day Stage (ft.)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	266.07	265.14	264.25	263.21	261.99	261.11	260.94	263.86	267.91	266.35	261.61	257.24	1
2	265.99	265.10	264.21	263.17	261.95	261.08	260.95	264.14	267.95	266.26	261.52	257.09	2
3	265.92	265.06	264.17	263.14	261.91	261.05	261.12	264.40	267.99	266.16	261.43	256.94	3
4	265.88	265.03	264.13	263.11	261.86	261.01	261.16	264.59	267.85	266.05	261.33	256.83	4
5	265.87	265.00	264.09	263.08	261.82	260.97	261.23	264.67	267.75	265.93	261.23	256.72	5
6	265.88	264.96	264.06	263.04	261.75	260.94	261.33	264.71	267.72	265.81	261.11	256.59	6
7	265.88	264.93	264.02	263.01	261.71	260.91	261.44	264.74	267.71	265.69	260.99	256.44	7
8	265.87	264.89	263.98	262.97	261.67	260.88	261.57	264.77	267.72	265.57	260.86	256.30	8
9	265.85	264.85	263.95	262.94	261.63	260.85	261.68	264.80	267.73	265.43	260.74	256.16	9
10	265.82	264.81	263.93	262.91	261.61	260.81	261.76	264.84	267.72	265.24	260.60	256.00	10
11	265.79	264.79	263.90	262.87	261.60	260.79	261.84	264.94	267.71	265.05	260.48	255.78	11
12	265.75	264.76	263.88	262.83	261.58	260.76	261.88	265.08	267.70	264.88	260.35	255.50	12
13	265.71	264.77	263.85	262.79	261.55	260.74	261.92	265.24	267.69	264.69	260.22	255.22	13
14	265.68	264.76	263.82	262.75	261.51	260.72	261.97	265.40	267.66	264.49	260.07	254.95	14
15	265.66	264.73	263.78	262.75	261.48	260.72	262.02	265.66	267.61	264.30	259.93	254.67	15
16	265.66	264.70	263.76	262.68	261.44	260.70	262.06	265.95	267.55	264.11	259.81	254.38	16
17	265.66	264.67	263.74	262.65	261.40	260.69	262.07	266.23	267.48	263.94	259.69	254.10	17
18	265.63	264.63	263.70	262.64	261.37	260.69	262.08	266.48	267.42	263.78	259.55	253.80	18
19	265.61	264.60	263.67	262.57	261.34	260.69	262.10	266.70	267.37	263.60	259.40	253.50	19
20	265.57	264.56	263.65	262.53	261.31	260.70	262.14	266.91	267.31	263.42	259.24	253.20	20
21	265.53	264.52	263.62	262.48	261.27	260.71	262.18	267.11	267.25	263.24	259.07	252.92	21
22	265.49	264.49	263.58	262.43	261.25	260.73	262.24	267.28	267.19	263.08	258.89	252.68	22
23	265.45	264.45	263.54	262.38	261.22	260.74	262.29	267.40	267.14	262.91	258.71	252.43	23
24	265.42	264.41	263.50	262.33	261.20	260.75	262.34	267.47	267.07	262.77	258.53	252.15	24
25	265.40	264.37	263.45	262.28	261.19	260.77	262.42	267.53	267.00	262.63	258.35	251.88	25
26	265.36	264.34	263.41	262.24	261.17	260.79	262.52	267.60	266.80	262.49	258.17	251.62	26
27	265.33	264.34	263.39	262.20	261.14	260.82	262.67	267.64	266.71	262.33	258.01	251.35	27
28	265.30	264.34	263.36	262.15	261.13	260.86	262.88	267.70	266.63	262.17	257.85	251.10	28
29	265.27	264.32	263.33	262.11		260.88	263.17	267.76	266.54	262.02	257.69	250.84	29
30	265.22	264.29	263.29	262.06		260.90	263.48	267.81	266.45	261.87	257.54	250.59	30
31	265.18		263.25	262.02		260.92		267.86		261.72	257.39		31

ELECTRIC LAKE STATISTICS

	Monthly												Yearly
Daily Mean	265.64	264.69	263.75	262.66	261.50	260.83	261.98	266.04	267.41	264.13	259.69	254.30	**262.72**
Daily Min	265.18	264.29	263.25	262.02	261.13	260.69	260.94	263.86	266.45	261.72	257.39	250.59	**250.59**
Daily Max	266.07	265.14	264.25	263.21	261.99	261.11	263.48	267.86	267.99	266.35	261.61	257.24	**267.99**

Notes:

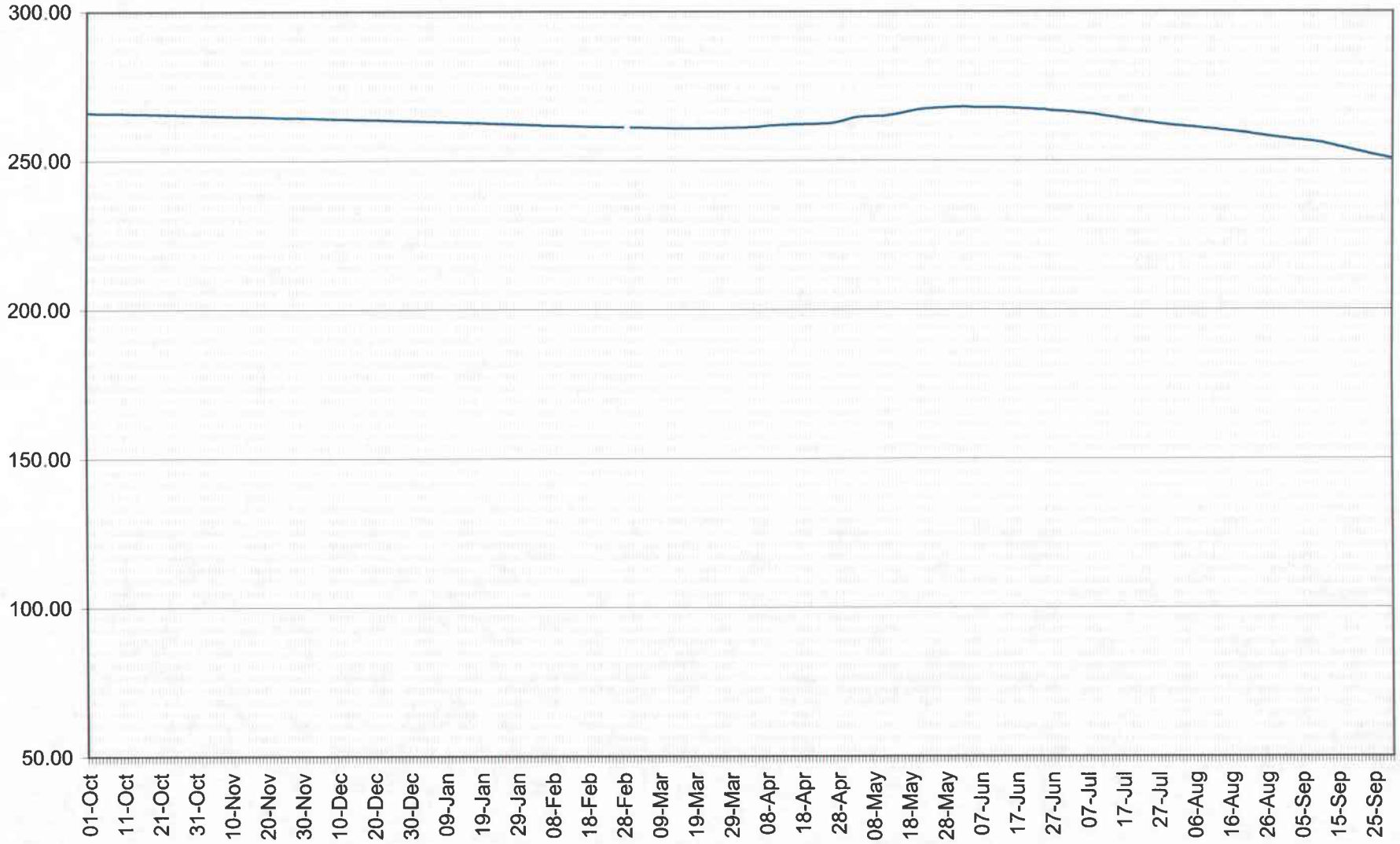
PacifiC[illegible]nergy
Reservoir Records
Electric Lake 2006 - 2007
Daily Evaporation (Acre Feet)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	0	0	0	0	0	0	0	0	5	4	3	1	1
2	0	0	0	0	0	0	0	4	5	4	3	1	2
3	0	0	0	0	0	0	0	4	5	4	3	1	3
4	0	0	0	0	0	0	0	4	5	4	3	1	4
5	0	0	0	0	0	0	0	4	5	4	3	1	5
6	0	0	0	0	0	0	0	4	5	4	3	1	6
7	0	0	0	0	0	0	0	4	5	4	3	1	7
8	0	0	0	0	0	0	0	4	5	4	3	1	8
9	0	0	0	0	0	0	0	4	5	4	3	1	9
10	0	0	0	0	0	0	0	4	5	4	3	1	10
11	0	0	0	0	0	0	0	4	5	4	3	1	11
12	0	0	0	0	0	0	0	4	5	4	3	1	12
13	0	0	0	0	0	0	0	4	5	4	3	1	13
14	0	0	0	0	0	0	0	4	5	4	3	1	14
15	0	0	0	0	0	0	0	4	5	4	3	1	15
16	0	0	0	0	0	0	0	4	5	4	3	1	16
17	0	0	0	0	0	0	0	4	5	4	3	1	17
18	0	0	0	0	0	0	0	4	5	4	3	1	18
19	0	0	0	0	0	0	0	4	5	4	3	1	19
20	0	0	0	0	0	0	0	4	5	4	3	1	20
21	0	0	0	0	0	0	0	4	5	4	3	1	21
22	0	0	0	0	0	0	0	4	5	4	3	1	22
23	0	0	0	0	0	0	0	4	5	4	3	1	23
24	0	0	0	0	0	0	0	4	5	4	3	1	24
25	0	0	0	0	0	0	0	4	5	4	3	1	25
26	0	0	0	0	0	0	0	4	5	4	3	1	26
27	0	0	0	0	0	0	0	4	5	4	3	1	27
28	0	0	0	0	0	0	0	4	5	4	3	1	28
29	0	0	0	0		0	0	4	5	4	3	1	29
30	0	0	0	0		0	0	4	5	4	3	1	30
31	0		0	0		0		4		4	3		31

	Monthly Totals												Yearly Totals
Mean	0	0	0	0	0	0	0	4	5	4	3	1	1
Min	0	0	0	0	0	0	0	0	5	4	3	1	0
Max	0	0	0	0	0	0	0	4	5	4	3	1	5
Change	0	0	0	0	0	0	0	4	0	0	0	0	4

Notes:

Electric Lake Stage



PacifiC[illegible] Energy
Reservoir Records
Electric Lake 2006 - 2007
Surface Area (Acre)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	418	412	408	402	396	392	391	406	428	419	394	374	1
2	417	412	407	402	396	392	391	407	428	419	394	373	2
3	417	412	407	402	396	391	392	408	429	418	393	372	3
4	416	412	407	402	395	391	392	409	428	417	393	372	4
5	416	412	407	402	395	391	392	410	427	417	392	372	5
6	416	411	407	401	395	391	393	410	427	416	392	371	6
7	416	411	406	401	395	391	393	410	427	415	391	370	7
8	416	411	406	401	394	391	394	410	427	415	391	370	8
9	416	411	406	401	394	391	395	411	427	414	390	369	9
10	416	411	406	401	394	390	395	411	427	413	389	368	10
11	416	411	406	400	394	390	395	411	427	412	389	367	11
12	416	410	406	400	394	390	396	412	427	411	388	366	12
13	416	410	406	400	394	390	396	413	427	410	387	365	13
14	415	410	405	400	394	390	396	414	427	409	387	364	14
15	415	410	405	400	394	390	396	415	426	408	386	363	15
16	415	410	405	400	393	390	396	417	426	407	386	361	16
17	415	410	405	399	393	390	396	418	426	406	385	360	17
18	415	410	405	399	393	390	397	420	425	405	384	359	18
19	415	410	405	399	393	390	397	421	425	404	384	358	19
20	415	409	405	399	393	390	397	422	425	403	383	356	20
21	415	409	404	399	393	390	397	423	424	402	382	355	21
22	414	409	404	398	392	390	397	424	424	402	381	354	22
23	414	409	404	398	392	390	398	425	424	401	380	353	23
24	414	408	404	398	392	390	398	426	423	400	380	352	24
25	414	408	403	398	392	390	398	426	423	399	379	351	25
26	414	408	403	397	392	390	399	426	422	399	378	350	26
27	413	408	403	397	392	390	399	427	421	398	377	349	27
28	413	408	403	397	392	391	401	427	421	397	377	348	28
29	413	408	403	397		391	402	427	420	396	376	346	29
30	413	408	403	396		391	404	428	420	395	375	345	30
31	413		402	396		391		428		395	374		31

	Monthly Totals												Yearly Totals
Mean	415	410	405	399	394	390	396	417	425	407	385	361	400
Min	413	408	402	396	392	390	391	406	420	395	374	345	345
Max	418	412	408	402	396	392	404	428	429	419	394	374	429
Change	-5	-4	-6	-6	-4	-1	13	22	-8	-24	-20	-29	-72

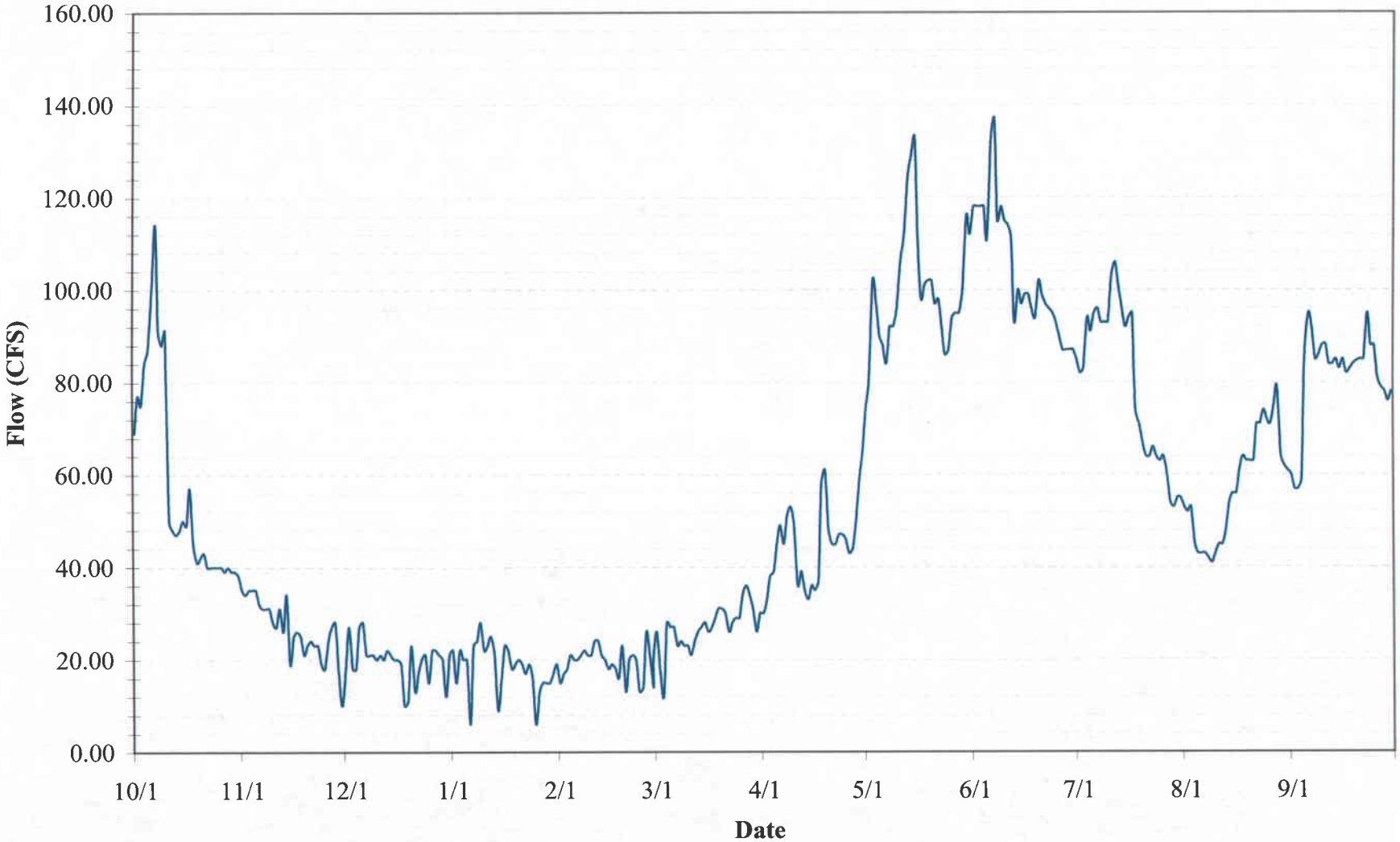
Notes:

PacifiC[illegible]nergy
Stream Discharge Records
Huntington Creek at Plant 2006 - 2007
Daily Discharge (CFS)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	69.0	35.0	18.0	22.0	15.0	26.0	30.0	74	118	85	53.0	60.0	1
2	77.0	34.0	27.0	15.0	17.0	17.0	33.0	81	118	82	52.0	57.0	2
3	75.0	35.0	18.0	22.0	18.0	12.0	38.0	102	118	83	53.0	57.0	3
4	84.0	35.0	18.0	20.0	21.0	28.0	39.0	97	118	94	45.0	59.0	4
5	87.0	35.0	27.0	20.0	20.0	27.0	45.0	90	111	91	43.0	86.0	5
6	100.0	32.0	28.0	6.0	20.0	27.0	49.0	88	133	95	43.0	95.0	6
7	114.0	31.0	21.0	23.0	21.0	23.0	45.0	84	137	96	43.0	92.0	7
8	91.0	31.0	21.0	24.0	22.0	24.0	51.0	92	115	93	42.0	85.0	8
9	88.0	31.0	21.0	28.0	21.0	23.0	53.0	92	118	93.0	41.0	86.0	9
10	91.0	28.0	20.0	22.0	21.0	23.0	49.0	96	115	93.0	43.1	88.0	10
11	50.0	27.0	21.0	23.0	24.0	21.0	36.0	106	114	103.0	45.0	88.2	11
12	48.0	31.0	20.0	25.0	24.0	24.0	39.0	112	111	106.0	45.0	84.0	12
13	47.0	26.0	22.0	21.0	21.0	26.0	35.0	124	93	101.0	48.0	84.0	13
14	48.0	34.0	21.0	9.0	20.0	27.0	33.0	129	100	96.0	54.0	85.0	14
15	50.0	19.0	20.0	16.0	18.0	28.0	36.0	133	97	92.0	56.0	83.0	15
16	49.0	25.0	20.0	23.0	19.0	26.0	35.0	111	99	94.0	56.0	85.0	16
17	57.0	26.0	19.0	22.0	18.0	27.0	37.0	98	99	95.0	61.0	82.0	17
18	45.0	25.0	10.0	18.0	16.0	29.0	58.0	101	96	74.0	64.0	82.9	18
19	41.0	21.0	11.0	19.0	23.0	31.0	61.0	102	94	71.0	63.0	84.0	19
20	42.0	23.0	23.0	20.0	13.0	31.0	48.0	102	102	67.0	63.0	84.6	20
21	43.0	24.0	13.0	19.0	20.0	30.0	45.0	97	99	64.0	63.0	85.0	21
22	40.0	23.0	17.0	17.0	21.0	26.0	45.0	98	97	64.0	71.0	85.0	22
23	40.0	23.0	20.0	19.0	20.0	28.0	47.0	92	96	66.0	71.0	95.0	23
24	40.0	19.0	21.0	16.0	13.0	29.0	47.0	86	95	64.0	74.0	88.0	24
25	40.0	18.0	15.0	6.0	14.0	29.0	46.0	87	93	63.0	72.0	88.0	25
26	40.0	24.0	22.0	13.0	26.0	34.0	43.0	94	90	64.0	71.0	81.0	26
27	39.0	27.0	22.0	15.0	21.0	36.0	44.0	95	87	60.0	75.0	79.0	27
28	40.0	28.0	21.0	15.0	14.0	34.0	50.0	95	87	54.0	79.0	78.0	28
29	39.0	17.0	20.0	15.0		31.0	59.1	100	87	53.0	64.0	76.0	29
30	39.0	10.0	12.0	17.0		26.0	65.0	116	87	55.0	62.0	78.0	30
31	38.0		21.0	19.0		30.0		112		55.0	61.0		31
						Monthly Statistics							**Yearly Stats**
Vol. (SFD)	1,791	797	610	569	541	833	1,341	3,086	3,124	2,466	1,776	2,441	**19,375**
Daily Mean	57.80	26.60	19.70	18.40	19.30	26.90	44.70	99.50	104.00	79.50	57.30	81.40	**52.90**
Daily Min	38.00	10.00	10.00	6.00	13.00	12.00	30.00	74.00	87.00	53.00	41.00	57.00	**6.00**
Daily Max	114.00	35.00	28.00	28.00	26.00	36.00	65.00	133.00	137.00	106.00	79.00	95.00	**137.00**
Ins. Min	30.70	8.10	4.27	3.59	4.27	3.92	25.90	60.50	71.20	53.00	39.50	56.20	**3.59**
Ins. Max	176.00	62.00	32.80	32.80	48.10	41.80	72.80	144.00	289.00	289.00	90.00	126.00	**289.00**
Vol. (AF)	3,550	1,580	1,210	1,130	1,070	1,650	2,660	6,120	6,200	4,890	3,520	4,840	**38,420**

Notes:

HUNTINGTON CREEK HYDROGRAPH
2006 - 2007



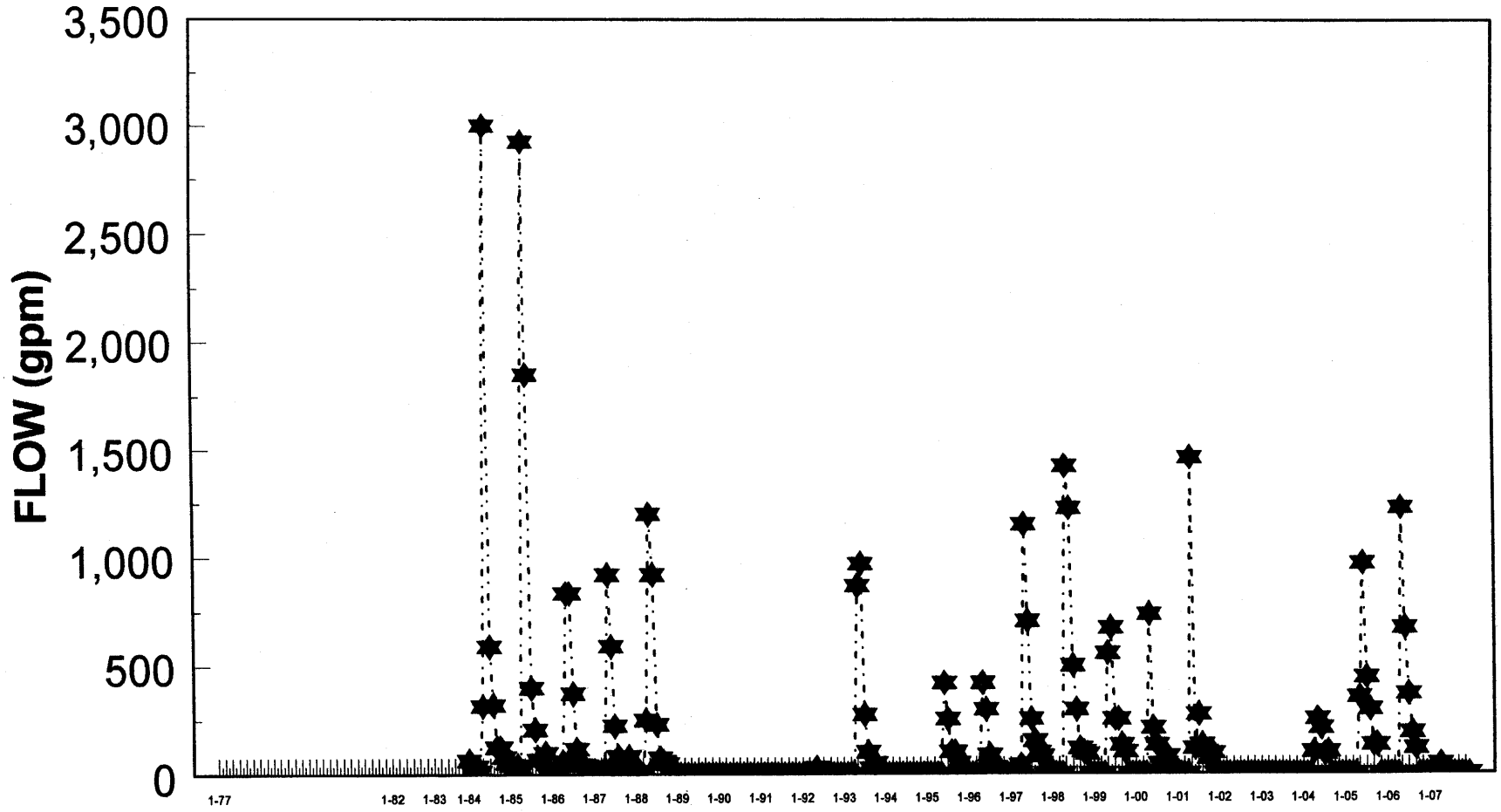
HUNTINGTON PLANT WATER DIVERSION RECORDS
2006-07 SUMMARY

MONTH	AVERAGE CU FT/SEC FOR MONTH	TOTAL ACRE FEET FOR MONTH
October-06	8.0	491.9
November-06	10.8	644.3
December-06	14.3	879.5
January-07	14.9	917.6
February-07	17.1	947.7
March-07	16.7	1,023.3
April-07	15.7	935.5
May-07	17.9	1,097.5
June-07	17.5	1,041.6
July-07	19.4	1,190.9
August-07	16.3	998.2
September-07	17.2	1,022.3
2006-07 TOTALS	**185.9**	**11190.2**

APPENDIX B
2007

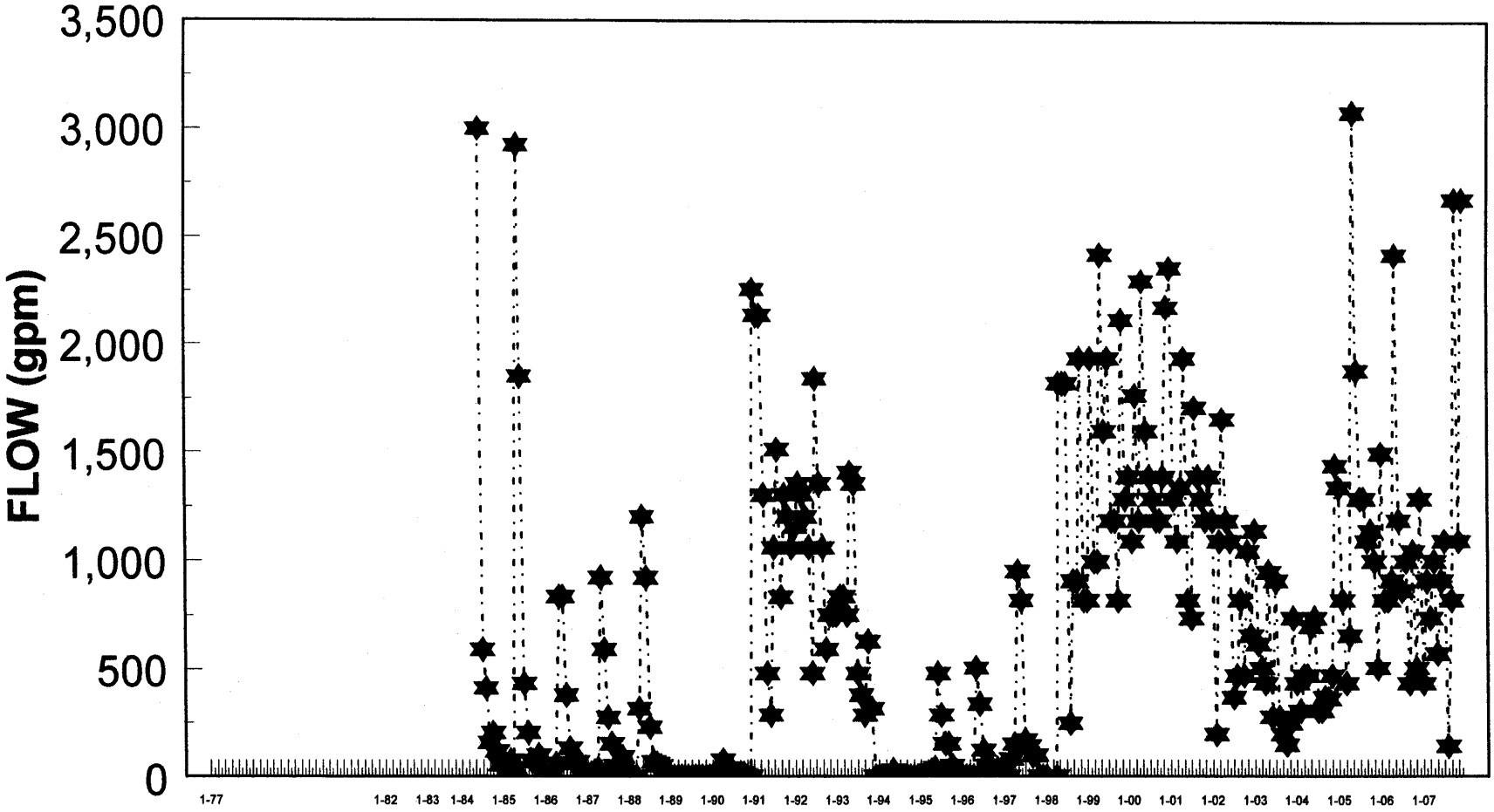
DEER CREEK

ABOVE MINE
DISCHARGE RECESSION CURVE



DEER CREEK

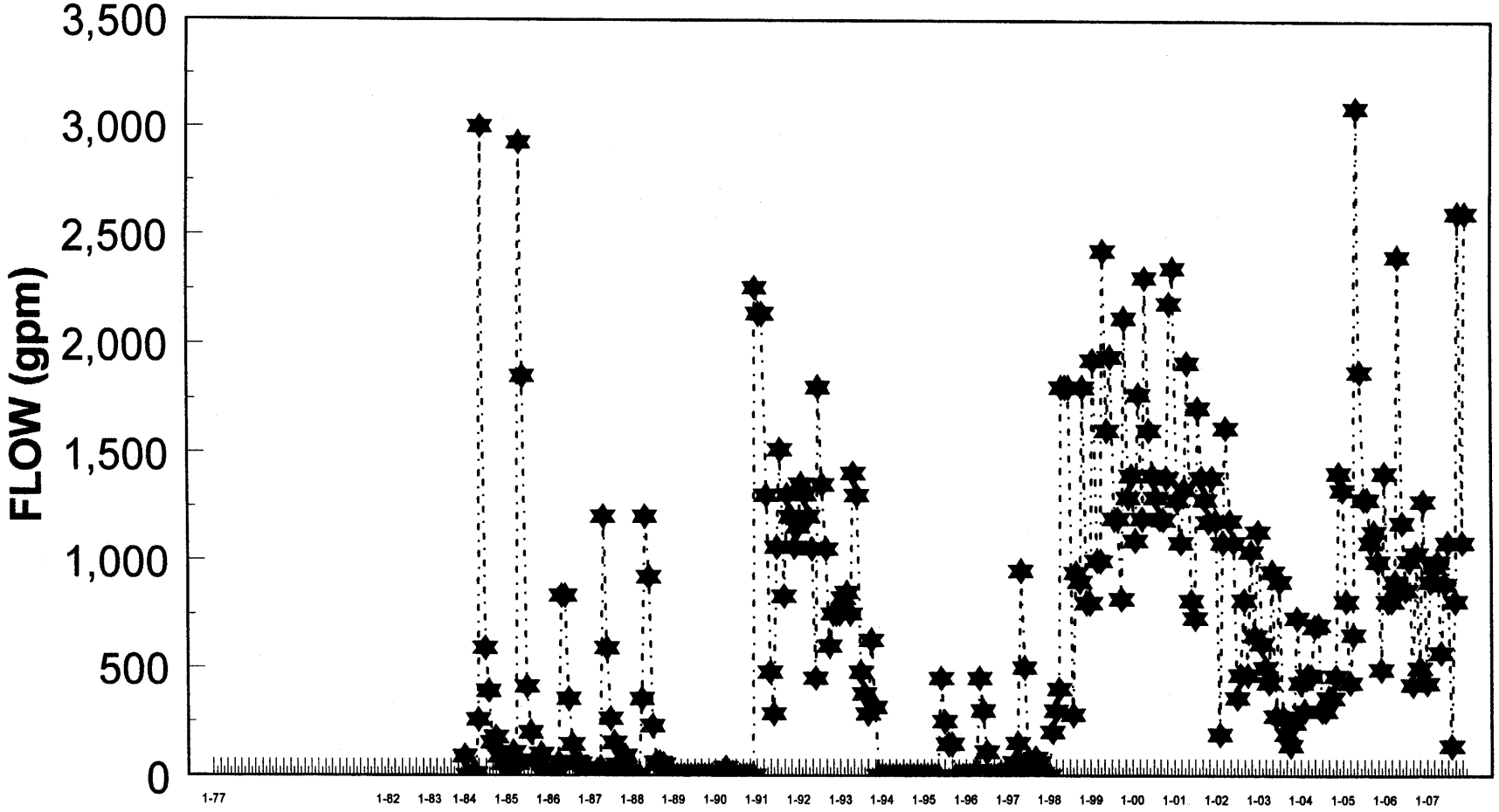
@ PERMIT BOUNDARY
DISCHARGE RECESSION CURVE



DEER CREEK

@ BELOW MINE

DISCHARGE RECESSION CURVE

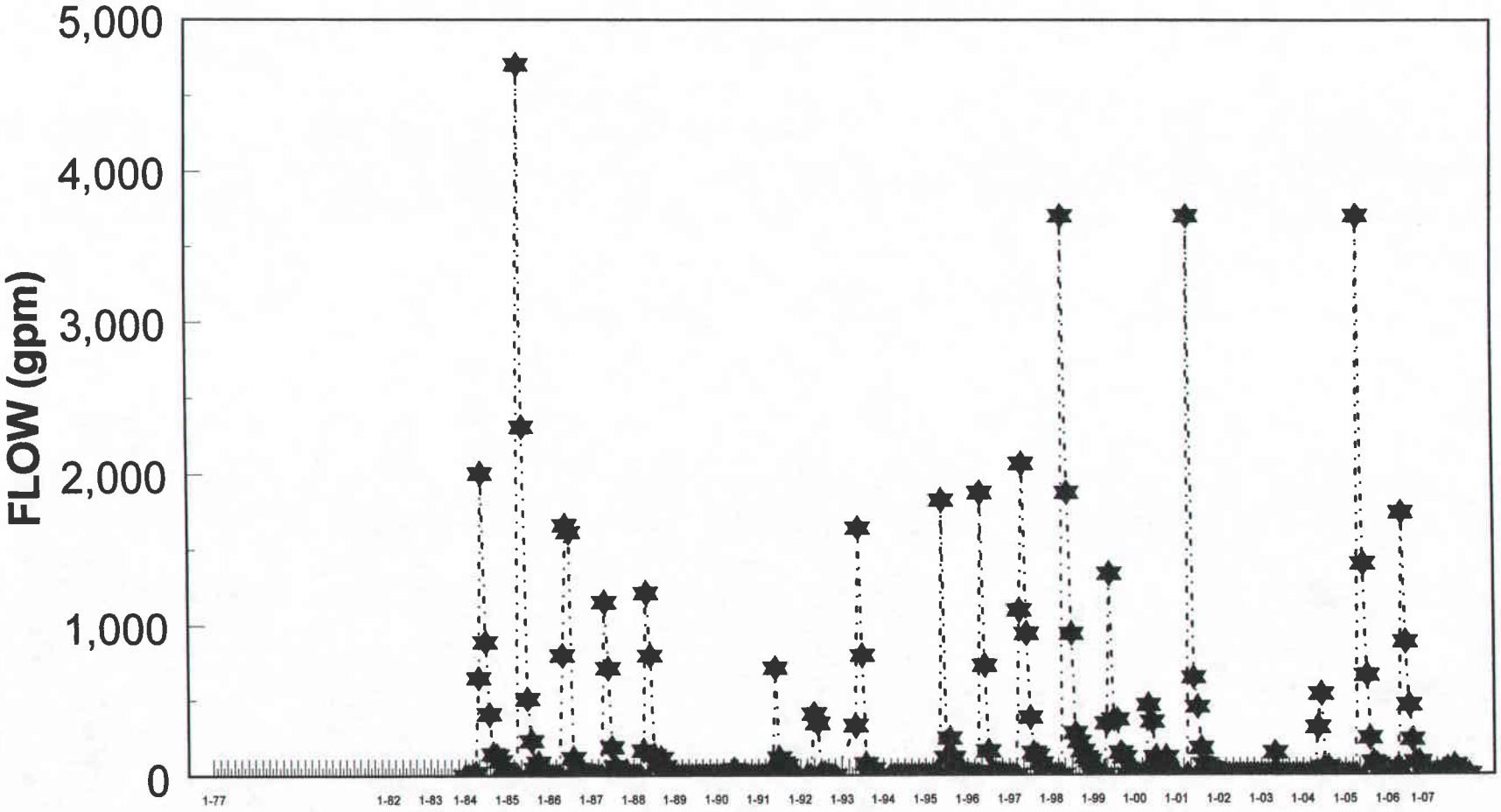


APPENDIX C
2007

MEETINGHOUSE CANYON

LEFT FORK

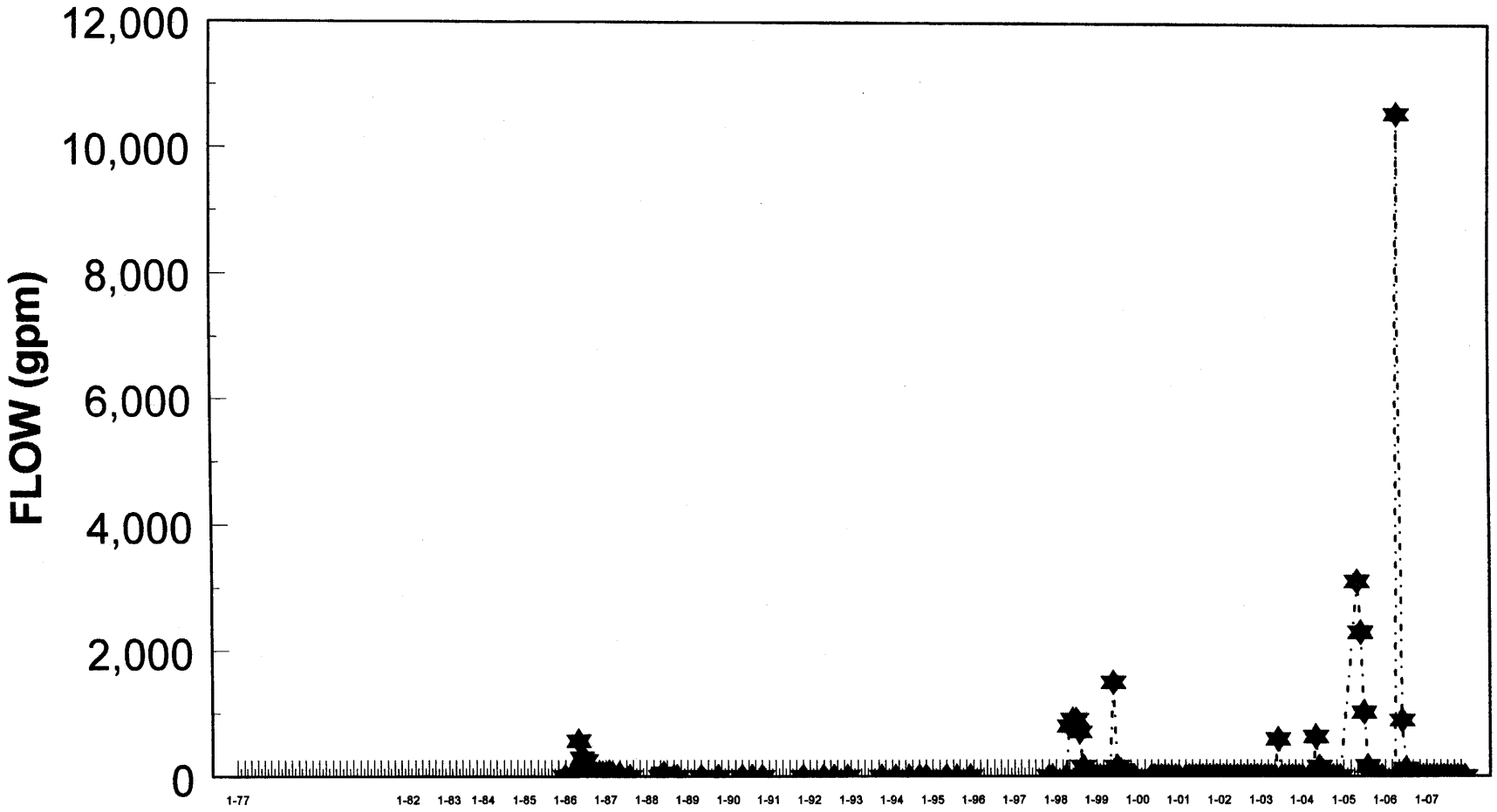
DISCHARGE RECESSION CURVE



APPENDIX D
2007

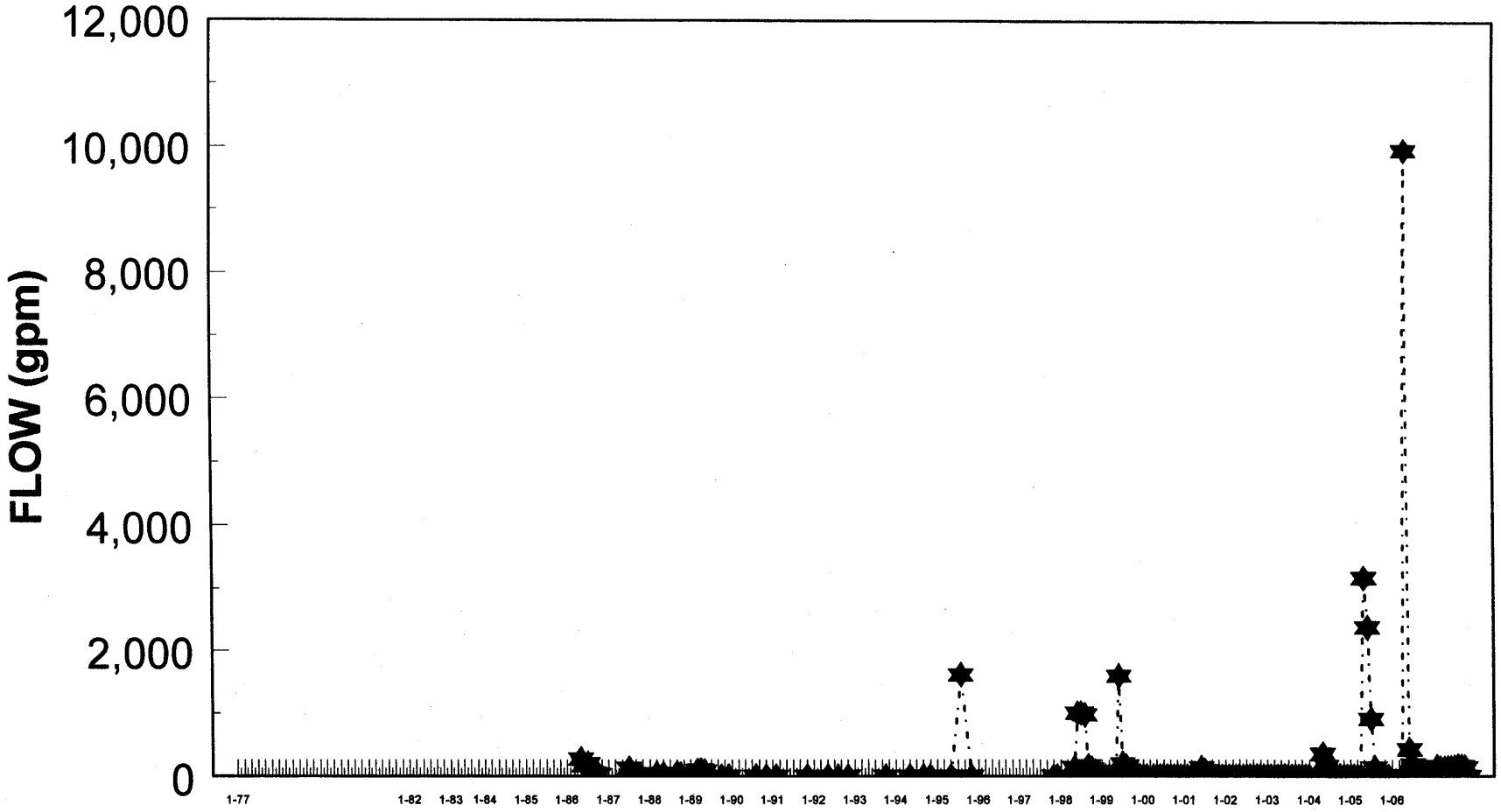
MILL FORK

MFA1: ABOVE MINE
DISCHARGE RECESSION CURVE



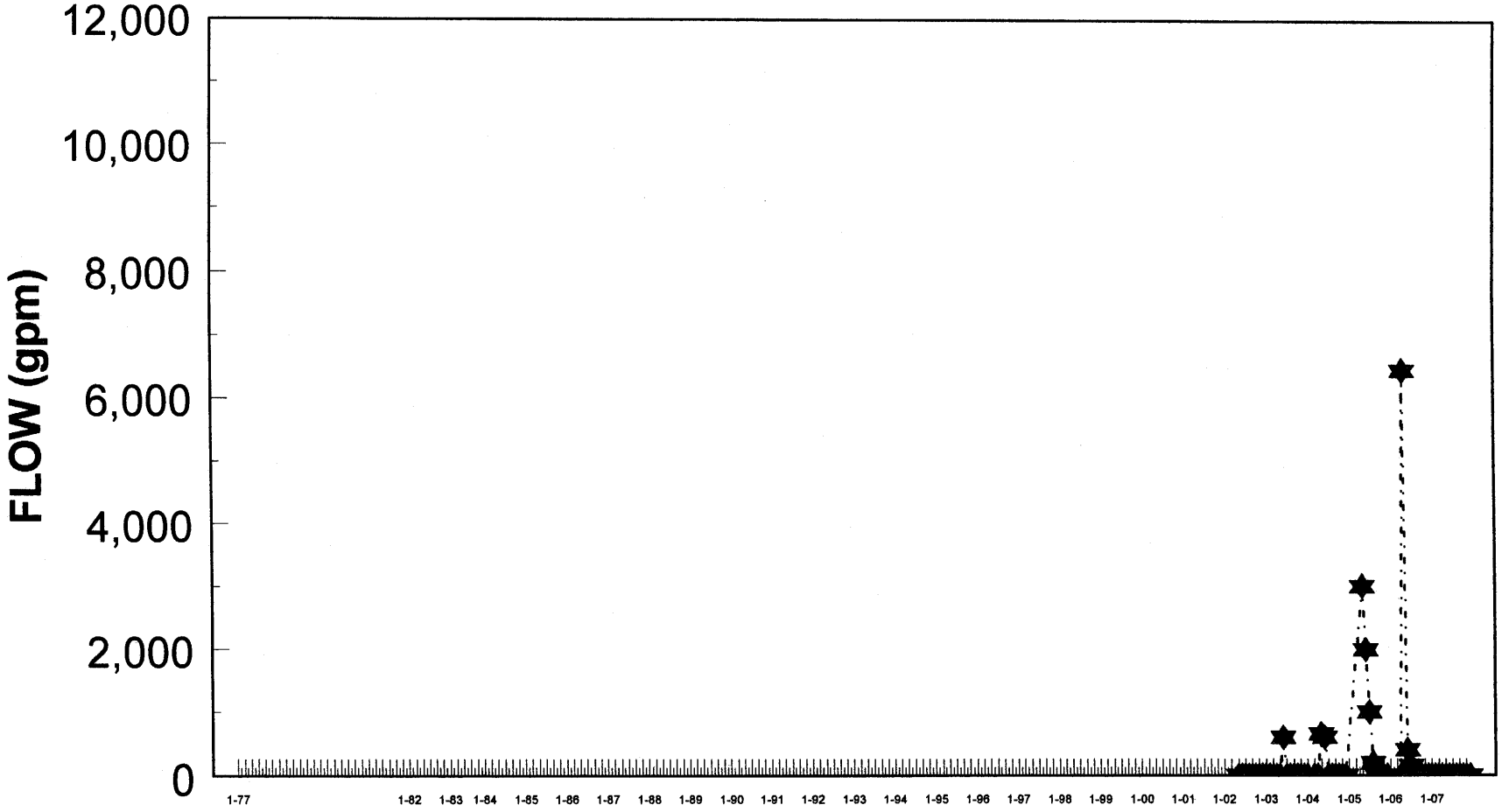
MILL FORK

MFB2: BELOW MINE
DISCHARGE RECESSION CURVE



MILL FORK

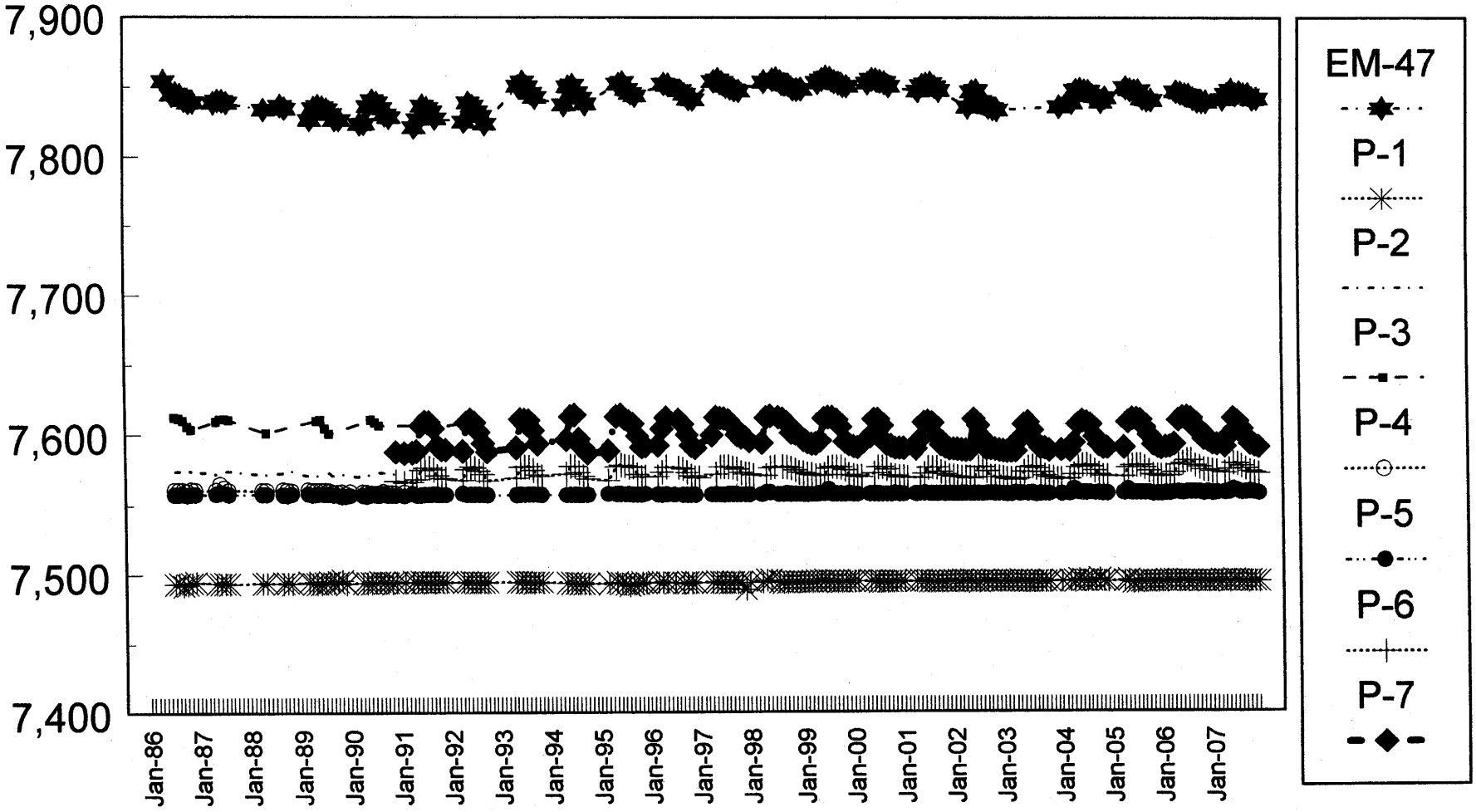
MFU3: ABOVE MILL FORK GRABEN
DISCHARGE RECESSION CURVE



APPENDIX E
2007

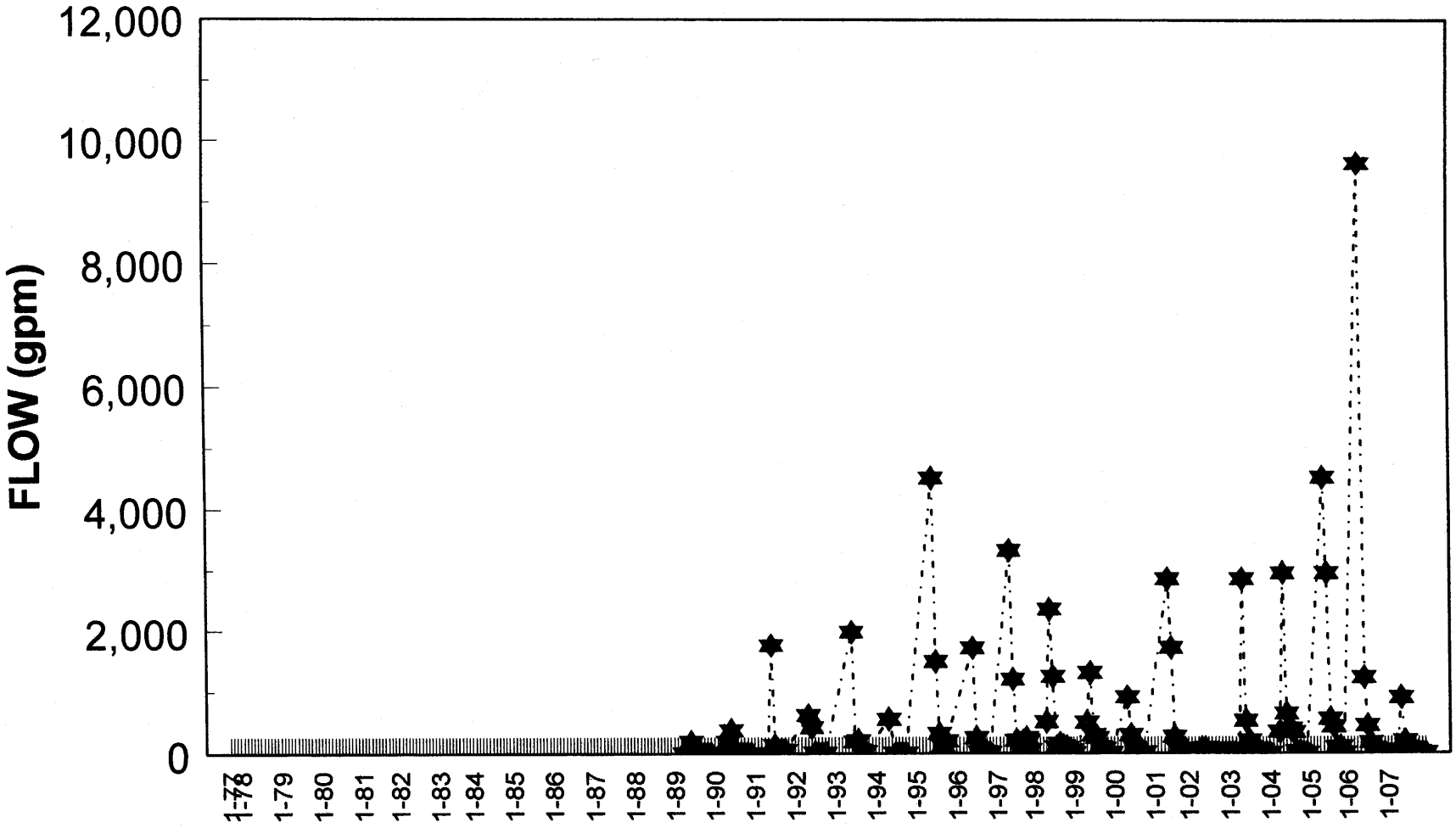
RILDA CANYON

MONITORING WELLS
PIEZOMETRIC DATA



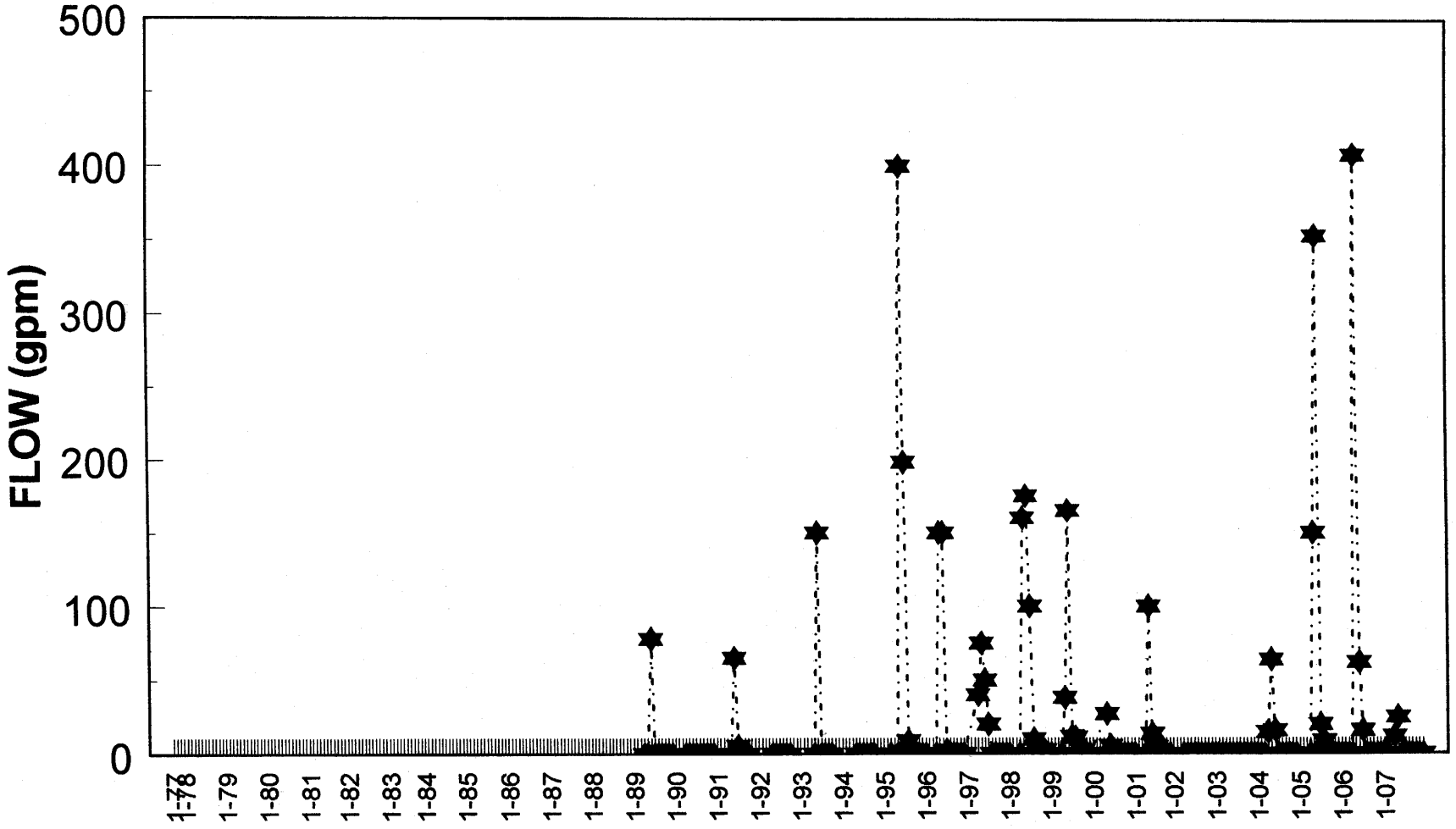
RILDA CANYON

RCF-1: RIGHT FORK
DISCHARGE RECESSION CURVE



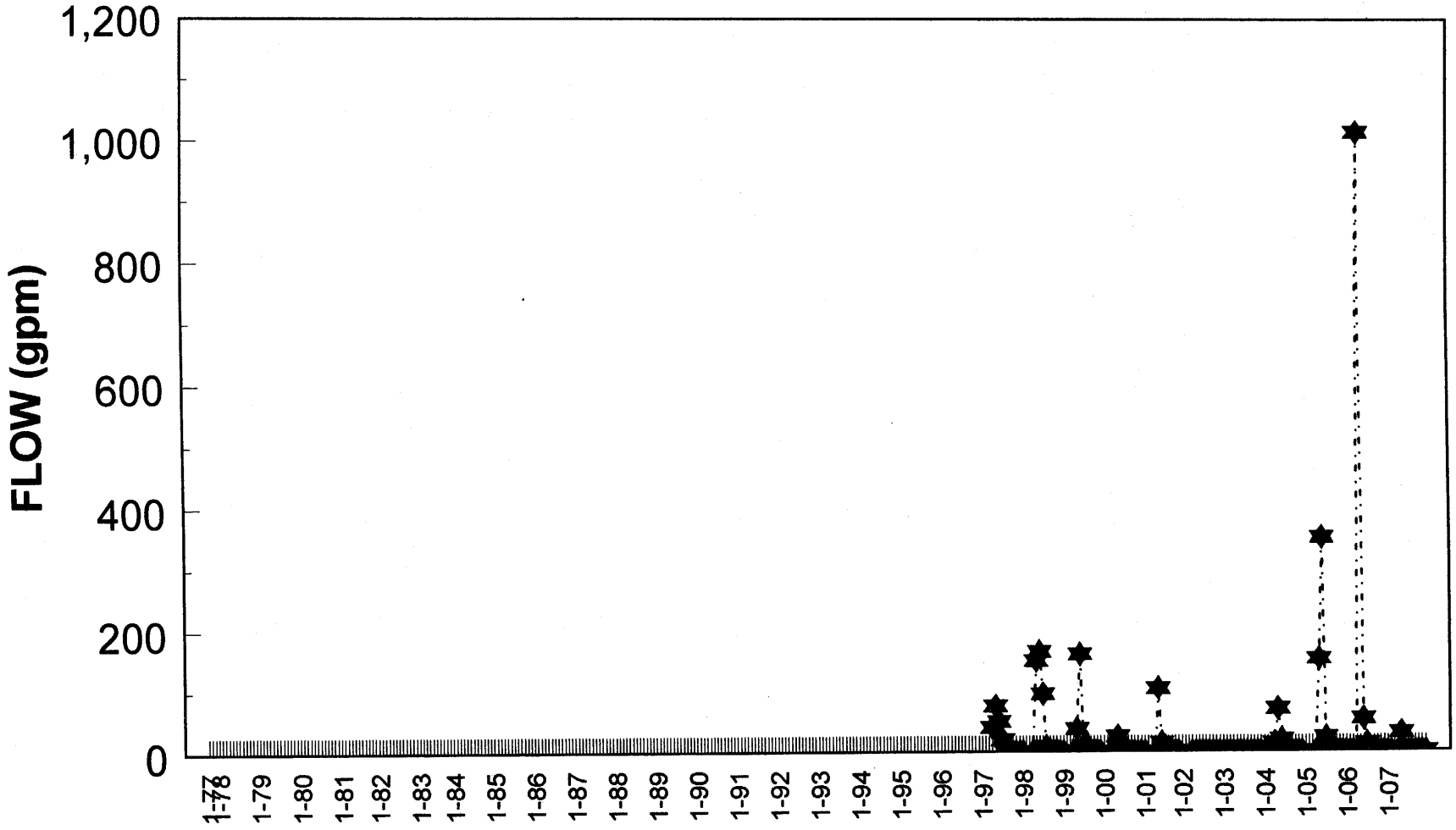
RILDA CANYON

RCLF-1: LEFT FORK - BELOW BREAKOUTS
DISCHARGE RECESSION CURVE



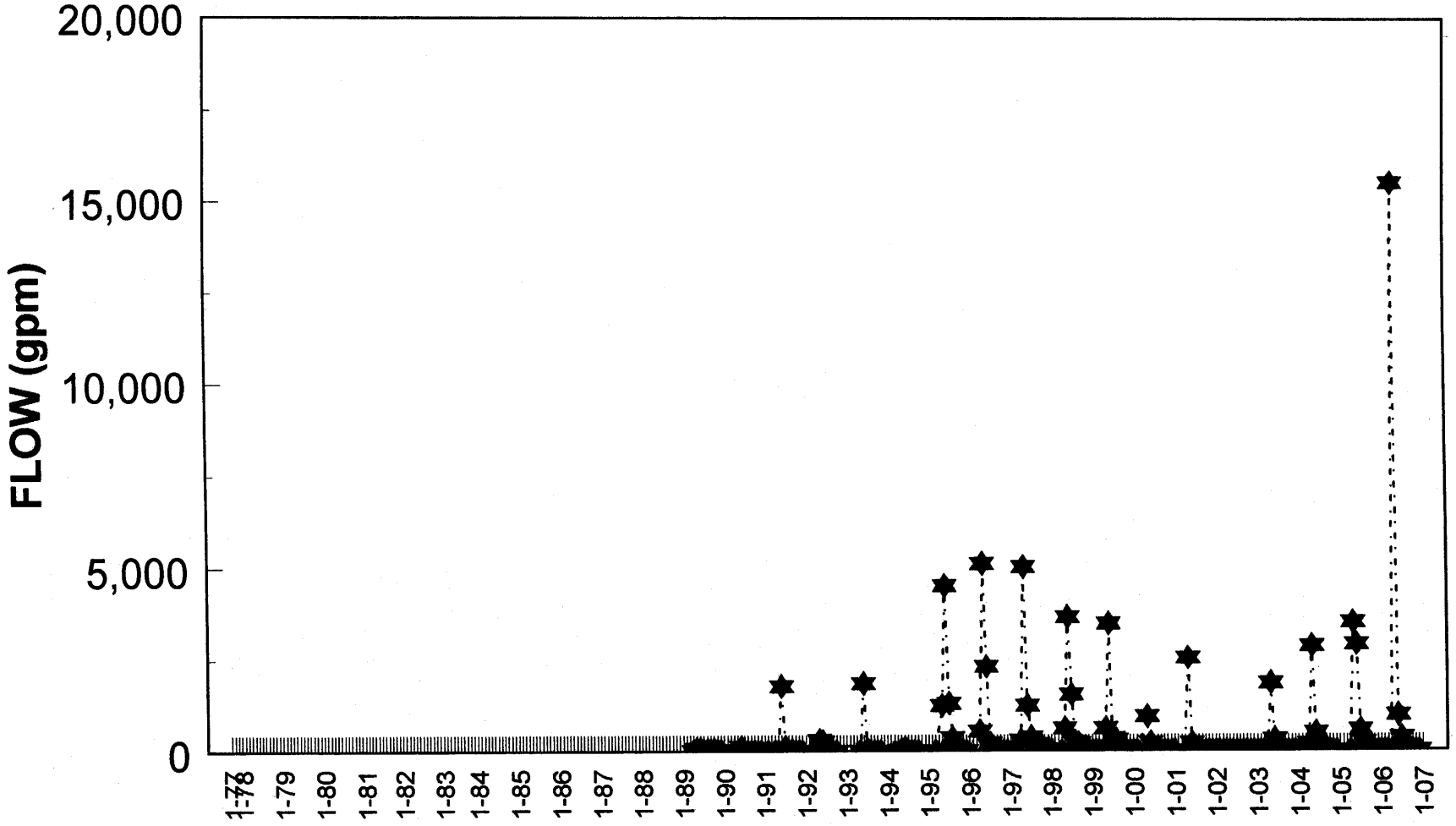
RILDA CANYON

RCLF-2: RIGHT FORK - ABOVE BREAKOUTS
DISCHARGE RECESSION CURVE



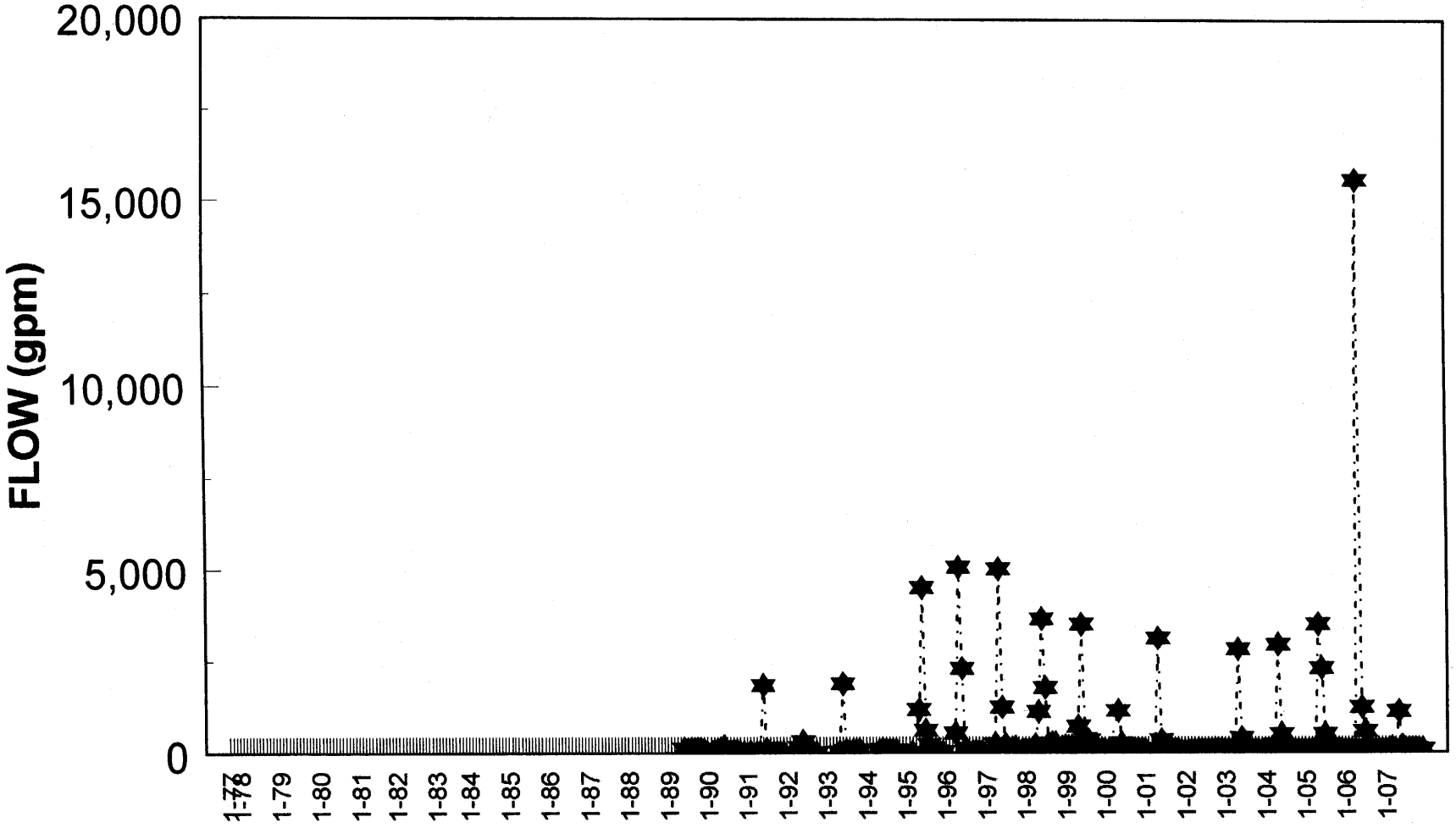
RILDA CANYON

RCF-2: ABOVE NEWUA SPRINGS
DISCHARGE RECESSION CURVE



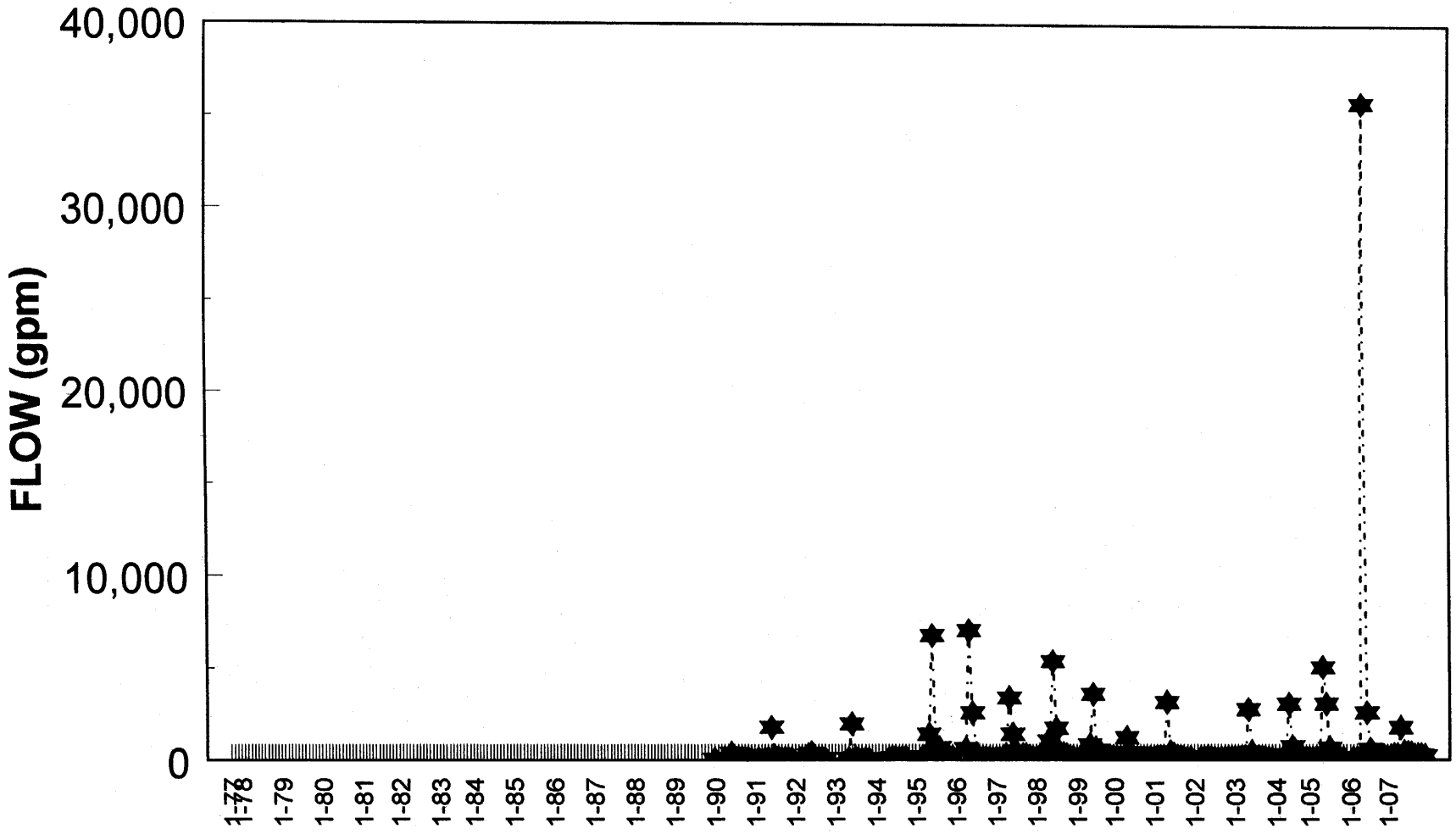
RILDA CANYON

RCF-3: BELOW NEWUA SPRINGS
DISCHARGE RECESSION CURVE



RILDA CANYON

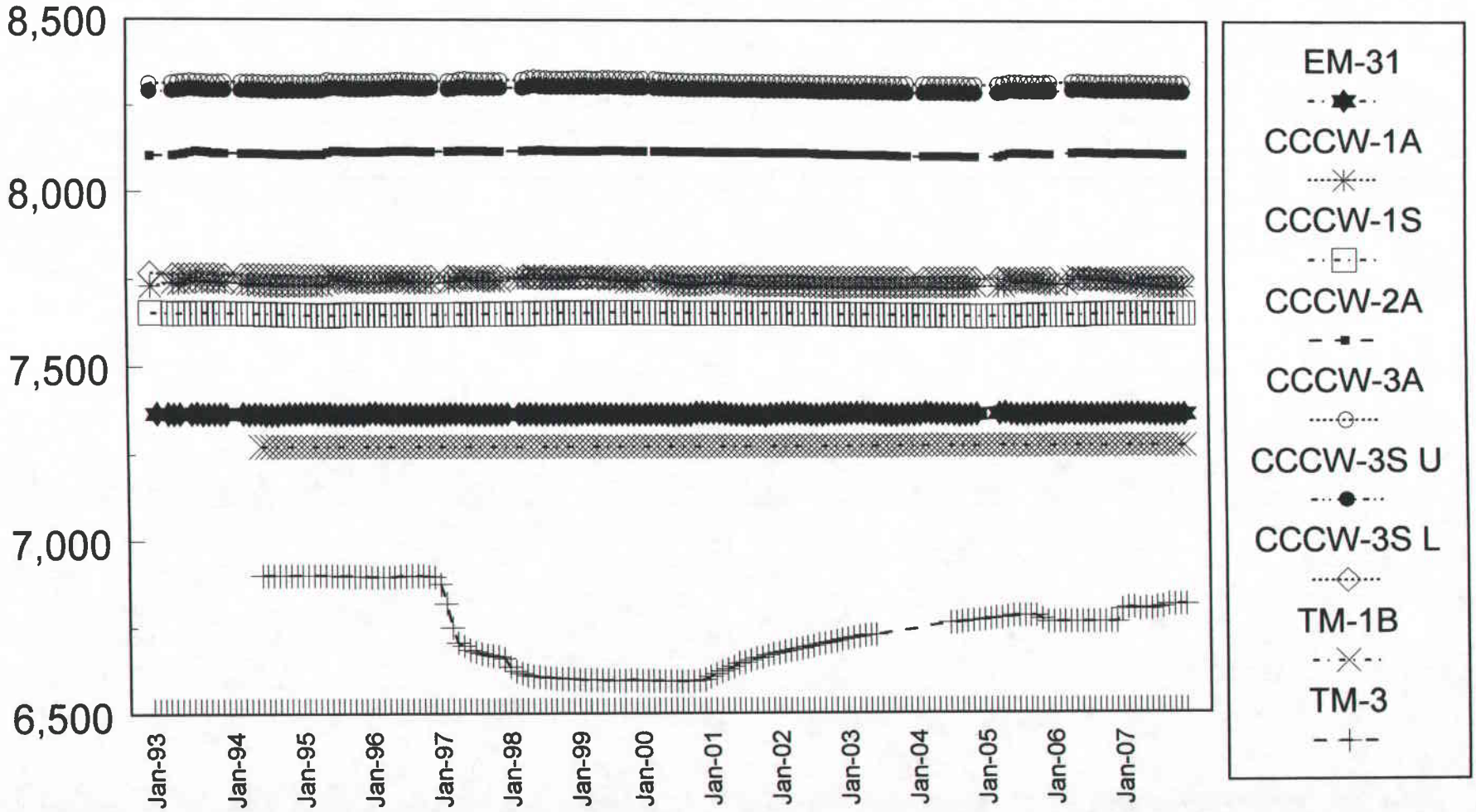
RCW-4: NEAR HUNTINGTON CANYON
DISCHARGE RECESSION CURVE

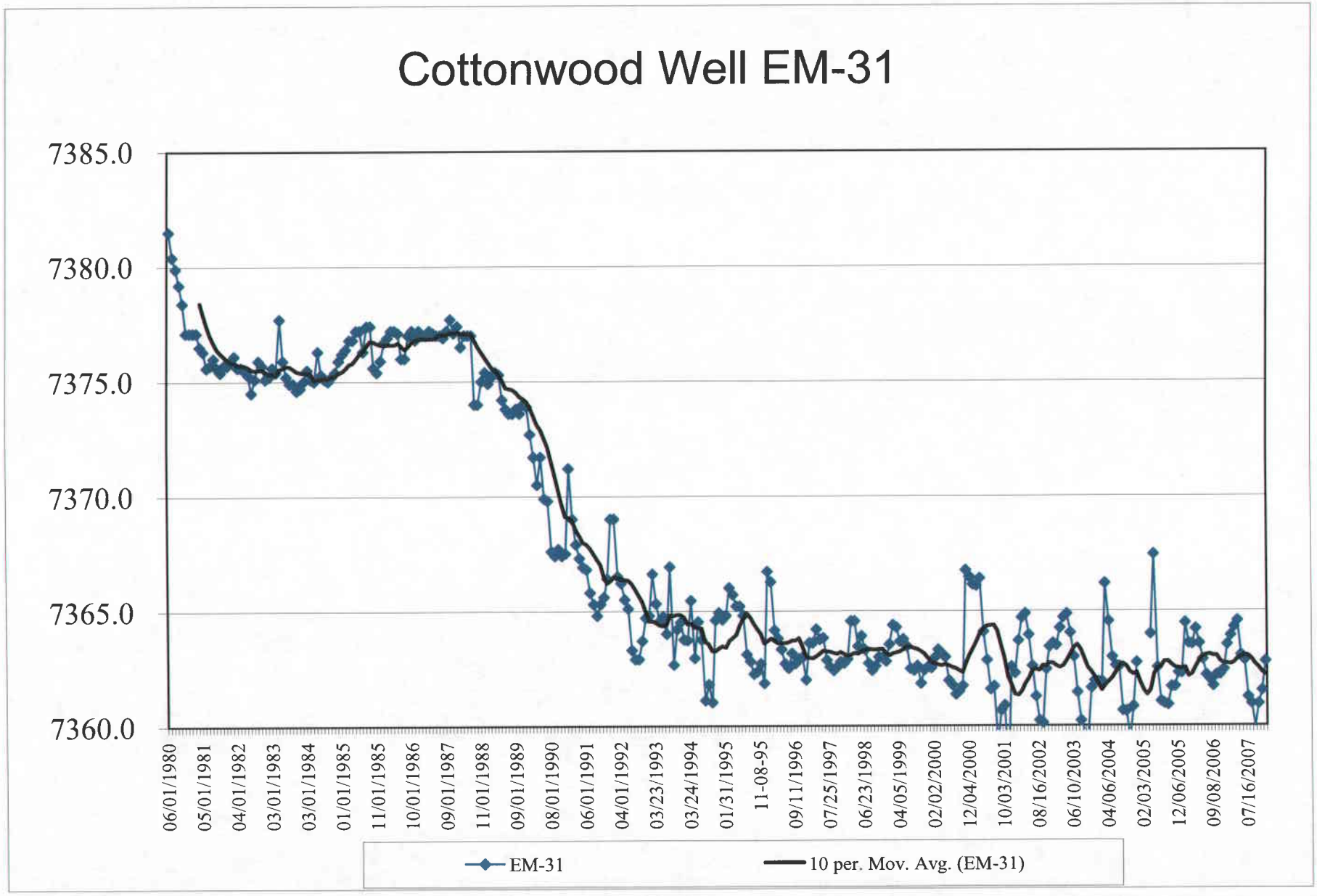


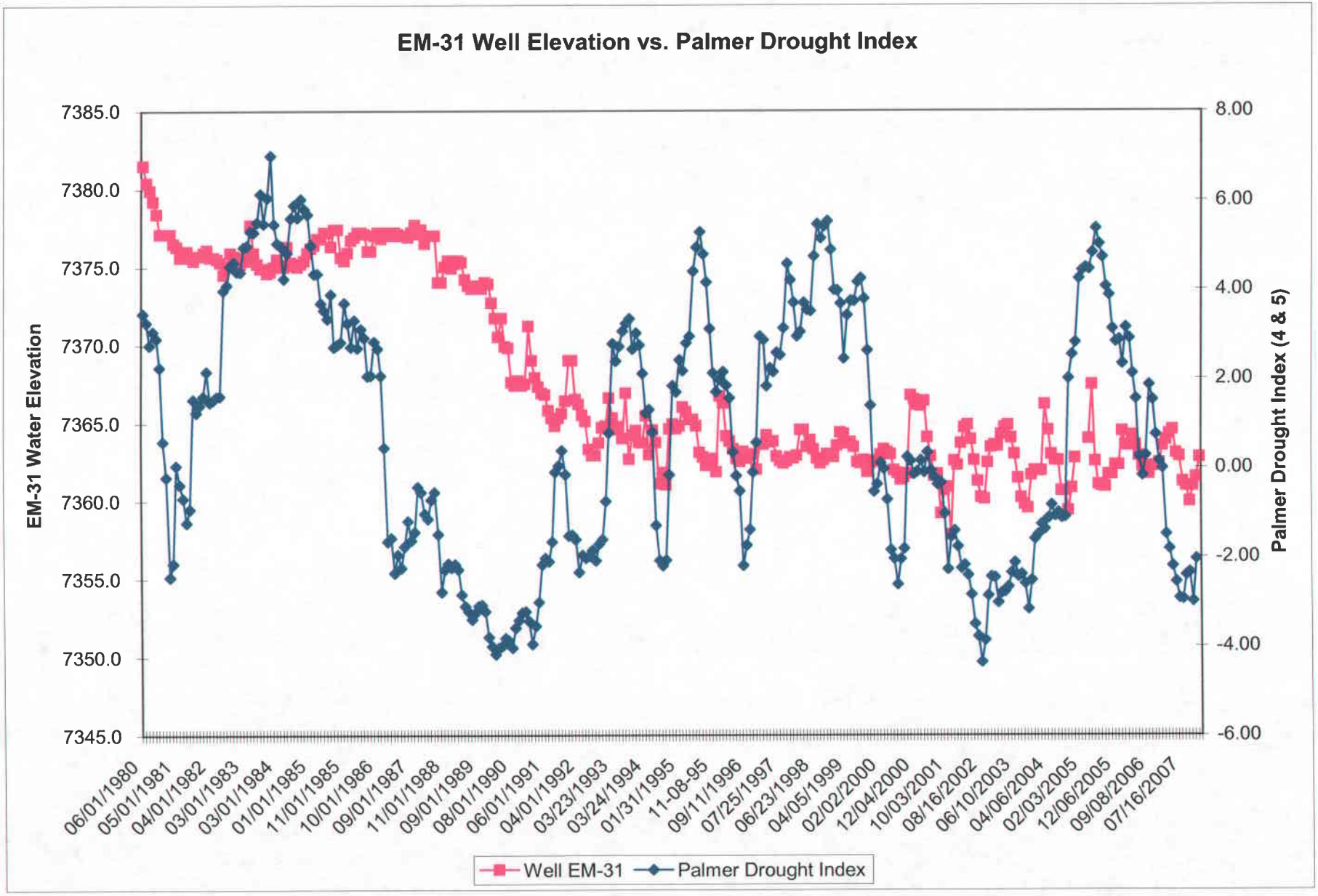
APPENDIX F
2007

COTTONWOOD CANYON

MONITORING WELLS
PIEZOMETRIC DATA

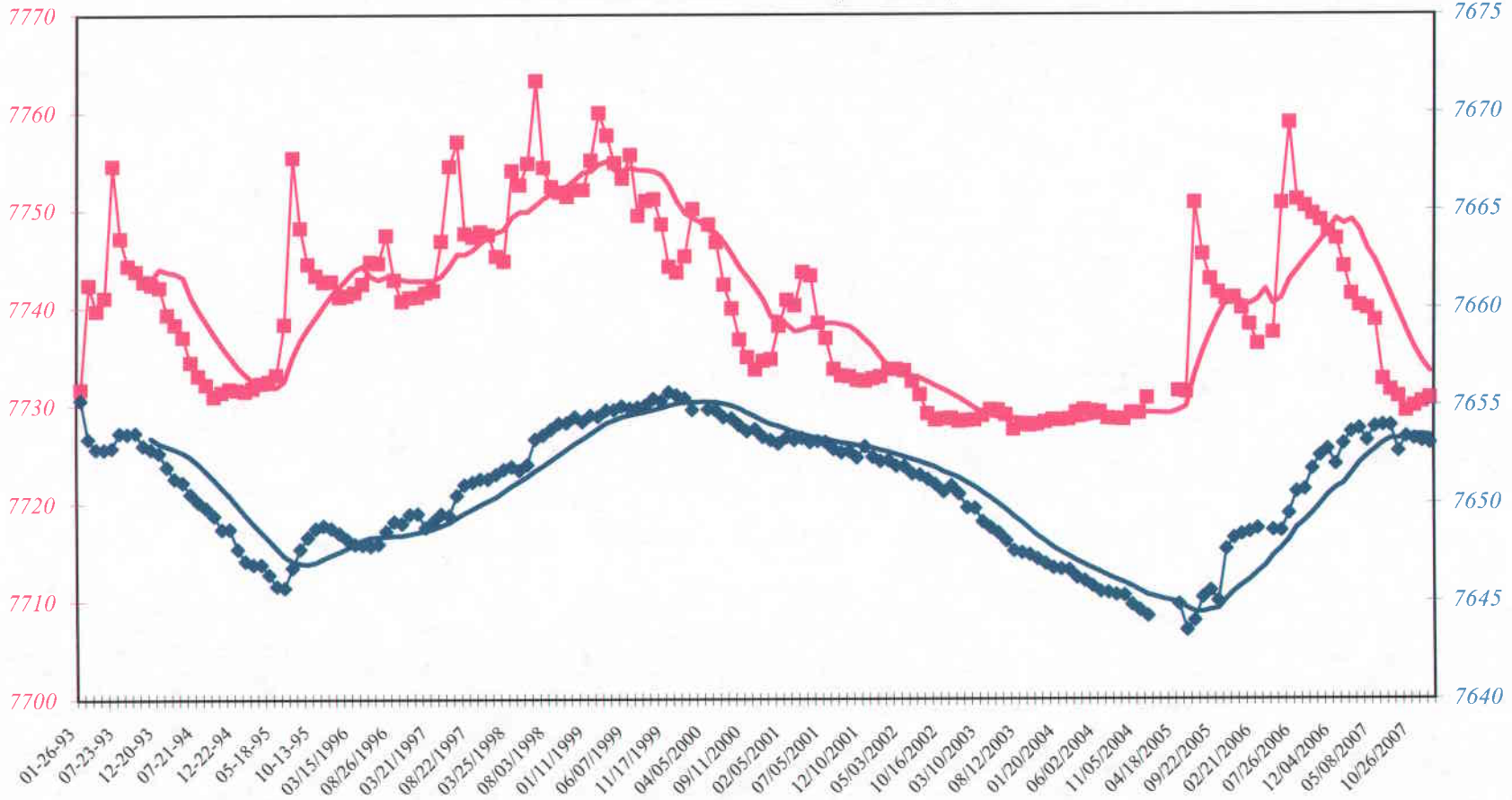



Cottonwood Well EM-31
7385.0
7380.0
7375.0
7370.0
7365.0
7360.0
06/01/1980
05/01/1981
04/01/1982
03/01/1983
03/01/1984
01/01/1985
11/01/1985
10/01/1986
09/01/1987
11/01/1988
09/01/1989
08/01/1990
06/01/1991
04/01/1992
03/23/1993
03/24/1994
01/31/1995
11-08-95
09/11/1996
07/25/1997
06/23/1998
04/05/1999
02/02/2000
12/04/2000
10/03/2001
08/16/2002
06/10/2003
04/06/2004
02/03/2005
12/06/2005
09/08/2006
07/16/2007
EM-31
10 per. Mov. Avg. (EM-31)


EM-31 Well Elevation vs. Palmer Drought Index
EM-31 Water Elevation
Palmer Drought Index (4 & 5)
7385.0
7380.0
7375.0
7370.0
7365.0
7360.0
7355.0
7350.0
7345.0
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
06/01/1980
05/01/1981
04/01/1982
03/01/1983
03/01/1984
01/01/1985
11/01/1985
10/01/1986
09/01/1987
11/01/1988
09/01/1989
08/01/1990
06/01/1991
04/01/1992
03/23/1993
03/24/1994
01/31/1995
11-08-95
09/11/1996
07/25/1997
06/23/1998
04/05/1999
02/02/2000
12/04/2000
10/03/2001
08/16/2002
06/10/2003
04/06/2004
02/03/2005
12/06/2005
09/08/2006
07/16/2007
Well EM-31
Palmer Drought Index

Cottonwood Wells - Site 1

Groundwater Elevation Data with Trend Lines

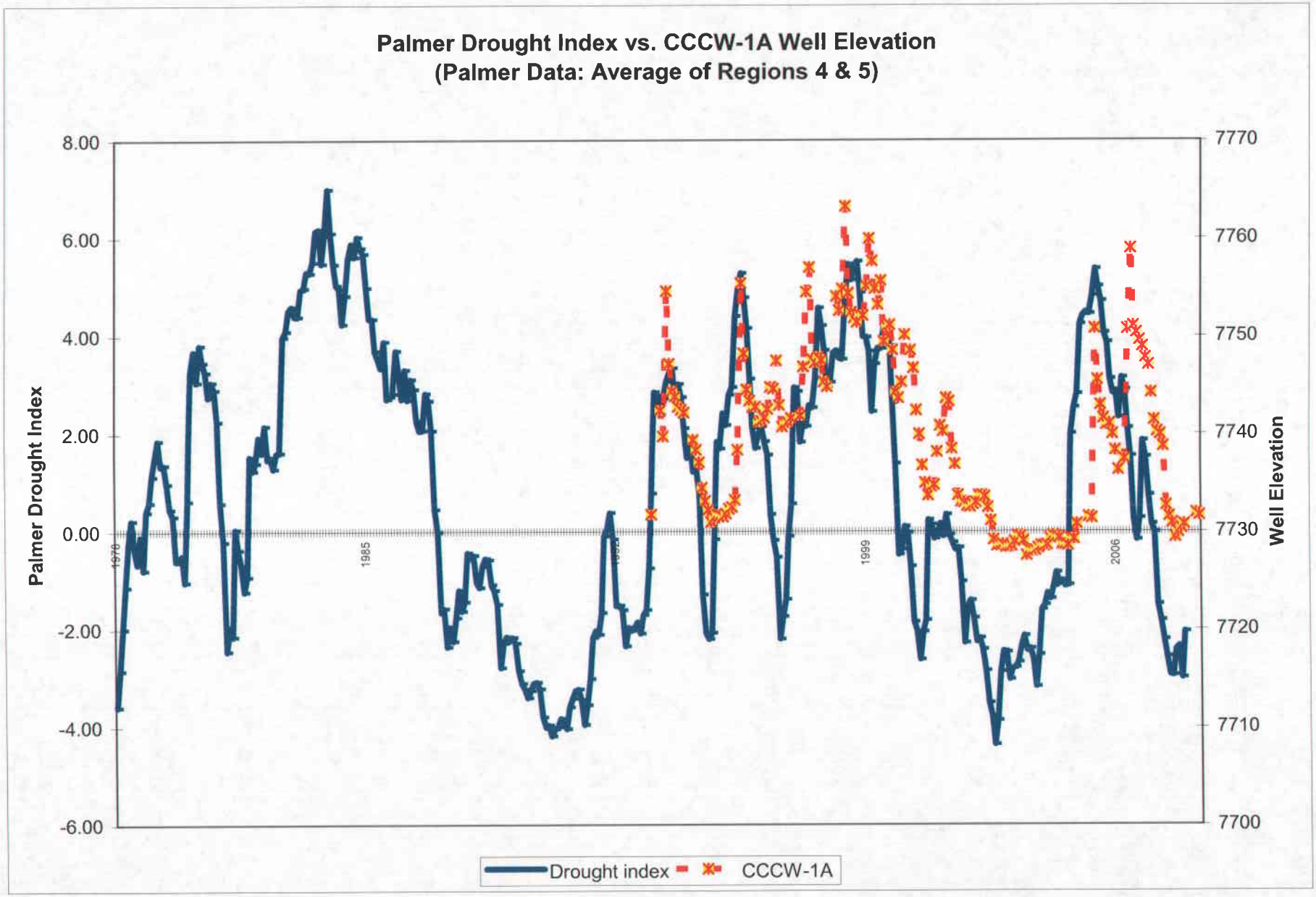


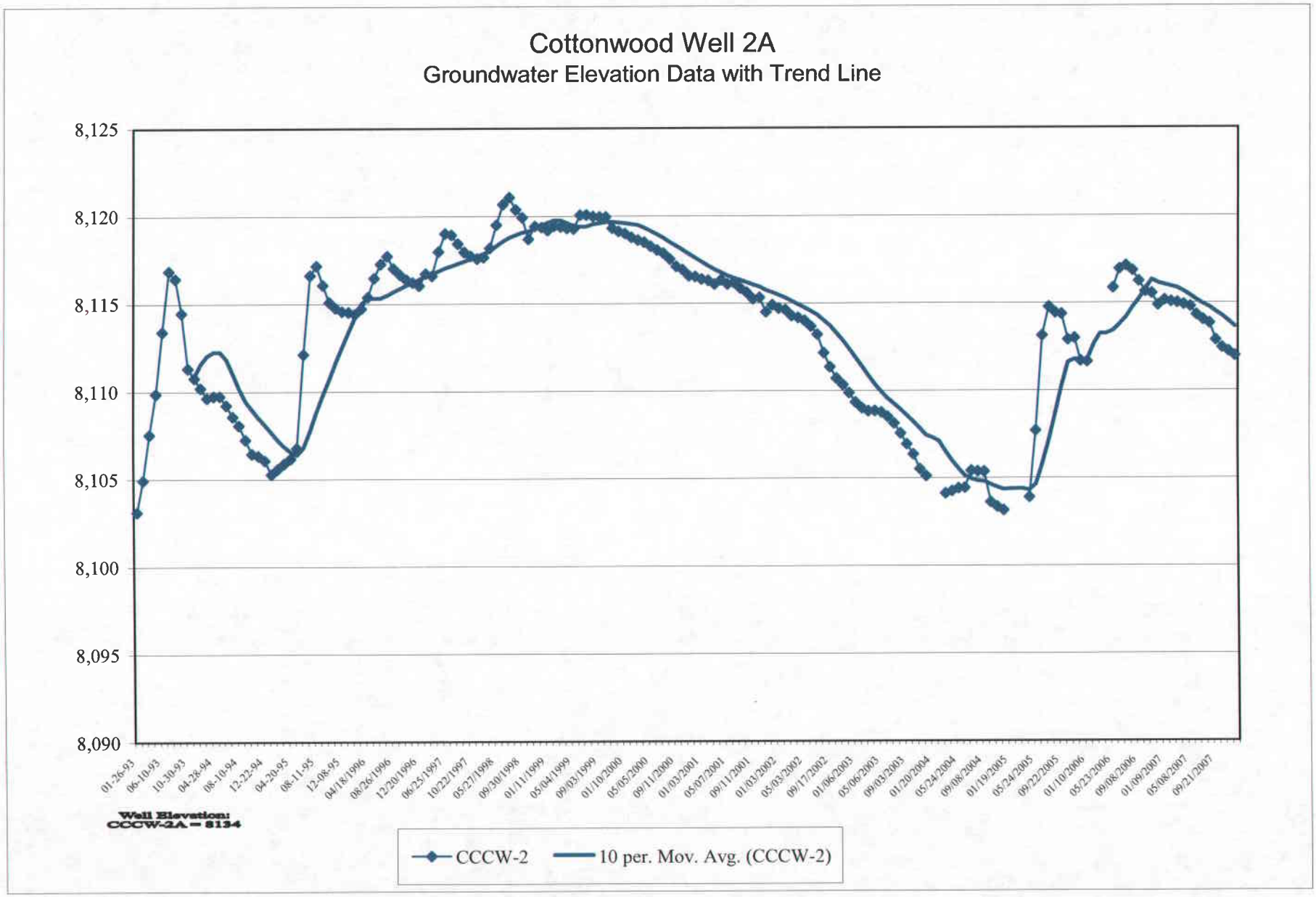
Well Elevations:
CCCW-1A = 7843
CCCW-1S = 7843

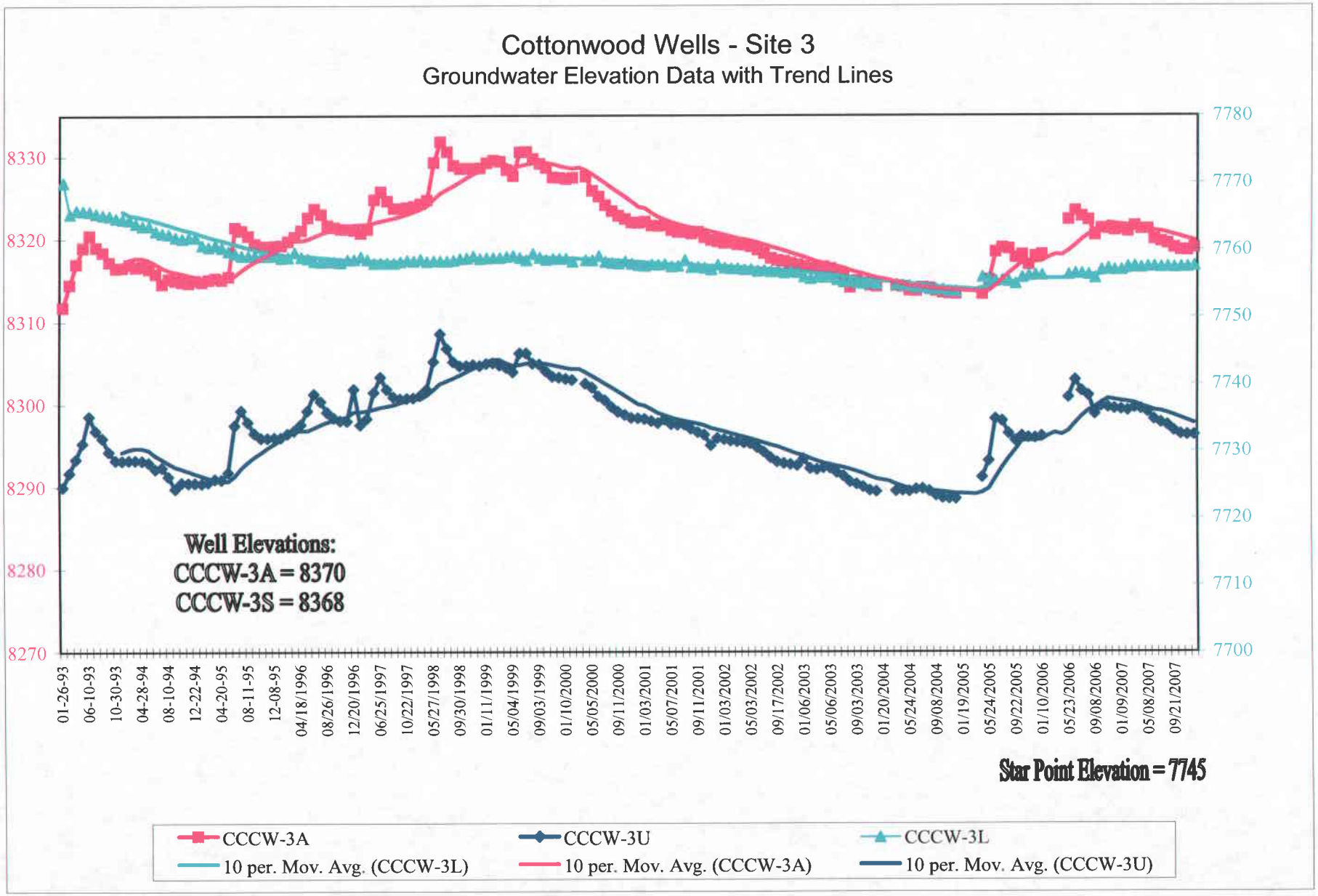
Star Point Formation
Elevation = 7232

Cottonwood Spring Elevation = 7749
Roans Canyon Spring = 7632

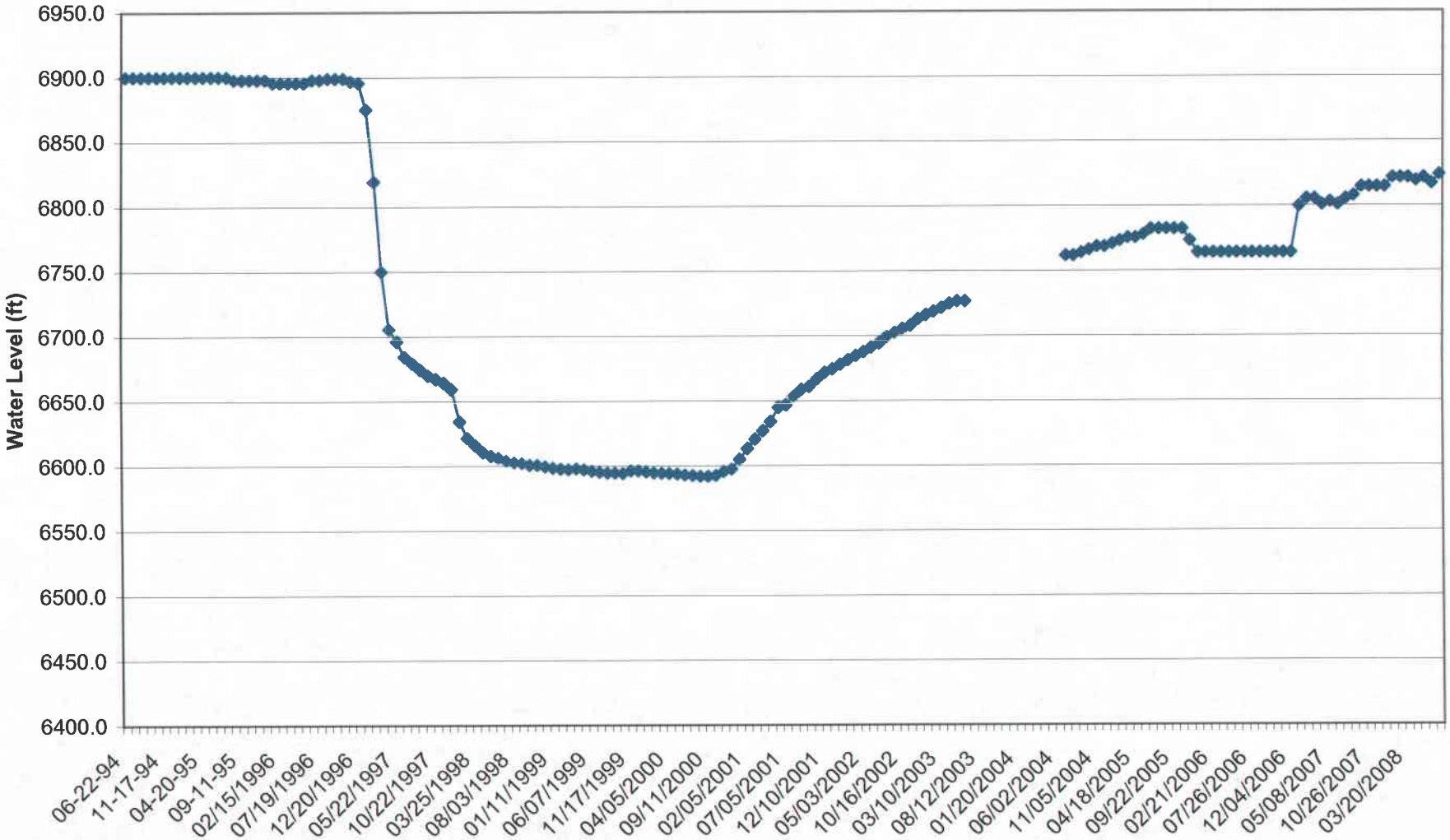
CCCW-1A
CCCW-1S
10 per. Mov. Avg. (CCCW-1A)
10 per. Mov. Avg. (CCCW-1S)


Palmer Drought Index vs. CCCW-1A Well Elevation
(Palmer Data: Average of Regions 4 & 5)
Palmer Drought Index
Well Elevation
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
7770
7760
7750
7740
7730
7720
7710
7700
1976
1985
1992
1999
2006
Drought index
CCCW-1A


Cottonwood Well 2A
Groundwater Elevation Data with Trend Line
8,125
8,120
8,115
8,110
8,105
8,100
8,095
8,090
01-26-93
06-10-93
10-30-93
04-28-94
08-10-94
12-22-94
04-20-95
08-11-95
12-08-95
04/18/1996
08/26/1996
12/20/1996
06/25/1997
10/22/1997
05/27/1998
09/30/1998
01/11/1999
05/04/1999
09/03/1999
01/10/2000
05/05/2000
09/11/2000
01/03/2001
05/07/2001
09/11/2001
01/03/2002
05/03/2002
09/17/2002
01/06/2003
05/06/2003
09/03/2003
01/20/2004
05/24/2004
09/08/2004
01/19/2005
05/24/2005
09/22/2005
01/10/2006
05/23/2006
09/08/2006
01/09/2007
05/08/2007
09/21/2007
Well Elevation:
CCCW-2A = 8134
CCCW-2
10 per. Mov. Avg. (CCCW-2)


Cottonwood Wells - Site 3
Groundwater Elevation Data with Trend Lines
8330
8320
8310
8300
8290
8280
8270
7780
7770
7760
7750
7740
7730
7720
7710
7700
01-26-93
06-10-93
10-30-93
04-28-94
08-10-94
12-22-94
04-20-95
08-11-95
12-08-95
04/18/1996
08/26/1996
12/20/1996
06/25/1997
10/22/1997
05/27/1998
09/30/1998
01/11/1999
05/04/1999
09/03/1999
01/10/2000
05/05/2000
09/11/2000
01/03/2001
05/07/2001
09/11/2001
01/03/2002
05/03/2002
09/17/2002
01/06/2003
05/06/2003
09/03/2003
01/20/2004
05/24/2004
09/08/2004
01/19/2005
05/24/2005
09/22/2005
01/10/2006
05/23/2006
09/08/2006
01/09/2007
05/08/2007
09/21/2007
Well Elevations:
CCCW-3A = 8370
CCCW-3S = 8368
Star Point Elevation = 7745
CCCW-3A
CCCW-3U
CCCW-3L
10 per. Mov. Avg. (CCCW-3L)
10 per. Mov. Avg. (CCCW-3A)
10 per. Mov. Avg. (CCCW-3U)

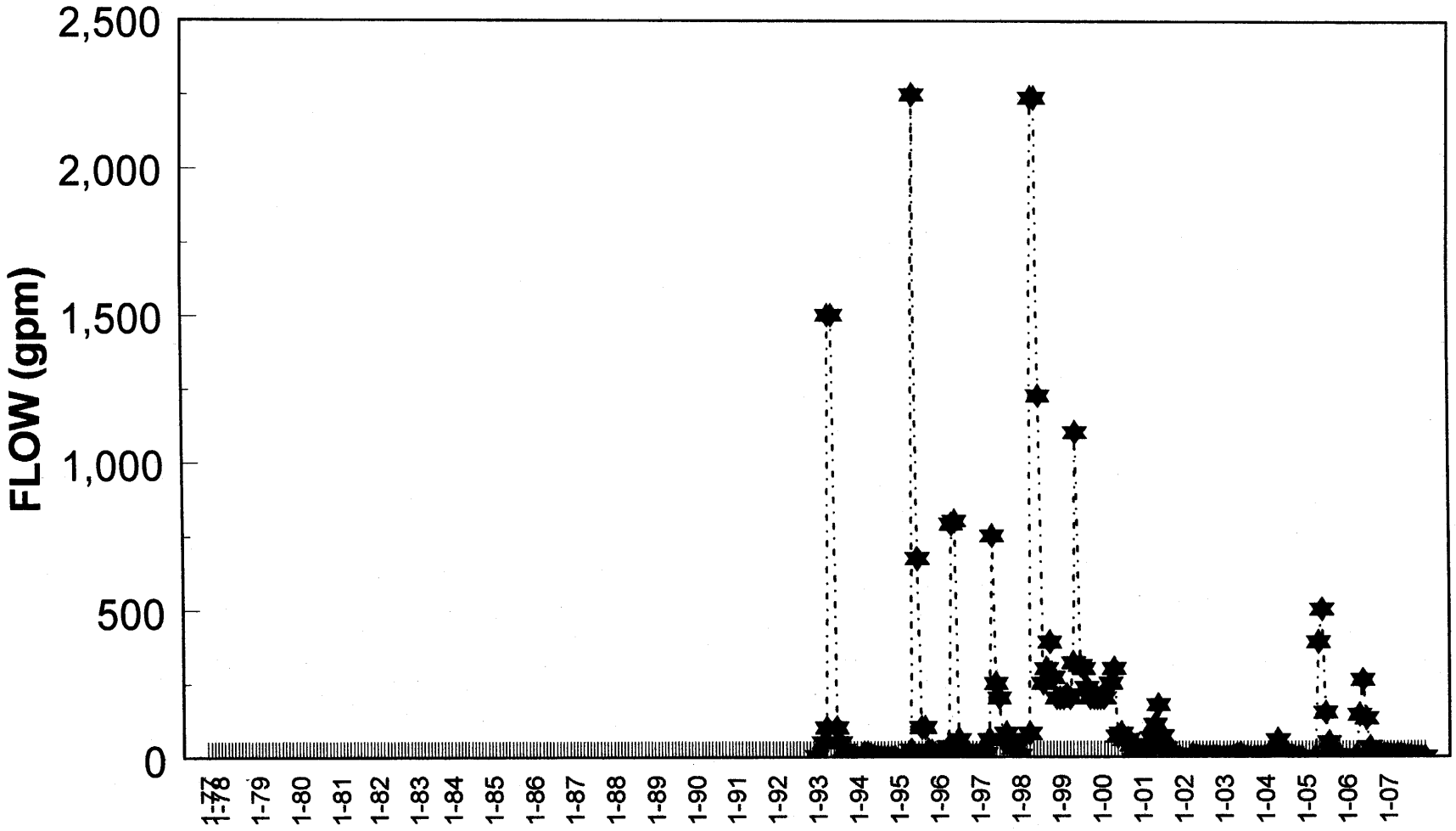
Trail Mountain Mine
Straight Canyon Well: TM-3



COTTONWOOD CANYON CREEK

SW-1

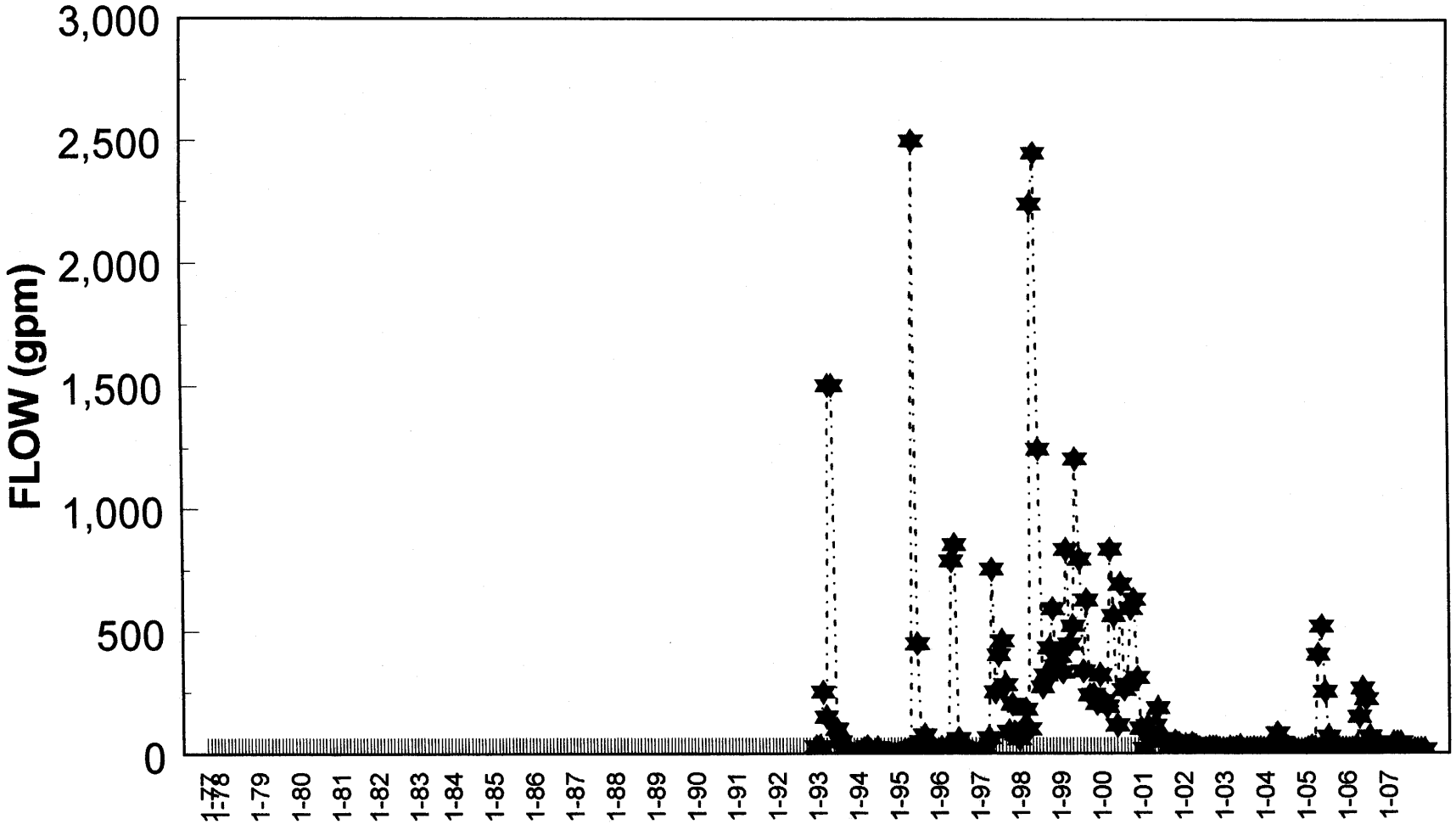
DISCHARGE RECESSION CURVE



COTTONWOOD CANYON CREEK

SW-2

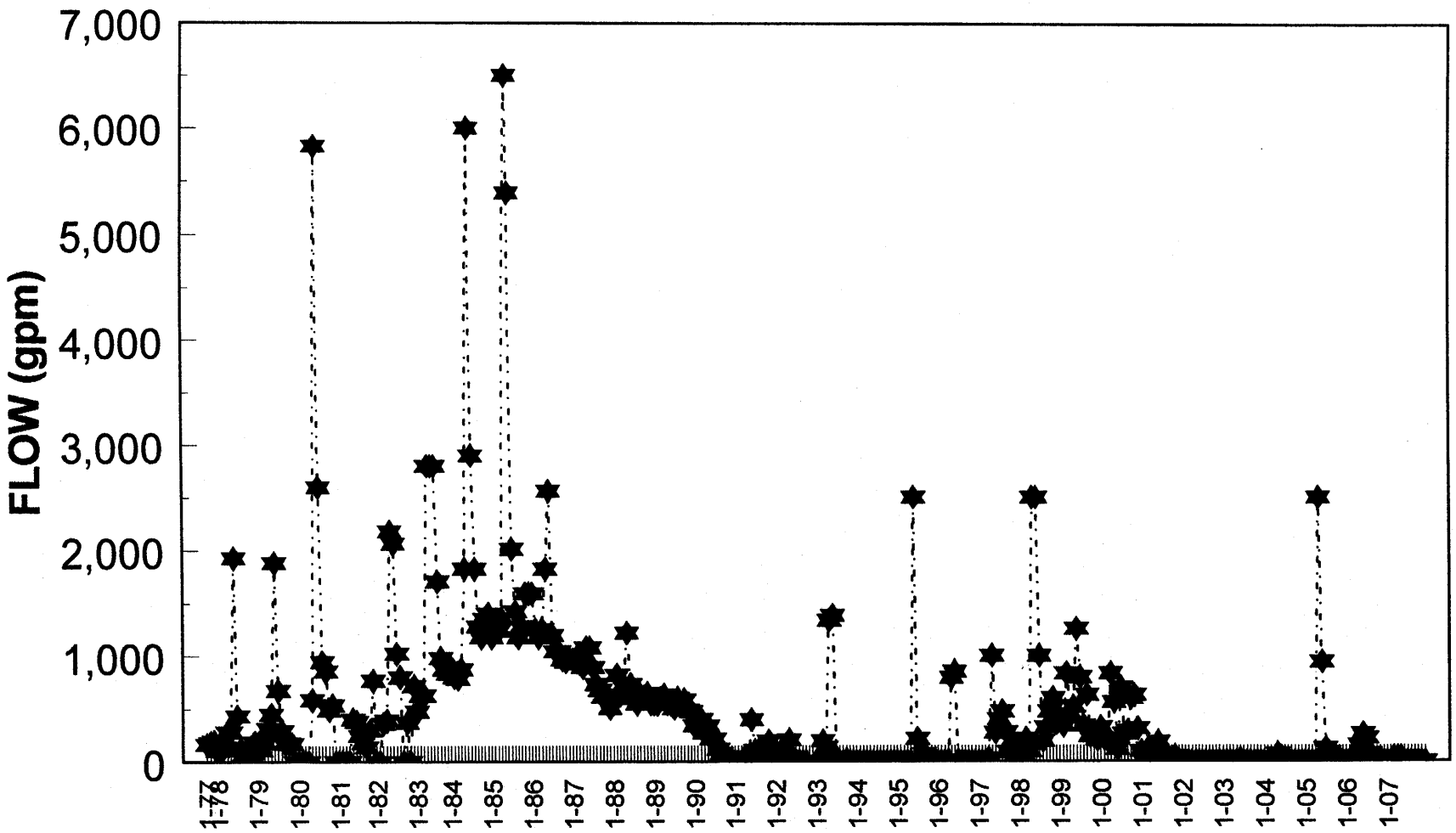
DISCHARGE RECESSION CURVE



COTTONWOOD CANYON CREEK

@ USGS FLUME

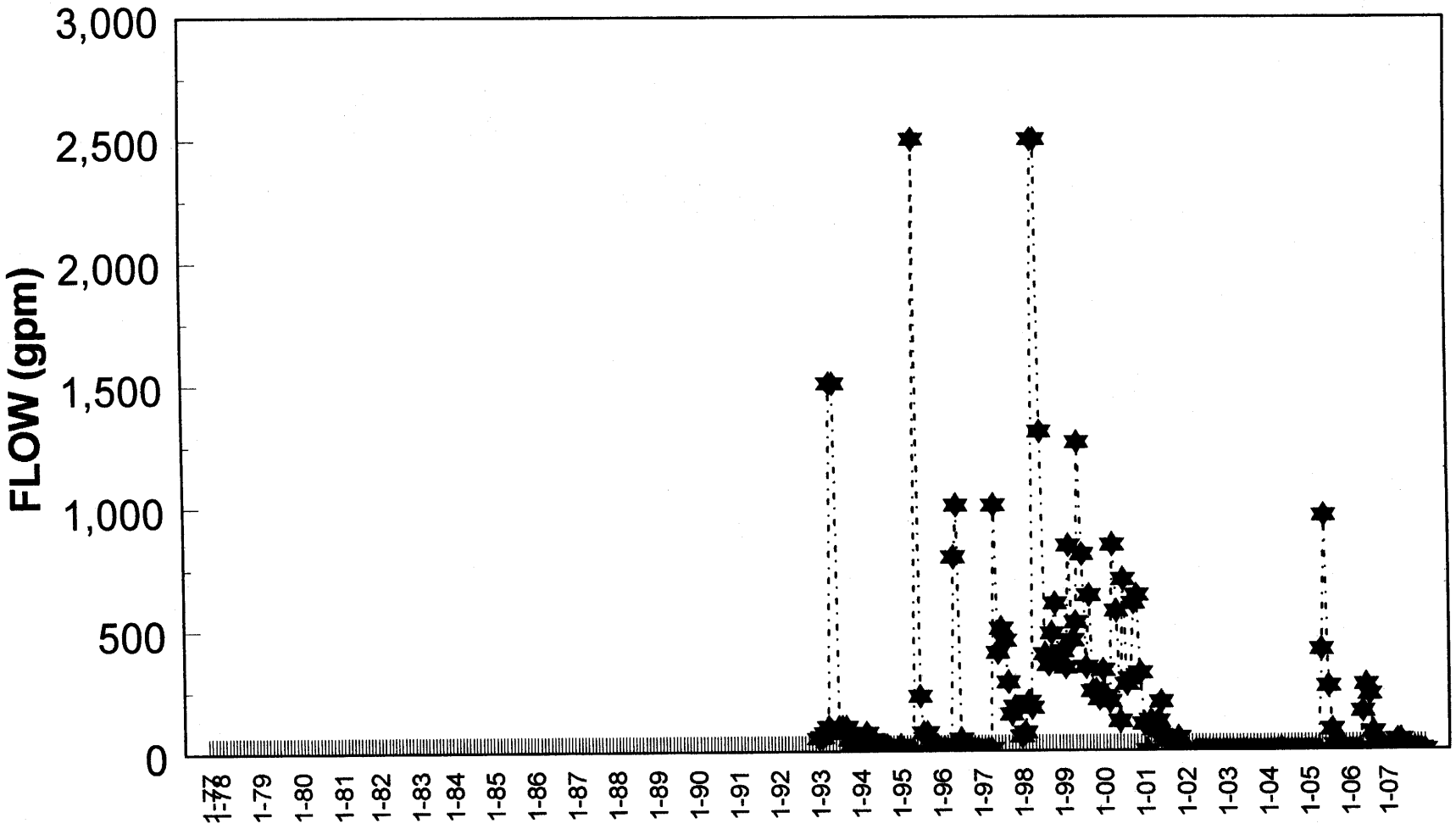
DISCHARGE RECESSION CURVE



COTTONWOOD CANYON CREEK

SW-3

DISCHARGE RECESSION CURVE



STRAIGHT CANYON WATER QUALITY *

T-19

APPENDIX F

2007* SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20070321		322	55.9	16	29	1016	420	2.19		68	0.04		8.29	2.88	67.80	179	158	622
20070629		357	59.2	6	36	1282	548			97			8.44	5.52	86.70	313		842
20070921		357	98.9	49	43	1840	836			143	0.02		8.07	8.86	83.90	518		1154
20071210	9	364	76.6	22	40	1452	640			109			8.29	6.34	89.83	409		975
2007**																		
MIN	9	322	55.9	6	29	1016	420	2.19		68	0.02		8.07	2.88	67.80	179	158	622
MAX	9	364	98.9	49	43	1840	836	2.19		143	0.04		8.44	8.86	89.83	518	158	1154
MEAN	9	350	72.6	23	37	1398	611	2.19		104	0.03		8.27	5.90	82.06	355	158	898
No. of Analysis	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2006**																		
MIN		290	43	13	19	843	338	0		56	0		8	2	36	99	13	456
MAX		312	62	13	30	1127	461	1		75	0		9	3	66	203	51	658
MEAN		298	52	13	25	944	387	1		62	0		8	3	51	139	31	526
2005**																		
MIN		287	42	17	22	827	360	0		62	0		9	2	44	124	33	498
MAX		329	68	24	37	1493	552	1		93	0		9	5	92	341	338	879
MEAN		306	55	20	28	1097	438	1		73	0		9	3	64	211	135	657
2004**																		
MIN		334	51.9	8	33	1060	429	0.07		73			8.41	3.93	63	271	10	698
MAX		430	95.7	8	38	1716	906	2.54		162			8.46	10.10	88	609	177	1256
MEAN		381	70.4	8	36	1326	617	0.90		107			8.43	6.09	78	393	94	913
2003**																		
MIN		376	64.1	5	32	1324	605	0.03	0.04	107		2	8.42	5.46	77	362	5	885
MAX		500	86.7	19	43	1646	836	0.08	0.04	154		2	8.67	9.48	90	542	8	1205
MEAN		425	74.7	12	36	1462	706	0.06	0.04	126		2	8.54	7.14	84	440	7	1026
2002**																		
MIN		410	58.0	5	33	1252	495	0.50		85			8.38	4.00	88	303	46	816
MAX		498	79.0	14	40	1674	786	0.50		143			8.55	9.00	90	520	46	1198
MEAN		459	68.0	8	37	1423	622	0.50		110			8.46	6.00	89	397	46	983
2001**																		
MIN		345	42.0	12	42	1105	400	0.30		68			8.18	3.00	103	181	7	722
MAX		424	58.0	23	53	1319	516	2.50		92			8.53	5.00	109	340	309	868
MEAN		393	50.8	16	48	1221	454	1.10		80			8.33	3.75	105	266	113	792
2000**																		
MIN		345	42.0	12	42	1105	400	0.30		68			8.18	3.00	103	181	7	722
MAX		424	58.0	23	53	1319	516	2.50		92			8.53	5.00	109	340	309	868
MEAN		393	50.8	16	48	1221	454	1.10		80			8.33	3.75	105	266	113	792
HISTORICAL 1977-2006																		
MIN	0.1	190	14.3	1.0	19.0	581	178	0.034	0.03	24	0.002	1.0	7.44	0.70	12	39.0	1.0	340
MAX	14.0	500	95.7	78.0	67.9	1716	993	5.10	0.38	162	0.20	5.0	8.87	30.20	125	609.0	420.0	1256
MEAN	6.9	366	51.5	15.1	36.8	1039	433	0.74	0.15	70	0.06	3.8	8.43	3.95	73.53	205.8	80.6	650
No. of Analysis	13	67	67	45	67	63	67	53	14	67	20	12	66	65	67	64	53	67

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

INDIAN CREEK WATER QUALITY *

ICA

APPENDIX F

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20071009		251	72.0		2	496		274	0.30		22.8	0.02		8.02	1.07	3.01	14	26	294
2006**																			
MEAN		297	77.5		3	554		282	0.06		21.5	0.01		7.96	0.64	2.71	8		282
2005**																			
MEAN		265	80.8		3	571	10	294	0.07		23	0		8.30	1.56	3.27	8	5	291
2004**																			
MEAN		262	77.4		2	493		281	0.08		21.4	0.03		8.06	0.79	2.92	13	7	299
2003**																			
MEAN		312	71.5		2	493		271	0.02		22.4			8.24	0.91	2.93	19		265
2002**																			
MEAN		286	67.0		2	483		258			22.0			8.25		4.00	23		304
2001**																			
MEAN		327	71.0		3	633		264	0.20		21.0			8.21		3.00	9		289
2000**																			
MEAN		313	69.0		2	487		255	0.20		20.0			8.10		3.00	10	43	274
HISTORICAL 2000-2006																			
MIN		262	67.0		2.0	483		255	0.02		20.0	0.002		7.96	0.64	2.71	8.0	5.0	265
MAX		327	80.8		3.0	633		294	0.20		22.5	0.007		8.30	1.56	4.00	23.0	43.0	304
MEAN		295	73.5		2.3	531		272	0.11		21.5	0.005		8.16	0.98	3.12	12.8	18.3	286
No. of Analysis		7	7		7	7		7	6		7	3		7	4	7	7	3	7

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

INDIAN CREEK WATER QUALITY *

ICB

APPENDIX F

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20071009		237	64.9		2.0	466		258	1.43		23	0.046		8.09	1.01	3.73	14.0	37	286
2006**																			
MEAN		239	72.0		3.0	527		268	0.24		22	0.005		8.25	0.61	3.62	9.0		278
2005**																			
MEAN		238	68.2	5	2.0	534	9	258	0.20		21	0.013		8.41	1.00	4.29	10.0	9	268
2004**																			
MEAN		258	73.4		2.0	490		271	0.72		21	0.025		7.94	0.75	3.29	12.0	10	284
2003**																			
MEAN		276	59.3		2.0	427		236	0.37		21			8.13	0.93	3.41	11.0	21	216
2002**																			
MEAN		282	57.0		2.0	432		233	0.40		22			8.21		4.00	8.0		235
2001**																			
MEAN		293	59.0		2.4	559		234	0.20		21			8.26		3.00	7.7	6	253
2000**																			
MEAN	12	301	65.0		2.0	468		245	0.10		20			8.19	1.00	3.00	9.0	9	266
HISTORICAL 2000-2006																			
MIN	12.0	238	57.0	5.0	2.0	427		233	0.10		20	0.005		7.94	0.61	3.00	7.7	6.0	216
MAX	12.0	301	73.4	5.0	3.0	559		271	0.72		22	0.023		8.41	1.00	4.29	12.0	21.0	284
MEAN	12.0	270	64.8	5.0	2.2	491		249	0.32		21	0.011		8.20	0.86	3.52	9.5	11.0	257
No. of Analysis	1	7	7	1	7	7		7	7		7	3		7	5	7	7	5	7

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

INDIAN CREEK WATER QUALITY *

ICD

APPENDIX F

2007** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20071009		256	96.8	6.0	4.0	717		388	0.12		35.60	0.02		8.17	1.39	10.30	130.0		484
2006**																			
MEAN		361	108.0		7	813	9	413	0.14		35	0.06	4.00	8.04	2.45	11.20	47	7	450
2005**																			
MEAN		361	108.0		7	813	9	413	0.14		35	0.06	4.00	8.04	2.45	11.20	47	7	450
No Flow During 2004																			
2003**																			
MEAN		307	81.5		3	624		329	0.13		30	0.009		8.21	1.05	8.87	108		367
2002**																			
MEAN		266	96.0		3	740		384	0.30		35			8.28		10.00	188		528
2001**																			
MEAN		379	80.0		4	753		323	0.10		30			8.29		10.00	43	10	369
2000**																			
MEAN		321	92.0		5	689		362			32			8.00	1.00	10.00	125		459
HISTORICAL 2000-2006																			
MIN		266	80.0		3.0	624		323	0.10		30	0.009		8.00	1.00	8.87	23.0	7.0	367
MAX		379	108.0		7.0	813		413	0.38		35	0.060		8.29	2.45	11.20	188.0	10.0	528
MEAN		327	91.3		4.5	725		361	0.21		32	0.036		8.14	1.41	9.82	89.0	8.5	425
No. of Analysis		6	6		6	6		6	5		6	3		6	4	6	6	2	6

* Quality parameters are reported as mg/l unless otherwise noted.

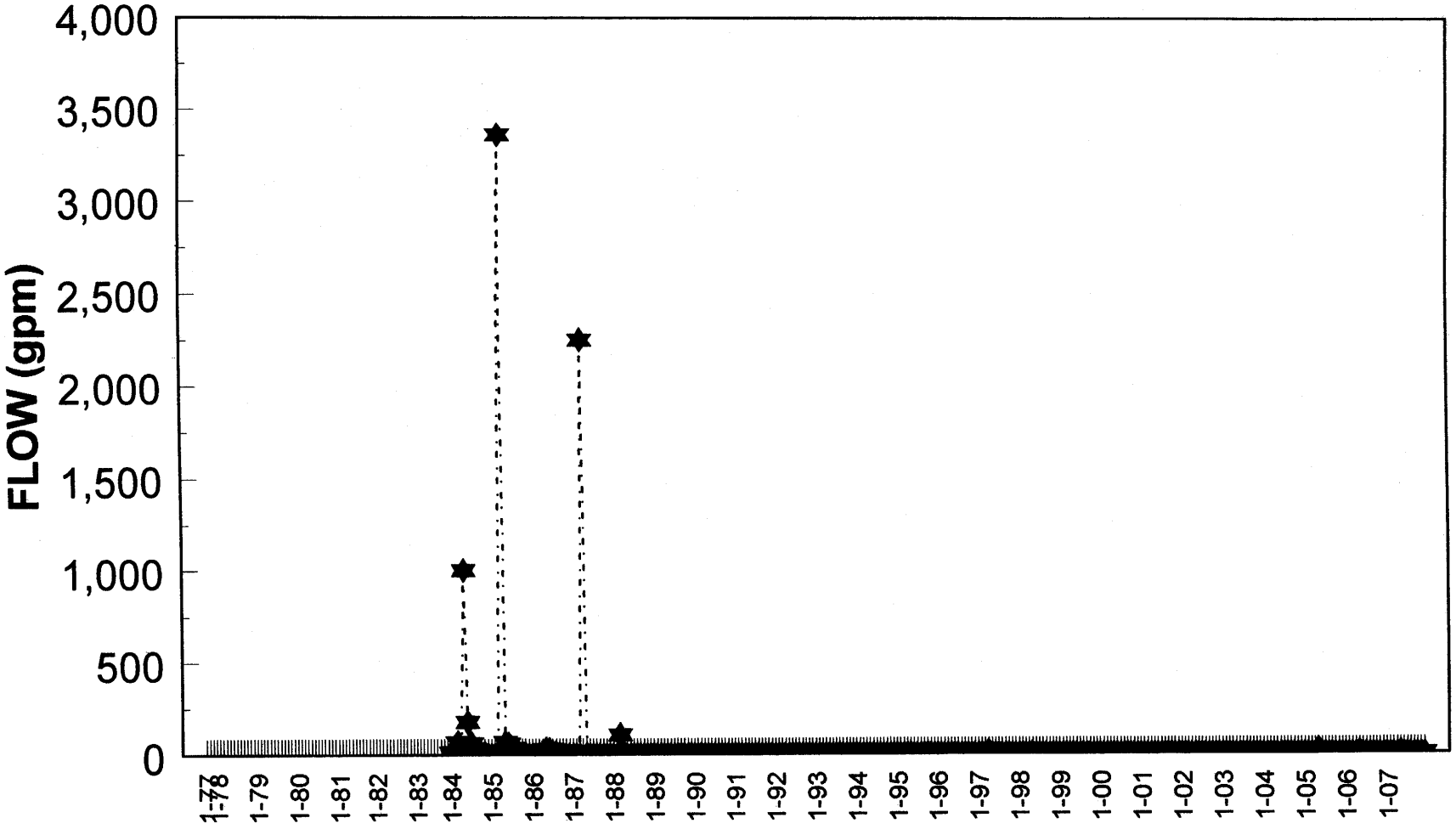
** Data: Database input restricted to values greater then laboratory minimum detection limit.

APPENDIX G
2007

GRIMES WASH

RIGHT FORK

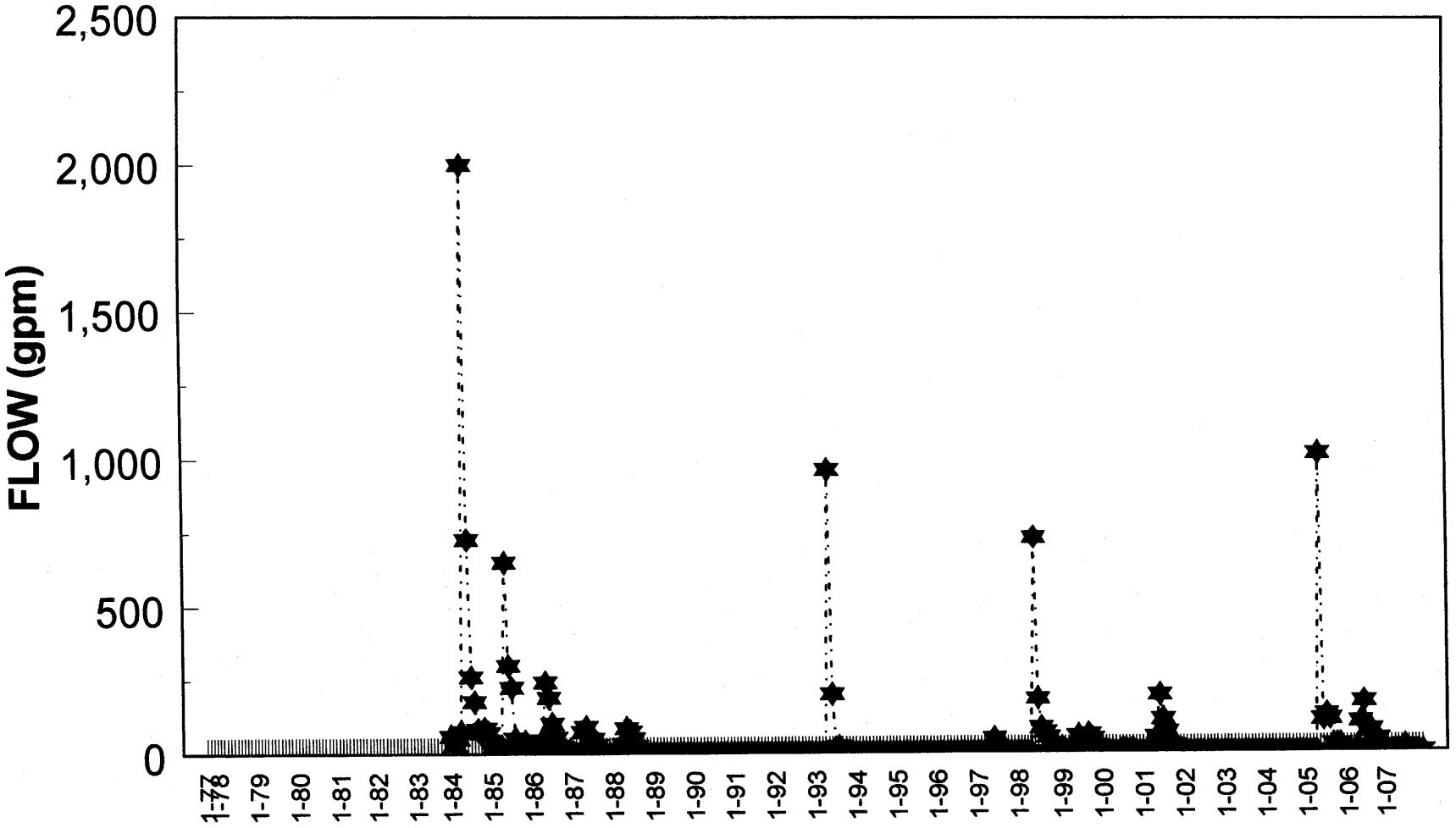
DISCHARGE RECESSION CURVE



GRIMES WASH

LEFT FORK

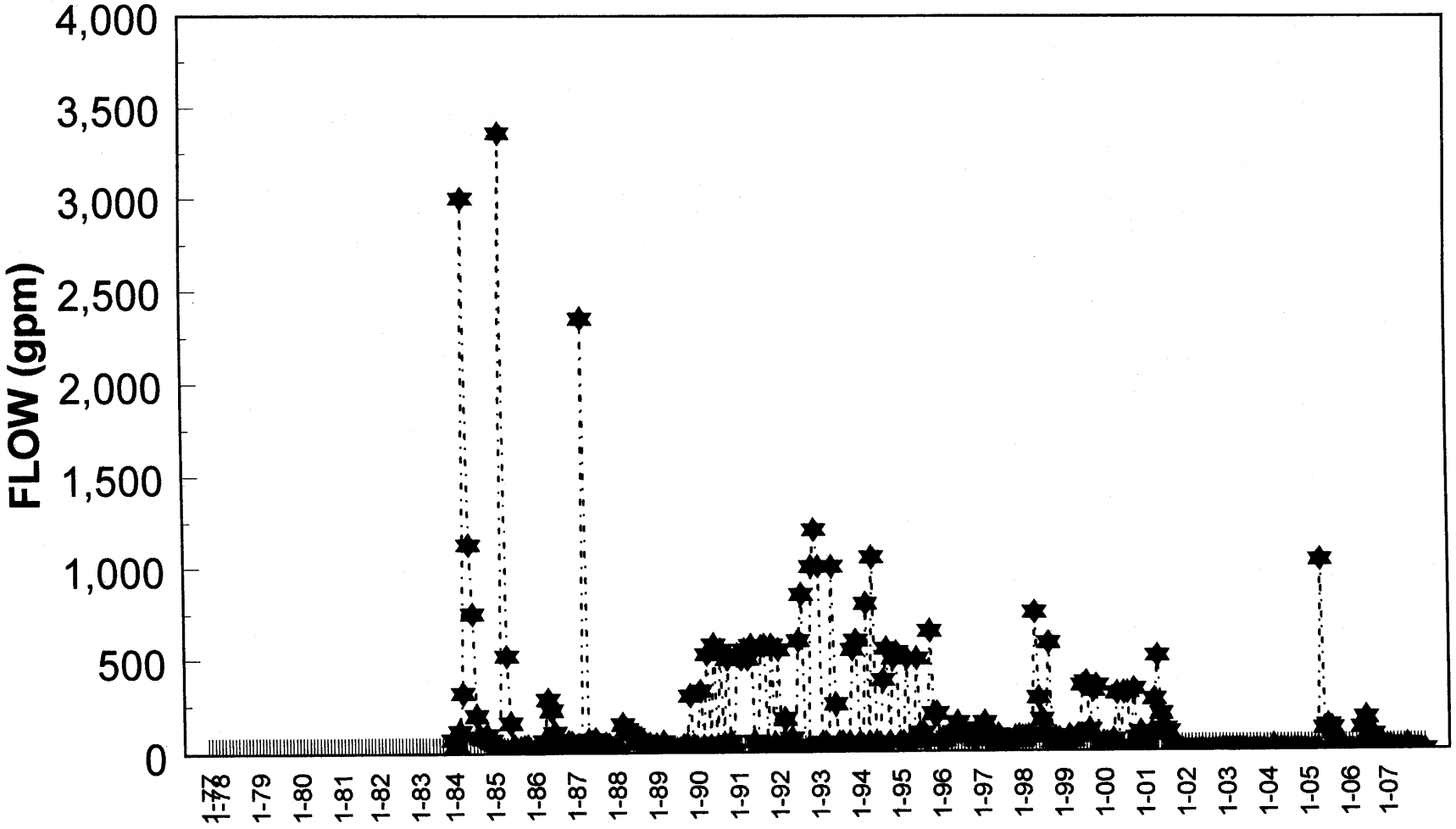
DISCHARGE RECESSION CURVE



GRIMES WASH

BELOW MINE

DISCHARGE RECESSION CURVE

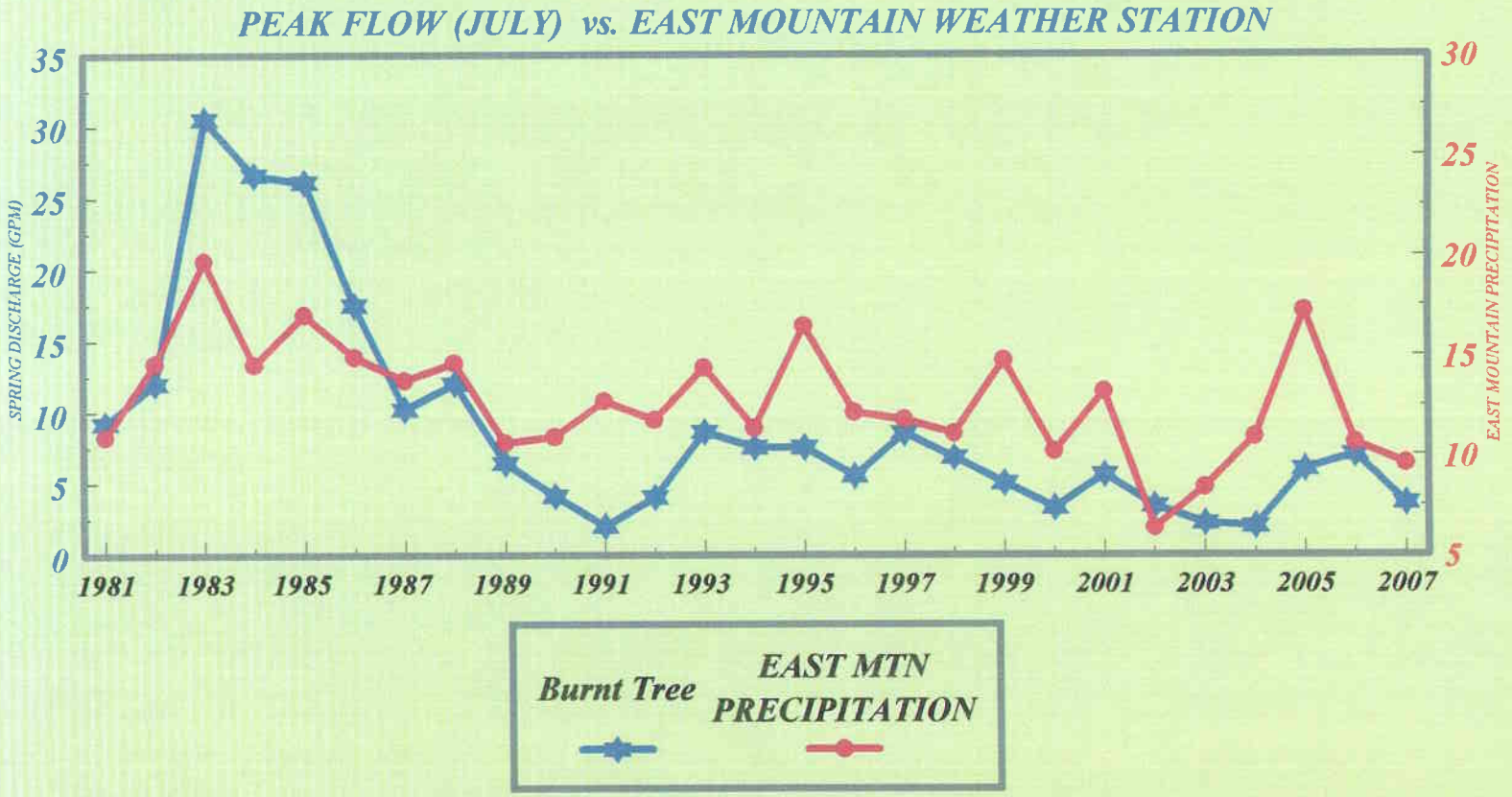


APPENDIX H
2007

EAST MOUNTAIN SPRINGS SOUTHERN AREA

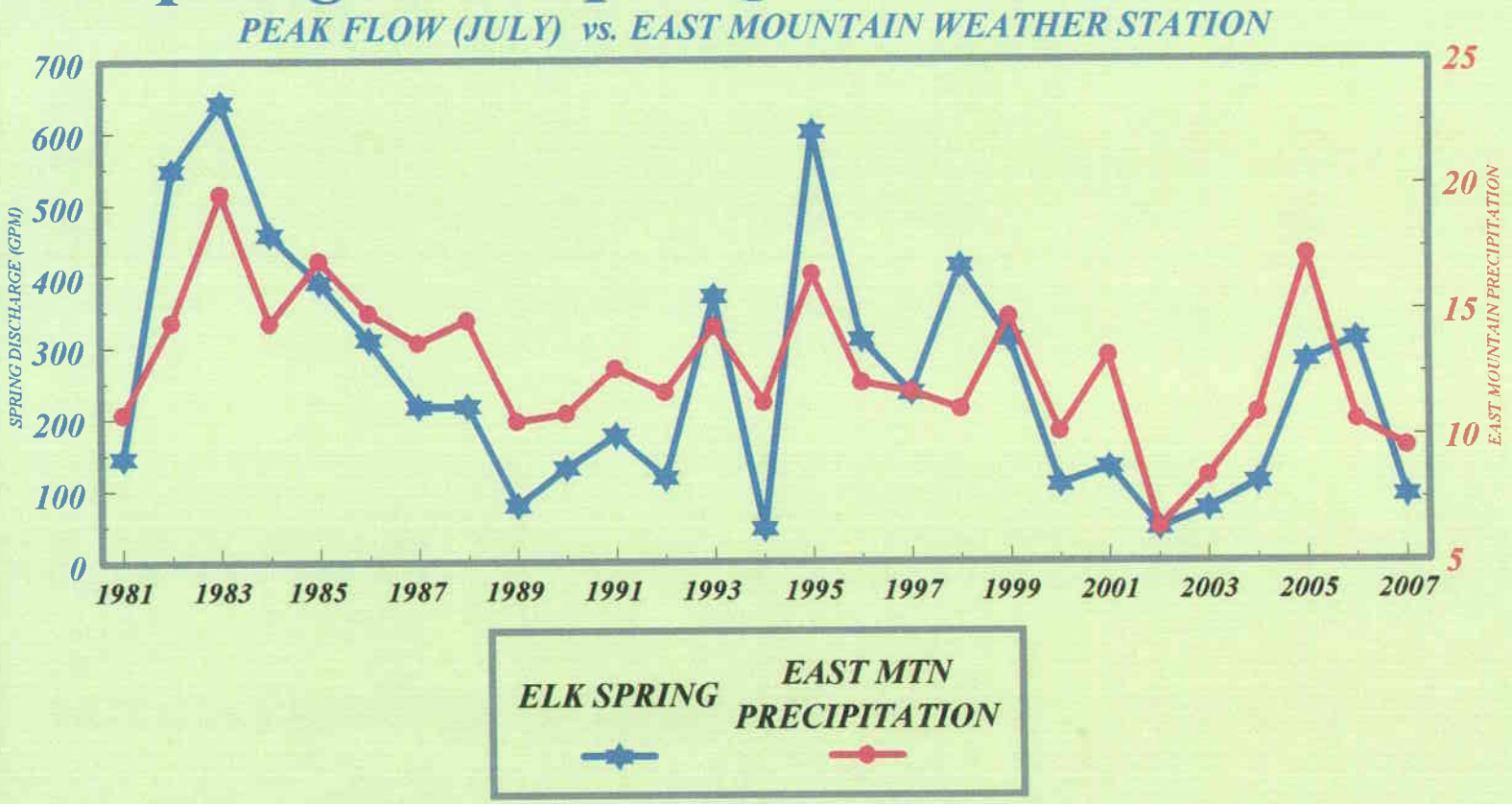
EAST MOUNTAIN SPRINGS

Spring: Burnt Tree vs. Precipitation



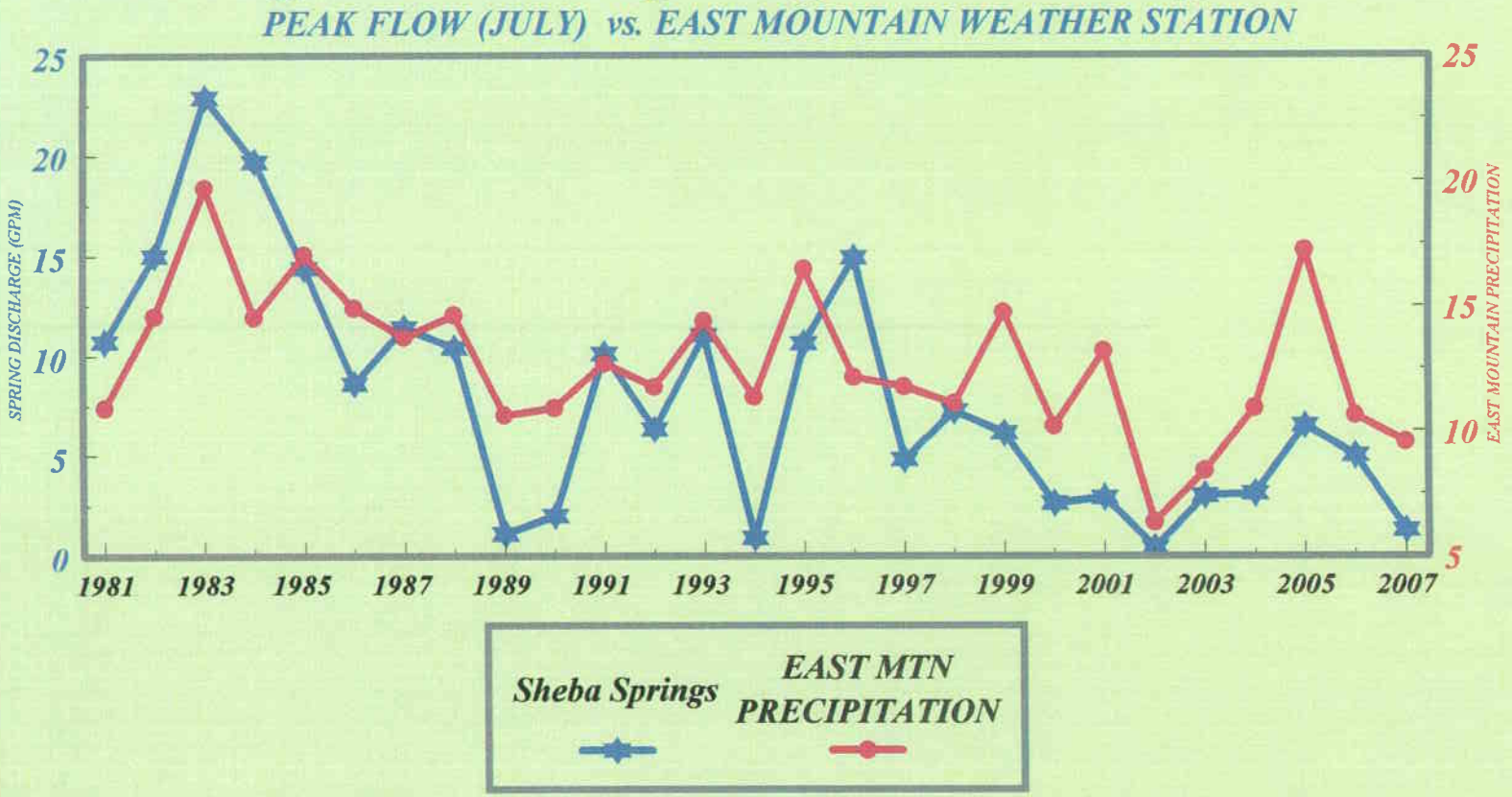
EAST MOUNTAIN SPRINGS

Spring: Elk Spring vs. Precipitation



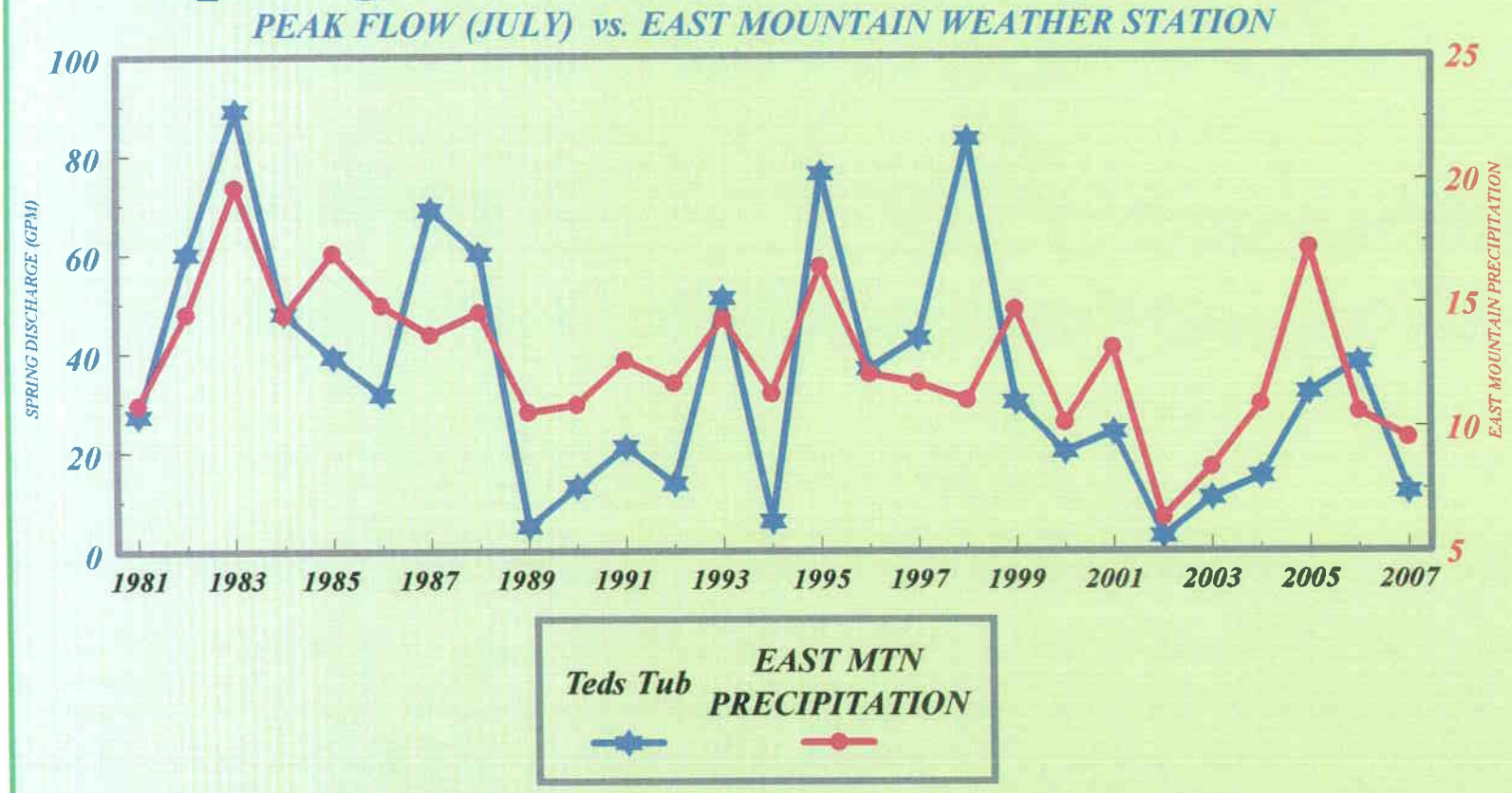
EAST MOUNTAIN SPRINGS

Spring: Sheba Springs vs. Precipitation



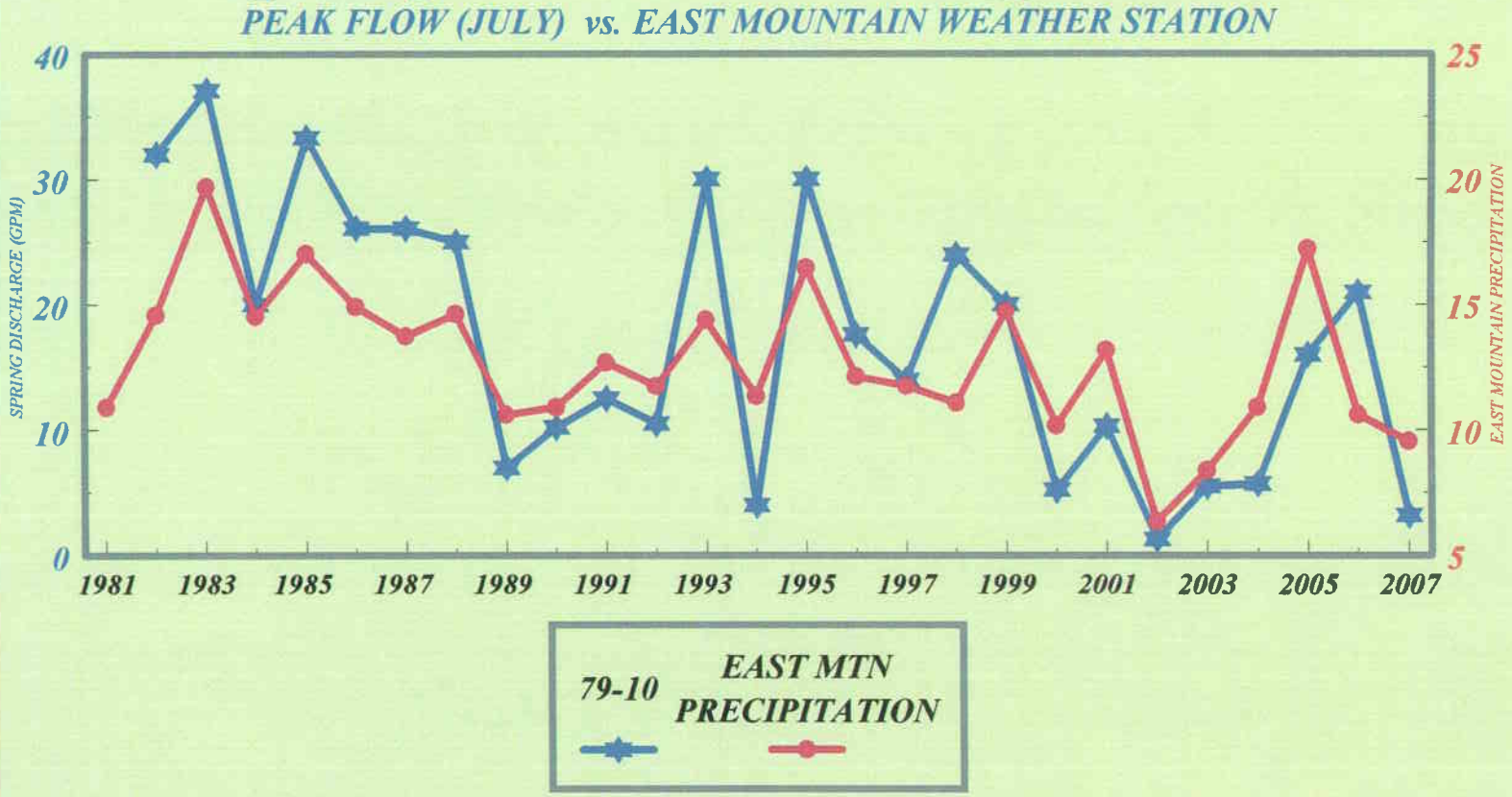
EAST MOUNTAIN SPRINGS

Spring: Teds Tub vs. Precipitation



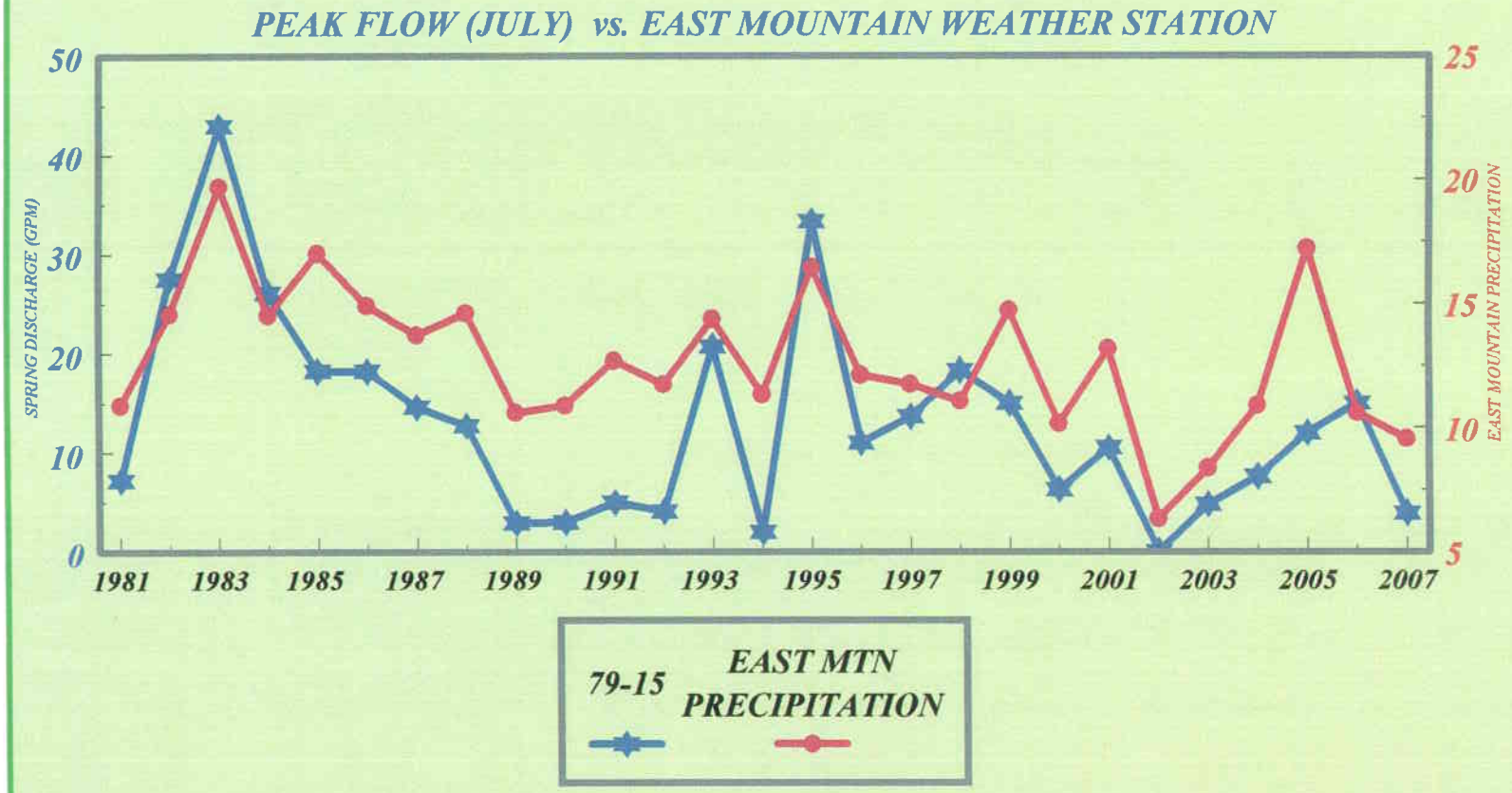
EAST MOUNTAIN SPRINGS

Spring: 79-10 vs. Precipitation



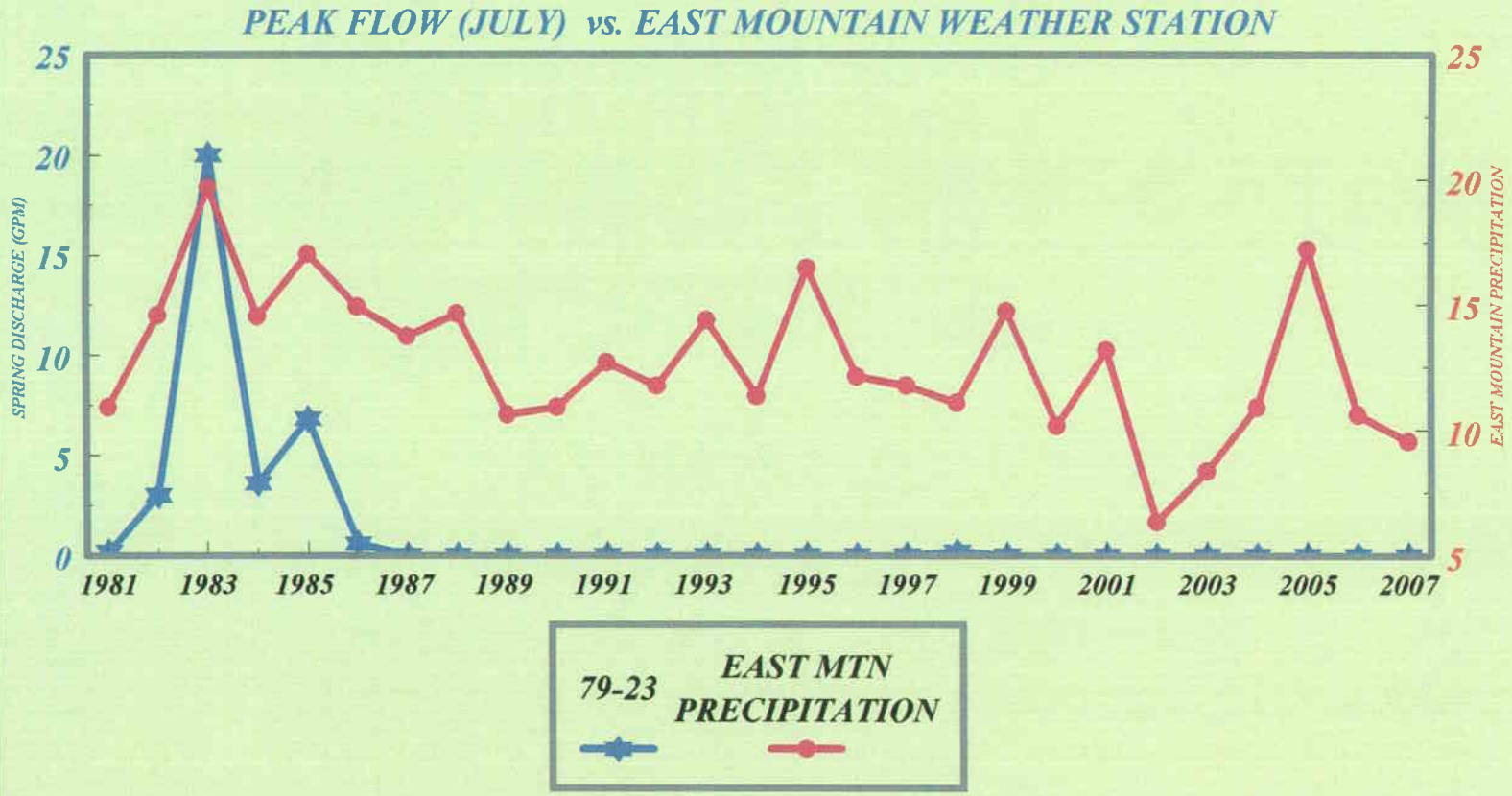
EAST MOUNTAIN SPRINGS

Spring: 79-15 vs. Precipitation



EAST MOUNTAIN SPRINGS

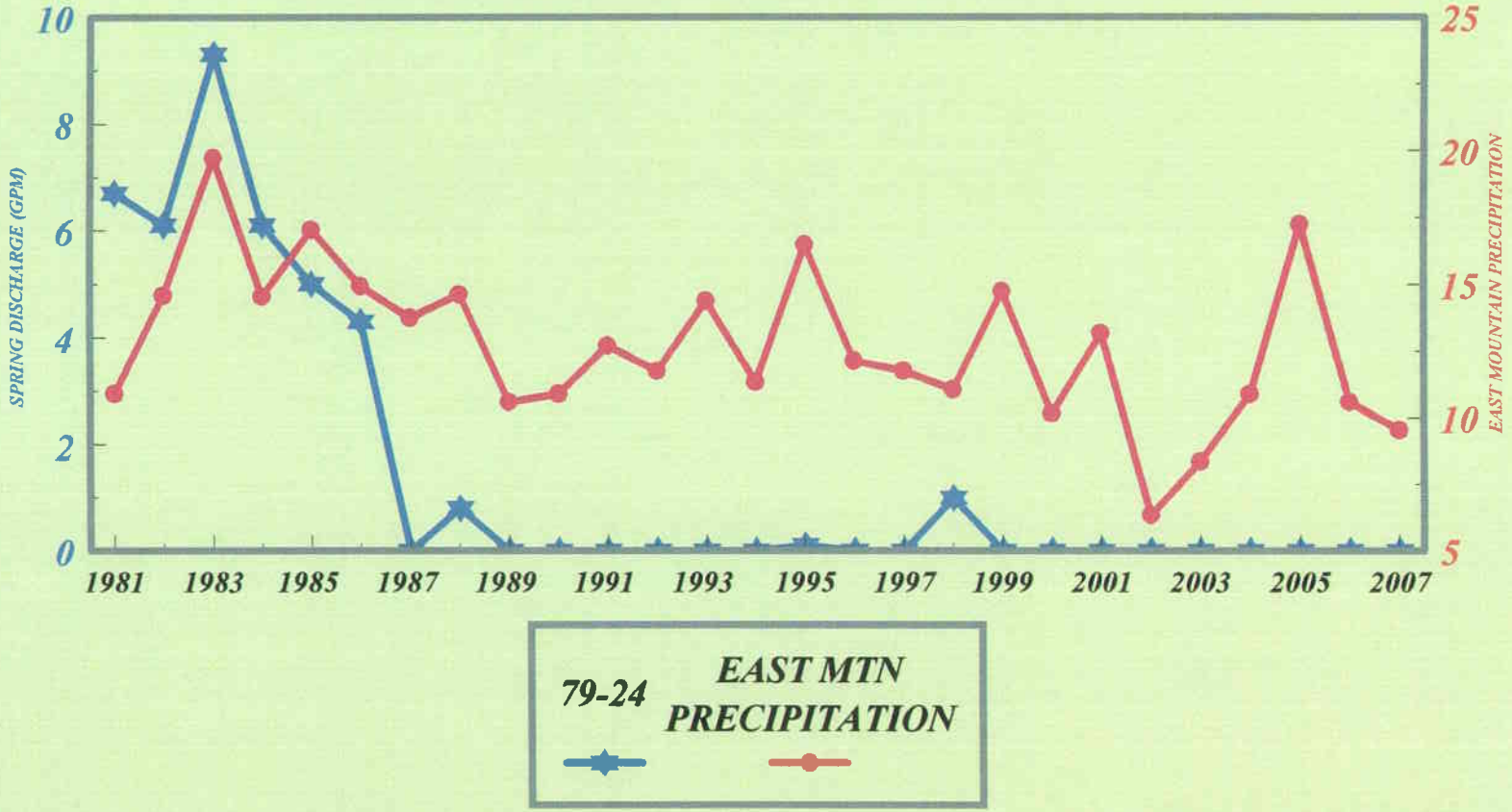
Spring: 79-23 vs. Precipitation



EAST MOUNTAIN SPRINGS

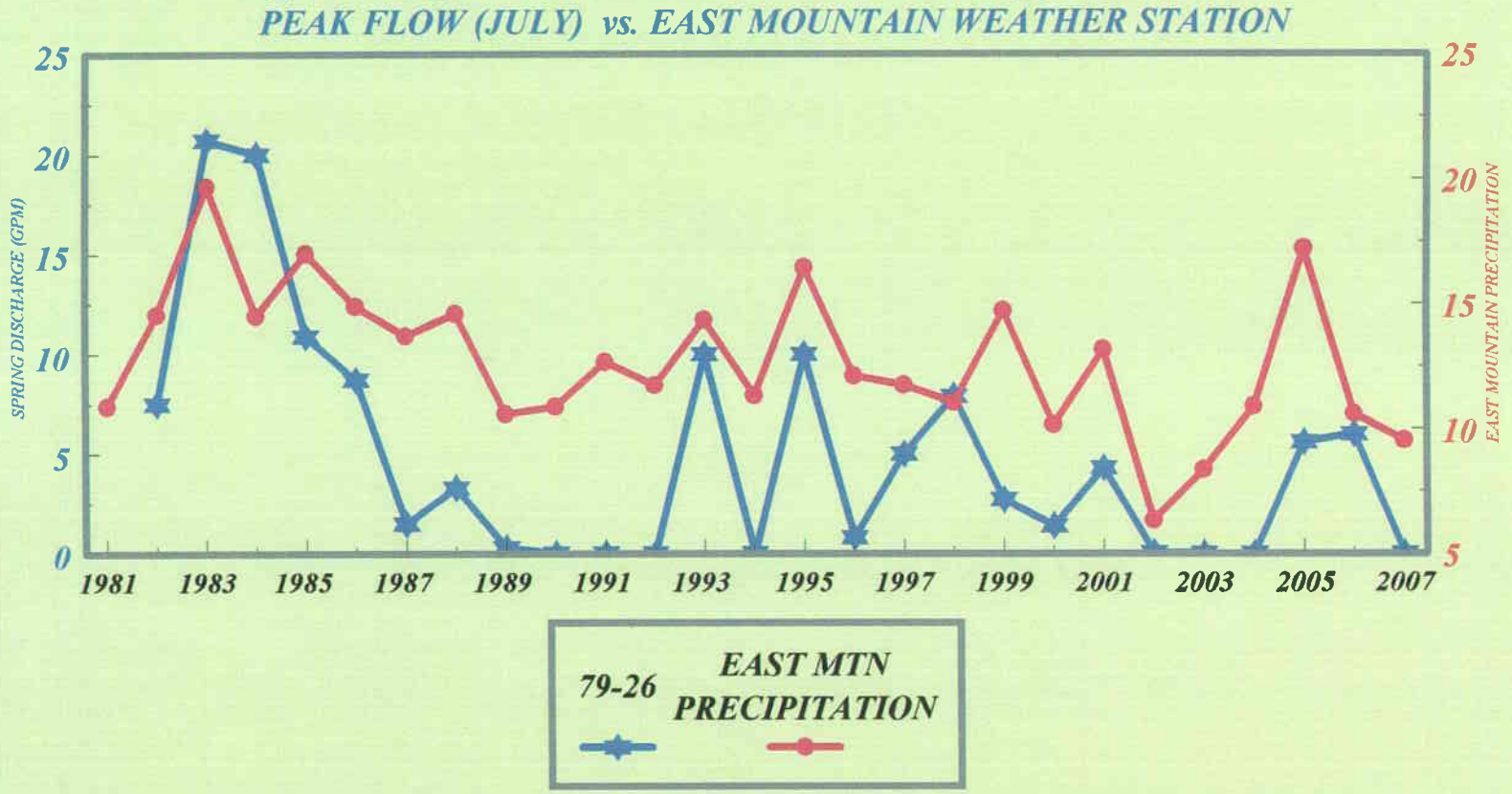
Spring: 79-24 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



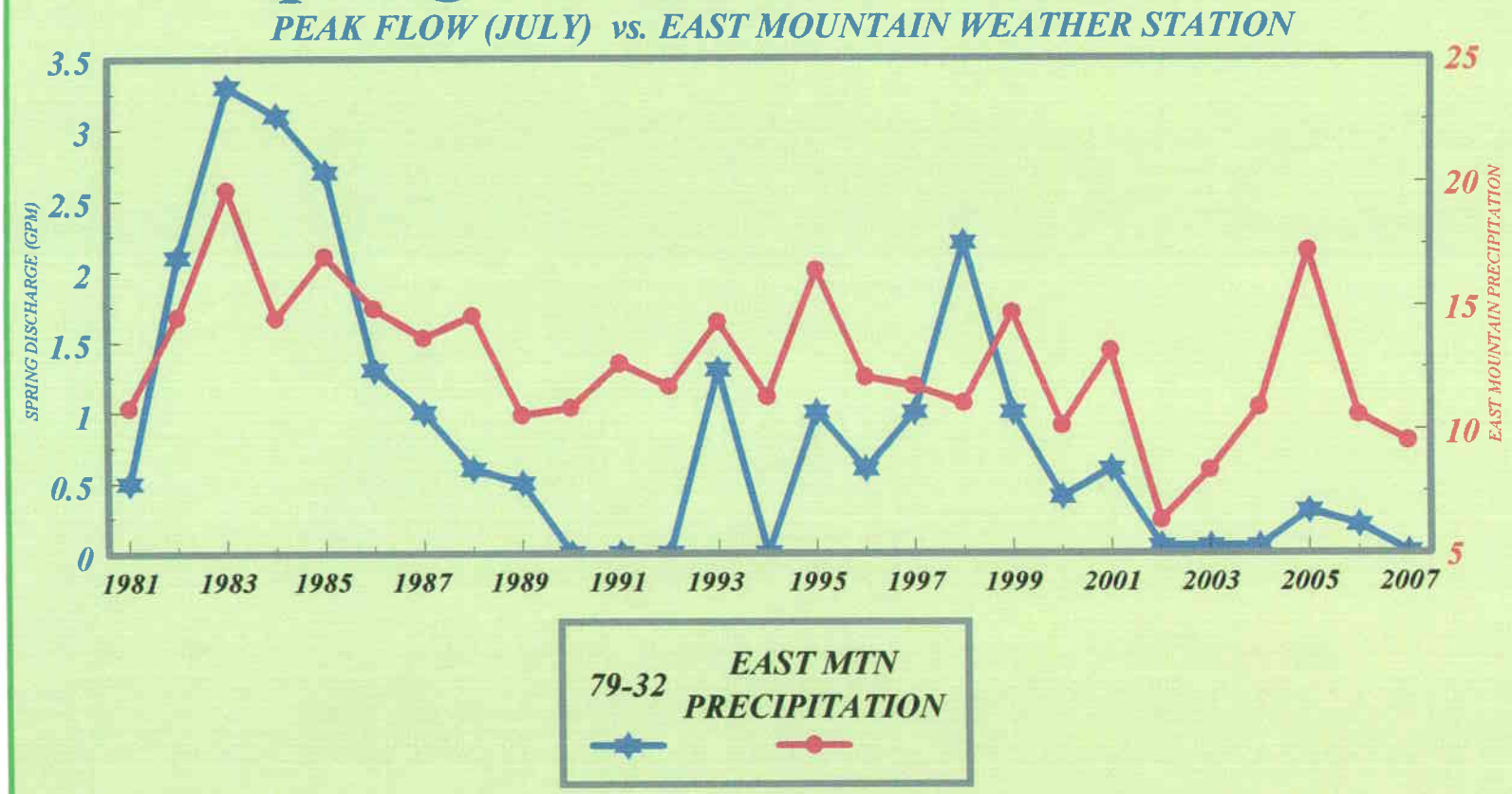
EAST MOUNTAIN SPRINGS

Spring: 79-26 vs. Precipitation



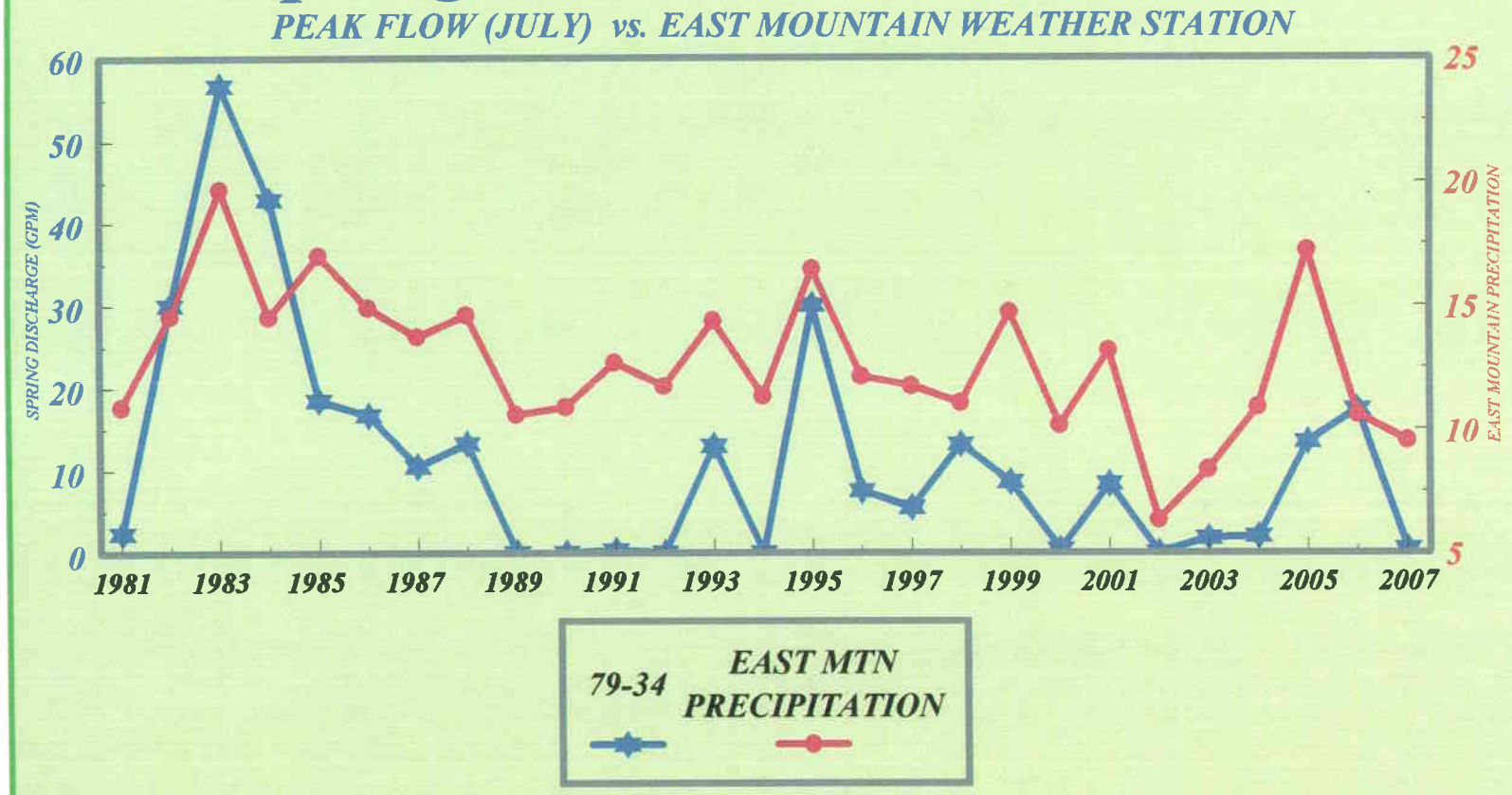
EAST MOUNTAIN SPRINGS

Spring: 79-32 vs. Precipitation



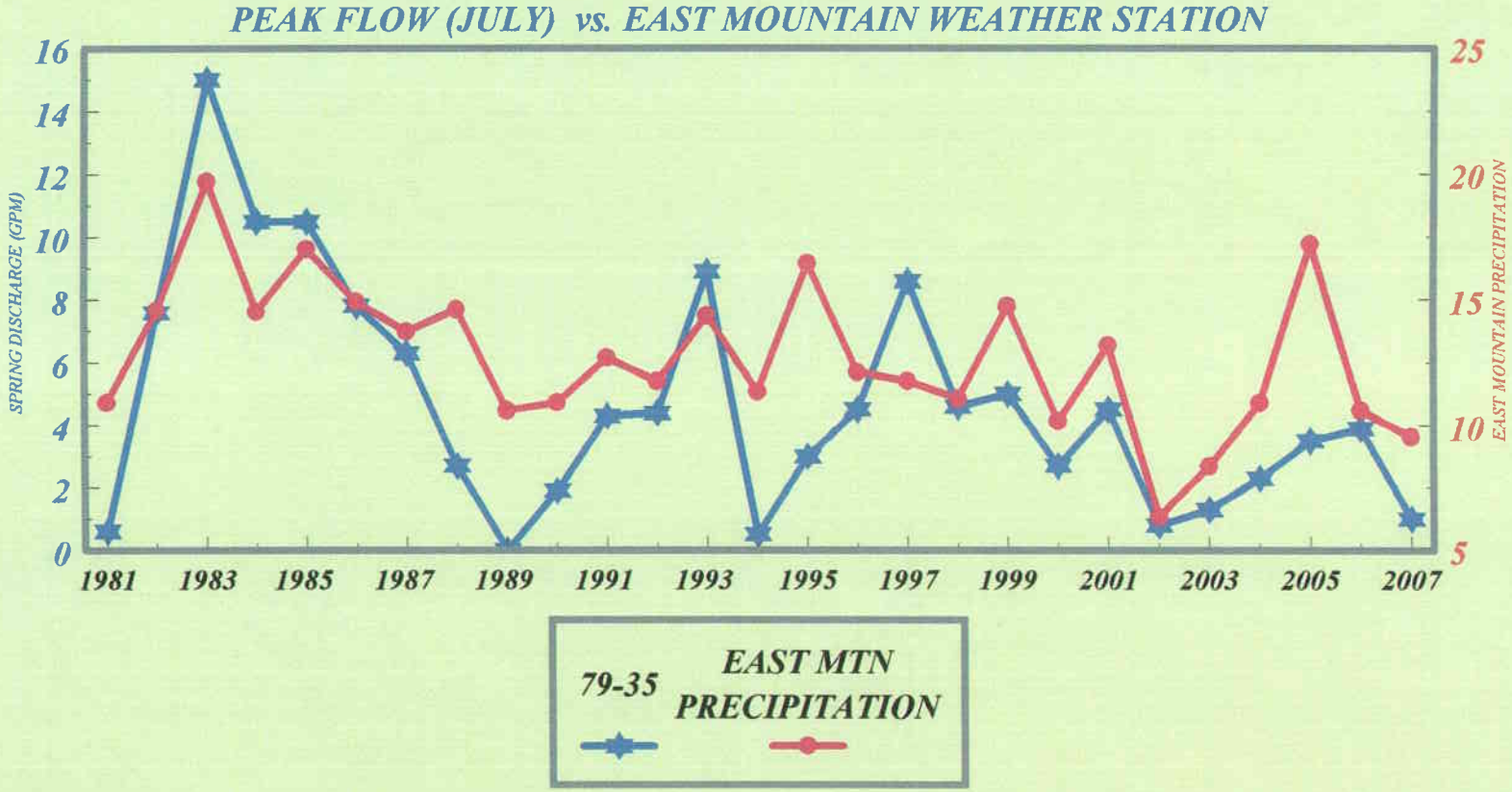
EAST MOUNTAIN SPRINGS

Spring: 79-34 vs. Precipitation



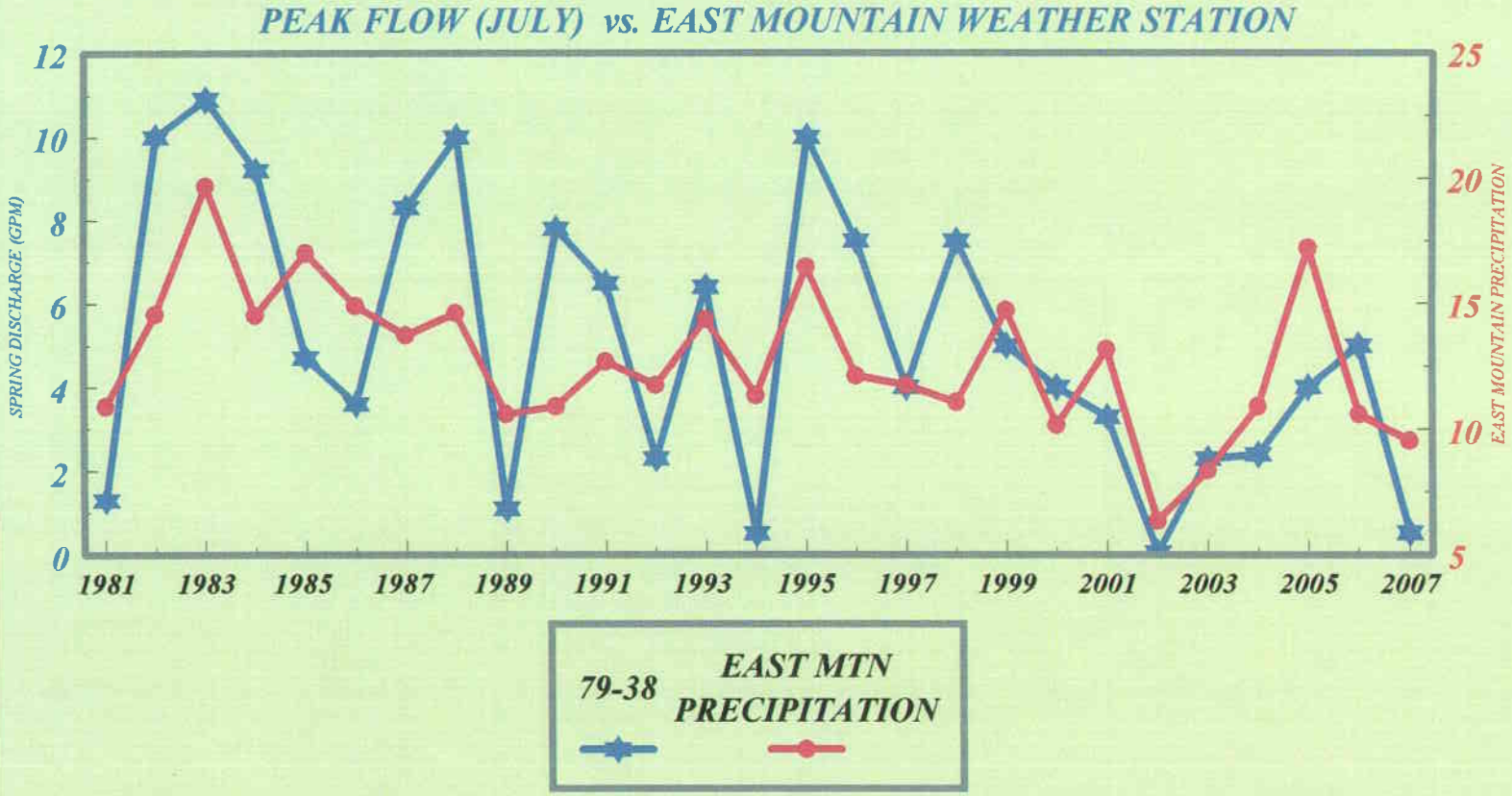
EAST MOUNTAIN SPRINGS

Spring: 79-35 vs. Precipitation



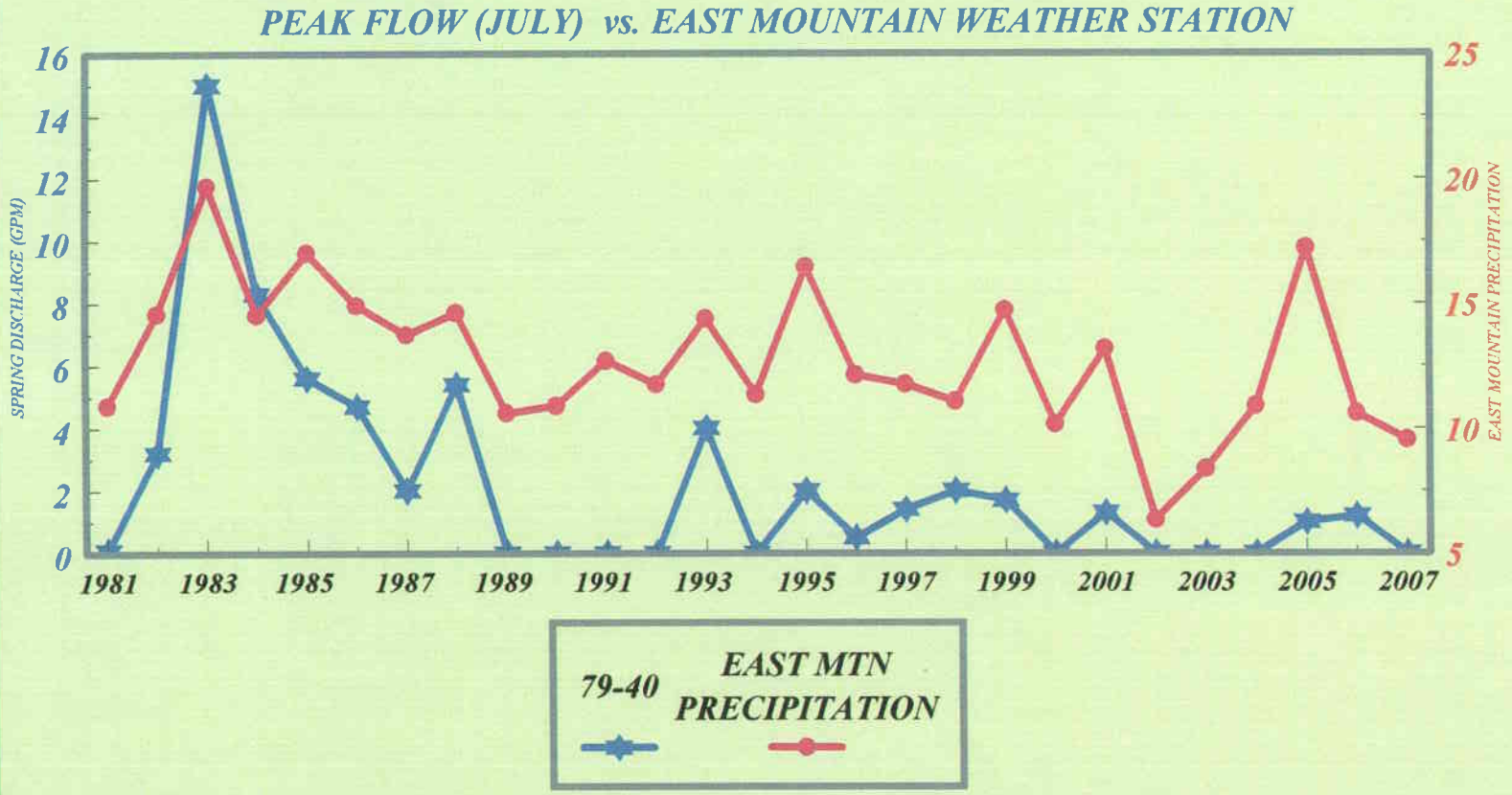
EAST MOUNTAIN SPRINGS

Spring: 79-38 vs. Precipitation



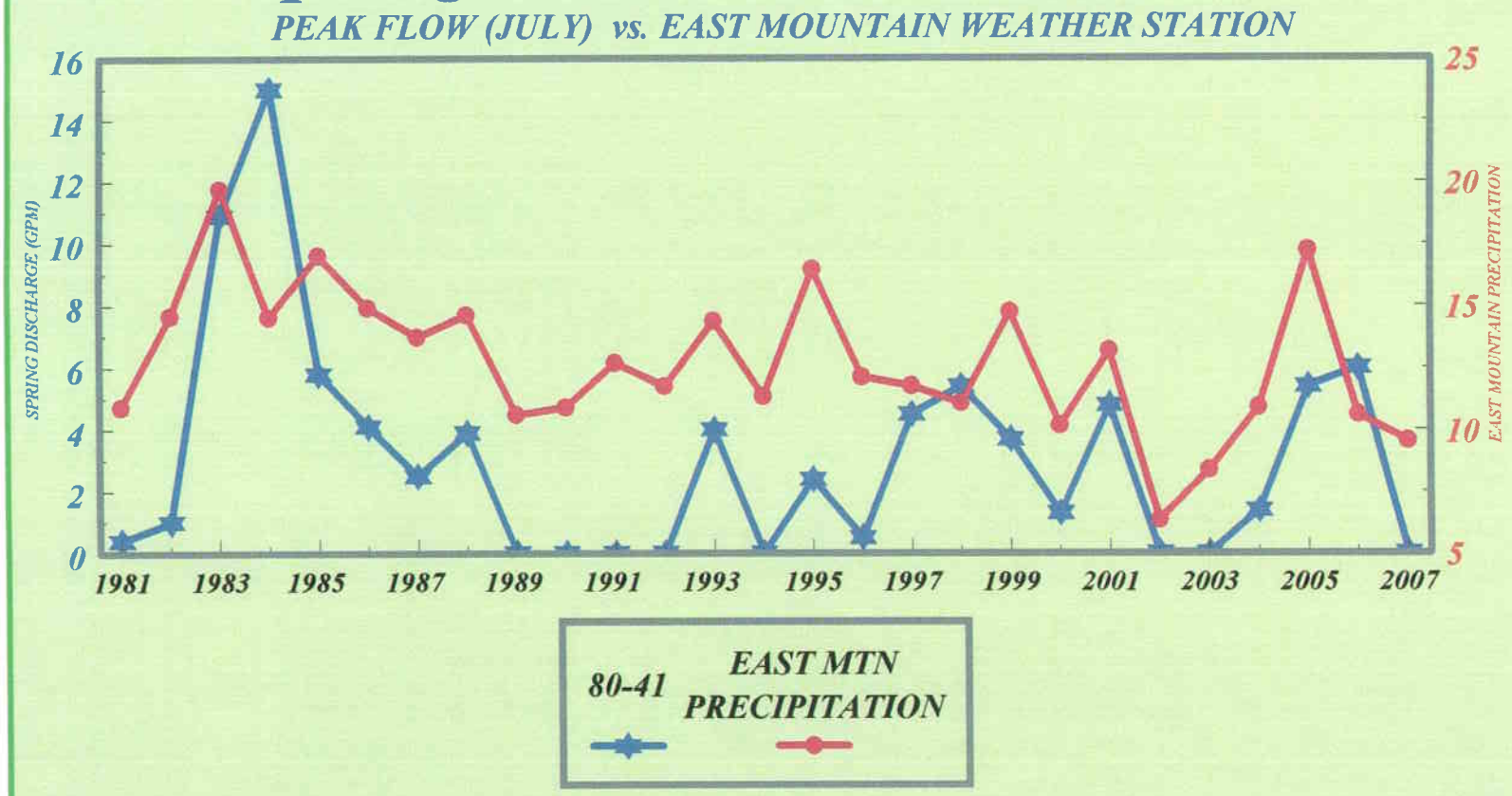
EAST MOUNTAIN SPRINGS

Spring: 79-40 vs. Precipitation



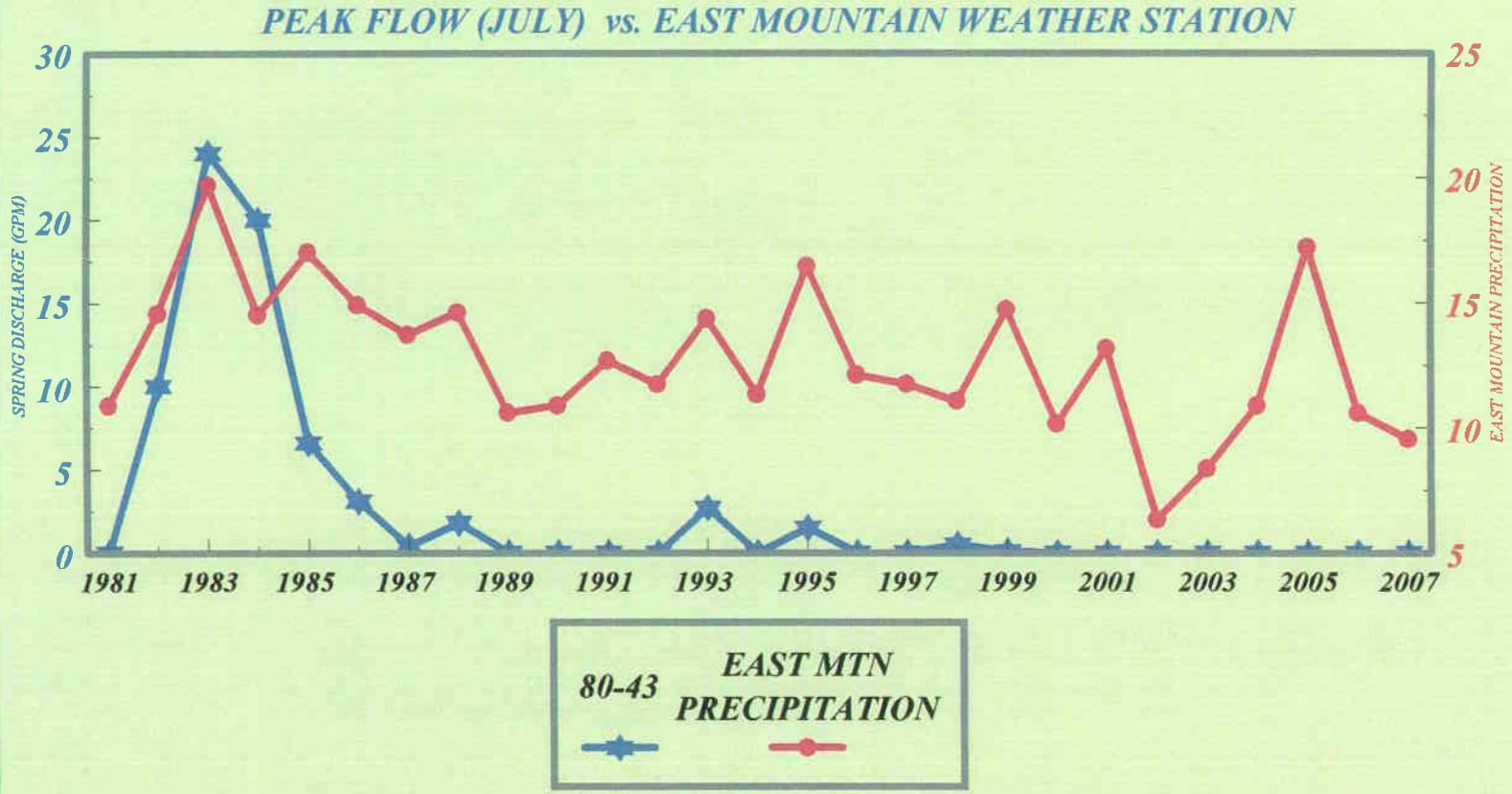
EAST MOUNTAIN SPRINGS

Spring: 80-41 vs. Precipitation



EAST MOUNTAIN SPRINGS

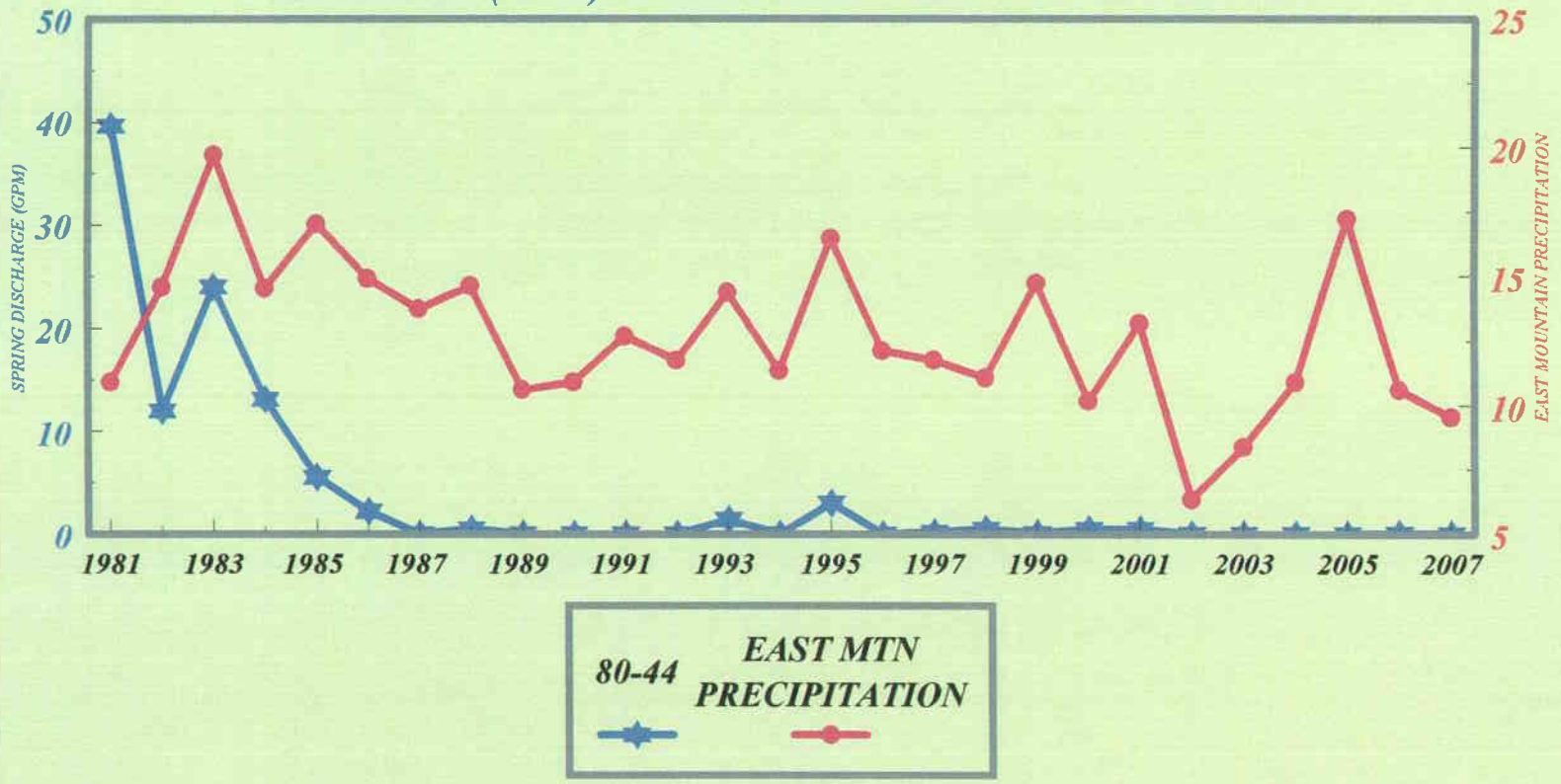
Spring: 80-43 vs. Precipitation



EAST MOUNTAIN SPRINGS

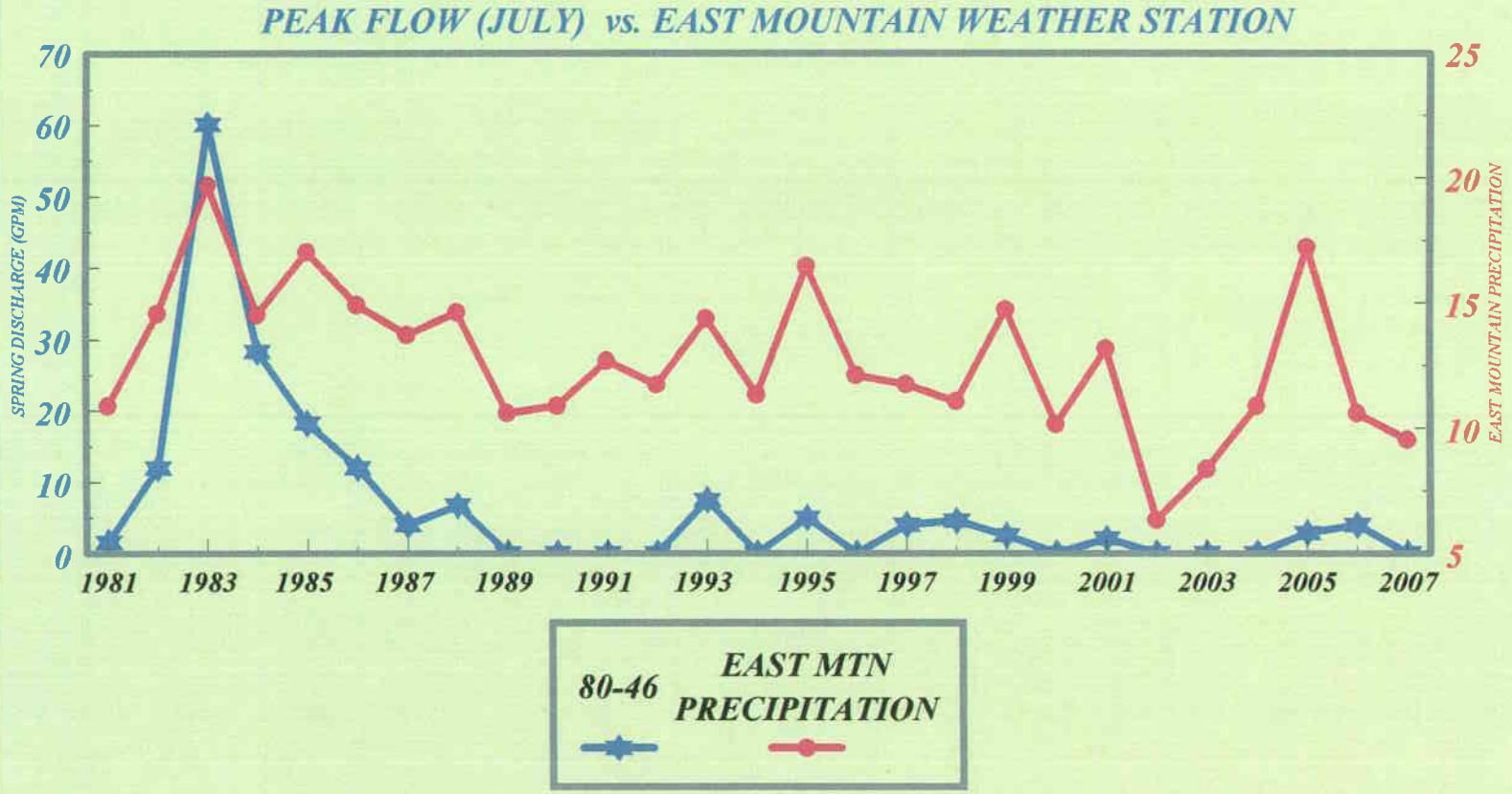
Spring: 80-44 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



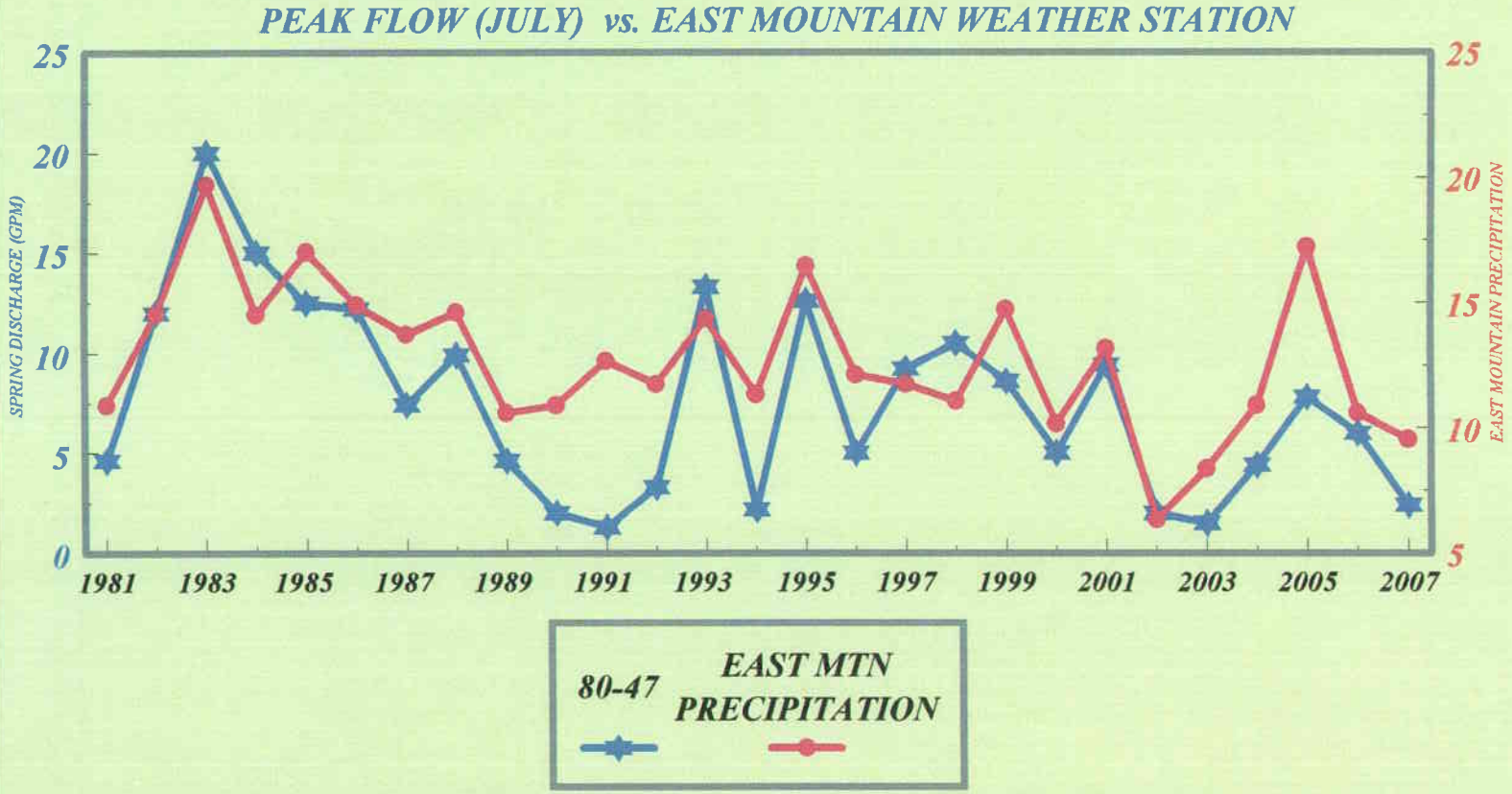
EAST MOUNTAIN SPRINGS

Spring: 80-46 vs. Precipitation



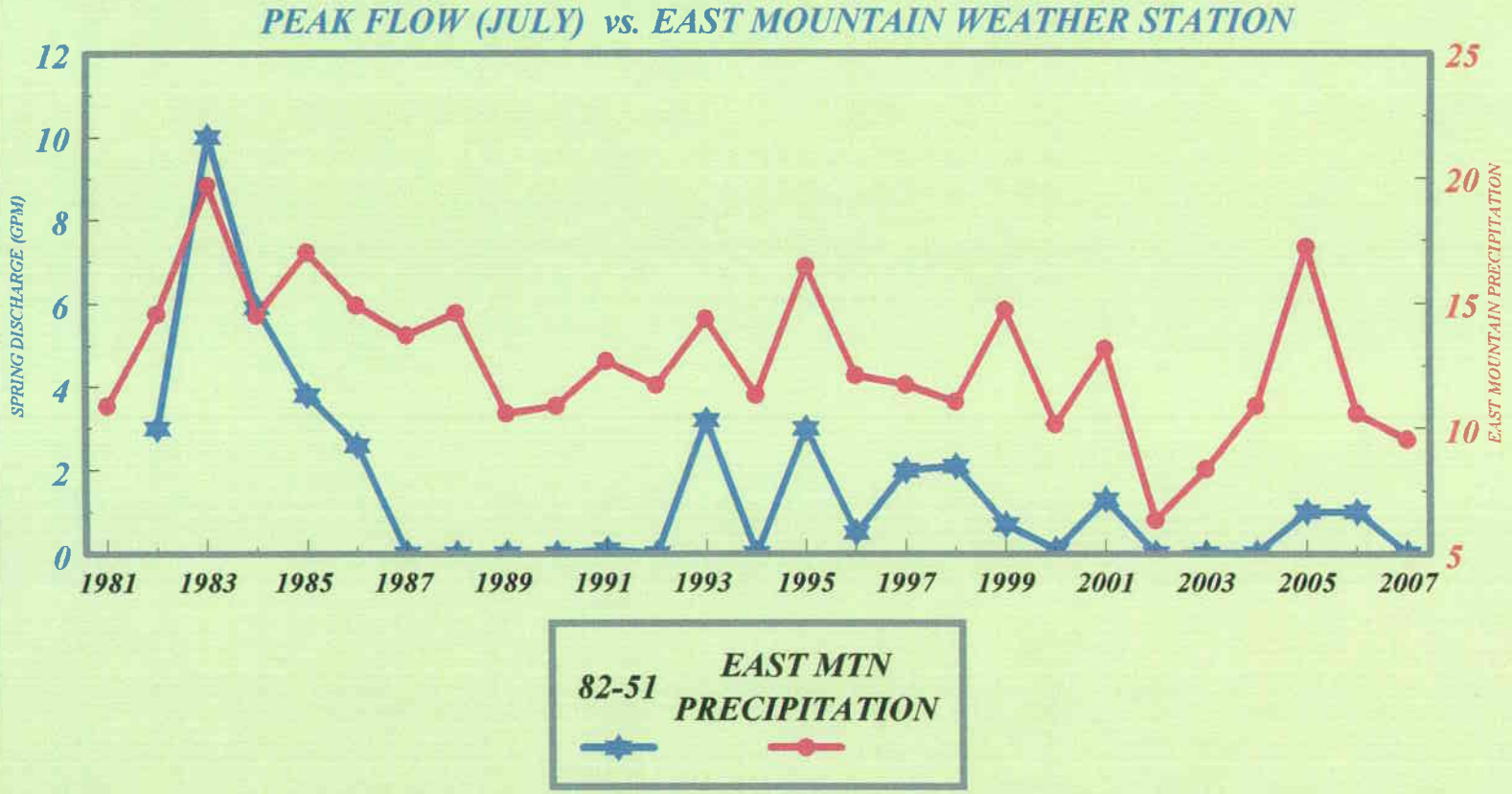
EAST MOUNTAIN SPRINGS

Spring: 80-47 vs. Precipitation



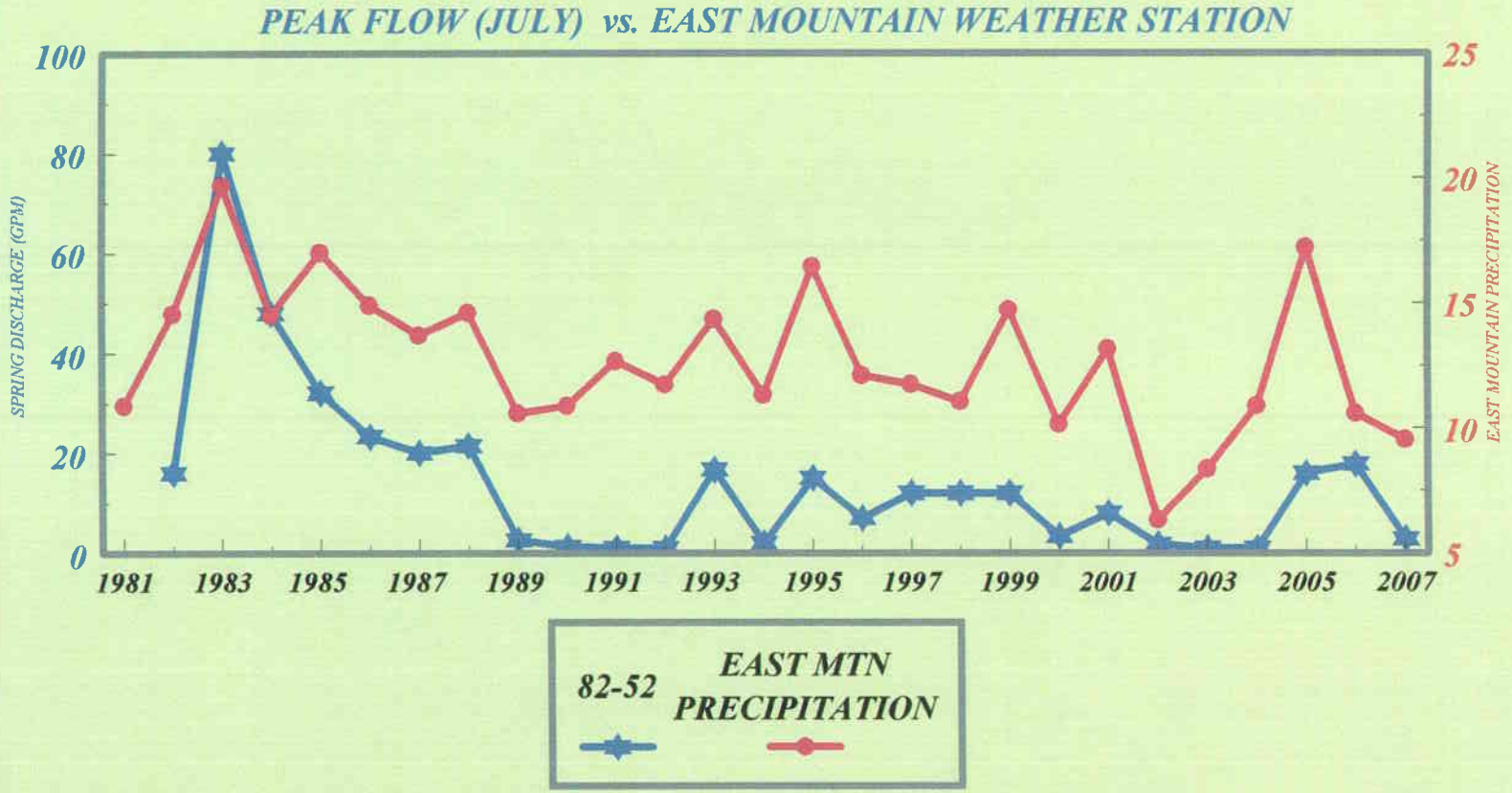
EAST MOUNTAIN SPRINGS

Spring: 82-51 vs. Precipitation



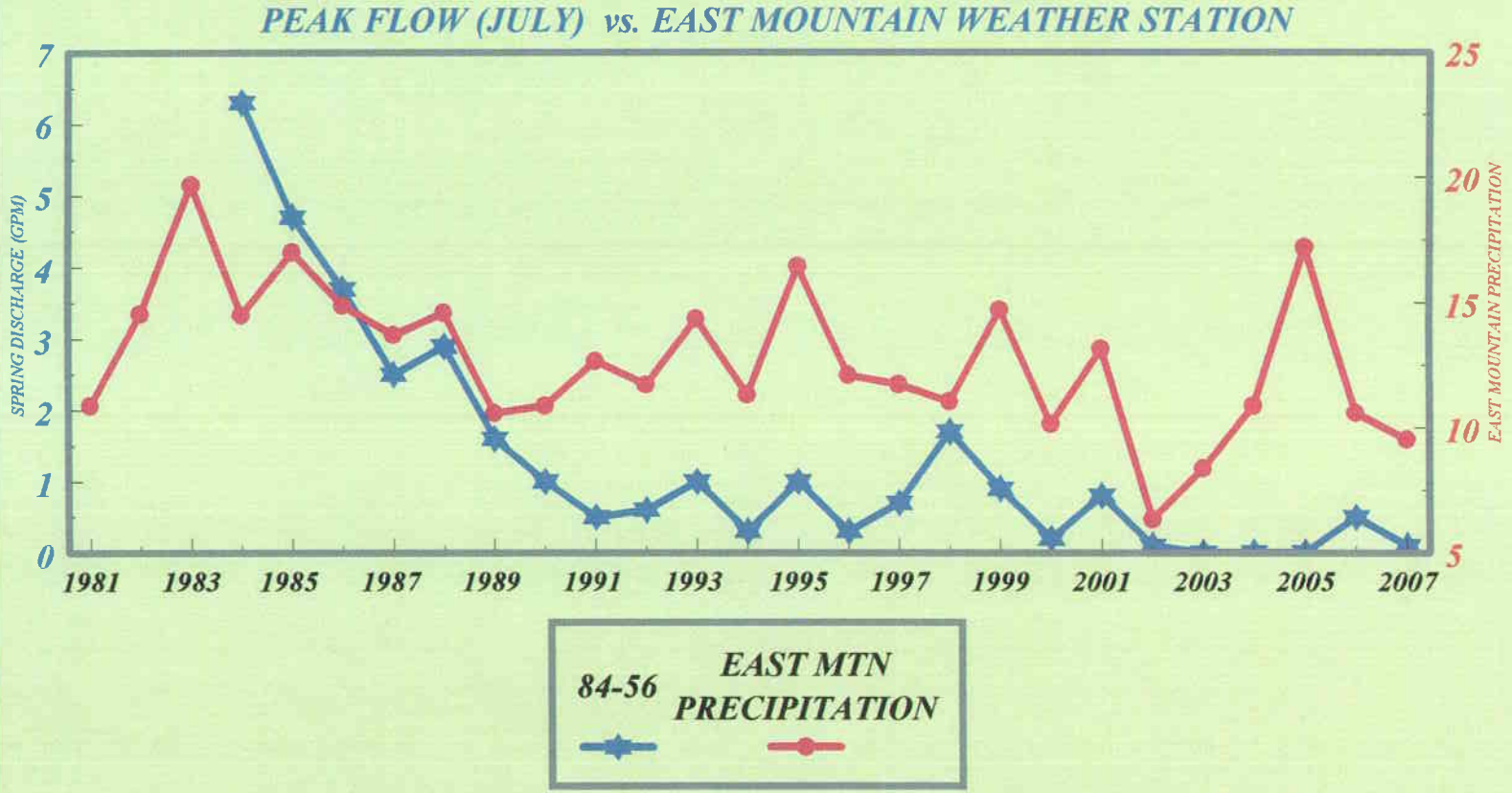
EAST MOUNTAIN SPRINGS

Spring: 82-52 vs. Precipitation



EAST MOUNTAIN SPRINGS

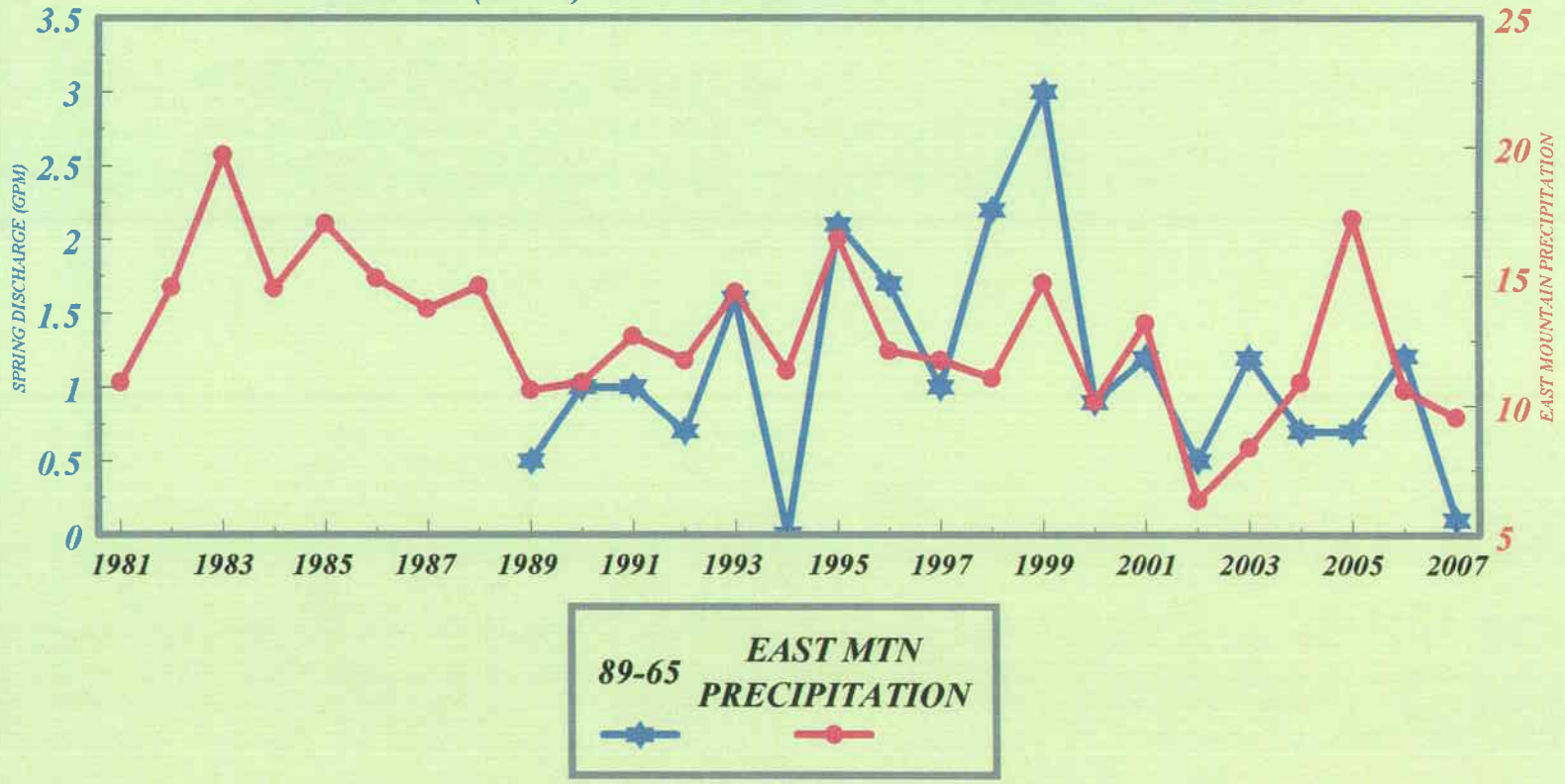
Spring: 84-56 vs. Precipitation



EAST MOUNTAIN SPRINGS

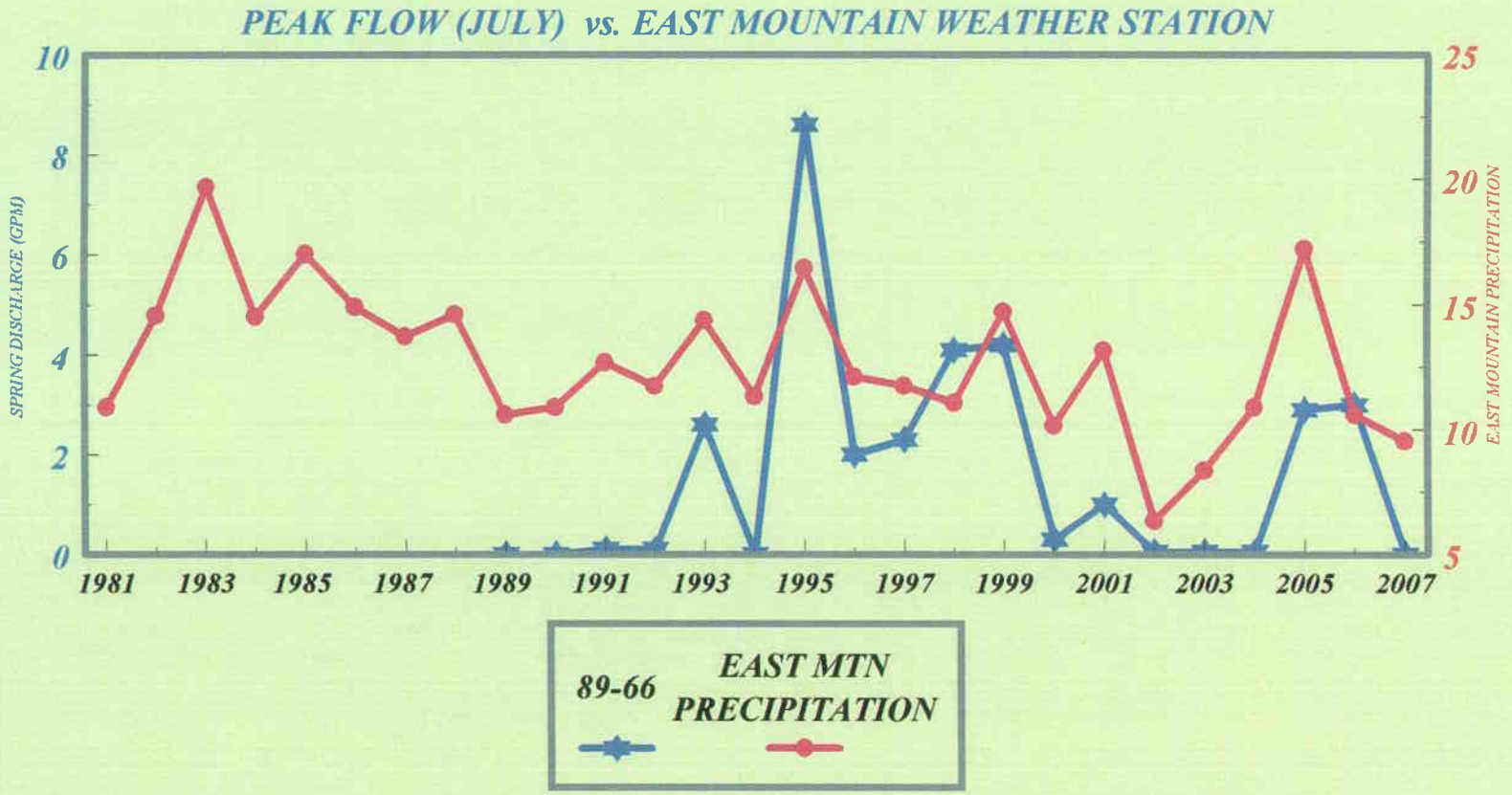
Spring: 89-65 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



EAST MOUNTAIN SPRINGS

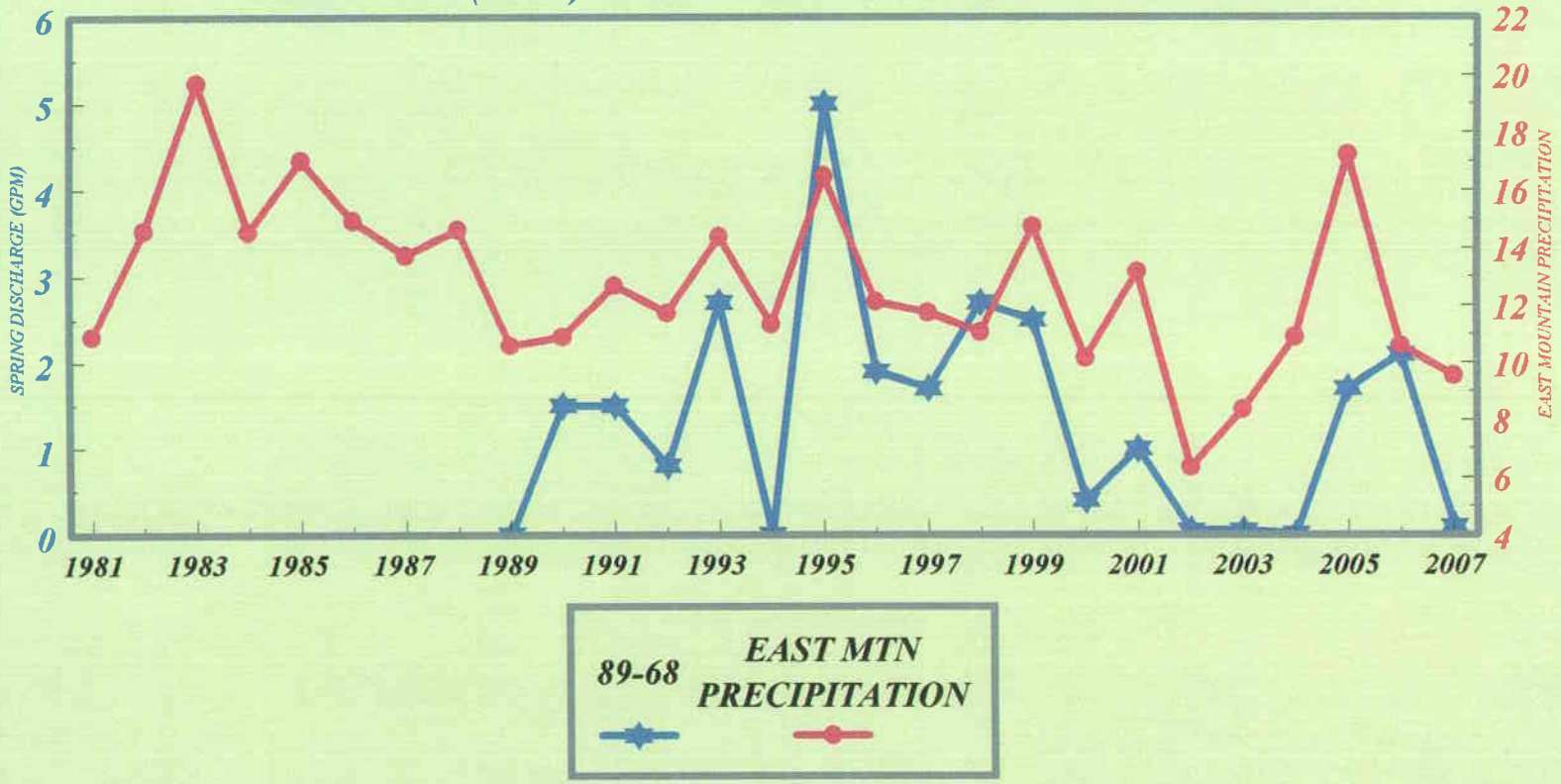
Spring: 89-66 vs. Precipitation



EAST MOUNTAIN SPRINGS

Spring: 89-68 vs. Precipitation

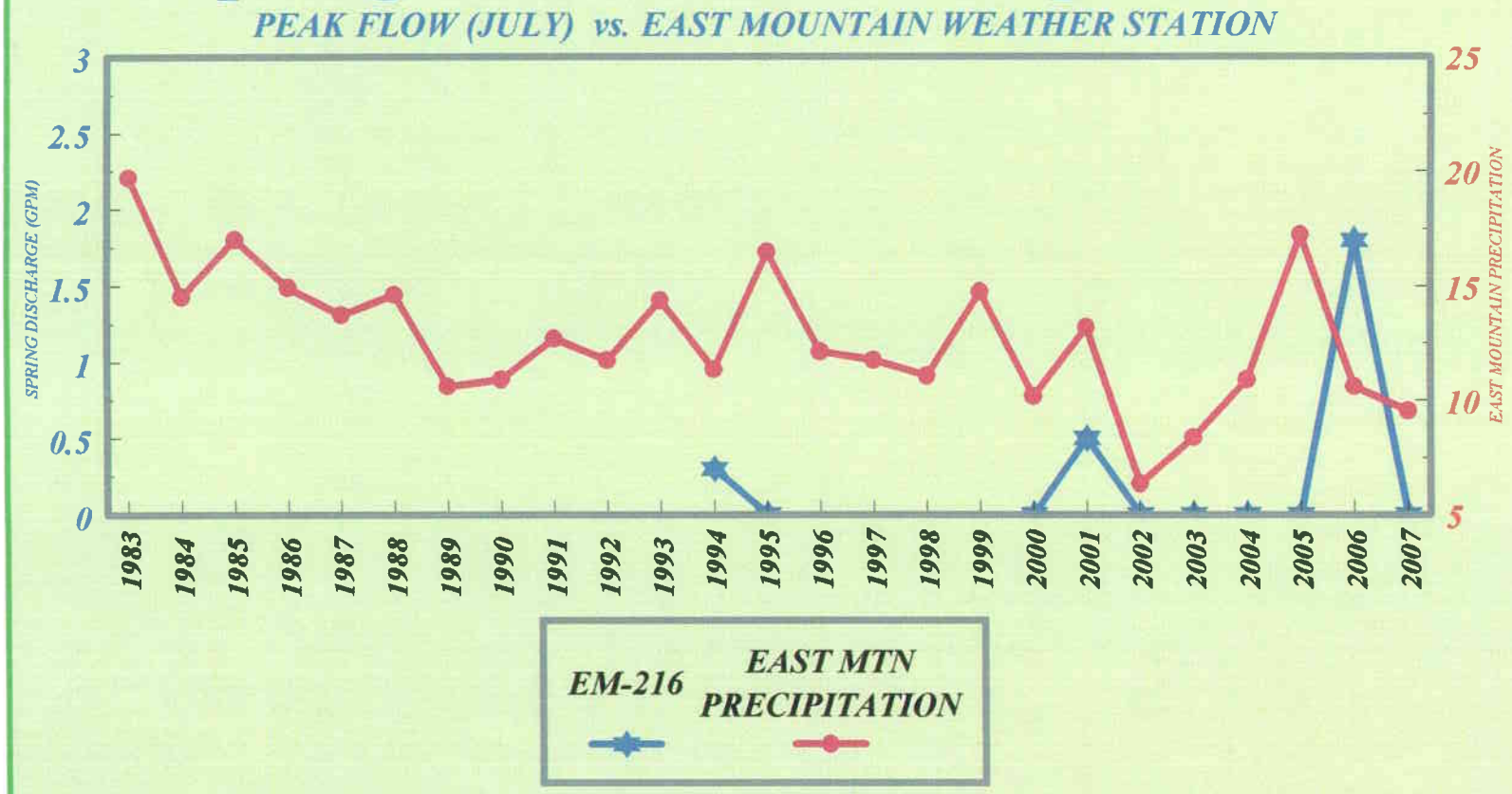
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



EAST MOUNTAIN SPRINGS NORTHERN AREA

EAST MOUNTAIN SPRINGS

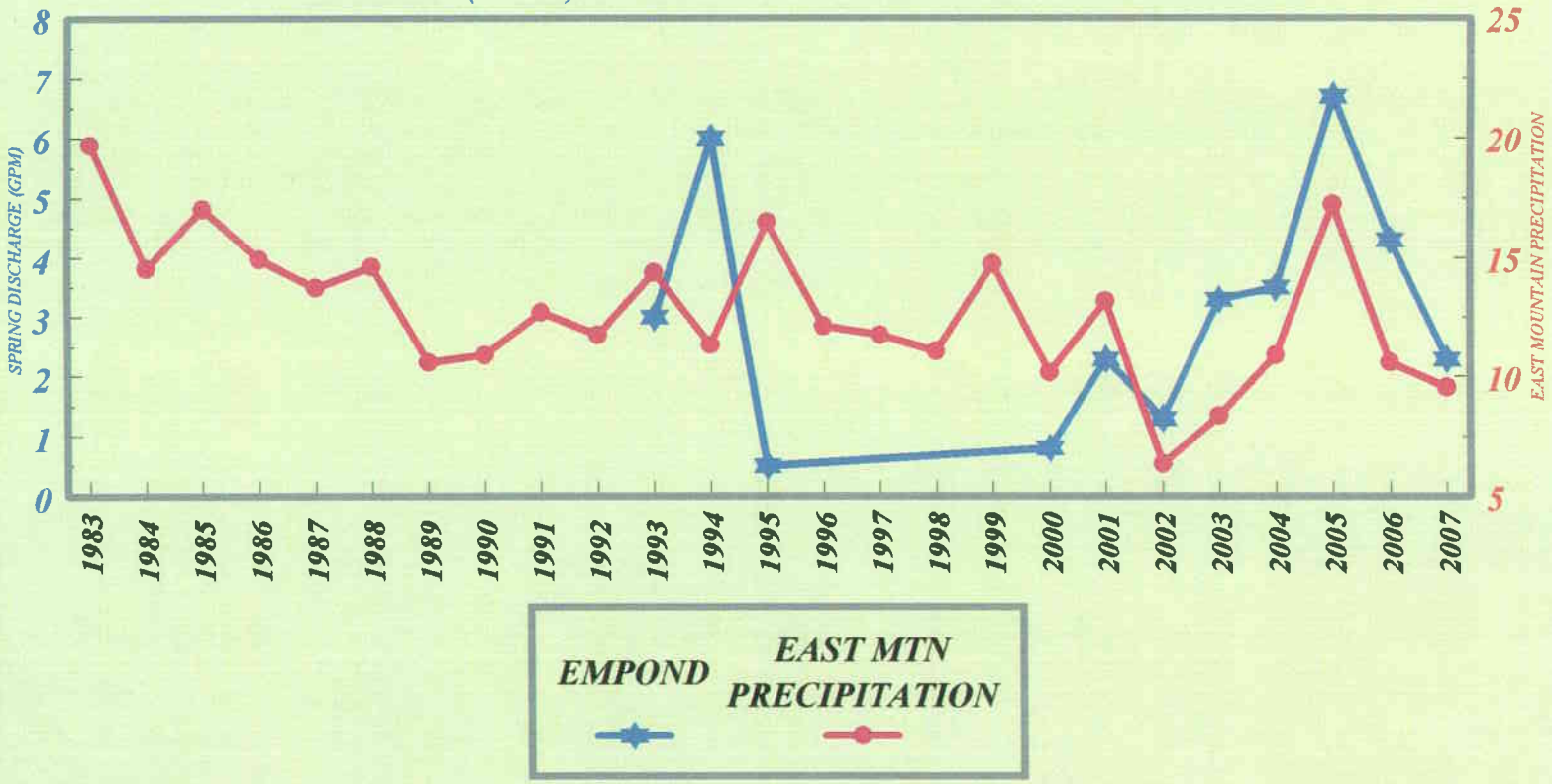
Spring: EM-216 vs. Precipitation



EAST MOUNTAIN SPRINGS

Spring: EMPOND vs. Precipitation

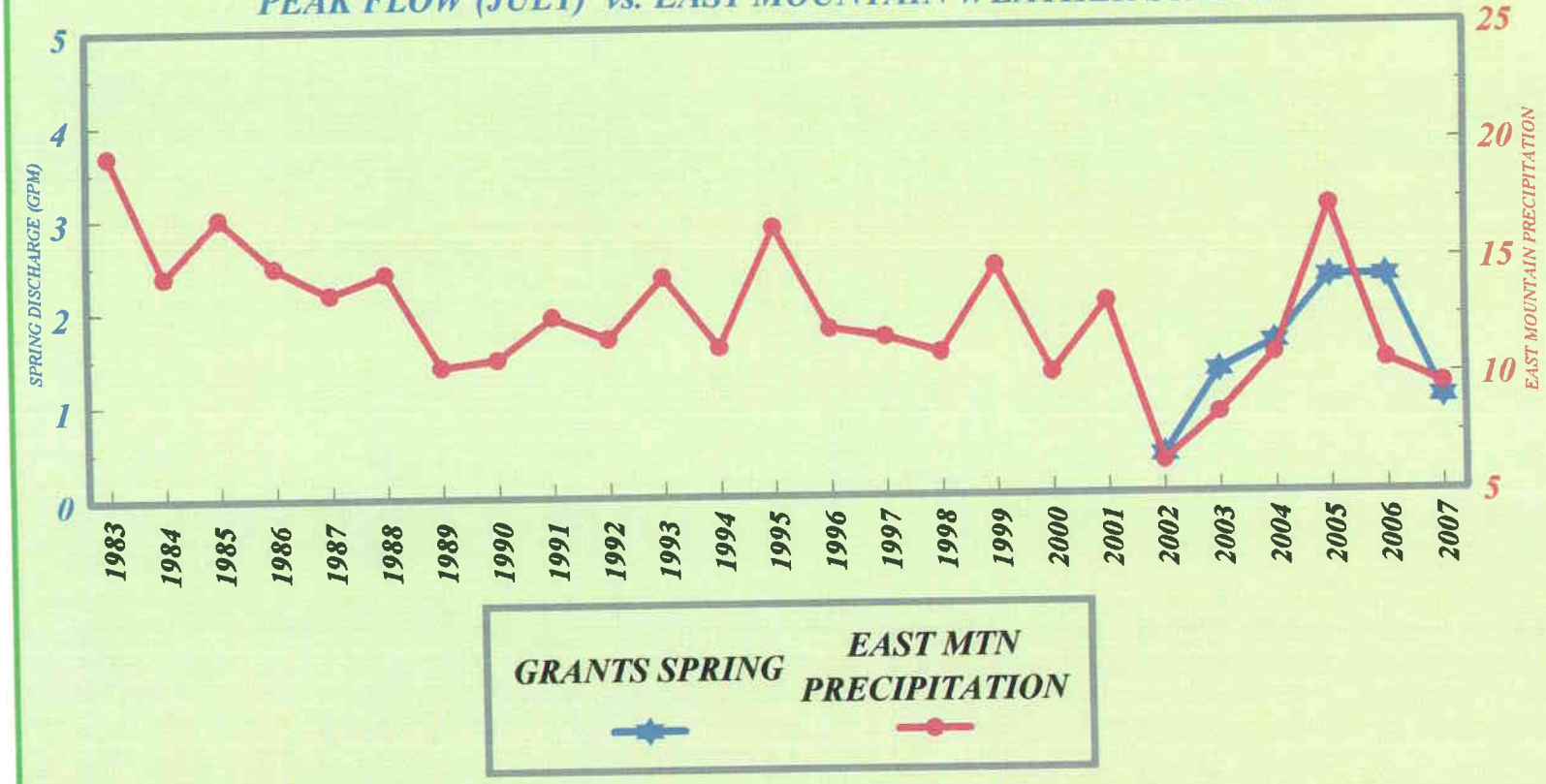
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



EAST MOUNTAIN SPRINGS

Spring: GRANTS SPRING vs. Precipitation

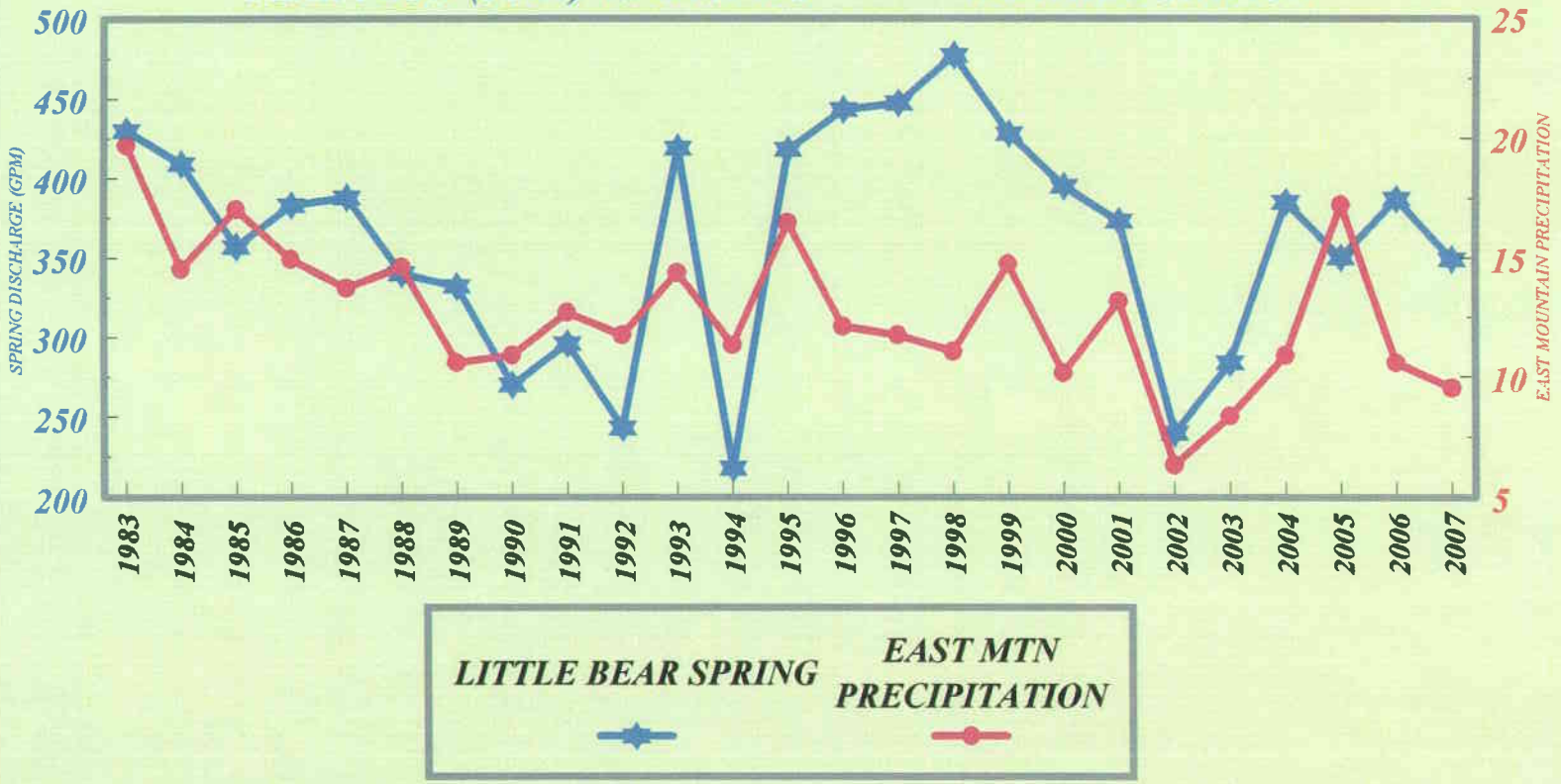
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



EAST MOUNTAIN SPRINGS

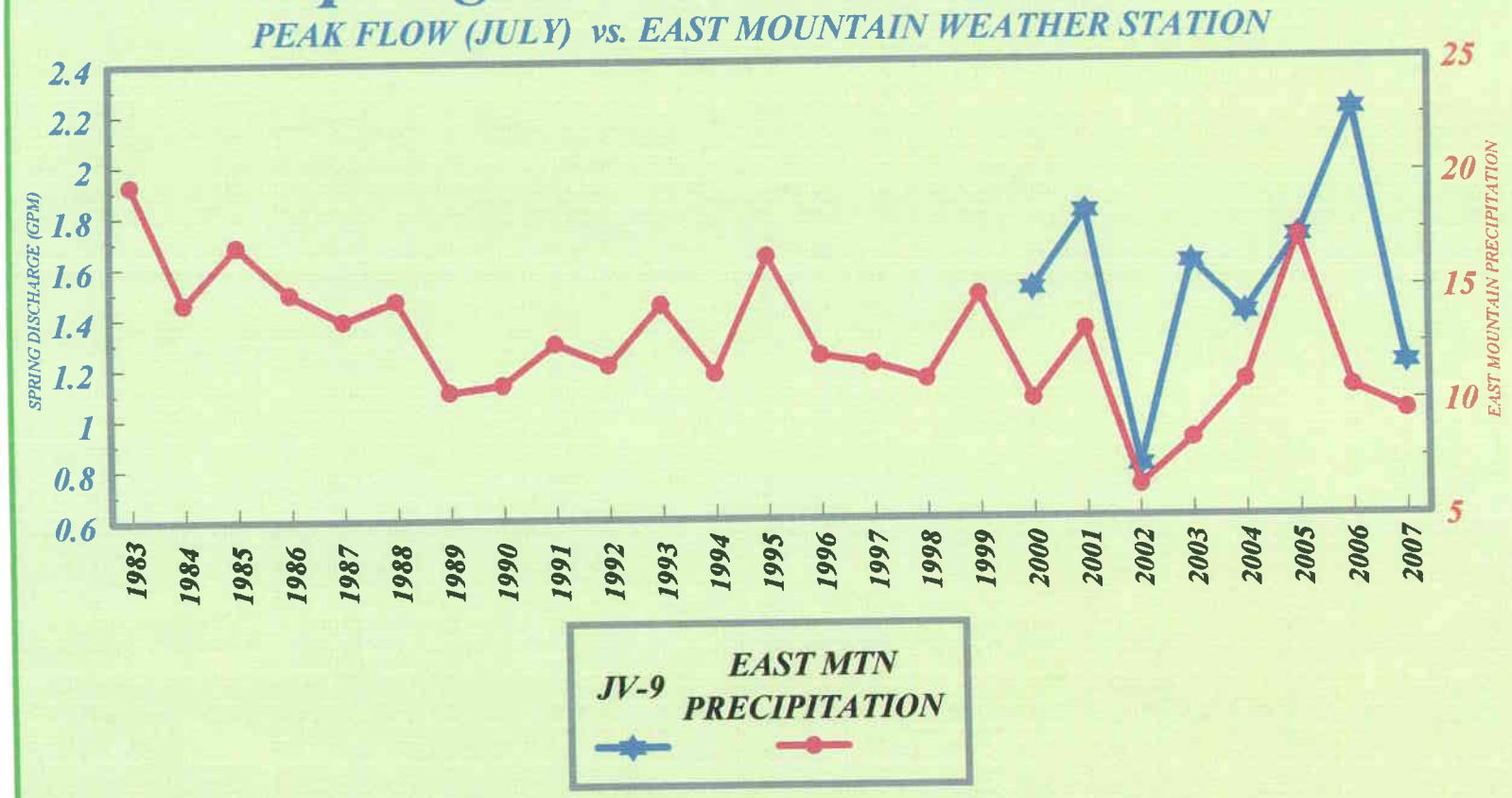
Spring: LITTLE BEAR vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



EAST MOUNTAIN SPRINGS

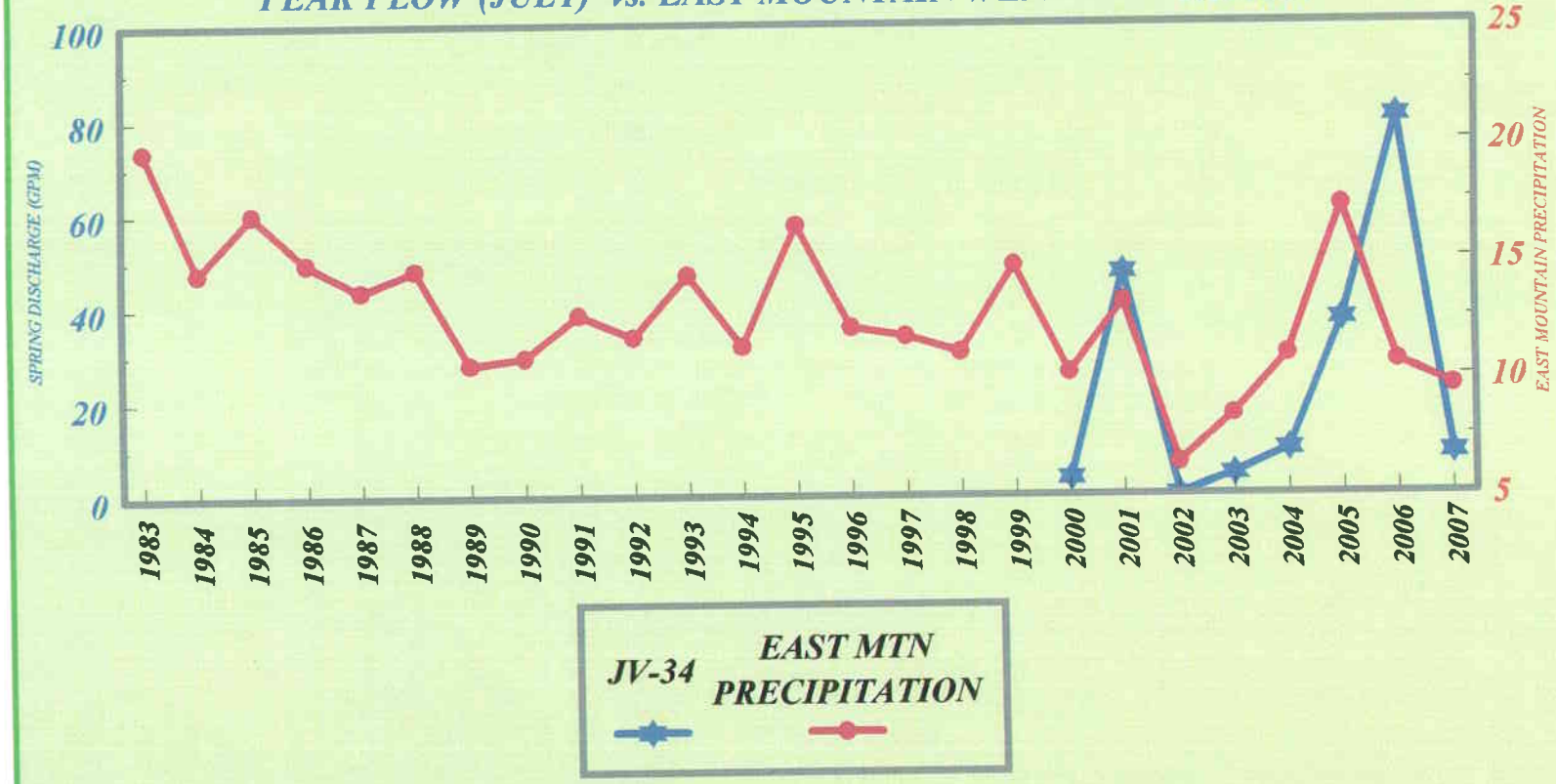
Spring: JV-9 vs. Precipitation



EAST MOUNTAIN SPRINGS

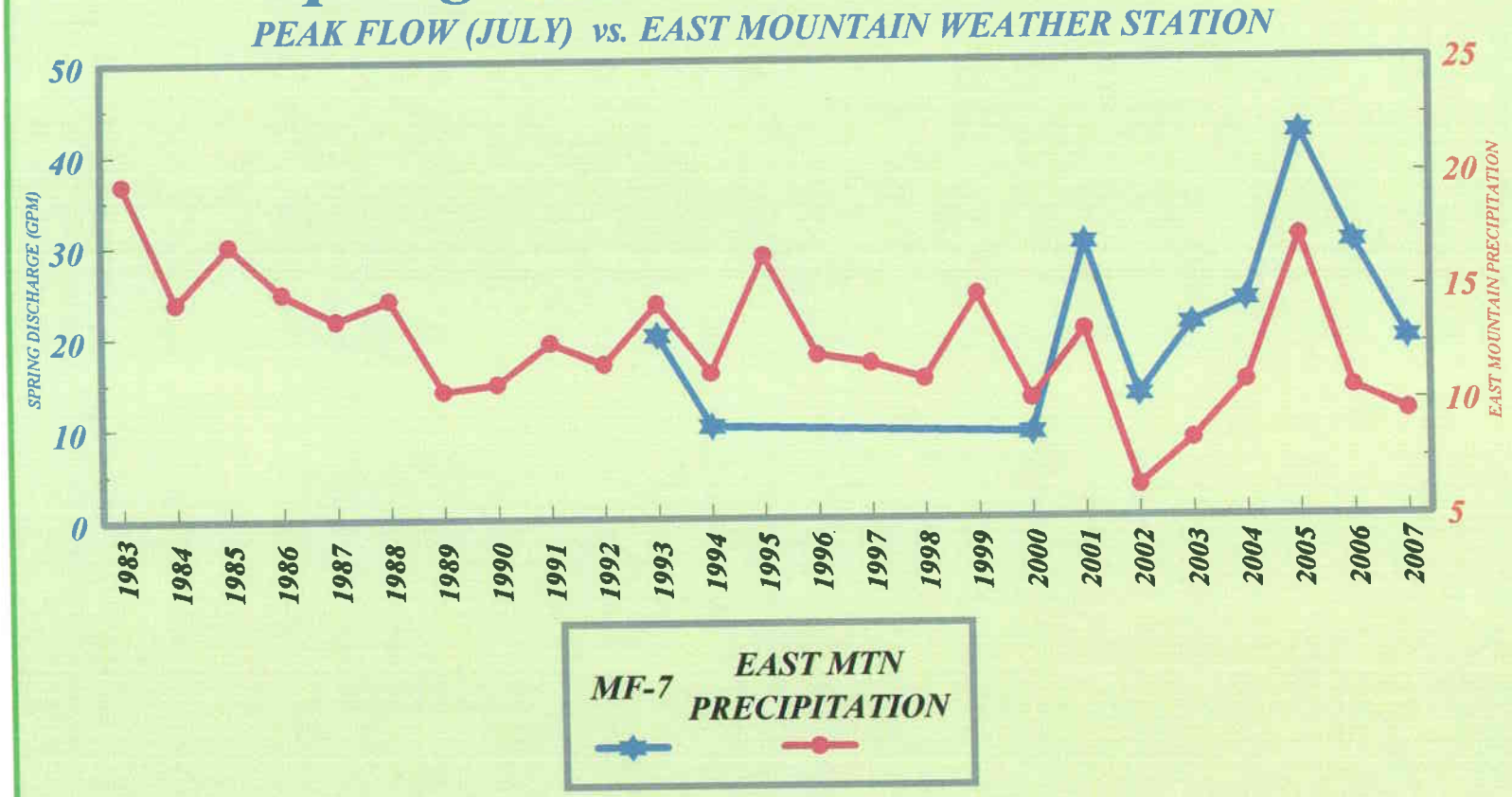
Spring: JV-34 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



EAST MOUNTAIN SPRINGS

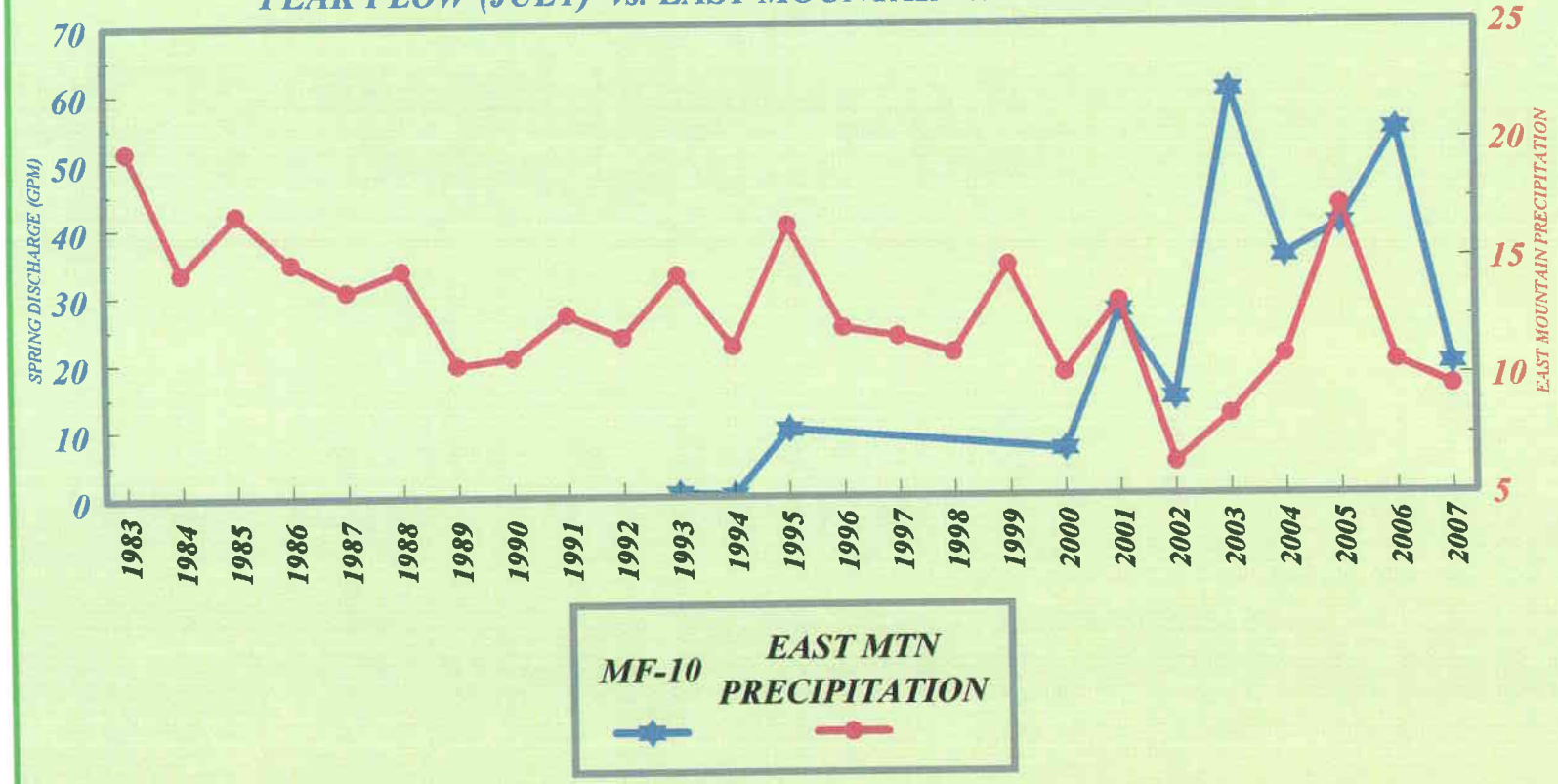
Spring: MF-7 vs. Precipitation



EAST MOUNTAIN SPRINGS

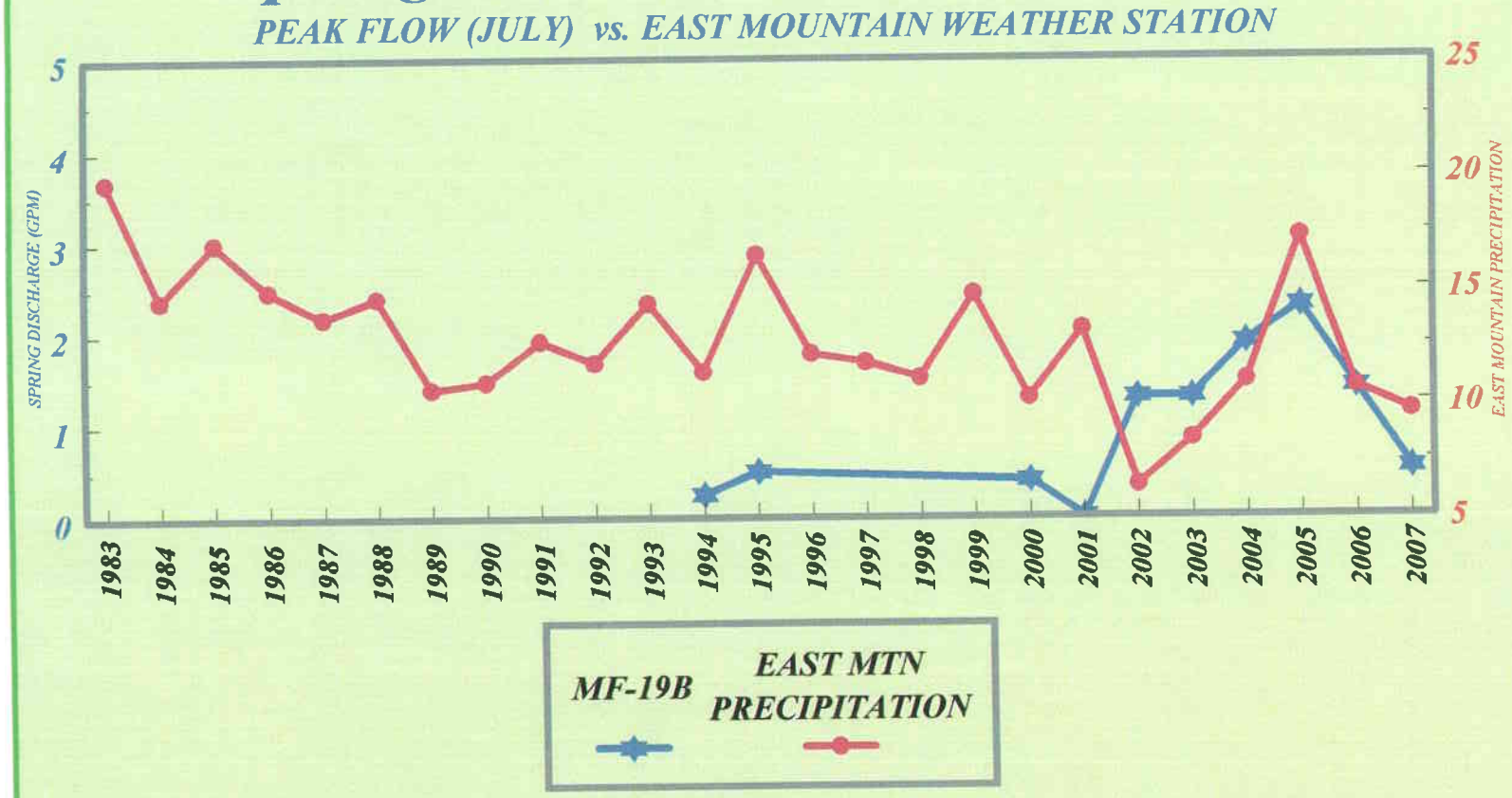
Spring: MF-10 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



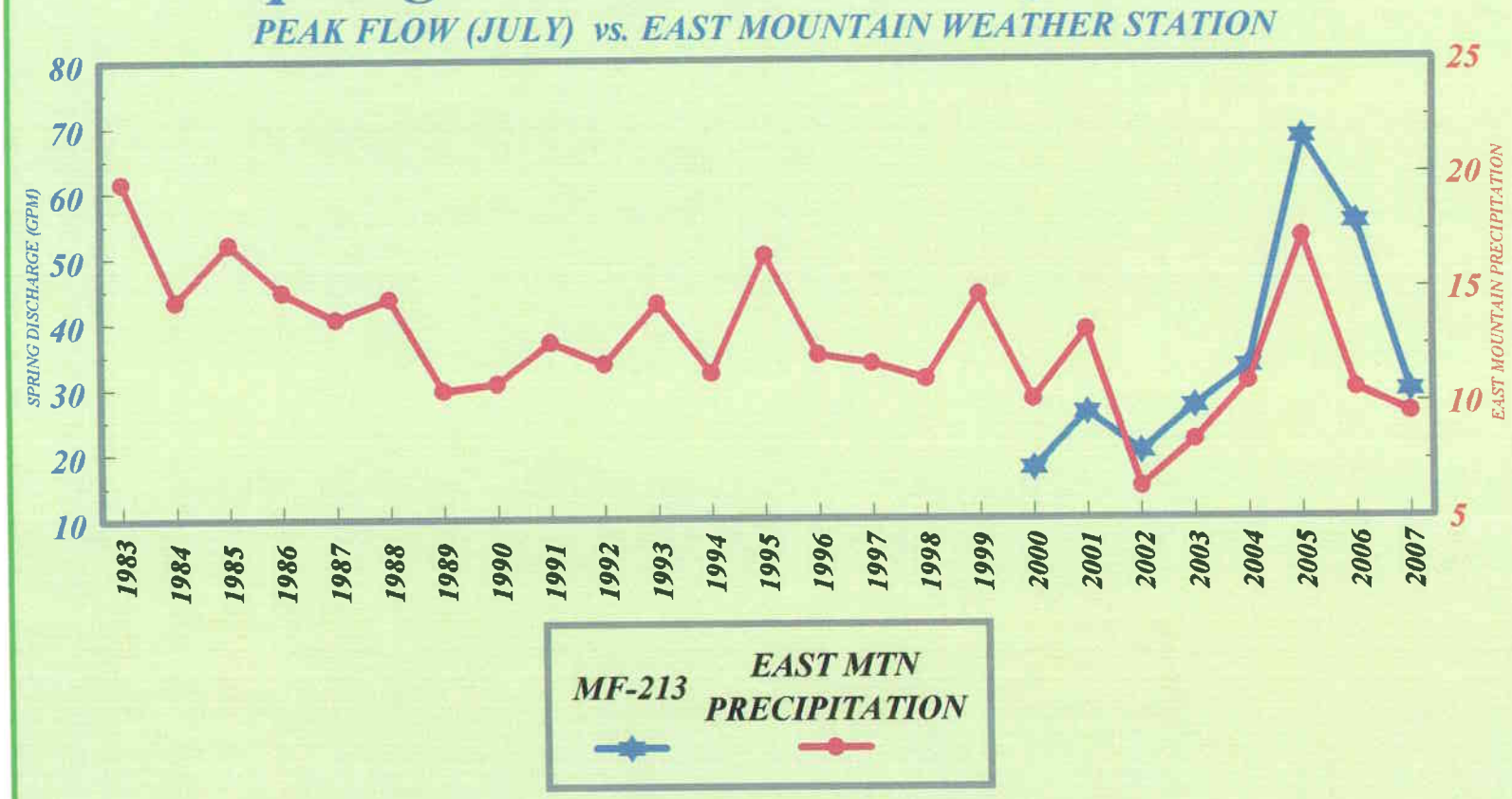
EAST MOUNTAIN SPRINGS

Spring: MF-19B vs. Precipitation



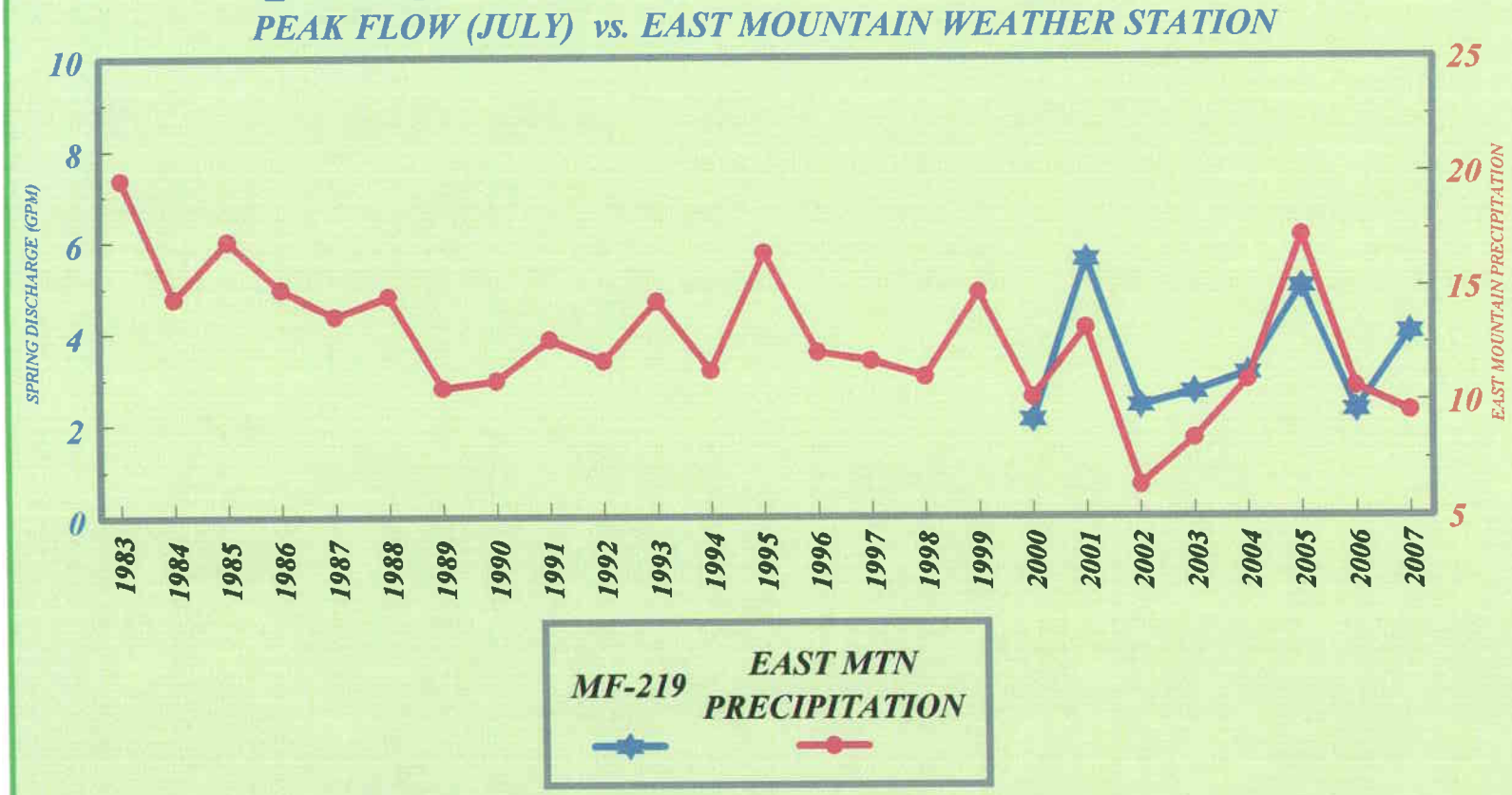
EAST MOUNTAIN SPRINGS

Spring: MF-213 vs. Precipitation



EAST MOUNTAIN SPRINGS

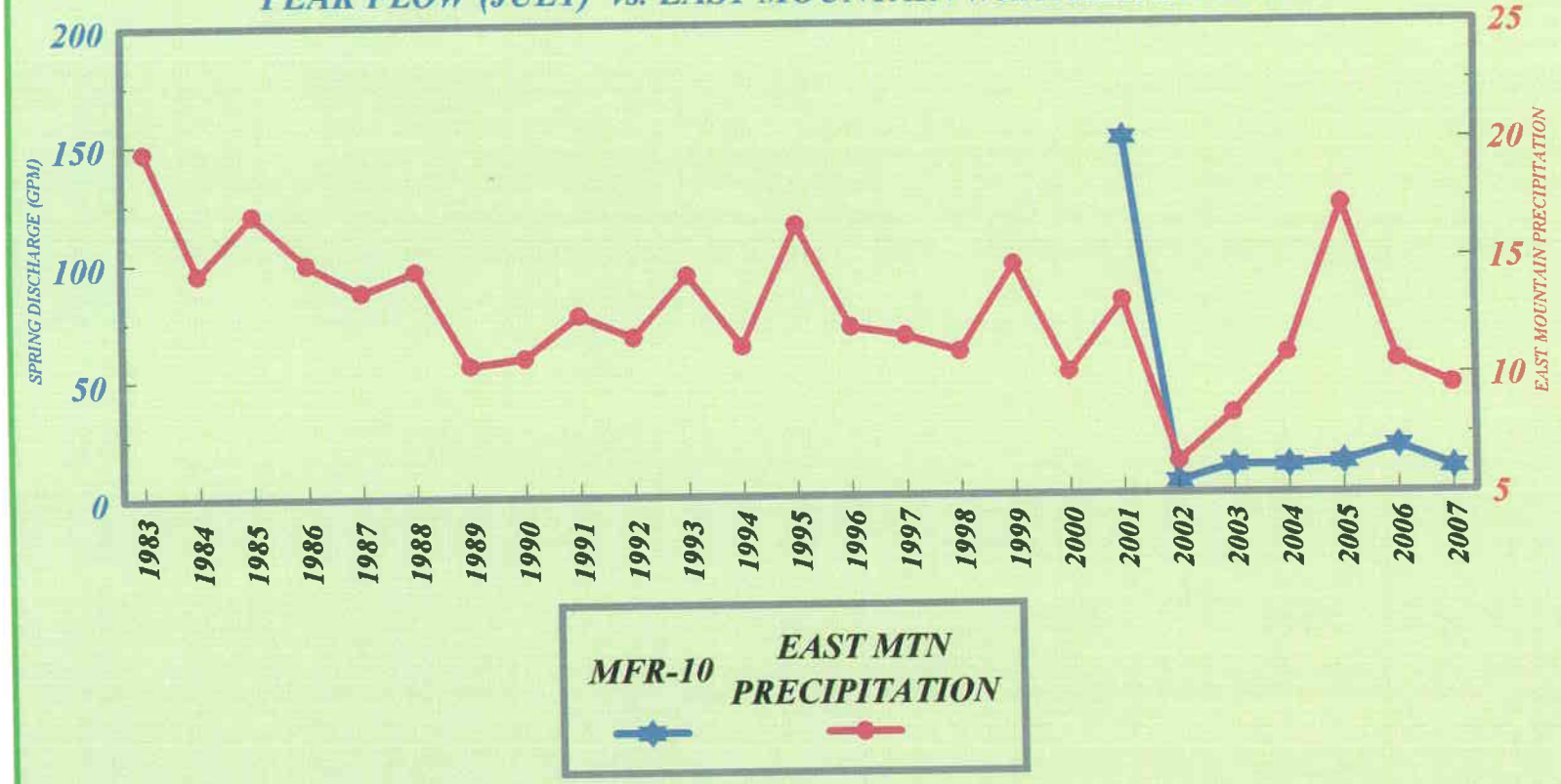
Spring: MF-219 vs. Precipitation



EAST MOUNTAIN SPRINGS

Spring: MFR-10 vs. Precipitation

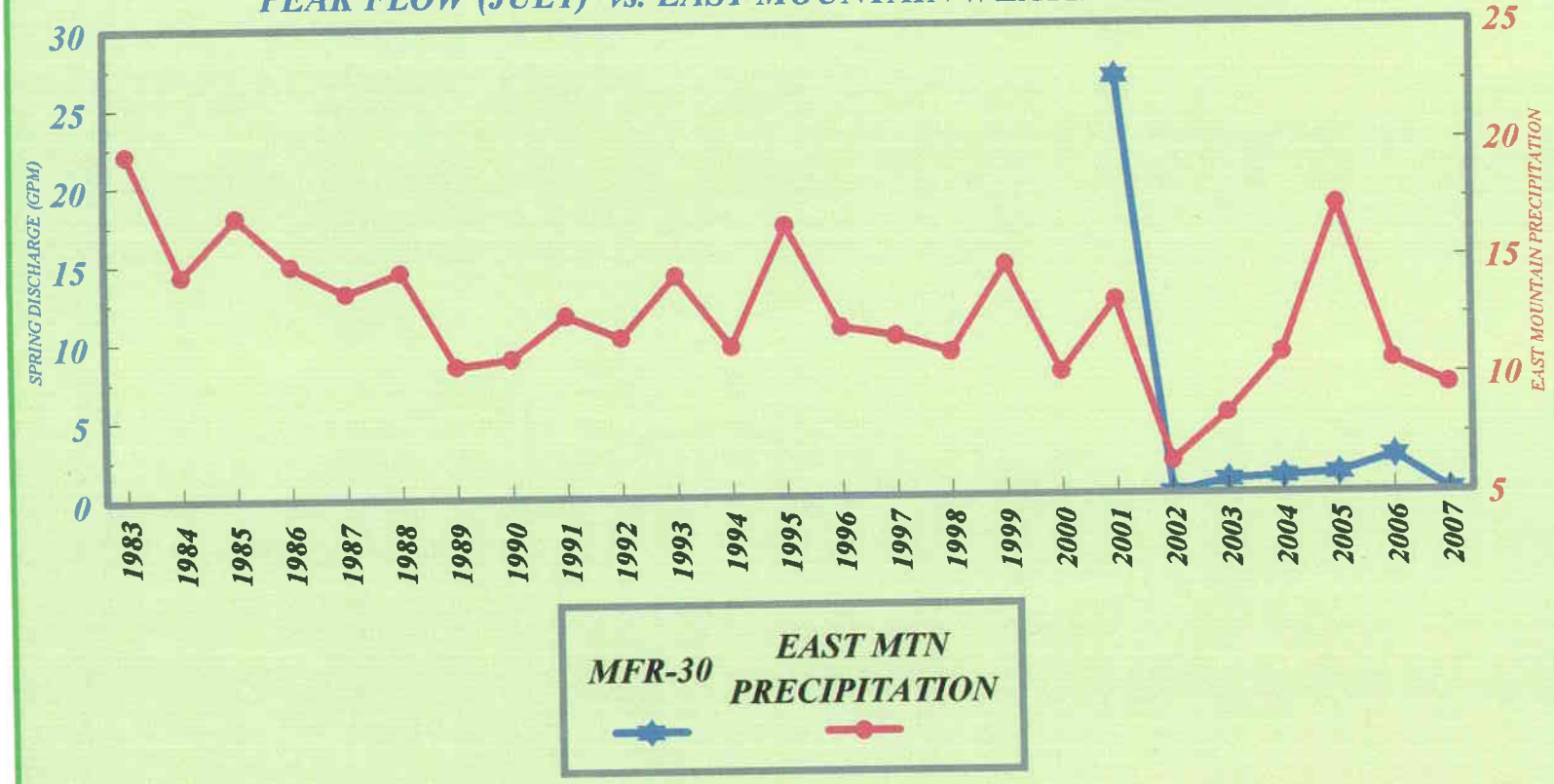
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



EAST MOUNTAIN SPRINGS

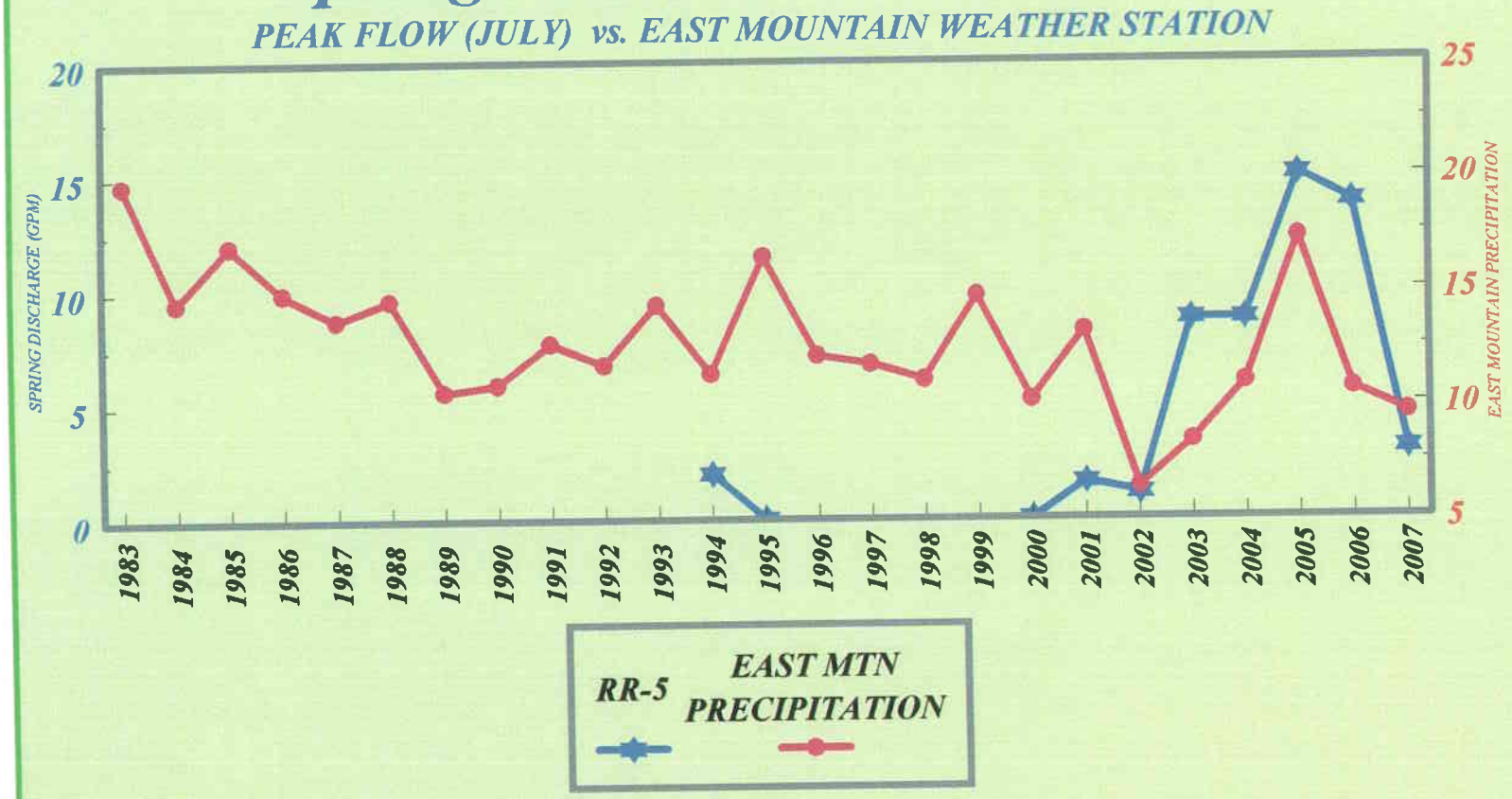
Spring: MFR-30 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



EAST MOUNTAIN SPRINGS

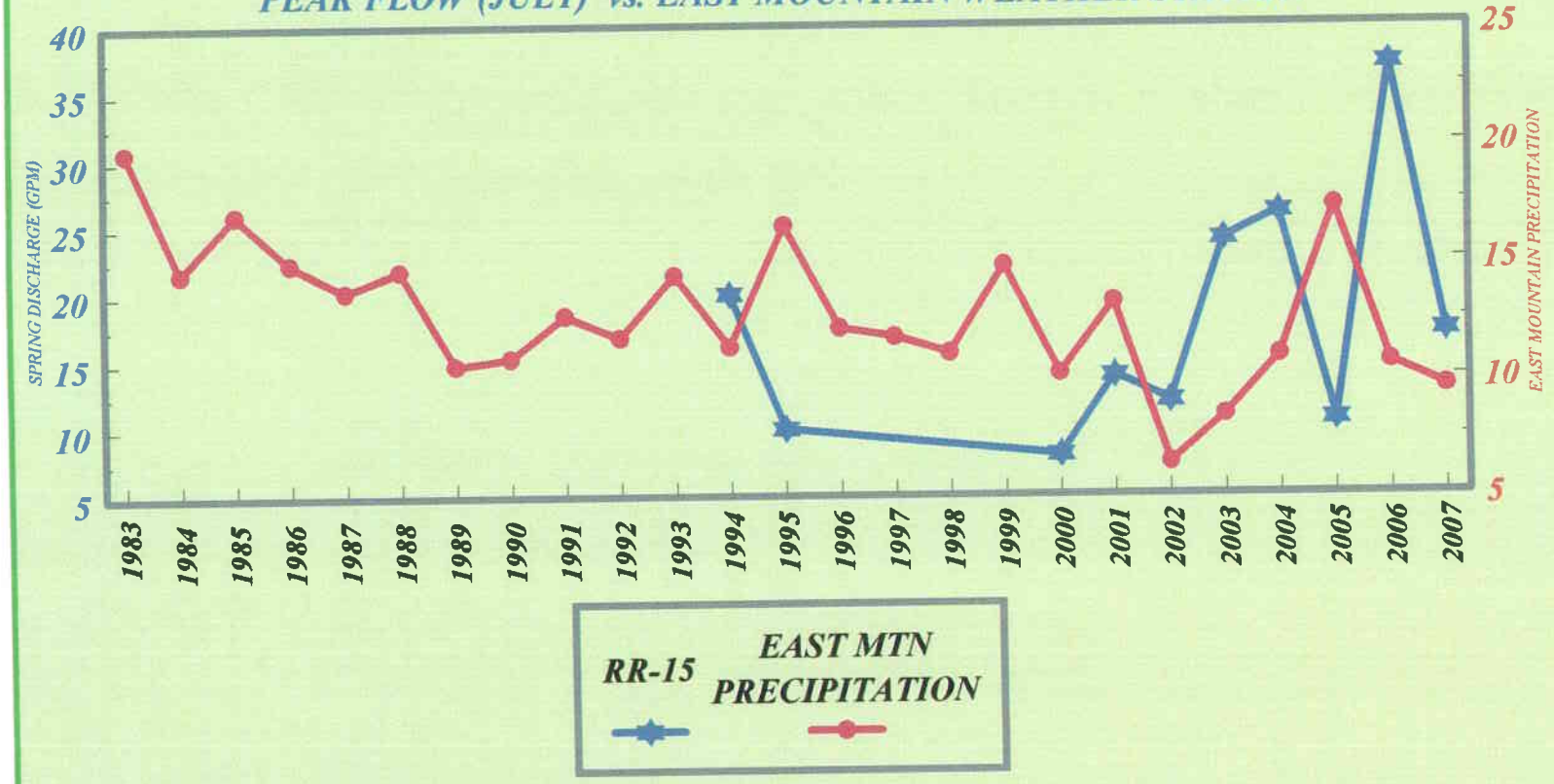
Spring: RR-5 vs. Precipitation



EAST MOUNTAIN SPRINGS

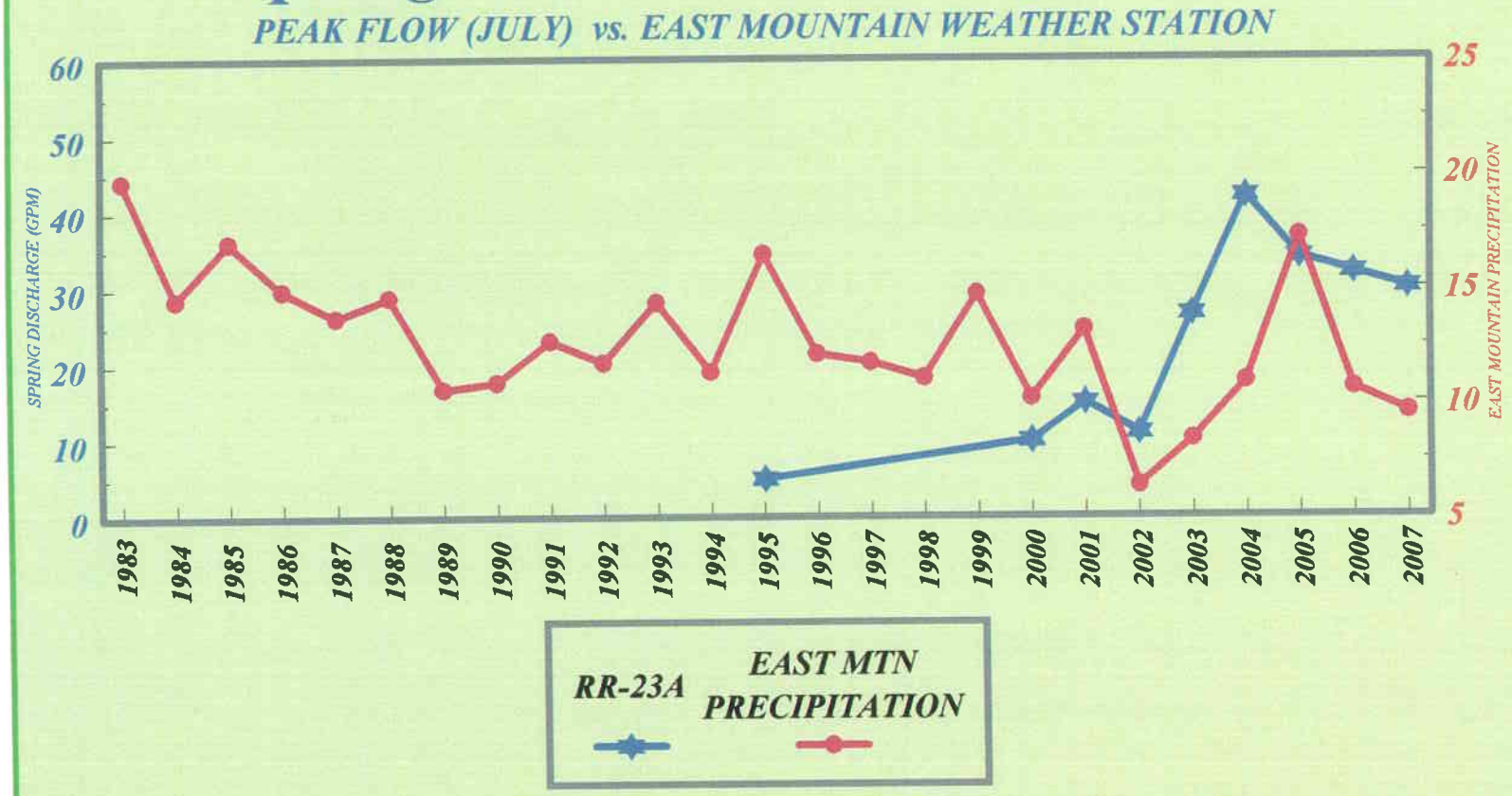
Spring: RR-15 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



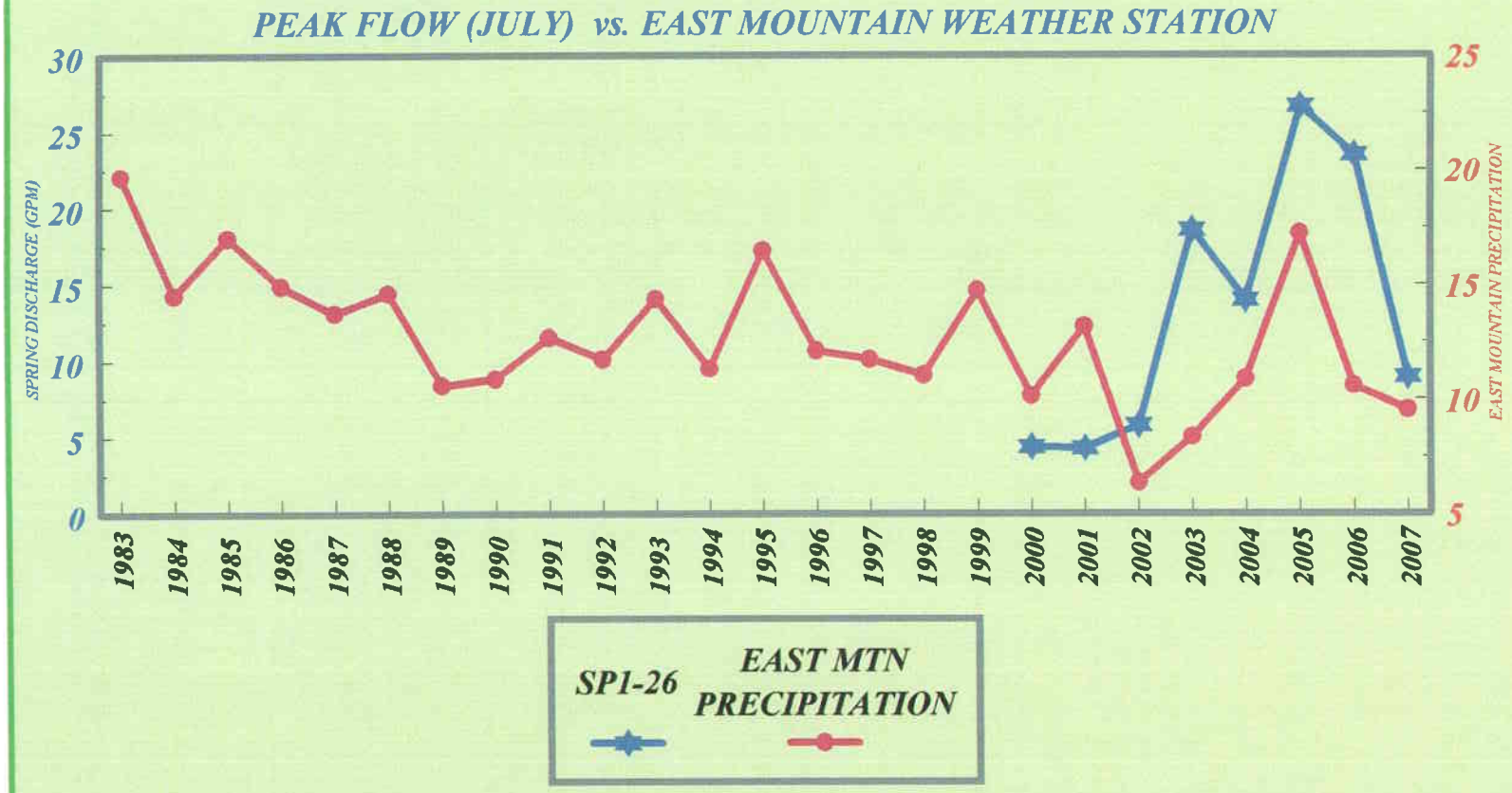
EAST MOUNTAIN SPRINGS

Spring: RR-23A vs. Precipitation



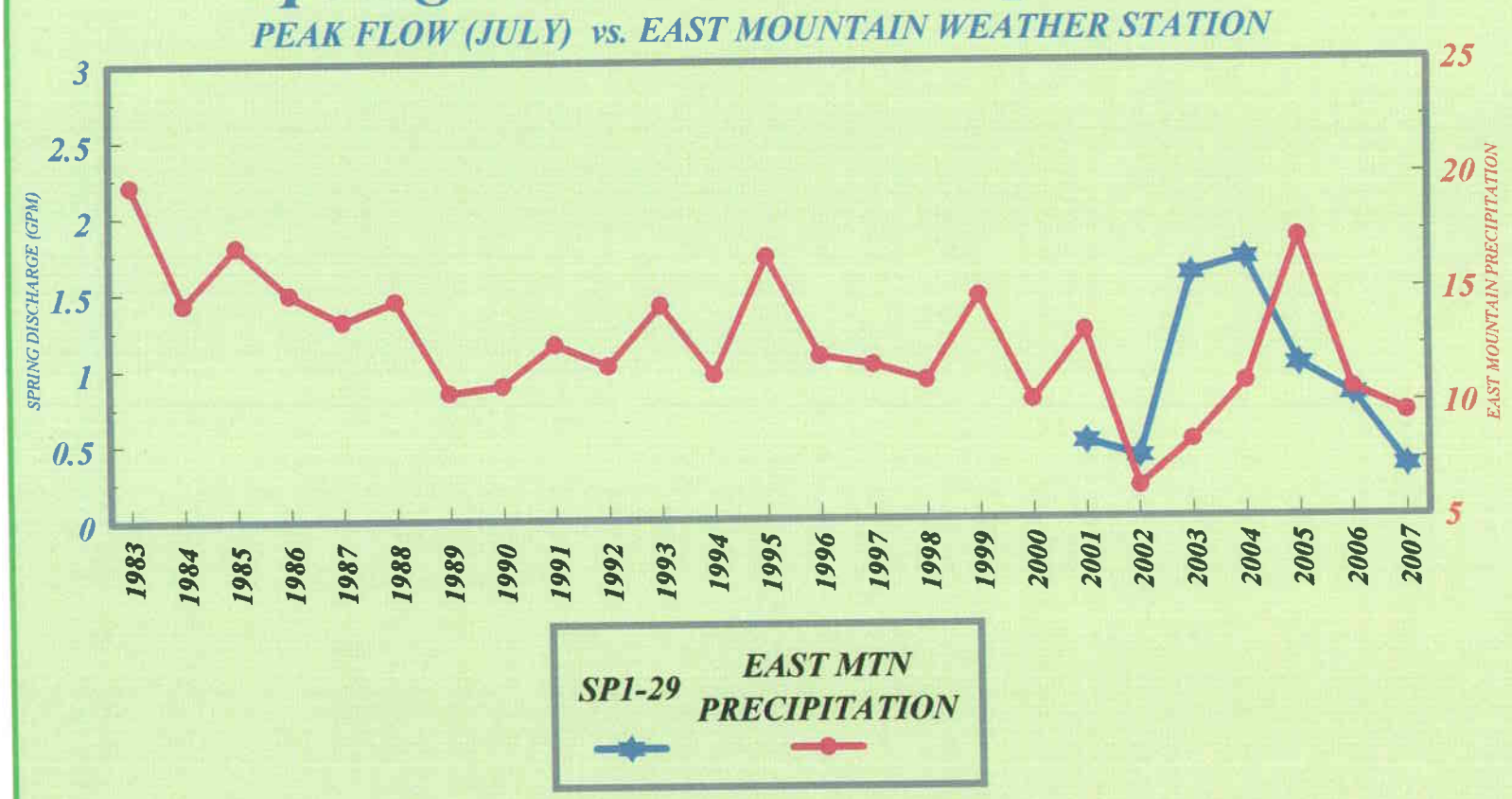
EAST MOUNTAIN SPRINGS

Spring: SP1-26 vs. Precipitation



EAST MOUNTAIN SPRINGS

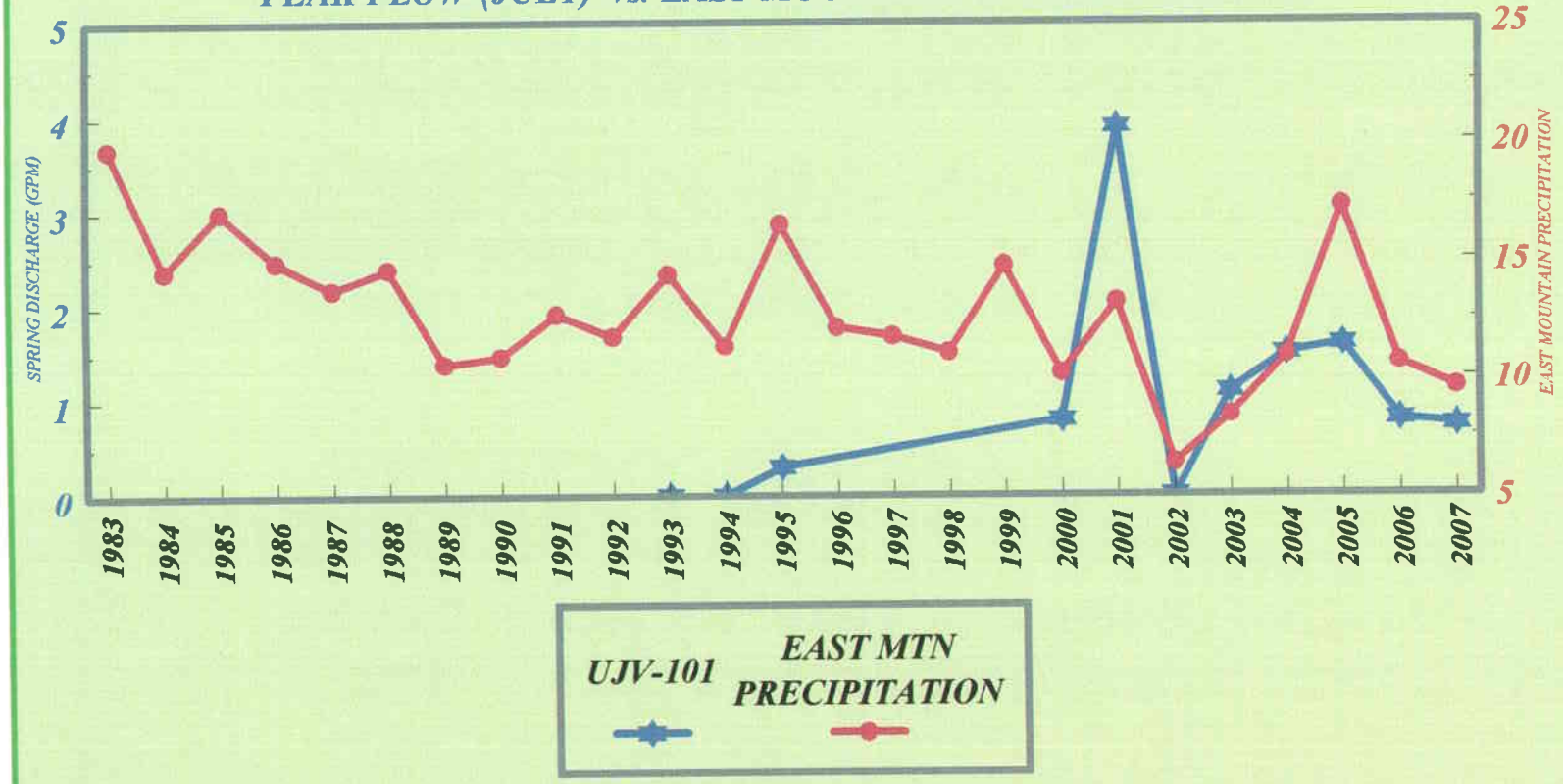
Spring: SP1-29 vs. Precipitation



EAST MOUNTAIN SPRINGS

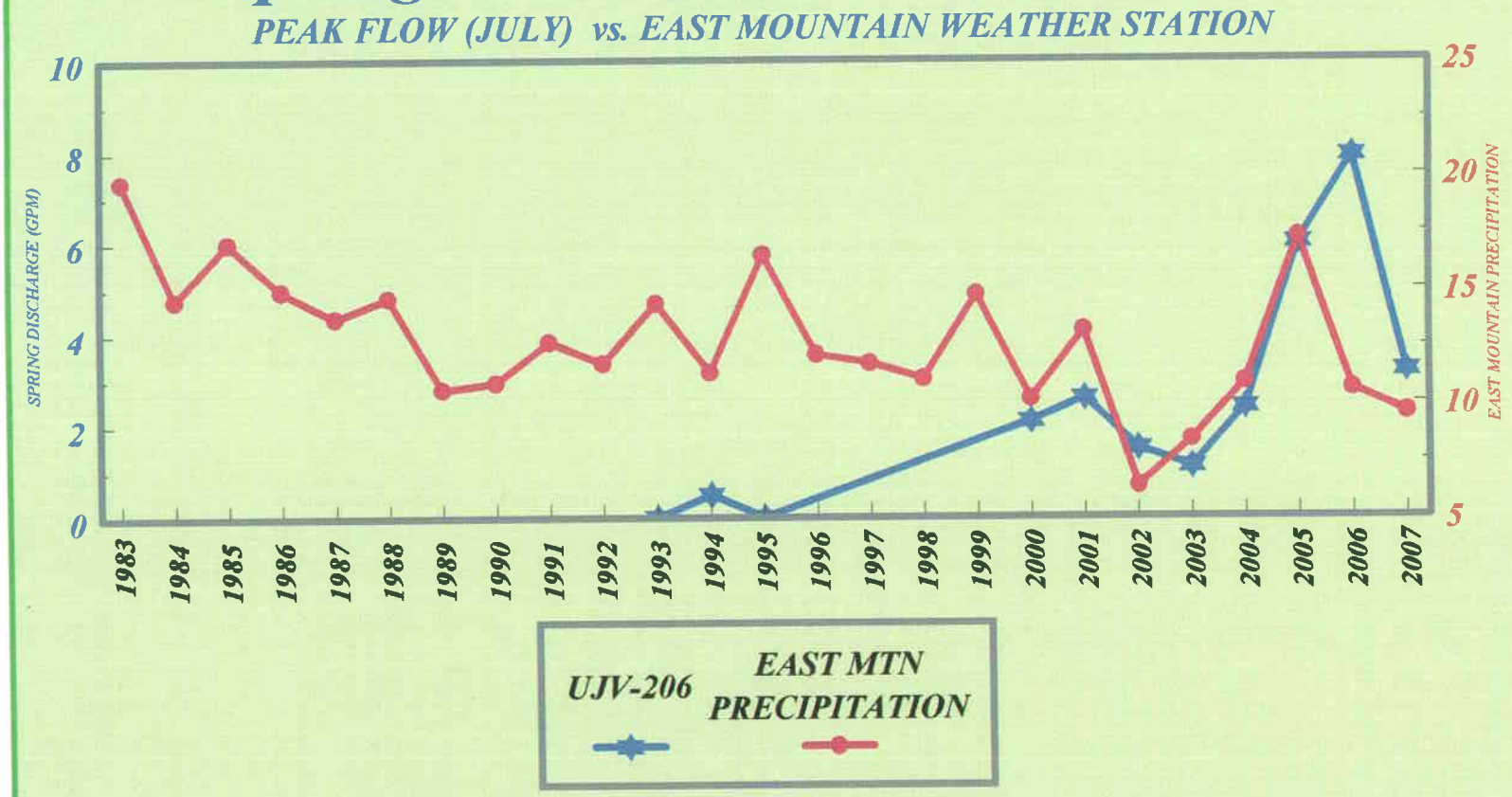
Spring: UJV-101 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



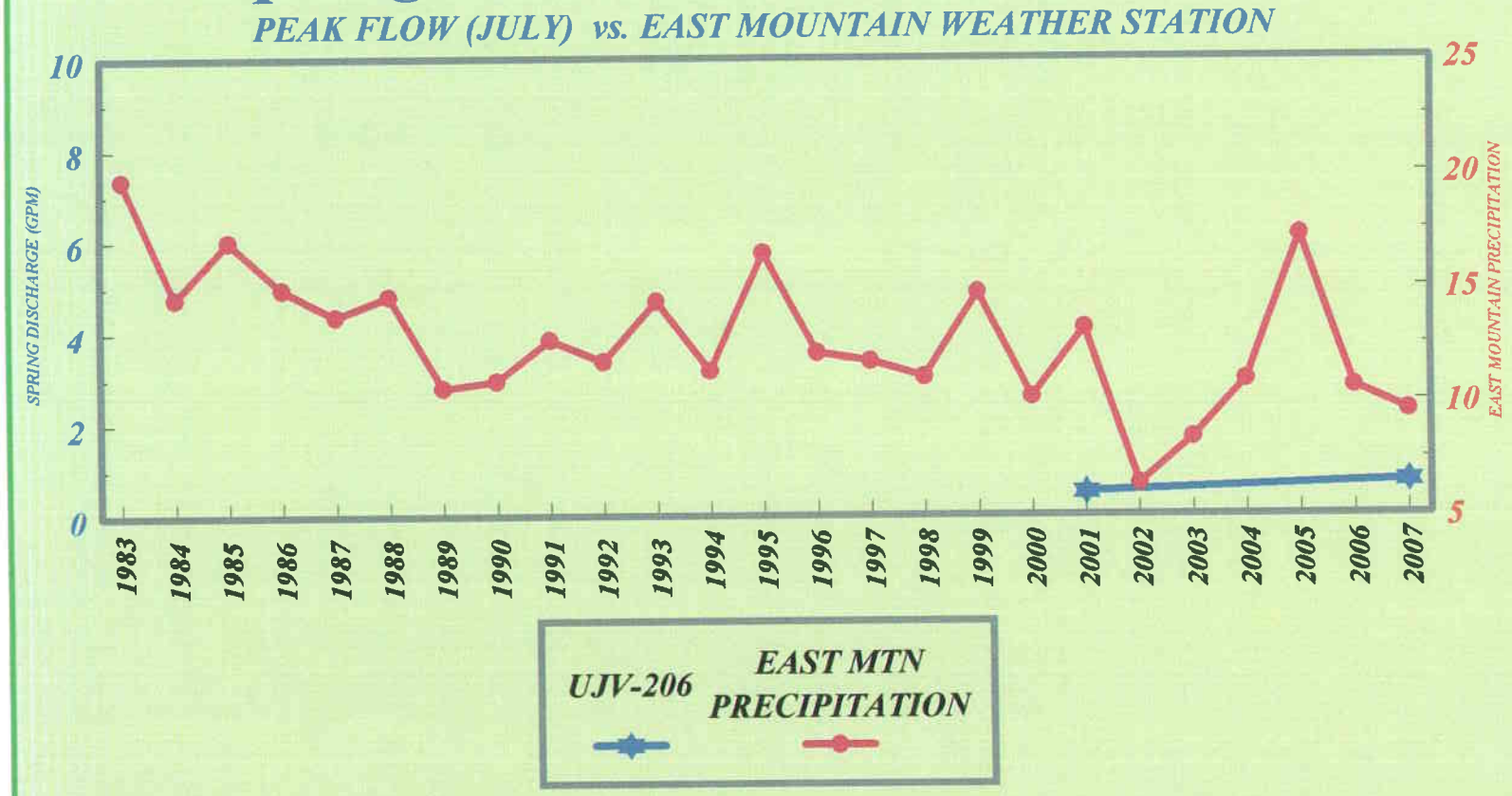
EAST MOUNTAIN SPRINGS

Spring: UJV-206 vs. Precipitation



EAST MOUNTAIN SPRINGS

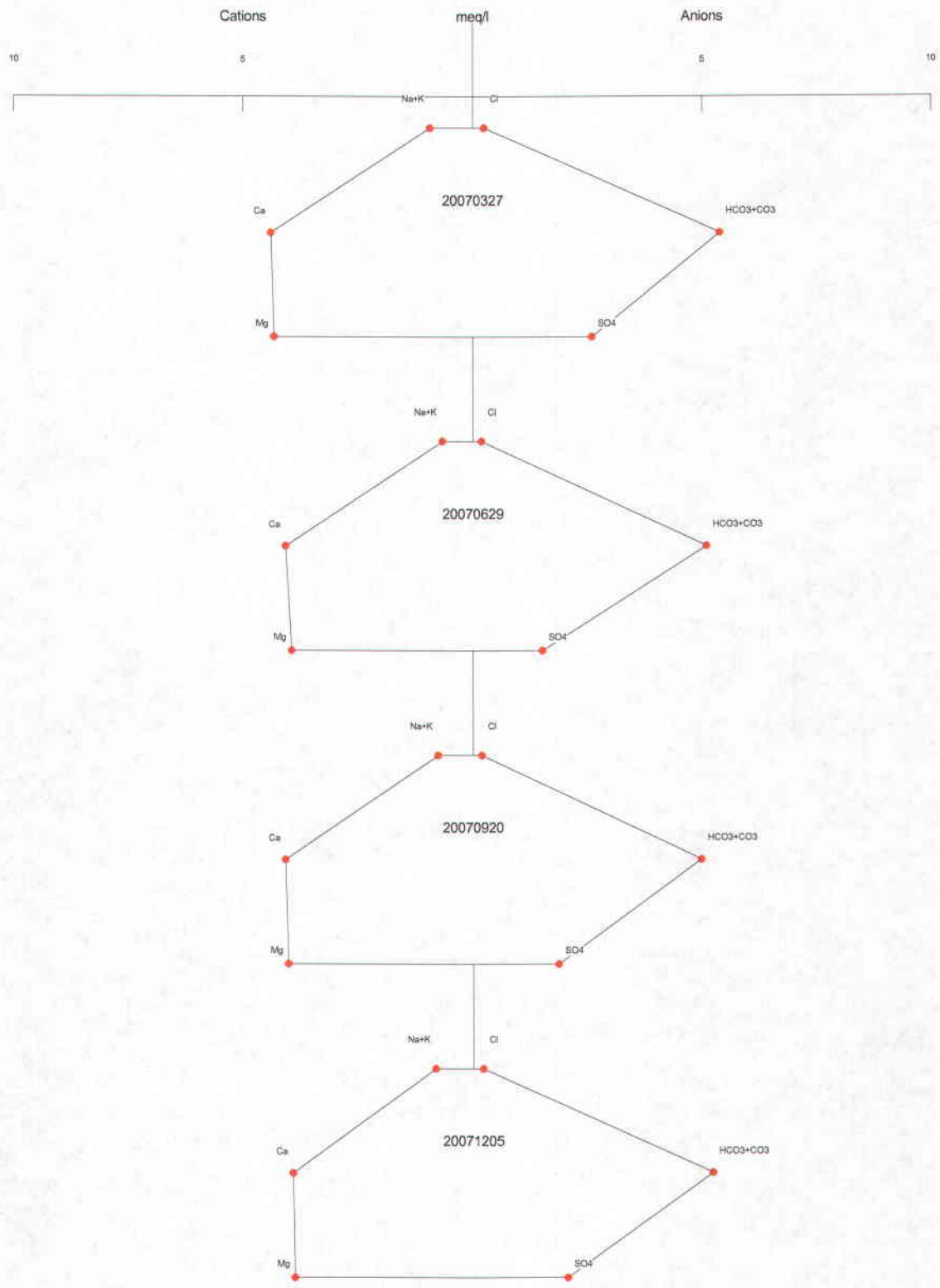
Spring: UJV-213 vs. Precipitation



East Mountain Springs
Stiff Diagrams
Alluvium

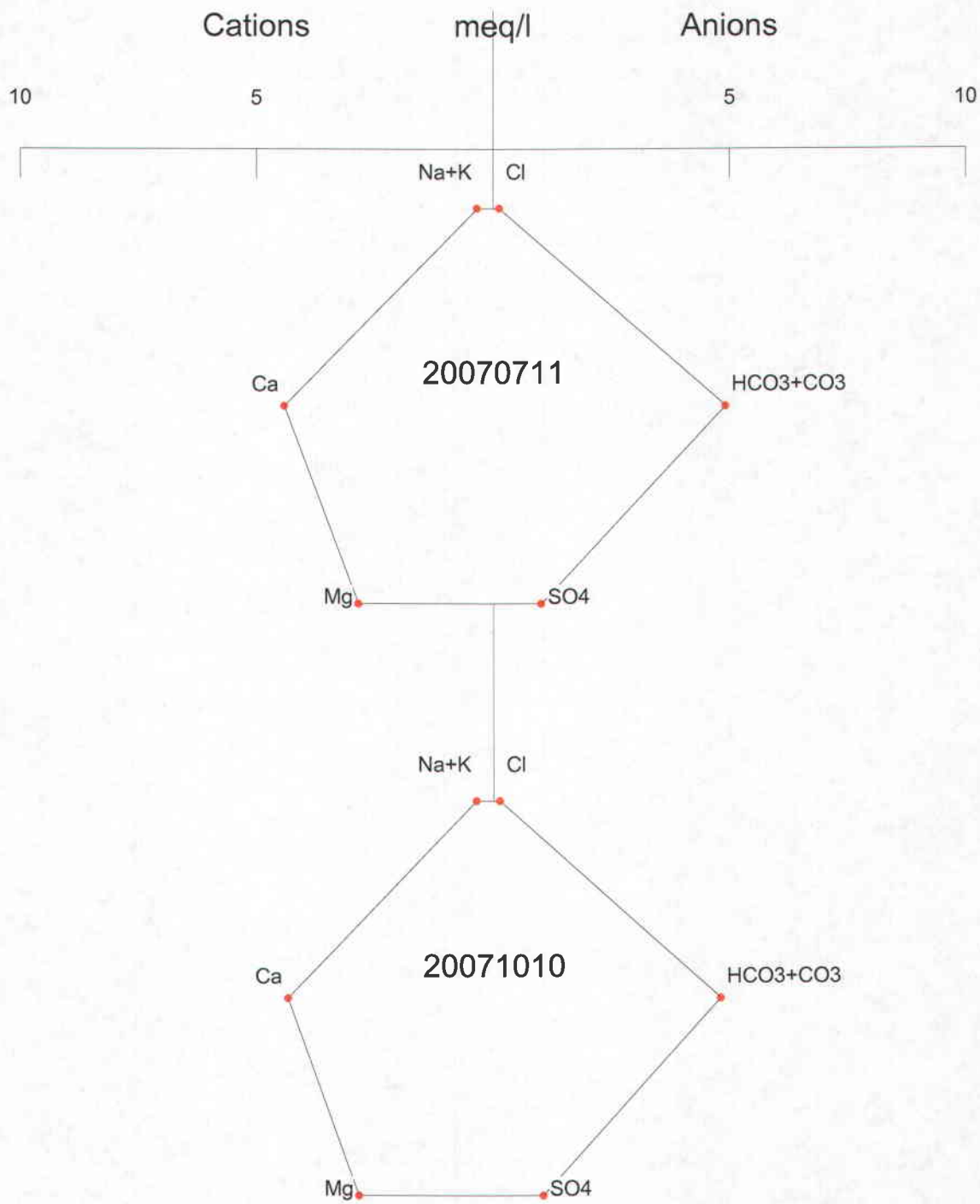
East Mountain Springs

Rilda Canyon - Meter 3



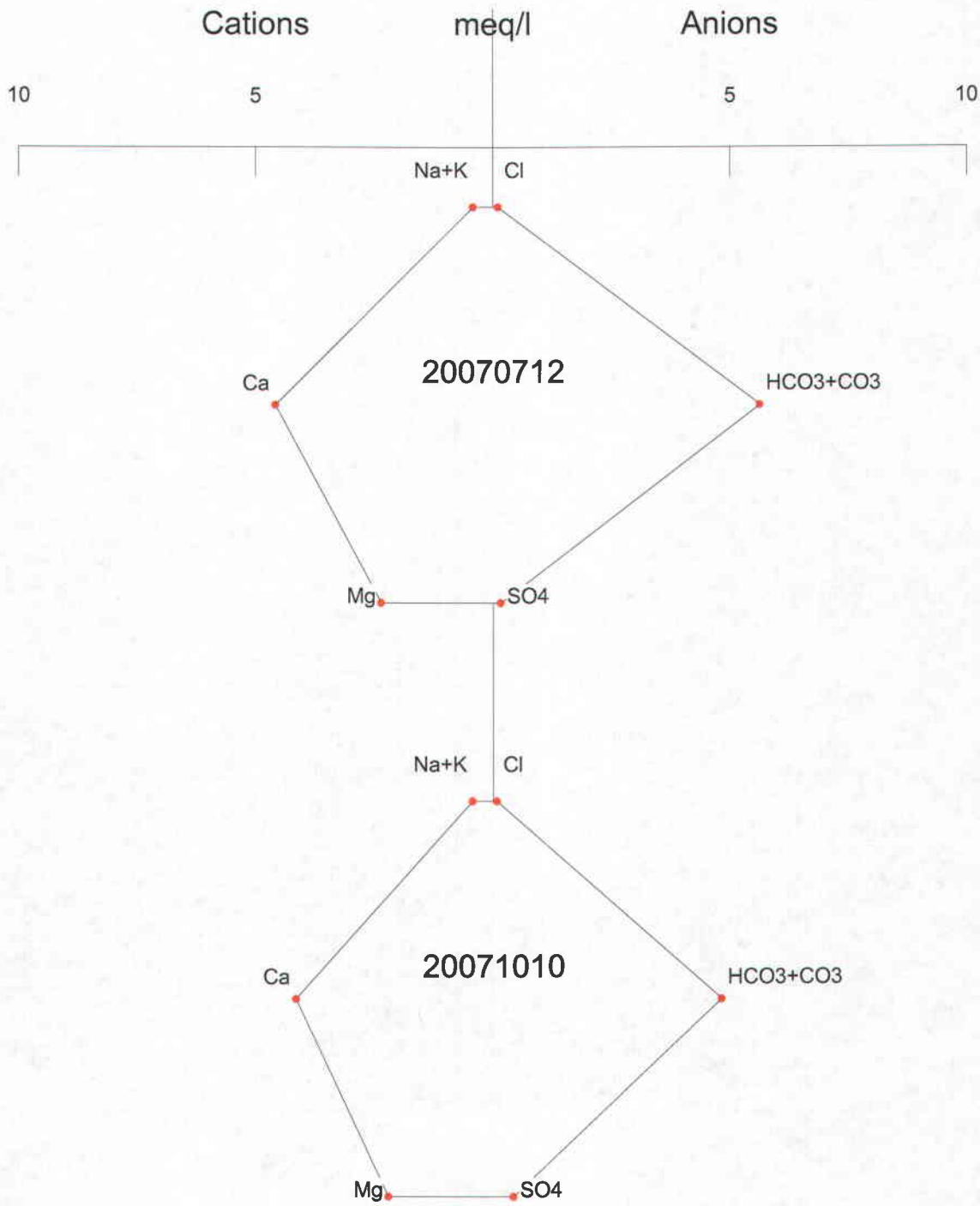
East Mountain Springs

EMS JV-9 Spring



East Mountain Springs

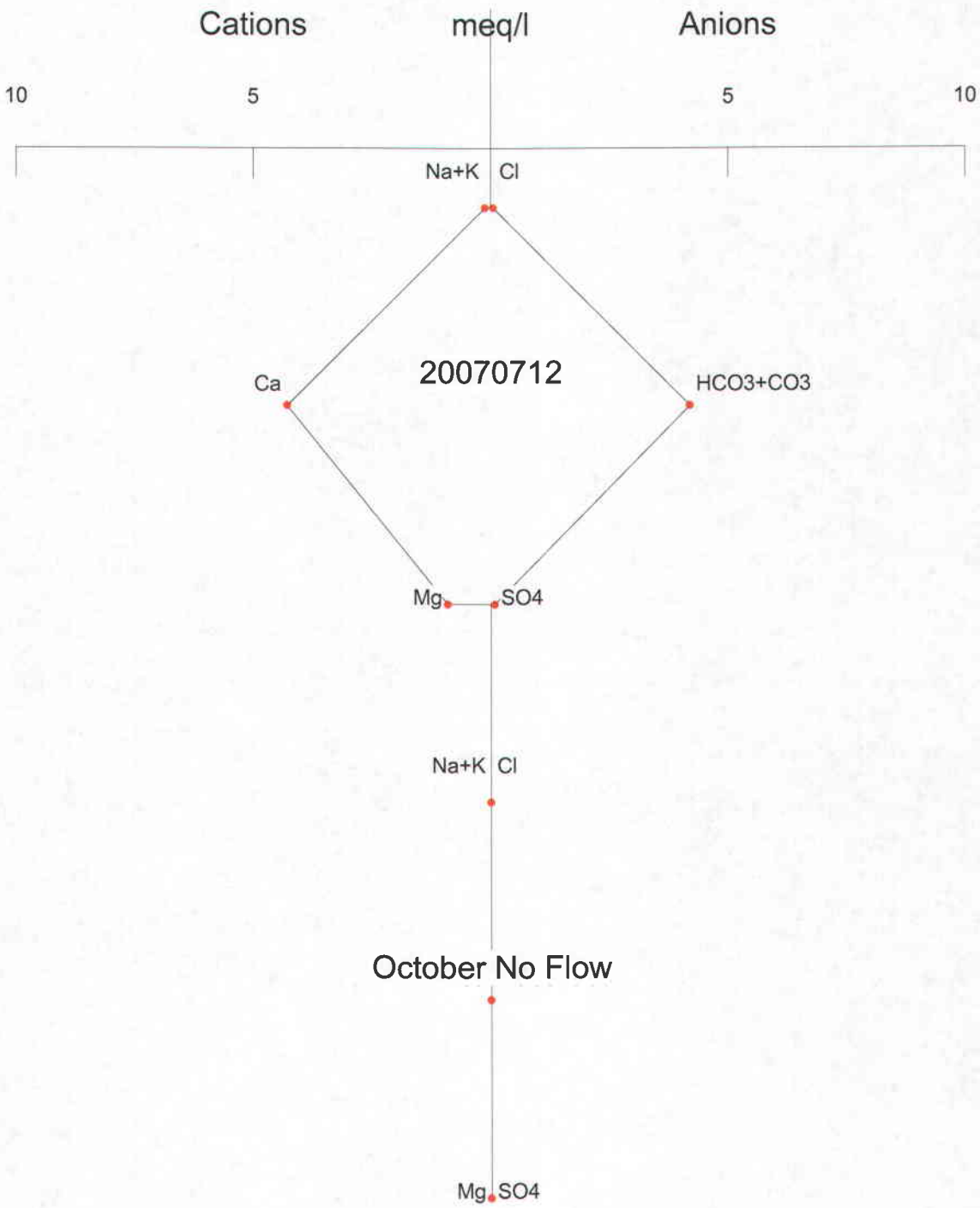
EMS JV-34 Spring



East Mountain Springs
Stiff Diagrams
Flagstaff Limestone

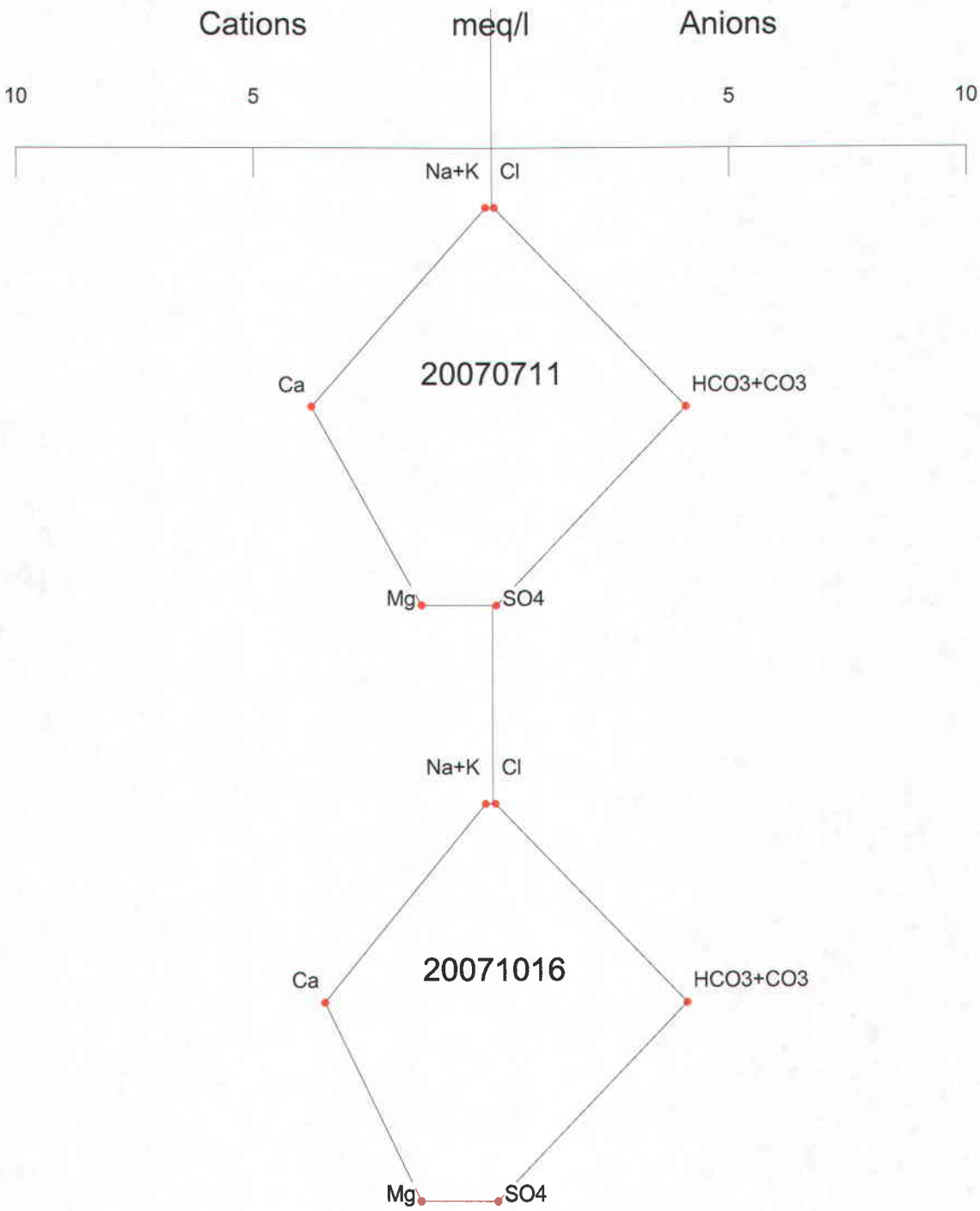
East Mountain Springs

EMS SHEBA SPRING



East Mountain Springs

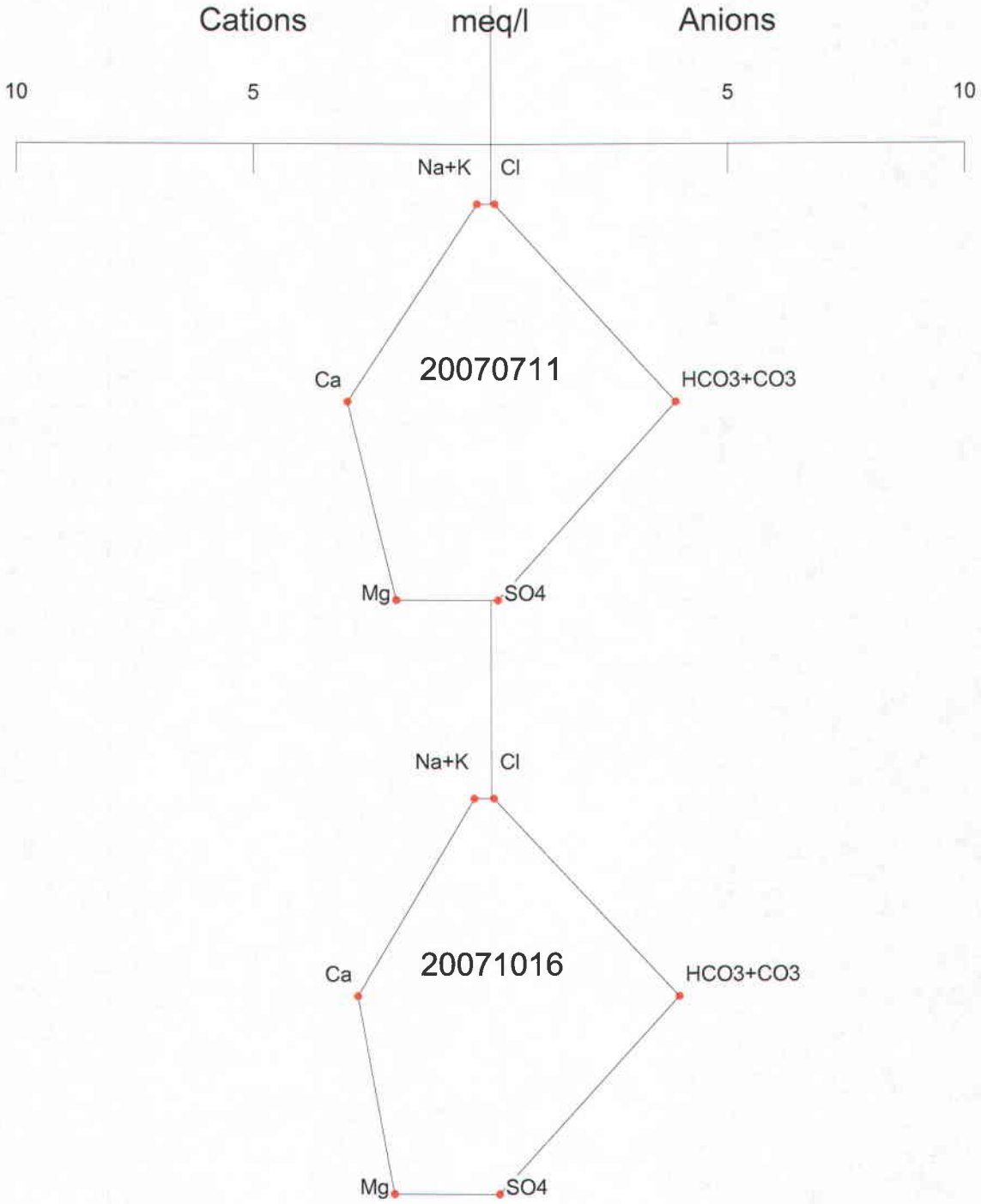
EMS 79-35 Spring



East Mountain Springs
Stiff Diagrams
North Horn Formation

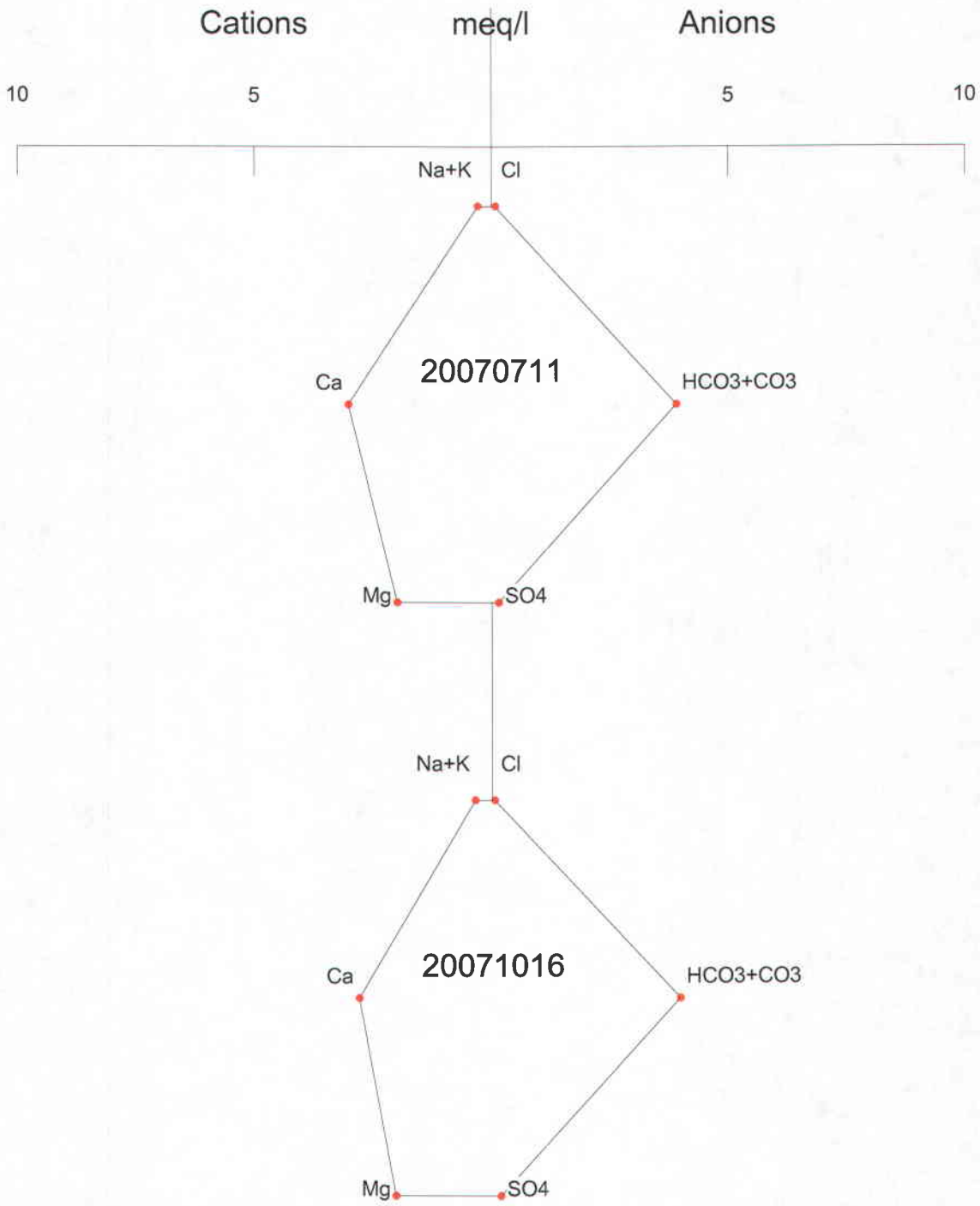
East Mountain Springs

Burnt Tree Spring



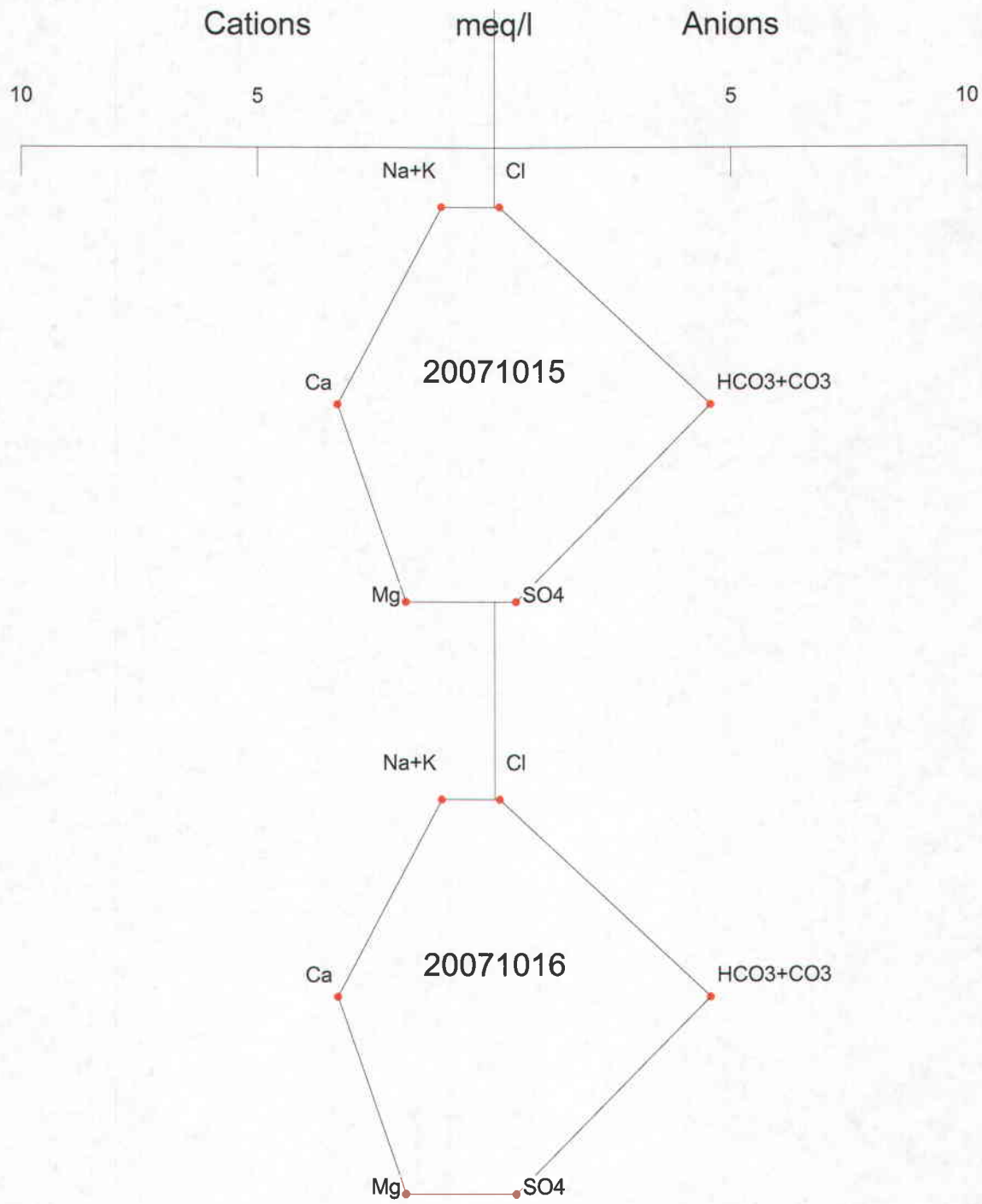
East Mountain Springs

Elk Spring



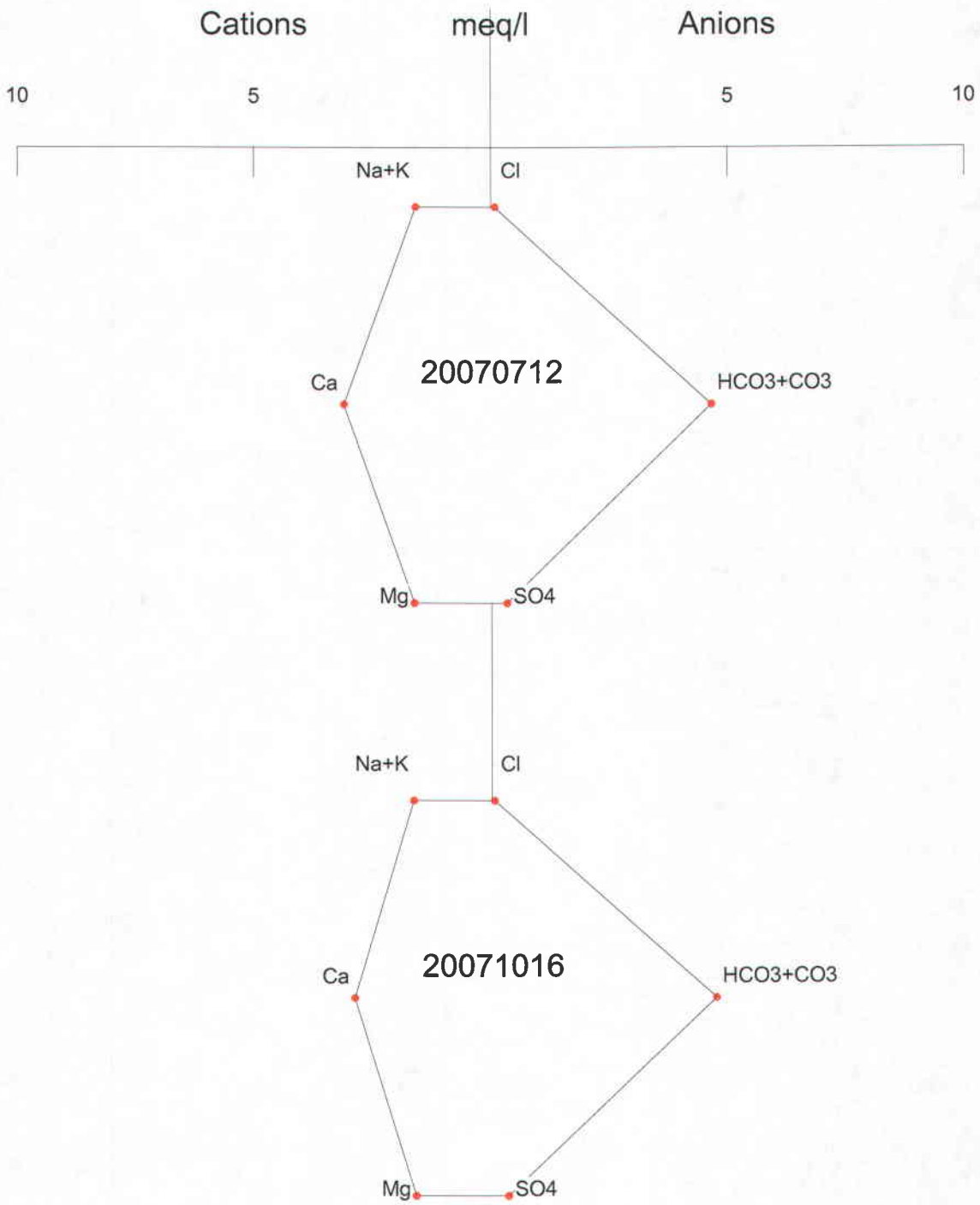
East Mountain Springs

EMS TED'S TUB



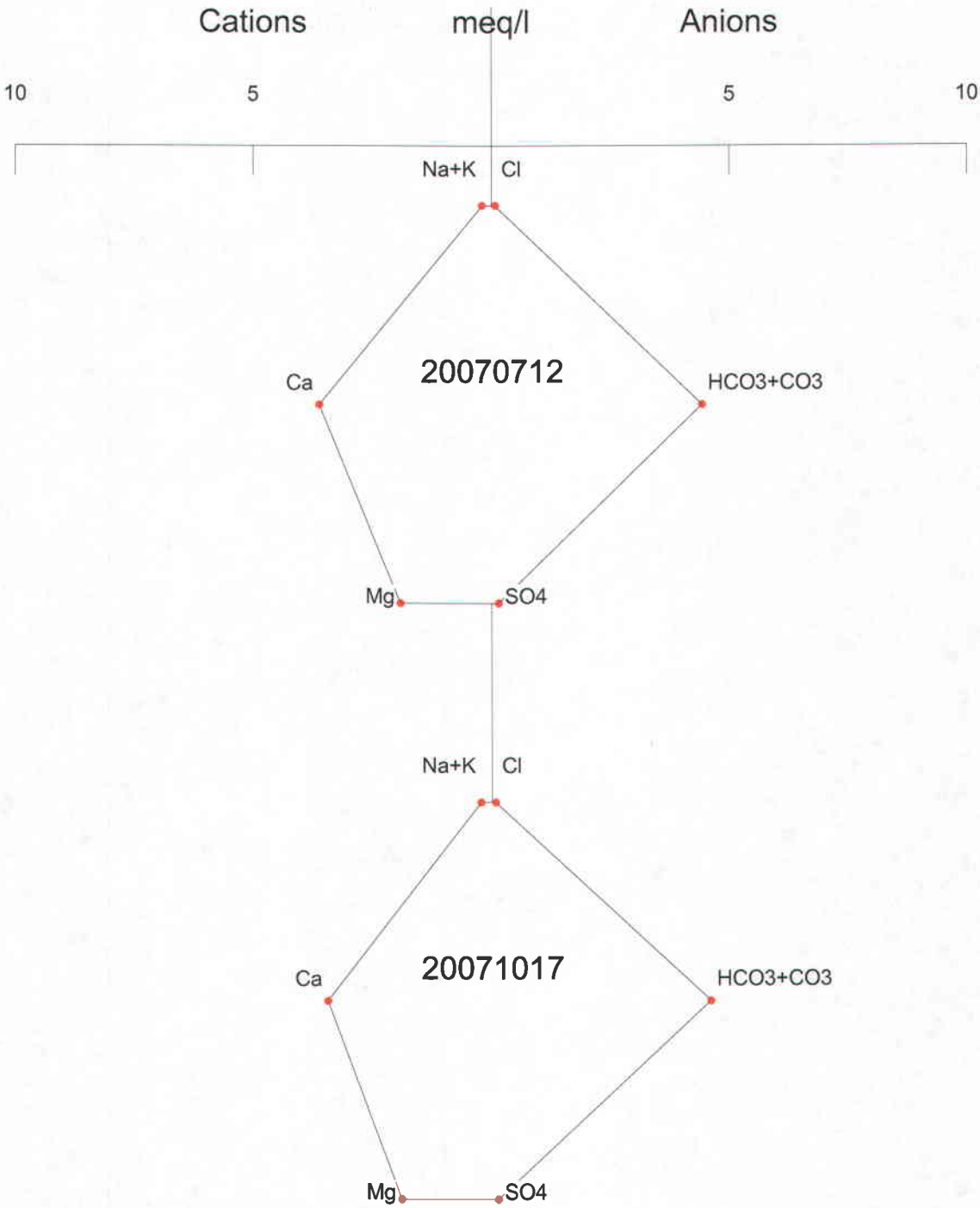
East Mountain Springs

EMS 79-02 Spring



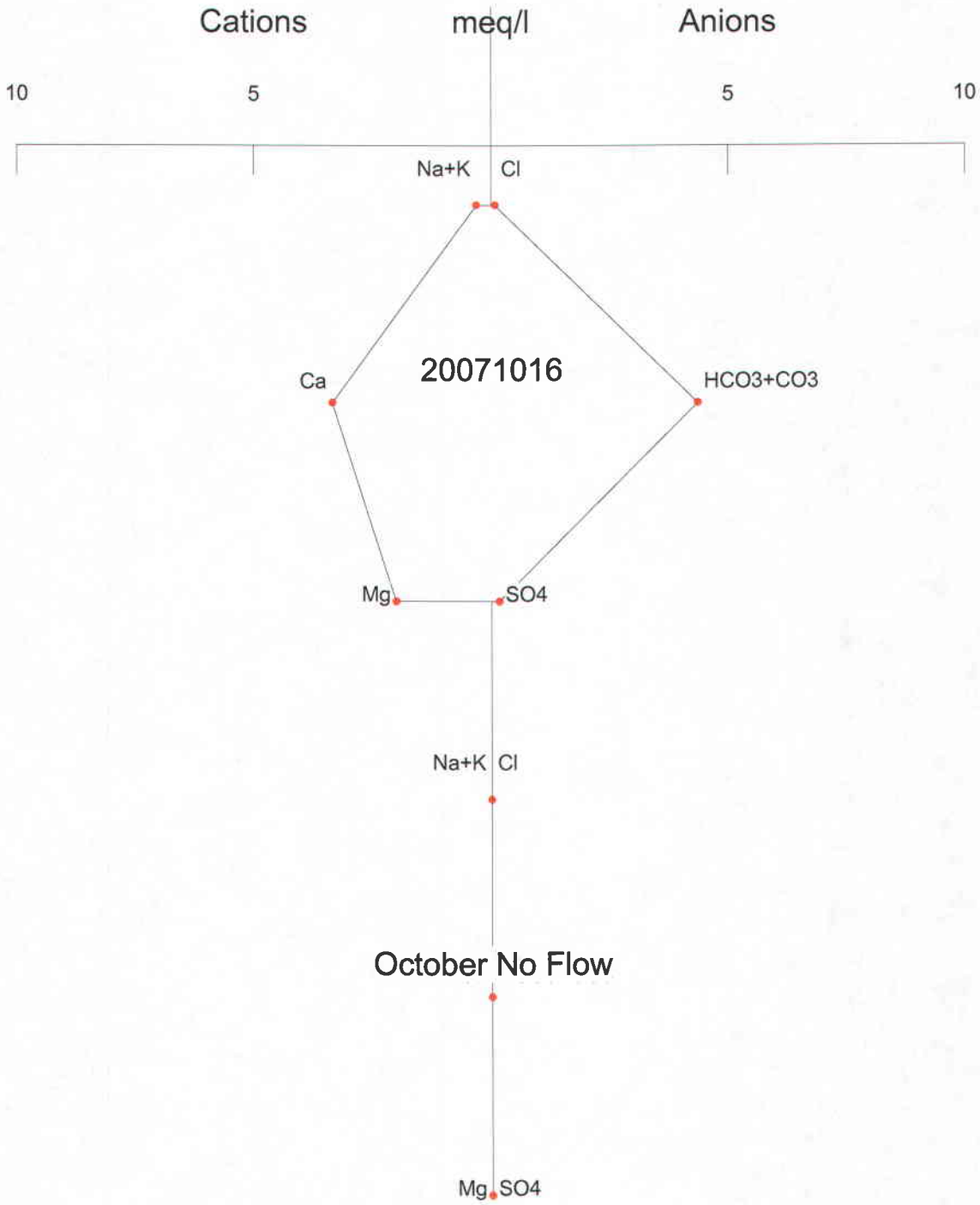
East Mountain Springs

EMS 79-10 Spring



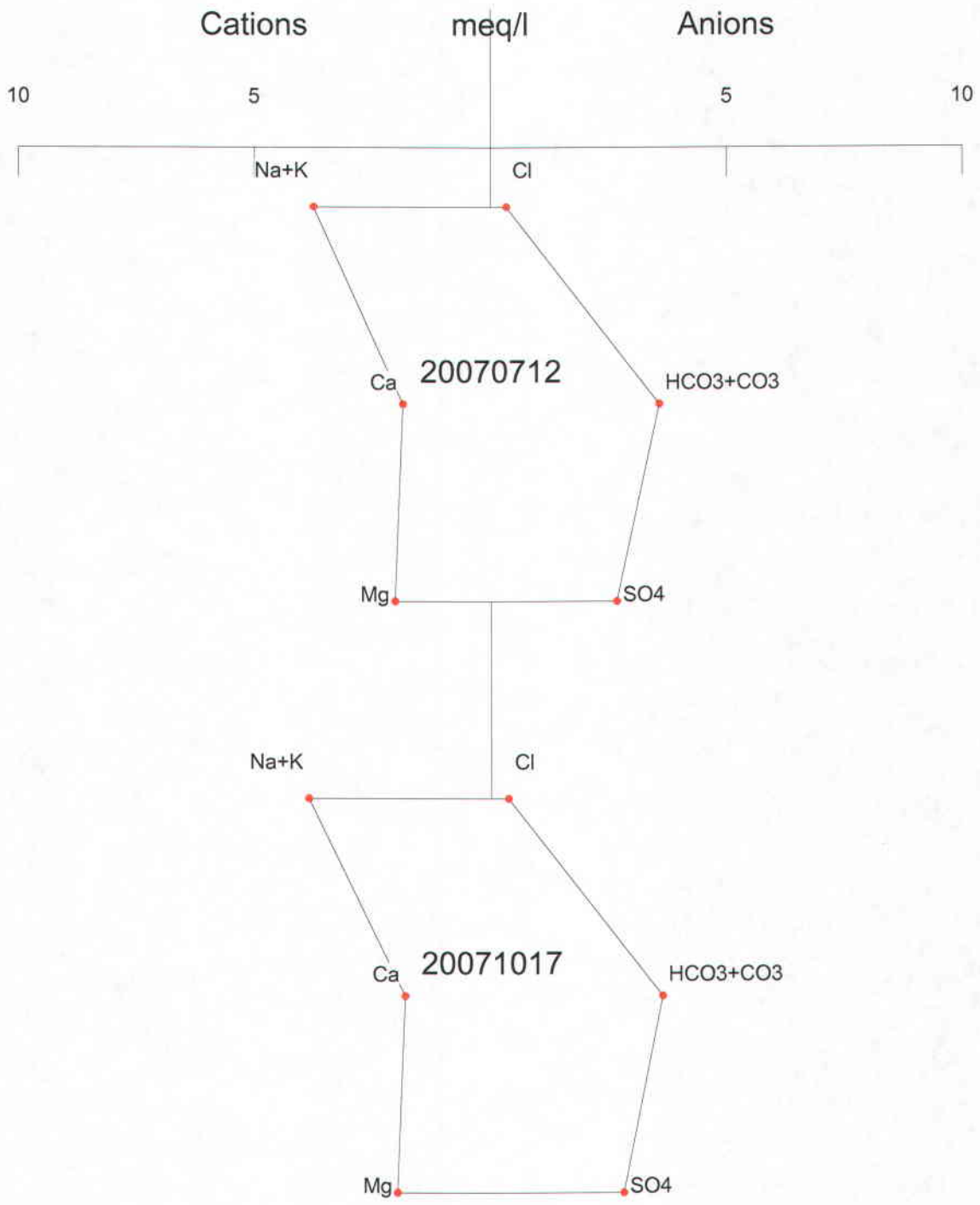
East Mountain Springs

EMS 79-15 Spring



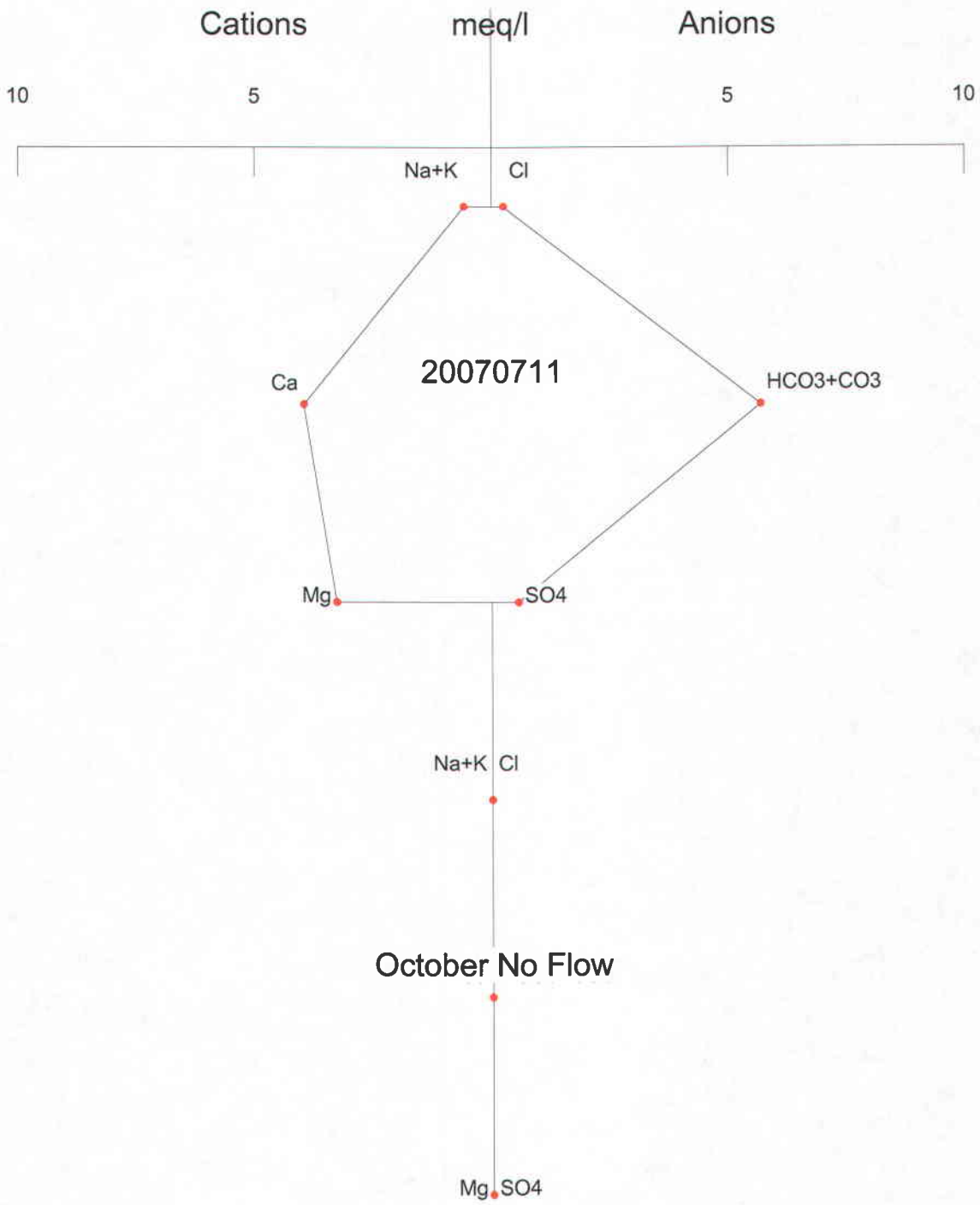
East Mountain Springs

EMS 79-28 Spring



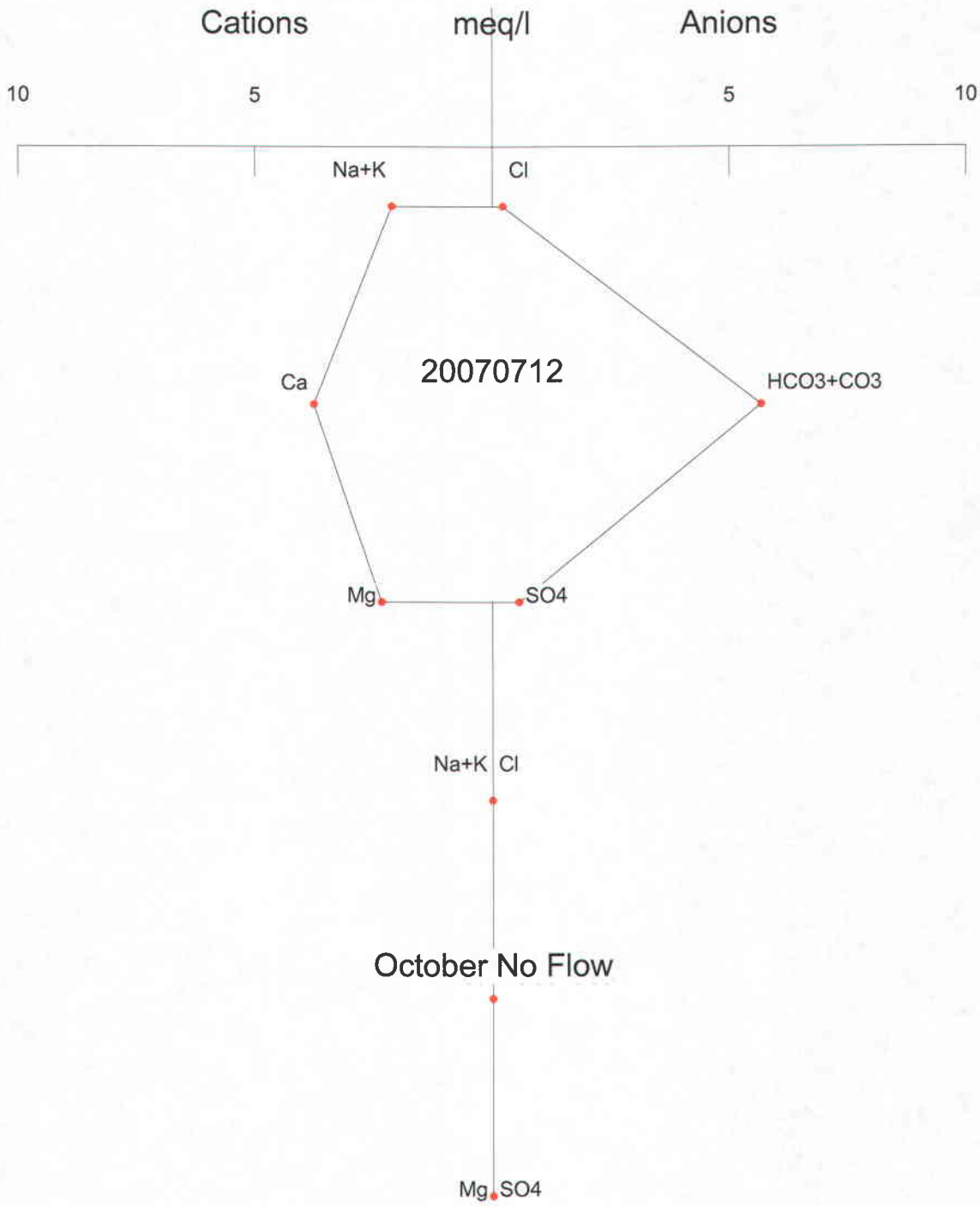
East Mountain Springs

EMS 79-34 Spring



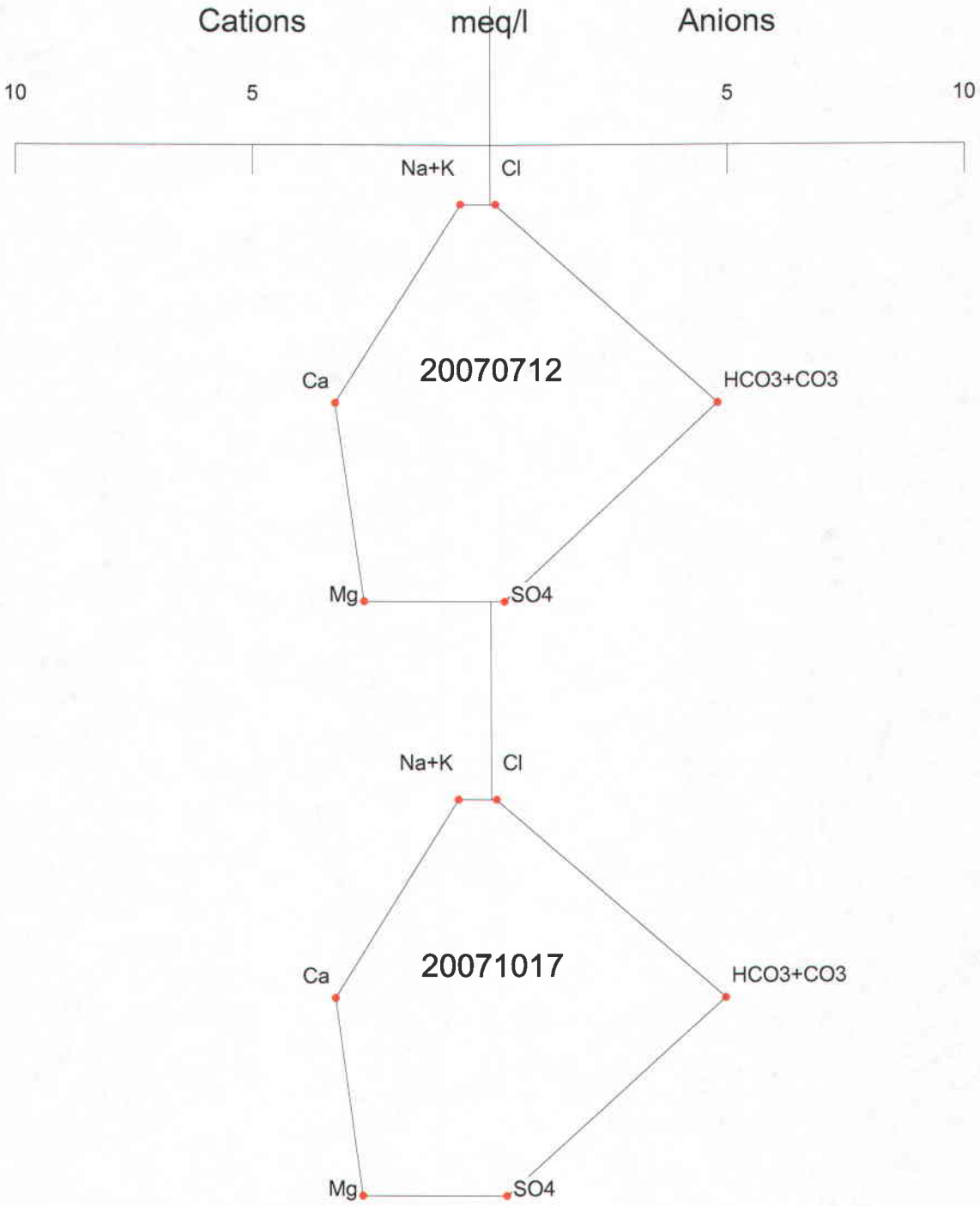
East Mountain Springs

EMS 79-38 Spring



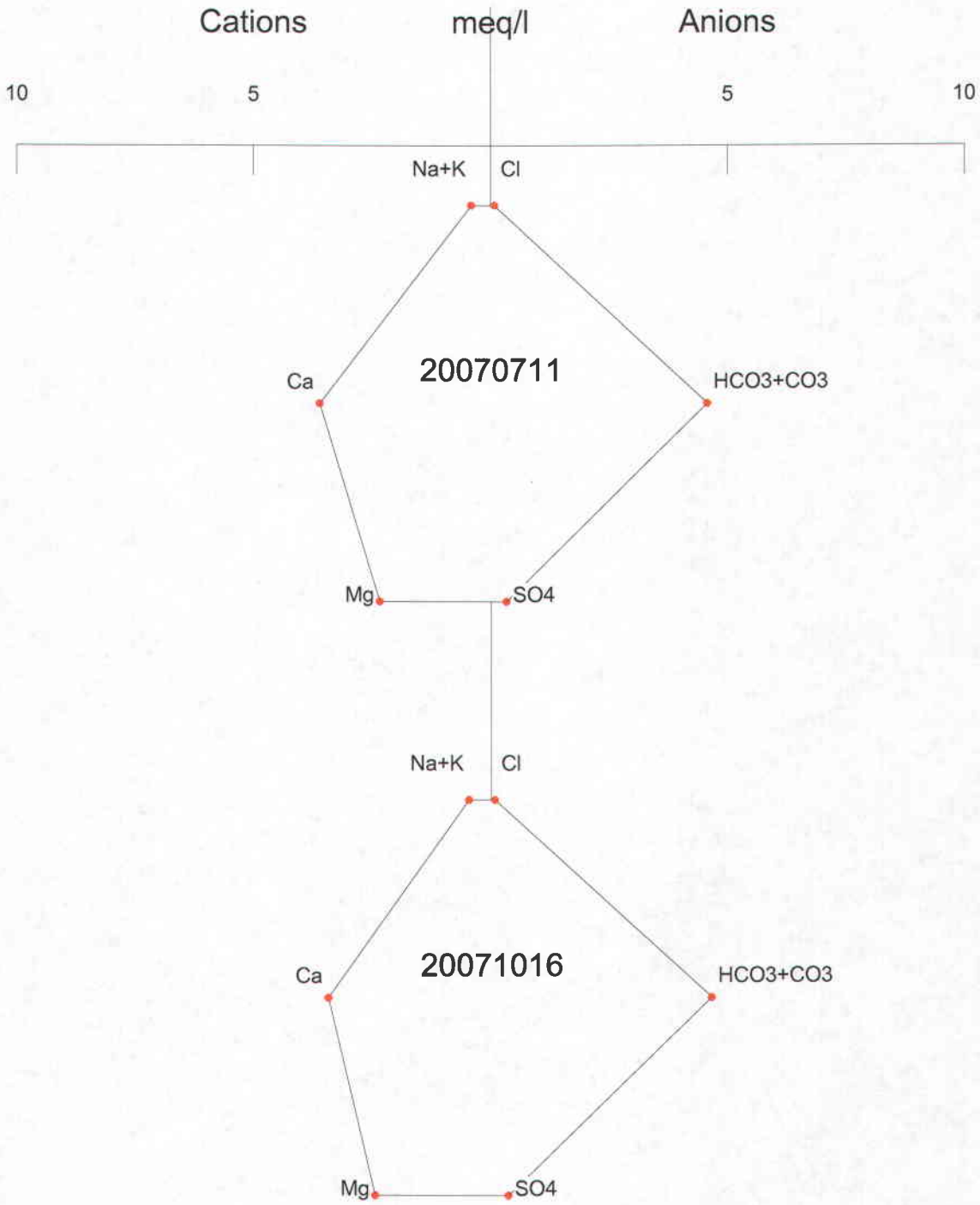
East Mountain Springs

EMS 80-47 Spring



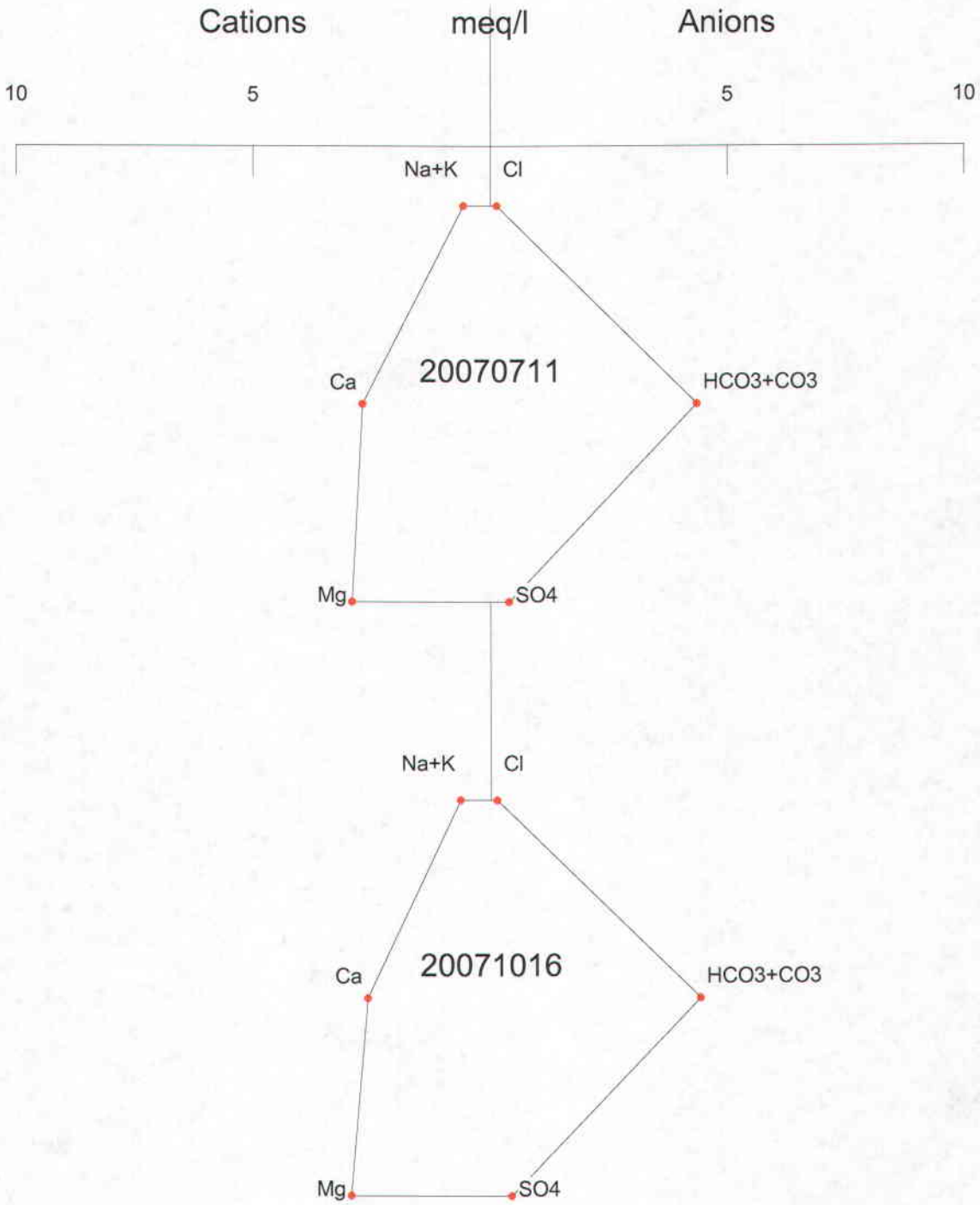
East Mountain Springs

EMS 89-61 Spring



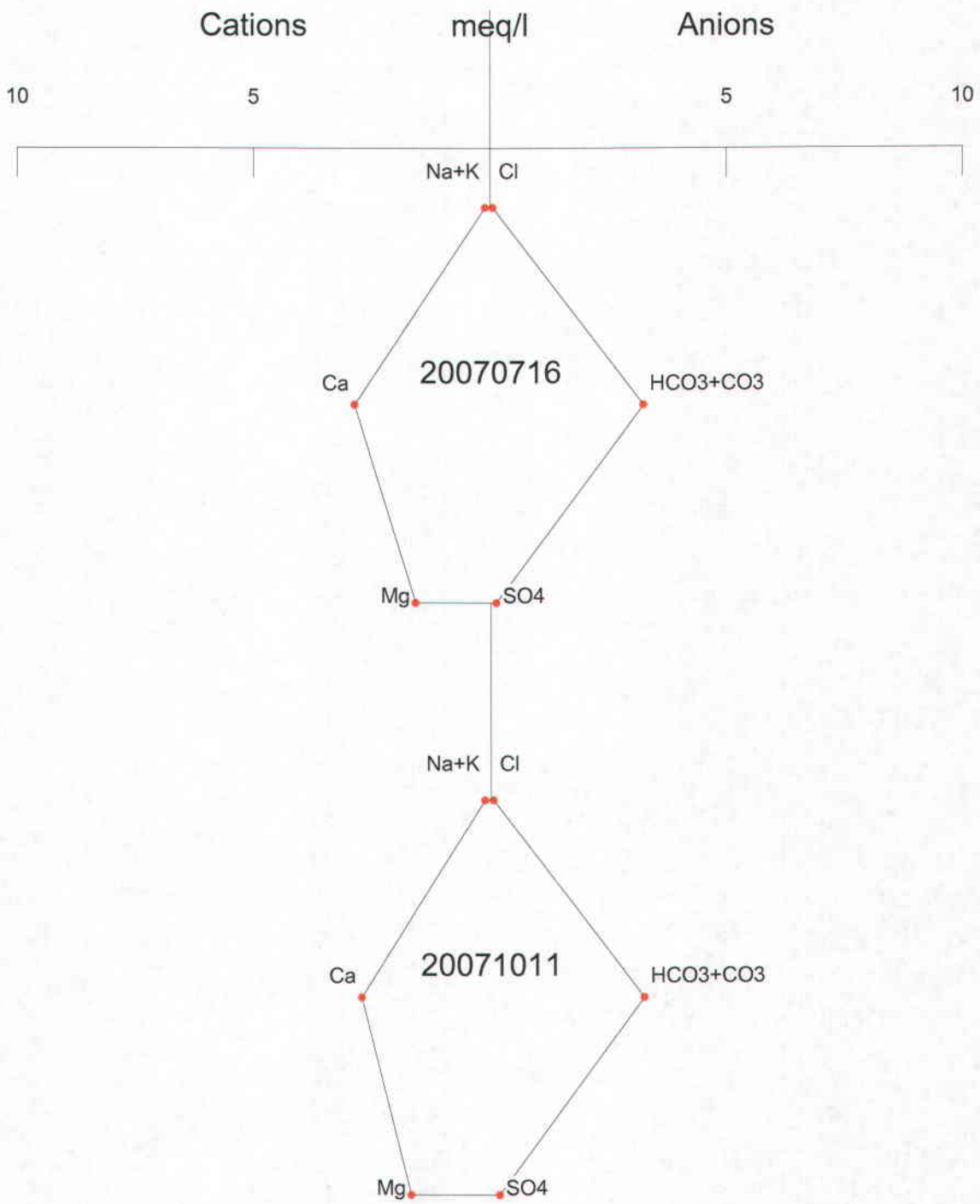
East Mountain Springs

EMS 89-67 Spring



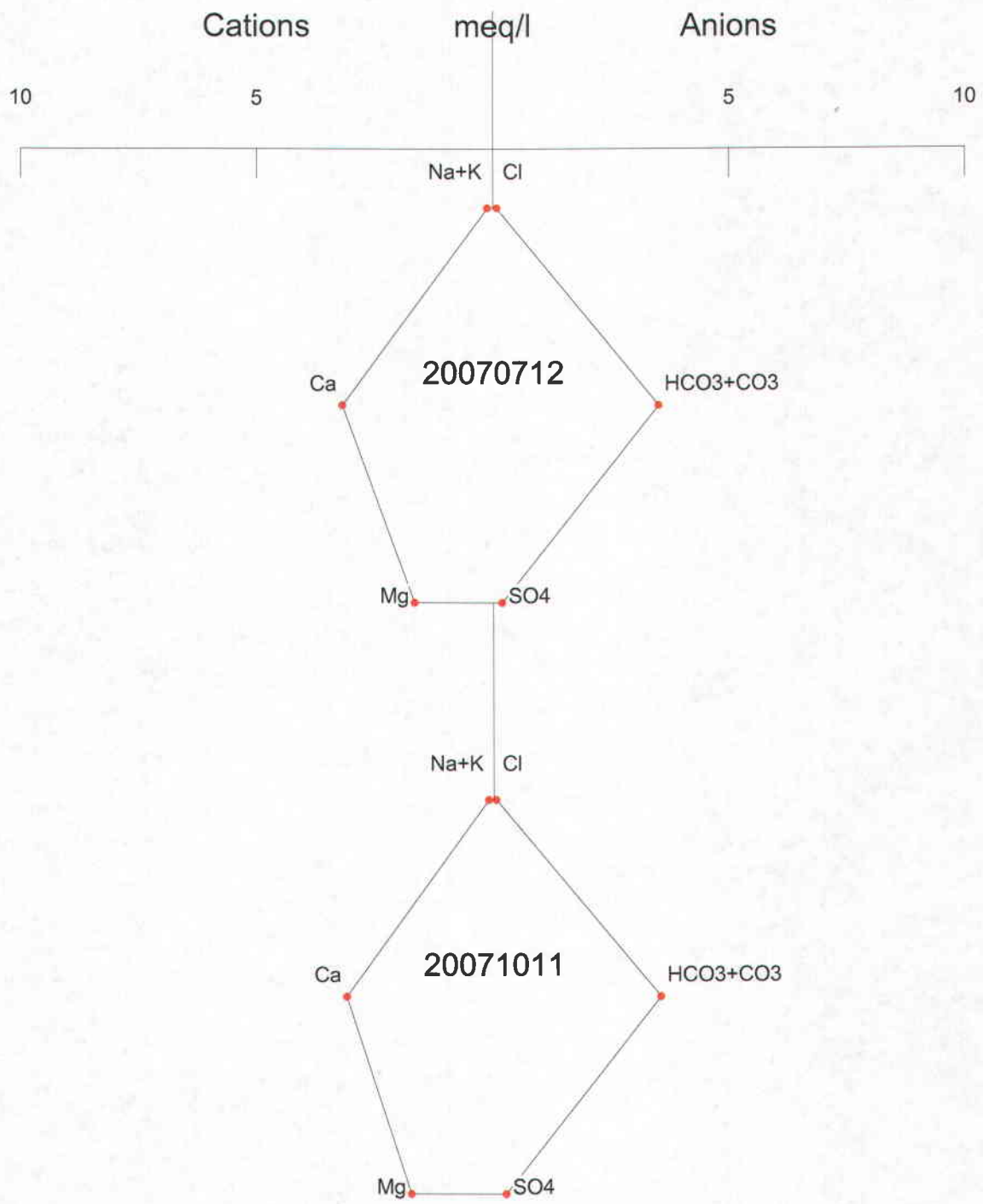
East Mountain Springs

EMS MF-10 Spring



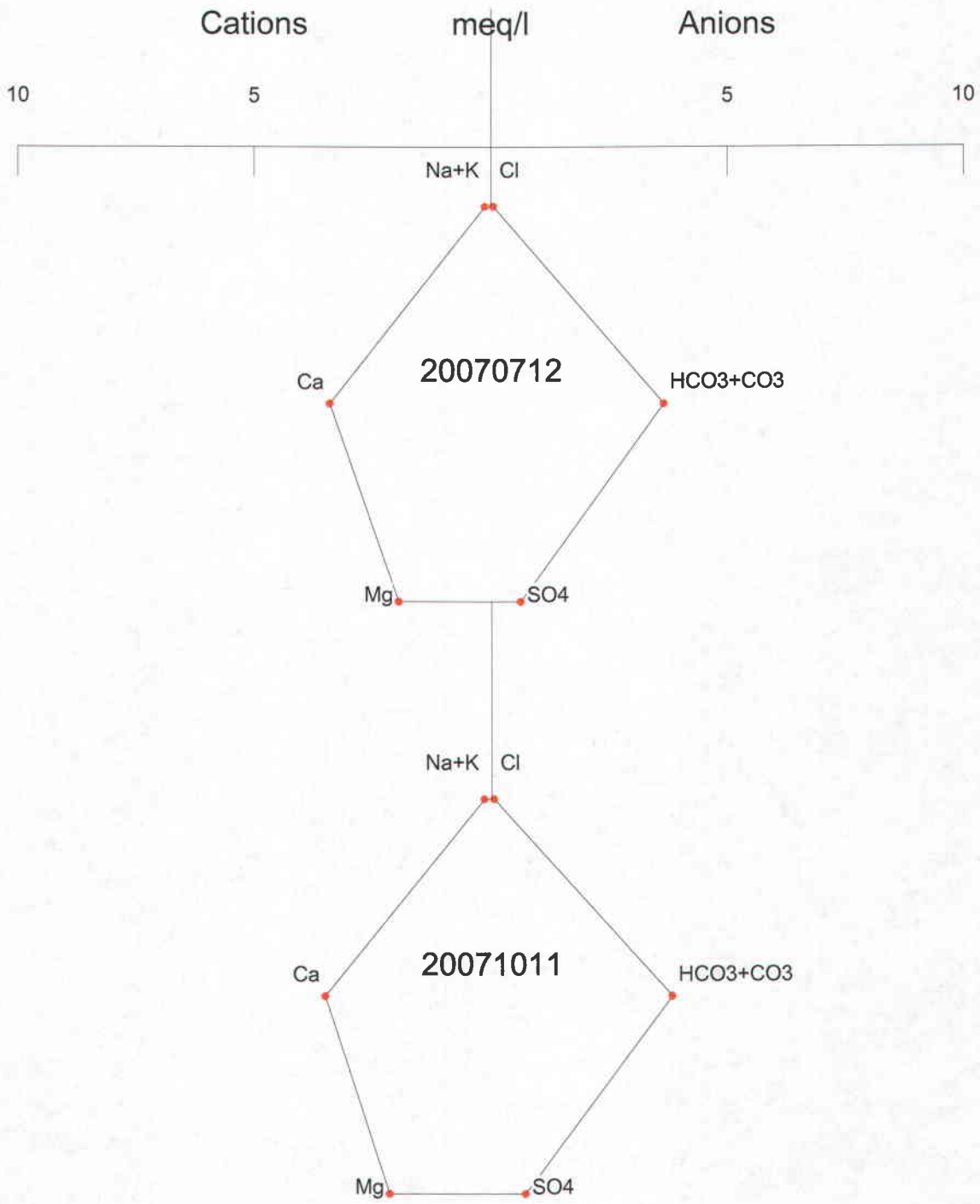
East Mountain Springs

EMS MF-19B Spring



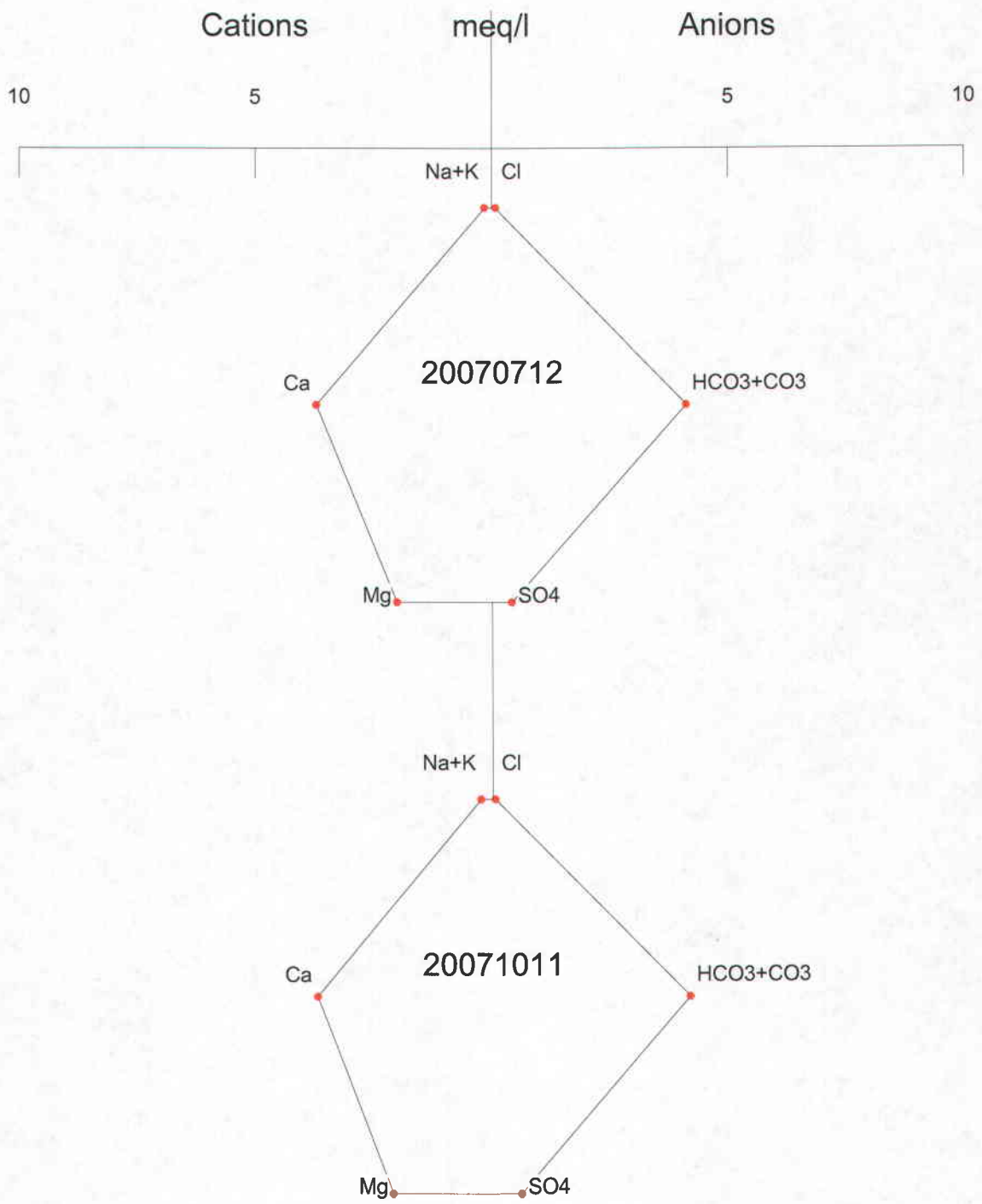
East Mountain Springs

EMS MF-219 Spring



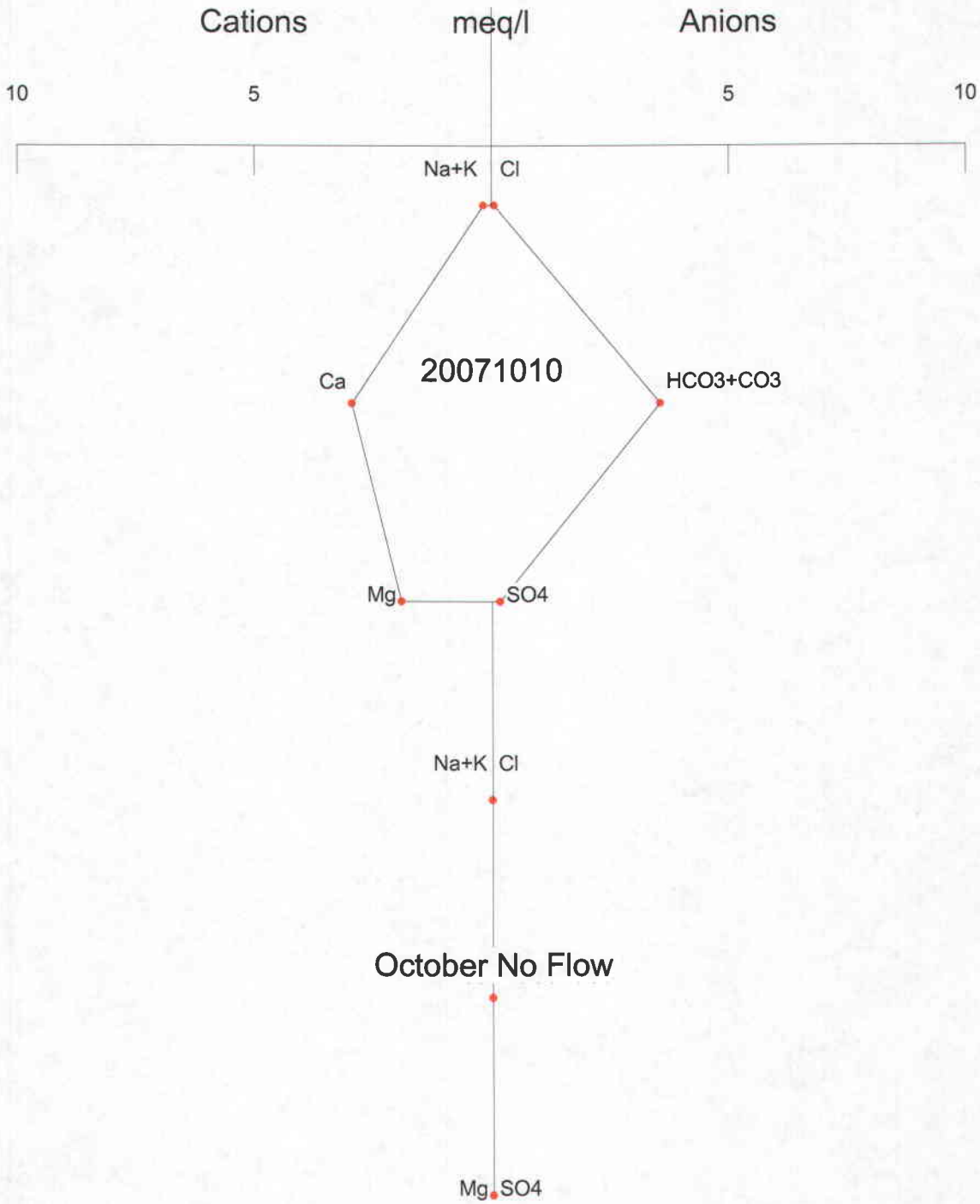
East Mountain Springs

EMS MFR-10 Spring



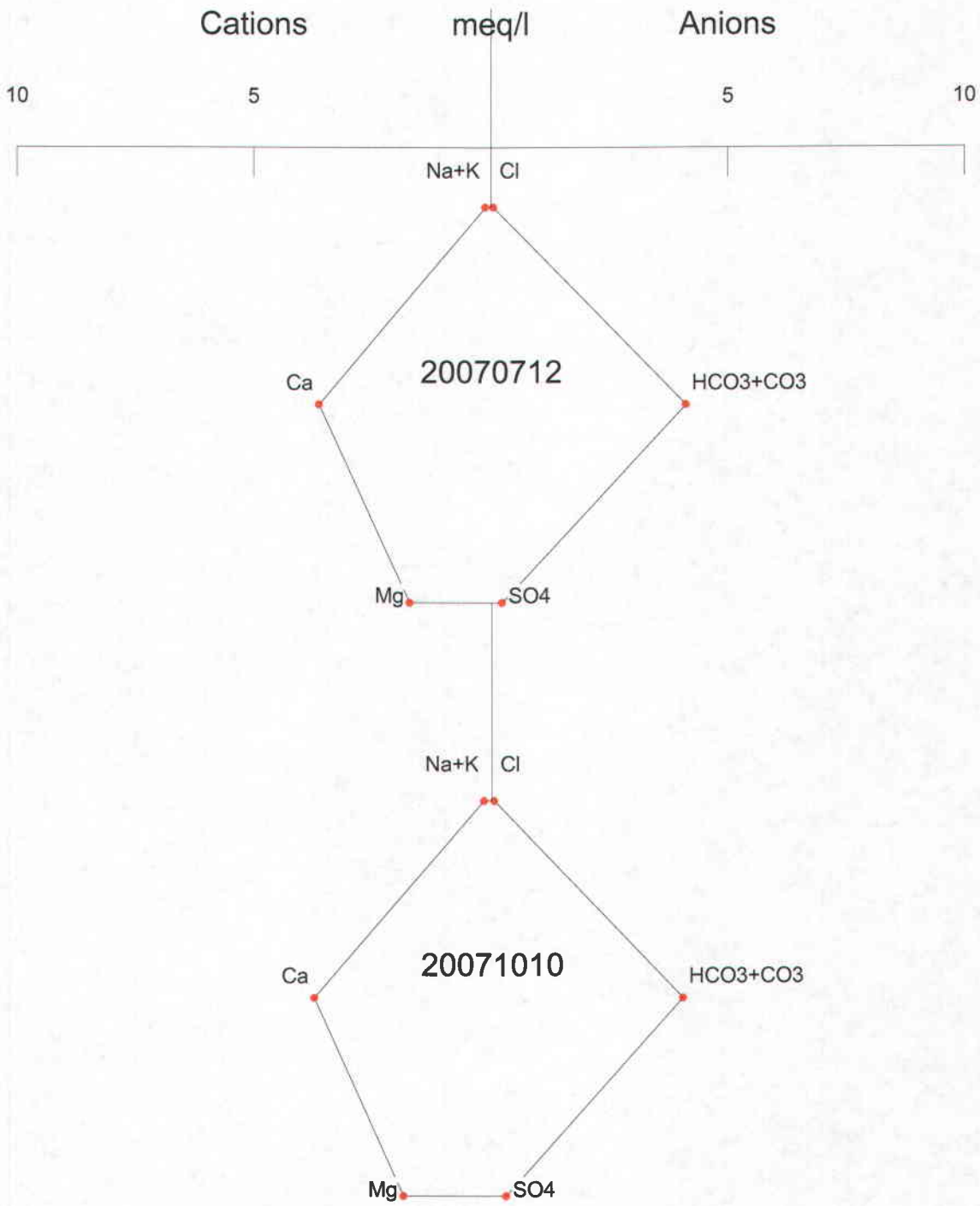
East Mountain Springs

EMS RR-15 Spring



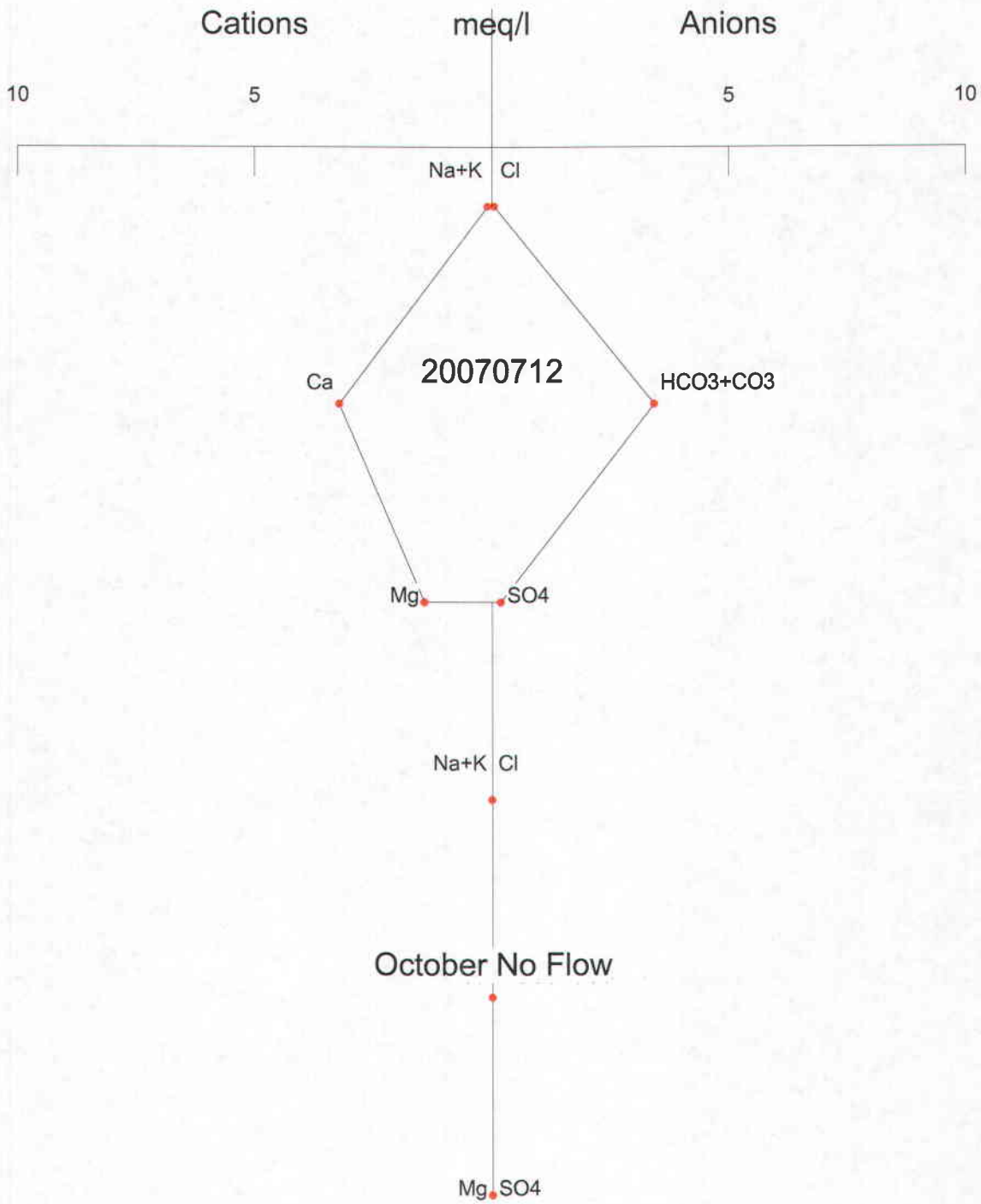
East Mountain Springs

EMS RR-23A Spring



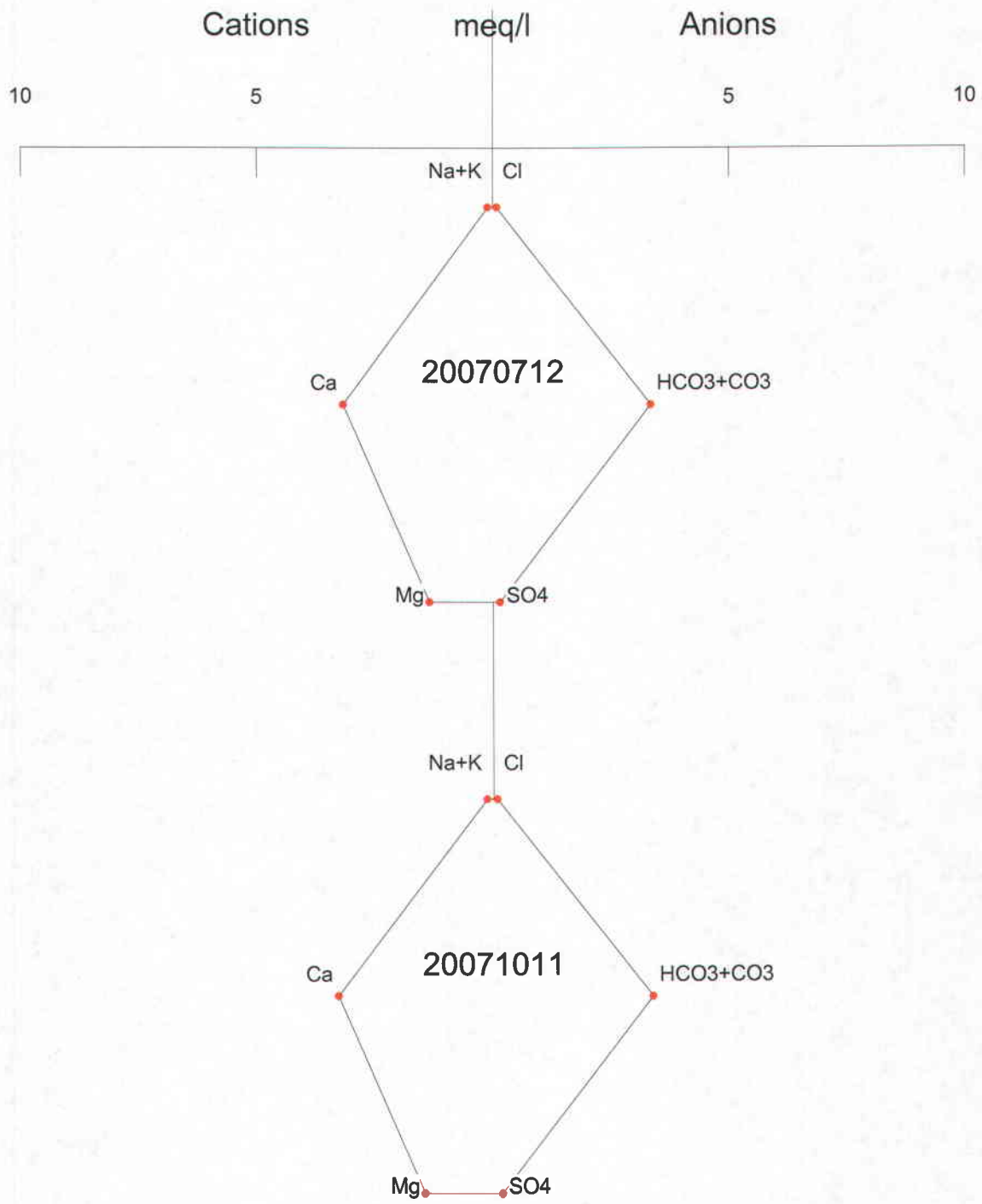
East Mountain Springs

EMS RR-5 Spring



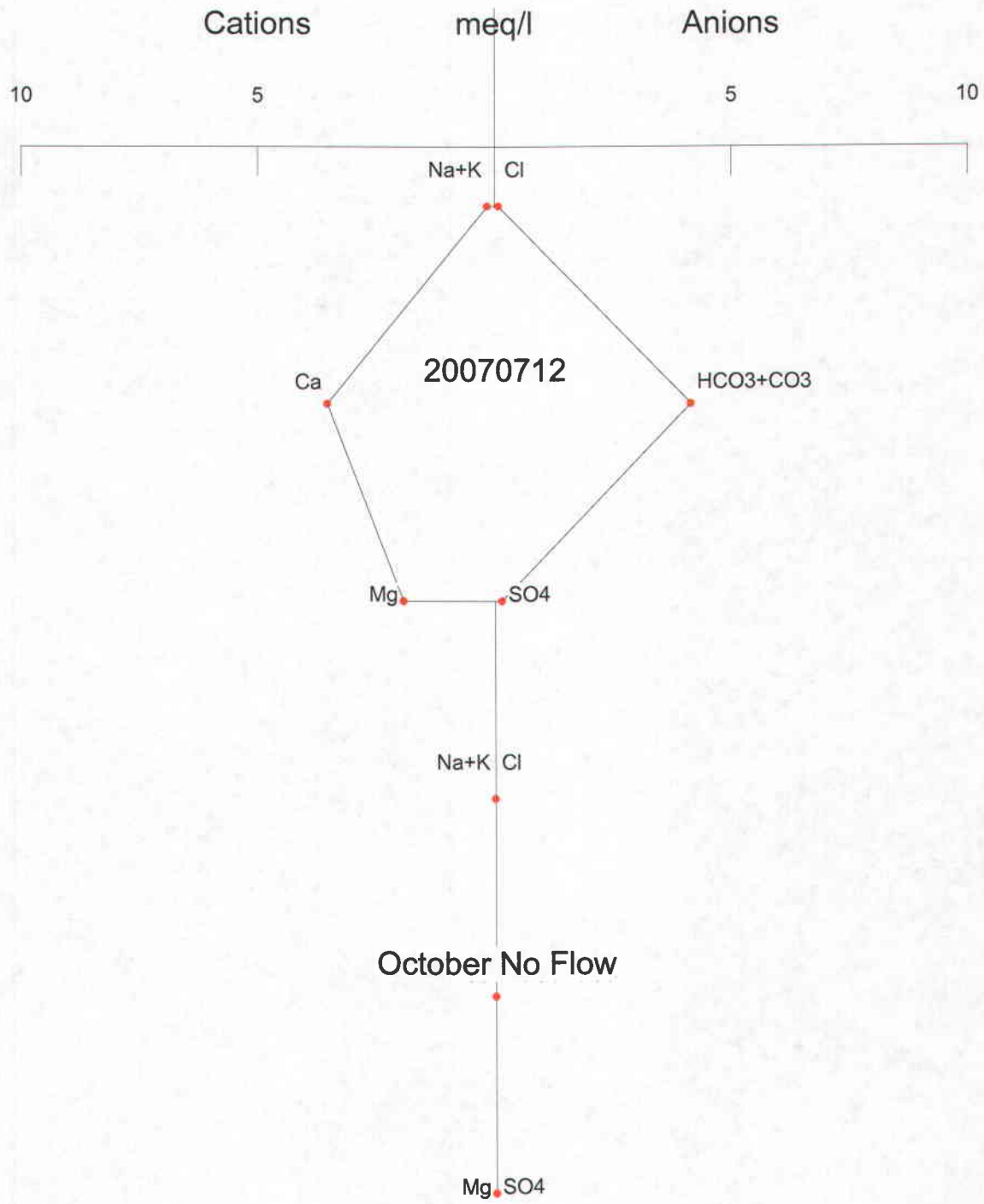
East Mountain Springs

EMS SPI-26 Spring



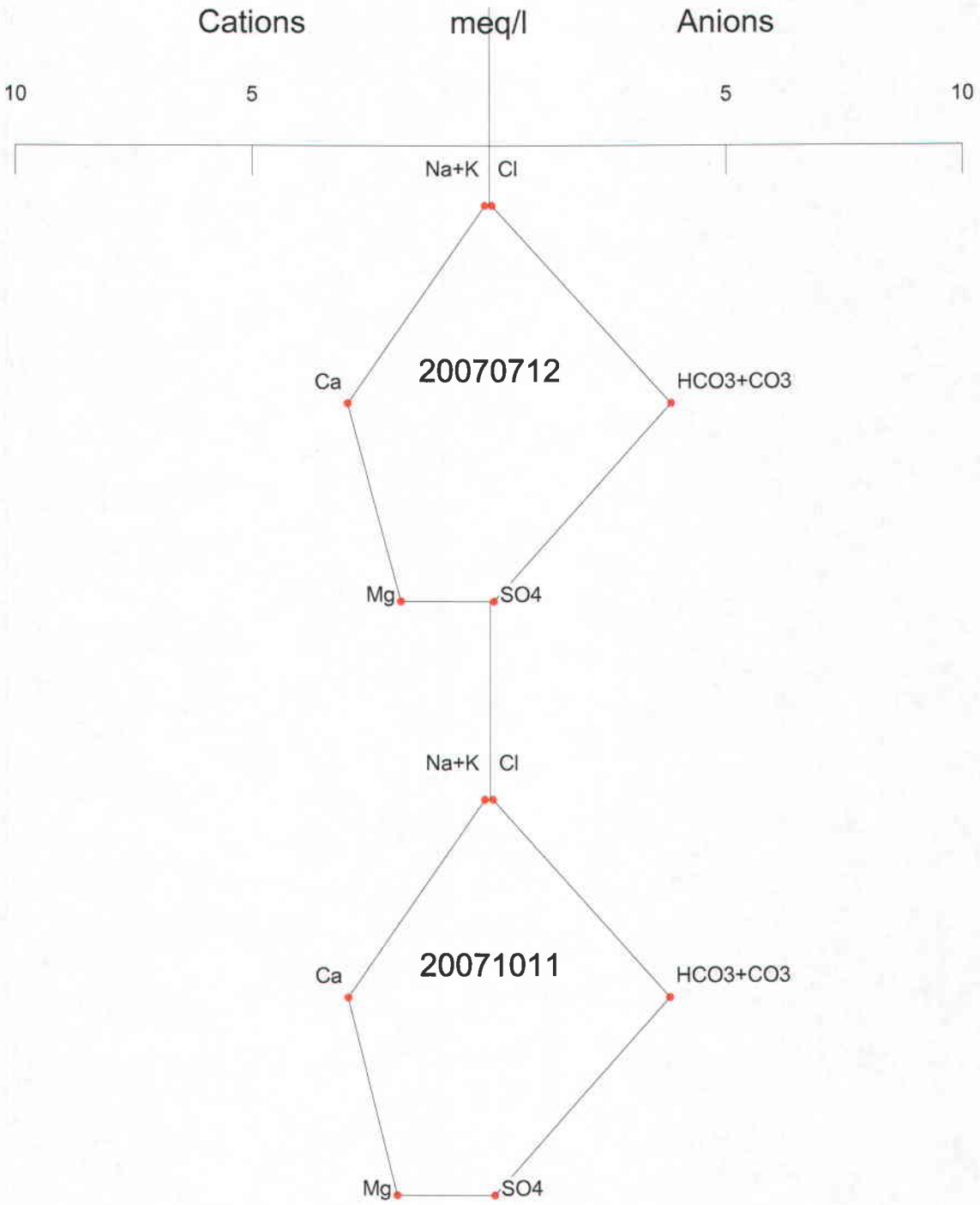
East Mountain Springs

EMS SPI-29 Spring



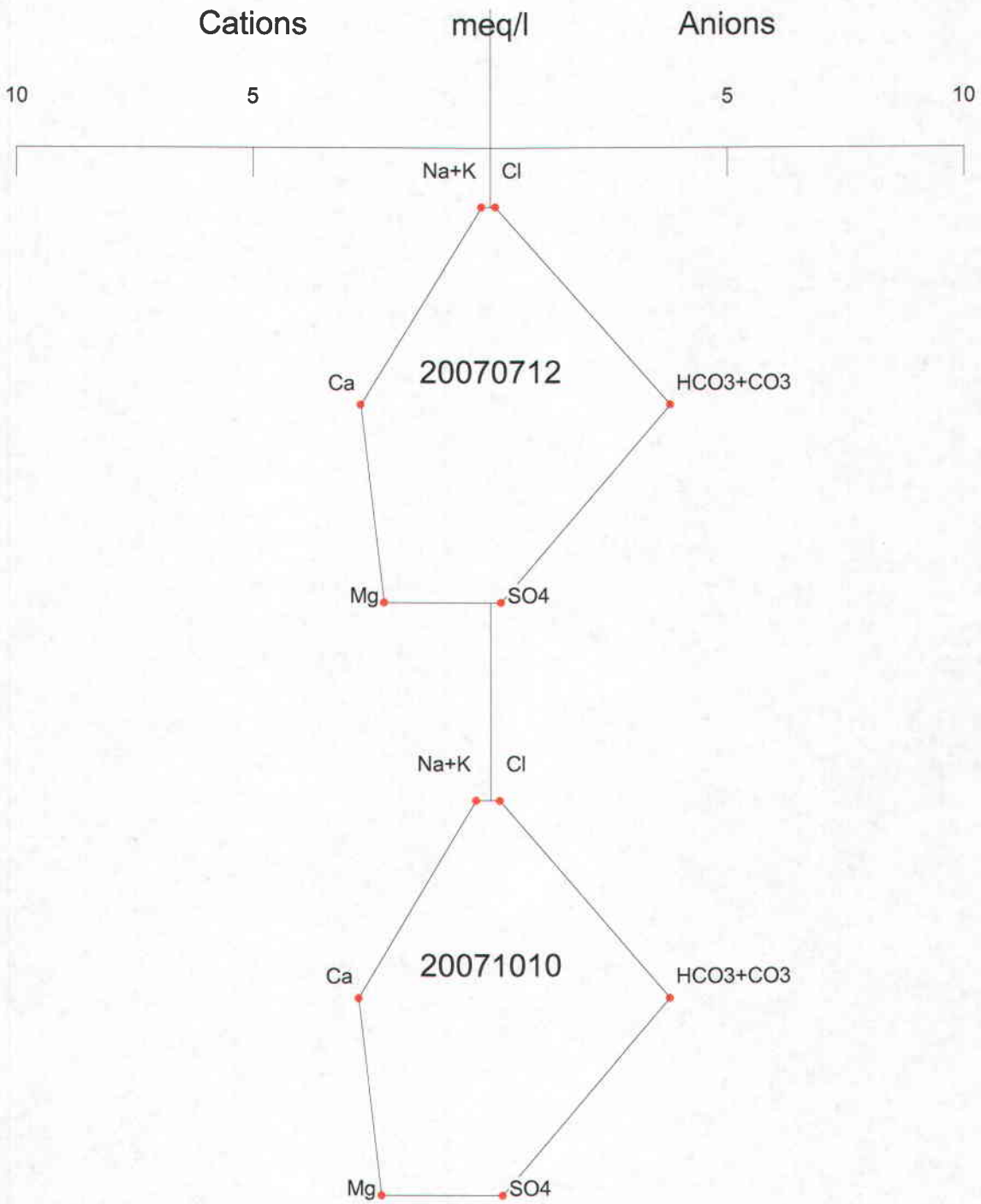
East Mountain Springs

EM Pond Spring



East Mountain Springs

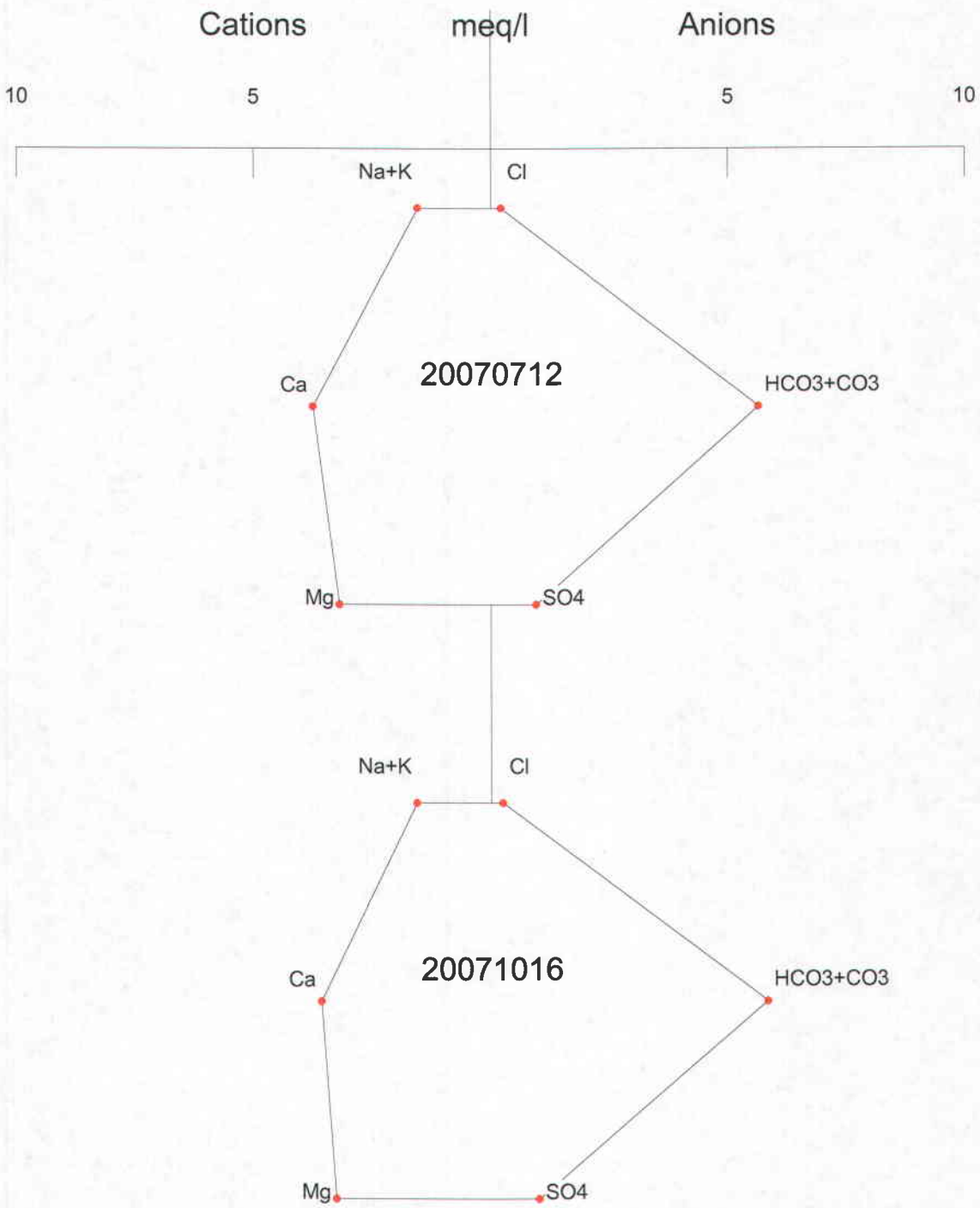
EMS GRANTS SPRING



East Mountain Springs
Stiff Diagrams
Price River Formation

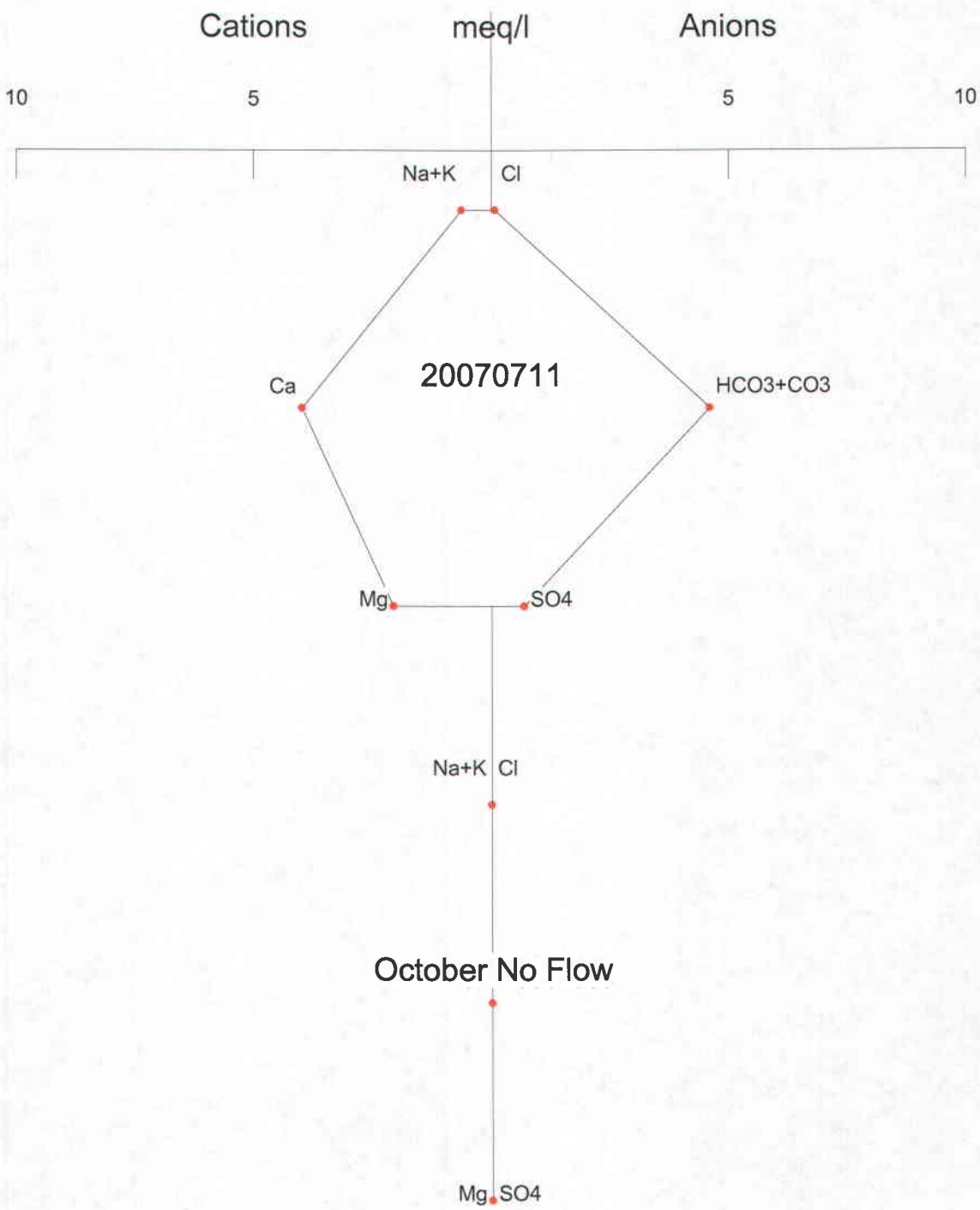
East Mountain Springs

EMS 82-52 Spring



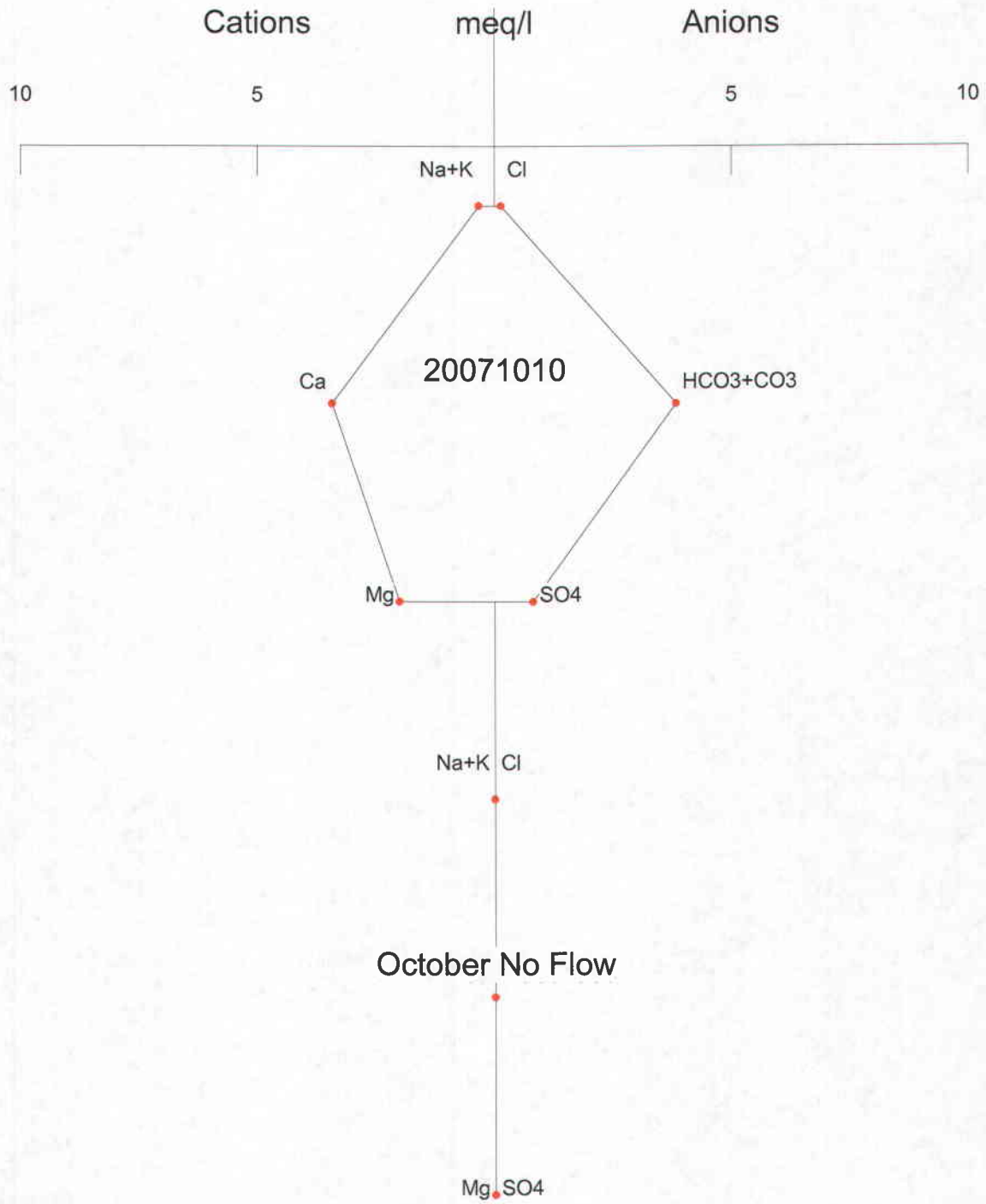
East Mountain Springs

EMS MFR-30 Spring



East Mountain Springs

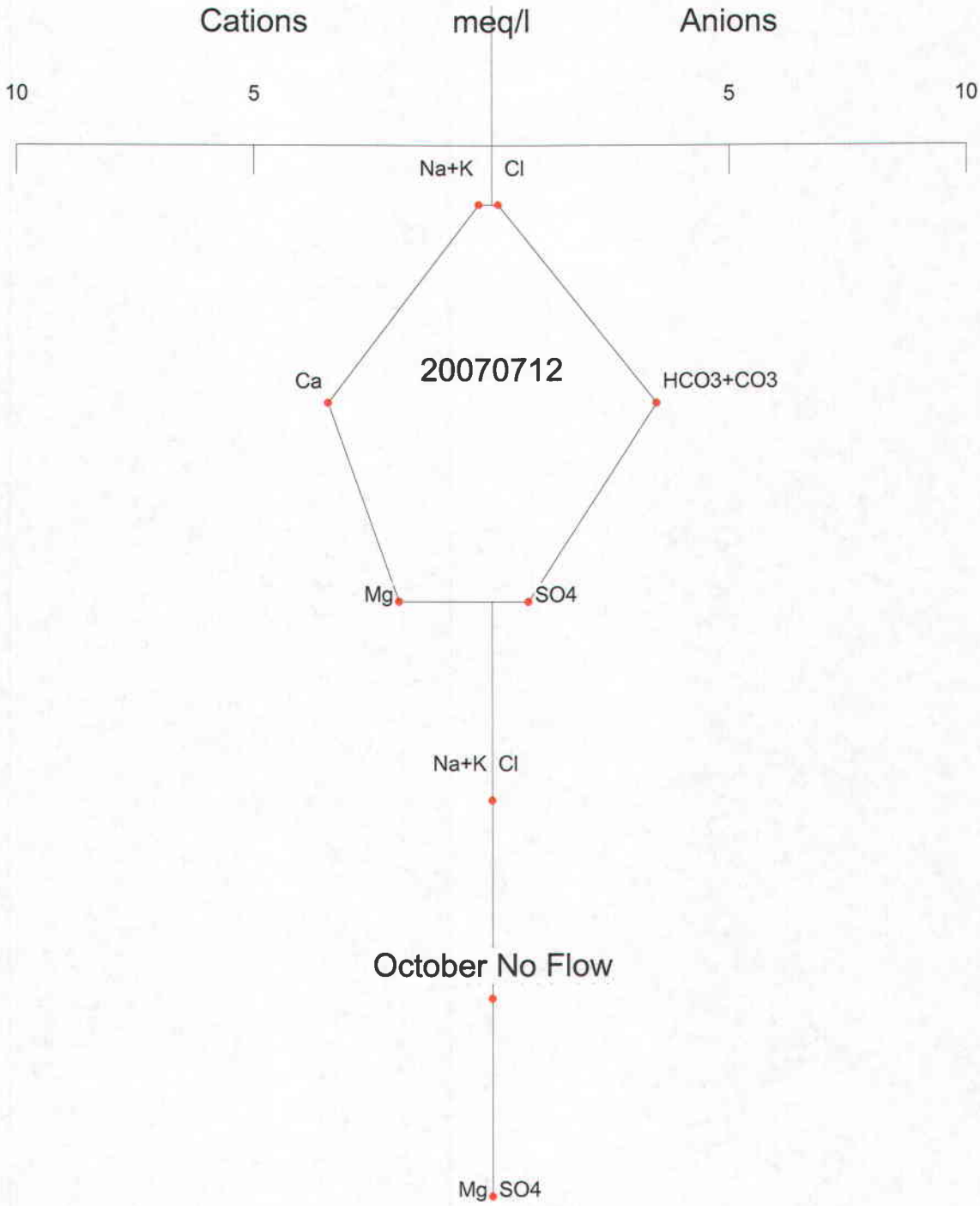
EMS UJV-206 Spring



East Mountain Springs
Stiff Diagrams
Castlegate Sandstone

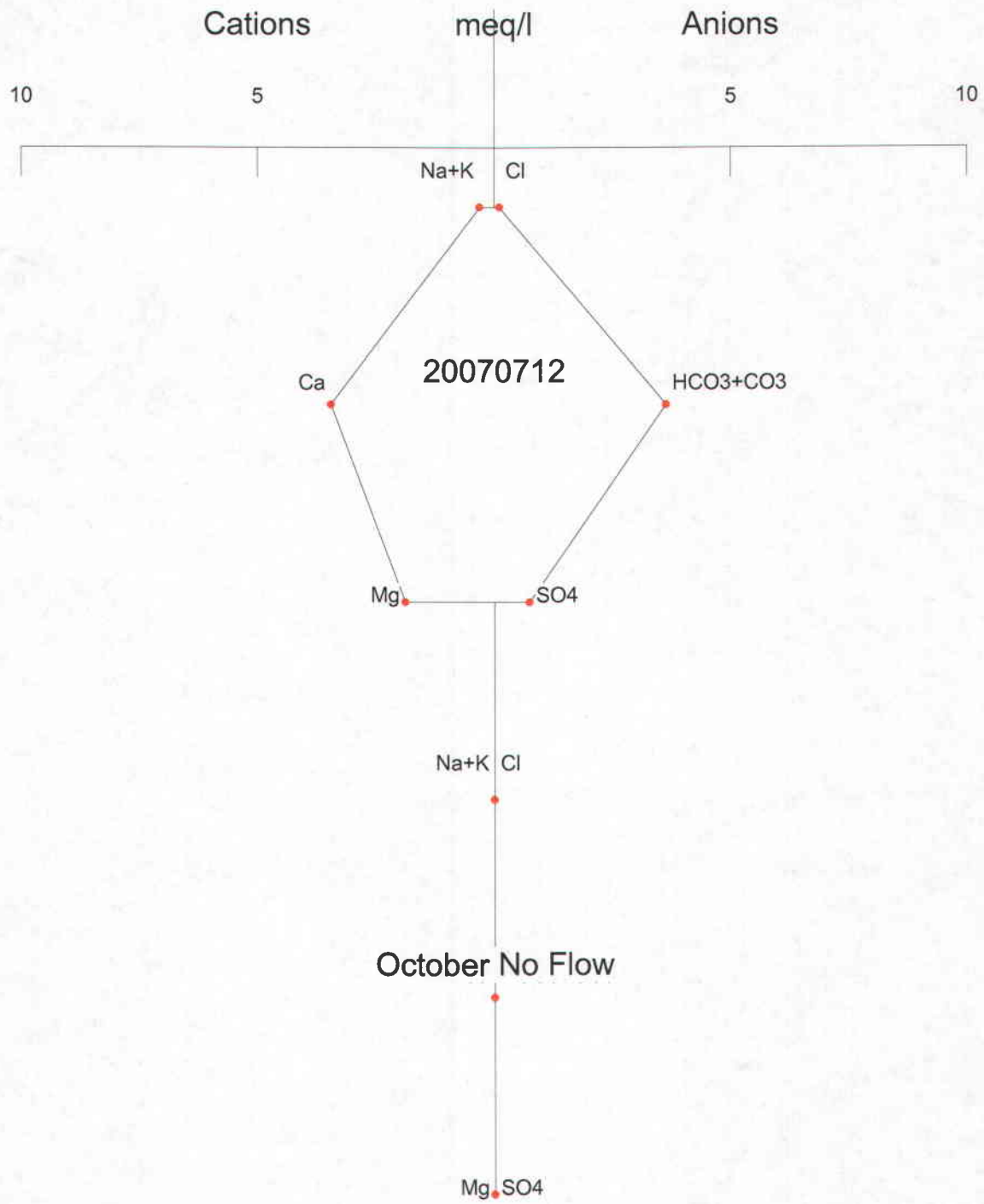
East Mountain Springs

EMS UJV-101 Spring



East Mountain Springs

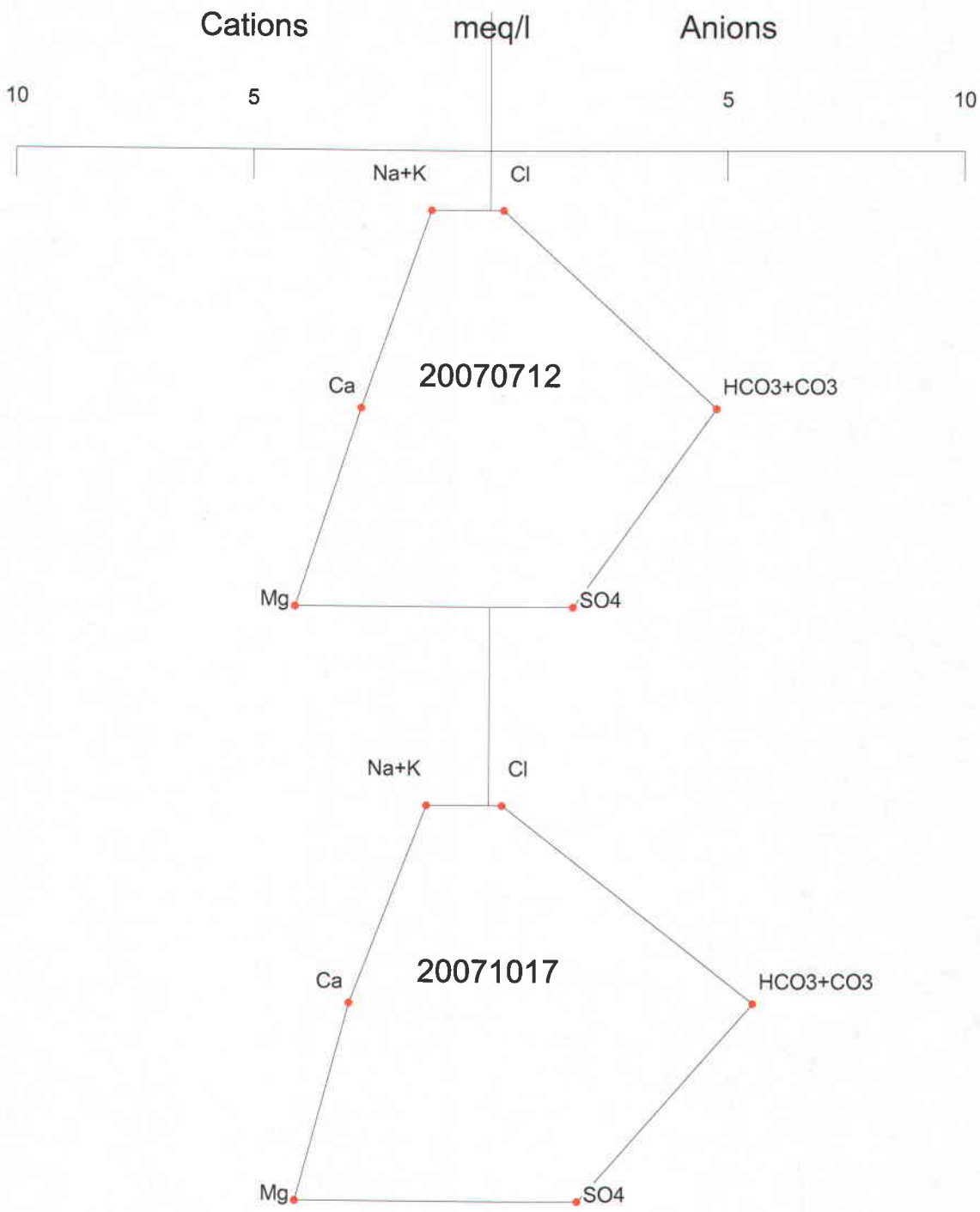
EMS UJV-213 Spring



East Mountain Springs
Stiff Diagrams
Blackhawk Formation

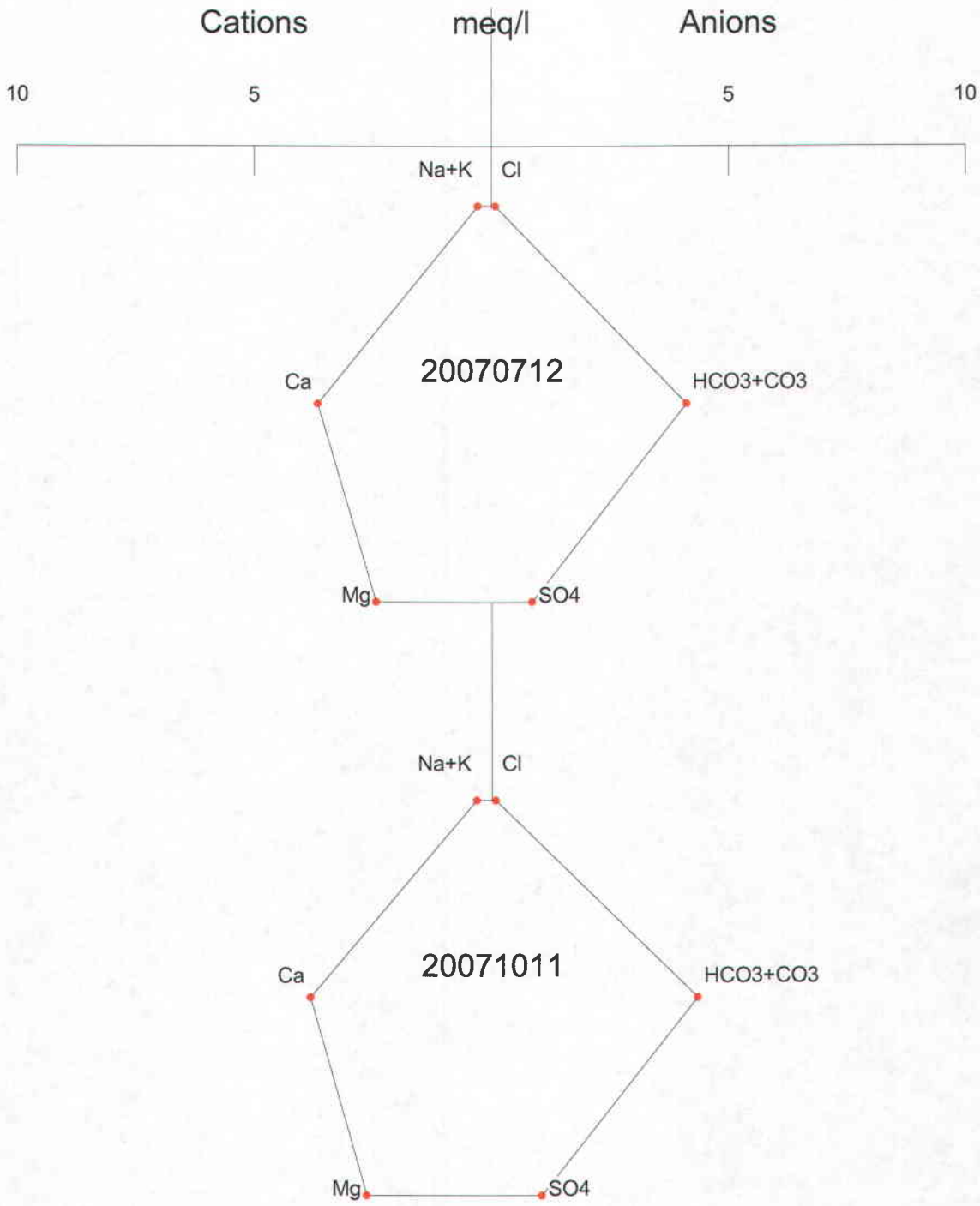
East Mountain Springs

EMS 91-72 Spring



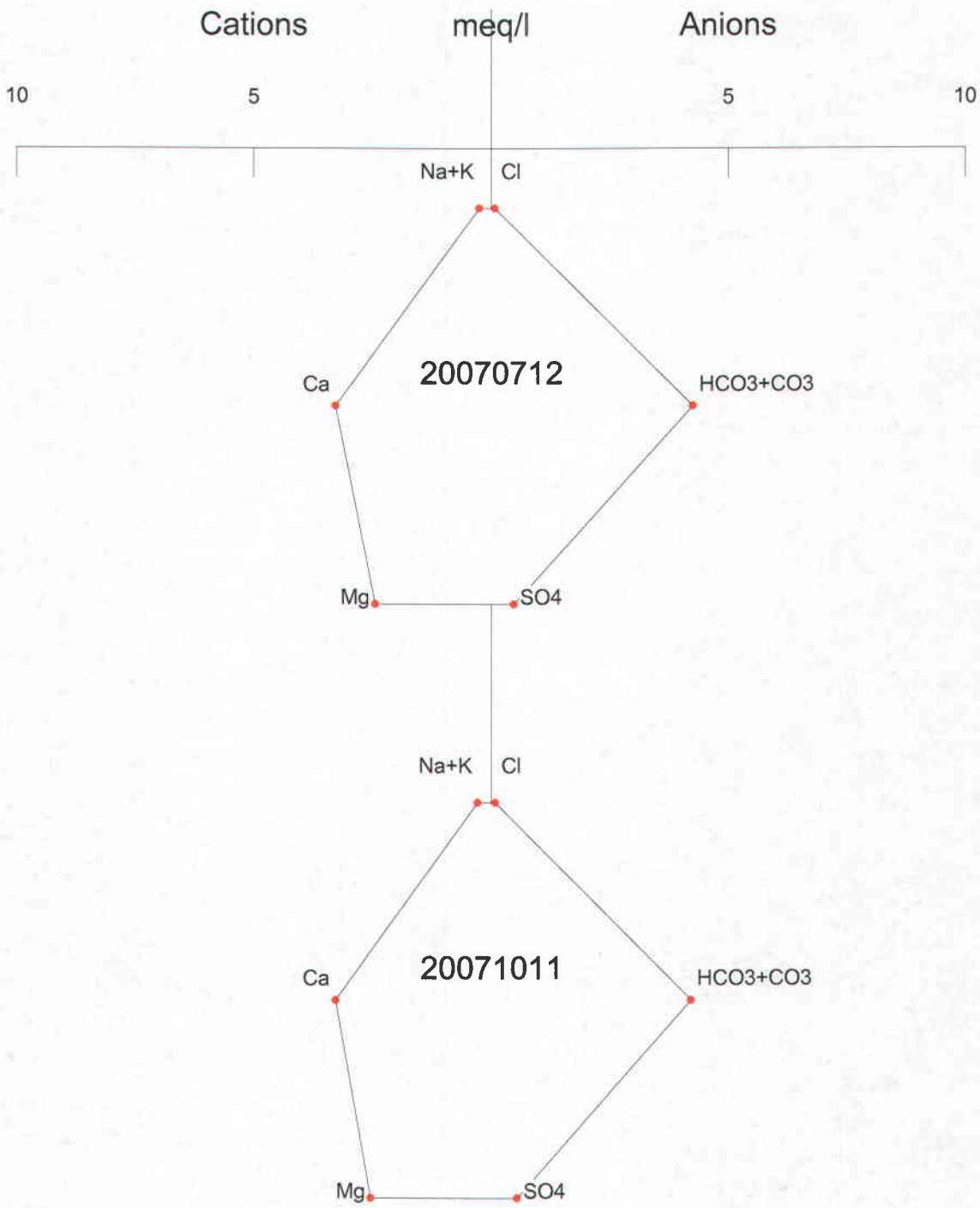
East Mountain Springs

EMS MF-7 Spring



East Mountain Springs

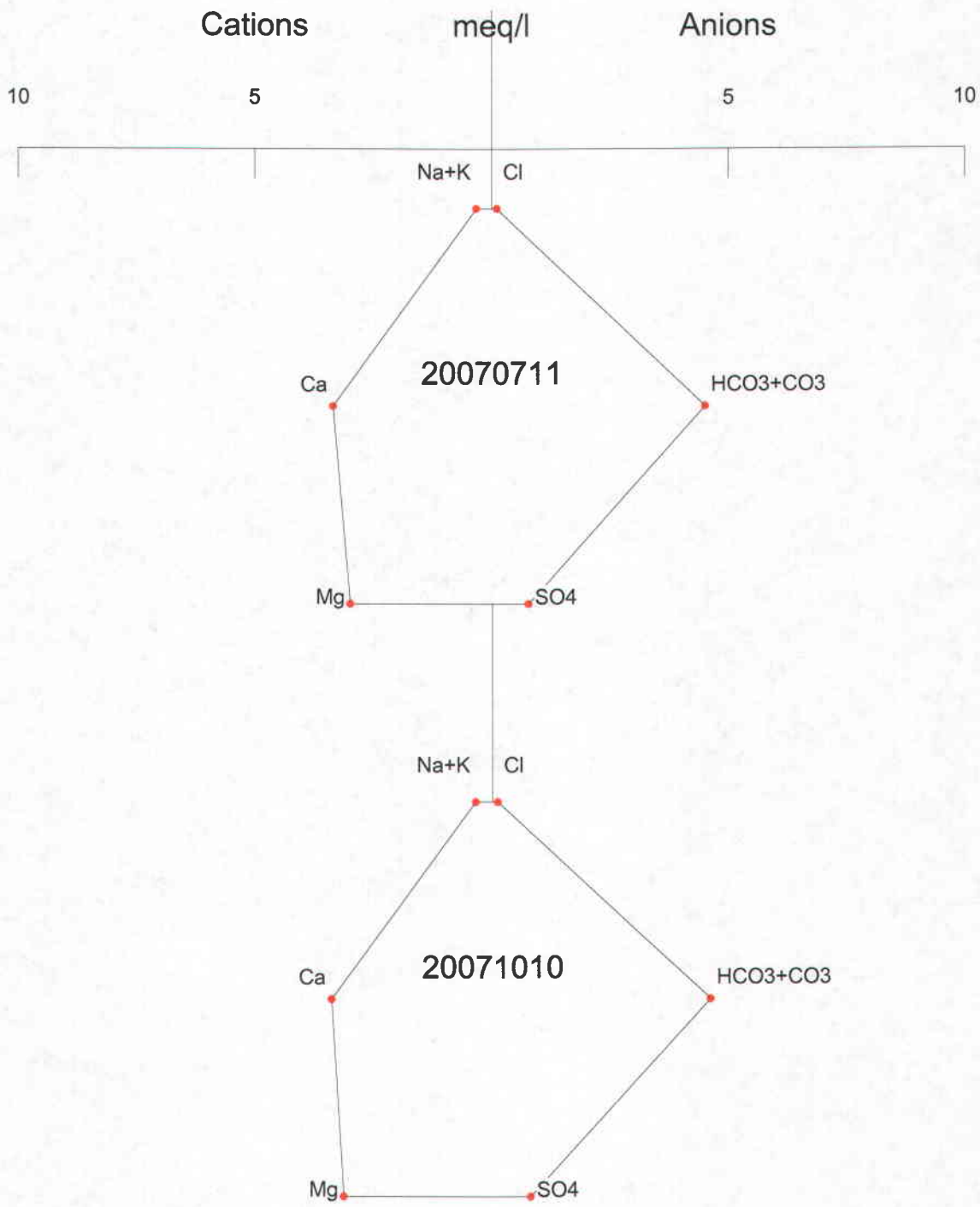
EMS MF-213 Spring



East Mountain Springs
Stiff Diagrams
Star Point Sandstone

East Mountain Springs

EMS LITTLE BEAR SPRING

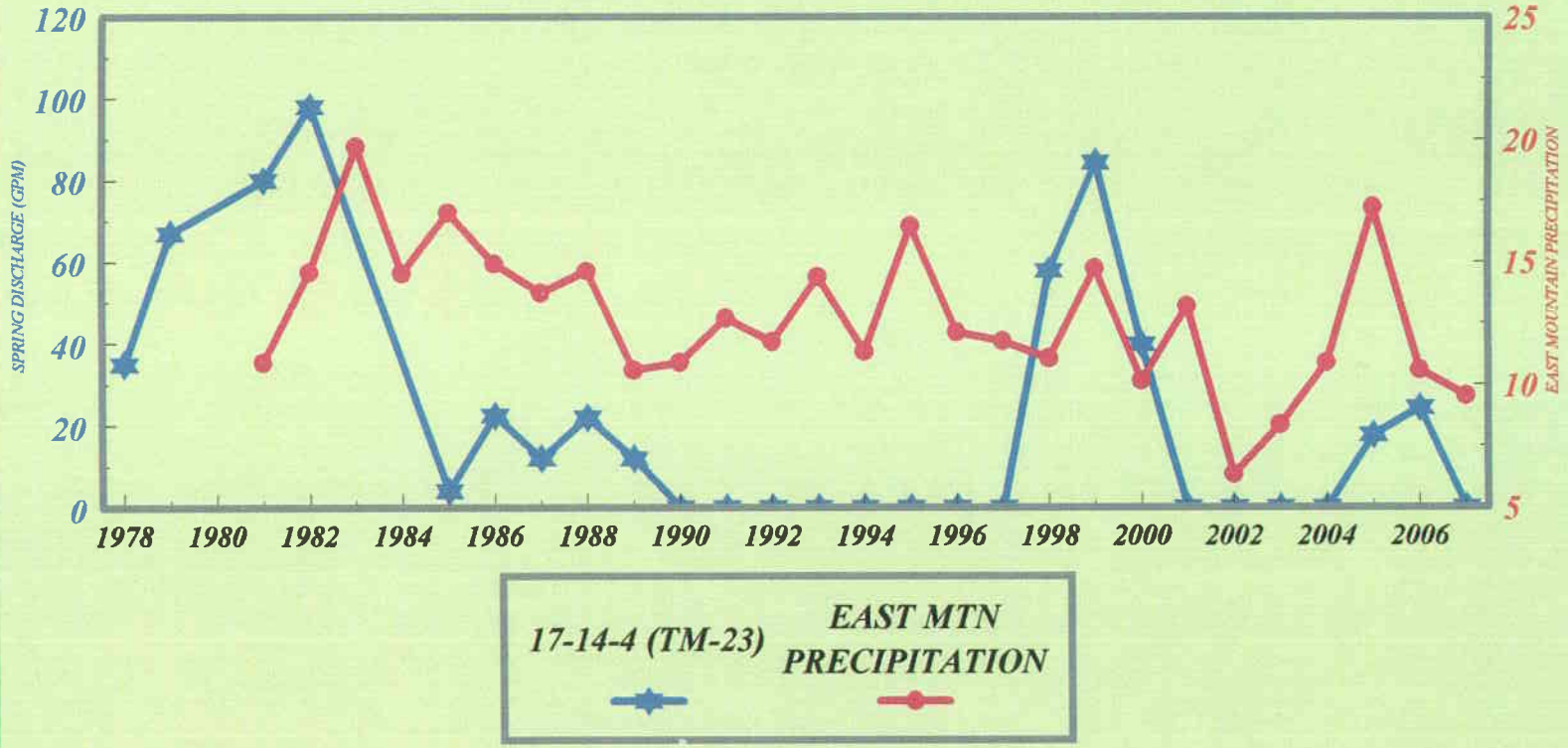


APPENDIX I
2007

TRAIL MOUNTAIN SPRINGS

Spring 17-14-4 vs. Precipitation

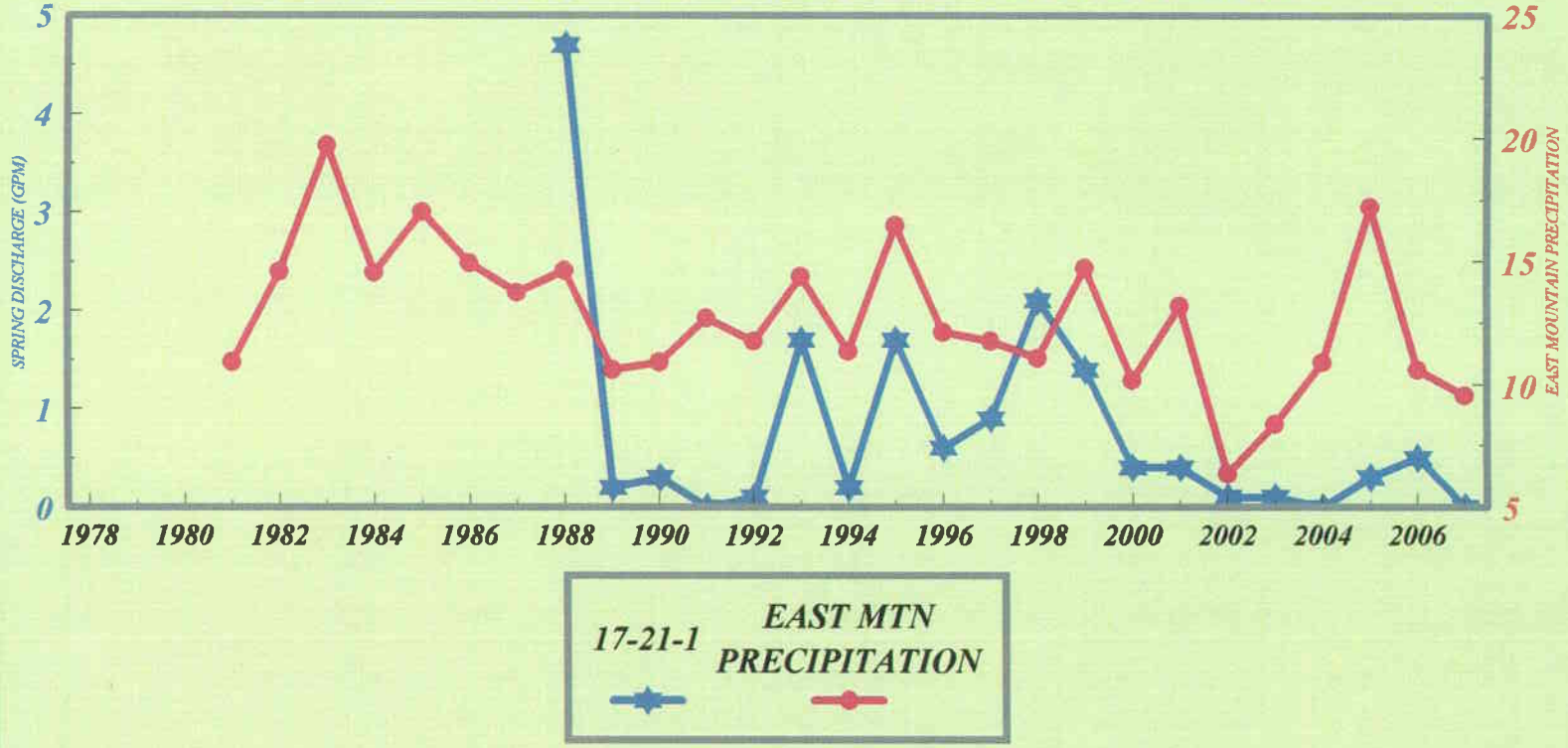
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-21-1 vs. Precipitation

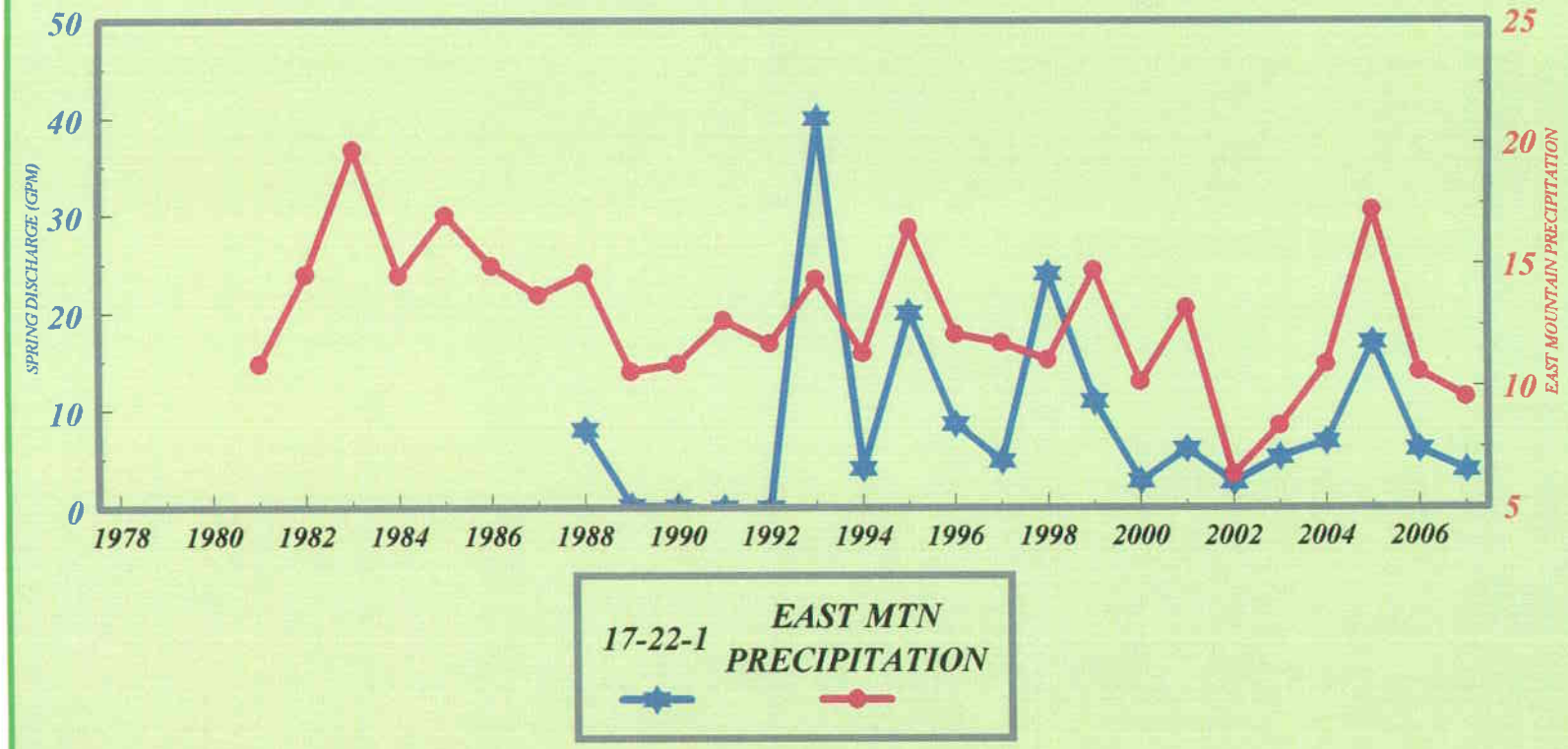
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-22-1 vs. Precipitation

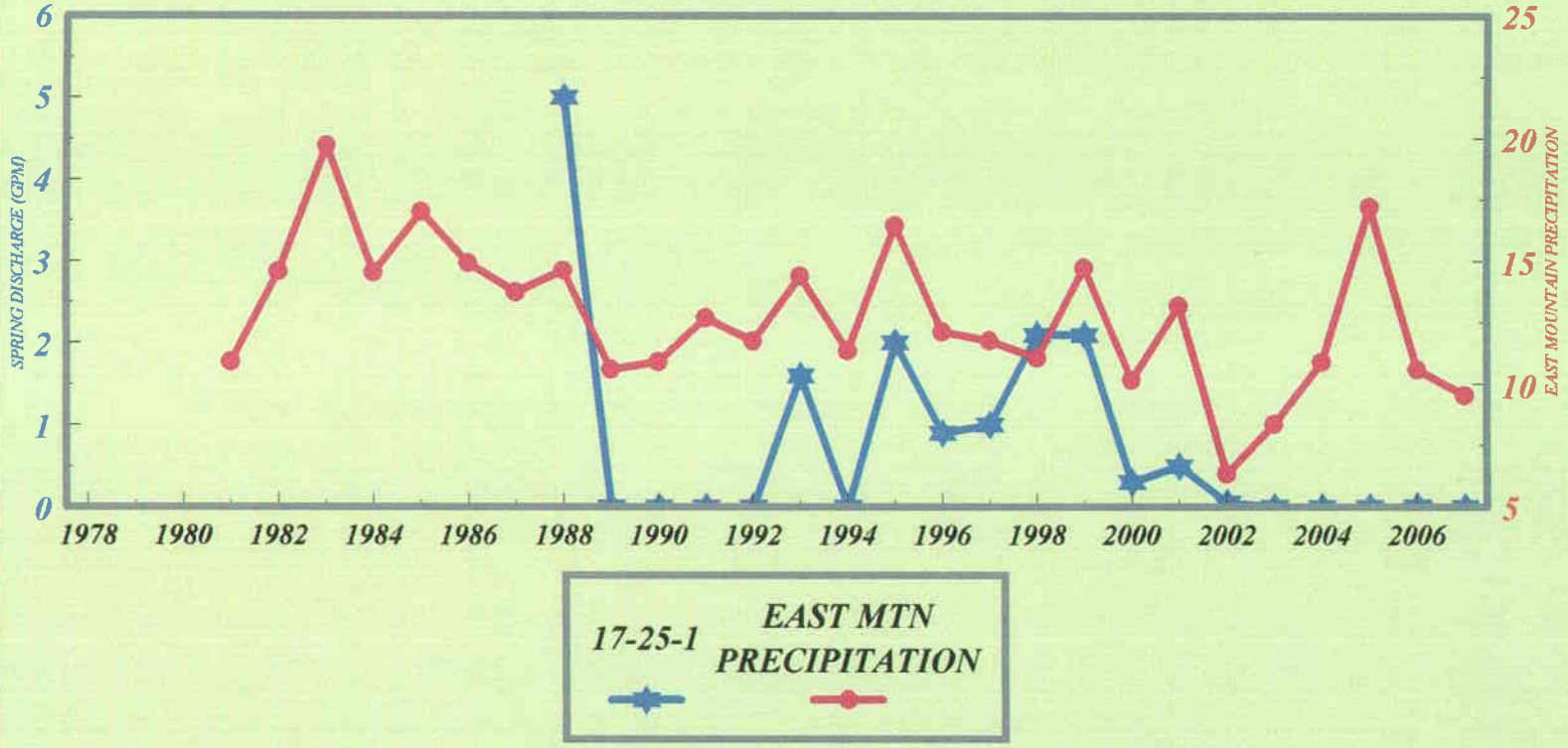
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-25-1 vs. Precipitation

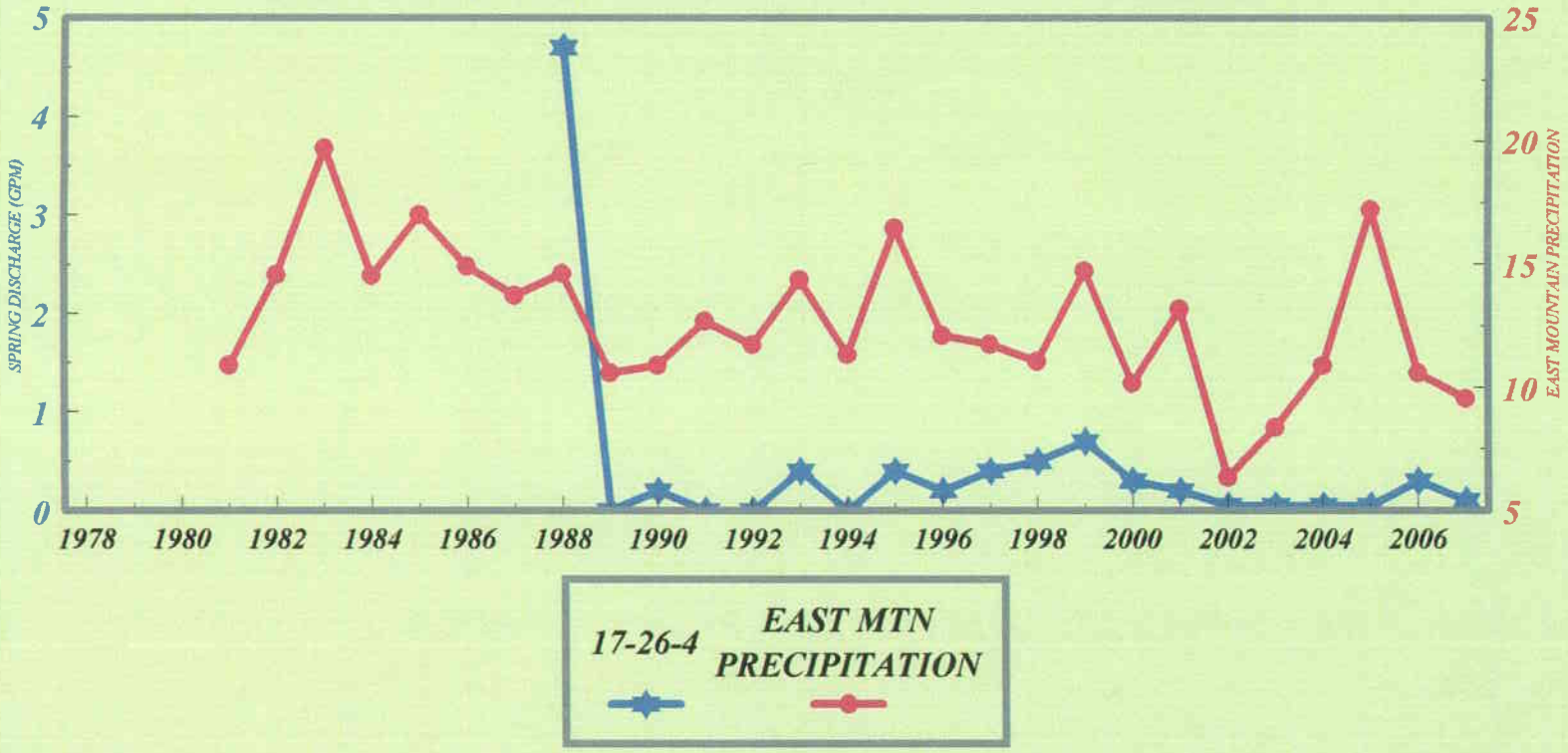
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-26-4 vs. Precipitation

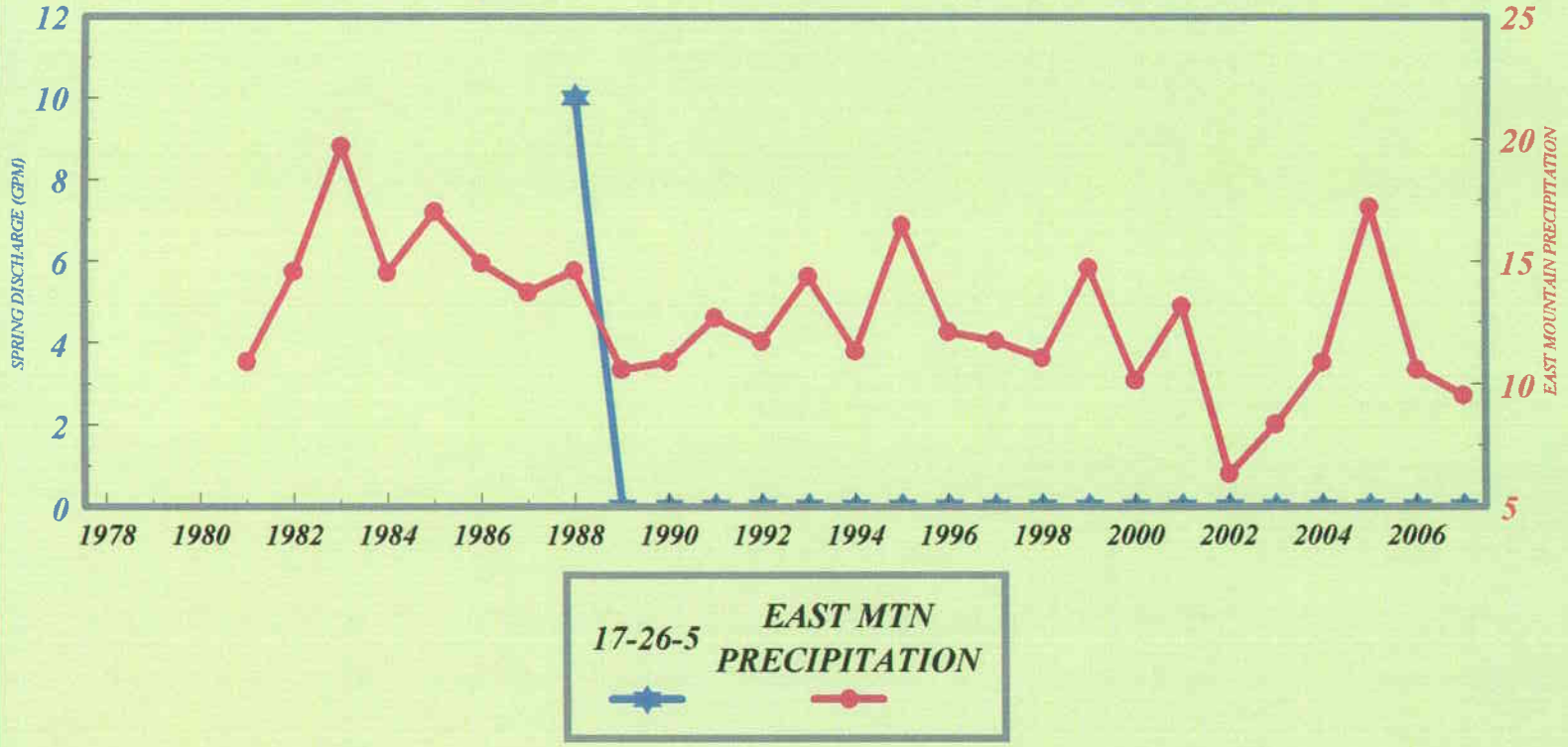
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-26-5 vs. Precipitation

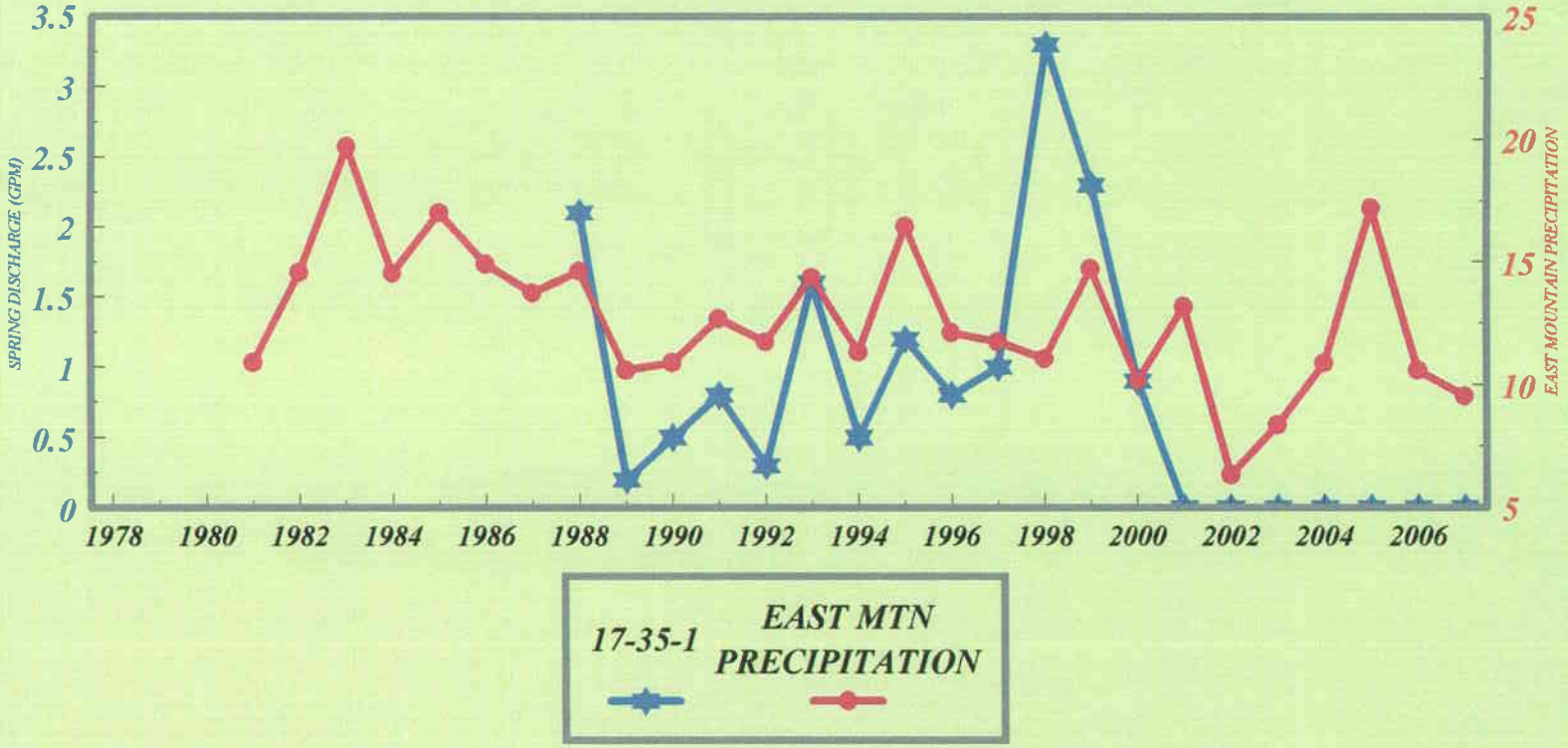
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-35-1 vs. Precipitation

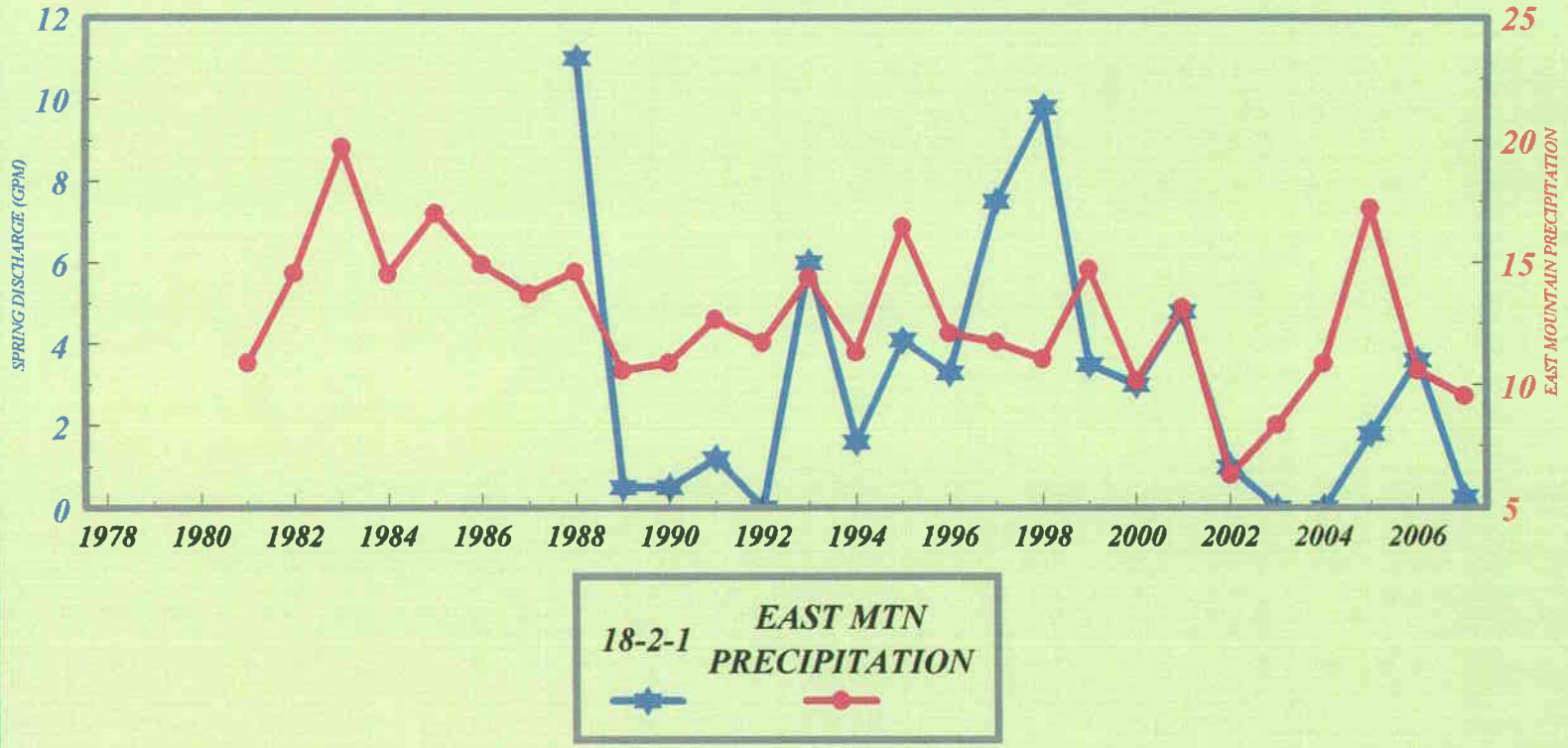
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

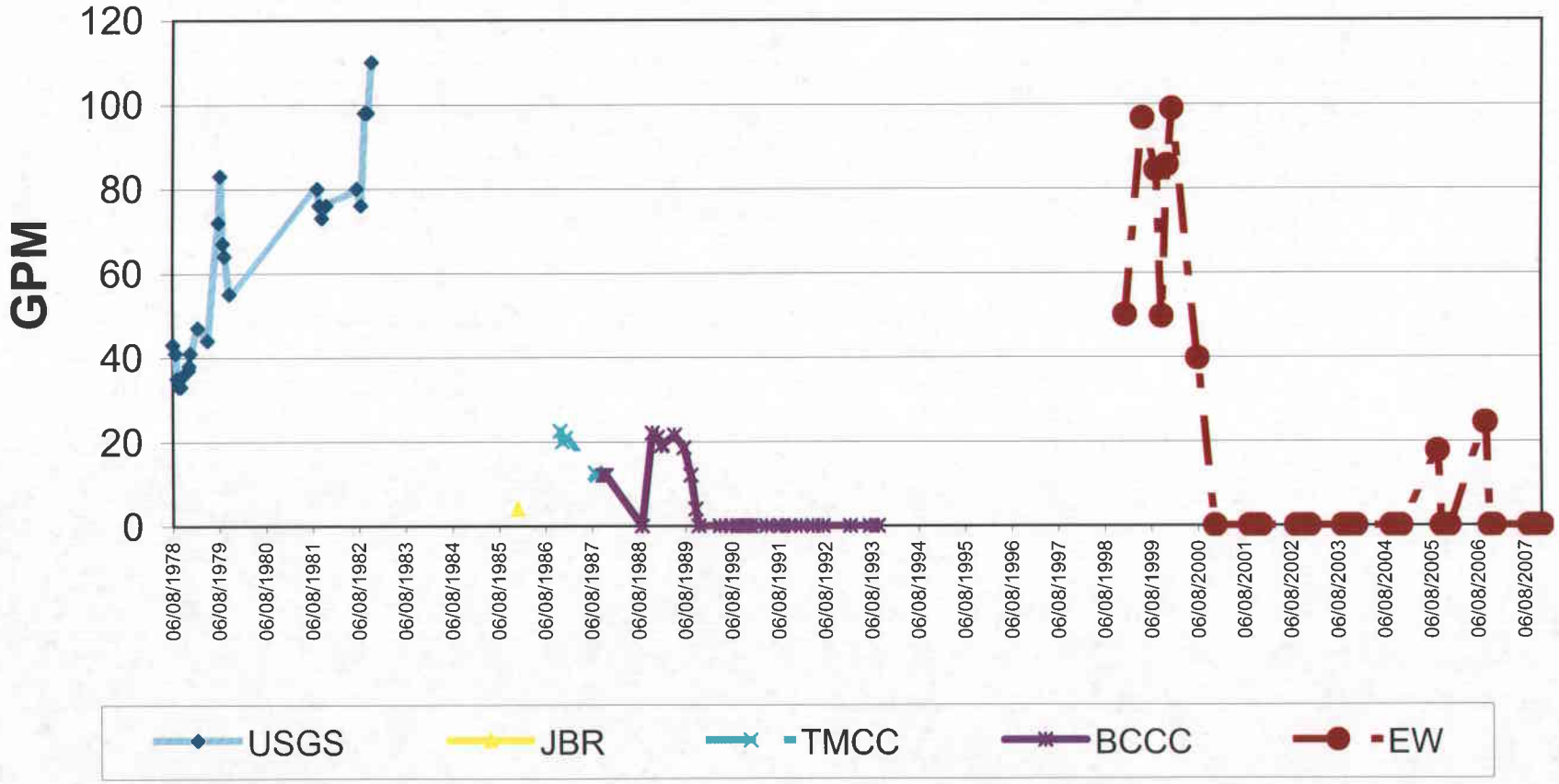
Spring 18-2-1 vs. Precipitation

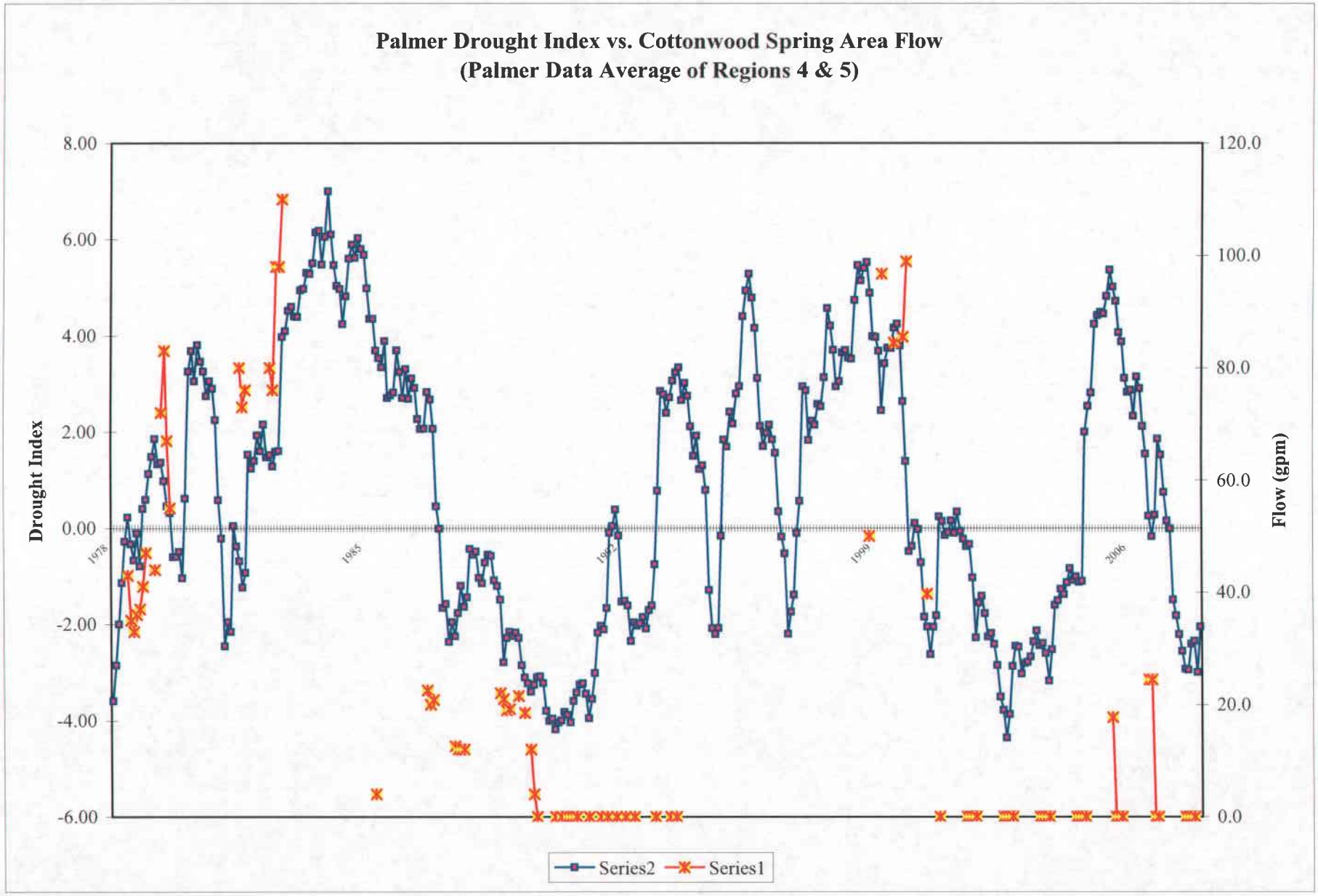
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



Cottonwood Spring: TM-23

Water Right No. 93-701: U.S.F.S. (0.011 cfs)

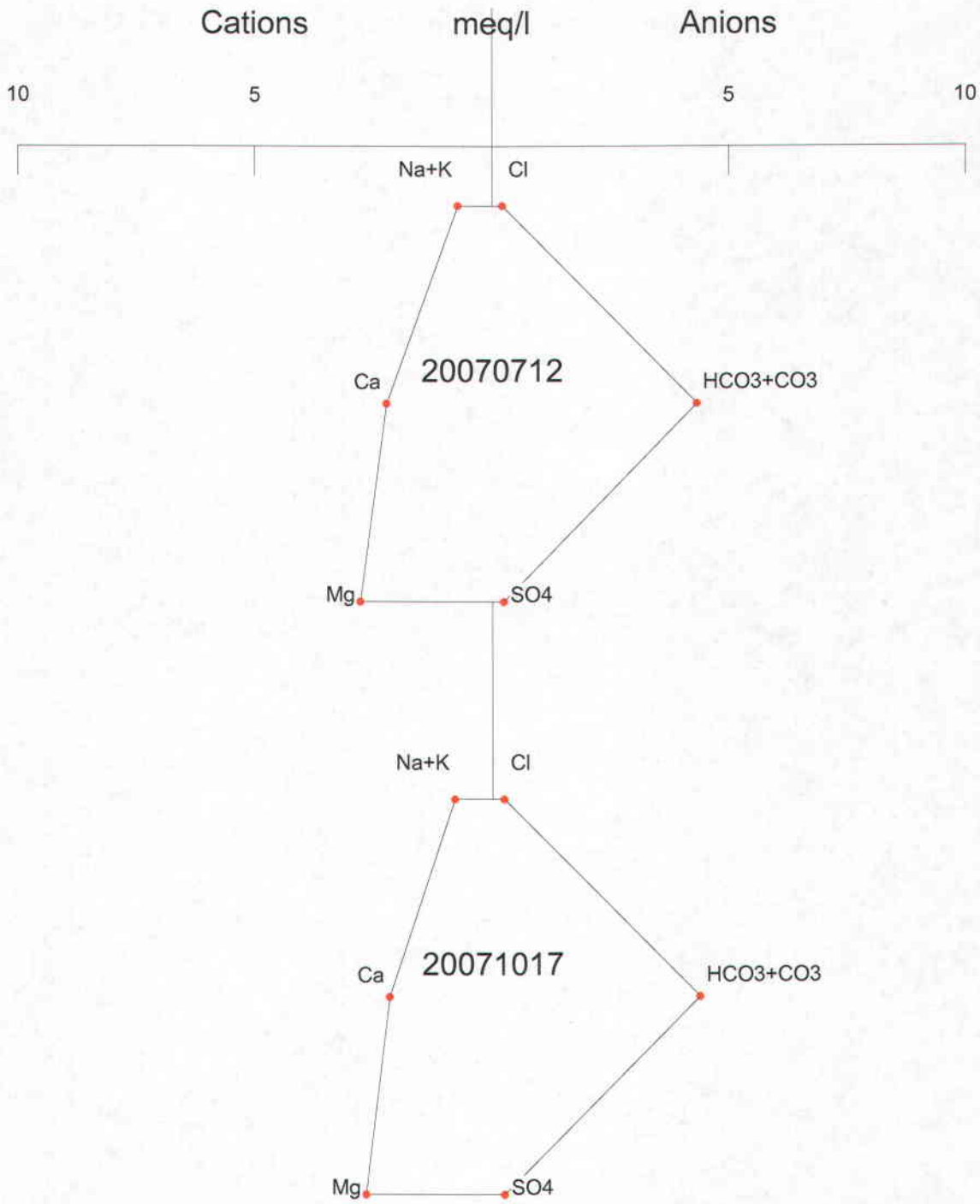



Palmer Drought Index vs. Cottonwood Spring Area Flow
(Palmer Data Average of Regions 4 & 5)
Drought Index
Flow (gpm)
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
120.0
100.0
80.0
60.0
40.0
20.0
0.0
1978
1985
1992
1999
2006
Series2
Series1

Trail Mountain Springs
Stiff Diagrams
North Horn Formation

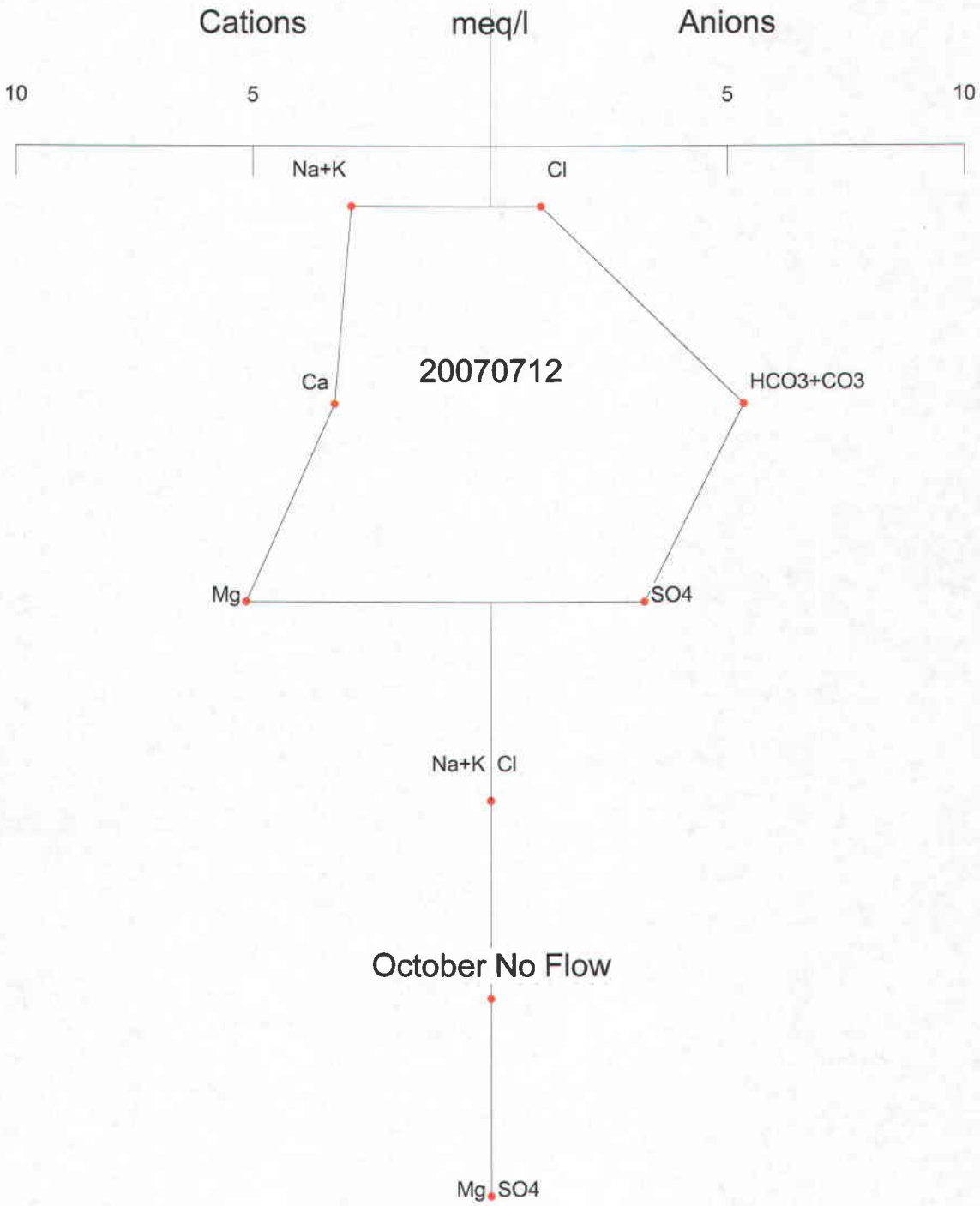
Trail Mountain Springs

17-22-1 Spring



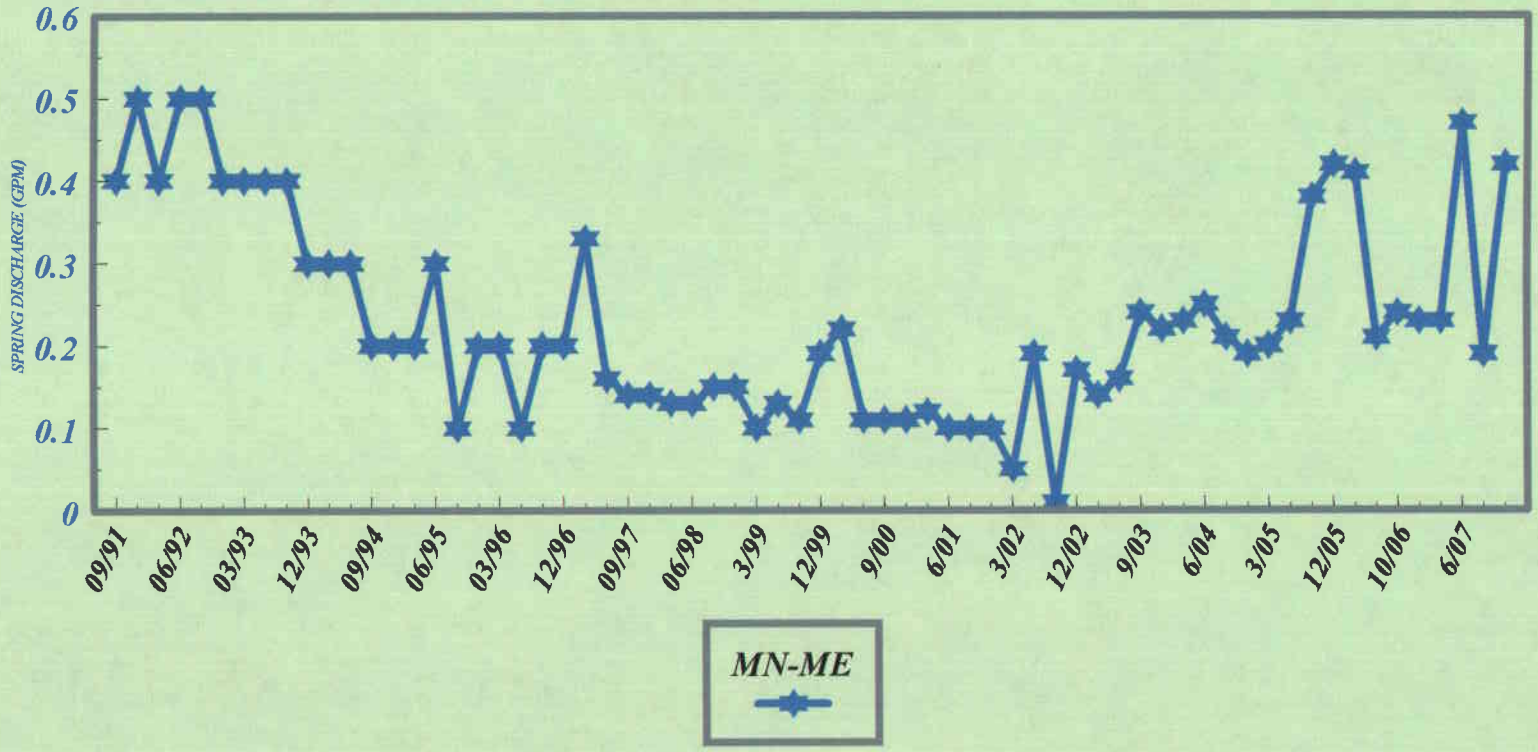
Trail Mountain Springs

18-2-1 Spring

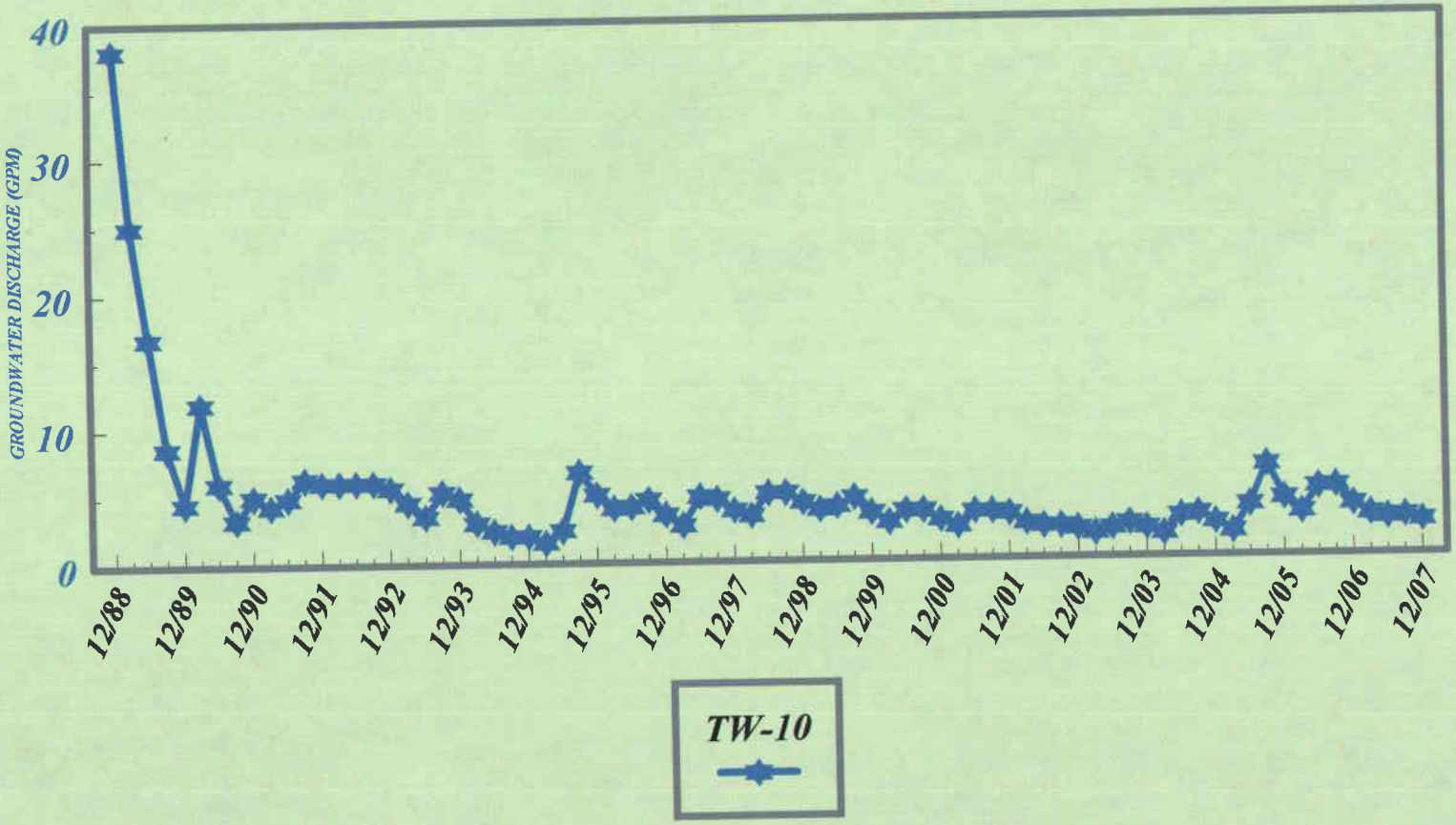


APPENDIX J
2007

Deer Creek In-Mine Monitoring
Main North - Main East

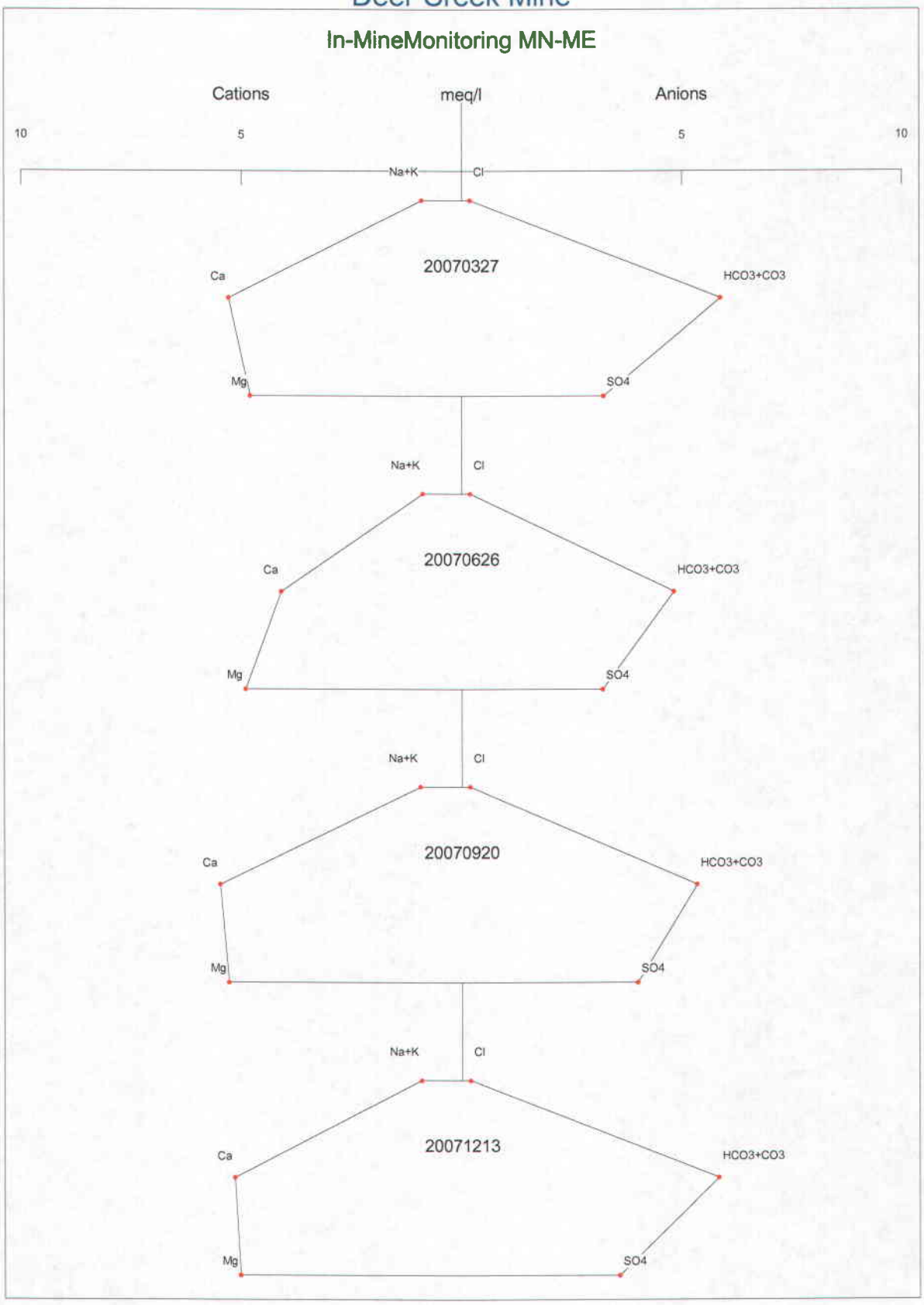


Deer Creek In-Mine Monitoring
3rd North xc-65 (TW-10)



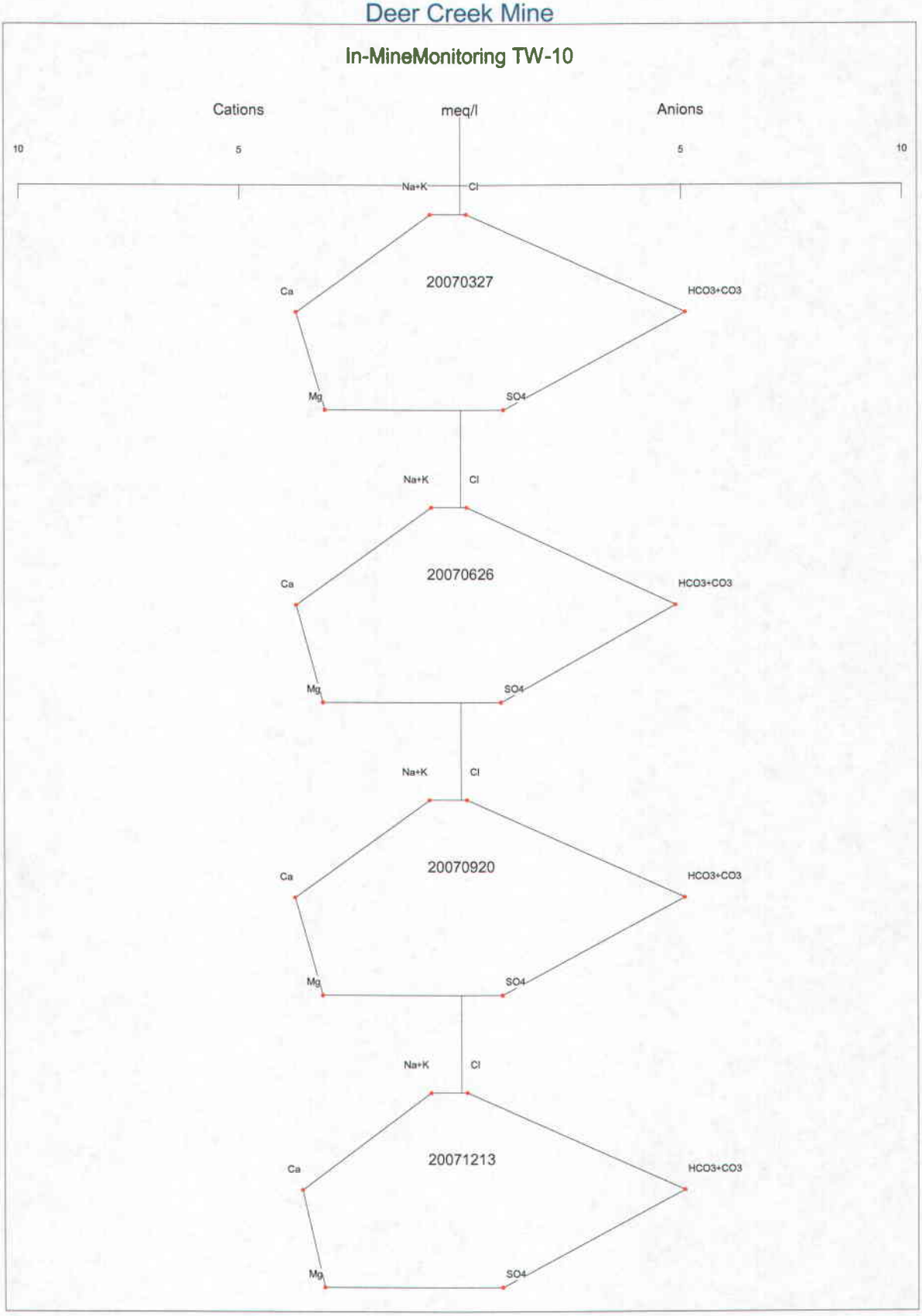
Deer Creek Mine

In-MineMonitoring MN-ME



Deer Creek Mine

In-MineMonitoring TW-10



APPENDIX K
2007

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

SURFACE PIEZOMETRIC DATA
COTTONWOOD CANYON

	EM-31		CCCW-1A		CCCW-1S		CCCW-2A		CCCW-3A		CCCW-3S U		CCCW-3S L		TM-1B		TM-3		
Collar Elevation	7417.8		7843.2		7844.5		8133.9		8369.7		8367.6		8366.0		7295.0 EST		6750.0 EST		
Date	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	
01/19/2005	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		-22.5	7272.5	9lbs. Pres	6770.8	9.0
02/03/2005	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		-22.5	7272.5	10lbs. Pre	6773.1	10.0
03/07/2005	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		-22.0	7273.0	11lbs. Pre	6775.4	11.0
04/18/2005	-53.8	7364.0	-111.7	7731.5	-198.4	7646.1	-30.0	8103.9	-56.4	8313.3	-78.5	8289.0	-613.8	7752.2	-21.9	7273.1	11lbs. Pre	6775.4	11.0
05/24/2005	-50.4	7367.5	-111.8	7731.4	-199.7	7644.8	-26.2	8107.7	-54.6	8315.1	-76.5	8291.0	-614.1	7752.0	-21.8	7273.2	12lbs.Pres	6777.7	12.0
06/20/2005	-55.3	7362.5	-92.5	7750.8	-199.2	7645.3	-20.8	8113.1	-51.3	8318.5	-71.5	8296.1	-614.4	7751.6	-21.7	7273.3	14lbs. Pre	6782.3	14.0
07/16/2005	-56.8	7361.1	-97.7	7745.5	-198.0	7646.5	-19.1	8114.8	-50.7	8319.0	-71.7	8295.9	-614.3	7751.7	-22.1	7272.9	14lbs. Pre	6782.3	14.0
08/01/2005	-56.9	7361.0	-100.3	7742.9	-197.7	7646.8	-19.4	8114.4	-50.9	8318.8	-73.2	8294.3	-614.4	7751.6	-22.2	7272.8	14lbs. Pre	6782.3	14.0
09/22/2005	-56.9	7360.9	-101.7	7741.6	-198.2	7646.3	-19.5	8114.4	-51.9	8317.8	-74.1	8293.5	-614.8	7751.2	-23.4	7271.6	14lbs. Pre	6782.3	14.0
10/06/2005	-56.1	7361.7	-102.3	7740.9	-195.5	7648.9	-21.0	8112.9	-51.6	8318.1	-73.5	8294.0	-613.9	7752.2	-22.6	7272.5	14lbs. Pre	6782.3	14.0
11/07/2005	-56.1	7361.7	-102.2	7741.0	-195.0	7649.5	-20.9	8113.0	-52.8	8316.9	-73.7	8293.8	-613.6	7752.4	-22.3	7272.7	10lbs. Pre	6773.1	10.0
12/06/2005	-55.5	7362.3	-103.3	7739.9	-194.8	7649.7	-22.2	8111.7	-51.8	8317.9	-73.8	8293.8	-613.4	7752.6	-22.4	7272.6	6lbs. Pres	6763.8	6.0
01/10/2006	-53.3	7364.5	-104.9	7738.3	-194.7	7649.8	-22.2	8111.6	-51.5	8318.2	-73.6	8294.0	-613.5	7752.5	-22.4	7272.6	6lbs. Pres	6763.8	6.0
02/21/2006	-54.2	7363.6	-106.9	7736.3	-194.5	7650.0	Inaccessible		Inaccessible		Inaccessible		Inaccessible		-21.3	7273.7	6lbs. Pres	6763.8	6.0
03/13/2006	-54.3	7363.5	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		-21.3	7273.7	6lbs. Pres	6763.8	6.0
04/10/2006	-53.6	7364.2	-105.8	7737.4	-194.6	7649.9	Inaccessible		Inaccessible		Inaccessible		Inaccessible		-21.5	7273.6	6lbs. Pres	6763.8	6.0
05/23/2006	-54.2	7363.6	-92.5	7750.7	-194.6	7649.9	-18.0	8115.9	-47.3	8322.4	-68.8	8298.7	-613.5	7752.6	-21.2	7273.8	6lbs. Pres	6763.8	6.0
06/15/2006	-54.9	7362.9	-84.3	7758.9	-193.7	7650.8	-16.9	8116.9	-46.2	8323.5	-66.7	8300.8	-613.3	7752.8	-21.6	7273.4	6lbs. Pres	6763.8	6.0
07/26/2006	-55.6	7362.2	-92.2	7751.0	-192.6	7651.9	-16.8	8117.1	-46.9	8322.8	-68.1	8299.5	-613.3	7752.8	-21.6	7273.4	6lbs. Pres	6763.8	6.0
08/07/2006	-55.8	7362.0	-92.9	7750.4	-192.5	7652.0	-17.0	8116.8	-47.4	8322.3	-68.6	8299.0	-613.4	7752.6	-21.5	7273.5	6lbs. Pres	6763.8	6.0
09/08/2006	-56.1	7361.7	-93.6	7749.6	-191.4	7653.1	-17.6	8116.2	-49.2	8320.5	-70.9	8296.7	-613.9	7752.1	-21.9	7273.1	6lbs. Pres	6763.8	6.0
10/24/2006	-55.6	7362.2	-94.3	7748.9	-190.8	7653.7	-18.2	8115.6	-48.4	8321.3	-69.9	8297.6	-612.7	7753.3	-22.3	7272.7	6lbs. Pres	6763.8	6.0
11/16/2006	-55.6	7362.2	-95.4	7747.8	-190.4	7654.1	-18.3	8115.5	-48.5	8321.3	-70.1	8297.5	-612.5	7753.5	-22.3	7272.7	6lbs. Pres	6763.8	6.0
12/04/2006	-55.4	7362.4	-96.2	7747.0	-191.2	7653.3	-19.0	8114.9	-48.6	8321.1	-70.2	8297.4	-612.7	7753.3	-21.8	7273.2	6lbs. Pres	6763.8	6.0
01/09/2007	-54.3	7363.5	-99.0	7744.2	-190.2	7654.3	-18.7	8115.2	-48.5	8321.2	-70.3	8297.3	-612.7	7753.3	-20.9	7274.1	21lbs. Pre	6799.6	21.5
02/12/2007	-53.9	7363.9	-101.8	7741.4	-189.6	7654.9	-18.8	8115.1	-48.8	8320.9	-70.4	8297.1	-612.2	7753.8	-21.6	7273.4	24lbs. Pre	6805.4	24.0
03/20/2007	-53.5	7364.3	-103.0	7740.2	-189.4	7655.1	-18.9	8115.0	-48.1	8321.6	-70.1	8297.4	-612.2	7753.9	-20.7	7274.3	24lbs. Pre	6805.4	24.0
04/04/2007	-53.2	7364.6	-103.3	7739.9	-190.0	7654.5	-19.0	8114.9	-48.5	8321.2	-70.2	8297.3	-612.4	7753.7	-20.9	7274.1	22lbs. Pre	6800.8	22.0
05/08/2007	-54.7	7363.1	-104.5	7738.7	-189.3	7655.2	-19.1	8114.8	-48.5	8321.2	-70.6	8297.0	-612.2	7753.8	-21.3	7273.7	23lbs. Pre	6803.1	23.0
06/28/2007	-55.0	7362.8	-110.6	7732.7	-189.2	7655.3	-19.6	8114.3	-49.7	8320.0	-71.5	8296.1	-612.2	7753.8	-21.0	7274.0	22lbs. Pre	6800.8	22.0
07/16/2007	-56.6	7361.2	-111.7	7731.6	-189.2	7655.3	-19.8	8114.0	-50.0	8319.7	-71.9	8295.7	-612.3	7753.7	-21.0	7274.0	24lbs. Pre	6805.4	24.0
08/02/2007	-56.9	7361.0	-112.3	7730.9	-190.5	7653.9	-20.1	8113.8	-50.2	8319.5	-72.2	8295.4	-612.2	7753.8	-21.1	7273.9	25lbs.Pres	6807.7	25.0
09/21/2007	-57.8	7360.0	-113.8	7729.4	-189.8	7654.7	-21.0	8112.9	-50.7	8319.0	-72.9	8294.7	-612.4	7753.7	-21.8	7273.2	28lbs.Pres	6814.6	28.0
10/26/2007	-56.9	7360.9	-113.3	7729.9	-189.9	7654.6	-21.5	8112.4	-51.0	8318.7	-73.3	8294.2	-612.3	7753.7	-21.9	7273.1	28lbs.Pres	6814.6	28.0
11/13/2007	-56.3	7361.5	-112.9	7730.4	-190.0	7654.5	-21.7	8112.2	-51.1	8318.6	-73.4	8294.2	-612.3	7753.7	-22.0	7273.0	28lbs.Pres	6814.6	28.0
12/10/2007	-55.0	7362.8	-112.5	7730.7	-190.1	7654.4	-21.9	8112.0	-50.7	8319.0	-73.4	8294.2	-612.1	7753.9	-21.5	7273.5	28lbs.Pres	6814.6	28.0

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

SURFACE PIEZOMETRIC DATA
RILDA CANYON

	Rilda Canyon (EM-47)		P - 1		P - 4		P - 5		P - 6		P - 7	
Collar Elevation	8,059.0		7,516.8		7,579.3		7,564.8		7,615.5		7,634.9	
Date	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level
01/26/2005	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible	
02/25/2005	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible	
03/21/2005	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible	
04/21/2005	Inaccessible		22.5	7,494.3	DAMP		7.6	7,557.3	46.3	7,569.3	45.2	7,589.7
05/25/2005	209.1	7,850.0	21.9	7,494.9	DAMP		5.0	7,559.8	40.2	7,575.3	27.0	7,607.9
06/21/2005	210.5	7,848.5	23.6	7,493.2	DAMP		7.4	7,557.4	38.8	7,576.7	24.6	7,610.3
07/16/2005	211.1	7,847.9	23.5	7,493.3	DAMP		7.5	7,557.3	38.6	7,576.9	24.8	7,610.1
08/02/2005	211.1	7,847.9	22.8	7,494.0	DAMP		7.6	7,557.2	38.5	7,577.0	25.8	7,609.2
09/22/2005	217.0	7,842.0	23.0	7,493.8	DAMP		7.5	7,557.3	40.1	7,575.4	30.9	7,604.0
10/13/2005	217.9	7,841.2	22.8	7,494.0	DAMP		7.6	7,557.2	42.5	7,573.0	36.3	7,598.6
11/17/2005	217.9	7,841.1	23.0	7,493.8	DAMP		8.3	7,556.5	45.1	7,570.4	43.3	7,591.7
12/13/2005	Inaccessible		22.8	7,494.0	DAMP		8.0	7,556.8	45.8	7,569.7	44.7	7,590.2
01/20/2006	Inaccessible		22.8	7,494.0	DAMP		8.3	7,556.5	46.2	7,569.3	45.6	7,589.3
02/23/2006	Inaccessible		22.6	7,494.2	DAMP		7.8	7,557.0	46.2	7,569.4	45.1	7,589.9
03/14/2006	Inaccessible		22.6	7,494.3	DAMP		7.9	7,556.9	46.1	7,569.4	44.7	7,590.2
04/25/2006	Inaccessible		22.4	7,494.4	DAMP		7.3	7,557.5	43.7	7,571.8	42.9	7,592.0
05/23/2006	212.0	7,847.0	22.6	7,494.2	DAMP		7.0	7,557.8	38.2	7,577.3	25.8	7,609.1
06/20/2006	212.9	7,846.1	22.5	7,494.4	DAMP		7.7	7,557.2	37.0	7,578.5	23.6	7,611.3
07/11/2006	213.9	7,845.1	22.6	7,494.2	DAMP		7.0	7,557.8	35.1	7,580.4	23.5	7,611.4
08/09/2006	214.2	7,844.8	22.9	7,493.9	DAMP		7.0	7,557.8	35.1	7,580.4	24.3	7,610.6
09/27/2006	216.7	7,842.3	22.9	7,493.9	DAMP		7.1	7,557.7	38.7	7,576.8	31.7	7,603.2
10/27/2006	218.5	7,840.5	22.8	7,494.0	DAMP		7.1	7,557.7	39.9	7,575.6	33.0	7,601.9
11/27/2006	218.9	7,840.1	22.9	7,493.9	DAMP		7.8	7,557.0	41.5	7,574.0	39.3	7,595.6
12/07/2006	219.0	7,840.0	23.0	7,493.8	DAMP		7.2	7,557.6	41.9	7,573.6	40.4	7,594.5
01/10/2007	Inaccessible		22.7	7,494.1	DAMP		8.0	7,556.9	42.8	7,572.7	42.3	7,592.6
02/20/2007	Inaccessible		22.9	7,493.9	DAMP		7.4	7,557.4	43.1	7,572.4	43.2	7,591.7
03/26/2007	Inaccessible		22.6	7,494.2	Inaccessible		Inaccessible		Inaccessible		Inaccessible	
04/17/2007	217.2	7,841.8	22.5	7,494.3	DAMP		7.4	7,557.4	43.9	7,571.6	44.5	7,590.4
05/10/2007	213.5	7,845.5	23.0	7,493.8	DAMP		7.2	7,557.6	41.4	7,574.1	36.8	7,598.1
06/29/2007	210.6	7,848.4	22.3	7,494.5	DAMP		5.2	7,559.6	37.0	7,578.5	24.3	7,610.6
07/25/2007	214.1	7,844.9	22.5	7,494.3	DAMP		6.1	7,558.7	37.6	7,577.9	26.7	7,608.2
08/20/2007	212.3	7,846.7	22.8	7,494.0	DAMP		7.4	7,557.4	39.2	7,576.3	32.2	7,602.7
09/20/2007	214.0	7,845.0	22.8	7,494.0	DAMP		7.2	7,557.7	41.0	7,574.5	38.2	7,596.7
10/26/2007	213.8	7,845.2	22.7	7,494.2	DAMP		6.9	7,558.0	42.9	7,572.6	42.7	7,592.3
11/14/2007	217.2	7,841.8	22.8	7,494.0	DAMP		7.3	7,557.5	43.6	7,571.9	43.8	7,591.1
12/05/2007	217.0	7,842.0	23.1	7,493.7	DAMP		8.1	7,556.7	44.5	7,571.0	45.0	7,589.9

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

WASTE ROCK DISPOSAL WELLS DATA

	DEER CREEK DCWR1		WILBERG\COTTONWOOD WCWR1		
* Collar Elevation	6313.4	Elevations Adjusted 12/90		6774.5	
Date	**Reading**	**Level**	**Date**	**Reading**	**Level**
03/09/2004	-7.1	6306.4	12/14/2004	-50.35	6724.2
06/03/2004	-7.3	6306.1	03/07/2005	-48.72	6725.8
09/09/2004	-8.6	6304.8	06/20/2005	-46.26	6728.2
12/14/2004	-5.0	6308.4	09/22/2005	-47.3	6727.2
03/21/2005	-4.4	6309.0	12/06/2005	-49.62	6724.9
06/22/2005	-3.6	6309.8	03/13/2006	-50.45	6724.1
09/23/2005	-8.0	6305.4	06/15/2006	-50.28	6724.2
12/13/2005	-5.9	6307.5	09/26/2006	-51.82	6722.7
03/14/2006	-7.1	6306.3	12/06/2006	-44.05	6730.5
06/22/2006	-5.6	6307.8	03/20/2007	-46.5	6728.0
09/27/2006	-7.6	6305.8	06/28/2007	-50.23	6724.3
12/07/2006	-9.0	6304.4	09/21/2007	-52.52	6722.0
03/26/2007	-9.9	6303.5	12/10/2007	-53	6721.5
06/29/2007	-9.3	6304.1			
09/19/2007	-10.0	6303.4			
12/05/2007	-10.9	6302.5			

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK FLOW & QUALITY

SW-1

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/19/2005	1140		INACCESSIBLE SNOW				clear30's	
02/03/2005	1433		INACCESSIBLE SNOW				cloudy30's	
03/07/2005	1108		INACCESSIBLE SNOW				clear40's	
04/18/2005	1235		2.5				cloudy50's	
05/24/2005	911		390				clear60's	
06/20/2005	1254	16.2	500	9.23	485	8.8	ptcloudy70's	
07/16/2005	859		150				clear70's	
08/01/2005	1137		50				cloudy60's	
09/22/2005	901	7.5	5	7.79	667		clear50's	
10/06/2005	1128		5				clear40's	
11/07/2005	1434		5				cloudy40's	
12/06/2005	1151		Frozen				cloudy20's	
01/10/2006	1440		Frozen				clear20's	
02/21/2006	1052		Frozen				clear20's	
03/13/2006	1315		INACCESSIBLE SNOW				ptcloudy30's	
04/10/2006	1333		6				clear40's	
05/23/2006	1226		143				ptcloudy50's	
06/15/2006	1237	9.9	260	8.27	526	11	cloudy60's	
07/26/2006	906		130				sunny80's	
08/07/2006	1048		33				clear90's	
09/26/2006	1038	9.6	15	8.3	15		clear50's	DO run at lab
10/24/2006	1017		10				clear30's	
11/16/2006	1433		10				clear30's	
12/06/2006	1008	5.2	10	8.08	822	7.81	clear30's	
01/09/2007	959		10				clear20's	
02/12/2007	1113		5				ptcloudy30's	
03/20/2007	1217	11.7	5.1	7.94	1020	7.22	ptcloudy60's	
04/04/2007	948		10				cloudy40's	
05/08/2007	1335		10				clear60's	
06/28/2007	1244	26.3	3	8.31	987	6.22	clear80's	
07/16/2007	1307		3				cloudy80's	
08/02/2007	1333		3				cloudy70's	
09/21/2007	1036		Seep				clear50's	
10/26/2007	1109		Seep				clear50's	
11/13/2007	1517		Damp				ptcloudy50's	
12/10/2007	1103		Damp				clear20's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK FLOW & QUALITY

SW-2

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/19/2005	1051		15				clear30's	
02/03/2005	1441		22				cloudy30's	
03/07/2005	1144	8.6	30	8.71	1030	15.3	clear40's	
04/18/2005	1243		25				cloudy50's	
05/24/2005	925		400				clear60's	
06/20/2005	1331	14.4	516	9.43	516	13.4	ptcloudy70's	
07/16/2005	913		250				clear70's	
08/01/2005	1249		70				cloudy60's	
09/22/2005	924	9.1	20	8.21	895		clear50's	
10/06/2005	1155		22				clear40's	
11/07/2005	1444		21				cloudy40's	
12/06/2005	1227	5.3	20	8.13	881		cloudy20's	
01/10/2006	1451		20				clear20's	
02/21/2006	1108		18				clear20's	
03/13/2006	1349	4.2	20	8.1	832		ptcloudy30's	DO run at lab
04/10/2006	1352		30				clear40's	
05/23/2006	1250		150				ptcloudy50's	
06/15/2006	1321	9.4	265	8.43	567	11.2	clloudy60's	
07/26/2006	943		220				sunny80's	
08/07/2006	1114		70				clear90's	
09/26/2006	1118	10.4	45	8.69	854		clear50's	DO run at lab
10/24/2006	1029		35				clear30's	
11/16/2006	1444		30				clear30's	
12/06/2006	1055	6.6	15	8.25	974	8.81	clear30's	
01/09/2007	1013		15				clear20's	
02/12/2007	1124		18				ptcloudy30's	
03/20/2007	1307	9.7	45	8.52	946	8.56	ptcloudy60's	
04/04/2007	1001		45				cloudy50's	
05/08/2007	1350		45				clear60's	
06/28/2007	1332	20.7	18	8.24	1003	6.89	clear80's	
07/16/2007	1331		15				cloudy80's	
08/02/2007	1340		14				cloudy70's	
09/21/2007	1150	14.1	15	8.22	997	7.96	clear60's	
10/26/2007	1119		15				clear50's	
11/13/2007	1527		17				ptcloudy50's	
12/10/2007	1145	5.7	17	8.32	1077	10.47	clear20's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK FLOW & QUALITY

SW-3

	<----------		Field Measurements ---			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
02/03/2005	1447		Dry				cloudy30's	
03/07/2005	1153		Dry				clear40's	
04/18/2005	1251		Dry				cloudy50's	
05/24/2005	941		410				clear60's	
06/20/2005	1353	18.3	953	9.55	533	10.3	ptcloudy70's	
07/16/2005	921		260				clear70's	
08/01/2005	1255		84				cloudy60's	
09/22/2005	952	11.6	21	7.33	2430		clear50's	
10/06/2005	1204		21				clear40's	
11/07/2005	1453		18				cloudy40's	
12/06/2005	1237		Dry				cloudy20's	
01/10/2006	1459		Dry				clear20's	
02/21/2006	1115		Dry				clear20's	
03/13/2006	1359		Dry				ptcloudy30's	
04/10/2006	1403		5				clear40's	
05/23/2006	1259		158				ptcloudy50's	
06/15/2006	1410	13.4	267	8.23	674		cloudy60's	
07/26/2006	1020		227				sunny80's	
08/07/2006	1439		74				clear90's	
09/26/2006	1137	13.7	20	8.54	1736		clear50's	DO run at lab
10/24/2006	1037		19				clear30's	
11/16/2006	1448		15				clear30's	
12/06/2006	1112		Frozen				clear30's	
01/09/2007	1019		Frozen				clear20's	
02/12/2007	1129		Frozen				ptcloudy30's	
03/20/2007	1307		Dry				ptcloudy60's	
04/04/2007	1010		42				cloudy40's	
05/08/2007	1359		43				ptcloudy60's	
06/28/2007	1351	26.5	10	8.24	2250	7.64	clear80's	
07/16/2007	1338		12				cloudy80's	
08/02/2007	1350		10				cloudy70's	
09/21/2007	1218	16.6	8	8.27	2620	9.02	clear50's	
10/26/2007	1125		5				clear50's	
11/13/2007	1531		4				ptcloudy50's	
12/10/2007	1157		Dry				clear20's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK
@ USGS FLUME
CCC01

	<----------		Field Measurements --- -------->					
			Flow			Cond.	Dis.	
Date	Time	Temp. (°C)	ft.	GPM	pH	(uS)	Oxygen	Weather Comments
01/19/2005	1056			Dry				clear30's
02/03/2005	1444			Dry				cloudy30's
03/07/2005	1150			Dry				clear40's
04/18/2005	1248			Dry				cloudy50's
05/24/2005	935			Over Capacity				clear60's
06/20/2005	1341	15.3		940	9.17	512	11.6	ptcloudy70's
07/16/2005	917			127				clear70's
08/01/2005	1251			83				cloudy60's
09/22/2005	939	9.5		20	7.75	943		clear50's
10/06/2005	1159			20				clear40's
11/07/2005	1448			21				cloudy40's
12/06/2005	1234			Dry				cloudy20's
01/10/2006	1456			Dry				clear20's
02/21/2006	1112			Dry				clear20's
03/13/2006	1354			Dry				ptcloudy30's
04/10/2006	1357			33				clear40's
05/23/2006	1253			155				ptcloudy50's
06/15/2006	1335	9.5		265	8.33	547		clear70's
07/26/2006	1008			222				sunny80's
08/07/2006	1132			73				clear90's
09/26/2006	1127	9		25	8.72	815		clear50's
10/24/2006	1033			20				clear30's
11/16/2006	1446			16				clear30's
12/06/2006	1108			frozen-no flow				clear30's
01/09/2007	1015			frozen-no flow				clear20's
02/12/2007	1126			frozen-no flow				ptcloudy30's
03/20/2007	1337	12.5		41	8.46	8.3	822	ptcloudy60's
04/04/2007	1005			41				cloudy40's
05/08/2007	1355			43				clear60's
06/28/2007	1338			Damp				clear80's
07/16/2007	1334			Damp				cloudy80's
08/02/2007	1344			Damp				cloudy70's
09/21/2007	1201			Dry				clear50's
10/26/2007	1121			Dry				clear50's
11/13/2007	1529			Dry				ptcloudy50's
12/10/2007	1150			Dry				clear20's

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

UN-NAMED DRAINAGE OFF STRAIGHT CANYON CREEK

T-19

	<———		Field Measurements			———>		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/20/2004	851		Frozen				ptcloudy20's	
02/18/2004	1418		Frozen				cloudy40's	
03/08/2004	1321		No Flow				clear50's	
04/06/2004	1159		122				ptcloudy50's	
05/24/2004	908		86				cloudy40's	
06/02/2004	950	9.7	66	9.54	968	6	clear70's	
07/23/2004	1040		35				ptcloudy80's	
08/05/2004	1215		32				cloudy70's	
09/08/2004	1053	13	17	9.31	1570		ptcloudy70's	
10/11/2004	1058		32				ptcloudy50's	
11/05/2004	1254		64				clear40's	
12/14/2004	816	1.9	20	7.93	647		clear20's	
01/19/2005	1028		20				clear30's	
02/03/2005	1418		20				cloudy30's	
03/07/2005	1041	3.3	30	9.66	1146	9.6	clear40's	
04/18/2005	1240		40				cloudy50's	
05/24/2005	813		95				clear60's	
06/20/2005	1113	13.7	146	9.72	743		ptcloudy70's	
07/16/2005	800		101				clear70's	
08/01/2005	1010		80				cloudy60's	
09/22/2005	749	7.7	17.2	8.32	684		clear40's	
10/06/2005	953		24				clear40's	
11/07/2005	1334		85				cloudy40's	
12/06/2005	1041		Frozen				cloudy20's	
01/10/2006	1333		Frozen				clear20's	
02/21/2006	1007		Frozen				clear20's	
03/13/2006	1257	2.7	30	8.22	833		ptcloudy30's	DO run at lab
04/10/2006	1256		200				clear40's	
05/23/2006	1310		70				ptcloudy50's	
06/15/2006	1109	11.2	250	8.5	776	10.8	cloudy60's	
07/26/2006	1037		125				sunny80's	
08/07/2006	1501		150				clear90's	
09/26/2006	1009	5.6	25	8.8	804		clear50's	DO run at lab
10/24/2006	925		25				clear30's	
11/16/2006	1455		25				clear30's	
12/04/2006	1350		Frozen				clear20's	
01/08/2007	1110		Frozen				clear20's	
02/12/2007	1138		20				ptcloudy30's	
03/20/2007	1057	8.6	120	8.43	1130	9.09	ptcloudy60's	
04/04/2007	1306		125				cloudy40's	
05/07/2007	1424		135				clear60's	
06/28/2007	1107	18.5	40	8.74	1213	7.42	clear80's	
07/16/2007	1139		20.6				cloudy80's	
08/02/2007	1136		35				cloudy70's	
09/21/2007	938	9.5	20	7.48	1513	9.04	clear50's	
10/26/2007	1013		20				clear50's	
11/13/2007	1427		31				ptcloudy50's	
12/10/2007	932	0.2		8.3	1572	11.72	cloudy20's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

ABOVE THE MINE - DCR01

	<---------- Field Measurements ------>							
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/25/2005	1347			Dry			ptcloudy40;s	
02/25/2005	1008			Dry			ptcloudy30's	
03/21/2005	1029			Dry			cloudy40's	
04/21/2005	933			Dry			cloudy30's	
05/25/2005	1248			353			ptcloudy60's	
06/22/2005	1057	10.9		971	8.6	361	cloudy70's	
07/16/2005	1251			445			clear80's	
08/02/2005	1109			296			clear70's	
09/23/2005	814	4.8		134	7.49	595	cloudy40's	
10/13/2005	1521			134			clear40's	
11/17/2005	1451			Frozen			clear40's	
12/13/2005	1102			Frozen			ptcloudy20's	
01/20/2006	938			Frozen			clear 20's	
02/23/2006	1115			Frozen			clear20's	
03/14/2006	1110			Frozen			ptcloudy20's	
04/25/2006	1400			Dry			cloudy40's	
05/24/2006	1249			1227			clear70's	
06/20/2006	1552	14.4		675	8.48	518	clear70's	
07/11/2006	1417			368			clear80's	
08/08/2006	1331			190			ptcloudy90's	
09/27/2006	1334	5.8		117	9.1	654	clear60's	
10/24/2006	1358			frozen			clear30's	
11/17/2006	1441			frozen			clear40's	
12/07/2006	1044			frozen			clear20's	
01/24/2007	1358			frozen			cloudy20's	
02/20/2007	1000			frozen			clear19	
03/26/2007	1341			frozen			ptcloudy40's	
04/18/2007	1021			45			clear50's	
05/11/2007	841			Dry			clear60's	
06/29/2007	1220			Dry			clear70's	
07/17/2007	1058			Dry			cloudy70's	
08/06/2007	1110			Dry			cloudy60's	
09/20/2007	1339			Dry			clear60's	
10/26/2007	1424			Dry			clear50's	
11/14/2007	1218			Dry			clear40's	
12/05/2007	1300			Dry			cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

@ PERMIT BOUNDARY - DCR04

	<---------- Field Measurements ------>							
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/25/2005	1353			1333			ptcloudy40's	
02/25/2005	1015			817			ptcloudy30's	
03/21/2005	1038	6.4		433	8.64	1079	cloudy40's	
04/21/2005	936			653			cloudy30's	
05/25/2005	1255			3081			ptcloudy60's	
06/22/2005	1112	15.2		1876	8.58	420	cloudy70's	
07/16/2005	1256			1282			clear80's	
08/02/2005	1115			1282			clear70's	
09/23/2005	827	10.3		1087	7.48	724	cloudy40's	
10/13/2005	1526			1135			clear40's	
11/17/2005	1459			994			clear40's	
12/13/2005	1109	7.4		503	8.25	590	ptcloudy20's	
01/20/2006	942			1489			clear20's	
02/21/2006	1120			817			clear20's	
03/14/2006	1116	4.2		817	8.2	3260	ptcloudy20's	
04/25/2006	1405			904			cloudy40's	
05/24/2006	1258			2420			clear70's	
06/20/2006	1607	15.8		1183	8.52	664	clear70's	
07/11/2006	1410			860			clear80's	
08/08/2006	1401			994			ptcloudy90's	
09/27/2006	1353	13.7		433	8.72	738	clear60's	
10/24/2006	1418			1040			clear30's	
11/17/2006	1446			503			clear40's	
12/07/2006	1049	6.4		1282	8.56	1061	clear20's	
01/24/2007	1403			433			cloudy20's	
02/20/2007	1007			904			clear19	
03/26/2007	1351	14.6		734	8.66	876	ptcloudy40's	
04/18/2007	1028			994			clear50's	
05/11/2007	849			571			clear60's	
06/29/2007	1243	18.7		904	8.67	833	clear70's	
07/17/2007	1103			1087			cloudy70's	
08/06/2007	1118			140			cloudy60's	
09/20/2007	1345	11.1		817	7.58	884	clear60's	
10/26/2007	1430			2677			clear50's	
11/14/2007	1223			1087			clear40's	
12/05/2007	1315	11.2		2677	8.5	883	cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

BELOW THE MINE - DCR06

	<---------- Field Measurements ------>							
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/25/2005	1357			1325			ptcloudy40's	
02/25/2005	1020			810			ptcloudy30's	
03/21/2005	1052	6.4		430	8.59	1219	cloudy40's	
04/18/2005	941			652			cloudy30's	
05/25/2005	1301			3090			ptcloudy60's	
06/22/2005	1125	14.5		1870	8.52	474	cloudy70's	
07/16/2005	1301			1280			clear80's	
08/02/2005	1121			1280			clear70's	
09/23/2005	840	8.9		1080	6.34	746	cloudy40's	
10/13/2005	1533			1130			clear40's	
11/17/2005	1505			991			clear40's	
12/13/2005	1129	4.1		491	8.22	688	ptcloudy20's	
01/20/2006	948			1400			clear20's	
02/23/2006	1131			810			clear20's	
03/14/2006	1151	2.1		810	8.16	1505	ptcloudy20's	
04/25/2006	1408			900			cloudy40's	
05/24/2006	1306			2400			clear70's	
06/20/2006	1627	22.1		1170	8.39	935	clear70's	
07/11/2006	1401			860			clear80's	
08/08/2006	1444			995			ptcloudy90's	
09/27/2006	1406	16.6		420	8.92	833	clear60's	
10/24/2006	1418			1031			clear30's	
11/17/2006	1454			500			clear40's	
12/07/2006	1107	3.7		1273	8.53	1161	clear20's	
01/24/2007	1411			428			cloudy20's	
02/20/2007	1014			900			clear19	
03/26/2007	1407	14.5		969	8.51	969	ptcloudy40's	
04/18/2007	1035			990			clear50's	
05/11/2007	855			570			clear60's	
06/29/2007	1243	23		889	8.86	829	clear70's	
07/17/2007	1107			1080			cloudy70's	
08/06/2007	1123			137			cloudy60's	
09/20/2007	1404	16.3		808	7.35	1246	clear60's	
10/26/2007	1437			2600			clear50's	
11/14/2007	1227			1080			clear40's	
12/05/2007	1328	8.8		2600	8.6	985	cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

RIGHT FORK - GWR01

	<-----	Field Measurements ------->						
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/19/2005	1106		no flow				clear30's	
02/03/2005	1456		no flow				cloudy30's	
03/07/2005	1104		no flow				clear40's	
04/18/2005	1315		no flow				cloudy50's	
05/24/2005	952		24				clear60's	
06/20/2005	1428		Damp				ptcloudy70's	
07/16/2005	931		no flow				clear70's	
08/01/2005	1301		no flow				cloudy60's	
09/22/2005	1010		no flow				clear50's	
10/06/2005	1215		no flow				clear40's	
11/07/2005	1503		no flow				cloudy40's	
12/06/2005	1243		no flow				cloudy20's	
01/10/2006	1446		no flow				clear20's	
02/21/2006	1122		no flow				clear30's	
03/13/2006	1405		no flow				ptcloudy30's	
04/10/2006	1432		DAMP				clear40's	
05/23/2006	1412		9				ptcloudy50's	
06/15/2006	1424		DAMP				cloudy60's	
07/26/2006	1102		no flow				sunny80's	
08/02/2006	1114		no flow				clear80's	
09/26/2006	1200		no flow				clear50's	
10/24/2006	1048		no flow				clear30's	
11/16/2006	1500		no flow				clear30's	
12/06/2006	1121		no flow				clear30's	
01/09/2007	1028		no flow				clear20's	
02/12/2007	1149		no flow				ptcloudy30's	
03/20/2007	1358		no flow				ptcloudy60's	
04/04/2007	1020		no flow				cloudy40's	
05/08/2007	1415		no flow				clear60's	
06/28/2007	1415		no flow				clear80's	
07/16/2007	1346		no flow				cloudy80's	
08/02/2007	1401		no flow				cloudy70's	
09/21/2007	1227		no flow				clear50's	
10/26/2007	1131		no flow				clear50's	
11/13/2007	1538		no flow				ptcloudy50's	
12/10/2007	1202		no flow				clear20's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

LEFT FORK - GWR02

	<-----	Field Measurements ------->						
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/19/2005	1110			Dry			clear30's	
02/03/2005	1459			Dry			cloudy30's	
03/07/2005	1109			Dry			clear40's	
04/18/2005	1321			Dry			cloudy50's	
05/24/2005	956			1014			clear60's	
06/20/2005	1444	14.7		108	9.64	714	ptcloudy70's	
07/16/2005	937			124			clear70's	
08/01/2005	1312			110			cloudy60's	
09/22/2005	1021	12.4		24	7.85	705	clear50's	
10/06/2005	1219			24			clear40's	
11/07/2005	1510			24			cloudy40's	
12/06/2005	1251			Frozen			cloudy20's	
01/10/2006	1514			Frozen			clear20's	
02/21/2006	1126			Frozen			clear30's	
03/13/2006	1409			Dry			ptcloudy30's	
04/10/2006	1434			13.8			clear40's	
05/23/2006	1418			100			ptcloudy50's	
06/15/2006	1433	9.6		168	8.12	775	cloudy60's	
07/26/2006	1109			67			sunny80's	
08/02/2006	1124			73			clear80's	
09/26/2006	1208	14.7		17	8.84	672	clear50's	
10/24/2006	1055			41			clear30's	
11/16/2006	1516			10			clear30's	
12/06/2006	1127			Frozen			clear30's	
01/09/2007	1034			Frozen			clear20's	
02/12/2007	1200			Dry			ptcloudy30's	
03/20/2007	1404			Dry			ptcloudy60's	
04/04/2007	1024			Dry			cloudy40's	
05/08/2007	1420			1			clear60's	
06/28/2007	1422	22.9		4	8.5	776	clear80's	
07/16/2007	1355			19			cloudy80's	
08/02/2007	1405			<1gpm			cloudy70's	
09/21/2007	1233			Damp			clear50's	
10/26/2007	1135			Damp			clear50's	
11/13/2007	1545			Damp			ptcloudy50's	
12/10/2007	1204			Dry			clear20's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

BELOW THE MINE - GWR03
**** FLOW INCLUDES MINE DISCHARGE**

	<-----	Field Measurements ------->						
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/19/2005	1116			frozen			clear30's	
02/03/2005	1503			frozen			cloudy30's	
03/07/2005	1214	7.6		6	8.82	2210	clear40's	
04/18/2005	1325			5			cloudy50's	
05/24/2005	1012			1030			clear60's	
06/20/2005	1455	14.6		115	9.39	777	ptcloudy70's	
07/16/2005	941			129			clear70's	
08/01/2005	1318			116			cloudy60's	
09/22/2005	1124	11.6		25	8	1097	clear50's	
10/06/2005	1229			25			clear40's	
11/07/2005	1516			27			cloudy40's	
12/06/2005	1255			Frozen			cloudy20's	
01/10/2006	1518			Frozen			clear20's	
02/21/2006	1131			Frozen			clear30's	
03/13/2006	1413			Frozen			ptcloudy30's	
04/10/2006	1438			15			clear40's	
05/23/2006	1429			120			ptcloudy50's	
06/15/2006	1455	10		170	8.37	845	cloudy60's	
07/26/2006	1116			75			sunny80's	
08/02/2006	1130			80			clear80's	
09/26/2006	1232	12.2		23	8.9	995	clear50's	
10/24/2006	1100			44			clear30's	
11/16/2006	1520			12			clear30's	
12/06/2006	1129			Frozen			clear30's	
01/09/2007	1039			Frozen			clear20's	
02/12/2007	1203			Frozen			ptcloudy30's	
03/20/2007	1413	14.2		10	7.8	2640	ptcloudy60's	
04/04/2007	1027			10			cloudy40's	
05/08/2007	1426			11			clear60's	
06/28/2007	1431	24.1		5	8.61	1619	clear80's	
07/16/2007	1401			29			cloudy80's	
08/02/2007	1410			3			cloudy70's	
09/21/2007	1240	18.1		1	7.93	3470	clear50's	
10/26/2007	1138			1			clear50's	
11/13/2007	1552			1			ptcloudy50's	
12/10/2007	1209			Frozen			clear20's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

HUNTINGTON CREEK FLOW & QUALITY

HUNTINGTON CREEK - HCC01

	<----------		Field Measurements		----------	------->		
Date	Time	Temp. (oC)	Flow CFS	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
03/09/2004	1357	6	17	8.88	456	13.1	clear50's	
06/03/2004	1230	13.6	80	9.5	385	9.4	clear70's	
09/09/2004	1357		50	8.52	322	8.9	ptcloudy70's	
12/14/2004	1319	1.9	18	8.17	435	10.6	clear30's	
03/21/2005	1101	4.4	18	7.09	551	11.2	cloudy40's	
06/22/2005	1134	10.8	224.91	9.68	335	9.7	cloudy70's	
09/23/2005	849	8.6	74.49	6.63	342		cloudy40's	DO Run at Lab
12/13/2005	1140	2.2	17.98	8.1	367		ptcloudy20's	DO Run at Lab
03/14/2006	1203	3.7	27.5	8.02	584		ptcloudy20's	DO Run at Lab
06/22/2006	947	11.4	173.45	8.45	378	5.7	clear70's	
09/27/2006	1428	11.7	103.76	8.65	340	7.38	clear60's	
12/07/2006	1123	2	26.81	8.68	604	11.13	clear20's	
03/26/2007	1417	11.3	34.96	7.72	461	8.02	cloudy50's	
06/29/2007	1253	16.5	88.19	8.7	342		clear70's	DO Run at Lab
09/19/2007	1051	9.5	84.65	8.59	386	9.36	clear60's	
12/05/2007	1342	2.3	43.06	8.42	533	11.75	cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

HUNTINGTON CREEK FLOW & QUALITY

HUNTINGTON CREEK - HCC02

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow CFS	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
12/03/2002	1411	1	46	6.76	362	9.8	clear20's	
03/13/2003	1112	6.2	13	7.47	514	9.7	clear50's	
06/26/2003	924	9.5	50	8.41	404	6.9	clear50's	
09/16/2003	1449	15.2	21	9.04	433	11.7	ptcloudy70's	
12/09/2003	1401	0.3	21	7.39	423	11.3	clear30's	
03/09/2004	1423	7.4	17	9.5	574	14.1	clear50's	
06/03/2004	1241	14.3	80	9.42	392	8	clear70's	
09/09/2004	1409	14.4	50	8.75	327	7.6	ptcloudy70's	
12/14/2004	1327	4.2	18	8.24	455	10.2	clear30's	
03/21/2005	1112	5.7	18	7.92	589	9.9	cloudy40's	
06/22/2005	1143	10.7	224.91	9.7	350	12	cloudy70's	
09/23/2005	900	8.8	74.49	6.5	350		cloudy40's	DO Run at Lab
12/13/2005	1151	2.3	17.98	7.91	369		ptcloudy20's	DO Run at Lab
03/14/2006	1218	2.5	27.5	8.07	738		ptcloudy20's	DO Run at Lab
06/22/2006	1001	11.4	173.45	8.35	386	4.8	clear70's	
09/27/2006	1438	12.6	103.76	8.83	345	7.24	clear60's	
12/07/2006	1140	2.6	26.81	8.37	627	11.1	clear20's	
03/26/2007	1434	11.6	34.96	8.24	493	8.24	cloudy50's	
06/29/2007	1305	16.4	88.19	8.83	341		clear70's	DO Run at Lab
09/19/2007	1101	9.8	84.65	8.39	389	8.69	clear60's	
12/05/2007	1350	3.6	43.06	8.56	549	11.83	cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

HUNTINGTON CREEK FLOW & QUALITY

HUNTINGTON CREEK - HCC04

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow CFS	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
03/19/2002	1434	4.5	21	8.3	510	10	clear40's	
06/25/2002	1518	19.1	60	8.77	380	6.3	ptcloudy80's	
09/19/2002	948	8.9	13	7.55	548	11.5	clear60's	
12/05/2002	1421	1.6	46	7.65	378	9.6	clear20's	
03/13/2003	1127	7.7	13	7.64	603	9.4	clear50's	
06/26/2003	937	10.2	50	8.69	424	7.4	clear50's	
09/16/2003	1459	15.7	21	8.99	468	10.6	ptcloudy70's	
12/09/2003	1415	0.2	21	7.34	500	11.5	clear30's	
03/09/2004	1423	8.9	17	9.31	600	13.9	clear50's	
06/03/2004	1252	14.3	80	9.3	401	8.1	clear70's	
09/09/2004	1421	15.1	50	8.37	353	6.7	ptcloudy70's	
12/14/2004	1342	4.4	18	8.55	514	10.8	clear30's	
03/21/2005	1122	6.9	18	7.64	698	9.8	cloudy40's	
06/22/2005	1152	11.1	224.91	9.32	360	12.3	cloudy70's	
09/23/2005	913	9.1	74.49	6.05	369		cloudy40's	DO Run at Lab
12/13/2005	1204	2.2	17.98	8.12	405		ptcloudy20's	DO Run at Lab
03/14/2006	1231	1.4	27.5	8.07	877		ptcloudy20's	DO Run at Lab
06/22/2006	1016	12.2	173.45	8.45	397	5.4	clear70's	
09/27/2006	1458	15.8	103.76	8.58	366	7.07	clear60's	
12/07/2006	1157	2.6	26.81	8.62	706	11.38	clear20's	
03/26/2007	1451	14.2	34.96	8.66	508	7.94	cloudy50's	
06/29/2007	1317	17.5	88.19	8.63	367		clear70's	DO Run at Lab
09/19/2007	1112	10.5	84.65	8.63	401	9.18	clear60's	
12/05/2007	1414	4.1	43.06	8.54	614	11.94	cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

MEETINGHOUSE CANYON
MHC01

	<---------- Field Measurements			----------	----------	--->	
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather Comments
01/25/2005	1342			Dry			ptcloudy40's
02/25/2005	1002			Dry			cloudy40's
03/21/2005	1021			Dry			cloudy30's
04/21/2005	926			Dry			cloudy30's
05/25/2005	1233			3700			ptcloudy60's
06/21/2005	1601	16.6		1399	8.89	442	ptcloudy80's
07/16/2005	1230			663			clear80's
08/02/2005	1158			241			clear70's
09/23/2005	744	7.2		83	8.3	466	cloudy40's
10/13/2005	1507			68			clear40's
11/17/2005	1434			Frozen			clear40's
12/13/2005	1058			Frozen			ptcloudy20's
01/20/2006	934			Frozen			clear20's
02/23/2006	1106			Frozen			clear20's
03/14/2006	1102			Frozen			ptcloudy20's
04/27/2006	945			47			cloudy40's
05/22/2006	1300			1737			ptcloudy50': expro water measurment
06/20/2006	1519	18.9		887	8.51	424	clear70's
07/11/2006	1435			463			clear80's
08/08/2006	1423			230			ptcloudy90's
09/27/2006	1304	10		83	8.9	450	clear60's
10/24/2006	1341			83			clear30's
11/17/2006	1434			Frozen			clear40's
12/07/2006	1038			Frozen			clear20's
01/24/2007	1340			Frozen			cloudy20's
02/20/2007	953			Frozen			clear19
03/26/2007	1108			Frozen			clear60's
04/18/2007	1005			Dry			clear50's
05/11/2007	824			20			clear60's
06/29/2007	1201	19.7		41	8.84	408	clear70's
07/17/2007	1050			20			cloudy70's
08/06/2007	1059			61			cloudy60's
09/20/2007	1330			<1gpm			clear60's
10/26/2007	1418			6			clear50's
11/14/2007	1234			6			clear40's
12/05/2007	1256			Dry			cloudy30's

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

MILL FORK CANYON FLOW & QUALITY

MILL FORK CANYON ABOVE MINE (MFA1)

	<----------		Field Measurements			----------	------>		
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/25/2005	1320			INACCESSIBLE SNOW				ptcloudy40's	
02/25/2005	930			INACCESSIBLE SNOW				ptcloudy30's	
03/21/2005	900			INACCESSIBLE SNOW				cloudy40's	
04/19/2005	1413			INACCESSIBLE SNOW				cloudy40's	
05/25/2005	1019			3100				ptcloudy60's	
06/21/2005	1114	9.7		2300	9.51	400	12.3	ptcloudy80's	
07/16/2005	1041			1020				clear80's	
08/02/2005	946			160				clear70's	
09/22/2005	1321			Dry				clear60's	
10/13/2005	955			Dry				clear40's	
11/17/2005	1322			Dry				clear40's	
12/13/2005	916			Dry				ptcloudy20's	
01/20/2006	830			INACCESSIBLE SNOW				clear20's	
02/23/2006	838			INACCESSIBLE SNOW				clear20's	
03/14/2006	900			INACCESSIBLE SNOW				ptcloudy20's	
04/25/2006	1315			Dry				cloudy40's	
05/24/2006	904			10574				clear50's	
06/20/2006	1519	18.9		887	8.51	424		clear70's	
07/11/2006	926			120				clear80's	
08/23/2006	1000			Dry				clear90's	
09/27/2006	921			Dry				clear60's	
10/24/2006	1320			Dry				clear30's	
11/17/2006	1215			Dry				clear40's	
12/07/2006	833			Dry				clear20's	
01/10/2007	1316			Dry				ptcloudy20's	
02/20/2007	848			Dry				clear20's	
03/26/2007	931			Dry				ptcloudy40's	
04/18/2007	838			Dry				clear50's	
05/10/2007	1027			Dry				ptcloudy60's	
06/29/2007	839			Dry				clear70's	
07/17/2007	951			Dry				cloudy70's	
08/06/2007	1034			Dry				cloudy60's	
09/19/2007	1016			Dry				clear60's	
10/26/2007	1301			Dry				clear50's	
11/14/2007	1038			Dry				clear40's	
12/05/2007	918			Dry				cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

MILL FORK CANYON FLOW & QUALITY

MILL FORK CANYON BELOW MINE (MFB2)

		<---------- Field Measurements				----------	---->		
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/25/2005	1334			Dry				ptcloudy40's	
02/25/2005	934			Dry				ptcloudy30's	
03/21/2005	900			Dry				cloudy40's	
04/19/2005	1420			Dry				cloudy40's	
05/25/2005	1027			3150				ptcloudy60's	
06/21/2005	1144	9.9		2370	9.76	440	12.2	ptcloudy80's	
07/16/2005	1048			900				clear80's	
08/02/2005	955			130				clear70's	
09/22/2005	1334	10.2		7	8.08	685		clear60's	
10/13/2005	1004			7				clear40's	
11/17/2005	1325			7				clear40's	
12/13/2005	926			Frozen				ptcloudy20's	
01/20/2006	845			Frozen				clear20's	
02/23/2006	853			Frozen				clear20's	
03/14/2006	937			Frozen				ptcloudy20's	
04/25/2006	1327			13.3				cloudy40's	
05/22/2006	1020			9960				ptcloudy50's	
06/20/2006	1207	11		420	8.4	537		clear70's	
07/11/2006	951			180				clear80's	
08/23/2006	1009			95				clear90's	
09/27/2006	931	5.4		35	9.13	880	8.52	clear60's	
10/24/2006	1327			35				clear30's	
11/17/2006	1220			35				clear40's	
12/07/2006	840			Frozen				clear20's	
01/10/2007	1335			Frozen				ptcloudy20's	
02/20/2007	906			Frozen				clear19	
03/26/2007	945	5.4		150	8.42	1016	10.2	ptcloudy40's	
04/18/2007	848			120				clear50's	
05/10/2007	1034			120				ptcloudy60's	
06/29/2007	856	9.2		130	8.76	860	8.46	clear70's	
07/17/2007	957			130				cloudy70's	
08/06/2007	1043			140				cloudy60's	
09/19/2007	1028	7.6		160	8.35	1015	9.18	clear60's	
10/26/2007	1310			153				clear50's	
11/14/2007	1047			139				clear40's	
12/05/2007	928			Frozen				cloudy30's	

MILL FORK CANYON FLOW & QUALITY

MILL FORK CANYON ABOVE MILL FORK FAULT (MFU03)

		<---------- Field Measurements				---------->			
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
05/07/2002	900			Dry				clear50's	
06/04/2002	1520			Dry				clear60's	
07/22/2002	945			Dry				clear70's	
08/16/2002	1220			Dry				clear90's	
09/18/2002	930			Dry				cloudy50's	
10/10/2002	1427			Dry				clear60's	
11/12/2002	905			Dry				clear20's	
12/05/2002	830			Dry				clear20's	
01/07/2003	848			Dry				clear20's	
02/20/2003	848			Dry				ptcloudy20's	
03/12/2003	900			Dry				ptcloudy40's	
04/21/2003	905			Dry				ptcloudy40's	
05/22/2003	957			Dry				clear70's	
06/12/2003	1009	6.4		600	8.9	419	7	clear70's	
07/09/2003	1352			Dry				clear70's	
08/12/2003	1300			Dry				cloudy70's	
09/16/2003	1243			Dry				ptcloudy70's	
10/06/2003	1308			Dry				ptcloudy60's	
11/17/2003	900			Dry				cloudy30's	
12/05/2003	1400			Dry				cloudy30's	
01/26/2004	1010			Dry				ptcloudy20's	
02/27/2004	1020			INACCESSIBLE SNOW				cloudy30's	
03/15/2004	853			Dry				clear40's	
04/26/2004	1315			Dry				clear50's	
05/24/2004	1350			650				cloudy40's	
06/24/2004	1220	10.4		600	9.21	431	7	cloudy70's	
07/29/2004	920			Dry				ptcloudy80's	
08/06/2004	857			Dry				clear50's	
09/09/2004	835			Dry				ptcloudy70's	
10/12/2004	900			Dry				clear40's	
11/30/2004	1012			Dry				clear14	
12/14/2004	1058			Dry				clear20's	
01/25/2005	1320			INACCESSIBLE SNOW				ptcloudy40's	
02/25/2005	930			INACCESSIBLE SNOW				ptcloudy30's	
03/21/2005	900			INACCESSIBLE SNOW				cloudy40's	
04/19/2005	1346			INACCESSIBLE SNOW				cloudy40's	
05/25/2005	953			3000				ptcloudy60's	
06/21/2005	1058	10.3		2000	9.5	402	8.8	ptcloudy80's	
07/16/2005	1030			1000				clear80's	
08/02/2005	935			200				clear70's	
09/22/2005	1308			Dry				clear60's	
10/13/2005	940			Dry				clear40's	
11/17/2005	1310			Dry				clear40's	
12/13/2005	901			Dry				ptcloudy20's	
01/20/2006	830			INACCESSIBLE SNOW				clear20's	
02/23/2006	838			INACCESSIBLE SNOW				clear20's	
03/14/2006	900			INACCESSIBLE SNOW				ptcloudy20's	
04/25/2006	1314			Dry				clear40's	
05/24/2006	941			6441				clear50's	
06/20/2006	1116	9.5		400	8.3	453		clear70's	
07/11/2006	926			150				clear80's	
08/23/2006	943			Dry				clear90's	
09/27/2006	910			Dry				clear60's	
10/24/2006	1258			Dry				clear30's	
11/17/2006	1208			Dry				clear40's	
12/07/2006	826			Dry				clear20's	
01/10/2007	1258			Dry				ptcloudy20's	
02/20/2007	836			Dry				clear19	
03/26/2007	920			Dry				ptcloudy40's	
04/18/2007	814			Dry				clear50's	
05/10/2007	1020			Dry				ptcloudy60's	
06/29/2007	810			Dry				clear70's	
07/17/2007	940			Dry				cloudy70's	
08/06/2007	1020			Dry				cloudy60's	
09/19/2007	1000			Dry				clear60's	
10/26/2007	1248			Dry				clear50's	
11/14/2007	1015			Dry				clear40's	
12/05/2007	900			Dry				cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #1(RCF1)

	<----- Field Measurements ------>							
			Flow			Cond.		
Date	Time	Temp. (oC)	ft.	GPM	pH	(uS)	Weather	Comments
04-17-89	1120		DRY				PC 60's	
01/26/2005	1337		INACCESSIBLE SNOW				ptcloudy40's	
02/25/2005	943		INACCESSIBLE SNOW				ptcloudy30's	
03/21/2005	942		INACCESSIBLE SNOW				cloudy40's	
04/19/2005	1435		INACCESSIBLE SNOW				cloudy40's	
05/25/2005	1141			4500			ptcloudy60's	
06/21/2005	1223	5.8		2945	9.68	404	ptcloudy80's	
07/16/2005	1114			556			clear80's	
08/02/2005	1000			432			clear70's	
09/22/2005	1412	7.4		90	7.91	441	clear60's	
10/13/2005	1037			101			clear40;'s	
11/17/2005	1339			Frozen			clear40;'s	
12/13/2005	936		INACCESSIBLE SNOW				ptcloudy20's	
01/20/2006	853		INACCESSIBLE SNOW				clear20's	
02/23/2006	900		INACCESSIBLE SNOW				clear20's	
03/14/2006	945		INACCESSIBLE SNOW				ptcloudy20's	
04/25/2006	1332		INACCESSIBLE SNOW				cloudy40's	
05/24/2006	1130			9632			clear50's	xpro water measurments
06/20/2006	1242	11.8		1227	8.44	415	clear70's	
07/11/2006	1245			445			clear80's	
08/09/2006	1049			171			cloudy80's	
09/27/2006	1010	4		55	8.76	437	clear560's	
10/27/2006	1029			50			clear30's	
11/27/2006	1427			Frozen			clear40's	
12/07/2006	858			Frozen			clear20's	
01/10/2007	1345		INACCESSIBLE SNOW				ptcloudy20's	
02/20/2007	915		INACCESSIBLE SNOW				clear20's	
03/26/2007	1000		INACCESSIBLE				ptcloudy40's	Gate locked
04/17/2007	1522			45			clear50's	
05/10/2007	1105			900			ptcloudy60's	
06/29/2007	945	10		200	8.55	420	clear70's	
07/25/2007	852			70			ptcloudy70's	
08/20/2007	1407			45			clear80's	
09/20/2007	1120	6.6		20	8.58	606	clear60's	
10/26/2007	1331			19			clear50's	
11/14/2007	1117			Dry			clear40's	
12/05/2007	941			Dry			cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - LEFT FORK (RCLF1)

	<-----	Field Measurements ------>						
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
02/25/2005	943			INACCESSIBLE SNOW			ptcloudy30's	
03/21/2005	942			INACCESSIBLE SNOW			cloudy40's	
04/19/2005	1436			Dry			cloudy40's	
05/25/2005	1115			150			ptcloudy60's	
06/21/2005	1305	13.8		353	9.46	505	ptcloudy80's	
07/16/2005	1130			20			clear80's	
08/02/2005	1015			9			clear70's	
09/22/2005	1445			Dry			clear60's	
10/13/2005	1001			Dry			clear40's	
11/17/2005	1359			Dry			clear40's	
12/20/2006	945			Dry			ptcloudy20's	
01/20/2006	856			Dry			clear20's	
02/23/2006	910			Dry			clear20's	
03/14/2006	949			Dry			ptcloudy20's	
04/25/2006	1334			Dry			cloudy40's	
05/22/2006	1055			408			ptcloudy50'	expro water measurment
06/20/2006	1322	14.8		62	8.43	533	clear70's	
07/11/2006	1210			16			clear80's	
08/09/2006	1156			Damp			cloudy80's	
09/27/2006	1100			Dry			clear60's	
10/27/2006	1048			Dry			clear30's	
11/17/2006	1235			Dry			clear40's	
12/07/2006	926			Dry			clear20's	
01/10/2007	1346			Dry			ptcloudy20's	
02/20/2007	916			Dry			clear19	
03/26/2007	1000			INACCESSIBLE			ptcloudy40'	Gate locked
04/18/2007	912			12			clear50's	
05/10/2007	1130			25			ptcloudy60's	
06/29/2007	1007			Dry			clear70's	
07/25/2007	912			Dry			ptcloudy70's	
08/20/2007	1428			Dry			clear80's	
09/20/2007	1200			Dry			clear60's	
10/26/2007	1340			Dry			clear50's	
11/14/2007	1138			Dry			clear40's	
12/05/2007	955			Dry			cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - LEFT FORK (RCLF2)

	<-----	Field Measurements ------>						
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/26/2005	1337			INACCESSIBLE SNOW			ptcloudy40's	
02/25/2005	943			INACCESSIBLE SNOW			ptcloudy30's	
03/21/2005	942			INACCESSIBLE SNOW			cloudy40's	
04/19/2005	1438			Dry			cloudy40's	
05/25/2005	1121			152			ptcloudy60's	
06/21/2005	1255	13.1		350	9.49	504	ptcloudy80's	
07/16/2005	1141			23			clear80's	
08/02/2005	1010			8			clear70's	
09/22/2005	1450			Dry			clear60's	
10/13/2005	1005			Dry			clear40's	
11/17/2005	1405			Dry			clear40's	
12/13/2005	947			Dry			ptcloudy20's	
01/20/2006	858			Dry			clear20's	
02/23/2006	913			Dry			clear20's	
03/14/2006	951			Dry			ptcloudy20's	
04/25/2006	1337			Dry			cloudy40's	
05/22/2006	1114			1014			ptcloudy50's	expro water measurments
06/20/2006	1330	15		53	8.38	528	clear70's	
07/11/2006	1326			13			clear80's	
08/09/2006	1211			Damp			cloudy80's	
09/27/2006	1105			Dry			clear60's	
10/27/2006	1053			Dry			clear30's	
11/17/2006	1238			Dry			clear40's	
12/07/2006	930			Dry			clear20's	
01/10/2007	1346			Dry			ptcloudy20's	
02/20/2007	918			Dry			clear20's	
03/26/2007	1000			INACCESSIBLE			ptcloudy40's	Gate locked
04/18/2007	915			Damp			clear50's	
05/10/2007	1133			30			ptcloudy60's	
06/29/2007	1010			Dry			clear70's	
07/25/2007	914			Dry			ptcloudy70's	
08/20/2007	1432			Dry			clear80's	
09/20/2007	1209			Dry			clear60's	
10/26/2007	1342			Dry			clear50's	
11/14/2007	1142			Dry			clear40's	
12/05/2007	958			Dry			cloudy30's	

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RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #2 (RCF2)

	<-----	Field Measurements ------>						
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/26/2005	1337			INACCESSIBLE SNOW			ptcloudy40's	
02/25/2005	943			INACCESSIBLE SNOW			ptcloudy30's	
03/21/2005	942			INACCESSIBLE SNOW			cloudy40's	
04/19/2005	1440			Dry			cloudy40's	
05/25/2005	1208			5000			ptcloudy60's	
06/21/2005	1508	12.7		2903	9.74	404	ptcloudy80's	
07/16/2005	1155			559			clear80's	
08/02/2005	1035			227			clear70's	
09/22/2005	1506			Damp			clear60's	
10/13/2005	1122			Dry			clear40's	
11/17/2005	1408			Dry			clear40's	
12/13/2005	956			Dry			ptcloudy20's	
01/20/2006	910			Dry			clear20's	
02/23/2006	932			Dry			clear20's	
03/14/2006	1003			Dry			ptcloudy20's	
04/25/2006	1340			Dry			cloudy40's	
05/22/2006	1043			15530			ptcloudy50's	expro water measurment
06/20/2006	1354	12.5		956	8.48	425	clear70's	
07/11/2006	1122			359			clear80's	
08/09/2006	1248			78			cloudy80's	
09/27/2006	1126			Dry			clear60's	
10/27/2006	1109			Dry			clear30's	
11/17/2006	1246			Dry			clear40's	
12/07/2006	948			Dry			clear20's	
01/10/2007	1403			Dry			ptcloudy20's	
02/20/2007	920			Dry			clear20's	
03/26/2007	1000			INACCESSIBLE			ptcloudy40's	Gate locked
04/18/2007	930			Dry			clear50's	
05/10/2007	1150			927			ptcloudy60's	
06/29/2007	1030	16.3		90	8.71	394	clear70's	
07/25/2007	930			Dry			ptcloudy70's	
08/20/2007	1443			Dry			clear80's	
09/20/2007	1212			Dry			clear60's	
10/26/2007	1347			Dry			clear50's	
11/14/2007	1203			Dry			clear40's	
12/05/2007	1000			Dry			cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #3 (RCF3)

	<----------		Field Measurements			---------->		
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather Comments
01/26/2005	1341			78				ptcloudy40's
02/25/2005	945			78				ptcloudy30's
03/21/2005	954	4.8		78	8.73	808	7.8	cloudy40's
04/18/2005	1442			78				cloudy40's
05/25/2005	1210			5000				ptcloudy60's
06/21/2005	1521	12.8		2290	9.52	420	8.7	ptcloudy80's
07/16/2005	1210			512				clear80's
08/02/2005	1039			227				clear70's
09/22/2005	1514	11.1		65	7.8	806		clear60's
10/13/2005	1134			78				clear40's
11/17/2005	1415			78				clear40's
12/13/2005	1020	3.9		78	7.74	717		ptcloudy20's
01/20/2006	915			70				clear20's
02/23/2006	939			74				clear20's
03/14/2006	1018	3.1		78	7.6	869		ptcloudy20' DO run at lab
04/25/2006	1345			78				cloudy40's
05/23/2006	912			#####				ptcloudy50' expro water measurments
06/20/2006	1421	13		1227	8.25	456		clear70's
07/11/2006	1057			584				clear80's
08/09/2006	1402			193				cloudy80's
09/27/2006	1135	8.8		90	8.39	975		clear60's
10/27/2006	1118			88				clear30's
11/17/2006	1255			80				clear40's
12/07/2006	959	5.5		78	8.32	1096	7.22	clear20's
01/10/2007	1405			78				ptcloudy20's
02/20/2007	927			90				clear19's
03/26/2007	1010	8.5		131	7.7	1008	7.83	ptcloudy40's
04/18/2007	934			78				clear50's
05/10/2007	1153			1104				ptcloudy60's
06/29/2007	1052	12.2		176	8.08	689		clear70's DO run at lab
07/17/2007	1012			101				cloudy70's
08/20/2007	1456			101				clear80's
09/20/2007	1239	10.5		101	7.59	1232	7.71	clear60's
10/26/2007	1349			101				clear50's
11/14/2007	1206			90				clear40's
12/05/2007	1006	5.8		100	7.89	1055	8.65	cloudy30's

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RILDA CANYON FLOW & QUALITY

RILDA CANYON - WEIR #4 (RCW4)

	<---------- Field Measurements				----------	---------->		
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/26/2005	1357			117				ptcloudy40's	
02/25/2005	951			116				ptcloudy30's	
03/21/2005	1009	3.7		140	8.3	956	9.7	cloudy40's	
04/19/2005	1447			140				cloudy40's	
05/25/2005	1220			6000				ptcloudy60's	
06/21/2005	1539	12.3		3015	9.34	466	9.7	ptcloudy80's	
07/16/2005	1215			665				clear80's	
08/02/2005	1046			305				clear70's	
09/22/2005	1534	10.4		157	7.29	949		clear60's	
10/13/2005	1210			117				clear40's	
11/17/2005	1426			117				clear40's	
12/13/2005	1051			Frozen				ptcloudy20's	
01/20/2006	928			Frozen				clear20's	
02/23/2006	954			125				clear20's	
03/14/2006	1050	2.3		110	7.89	1079		ptcloudy20's	DO run at lab
04/25/2006	1351			165				cloudy40's	
05/22/2006	1028			35767				ptcloudy50's	expro water measurments
06/20/2006	1504	12.9		2538	8.32	560		clear70's	
07/11/2006	1029			588				clear80's	
08/09/2006	1521			213				cloudy80's	
09/27/2006	1218	7.7		205	8.76	1137	8.16	clear60's	
10/27/2006	1142			241				clear30's	
11/17/2006	1330			234				clear40's	
12/07/2006	1031			Frozen				clear20's	
01/10/2007	1420			200				ptcloudy20's	
02/20/2007	940			223				clear19	
03/26/2007	1047	7.2		292	8.08	1726	8.39	ptcloudy40's	
04/18/2007	951			280				clear50's	
05/10/2007	1202			1762				ptcloudy60's	
06/29/2007	1135	14.1		481	8.53	1146		clear70's	DO run at lab
07/17/2007	1032			417				cloudy70's	
08/20/2007	1513			372				clear80's	
09/20/2007	1311	8.1		268	7.77	1993	9.03	clear60's	
10/26/2007	1406			292				clear50's	
11/14/2007	1213			280				clear40's	
12/05/2007	1050	2.4		256	8.31	1954	11.5	cloudy30's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

INDIAN CREEK ABOVE CAMP GROUND

ICA

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
10/15/2001	1400		111	8.21	633		clear60's	
10/30/2002	1410	4.2	65	8.25	483		cloudy30's	
11/11/2003	1130	2.1	27	8.24	493		cloudy30's	
12/08/2004	1420	16	150	8.34	373		cloudy20's	
10/19/2005	1510	8.4	318	7.8	488	9.5	clear30's	
10/26/2006	1140	3.7	359	8.77	456	9.09	clear30's	
10/08/2007	1310	10.2	74	8.44	488	8.9	clear40's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

INDIAN CREEK BELOW CROSS OVER ROAD

ICB

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
10/15/2001	1500		268	8.26	559		clear60's	
10/30/2002	1357	3.8	136	8.21	432		cloudy30's	
11/11/2003	1319	1.2	56	8.13	427		cloudy30's	
12/08/2004	743	0.3	213	7.94	490		cloudy20's	
10/19/2005	1335	7.1	607	8.36	381	9.4	clear30's	
10/26/2006	1228	3.5	481	8.79	465	8.79	clear30's	
10/08/2007	1420	8.1	148.6	8.61	458	10.7	clear40's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

INDIAN CREEK DITCH ABOVE CROSS OVER ROAD

ICD

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
10/15/2001	1440		31	8.29	753		clear60's	
10/30/2002	1350	4.1	12	8.28	740		cloudy30's	
11/11/2003	1255	1.2	21	8.21	624		cloudy30's	
12/08/2004	1420		No Flow				cloudy20's	
10/19/2005	1416	8.6	91	7.95	674		clear30's	
10/26/2006	1248	5.5	85	8.79	663	9	clear30's	
10/08/2007	1400	14.9	23	8.29	733	11	clear40's	

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

INDIAN CREEK FLUME BELOW CAMP GROUND

ICF

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
10/15/2001	1510		614				clear60's	
10/24/2002	1120		305				snow30's	checked w/90° vnotch15
11/11/2003	1210		433				cloudy30's	
12/08/2004	1420		539				cloudy20's	
10/19/2005	1525		668				clear30's	
10/26/2006	1202	4.4	986	8.42	500	8.64	clear30's	
10/08/2007	1335	10.2	410.7	8.34	474	9.67	clear40's	

EAST MOUNTAIN SPRINGS DISCHARGE

2007

Spring	Date Sampled	Flow (GPM)	Temp. C	Date Sampled	Flow (GPM)	Temp. C	Seasonal Net Change %
Sheba	07/11/2007	1.3	12.6	10/16/2007	0.0		-99.23
Elk Spring	07/10/2007	91.0	8.8	10/15/2007	41.0	4.7	-54.95
Burnt Tree	07/11/2007	3.6	7.5	10/15/2007	3.5	7.5	-2.78
Jerk Water							
Pine Springs							
Pine Sp. Trough							
Ted's Tub	07/10/2007	11.9	10.4	10/15/2007	2.0	6.2	-83.19
79-1							
79-2	07/11/2007	1.2	2.6	10/15/2007	0.4	5.8	-65.00
79-3							
79-4							
79-5							
79-6							
79-7							
79-8							
79-9							
79-10	07/11/2007	3.2	11.8	10/16/2007	1.4	6.7	-56.25
79-11							
79-12	07/10/2007	Dry		10/15/2007	Dry		
79-13							
79-14							
79-15	07/10/2007	3.9	12.3	10/15/2007	1.8	6.1	-53.85
79-16							
79-17							
79-18							
79-19							
79-20							
79-21							
79-22							
79-23	07/11/2007	Dry		10/15/2007	Dry		
79-24	07/11/2007	Dry		10/15/2007	Dry		
79-25							
79-26	07/11/2007	0.0		10/16/2007	0.0		-100.00
79-27							
79-28	07/11/2007	0.5	12.6	10/16/2007	1.2	6.7	126.42
79-29	07/11/2007	0.2		10/16/2007	0.1		-50.00
79-30							
79-31							
79-32	07/11/2007	Seep		10/16/2007	Seep		

79-33							
79-34	07/10/2007	0.5	11.6	10/15/2007	0.0		-97.83
79-35	07/10/2007	1.0	9.5	10/15/2007	0.4	8.0	-57.00
79-36							
79-37							
79-38	07/11/2007	0.5	15.7	10/15/2007	0.0		-98.11
79-39							
79-40	07/11/2007	Dry		10/16/2007	Dry		
80-41	07/11/2007	SEEP		10/16/2007	Seep		
80-42							
80-43	07/11/2007	Dry		10/15/2007	Dry		
80-44	07/11/2007	Damp		10/16/2007	DAMP		
80-45							
80-46	07/11/2007	Dry		10/16/2007	Dry		
80-47	07/11/2007	2.4	4.5	10/16/2007	2.2	5.9	-8.33
80-48	07/10/2007	0.0		10/15/2007	0.0		0.00
80-49							
80-50	07/25/2007	0.0		10/26/2007	0.0		0.00
82-51	07/11/2007	Dry		10/15/2007	Dry		
82-52	07/11/2007	2.9	7.8	10/15/2007	1.5	4.8	-48.28
84-53							
84-54							
84-55							
84-56	07/11/2007	0.0		10/16/2007	0.0		0.00
85-57							
86-58							
86-59							
89-60	07/11/2007	0.0		10/15/2007	0.0		-100.00
89-61	07/10/2007	56.6	6.2	10/15/2007	17.0	4.5	-69.96
89-62							
89-63							
89-64							
89-65	07/10/2007	<.1		10/15/2007	<.1		
89-66	07/10/2007	Seep		10/15/2007	Seep		
89-67	07/10/2007	5.0	6.5	10/15/2007	2.7	4.6	-46.00
89-68	07/10/2007	<.1		10/15/2007	Seep		
89-69							
89-70							
89-71							
91-72	07/12/2007	3.2	9.7	10/16/2007	3.6	10.0	12.50
91-73	07/12/2007	Dry		10/16/2007	Dry		

TOTAL FLOW FOR JULY	**185.8**	**75.3**	
(W\OUT 80-50, 91-72 & 73)		**Net Change - Average**	-43.27
		Net Change - By Volume	-59.46

TOTAL FOR JULY 2006 = 583.8 GPM
JULY 2007 68 % LOWER THAN JULY 2006

EAST MOUNTAIN SPRINGS DISCHARGE

MILL FORK

2007

Spring	Date Sampled	Flow (GPM)	Temp. C	Date Sampled	Flow (GPM)	Temp. C	Seasonal Net Change %
EM-216	07/11/2007	0.0	0.0	10/10/2007	Seep		
EMPOND	07/11/2007	2.3	5.4	10/10/2007	1.7	6.7	-26.09
GRANTS SPRING	07/11/2007	1.0	6.5	10/09/2007	0.7	7.6	-30.00
LITTLE BEAR	07/11/2007	340.0	9.1	10/10/2007	338.0	10.2	-0.59
JV-9	07/11/2007	1.2	8.5	10/10/2007	1.2	7.1	0.00
JV-34	07/11/2007	8.6	20.3	10/10/2007	3.0	8.6	-65.12
MF-7	07/11/2007	19.4	5.9	10/10/2007	18.9	4.8	-2.84
MF-10	07/12/2007	19.2	3.0	10/10/2007	7.6	3.0	-60.42
MF-19B	07/11/2007	0.5	9.3	10/10/2007	0.3	7.1	-38.46
MF-213	07/11/2007	29.3	8.7	10/10/2007	18.9	9.5	-35.49
MF-219	07/11/2007	4.0	6.3	10/10/2007	3.0	7.6	-25.00
MFR-10	07/11/2007	10.4	5.0	10/10/2007	3.5	6.4	-66.35
MFR-30	07/11/2007	0.1	6.4	10/10/2007	Seep		
RR-5	07/11/2007	3.0	3.8	10/09/2007	Seep		
RR-15	07/11/2007	17.1	3.7	10/09/2007	7.6	8.5	-55.56
RR-23A	07/11/2007	30.0	3.9	10/09/2007	11.3	8.6	-62.33
SPI-26	07/11/2007	9.0	4.2	10/10/2007	2.5	5.2	-72.22
SPI-29	07/11/2007	0.3	4.6	10/10/2007	Seep		
UJV-101	07/11/2007	0.7	9.6	10/10/2007	Seep		
UJV-206	07/11/2007	3.2	8.2	10/10/2007	2.6	5.4	-18.75
UJV-213	07/11/2007	0.7	9.9	10/10/2007	Seep		
TOTAL FLOW FOR JULY		**500.1**			**420.8**		
				Net Change - Average			-37.28
				Net Change - By Volume			-15.86

TOTAL FOR JULY 2006 = 757.8 GPM
JULY 2006 34 % HIGHER THAN JULY 2007

EAST MOUNTAIN

SPRING DISCHARGE RECESSION STUDY

YEAR 2007

SPRING		JUL	AUG	SEP	OCT
79-10	Flow (GPM)	3.2	2.4	2.0	1.4
	Temp. (C)	11.8	6.6	5.8	6.7
SHEBA	Flow (GPM)	1.3	1.2	Seep	Seep
SPRINGS	Temp. (C)	12.6	8.4		
ELK	Flow (GPM)	91.0	56.0	24.0	41.0
SPRING	Temp. (C)	8.8	4.7	4.3	4.7
79-35	Flow (GPM)	1.0	1.0	1.0	0.4
	Temp. (C)	9.5	6.5	6.2	8.0
79-26	Flow (GPM)	Damp	Damp	Dry	1.7
	Temp. (C)				6.4
79-29	Flow (GPM)	<.2	<.2	<.1	<.1
	Temp. (C)				
84-56	Flow (GPM)	<.1	<.1	<.1	<.1
	Temp. (C)				
80-44	Flow (GPM)	Damp	Damp	Damp	Damp
	Temp. (C)				
80-46	Flow (GPM)	Dry	Dry	Dry	Dry
	Temp. (C)				
BURNT	Flow (GPM)	3.6	3.7	3.6	3.5
TREE	Temp. (C)	7.5	7.5	7.3	7.5
79-23	Flow (GPM)	Dry	Dry	Dry	Dry

	Temp. (C)				
82-52	Flow (GPM)	2.9	2.0	1.6	1.5
	Temp. (C)	7.8	5.6	5.0	5.0

TRAIL MOUNTAIN

SPRING DISCHARGE RECESSION STUDY

YEAR 2007

SPRING		JUL	AUG	SEP	OCT	Seasonal Net Change %
T-6	Flow (GPM)	0.3	0.0	0.0	0.0	-100.0
18-2-1	Temp. (C)	11				
T-8	Flow (GPM)	0.0	0.0	0.0	0.0	
17-21-1	Temp. (C)					
T-9	Flow (GPM)	3.9	4.0	3.5	4.3	10.3
17-22-1	Temp. (C)	6	8	8	7	
T-10	Flow (GPM)	0.0	<.1	<.1	0.0	
17-26-4	Temp. (C)					
T-14	Flow (GPM)	0.0	0.0	0.0	0.0	
17-25-1	Temp. (C)					
T-14A	Flow (GPM)	0.0	0.0	0.0	0.0	
17-26-5	Temp. (C)					
T-15	Flow (GPM)	0.0	0.0	0.0	0.0	
17-35-1	Temp. (C)					
T-16	Flow (GPM)	0.0	0.0	0.0	0.0	
17-35-2	Temp. (C)					
TM-23*	Flow (GPM)	0.0	0.0	0.0	0.0	
	Temp. (C)					

JULY TOTAL **4.18**

OCTOBER TOTAL **4.31**

Net Change - Average -44.87

Net Change - By Volume 3.11

TOTAL FOR JULY 2006 = 34.8

JULY 2007 88% LOWER THAN JULY 2006

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING
DEER CREEK MINE / DISCHARGE

PERMIT # 0023604-002
(DCD)

		Quality			Quantity	
Date	**Time**	**GPM**	**Temp. (°C)**	**Comments**	**Month**	**Gallons/day**
01/12/2005	1430	76	13.2		December	315,028
01/19/2005	842	683	12.03	State sampling	January 2006	407,880
02/23/2005	1409	674	13		February	341,174
03/22/2005	1004	669	13.6		March	306,388
04/14/2005	1456	658.3	14.4		April	319,526
05/16/2005	1500	60	13.7		May	417,123
05/25/2005	825	63	12.9	State sampling	June	483,414
06/05/2005				No samples taken for June	July	459,396
07/25/2005	1444	738	14.8		August	360,905
07/27/2005	1120	476	13.9		September	300,306
08/09/2005	1415	620	13.5		October	346,974
08/31/2005	833	75	12.8	State sampling	November	317,785
09/06/2005	1045	30	13.7		December	352,573
10/06/2005	1530	530	13.1		January 2007	346,974
11/07/2005	1110	50	13.1		February	317,785
12/13/2005	1415	587	13.3		March	352,673
01/26/2006	1445	75	13		April	328,543
02/08/2006	851	183	12.56		May	326,679
03/30/2006	1500	75	13.1		June	314,922
04/25/2006	1000	75	13.1		July	306,051
05/08/2006	1505	163	13.2		August	319,942
05/10/2006		no discharge		Filling high pressure water tank.	September	334,668
06/21/2006	832	75	12.12		October	412,987
07/14/2006	906	160	13.4		November	482,597
08/10/2006	1440	257	13.6		December	1,338,317
09/14/2006	1355	232	10.7			
10/12/2006	1235	404	13.4			
11/01/2006	843	393	11.8			
12/05/2006	1547	392	13.1			
01/10/2007	1100	264	13.5			
02/06/2007	1400	290	14.2			
03/06/2007	950	291	13.6			
04/04/2007	1010	287	14.1			
05/16/2007	1040	248	14.3			
06/05/2007	1000	361	14.9			
07/03/2007	1000	240	14.2			
08/13/2007	1035	653	15.1			
09/05/2007	1045	272	14.7			
09/18/2007	920	119	12.7	State sampling		
10/01/2007	1350	230	14.4			
11/01/2007	1450	1780	12.5			
12/04/2007	1010	1350	15.2			

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TECHNICAL SERVICES - HYDROLOGIC MONITORING

OLIPHANT MINE - STRAIGHT CANYON

			(T-18) Quality				Quantity	
Date	Time	GPM	Temp. (°C)	pH	Cond. (uS)	Oxygen	Dis. Gallons/day	Comments
03/07/2005	1055	<0.1						Insufficient flow - no sample taken
06/20/2005	1133	<0.1						Insufficient flow - no sample taken
09/22/2005	804	<0.1						Insufficient flow - no sample taken
12/06/2005	1052	<0.1						Insufficient flow - no sample taken
03/13/2006	1305	<0.1						Insufficient flow - no sample taken
06/15/2006	1124	<0.1						Insufficient flow - no sample taken
09/26/2006	1019	<0.1						Insufficient flow - no sample taken
12/04/2006	1400	<0.1						Insufficient flow - no sample taken
03/20/2007	1119	<0.1						Insufficient flow - no sample taken
06/28/2007	1120	<0.1						Insufficient flow - no sample taken
09/21/2007	951	<0.1						Insufficient flow - no sample taken
12/10/2007	958	<0.1						

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

TRAIL MOUNTAIN MINE - COTTONWOOD CANYON
PERMIT # UTG040003-002
(TRAIL MOUNTAIN MINE DISCHARGE to COTTONWOOD CANYON CREEK)

		Quality				Quantity
Date	Time	GPM	Temp. (^{O}C)	Comments	Month	Gallons/day
02/22/2001	1040	400	10.7			
02/26/2001	1005	520	7.9			
03/20/2001	1415	300	11.6			
04/04/2001	1045	360	8.7			
04/17/2001	850	500	8.3			
05/08/2001	940	340	10.4			
June-Dec-01	NO DISCHARGE MINE SEALED					
2002	NO DISCHARGE MINE SEALED					
2003	NO DISCHARGE MINE SEALED					
2004	NO DISCHARGE MINE SEALED					
2005	NO DISCHARGE MINE SEALED					
2006	NO DISCHARGE MINE SEALED					
2007	NO DISCHARGE MINE SEALED					

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG MINE - GRIMES WASH
PERMIT # 0022896-001A
(WMDO1)
TMA Discharge to Cottonwood Canyon Creek
UPDES 001 Transferred to TMA - June 2001

Date	Time	GPM	Quality Temp. (°C)	Comments	Month	Quantity Gallons/day
01/12/2005	1106	9	10.7		December	21,168
01/19/2005	930	14.6	9.7	State sampling	January2006	21,168
02/21/2005	1442	19	10.4		February	18,202
03/21/2005	1600	14.6	10.1		March	21,082
04/14/2005	1400	14.6	10.5		April	21,082
05/16/2005	1610	23.7	10.7		May	21,082
05/25/2005	927	14.6	13.3	State sampling	June	18,144
06/05/2005				No samples taken for Jun	July	21,024
07/22/2005	1130	14.6	12.9		August	21,024
07/27/2005	1220	14.6	10.9		September	21,024
08/09/2005	1220	14.4	10.5		October	18,144
08/31/2005	927	14.6	10.4	State sampling	November	18,144
09/06/2005	945	14.7	11.5		December	18,144
10/05/2005	947	4.3	9.9		January2007	18,144
11/07/2005	1354	14.7	10.4		February	34,070
11/30/2005	927	23.7	9.9		March	34,070
12/14/2005	1500	14.7	10.2		April	37,642
01/26/2006	1530	14.7	10.2		May	34,070
02/08/2006	952	12.6	9.8	State sampling	June	37,642
03/30/2006	1415	14.6	10.6		July	30,614
04/17/2006	1020	14.6	10.4		August	30,614
05/08/2006	1340	14.6	10.5		September	30,614
05/10/2006	921	12.6	8.5	State sampling	October	24,120
06/21/2006	944	12.6	10.4		November	18,144
07/13/2006	1459	14.6	10.7		December	45,216
08/10/2006	1054	14.6	10.8			
09/13/2006	900	14.6	10.2			
10/12/2006	1030	12.6	10.5			
11/01/2006	939	12.6	9.5	State sampling		
12/05/2006	1430	12.6	10.4			
01/10/2007	1410	12.6	11.5			
02/06/2007	1455	25.6	11.5			
03/06/2007	1120	23.6	11.4			
03/28/2007	955	23.6	10.1	State sampling		
04/04/2007	1140	26.1	11.5			
05/16/2007	1310	23.6	11.3			
06/05/2007	1400	26.1	11.6			
07/03/2007	1115	21.2	11.2			
08/13/2007	1340	21.2	11.6			
09/05/2007	1415	21.6	11.5			
09/18/2007	810	23.6	10.4	State sampling		
10/02/2007	1400	16.7	11			
11/01/2007	1320	12.6	10.3			
12/04/2007	1120	31.3	12.3			

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG MINE - MILLER CANYON
PERMIT # 0022896-004A

Miller Canyon Breakout
(MILLER)

		Quality				Quantity
Date	Time	GPM	Temp. (°C)	Comments	Month	Gallons/day
01/06/2005	951	Dry			January 2005	No Discharge
02/21/2005	1220	Dry			February	No Discharge
03/27/2005	1000	Dry			March	No Discharge
04/05/2005	1330	Dry			April	No Discharge
05/09/2005	845	Dry			May	No Discharge
06/23/2005	930	Dry			June	No Discharge
07/10/2005	1006	Dry			July	No Discharge
08/29/2005	920	Dry			August	No Discharge
09/17/2005	1345	Dry			September	No Discharge
10/10/2005	1324	Dry			October	No Discharge
11/08/2005	1123	Dry			November	No Discharge
12/04/2005	1247	Dry			December	No Discharge
01/10/2006	1500	Dry			January 2006	No Discharge
02/21/2006	1231	Dry			February	No Discharge
03/13/2006	1350	Dry			March	No Discharge
04/10/2006	1348	Dry			April	No Discharge
05/23/2006	1301	Dry			May	No Discharge
06/15/2006	1430	Dry			June	No Discharge
07/26/2006	1028	Dry			July	No Discharge
08/07/2006	1443	Dry			August	No Discharge
09/26/2006	1140	Dry			September	No Discharge
10/24/2006	1022	Dry			October	No Discharge
11/16/2006	1450	Dry			November	No Discharge
12/06/2006	1115	Dry			December	No Discharge
01/15/2007	1300	Dry			January 2007	No Discharge
02/02/2007	920	Dry			February	No Discharge
03/20/2007	1021	Dry			March	No Discharge
04/10/2007	1430	Dry			April	No Discharge
05/25/2007	854	Dry			May	No Discharge
06/10/2007	831	Dry			June	No Discharge
07/12/2007	920	Dry			July	No Discharge
08/03/2007	1206	Dry			August	No Discharge
09/21/2007	1346	Dry			September	No Discharge
10/17/2007	1302	Dry			October	No Discharge
11/18/2007	1000	Dry			November	No Discharge
12/05/2007	1145	Dry			December	No Discharge

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK IN-MINE QUALTIY & LONG TERM FLOW

QUALITY

Date	Location	Time	Temp. (°C)	GPM
09/26/2001	TW-10	1313	7.4	3.5
09/26/2001	MAIN N.-MAIN E.	1335	8.3	0.1
12/17/2001	TW-10	1015	7.5	3.3
12/17/2001	MAIN N.-MAIN E.	1030	6.5	0.1
03/27/2002	TW-10	1000	7.5	2.61
03/27/2002	MAIN N.-MAIN E.	1100	6.5	0.05
06/24/2002	TW-10	1053	7.9	2.34
06/24/2002	MAIN N.-MAIN E.	1110	7.6	0.19
09/24/2002	TW-10	1245	7	2.34
09/24/2002	MAIN N.-MAIN E.	1305	7.5	0.01
12/17/2002	TW-10	1240	7	2.16
12/17/2002	MAIN N.-MAIN E.	1250	4.9	0.17
03/27/2003	TW-10	920	6.9	1.76
03/27/2003	MAIN N.-MAIN E.	945	2.9	0.14
07/03/2003	TW-10	1020	6.9	2.16
07/03/2003	MAIN N.-MAIN E.	1030	6	0.16
09/29/2003	TW-10	1230	7.1	2.5
09/29/2003	MAIN N.-MAIN E.	1250	6.8	0.24
12/10/2003	TW-10	1145	6.9	2.14
12/10/2003	MAIN N.-MAIN E.	1225	3.4	0.22
03/30/2004	TW-10	920	6.6	1.67
03/30/2004	MAIN N.-MAIN E.	1040	2.8	0.23
07/02/2004	TW-10		7.1	3
07/02/2004	MAIN N.-MAIN E.		7.9	7.9
10/04/2004	TW-10	1035	6	3.17
10/04/2004	MAIN N.-MAIN E.	1205	5	0.21
12/16/2004	TW-10	905	7.1	2.5
12/16/2004	MAIN N.-MAIN E.	920	2.1	0.19
03/30/2005	TW-10	930	7.1	1.8
03/30/2005	MAIN N.-MAIN E.	945	2.4	0.2
06/22/2005	TW-10	1305	7.1	3.74
06/02/2005	MAIN N.-MAIN E.	1325	7.4	0.23
10/05/2005	TW-10	1035	7.1	6.7
10/05/2005	MAIN N.-MAIN E.	1055	6.7	0.38
12/20/2005	TW-10	1045	7.1	4.22
12/20/2005	MAIN N.-MAIN E.	1100	2.3	0.42
03/22/2006	TW-10	940	8.1	3.16
03/22/2006	MAIN N.-MAIN E.	1000	3.5	0.41
06/20/2006	TW-10	935	7.8	5
06/20/2006	MAIN N.-MAIN E.	915	7.7	0.21
10/27/2006	TW-10	1215	7.6	5.08
10/27/2006	MAIN N.-MAIN E.	1230	6.8	0.24
12/20/2006	TW-10	950	6.9	3.7
12/20/2006	MAIN N.-MAIN E.	1005	2.2	0.23
03/27/2007	TW-10	910	6.9	2.97
03/27/2007	MAIN N.-MAIN E.	930	3.6	0.23
06/26/2007	TW-10	1203	7.1	2.7
06/26/2007	MAIN N.-MAIN E.	1220	7.1	0.47
09/20/2007	TW-10	1140	7.2	2.8
09/20/2007	MAIN N.-MAIN E.	1215	7.6	0.19
12/13/2007	TW-10	1000	7.4	2.45
12/13/2007	MAIN N.-MAIN E.	1030	2.1	0.42

LONG TERM FLOW (GPM)

Date	Site #1	Site #2
12/20/2005	0.42	4.22
03/22/2006	0.41	3.16
06/22/2005	0.21	5.00
10/05/2005	0.24	5.08
12/20/2005	0.23	3.70
03/27/2007	0.23	2.97
06/26/2007	0.47	2.70

Site #1 Main North-Main East
Site #2 3rd North XC-65 2R, TW-10

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Deer Creek
Permit # 0023604-001

Date	Time	GPM	Temp. (°C)	Weather	Comments
01/19/2005	825	91	3	sunny30's	State sampling
02/21/2005	1528	79	5	cloudy30's	
03/21/2005	1500	11	6	sunny40's	
04/14/2005	1510	7	7	sunny50's	
05/16/2005	1432	54	11	cloudy60's	
05/25/2005	825	45	11	clear60's	
07/21/2005	1428	15	17	sunny80's	No samples taken in June
07/27/2005	1105	15	16	sunny70's	
08/302005	1320	20	13	sunny70's	
08/31/2005	823	20	11	sunny70's	State sampling
09/06/2005	1030	20	12	ptcloudy70's	
10/05/2005	839	13	8	clear40's	State sampling
11/07/2005	1130	38	5	cloudy40's	
11/30/2005	826	38	4	ptcloudy30'	State sampling
12/13/2006		no flow			
01/26/2006	1424	31	2	cloudy30's	
02/08/2006	837	34	2	clear20's	State sampling
03/30/2006		no flow			
04/18/2006	950	97	7	ptcloudy40's	
05/08/2006	1340	15	11	sunny60's	
05/10/2006	820	54	9	clear60's	State sampling
06/21/2006	820	54	12	sunny60's	
07/13/2006	1547	25	14	sunny80's	
07/20/2006	1526	34	14	sunny80's	State sampling
08/10/2006	900	54	14	sunny70's	
09/13/2006	800	42	11	clear50's	State sampling
10/12/2006	1250	166	8	sunny50's	
11/01/2006	831	54	3	ptcloudy30'	State sampling
12/05/2006	1520	79	4	clear30's	
01/10/2007	1040	20	5	clear20's	
02/06/2007	1345	42	6	ptcloudy30's	
03/06/2007	930	54	5	ptcloudy60's	
03/28/2007	850	54	6	clear40's	State sampling
04/04/2007	950	54	7	cloudy40's	
05/16/2007		no discharge		clear60's	Cleaning pond
06/05/2007		no discharge		clear70's	Not up to discharge level, since pond cleaning.
07/03/2007	1025	34	15	cloudy80's	
08/13/2007	1100	45	17	cloudy60's	
09/05/2007	1125	22	16	clear60's	
09/18/2007	900	25	11	clear60's	State sampling
10/02/2007	1135	25	8	clear50's	
11/01/2007	1510	31	5	ptcloudy50's	
11/20/2007	750			cloudy50's	Tss only
11/24/2007	730			clear40's	Tss only
12/04/2007	1025	20	6	cloudy30's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Wilberg Mine
Permit # 0022896-003A

Date	Time	GPM	Temp. (°C)	Weather	Comments
09/20/2000	1245	10	14	sunny80's	
10/16/2000	1445	14	7	clear60's	
11/06/2000	1105	8	1	ptcloudy30's	
11/08/2000	1143	8	2	ptcloudy30': state sampling	
12/19/2000	1410	48	2	ptcloudy20;s	
01/09/2001	1405	25	1	cloudy30's	
02/05/2001	1610	25	0	sunny30's	
03/20/2001	1325	19	5	sunny50's	
April-Dec,2001		No Discharge			
Jan-Dec.2002		No Discharge			
Jan-Dec.2003		No Discharge			
Jan-Dec.2004		No Discharge			
Jan-Dec.2005		No Discharge			
Jan-Dec.2006		No Discharge			
Jan-Dec.2007		No Discharge			

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Trail Mountain Mine
Permit # UTG040003-001

Date	Time	GPM	Temp. (°C)	Weather	Comments
11/09/1999		No Discharge		sunny50's	
12/08/1999		No Discharge		sunny20's	
01/12/2000		No Discharge		ptcloudy30's	
02/10/2000		No Discharge		cloudy30's	Prec-Event snow / rain
03/07/2000		No Discharge		sunny40's	
April-Sept.2000		No Discharge		sunny80's	
10/31/2000	1430	100	2.5	cloudy30's	Prec-Event snow
Nov-Dec.2000		No Discharge			
Jan-Dec.2001		No Discharge			
Jan-Dec.2002		No Discharge			
Jan-Dec.2003		No Discharge			
Jan-Dec.2004		No Discharge			
Jan-Dec.2005		No Discharge			
Jan-Dec.2006		No Discharge			
Jan-Dec.2007		No Discharge			

EAST MOUNTAIN TEMPERATURES- 2007 WATER YEAR

	Oct-06	SUMMARY
	HIGH	LOW
AVG.	51.3	33.4
MAX.	68.8	52.2
MIN.	22.5	18.6

	Nov-06	SUMMARY
	HIGH	LOW
AVG.	39.3	25.6
MAX.	55.7	42.2
MIN.	6.6	1.3

	Dec-06	SUMMARY
	HIGH	LOW
AVG.	39.8	25.7
MAX.	50.4	35.0
MIN.	24.0	9.4

	Jan-07	SUMMARY
	HIGH	LOW
AVG.	40.7	22.7
MAX.	49.3	46.8
MIN.	19.6	0.1

	Feb-07	SUMMARY
	HIGH	LOW
AVG.	39.3	24.2
MAX.	57.2	37.1
MIN.	21.7	8.9

	Mar-07	SUMMARY
	HIGH	LOW
AVG.	56.4	35.1
MAX.	70.9	49.8
MIN.	21.4	13.3

	Apr-07	SUMMARY
	HIGH	LOW
AVG.	53.6	33.0
MAX.	77.2	52.9
MIN.	25.9	16.3

	May-07	SUMMARY
	HIGH	LOW
AVG.	66.1	41.4
MAX.	79.1	54.0
MIN.	34.4	23.5

	Jun-07	SUMMARY
	HIGH	LOW
AVG.	80.1	54.3
MAX.	92.6	67.0
MIN.	43.7	29.7

	Jul-07	SUMMARY
	HIGH	LOW
AVG.	87.3	59.7
MAX.	93.7	65.1
MIN.	72.7	50.9

	Aug-07	SUMMARY
	HIGH	LOW
AVG.	81.8	55.9
MAX.	87.9	61.8
MIN.	62.0	44.5

	Sep-07	SUMMARY
	HIGH	LOW
AVG.	65.7	42.2
MAX.	81.2	57.7
MIN.	38.1	17.6

2007 SUMMARY		
PARAMETER	DATE	TEMP
AVG. HIGH	#N/A	58.4
MAX. HIGH	07/02/07	93.7
MIN. HIGH	11/29/06	6.6
AVG. LOW	#N/A	37.8
MAX. LOW	06/16/07	67.0
MIN. LOW	01/13/07	0.1

EAST MOUNTAIN TEMPERATURES - HISTORICAL SUMMARY

	OCTOBER SUMMARY	
	HIGH	LOW
AVG.	49.2	32.9
MAX.	75.4	55.8
MIN.	11.6	4.3

	NOVEMBER SUMMARY	
	HIGH	LOW
AVG.	35.1	22.6
MAX.	59.2	54.7
MIN.	6.6	-4.8

	DECEMBER SUMMARY	
	HIGH	LOW
AVG.	29.3	15.4
MAX.	62.5	45.0
MIN.	-2.6	-17.6

	JANUARY SUMMARY	
	HIGH	LOW
AVG.	30.8	16.5
MAX.	63.2	53.8
MIN.	2.0	-15.2

	FEBRUARY SUMMARY	
	HIGH	LOW
AVG.	32.9	16.9
MAX.	57.2	40.0
MIN.	-2.3	-14.7

	MARCH SUMMARY	
	HIGH	LOW
AVG.	40.6	22.1
MAX.	70.9	49.8
MIN.	7.4	-6.6

	APRIL SUMMARY	
	HIGH	LOW
AVG.	47.4	28.0
MAX.	77.2	52.9
MIN.	12.7	-0.3

	MAY SUMMARY	
	HIGH	LOW
AVG.	57.1	36.4
MAX.	89.0	64.3
MIN.	15.8	1.8

	JUNE SUMMARY	
	HIGH	LOW
AVG.	68.6	46.1
MAX.	92.6	74.1
MIN.	27.7	13.1

	JULY SUMMARY	
	HIGH	LOW
AVG.	75.9	53.5
MAX.	96.0	72.0
MIN.	48.5	20.4

	AUGUST SUMMARY	
	HIGH	LOW
AVG.	73.1	52.3
MAX.	94.7	70.5
MIN.	35.8	31.8

	SEPTEMBER SUMMARY	
	HIGH	LOW
AVG.	63.0	43.1
MAX.	85.6	65.0
MIN.	31.6	17.6

HISTORICAL SUMMARY - 1981 through 2007		
PARAMETER	DATE	TEMP
AVERAGE HIGH	NA	50.2
MAXIMUM HIGH	13-Jul-02	96.0
AVG. MAX. HIGH	NA	77.0
MINIMUM HIGH	22-Dec-91	-2.6
AVG. MIN. HIGH	NA	16.2
AVERAGE LOW	NA	32.2
MAXIMUM LOW	28-Jun-93	74.1
AVG. MAX. LOW	NA	58.2
MINIMUM LOW	22-Dec-90	-17.6
AVG. MIN. LOW	NA	2.5

ENERGY WEST MINING COMPANY
EAST MOUNTAIN PRECIPITATION
HISTORICAL COMPARISON

MONTH	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	MIN	MEAN	MAX	ST DEV
OCT	1.28	1.93	0.38	0.76	3.27	1.15	1.57	2.77	0.61	0.28	0.48	0.49	1.57	2.23	1.86	0.18	1.50	0.24	3.01	0.04	3.48	0.11	0.73	0.27	2.56	1.44	3.66	0.04	1.40	3.66	1.11
NOV	0.39	0.53	2.90	2.43	0.97	2.38	0.39	1.91	0.43	0.39	0.26	1.07	0.57	1.12	1.42	0.46	1.63	0.84	1.08	0.05	0.62	0.40	0.82	0.86	2.06	0.64	0.21	0.05	0.99	2.90	0.75
DEC	0.05	0.97	1.39	2.42	1.67	0.87	0.16	1.29	1.56	0.16	0.66	0.07	1.53	0.14	0.65	0.64	1.66	0.23	0.00	0.28	0.39	0.18	0.75	1.95	1.16	0.98	0.48	0.00	0.83	2.42	0.66
JAN	0.29	3.22	1.30	0.27	0.49	0.30	1.37	1.42	1.00	0.74	0.34	0.61	4.10	0.32	1.37	1.39	2.49	0.97	0.75	0.48	1.96	0.03	0.01	0.21	3.47	0.87	0.25	0.01	1.11	4.10	1.06
FEB	0.52	0.14	1.81	0.65	0.59	2.10	1.37	0.00	0.68	2.08	0.39	1.73	2.34	1.35	0.66	1.18	1.56	3.34	0.34	3.27	1.21	0.19	0.96	2.73	1.41	0.41	0.18	0.00	1.23	3.34	0.93
MAR	2.77	1.67	1.98	1.22	1.77	1.43	1.65	0.99	1.03	1.75	2.34	2.39	2.01	0.34	0.79	2.23	0.00	0.71	0.07	1.56	1.03	0.10	1.20	0.00	0.63	3.67	0.96	0.00	1.34	3.67	0.89
APR	0.64	0.00	0.92	0.50	1.35	1.05	1.16	2.08	0.26	1.03	0.59	0.56	0.33	2.65	3.75	0.21	0.40	0.81	2.82	0.15	1.12	0.16	0.37	1.94	1.19	0.44	0.98	0.00	1.02	3.75	0.90
MAY	0.87	0.45	0.71	0.22	1.73	0.38	1.77	1.03	0.47	0.26	1.83	2.19	0.72	0.36	2.29	1.14	0.91	0.37	0.36	0.72	1.39	0.00	0.57	0.12	1.04	0.03	0.19	0.00	0.82	2.29	0.65
JUN	0.11	0.09	0.61	1.18	0.28	0.53	0.58	0.81	0.43	0.67	0.21	0.95	0.19	0.39	1.19	0.30	0.15	0.04	1.21	0.59	0.19	0.06	0.37	1.27	1.36	0.55	0.05	0.04	0.53	1.36	0.41
JUL	0.57	1.86	1.27	1.90	2.47	0.87	2.49	0.45	1.19	0.88	1.01	0.85	0.04	0.10	0.34	0.58	0.15	0.78	2.08	0.03	0.58	0.26	0.06	0.49	0.44	0.58	0.70	0.03	0.85	2.49	0.71
AUG	0.85	1.10	4.83	2.33	0.12	2.24	1.16	0.96	2.44	1.03	1.48	0.48	0.82	0.83	1.52	0.35	1.30	0.57	2.24	2.03	1.09	0.69	1.59	0.67	0.83	0.50	0.89	0.12	1.29	4.83	0.93
SEP	2.55	2.61	1.62	0.64	2.31	1.63	0.06	0.91	0.49	1.62	3.11	0.35	0.14	1.49	0.62	3.46	2.43	2.16	0.78	0.96	0.12	4.15	0.94	0.38	1.07	0.48	0.99	0.06	1.41	4.15	1.08
TOTAL	10.90	14.57	19.71	14.53	17.02	14.92	13.73	14.62	10.59	10.90	12.69	11.74	14.37	11.33	16.46	12.12	11.75	11.05	14.73	10.16	13.17	6.34	8.36	10.89	17.22	10.59	9.54	6.34	12.74	19.71	2.90

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR					
DATE	TIME	PRECIPITATION			
10/05/06	2:12 AM	Start			
10/05/06	3:12 AM	Stop	0.04		
10/05/06	8:00 AM	Start			
10/07/06	3:37 AM	Stop	2.13		
10/09/06	1:29 AM	Start			
10/09/06	10:33 AM	Stop	0.32		
10/10/06	1:40 AM	Start			
10/10/06	3:02 AM	Stop	0.25		
10/13/06	11:22 PM	Start			
10/14/06	12:25 AM	Stop	0.18		
10/14/06	8:03 AM	Start			
10/15/06	6:00 AM	Stop	0.12		
10/15/06	6:37 PM	Start			
10/16/06	6:22 AM	Stop	0.11		
10/17/06	2:44 AM	Start			
10/17/06	12:10 PM	Stop	0.25		
10/18/06	4:58 AM	Start			
10/18/06	7:49 AM	Stop	0.26	3.66	Inches Oct-06
11/12/06	1:56 PM	Start			
11/12/06	4:24 PM	Stop	0.01		
11/14/06	6:28 AM	Start			
11/14/06	1:45 PM	Stop	0.05		
11/15/06	11:36 AM	Start			
11/15/06	7:13 PM	Stop	0.07		
11/27/06	11:03 PM	Start			
11/28/06	12:55 AM	Stop	0.08	0.21	Inches Nov-06
12/04/06	4:50 AM	Start			
12/04/06	8:48 AM	Stop	0.03		
12/06/06	7:07 AM	Start			
12/06/06	2:12 PM	Stop	0.03		
12/07/06	5:33 AM	Start			
12/07/06	1:33 PM	Stop	0.10		
12/10/06	11:57 PM	Start			
12/11/06	12:57 AM	Stop	0.02		
12/12/06	5:15 AM	Start			
12/13/06	6:33 AM	Stop	0.05		
12/15/06	6:18 PM	Start			
12/15/06	7:46 PM	Stop	0.02		
12/21/06	5:37 AM	Start			
12/21/06	10:01 AM	Stop	0.07		
12/22/06	11:14 AM	Start			
12/22/06	12:56 PM	Stop	0.02		
12/23/06	9:20 PM	Start			
12/23/06	11:02 PM	Stop	0.04		
12/25/06	5:59 AM	Start			

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR					
DATE	TIME	PRECIPITATION			
12/25/06	9:06 AM	Stop	0.05		
12/27/06	6:14 PM	Start			
12/28/06	5:44 AM	Stop	0.03		
12/30/06	7:39 AM	Start			
12/30/06	8:36 AM	Stop	0.02	0.48	Inches Dec-06
01/03/07	8:34 AM	Start			
01/06/07	6:14 PM	Stop	0.14		
01/20/07	8:41 PM	Start			
01/20/07	10:31 PM	Stop	0.06		
01/22/07	7:31 AM	Start			
01/23/07	12:16 PM	Stop	0.05	0.25	Inches Jan-07
02/24/07	11:32 AM	Start			
02/27/07	4:45 AM	Stop	0.08		
02/28/07	2:17 AM	Start			
02/28/07	4:28 AM	Stop	0.06		
03/03/07	3:16 AM	Start			
03/03/07	5:36 AM	Stop	0.04	0.18	Inches Feb-07
03/20/07	11:12 PM	Start			
03/21/07	10:25 AM	Stop	0.15		
03/23/07	8:23 AM	Start			
03/23/07	4:54 PM	Stop	0.12		
03/26/07	11:31 AM	Start			
03/27/07	4:13 PM	Stop	0.06		
03/28/07	4:54 AM	Start			
03/31/07	4:40 AM	Stop	0.63	0.96	Inches Mar-07
04/07/07	11:27 PM	Start			
04/08/07	8:16 PM	Stop	0.04		
04/11/07	6:06 AM	Start			
04/14/07	2:56 AM	Stop	0.09		
04/15/07	9:34 PM	Start			
04/16/07	3:25 PM	Stop	0.23		
04/19/07	3:34 AM	Start			
04/19/07	5:12 AM	Stop	0.06		
04/22/07	8:27 AM	Start			
04/24/07	8:04 PM	Stop	0.56	0.98	Inches Apr-07
05/04/07	12:41 AM	Start			
05/05/07	3:48 PM	Stop	0.14		
05/21/07	11:16 AM	Start			
05/21/07	6:11 PM	Stop	0.05	0.19	Inches May-07
06/06/07	12:08 AM	Start			
06/06/07	5:40 PM	Stop	0.05	0.05	Inches Jun-07

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR					
DATE	TIME	PRECIPITATION			
07/12/07	10:25 AM	Start			
07/12/07	6:37 PM	Stop	0.14		
07/21/07	3:58 PM	Start			
07/21/07	3:19 PM	Stop	0.10		
07/25/07	1:14 PM	Start			
07/25/07	1:06 PM	Stop	0.12		
07/26/07	11:58 AM	Start			
07/26/07	12:15 PM	Stop	0.05		
07/28/07	11:58 AM	Start			
07/28/07	11:46 AM	Stop	0.21		
07/29/07	12:17 AM	Start			
07/29/07	2:02 AM	Stop	0.02		
07/29/07	1:35 PM	Start			
07/29/07	2:43 PM	Stop	0.06	0.70	Inches Jul-07
08/02/07	7:30 AM	Start			
08/02/07	9:28 AM	Stop	0.26		
08/05/07	3:05 PM	Start			
08/06/07	12:37 AM	Stop	0.13		
08/17/07	6:02 AM	Start			
08/17/07	10:24 AM	Stop	0.11		
08/26/07	11:58 AM	Start			
08/28/07	6:36 PM	Stop	0.39	0.89	Inches Aug-07
09/04/07	3:21 PM	Start			
09/04/07	6:20 PM	Stop	0.27		
09/22/07	8:59 AM	Start			
09/23/07	12:19 PM	Stop	0.62		
09/30/07	4:08 AM	Start			
09/30/07	1:15 PM	Stop	0.10	0.99	Inches Sep-07
				9.54	TOTAL 2007

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR		
DATE	TIME	PRECIPITATION

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
10/03/06	9:11 PM		39.3	Low
10/04/06	6:44 AM		40.1	Low
10/04/06	12:20 PM	55.4		High
10/05/06	9:00 AM	47.5		High
10/05/06	8:00 PM		44.5	Low
10/06/06	2:09 AM	44.6		High
10/06/06	2:40 PM		35.6	Low
10/07/06	3:54 AM		32.6	Low
10/07/06	12:23 PM	50.3		High
10/08/06	3:14 AM		33.5	Low
10/08/06	12:48 PM	55.0		High
10/09/06	7:00 AM	40.0		High
10/09/06	11:00 PM		32.0	Low
10/10/06	2:45 AM		32.0	Low
10/10/06	10:32 AM	43.3		High
10/11/06	2:25 AM		32.4	Low
10/11/06	12:21 PM	52.3		High
10/12/06	2:11 AM		34.8	Low
10/12/06	12:34 PM	55.1		High
10/13/06	2:30 AM		36.7	Low
10/13/06	11:34 AM	54.5		High
10/14/06	8:53 AM	39.1		High
10/14/06	8:28 PM		35.7	Low
10/15/06	3:35 AM		34.7	Low
10/15/06	9:33 AM	47.1		High
10/16/06	11:20 PM	49.3		High
10/16/06	10:07 PM		26.4	Low
10/17/06	7:37 AM	31.5		High
10/17/06	10:38 PM		18.6	Low
10/18/06	3:20 AM		19.4	Low
10/18/06	8:05 AM	32.1		High
10/19/06	3:13 AM		26.6	Low
10/19/06	10:53 AM	43.8		High
10/20/06	11:08 AM	42.6		High
10/20/06	11:13 PM		23.8	Low
10/20/06	3:00 AM	22.5		Low
10/21/06	11:32 AM	40.1		High
10/22/06	2:23 AM		22.7	Low
10/22/06	11:53 AM	45.3		High
10/23/06	1:50 AM		30.0	Low
10/23/06	10:59 AM	47.1		High
10/24/06	12:30 PM	49.3		High
10/24/06	9:35 PM		33.8	Low
10/25/06	4:02 AM	34.5		High
10/25/06	3:04 PM		19.4	Low
10/26/06	1:53 AM		22.1	Low
10/26/06	1:49 PM	39.6		High
10/27/06	4:52 AM		31.8	Low

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
10/27/06	2:46 PM	46.7		High
10/28/06	4:20 AM		38.2	Low
10/28/06	10:36 AM	54.5		High
10/29/06	12:56 PM	45.8		High
10/29/06	3:50 PM		33.1	Low
10/30/06	7:24 AM		35.4	Low
10/30/06	11:52 AM	45.2		High
10/31/06	12:00 PM	43.0		High
10/31/06	11:00 PM		27.5	Low
11/01/06	7:21 AM		25.2	Low
11/01/06	1:28 PM	41.4		High
11/02/06	5:42 AM		27.9	Low
11/02/06	3:48 PM	47.5		High
11/03/06	5:14 AM		34.3	Low
11/03/06	12:14 PM	50.6		High
11/04/06	9:32 AM	46.7		High
11/04/06	6:13 PM		31.0	Low
11/05/06	4:42 AM		29.7	Low
11/05/06	12:33 PM	45.0		High
11/06/06	2:03 AM		35.4	Low
11/06/06	10:58 AM	53.4		High
11/07/06	6:35 AM		42.2	Low
11/07/06	2:41 PM	55.7		High
11/08/06	12:22 PM	54.1		High
11/08/06	8:51 PM		40.9	Low
11/09/06	7:13 AM	44.1		High
11/09/06	9:33 PM		23.7	Low
11/10/06	4:33 AM		16.9	Low
11/10/06	11:22 AM	38.1		High
11/11/06	2:30 AM		23.4	Low
11/11/06	9:23 AM	34.7		High
11/12/06	4:32 AM		17.5	Low
11/12/06	10:10 AM	31.5		High
11/13/06	3:37 AM		21.7	Low
11/13/06	11:18 AM	39.3		High
11/14/06	2:42 AM	35.0		High
11/14/06	7:23 PM		22.2	Low
11/15/06	4:51 AM		21.1	Low
11/15/06	9:08 AM	37.6		High
11/16/06	2:43 AM		27.5	Low
11/16/06	9:11 AM	44.7		High
11/17/06	3:17 AM		31.8	Low
11/17/06	9:22 AM	44.0		High
11/18/06	2:35 AM		32.0	Low
11/18/06	10:14 AM	46.5		High
11/19/06	3:25 AM		28.3	Low
11/19/06	9:40 AM	44.8		High

	Oct-06	SUMMARY
	HIGH	LOW
AVG.	51.3	33.4
MAX.	68.8	52.2
MIN.	22.5	18.6

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
11/20/06	2:21 AM		28.0	Low
11/20/06	11:00 AM	43.2		High
11/21/06	2:59 AM		29.5	Low
11/21/06	11:15 AM	43.5		High
11/22/06	2:55 AM		33.5	Low
11/22/06	9:14 AM	45.5		High
11/23/06	10:02 AM	43.2		High
11/23/06	9:31 PM		26.9	Low
11/24/06	4:09 AM		24.9	Low
11/24/06	10:13 AM	40.3		High
11/25/06	2:52 AM		23.9	Low
11/25/06	9:06 AM	39.1		High
11/26/06	3:42 AM		22.0	Low
11/26/06	8:27 AM	36.3		High
11/27/06	9:53 AM		27.4	Low
11/27/06	9:20 PM		12.7	Low
11/28/06	4:54 AM	19.1		High
11/28/06	10:55 PM		1.4	Low
11/29/06	5:04 AM		1.3	Low
11/29/06	9:41 PM	6.6		High
11/30/06	4:01 AM		3.9	Low
11/30/06	11:34 AM	28.3		High
12/01/06	7:33 AM	32.2		High
12/01/06	8:56 PM		10.4	Low
12/02/06	5:39 AM	24.0		High
12/02/06	4:46 PM		9.4	Low
12/03/06	1:42 AM		9.6	Low
12/03/06	9:54 PM	29.6		High
12/04/06	1:12 AM		29.1	Low
12/04/06	5:57 AM	46.8		High
12/05/06	6:11 AM	46.9		High
12/05/06	8:23 PM		29.0	Low
12/06/06	6:14 AM	46.3		High
12/06/06	8:19 PM		30.4	Low
12/07/06	5:13 AM	43.1		High
12/07/06	8:29 PM		28.1	Low
12/08/06	5:15 AM	41.9		High
12/08/06	9:22 PM		23.4	Low
12/09/06	4:44 AM	37.1		High
12/09/06	7:44 PM		22.5	Low
12/10/06	4:32 AM	33.4		High
12/10/06	11:13 AM		25.6	Low
12/11/06	6:57 AM	33.7		High
12/11/06	10:22 AM		24.9	Low
12/12/06	3:06 AM	38.5		High
12/12/06	1:17 PM		29.8	Low
12/13/06	2:28 AM		34.9	Low

	Nov-06	SUMMARY
	HIGH	LOW
AVG.	39.3	25.6
MAX.	55.7	42.2
MIN.	6.6	1.3

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
12/13/06	3:17 AM	43.5		High
12/14/06	5:41 AM	49.5		High
12/14/06	9:55 PM		35.0	Low
12/15/06	6:41 AM	42.4		High
12/15/06	10:08 PM		29.6	Low
12/16/06	1:46 AM	29.8		High
12/16/06	2:05 PM		23.0	Low
12/17/06	3:52 AM	29.4		High
12/17/06	1:48 PM		12.7	Low
12/18/06	3:09 AM	29.4		High
12/18/06	9:16 AM		19.7	Low
12/19/06	2:46 AM	32.5		High
12/19/06	7:40 PM		23.3	Low
12/20/06	4:30 AM	36.9		High
12/20/06	12:08 PM		28.3	Low
12/21/06	5:11 AM	43.8		High
12/21/06	6:42 PM		21.0	Low
12/22/06	3:56 AM	35.3		High
12/22/06	8:52 PM		20.0	Low
12/23/06	3:21 AM	39.5		High
12/23/06	9:28 PM		23.9	Low
12/24/06	4:49 AM	34.1		High
12/24/06	2:58 PM		23.8	Low
12/25/06	5:06 AM	50.4		High
12/25/06	8:13 PM		34.6	Low
12/26/06	4:11 AM	44.5		High
12/26/06	8:52 AM		25.9	Low
12/27/06	3:47 AM	37.0		High
12/27/06	6:06 AM		28.2	Low
12/28/06	2:10 AM	34.0		High
12/28/06	4:39 PM		26.5	Low
12/29/06	11:14 AM		30.8	Low
12/29/06	8:03 PM	35.9		High
12/30/06	6:17 AM	48.3		High
12/30/06	10:00 PM		32.8	Low
12/31/06	6:38 AM	43.7		High
12/31/06	6:00 PM		26.0	Low
01/01/07	5:44 AM	41.4		High
01/01/07	6:54 PM		27.1	Low
01/02/07	7:40 AM	46.3		High
01/02/07	5:36 PM		35.0	Low
01/03/07	2:16 AM		35.5	Low
01/03/07	7:28 AM	45.7		High
01/04/07	8:02 AM	44.6		High
01/04/07	9:08 PM		20.1	Low
01/05/07	4:47 AM	22.1		High
01/05/07	2:16 PM		46.8	High

	Dec-06	SUMMARY
	HIGH	LOW
AVG.	39.8	25.7
MAX.	50.4	35.0
MIN.	24.0	9.4

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
01/06/07	6:33 AM	29.7		High
01/06/07	9:53 PM		12.5	Low
01/07/07	2:58 AM		12.7	Low
01/07/07	3:18 PM	37.0		High
01/08/07	2:36 AM		28.9	Low
01/08/07	6:37 AM	47.4		High
01/09/07	6:58 AM	48.7		High
01/09/07	6:31 PM		23.5	Low
01/10/07	2:22 AM		23.2	Low
01/10/07	7:10 AM	37.7		High
01/11/07	6:28 AM	40.2		High
01/11/07	9:43 PM		25.2	Low
01/12/07	5:23 AM	32.3		High
01/12/07	10:39 PM		3.0	Low
01/13/07	6:07 AM	19.6		High
01/13/07	11:19 AM		0.1	Low
01/14/07	6:07 AM		17.7	Low
01/14/07	4:49 PM	43.5		High
01/15/07	4:23 AM	25.0		High
01/15/07	7:23 PM		14.5	Low
01/16/07	5:30 AM	30.9		High
01/16/07	10:14 PM		8.0	Low
01/17/07	3:13 AM		10.5	Low
01/17/07	5:49 AM	24.9		High
01/18/07	2:11 AM		17.3	Low
01/18/07	6:47 AM	34.9		High
01/19/07	1:07 AM		25.5	Low
01/19/07	6:11 AM	42.9		High
01/20/07	4:18 AM	38.9		High
01/20/07	5:07 PM		11.2	Low
01/21/07	12:44 AM		11.7	Low
01/21/07	4:44 AM	23.0		High
01/22/07	2:44 AM		19.5	Low
01/22/07	10:18 PM	38.5		High
01/23/07	7:24 AM	49.3		High
01/23/07	9:40 PM		34.7	Low
01/24/07	5:59 AM	49.0		High
01/24/07	8:32 PM		32.5	Low
01/25/07	5:42 AM	46.8		High
01/25/07	9:32 PM		30.5	Low
01/26/07	1:42 AM		31.4	Low
01/26/07	6:33 AM	48.1		High
01/27/07	7:38 AM	42.7		High
01/27/07	6:35 PM		23.9	Low
01/28/07	4:19 AM	40.2		High
01/28/07	7:53 PM		23.1	Low
01/29/07	6:38 AM	43.5		High
01/29/07	10:14 PM		24.1	Low

Jan-07 SUMMARY

ENERGY WEST MINING COMPANY
EAST MOUNTAIN WEATHER STATION
2007 WATER YEAR

DATE	TIME	HIGH	LOW	
01/30/07	5:59 AM	39.8		High
01/30/07	9:49 PM	35.9	35.9	Low
01/31/07	7:04 AM	30.1		High
01/31/07	10:14 PM		14.4	Low
02/01/07	9:59 AM	21.7		High
02/01/07	8:39 PM		8.9	Low
02/02/07	3:21 AM		8.9	Low
02/02/07	11:27 AM	30.6		High
02/03/07	1:34 AM		25.3	Low
02/03/07	11:30 AM	41.2		High
02/04/07	1:02 AM		34.9	Low
02/04/07	10:33 AM	46.8		High
02/05/07	4:44 AM		37.1	Low
02/05/07	10:56 AM	57.2		High
02/06/07	7:23 AM	51.3		High
02/06/07	5:40 PM		36.3	Low
02/07/07	10:49 AM	48.7		High
02/07/07	7:55 PM		33.7	Low
02/08/07	2:01 AM		35.2	Low
02/08/07	10:23 AM	48.2		High
02/09/07	5:22 AM		35.0	Low
02/09/07	9:49 AM	51.1		High
02/10/07	4:28 AM		36.1	Low
02/10/07	10:07 AM	52.3		High
02/11/07	7:32 AM	44.7		High
02/11/07	9:42 PM		32.1	Low
02/12/07	9:00 AM	44.3		High
02/12/07	10:07 PM		29.5	Low
02/13/07	7:07 AM		36.7	Low
02/13/07	9:14 PM	43.5		High
02/14/07	2:42 AM		21.4	Low
02/14/07	7:15 AM	29.5		High
02/15/07	1:02 AM		22.6	Low
02/15/07	9:59 PM	36.3		High
02/16/07	5:59 AM	40.5		High
02/16/07	9:05 PM		27.2	Low
02/17/07	11:51 AM	50.2		High
02/17/07	11:22 PM		29.8	Low
02/18/07	3:36 AM		27.5	Low
02/18/07	7:51 AM	43.0		High
02/19/07	8:09 AM	41.3		High
02/19/07	6:29 PM		21.1	Low
02/20/07	2:08 AM		22.1	Low
02/20/07	10:53 AM	45.0		High
02/21/07	11:38 AM	49.9		High
02/21/07	8:42 PM		29.7	Low
02/22/07	3:37 AM		29.3	Low

	HIGH	LOW
AVG.	40.7	22.7
MAX.	49.3	46.8
MIN.	19.6	0.1

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
02/22/07	11:54 AM	53.2		High
02/23/07	2:10 AM	33.9		High
02/23/07	10:34 PM		14.7	Low
02/24/07	2:13 AM		14.1	Low
02/24/07	12:28 PM	38.5		High
02/25/07	2:45 AM		22.7	Low
02/25/07	10:20 AM	31.4		High
02/26/07	1:51 AM		23.0	Low
02/26/07	8:21 AM	37.5		High
02/27/07	4:26 AM	35.7		High
02/27/07	11:09 PM		16.7	Low
02/28/07	2:47 AM		13.6	Low
02/28/07	7:10 AM	30.9		High
03/01/07	2:28 AM		13.3	Low
03/01/07	10:58 AM	35.9		High
03/02/07	12:18 PM	21.4		High
03/02/07	9:39 PM		13.3	Low
03/03/07	3:36 AM		13.9	Low
03/03/07	12:43 PM	39.6		High
03/04/07	0.077419		20.79	Low
03/04/07	0.492716	48.27		High
03/05/07	5:00 AM		28.9	Low
03/05/07	10:33 AM	46.3		High
03/06/07	9:40 AM	53.7		High
03/06/07	10:00 PM		36.4	Low
03/07/07	2:14 AM		34.8	Low
03/07/07	10:42 AM	55.9		High
03/08/07	9:38 AM	50.6		High
03/08/07	6:35 PM		35.5	Low
03/09/07	2:24 AM		33.7	Low
03/09/07	8:00 AM	46.8		High
03/10/07	6:25 AM	47.0		High
03/10/07	7:04 PM		32.2	Low
03/11/07	1:36 AM		36.4	Low
03/11/07	10:07 AM	58.7		High
03/12/07	2:23 AM		46.5	Low
03/12/07	9:56 AM	65.0		High
03/13/07	8:51 AM	63.7		High
03/13/07	9:37 PM		46.0	Low
03/14/07	2:45 AM		44.5	Low
03/14/07	9:17 AM	59.3		High
03/15/07	8:58 AM	57.4		High
03/15/07	4:47 PM		41.2	Low
03/16/07	1:34 AM		44.2	Low
03/16/07	11:42 AM	67.8		High
03/17/07	2:26 AM		48.6	Low
03/17/07	10:39 AM	70.9		High

	Feb-07	SUMMARY
	HIGH	LOW
AVG.	39.3	24.2
MAX.	57.2	37.1
MIN.	21.7	8.9

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
03/18/07	10:28 AM	69.4		High
03/18/07	8:37 PM	43.5	43.5	Low
03/19/07	2:32 AM		49.8	Low
03/19/07	8:09 AM	67.7		High
03/20/07	9:07 AM	68.4		High
03/20/07	10:16 PM		37.5	Low
03/21/07	3:59 AM	47.4		High
03/21/07	4:49 PM		34.2	Low
03/22/07	9:16 AM	59.3		High
03/22/07	8:37 PM		38.7	Low
03/23/07	5:04 AM	53.9		High
03/23/07	4:13 PM		36.2	Low
03/24/07	6:16 AM	53.8		High
03/24/07	7:30 PM		34.8	Low
03/25/07	9:55 AM	61.6		High
03/25/07	9:32 PM		43.0	Low
03/26/07	9:28 AM	64.1		High
03/26/07	9:49 PM		38.4	Low
03/27/07	7:07 AM	54.6		High
03/27/07	7:42 PM		23.4	Low
03/28/07	3:45 AM	36.3		High
03/28/07	5:45 PM		22.2	Low
03/29/07	3:18 AM	33.1		High
03/29/07	5:24 PM		16.0	Low
03/30/07	5:02 AM	39.7		High
03/30/07	10:53 AM		29.9	Low
03/31/07	1:21 AM		36.5	Low
03/31/07	10:14 AM	51.5		High
04/01/07	1:40 AM		40.9	Low
04/01/07	10:21 AM	58.7		High
04/02/07	1:46 AM		44.8	Low
04/02/07	6:42 AM	52.7		High
04/03/07	2:22 AM		32.1	Low
04/03/07	11:58 AM	59.2		High
04/04/07	0.489491	64.16		High
04/04/07	0.8573		40.52	Low
04/05/07	1:47 AM		38.2	Low
04/05/07	11:01 AM	61.0		High
04/06/07	10:58 AM	64.5		High
04/06/07	8:52 PM		46.8	Low
04/07/07	11:06 AM	60.4		High
04/07/07	10:13 PM		38.4	Low
04/08/07	8:51 AM	48.3		High
04/08/07	7:36 PM		29.7	Low
04/09/07	9:20 AM	51.3		High
04/09/07	10:11 PM		17.9	Low
04/10/07	7:47 AM	25.9		High

	Mar-07	SUMMARY
	HIGH	LOW
AVG.	56.4	35.1
MAX.	70.9	49.8
MIN.	21.4	13.3

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
04/10/07	9:57 PM		17.2	Low
04/11/07	1:50 AM		18.0	Low
04/11/07	9:50 AM	39.1		High
04/12/07	12:32 AM		22.5	Low
04/12/07	6:20 AM	36.6		High
04/13/07	12:47 AM		25.7	Low
04/13/07	9:29 AM	45.6		High
04/14/07	1:39 AM		28.0	Low
04/14/07	10:30 AM	57.0		High
04/15/07	8:50 AM	52.5		High
04/15/07	8:12 PM		43.5	Low
04/16/07	4:58 AM	46.6		High
04/16/07	12:25 PM		30.8	Low
04/17/07	10:20 AM	58.7		High
04/17/07	9:54 PM		33.7	Low
04/18/07	5:58 AM	48.1		High
04/18/07	8:24 PM		16.3	Low
04/19/07	2:22 AM		20.1	Low
04/19/07	12:35 PM	45.4		High
04/20/07	2:13 AM		26.6	Low
04/20/07	10:46 AM	48.0		High
04/21/07	11:26 AM	46.5		High
04/21/07	9:41 PM		28.4	Low
04/22/07	4:26 AM	42.4		High
04/22/07	6:43 PM		24.7	Low
04/23/07	2:53 AM		30.1	Low
04/23/07	6:08 AM	38.3		High
04/24/07	1:23 AM		34.3	Low
04/24/07	11:34 AM	44.5		High
04/25/07	1:37 AM		34.3	Low
04/25/07	11:05 AM	60.4		High
04/26/07	11:12 AM	57.3		High
04/26/07	9:05 PM		37.2	Low
04/27/07	1:46 AM		42.1	Low
04/27/07	1:30 PM	69.7		High
04/28/07	2:28 AM		44.7	Low
04/28/07	1:49 PM	74.8		High
04/29/07	3:21 AM		49.5	Low
04/29/07	2:03 PM	77.2		High
04/30/07	1:01 PM	72.6		High
04/30/07	9:33 PM		52.9	Low
05/01/07	3:35 AM		50.4	Low
05/01/07	8:55 AM	74.0		High
05/02/07	10:51 AM	60.5		High
05/02/07	10:01 PM		38.7	Low
05/03/07	6:13 AM	43.5		High
05/03/07	11:44 AM		26.3	Low

	Apr-07	SUMMARY
	HIGH	LOW
AVG.	53.6	33.0
MAX.	77.2	52.9
MIN.	25.9	16.3

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
05/04/07	6:12 AM	34.37		High
05/04/07	10:13 PM		25.14	Low
05/05/07	3:00 AM		23.5	Low
05/05/07	11:14 AM	46.8		High
05/06/07	2:05 AM		25.2	Low
05/06/07	12:01 PM	36.1		High
05/07/07	2:24 AM		30.1	Low
05/07/07	12:01 PM	56.0		High
05/08/07	1:14 AM		34.8	Low
05/08/07	11:45 AM	64.1		High
05/09/07	2:58 AM		42.0	Low
05/09/07	12:40 PM	65.67		High
05/10/07	3:17 AM		46.7	Low
05/10/07	2:01 PM	78.8		High
05/11/07	3:49 AM		51.8	Low
05/11/07	2:08 PM	79.1		High
05/12/07	3:48 AM		52.2	Low
05/12/07	11:01 AM	77.7		High
05/13/07	12:42 PM	78.4		High
05/13/07	10:42 PM		54.0	Low
05/14/07	9:18 AM	71.2		High
05/14/07	9:52 PM		43.5	Low
05/15/07	2:09 AM		43.7	Low
05/15/07	2:00 PM	71.6		High
05/16/07	9:14 AM	70.5		High
05/16/07	10:29 PM		42.8	Low
05/17/07	1:40 AM		43.7	Low
05/17/07	11:18 AM	75.2		High
05/18/07	3:03 AM		46.8	Low
05/18/07	12:50 PM	75.7		High
05/19/07	11:09 AM	74.1		High
05/19/07	10:04 PM		49.5	Low
05/20/07	2:19 AM		46.5	Low
05/20/07	2:17 PM	70.4		High
05/21/07	9:32 AM	69.2		High
05/21/07	10:20 PM		28.2	Low
05/22/07	2:02 AM		27.7	Low
05/22/07	11:59 AM	48.6		High
05/23/07	2:04 AM		29.6	Low
05/23/07	10:33 AM	49.7		High
05/24/07	1:14 AM		32.4	Low
05/24/07	11:59 AM	56.4		High
05/25/07	2:03 AM		38.4	Low
05/25/07	11:13 AM	69.2		High
05/26/07	3:33 AM		47.1	Low
05/26/07	1:31 PM	70.6		High
05/27/07	2:09 AM		50.7	Low
05/27/07	2:08 PM	77.7		High

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
05/28/07	1:00 PM	74.4		High
05/28/07	10:13 PM		45.9	Low
05/29/07	4:56 AM		40.3	Low
05/29/07	2:10 PM	58.8		High
05/30/07	3:53 AM		37.8	Low
05/30/07	12:40 PM	35.9		High
05/31/07	0.189047		48.06	Low
05/31/07	0.528926	70.08		High
06/01/07	2:23 AM		51.0	Low
06/01/07	1:31 PM	70.6		High
06/02/07	3:03 AM		53.3	Low
06/02/07	1:32 PM	75.8		High
06/03/07	1:46 AM		55.0	Low
06/03/07	11:34 AM	72.6		High
06/04/07	5:08 AM		54.66	Low
06/04/07	7:48 PM	80.12		High
06/05/07	6:18 AM		55.4	Low
06/05/07	3:40 PM	76.6		High
06/06/07	1:37 AM	59.5		High
06/06/07	12:06 PM		31.6	Low
06/07/07	7:07 AM		29.7	Low
06/07/07	4:47 PM	43.7		High
06/08/07	1:37 AM		31.9	Low
06/08/07	3:59 PM	64.6		High
06/09/07	4:05 AM		43.9	Low
06/09/07	5:44 PM	76.19		High
06/10/07	6:37 AM		53.9	Low
06/10/07	3:30 PM	78.7		High
06/11/07	8:10 AM		56.0	Low
06/11/07	7:58 PM	76.7		High
06/12/07	5:49 AM		44.6	Low
06/12/07	3:14 PM	69.4		High
06/13/07	3:20 AM		48.2	Low
06/13/07	5:52 PM	78.0		High
06/14/07	7:18 AM		54.6	Low
06/14/07	5:38 PM	79.5		High
06/15/07	7:45 AM		60.3	Low
06/15/07	6:48 PM	87.6		High
06/16/07	7:50 AM		67.0	Low
06/16/07	5:33 PM	89.9		High
06/17/07	2:52 PM	78.4		High
06/17/07	10:10 PM		60.1	Low
06/18/07	7:49 AM		46.0	Low
06/18/07	6:20 PM	78.1		High
06/19/07	4:10 AM		57.9	Low
06/19/07	5:40 PM	88.0		High
06/20/07	6:28 AM		60.9	Low

	May-07	SUMMARY
	HIGH	LOW
AVG.	66.1	41.4
MAX.	79.1	54.0
MIN.	34.4	23.5

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
06/20/07	5:59 PM	92.6		High
06/21/07	7:35 AM		59.6	Low
06/21/07	4:41 PM	88.1		High
06/22/07	7:18 AM		63.5	Low
06/22/07	8:38 PM	87.3		High
06/23/07	7:29 AM		62.2	Low
06/23/07	7:28 PM	90.5		High
06/24/07	7:36 AM		64.6	Low
06/24/07	8:20 PM	91.2		High
06/25/07	6:59 AM		62.3	Low
06/25/07	5:01 PM	85.0		High
06/26/07	7:30 AM		58.3	Low
06/26/07	7:29 PM	88.3		High
06/27/07	8:23 AM		62.6	Low
06/27/07	7:52 PM	89.1		High
06/28/07	7:29 AM		58.3	Low
06/28/07	6:12 PM	87.9		High
06/29/07	7:53 AM		61.1	Low
06/29/07	7:47 PM	91.9		High
06/30/07	8:18 AM		61.6	Low
06/30/07	9:27 PM	87.6		High
07/01/07	4:56 AM		63.21	Low
07/01/07	9:19 PM	92.68		High
07/02/07	6:42 AM		64.18	Low
07/02/07	8:49 PM	93.72		High
07/03/07	10:04 AM		64.14	Low
07/03/07	6:59 PM	89.95		High
07/04/07	9:58 AM		64.74	Low
07/04/07	11:00 PM	92.65		High
07/05/07	11:06 AM		65.11	Low
07/05/07	1:47 PM	86.6		High
07/06/07	3:56 AM		55.3	Low
07/06/07	1:31 PM	86.6		High
07/07/07	3:13 AM		55.4	Low
07/07/07	12:41 PM	83.8		High
07/08/07	2:23 AM		61.1	Low
07/08/07	12:29 PM	80.9		High
07/09/07	3:06 AM		58.8	Low
07/09/07	11:54 AM	86.41		High
07/10/07	1:54 AM		61.4	Low
07/10/07	1:18 PM	89.5		High
07/11/07	3:06 AM		61.3	Low
07/11/07	11:30 AM	85.4		High
07/12/07	2:17 AM		52.5	Low
07/12/07	7:25 AM	72.7		High
07/13/07	2:48 AM		52.8	Low
07/13/07	1:38 PM	83.8		High

	Jun-07	SUMMARY
	HIGH	LOW
AVG.	80.1	54.3
MAX.	92.6	67.0
MIN.	43.7	29.7

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
07/14/07	2:29 AM		55.0	Low
07/14/07	11:15 AM	87.0		High
07/15/07	2:09 AM		60.4	Low
07/15/07	12:30 PM	89.7		High
07/16/07	2:09 AM		61.1	Low
07/16/07	10:32 AM	86.2		High
07/17/07	3:49 AM		58.2	Low
07/17/07	1:48 PM	78.4		High
07/18/07	3:00 AM		55.8	Low
07/18/07	11:22 AM	86.6		High
07/19/07	10:44 AM	87.8		High
07/19/07	10:12 PM		55.7	Low
07/20/07	2:19 AM		56.4	Low
07/20/07	10:33 AM	86.9		High
07/21/07	1:40 AM		60.8	Low
07/21/07	9:37 AM	86.8		High
07/22/07	12:10 PM	85.6		High
07/22/07	9:32 PM		57.0	Low
07/23/07	9:46 AM	82.2		High
07/23/07	10:14 PM		52.8	Low
07/24/07	1:53 AM		50.9	Low
07/24/07	11:55 AM	81.2		High
07/25/07	7:53 AM	81.1		High
07/25/07	9:38 PM		54.3	Low
07/26/07	1:43 AM		54.4	Low
07/26/07	6:09 AM	74.6		High
07/27/07	1:58 AM		54.5	Low
07/27/07	12:42 PM	77.9		High
07/28/07	1:28 AM		54.2	Low
07/28/07	5:54 AM	74.6		High
07/29/07	7:19 AM	77.3		High
07/29/07	7:25 PM		58.1	Low
07/30/07	12:11 PM	83.8		High
07/30/07	10:42 PM		56.2	Low
07/31/07	2:17 AM		55.71	Low
07/31/07	1:15 PM	85.96		High
08/01/07	2:09 AM		59.3	Low
08/01/07	1:07 PM	87.88		High
08/02/07	7:19 AM		52.29	Low
08/02/07	12:17 PM	68.33		High
08/03/07	2:42 AM		54.81	Low
08/03/07	2:08 PM	74.22		High
08/04/07	2:34 AM		50.47	Low
08/04/07	2:20 PM	76.97		High
08/05/07	12:09 PM	79.31		High
08/05/07	9:55 PM		49.8	Low
08/06/07	3:21 AM		49.1	Low

	Jul-07	SUMMARY
	HIGH	LOW
AVG.	87.3	59.7
MAX.	93.7	65.1
MIN.	72.7	50.9

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2007 WATER YEAR				
DATE	TIME	HIGH	LOW	
08/06/07	11:55 AM	73.1		High
08/07/07	3:08 AM		51.4	Low
08/07/07	12:02 PM	78.7		High
08/08/07	3:07 AM		53.9	Low
08/08/07	11:59 AM	81.0		High
08/09/07	3:01 AM		52.6	Low
08/09/07	11:46 AM	82.75		High
08/10/07	3:32 AM		56.8	Low
08/10/07	1:20 PM	81.4		High
08/11/07	2:33 AM		56.3	Low
08/11/07	11:30 AM	86.2		High
08/12/07	3:06 AM		58.9	Low
08/12/07	9:50 AM	83.7		High
08/13/07	11:25 AM	81.4		High
08/13/07	9:10 PM		54.6	Low
08/14/07	1:47 AM		55.5	Low
08/14/07	7:37 AM	77.0		High
08/15/07	1:48 AM		55.6	Low
08/15/07	12:59 PM	77.7		High
08/16/07	1:35 AM		56.3	Low
08/16/07	10:28 AM	85.6		High
08/17/07	9:35 AM	74.2		High
08/17/07	9:53 PM		54.4	Low
08/18/07	2:06 AM		53.0	Low
08/18/07	10:48 AM	75.4		High
08/19/07	1:46 AM		55.0	Low
08/19/07	9:05 AM	82.9		High
08/20/07	2:04 AM		56.4	Low
08/20/07	11:23 AM	81.4		High
08/21/07	1:40 AM		59.3	Low
08/21/07	11:58 AM	84.6		High
08/22/07	1:55 AM		59.3	Low
08/22/07	10:08 AM	86.7		High
08/23/07	12:22 PM	77.2		High
08/23/07	9:15 PM		50.2	Low
08/24/07	1:45 AM		54.8	Low
08/24/07	12:08 PM	79.4		High
08/25/07	1:54 AM		61.8	Low
08/25/07	11:52 AM	85.0		High
08/26/07	8:05 AM	79.3		High
08/26/07	10:27 PM		48.3	Low
08/27/07	7:39 AM	62.0		High
08/27/07	8:38 PM		44.5	Low
08/28/07	11:39 AM	71.7		High
08/28/07	2:50 PM		48.9	Low
08/29/07	1:52 AM		53.1	Low
08/29/07	11:42 AM	79.2		High
08/30/07	2:01 AM		55.3	Low

	Aug-07	SUMMARY
	HIGH	LOW

ENERGY WEST MINING COMPANY
EAST MOUNTAIN WEATHER STATION
2007 WATER YEAR

DATE	TIME	HIGH	LOW	
08/30/07	12:14 PM	81.9		High
08/31/07	9:49 AM	77.89		High
08/31/07	10:01 PM		56.82	Low
09/01/07	2:36 AM		53.39	Low
09/01/07	9:21 AM	78.98		High
09/02/07	2:35 AM		57.25	Low
09/02/07	9:38 AM	79.82		High
09/03/07	4:02 AM		57.65	Low
09/03/07	4:16 PM	81.15		High
09/04/07	5:03 AM		51.27	Low
09/04/07	11:48 AM	70.48		High
09/05/07	11:23 AM	64.56		High
09/05/07	7:33 PM		45.2	Low
09/06/07	3:55 AM		41.4	Low
09/06/07	1:24 PM	62.5		High
09/07/07	2:14 AM		45.0	Low
09/07/07	11:43 AM	71.2		High
09/08/07	2:02 AM		50.1	Low
09/08/07	11:09 AM	73.4		High
09/09/07	2:37 AM		51.0	Low
09/09/07	11:57 AM	71.18		High
09/10/07	2:15 AM		46.5	Low
09/10/07	10:05 AM	68.7		High
09/11/07	2:03 AM		46.7	Low
09/11/07	7:40 AM	66.4		High
09/12/07	2:42 AM		47.8	Low
09/12/07	10:31 AM	72.8		High
09/13/07	2:57 AM		54.8	Low
09/13/07	9:38 AM	77.7		High
09/14/07	9:48 AM	72.8		High
09/14/07	8:12 PM		51.6	Low
09/15/07	2:02 AM		48.2	Low
09/15/07	11:13 AM	74.4		High
09/16/07	10:38 AM	73.6		High
09/16/07	10:41 PM		46.7	Low
09/17/07	9:13 AM	64.8		High
09/17/07	11:12 PM		36.9	Low
09/18/07	2:08 AM		37.1	Low
09/18/07	11:05 AM	65.7		High

AVG.	81.8	55.9
MAX.	87.9	61.8
MIN.	62.0	44.5

APPENDIX L
2007

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

I. MONITORING LOCATIONS

A. Surface Water Hydrology (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1, Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D Mill Fork Lease for East Mountain locations listed below / Trail Mountain Mine: Volume 3 Plate 7-1 and Plate 7-2 for Trail Mountain locations listed below)

1. Cottonwood Creek Drainage System

a. ***Cottonwood Canyon Creek*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1 or Trail Mountain Mine Permit Volume 3 Plate 7-1)

(1) SW-1 - Above Trail Mtn. Mine
(Approximately 5000 feet upstream from the inlet culvert for the disturbed area.) 2150 feet South, 2000 feet East of the Northwest corner of Section 24, Township 17 South, Range 6 East.

(2) SW-2 - Below Trail Mtn. Mine
(Approximately 200 feet downstream from the outlet culvert for the disturbed area.) 1300 feet South, 1750 feet West of the Northeast corner of Section 25, Township 17 South, Range 6 East.

(3) CCC01 - USGS Flume:
(Approximately 7800 feet downstream from the outlet culvert for the disturbed area.)1500 feet North, 200 feet East of the Southwest corner of Section 31, Township 17 South, Range 7 East.

(4) SW-3 - Below Trail Mtn. Mine
(Approximately 3800 feet above confluence with Straight Canyon) 2400 feet South, 2400 feet East of the Northeast corner of Section 6, Township 18 South, Range 6 East.

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b. ***Unnamed Drainage off Straight Canyon*** (refer to Trail Mountain Mine Permit Volume 3 Plate 7-1)

(1) T-19
(Approximately 200 feet upstream from the from confluence with Straight Canyon) 2500 feet South, 1100 feet East of the Northeast corner of Section 3, Township 18 South, Range 6 East.

c. ***Grimes Wash*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(1) GWR01 - Right Fork:
(Approximately 1500 feet upstream from the inlet culvert for the disturbed area.) 550 feet North, 1500 feet West of the Southwest corner of Section 22, Township 17 South, Range 7 East.

(2) GWR02 - Left Fork:
(Approximately 50 feet upstream from the inlet culvert for the disturbed area.) 200 feet South, 2350 feet East of the Northwest corner of Section 27, Township 17 South, Range 7 East.

(3) GWR03 - Below the mine:
(Approximately 500 feet downstream from the outlet culvert below the disturbed area.) 1770 feet South, 1820 feet West of the Northeast corner of Section 27, Township 17 South, Range 7 East.

d. ***Indian Creek*** (refer to Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

(1) ICA - Indian Creek Above
(Approximately 2500 feet northwest of the Mill Fork permit boundary) 400 feet North, 2350 feet West of the Southwest corner of Section 3, Township 16 South, Range 6 East.

(2) ICF - Indian Creek Flume
(Approximately 2100 feet west of the Mill Fork permit boundary) 300 feet North, 3400 feet West of the Southwest corner of Section 10, Township 16 South, Range 6 East.

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(3) ICD - Indian Creek Ditch
(Approximately 1600 feet west of the Mill Fork permit boundary, irrigation ditch for Upper Joes Valley) 240 feet North, 2850 feet West of the Southwest corner of Section 15, Township 16 South, Range 6 East.

(4) ICB - Indian Creek Below
(Approximately 3700 feet west of the Mill Fork permit boundary, junction of Indian Creek and FDR040) 70 feet North, 120 feet West of the Southwest corner of Section 16, Township 16 South, Range 6 East.

2. Huntington Creek Drainage System

a. ***Huntington Creek*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(1) HCC01 - Above Deer Creek Confluence:
1400 feet north, 2200 feet west of the southeast corner of Section 36, Township 16 South, Range 7 East.

(2) HCC02 - Below Deer Creek Confluence:
300 feet north, 300 feet west of the southwest corner of Section 31, Township 16 South, Range 8 East.

(3) HCC03 - Below Huntington Power Plant:
2500 feet north, 1500 feet east of the southeast corner of Section 6, Township 17 South, Range 8 East.

(4) HCC04 - @ Research Farm*
800 feet north, 200 feet east of the southwest corner of Section 5, Township 17 South, Range 8 East.
*Not listed on map due to scale.

b. ***Deer Creek*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(1) DCR01 - Above the mine:
(Approximately 600 feet upstream from the mine facility.)
200 feet North, 800 feet West of the Southeast corner of Section 10, Township 17 South, Range 7 East.

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(2) DCR04 - Near C1/C2 Belt Intersection: (Approximately 5,000 feet downstream from the mine facility.) 300 feet North, 2000 feet East of the Southeast corner of Section 2, Township 17 South, Range 7 East.

(3) DCR06 - @ Huntington Creek Confluence: (Approximately 15,000 feet downstream from the facility) 1400 feet north, 1100 feet east of the southeast corner of Section 36, Township 16 South, Range 7 East.

c. ***Meetinghouse Canyon - South Fork*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(Approximately 200 feet upstream from the north and south convergence.) 800 feet North, 1500 feet East of the Southwest corner of Section 35, Township 16 South, Range 7 East.

d. ***Rilda Canyon*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(1) RCF-1 - Rilda Canyon - Right Fork: (Approximately 4000 feet upstream from the Right and Left fork convergence.) 400 feet South, 200 feet West of the Northeast corner of Section 30, Township 16 South, Range 7 East.

(2) RCLF1 - Rilda Canyon - Left Fork, below Rilda Canyon Portals: (Approximately 200 feet upstream from the Right and Left fork convergence.) 2400 feet North, 2100 feet West of the Southeast corner of Section 29, Township 16 South, Range 7 East.

(3) RCLF2 - Rilda Canyon - Left Fork, above Rilda Canyon Portals: (Approximately 1600 feet upstream from the Right and Left fork convergence.) 1600 feet North, 2300 feet West of the Southwest corner of Section 29, Township 16 South, Range 7 East.

(4) RCF2 - Rilda Canyon - Above NEWUA springs: 2500 feet South, 400 feet West of the Northeast corner of Section 29, Township 16 South, Range 7 East.

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(5) RCF3 - Rilda Canyon - Below NEWUA springs: 2550 feet South, 1000 feet East of the Northeast corner of Section 28, Township 16 South, Range 7 East.

(6) RCW4 - Rilda Canyon: (Approximately 1000 feet upstream from the confluence with Huntington Creek.) 850 feet North, 1900 feet West of the Southeast corner of Section 26, Township 16 South, Range 7 East.

e. ***Mill Fork Canyon*** (refer to Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

(1) MFA01 - Mill Fork Canyon - Above Old Mine: (Approximately 2000 feet above old mine portals @ end of USFS development road.) 100 feet North, 1500 feet West of the Southeast corner of Section 17, Township 16 South, Range 7 East.

(2) MFB02 - Mill Fork Canyon - Above Huntington Creek Confluence: (Approximately 200 feet above confluence with Huntington Creek @ culvert outfall.) 100 feet South, 1900 feet East of the Northwest corner of Section 22, Township 16 South, Range 7 East.

(3) MFU03 - Mill Fork Canyon - Above Mill Fork Fault Crossing: (Approximately 700 feet upstream of projected Mill Fork Fault crossing) 1150 feet North, 1700 feet East of the Southwest corner of Section 17, Township 16 South, Range 7 East.

3. Reclamation Monitoring:
Following stage 1 final reclamation backfilling and grading monitoring will be conducted at points immediately above and below the last sediment pond(s).

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ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

B. Groundwater Hydrology

1. **East Mountain Springs** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine Permit : Volume 9 maps HM-4 and HM-5)

Burnt Tree *	80-41
Elk Spring *	80-43
Sheba Springs *	80-44*
Ted's Tub	80-46*
79-2	80-47
79-10 *	80-48
79-15	80-50
79-23 *	82-51
79-24	82-52*
79-26 *	84-56*
79-28 (Flag Lake)	89-60(Alpine Spring)
79-29 *	89-61
79-32	89-65
79-34	89-66
79-35 *	89-67
79-38	89-68
79-40	Rilda Canyon-(Meters 2&3)

* Recession Study Springs (Flow August & September)

2. **Trail Mountain Springs** (refer to Trail Mountain Mine Permit Volume 3 Plate 7-1)

T-6	T-14
T-8	T-15
T-9	T-16
T-10	T-18 (Oliphant Mine Discharge)

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3. **East Mountain Springs - Mill Fork Area** (refer to Deer Creek Permit Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

EM-216	MFR-30
JV-9	RR-5
JV-34	RR-15
MF-7	RR-23A
MF-10	SP1-26
MF-19B	SP1-29
MF-213	UJV-101
MF-219	UJV-206
MFR-10	UJV-213
EMPOND	Grants Spring
Little Bear Spring	

3. **Piezometric Data**
   a. Surface
      (1) Rilda Canyon (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)
         P1
         P5
         P6
         P7
         EM-47
      (2) Cottonwood Canyon Creek
         East Mountain (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)
         EM-31
         CCCW-1A
         CCCW-1S
         CCCW-2A
         CCCW-3A
         CCCW-3S U
         CCCW-3S L

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Trail Mountain (refer to Trail Mountain Mine Permit Volume 3 Plate 7-1)
TM-1B
TM-3

b. Underground: In-Mine
(1) Deer Creek Mine (Refer to Annual Hydrologic Reports for Locations : Map HM-2)

4. In-Mine Water Locations
a. Deer Creek Mine (Refer to Annual Hydrologic Reports for Locations : Map HM-2)
b. Wilberg/Cottonwood Mines (Refer to Annual Hydrologic Reports for Locations : Map HM-3)
c. Trail Mountain Mine (Refer to Annual Hydrologic Reports for Locations : PLATE 7-3)

5. Waste Rock Wells (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)
a. Deer Creek
b. Cottonwood

C. UPDES Monitoring Locations

a. ***Deer Creek Mine***
UPDES UT0023604
001- Sediment Pond
002- Mine Discharge

b. ***Des-Bee-Dove Mines***
UPDES UTG040022
001- Sediment Pond

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c. ***Wilberg/Cottonwood Mines***
UPDES UT0022896
001- Mine Discharge @ Cottonwood Canyon (TMA)
002- Sediment Pond Discharge @ Cottonwood Canyon
003- Sediment Pond @ Mine Facilities
004- Mine Discharge @ Miller Canyon
005- Sediiment Pond Discharge @ Waste Rock Site

d. ***Trail Mountain Mine***
UPDES UT0023728
001- Sediment Pond
002- Mine Discharge

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II. MONITORING SCHEDULE (see enclosed monitoring table)

A. Field Measurements

Field Measurements collected during quality sampling: Listed below are the sites which will be monitored by PacifiCorp - Energy West in accordance with the guidelines established by DOGM; i.e.,

- Date and Time
- Flow
- pH
- Temperature
- Conductivity
- Dissolved oxygen (perennial streams only)

Surface Monitoring

Surface monitoring locations will be field monitored quarterly for all field parameters, except Indian Creek - monitoring to be conducted during baseflow only.

1. Cottonwood Canyon Creek

a. Cottonwood Canyon Creek
   (1) SW-1
   (2) SW-2
   (3) Cottonwood Canyon Creek - USGS Flume
   (4) SW-3

b. Grimes Wash
   (1) GWR01
   (2) GWR02
   (3) GWR03

c. Indian Creek
   (1) ICA
   (2) ICF
   (3) ICD
   (4) ICB

d. Straight Canyon
   (1) T-19 (Unnamed Side Drainage)

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2. Huntington Canyon Drainage

a. Deer Creek
   (1) DCR01
   (2) DCR04
   (3) DCR06

b. Huntington Creek
   (1) HCC01
   (2) HCC02
   (3) HCC04

   Flow in Huntington Creek is measured only at HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report.

c. Meetinghouse Canyon - South Fork: MCH01

d. Rilda Canyon
   (1) RCF1*
   (2) RCLF 1
   (3) RCLF 2
   (4) RCF2
   (5) RCF3
   (6) RCW4

   * Baseline flow will be measured adjacent to EM-163

e. Mill Fork Canyon
   (1) MFA01
   (2) MFB02
   (3) MFU03

Groundwater Monitoring

1. East Mountain Springs (see monitoring location list)
2. Trail Mountain Springs (see monitoring location list)
3. East Mountain Springs - Mill Fork Area (see monitoring location list)

   East/Trail Mountain Springs will be field monitored during the months of July and October. In addition, the East Mountain Recession Study Springs (denoted by asterisks in the Monitoring Location section) and Trail Mountain Springs will be field monitored for flow only from July through October. T-18: Oliphant Mine Discharge, will be collected and analyzed

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quarterly. Rilda Canyon Springs - NEWUA (meters 2 & 3) will be field monitored monthly depending upon access.

3. In-Mine
   a. Deer Creek
   b. Wilberg/Cottonwood
   c. Trail Mountain

   In-mine locations will be field monitored quarterly for all field parameters except pH, conductivity, and dissolved oxygen.

4. Piezometric Wells
   a. Surface

      Piezometric surface wells will be field monitored for level only on a monthly basis depending upon access.

      (1) Rilda Canyon (see Map HM-1 for locations)
         P1
         P5
         P6
         P7
         EM-47

      (2) Cottonwood Canyon Creek (see Map HM-1 for locations)
         EM-31
         CCCW-1A
         CCCW-1S
         CCCW-2A
         CCCW-3A
         CCCW-3S U
         CCCW-3S L
         TM-1B
         TM-3

5. Waste Rock Wells
   a. Deer Creek
   b. Cottonwood

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UPDES Monitoring

1. Deer Creek
2. Des-Bee-Dove
3. Wilberg/Cottonwood
4. Trail Mountain

UPDES sites will be monitored as speicfied in the individual permits.

Reclamation Monitoring

Surface Water Resources: (see enclosed monitoring table)
Surface monitoring locations will be field monitored monthly for flow and all field parameters quarterly until bond release.

Ground Water Resources: (see enclosed monitoring table)

Springs: East/Trail Mountain Springs will be field monitored during the months of July and October.
Rilda Canyon Springs NEWUA (meters 2 & 3) will be field monitored monthly for flow depending upon access. East/Trail Mountain Springs (including Rilda Springs and T-18 [Oliphant Mine]) monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.

Wells: Piezometric surface wells (Rilda Canyon and Cottonwood Canyon including TM-3 in Straight Canyon): will be field monitored for level only on a monthly basis depending upon access. Piezometric surface well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.
Waste Rock Wells and TM-1B: will be field monitored for level only on a quarterly basis. Monitoring will be conducted until sealing during Phase I reclamation.

UPDES: Sites will be monitored as specified in the individual permits

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B. Quality Sampling (Laboratory Measurements)

1. **Surface Water Hydrology:** Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter, except for Indian Creek - quality samples will be collected during baseflow only. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table #1). Quarterly sampling was initiated during March 1988 and will continue throughout the year; i.e., June, September, and December. Baseline analysis was performed in 2001 and will be repeated every five years thereafter.

   a. **Cottonwood Creek Drainage**
      - (1)Cottonwood Canyon Creek
        - (a) SW-1
        - (b) SW-2
        - (c) SW-3
      - (2)Grimes Wash
        - (a)GWR01
        - (b)GWR02
        - (c)GWR03
      - (3) Indian Creek
        - (a) ICA
        - (b) ICD
        - (c) ICB
      - (4) Straight Canyon
        - (a) T-19

   b. **Huntington Creek Drainage**
      - (1) Deer Creek
        - (a) DCR01
        - (b) DCR04
        - (c) DCR06
      - (2) Huntington Creek
        - (a) HCC01
        - (b) HCC02
        - (c) HCC04
      - (3) Meetinghouse Canyon - South Fork: MCH01

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(4) Rilda Canyon
  (a) RCF1
  (b) RCF3
  (c) RCW4
(5) Mill Fork Canyon
  (a) MFA01
  (b) MFB02
  (c) MFU03

Reclamation Monitoring - Surface Water Hydrology: Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table #1). Sampling will be conducted on a quarterly basis until bond release. Baseline analysis will be performed on the 5th and 9th years following reclamation. In no case will baseline sampling time frame exceed 5 years converting from operational to reclamation monitoring.

2. Groundwater Hydrology

a. East/Trail Mountain Springs: Water samples will be collected and analyzed during the months of July and October. Rilda Canyon Springs (NEWUA: Meters 2 & 3) and T-18 (Oliphant Mine Discharge) will be monitored for quarterly for quality. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
b. In-Mine: Two water samples will be collected and analyzed per mine quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
c. Wells: TM-1B will be sampled quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
d. Waste Rock Wells: One water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

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Baseline analysis was performed in 2001 and will be repeated every five years thereafter.

Reclamation Monitoring - Groundwater Hydrology:

a. East/Trail Mountain Springs: Water samples will be collected and analyzed during the months of July and October. Rilda Canyon Springs (NEWUA: Meters 2 & 3) will be monitored quarterly for quality. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2). East/Trail Mountain Springs (including Rilda Springs and T-18 [Oliphant Mine Discharge]) monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.

b. In-Mine: Two water samples will be collected and analyzed per mine quarterly until the mine is sealed or the sites become inaccessible. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

c. Wells: Well TM-1B will be sealed during Phase I reclamation. Quarterly sampling will continue until sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

d. Waste Rock Wells: Waste rock wells will be sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

e. Post Reclamation Monitoring: PacifiCorp commits to conduct annual surveys to identify new discharge locations within and below sealed portals. If discharge occurs, one water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2). Baseline analysis will be performed on the 5th and 9th year.

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3. **UPDES Monitoring Sites**
   a. Deer Creek Mine
   b. Des-Bee-Dove Mines
   c. Wilberg/Cottonwood Mines
   d. Trail Mountain Mine

   UPDES sites will be monitored as speicfied in the individual permits.

III. ANNUAL REPORTS

All data collected regarding the hydrology of East/Trail Mountain will be summarized by the applicant in an annual Hydrologic Monitoring Report. Copies of the report will be submitted to the; U.S. Forest Service; and the Utah State Division of Oil, Gas and Mining. In addition, any raw data collected will be submitted to the Utah State Division of Oil, Gas and Mining on a quarterly basis.

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TABLE 1
SURFACE WATER (UPDES Monitoring) BASELINE, OPERATIONAL, POSTMINING WATER QUALITY PARAMETER LIST

Field Measurements:

	*	-	Water Level or Flow
	*	-	pH
	*	-	Specific Conductivity (umhos/cm)
	*	-	Dissolved Oxygen (ppm) (Perennial Streams Only)
	*	-	Temperature

Laboratory Measurements: (mg/l)

#	*	-	Total Settleable Solids (UPDES Only)
#	*	-	Total Suspended Solids
	*	-	Total Dissolved Solids
	*	-	Total Hardness ($CaCO_3$)
		-	Acidity ($CaCO_3$)
		-	Aluminum (Al) - Dissolved
		-	Arsenic (As) - Dissolved
		-	Boron (B) - Dissolved (Waste Rock Sites Only)
	*	-	Carbonate ($CaCO_3$)
	*	-	Total Alkalinity/Bicarbonate ($CaCO_3$)
		-	Cadmium (Cd) - Dissolved
	*	-	Calcium (Ca) - Dissolved
	*	-	Chloride (Cl^-)
		-	Copper (Cu) - Dissolved
	*	-	Iron (Fe) - Total & Dissolved
		-	Lead (Pb) - Dissolved
	*	-	Magnesium (Mg) - Dissolved
	*	-	Manganese (Mn) - Total & Dissolved
		-	Molybdenum (Mo) - Dissolved
		-	Nitrogen: Ammonia (NH_3) - reported as N
		-	Nitrite (NO_2) - reported as N
		-	Nitrate (NO_3^-) - reported as N
	*	-	Potassium (K) - Dissolved
	*	-	Oil & Grease (UPDES & Above & Below Mine Sites Only)
		-	Ortho Phosphate (PO_4^{-3}) - reported as P
		-	Selenium (Se) - Dissolved (Waste Rock Sites Only)
	*	-	Sodium (Na) - Dissolved
	*	-	Sulfate (SO_4^{-2})
		-	Zinc (Zn) - Dissolved
	*	-	Cation-Anion Balance

Construction * Operational - Baseline

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TABLE 2
GROUND WATER BASELINE, OPERATIONAL, POSTMINING WATER QUALITY PARAMETER LIST

Field Measurements:

*	-	Water Level or Flow
*	-	pH
*	-	Specific Conductivity (umhos/cm)
*	-	Temperature

Laboratory Measurements: (mg/l)

*	-	Total Dissolved Solids
*	-	Total Hardness ($CaCO_3$)
	-	Acidity ($CaCO_3$)
	-	Aluminum (Al) - Dissolved
	-	Arsenic (As) - Dissolved
	-	Boron (B) - Dissolved (Waste Rock Sites Only)
*	-	Carbonate (CO_3^{-2})
*	-	Total Alkalinity/Bicarbonate ($CaCO_3$)
	-	Cadmium (Cd) - Dissolved
*	-	Calcium (Ca) - Dissolved
*	-	Chloride (Cl^-)
	-	Copper (Cu) - Dissolved
*	-	Iron (Fe) - Total & Dissolved
	-	Lead (Pb) - Dissolved
*	-	Magnesium (Mg) - Dissolved
*	-	Manganese (Mn) - Total & Dissolved
	-	Molybdenum (Mo) - Dissolved
	-	Nitrogen: Ammonia (NH_3) - reported as N
	-	Nitrite (NO_2) - reported as N
	-	Nitrate (NO_3^-) - reported as N
*	-	Potassium (K) - Dissolved
	-	Ortho Phosphate (PO_4^{-3}) reported as P
	-	Selenium (Se) - Dissolved (Waste Rock Sites Only)
*	-	Sodium (Na) - Dissolved
*	-	Sulfate (SO_4^{-2})
	-	Zinc (Zn) - Dissolved
*	-	Cation-Anion Balance

* Operational - Baseline

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WATER SAMPLE DOCUMENTATION

The following information will be included on the lab sheets:

1. Sample time and date
2. Individual taking sample
3. Field parameters (except in-mine)
   - Temperature
   - Flow
   - pH (units)
   - Conductivity (umhos/cm)
   - Dissolved Oxygen (PPM), depending on location
4. Precipitation date if applicable
5. Date and time each parameter is analyzed at the lab

ANALYTICAL METHOD AND DETECTION LIMIT

Parameter	MRL	UNITS	Method
Acidity	5	mg/l $CaCO_3$	D1067-92
Alkalinity, Bicarbonate	5	mg/l $CaCO_3$	SM 2320 B
Alkalinity, Carbonate	5	mg/l $CaCO_3$	SM 2320 B
Alkalinity, Total	5	mg/l $CaCO_3$	SM 2320 B
Aluminum	0.03	mg/l	EPA 200.7
Anions	----	meq/l	----------
Arsenic	.01	mg/l	EPA 200.7
Barium	0.02	mg/l	EPA 200.7
Boron	0.01	mg/l	EPA 200.7
Cadmium	0.001	mg/l	EPA 200.7
Calcium	0.03	mg/l	EPA 200.7
Cations	----	meq/l	----------
Chloride	1	mg/l	EPA 300.0
Chromium	0.001	mg/l	EPA 200.7
Conductivity	---	umhos/cm	SM2510-B
Copper, Drinking Water	0.01	mg/l	EPA 220.1
Copper, Waste Water	0.01	mg/l	EPA 200.7
Fluoride	0.05	mg/l	EPA 300.0
Hardness, Total	----	mg/l $CaCO_3$	SM2340-B
Iron	0.05	mg/l	EPA 200.7
Iron, Dissolved	0.03	mg/l	EPA 200.7
Lead, Drinking Water	0.001	mg/l	EPA 239.2
Lead, Waste Water	0.01	mg/l	EPA 200.7
Magnesium	0.01	mg/l	EPA 200.7
Manganese	0.002	mg/l	EPA 200.7
Mercury	.0002	mg/l	EPA 245.1
Molybdenum	0.005	mg/l	EPA 200.7
Nickel	0.001	mg/l	EPA 200.7
Nitrogen, Ammonia	0.1	mg/l	EPA 350.3
Nitrogen, Nitrate	0.05	mg/l	EPA 300.0
Nitrogen, Nitrite	0.05	mg/l	EPA 300.0
Oil & Grease	2	mg/l	EPA 413.1
Oxygen, Dissolved	----	mg/l	EPA 360.1
pH	----	Units	EPA 150.1
Phosphorus, Ortho	0.05	mg/l	EPA 300.0
Phosphorus, Total	0.05	mg/l	SM 4500P, B & E
Potassium	0.14	mg/l	EPA 200.7
Selenium	0.02	mg/l	EPA 200.7
Silver, Total	0.002	mg/l	EPA 200.7
Sodium	0.01	mg/l	EPA 200.7
Solids, Settleable	0.1	ml/l	EPA 160.5
Solids, Total Dissolved	30	mg/l	EPA 160.1
Solids, Total Suspended	5	mg/l	EPA 160.2
Sulfate	1	mg/l	EPA 300.0
Sulfide	1	mg/l	EPA 376.1
Turbidity	0.1	NTU	EPA 180.1
Zinc, Total	0.004	mg/l	EPA 200.7
Zinc, Dissolved	0.004	mg/l	EPA 200.7

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DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

SURFACE HYDROLOGY - OPERATIONAL SAMPLING (Table 1)

Drainage System	Drainage	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cottonwood Creek Drainage System	*Cottonwood Canyon Creek*	SW1	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		SW2	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		CCC01	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		SW3	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Grimes Wash	GWR01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		GWR02	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		GWR03	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Joes Valley Indian Creek	ICA	Based Flow Monitoring Only (October or November)									Operational		
		ICF	Based Flow Monitoring Only (October or November)									Field		
		ICD	Based Flow Monitoring Only (October or November)									Operational		
		ICB	Based Flow Monitoring Only (October or November)									Operational		
	Straight Canyon	T-19	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
Huntington Drainage System	*Deer Creek*	DCR01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		DCR04	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		DCR06	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Huntington Creek	HCC01	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*
		HCC02			Operational*			Operational*			Operational*			Operational*
		HCC04			Operational*			Operational*			Operational*			Operational*
			* Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report											
	Meetinghouse Canyon	MCH01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Rilda Canyon	RCF1*	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		RCLF1	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCLF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCF3	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		RCW4	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
			* Baseline flow will be measured adjacent to EM-163											
	Mill Fork Canyon	MFA01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		MFB02	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		MFU03	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational

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GROUNDWATER HYDROLOGY - OPERATIONAL SAMPLING (Table 2)

Groundwater Type			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Springs	*East Mountain*	*(Includes Mill Fork Springs)*							Operational	Flow *	Flow *	Operational		
										* Recession Springs				
	East Mountain-Rilda Canyon		Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Trail Mountain								Operational	Flow	Flow	Operational		
	Oliphant	T-18			Operational			Operational			Operational			Operational
In-Mine	*Cottonwood*				Operational			Operational			Operational			Operational
	Deer Creek				Operational			Operational			Operational			Operational
	Trail Mountain				Operational			Operational			Operational			Operational
Wells	*Cottonwood Waste Rock Well*				Operational			Operational			Operational			Operational
	Cottonwood Canyon Wells		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	(includes Straight Canyon TM-3)													
	Deer Creek Waste Rock Well				Operational			Operational			Operational			Operational
	Deer Creek In-Mine Well				Level			Level			Level			Level
	Rilda Canyon Wells		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	Trail Mountain (TM-1B)		Level	Level	Operational	Level	Level	Operational	Level	Level	Operational	Level	Level	Operational

UPDES SAMPLING - (Table 1)

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mine Water Discharge	*Cottonwood*	TMA	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
		Miller	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Deer Creek	DCD	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Trail Mountain	TMD	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
Sediment Pond Discharge	*Cottonwood*	2 Outfalls	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Deer Creek	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Des-Bee-Dove	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Trail Mtn	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational

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DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

SURFACE HYDROLOGY - BASELINE SAMPLING (Table 1) - 2006

Drainage System	Drainage	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cottonwood Creek Drainage System	*Cottonwood Canyon Creek*	SW1	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		SW2	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		CCC01	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		SW3	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Grimes Wash	GWR01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		GWR02	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		GWR03	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Joes Valley	ICA	Based Flow Monitoring Only (October or November)									Baseline		
	Indian Creek	ICF	Based Flow Monitoring Only (October or November)									Field		
		ICD	Based Flow Monitoring Only (October or November)									Baseline		
		ICB	Based Flow Monitoring Only (October or November)									Baseline		
	Straight Canyon	T-19	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
Huntington Drainage System	*Deer Creek*	DCR01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		DCR04	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		DCR06	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Huntington Creek	HCC01	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*
		HCC02			Baseline*			Baseline*			Baseline*			Baseline*
		HCC04			Baseline*			Baseline*			Baseline*			Baseline*
			* Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report											
	Meetinghouse Canyon	MCH01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Rilda Canyon	RCF1*	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		RCLF1	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCLF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCF3	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		RCW4	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
			* Baseline flow will be measured adjacent to EM-163											
	Mill Fork Canyon	MFA01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		MFB02	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		MFU03	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline

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DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

GROUNDWATER HYDROLOGY - BASELINE SAMPLING (Table 2) - 2006

Groundwater Type			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Springs	*East Mountain*	*(Includes Mill Fork Springs)*							Baseline	Flow *	Flow *	Baseline		
										* Recession Springs				
	East Mountain-Rilda Canyon		Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Trail Mountain								Baseline	Flow	Flow	Baseline		
	Oliphant	T-18			Baseline			Baseline			Baseline			Baseline
In-Mine	*Cottonwood*				Baseline			Baseline			Baseline			Baseline
	Deer Creek				Baseline			Baseline			Baseline			Baseline
	Trail Mountain				Baseline			Baseline			Baseline			Baseline
Wells	*Cottonwood Waste Rock Well*				Baseline			Baseline			Baseline			Baseline
	Cottonwood Canyon Wells		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	(includes Straight Canyon TM-3)													
	Deer Creek Waste Rock Well				Baseline			Baseline			Baseline			Baseline
	Deer Creek In-Mine Well				Level			Level			Level			Level
	Rilda Canyon Wells		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	Trail Mountain (TM-1B)		Level	Level	Baseline	Level	Level	Baseline	Level	Level	Baseline	Level	Level	Baseline

UPDES SAMPLING - (Table 1)

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mine Water Discharge	*Cottonwood*	TMA	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
		Miller	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Deer Creek	DCD	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Trail Mountain	TMD	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
Sediment Pond Discharge	*Cottonwood*	3 Outfalls	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Deer Creek	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Des-Bee-Dove	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Trail Mtn	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational

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DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

SURFACE HYDROLOGY - RECLAMATION SAMPLING (Table 1)

Drainage System	Drainage	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
*Cottonwood Creek Drainage System**	*Cottonwood Canyon Creek*	SW1			Operational			Operational			Operational			Operational
		SW2			Operational			Operational			Operational			Operational
		CCC01			Field			Field			Field			Field
		SW3			Operational			Operational			Operational			Operational
	Grimes Wash	GWR01			Operational			Operational			Operational			Operational
		GWR02			Operational			Operational			Operational			Operational
		GWR03			Operational			Operational			Operational			Operational
	Joes Valley	ICA	Based Flow Monitoring Only (October or November)									Operational		
	Indian Creek	ICF	Based Flow Monitoring Only (October or November)									Field		
	Indian Creek	ICD	Based Flow Monitoring Only (October or November)									Operational		
		ICB	Based Flow Monitoring Only (October or November)									Operational		
	Straight Canyon	T-19			Operational			Operational			Operational			Operational
*Huntington Drainage System**	*Deer Creek*	DCR01			Operational			Operational			Operational			Operational
		DCR04			Operational			Operational			Operational			Operational
		DCR06			Operational			Operational			Operational			Operational
	Huntington Creek	HCC01			Operational**			Operational**			Operational**			Operational**
		HCC02			Operational**			Operational**			Operational**			Operational**
		HCC04			Operational**			Operational**			Operational**			Operational**
			*** Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report*											
	Meetinghouse Canyon	MCH01			Operational			Operational			Operational			Operational
	Rilda Canyon	RCF1***			Operational			Operational			Operational			Operational
		RCLF1			Field			Field			Field			Field
		RCLF2			Field			Field			Field			Field
		RCF2			Field			Field			Field			Field
		RCF3			Operational			Operational			Operational			Operational
		RCW4			Operational			Operational			Operational			Operational
			*** Baseline flow will be measured adjacent to EM-163*											
	Mill Fork Canyon	MFA01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		MFB02	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		MFU03	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational

** Analyzed for Baseline Parameters During the Fifth (5) and Ninth (9) Year After Final Reclamation*

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DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

In no case will baseline sampling time frame exceed 5 years converting from operational to reclamation monitoring.

GROUNDWATER HYDROLOGY - RECLAMATION SAMPLING (Table 2)

Groundwater Type		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Springs	**East Mountain (Includes Mill Fork Springs)**							Operational			Operational		
	Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
	East Mountain-Rilda Canyon	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Rilda Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
	Trail Mountain							Operational			Operational		
	Oliphant T-18			Operational			Operational			Operational			Operational
	Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
In-Mine	**Deer Creek/Cottonwood/Trail Mtn. samples will be collected and analyzed quarterly until the mine is sealed or the sites become inaccessible**												
	Oliphant Mine discharge monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
Wells	**Cottonwood Waste Rock Well**			Operational			Operational			Operational			Operational
	Cottonwood Waste Rock Well will sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing												
	Cottonwood Canyon Wells*	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	(includes Straight Canyon TM-3)												
	Cottonwood Canyon well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
	Deer Creek Waste Rock Well			Operational			Operational			Operational			Operational
	Deer Creek Waste Rock Well will sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing												
	Rilda Canyon Wells*	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	Rilda Canyon well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
	Trail Mountain (TM-1B)	Level	Level	Operational	Level	Level	Operational	Level	Level	Operational	Level	Level	Operational
	TM-1B well will sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing												
	** Monitored monthly subject ot access*												

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UPDES SAMPLING - (Table 1)

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
*Mine Water Discharge***	*Cottonwood*	TMA	As Needed Basis According to UPDES Permit Stipulations											
		Miller	As Needed Basis According to UPDES Permit Stipulations											
	Deer Creek	DCD	As Needed Basis According to UPDES Permit Stipulations											
	Trail Mountain	TMD	As Needed Basis According to UPDES Permit Stipulations											
	***** After Portal Sealing, PacifiCorp Will Monitor Down Dip For Development Of Groundwater Seeps/Springs Until Bond Release***													
Sediment Pond Discharge	*Cottonwood*	2 Outfalls	As Needed Basis According to UPDES Permit Stipulations											
	Deer Creek	1 Outfall	As Needed Basis According to UPDES Permit Stipulations											
	Des-Bee-Dove	1 Outfall	As Needed Basis According to UPDES Permit Stipulations											
	Trail Mtn	1 Outfall	As Needed Basis According to UPDES Permit Stipulations											

Map HM-5 to be completed with Annual Subsidence Report

(Scheduled 9/30/08)