

May 3, 2013

Electronically Submitted

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 Volume 9, Appendix A to Reduce the Hydrologic Monitoring Program for Sites Within and Outside Mine Permit Boundaries, PacifiCorp, Wilberg/Cottonwood Mine C/015/0019, Deer Creek Mine C/015/0018, 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 amendment to amend Volume 9, Hydrologic Volume, Appendix A to reduce the water monitoring responsibilities as outlined in the hydrologic monitoring program.

Energy West proposes to reduce the mine’s hydrologic monitoring by eliminating sites that are either 1) outside of its current mine permit boundaries, 2) outside its current federal coal lease boundaries, 3) in areas that have been mined and are not planned for future underground mining operations, or 4) those areas that are considered to have no economic value because of either poor coal quality or problematic mining conditions.

Energy West also proposes to suspend monitoring of certain sites where mining operations have been ceased. In 2001, Energy West placed both the Wilberg/Cottonwood and Trail Mountain mines into a temporary cessation status. Both mines may have potential for mining operations in the future; however, neither operation is active at this time. A list of the sites to be suspended is given in the Summary List tables.

To justify removal from the monitoring program, Energy West has detailed pertinent information for each proposed site to be removed. Much of the information was retrieved from the current Supplemental Volume 1 – “Lease Relinquishment; Phase’s I, II, and III”, or “Partial Lease Relinquishment, Federal Coal Lease UTU-64375 January 9, 2009”. Justification for removal is outlined by mine (i.e. Wilberg/Cottonwood, Deer Creek, etc.). First, tables (Summary List) are presented that show which sites are proposed to be removed, suspended, or continued to be monitored. For those sites to be removed from the monitoring, its general information is presented which includes location description, lease association, subsidence monitoring results, water quality and quantity data, and a justification for removal statement. Water Quality data is presented giving (in most cases) pre- and post-mining water quality, and historic water quality. A subsidence profile (copied from the Annual Subsidence Report) is also included to show the maximum subsidence that has occurred within the area of the site, if applicable. And lastly, a map illustrates the physical location of each site on both East and Trail mountains.

In 2002, Energy West submitted and received approval (by DOGM) to include in its Mining and Reclamation Plan its “Volume 1 – Lease Relinquishment, Phase’s I, II, and III.” This volume is a collection of information to support lease relinquishment and the issue of “substantial completeness” as it pertains to areas of mining-induced subsidence. Lease-specific information supplied to regulatory agencies (surface ownership, United States Forest Service, Bureau of Land Management) contains the disposition of subsided areas with descriptions of hydrologic and vegetative impacts, if any. Subsidence

monitoring contains several years of a collection of both aerial photogrammetric and conventional surveying information. From this information, the determination was made that mining-induced subsidence had reached its predicted value and was considered "substantially complete" with no significant or irreparable damage to the environment, inclusive of the hydrology, vegetation, wildlife and other land uses. The BLM accepted this information and approved all three phases of relinquishment in April and October of 1992, April 1997, and again in 2009. Energy West included all the information associated with the phased relinquishment into the State mining and reclamation permit which was approved for addition in November 2002. The BLM also approved the partial relinquishment of lease UTU-64375 and UTU-49332 within the Trail Mountain LMU in January 2009. The map provided with this submittal shows all federal coal leases previously approved for relinquishment.

Also include with this submittal is the amended Volume 9, Appendix A. Sites that are proposed for removal are "~~struck out~~". Those sites proposed for suspension are noted in bold "**(Suspend)**".

The required C1/C2 forms are also included with this submittal. If you have any questions concerning this action, please contact Dennis Oakley at 435-687-4825.

Sincerely,



Kenneth Fleck

Geology and Environmental Affairs Manager

Cc: file

# APPLICATION FOR COAL PERMIT PROCESSING

Permit Change  New Permit  Renewal  Exploration  Bond Release  Transfer

Permittee: PacifiCorp

Mine: Wilberg/Cottonwood, Deer Creek, Des Bee Dove, & Trail Mtn Mines Permit Number: C/015/0019, etc.

Title: Amendment to Volume 9, Appendix A to Reduce the Hydrologic Monitoring Program for Sites Within and Outside Mine Permit Boundaries, PacifiCorp, Wilberg/Cottonwood Mine C/015/0019, Deer Creek Mine C/015/0018, 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

Kenneth S. Fleck  
Sign Name, Position, Date

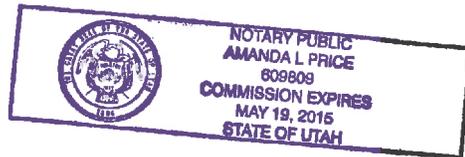
Manager of Environmental Affairs MAY 2, 2013

Subscribed and sworn to before me this 2 day of May, 20 13

Amanda L Price  
Notary Public

My commission Expires:

Attest: State of Utah, 20 15 } ss:  
County of Emery



<b>For Office Use Only:</b>	<b>Assigned Tracking Number:</b>	<b>Received by Oil, Gas &amp; Mining</b>
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Form DOGM- C1 (Revised March 12, 2002)



**PACIFICORP**  
**ENERGY WEST**  
HYDROLOGIC MONITORING PROGRAM  
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE,  
and TRAIL MOUNTAIN MINES

**I. MONITORING LOCATIONS**

**A. Surface Water Hydrology** (for maps 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).

Note that the Wilberg/Cottonwood and Trail Mountain mines have been in cessation since 2001. Until the future disposition of each mine is determined, monitoring of certain site locations will be suspended as of June 2013. Suspended site locations are identified by the use of the note (SUSPEND) after the site name. If the mine is reactivated, monitoring of the associated sites will be reinitiated as of the date of the reactivation date of the mine.

**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 **(SUSPEND)**  
(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 **(SUSPEND)**  
(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: **(SUSPEND)**  
(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.

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- (4) SW-3 - Below Trail Mtn. Mine **(SUSPEND)**  
(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.
  
- 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: **(SUSPEND)**  
(Approximately 1500 feet upstream of 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: **(SUSPEND)**  
(Approximately 50 feet upstream of 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: **(SUSPEND)**  
(Approximately 500 feet downstream of 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

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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.
- (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) 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)

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- (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.
  - (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 6, 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)
- (1) MHC01 - Meetinghouse Canyon South Fork  
(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.

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- (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 NEWUSSD springs: 2500 feet South, 400 feet West of the Northeast corner of Section 29, Township 16 South, Range 7 East.
  - (5) RCF3 - Rilda Canyon - Below NEWUSSD 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.

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3. **Reclamation Monitoring:** Following final reclamation, backfilling and grading monitoring will be conducted at points immediately above and below the reclaimed site.

**B. Groundwater Hydrology**

Note that the Wilberg/Cottonwood and Trail Mountain mines have been in cessation since 2001. Until the future disposition of each mine is determined, monitoring of certain site locations will be suspended as of June 2013. Suspended site locations are identified by the use of the note **(SUSPEND)** after the site name. If the mine is reactivated, monitoring of the associated sites will be reinitiated as of the date of the reactivation date of the mine.

**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 <sup>1</sup> *	80-43
Sheba Springs *	80-44*
Fed's Tub	80-46*
79-2	80-47
79-10 *	80-48 <b>(SUSPEND)</b>
79-15-	80-50
79-23 *	82-51
79-24-	82-52*
79-26 *	84-56*
79-28 (Flag Lake) <b>(SUSPEND)</b>	89-60(Alpine Spring)
79-29 *	89-61 <sup>1</sup>
79-32-	89-65 <b>(SUSPEND)</b>
79-34	89-66 <b>(SUSPEND)</b>
79-35 *	89-67 <b>(SUSPEND)</b>
79-38	89-68 <b>(SUSPEND)</b>
79-40	Rilda Canyon-(Meters 2&3) <sup>2</sup> <sup>1</sup>

\* Recession Study Springs (Flow August & September)

<sup>1</sup> -Developed by NEWUSSD in 2009

<sup>2</sup> <sup>1</sup> -NEWUSSD controls Rilda Canyon meters. Monitoring will be conducted when meters are functioning.

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2. **Trail Mountain Springs** (refer to Trail Mountain Mine Permit Volume 3 Plate 7-1)

T-6	T-14 <b>(SUSPEND)</b>
T-8	T-15
T-9	T-16
T-10 <b>(SUSPEND)</b>	T-18 (Elephant Mine Discharge)

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	

4. **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)*

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EM-31  
CCCW-1A  
CCCW-1S  
CCCW-2A  
CCCW-3A  
CCCW-3S U  
CCCW-3S L

*Trail Mountain (refer to Trail Mountain Mine Permit Volume 3 Plate 7-1)*

TM-1B **(SUSPEND)**  
~~TM-3~~

- b. Underground: In-Mine
  - (1) Deer Creek Mine (Refer to Annual Hydrologic Reports for Locations : Map HM-2)

**5. 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) **In temporary cessation, portals sealed.**
- c. Trail Mountain Mine (Refer to Annual Hydrologic Reports for Locations : PLATE 7-3) **In temporary cessation, portals sealed.**

**6. Waste Rock Wells** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

- a. Deer Creek
- b. Cottonwood

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**C. UPDES Monitoring Locations**

- a. ***Deer Creek Mine***  
UPDES UT0023604  
001- Sediment Pond  
002- Mine Discharge
  
- b. ***Wilberg/Cottonwood Mines***  
UPDES UT0022896  
001- Mine Discharge @ Cottonwood Canyon (TMA)  
003- Sediment Pond @ Mine Facilities  
005- Sediment 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 schedules for operational, baseline, and reclamation monitoring*)

**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 **(SUSPEND)**
- (2) SW-2 **(SUSPEND)**
- (3) CCC01 - USGS Flume **(SUSPEND)**
- (4) SW-3 **(SUSPEND)**

b. Grimes Wash

- (1) GWR01 **(SUSPEND)**
- (2) GWR02 **(SUSPEND)**
- (3) GWR03 **(SUSPEND)**

c. Indian Creek

- (1) ICA
- (2) ICF
- (3) ICD
- (4) ICB

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d. ~~Straight Canyon~~

(1) ~~T 19 (Unnamed Side Drainage)~~

**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:

- (1) 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

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**Groundwater Monitoring**

1. East Mountain Springs (see monitoring location list I.B.1)
2. Trail Mountain Springs (see monitoring location list I.B.2)
3. East Mountain Springs - Mill Fork Area (see monitoring location list I.B.3)

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: Elephant Mine Discharge will be collected and analyzed quarterly.~~ Rilda Canyon Springs - (NEWUSSD: Meters 2 & 3; when functioning) will be field monitored monthly depending upon access.

4. 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.

5. 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

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(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 **(SUSPEND)**  
~~TM-3~~

6. Waste Rock Wells
  - a. Deer Creek
  - b. Cottonwood

**UPDES Monitoring**

1. Deer Creek
2. Wilberg/Cottonwood
3. Trail Mountain

UPDES sites will be monitored as specified in the individual permits.

**Reclamation Monitoring**

Surface Water Resources: (see enclosed summary of operational, baseline, and reclamation monitoring schedules)

Surface monitoring locations will be field monitored monthly for flow and all field parameters quarterly until bond release.

Ground Water Resources: (see enclosed summary of operational, baseline, and reclamation monitoring schedules)

Springs East/Trail Mountain Springs will be field monitored during the months of July and October.

Rilda Canyon Springs (NEWUSSD: Meters 2 & 3; when functioning) will be field monitored monthly for flow depending upon access. East/Trail Mountain Springs (including Rilda

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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 **(SUSPEND)**: will be field monitored for level only on a quarterly basis. Monitoring will be conducted until sealing during final reclamation.

UPDES: Sites will be monitored as specified in the individual permits

**B. Quality Sampling** (Laboratory Measurements)

a. **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-Surface Water Quality Parameter List). 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 there-after.

a. **Cottonwood Creek Drainage**

(1) Cottonwood Canyon Creek

(a) SW-1 **(SUSPEND)**

(b) SW-2 **(SUSPEND)**

(c) SW-3 **(SUSPEND)**

(2) Grimes Wash

(a) GWR01 **(SUSPEND)**

(b) GWR02 **(SUSPEND)**

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and TRAIL MOUNTAIN MINES

(c) GWR03 **(SUSPEND)**

(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:

(a) MCH01

(5) Rilda Canyon

- (a) RCF1
- (b) RCF3
- (c) RCW4

(6) Mill Fork Canyon

- (a) MFA01
- (b) MFB02

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(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-Surface Water Quality Parameter List). Sampling will be conducted on a quarterly basis until bond release. Baseline analysis will be performed on the 5<sup>th</sup> and 9<sup>th</sup> 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 (NEWUSSD: Meters 2 & 3; when functioning) 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-Ground Water Quality Parameter List).
- 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-Ground Water Quality Parameter List).
- c. Wells: TM-1B will be sampled quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).
- 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-Ground Water Quality Parameter List).

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

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(NEWUSSD: Meters 2 & 3; when functioning) will be monitored quarterly for quality. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List). East/Trail Mountain Springs (including Rilda Springs and ~~T-18 [Elephant 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-Ground Water Quality Parameter List).
- c. Wells: Well TM-1B will be sealed during final reclamation. Quarterly sampling will continue until sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).
- d. Waste Rock Wells: Waste rock wells will be sealed during final 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-Ground Water Quality Parameter List).
- 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-Ground Water Quality Parameter List). Baseline analysis will be performed on the 5<sup>th</sup> and 9<sup>th</sup> year.

**3. UPDES Monitoring Sites**

- a. Deer Creek Mine
- b. Wilberg/Cottonwood Mines
- c. Trail Mountain Mine

UPDES sites will be monitored as specified in the individual permits.

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and TRAIL MOUNTAIN MINES

***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 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.

OPB = Outside Permit Boundaries  
 CCC = Cottonwood Canyon Creek  
 DC = Deer Creek  
 MF = Mill Fork  
 RC = Rilda Creek  
 HU = Huntington Creek  
 MHC = Meetinghouse Creek  
 GW = Grimes Wash  
 ST = Straight Canyon  
 IC = Indian Creek

#	Monitoring Site	Mine	Location (Section)	Location (Twnshp/Rng)	Within Relinquished Area? (Y/N)	Lease #	Type	Stratigraphic Structure/Water Body Influence	Continue (C) Suspend (S) Remove (R)	Remarks
91	UT0022896-001	CTW	25	T17S, R6E	N	LDS Fee	UPDES	CCC	C	Mine in cessation since 2001 - active discharge
92	UT0022896-003	CTW	27	T17S, R7E	N	U-044025	UPDES	GW	C	Mine in cessation since 2001
94	UT0022896-005	CTW	34	T17S, R7E	N	ROW: UTU-65027	UPDES	Ephemeral Drainage	C	Mine in cessation since 2001
28	80-50	DC	29	T16S, R7E	N	U-06039	Spring	Blackhawk Form.	C	
64	DCR01	DC	10	T17S, R7E	N	McKinnon Fee	Surface	DC	C	
65	DCR04	DC	2	T17S, R7E	N	SULA #1382	Surface	DC	C	
66	DCR06	DC	36	T16S, R7E	OPB	No Lease Assoc.	Surface	DC	C	
40	EM-216	DC	22	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
41	EMPOND	DC	23	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
42	Grants Spring	DC	23	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
70	HCC01	DC	36	T16S, R7E	OPB	No Lease Assoc.	Surface	HU	C	
71	HCC02	DC	36	T16S, R7E	OPB	No Lease Assoc.	Surface	HU	C	
72	HCC03	DC	6	T17S, R8E	OPB	No Lease Assoc.	Surface	HU	C	
73	HCC04	DC	5	T17S, R8E	OPB	No Lease Assoc.	Surface	HU	C	
43	ICA	DC	3	T16S, R6E	OPB	No Lease Assoc.	Surface	IC	C	
74	ICB	DC	16	T16S, R6E	OPB	No Lease Assoc.	Surface	IC	C	
75	ICD	DC	15	T16S, R6E	OPB	No Lease Assoc.	Surface	IC	C	
76	ICF	DC	10	T16S, R6E	OPB	No Lease Assoc.	Surface	IC	C	
44	JV-34	DC	15	T16S, R6E	OPB	No Lease Assoc.	Spring	Joes Valley Alluvium	C	
45	JV-9	DC	22	T16S, R6E	OPB	No Lease Assoc.	Spring	Joes Valley Alluvium	C	
46	Little Bear	DC	8	T16S, R7E	OPB	No Lease Assoc.	Spring	Star Point Form.	C	
47	MF-19B	DC	13	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
48	MF-213	DC	17	T16S, R7E	OPB	No Lease Assoc.	Spring	Blackhawk Form.	C	
49	MF-219	DC	11	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
50	MF-7	DC	13	T16S, R6E	N	UTU-88554	Spring	Blackhawk Form.	C	
77	MFA01	DC	20	T16S, R7E	OPB	No Lease Assoc.	Surface	MFC	C	
78	MFB02	DC	22	T16S, R7E	OPB	No Lease Assoc.	Surface	MFC	C	
51	MFR-10	DC	12	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
52	MFR-30	DC	7	T16S, R7E	N	UTU-88554	Spring	Price River Form.	C	
53	MFU03	DC	17	T16S, R7E	OPB	No Lease Assoc.	Surface	MFC	C	
79	MHC01	DC	35	T16S, R7E	OPB	No Lease Assoc.	Surface	MFC	C	
105	P-1	DC	28	T16S, R7E	N	U-2810	Well	Alluvial	C	
106	P-5	DC	28	T16S, R7E	N	U-051221	Well	Alluvial	C	
107	P-6	DC	29	T16S, R7E	N	U-06039	Well	Alluvial	C	
108	P-7	DC	29	T16S, R7E	N	U-06039	Well	Alluvial	C	
80	RCF1	DC	30	T16S, R7E	N	U-06039	Surface	RC	C	
81	RCF2	DC	29	T16S, R7E	N	U-06039	Surface	RC	C	
82	RCF3	DC	28	T16S, R7E	N	U-051221	Surface	RC	C	
83	RCLF1	DC	29	T16S, R7E	N	U-06039	Surface	RC	C	

CONTINUED SITES

#	Monitoring Site	Mine	Location (Section)	Location (Twnshp/Rng)	Within Relinquished Area? (Y/N)	Lease #	Type	Stratigraphic Structure/Water Body Influence	Continue (C) Suspend (S) Remove (R)	Remarks
84	RCLF2	DC	29	T16S, R7E	N	U-06039	Surface	RC	C	
85	RCW4	DC	22	T16S, R7E	OPB	No Lease Assoc.	Surface	RC	C	
54	RR-15	DC	23	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
55	RR-23A	DC	22	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
56	RR-5	DC	14	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
58	SP1-26	DC	11	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
59	SP1-29	DC	11	T16S, R6E	N	UTU-88554	Spring	North Horn Form.	C	
61	UJV101	DC	10	T16S, R6E	N	U-84285	Spring	Castle Gate Form.	C	
62	UJV-206	DC	22	T16S, R6E	N	UTU-88554	Spring	Price River Form.	C	
63	UJV-213	DC	10	T16S, R6E	N	U-84285	Spring	Castle Gate Form.	C	
95	UT-0023604-001	DC	11	T17S, R7E	N	McKinnon Fee	UPDES	DC	C	
96	UT-0023604-002	DC	10	T17S, R7E	N	McKinnon Fee	UPDES	DC	C	
57	Sheba Spring	DC	7	T17S, R7E	N	U-084924	Spring	Flagstaff Form.	C	Monitored by CVSSD
101	CCCW-2A	DC	11	T17S, R6E	OPB	ML-51191	Well	Mill Fork Fault	C	Controlled by Fossil Rock Fuels
102	CCCW-3A	DC	2	T17S, R6E	OPB	ML-51191	Well		C	Controlled by Fossil Rock Fuels
103	CCCW-3S	DC	2	T17S, R6E	OPB	ML-51191	Well		C	Controlled by Fossil Rock Fuels
110	EM-47	DC	29	T17S, R7E	N	U-06039	Well		C	
99	CCCW-1A	DC/CTW	14	T17S, R6E	OPB	ML-51191	Well	Roan Cyn Fault	C	Controlled by Fossil Rock Fuels
100	CCCW-1S	DC/CTW	14	T17S, R6E	OPB	ML-51191	Well	Roan Cyn Fault	C	Controlled by Fossil Rock Fuels
104	EM-31	DC/CTW	24	T17S, R6E	N	U-083066	Well		C	
97	UT040003-001	TM	25	T17S, R6E	N	PacifiCorp Fee	UPDES	CCC	C	Mine in cessation since 2001
98	UT040003-002	TM	25	T17S, R6E	N	PacifiCorp Fee	UPDES	CCC	C	Mine in cessation since 2001

CONTINUED SITES

OPB = Outside Permit Boundaries  
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 RC = Rilda Creek  
 HU = Huntington Creek  
 MHC = Meetinghouse Creek  
 GW = Grimes Wash  
 ST = Straight Canyon  
 IC = Indian Creek

DOGM Database #	Monitoring Site	Mine	Location (Section)	Location (Twnshp/Rng)	Within Relinquished Area? (Y/N)	Lease #	Relinquishment Date	Date Mined (Blind Canyon)*	Date Mined (Hiawatha)*	Type	Stratigraphic Structure/Water Body Influence	Continue (C) Suspend (S) Remove (R)	Remarks
31	84-56	CTW	28	T17S, R7E	Y	U-47978	Apr-92			Spring	North Horn Form.	R	No legal right of entry into area
29	82-51	DBD	26	T17S, R7E	N	U-02664	Dec-06	1980 (1st) 1986 (2nd)		Spring	Price River Form.	R	DBD Mine reclaimed
9	79-10	DC	12	T17S, R6E	N	U-084924		No Mining	No Mining	Spring	North Horn Form.	R	Sheba being retained and located 1907' N and 1333' E of 79-10
10	79-15	DC	8	T17S, R7E	Y	U-02664	Apr-92	1975 (1st)		Spring	North Horn Form.	R	No legal right of entry into area
12	79-23	DC	15	T17S, R7E	N	U-040151		1974-1975 (1st)	1981-1982 (1st)	Spring	North Horn Form.	R	Area mined out. No future mining proposed
13	79-24	DC	15	T17S, R7E	N	U-040151		1974-1975 (1st)	1981-1982 (1st)	Spring	Price River Form.	R	Area mined out. No future mining proposed
16	79-29	DC	18	T17S, R7E	N	U-084923		1991 (1st) 1992 (2nd)		Spring	North Horn Form.	R	Located far southern end of DC on border of relinquished lease U-084923
18	79-34	DC	8	T17S, R7E	Y	U-02664	Apr-92	1974 (1st) 1990 (1st)		Spring	North Horn Form.	R	No legal right of entry into area
19	79-35	DC	8	T17S, R7E	Y	U-02664	Apr-92	1990 (2nd)		Spring	Flagstaff Form.	R	No legal right of entry into area
30	82-52	DC	15	T17S, R7E	N	SL-070645/U-02292		1975 (1st)	1982 (1st)	Spring	Price River Form.	R	Located far southern end of DC - 1st mining only - No future mining planned
33	89-61	DC	5	T17S, R7E	N	U-084923		No Mining	No Mining	Spring	North Horn Form.	R	developed spring NEWUSSD - Mining to the east of spring
38	Burnt Tree	DC	16	T17S, R7E	Y	U-040151	Apr-97	1987 (2nd)	1993 (2nd)	Spring	North Horn Form.	R	No legal right of entry into area
39	Elk Spring	DC	5	T17S, R7E	N	U-084923		No Mining	No Mining	Spring	North Horn Form.	R	developed spring NEWUSSD - Mining to the east of spring
60	Ted's Tub	DC	17	T17S, R7E	Y	U-083066	Apr-97	1988 (2nd) 1988-1991 (2nd)	1993 (2nd)	Spring	North Horn Form.	R	No legal right of entry into area
20	79-38	DC/CTW	16	T17S, R7E	Y	U-040151	Apr-92	1988-1991 (2nd)	1992 (2nd)	Spring	North Horn Form.	R	No legal right of entry into area
32	89-60	DC/CTW	16	T17S, R7E	Y	SL-070645/U-02292	Apr-92	1988-1991 (2nd)	1992 (2nd)	Spring	Price River Form.	R	No legal right of entry into area
11	79-2	DC/CTW	21	T17S, R7E	N	U-040151		1982-1986 (2nd)	1994 (1st) 1995 (2nd)	Spring	North Horn Form.	R	Area mined out. No future mining proposed
21	79-40	DC/CTW	21	T17S, R7E	N	U-040151		1982-1986 (2nd)	1994 (1st) 1995 (2nd)	Spring	Price River Form.	R	Area mined out. No future mining proposed
22	80-41	DC/CTW	21	T17S, R7E	N	U-040151		1982-1986 (2nd)	1994 (1st) 1995 (2nd)	Spring	Price River Form.	R	Area mined out. No future mining proposed
23	80-43	DC/CTW	20	T17S, R7E	N	U-040151		1982-1986 (2nd)	1994 (1st) 1995 (2nd)	Spring	North Horn Form.	R	Area mined out. No future mining proposed
24	80-44	DC/CTW	21	T17S, R7E	N	U-040151		1982-1986 (2nd)	1995 (1st) 1996 (2nd)	Spring	Price River Form.	R	Area mined out. No future mining proposed
25	80-46	DC/CTW	21	T17S, R7E	N	U-040151			1980 (1st) 1983 (2nd)	Spring	North Horn Form.	R	Area mined out. No future mining proposed
26	80-47	DC/CTW	21	T17S, R7E	N	U-040151			1977 (1st)	Spring	North Horn Form.	R	Area mined out. No future mining proposed
111	TM-3	TM	3	T18S, R6E	OPB	No Lease Assoc.				Well	ST	C	Monitor until well reaches pre-mining level. Remove at that point.
1	17-21-1 (T-8)	TM	21	T17S, R6E	OPB	ML-51191				Spring	North Horn Form.	R	Controlled by Fossil Rock Fuels
2	17-22-1 (T-9)	TM	22	T17S, R6E	OPB	ML-51191				Spring	North Horn Form.	R	Controlled by Fossil Rock Fuels
5	17-35-1 (T-15)	TM	35	T17S, R6E	Y	UTU-64375	Sep-10		1998 (1st) 2000 (2nd)	Spring	North Horn Form.	R	No legal right of entry into area
6	17-35-2 (T-16)	TM	35	T17S, R6E	Y	UTU-64375	Sep-10			Spring	North Horn Form.	R	No legal right of entry into area - No flow data ever recorded
89	T-19	TM	3	T18S, R6E	OPB	No Lease Assoc.				Surface		S	
7	18-1-1 (T-18)	TM	11	T18S, R6E	OPB	No Lease Assoc.				Spring	North Horn Form.	R	Oliphant Mine Discharge
14	79-26	CTW	17	T17S, R7E	N	U-083066		No Mine Workings	No Mine Workings	Spring	North Horn Form.	S	
17	79-32	CTW	19	T17S, R7E	N	U-083066		No Mine Workings	No Mine Workings	Spring	Base of Flagstaff Form.	S	
8	18-2-1 (T-6)	TM	2	T18S, R6E	Y	UTU-64375	Sep-10		1996 (1st) 1998 (2nd)	Spring	Upper Price River	R	No legal right of entry into area

REMOVED SITES

OPB = Outside Permit Boundaries  
 CCC = Cottonwood Canyon Creek  
 DC = Deer Creek  
 MF = Mill Fork  
 RC = Rilda Creek  
 HU = Huntington Creek  
 MHC = Meetinghouse Creek  
 GW = Grimes Wash  
 ST = Straight Canyon  
 IC = Indian Creek

#	Monitoring Site	Mine	Location (Section)	Location (Twnshp/Rng)	Within Relinquished Area? (Y/N)	Lease #	Relinquishment Date	Date Mined (Hiawatha)	Date Mined (Blind Canyon)	Type	Stratigraphic Structure/Water Body Influence	Continue (C) Suspend (S) Remove (R)	Remarks
15	79-28	CTW	20	T17S, R7E	N	U-083066		1979 (1st)		Spring	North Horn Form.	S	Suspend until final disposition of CTW is filed
67	GWR01	CTW	22	T17S, R7E	N	SL-064900				Surface	GW	S	Suspend until disposition of CTW is filed
68	GWR02	CTW	27	T17S, R7E	N	U-040151				Surface	GW	S	Suspend until disposition of CTW is filed
69	GWR03	CTW	27	T17S, R7E	N	USFS SUP				Surface	GW	S	Suspend until disposition of CTW is filed
27	80-48	DC	33	T16S, R7E	N	U-024319				Spring	North Horn Form.	S	Suspend until mining 3rd N B
35	89-66	DC	5	T17S, R7E	N	U-084923				Spring	North Horn Form.	S	Suspend until mining 3rd N B
36	89-67	DC	32	T16S, R7E	N	U-47977				Spring	North Horn Form.	S	Suspend until mining 3rd N B
37	89-68	DC	32	T16S, R7E	N	U-47977				Spring	North Horn Form.	S	Suspend until mining 3rd N B
34	89-65	DC	31	T16S, R7E	Y	U7653	Mar-02			Spring	North Horn Form.	S	Suspend until mining 3rd N B
86	SW-1	DC/CTW	24	T17S, R6E	N	U-083066				Surface	CCC	S	Suspend until reactivation of Trail
87	SW-2	DC/CTW	25	T17S, R6E	N	PacifiCorp Fee				Surface	CCC	S	Suspend until reactivation of Trail
88	SW-3	DC/CTW	6	T18S, R7E	OPB	No Lease Assoc.				Surface	CCC	S	Suspend until reactivation of Trail
90	USGS Flume	DC/CTW	31	T17S, R7E	OPB	No Lease Assoc.				Surface	CCC	S	Suspend until reactivation of Trail
3	17-25-1 (T-14)	TM	25	T17S, R6E	N	U-49332				Spring	North Horn Form.	S	Suspend until reactivation of Trail
4	17-26-4 (T10)	TM	26	T17S, R6E	N	U-49332				Spring	North Horn Form.	S	Suspend until reactivation of Trail
109	TM-1B	TM	25	T17S, R6E	N	PacifiCorp Fee				Well		S	Suspend until reactivation of Trail

SUSPENDED SITES

**Location:** Section 21, Township 17 South, Range 6 East, SLB&M. This site is outside the Trail Mountain mine permit boundary and within the new State Lease ML-51191. The lessee of this lease is PacifiCorp's Fossil Rock Fuel.

**Lease Association:** This site is associated with State Lease ML-51191. There are currently no mining plans available for this lease.

**Subsidence:** None

**Water Data:** Water quality data is included for spring 17-21-1. Data show insignificant variances of quality throughout history. Historic flow data has been collected since 1987 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation of the East Mountain weather station, as well as, the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation.

**Justification for removal from monitoring:** Site 17-21-1 has been monitored by Energy West Mining Company since 1993. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site. This site is not within 1 mile of Trail Mountain mine workings. Therefore, it is requested that the site be removed from the monitoring program.

**Trail Mountain Spring: 17-21-1 (T-8)**  
**Water Quality Data: Operational**  
**Mine Association: Trail Mountain Mine**  
**Date of Development: No mining below spring**

**Notes:**

- Out of Lease Boundary
- Out of Permit Boundary
- Not influence by mining (refer to map)

<b>Historical Data: 1987 - 2011</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	438	302	387.53	51
<b>CALCIUM</b>	70	7	52.936	51
<b>CARBONATE</b>	5	0	1.1769	13
<b>CHLORIDE</b>	43.1	23	30.696	51
<b>CONDUCTIVITY</b>	882	627	717.9	48
<b>DISSOLVED OXYGEN</b>	10.3	2.1	4.7857	14
<b>FLOW</b>	5	0.06	0.7666	46
<b>HARDNESS</b>	272	207	244.33	46
<b>TOTAL IRON</b>	0.34	0	0.0945	22
<b>DISSOLVED IRON</b>	0.23	0	0.0953	19
<b>MAGNESIUM</b>	59	13	27.883	51
<b>DISSOLVED MANGANESE</b>	0	0	0	3
<b>MANGANESE</b>	0.2	0	0.0506	32
<b>OIL AND GREASE</b>				0
<b>PH</b>	8.2	6.54	7.5925	51
<b>POTASSIUM</b>	5	1	2.047	50
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	70.5	12	61.334	51
<b>SULFATE</b>	40	10	17.894	51
<b>SUSPENDED SOLIDS</b>	20	0.5	5.0536	28
<b>TEMPERATURE</b>	55.2	5.8	17.432	26
<b>TOTAL DISSOLVED SOLIDS</b>	496	310	393.96	51

**Location:** Section 22, Township 17 South, Range 6 East, SLB&M. This site is outside the Trail Mountain mine permit boundary and within the new State Lease ML-51191. The lessee of this lease is PacifiCorp's Fossil Rock Fuel.

**Lease Association:** This site is associated with State Lease ML-51191. There are currently no mining plans available for this lease.

**Subsidence:** None

**Water Data:** Water quality data is included for spring 17-22-1. Data show insignificant variances of quality throughout history. Historic flow data has been collected since 1987 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation of the East Mountain weather station, as well as, the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation.

**Justification for removal from monitoring:** Site 17-22-1 has been monitored by Energy West Mining Company since 1993. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site. This site is not within 1/2 mile of Trail Mountain mine workings. Therefore, it is requested that the site be removed from the monitoring program.

**Trail Mountain Spring: 17-22-1 (T-9)**  
**Water Quality Data: Operational**  
**Mine Association: Trail Mountain Mine**  
**Date of Development: No mining below spring**

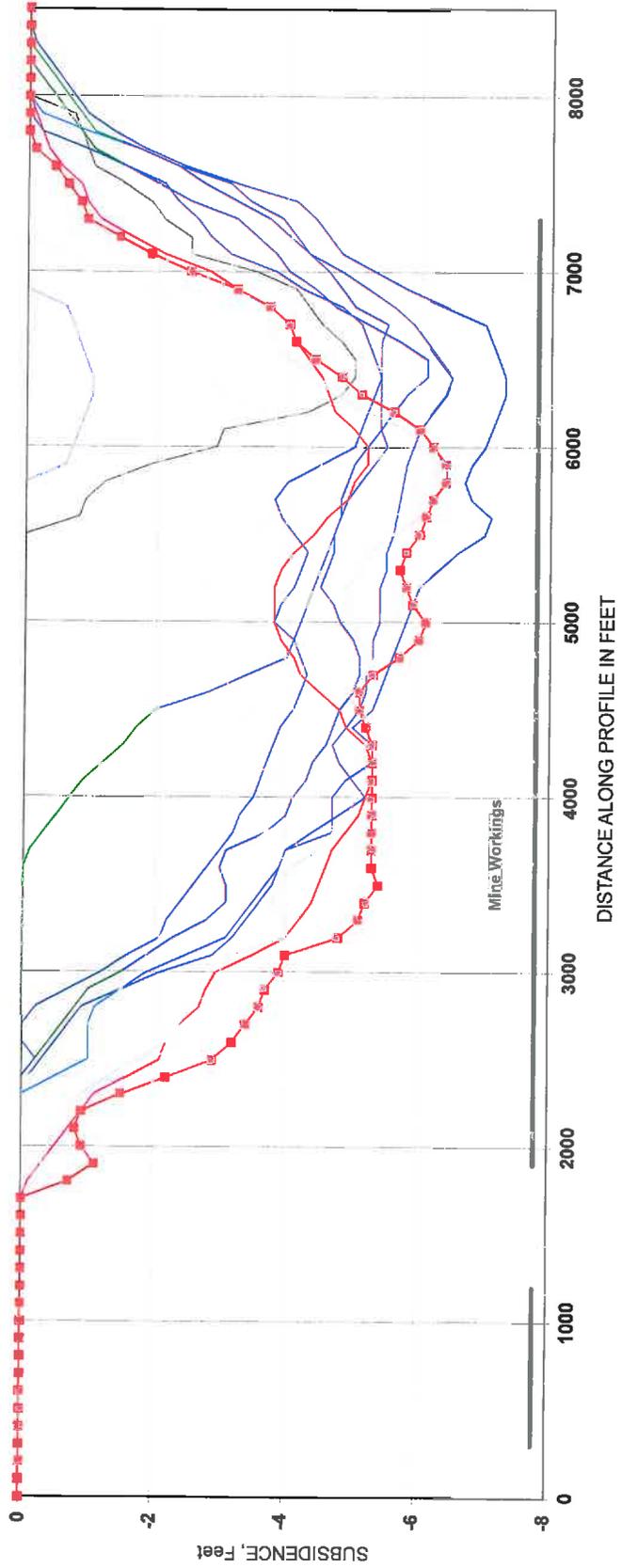
**Notes:**

- Out of Lease Boundary
- Out of Permit Boundary
- Not influence by mining (refer to map)

<b>Historical Data: 1987 - 2012</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	406	222	307.25	65
<b>CALCIUM</b>	107	21	46.282	65
<b>CARBONATE</b>	24.6	0	2.387	23
<b>CHLORIDE</b>	30	6.9	9.7523	65
<b>CONDUCTIVITY</b>	858	435	538.11	62
<b>DISSOLVED OXYGEN</b>	12.2	3.7	7.5467	15
<b>FLOW</b>	40	0.1	6.5046	63
<b>HARDNESS</b>	338	193	255.22	63
<b>TOTAL IRON</b>	1.6	0	0.2892	36
<b>DISSOLVED IRON</b>	0.2	0	0.0721	29
<b>MAGNESIUM</b>	69	11	34.018	65
<b>DISSOLVED MANGANESE</b>	0.053	0	0.016	18
<b>MANGANESE</b>	0.2	0	0.0439	39
<b>OIL AND GREASE</b>				0
<b>PH</b>	8.8	6.92	7.7994	65
<b>POTASSIUM</b>	5	0.05	1.4642	54
<b>SET SOLIDS</b>	0.1	0.1	0.1	1
<b>SODIUM</b>	118.4	12	20.01	65
<b>SULFATE</b>	200	11	17.675	65
<b>SUSPENDED SOLIDS</b>	112	1	22.44	25
<b>TEMPERATURE</b>	46.76	5.5	12.843	43
<b>TOTAL DISSOLVED SOLIDS</b>	420	230	292.54	65

**Energy West 2008 Subsidence Report**  
**Area 24 Subsidence Profile**  
**North - South - Trail Mtn. West Side**

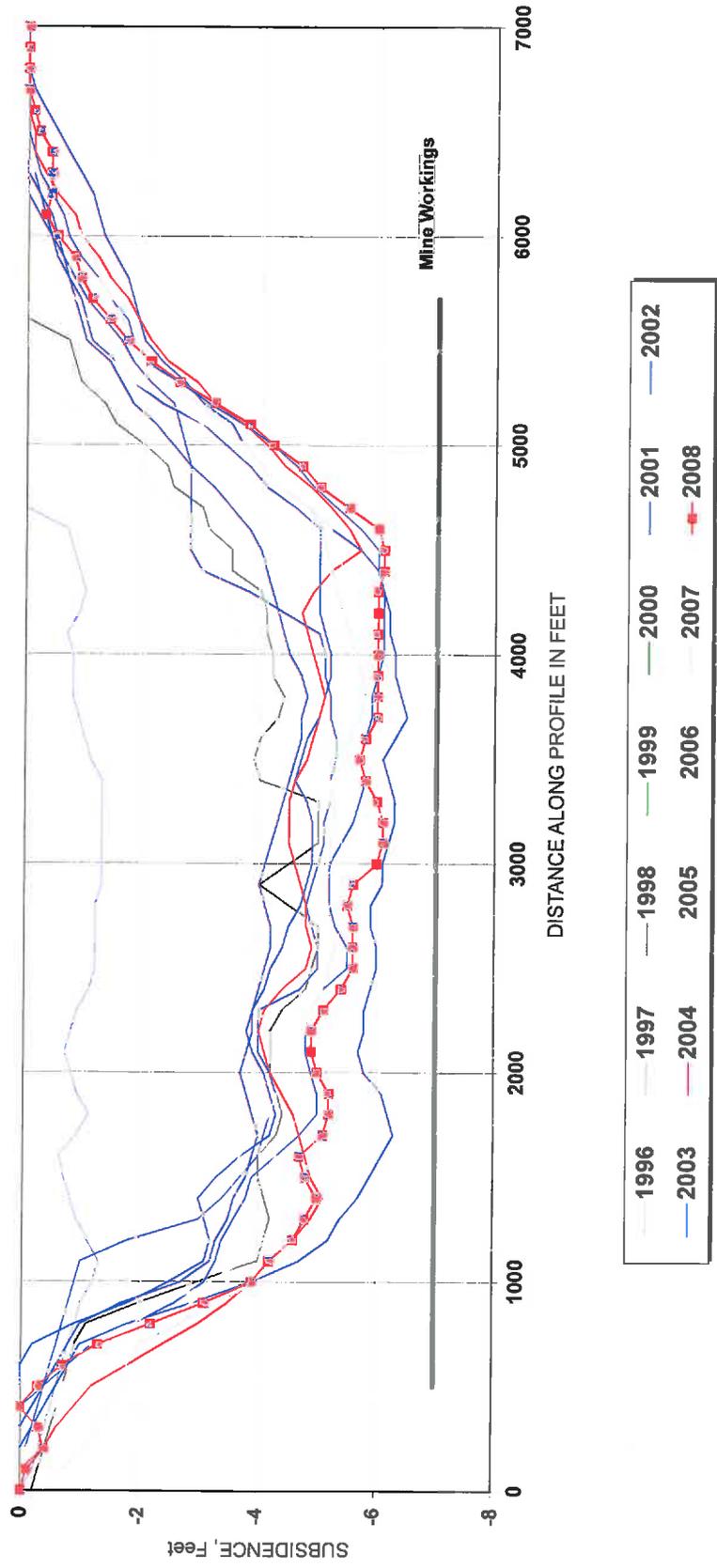
Chart 22

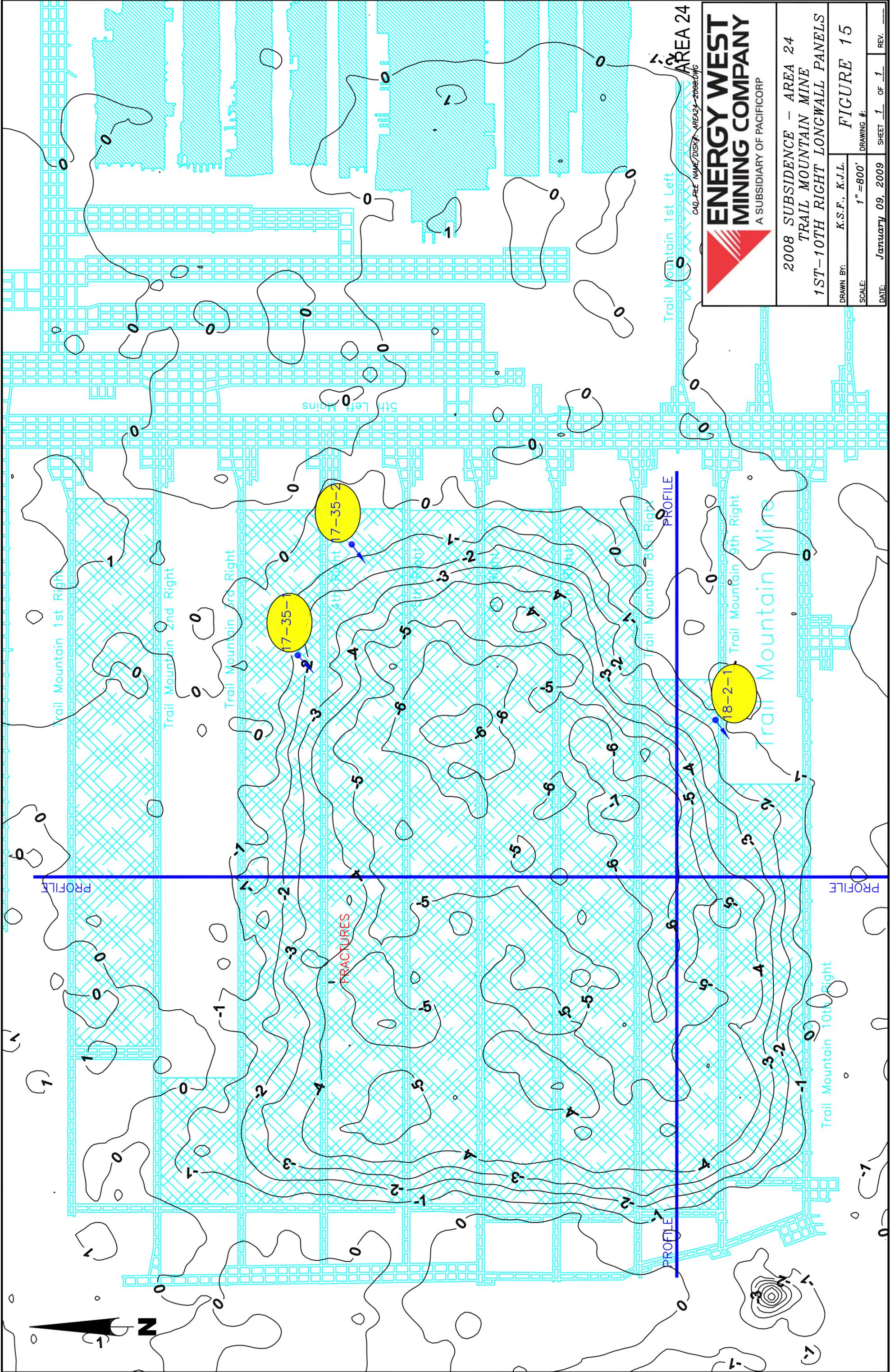


1996	1997	1998	1999	2000	2001	2002
2003	2004	2005	2006	2007	2008	

**Energy West 2008 Subsidence Report**  
**Area 24 Subsidence Profile**  
**West - East - Trail Mtn. West Side**

**Chart 23**





**ENERGY WEST MINING COMPANY**  
A SUBSIDIARY OF PACIFICORP

2008 SUBSIDENCE - AREA 24  
TRAIL MOUNTAIN MINE  
1ST-10TH RIGHT LONGWALL PANELS

DRAWN BY: K.S.F., K.J.L.  
SCALE: 1" = 800'  
DATE: January 09, 2009

CAD FILE NAME/DISK# AREA24-2008.DWG

AREA 24

FIGURE 15  
DRAWING #:  
SHEET 1 OF 1  
REV. \_\_\_\_\_

**Location:** Section 35, Township 17 South, Range 6 East, SLB&M. This site is outside the current Trail Mountain mine permit boundary and outside any federal coal lease.

**Lease Association:** The springs 17-35-1 and 17-35-2 are located within the former Federal lease UTU-64375 which PacifiCorp was the lessee. In 2009, PacifiCorp applied for partial relinquishment of leases UTU-64375 and UTU-49332 (refer to January 5, 2009 application document “Partial Relinquishment, Federal Coal Lease, UTU-64375” and “Partial Relinquishment, Federal Coal Lease, UTU-49332”) as all reserves had been mined and subsidence was substantially complete. The BLM retroactively approved partial relinquishment as of January 9, 2009.

**Subsidence:** Mining in the 5<sup>th</sup> Left Mains occurred in 1990 and 1991 and was conducted by Atlantic Richfield Company (ARCO), Mountain Coal Company, Trail Mountain #9. After the purchase of Trail Mountain Mine by PacifiCorp in 1992, PacifiCorp completed development of the 5<sup>th</sup> Left Mains further to the south and began development of the 1<sup>st</sup> through 5<sup>th</sup> East gateroads beginning in 1995. Development of the 10<sup>th</sup> Right gateroads was started in 1997. Within the area of the springs (within a 1/2 mile diameter), panel development of the 5<sup>th</sup> Right through 2<sup>nd</sup> Right gateroads began in 1998 and 1999. Panel extraction began in 5<sup>th</sup> Right in 1999. The 5<sup>th</sup> Right, 4<sup>th</sup> Right, and 3<sup>rd</sup> Right panels were completely extracted; however, the 2<sup>nd</sup> Right panel was abandoned in 2000 after retreating only 1,200 feet due to poor mining conditions. The 1<sup>st</sup> Right panel was extracted in 2001.

At the completion of panel extraction of the 5<sup>th</sup> Right through 1<sup>st</sup> Right panels, a maximum of 6 feet of subsidence had occurred. However, only approximately 2 feet of subsidence has been reported in the area of the springs.

**Water Data:** As mentioned above, PacifiCorp purchased the Trail Mountain Mine in 1992. Its staff began monitoring the surface and groundwater sites in 1993. PacifiCorp could not verify any quantity or quality data prior to the time of purchase. Therefore, for the purposes of this document, data for Trail Mountain Mine monitoring sites begins in 1993 and extends through 2012. Water quality and quantity data is included for spring 17-35-1. Spring 17-35-2 has never reported flow (refer to flow charts).

Water quality shows little variation between pre-mining and post-mining operations. Flow data however, show a significant reduction in flow from 1997 to 2001. Two explanations are needed

here. First, as illustrated on the Flow vs. Precipitation chart, spring discharge from 17-35-1 closely mimics the Palmer Drought Index between the years 1992 and 2000. Beginning in 1999, the region started experiencing drought conditions. These drought conditions persisted until 2004. Flow had peaked (3.3 gpm) from spring 17-35-1 in 1997. However, flow steadily decreased until it discontinued its flow in 2000. The flow at 17-35-1 never recovered even though the indices indicated a wet cycle beginning again in 2004.

Secondly, during the occurrence of drought conditions between the years 1999 and 2004, the grazing permittee attempted to redevelop this spring and associated trough. Redevelopment activities were conducted in 2000. These activities included installation of a pipeline and refurbishment of the trough. After redevelopment of the spring, there has been no report of discharge from 17-35-1, however, the erosion control contour ditches adjacent to the trough were saturated but allowed no point for measurement. Spring 17-35-2 is located above a small man made pond. This site has no evidence of flow.

**Justification for removal from monitoring:** Sites 17-35-1 and 17-35-2 has been monitored by Energy West Mining Company since 1992. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site. This site is not within the Trail Mountain Mine permit area or federal coal lease. Therefore, it is requested that the site be removed from the monitoring program.

**Trail Mountain Spring: 17-35-1 (T-15)**  
**Water Quality Data: Operational**  
**Mine Association: Trail Mountain Mine**  
**Date of Development: Hiawatha Seam: 1998**  
**Date of Second Mining: Hiawatha Seam: 1999-2000**

**Notes:**

- Cattlemen permittees attempted to redevelop spring in 2000
- Spring has not produced flow since 2001
- Pre-mining data includes data collected prior to Energy West

Historical Data: 1992 - 2012					Pre-Mining Data: -1998			
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS
BICARBONATE	438	206	384.48	23	441	206	384.63	40
CALCIUM	56.1	30.8	41.75	23	56.1	27	41.66	40
CARBONATE	5	0.1	1.53	10	18.3	0.1	5.71	18
CHLORIDE	56	20.3	41.1	23	59	20.3	42.43	40
CONDUCTIVITY	841	686	776.61	23	970	508	766.16	37
DISSOLVED OXYGEN	11.9	4.4	7.54	14	11.9	4.4	7.54	14
FLOW	5	0.33	1.37	23	5	0.16	1.02	36
HARDNESS	255	180	235.04	23	297	180	251.94	36
TOTAL IRON	1.3	0.1	0.32	9	6.5	0.04	0.67	21
DISSOLVED IRON	0.02	0.06	0.14	10	4.74	0.05	0.48	18
MAGNESIUM	36	24.4	31.69	23	55	24.4	36.49	40
DISSOLVED MANGANESE				0				0
MANGANESE	0.2	0.02	0.1	13	0.46	0.01	0.08	33
OIL AND GREASE				0				0
PH	8.24	7.24	7.82	23	8.75	7.24	7.99	40
POTASSIUM	5	0.78	1.76	17	5	0.51	1.58	34
SET SOLIDS				0				0
SODIUM	96	67	84.34	23	97.2	12	77.09	40
SULFATE	85	32	48.69	23	85	10.3	45.25	40
SUSPENDED SOLIDS	29	1	5.85	13	488	1	66.11	28
TEMPERATURE	55.6	7.6	24.19	16	55.6	8.2	27.19	13
TOTAL DISSOLVED SOLIDS	520	310	448.09	23	520	200	438.68	40

**Trail Mountain Spring: 17-35-2 (T-16)**  
**Water Quality Data: Operational\***  
**Mine Association: Trail Mountain Mine**  
**Date of Development: Hiawatha Seam: 1998**  
**Date of Second Mining: Hiawatha Seam: 2000**

Historical Data: 1978 - 2012		No Flow Reported		
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS
BICARBONATE				
CALCIUM				
CARBONATE				
CHLORIDE				
CONDUCTIVITY				
DISSOLVED OXYGEN				
FLOW	Damp	Dry		
HARDNESS				
TOTAL IRON				
DISSOLVED IRON				
MAGNESIUM				
DISSOLVED MANGANESE				
MANGANESE				
OIL AND GREASE				
PH				
POTASSIUM				
SET SOLIDS				
SODIUM				
SULFATE				
SUSPENDED SOLIDS				
TEMPERATURE				
TOTAL DISSOLVED SOLIDS				

\* No flow ever recorded

**[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]**

**Trail Mountain  
Mine Discharge:  
Oliphant Mine**

**Location:** Section 11, Township 18 South, Range 6 East, SLB&M. This site is outside the Trail Mountain mine permit boundary in Straight Canyon.

**Lease Association:** N/A.

**Subsidence:** None

**Water Data:** Water quality data is included for site 18-1-1. Data show insignificant variances of quality throughout history. Historic flow data has been collected since 1988 and has continued through 2012. This information is found on the following page where flow is plotted against precipitation of the East Mountain weather station. The East Mountain weather station is located on the southern tip of East Mountain. The Oliphant Mine portals discharge rarely produced any significant flow.

**Justification for removal from monitoring:** Site 18-1-1 has been monitored by Energy West Mining Company since 1988. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site. This site is not within PacifiCorp's logical mining unit, or its permit boundary. Therefore, it is requested that the site be removed from the monitoring program.

**Trail Mountain Spring: 18-1-1 (T-18)**  
**Water Quality Data: Operational**  
**Mine Association: Trail Mountain Mine**  
**Date of Development: Off lease, off permit**  
**Date of Second Mining: NA**

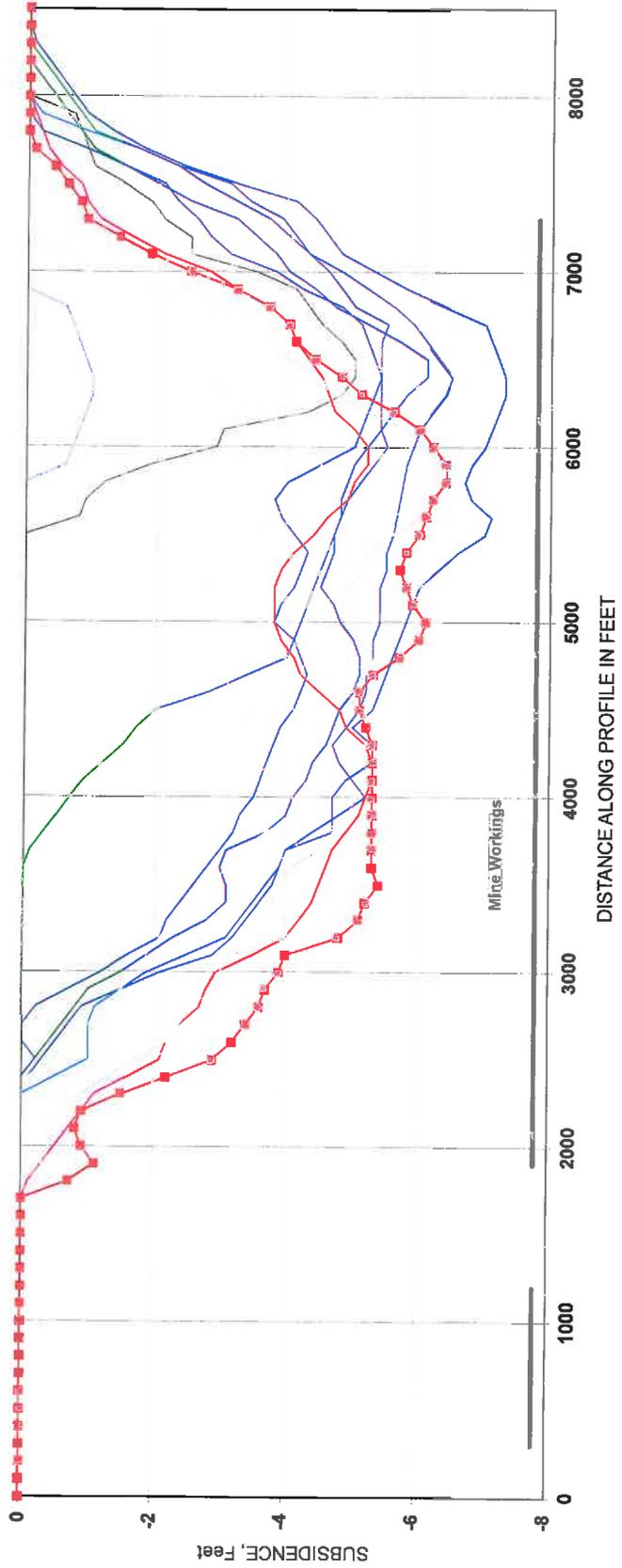
**Notes:**

- Data compares quality prior to longwall mining to historic quality data.  
No flow after 2001.

Historical Data: 1988 - 2001					Pre-Mining Data: 1988-1997				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	327	214	281.71	45	327	214	282.28	32	
CALCIUM	87.9	17.5	59.742	45	87.9	17.5	60.169	32	
CARBONATE	30	0.1	12.077	13	30	0.1	12.077	13	
CHLORIDE	21	4	8.2733	45	21	5.9	9.1594	32	
CONDUCTIVITY	925	482	662.83	42	925	482	665.48	29	
DISSOLVED OXYGEN	14.7	3.6	7.8167	12	14.7	3.6	7.8727	11	
FLOW	14	0.125	1.9252	45	14	0.125	2.5286	32	
HARDNESS	381	282	319.33	45	381	291	327.47	32	
TOTAL IRON	0.7	0.01	0.1591	23	0.7	0.01	0.1591	23	
DISSOLVED IRON				0				0	
MAGNESIUM	67.32	35	41	45	67.32	35.5	42.594	32	
DISSOLVED MANGANESE				0				0	
MANGANESE	0.2	0.02	0.0638	16	0.2	0.02	0.0638	16	
OIL AND GREASE	5	0.4	4.425	8	5	0.4	4.425	8	
PH	8.91	7.54	8.1009	45	8.91	7.63	8.2366	32	
POTASSIUM	5.42	3	3.8981	43	5.42	3	4.02	31	
SET SOLIDS	0.1	0.1	0.1	1	0.1	0.1	0.1	1	
SODIUM	31	12	21.084	45	31	12	21.713	32	
SULFATE	330	90	123.2	45	173.7	90	119.2	32	
SUSPENDED SOLIDS	90	1	22.565	23	90	1	22.565	23	
TEMPERATURE	71.6	3	33.748	45	71.6	3.5	44.133	32	
TOTAL DISSOLVED SOLIDS	584	354	410.04	45	584	354	417.06	32	

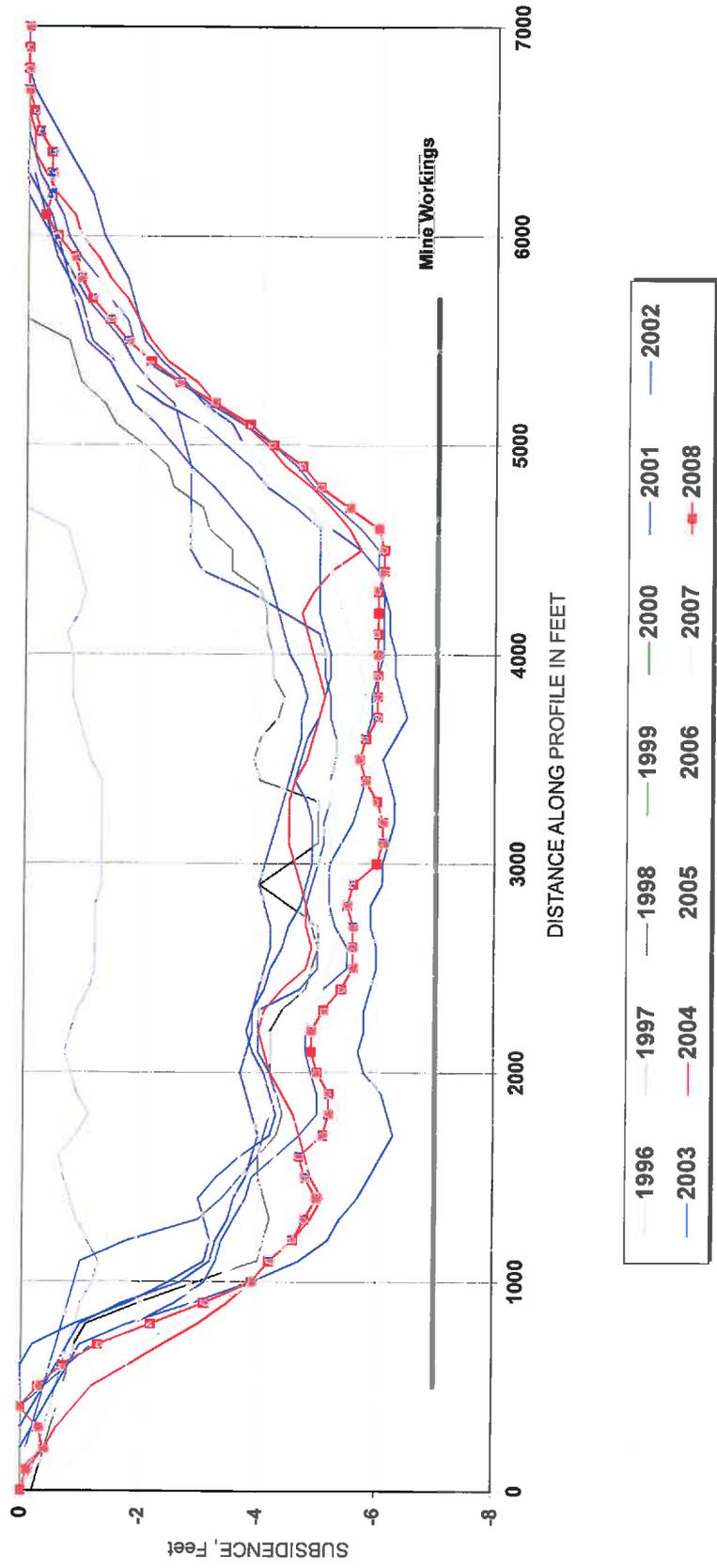
**Energy West 2008 Subsidence Report**  
**Area 24 Subsidence Profile**  
**North - South - Trail Mtn. West Side**

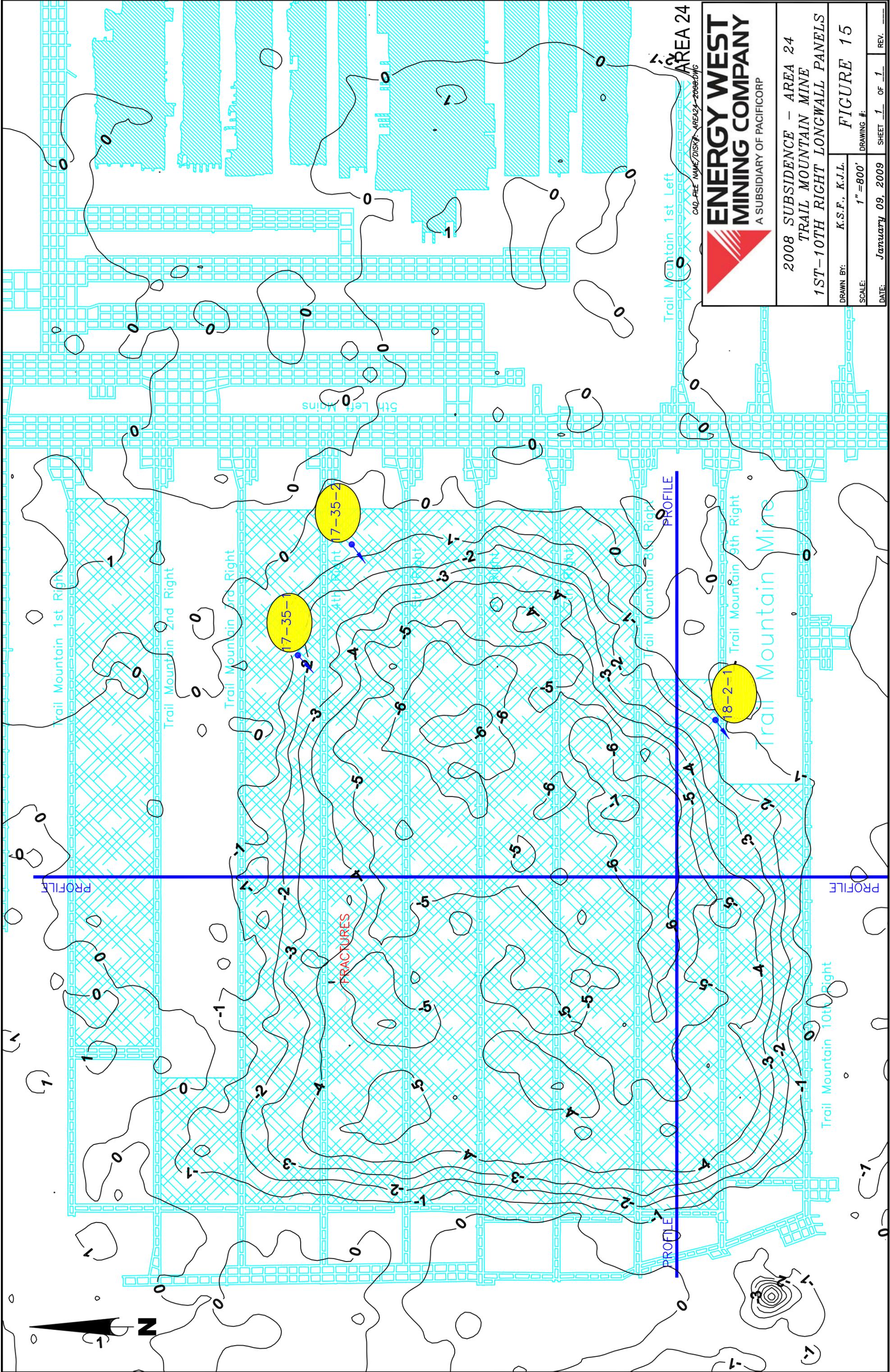
Chart 22



**Energy West 2008 Subsidence Report**  
**Area 24 Subsidence Profile**  
**West - East - Trail Mtn. West Side**

**Chart 23**





**ENERGY WEST**  
**MINING COMPANY**  
 A SUBSIDIARY OF PACIFICORP

2008 SUBSIDENCE - AREA 24  
 TRAIL MOUNTAIN MINE  
 1ST-10TH RIGHT LONGWALL PANELS

DRAWN BY: K.S.F., K.J.L.  
 SCALE: 1" = 800'  
 DATE: January 09, 2009

CAD FILE NAME/DISK# AREA24-2008.DWG

AREA 24

FIGURE 15  
 DRAWING #:  
 SHEET 1 OF 1  
 REV. \_\_\_\_\_

**Location:** Section 2, Township 18 South, Range 6 East, SLB&M. This site is outside the Trail Mountain mine permit boundary and outside any Federal coal lease.

**Lease Association:** The spring 18-2-1 is located within the former federal coal lease UTU-64375. PacifiCorp was the lessee. In 2009, PacifiCorp applied for partial relinquishment of lease UTU-64375 and UTU-49332 (refer to January 5, 2009 application document “Partial Relinquishment, Federal Coal Lease, UTU-64375” and “Partial Relinquishment, Federal Coal Lease, UTU-49332”) as all reserves had been mined and subsidence was substantially complete. The BLM retroactively approved partial relinquishment as of January 9, 2009.

**Subsidence:** Panel development began with the advancement of the 8<sup>th</sup> and 9<sup>th</sup> Right gateroads in 1996. Panel extraction began in the 9<sup>th</sup> Right panel in 1997. Extraction of the 8<sup>th</sup> Right panel followed and was completed in 1998. Subsidence within this vicinity shows a maximum of approximately 6 feet. All subsidence is directly west of the spring. Extraction of both panels stopped short (1600 feet in 8<sup>th</sup> Right and 2600 feet in 9<sup>th</sup> Right) because of poor coal quality found in these two panels.

**Water Data:** Water quality data is included for site 18-2-1. Data show insignificant variances of quality throughout history. Pre- and Post-mining quality is included and shows no significant changes in quality. Historic flow data has been collected since 1988 and has continued through 2012. PacifiCorp cannot verify the flow data prior to its purchase of the Trail Mountain Mine in 1992. This information is found on the following page where July spring flow is plotted against precipitation data collected from the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation.

**Justification for removal from monitoring:** Site 18-2-1 has been monitored by Energy West Mining Company since 1992. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site. This site is not within PacifiCorp’s logical mining unit, nor its permit boundary. Therefore, it is requested that the site be removed from the monitoring program.

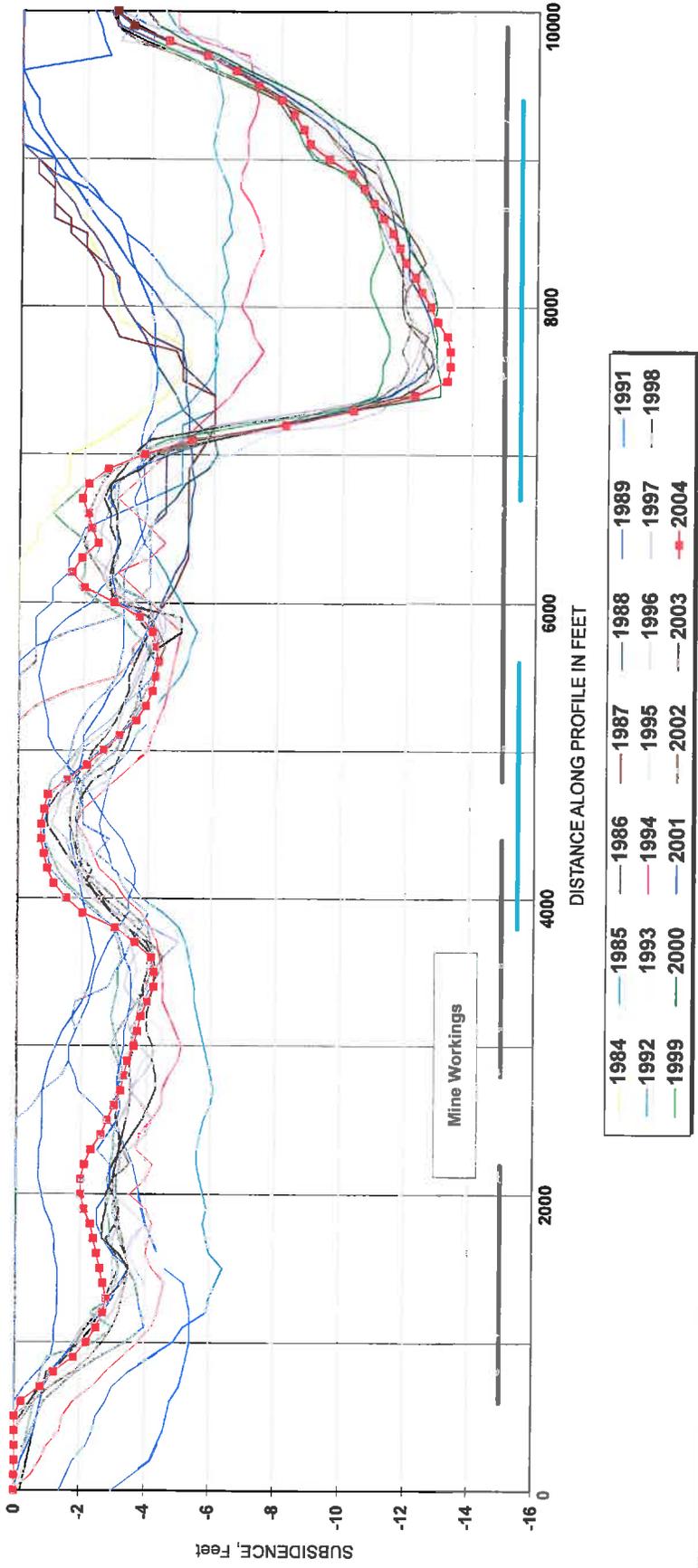
Trail Mountain Spring: 18-2-1 (T-6)  
 Water Quality Data: Operational  
 Mine Association: Trail Mountain Mine  
 Date of Development: Hiawatha Seam: 1996  
 Date of Second Mining: Hiawatha Seam: 1998

- Historic data includes data collected prior to Energy West Mining Company.

Historical Data: 1987 - 2012					Pre-Mining Data: 1992-1995				Post-Mining Data: 1998-2012				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	452	326	393.49	55	452	350	397.23	13	421	326	374.67	18	BICARBONATE
CALCIUM	80.6	44	61.84	55	67.5	45.7	58.66	13	71.5	56	63.15	18	CALCIUM
CARBONATE	5	0	1.1643	14	5	0.1	1.48	11	0	0	0	3	CARBONATE
CHLORIDE	61.7	38	45.365	55	48.7	38	44.58	13	48	38	43.18	18	CHLORIDE
CONDUCTIVITY	1256	810	974.37	52	969	810	909.85	13	1256	839	1044	18	CONDUCTIVITY
DISSOLVED OXYGEN	12.3	4.6	7.55	14	12.3	4.6	7.7	10				0	DISSOLVED OXYGEN
FLOW	18.9	0.03	3.0457	49	6	0.03	2.04	12	10.2	0.27	2.91	18	FLOW
HARDNESS	461	330	391.02	50	405	330	380.31	13	461	366	404.72	18	HARDNESS
TOTAL IRON	1.28	0	0.1632	25	1.28	0.1	0.29	9	0.06	0	0.02	3	TOTAL IRON
DISSOLVED IRON	0.2	0	0.0889	19	0.2	0.05	0.14	10	0	0	0	3	DISSOLVED IRON
MAGNESIUM	76	45.5	57.368	55	65	50	56.86	13	68.5	55	60.01	18	MAGNESIUM
DISSOLVED MANGANESE	0.005	0	0.0017	3				0	0.005	0	0.0017	3	DISSOLVED MANGANESE
MANGANESE	0.02	0	0.0464	35	0.2	0.02	0.99	13	0.003	0	0.001	3	MANGANESE
OIL AND GREASE				0				0				0	OIL AND GREASE
PH	8.15	7.01	7.742	55	8.15	7.01	7.81	13	7.6	7.28	7.49	18	PH
POTASSIUM	5	0.6	1.5574	42	5	0.6	2.41	13	1.16	0.87	1.04	9	POTASSIUM
SET SOLIDS	0.1	0.1	0.1	1			0.1	0				0	SET SOLIDS
SODIUM	81	53	66.488	55	70	53	61.65	13	75	60	67.04	18	SODIUM
SULFATE	210	80	141.22	55	210	80	131.77	13	196	131	160.57	18	SULFATE
SUSPENDED SOLIDS	560	1	34.603	29	32	2	10.75	12				0	SUSPENDED SOLIDS
TEMPERATURE	56.1	6.1	17.419	28	56.1	36.1	47.36	6	13.5	6.1	9.34	18	TEMPERATURE
TOTAL DISSOLVED SOLIDS	655	480	585.78	55	594	500	564.77	13	655	567	614.22	18	TOTAL DISSOLVED SOLIDS

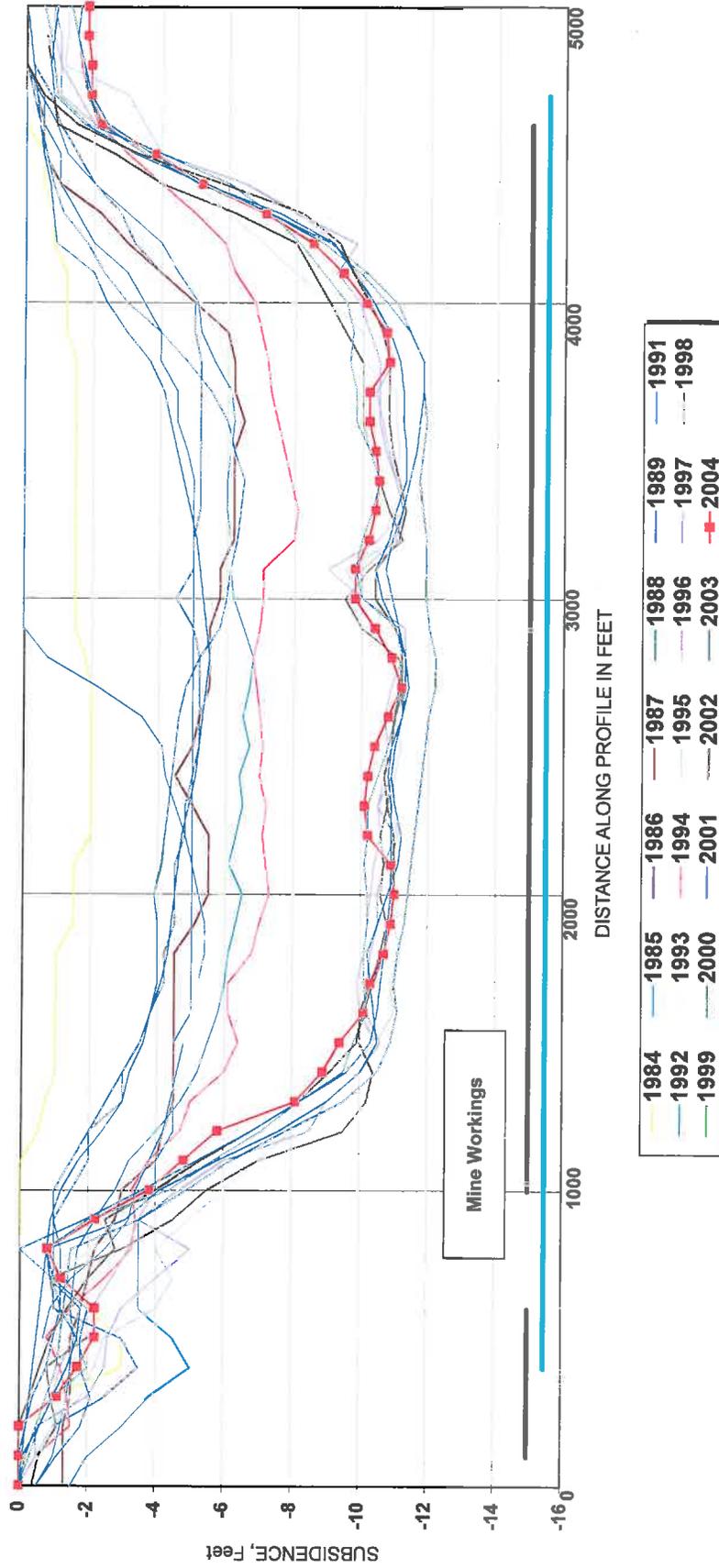
Energy West 2004 Subsidence Report  
 Area 4 Subsidence Profile  
 North - South

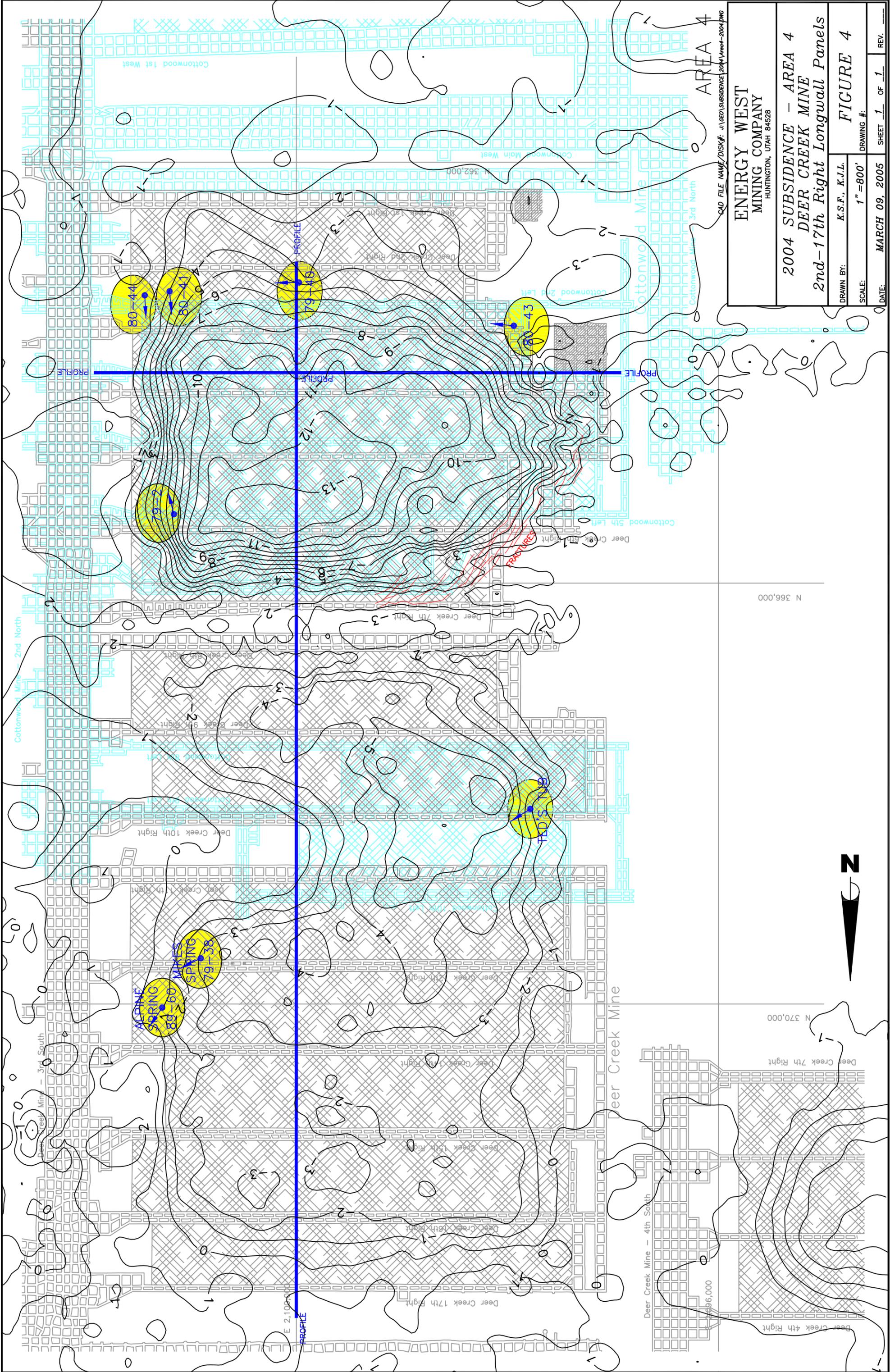
Chart 2



**Energy West 2004 Subsidence Report**  
**Area 4 Subsidence Profile**  
**West - East**

Chart 3





CAD FILE NAME/DISK#: \\GEO\SUBSIDENCE 2004\Area4-2004.DWG

<b>ENERGY WEST MINING COMPANY</b> HUNTINGTON, UTAH 84528	
<b>2004 SUBSIDENCE - AREA 4 DEER CREEK MINE 2nd-17th Right Longwall Panels</b>	
DRAWN BY: K.S.F., K.J.L.	DRAWING #: FIGURE 4
SCALE: 1" = 800'	DATE: MARCH 09, 2005
SHEET 1 OF 1 REV.	

AREA 4



N 366,000

N 370,000

N 366,000

Cottonwood Mine - 2nd North

Cottonwood Mine

Cottonwood Mine 3rd North

Deer Creek Mine

Deer Creek Mine - 4th South

Cottonwood 1st West

Cottonwood Main West

Deer Creek 2nd Right

Deer Creek 3rd Right

Cottonwood 2nd Left

Cottonwood 3rd Left

Deer Creek 4th Right

Deer Creek 5th Right

Deer Creek 6th Right

Deer Creek 7th Right

Deer Creek 8th Right

Deer Creek 9th Right

Deer Creek 10th Right

Deer Creek 11th Right

Deer Creek 12th Right

Deer Creek 13th Right

Deer Creek 14th Right

Deer Creek 15th Right

Deer Creek 16th Right

Deer Creek 17th Right

Deer Creek 18th Right

Deer Creek 19th Right

Deer Creek 20th Right

Deer Creek 21st Right

Deer Creek 22nd Right

Deer Creek 23rd Right

Deer Creek 24th Right

Deer Creek 25th Right

Deer Creek 26th Right

Deer Creek 27th Right

Deer Creek 28th Right

**[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]**

**East Mountain  
Springs 79-2, 79-40,  
80-41, 80-43, 80-44**

**Location:** Sections 20 and 21, Township 17 South, Range 7 East, SLB&M. These sites are located within the Deer Creek and Wilberg/Cottonwood Mine permit boundaries.

**Lease Association:** Springs 79-2, 79-40, 80-41 and 80-44 are associated with federal coal lease U-040151. 80-43 is associated with federal coal lease U-083066. PacifiCorp is the leaseholder of U-040151 and sublessee to the Church of Jesus Christ of Latter Day Saints who is currently the leaseholder of U-083066. Panel development off of the 3<sup>rd</sup> South Mains was started in 1982 in the Blind Canyon Seam (DC) for the 1<sup>st</sup> thru 7<sup>th</sup> Right longwall panels. These panels undermine all the above stated springs. Extraction of these panels was completed in 1986.

For development in the Hiawatha Seam (Wilberg/Cottonwood Mine) near the vicinity of the springs, the 2<sup>nd</sup> thru 6<sup>th</sup> Left longwall panel began in 1993 and was completed in 1996.

**Subsidence:** Maximum subsidence in the mined area stated above reached approximately 13 feet. This was in areas where double seam extraction took place (3<sup>rd</sup> thru 5<sup>th</sup> Right longwall panel (DC) and the 2<sup>nd</sup> thru 5<sup>th</sup> Left panel (WIL/CTW)). The attached map (2004 Annual Subsidence Report) shows the springs location relative to the maximum subsidence. Fractures were discovered in 1995 along the western extent of the 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup> Right longwall panels. The subsidence was virtually unchanged between 1995 and 2004 as shown in the subsidence profile charts attached herein. Refer to Supplemental Volume 1, Lease Relinquishment, tab Phase III, tab Data Summary Report for more detailed information.

Additional data from the 2004 Annual Subsidence Report is included herein.

**Water Data:** Pre- and Post-water quality data is included for springs 79-2, 79-40, 80-41, 80-43, and 80-44. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected since 1983 for these springs and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation of the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for Spring 79-2 and 80-43 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation. The mode of occurrence for 79-40, 80-41, and 80-44 has not been identified. The springs are stratigraphically located in the Price River Formation.

**Justification for removal from monitoring:** Sites 79-2, 79-40, 80-41, 80-43, and 80-44 have been monitored by Energy West Mining Company since 1979. There have been no reported occurrences in which mining has impacted these sites. Historic quality and quantity data has not indicated such impacts to the sites.

**[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]**

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**East Mountain  
Springs 79-2, 79-40,  
80-41, 80-43, 80-44**

Although these sites are within a current federal coal lease and within the mine permit boundaries, their location is in the southern extents of the Deer Creek permit boundary where no future mining is planned. The area in the vicinity of the springs has been completely mined out in both seams of both mines. Therefore, it is requested that the site be removed from the monitoring program.

**East Mountain Spring: 79-2**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine/Wilberg/Cottonwood Mine**  
**Date of Development: Blind Canyon Seam: 1982, Hiawatha Seam: 1994**  
**Date of Second Mining: Blind Canyon Seam: 1986, Hiawatha Seam: 1995**

Historical Data: 1987 - 2012					Pre-Mining Data: NA			
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS
BICARBONATE	422	278	334.67	51				
CALCIUM	109	55.7	66.937	51				
CARBONATE	10	0	1.28	25				
CHLORIDE	20	1.7	4.0196	51				
CONDUCTIVITY	629	331	545.18	51				
DISSOLVED OXYGEN	10.5	5.7	7.0647	17				
FLOW	7.5	0.36	1.9158	50				
HARDNESS	371	210	250.43	51				
TOTAL IRON	0.2	0	0.0533	15				
DISSOLVED IRON	0.29	0	0.0615	27				
MAGNESIUM	25.7	17	20.191	51				
DISSOLVED MANGANESE	0	0	0	10				
MANGANESE	0.2	0	0.0338	24				
OIL AND GREASE				0				
PH	8.5	6.8	7.4814	50				
POTASSIUM	7.9	0.07	1.0513	33				
SET SOLIDS				0				
SODIUM	43.31	5.2	27.556	51				
SULFATE	50	5	14.792	51				
SUSPENDED SOLIDS	44	1	6.3889	18				
TEMPERATURE	46.4	2.6	17.076	47				
TOTAL DISSOLVED SOLIDS	352	174	304.36	50				

East Mountain Spring: 79-40  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine/Wilberg/Cottonwood Mine  
 Date of Development: Blind Canyon Seam: 1982, Hiawatha Seam: 1994  
 Date of Second Mining: Blind Canyon Seam: 1986, Hiawatha Seam: 1995

Historical Data: 1979 - 2011					Pre-Mining Data: 1979-1981				Post-Mining Data: 1996-2011				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	451	306	402.41	17	422	306	364	2	443	354	403	7	BICARBONATE
CALCIUM	110	41.8	77.629	16	71.6	71.6	71.6	1	87.9	67	79.837	7	CALCIUM
CARBONATE	15	0	4.25	4				0	0	0	0	1	CARBONATE
CHLORIDE	10.6	6	7.3188	16	6.2	6.2	6.2	1	9	6	7.1429	7	CHLORIDE
CONDUCTIVITY	900	523	691.88	16	590	590	590	1	794	523	710.14	7	CONDUCTIVITY
DISSOLVED OXYGEN	8.5	5.2	6.6333	3				0	6.2	6.2	6.2	1	DISSOLVED OXYGEN
FLOW	15	0.13	3.0812	17	0.4	0.13	0.265	2	2	1	1.5071	7	FLOW
HARDNESS	351	194	301.27	11				0	351	270	318.71	7	HARDNESS
TOTAL IRON	0.37	0	0.152	5				0	0.37	0	0.14	4	TOTAL IRON
DISSOLVED IRON	4.2	0	0.495	10	4.2	4.2	4.2	1	0	0	0	1	DISSOLVED IRON
MAGNESIUM	32	18.3	27.054	16	18.3	18.3	18.3	1	32	25	28.994	7	MAGNESIUM
DISSOLVED MANGANESE	0.021	0	0.0077	3				0	0.021	0	0.0077	3	DISSOLVED MANGANESE
MANGANESE	0.1	0	0.0286	5				0	0.33	0	0.0015	2	MANGANESE
OIL AND GREASE	0.1	0.1	0.1	1	0.1	0.1	0.1	1				0	OIL AND GREASE
PH	8.4	7.07	7.7582	17	8.4	8.1	8.2	2	8.02	7.6	7.8114	7	PH
POTASSIUM	7	0.5	1.8342	12	1	1	1	1	6.41	0.86	2.72	3	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	51	11.8	36.646	16	11.8	11.8	11.8	1	42	27.5	35.104	7	SODIUM
SULFATE	139	4.1	38.912	17	30.4	4.1	17.25	2	45	32	37.857	7	SULFATE
SUSPENDED SOLIDS	407.6	0.5	57.567	9	407.6	2	204.8	2				0	SUSPENDED SOLIDS
TEMPERATURE	58	3.9	15.047	17	5	3.9	4.45	2	11.7	4.2	6	7	TEMPERATURE
TOTAL DISSOLVED SOLIDS	450	320	397.12	17	385	333	359	2	450	406	421.14	7	TOTAL DISSOLVED SOLIDS

East Mountain Spring: 80-41  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine/Wilberg/Cottonwood Mine  
 Date of Development: Blind Canyon Seam: 1982, Hiawatha Seam: 1994  
 Date of Second Mining: Blind Canyon Seam: 1986, Hiawatha Seam: 1995

Historical Data: 1980 - 2011					Pre-Mining Data: 1980				Post-Mining Data: 1995 - 2011				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	495	343	411.37	27	495	358	426.5	2	469	343	407.69	16	BICARBONATE
CALCIUM	190	51.5	88.471	27	89.5	63	76.25	2	97.2	77	88.414	16	CALCIUM
CARBONATE	30	0	6.4	5				0	0	0	0	2	CARBONATE
CHLORIDE	13.3	5.7	9.2556	27	13.3	5.7	9.5	2	11	7	8.9938	16	CHLORIDE
CONDUCTIVITY	1000	600	797.19	27	800	600	700	2	942	756	833.25	16	CONDUCTIVITY
DISSOLVED OXYGEN	8.1	5.4	6.4333	3				0	5.8	5.8	5.8	1	DISSOLVED OXYGEN
FLOW	15	0.3	4.0329	28	14	0.4	6.4667	3	6	0.3	2.745	16	FLOW
HARDNESS	433	323	395.25	20				0	433	349	399.69	16	HARDNESS
TOTAL IRON	0.6	0	0.2133	9				0	0.6	0	0.2275	8	TOTAL IRON
DISSOLVED IRON	3	0	0.3125	12	3	3	3	1	0	0	0	2	DISSOLVED IRON
MAGNESIUM	47.1	14	40.42	27	23.6	14	18.8	2	46.6	38	43.459	16	MAGNESIUM
DISSOLVED MANGANESE	0.021	0	0.0076	5				0	0.021	0	0.0076	5	DISSOLVED MANGANESE
MANGANESE	0.1	0	0.0325	4				0	0	0	0	2	MANGANESE
OIL AND GREASE				0				0				0	OIL AND GREASE
PH	8.18	6.9	7.769	26	8	7.4	7.7	2	8.03	7.43	7.7473	15	PH
POTASSIUM	3	0.2	0.9278	18	2	0.6	1.3	2	0.88	0.68	0.7571	7	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	32	6.5	23.707	27	17.4	14	15.7	2	32	19	25.388	16	SODIUM
SULFATE	170	20.2	86.567	27	70	20.2	45.1	2	114	74	90.819	16	SULFATE
SUSPENDED SOLIDS	35.5	0.5	10.136	11	32.5	1	16.75	2				0	SUSPENDED SOLIDS
TEMPERATURE	60.7	2.2	10.13	27	4.4	2.2	3.6667	3	9	2.3	4.3313	16	TEMPERATURE
TOTAL DISSOLVED SOLIDS	551	392	476.3	27	448	396	422	2	551	457	490.44	16	TOTAL DISSOLVED SOLIDS

East Mountain Spring: 80-43  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine/Wilberg/Cottonwood Mine  
 Date of Development: Blind Canyon Seam: 1982, Hiawatha Seam: 1994  
 Date of Second Mining: Blind Canyon Seam: 1986, Hiawatha Seam: 1995

Historical Data: 1980 - 2011					Pre-Mining Data: 1980-1981				Post-Mining Data: 1995 - 2011				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	384	287	348.18	11	380	380	380	1	287	287	287	1	BICARBONATE
CALCIUM	142	48.3	72.022	11	48.3	48.3	48.3	1	70.24	70.24	70.24	1	CALCIUM
CARBONATE	10	0	3	4				0	0	0	0	1	CARBONATE
CHLORIDE	6.7	2.9	4.0636	11	6.7	6.7	6.7	1	3	3	3	1	CHLORIDE
CONDUCTIVITY	600	480	537.91	11	505	505	505	1	549	549	549	1	CONDUCTIVITY
DISSOLVED OXYGEN	10.1	5.7	7.9	2				0				0	DISSOLVED OXYGEN
FLOW	24	0.4	7.3364	11	10	10	10	1	0.6	0.6	0.6	1	FLOW
HARDNESS	280	234	267	5				0	274	274	274	1	HARDNESS
TOTAL IRON	0.3	0.12	0.21	2				0	0.12	0.12	0.12	1	TOTAL IRON
DISSOLVED IRON	102	0	9.3427	11	102	102	102	1	0	0	0	1	DISSOLVED IRON
MAGNESIUM	30	20.4	25.466	11	20.4	20.4	20.4	1	23.93	23.93	23.93	1	MAGNESIUM
DISSOLVED MANGANESE	0.003	0.003	0.003	1				0	0.003	0.003	0.003	1	DISSOLVED MANGANESE
MANGANESE	0.1	0	0.035	4				0	0	0	0	1	MANGANESE
OIL AND GREASE				0				0				0	OIL AND GREASE
PH	7.95	6.75	7.5309	11	7.9	7.9	7.9	1	7.53	7.53	7.53	1	PH
POTASSIUM	3	0.2	1.0409	11	1.8	1.8	1.8	1	1.02	1.02	1.02	1	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	11	5.7	8.4264	11	5.7	5.7	5.7	1	10.81	10.81	10.81	1	SODIUM
SULFATE	160	6	23.109	11	8.2	8.2	8.2	1	10	10	10	1	SULFATE
SUSPENDED SOLIDS	20	0.5	7.4	10	0.5	0.5	0.5	1				0	SUSPENDED SOLIDS
TEMPERATURE	49	3.9	20.091	11	5.6	5.6	5.6	1	7.9	7.9	7.9	1	TEMPERATURE
TOTAL DISSOLVED SOLIDS	391	235	303	11	279	279	279	1	321	321	321	1	TOTAL DISSOLVED SOLIDS

East Mountain Spring: 80-44  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine/Wilberg/Cottonwood Mine  
 Date of Development: Blind Canyon Seam: 1982, Hiawatha Seam: 1994  
 Date of Second Mining: Blind Canyon Seam: 1986, Hiawatha Seam: 1996

	Historical Data: 1980 - 2011				Pre-Mining Data: 1980-1981				Post-Mining Data: 1997-2011				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	501	372	436.27	11	501	501	501	1	426	372	399	2	BICARBONATE
CALCIUM	174.3	67.8	97.577	11	67.8	67.8	67.8	1	92.95	79	85.975	2	CALCIUM
CARBONATE	1	0	0.6667	3				0	0	0	0	1	CARBONATE
CHLORIDE	16.4	8	10.873	11	16.4	16.4	16.4	1	11	8	9.5	2	CHLORIDE
CONDUCTIVITY	1100	680	867.18	11	820	820	820	1	913	807	860	2	CONDUCTIVITY
DISSOLVED OXYGEN	6.9	6.8	6.85	2				0	6.8	6.8	6.8	1	DISSOLVED OXYGEN
FLOW	39.6	0.24	10.038	12	20	20	20	2	0.92	0.24	0.58	2	FLOW
HARDNESS	420	350	385.75	4				0	420	350	385	2	HARDNESS
TOTAL IRON	0	0	0	1				0	0	0	0	1	TOTAL IRON
DISSOLVED IRON	0.3	0	0.1	10	0.08	0.08	0.08	1	0	0	0	1	DISSOLVED IRON
MAGNESIUM	52.8	25.1	41.555	11	25.1	25.1	25.1	1	45.7	37	41.35	2	MAGNESIUM
DISSOLVED MANGANESE	0.003	0.003	0.003	1				0	0.003	0.003	0.003	1	DISSOLVED MANGANESE
MANGANESE	0.03	0	0.0125	4				0	0	0	0	1	MANGANESE
OIL AND GREASE				0				0				0	OIL AND GREASE
PH	8.2	7.1	7.8564	11	8.1	8.1	8.1	1	8.12	7.75	7.935	2	PH
POTASSIUM	13	0.76	3.586	10	2.2	2.2	2.2	1	0.76	0.76	0.76	1	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	47.85	17.7	36.177	11	17.7	17.7	17.7	1	47.85	27	37.425	2	SODIUM
SULFATE	335.8	79.8	136.05	11	79.8	79.8	79.8	1	137	110	123.5	2	SULFATE
SUSPENDED SOLIDS	89	0.5	24.389	9	1	1	1	1				0	SUSPENDED SOLIDS
TEMPERATURE	75.4	4	17.22	10	5	5	5	1	11.1	4.4	7.75	2	TEMPERATURE
TOTAL DISSOLVED SOLIDS	607	439	533.91	11	476	476	476	1	578	500	539	2	TOTAL DISSOLVED SOLIDS

**Location:** Section 12, Township 17 South, Range 7 East, SLB&M. The site is located within the Deer Creek Mine permit boundary and situated within the confines of the Roans Canyon Fault Graben.

**Lease Association:** This site has been associated with federal coal lease U-084924. The lease was acquired by Utah Power & Light in 1977 from Peabody Coal Company. Because the spring is located within the confines of the Roans Canyon Fault Graben no mining has not been conducted in the immediate vicinity of the spring.

**Subsidence:** No subsidence has occurred in the area of Spring 79-10.

**Water Data:** The spring was originally chosen as a monitoring site because of its location within the fault graben and down dip from mine workings. Its location allowed the permittee to monitor quantity and quality parameters as related to its mining in the general area. Historic water quality data is included for spring 79-10. Data show no abnormalities in the water quality parameter for this area of East Mountain. Historic flow data has been collected since 1979 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation data collected from the East Mountain weather station, as well as, the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence as indicated above for this site is the Roans Canyon Fault Graben. The stratigraphic location is within the North Horn Formation.

**Justification for removal from monitoring:** Site 79-10 has been monitored by Energy West Mining Company since 1979. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

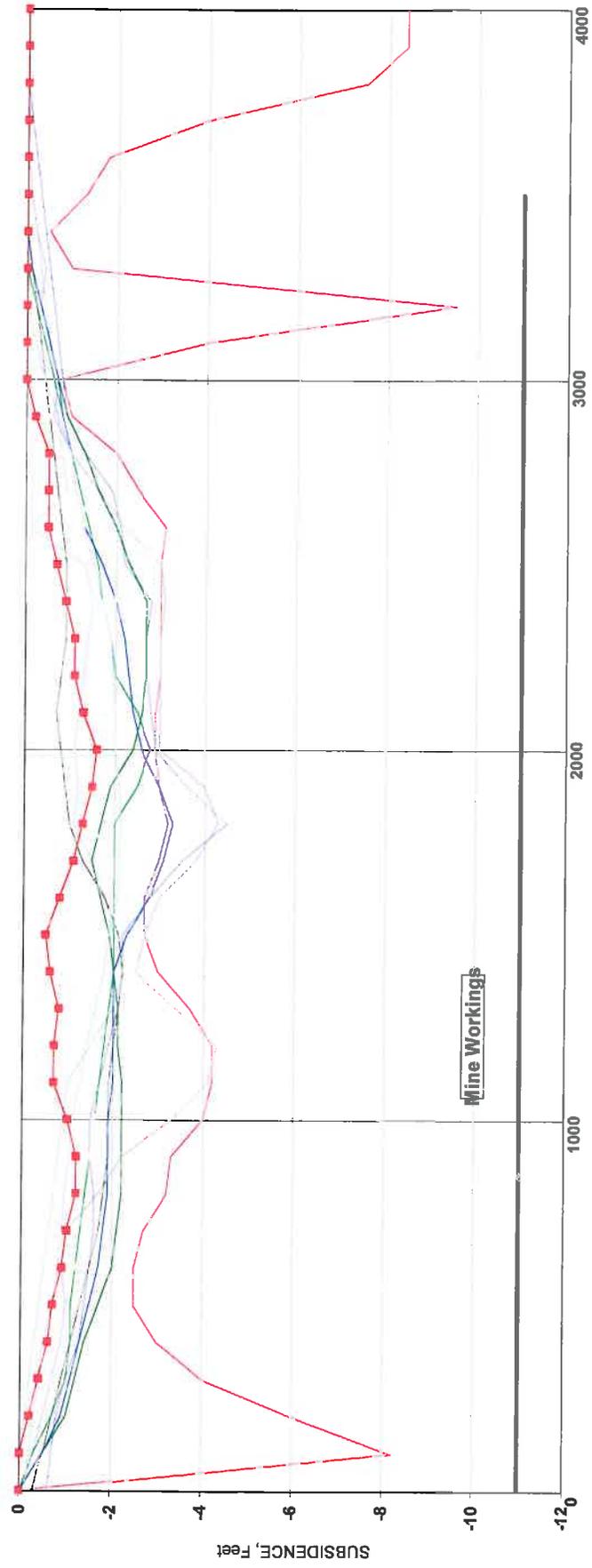
Although this site is within a current federal coal Lease and within the mine permit boundary, its location is in the southern extents of the permit boundary where no future mining is planned. Sheba Spring, located 1900 feet north and 1300 feet east of Spring 79-10, will be retained as part of the water monitoring program of the permittee. Therefore, it is requested that the site be removed from the monitoring program.

**East Mountain Spring: 79-10**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: No Developmental Mining**  
**Date of Second Mining: None**

<b>Historical Data: 1979 - 2012</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	370	244	305	61
<b>CALCIUM</b>	112.9	41.5	71.915	71
<b>CARBONATE</b>	18	0	1.641	39
<b>CHLORIDE</b>	20	1	4.7759	58
<b>CONDUCTIVITY</b>	605	280	487.54	72
<b>DISSOLVED OXYGEN</b>	11.4	5.5	8.1962	26
<b>FLOW</b>	32	1.1	8.8458	74
<b>HARDNESS</b>	363	200	272.96	70
<b>TOTAL IRON</b>	1.1	0	0.3037	20
<b>DISSOLVED IRON</b>	0.33	0	0.0841	29
<b>MAGNESIUM</b>	25.4	12.6	22.418	71
<b>DISSOLVED MANGANESE</b>	0.042	0	0.0125	10
<b>MANGANESE</b>	0.2	0	0.0398	42
<b>OIL AND GREASE</b>	0.1	0.1	0.1	1
<b>PH</b>	8.35	7.05	7.7016	74
<b>POTASSIUM</b>	11.8	0.17	1.6134	37
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	16.5	1.47	4.8231	58
<b>SULFATE</b>	144	3	10.986	59
<b>SUSPENDED SOLIDS</b>	22	0.5	4.8913	23
<b>TEMPERATURE</b>	47.1	3.3	22.79	67
<b>TOTAL DISSOLVED SOLIDS</b>	382	200	275.93	59

Energy West 2004 Subsidence Report  
Area 20 Subsidence Profile  
West - East

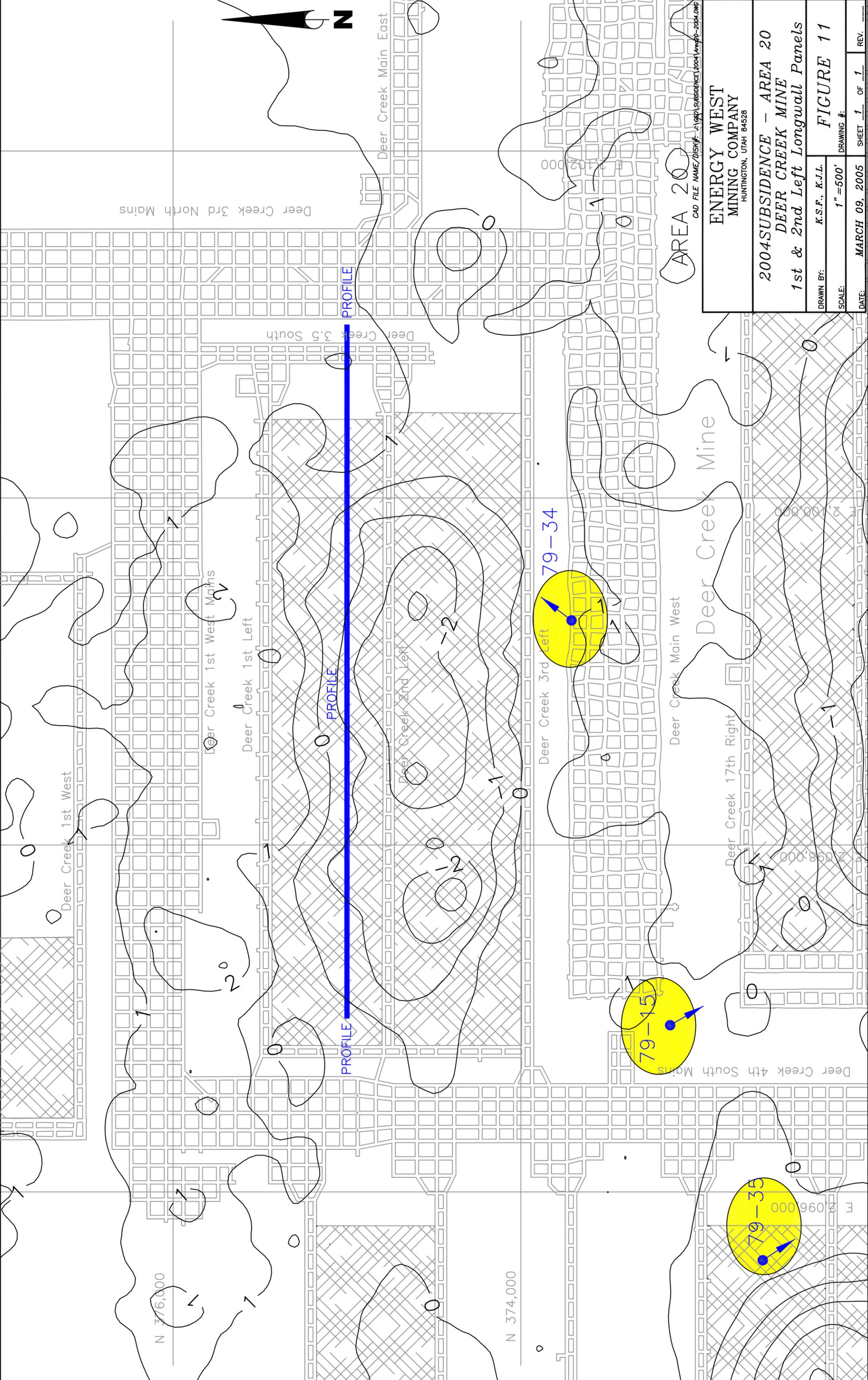
Chart 15



DISTANCE ALONG PROFILE IN FEET



Mine Workings



ENERGY WEST MINING COMPANY HUNTINGTON, UTAH 84528	
2004SUBSIDENCE - AREA 20 DEER CREEK MINE 1st & 2nd Left Longwall Panels	
DRAWN BY: K.S.F., K.J.L.	DRAWING #: 1" = 500'
DATE: MARCH 09, 2005	SHEET 1 OF 1
FIGURE 11	

CAD FILE NAME/DISK# : J:\9001SUBSIDENCE\2004\area20-2004.dwg

**[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]**

**East Mountain  
Spring 79-15, 79-34,  
79-35**

**Location:** Section 8, Township 17 South, Range 7 East, SLB&M. These sites are located outside the Deer Creek Mine permit boundary and outside of a current Federal Coal Lease.

**Lease Association:** Sites 79-15, 79-34, and 79-35 have been associated with federal coal lease SL-070645/U-02292. The lease was acquired by Utah Power & Light in 1977 from Peabody Coal Company. Room and pillar mining was started in 1975 in the Blind Canyon Seam below Spring 79-34. Longwall mining in the surrounding area includes the 2<sup>nd</sup> Left panels (completed in 1993) to the north, 1<sup>st</sup> thru 7<sup>th</sup> Right panels (completed in 1992) to the west and in the location of spring 79-35, and 17<sup>th</sup> Right panels (completed in 1991) to the south. There has been no second mining below springs 79-15 and 79-34.

The permittee submitted an application for the relinquishment of 1,240 acres in April 1997. In March 2006, The BLM approved (with USFS and DOGM concurrence) relinquishment of this acreage. This approval was retroactive as of the date of the submittal. There are no remaining economical recoverable coal reserves in the relinquished area.

**Subsidence:** Refer to the Supplemental Volume 1, Lease Relinquishment, tab Phase III, tab Data Report Summary for additional subsidence information. Additional data from the 2004 Annual Subsidence Report is included herein.

Subsidence in the vicinity of spring 79-35 and west of the area of springs 79-15 and 79-34 reached a maximum of less than 1 foot. The subsided areas to the north and south were of lesser extent. Subsidence was determined complete in 1994. There is no subsidence in the vicinity of springs 79-15 and 79-34 and there has been no evidence to show any impacts to quality or quantity of the spring's discharge.

**Water Data:** Since the area underlying springs 79-15 and 79-34 was mined prior to spring monitoring, no pre-mining data is available. Historic data show no abnormalities in the water quality parameters for this area of East Mountain.

Pre- and Post- water quality data is included for spring 79-35. Data show insignificant variances between pre- and post- mining quality results. Historic flow data has been collected for these springs since 1983 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation data collected from the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for these springs are permeable fluvial channels that intersect the land surface within the stratigraphic location of the North Horn Formation.

**[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]**

**East Mountain  
Spring 79-15, 79-34,  
79-35**

**Justification for removal from monitoring:** Sites 79-15, 79-34, and 79-35 have been monitored by Energy West Mining Company since 1979. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

Since the federal coal lease has been relinquished (with DOGM concurrence) and the sites are no longer within the boundaries of a mine permit, Energy West Mining Company retains no legal right of entry to the site, nor control of the site. Therefore, it is requested that the sites be removed from the monitoring program.

**East Mountain Spring: 79-15**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: Blind Canyon Seam: 1975**  
**Date of Second Mining: None**

<b>Historical Data: 1979 - 2011</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	432	252	320.88	58
<b>CALCIUM</b>	328	59.4	79.521	57
<b>CARBONATE</b>	8	0	1.6087	23
<b>CHLORIDE</b>	20	2	5.0321	56
<b>CONDUCTIVITY</b>	675	351	508.02	57
<b>DISSOLVED OXYGEN</b>	12.4	4.7	7.4824	17
<b>FLOW</b>	43	0.69	9.1943	58
<b>HARDNESS</b>	930	236	294.58	45
<b>TOTAL IRON</b>	2.4	0.076	0.4088	28
<b>DISSOLVED IRON</b>	0.36	0	0.0786	35
<b>MAGNESIUM</b>	41.12	16.3	24.141	57
<b>DISSOLVED MANGANESE</b>	0.026	0	0.0097	12
<b>MANGANESE</b>	0.2	0	0.0439	23
<b>OIL AND GREASE</b>	0.2	0.2	0.2	1
<b>PH</b>	8.77	7	7.6891	58
<b>POTASSIUM</b>	8	0.09	1.3286	40
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	39	3.32	7.2279	57
<b>SULFATE</b>	591	1	29.272	57
<b>SUSPENDED SOLIDS</b>	399	0.5	21.977	31
<b>TEMPERATURE</b>	61.4	2.8	16.274	54
<b>TOTAL DISSOLVED SOLIDS</b>	430	214	289.45	58

**East Mountain Spring: 79-34**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: Blind Canyon Seam: 1974**  
**Date of Second Mining: None**

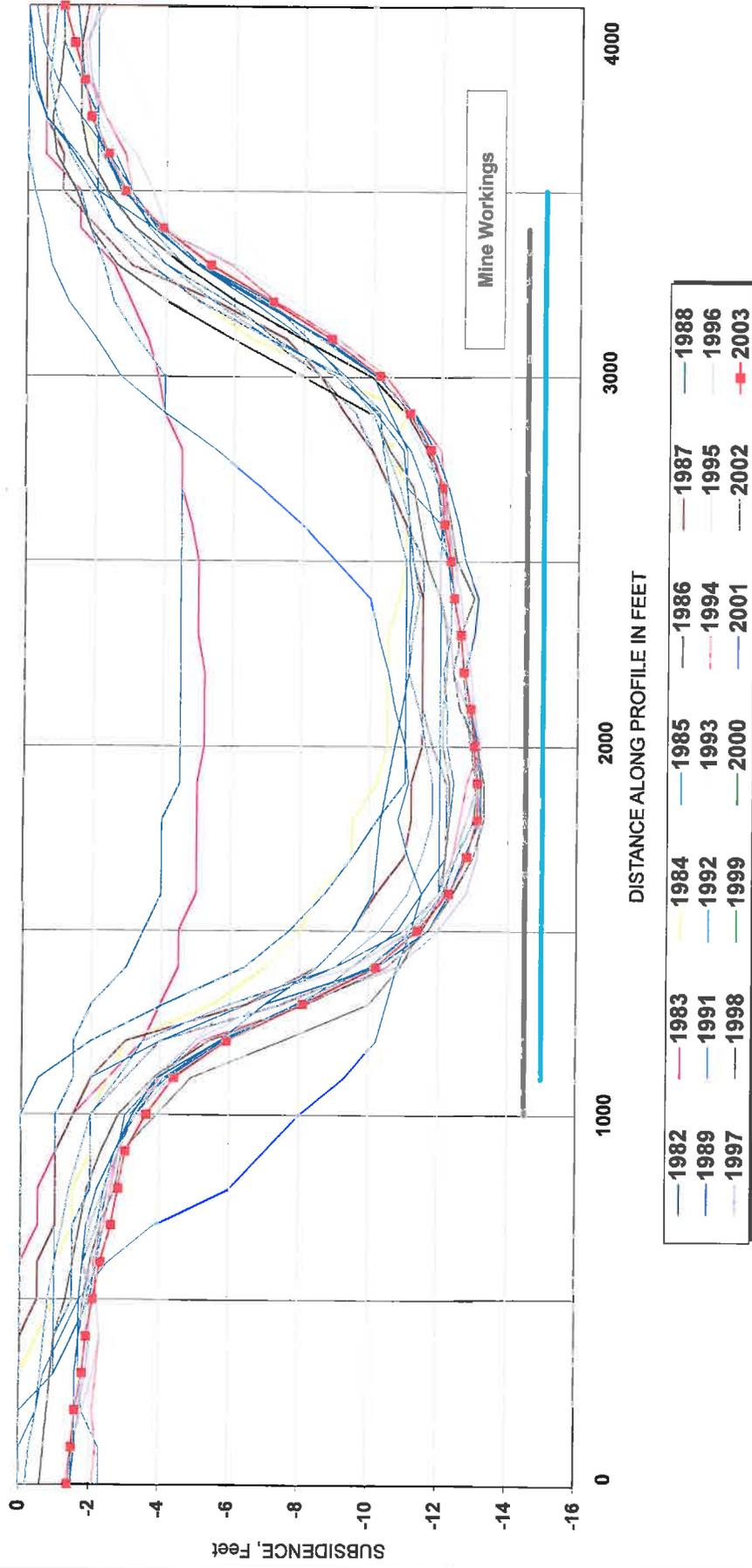
**Historical Data: 1979 - 2012**

	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	459	263	343.46	37
<b>CALCIUM</b>	144	37.9	77.315	36
<b>CARBONATE</b>	5	0	0.5714	14
<b>CHLORIDE</b>	10	2	6.2029	34
<b>CONDUCTIVITY</b>	763	420	595.81	36
<b>DISSOLVED OXYGEN</b>	12.3	4.5	7.62	5
<b>FLOW</b>	56.7	0.28	10.894	37
<b>HARDNESS</b>	363	216	308.14	29
<b>TOTAL IRON</b>	34.4	0	2.6168	25
<b>DISSOLVED IRON</b>	1.82	0	0.1278	25
<b>MAGNESIUM</b>	40.9	21.4	31.353	36
<b>DISSOLVED MANGANESE</b>	0.878	0	0.1026	18
<b>MANGANESE</b>	0.1	0	0.0164	17
<b>OIL AND GREASE</b>	0.7	0.7	0.7	1
<b>PH</b>	7.92	6.7	7.5627	37
<b>POTASSIUM</b>	7.5	0.5	1.4243	30
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	20.3	5.44	10.538	36
<b>SULFATE</b>	251	2	28.765	37
<b>SUSPENDED SOLIDS</b>	61	0.5	18.462	13
<b>TEMPERATURE</b>	46.3	2.8	10.303	36
<b>TOTAL DISSOLVED SOLIDS</b>	472	264	339.27	37

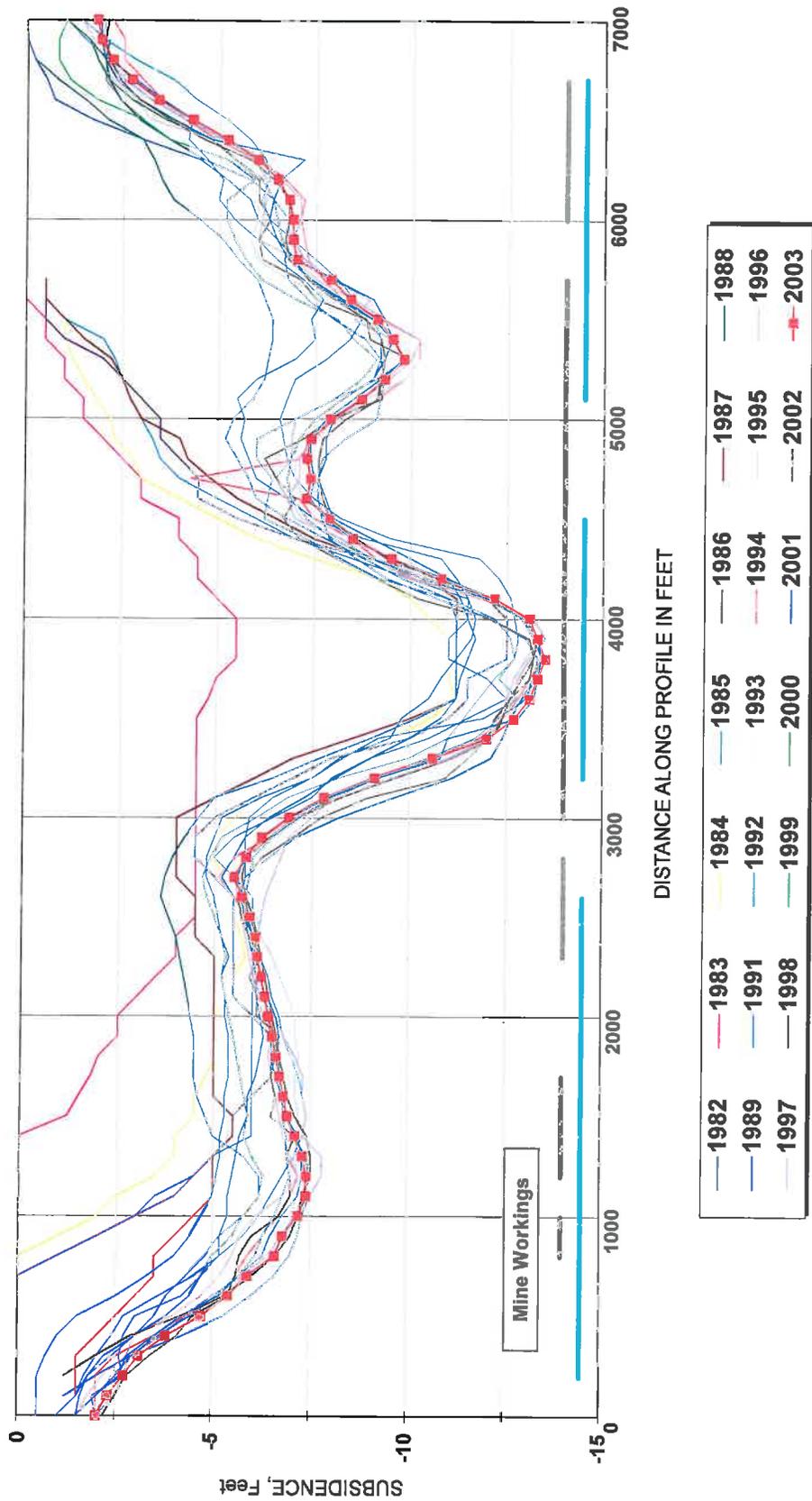
East Mountain Spring: 79-35  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine  
 Date of Development: Blind Canyon Seam: 1990  
 Date of Second Mining: Blind Canyon Seam: 1990

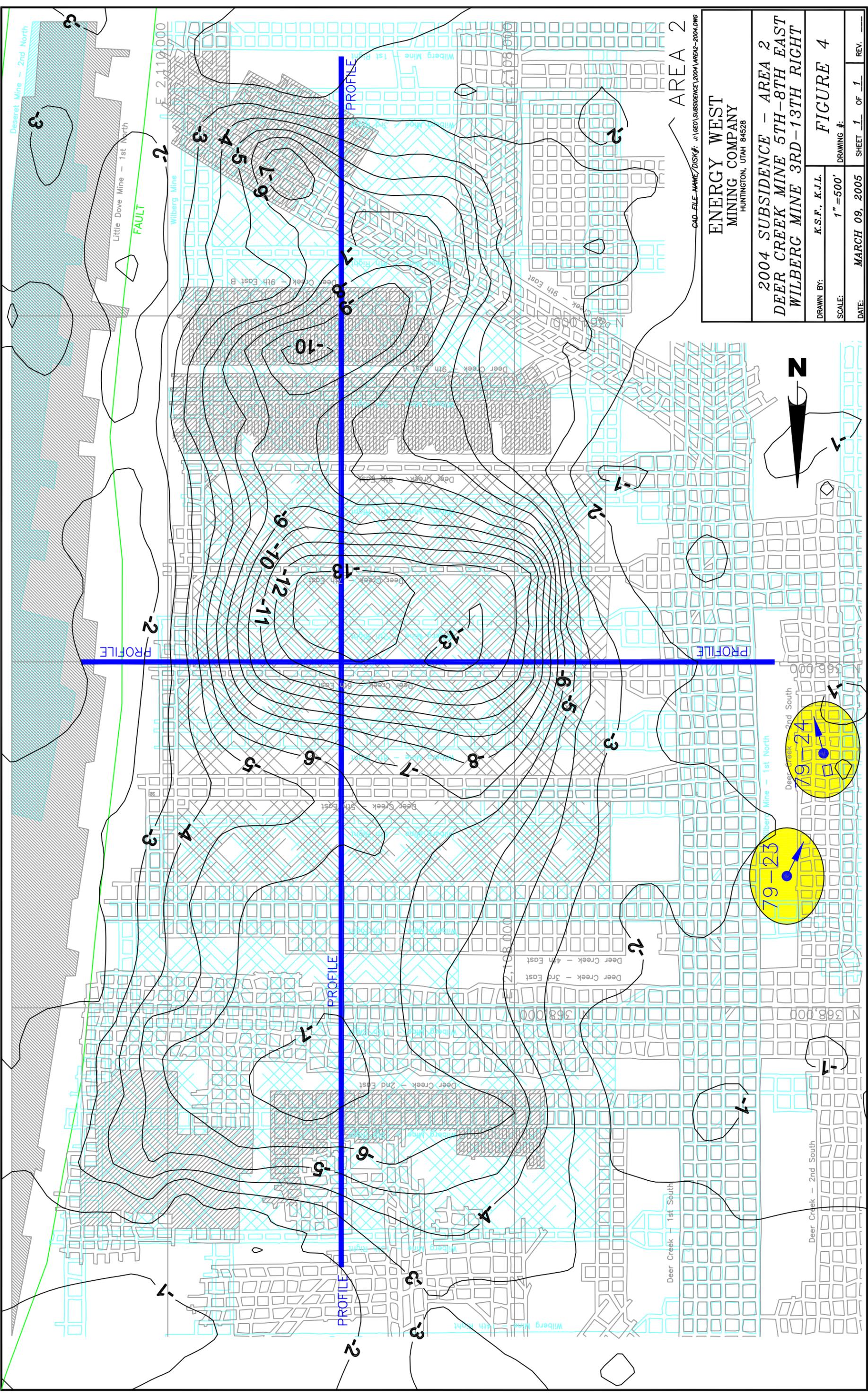
Historical Data: 1979 - 2012					Pre-Mining Data: 1979-1990				Post-Mining Data: 1992-2012				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	355	236	290.22	59	355	272	308.67	12	336	236	285	45	BICARBONATE
CALCIUM	192	59.8	79.94	66	192	70	95.314	14	98.8	59.8	75.262	48	CALCIUM
CARBONATE	7	0	1.125	32	1	1	1	12	7	0	1.2353	17	CARBONATE
CHLORIDE	40	0.9	3.7786	56	10	2.5	4.2091	11	15	0.9	2.6814	43	CHLORIDE
CONDUCTIVITY	580	300	457.58	67	580	312	446.33	15	547	344	470.48	48	CONDUCTIVITY
DISSOLVED OXYGEN	11.2	4.7	8.2476	21	8.1	6.7	7.5667	3	11.2	4.7	8.5857	14	DISSOLVED OXYGEN
FLOW	20	0.3	2.9712	69	20	0.33	4.6939	18	8.9	0.3	2.3025	48	FLOW
HARDNESS	421	219	264.69	62	421	228	285	11	314	219	259.55	47	HARDNESS
TOTAL IRON	1.2	0	0.3178	28				0	1.2	0	0.3178	28	TOTAL IRON
DISSOLVED IRON	0.47	0	0.0877	31	0.47	0.02	0.1508	12	0.2	0	0.0512	17	DISSOLVED IRON
MAGNESIUM	21.7	10.9	16.271	66	17.4	12.3	14.2	14	21.7	10.9	16.942	48	MAGNESIUM
DISSOLVED MANGANESE	0.076	0	0.011	17				0	0.076	0	0.011	17	DISSOLVED MANGANESE
MANGANESE	0.2	0	0.0357	37	0.03	0.01	0.014	10	0.2	0	0.0479	23	MANGANESE
OIL AND GREASE	1.8	1.8	1.8	1	1.8	1.8	1.8	1				0	OIL AND GREASE
PH	8.52	6.94	7.822	70	8.3	6.95	7.675	18	8.52	6.94	7.9165	48	PH
POTASSIUM	5	0.1	0.8666	35	4	0.1	0.8236	11	5	0.15	0.7878	23	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	36	0.17	4.2638	56	36	2.61	8.4682	11	5	0.17	3.2174	43	SODIUM
SULFATE	206	0.3	14.946	56	206	2	53.142	12	10	0.3	4.4595	42	SULFATE
SUSPENDED SOLIDS	101	0.1	13.695	21	84.5	0.1	9.2167	12	101	1	24.857	7	SUSPENDED SOLIDS
TEMPERATURE	49.8	3.9	19.493	63	44	3.9	24.193	15	49.8	4.6	18.025	48	TEMPERATURE
TOTAL DISSOLVED SOLIDS	430	210	267.46	57	430	218	273.58	12	297	210	265.91	43	TOTAL DISSOLVED SOLIDS

**Energy West 2004 Subsidence Report  
 Area 2 Subsidence Profile  
 West - East**



**Energy West 2004 Subsidence Report  
Area 2 Subsidence Profile  
North - South**





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ENERGY WEST MINING COMPANY HUNTINGTON, UTAH 84528	
2004 SUBSIBENCE - AREA 2 DEER CREEK MINE 5TH-8TH EAST WILBERG MINE 3RD-13TH RIGHT	
DRAWN BY:	K.S.F., K.J.L.
SCALE:	1" = 500'
DATE:	MARCH 09, 2005
SHEET	1 OF 1
REV.	

FIGURE 4

**Location:** Section 15, Township 17 South, Range 7 East, SLB&M. These sites are located within the Deer Creek and Wilberg/Cottonwood mine permit boundary and within the Federal Coal lease U-040151.

**Lease Association:** Both 79-23 and 79-24 are located in federal coal lease U-040151. The lease was acquired from the Church of Jesus Christ of Latter Day Saints in 1999. Both the Hiawatha and Blind Canyon seams have been mined in this lease. Room and pillar mining began the Blind Canyon Seam in 1974 from Deer Creek's 2nd South Mains. From the Wilberg/Cottonwood Mine, 1 ½ North was advanced in the Hiawatha Seam. Longwall mining occurred east of the springs in the Blind Canyon Seam (Deer Creek 1987) and Hiawatha Seam (Wilberg/Cottonwood Mine 1994).

**Subsidence:** Maximum subsidence in area east and adjacent to the springs has stabilized at approximately 13 feet. The 2003 Annual Subsidence Report reported that the subsidence has been stable since at least 1995. The springs are outside of the subsided areas.

Additional data from the 2004 Annual Subsidence Report is included herein.

**Water Data:** Historic water quality data is included for springs 79-23 and 79-24. Data show no abnormalities in the water quality parameters for this area of East Mountain. Historic flow data has been collected since 1983 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation data collected from the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring 79-23 stopped flowing in 1987. There has been no report of flow since that time except for a small flow of 0.2 gpm in 1998. The mode of occurrence for this site is flow along permeable strata underlain by impermeable mudstone which intersects the land surface. The stratigraphic location of this site is the base of the North Horn Formation.

Spring 79-24 stopped flowing in 1989. There has been little report of flow since that time. In 1998, a flow of 1.0 gpm was reported. The mode of occurrence for this site has not been identified. The stratigraphic location of this site is the Price River Formation.

**Justification for removal from monitoring:** Sites 79-23 and 79-24 have been monitored by Energy West Mining Company since 1979. There have been no reported occurrences in which mining has impacted these sites. Historic quality and quantity data has not indicated such impacts to the site.

Although these sites are within a current federal coal lease and within the mine permit boundaries, their location is in the southern extents of the Deer Creek permit boundary where no future mining is planned. The area in the vicinity of the springs has been completely mined out

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in both seams of both mines. Therefore, it is requested that the site be removed from the monitoring program.

**East Mountain Spring: 79-23**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: Blind Canyon Seam: 1974-1975**  
**Date of Second Mining: None**

**Historical Data: 1979 - 1986**

	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	463	343	413.13	8
<b>CALCIUM</b>	132	58	79.643	7
<b>CARBONATE</b>	1	1	1	1
<b>CHLORIDE</b>	13.9	10.3	11.271	7
<b>CONDUCTIVITY</b>	900	419	691.29	7
<b>DISSOLVED OXYGEN</b>				0
<b>FLOW</b>	20	0.2	5.6125	8
<b>HARDNESS</b>				0
<b>TOTAL IRON</b>				0
<b>DISSOLVED IRON</b>	0.3	0.04	0.0886	7
<b>MAGNESIUM</b>	48.1	22.5	38.286	7
<b>DISSOLVED MANGANESE</b>				0
<b>MANGANESE</b>	0.01	0.01	0.01	1
<b>OIL AND GREASE</b>	0.3	0.3	0.3	1
<b>PH</b>	8.3	7.3	7.725	8
<b>POTASSIUM</b>	7	0.5	1.5414	7
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	15.5	14	14.871	7
<b>SULFATE</b>	91.2	9	27.188	8
<b>SUSPENDED SOLIDS</b>	120	0.5	19.763	8
<b>TEMPERATURE</b>	15.6	5	8.625	8
<b>TOTAL DISSOLVED SOLIDS</b>	410	292	364.25	8

**East Mountain Spring: 79-24**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: Blind Canyon Seam: 1974-1975, Hiawatha Seam: 1981-1982**  
**Date of Second Mining: None**

<b>Historical Data: 1979 - 1988</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	414	395	404.5	2
<b>CALCIUM</b>	61.5	61.5	61.5	1
<b>CARBONATE</b>	1	1	1	1
<b>CHLORIDE</b>	16.5	16.5	16.5	1
<b>CONDUCTIVITY</b>	700	700	700	1
<b>DISSOLVED OXYGEN</b>	0			0
<b>FLOW</b>	60	0.75	14.13	5
<b>HARDNESS</b>	342	342	342	1
<b>TOTAL IRON</b>				0
<b>DISSOLVED IRON</b>	7.6	0.16	3.88	2
<b>MAGNESIUM</b>	45.7	45.7	45.7	1
<b>DISSOLVED MANGANESE</b>				0
<b>MANGANESE</b>	0.02	0.02	0.02	1
<b>OIL AND GREASE</b>	0.1	0.1	0.1	1
<b>PH</b>	8.2	8.1	8.15	2
<b>POTASSIUM</b>	2.06	2.06	2.06	1
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	17.8	17.8	17.8	1
<b>SULFATE</b>	52.3	26	39.15	2
<b>SUSPENDED SOLIDS</b>	673.6	30	351.8	2
<b>TEMPERATURE</b>	66	0.6	33.3	2
<b>TOTAL DISSOLVED SOLIDS</b>	584	340	462	2

**Location:** Spring 79-26 is located in Section 17, Township 17 South, Range 7 East, SLB&M. Spring 79-32 is located in Section 19, Township 17 South, Range 7 East, SLB&M. These sites are located within the Wilberg/Cottonwood Mine permit boundary and within the federal coal lease U-083066.

**Lease Association:** The springs are associated with federal coal lease U-083066. PacifiCorp is the sublessee to the Church of Jesus Christ of Latter Day Saints who is the leaseholder of U-083066.

**Subsidence:** No coal mining activities have occurred in the underground areas below the springs.

**Water Data:** Water quality data is included for springs 79-26 and 79-32. Data show no abnormalities in the water quality parameter for this area of East Mountain. Historic flow data has been collected since 1979 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation data collected from the East Mountain weather station, as well as, the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The stratigraphic location for Spring 79-26 is within the North Horn Formation. The Stratigraphic location for Spring 79-32 is the base of the Flagstaff Formation.

**Justification for removal from monitoring:** Sites 79-26 and 79-32 have been monitored by Energy West Mining Company since 1979. There have been no reported occurrences in which mining has impacted these sites. Historic quality and quantity data has not indicated such impacts to the sites.

Although these sites are within a current federal coal lease and within the Wilberg/Cottonwood Mine permit boundary, its location is not in an area where future mining is planned. Therefore, it is requested that the site be removed from the monitoring program.

**East Mountain Spring: 79-26**  
**Water Quality Data: Operational**  
**Mine Association: Wilberg/Cottonwood**  
**Date of Development: No Developmental Mining**  
**Date of Second Mining: None**

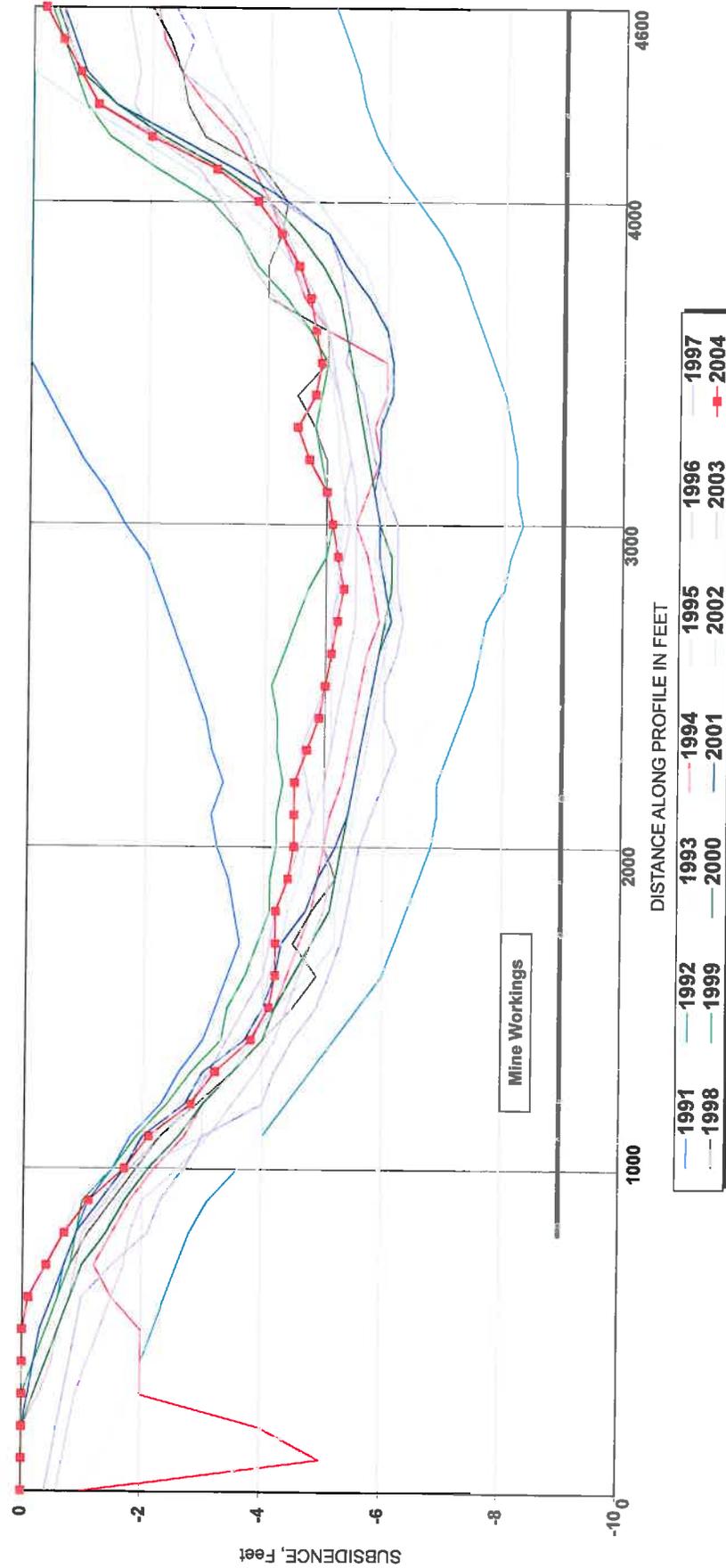
<b>Historical Data: 1979 - 2012</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	368	249	320.46	35
<b>CALCIUM</b>	127	33.5	54.45	37
<b>CARBONATE</b>	30	0	4.65	20
<b>CHLORIDE</b>	10	4	6.44	32
<b>CONDUCTIVITY</b>	615	431	523.00	38
<b>DISSOLVED OXYGEN</b>	9.7	5.1	7.61	10
<b>FLOW</b>	10	0.33	3.34	40
<b>HARDNESS</b>	329	198	265.74	35
<b>TOTAL IRON</b>	2.7	0.05	0.46	16
<b>DISSOLVED IRON</b>	0.46	0	0.14	16
<b>MAGNESIUM</b>	37.1	9	31.16	37
<b>DISSOLVED MANGANESE</b>	0.09	0.002	0.02	8
<b>MANGANESE</b>	0.04	0	0.02	19
<b>OIL AND GREASE</b>	0.1	0.1	0.10	1
<b>PH</b>	8.6	6.9	8.10	41
<b>POTASSIUM</b>	7	0.3	1.51	21
<b>SET SOLIDS</b>				
<b>SODIUM</b>	29	11.6	15.52	32
<b>SULFATE</b>	120	8	19.59	33
<b>SUSPENDED SOLIDS</b>	39.4	2	15.42	13
<b>TEMPERATURE</b>				
<b>TOTAL DISSOLVED SOLIDS</b>	482	240	292.94	33

**East Mountain Spring: 79-32**  
**Water Quality Data: Operational**  
**Mine Association: Wilberg/Cottonwood**  
**Date of Development: No Developmental Mining**  
**Date of Second Mining: None**

<b>Historical Data: 1979 - 2012</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	607	338	479.74	27
<b>CALCIUM</b>	261	39.7	90.81	26
<b>CARBONATE</b>	25	0	4.00	10
<b>CHLORIDE</b>	28.7	14	17.99	26
<b>CONDUCTIVITY</b>	1489	700	896.08	26
<b>DISSOLVED OXYGEN</b>	12.3	5.1	7.40	5
<b>FLOW</b>	3	0.23	0.98	27
<b>HARDNESS</b>	698	338	429.77	22
<b>TOTAL IRON</b>	6.87	0.2	2.05	17
<b>DISSOLVED IRON</b>	2.99	0	0.36	16
<b>MAGNESIUM</b>	66.7	14.2	52.17	26
<b>DISSOLVED MANGANESE</b>	0.341	0.018	0.09	11
<b>MANGANESE</b>	0.14	0.003	0.05	9
<b>OIL AND GREASE</b>	0.6	0.6	0.60	1
<b>PH</b>	8.29	6.95	7.83	27
<b>POTASSIUM</b>	8	0.95	2.36	26
<b>SET SOLIDS</b>				
<b>SODIUM</b>	45.55	21	35.52	26
<b>SULFATE</b>	412	24	95.93	27
<b>SUSPENDED SOLIDS</b>	168.8	0.5	22.88	10
<b>TEMPERATURE</b>	56	4.4	17.06	27
<b>TOTAL DISSOLVED SOLIDS</b>	979	327	529.11	27

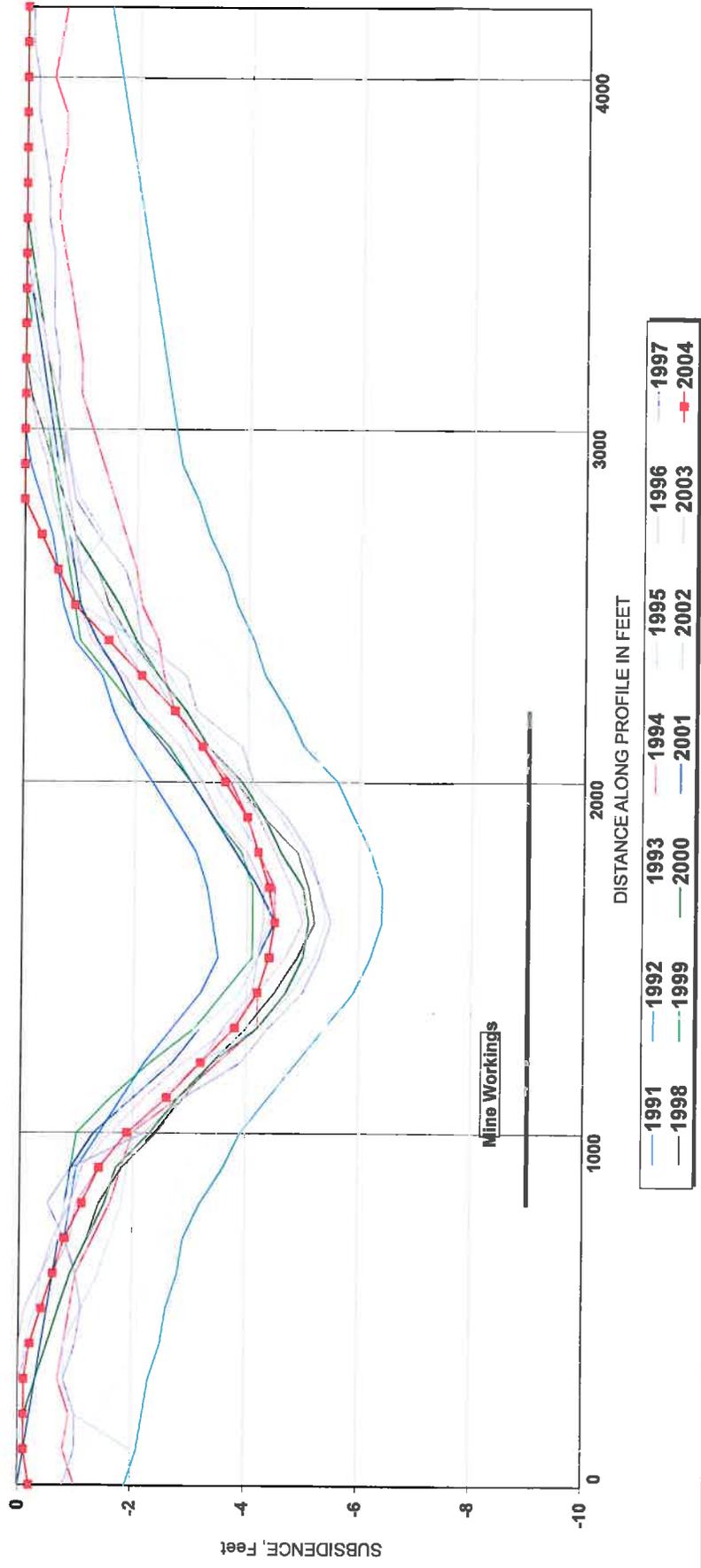
**Energy West 2004 Subsidence Report  
Area 18 Subsidence Profile  
North - South**

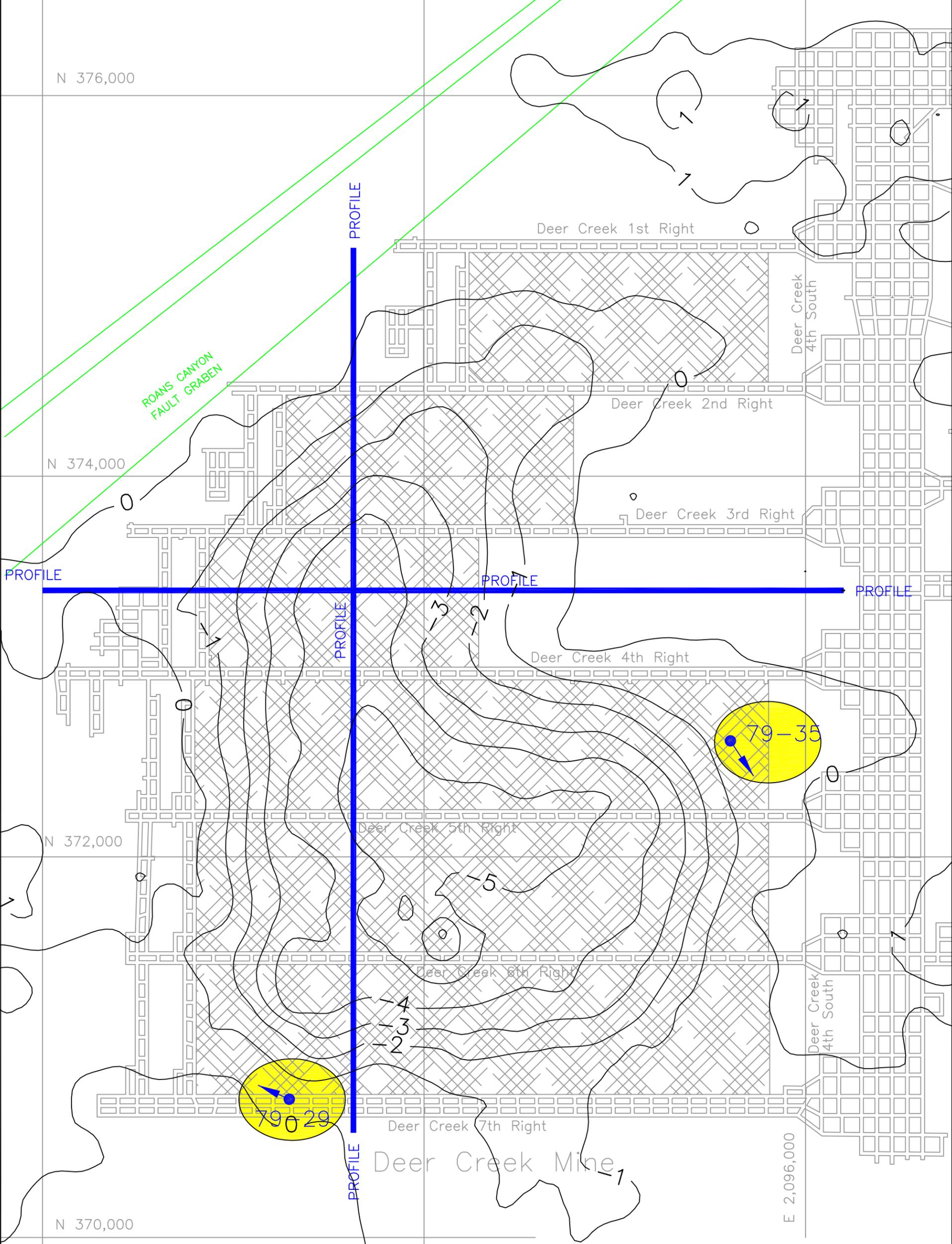
Chart 12



**Energy West 2004 Subsidence Report**  
**Area 18 Subsidence Profile**  
**West - East**

Chart 13





AREA 18

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**ENERGY WEST  
MINING COMPANY**  
HUNTINGTON, UTAH 84528

*2004 SUBSIDENCE - AREA 18  
DEER CREEK MINE  
2nd - 7th Right Longwall Panels*

DRAWN BY: *K.S.F., K.J.L.*

**FIGURE 9**

SCALE: *1" = 500'*

DRAWING #:

DATE: *MARCH 09, 2005*

SHEET *1* OF *1* REV. *---*



E 2,092,000

E 2,094,000

E 2,096,000

N 376,000

N 374,000

N 372,000

N 370,000

**Location:** Section 18, Township 17 South, Range 7 East, SLB&M. This site is located within the Deer Creek Mine permit boundary and within the federal coal lease U-084923.

**Lease Association:** This site is associated with federal coal lease U-084923. The lease (subleased by M. McKinnon) was assigned to Utah Power & Light Co. from the Peabody Coal Company in 1979. The Blind Canyon seam has been mine in this lease. Panel development began the Blind Canyon Seam in 1991 from Deer Creek's 4<sup>th</sup> South Mains. Longwall mining occurred on the west side of the 4<sup>th</sup> South Mains where six panels were extracted. Mining in this area was completed in 1992.

**Subsidence:** Maximum subsidence in the area north and adjacent to Spring 79-29 has stabilized at approximately less than one foot. A comparison of the subsidence shown on the 1996 subsidence map to equivalent maps for years 1993, 1994, and 1995 shows subsidence was stable and complete for this area.

Additional data from the 2004 Annual Subsidence Report is included herein for the area north of Spring 79-29.

**Water Data:** Pre- and Post- water quality data is included for spring 79-29. Data show insignificant variances between pre- and post-mining quality results. Historic flow data has been collected since 1983 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation of the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for this site is permeable fluvial channel that intersect the land surface. The stratigraphic location is within the North Horn Formation.

**Justification for removal from monitoring:** Site 79-29 has been monitored by Energy West Mining Company since 1979. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

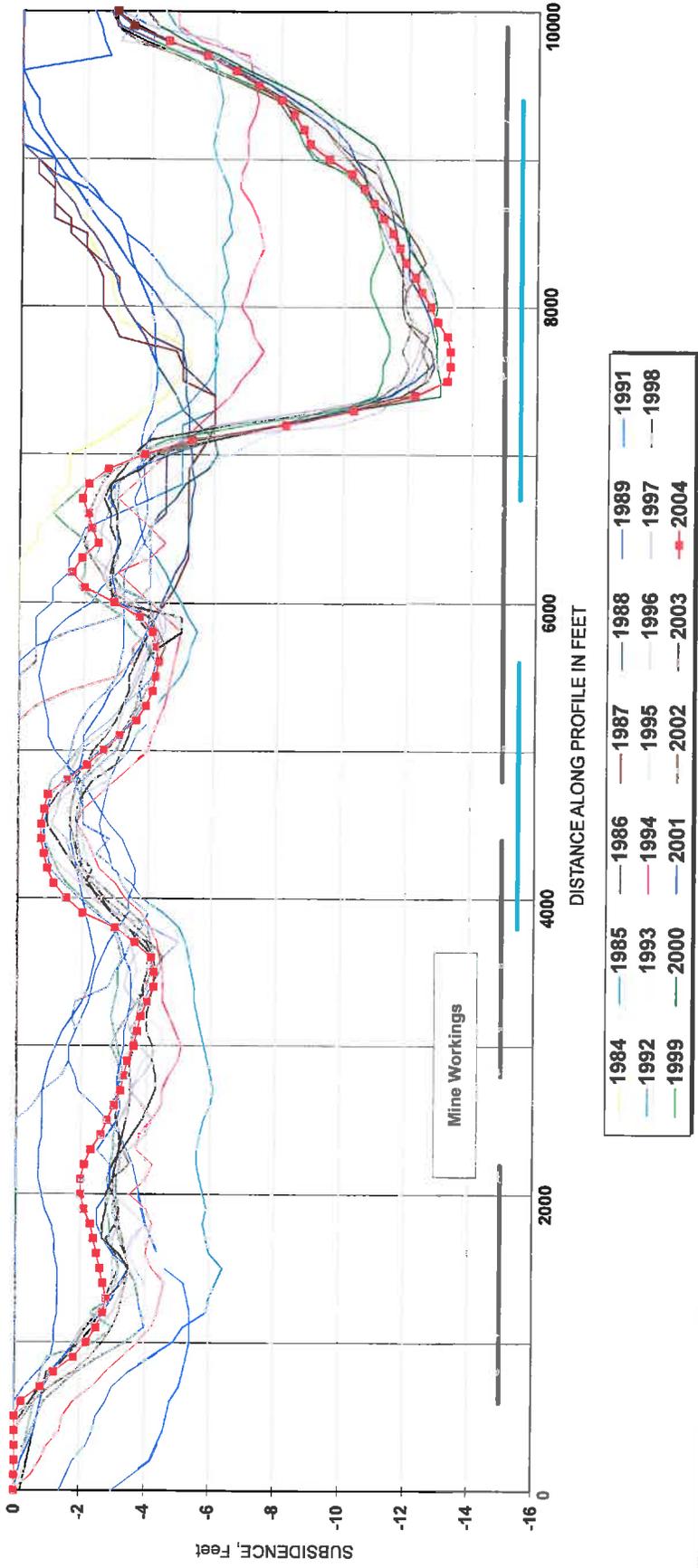
Although this site is within a current federal coal lease and within the mine permit boundary, its location is in the southern extents of the permit boundary where no future mining is planned. Therefore, it is requested that the site be removed from the monitoring program.

East Mountain Spring: 79-29  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine  
 Date of Development: Blind Canyon Seam: 1991  
 Date of Second Mining: Blind Canyon Seam: 1992

Historical Data: 1979 - 2012					Pre-Mining Data: 1979-1990				Post-Mining Data: 1993-2012				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	405	247	312.49	53	405	281	328.57	14	345	247	303.06	33	BICARBONATE
CALCIUM	110	23.9	44.237	63	110	30.2	52.784	19	104	32.9	40.642	36	CALCIUM
CARBONATE	10	0	1.3077	39	1	1	1	18	10	0	1.6667	18	CARBONATE
CHLORIDE	40	11.2	18.404	50	25.2	11.2	18.092	13	22	13	16.935	31	CHLORIDE
CONDUCTIVITY	664	380	561.22	64	660	380	545.9	20	664	503	583.11	36	CONDUCTIVITY
DISSOLVED OXYGEN	11.7	5	6.9429	28	8.8	6	6.9286	7	11.7	5	7.0615	13	DISSOLVED OXYGEN
FLOW	7	0.25	1.6788	66	6	0.7	2.1848	23	7	0.25	1.5242	36	FLOW
HARDNESS	480	197	253.75	60	319	197	247.88	17	480	226	254.51	35	HARDNESS
TOTAL IRON	2.7	0	0.2888	17				0	2.7	0	0.2888	17	TOTAL IRON
DISSOLVED IRON	0.26	0	0.0855	33	0.26	0.02	0.1214	14	0.2	0	0.0656	16	DISSOLVED IRON
MAGNESIUM	54	19.5	35.436	63	39	19.5	32.553	19	54	29	36.819	36	MAGNESIUM
DISSOLVED MANGANESE	0.01	0	0.0029	9				0	0.01	0	0.0029	9	DISSOLVED MANGANESE
MANGANESE	36	0	0.8931	42	0.08	0.01	0.0156	16	36	0	1.771	21	MANGANESE
OIL AND GREASE	0.9	0.9	0.9	1	0.9	0.9	0.9	1				0	OIL AND GREASE
PH	8.3	6.95	7.7376	67	8.3	6.95	7.7961	23	8.29	7.38	7.7419	36	PH
POTASSIUM	9	0.3	2.0557	46	9	0.46	3.1692	12	5	0.8	1.6647	30	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	40.08	21.8	33.01	50	36.27	21.8	31.328	13	37.28	30	33.31	31	SODIUM
SULFATE	230	4.1	37.525	51	230	4.1	58.471	14	37	20	30.071	31	SULFATE
SUSPENDED SOLIDS	37	1	6.888	25	37	1	8.1571	14	28	3	8.5	6	SUSPENDED SOLIDS
TEMPERATURE	48.1	3	23.413	59	43	3	29.179	19	41.8	3.4	18.024	36	TEMPERATURE
TOTAL DISSOLVED SOLIDS	432	240	325.61	51	432	252	337.14	14	350	240	319.52	31	TOTAL DISSOLVED SOLIDS

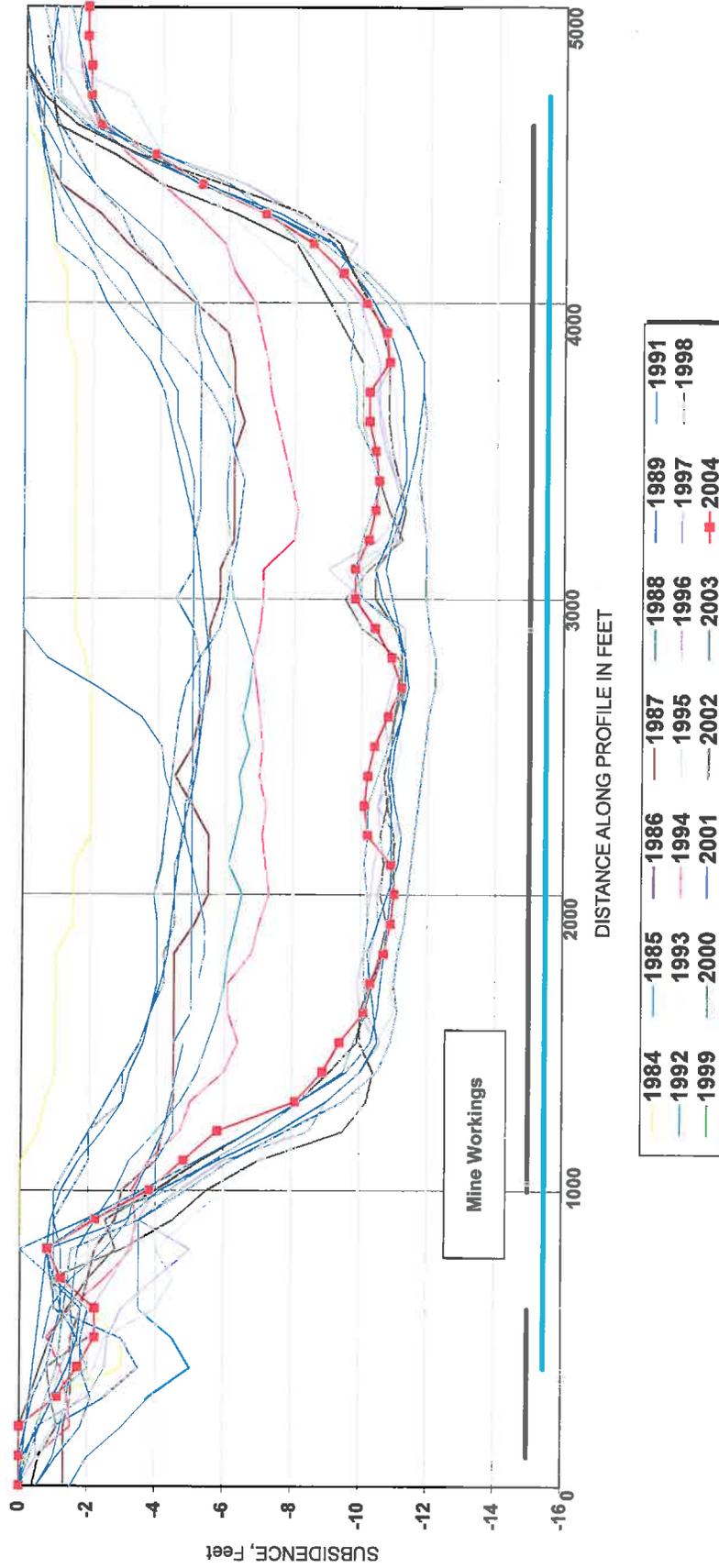
Energy West 2004 Subsidence Report  
 Area 4 Subsidence Profile  
 North - South

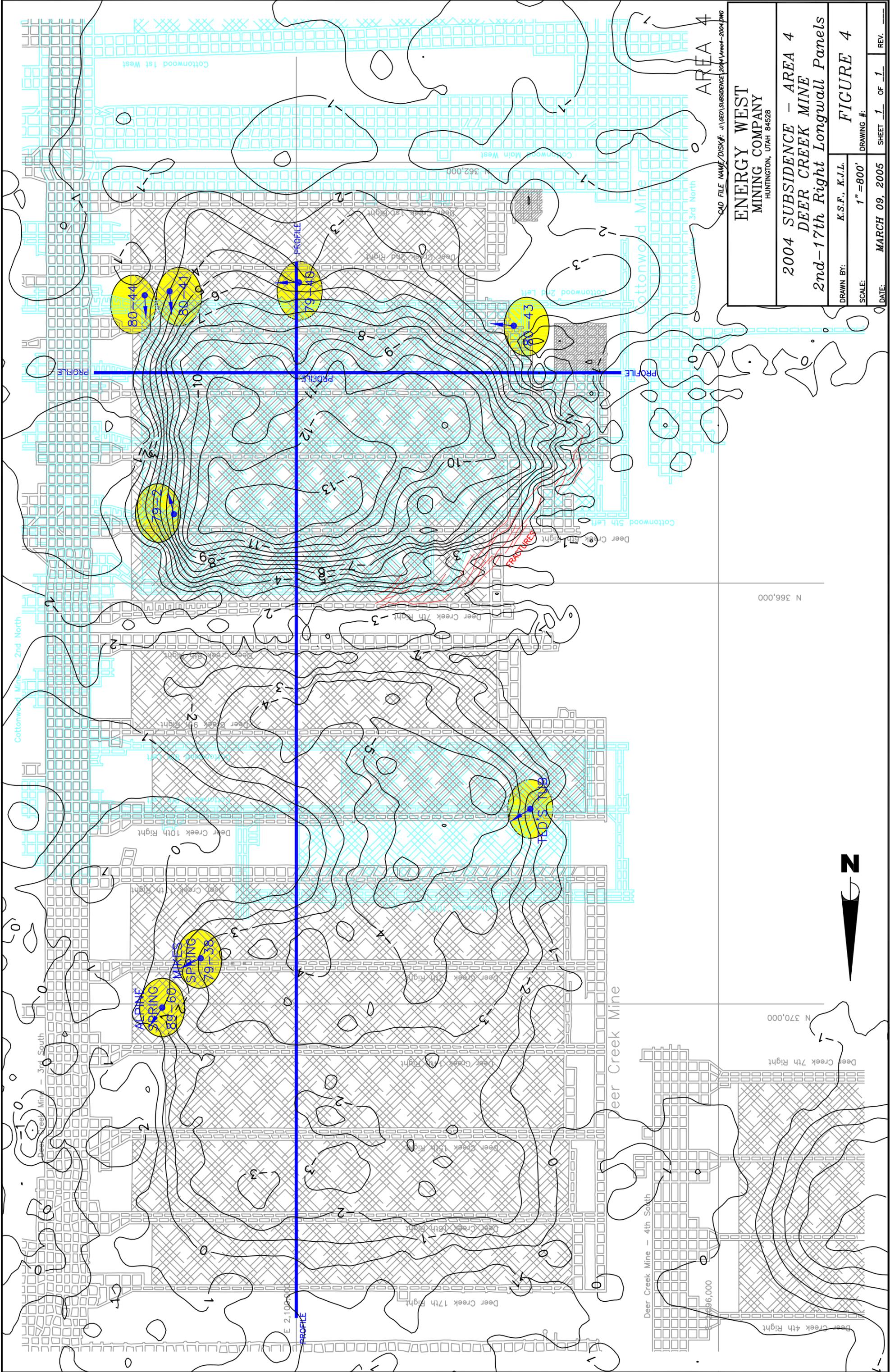
Chart 2



**Energy West 2004 Subsidence Report**  
**Area 4 Subsidence Profile**  
**West - East**

Chart 3





CAD FILE NAME/DISK#: \\GEO\SUBSIDENCE 2004\Area4-2004.DWG

AREA 4

<b>ENERGY WEST MINING COMPANY</b> HUNTINGTON, UTAH 84528	
<b>2004 SUBSIDENCE - AREA 4</b> <b>DEER CREEK MINE</b> <b>2nd-17th Right Longwall Panels</b>	
DRAWN BY:	K.S.F., K.J.L.
SCALE:	1" = 800'
DATE:	MARCH 09, 2005
DRAWING #:	
<b>FIGURE 4</b>	
SHEET 1	OF 1
REV.	



N 366,000

N 370,000

N 366,000

Cottonwood Mine - 2nd North

Cottonwood Mine

Deer Creek Mine

Deer Creek Mine - 4th South

Cottonwood 1st West

Cottonwood Main West

Deer Creek 2nd Right

Deer Creek 3rd Right

Cottonwood 2nd Left

Cottonwood 3rd North

Cottonwood 4th Right

Deer Creek 5th Left

Deer Creek 6th Right

Deer Creek 7th Right

Deer Creek 8th Right

Deer Creek 9th Right

Deer Creek 10th Right

Deer Creek 11th Right

Deer Creek 12th Right

Deer Creek 13th Right

Deer Creek 14th Right

Deer Creek 15th Right

Deer Creek 16th Right

Deer Creek 17th Right

Deer Creek 18th Right

Deer Creek 19th Right

Deer Creek 20th Right

Deer Creek 21st Right

Deer Creek 22nd Right

Deer Creek 23rd Right

Deer Creek 24th Right

Deer Creek 25th Right

Deer Creek 26th Right

Deer Creek 27th Right

Deer Creek 28th Right

**[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]**

**East Mountain  
Springs 79-38, 89-60,  
Ted's Tub**

**Location:** Section 16 and 17, Township 17 South, Range 7 East, SLB&M. Historically, these sites were located within the Deer Creek Mine permit boundary; however, since relinquishment of lease SL-070645/U-02292 and U-083066, (see below) the sites now lie outside any federal coal lease or mine permit boundary.

**Lease Association:** Springs 79-38 and 89-60 were associated with federal coal lease SL-070645/U-02292. Ted's Tub was associated with Federal Coal lease U-083066. The former was acquired in 1977 by Utah Power & Light from Peabody Coal Company. The latter, PacifiCorp was the sublessee to the Church of Jesus Christ of Latter Day Saints who was leaseholder of U-083066. Panel development off of the 3<sup>rd</sup> South Mains was started in 1988 in the Blind Canyon Seam for the 12<sup>th</sup> Right through 17<sup>th</sup> Right longwall panels. Extraction of these panels was completed in 1991.

For development in the Hiawatha Seam (Wilberg/Cottonwood Mine) near the vicinity of the springs, the 9<sup>th</sup> Left longwall panel was completed in 1992

The permittee submitted an application for the relinquishment of 1,240 acres in April 1997. In March 2006, The BLM approved (with USFS and DOGM concurrence) relinquishment of this acreage. This approval was retroactive as of the date of the submittal. There are no remaining economical recoverable coal reserves in the relinquished area.

**Subsidence:** Maximum subsidence in the mined area stated above reached approximately 13 feet. However, this was in the areas where double seam extraction took place (3<sup>rd</sup> thru 5<sup>th</sup> Right longwall panel (DC) and the 2<sup>nd</sup> thru 5<sup>th</sup> Left panel (WIL/CTW)); south of springs. The attached North/South Profile (2004 Annual Subsidence Report) shows only approximately 4 feet of subsidence occurred near 79-38/89-60, and Ted's Tub. A comparison of the subsidence shown on the 1996 subsidence map to equivalent maps for years 1993, 1994, and 1995 shows subsidence was stable and complete for this area. Refer to Supplemental Volume 1, Lease Relinquishment, tab Phase III, tab Data Summary Report.

Additional data from the 2004 Annual Subsidence Report is included herein.

**Water Data:** Pre- and Post-water quality data is included for springs 79-38, 89-60, and Ted's Tub. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected since 1983 (springs 79-38, Ted's Tub) and 1989 (spring 89-60) and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation of the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for Spring 79-38 is flow along permeable strata underlain by impermeable mudstone which intersect the land surface. The stratigraphic location for 79-38 is the base of the

**[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]**

**East Mountain  
Springs 79-38, 89-60,  
Ted's Tub**

North Horn Formation. No mode of occurrence has been identified for Spring 89-60. This spring is stratigraphically located in the Price River Formation. Mode of occurrence for Ted's Tub is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

**Justification for removal from monitoring:** Sites 79-38, 89-60, and Ted's Tub have been monitored by Energy West Mining Company since 1979. There have been no reported occurrences in which mining has impacted these sites. Historic quality and quantity data has not indicated such impacts to the sites.

Since the federal coal lease has been relinquished (with DOGM concurrence) and the sites are no longer within the boundaries of a mine permit, Energy West Mining Company retains no legal right of entry to the sites, nor control of the sites. Therefore, it is requested that these sites be removed from the monitoring program.

East Mountain Spring: 79-38  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine  
 Date of Development: Blind Canyon Seam: 1989; Hiawatha Seam: 1992  
 Date of Second Mining: Blind Canyon Seam: 1990; Hiawtha Seam: 1993

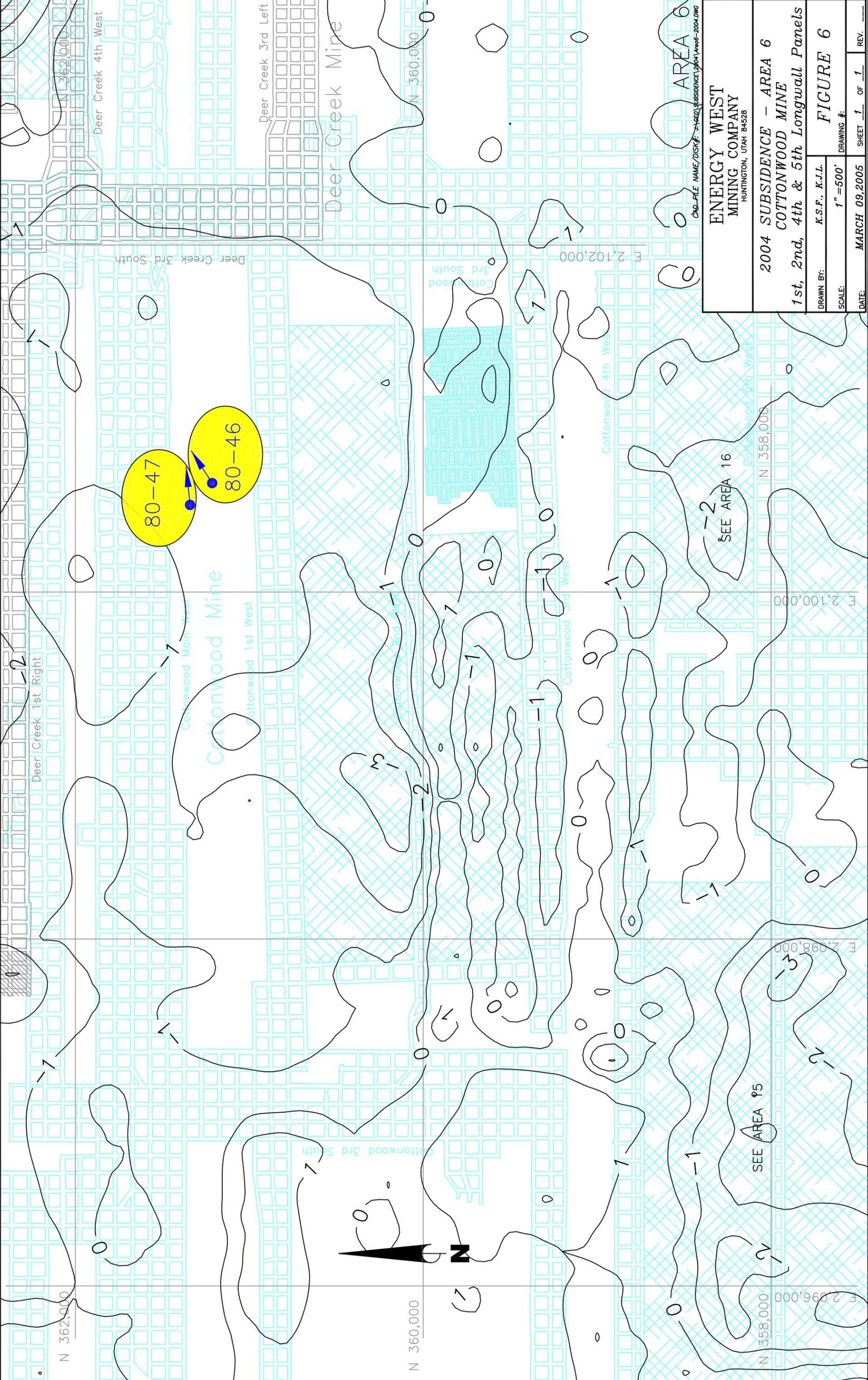
Historical Data: 1979 - 2011					Pre-Mining Data: 1979-1988				Post-Mining Data: 1991-2012				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	478	313	387.9	51	478	314	391.45	11	446	313	383.25	36	BICARBONATE
CALCIUM	181	34	75.792	50	181	56	96.19	10	95.2	34	68.645	36	CALCIUM
CARBONATE	5	0	1.2222	18	1	1	1	4	5	0	1.4	10	CARBONATE
CHLORIDE	30	3.2	8.94	50	17	3.2	7.83	10	30	4	9.2694	36	CHLORIDE
CONDUCTIVITY	804	430	651.48	50	750	430	626.5	10	804	470	668.25	36	CONDUCTIVITY
DISSOLVED OXYGEN	10.4	4.1	7.0071	14				0	10.4	4.1	6.9667	12	DISSOLVED OXYGEN
FLOW	10.9	0.38	3.8694	51	10.9	1.3	6.3091	11	10	0.38	3.1872	36	FLOW
HARDNESS	351	230	278.5	44	313	265	286.5	4	315	230	272.14	36	HARDNESS
TOTAL IRON	7.64	0.09	1.5219	29				0	7.64	0.09	1.5219	29	TOTAL IRON
DISSOLVED IRON	0.83	0	0.2207	28	0.61	0.05	0.2182	11	0.32	0	0.1031	13	DISSOLVED IRON
MAGNESIUM	55.9	14.7	25.82	50	55.9	17.2	29.92	10	36	14.7	24.713	36	MAGNESIUM
DISSOLVED MANGANESE	0.343	0.002	0.0564	16				0	0.343	0.002	0.0564	16	DISSOLVED MANGANESE
MANGANESE	0.2	0.002	0.0467	24	0.02	0.01	0.015	2	0.2	0.002	0.0511	18	MANGANESE
OIL AND GREASE	2.5	2.5	2.5	1	2.5	2.5	2.5	1				0	OIL AND GREASE
PH	8.35	6.85	7.8153	51	8.1	6.85	7.5673	11	8.35	6.97	7.8872	36	PH
POTASSIUM	8.5	0.04	1.4744	35	8.5	0.7	2.4844	9	5	0.1	1.1793	22	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	73.63	3.1	42.98	50	30.4	10.5	22.5	10	73.63	40.8	49.816	36	SODIUM
SULFATE	283	2.9	37.116	51	283	2.9	60.809	11	50	20	29.417	36	SULFATE
SUSPENDED SOLIDS	358	2	41.443	23	358	2	57.473	11	75	5	29.25	8	SUSPENDED SOLIDS
TEMPERATURE	55.9	2.7	17.713	47	49	3.5	19.482	11	55.9	2.7	15.476	34	TEMPERATURE
TOTAL DISSOLVED SOLIDS	546	202	383.53	49	546	310	362.4	10	457	202	392.94	35	TOTAL DISSOLVED SOLIDS

**East Mountain Spring: 89-60**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: Blind Canyon Seam: 1989; Hiawatha Seam: 1992**  
**Date of Second Mining: Blind Canyon Seam: 1990; Hiawatha Seam: 1993**

<b>Historical Data: 1989 - 2012</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	498	336	404.93	27
<b>CALCIUM</b>	118.3	64.54	81.26	27
<b>CARBONATE</b>	10	0	1.3	10
<b>CHLORIDE</b>	10	4	6.2889	27
<b>CONDUCTIVITY</b>	789	480	696	27
<b>DISSOLVED OXYGEN</b>	9	4.1	6.6714	7
<b>FLOW</b>	24.5	0.14	3.9259	27
<b>HARDNESS</b>	417	263	313.93	27
<b>TOTAL IRON</b>	7.14	0.06	1.0832	19
<b>DISSOLVED IRON</b>	0.1	0	0.035	12
<b>MAGNESIUM</b>	34	0.01	25.717	27
<b>DISSOLVED MANGANESE</b>	0.552	0.003	0.0857	10
<b>MANGANESE</b>	0.1	0	0.021	13
<b>OIL AND GREASE</b>				0
<b>PH</b>	8.46	7.06	8.0326	27
<b>POTASSIUM</b>	1.35	0.3	0.9106	18
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	63.14	30.4	42.111	27
<b>SULFATE</b>	80	2	34.83	27
<b>SUSPENDED SOLIDS</b>	65	6	32.333	6
<b>TEMPERATURE</b>	54.5	3.1	14.748	25
<b>TOTAL DISSOLVED SOLIDS</b>	480	347	418.15	27

East Mountain Spring: Ted's Tub  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine  
 Date of Development: Blind Canyon Seam: 1988, Hiawatha Seam: 1992  
 Date of Second Mining: Blind Canyon Seam: 1988, Hiawatha Seam 1993

Historical Data: 1979 - 2012					Pre-Mining Data: 1979-1987				Post-Mining Data: 1994-2012				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	375	254	313.67	63	375	283	322.69	16	370	254	305.63	38	BICARBONATE
CALCIUM	143	58	74.406	61	143	64	91.286	14	72.4	58	67.006	38	CALCIUM
CARBONATE	15	0	1.3636	22	1	1	1	2	15	0	1.5714	14	CARBONATE
CHLORIDE	20	1.7	4.3098	61	5.6	2.4	3.9286	14	6	1.7	3.2421	38	CHLORIDE
CONDUCTIVITY	611	315	513.97	61	600	315	494.93	14	611	453	534.74	38	CONDUCTIVITY
DISSOLVED OXYGEN	9.1	4.4	7.5385	13				0	8.5	4.4	6.9	6	DISSOLVED OXYGEN
FLOW	89	1.1	22.034	62	89	2.2	31.288	16	83.2	1.1	17.495	38	FLOW
HARDNESS	389	222	261.31	49	265	247	256	2	274	222	256.45	38	HARDNESS
TOTAL IRON	4.66	0.06	0.7666	32				0	4.66	0.06	0.7848	31	TOTAL IRON
DISSOLVED IRON	0.58	0	0.1014	37	0.41	0.04	0.126	15	0.2	0	0.0429	14	DISSOLVED IRON
MAGNESIUM	26.2	7	20.4	61	22	7	1685	14	24	18.41	21.668	38	MAGNESIUM
DISSOLVED MANGANESE	0.393	0.004	0.0575	19				0	0.393	0.004	0.0575	19	DISSOLVED MANGANESE
MANGANESE	0.2	0.002	0.0367	32				0	0.2	0.002	0.0375	23	MANGANESE
OIL AND GREASE	2.9	1.5	2.2	2	2.9	1.5	2.2	2				0	OIL AND GREASE
PH	8.52	6.95	7.7071	63	8.1	6.95	7.6119	16	8.52	7.3	7.7647	38	PH
POTASSIUM	13.15	0.2	1.5686	45	8	0.2	1.27	14	5	0.35	1.2145	26	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	25.93	4.54	12.394	61	14.5	5	7.0186	14	25.93	7	15.156	38	SODIUM
SULFATE	140	1	19.344	63	140	1	36.15	16	22	6	12.429	38	SULFATE
SUSPENDED SOLIDS	169	0.5	14.087	30	66	0.5	8.975	16	169	4	39	5	SUSPENDED SOLIDS
TEMPERATURE	59	2.8	13.666	60	47	2.8	8.8188	16	54.7	3.1	10.213	38	TEMPERATURE
TOTAL DISSOLVED SOLIDS	359	239	293.13	63	359	239	286.19	16	350	240	296.32	38	TOTAL DISSOLVED SOLIDS



ENERGY WEST  
MINING COMPANY  
HUNTINGTON, UTAH 84528

2004 SUBSIDENCE - AREA 6  
COTTONWOOD MINE  
1st, 2nd, 4th & 5th Longwall Panels

DRAWN BY: K.S.F., K.J.L.  
SCALE: 1" = 500'  
DATE: MARCH 09, 2005

DRAWING #: **FIGURE 6**  
SHEET 1 OF 1  
REV.

**Location:** Section 21, Township 17 South, Range 7 East, SLB&M. These sites are located within the Deer Creek and Wilberg/Cottonwood mine permit boundaries.

**Lease Association:** Springs 80-46 and 80-47 are associated with federal coal lease U-040151. PacifiCorp is the sublessee to the Church of Jesus Christ of Latter Day Saints which is the leaseholder of the Federal Coal Lease. The springs are located above the coal barrier separating the Main West and 1<sup>st</sup> West Mains in the Wilberg/Cottonwood Mine. These mains were developed in 1977. Two panels south of the springs (2<sup>nd</sup> and 3<sup>rd</sup> West longwall panels) have been completely extracted from the Hiawatha Seam.

**Subsidence:** Maximum subsidence within the area of the longwall panels reached approximately 3 to 4 feet. No subsidence is reported in the vicinity of the springs. Refer to the 2004 Annual Subsidence Report data which are included herein.

**Water Data:** Pre- and Post-water quality data is included for springs 80-46 and 80-47. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected since 1983 for 80-47 and 1988 for 80-46 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation of the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for Spring 80-46 and 80-47 is permeable fluvial channels that intersect land surface. The stratigraphic location for these springs is the North Horn Formation.

**Justification for removal from monitoring:** Sites 80-46 and 80-47 have been monitored by Energy West Mining Company since 1980. There have been no reported occurrences in which mining has impacted these sites. Historic quality and quantity data has not indicated such impacts to the sites.

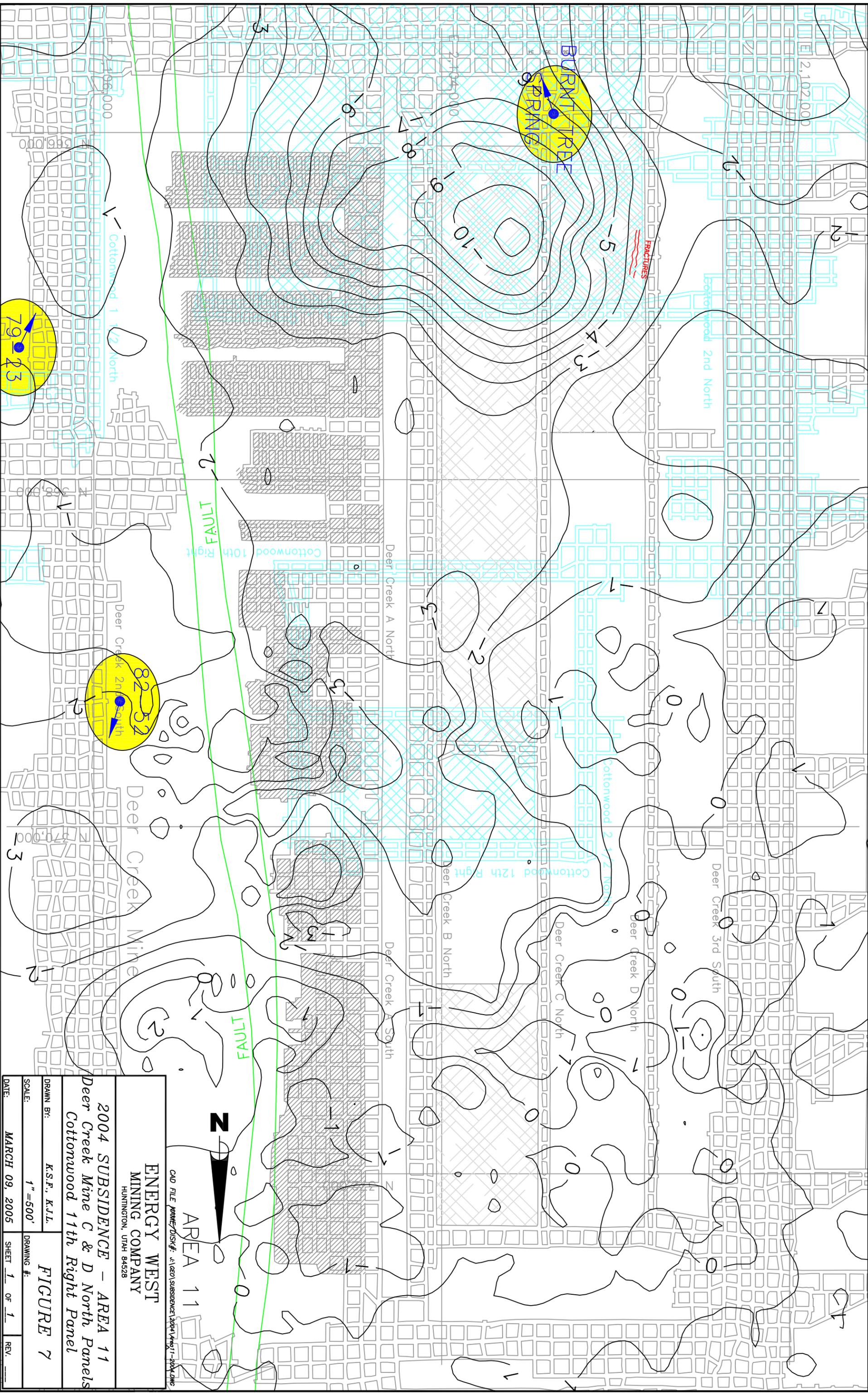
Although this site is within a current federal coal lease and within the mine permit boundaries, its location is in the southern extents of the Deer Creek and Wilberg/Cottonwood permit boundaries where no future mining is planned. Therefore, it is requested that the site be removed from the monitoring program.

East Mountain Spring: 80-46  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine/Wilberg/Cottonwood Mine  
 Date of Development: Adjacent First Mining, 1980  
 Date of Second Mining: Adjacent Second Mining 1996

	Historical Data: 1980 - 2012				Pre-Mining Data: 1980-1981				Post-Mining Data: 1997-2012				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	640	277	345.12	25	416	371	393.5	2	361	277	316.75	8	BICARBONATE
CALCIUM	94.6	39.7	61.427	27	55	45.3	50.15	2	65.2	53	60.429	8	CALCIUM
CARBONATE	5	0	1.6364	11				0	0	0	0	1	CARBONATE
CHLORIDE	8.5	2.7	4.55	24	8.5	3.7	6.1	2	5	2.7	3.5875	8	CHLORIDE
CONDUCTIVITY	658	440	549.61	28	505	490	497.5	2	615	519	553.38	8	CONDUCTIVITY
DISSOLVED OXYGEN	9.5	5.3	7.375	4				0	5.3	5.3	5.3	1	DISSOLVED OXYGEN
FLOW	60	0.45	9.4733	30	31	1.6	12.867	3	4.6	0.45	2.8125	8	FLOW
HARDNESS	355	227	280.68	19				0	294	235	272.13	8	HARDNESS
TOTAL IRON	0.11	0	0.0775	4				0	0.11	0	0.07	3	TOTAL IRON
DISSOLVED IRON	3	0	0.23	16	3	0.03	1.515	2	0	0	0	1	DISSOLVED IRON
MAGNESIUM	32.8	15	29.045	27	25.5	15	20.25	2	31.8	25	29.478	8	MAGNESIUM
DISSOLVED MANGANESE	0.002	0	0.001	2				0	0.002	0	0.001	2	DISSOLVED MANGANESE
MANGANESE	0.1	0	0.0291	11				0	0	0	0	1	MANGANESE
OIL AND GREASE				0				0				0	OIL AND GREASE
PH	8	6.7	7.4076	29	7.9	7.1	7.5	2	7.5	7.17	7.3413	8	PH
POTASSIUM	2	0.4	0.79	18	2	1.8	1.9	2	0.55	0.54	0.5433	3	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	11.44	7.9	9.9054	24	10	8.5	9.25	2	11.44	9	10.13	8	SODIUM
SULFATE	55	1.4	16.308	24	10.7	10.3	10.5	2	16	11	13.75	8	SULFATE
SUSPENDED SOLIDS	14	0.5	3.5667	15	6.5	2.5	4.5	2				0	SUSPENDED SOLIDS
TEMPERATURE	45.86	3.9	18.72	28	7.8	4.4	5.7333	3	8.2	4.1	5.5375	8	TEMPERATURE
TOTAL DISSOLVED SOLIDS	523	260	309.58	24	310	281	295.5	2	523	260	317.13	8	TOTAL DISSOLVED SOLIDS

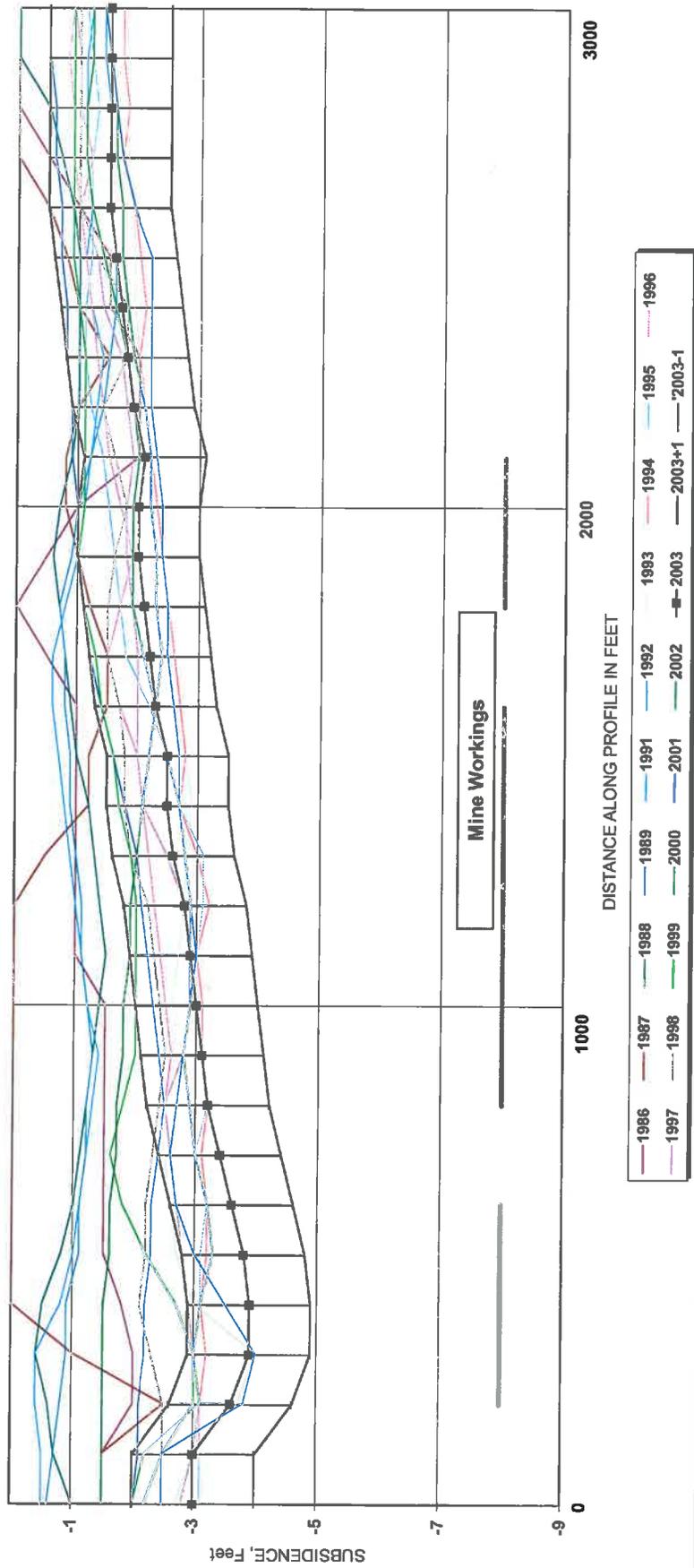
East Mountain Spring: 80-47  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine/Wilberg/Cottonwood Mine  
 Date of Development: Adjacent First Mining, 1980  
 Date of Second Mining: Adjacent Second Mining 1996

Historical Data: 1980 - 2012					Pre-Mining Data: 1980-1981				Post-Mining Data: 1997-2012				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	467	282	342.16	62	361	361	361	1	377	288	327.16	32	BICARBONATE
CALCIUM	125	55.2	67.291	62	110.2	110.2	110.2	1	68.7	56	63.702	32	CALCIUM
CARBONATE	20	0	1.7308	26				0	0	0	0	11	CARBONATE
CHLORIDE	25	2	5.2403	62	5.1	5.1	5.1	1	5	2	3.4938	32	CHLORIDE
CONDUCTIVITY	703	360	565.53	62	610	610	610	1	703	545	591.41	32	CONDUCTIVITY
DISSOLVED OXYGEN	12.6	4.7	7.5625	16				0	7.5	6.9	7.2	2	DISSOLVED OXYGEN
FLOW	20	0.5	6.143	64	12	12	12	3	10.5	0.59	4.4641	3	FLOW
HARDNESS	387	254	290.96	51				0	307	254	288.81	32	HARDNESS
TOTAL IRON	0.646	0	0.1855	32				0	0.646	0	0.1854	25	TOTAL IRON
DISSOLVED IRON	1.42	0	0.1327	37	0.28	0.28	0.28	1	0	0	0	10	DISSOLVED IRON
MAGNESIUM	41	26.2	31.418	62	33.5	33.5	33.5	1	34.76	27	31.524	32	MAGNESIUM
DISSOLVED MANGANESE	0.13	0	0.015	17				0	0.13	0	0.015	17	DISSOLVED MANGANESE
MANGANESE	0.2	0	0.0317	27				0	0.005	0	0.0011	14	MANGANESE
OIL AND GREASE				0				0				0	OIL AND GREASE
PH	8.26	6.7	7.65	61	7.6	7.6	7.6	1	8	7.1	7.5916	31	PH
POTASSIUM	7.5	0.32	1.562	47	7.5	7.5	7.5	1	0.831	0.585	0.7118	20	POTASSIUM
SET SOLIDS				0				0				0	SET SOLIDS
SODIUM	23	11	14.526	62	20.5	20.5	20.5	1	16	11	14.217	32	SODIUM
SULFATE	220.9	1.5	23.344	62	220.9	220.9	220.9	1	17	11	14.309	32	SULFATE
SUSPENDED SOLIDS	220	0.5	19.625	28	1.5	1.5	1.5	1				0	SUSPENDED SOLIDS
TEMPERATURE	54.2	2.6	14.766	58	3.3	3.3	3.3	1	9.6	2.6	5.85	32	TEMPERATURE
TOTAL DISSOLVED SOLIDS	1691	265	341.68	62	390	390	390	1	1691	270	353.34	32	TOTAL DISSOLVED SOLIDS

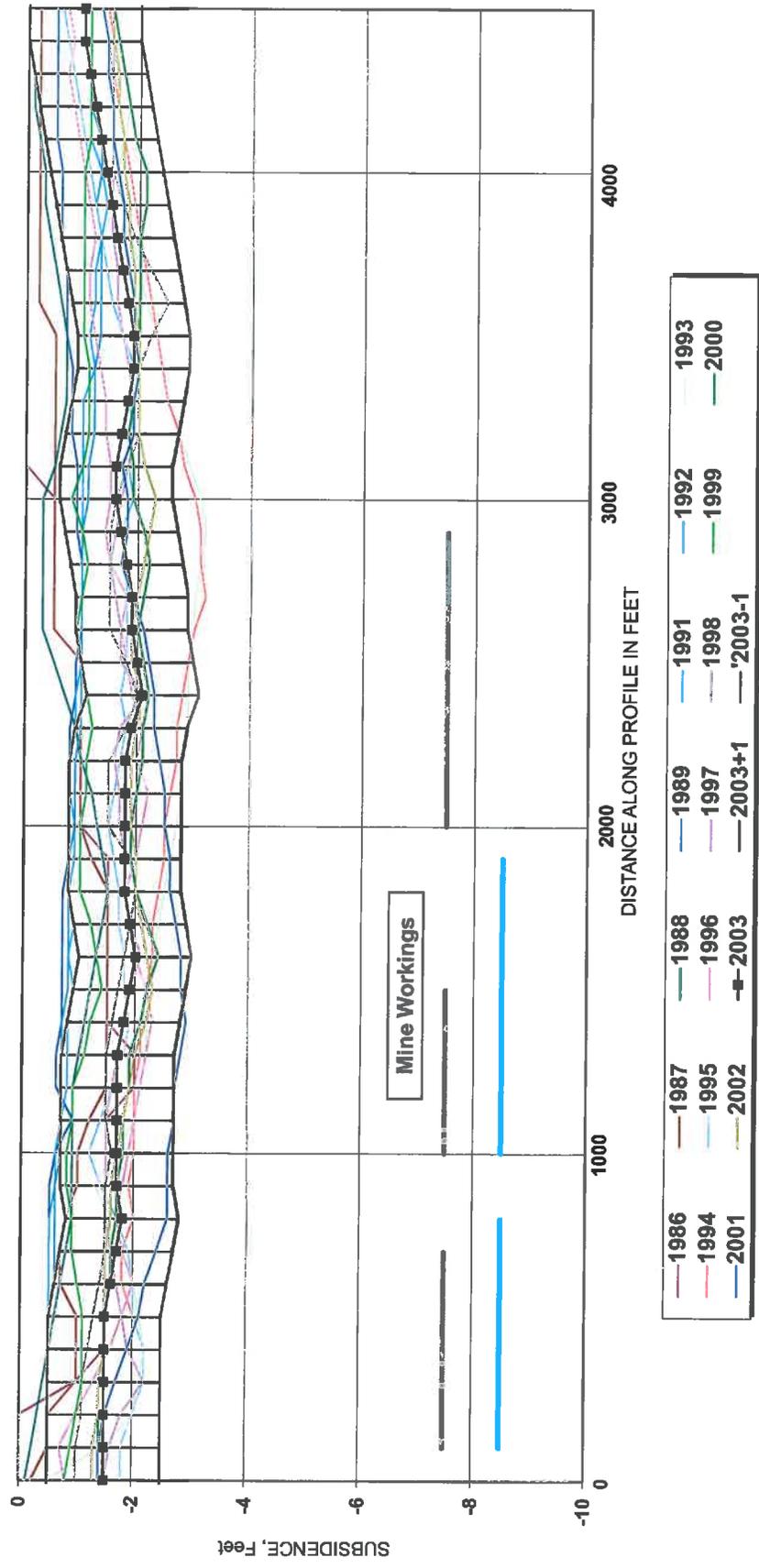


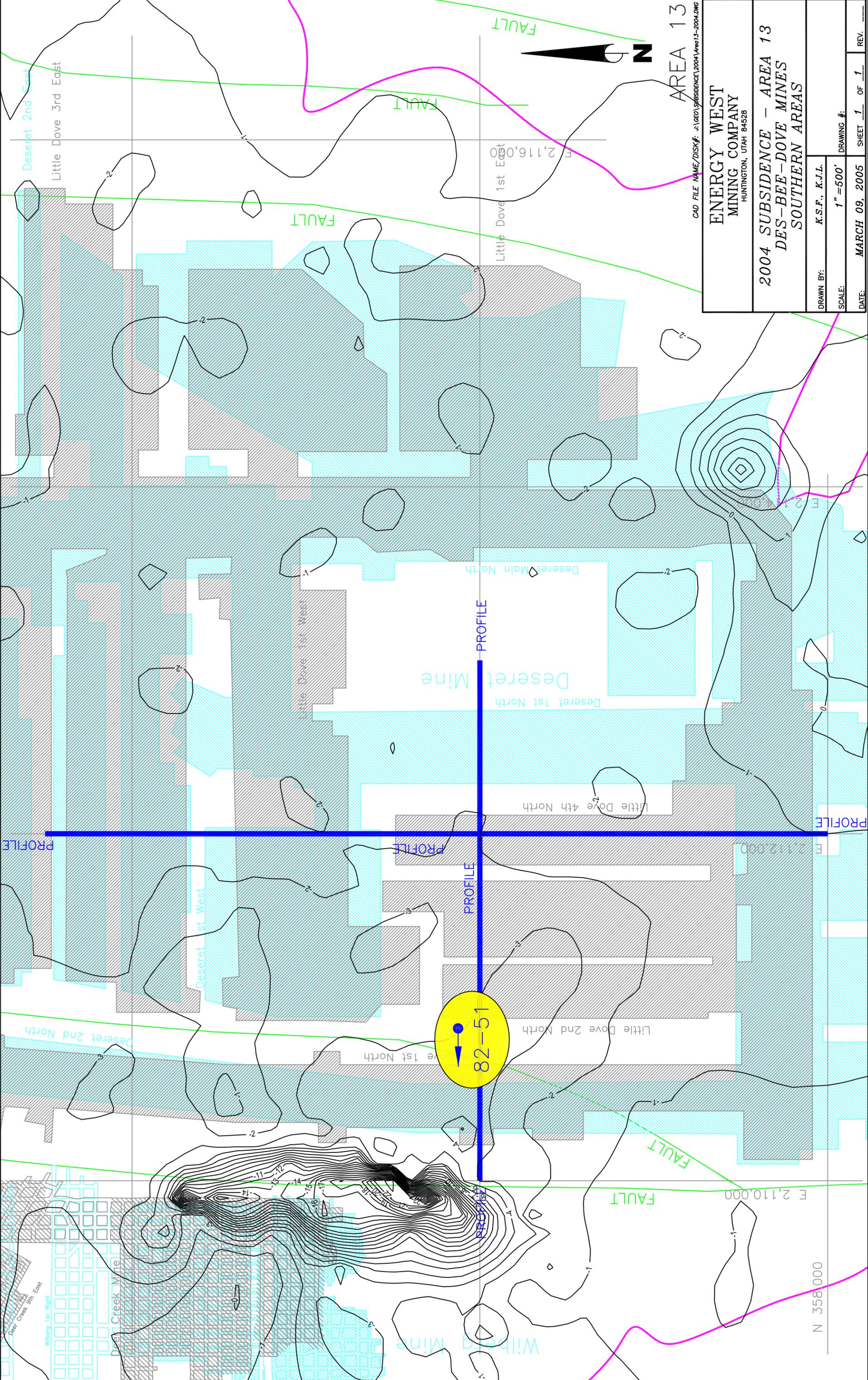
CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area11-2004.dwg <b>ENERGY WEST</b> <b>MINING COMPANY</b> HUNTINGTON, UTAH 84528	
<b>2004 SUBSIDENCE - AREA 11</b> Deer Creek Mine C & D North Panels Cottonwood 11th Right Panel	
DRAWN BY: K.S.F., K.J.L.	<b>FIGURE 7</b>
SCALE: 1" = 500'	DRAWING #
DATE: MARCH 09, 2005	SHEET 1 OF 1 REV.

**Energy West 2004 Subsidence Report  
Area 13 Subsidence Profile w/+- 1' Variance in 2003 Data  
West - East**



**Energy West 2004 Subsidence Report  
Area 13 Subsidence Profile w/+- 1' Variance in 2003 Data  
North - South**





AREA 13

CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area13-2004.DWG

**ENERGY WEST  
MINING COMPANY**  
HUNTINGTON, UTAH 84528

**2004 SUBSIDENCE - AREA 13  
DES-BEE-DOVE MINES  
SOUTHERN AREAS**

DRAWN BY:	K.S.F., K.J.L.
SCALE:	1" = 500'
DATE:	MARCH 09, 2005
DRAWING #:	
SHEET	1 OF 1
REV.	

82-51

N 358,000

E 2,110,000

E 2,116,000

E 2,112,000

Deseret 2nd East

Little Dove 3rd East

Little Dove 1st East

Deseret 1st West

Little Dove 1st West

Little Dove 2nd North

Little Dove 4th North

Deseret 1st North

Deseret Main North

Deseret 2nd North

Wilberg 1st Right  
Dear Creek 9th East

Dear Creek Mine

Wilberg Mine

FAULT

FAULT

FAULT

FAULT

FAULT

PROFILE

PROFILE

PROFILE

PROFILE

PROFILE

PROFILE

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**Location:** Section 26, Township 17 South, Range 7 East, SLB&M. Historically, the site was located within the Des Bee Dove Mine permit boundary; however, since relinquishment of the federal coal lease, U-02664, and reduction of the permit boundary after final reclamation of the mine site in 2001, this site now lies outside a federal coal lease, as well as the mine permit boundary.

**Lease Association:** This site was associated with federal coal lease U-02664. The lease was acquired from the Church of Jesus Christ of Latter Day Saints in 1972. Room and pillar mining began in the Little Dove Mine in 1980 in the 2<sup>nd</sup> North Mains of the Blind Canyon Seam. Retreat mining (pillaring) was completed in this area in 1986.

In the Hiawatha Seam or Deseret Mine, room and pillar mining began in 1973 in the 1<sup>st</sup> North Mains and 1981 in the 2<sup>nd</sup> North Mains. No retreat mining was conducted in this area of the Deseret Mine.

In December 1995, the BLM approved (with concurrence by USFS and DOGM) a partial relinquishment of 240 acres for U-02664. In February, 2004, the BLM accepted an additional 250 acres. Both approvals were retroactive as of April 24, 1992 (date of application). In September 2011, The BLM accepted relinquishment of the remaining 430 acres of U-02664. The final relinquishment of the remaining acreage was retroactive as of December 15, 2006.

**Subsidence:** As stated in the 2004 Subsidence Report, submitted May 2005, Area 13 of the Des Bee Dove mine site (and the area of spring 82-51) subsidence is substantially complete. Figures 41, 42, and 43 show a maximum subsidence in Area 13 of approximately 3 feet (refer to Supplemental Volume 1, Lease Relinquishment, tab Phase I&II, tab Profiles and Isograms and also included herein). There is no indication that subsidence has affected the flow quantity of spring 82-51.

**Water Data:** Historical water quality data is included for spring 82-51. Data show no abnormalities in the water quality parameters for this area of East Mountain. Historic flow data has been collected since 1983 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation data collected from the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for this site is permeable fluvial channels that intersect the land surface within the stratigraphic location of the Price River Formation.

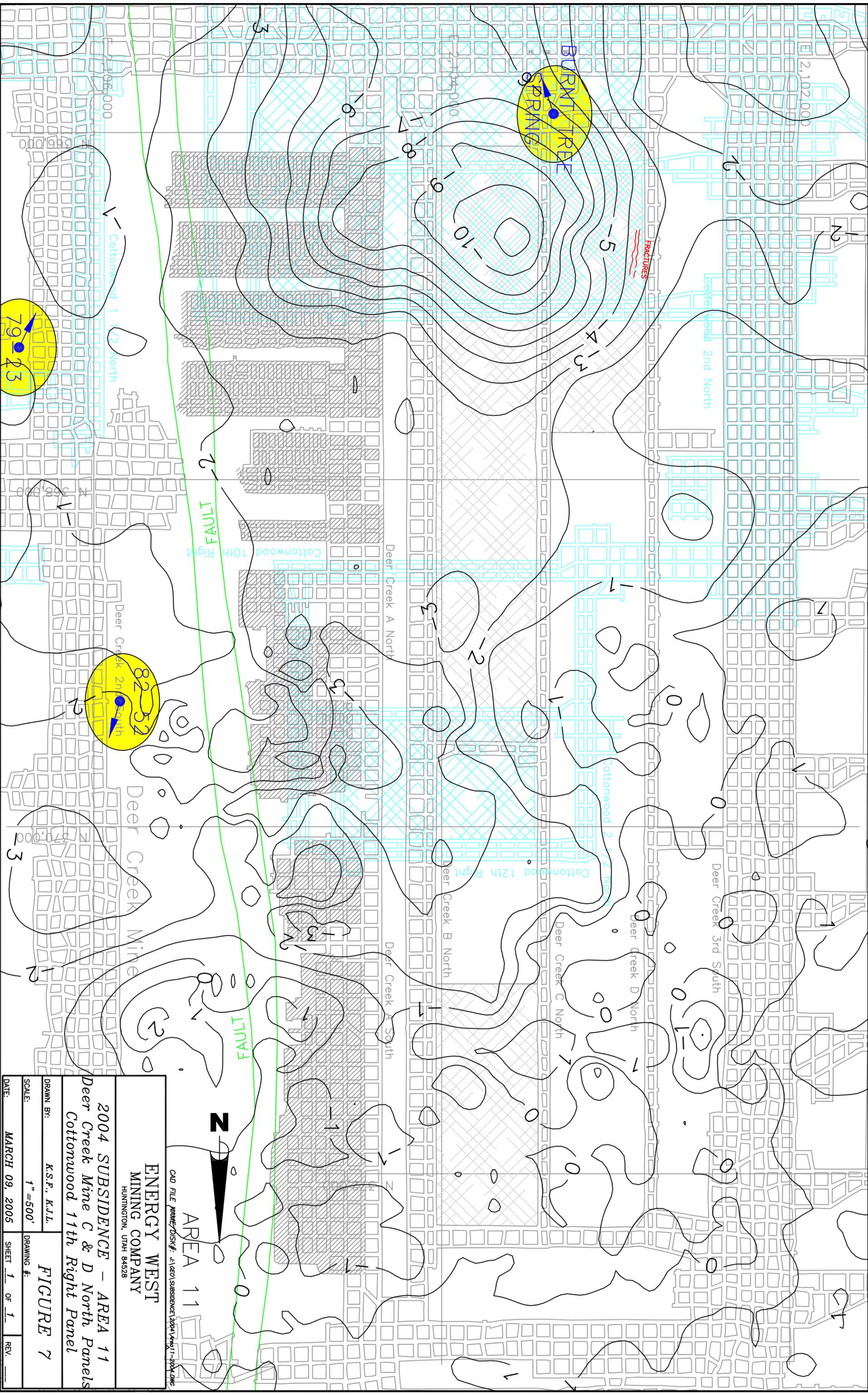
**Justification for removal from monitoring:** Site 82-51 has been monitored by Energy West Mining Company since 1980. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

Since the federal coal lease has been relinquished (with concurrence by DOGM) and the site is no longer within the boundaries of a mine permit, Energy West Mining Company retains no legal right of entry to the site, nor control of the site. Therefore, it is requested that the site be removed from the monitoring program.

**East Mountain Spring: 82-51**  
**Water Quality Data: Operational**  
**Mine Association: Des Bee Dove Mine**  
**Date of Development: Blind Canyon Seam: 1980**  
**Date of Second Mining: Blind Canyon Seam: Completed in 1986**

**Historical Data: 1980 - 2011**

	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	411	275	346.29	21
<b>CALCIUM</b>	122	46	81.413	21
<b>CARBONATE</b>	20	0	6	6
<b>CHLORIDE</b>	20	7.9	15.467	21
<b>CONDUCTIVITY</b>	1000	562	842.62	21
<b>DISSOLVED OXYGEN</b>	11.9	5.6	7.48	5
<b>FLOW</b>	15	0.14	2.5945	22
<b>HARDNESS</b>	520	295	407.29	17
<b>TOTAL IRON</b>	10.57	0	1.5587	15
<b>DISSOLVED IRON</b>	0.1	0	0.042	10
<b>MAGNESIUM</b>	62.2	41	48.23	21
<b>DISSOLVED MANGANESE</b>	0.242	0	0.0713	7
<b>MANGANESE</b>	0.1	0	0.0243	6
<b>OIL AND GREASE</b>				0
<b>PH</b>	8.35	7.3	7.86	21
<b>POTASSIUM</b>	6.09	0.38	1.5244	16
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	44	20.9	30.115	21
<b>SULFATE</b>	191	14	139.38	21
<b>SUSPENDED SOLIDS</b>	140	2	40.75	6
<b>TEMPERATURE</b>	52.9	3.2	13.162	21
<b>TOTAL DISSOLVED SOLIDS</b>	612	153	518	21



CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area11-2004.dwg <b>ENERGY WEST</b> <b>MINING COMPANY</b> HUNTINGTON, UTAH 84528	
<b>2004 SUBSIDENCE - AREA 11</b> Deer Creek Mine C & D North Panels Cottonwood 11th Right Panel	
DRAWN BY: K.S.F., K.J.L.	<b>FIGURE 7</b>
SCALE: 1" = 500'	DRAWING #
DATE: MARCH 09, 2005	SHEET 1 OF 1 REV.

**Location:** Section 15, Township 17 South, Range 7 East, SLB&M. This site is located within the Deer Creek Mine permit boundary and within the federal coal lease SL-070645/U-02292. The site was originally located within the Wilberg/Cottonwood and Deer Creek mine permit boundary. The Wilberg/Cottonwood mine permit boundary was reduced which excluded the area of spring 82-52 from its permit boundary. DOGM approved this permit boundary reduction in 2002.

**Lease Association:** This site is associated with Federal Coal lease SL-070645/U-02292. The lease was acquired by Utah Power & Light in 1977 from Peabody Coal Company. Both the Hiawatha and Blind Canyon seams have been mined in this lease. For mining areas near the spring, room and pillar mining began the Blind Canyon Seam in 1975 from Deer Creek's 2nd South Mains.

**Subsidence:** Spring 82-52 lies nearly directly over the 2<sup>nd</sup> South Mains of the Deer Creek Mine. Approximately 2 feet subsidence has been noted at this location. Refer to Supplemental Volume 1, Lease Relinquishment, tab Phase III, tab Data Summary Report for more detail.

Additional data from the 2004 Annual Subsidence Report is included herein.

**Water Data:** Pre- and Post- water quality data is included for spring 82-52. Data show insignificant variances between pre- and post- quality results. Historic flow data has been collected since 1983 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation of the East Mountain weather station, as well as, the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for this site has not been identified. The stratigraphic location is within the Price River Formation.

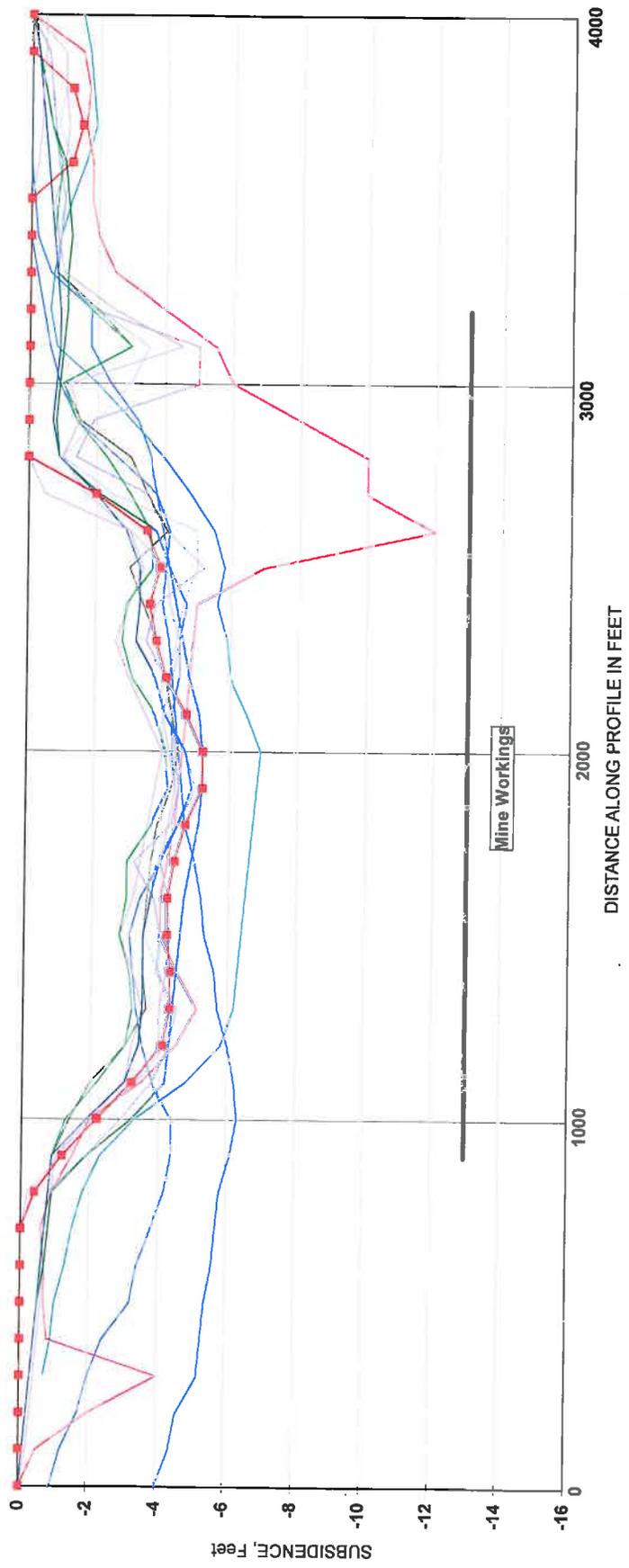
**Justification for removal from monitoring:** Site 82-52 has been monitored by Energy West Mining Company since 1982. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

Although this site is within a current Federal Coal Lease and within the mine permit boundary, its location is in the southern extents of the permit boundary where no future mining is planned. Therefore, it is opined that the site should be removed from the monitoring program.

**East Mountain Spring: 82-52**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: Blind Canyon Seam: 1975**  
**Date of Second Mining:**

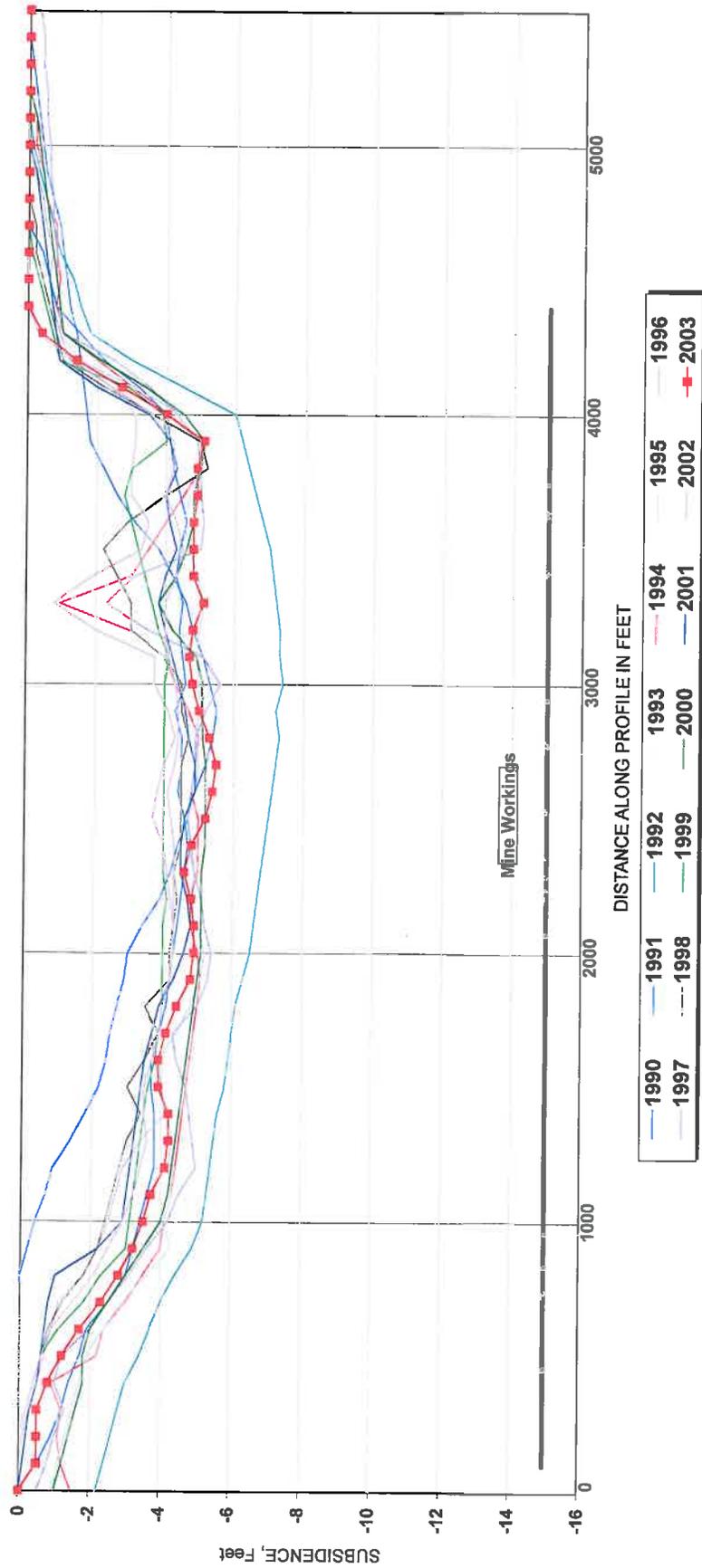
<b>Historical Data: 1982 - 2011</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	523	334	409.85	61
<b>CALCIUM</b>	160	38.4	74.401	72
<b>CARBONATE</b>	9	0	1.6061	33
<b>CHLORIDE</b>	35	2	10.067	58
<b>CONDUCTIVITY</b>	826	401	682.67	72
<b>DISSOLVED OXYGEN</b>	10.8	4.2	7.7407	27
<b>FLOW</b>	80	0.24	8.5126	73
<b>HARDNESS</b>	436	192	330.9	63
<b>TOTAL IRON</b>	0.74	0	0.1796	19
<b>DISSOLVED IRON</b>	0.33	0	0.0872	33
<b>MAGNESIUM</b>	42.15	8	35.933	72
<b>DISSOLVED MANGANESE</b>	0.02	0	0.0066	8
<b>MANGANESE</b>	0.2	0	0.0412	40
<b>OIL AND GREASE</b>				0
<b>PH</b>	8.66	6.8	7.6631	74
<b>POTASSIUM</b>	8	0.09	1.4779	44
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	37.63	12	29.16	59
<b>SULFATE</b>	211	5	44.288	59
<b>SUSPENDED SOLIDS</b>	96	0.5	8.4516	31
<b>TEMPERATURE</b>	51	2.2	21.019	64
<b>TOTAL DISSOLVED SOLIDS</b>	488	262	400.42	59

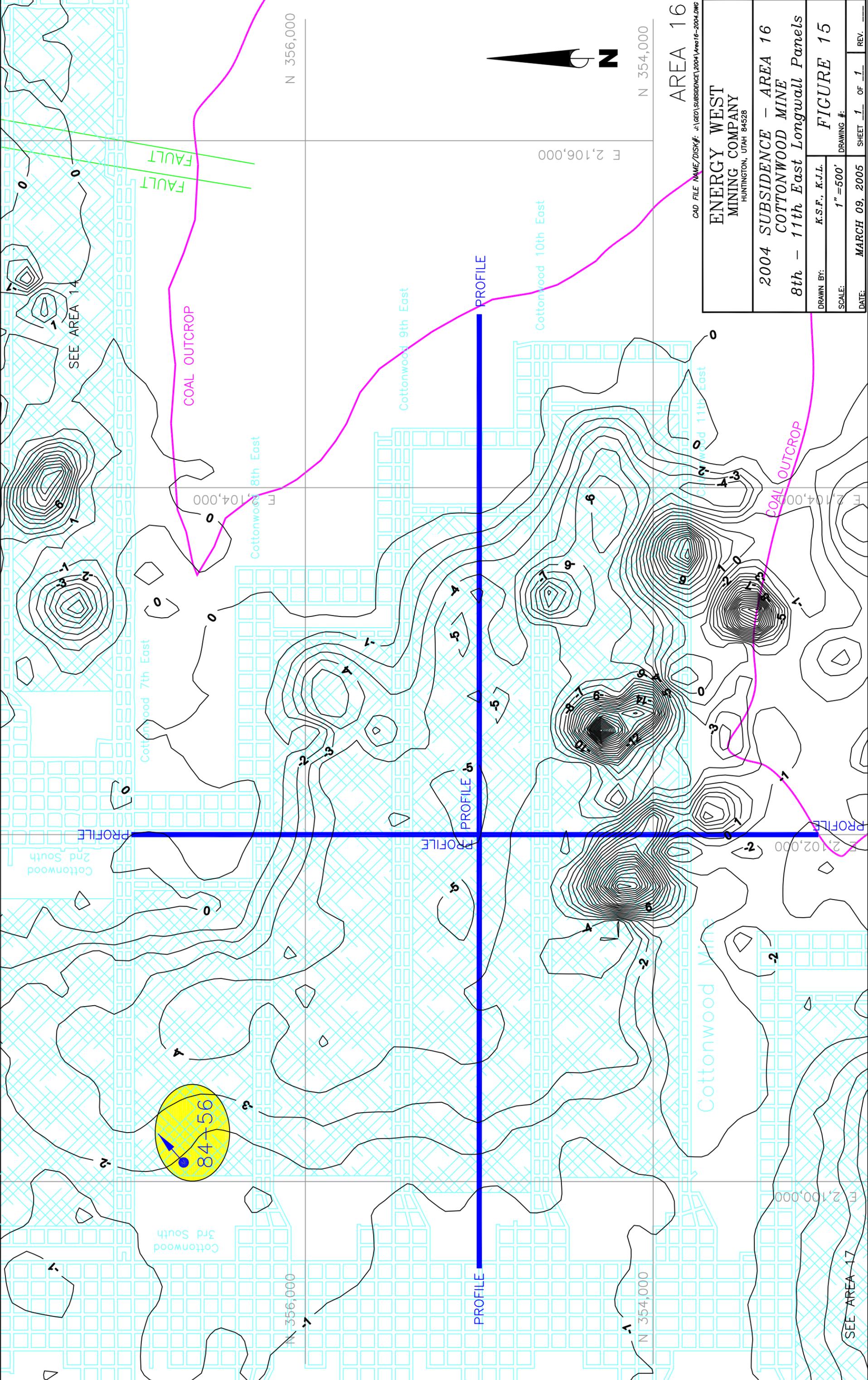
**Energy West 2004 Subsidence Report**  
**Area 16 Subsidence Profile**  
**North - South**



1990	1991	1992	1993	1994	1995	1996
1997	1998	1999	2000	2001	2002	2003

Energy West 2004 Subsidence Report  
Area 16 Subsidence Profile  
West - East





CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area16-2004.DWG

<b>ENERGY WEST MINING COMPANY</b> HUNTINGTON, UTAH 84528	
2004 SUBSIDENCE - AREA 16 COTTONWOOD MINE	
8th - 11th East Longwall Panels	
DRAWN BY: K.S.F., K.J.L.	DRAWING #: <b>FIGURE 15</b>
SCALE: 1" = 500'	
DATE: MARCH 09, 2005	
SHEET 1 OF 1	
REV.	

AREA 16

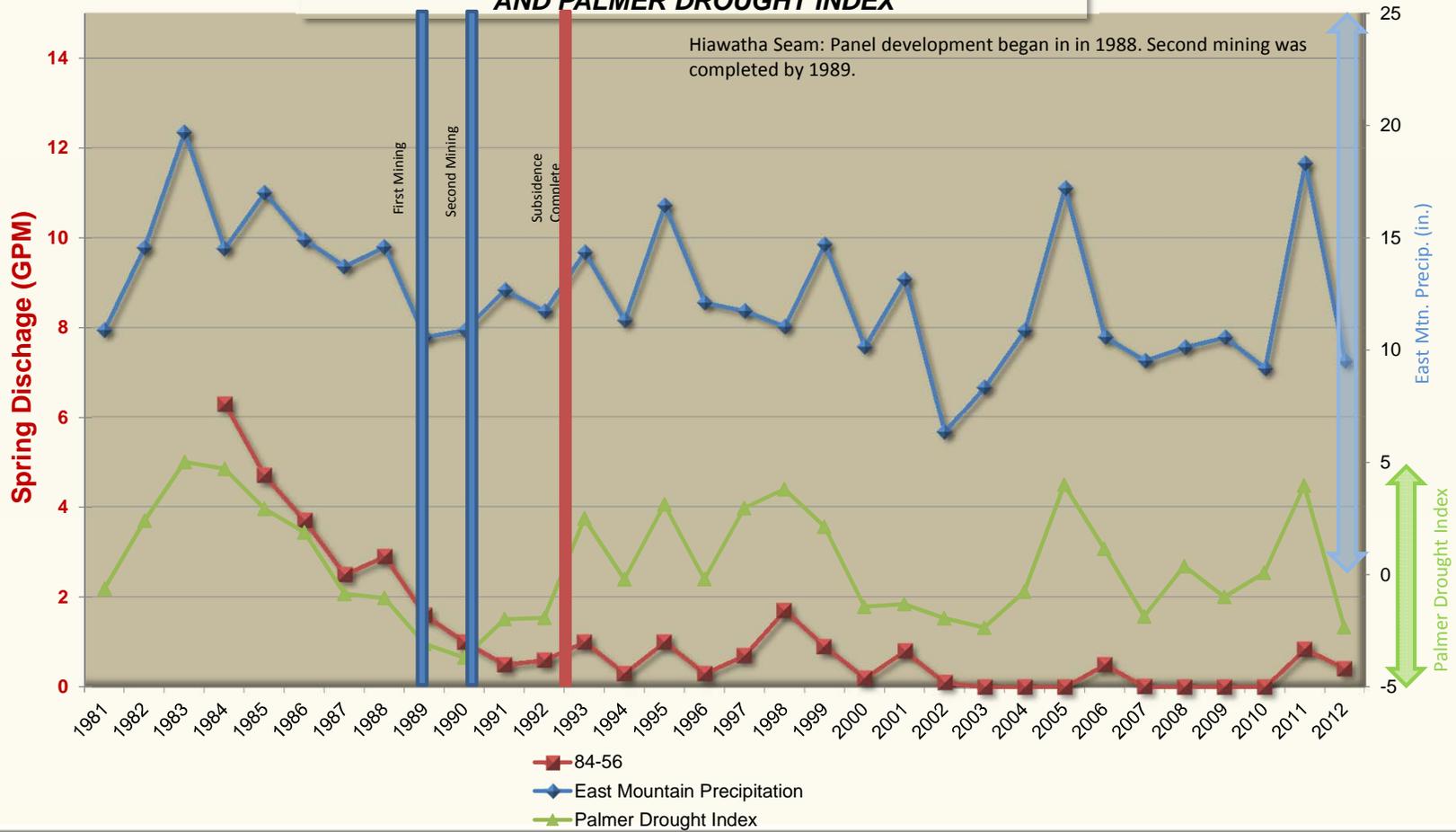
SEE AREA 17

SEE AREA 14

# EAST MOUNTAIN SPRINGS

## SPRING: 84-56 vs. PRECIPITATION

### PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION AND PALMER DROUGHT INDEX



**Location:** Section 28, Township 17 South, Range 7 East, SLB&M. Historically, the site was located within the Wilberg/Cottonwood Mine permit; however, since relinquishment of lease U-47978, (see below) this site now lies outside any federal coal lease and mine permit boundary.

**Lease Association:** This site has been associated with federal coal lease U-47978. The lease was acquired in 1981. Mining began in 1984 and was completed in 1992. Both the development and extraction mining were conducted in this lease and within the Hiawatha Seam only. The spring has been undermined by mining operations.

In December 1995, the BLM approved (with concurrence by USFS and DOGM) a partial relinquishment of 1,347.31 acres for U-47978. The relinquishment was retroactive as of April 24, 1992 (date of application). In March 2004, the BLM again approved a partial relinquishment of 1,820.00 acres. Only 180 acres has been retained for this lease and is part of the Wilberg/Cottonwood Mine permit boundary. The second relinquishment was retroactive as of October 16, 1992.

**Subsidence:** Refer to the Supplemental Volume 1, Lease Relinquishment, tab Phase I & II, tab Data Summary Report. Monitoring shows that the area subsided up to 7 feet, but generally only 5 to 6 feet in most monitored areas, and directly beneath the spring, 2 feet. Data from the 2004 Annual Subsidence Report is included herein. There is no indication that subsidence has affected the flow quantity of Spring 84-56.

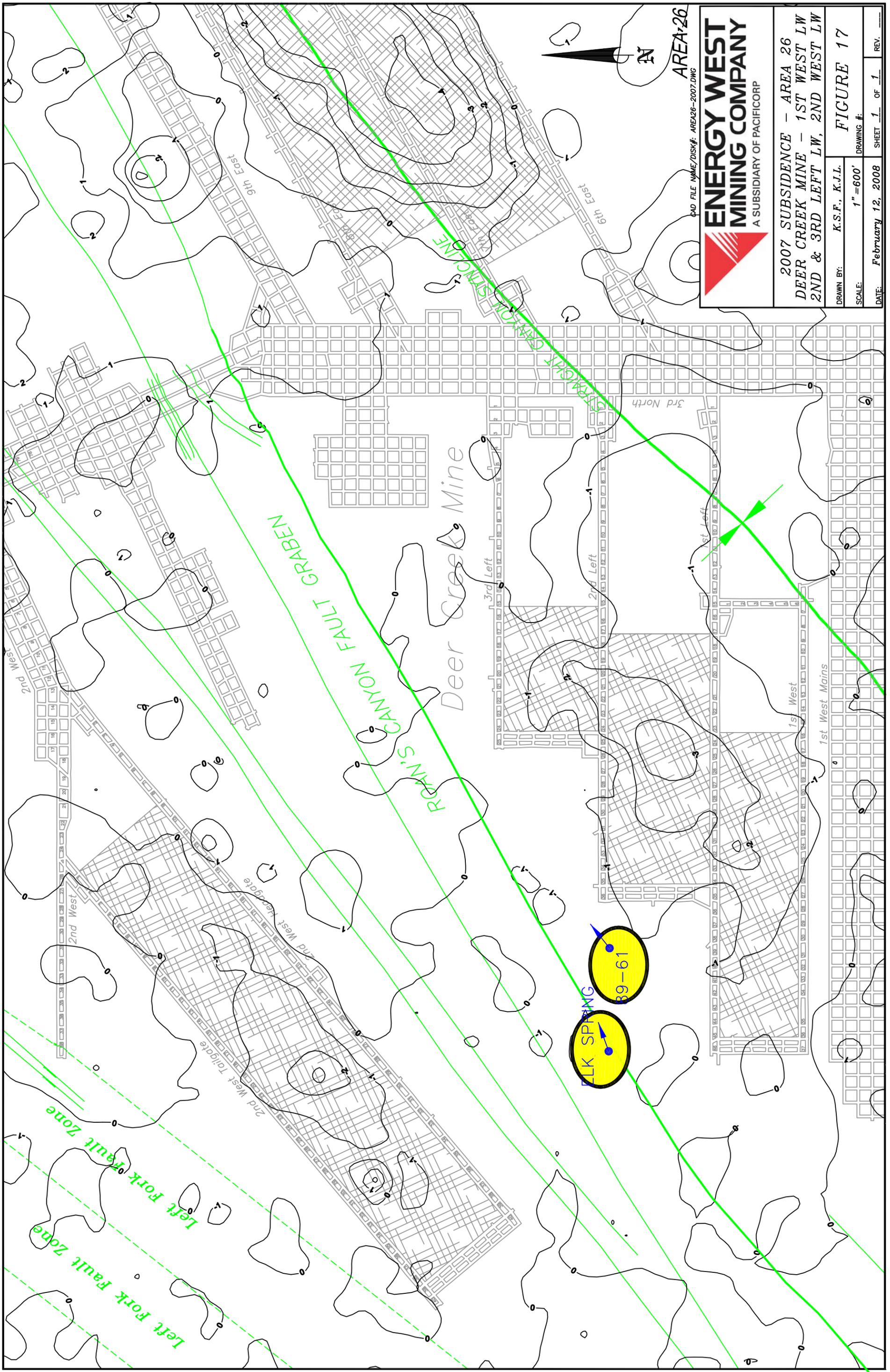
**Water Data:** Historic and Post-water quality data is included for spring 84-56. Data show insignificant variances between the historic quality and post-mining quality results. Historic flow data has been collected since 1984 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation data collected from the East Mountain weather station, as well as, the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for this site is permeable fluvial channels that intersect the land surface. The stratigraphic location is within the North Horn Formation.

**Justification for removal from monitoring:** Site 84-56 has been monitored by Energy West Mining Company since 1984. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

Since the federal coal lease has been relinquished (with concurrence by DOGM) and the site is no longer within the boundaries of a mine permit, Energy West Mining Company retains no legal right of entry to the site, nor control of the site. Therefore, it is requested that the site be removed from the monitoring program.

East Mountain Spring: 84-56  
 Water Quality Data: Operational  
 Mine Association: Wilberg/Cottonwood  
 Date of Development: Hiawatha Seam: 1988  
 Date of Second Mining: Hiawatha Seam: 1999

Historical Data: 1984 - 2012					Pre-Mining Data: 1984-1986				Post-Mining Data: 1993-2012				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	406	266	339.02	43	No Pre-Mining Quality Data				370	268	334.23	26	BICARBONATE
CALCIUM	86.9	39.7	61.146	53					69	39.7	57.184	29	CALCIUM
CARBONATE	10	0	1.5	34					10	0	2.3077	13	CARBONATE
CHLORIDE	35	4	9.4585	41					10	4	7.6208	24	CHLORIDE
CONDUCTIVITY	680	360	554.28	53					658	505	575.69	29	CONDUCTIVITY
DISSOLVED OXYGEN	9.3	4.9	6.7692	26					9.3	5.2	6.7083	12	DISSOLVED OXYGEN
FLOW	67.1	0.08	2.3644	55					1.7	0.08	0.6407	29	FLOW
HARDNESS	387	235	290.33	52					316	235	280.5	28	HARDNESS
TOTAL IRON	3.8	0	0.4364	11					3.8	0	0.4364	11	TOTAL IRON
DISSOLVED IRON	0.2	0	0.0625	24					0.2	0	0.0955	11	DISSOLVED IRON
MAGNESIUM	42	19.8	32.822	53					35	30	33.112	29	MAGNESIUM
DISSOLVED MANGANESE	0	0	0	4					0	0	0	4	DISSOLVED MANGANESE
MANGANESE	0.2	0	0.0457	35					0.2	0	0.0869	16	MANGANESE
OIL AND GREASE				0								0	OIL AND GREASE
PH	8.42	6.7	7.478	56					7.67	7.16	7.4721	29	PH
POTASSIUM	5	0.03	1.3737	27					5	0.1	1.88	13	POTASSIUM
SET SOLIDS				0								0	SET SOLIDS
SODIUM	20.8	11.7	17.133	41					20.55	13.8	17.245	24	SODIUM
SULFATE	100	7	28.168	41					33	19	26.829	24	SULFATE
SUSPENDED SOLIDS	59	0.5	6.4348	23					24	4	8	7	SUSPENDED SOLIDS
TEMPERATURE	49.82	3.6	28.263	49					49.82	3.6	21.923	29	TEMPERATURE
TOTAL DISSOLVED SOLIDS	445	179	322.02	41					370	290	320.58	24	TOTAL DISSOLVED SOLIDS



AREA 26

CAD FILE NAME/DISK#: AREA26-2007.DWG



2007 SUBSIDENCE - AREA 26  
 DEER CREEK MINE - 1ST WEST LW  
 2ND & 3RD LEFT LW, 2ND WEST LW

DRAWN BY:	K.S.F., K.J.L.	DRAWING #:	FIGURE 17
SCALE:	1" = 600'		
DATE:	February 12, 2008		

[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]

East Mountain  
Spring 89-61, Elk  
Spring

**Location:** Section 5, Township 17 South, Range 7 East, SLB&M. These sites are located within the Deer Creek Mine permit along the Roans Canyon Fault Graben. The two springs approximately 600 feet apart on the southern side of the graben.

**Lease Association:** This site is associated with federal coal lease U-084923. The lease (subleased by M. McKinnon) was assigned to Utah Power & Light Co. from the Peabody Coal Company in 1979.

**Subsidence:** The springs lie above an unmined area directly west of the 1<sup>st</sup> and 2<sup>nd</sup> Left longwall panels. These panels were stopped short of complete panel extraction. Monitoring shows that the area has little to no subsidence. No other subsidence data is included of these sites.

**Water Data:** Historic and post-water quality data is included for spring 89-61 and Elk Spring. Data show insignificant variances between the historic quality and post-quality results. Historic flow data has been collected since 1984 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation data collected from the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for this site is fault controlled. The stratigraphic location is within the North Horn Formation.

**Justification for removal from monitoring:** Sites 89-61 and Elk Spring were developed for culinary use starting in 2009 by North Emery Water Users Special Services District. The spring water is diverted into a collection line and directed down canyon through a 6" waterline and to the slow sand water treatment plant in Huntington Canyon. The springs give NEWUSSD additional source capacity to meet their yearly culinary demands. Although Energy West Mining Company has monitored these sites since 1984, the data since development of the springs is irrelevant to the mining operations. Prior to development, there have been no reported occurrences in which mining has impacted these sites. Historic quality and quantity data has not indicated such impacts to the site.

Since the springs have been developed for culinary use by NEWUSSD, Energy West Mining Company retains no legal right of entry to the site, nor control of the site. Therefore, it is requested that the site be removed from the monitoring program.

**East Mountain Spring: 89-61**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: No Mining**  
**Date of Second Mining: No Mining**  
**Spring Developed for Culinary Use by NEWUSSD in 2009**

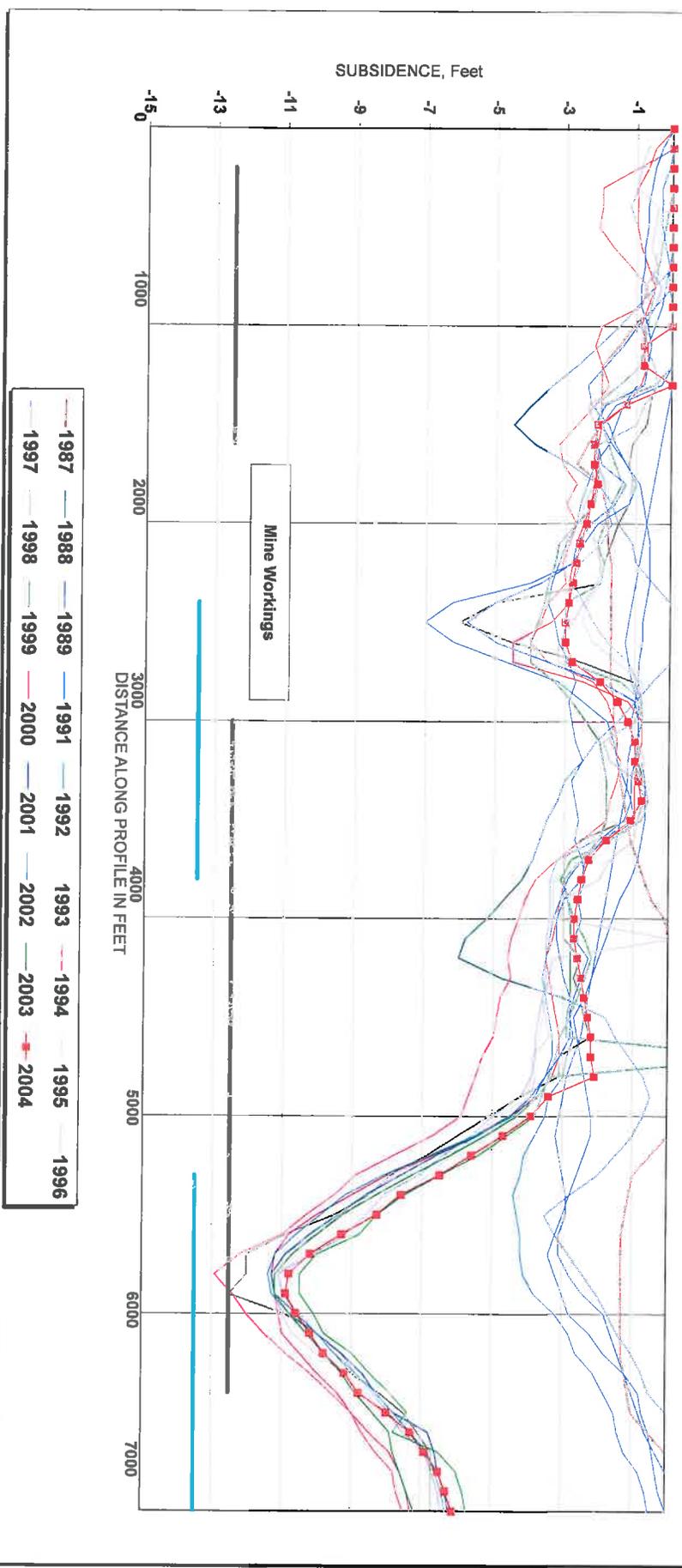
<b>Historical Data: 1989 - 2012</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	443	271	335.73	40
<b>CALCIUM</b>	110.1	59.6	71.518	41
<b>CARBONATE</b>	5	0	1.3846	13
<b>CHLORIDE</b>	15	2	4.6902	41
<b>CONDUCTIVITY</b>	624	390	545.46	41
<b>DISSOLVED OXYGEN</b>	10.1	4.6	7.3938	16
<b>FLOW</b>	200	0.45	50.985	40
<b>HARDNESS</b>	380	264	294.1	41
<b>TOTAL IRON</b>	0.2	0	0.1	8
<b>DISSOLVED IRON</b>	0.2	0	0.0794	17
<b>MAGNESIUM</b>	32.4	24.2	27.993	41
<b>DISSOLVED MANGANESE</b>	0	0	0	3
<b>MANGANESE</b>	0.2	0	0.0538	16
<b>OIL AND GREASE</b>				0
<b>PH</b>	8	6.6	7.4466	41
<b>POTASSIUM</b>	5.97	0.01	1.4112	23
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	14.72	5.6	8.8712	41
<b>SULFATE</b>	27	1.5	15.28	41
<b>SUSPENDED SOLIDS</b>	13	1	5.0714	14
<b>TEMPERATURE</b>	45.6	3.4	14.584	37
<b>TOTAL DISSOLVED SOLIDS</b>	359	243	304.93	40

**East Mountain Spring: Elk Spring**  
**Water Quality Data: Operational**  
**Mine Association: Deer Creek Mine**  
**Date of Development: No Mining**  
**Date of Second Mining: No Mining**  
**Spring Developed for Culinary Use by NEWUSSD in 2009**

<b>Historical Data: 1979 - 2012</b>				
	<b>MAXIMUM</b>	<b>MINIMUM</b>	<b>AVERAGE</b>	<b># ANALYSIS</b>
<b>BICARBONATE</b>	347	236	279.72	68
<b>CALCIUM</b>	112	35.5	62.25	78
<b>CARBONATE</b>	10	0	1.2973	37
<b>CHLORIDE</b>	20	1.6	4.3708	65
<b>CONDUCTIVITY</b>	545	262	449.94	79
<b>DISSOLVED OXYGEN</b>	11.1	4.9	8.0259	27
<b>FLOW</b>	599.3	0.1	122.06	79
<b>HARDNESS</b>	376	192	247.09	69
<b>TOTAL IRON</b>	0.2	0	0.0667	18
<b>DISSOLVED IRON</b>	0.5	0	0.089	41
<b>MAGNESIUM</b>	35.7	10	22.915	78
<b>DISSOLVED MANGANESE</b>	0.007	0	0.0006	11
<b>MANGANESE</b>	0.2	0	0.041	42
<b>OIL AND GREASE</b>	1.1	0.1	0.6	2
<b>PH</b>	8.55	6.8	7.8311	82
<b>POTASSIUM</b>	10	0.1	1.6366	44
<b>SET SOLIDS</b>				0
<b>SODIUM</b>	29	2.78	7.3865	65
<b>SULFATE</b>	196.9	0.7	15.817	66
<b>SUSPENDED SOLIDS</b>	30	0.2	4.1387	31
<b>TEMPERATURE</b>	45.5	3.3	18.348	73
<b>TOTAL DISSOLVED SOLIDS</b>	351	178	253.55	67

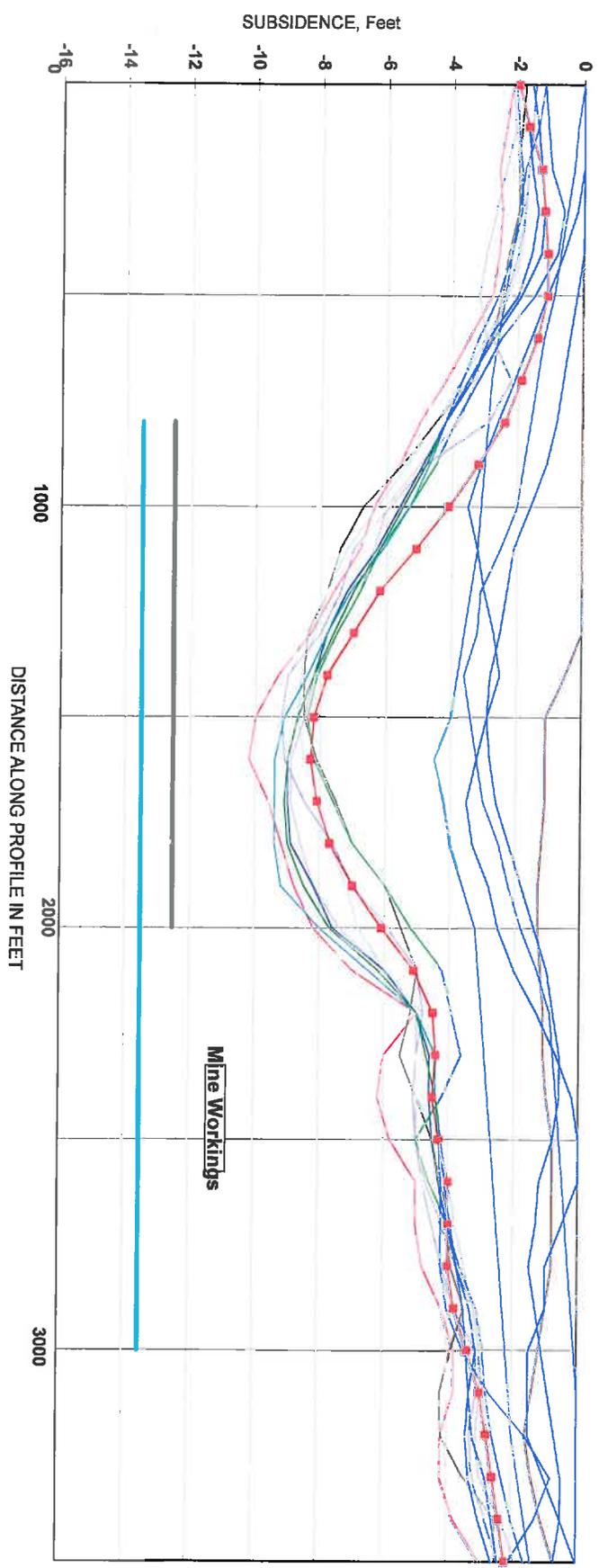
# Energy West 2004 Subsidence Report Area 11 Subsidence Profile North - South

Chart 8

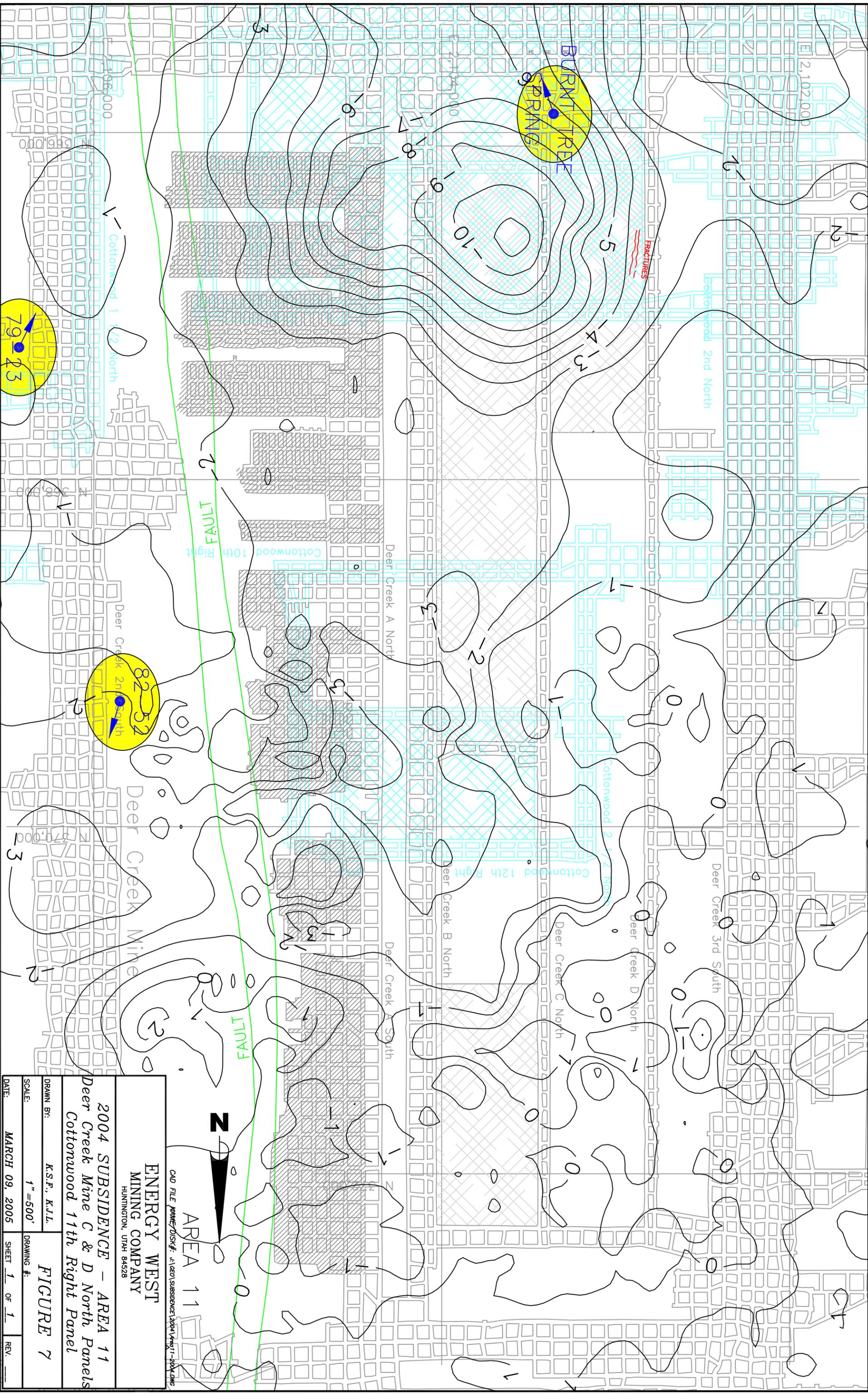


# Energy West 2004 Subsidence Report Area 11 Subsidence Profile West - East

Chart 9



1987	1988	1989	1991	1992	1993	1994	1995	1996
1997	1998	1999	2000	2001	2002	2003	2004	



CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area11-2004.dwg <b>ENERGY WEST</b> <b>MINING COMPANY</b> HUNTINGTON, UTAH 84528	
<b>2004 SUBSIDENCE - AREA 11</b> Deer Creek Mine C & D North Panels Cottonwood 11th Right Panel	
DRAWN BY: K.S.F., K.J.L.	<b>FIGURE 7</b>
SCALE: 1" = 500'	DRAWING #
DATE: MARCH 09, 2005	SHEET 1 OF 1 REV.

**Location:** Section 16, Township 17 South, Range 7 East, SLB&M. Historically, this site was located within the Deer Creek and Wilberg/Cottonwood mine permit boundaries; however, since relinquishment of lease U-040151, (see below) the sites now lie outside any federal coal lease or mine permit boundary.

**Lease Association:** Burnt Tree spring was associated with federal coal lease U-040151. PacifiCorp was sublessee to the Church of Jesus Christ of Latter Day Saints which held the Federal Coal Lease. In April 1997, PacifiCorp applied for partial relinquishment of 700 acres from the lease as the area had been mined out or was unmineable due to adverse geologic, engineering, or safety conditions.

Two seams were mined within the vicinity of the Burnt Tree spring; the Blind Canyon Seam from Deer Creek Mine, and the Hiawatha Seam from the Wilberg/Cottonwood Mine. The spring lies directly over the 7<sup>th</sup> Right mined out longwall panel of the Hiawatha Seam (Wil/Cot) and on the southern edge of the C and D North mined out panels in the Blind Canyon Seam (DC). Refer to the profile attached herein called 2004 Subsidence – Area 11. The stated panel in the Hiawatha Seam was completed in 1993. The stated panel in the Blind Canyon Seam was completed in in 1987.

**Subsidence:** Maximum subsidence in the mined area stated above reached approximately 11 feet. However, this was in the areas where double seam extraction took place; north of the spring. The attached North/South Profile (2004 Annual Subsidence Report) shows approximately 11 feet of subsidence occurred. The West/East Profile shows approximately 10 of subsidence. Surface fractures were discovered in 1995 approximately 800 feet southeast of Burnt Tree spring. Measurements of the spring discharge throughout the summer of 1993 and 1994 indicated that the fracturing had no effect on the spring. Yearly subsidence reconnaissance indicated that subsidence was substantially complete by 1995. Refer to Supplemental Volume 1, Lease Relinquishment, tab Phase III, tab Data Summary Report.

Additional data from the 2004 Annual Subsidence Report is included herein.

**Water Data:** Pre- and Post-water quality data is included for Burnt Tree spring. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected since 1983 and has continued through 2012. This information is found on the following page where July spring flow is plotted against precipitation of the East Mountain weather station, as well as the Palmer Drought Index for regions 4, 5, and 6. The East Mountain weather station is located on the southern tip of East Mountain. Spring flow shows a positive correlation with precipitation. The mode of occurrence for the Burnt Tree spring is permeable fluvial channels that intersect the land surface. The stratigraphic location for Burnt Tree spring is the North Horn Formation.

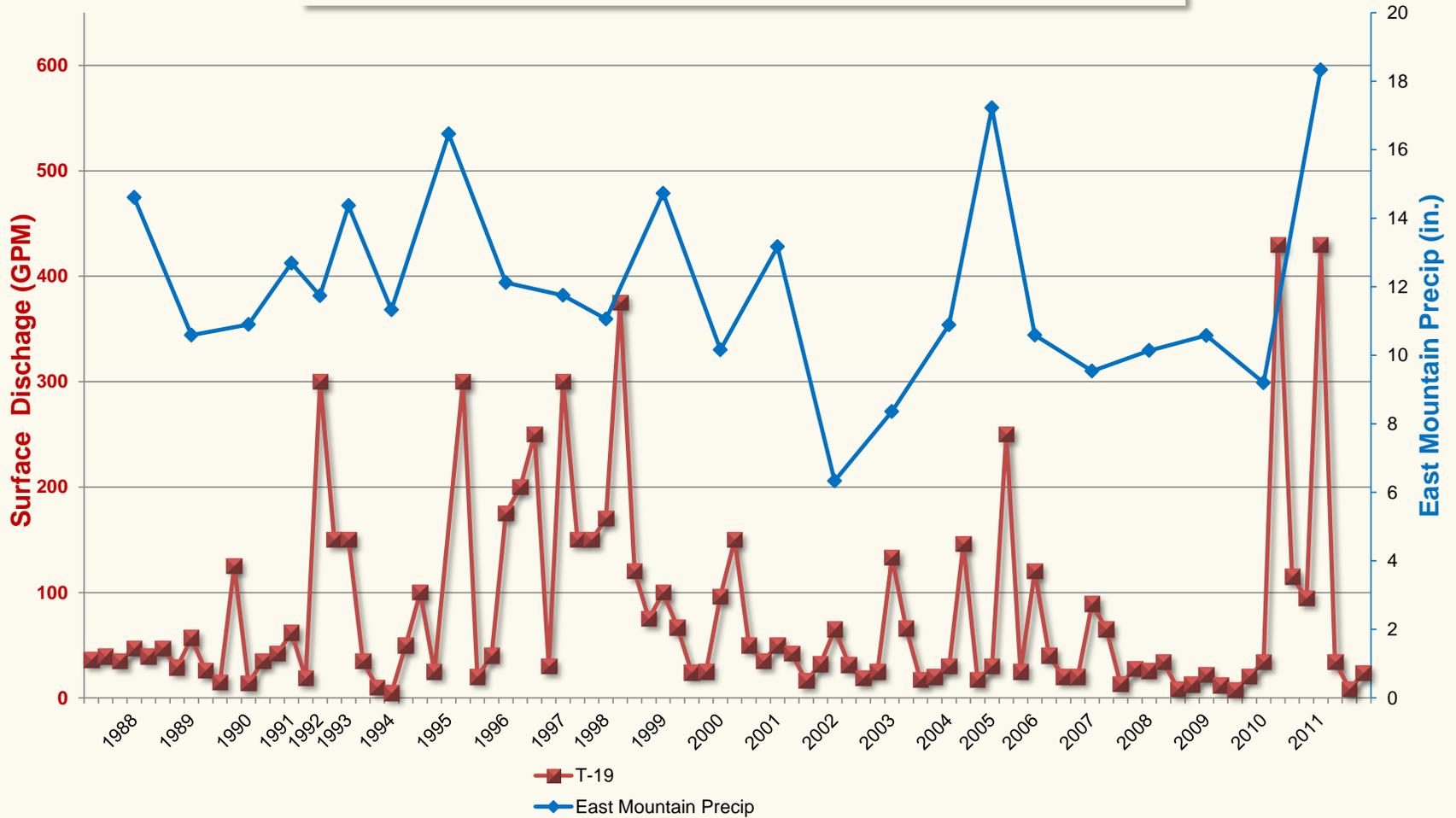
**Justification for removal from monitoring:** The Burnt Tree spring has been monitored by Energy West Mining Company since 1979. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

Since the federal coal lease has been relinquished (with DOGM concurrence) and the site is no longer within the boundaries of a mine permit, Energy West Mining Company retains no legal right of entry, nor control of the site. Therefore, it is requested that this site be removed from the monitoring program.

East Mountain Spring: Burnt Tree  
 Water Quality Data: Operational  
 Mine Association: Deer Creek Mine  
 Date of Development: Blind Canyon Seam: 1987, Hiawatha Seam: 1992  
 Date of Second Mining: Blind Canyon Seam: 1987, Hiawatha Seam: 1993

Historical Data: 1979 - 2012					Pre-Mining Data: 1979-1986				Post-Mining Data:				
	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	MAXIMUM	MINIMUM	AVERAGE	# ANALYSIS	
BICARBONATE	647	188	320.1	73	397	313	334.88	17	647	258	310.93	41	BICARBONATE
CALCIUM	110	38.5	58.571	80	11	48	69.107	15	57.9	49	53.72	42	CALCIUM
CARBONATE	10	0	1.275	40	1	1	1	1	10	0	1.6111	18	CARBONATE
CHLORIDE	25	2.9	5.3522	69	6.6	2	4.8063	16	7	2.9	3.7564	39	CHLORIDE
CONDUCTIVITY	620	330	513	82	590	410	514.94	16	596	450	528.24	42	CONDUCTIVITY
DISSOLVED OXYGEN	9.6	1	7.2	25	8.3	8.3	8.3	1	9.6	4.2	7.0875	8	DISSOLVED OXYGEN
FLOW	30.5	1.2	7.7831	84	30.5	1.9	16.447	17	12	1.2	5.1424	42	FLOW
HARDNESS	333	224	258.29	68				0	281	229	250.74	42	HARDNESS
TOTAL IRON	0.2	0	0.0869	19				0	0.2	0	0.0806	18	TOTAL IRON
DISSOLVED IRON	3	0	0.138	44	3	0.04	0.2725	16	0.2	0	0.0533	15	DISSOLVED IRON
MAGNESIUM	36.1	11.8	27.74	81	30.6	11.8	24.607	15	35	25.34	28.281	42	MAGNESIUM
DISSOLVED MANGANESE	0.05	0	0.0045	11				0	0.05	0	0.0045	11	DISSOLVED MANGANESE
MANGANESE	0.2	0	0.038	43	0.01	0.01	0.01	1	0.2	0	0.0633	19	MANGANESE
OIL AND GREASE	1.3	0.1	0.7	2	1.3	0.1	0.8	3				0	OIL AND GREASE
PH	8.24	6.8	7.5466	85	8	6.8	7.4872	18	7.99	7.04	7.5451	41	PH
POTASSIUM	8.5	0.02	1.1906	50	8.5	0.46	1.4072	15	5	0.514	1.1964	25	POTASSIUM
SET SOLIDS	0							0				0	SET SOLIDS
SODIUM	25	10	16.33	69	25	10	14.34	15	21.49	15	18.015	39	SODIUM
SULFATE	110	0.2	18.215	71	110	7.4	35.539	18	14	7	11.113	39	SULFATE
SUSPENDED SOLIDS	27	0.1	3.95	36	7	0.1	1.9	18	15	4	7	5	SUSPENDED SOLIDS
TEMPERATURE	60.8	3.4	20.381	78	12.8	3.4	6.5	17	60.8	5.1	14.94	42	TEMPERATURE
TOTAL DISSOLVED SOLIDS	367	164	286.04	71	344	258	292.18	17	350	250	282.97	39	TOTAL DISSOLVED SOLIDS

# TRAIL MOUNTAIN SURFACE FLOW T-19 HISTORIC FLOW vs. EAST MTN. PRECIP



[PROPOSAL TO REMOVE SITE FROM WATER  
MONITORING PROGRAM]

Trail Mountain  
Surface  
Flow: T-19

**Location:** Section 3, Township 18 South, Range 6 East, SLB&M. This site is outside the Trail Mountain mine permit boundary in Straight Canyon.

**Lease Association:** N/A.

**Subsidence:** None

**Water Data:** Water quality data is included for site T-19. Data show insignificant variances of quality throughout history. Historic flow data has been collected since 1988 and has continued through 2012. This information is found on the following page where flow is plotted against precipitation of the East Mountain weather station. The East Mountain weather station is located on the southern tip of East Mountain. The surface flow shows a positive correlation with precipitation.

**Justification for removal from monitoring:** Site T-19 has been monitored by Energy West Mining Company since 1988. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site. This site is not within PacifiCorp's logical mining unit or its permit boundary. Therefore, it is requested that the site be removed from the monitoring program.

**Trail Mountain Spring: T-19**  
**Water Quality Data: Operational**  
**Mine Association: Trail Mountain Mine**  
**Date of Development: Off lease, off permit**  
**Date of Second Mining: NA**

Notes:

- Trail Mountain Mine was placed into temporary cessation in May, 2001. The portals were sealed as part of closure.

	Pre-Closure Data: 1988 - 2001			Post-Closure Data: 2001-2012		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	437	190	355.50	500	255	360.60
CALCIUM	92	14.3	46.11	98.9	42.1	65.95
CARBONATE	78	1	16.75	49	0	12.67
CHLORIDE	67.9	20	38.38	43	19	33.13
CONDUCTIVITY	1380	581	926.36	1840	650	1249.84
DISSOLVED OXYGEN	11.7	5.4	8.30	8.1	8.1	8.10
FLOW	375	5	94.51	430	7.67	65.72
HARDNESS	993	178	379.54	906	301	566.96
TOTAL IRON	5.1	0.05	0.77	2.7	0	0.43
DISSOLVED IRON	0.38	0.03	0.16	0.039	0	0.00
MAGNESIUM	92	24	59.04	162	46.93	98.19
DISSOLVED MANGANESE				0.1	0	0.01
MANGANESE	0.2	0.01	0.06	0.053	0	0.00
OIL AND GREASE	5	1	3.99	2	0	0.11
PH	8.87	7.44	8.41	8.68	8.07	8.45
POTASSIUM	30.2	0.7	3.42	10.39	1.75	5.46
SET SOLIDS	0.5	0.5	0.50			
SODIUM	125.2	12	72.82	91.5	33.29	73.37
SULFATE	340	39	155.46	609	63	317.19
SUSPENDED SOLIDS	420	1	83.67	338	0	49.15
TEMPERATURE	71	-1.5	28.91	18.5	0.2	7.73
TOTAL DISSOLVED SOLIDS	910	340	572.13	1256	387	827.73

**Location:** Section 3, Township 18 South, Range 6 East, SLB&M. This site is outside the Trail Mountain mine permit boundary in Straight Canyon.

**Lease Association:** N/A.

**Subsidence:** None

**Water Data:** Well level data is included for site TM-3. Data show that the well level substantially decreased in 1996 as a result of mining in the western portion of the Trail Mountain Mine. The decrease in level was caused by a depressurization of the Star Point Sandstone. However, as mining proceeded to the north and the southern portion of the mine was sealed, the aquifer began to recharge (see chart). Historic level data has been collected since 1994 and has continued through 2012. This information is found on the following page where well water level is plotted against time.

**Justification for removal from monitoring:** Site TM-3 has been monitored by Energy West Mining Company since 1994. There has been one reported occurrence in which mining has affected this site. However, the well water level is nearly recovered. This site is not within PacifiCorp's logical mining unit nor its permit boundary. Therefore, it is requested that the site continue to be monitored until it recovers completely (its pre-mining elevation of 6,900 feet). At that time, the site should be removed from the monitoring program. Energy West shall notify the Division when the well has reached its recovered elevation.

East Mountain Well: TM-3  
Water Depth Data - Operational  
Mine Association: Trail Mountain Mine  
Date of Development: No Workings

**Notes:**

- Well was installed in September 1993 to monitor the piezometric gradient of the Spring Canyon Member
- Depth: 560'
- Monitoring Zone: Star Point Sandstone
- Original Potentiometric Level: 6,900 feet
- Current Potentiometric Level: 6,860.7 (12/2012)
- Will continue to monitor until potentiometric level reaches 6,900 feet.

