

Annual Subsidence Monitoring Report East/Trail Mountain Properties 2004



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ENERGY WEST MINING COMPANY
SUBSIDENCE MONITORING PROGRAM
ANNUAL REPORT FOR 2004

May, 2005

Submitted to:

United States Department of the Interior
Office of Surface Mining
Minerals Management Service
Utah Division of Oil, Gas and Mining

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INTRODUCTION

Energy West's East Mountain/Trail Mountain subsidence monitoring study is an ongoing project designed to detect, observe, and report the effects of mining-induced subsidence above the Deer Creek, Trail Mountain, Wilberg/Cottonwood, and Des-Bee-Dove Mines (see Figure 1). This is the twenty-second such annual report submitted, and covers the period between August 31, 2003 and August 31, 2004.

The initial report submitted in 1982 details the monitoring methods used in the study; therefore, they are not discussed in depth here. Energy West uses aerial photogrammetric survey methods and annual helicopter reconnaissance flights to monitor subsidence.

The aerial photogrammetry work is contracted to a commercial mapping company. Contracts for the work are bid and awarded for three-year periods. Between 1982 and 1987 the work was contracted through Intermountain Aerial Surveys. They established reading points on generally a 200-foot grid but adjusted the location of each point to be on easily reproducible locations. Between 1988 and 1990 the work was contracted to Maps Inc. Because of the type of equipment used by Maps, Inc., it was better for them to establish uniform grid points on 200-foot spacing. In 1991 the work was contracted to MapCon Mapping Consultants. The owners of this company were previously employed by Intermountain Aerial Surveys and felt that better results could be obtained by using the original grid established by Intermountain Aerial Surveys. Therefore, the photogrammetric process reverted back to the original monitoring grid. A change in the method of reading the aerial photographs may result in some slight changes in measured subsidence in some

areas. Also, it is crucial that accurate paneled ground control points be surveyed and recorded on the photographs to allow close subsidence readings. Between 1987 and 1990, some of the survey control points in the more difficult to reach areas were not properly paneled and could not be identified on the photographs. It appears that this diminished the precision of the subsidence reading in some of the areas during those years.

Using the aerial photographs derived from flights conducted on September 14-15, 2004, elevations were measured at 23,483 different points. These elevations were then compared with the baseline survey elevations measured from the aerial photos collected in 1980, 1986, 1987 and 1994. The difference in elevation between the original surveys and the 2004 survey constitutes the total amount of subsidence that has occurred.

Between 1991 and 1999, the subsidence data were contoured using Exploration Computer Services Minex program on a Digital/VAX computer. The VAX system became obsolete and was retired in mid-2000. Since 1999, Surfer 8 and Surfer 9, contouring programs by Golden Software, have been used to produce the subsidence contour maps. A comparison of the maps produced by Minex in 1999 and by Surfer in 2000 showed close agreement in contouring results. A map of all areas of subsidence is included in the appendix to this report (East Mountain/Trail Mountain 2004 Subsidence Map). The raw data is included as an appendix to this report on a compact disk in an ASCII file called 2004SUB.TXT. Helicopter reconnaissance flights in July and August of 2004 revealed new surface fracturing in Area 25 (Figure 16), but no new fracturing or visible signs of subsidence in any of the other monitored areas. Prior to PacifiCorp's acquisition of the

Trail Mountain Mine from ARCO Coal Co. in 1992, subsidence was monitored with conventional ground monuments and transit surveys. Nowhere did that monitoring identify subsidence greater than a few tenths of feet. Longwall mining was completed in the Trail Mountain Mine in 2001. As a result, subsidence has been detected and is reported herein.

Location

Figure 2 shows all areas above Energy West's mines that have potential for mining-induced subsidence. In 2004 fourteen areas of potential subsidence were monitored and mapped. In areas where subsidence has been detected, data is shown in the form of contour maps and profiles. Both indicate ground elevation changes from pre-mining ground elevations. The profile charts present data for all years monitored with the exception of the 1990 data, which was irretrievably lost. In many areas of subsidence the angle-of-draw has been calculated and reported; however, in some of the cases the angle should not be considered the actual final angle-of-draw due to several factors. For example, the zone of subsidence to date may be small and contained within the underlying mined area, suggesting that the subsidence has not yet reached its maximum extent. Also, many mined sections are surrounded by other older workings that influence the calculation. In a few areas where the mined-out workings are surrounded by burned coal, the failure of clinker beds promotes subsidence outside the mined area resulting in an angle-of-draw greater than might be expected.

Three of the original twenty-five areas chosen for subsidence monitoring were

either incorporated into other maps (Areas 9 and 10) or not been represented on an individual map (Area 12) due to complete lack of subsidence over time. These areas are still mentioned in the report, but are not shown on individual maps or profiles.

Lease Relinquishment and Reduction in Subsidence Monitoring

Several portions of the original mine leases have been relinquished, which means that subsidence in those areas has been shown to be complete enough for the relinquishment to take place. Having relinquished these areas, or in the case of area 12, where no measurable subsidence has occurred, Energy West will no longer report on the subsidence conditions for those areas. They are: 1, 2, 7, 9-10, 12, 15, 16, and 17, all in the south end of the East Mountain. Also, all areas above the Des-Bee-Dove mines (areas 8 and 13) are considered to be completely subsided. Of the original 25 areas that were chosen for subsidence monitoring, 14 are detailed in this report: 3, 4, 5, 6, 11, 14, 18, 19, 20, 21, 22, 23, 24, and 25.

Area 3

Deer Creek 1st North Area

Most of the 1st North section of the Deer Creek Mine was abandoned and sealed in 1978 after being mined out. Pillar extraction in the 3rd Left and 1 ½ North sections was completed early in 1980 (Figure 3).

The subsidence above 1st North occurs on a narrow ridge capped by a highly fractured sandstone. The subsidence measured is depicted in Figure 3. The profile chart (Chart 1) for Area 3 is a profile of total subsidence as it occurred above the workings. The subsidence in Area 3 has shown no significant change in the past 8 years.

A helicopter survey in 2004 did not reveal any new surface cracks or new areas of cliff failure.

No angle-of-draw was determined due to the steep slopes, and the presence of burned coal. No surface springs have been affected by mining in 1st North.

Area 4

Deer Creek 2nd through 17th Right Longwall Panels

Cottonwood 9th, 8th, 5th – 2nd Left Longwall Panels

This is a dual-seam mining area. Longwall mining began in Deer Creek in the 2nd Right longwall panel in 1980 and ended in August 1991 with the completion of the 17th Right panel (Figure 4). In the underlying Cottonwood Mine, longwall mining began in September of 1992 in the 9th Left Panel off 2nd North. The 8th Left Panel was completed February 1993. Mining resumed in this area in the 5th Left Longwall Panel in August of 1994 and continued through August of 1995 when mining was active in the 2nd Left longwall panel (Figure 4). Subsidence in Area 4 was detected for the first time in 1984 by photogrammetric methods.

Maximum subsidence increased dramatically between 1994 and 1995, from eight feet caused by mining in Deer Creek to over thirteen feet (Figure 4) due to the additional mining in the Hiawatha seam in Cottonwood Mine. The subsidence has been virtually unchanged between 1995 and 2004 as shown in the subsidence profile charts (Charts 2 & 3).

Surface fractures were identified in the field in late May of 1995. These fractures were located on fee surface. Energy West filled in the fractures with a motor grader and reseeded the area. The location of the fractures is shown on Figure 4. The revegetation in these areas is now established and no further fracturing has been identified.

The calculated angle-of-draw of the subsidence ranges from less than zero to 22 degrees. Several springs are located on East Mountain above these longwall panels and the 2nd through 5th Left panels located directly to the east (see Area 5). Fluctuations in spring flow occur from year to year but are to be related to variations in precipitation rather than mining. Flows are generally low in dry years and higher in wetter years (see Hydrologic Monitoring Report, 2004).

The left fork of the Grimes Wash drainage crosses the middle of the subsidence area. Stream monitoring has revealed no changes attributable to mining. This stream has been called perennial by the U.S.D.A. Forest Service, but our data indicates that it is ephemeral.

Area 5

Deer Creek 2nd through 5th Left Longwall Panels

Cottonwood 6th through 1st Right Longwall Panels

This is a dual-seam mining area. Mining of the 2nd Left longwall panel in the Deer Creek Mine began in January 1983, and by October 1985 all four panels (2nd through 5th Left) had been completed (Figure 5). In the underlying Cottonwood Mine, longwall mining began in the 6th Right Longwall Panel in February 1993 and the last mining was completed in the 1st Right Longwall Panel in August 1994, completing all mining in this area (Figure 5). Photogrammetry revealed subsidence in Area 5 for the first time in 1984.

Maximum subsidence over the panels is slightly greater than thirteen (13) feet where both seams have been mined (Figure 5). The maximum subsidence showed a substantial increase between 1993 and 1994 but showed slight change between 1994 and 1998. The 2004 monitoring showed virtually no change as compared with the 2003 data (see the Profile Charts 4 & 5 for Area 5). No surface disturbance has been identified over the panels.

As mentioned in the previous section, none of the springs located above the workings show any adverse effects due to mining or subsidence.

Measured angle-of-draw is between zero and 13 degrees.

Area 6

Wilberg 1st and 2nd West Longwall Panels

Mining in the Wilberg 1st and 2nd West longwall panels was completed in June 1983 (Figure 6). This area of subsidence has now reached a maximum of between four and five feet over the Second West Longwall Panel (Figure 6). The subsidence in this area has been stable for the past five years. The subsidence Profile Charts (Charts 6 & 7) for Area 6 show the change in subsidence since 1983.

Calculated angle-of-draw ranges from zero to 15 degrees where not influenced by other workings.

Four springs located just north of the area show no adverse effects from the nearby subsidence (see Hydrologic Monitoring Report, 2004).

Area 11

Deer Creek C and D North Longwall Panels

Cottonwood 11th Right Longwall Panel off 2 ½ North

Cottonwood 6th & 7th Right Longwall Panel off of 2nd North

This is a dual-seam mining area. Longwall mining in the Deer Creek C-North panel began in December 1984 and was terminated prematurely in April 1986. New setup entries were driven further south and mining resumed in September 1986; the panel was completed in March 1987. The D-North longwall panel began production in July 1987, but after October 1987 production was limited due to poor coal quality. The panel was terminated in August 1988 at a length of 1750 feet. Pillar extraction mining in A North and A South was completed in June 1983 (Figure 7).

Mining in the 11th Right Panel in the Cottonwood Mine began In July of 1992 and was completed in September 1992 (Figure 7). The 10th Right Panel to the south was developed but could not be mined with longwall methods due to thin coal and poor coal quality. Mining began in the 7th Right Panel in February 1993 and by August 1993 mining in the 6th Right Panel was completed.

Measurable subsidence to date has exceeded twelve (12) feet in the area of multiple seam mining above the 6th and 7th Right Longwall Panels in the Cottonwood mine (Figure 7). The maximum subsidence showed an increase between 1993 and 1994 but has been stable the past nine years (see Profile Charts 8 & 9 for Area 11).

Fractures were discovered at the western end of coal extraction above the 7th Right

Longwall Panel on June 17, 1993. Mining of the longwall panel was completed on May 12, 1993. An aerial reconnaissance of the area on May 18, 1993 revealed no surface fractures at that time. This places the occurrence of the fractures between May 18, 1993 and June 17, 1993. PacifiCorp reclaimed the fractures in fall of 1995. Burnt Tree Spring is located approximately 800 feet to the southeast of the fractures. Measurements of the spring discharge throughout the summer of 1993 through 2004 indicated that the fracturing has had no effect on the spring. The angle-of-draw measured ranges from less than zero to 28 degrees.

Area 14

Cottonwood 6th and 7th East Longwall Panels

Mining began in the 6th East panel in September 1986 and continued until the panel was completed in March 1987. Mining in the 7th East panel began in April 1987, and the panel was completed in September 1987 (Figure 8). Subsidence in Area 14 was first monitored and detected in 1987. Subsidence profiles are shown in Charts 10 & 11.

A majority of this area has been relinquished effective 1995. Only the northern portion remains in the Cottonwood Mine permit boundary. Monitoring will continue as long as this remains within the permit boundary.

Topography consists of very steep south facing slopes and cliffs. Overburden ranges from 200 to nearly 1,400 feet.

The Castlegate Sandstone forms a 200-foot high escarpment along the north side of Newberry Canyon with numerous naturally occurring joints and fractures. Stress caused by removal of coal was transferred to the fractures resulting in brittle failure of the cliff face (spalling) in some places. Talus from the spalling has accumulated on the steep slopes below the cliffs on older natural talus slopes. Surface cracks have been observed and mapped along the ridge above the cliff. The cracks are discontinuous and extend for approximately 2,000 feet parallel to the northern edge of the 6th East longwall panel. A few cracks are also found directly on top of the Castlegate Sandstone escarpment. PacifiCorp repaired a series of surface fractures in the summer of 1998. Maximum subsidence to date is over fifteen (15) feet above the middle of the 6th East Longwall Panel and five (5) feet

over the eastern end of 6th East along the Pleasant Valley Fault (Figure 8). Because this area has rugged and steep terrain, it is the most difficult to achieve consistent results using the photogrammetric monitoring. As can be seen on the subsidence map (Figure 8) and the subsidence profile charts the subsidence appears to vary substantially from one location to another and change up and down in time. This is because the photogrammetric monitoring is difficult in this type of terrain. The “bulls-eyes” of subsidence shown in 1996 are still present in the 2004 data. The helicopter aerial reconnaissance in June 2004 showed no visible indication of change in these areas. Inaccuracies in the survey in this area should be expected because of the rugged terrain. Several survey targets were established in this area on the Castlegate cliff and were surveyed from 1996 through 1997. This monitoring showed no changes in the last six years of the monitoring period. The angle-of-draw was not calculated to the west, south and east because of the steep slopes, burned coal, and other workings surrounding the 6th and 7th East panels. The angle of draw on the north side of the 6th East Panel is 25 degrees.

There are no springs in the vicinity of Area 14. The strata are generally dry; thus, mining is expected to have no adverse impact on the hydrology.

Area 18

Deer Creek Mine 2nd through 7th Right Longwall Panels

Longwall mining in this area began in November, 1990 in 2nd Right Panel, and was completed in May, 1992 with the extraction of the six adjacent longwall panels (Figure 9). The 3rd and 4th Right panels were terminated short of full length due to geologic complications. The land surface in the area of these panels contains steep slopes covered by conifer and aspen trees, and sagebrush. The longwall panels underlie the main ridge of East Mountain and have overburden ranging from over 2,200 feet in the north-central portion of the area to about 1,800 feet on the southwest corner of 7th Right Panel.

Subsidence in this area has reached a maximum of over seven (7) feet, and has remained stable since 1998. (Figure 9, subsidence Profile Charts 12 & 13). The subsidence zone is a broad trough running in a north - south direction. This area is overlain by several springs. Monitoring of these springs has shown no mining or subsidence-related change in the quality or quantity of water discharged (see Appendix and the 2004 Hydrologic Monitoring report).

Area 19

Deer Creek 7th and 8th East Longwall Panels off 3rd North

Mining in the 7th East Longwall Panel began in May, 1992 and by January 1993 mining was completed in the 8th East Longwall Panel (Figure 10).

The land surface above these two panels is very rugged. The longwall panels are located beneath a ridge located between the left and right forks of Meetinghouse Canyon. The area is covered by sagebrush on the south facing slopes and dense stands of spruce trees on the north facing slopes. The overburden in the area of these panels ranges from 400 feet on the north to over 1,800 feet on the south.

Subsidence in this area has increased from slightly over one foot in 1992 to over four feet in 1993 but has been stable between 1993 and 2004 (Figure 10, subsidence Profile Chart 14).

This area is overlain by a few springs. Monitoring of these springs has shown no mining-related change in the quality or quantity of water discharged (see Appendix and the 2004 Hydrologic Monitoring Report).

Area 20

Deer Creek 1st & 2nd Left Longwall Panels off 3½ South

Mining in the 2nd Left Longwall Panel began in February 1993 and was completed in June 1993. Mining then started in the 1st Left Longwall Panel in July 1993 and was completed in November of 1993 (Figure 11).

These longwall panels are overlain by moderately steep slopes that are heavily covered with aspen and spruce trees. The overburden above these panels ranges from 1,400 feet at their east end to over 2,000 feet above their west end.

The monitoring detected a maximum of slightly less than five (5) feet of subsidence in 2004 which is similar to that measured in 1997 – 2004 (Profile Chart 15), but less than the maximum of slightly over six (6) feet of subsidence above the 2nd Left Longwall Panel measured in 1996. The 1996 reading showed an increase from the maximum of slightly over four feet that was measured in 1995 and a foot greater than that measured in 1994 which showed a maximum of five feet of subsidence (Profile Chart 15). These data show that subsidence in this area is substantially complete. All of the subsidence detected falls within the bounds of the longwall area. Therefore; the angle of draw in this area is considered to be less than 10°.

These longwall panels are overlain by several springs. Monitoring of the springs revealed no impacts due to subsidence.

Area 21

Deer Creek Mine 2nd East Through 7th East Longwall Panels

Mining in the 2nd East Longwall panel began in November of 1993. Mining in this area, concluding with 7th East Longwall Panel, was completed in January 1996.

The topography in this area is fairly rugged. A ridge along the south side of Rilda Canyon is located through the center of the area. The slopes leading down from this ridge to Rilda Canyon on the north are heavily vegetated with conifer trees. Overburden in this area ranges from less than 200 feet in the north to greater than 1,800 feet beneath the ridge top.

Subsidence detected in 1994 had reached a maximum of over four (4) feet above the 2nd East Longwall Panel (Figure 12). Subsidence over the 3rd East longwall panel was not detected because this panel is longer than the 2nd East panel and subsidence does not usually occur until two panel widths have been mined. In 1995, subsidence had progressed to where most of the areas underlain by the 2nd through 6th East Longwall Panels had subsided between 5 and 6 feet. In 1996, the maximum subsidence that was measured had not increased from that measured in 1995 but an increase in subsidence was noted on the north end. This is in the area of the 6th and 7th East Longwall Panels that were the last to be extracted. The 1997 through 1999 monitoring indicated that subsidence has been stable during those years. The 2004 monitoring shows no further increase in subsidence. (Profile Charts 16, 17). During the helicopter reconnaissance in 1995, several fractures were identified and several areas were noted where boulders had rolled from the Castlgate cliff.

These are shown on Figure 12. The area of subsidence is completely contained within the mining area; therefore, the angle of draw is nearly vertical.

Several springs are located above these longwall panels. Hydrologic monitoring has not detected any change to the spring flow that is attributable to mining or subsidence (see 2004 Hydrologic Monitoring Report).

Area 22

Deer Creek Mine 2nd through 8th West Longwall Panels off 3rd North

Longwall Mining began in the 8th West Longwall Panel in February 1996 and the entire panel was mined by July 1996 (Figure 13). Mining then moved to the 7th West longwall panel in July 1996 was completed in January 1997. Mining then started in the 6th West panel in January 1997 and this panel was completed in July 1997. Mining in the 5th West panel began in July 1997 and was completed in February 1998. Mining in the 4th West panel began in March 1998 and was completed in November 1998. The 3rd West panel was not mined in its entirety. The western 2,000 feet of the panel was not mined because of poor roof conditions and coal quality. The central 3,200 feet was mined between November 1998 and January 1999. The longwall moved around an area containing faults and the eastern 1,500 feet of the panel was completed between January 1999 and April 1999.

This area is located on the southern side of Rilda Canyon in an area where the overlying terrain is very rugged. Several north-south tributaries to Rilda Canyon cross the northern half of the area and form a series of canyons and steep ridges along the flanks of Rilda Canyon. Elevations range from 8,000 feet at the coal outcrop to 9,900 feet along the ridge tops. The area is heavily vegetated with spruce trees, aspen trees at the higher elevations and pinion-junipers at the lower elevations.

The subsidence monitoring showed a slight increase in subsidence in 2000 over previous years but showed no significant change in 2004 (Profile Charts 18 and 19). The maximum subsidence appears to have stabilized at slightly over six (6) feet. The topography

in this area is fairly rugged which limits the resolution of the photogrammetric monitoring.

Several springs are located in the area and have been catalogued and are being monitored (see 2004 Annual Hydrologic Monitoring Report).

Area 23

Trail Mountain Mine 2nd through 5th East Longwall Panels off 5th Left

Mining of the 2nd East Longwall Panel began in October 1995 and continued until February 1996. In this panel only the eastern 2,600 feet was mined because the western 2,000 feet was not mineable due poor coal quality. Mining began in the 3rd East Panel in February and was completed in June 1996. Mining began in the 4th East panel in June 1996 and was completed in October 1996. Mining began in the 5th East panel and was completed in March 1997 (see Figure 14). All of the longwall mining conducted to date has extracted an average thickness of 8 feet of coal.

This area generally contains gentle south-facing slopes that project down to a steep escarpment along the south and east end of the area. Elevations in the area range from 8,750 feet to less than 6,700 feet along the coal outcrop in Straight Canyon. The land is sparsely vegetated with grasses and brush with some dense patches of ponderosa pine at the higher elevations and pinion-juniper trees in the steeper slopes above and below the escarpment.

The subsidence monitoring has detected up to eight (8) feet of subsidence that has occurred. This maximum subsidence is located over the eastern end of the 4th East longwall panels (Figure 22, Profile Charts 20 and 21). Most of the undermined area has subsided between six (6) and eight (8) feet. One point at the extreme eastern side of the 5th East panel shows subsidence of over 22 feet. This may be an inaccurate reading due to steep terrain, or a large boulder may have moved causing the change in readings between 1996

and 1997 but no additional change has been noted in the past seven years. The subsidence area is entirely contained within the undermined area, therefore; the angle of draw is steeper than 10 degrees from the vertical.

No surface fractures or visual evidence of subsidence has been observed. No springs are located within this area.

Area 24

Trail Mountain Mine 1st - 10th Right off 5th Left

Mining in the 9th Right panel began in March 1997 and was completed at the end of August 1997 leaving the remaining 1,600 feet unmined due to poor coal quality (Figure 15).

Mining in the 7th Right panel was completed by the end of March 1998, this entire panel had been extracted. Mining then moved south to 10th Right and mining was completed by September 1998. By August 1999, the entire 6th Right panel had been extracted and all but the eastern 750 feet of the 5th Right panel had been mined. By the end of August of 2000, longwall mining had been completed in both the 4th and 3rd Right panels. 2nd Right panel, begun in September 2000, was abandoned in October, 2000, after retreating only 1,200 feet due to poor mining conditions. 1st Right panel was begun in November, 2000, and completed March 15, 2001, the final longwall mining date for the Trail Mountain Mine.

Longwall mining in these areas was completed to an average mining height of nine (9) feet.

The topography within this mining area is quite variable. Elevations range from less than 7,000 feet in Straight Canyon on the southwest side of the area, where the topography is very rugged, to over 8,800 feet in the northeast portion of the area where the land is gently sloping to the south. The lower elevation areas are heavily vegetated with pinion and juniper trees interspersed with grasses. The higher elevations have stands of spruce and aspen trees separated by areas of sage brush and grasses.

The overburden above the coal seam in this area ranges from less than 1,400 feet in the southwest corner of the area to over 2,200 feet in the northeast corner of the area.

The subsidence monitoring showed a steady increase in subsidence from 1997 through 2001 (Profile charts 22, 23). A small group of fractures appeared on the surface above 4th Right panel in October 2000. These were already partially “healed” or filled in when noticed. The subsidence profiles for 2004 are very similar to previous years, indicating that subsidence in this area is essentially complete. The subsidence that has occurred has not had any effect on the current land use or on the hydrology of the area (see 2004 Annual Hydrologic Monitoring Report).

Area 25

Deer Creek Mine 8th Through 14th East off 5th North Longwall Panels (Blind Canyon)

Deer Creek Mine 2nd Through 8th Right off 6th North Longwall Panels (Hiawatha)

Area 25 contains all of the North Rilda Ridge reserves in the Blind Canyon and Hiawatha seams (Figure 16, Profile Charts 24 & 25). This is an area of dual-seam mining similar to the areas where Deer Creek Mine was directly above the Cottonwood/Wilberg mines. As of September 2004, the Blind Canyon reserves (8th, 9th, 10th, 11th, 12th, 14th, and 15th East panels) are completely mined out, and mining of the Hiawatha reserves 80 feet below is complete, with the complete extraction of 2nd Right through 8th Right panels.

Longwall mining began in this area in the Blind Canyon seam 11th West panel in April of 1999. By August 31, 1999, the eastern 4,400 feet of this panel had been mined. By the end of August 2000, the 12th East Panel had been completed and the eastern 1,900 feet of the 14th East Panel had been mined (there is no 13th East Panel). By the end of August 2001, mining had extracted the remainder of the 14th, 15th, and 9th East Panels. During 2002, the final panel in the Blind Canyon seam (8th East) was completed (December 2001).

Longwall mining in the Hiawatha seam began in the 5th Right panel (February 2002). 5th Right panel was completed in August 2002. 4th Right panel started in August of 2002, and was completed in January 2003. 3rd Right panel was begun in January 2003 and completed in July, 2003. 2nd Right panel was begun in August 2003 and was completed in October, 2003. 7th Right panel was begun in October 2003, and completed in May 2004. 8th Right panel was begun in May 2004, and completed in August 2004, by the time of the

aerial survey of September 14-15, 2004.

Overburden in this area ranges from less than 400 feet in both the north and south of the area to over 1,700 feet beneath North Rilda Ridge. The topography in this region is very rugged. North Rilda Ridge trends east-west in the center of the area and the topography drops off steeply to the north into Mill Fork and the south into Rilda Canyon. The Castlegate Sandstone forms an escarpment (cliff), 100 to 300 feet high, which is present near the top of and encircles North Rilda Ridge on the east, south and southwest. The south facing slopes below the cliff are covered with grass, brush, and juniper trees while the north facing slopes in Mill Fork Canyon are covered with a dense conifer forest. Only small points of Castlegate escarpment are present on the north facing slope.

Subsidence monitoring in this area shows that subsidence has occurred under all of the area mined out in the Blind Canyon seam. The maximum amount of subsidence observed for Blind Canyon mining areas is just over 7 feet in the eastern end of 9th East panel. As the underlying 5th, 4th, 3rd, and 2nd Right Hiawatha seam panels were mined in 2002 and 2003, the amount of subsidence over the 2-seam extraction area increased to over 13 feet in the 2-seam mining area. Now that longwall mining in the Hiawatha seam is complete, new subsidence over the 7th and 8th Right panels can be seen on the north-south profile (Chart #24). Total subsidence in the North Rilda area should stabilize quickly over the double- seam mining area to about 12-15 feet. Numerous subsidence "bullseyes" are present in the area of the prominent cliffs on the south-facing side of Rilda Canyon. These are evidently related to cliff movement, boulder movement, and possibly ground cracking in

the vicinity of the cliffs.

In February and June of 1999 six prisms were placed on the top of the Castlegate sandstone cliff or escarpment to monitor the movement of the cliffs as they are undermined in Area 25. All of the prisms have moved within a few days or weeks as they were undermined. The prism movement data can be found in the Appendix. Several Castlegate escarpment failures and rock falls occurred as 9th and 8th East panels were mined in the Blind Canyon seam during the spring, summer, and fall of 2002. These are shown on Figure 24. Significant additional rock falls have occurred along the escarpment have occurred as the 4th, 3rd, and 2nd Right panels were mined during December 2002 – September 2003, extending double seam mining under the escarpment area.

Fractures have appeared on the surface of North Rilda Ridge in several places. The first of these was an area where several east-west cracks appeared above and to the south of the dual-seam extraction of 11th and 12th East in the Blind Canyon seam and 5th Right panel in the Hiawatha seam. These cracks are gradually filling in, and are less evident now than they were in 2002.

Areas of surface cracking that occurred during 2003 were:

In the area around the rocky Castlegate point containing Prism #1, above 14th East panel (Blind Canyon, single seam mining area), large north-south cracks opened. Apparently, one of the subsidence monitoring points is in the vicinity of these cracks, and a subsidence contour “bulls-eye” has been created here.

Significant east-west cracking has occurred on and just below the prominent

Castlegate point at the east end of the mining area. The 9th East Blind Canyon panel, completely extracted in 9/01, has been undermined by the 3rd Right Hiawatha panel, completely extracted in 1/03.

A large east-west crack crosses a ridge on the north side, above the center of the 14th East Blind Canyon panel and the south edge of the 8th Right Hiawatha panel. Warning signs were placed above and below this crack prior to hunting season on 10/14/03. The most severe portion of this crack was filled in using helicopter supported operations during July, 2004.

A few minor springs are located to the west of the undermined area on top of North Rilda Ridge. No effects to these springs by mining have been observed.

Since June 1998, four survey points have been monitored for subsidence in the right fork of Rilda Canyon directly above the 5th North Mains in the Blind Canyon seam where 5th North crosses under the stream bed in the right fork (Figure 16). This is an area of first mining only, with longer pillars and offset crosscuts specifically designed to prevent subsidence. As of the last survey date in July, 2004, no significant movement of any of the points has occurred.

Predicted Maximum Subsidence

A comparison between observed and predicted maximum subsidence for the various areas on Energy West's property has been made using a method developed by the British National Coal Board (NCB). The NCB method utilizes graphs compiled from numerous field observations and takes into consideration the length and width of the mined-out area, thickness of coal extracted, and depth of cover. The method is claimed to be correct to $\pm 10\%$ in the majority of cases, assuming certain limiting conditions are met. The table below compares predicted maximum subsidence with observed subsidence for areas on East Mountain.

Area	Subsidence (feet)		
	Predicted Maximum	Observed	% of Predicted
1* DC 9E/W 1R	15.2	28.0	184
2 DC 5-8E/W, 3-13R	13.8	13.1	95
3 DC 1N Area	7.7	5.5	71
4 DC 2-17R	13.6	13.5	99
5 DC 2-5L	13.5	15.5	114
6 W 1-2W	5.0	4.5	90
7 Bee 2N off 8W	6.6	7.4	112
8 Bee/Des E&W Sections	6.8	4.8	104
9 Little Dove 1N	4.3	3.5	81
10 Old American Fuel Mine	7.0	6.1	87

Area	Subsidence (feet)		
	Predicted Maximum	Observed	% of Predicted
11 DC C&D N	13.7	13.2	96
12 W 2L	1.5	0.0	0
13 Des-Bee-Dove Southern Areas	2.0	1.8	90
14 Cottonwood 6-7E	7.6	4.7	62
15 Cottonwood 9-12W	7.2	5.0	69
16 Cottonwood 8-11E	7.4	4.5	61
17 Cottonwood 16-15 W	8.1	7.2	89
18 Deer Creek 2nd-7th R	7.7	7.2	94
19 Deer Creek 7th & 8th E	7.9	4.5	57
20 Deer Creek 1st & 2nd L	7.8	6.1	79
21 Deer Creek 2nd- 7th E	7.5	7.5	100
22 Deer Creek 2nd-8th W	7.5	8.1	108
23 Trail Mountain 2nd-5th E	7.8	8.1	104
24 Trail Mountain 1 st - 10 th Right	7.5	7.0	93
25 Deer Cr. 8-15 th East B.C. Seam	8.6	7.5	87
25 Deer Cr. N. Rilda Both Seams	17.1	15.1	88

* This area does not fit the NCB prediction model.

In most areas subsidence is less than the maximum predicted by the NCB model. The observed subsidence shown here represents the actual maximum subsidence for the

particular geologic conditions -- probably the case in some areas since subsidence appears to have ceased in several areas where the NCB predicted maxima were not reached. In areas showing greater than expected subsidence, chain pillars or barriers between sections are probably crushing so that strata above the workings cave as it would if a wider zone had been mined.

Mitigation of Surface Effects

Prior to mining in an area, Energy West notifies the land owner that mining will be in progress beneath his property. The land owners within the permit boundary are as follows:

Karl A. Seely, Inc.

LDS Church

USDA Forest Service

Elk Springs Property Users Association

Kent Barton

PacifiCorp

State of Utah Trust Lands Administration

McKinnon Estate

Lavar Jensen & Phyllis Jensen

Energy West will continue to notify those owners prior to undermining their properties.

Over most areas where subsidence has been observed on East Mountain, present land use has not been affected in any way. Areas 2, 5, 6, 8, 9, 10, 12, 13, 15, 16, 17, 18, 19, 20, 23, and 24 are good examples of subsidence without visible surface disturbance or adverse hydrologic effects. In such areas no mitigation is necessary.

In a few areas, such as Areas 1, 3, 4, 7, 10, 11, 14, 21 and 22, 24, and 25, surface fractures have been detected. In order to protect livestock PacifiCorp has erected a fence

around Area 1 (since removed) where fractures are of sufficient magnitude to pose a threat to wandering cattle. In the regions where the fractures could be reclaimed they have been filled in with heavy equipment and the escarpments have been evenly contoured and reseeded. In Area 4, the small tension fractures that formed were reclaimed by filling in the fractures using a motor-grader and reseeding the area. In Area 14, where cracks have also been observed, these were filled in by hand in 1998 and reseeded. The U. S. D. A. Forest Service accepted this mitigation as being sufficient and complete. In area 25, a large fracture was filled to prevent hazardous conditions at the surface.

In Areas 3, 7, 10, 11, 21, 22, and 24, where only minor fracturing has occurred on remote ridges and/or where land use has not been affected, more damage would be done by gaining access to and repairing or fencing fractures than can be justified. Therefore, mitigation is counterproductive in those areas and is not planned.

Summary

As of September 2004 PacifiCorp has identified fourteen (14) areas for study of mining-induced subsidence on the East Mountain/Trail Mountain property. Terrain in the subsidence study areas ranges from relatively flat mountain tops with thick overburden of up to 2,200 feet to steep slopes and cliffs with overburden of less than 200 feet. The most noticeable subsidence effects occur in the steep cliff areas and where mining next to burned coal appears to have caused crushing of the clinker beds. Most of the fractures observed over mined areas have occurred under these conditions, especially where the Castlegate Sandstone (or similar lithologic unit) crops out or is near the surface. The sandstones yield to stress by brittle deformation (fracturing) and by undermining of balanced or overhanging outcrops.

In areas where overburden is thicker and other more clay-rich formations are present above the mine workings, longwall and room-and-pillar mining methods have allowed the multiple seam mining of large quantities of coal without apparent impact on the surface environment because the overburden yields through plastic deformation. More than eighty percent (80%) of the East Mountain property has conditions similar to those areas; therefore, the mining methods being utilized are well suited to the geologic conditions, allowing subsidence to occur without impacting the hydrology or present land use of the area.

An effort was made again this year to predict maximum possible subsidence for the various areas where subsidence has been detected. The prediction was then compared with

observed subsidence for each area. It appears that the actual subsidence occurring on East Mountain/Trail Mountain is slightly less than that predicted by the NCB model.

Professional Certification of Subsidence Data

I, Kenneth S. Fleck, being a Licensed Professional Geologist in the State of Utah (#5224883-2250), with significant experience in subsidence monitoring, certify that the subsidence data contained in this document was collected under my direction, and the attached subsidence materials were prepared by me using industry-accepted methods. I further certify that the interpretations contained herein are an accurate representation of the subsidence that has occurred.

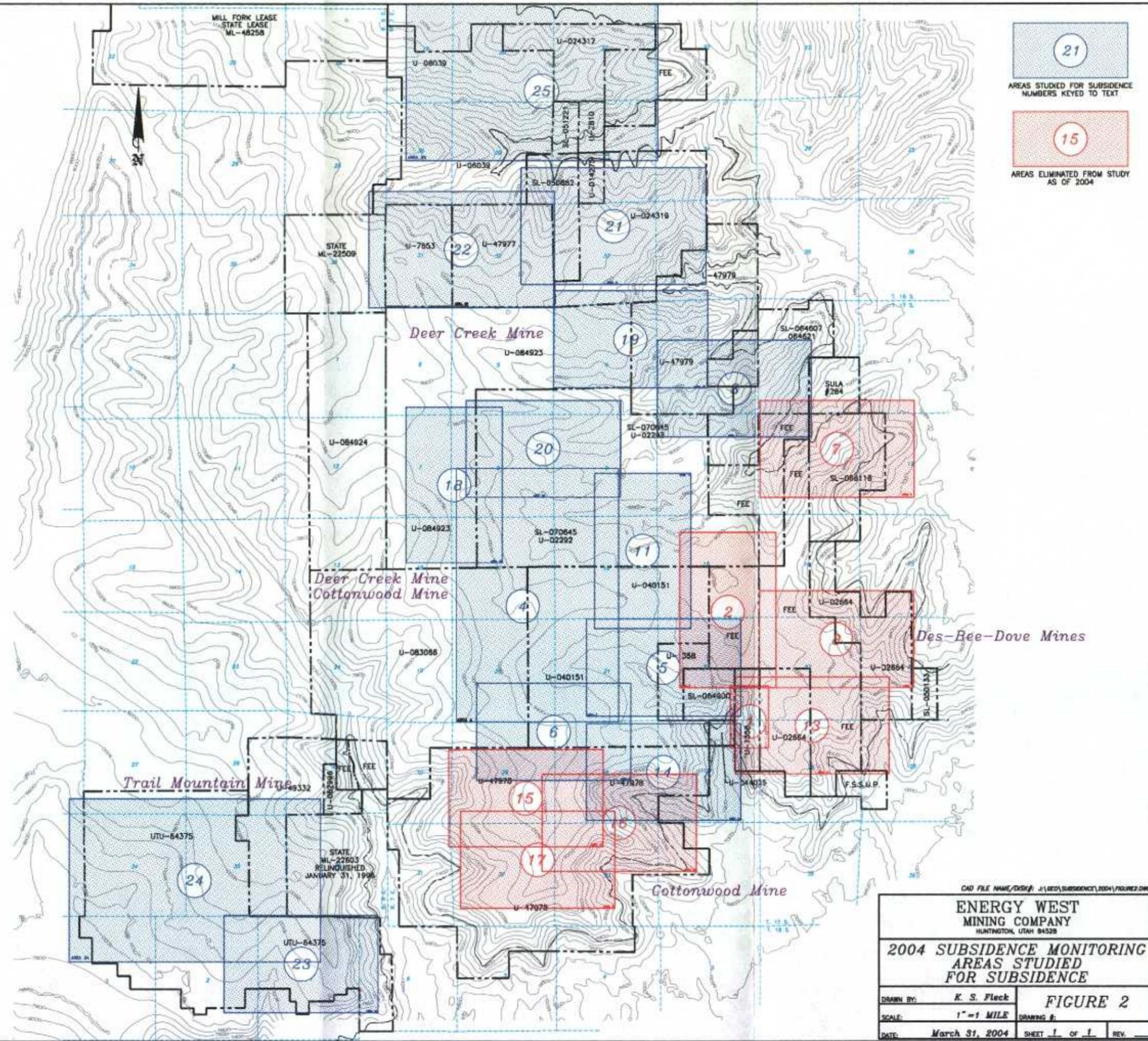
Dated this 1st day of June 2005.

Kenneth S. Fleck

Professional Geologist

License No. 5224883-2250

APPENDICES:
FIGURES 1 & 2
LOCATION MAPS



21
AREAS STUDIED FOR SUBSIDENCE NUMBERS KEYED TO TEXT
15
AREAS ELIMINATED FROM STUDY AS OF 2004

CAD FILE NAME/DIR/F: J:\GEO\SUBSIDENCE\2004\FIGURE2.DWG

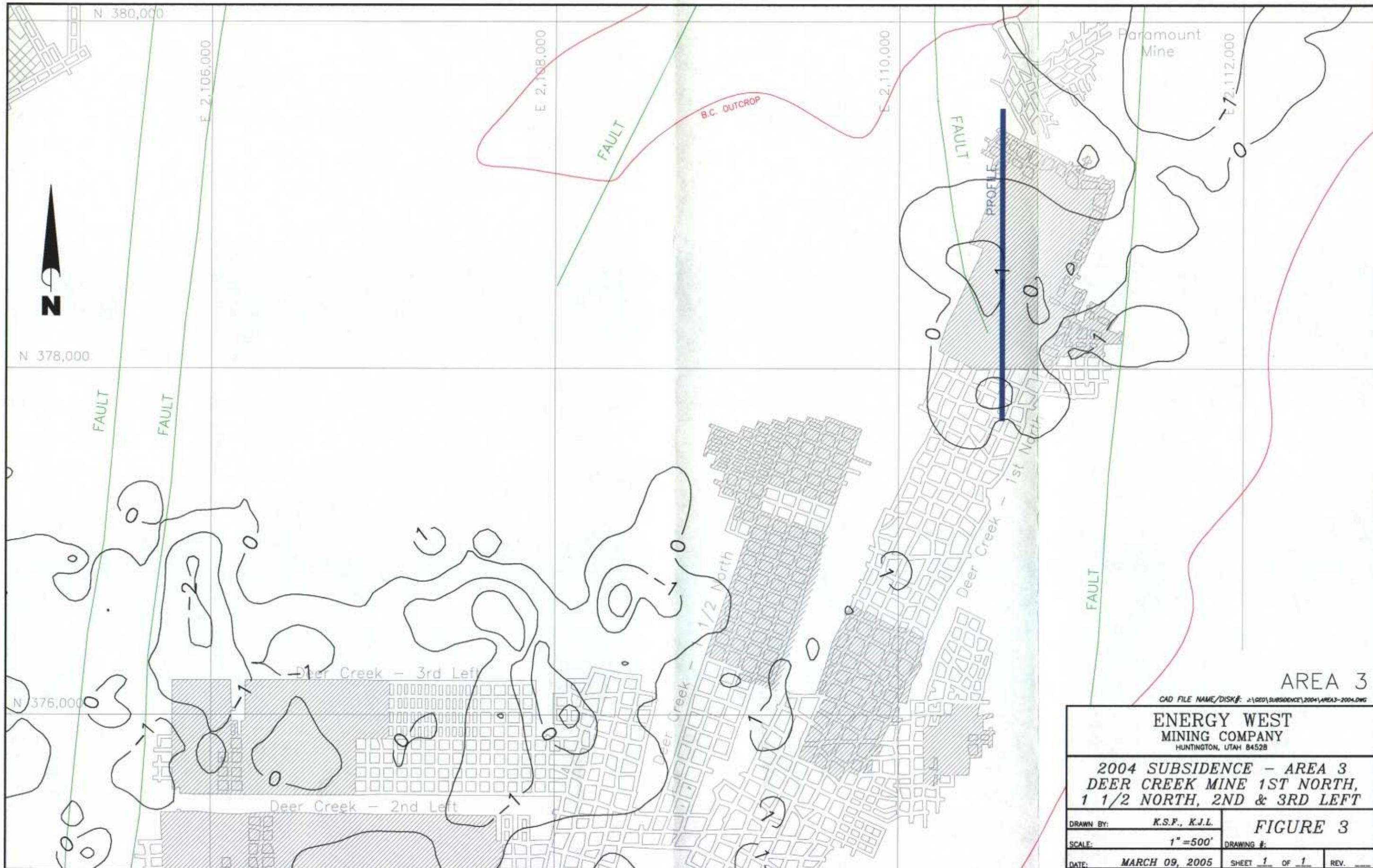
**ENERGY WEST
MINING COMPANY**
HUNTINGTON, UTAH 84528

**2004 SUBSIDENCE MONITORING
AREAS STUDIED
FOR SUBSIDENCE**

DRAWN BY: K. S. Fleck	FIGURE 2
SCALE: 1" = 1 MILE	DRAWING #:
DATE: March 31, 2004	SHEET 1 OF 1 REV. —

FIGURES 3 - 16

SUBSIDENCE AREA MAPS



AREA 3

CAD FILE NAME/DISK#: J:\2004\SUBSIDENCE\2004\AREA3-2004.DWG

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

**2004 SUBSIDENCE - AREA 3
DEER CREEK MINE 1ST NORTH,
1 1/2 NORTH, 2ND & 3RD LEFT**

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

FIGURE 3

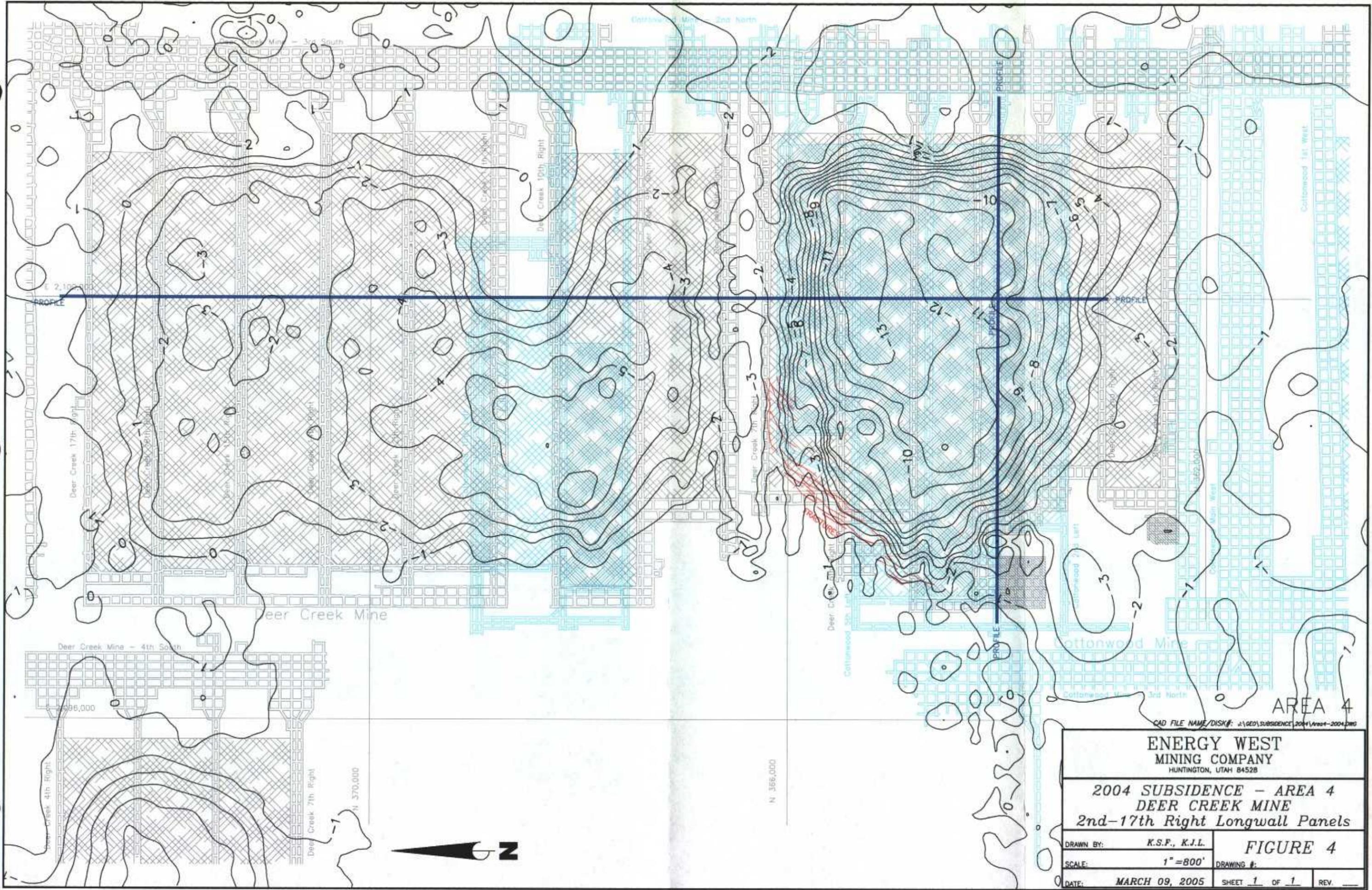
SCALE: **1" = 500'**

DRAWING #:

DATE: **MARCH 09, 2005**

SHEET **1** OF **1**

REV. **---**

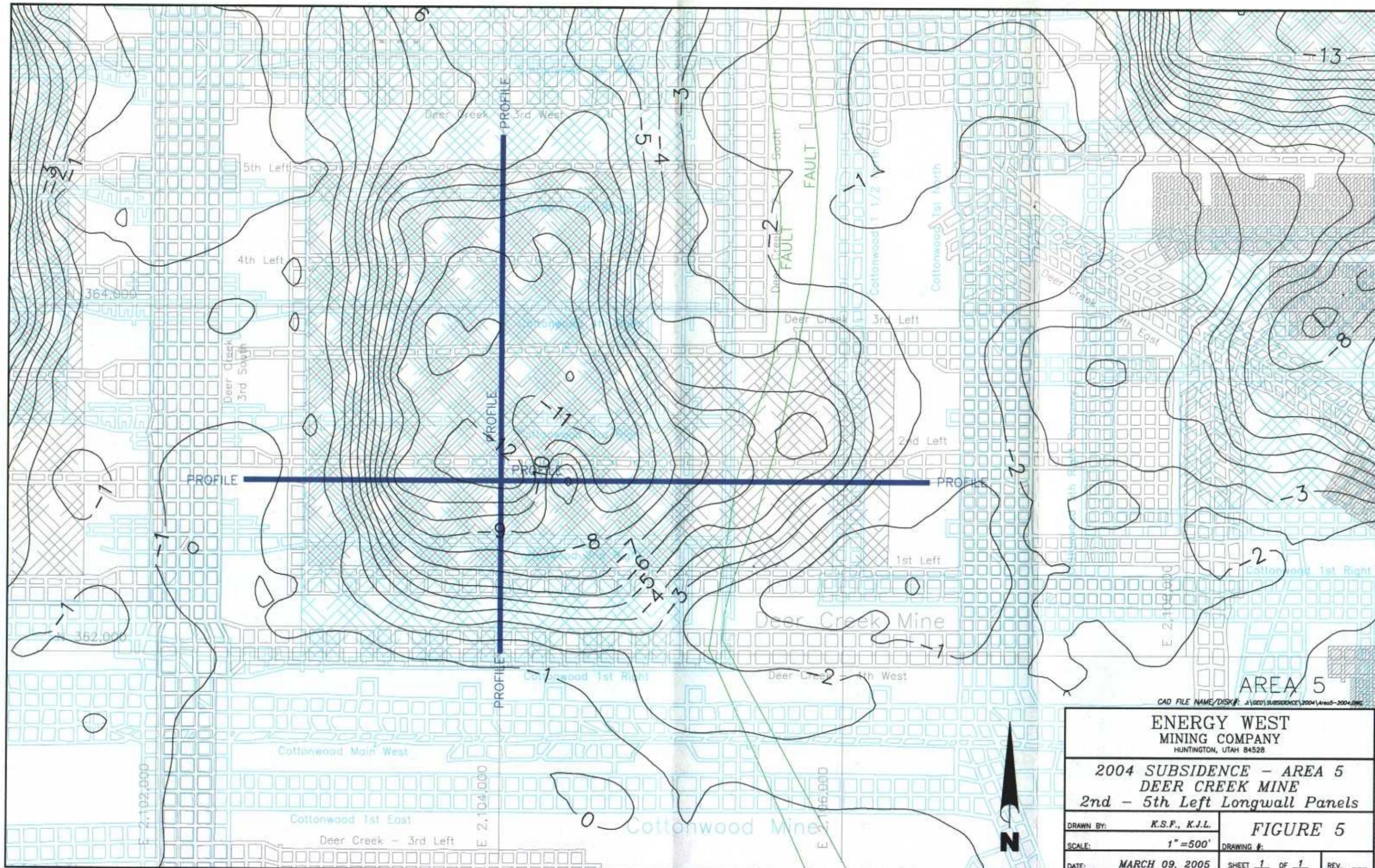


CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\West-2004.dwg

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

**2004 SUBSIDENCE - AREA 4
DEER CREEK MINE
2nd-17th Right Longwall Panels**

DRAWN BY:	K.S.F., K.J.L.	FIGURE 4
SCALE:	1" = 800'	
DATE:	MARCH 09, 2005	SHEET 1 OF 1

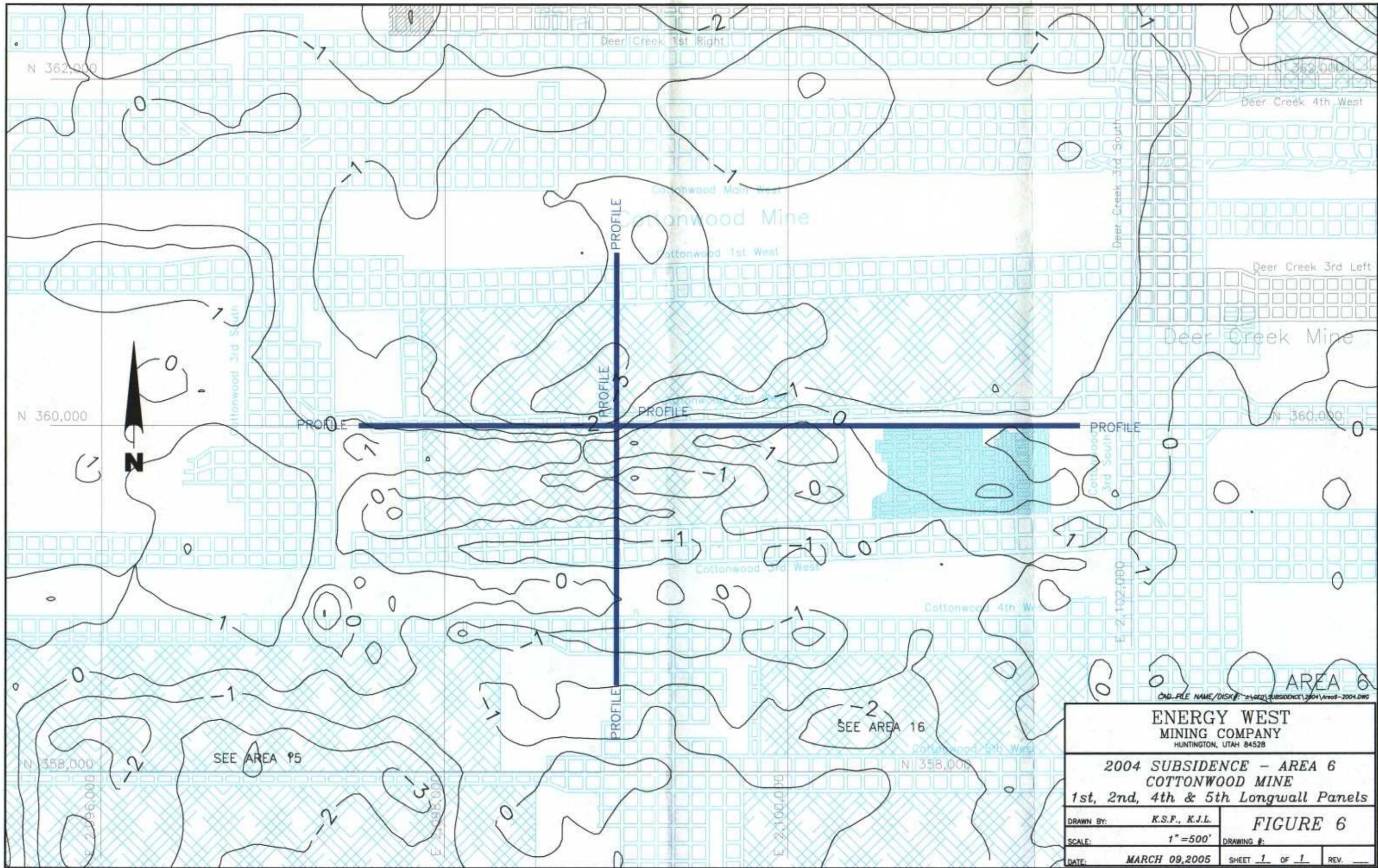


CAD FILE NAME/DISK#: J:\007\SUBSIDENCE\2004\Area5-2004.DWG

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

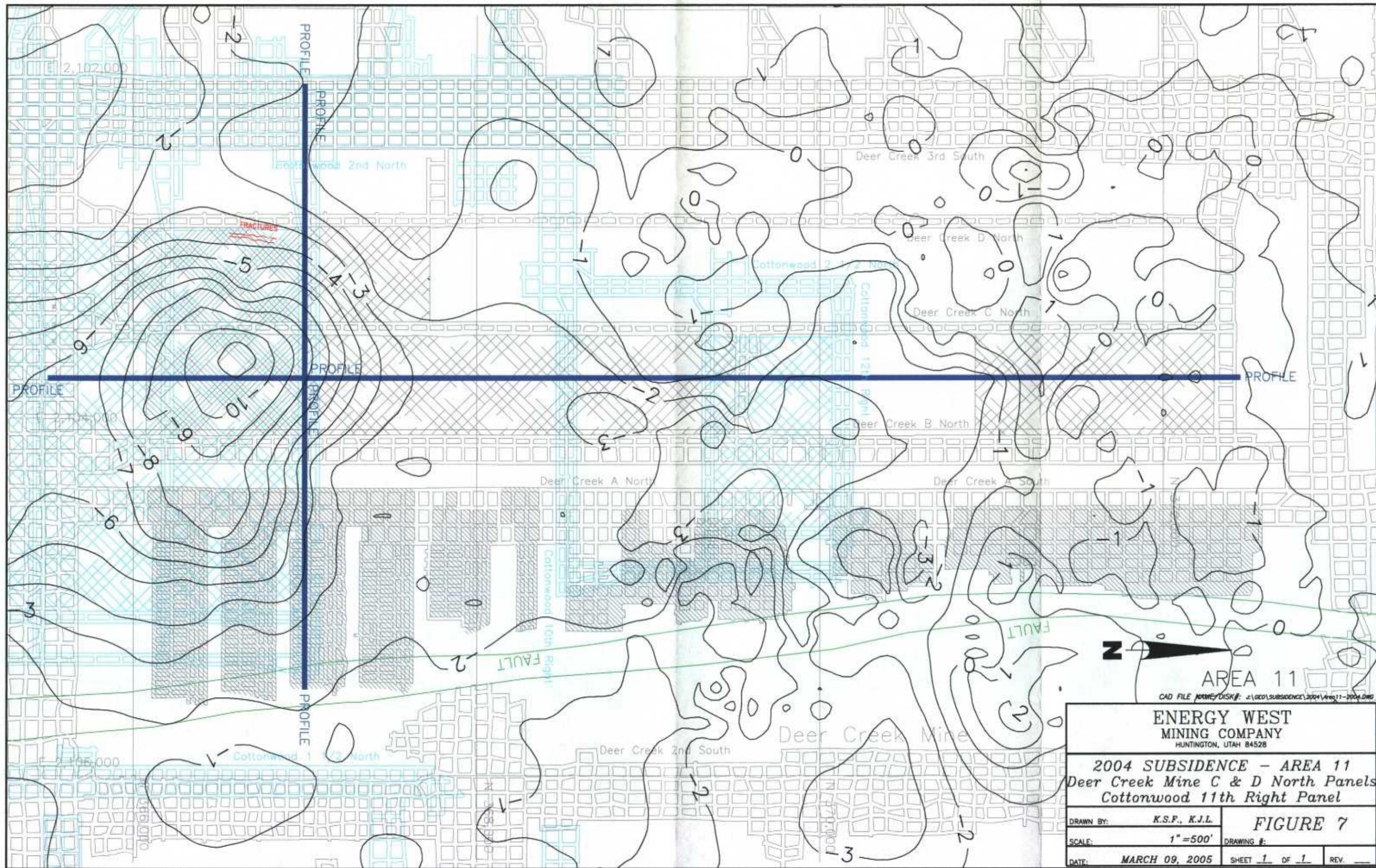
**2004 SUBSIDENCE - AREA 5
DEER CREEK MINE
2nd - 5th Left Longwall Panels**

DRAWN BY:	K.S.F., K.J.L.	FIGURE 5
SCALE:	1" = 500'	
DATE:	MARCH 09, 2005	SHEET 1 OF 1 REV. _____



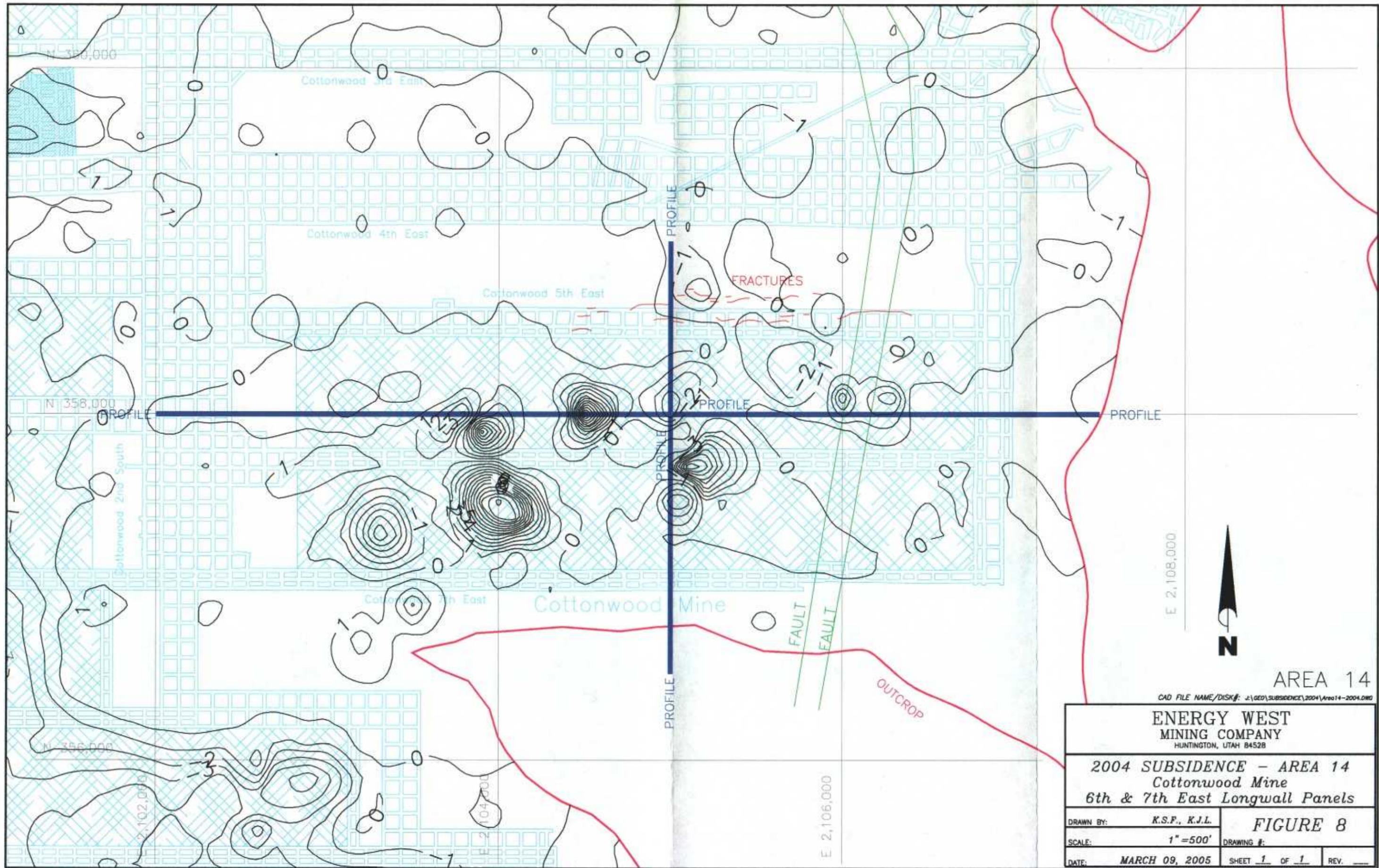
CAD FILE NAME/DISK#: 210201\SUBSIDENCE\2004\Area6-2004.DWG

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.	FIGURE 6	
SCALE:	1" = 500'	DRAWING #:	
DATE:	MARCH 09, 2005	SHEET 1 OF 1	REV. _____



AREA 11
 CAD FILE NAME/DISK#: A:\001\SUBSIDENCE\2004\Area11-2004.dwg

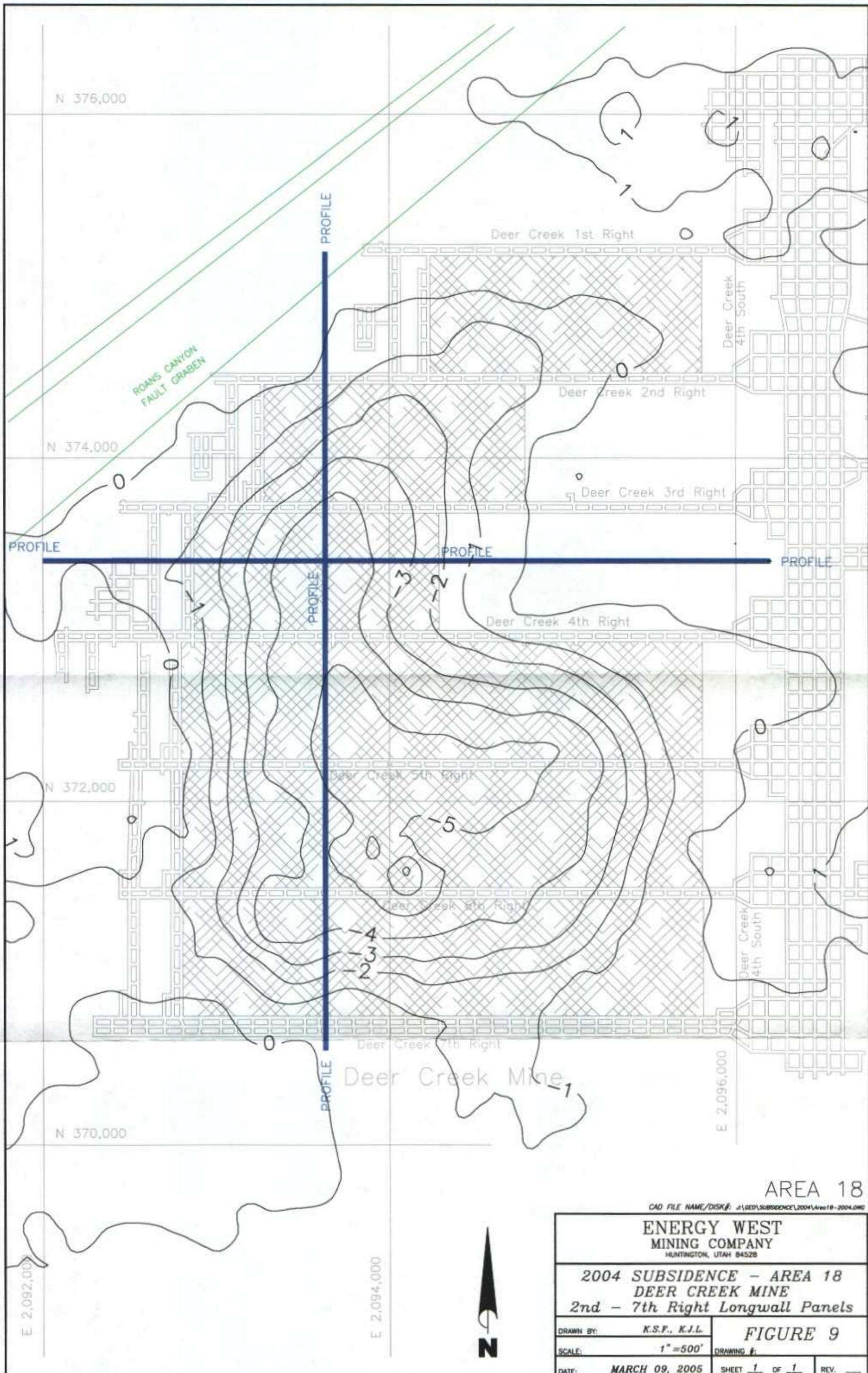
ENERGY WEST MINING COMPANY HUNTINGTON, UTAH 84528			
2004 SUBSIDENCE - AREA 11 Deer Creek Mine C & D North Panels Cottonwood 11th Right Panel			
DRAWN BY:	K.S.F., K.J.L.	FIGURE 7	
SCALE:	1" = 500'	DRAWING #:	
DATE:	MARCH 09, 2005	SHEET 1 OF 1	REV. _____



AREA 14

CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area14-2004.DWG

ENERGY WEST MINING COMPANY HUNTINGTON, UTAH 84528	
2004 SUBSIDENCE - AREA 14 Cottonwood Mine 6th & 7th East Longwall Panels	
DRAWN BY: K.S.F., K.J.L.	FIGURE 8
SCALE: 1" = 500'	DRAWING #:
DATE: MARCH 09, 2005	SHEET 1 OF 1 REV. ---



AREA 18

CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area18-2004.dwg

**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**

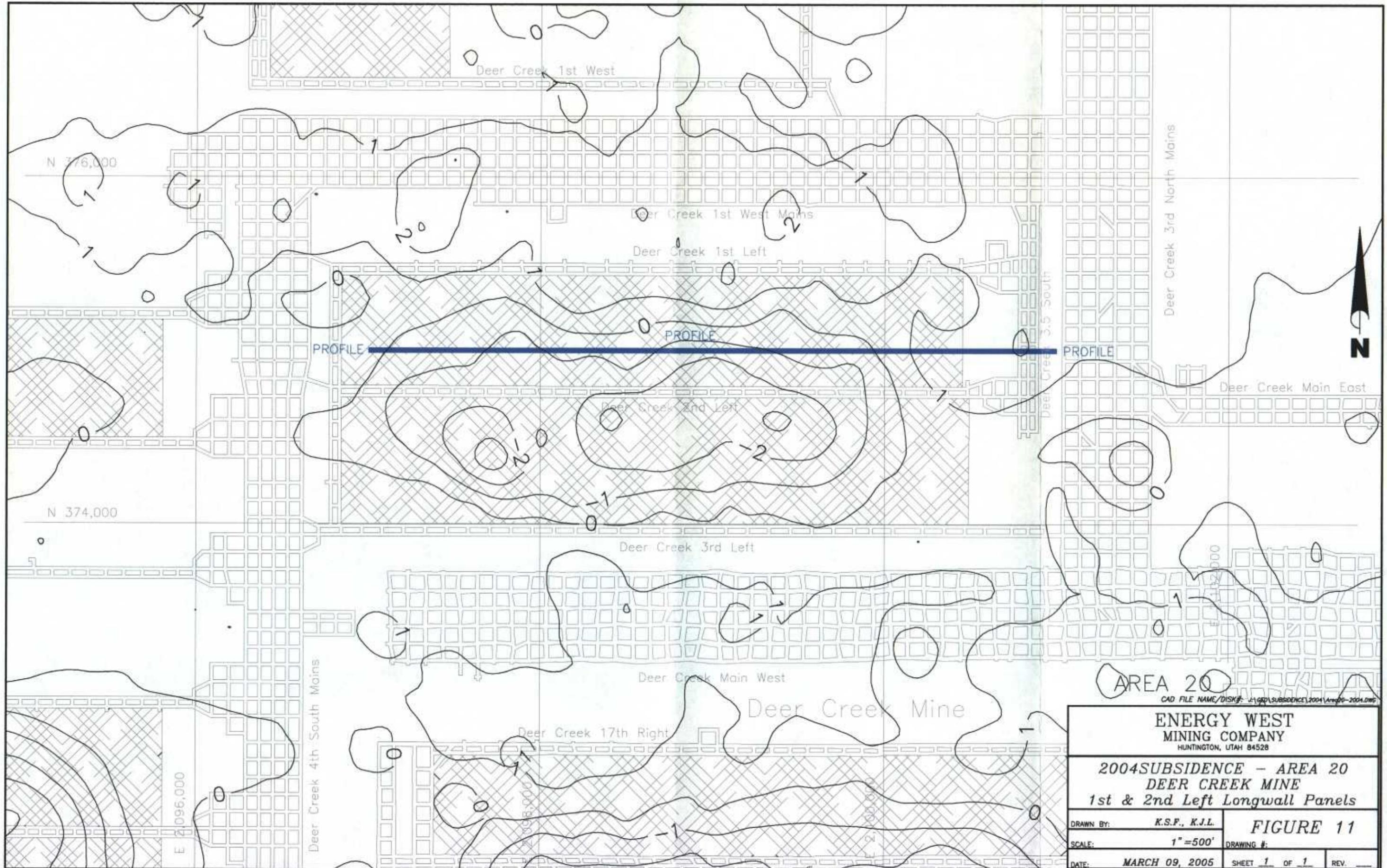
REV. _____



AREA 19

CAD FILE NAME/DISK#: J:\GED\SUBSIDENCE\2004\Area19-2004.DWG

ENERGY WEST MINING COMPANY HUNTINGTON, UTAH 84528			
2004 SUBSIDENCE - AREA 19 DEER CREEK MINE 7th & 8th East Longwall Panels			
DRAWN BY:	K.S.F., K.J.L.	FIGURE 10	
SCALE:	1" = 500'	DRAWING #:	
DATE:	MARCH 09, 2005	SHEET 1 OF 1	REV. _____

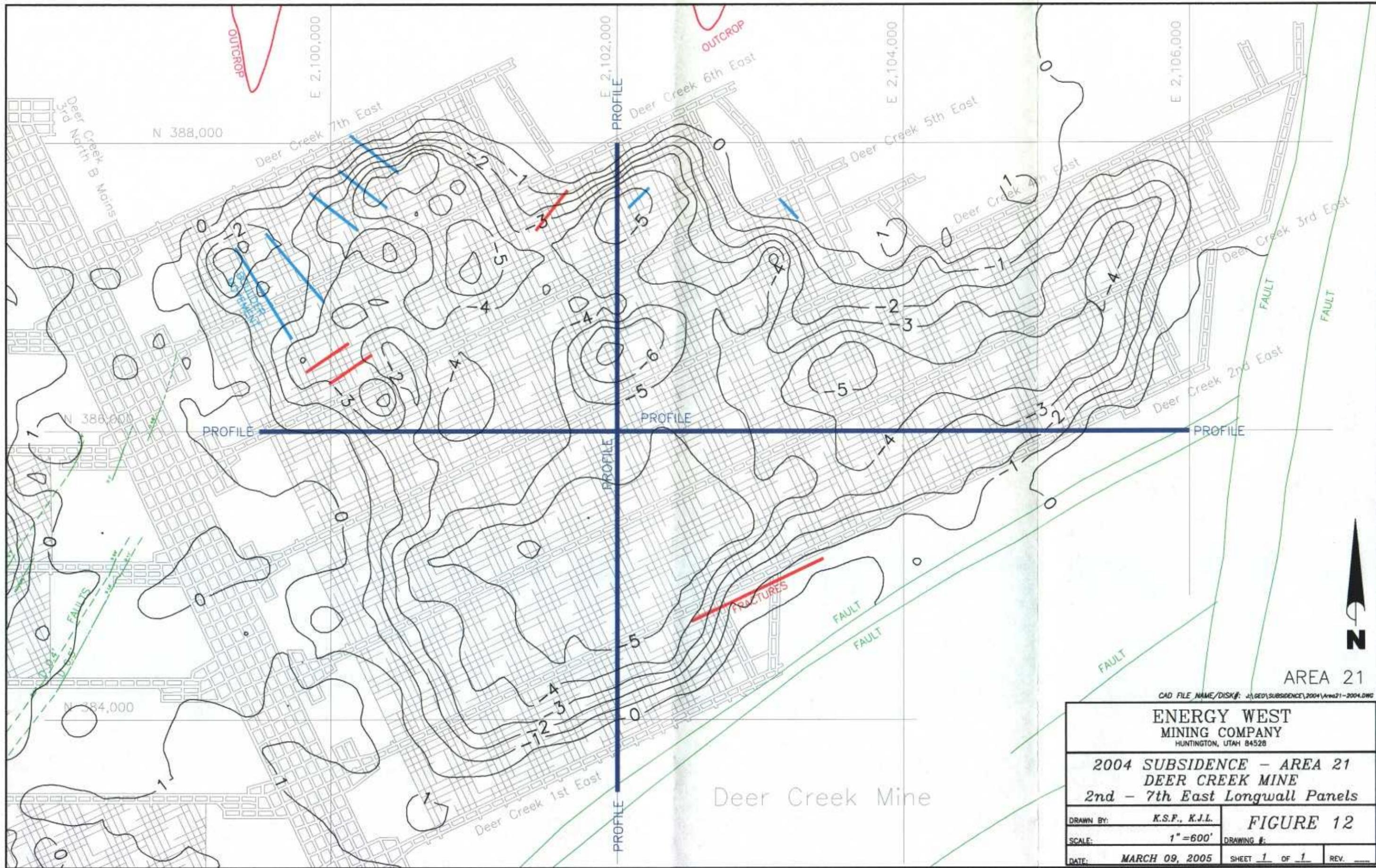


AREA 20
CAD FILE NAME/DISK# J:\2004SUBSIDENCE\2004\Area20-2004.dwg

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

**2004SUBSIDENCE - AREA 20
 DEER CREEK MINE
 1st & 2nd Left Longwall Panels**

<small>DRAWN BY:</small> K.S.F., K.J.L.	FIGURE 11
<small>SCALE:</small> 1" = 500'	<small>DRAWING #:</small>
<small>DATE:</small> MARCH 09, 2005	<small>SHEET</small> 1 <small>OF</small> 1 <small>REV.</small>



AREA 21

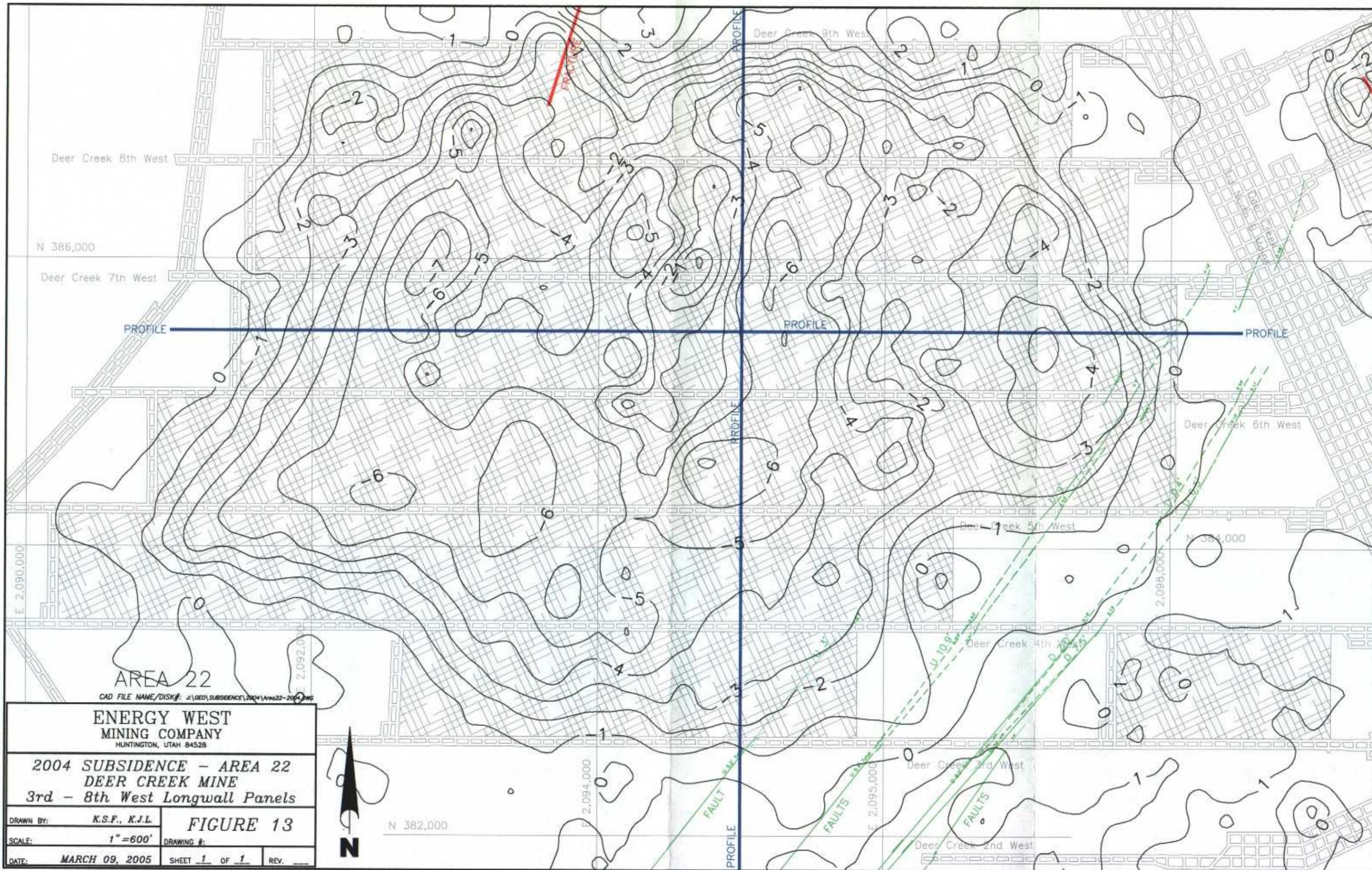
CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area21-2004.DWG

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

**2004 SUBSIDENCE - AREA 21
DEER CREEK MINE
2nd - 7th East Longwall Panels**

DRAWN BY:	K.S.F., K.J.L.	FIGURE 12
SCALE:	1" = 600'	
DATE:	MARCH 09, 2005	SHEET 1 OF 1

REV. _____



AREA 22

CAD FILE NAME/DISK#: J:\GEO\SUBSIDENCE\2004\Area22-2004.dwg

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

**2004 SUBSIDENCE - AREA 22
DEER CREEK MINE
3rd - 8th West Longwall Panels**

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

FIGURE 13

SCALE: **1" = 600'**

DRAWING #:

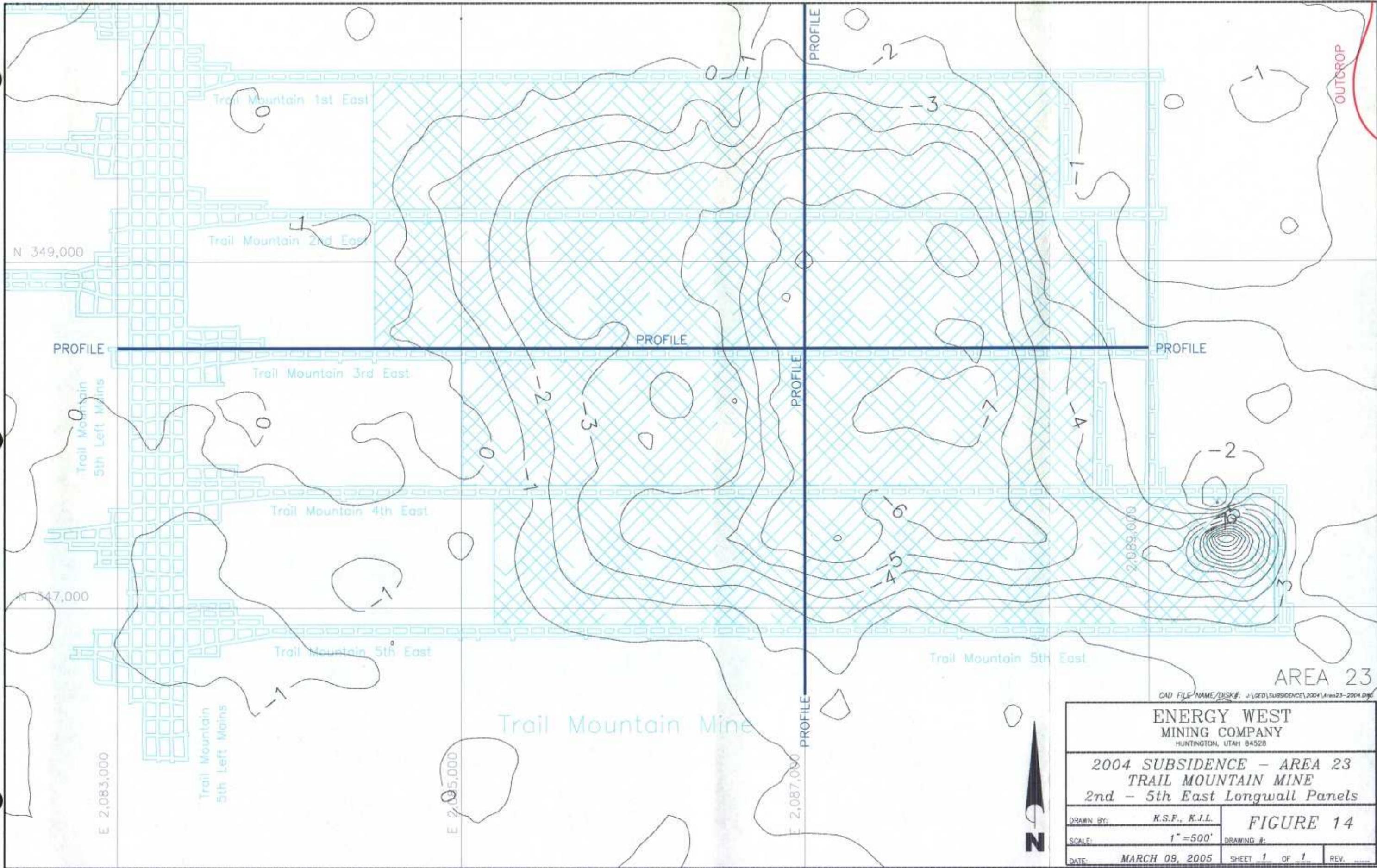
DATE: **MARCH 09, 2005**

SHEET **1** OF **1**

REV. _____



N 382,000



N 349,000

N 347,000

E 2,083,000

E 2,085,000

E 2,087,000

2,089,070

PROFILE

PROFILE

PROFILE

PROFILE

PROFILE

OUTCROP

Trail Mountain 1st East

Trail Mountain 2nd East

Trail Mountain 3rd East

Trail Mountain 4th East

Trail Mountain 5th East

Trail Mountain 5th East

Trail Mountain
5th Left Mains

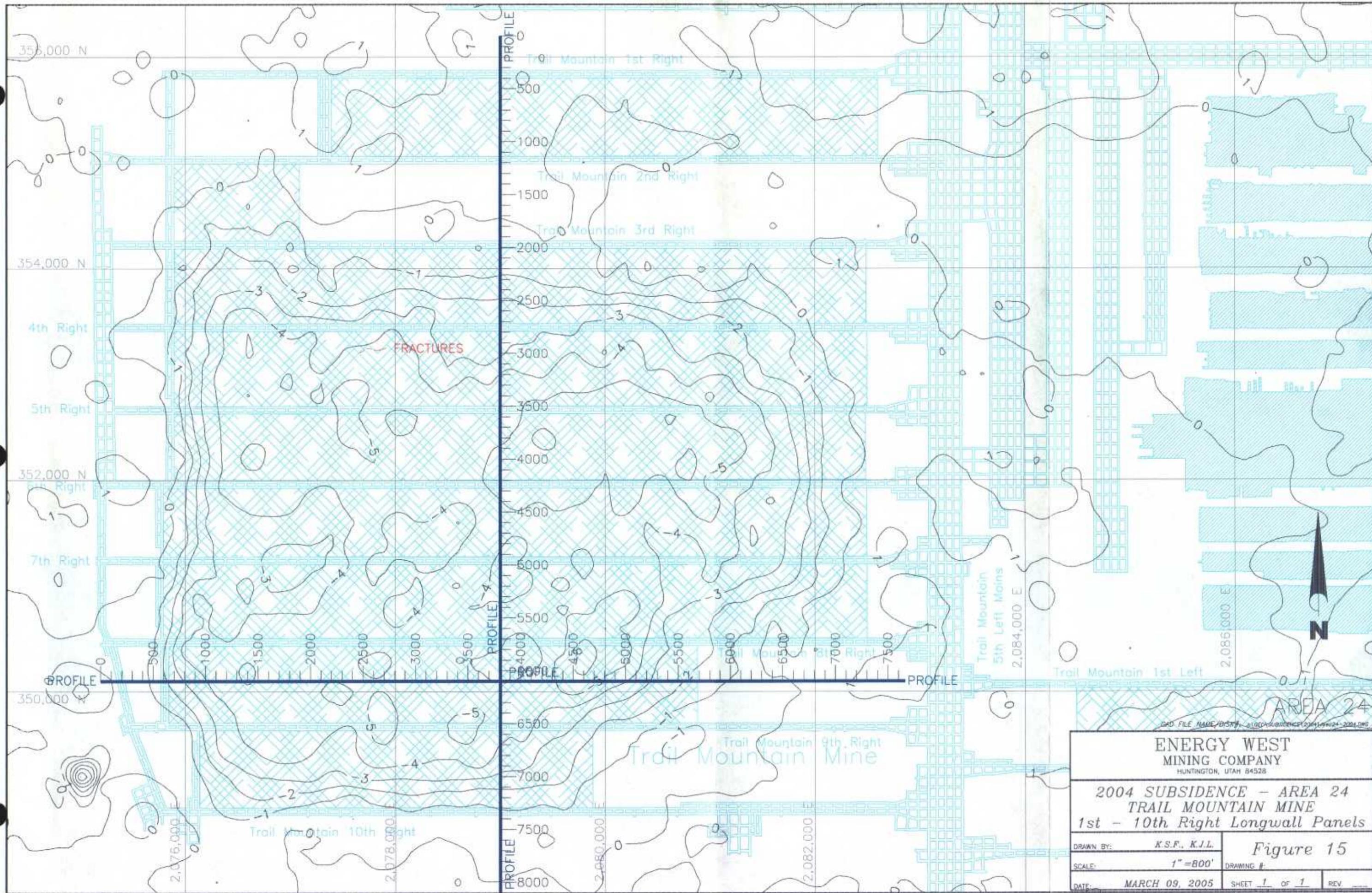
Trail Mountain Mine

AREA 23

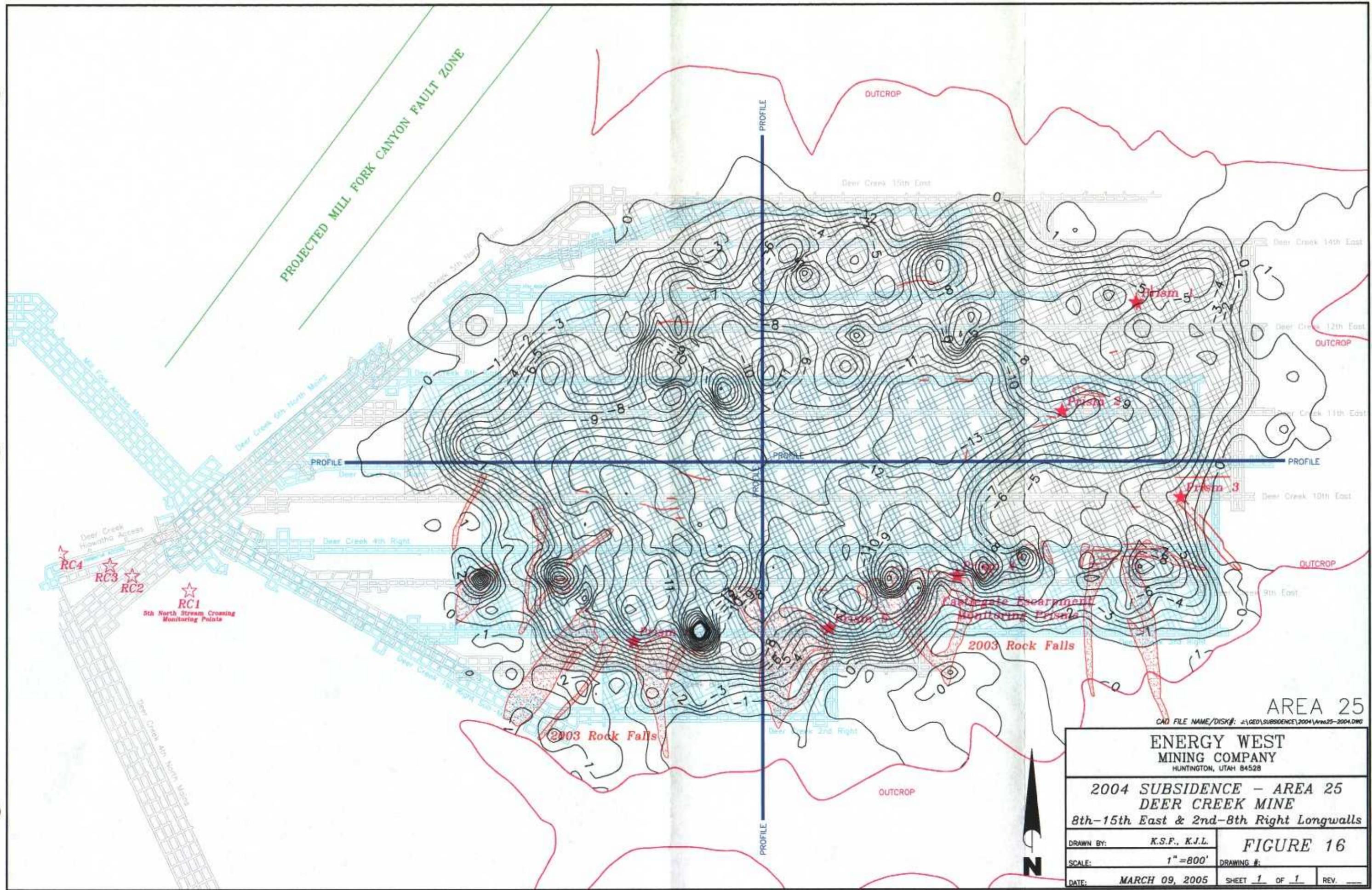
CAD FILE NAME/DISK# : \\GEO\SUBSIDENCE\2004\Area23-2004.dwg

ENERGY WEST MINING COMPANY HUNTINGTON, UTAH 84528			
2004 SUBSIDENCE - AREA 23 TRAIL MOUNTAIN MINE 2nd - 5th East Longwall Panels			
DRAWN BY:	K.S.F., K.J.L.	FIGURE 14	
SCALE:	1" = 500'	DRAWING #:	
DATE:	MARCH 09, 2005	SHEET 1 OF 1	REV.





ENERGY WEST MINING COMPANY <small>HUNTINGTON, UTAH 84528</small>		
2004 SUBSIDENCE - AREA 24 TRAIL MOUNTAIN MINE 1st - 10th Right Longwall Panels		
DRAWN BY:	K.S.F., K.J.L.	Figure 15
SCALE:	1" = 800'	DRAWING #
DATE:	MARCH 09, 2005	SHEET 1 OF 1 REV



AREA 25
 CAD FILE NAME/DISK#: \\GEO\SUBSIDENCE\2004\Area25-2004.DWG

ENERGY WEST MINING COMPANY HUNTINGTON, UTAH 84528	
2004 SUBSIDENCE - AREA 25 DEER CREEK MINE 8th-15th East & 2nd-8th Right Longwalls	
DRAWN BY: K.S.F., K.J.L.	FIGURE 16
SCALE: 1" = 800'	DRAWING #:
DATE: MARCH 09, 2005	SHEET 1 OF 1 REV. ---

CHARTS 1 - 25

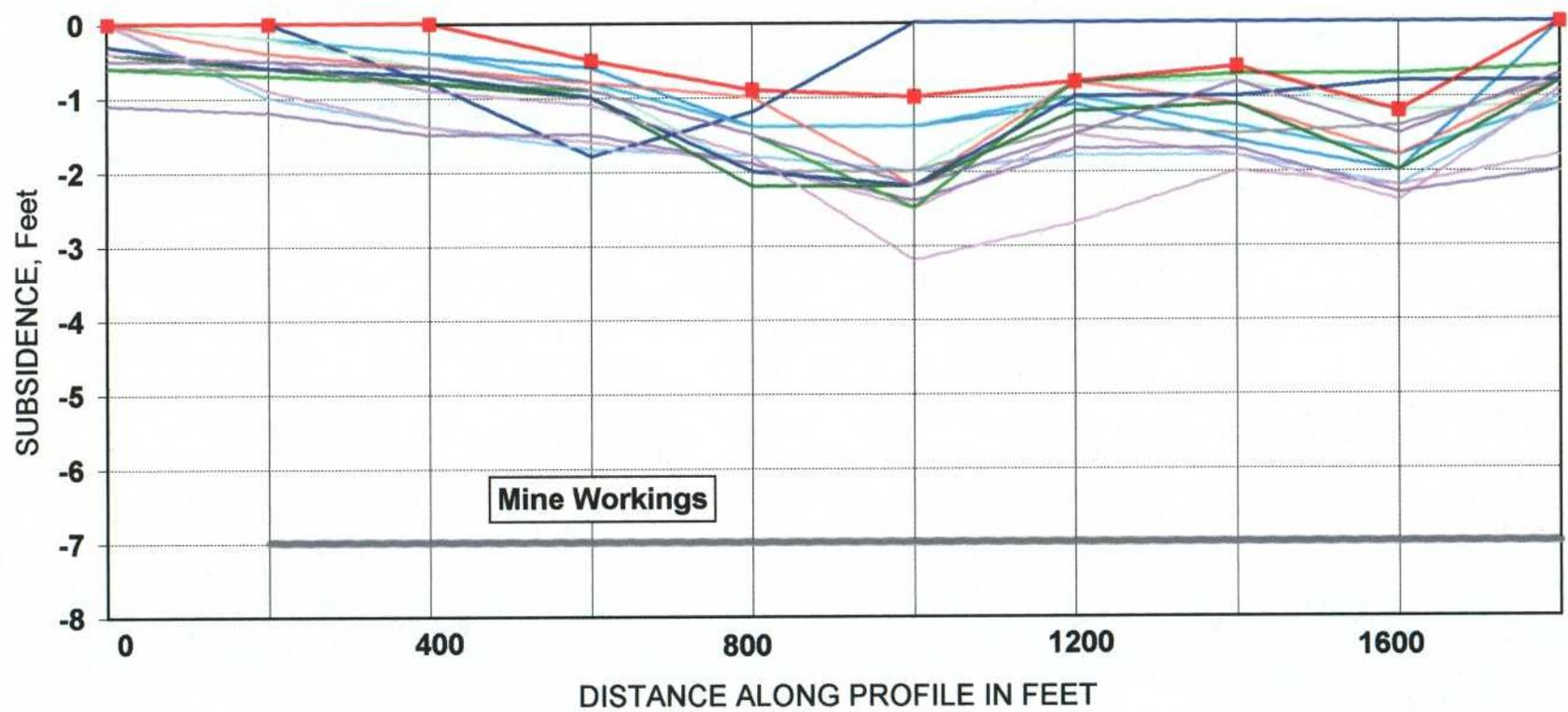
AREA SUBSIDENCE PROFILES

Energy West 2004 Subsidence Report

Area 3 Subsidence Profile

North - South

Chart 1



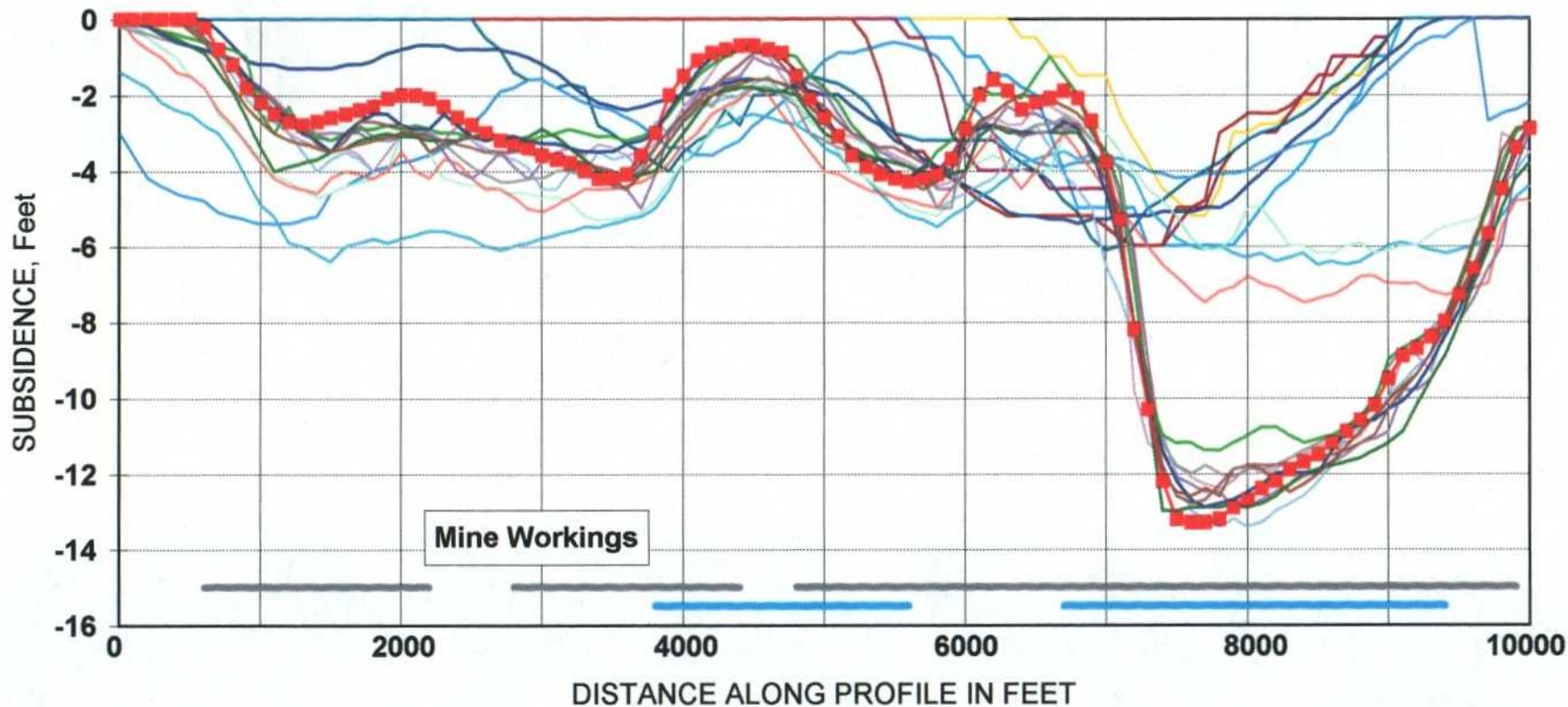
— 1989	— 1991	— 1992	— 1993	— 1994	— 1995
— 1996	— 1997	— 1998	— 1999	— 2000	— 2001
— 2002	— 2003	— 2004			

Energy West 2004 Subsidence Report

Area 4 Subsidence Profile

North - South

Chart 2



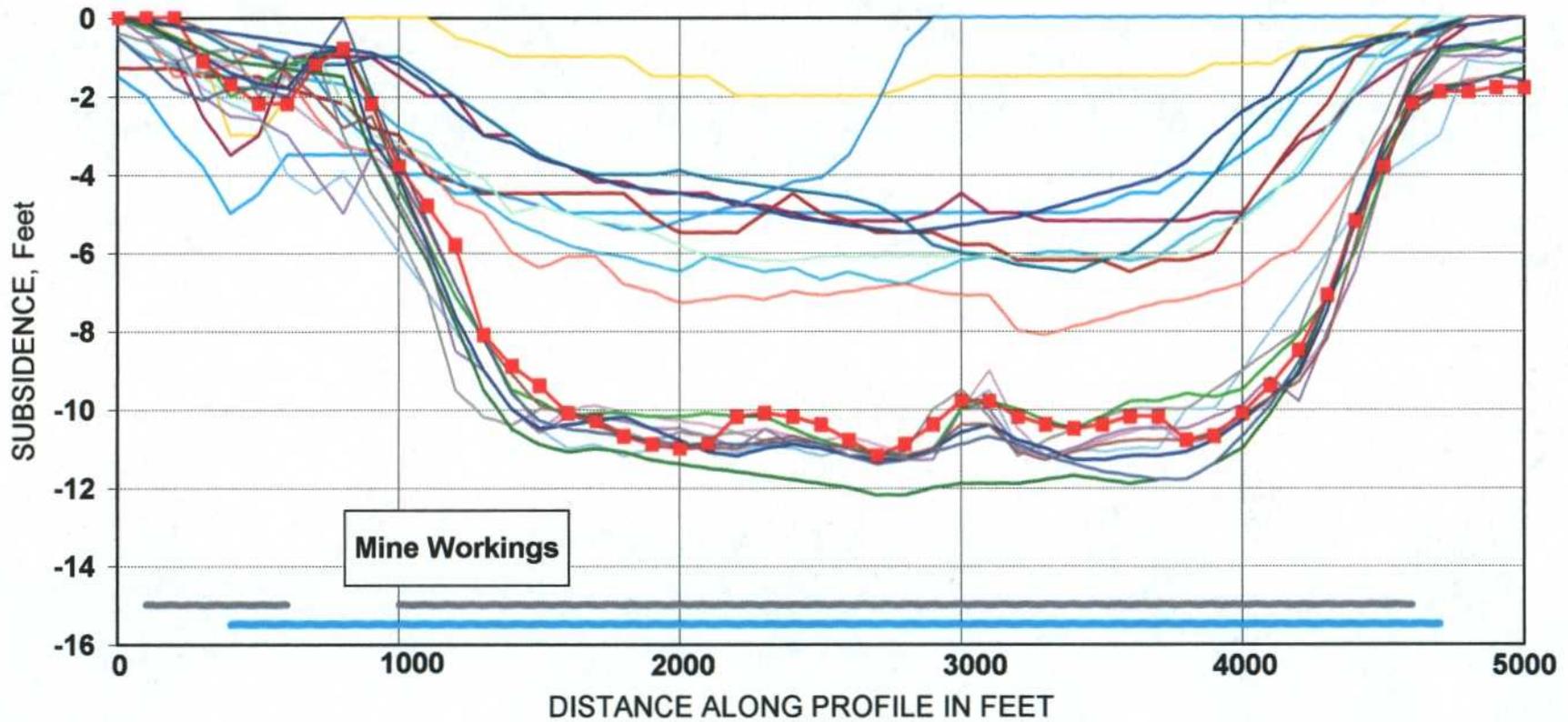
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1992	1993	1994	1995	1996	1997	1998
1999	2000	2001	2002	2003	2004	

Energy West 2004 Subsidence Report

Area 4 Subsidence Profile

West - East

Chart 3



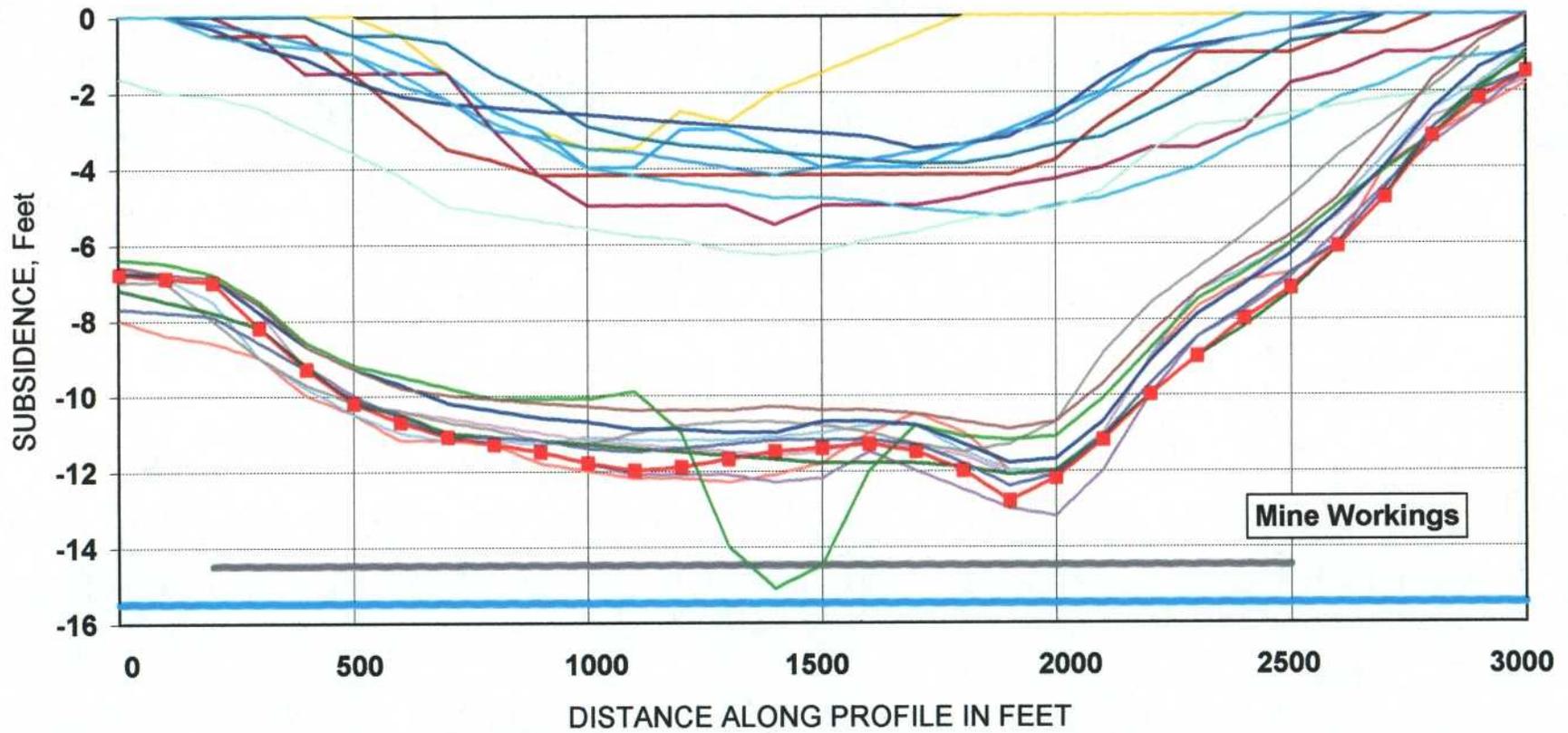
1984	1985	1986	1987	1988	1989	1991
1992	1993	1994	1995	1996	1997	1998
1999	2000	2001	2002	2003	2004	

Energy West 2004 Subsidence Report

Area 5 Subsidence Profile

North - South

Chart 4



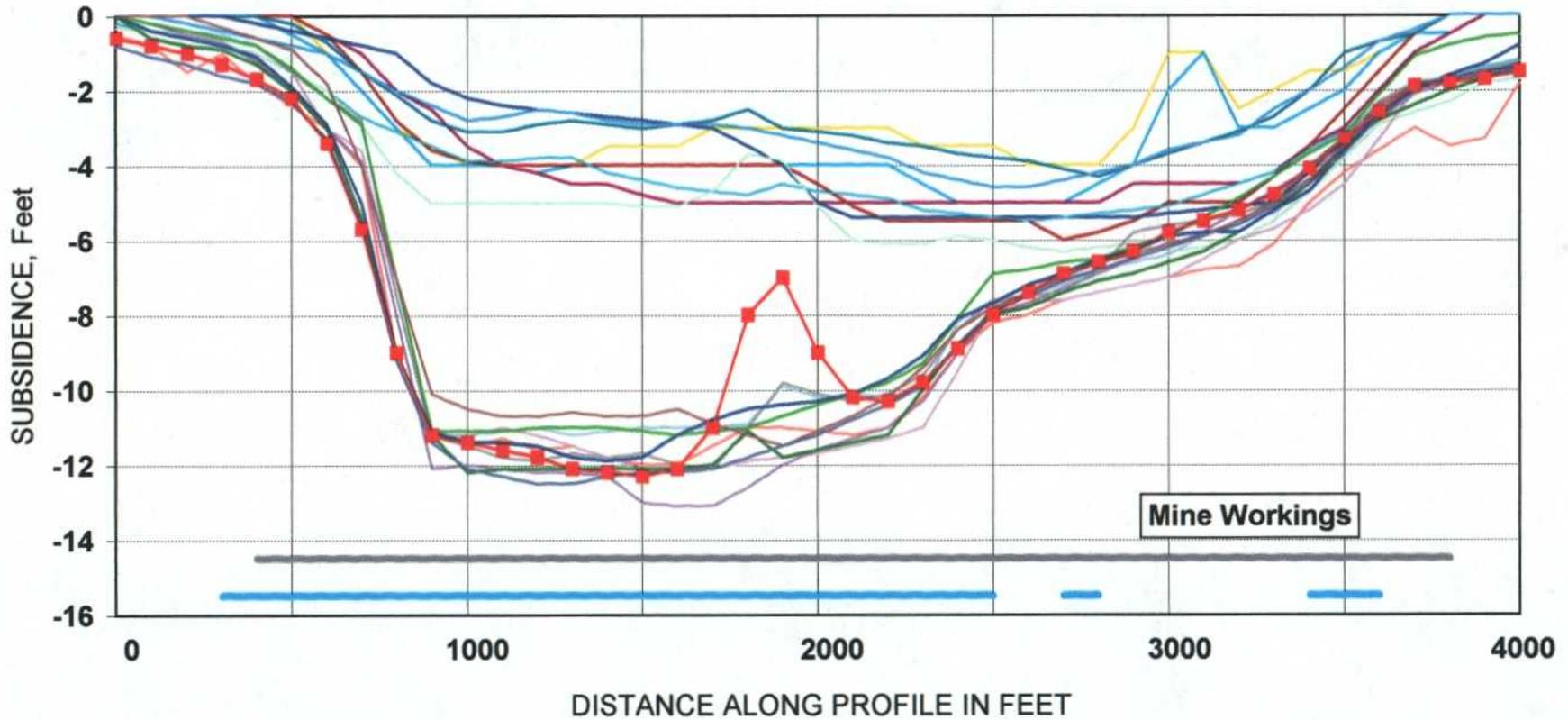
1984	1985	1986	1987	1988	1989	1991
1992	1993	1994	1995	1996	1997	1998
1999	2000	2001	2002	2003	2004	

Energy West 2004 Subsidence Report

Area 5 Subsidence Profile

West - East

Chart 5



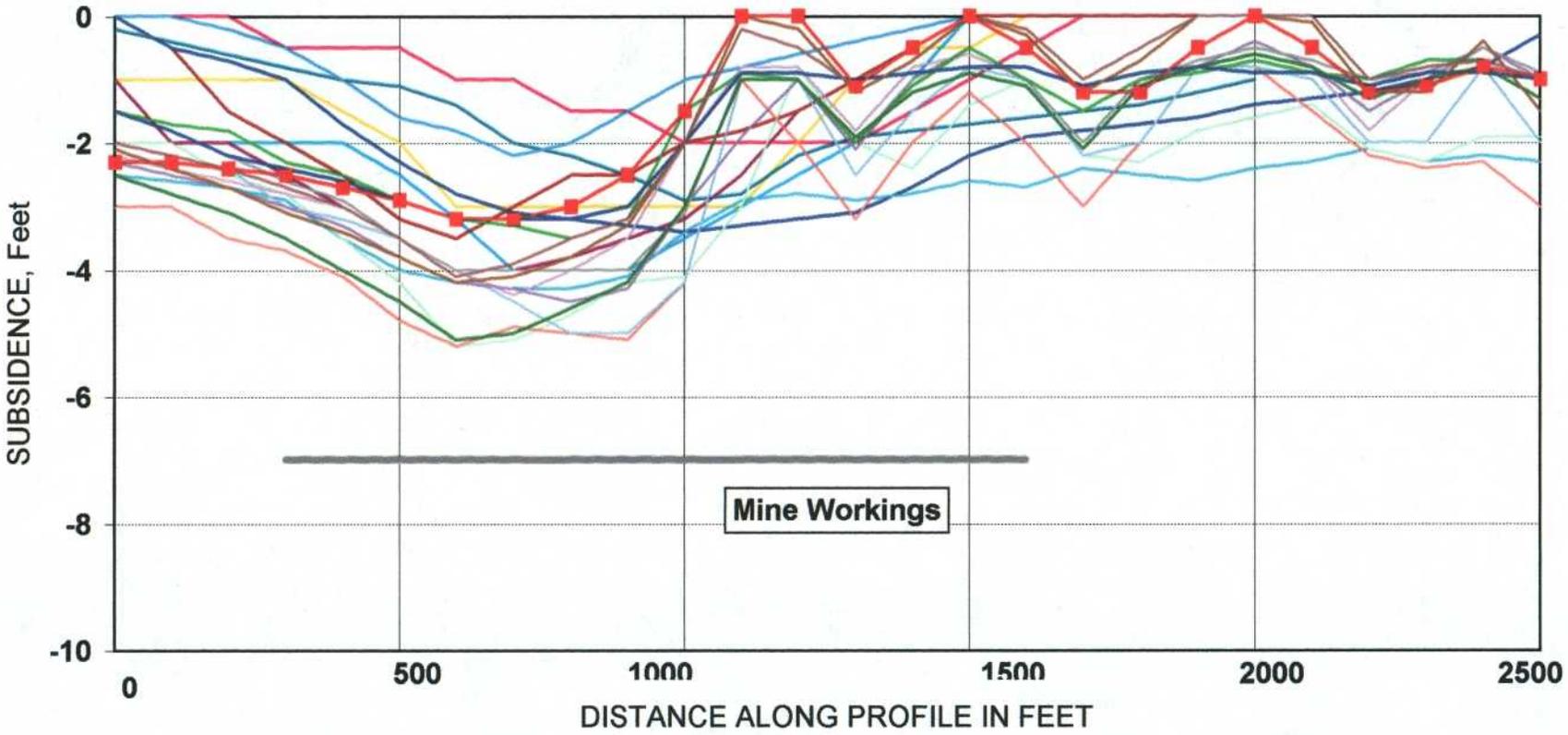
1984	1985	1986	1987	1988	1989	1991
1992	1993	1994	1995	1996	1997	1998
1999	2000	2001	2002	2003	2004	

Energy West 2004 Subsidence Report

Area 6 Subsidence Profile

North - South

Chart 6



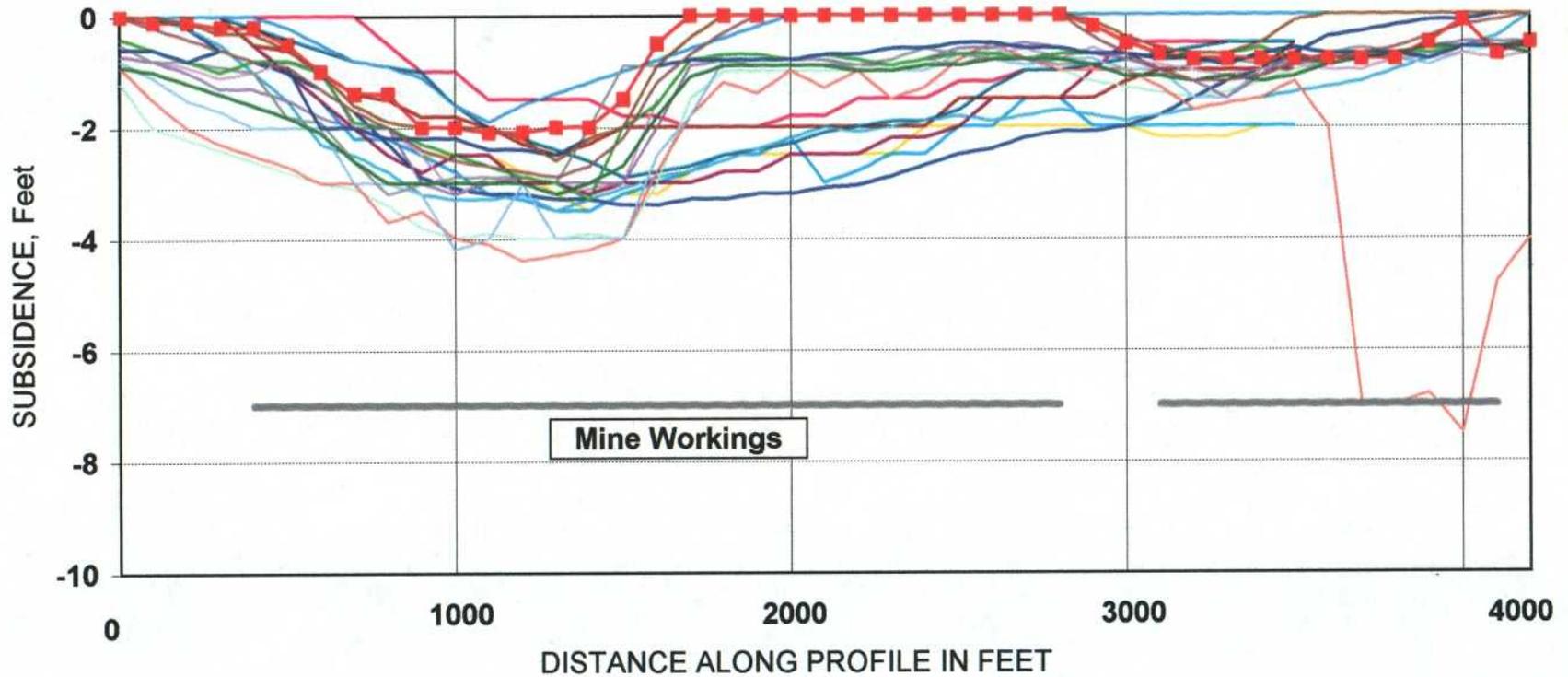
— 1982	— 1983	— 1984	— 1985	— 1986	— 1987	— 1988	— 1989
— 1991	— 1992	— 1993	— 1994	— 1995	— 1996	— 1997	— 1998
— 1999	— 2000	— 2001	— 2002	— 2003	— 2004		

Energy West 2004 Subsidence Report

Area 6 Subsidence Profile

West - East

Chart 7



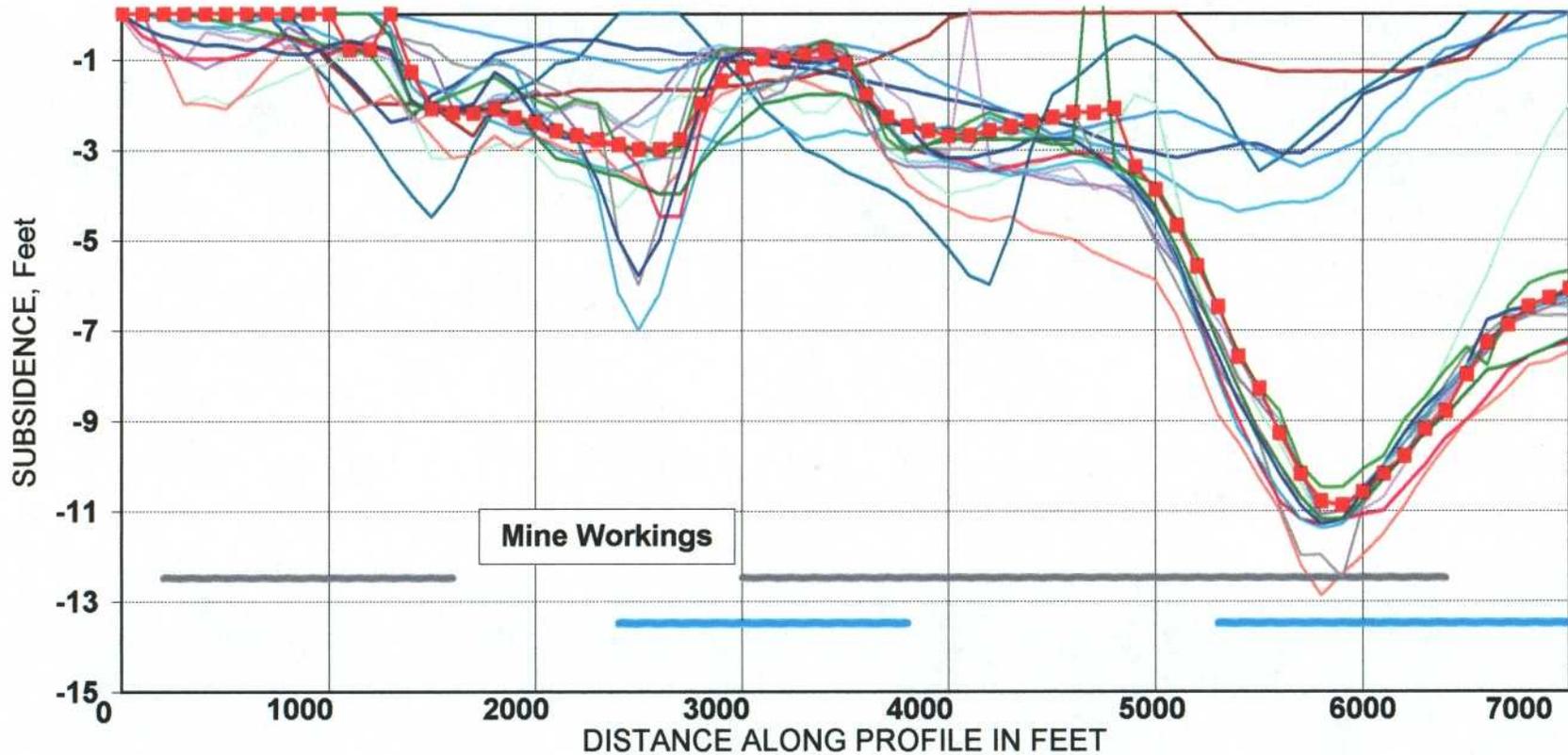
1983	1984	1985	1986	1987	1988	1989
1991	1992	1993	1994	1995	1996	1997
1998	1999	2000	2001	2002	2003	2004

Energy West 2004 Subsidence Report

Area 11 Subsidence Profile

North - South

Chart 8



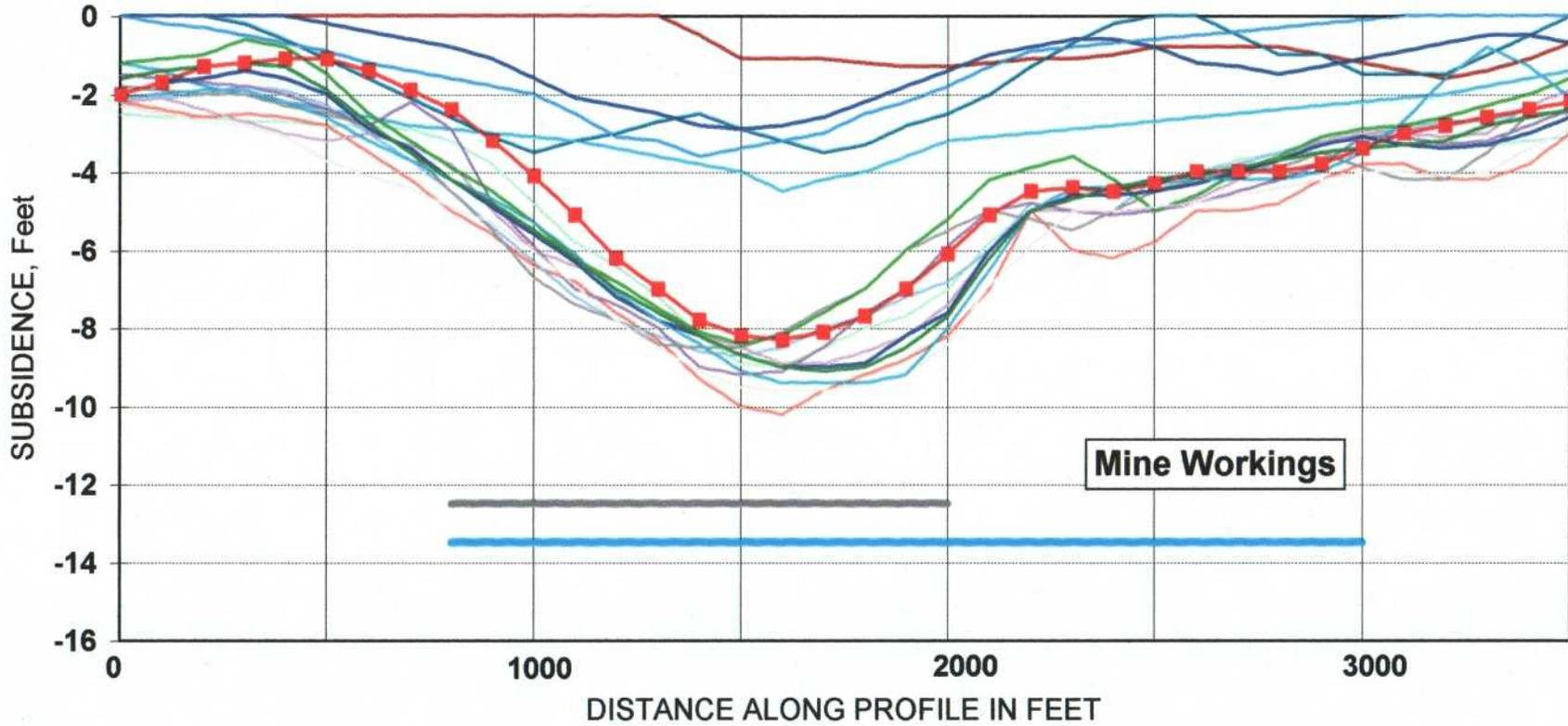
1987	1988	1989	1991	1992	1993	1994
1995	1996	1997	1998	1999	2000	2001
2002	2003	2004				

Energy West 2004 Subsidence Report

Area 11 Subsidence Profile

West - East

Chart 9



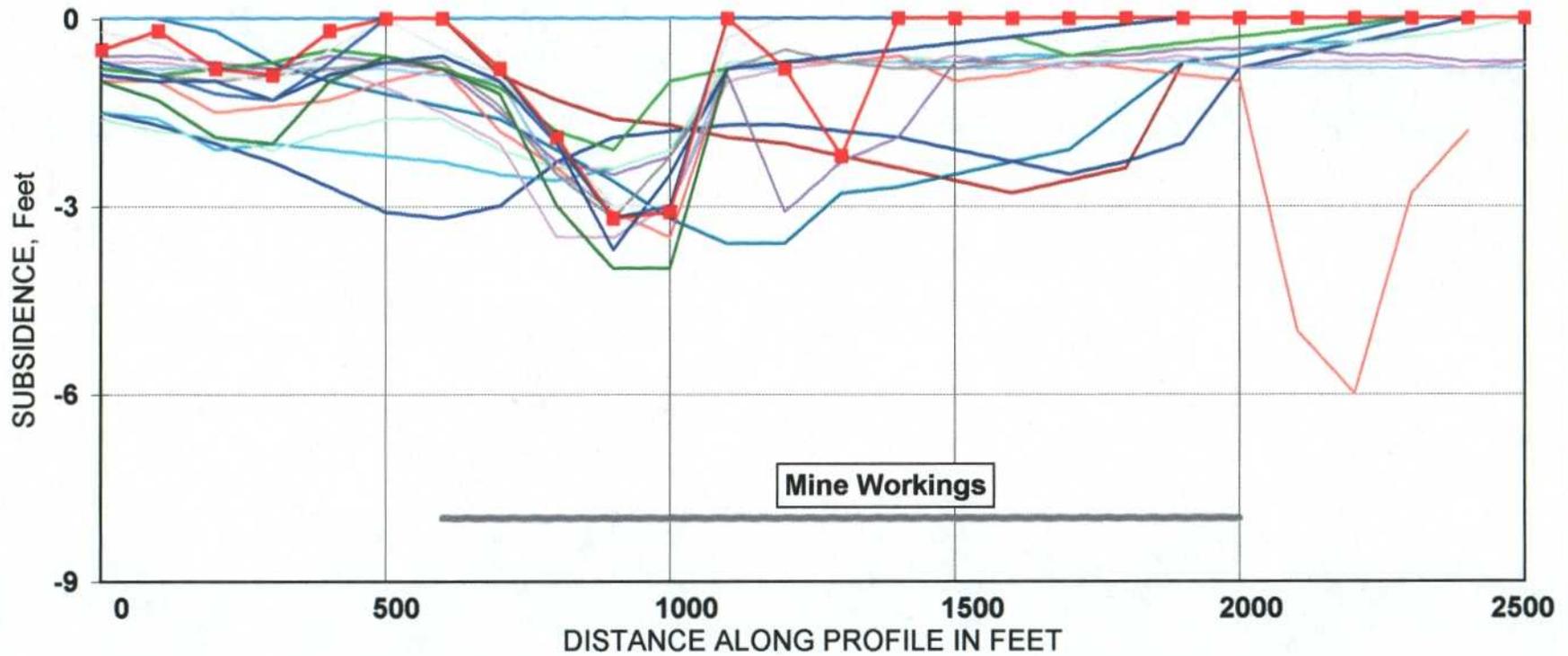
1987	1988	1989	1991	1992	1993	1994
1995	1996	1997	1998	1999	2000	2001
2002	2003	2004				

Energy West 2004 Subsidence Report

Area 14 Subsidence Profile

North - South

Chart 10



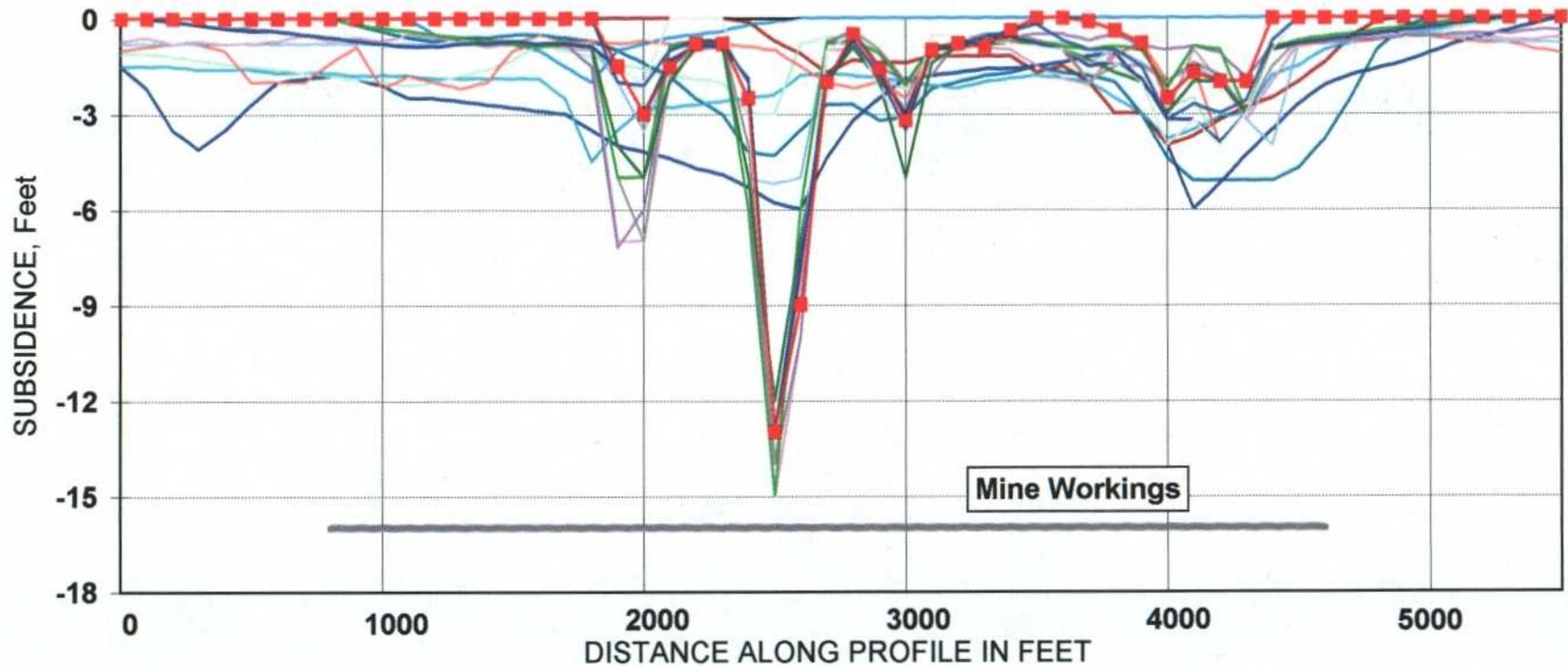
— 1987	— 1988	— 1989	— 1991	— 1992	— 1993
— 1994	— 1995	— 1996	— 1997	— 1998	— 1999
— 2000	— 2001	— 2002	— 2003	—■ 2004	

Energy West 2004 Subsidence Report

Area 14 Subsidence Profile

West - East

Chart 11



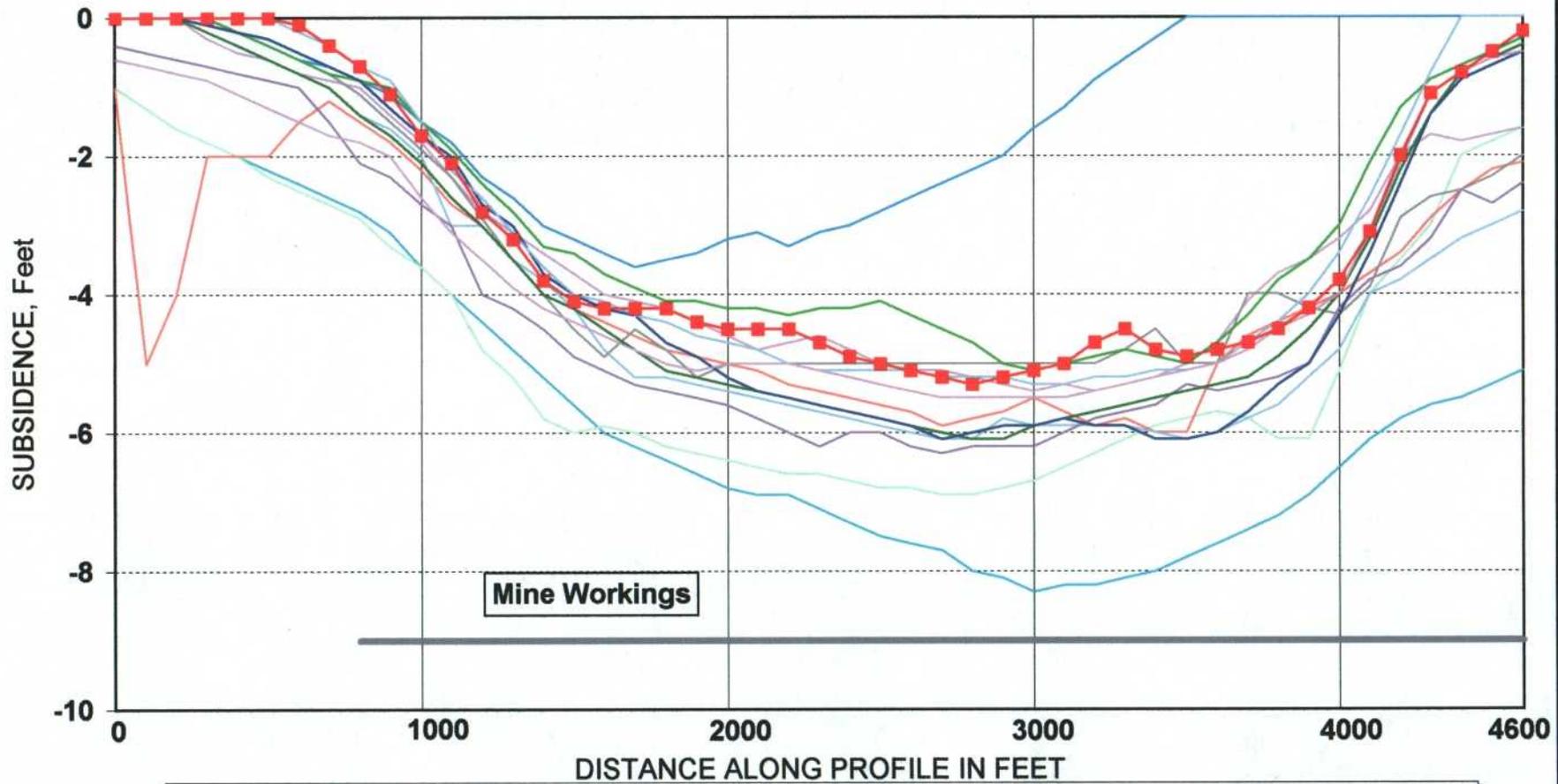
— 1987	— 1988	— 1989	— 1991	— 1992
— 1993	— 1994	— 1995	— 1996	— 1997
— 1998	— 1999	— 2000	— 2001	— 2002
— 2003	■ 2004			

Energy West 2004 Subsidence Report

Area 18 Subsidence Profile

North - South

Chart 12



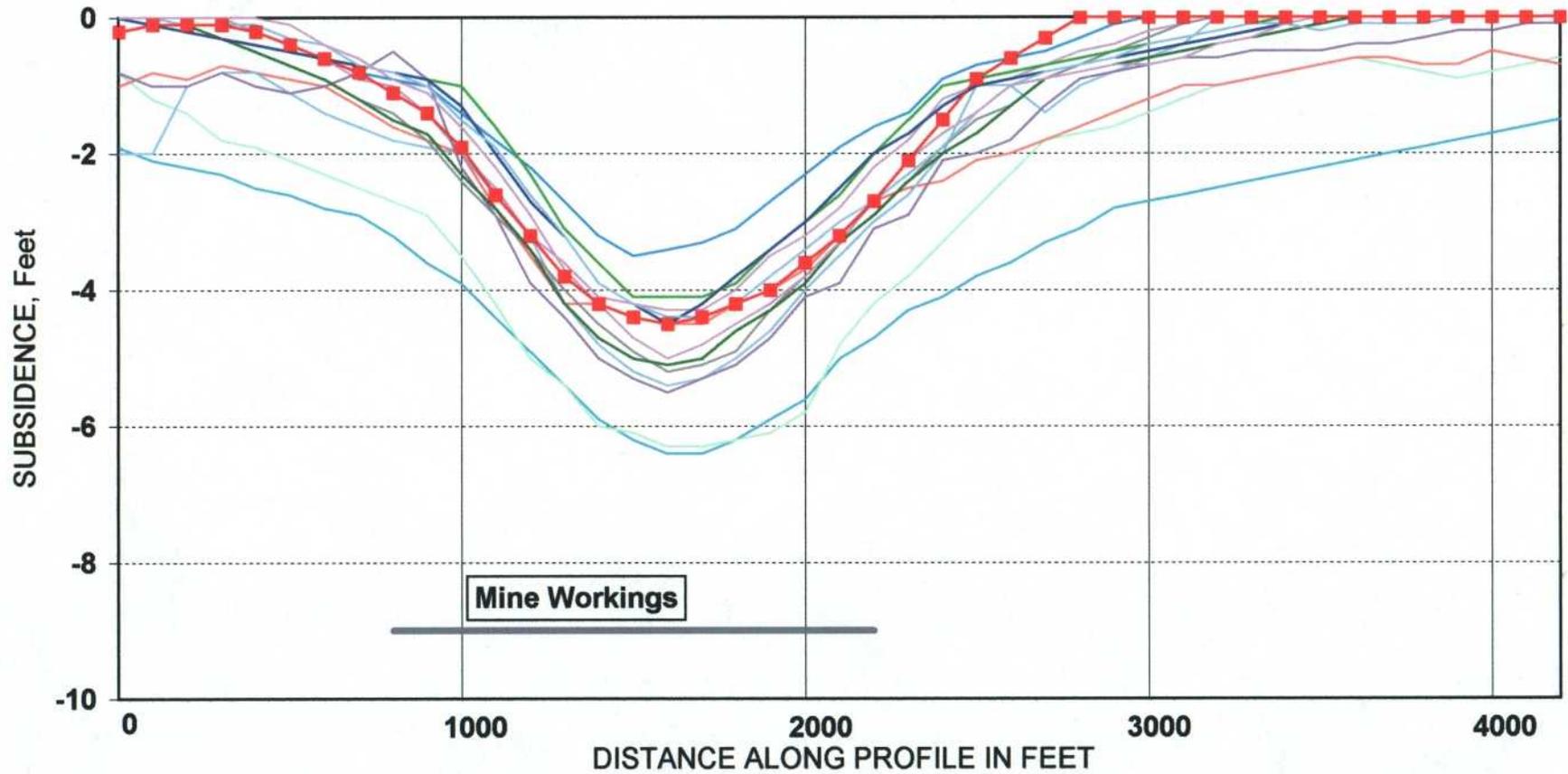
1991	1992	1993	1994	1995	1996	1997
1998	1999	2000	2001	2002	2003	2004

Energy West 2004 Subsidence Report

Area 18 Subsidence Profile

West - East

Chart 13



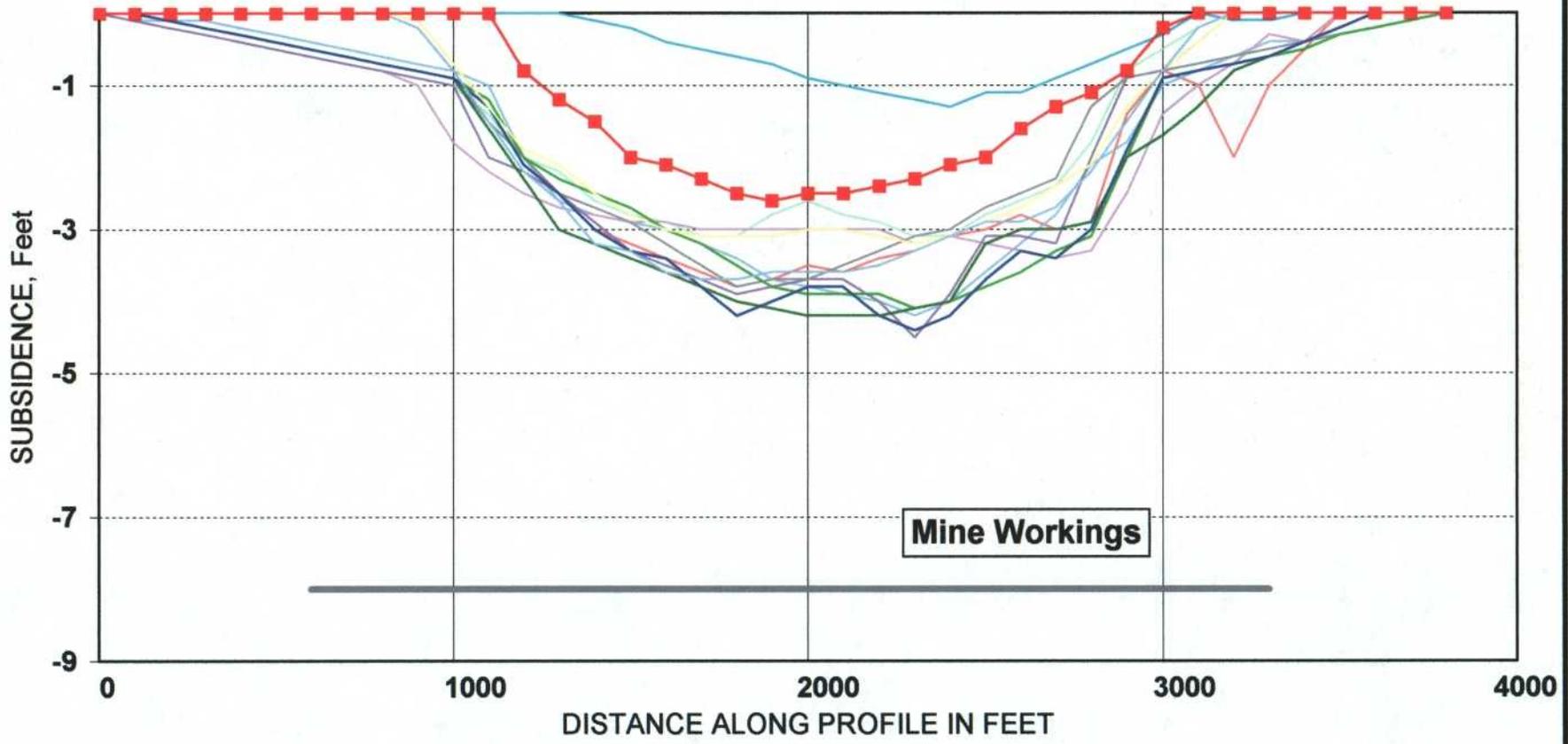
— 1991	— 1992	— 1993	— 1994	— 1995	— 1996	— 1997
— 1998	— 1999	— 2000	— 2001	— 2002	— 2003	—■ 2004

Energy West 2004 Subsidence Report

Area 19 Subsidence Profile

West - East

Chart 14



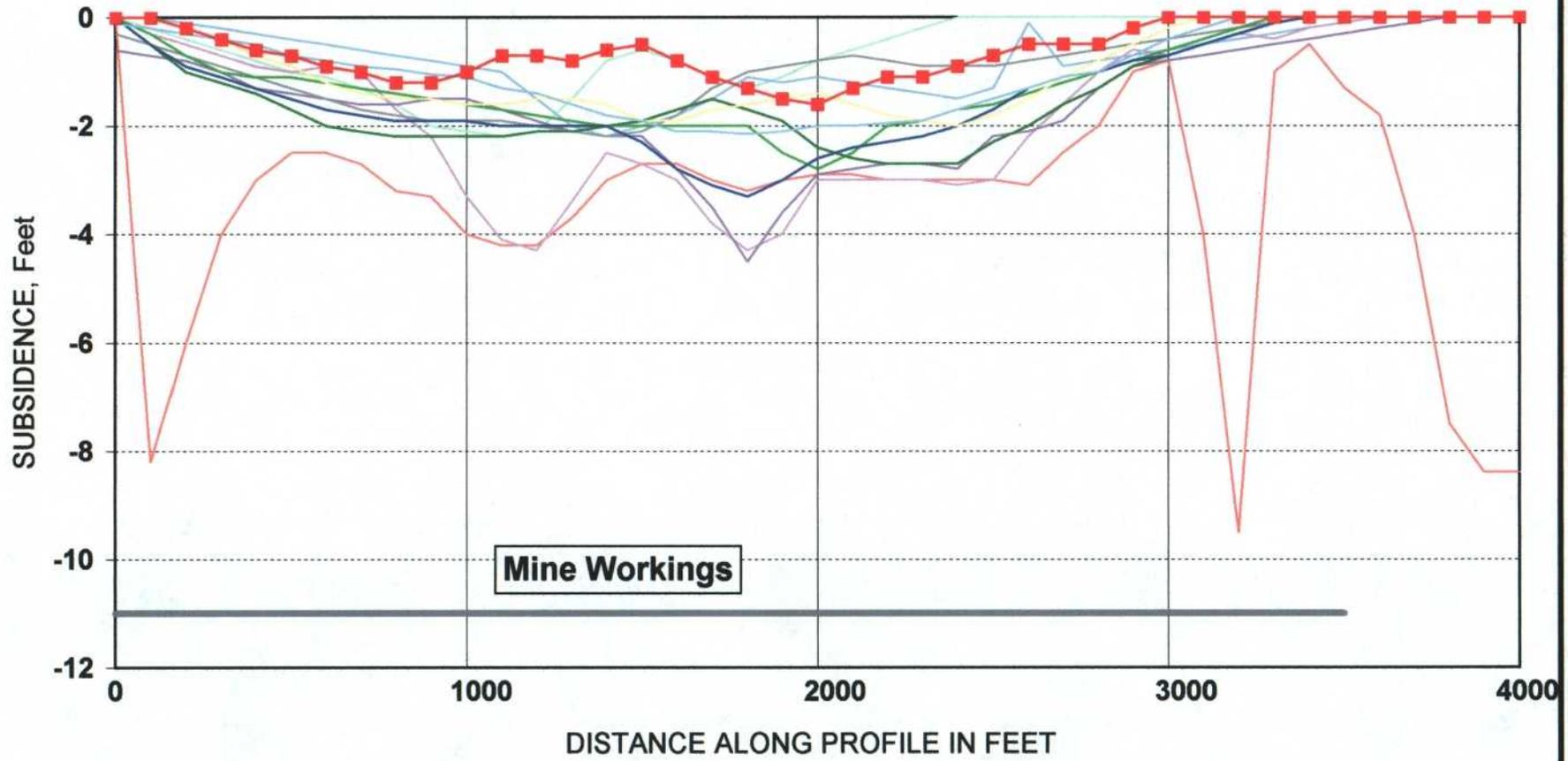
1992	1993	1994	1995	1996	1997	1998
1999	2000	2001	2002	2003	2004	

Energy West 2004 Subsidence Report

Area 20 Subsidence Profile

West - East

Chart 15



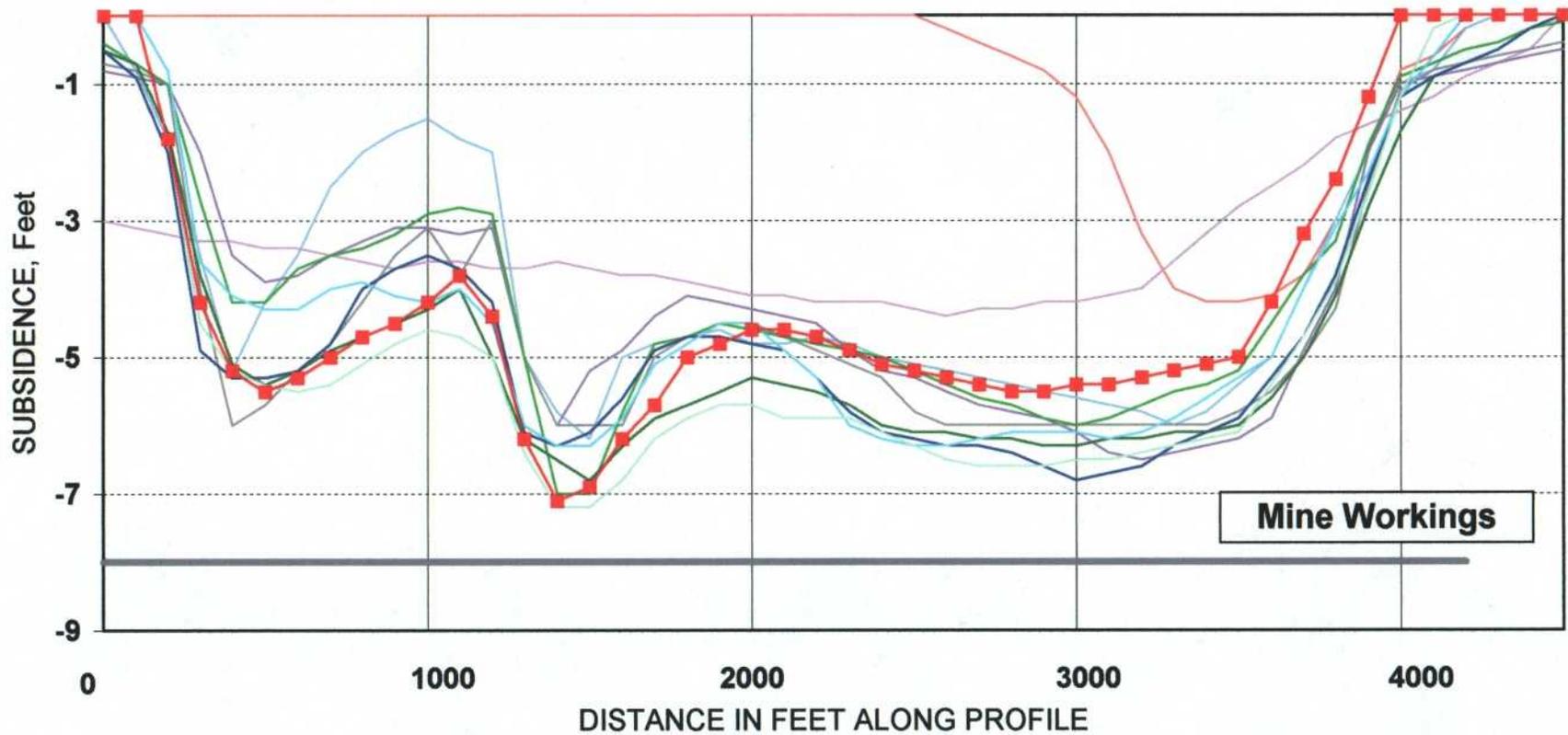
1992	1993	1994	1995	1996	1997	1998
1999	2000	2001	2002	2003	2004	

Energy West 2004 Subsidence Report

Area 21 Subsidence Profile

North - South

Chart 16

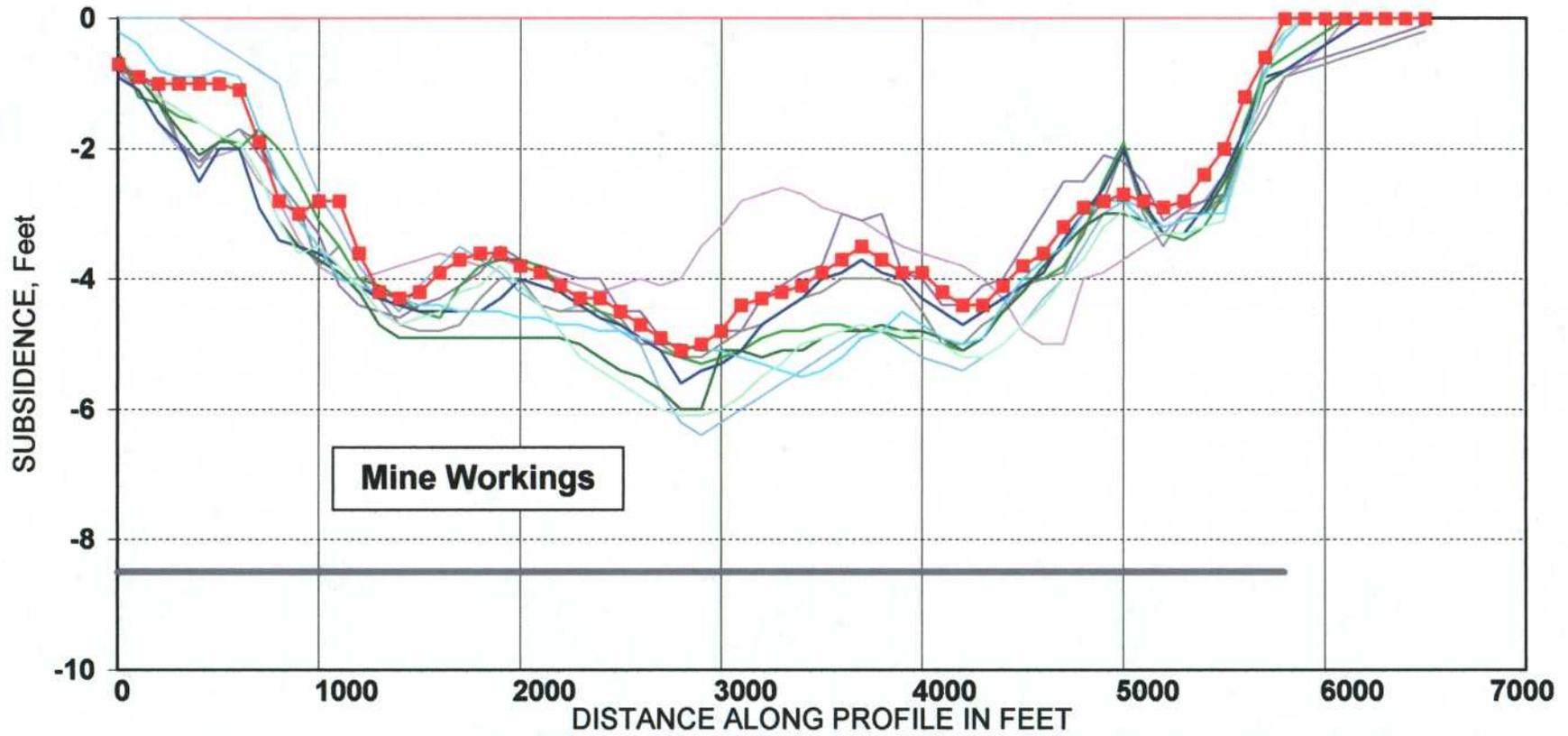


Energy West 2004 Subsidence Report

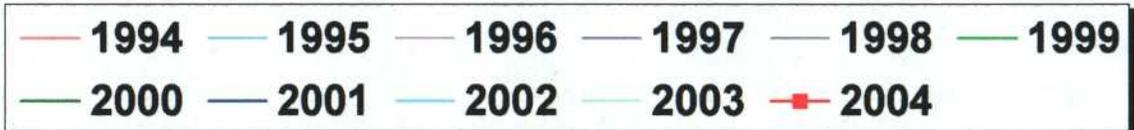
Area 21 Subsidence Profile

West - East

Chart 17



Mine Workings

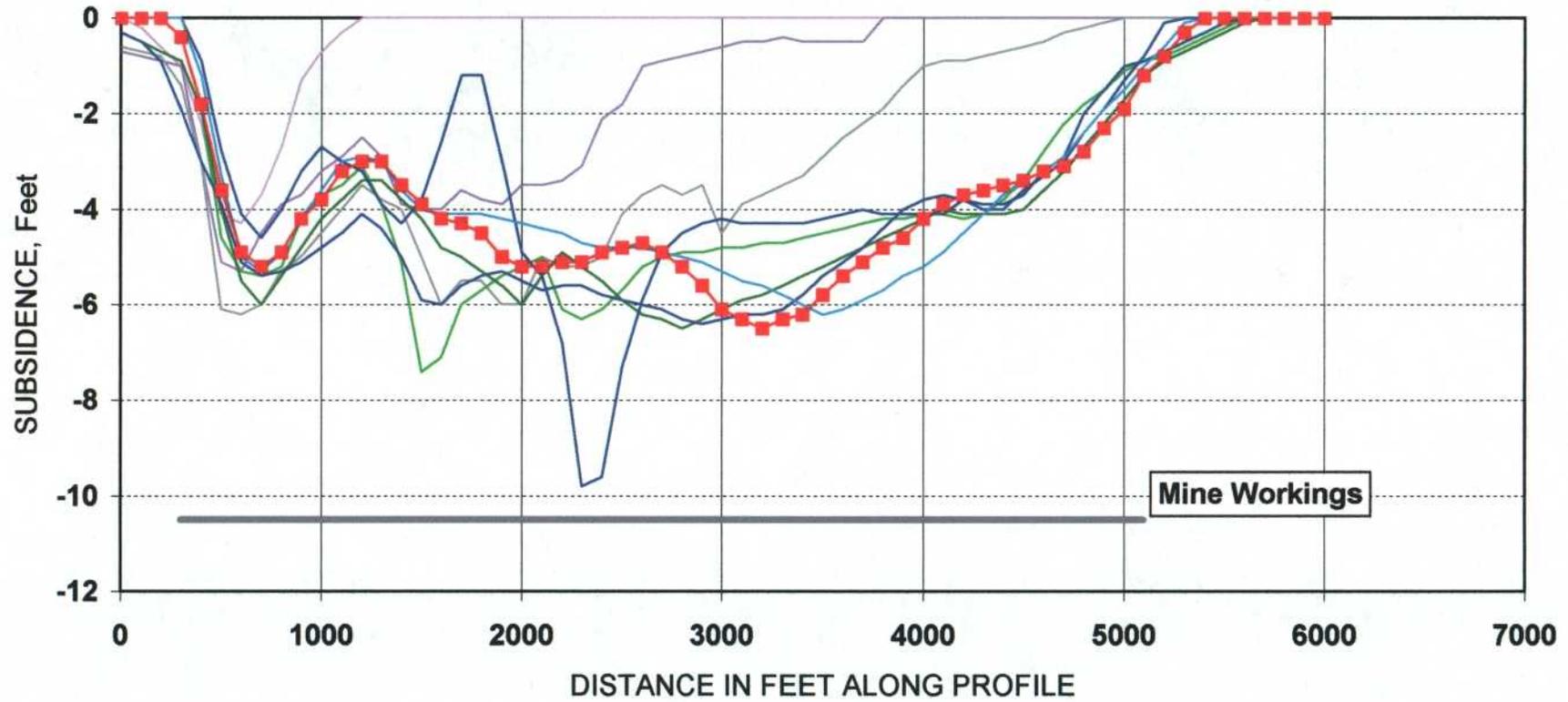


Energy West 2004 Subsidence Report

Area 22 Subsidence Profile

North - South

Chart 18

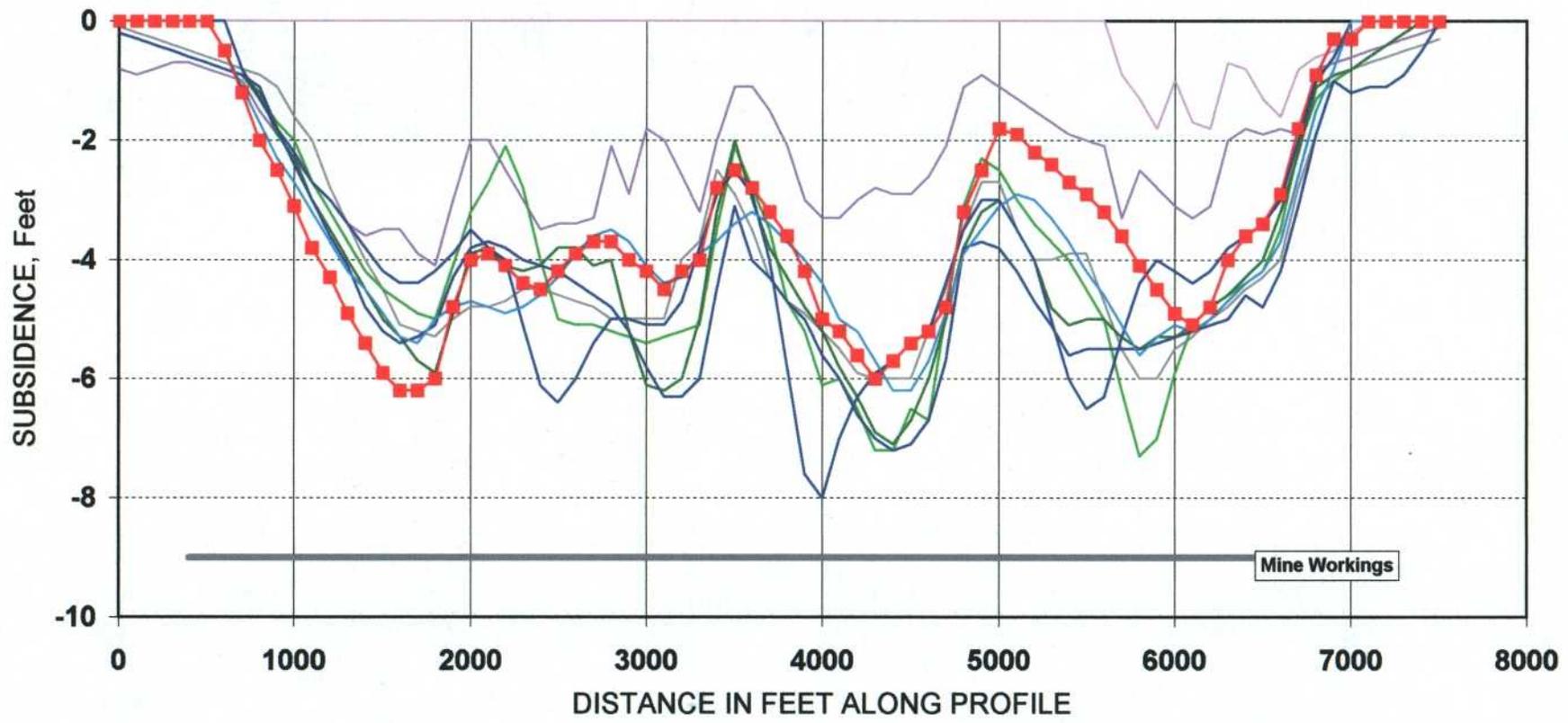


Energy West 2004 Subsidence Report

Area 22 Subsidence Profile

West - East

Chart 19



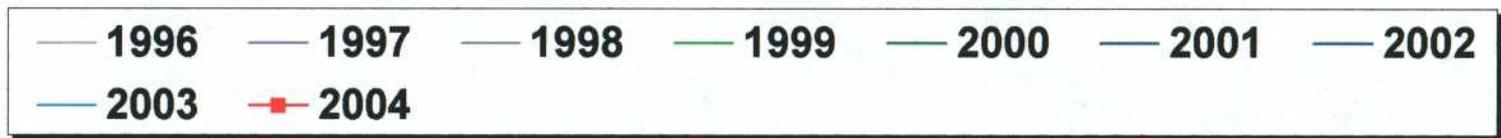
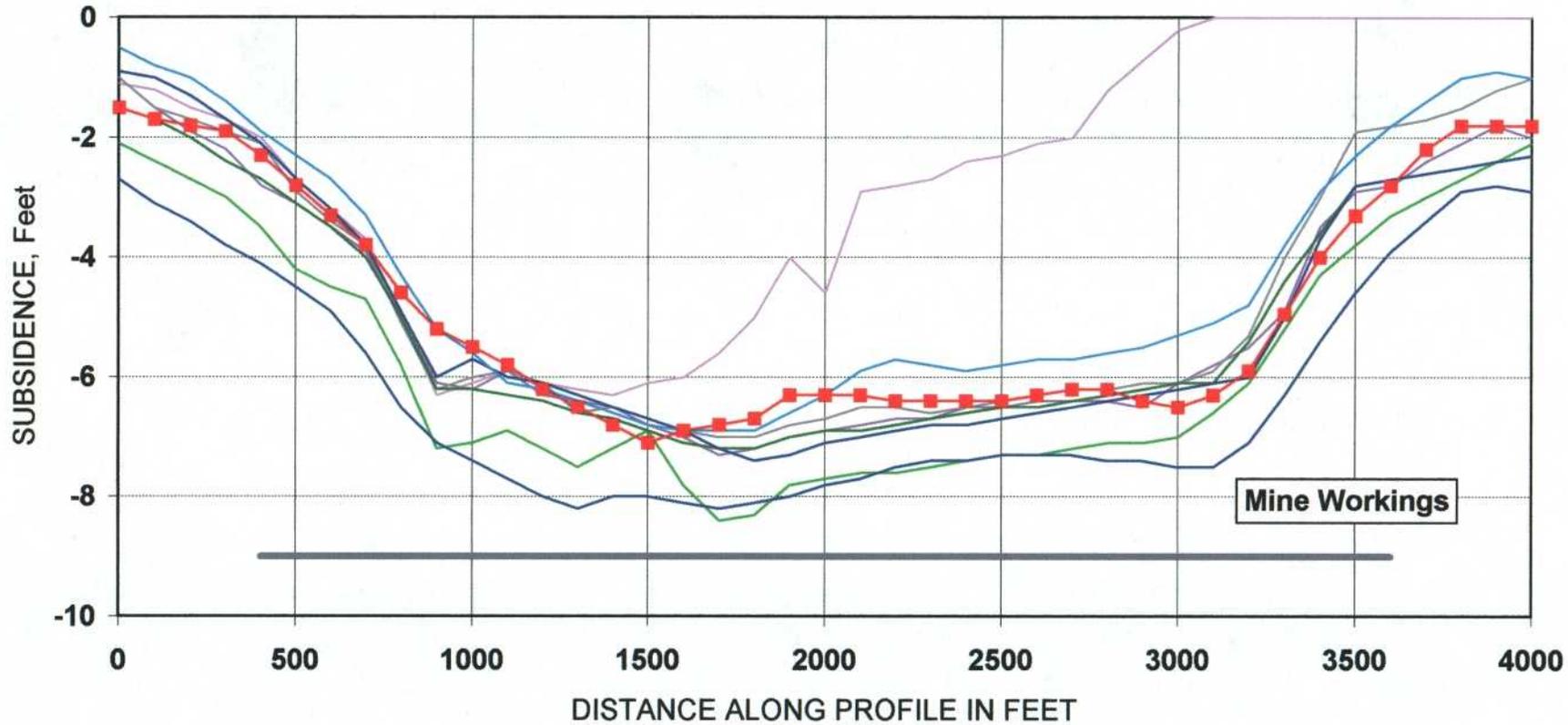
— 1996	— 1997	— 1998	— 1999	— 2000	— 2001	— 2002
— 2003	— 2004					

Energy West 2004 Subsidence Report

Area 23 Subsidence Profile

North - South

Chart 20

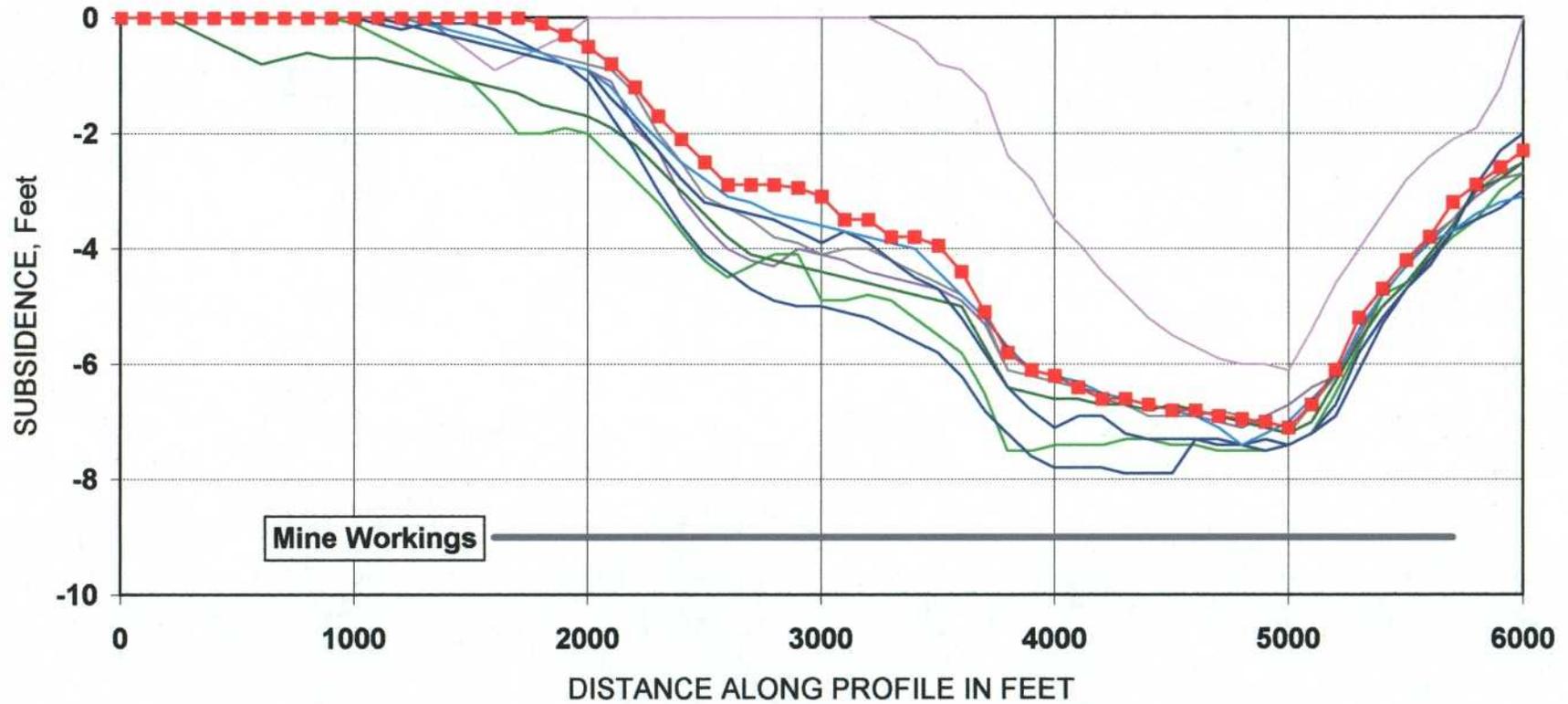


Energy West 2004 Subsidence Report

Area 23 Subsidence Profile

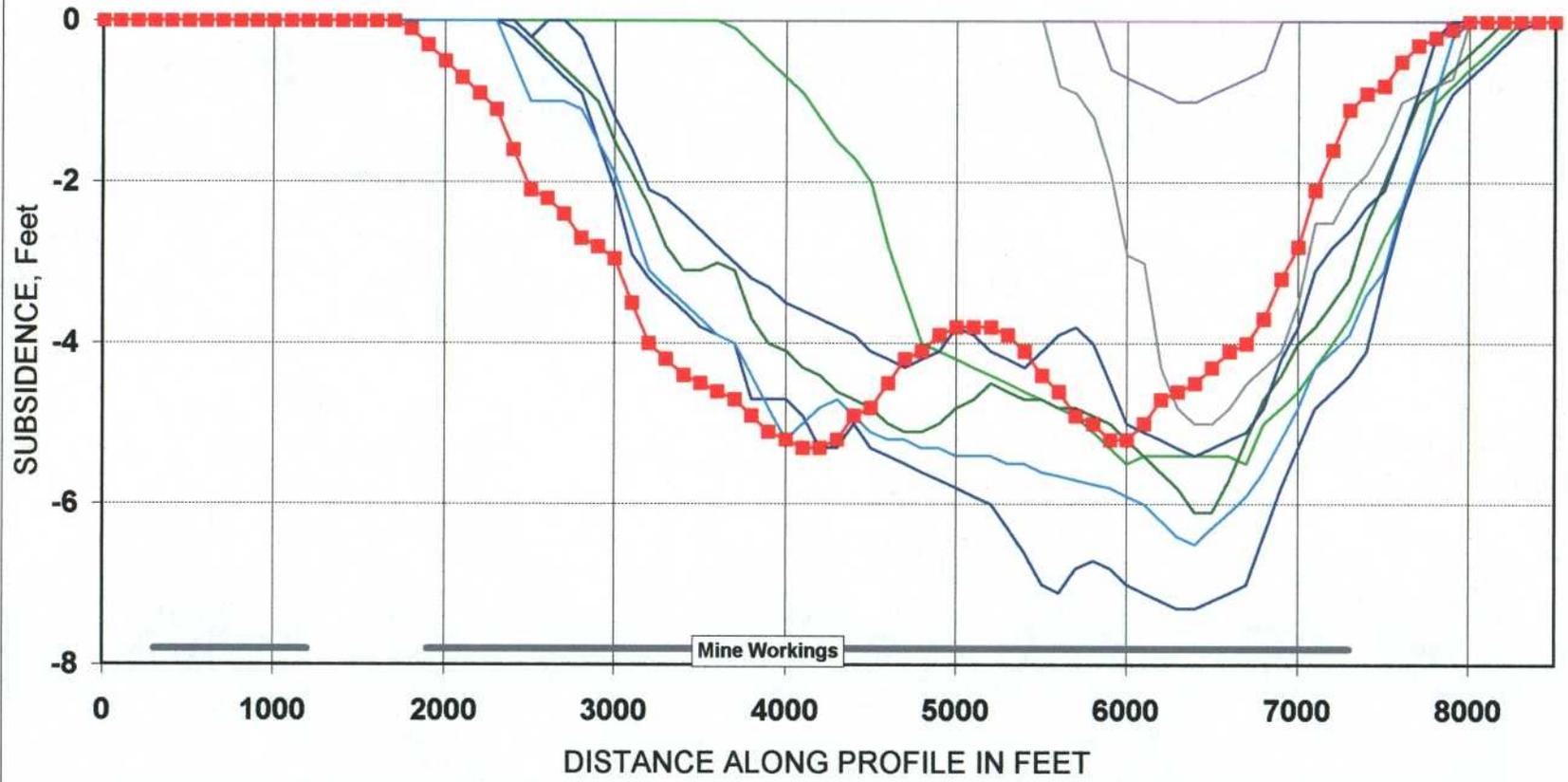
West - East

Chart 21



Energy West 2004 Subsidence Report Area 24 Subsidence Profile (Trail Mountain) North - South

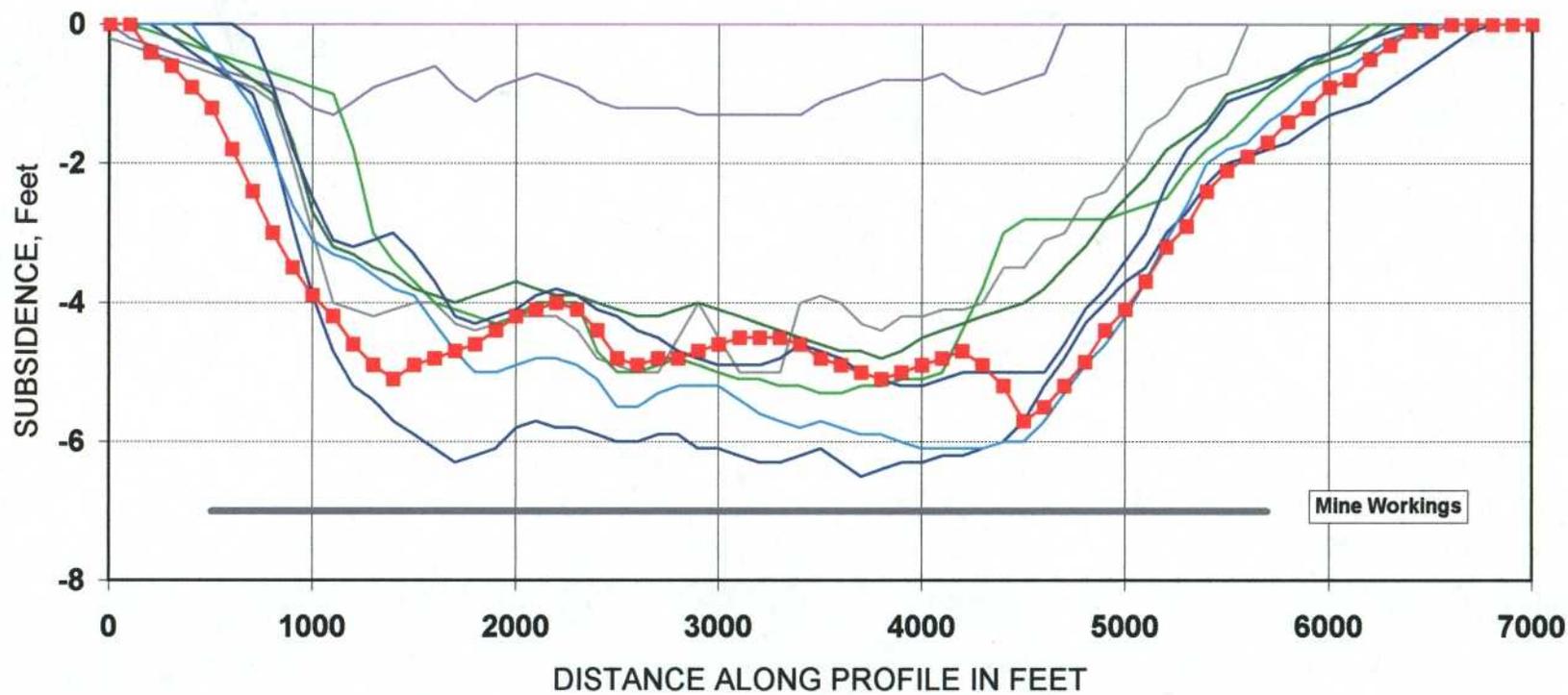
Chart 22



- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004

**Energy West 2004 Subsidence Report
Area 24 Subsidence Profile (Trail Mountain)
West - East**

Chart 23

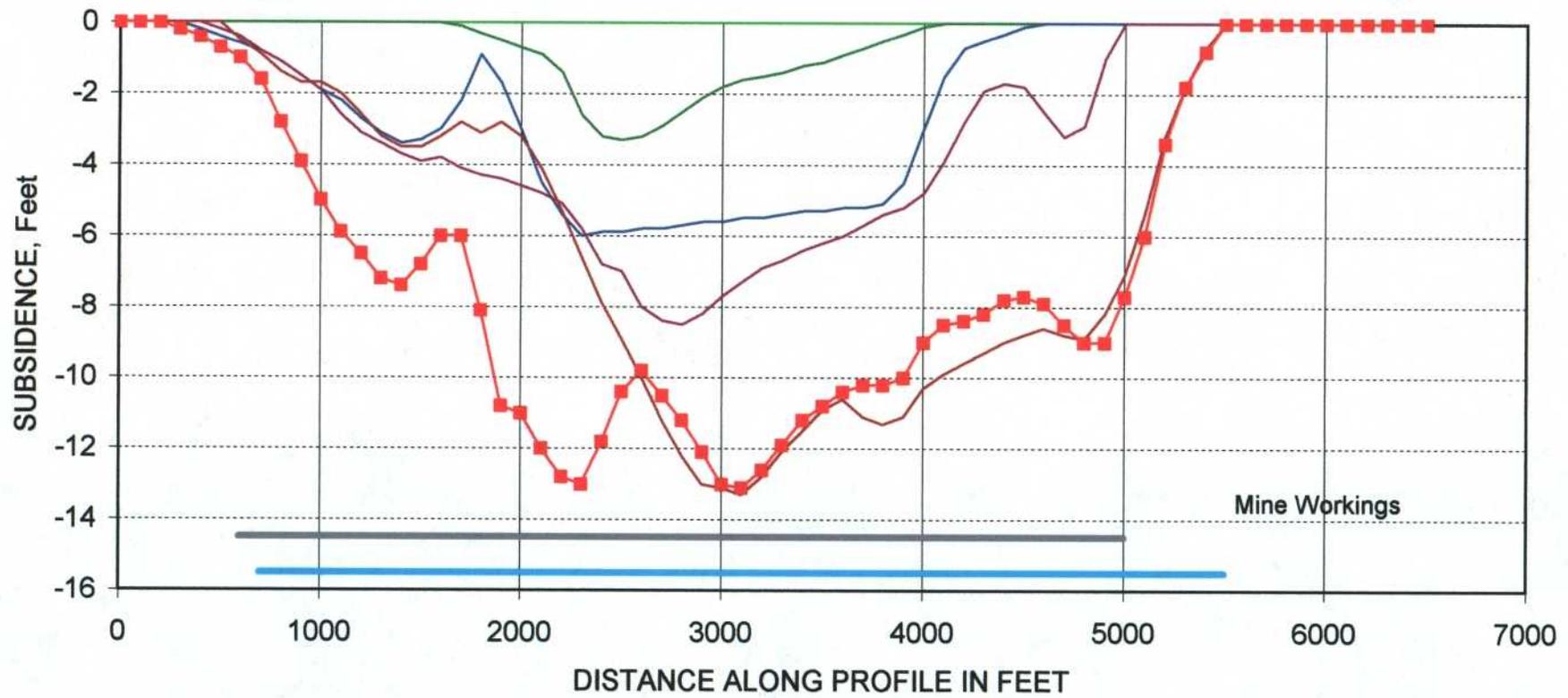


Energy West 2004 Subsidence Report

Area 25 Subsidence Profile (North Rilda Area)

North - South

Chart 24



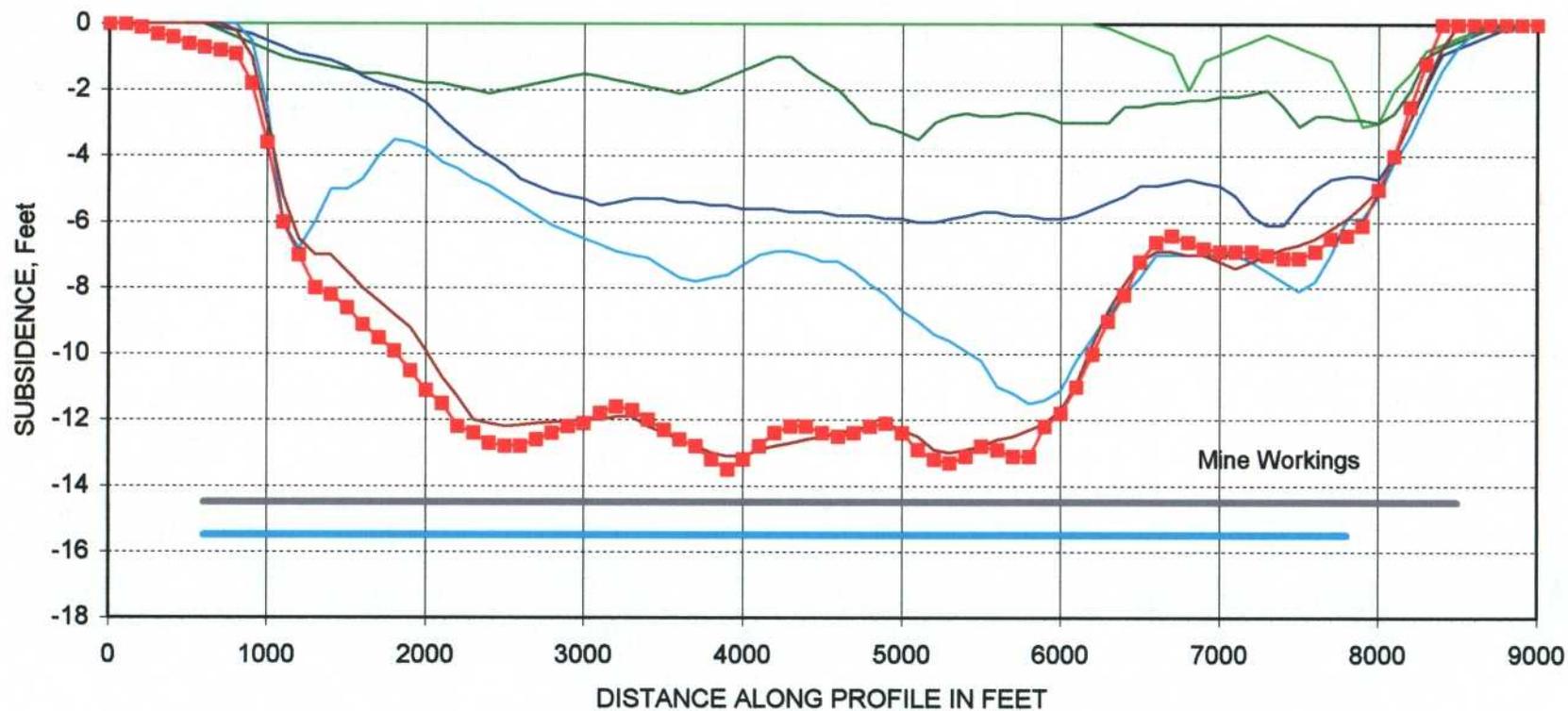
— 1999 — 2000 — 2001 — 2002 — 2003 —■ 2004

Energy West 2004 Subsidence Report

Area 25 Subsidence Profile (North Rilda Area)

West - East

Chart 25



— 1999 — 2000 — 2001 — 2002 — 2003 —■— 2004

EAST MOUNTAIN/TRAIL MOUNTAIN 2004

SUBSIDENCE MAP

SPRING MAP WITH SUBSIDENCE AND 5-YEAR

MINE PLAN

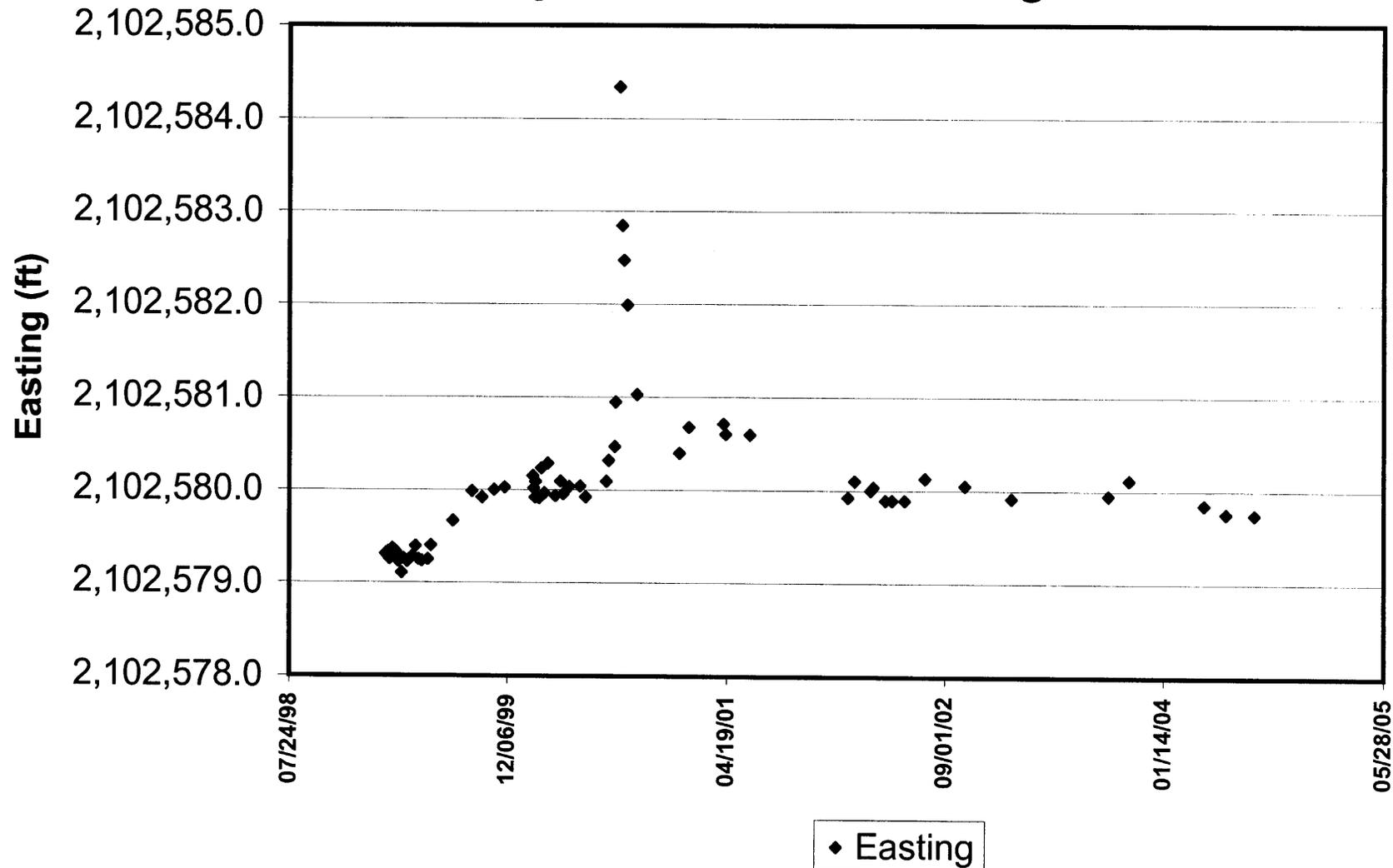
RILDA CANYON CLIFF MONITORING PRISMS

RILDA CANYON 5TH NORTH STREAM

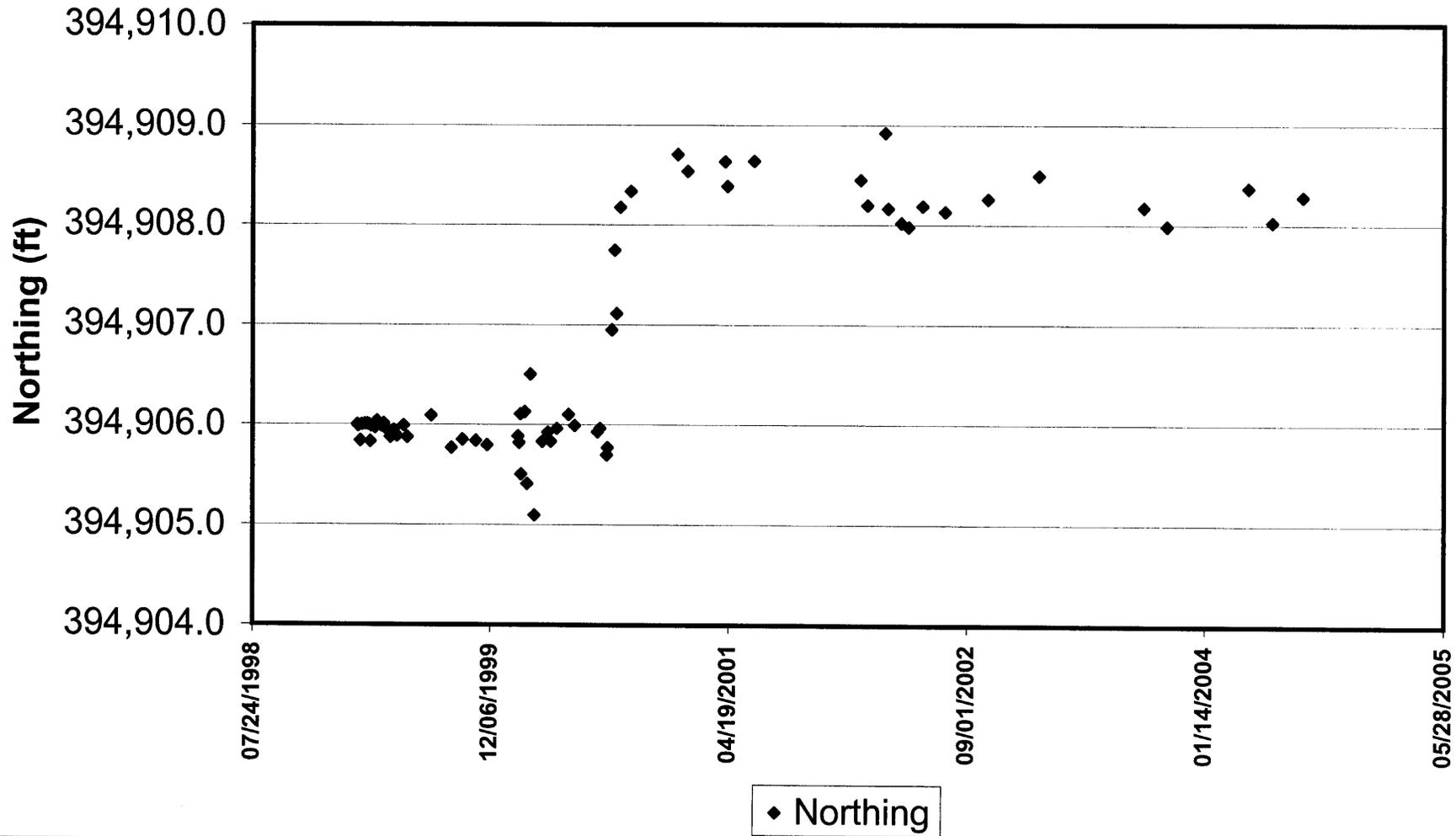
CROSSING DATA

Energy West 2004 Subsidence Report

Rilda Canyon Prism #1 - Easting



Energy West 2004 Subsidence Report Rilda Canyon Prism #1 - Northing



RILDA CANYON PRISMS

Prisms 1-3 Installed on February 24, 1999

Baseline Data PRISM 1

Date	Northing		Easting		Elevation	
	Reading	Variance	Reading	Variance	Reading	Variance
03/02/1999	394,906.00		2,102,579.31		8758.21	
03/04/1999	394,905.99		2,102,579.32		8758.21	
03/08/1999	394,905.84		2,102,579.33		8758.19	
03/11/1999	394,906.00		2,102,579.25		8758.13	
03/18/1999	394,906.01		2,102,579.37		8758.13	
03/23/1999	394,906.01		2,102,579.35		8758.13	
03/26/1999	394,906.00		2,102,579.33		8758.16	
03/29/1999	394,905.83		2,102,579.28		8758.08	
03/31/1999	394,905.99		2,102,579.23		8757.94	
04/08/1999	394,905.97		2,102,579.11		8757.97	
04/12/1999	394,906.04		2,102,579.26		8758.1	
04/21/1999	394,905.99		2,102,579.23		8757.98	
04/26/1999	394,906.01		2,102,579.25		8758.05	
05/03/1999	394,905.95		2,102,579.28		8757.99	
05/10/1999	394,905.87		2,102,579.39		8757.93	
05/17/1999	394,905.94		2,102,579.25		8757.93	
05/24/1999	394,905.89		2,102,579.23		8757.95	
06/07/1999	394,905.99		2,102,579.25		8757.91	
06/14/1999	394,905.87		2,102,579.40		8758.26	
08/03/1999	394,906.09	0.13	2,102,579.67	0.38	8758.85	0.78
09/15/1999	394,905.77	-0.19	2,102,579.99	0.70	8758.83	0.76
10/08/1999	394,905.85	-0.11	2,102,579.92	0.63	8758.74	0.67
11/05/1999	394,905.84	-0.12	2,102,580.00	0.72	8758.89	0.82
11/29/1999	394,905.80	-0.16	2,102,580.03	0.74	8759.05	0.98
02/02/2000	394,905.88	-0.07	2,102,580.15	0.86	8759.07	1.00
02/04/2000	394,905.82	-0.14	2,102,580.02	0.73	8759	0.93
02/07/2000	394,906.11	0.15	2,102,579.92	0.63	8758.81	0.74
02/08/2000	394,905.50	-0.45	2,102,580.09	0.80	8758.96	0.89
02/16/2000	394,906.13	0.17	2,102,579.91	0.63	8758.85	0.78
02/21/2000	394,905.41	-0.55	2,102,580.23	0.95	8759.47	1.40
02/28/2000	394,906.51	0.55	2,102,579.97	0.68	8759.4	1.33
03/07/2000	394,905.09	-0.86	2,102,580.29	1.00	8759.45	1.38
03/24/2000	394,905.83	-0.13	2,102,579.94	0.65	8758.78	0.71
04/05/2000	394,905.92	-0.03	2,102,580.09	0.81	8759.1	1.03
04/11/2000	394,905.83	-0.12	2,102,579.96	0.67	8758.72	0.65
04/24/2000	394,905.96	0.00	2,102,580.04	0.75	8759.04	0.97
05/19/2000	394,906.10	0.14	2,102,580.04	0.75	8759.1	1.03
06/01/2000	394,905.99	0.03	2,102,579.92	0.64	8758.69	0.62
07/19/2000	394,905.93	-0.03	2,102,580.09	0.81	8758.7	0.63
07/24/2000	394,905.96	0.01	2,102,580.32	1.03	8758.75	0.68
08/07/2000	394,905.70	-0.26	2,102,580.47	1.18	8758.96	0.89
08/09/2000	394,905.77	-0.19	2,102,580.95	1.66	8758.73	0.66
08/18/2000	394,906.95	0.99	2,102,584.34	5.05	8754.49	-3.58
08/24/2000	394,907.74	1.79	2,102,582.85	3.56	8753.86	-4.21
08/28/2000	394,907.11	1.15	2,102,582.47	3.19	8753.39	-4.68
09/05/2000	394,908.17	2.22	2,102,581.99	2.70	8753.34	-4.73
09/27/2000	394,908.33	2.38	2,102,581.03	1.74	8753.04	-5.03
01/02/2001	394,908.70	2.75	2,102,580.40	1.11	8753.28	-4.79
01/23/2001	394,908.53	2.58	2,102,580.68	1.39	8753.21	-4.86
04/11/2001	394,908.63	2.68	2,102,580.71	1.43	8752.89	-5.18
04/16/2001	394,908.38	2.43	2,102,580.60	1.32	8752.89	-5.18
06/11/2001	394,908.64	2.68	2,102,580.60	1.31	8752.86	-5.21
01/21/2002	394,908.45	2.49	2,102,579.93	0.64		
02/05/2002	394,908.19	2.24	2,102,580.10	0.81	8752.52	-5.55
03/14/2002	394,908.92	2.96	2,102,580.00	0.71	8753.09	-4.98
03/20/2002	394,908.16	2.21	2,102,580.04	0.75	8753.09	-4.98
04/17/2002	394,908.02	2.06	2,102,579.89	0.61	8753.14	-4.93
05/02/2002	394,907.98	2.02	2,102,579.89	0.61	8752.9	-5.17
05/31/2002	394,908.19	2.23	2,102,579.89	0.61	8752.38	-5.69
07/17/2002	394,908.13	2.17	2,102,580.13	0.84	8753	-5.07
10/15/2002	394,908.26	2.30	2,102,580.05	0.77	8753.04	-5.03
01/30/2003	394,908.49	2.54	2,102,579.92	0.63	8752.84	-5.23
09/09/2003	394,908.17	2.22	2,102,579.95	0.66	8753.06	-5.01
10/27/2003	394,907.99	2.03	2,102,580.11	0.83	8753.3	-4.77
04/14/2004	394,908.37	2.41	2,102,579.85	0.57	8752.91	-5.16
06/03/2004	394,908.03	2.07	2,102,579.76	0.47	8752.74	-5.33
08/06/2004	394,908.28	2.33	2,102,579.75	0.46	8752.76	-5.31

Average Survey Prior
To Undermining
Cut off Date 14-Jun-99
Northing 394,905.96
Easting 2,102,579.29
Elevation 8,758.07

Average Cutoff

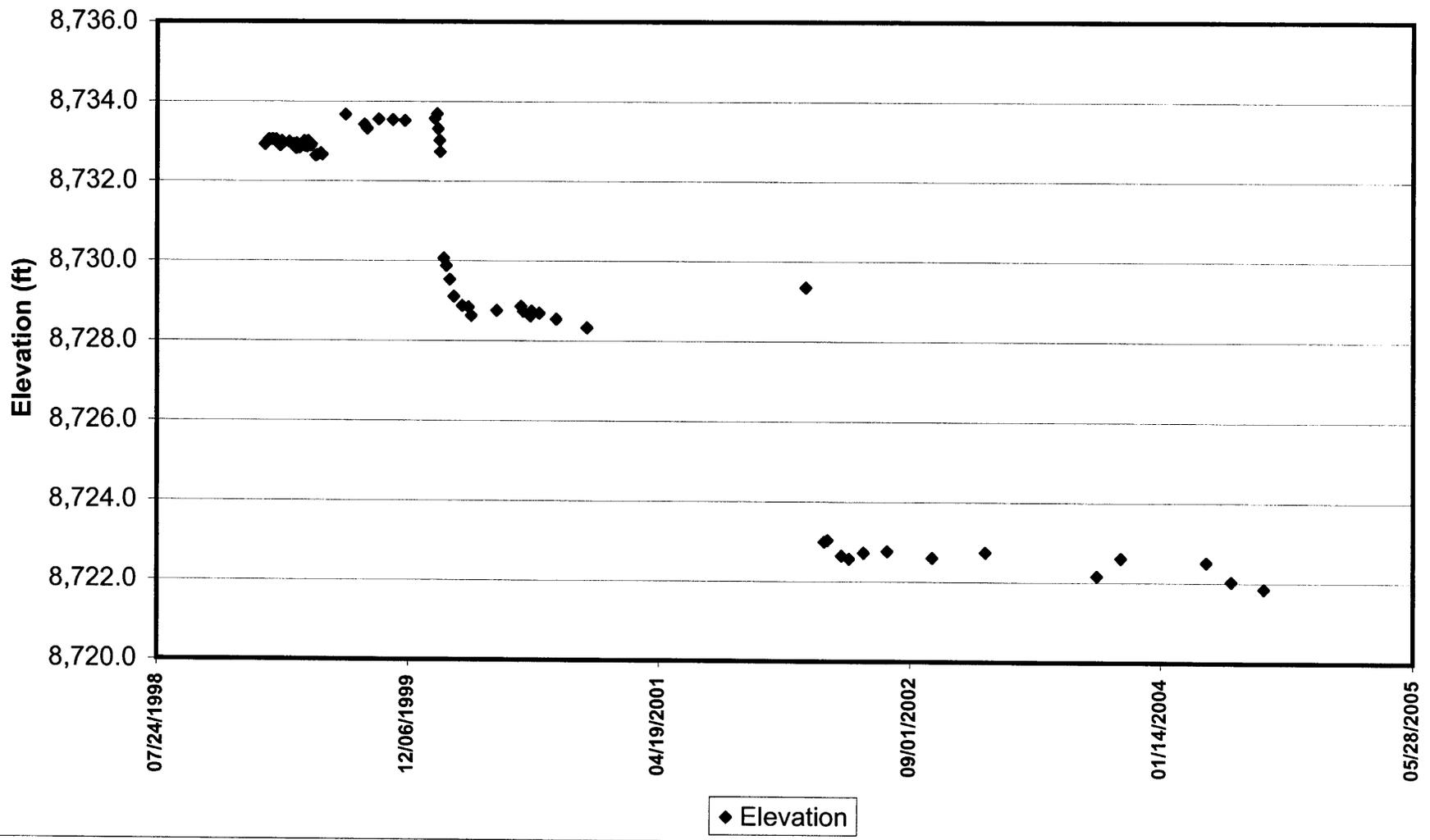
MINED UNDER #1 PRISM - Blind Canyon Seam

(#1 PRISM WAS NOT UNDERMINED IN THE
HIAWATHA SEAM)

NEW PRISM

Energy West 2004 Subsidence Report

Rilda Canyon Prism #2 - Elevation



RILDA CANYON PRISMS
Prisms 1-3 Installed on February 24, 1999

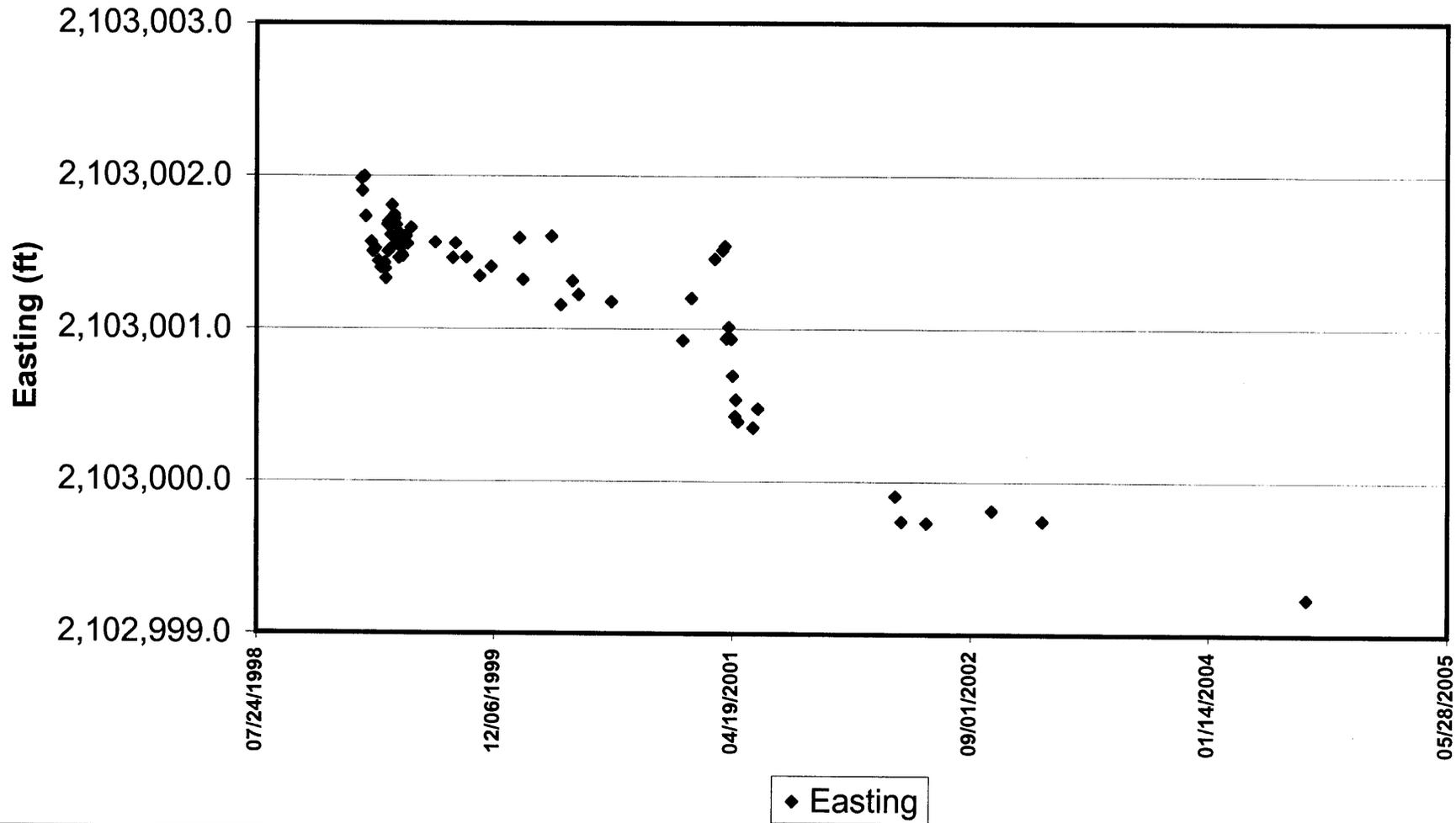
Baseline Data
PRISM 2

Date	Northing		Easting		Elevation	
	Reading	Variance	Reading	Variance	Reading	Variance
03/04/1999	393,876.71		2,101,870.34		8733.05	
03/11/1999	393,876.70		2,101,870.29		8733.05	
03/18/1999	393,876.67		2,101,870.32		8733.04	
03/26/1999	393,876.74		2,101,870.29		8732.89	
03/29/1999	393,876.89		2,101,870.37		8733.00	
03/31/1999	393,876.73		2,101,870.39		8732.95	
04/12/1999	393,876.71		2,101,870.30		8732.98	
04/21/1999	393,876.66		2,101,870.32		8732.92	
04/22/1999	393,876.66		2,101,870.24		8732.92	
04/26/1999	393,876.62		2,101,870.29		8732.82	
04/27/1999	393,876.74		2,101,870.31		8732.94	
04/28/1999	393,876.67		2,101,870.35		8,732.93	
05/03/1999	393,876.53		2,101,870.35		8732.83	
05/06/1999	393,876.78		2,101,870.23		8732.90	
05/11/1999	393,876.63		2,101,870.33		8732.99	
05/12/1999	393,876.63		2,101,870.40		8733.00	
05/13/1999	393,876.64		2,101,870.35		8732.96	
05/14/1999	393,876.76		2,101,870.22		8732.87	
05/18/1999	393,876.69		2,101,870.34		8732.86	
05/19/1999	393,876.73		2,101,870.41		8732.92	
05/20/1999	393,876.68		2,101,870.37		8733.00	
02/24/1999	393,876.80		2,101,870.32		8732.92	
05/25/1999	393,876.63		2,101,870.28		8732.88	
05/26/1999	393,876.86		2,101,870.32		8732.92	
06/04/1999	393,876.61		2,101,870.33		8732.63	
06/07/1999	393,876.63		2,101,870.32		8732.65	
06/14/1999	393,876.76		2,101,870.45		8732.70	
06/17/1999	393,876.75		2,101,870.26		8732.66	
08/03/1999	393,876.76		2,101,870.84		8733.67	
09/09/1999	393,876.92		2,101,870.63		8733.42	
09/15/1999	393,876.34		2,101,871.04		8733.32	
Average Cutoff						
10/08/1999	393,876.54	-0.15	2,101,871.06	0.69	8733.55	0.60
11/05/1999	393,876.41	-0.29	2,101,871.08	0.70	8733.54	0.59
11/29/1999	393,876.47	-0.23	2,101,871.01	0.63	8733.52	0.57
01/28/2000	393,876.79	0.09	2,101,871.10	0.73	8733.57	0.62
02/02/2000	393,876.70	0.00	2,101,871.26	0.89	8733.69	0.74
02/04/2000	393,876.43	-0.26	2,101,871.53	1.16	8733.31	0.36
MINED UNDER #2 PRISM - Blind Canyon Seam						
02/07/2000	393,876.62	-0.07	2,101,871.22	0.85	8733.02	0.07
02/08/2000	393,876.12	-0.58	2,101,871.98	1.60	8732.73	-0.22
02/16/2000	393,876.53	-0.17	2,101,872.54	2.16	8730.06	-2.89
02/21/2000	393,876.53	-0.17	2,101,872.35	1.98	8729.87	-3.08
02/28/2000	393,876.98	0.28	2,101,871.78	1.41	8729.52	-3.43
03/07/2000	393,876.67	-0.03	2,101,871.53	1.16	8729.09	-3.86
03/24/2000	393,876.64	-0.06	2,101,871.27	0.89	8728.86	-4.09
04/05/2000	393,876.50	-0.20	2,101,871.19	0.81	8728.83	-4.12
04/11/2000	393,876.52	-0.17	2,101,871.09	0.71	8728.62	-4.33
04/24/2000						
05/19/2000						
No Distance						
No Distance						
06/01/2000	393,876.72	0.02	2,101,870.98	0.60	8728.74	-4.21
07/19/2000	393,876.80	0.10	2,101,871.02	0.65	8728.85	-4.10
07/24/2000	393,876.63	-0.07	2,101,871.03	0.66	8728.72	-4.23
08/07/2000	393,876.54	-0.16	2,101,871.04	0.67	8728.61	-4.34
08/09/2000	393,876.58	-0.12	2,101,871.00	0.62	8728.73	-4.22
08/24/2000	393,876.68	-0.01	2,101,871.05	0.68	8728.68	-4.27
09/27/2000	393,877.80	1.10	2,101,870.84	0.47	8728.53	-4.42
11/27/2000	393,877.94	1.24	2,101,870.55	0.18	8728.32	-4.63
Mirrors Replaced (7/2001)						
02/05/2002	393,878.05	1.35	2,101,869.91	-0.47	8729.34	-3.61
MINED UNDER #2 PRISM - Hiawatha Seam						
03/14/2002	393,875.77	-0.93	2,101,871.42	1.04	8722.99	-9.96
03/20/2002	393,875.42	-1.28	2,101,871.16	0.78	8723.03	-9.92
04/17/2002	393,875.21	-1.49	2,101,870.94	0.56	8722.64	-10.31
05/02/2002	393,875.10	-1.59	2,101,870.88	0.50	8722.57	-10.38
05/31/2002	393,875.44	-1.26	2,101,870.85	0.47	8722.72	-10.23

**Average Survey Prior
To Undermining**
Cut off Date 15-Sep-99
Northing 393,876.70
Easting 2,101,870.37
Elevation 8,732.95

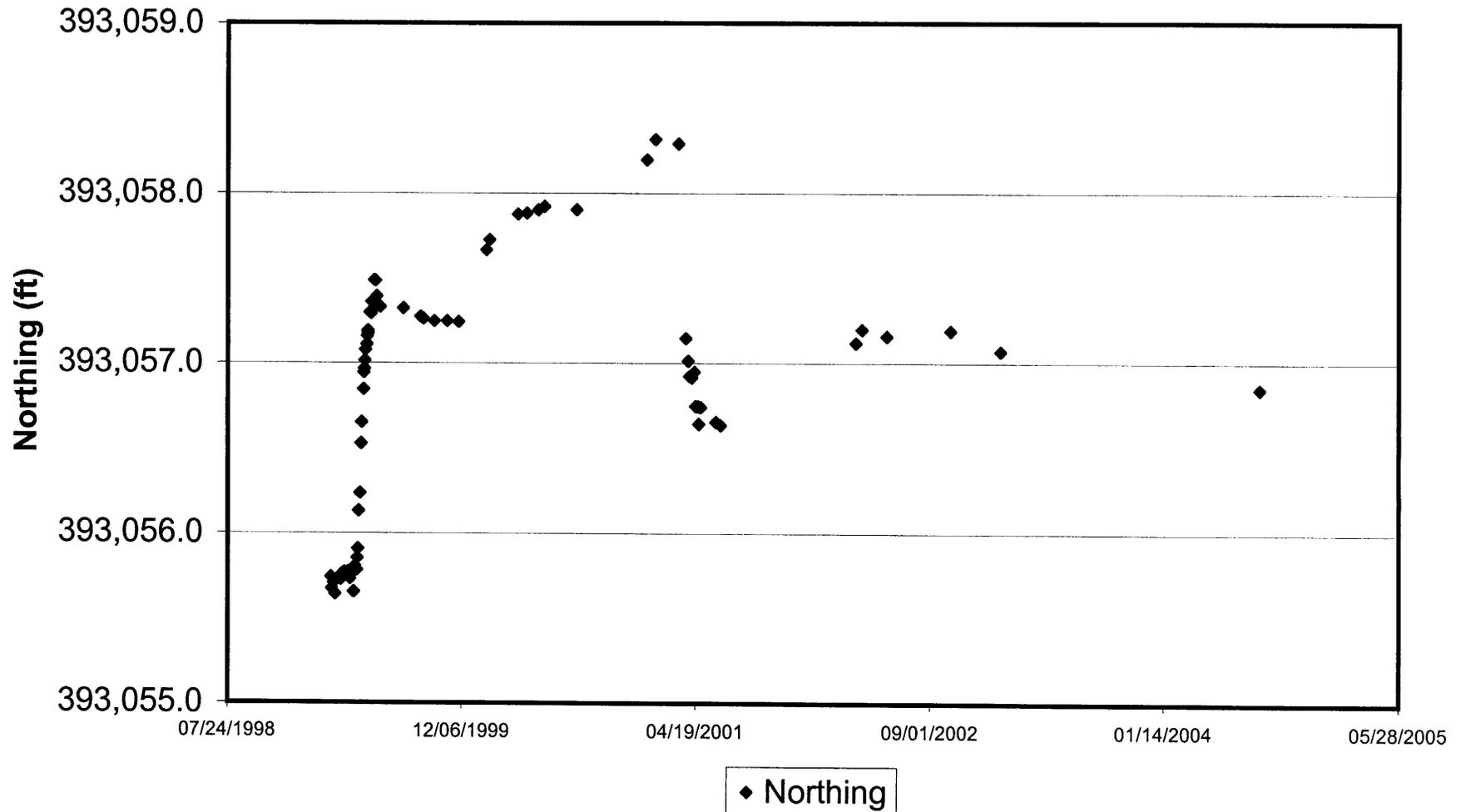
Energy West 2004 Subsidence Report

Rilda Canyon Prism #3 - Easting



Energy West 2004 Subsidence Report

Rilda Canyon Prism #3 - Northing



RILDA CANYON PRISMS
Prisms 1-3 Installed on February 24, 1999

Baseline Data

PRISM 3

Date	Northing		Easting		Elevation	
	Reading	Variance	Reading	Variance	Reading	Variance
03/02/1999	393,055.74		2,103,001.98		8706.11	
03/04/1999	393,055.67		2,103,001.90		8706.17	
03/08/1999	393,055.71		2,103,001.99		8706.06	
03/11/1999	393,055.64		2,103,001.73		8705.98	
03/23/1999	393,055.73		2,103,001.57		8705.92	
03/26/1999	393,055.76		2,103,001.50		8705.95	
03/29/1999	393,055.74		2,103,001.52		8705.97	
03/31/1999	393,055.77		2,103,001.53		8705.89	
<hr/>						
04/07/1999	393,055.77	0.05	2,103,001.44	-0.28	8705.89	-0.12
04/12/1999	393,055.73	0.01	2,103,001.40	-0.32	8705.94	-0.07
04/19/1999	393,055.65	-0.07	2,103,001.43	-0.29	8706.08	0.07
04/20/1999	393,055.65	-0.07	2,103,001.43	-0.29	8706.03	0.02
04/21/1999	393,055.78	0.06	2,103,001.39	-0.32	8705.89	-0.12
04/22/1999	393,055.80	0.08	2,103,001.33	-0.39	8705.89	-0.12
04/26/1999	393,055.78	0.06	2,103,001.68	-0.03	8705.96	-0.05
04/27/1999	393,055.85	0.13	2,103,001.50	-0.21	8705.90	-0.11
04/28/1999	393,055.91	0.19	2,103,001.70	-0.01	8705.86	-0.15
04/30/1999	393,056.13	0.41	2,103,001.52	-0.20	8705.91	-0.10
05/03/1999	393,056.24	0.52	2,103,001.61	-0.10	8705.87	-0.14
05/05/1999	393,056.53	0.81	2,103,001.81	0.09	8705.78	-0.23
05/06/1999	393,056.65	0.93	2,103,001.71	-0.01	8705.73	-0.28
05/10/1999	393,056.84	1.12	2,103,001.74	0.03	8705.76	-0.25
05/11/1999	393,056.94	1.22	2,103,001.72	0.00	8705.67	-0.34
05/12/1999	393,056.96	1.24	2,103,001.60	-0.12	8705.68	-0.33
05/13/1999	393,057.01	1.29	2,103,001.55	-0.16	8705.69	-0.32
05/14/1999	393,057.08	1.36	2,103,001.68	-0.04	8705.68	-0.33
05/17/1999	393,057.11	1.39	2,103,001.61	-0.10	8705.76	-0.25
05/18/1999	393,057.16	1.44	2,103,001.55	-0.17	8705.72	-0.29
05/19/1999	393,057.19	1.47	2,103,001.63	-0.09	8705.67	-0.34
05/20/1999	393,057.17	1.45	2,103,001.46	-0.25	8705.76	-0.25
05/24/1999	393,057.29	1.57	2,103,001.53	-0.18	8705.70	-0.31
05/25/1999	393,057.30	1.58	2,103,001.58	-0.14	8705.74	-0.27
05/26/1999	393,057.29	1.57	2,103,001.48	-0.23	8705.73	-0.28
05/27/1999	393,057.36	1.64	2,103,001.47	-0.24	8705.63	-0.38
06/02/1999	393,057.49	1.77	2,103,001.60	-0.11	8705.61	-0.40
06/04/1999	393,057.48	1.76	2,103,001.60	-0.11	8705.55	-0.46
06/07/1999	393,057.39	1.67	2,103,001.56	-0.16	8705.71	-0.30
06/14/1999	393,057.33	1.61	2,103,001.66	-0.06	8705.67	-0.34
08/03/1999	393,057.32	1.60	2,103,001.56	-0.15	8705.93	-0.08
09/09/1999	393,057.27	1.55	2,103,001.46	-0.25	8706.02	0.01
09/15/1999	393,057.26	1.54	2,103,001.56	-0.16	8705.90	-0.11
10/08/1999	393,057.24	1.52	2,103,001.46	-0.25	8705.92	-0.09
11/05/1999	393,057.24	1.52	2,103,001.34	-0.37	8705.93	-0.08
11/29/1999	393,057.24	1.52	2,103,001.40	-0.31	8705.99	-0.02
01/28/2000	393,057.66	1.94	2,103,001.59	-0.12	8705.89	-0.12
02/04/2000	393,057.73	2.01	2,103,001.32	-0.40	8705.83	-0.18
04/05/2000	393,057.88	2.16	2,103,001.60	-0.11	8705.87	-0.14
04/24/2000	393,057.88	2.16	2,103,001.16	-0.56	8705.82	-0.19
05/19/2000	393,057.90	2.18	2,103,001.31	-0.40	8705.81	-0.20
06/01/2000	393,057.92	2.20	2,103,001.22	-0.49	8705.76	-0.25
08/09/2000	393,057.90	2.18	2,103,001.18	-0.54	8705.80	-0.21
01/23/2001	393,058.32	2.60	2,103,001.20	-0.52	8705.73	-0.28
01/05/2001	393,058.20	2.48	2,103,000.92	-0.79	8705.84	-0.17
03/13/2001	393,058.29	2.57	2,103,001.46	-0.26	8705.58	-0.43
03/29/2001	393,057.14	1.42	2,103,001.51	-0.20	8702.31	-3.70
<hr/>						
04/03/2001	393,057.01	1.29	2,103,001.54	-0.17	8702.23	-3.78
04/06/2001	393,056.92	1.20	2,103,000.94	-0.78	8702.05	-3.96
04/11/2001	393,056.91	1.19	2,103,001.01	-0.71	8702.00	-4.01
04/16/2001	393,056.95	1.23	2,103,000.93	-0.78	8701.78	-4.23
04/19/2001	393,056.75	1.03	2,103,000.69	-1.02	8701.99	-4.02
04/24/2001	393,056.75	1.03	2,103,000.43	-1.29	8701.91	-4.10
04/26/2001	393,056.64	0.92	2,103,000.53	-1.18	8702.04	-3.97
04/30/2001	393,056.74	1.02	2,103,000.39	-1.33	8701.81	-4.20
06/01/2001	393,056.65	0.93	2,103,000.35	-1.36	8701.96	-4.05
06/11/2001	393,056.64	0.92	2,103,000.48	-1.24	8701.93	-4.08
03/27/2002	393,057.12	1.40	2,102,999.91	-1.81	8701.82	-4.23
04/09/2002	393,057.20	1.48	2,102,999.74	-1.98	8701.78	-4.19
05/31/2002	393,057.16	1.44	2,102,999.73	-1.98	8701.87	-4.14
10/15/2002	393,057.19	1.47	2,102,999.81	-1.90	8701.87	-4.14

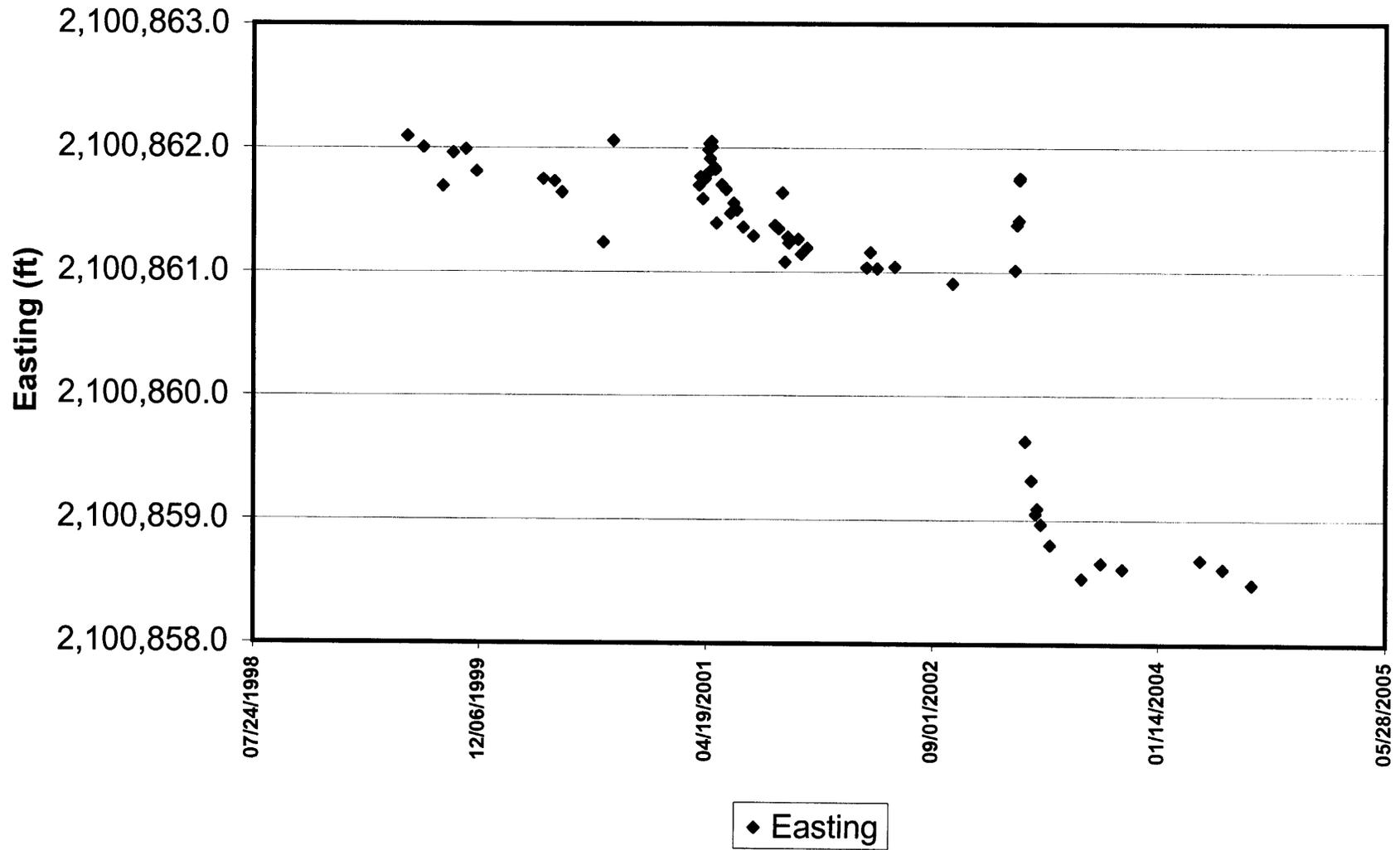
Average Cutoff

Average Survey Prior
To Undermining
Cutoff Date 03/31/1999
Northing 393,055.72
Easting 2,103,001.72
Elevation 8,706.01

MINED UNDER #3 PRISM - Blind Canyon Seam

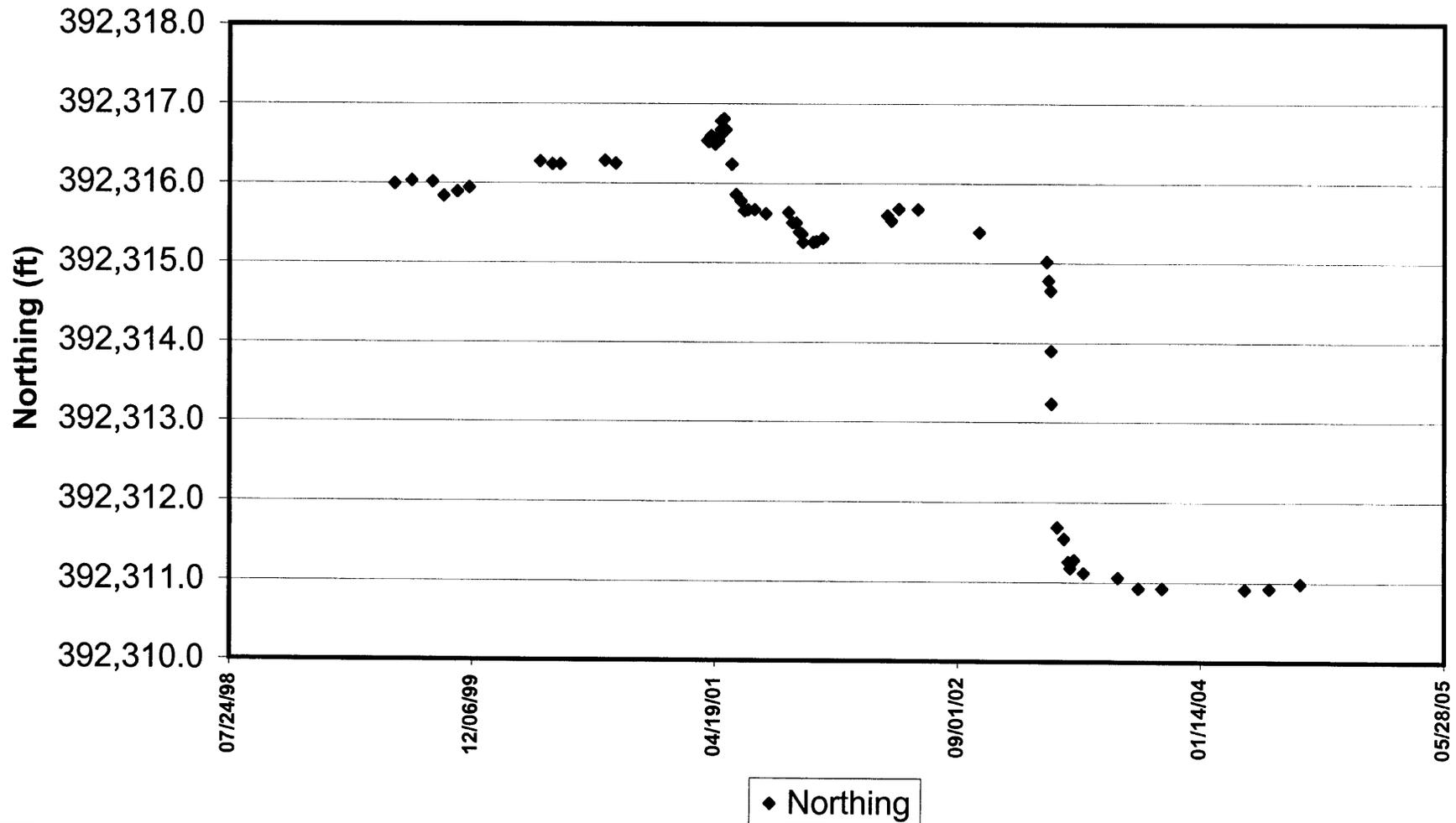
(#3 PRISM WAS NOT UNDERMINED IN THE
HIAWATHA SEAM)

Energy West 2004 Subsidence Report Rilda Canyon Prism #4 - Easting



Energy West 2004 Subsidence Report

Rilda Canyon Prism #4 - Northing



RILDA CANYON PRISMS

Prisms 4-6 Installed on JUNE 21, 1999

Baseline Data

PRISM 4

Date	Northing		Easting		Elevation		
	Reading	Variance	Reading	Variance	Reading	Variance	
06/29/1999	392,315.99		2,100,862.09		8794.10		
08/03/1999	392,316.03		2,100,862.00		8794.14		
09/15/1999	392,316.01		2,100,861.69		8794.12		
10/08/1999	392,315.84		2,100,861.96		8794.24		
11/05/1999	392,315.89		2,100,861.99		8794.14		
11/29/1999	392,315.94		2,100,861.81		8794.20		
04/24/2000	392,316.27		2,100,861.75		8794.09		
05/19/2000	392,316.24		2,100,861.73		8794.35		
06/05/2000	392,316.24		2,100,861.64		8794.10		
09/05/2000	392,316.28		2,100,861.24		8794.04		
09/27/2000	392,316.25		2,100,862.06		8794.13		
04/03/2001	392,316.53		2,100,861.70		8794.17		
04/06/2001	392,316.52	0.43	2,100,861.77	-0.04	8794.17	0.02	
04/11/2001	392,316.59	0.51	2,100,861.59	-0.22	8794.24	0.09	
04/16/2001	392,316.51	0.42	2,100,861.75	-0.05	8794.2	0.05	
04/19/2001	392,316.49	0.40	2,100,861.79	-0.02	8794.24	0.09	
04/24/2001	392,316.52	0.43	2,100,861.98	0.18	8794.12	-0.03	
04/26/2001	392,316.53	0.44	2,100,862.03	0.23	8794.16	0.01	
04/27/2001	392,316.60	0.51	2,100,861.91	0.11	8794.16	0.01	
04/30/2001	392,316.60	0.51	2,100,862.05	0.25	8794.09	-0.06	
05/01/2001	392,316.67	0.58	2,100,862.01	0.20	8794.09	-0.06	
05/02/2001	392,316.78	0.70	2,100,861.83	0.02	8794.08	-0.07	
05/07/2001	392,316.81	0.72	2,100,861.84	0.04	8793.88	-0.27	
05/09/2001	392,316.68	0.59	2,100,861.83	0.02	8793.75	-0.40	
05/11/2001	392,316.67	0.58	2,100,861.39	-0.41	8793.86	-0.29	
05/23/2001	392,316.24	0.15	2,100,861.70	-0.10	8793.63	-0.52	
06/01/2001	392,315.86	-0.23	2,100,861.66	-0.14	8793.55	-0.60	
06/11/2001	392,315.78	-0.31	2,100,861.47	-0.33	8793.48	-0.67	
06/18/2001	392,315.65	-0.43	2,100,861.55	-0.25	8793.52	-0.63	
06/25/2001	392,315.66	-0.42	2,100,861.50	-0.31	8793.44	-0.71	
07/09/2001	392,315.67	-0.42	2,100,861.36	-0.44	8793.41	-0.74	
08/01/2001	392,315.62	-0.47	2,100,861.29	-0.51	8793.49	-0.66	
09/17/2001	392,315.63	-0.46	2,100,861.38	-0.43	8793.33	-0.82	
09/25/2001	392,315.50	-0.58	2,100,861.35	-0.46	8793.43	-0.72	
10/03/2001	392,315.50	-0.59	2,100,861.64	-0.17	8793.46	-0.69	
10/09/2001	392,315.39	-0.70	2,100,861.08	-0.73	8793.56	-0.59	
10/15/2001	392,315.36	-0.72	2,100,861.28	-0.52	8793.35	-0.80	
10/17/2001	392,315.26	-0.83	2,100,861.23	-0.57	8793.28	-0.87	
11/07/2001	392,315.26	-0.83	2,100,861.26	-0.54	8793.35	-0.80	
11/14/2001	392,315.27	-0.82	2,100,861.14	-0.66	8793.45	-0.70	
11/27/2001	392,315.31	-0.78	2,100,861.19	-0.61	8793.33	-0.82	
04/09/2002	392,315.60	-0.49	2,100,861.04	-0.77	8793.27	-0.88	
04/17/2002	392,315.53	-0.56	2,100,861.16	-0.65	8793.29	-0.86	
05/02/2002	392,315.68	-0.41	2,100,861.03	-0.78	8793.21	-0.94	
06/10/2002	392,315.67	-0.42	2,100,861.04	-0.76	8793.19	-0.96	
10/15/2002	392,315.39	-0.70	2,100,860.91	-0.90	8792.91	-1.24	
03/03/2003	392,315.02	-1.07	2,100,861.01	-0.79	8792.76	-1.39	MINED UNDER #4 PRISM - Hiawatha Seam

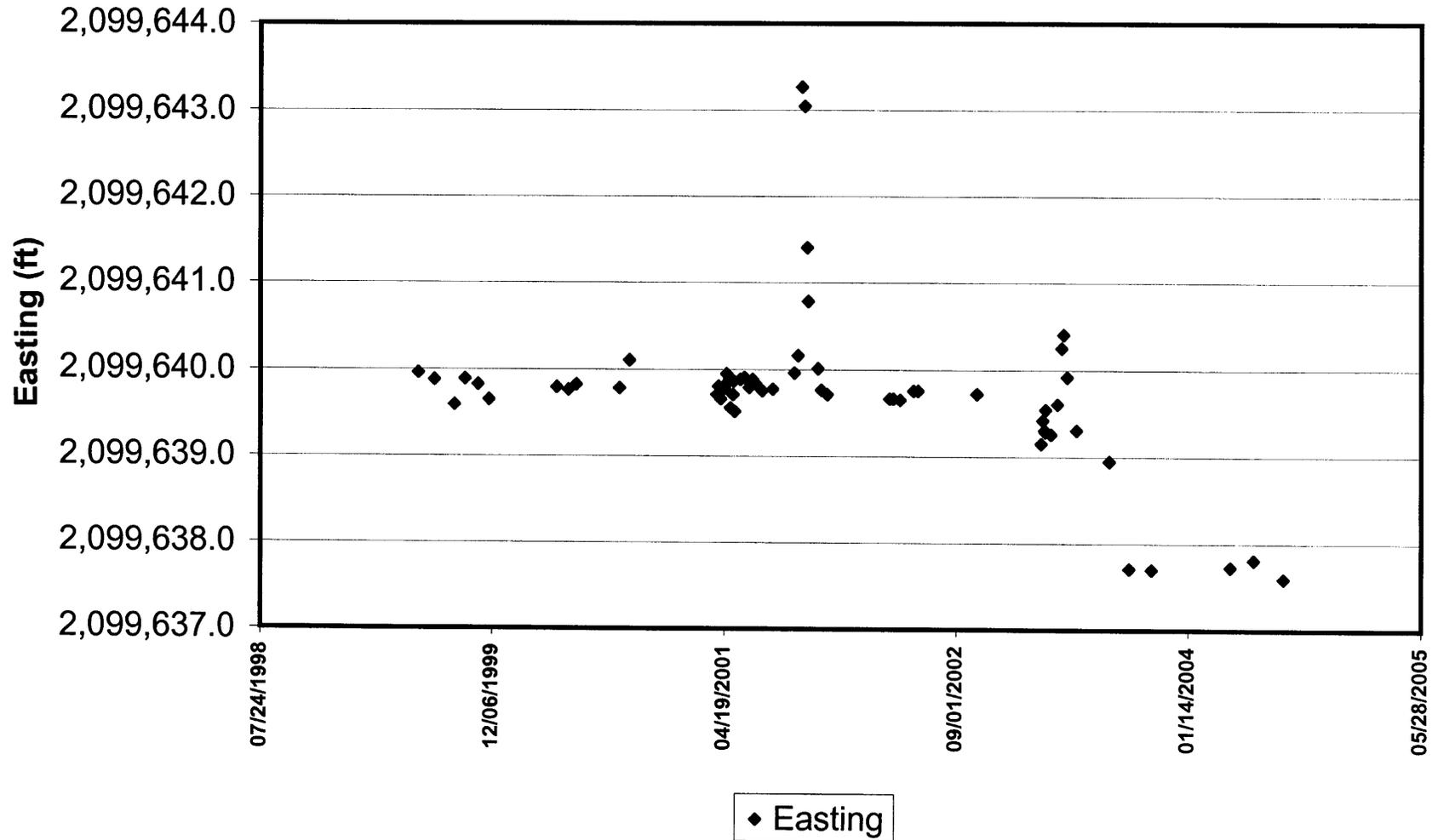
AVERAGE SURVEY PRIOR
TO UNDERMINING

Cutoff Date	04/03/2001
Northing	392,316.09
Easting	2,100,861.80
Elevation	8794.15

Average Cutoff

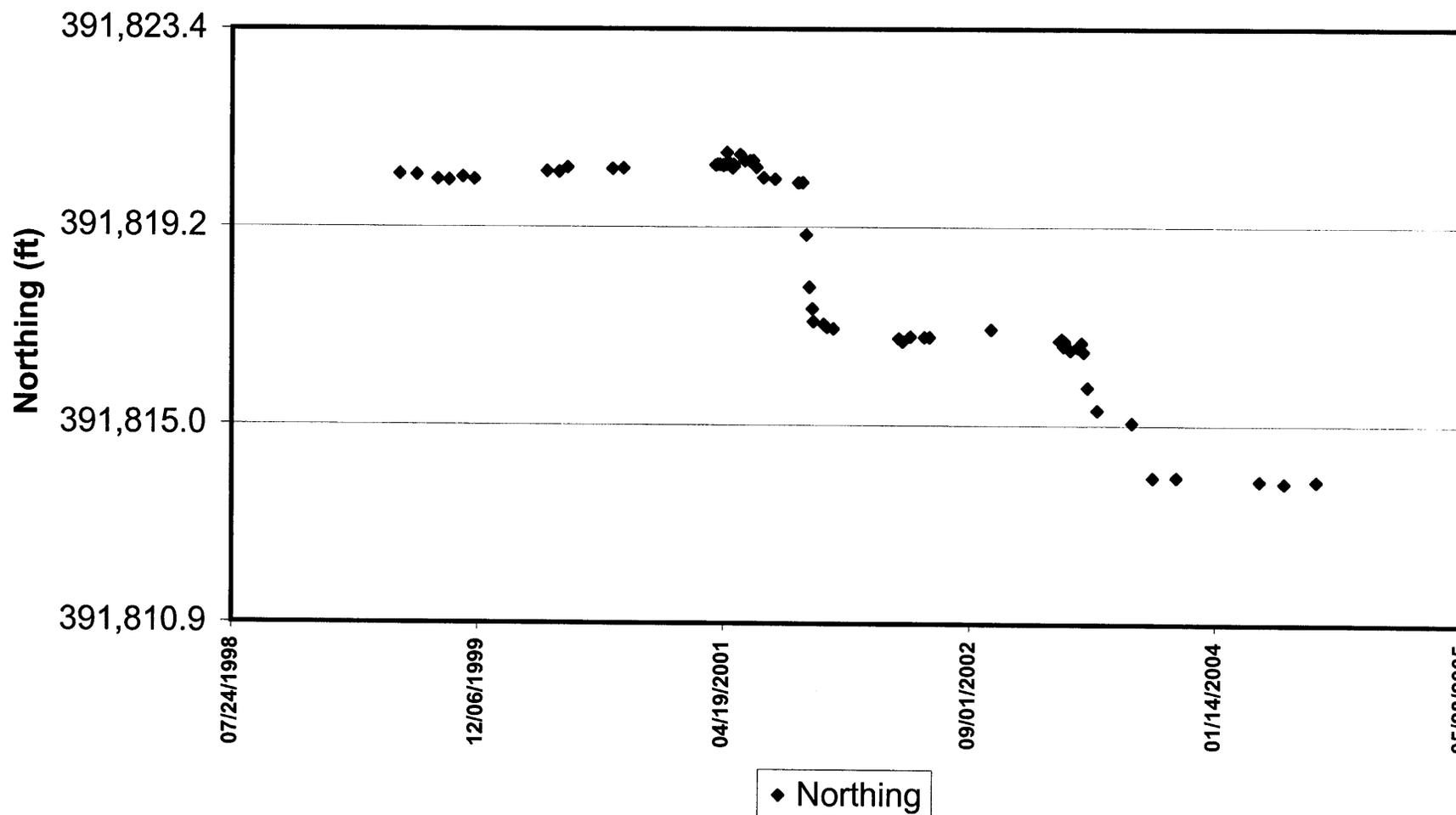
Energy West 2004 Subsidence Report

Rilda Canyon Prism #5 - Easting



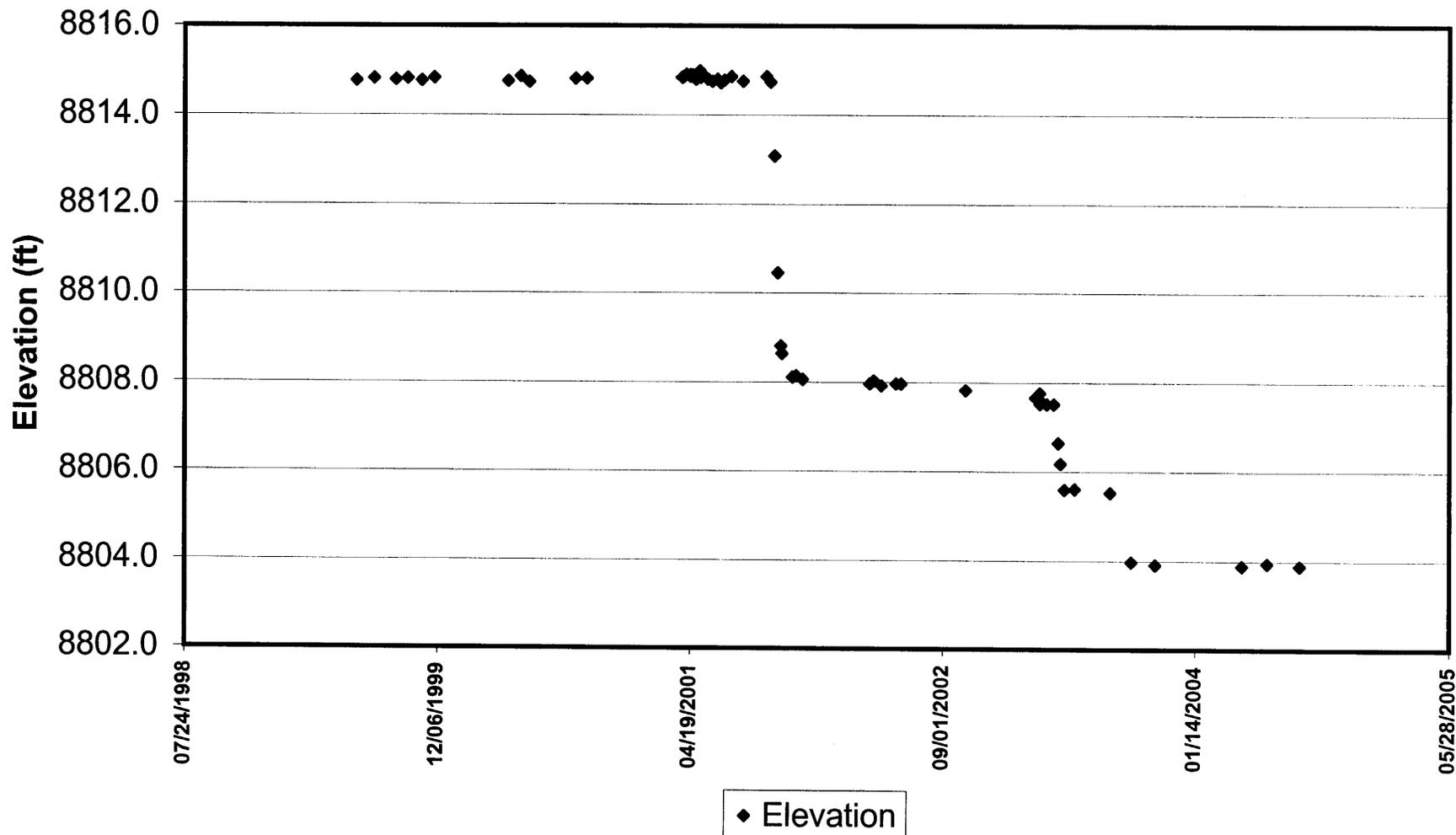
Energy West 2004 Subsidence Report

Rilda Canyon Prism #5 - Northing



Energy West 2004 Subsidence Report

Rilda Canyon Prism #5 - Elevation



RILDA CANYON PRISMS

Prisms 4-6 Installed on JUNE 21, 1999

Baseline Data

PRISM 5

Date	Northing		Easting		Elevation	
	Reading	Variance	Reading	Variance	Reading	Variance
06/29/1999	391,820.30		2,099,639.96		8814.77	
08/03/1999	391,820.29		2,099,639.88		8814.82	
09/15/1999	391,820.20		2,099,639.59		8814.79	
10/08/1999	391,820.18		2,099,639.89		8814.82	
11/05/1999	391,820.24		2,099,639.83		8814.77	
11/29/1999	391,820.20		2,099,639.65		8814.83	
04/24/2000	391,820.36		2,099,639.79		8814.76	
05/19/2000	391,820.35		2,099,639.76		8814.87	
06/05/2000	391,820.44		2,099,639.83		8814.74	
09/05/2000	391,820.41		2,099,639.78		8814.81	
09/27/2000	391,820.42		2,099,640.10		8814.82	
04/03/2001	391,820.49		2,099,639.71		8814.84	
04/06/2001	391,820.51		2,099,639.81		8814.86	
04/11/2001	391,820.51		2,099,639.66		8814.91	
04/19/2001	391,820.48		2,099,639.78		8814.90	
04/19/2001	391,820.50		2,099,639.79		8814.86	
04/24/2001	391,820.51		2,099,639.95		8814.89	
04/26/2001	391,820.76		2,099,639.85		8814.85	
04/30/2001	391,820.53		2,099,639.90		8814.80	
05/02/2001	391,820.52		2,099,639.56		8814.83	
05/07/2001	391,820.43		2,099,639.71		8814.99	
05/09/2001	391,820.51		2,099,639.87		8814.84	
05/11/2001	391,820.47		2,099,639.52		8814.93	
05/23/2001	391,820.72		2,099,639.88		8814.80	
06/01/2001	391,820.59		2,099,639.91		8814.75	
06/11/2001	391,820.58		2,099,639.79		8814.80	
06/18/2001	391,820.59		2,099,639.89		8814.72	
06/25/2001	391820.45		2,099,639.84		8814.78	
Average Cutoff						
07/09/2001	391,820.23	-0.22	2,099,639.75	-0.05	8814.86	0.03
08/01/2001	391,820.20	-0.25	2,099,639.78	-0.03	8814.76	-0.07
09/17/2001	391,820.12	-0.32	2,099,639.96	0.16	8814.86	0.03
09/25/2001	391,820.13	-0.32	2,099,640.16	0.36	8814.74	-0.09
MINED UNDER #5 PRISM - Blind Canyon Seam						
10/03/2001	391,819.04	-1.41	2,099,643.27	3.46	8813.08	-1.75
10/09/2001	391,817.93	-2.51	2,099,643.05	3.24	8810.45	-4.38
10/15/2001	391,817.48	-2.97	2,099,641.41	1.60	8808.81	-6.02
10/17/2001	391,817.21	-3.24	2,099,640.78	0.98	8808.64	-6.19
11/07/2001	391,817.16	-3.29	2,099,640.01	0.21	8808.11	-6.72
11/14/2001	391,817.09	-3.36	2,099,639.77	-0.04	8808.14	-6.69
11/27/2001	391,817.07	-3.38	2,099,639.72	-0.09	8808.06	-6.77
04/09/2002	391816.856	-3.59	2,099,639.67	-0.14	8807.96	-6.87
04/17/2002	391,816.79	-3.65	2,099,639.67	-0.14	8808.03	-6.80
05/02/2002	391,816.90	-3.55	2,099,639.66	-0.15	8807.92	-6.91
05/31/2002	391,816.89	-3.56	2,099,639.76	-0.05	8807.96	-6.87

AVERAGE SURVEY PRIOR TO UNDER MINING

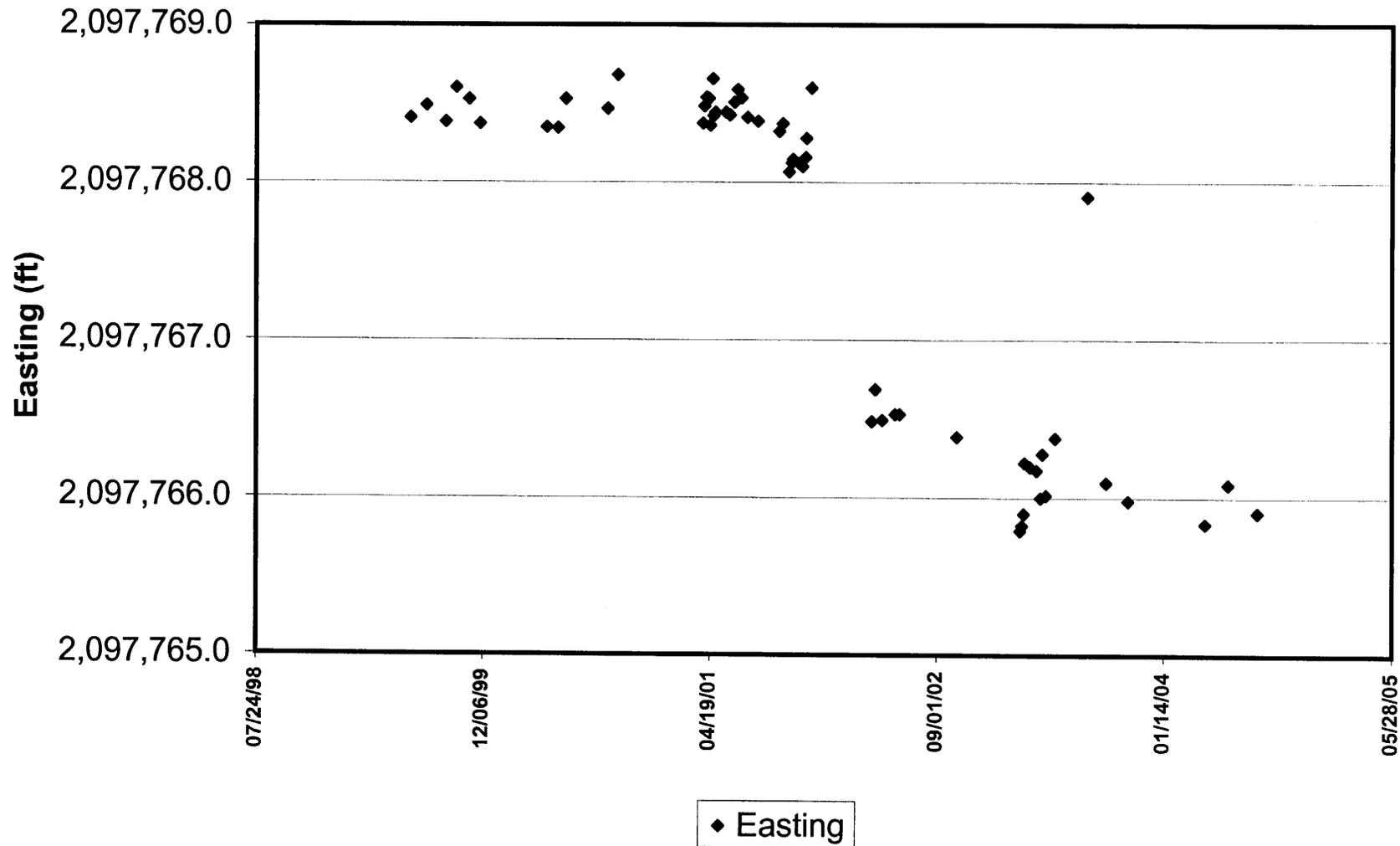
Cutoff Date	06/25/2001
Northing	391,820.45
Easting	2,099,639.80
Elevation	8814.83

Average Cutoff

MINED UNDER #5 PRISM - Blind Canyon Seam

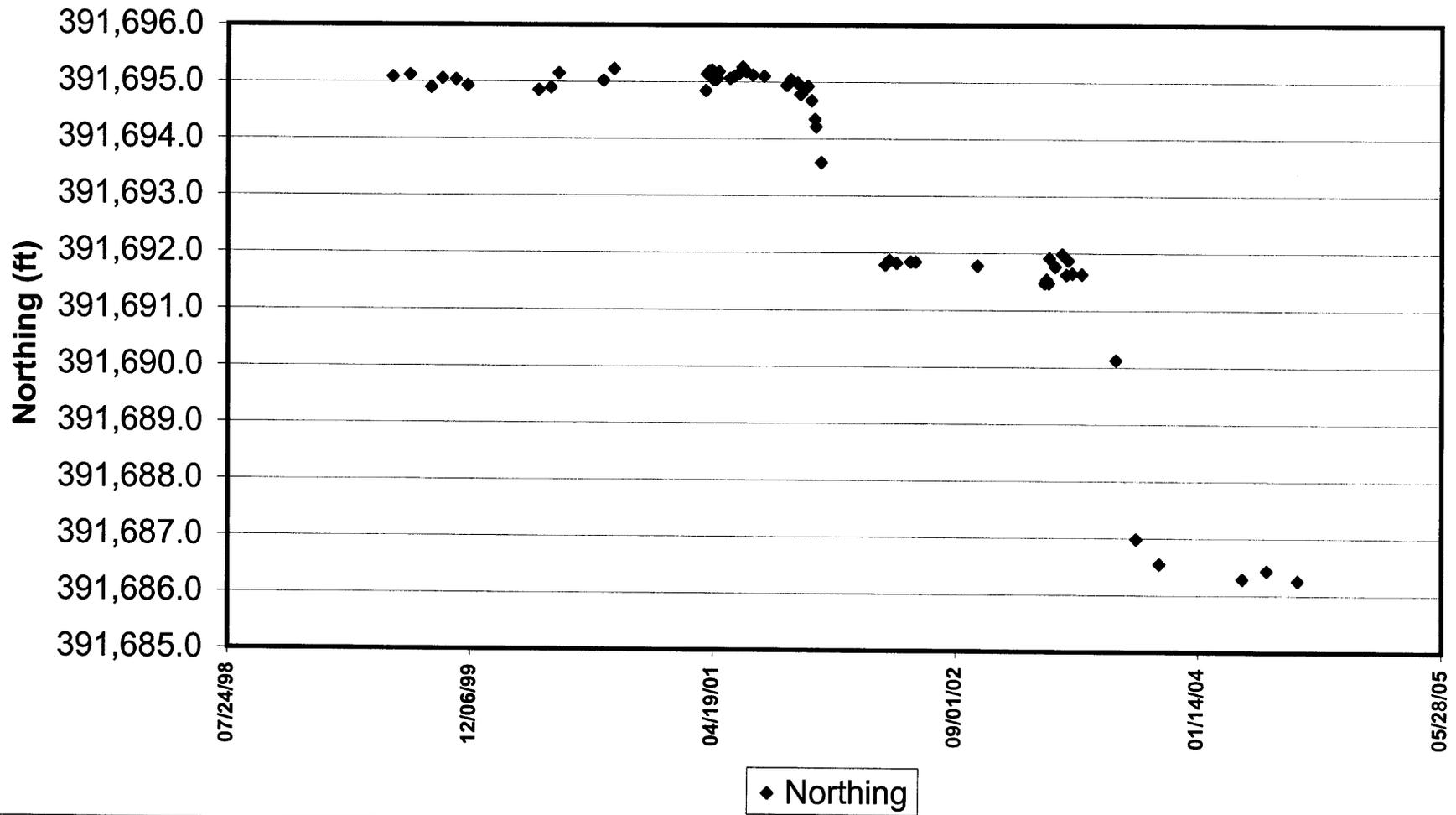
Energy West 2004 Subsidence Report

Rilda Canyon Prism #6 - Easting



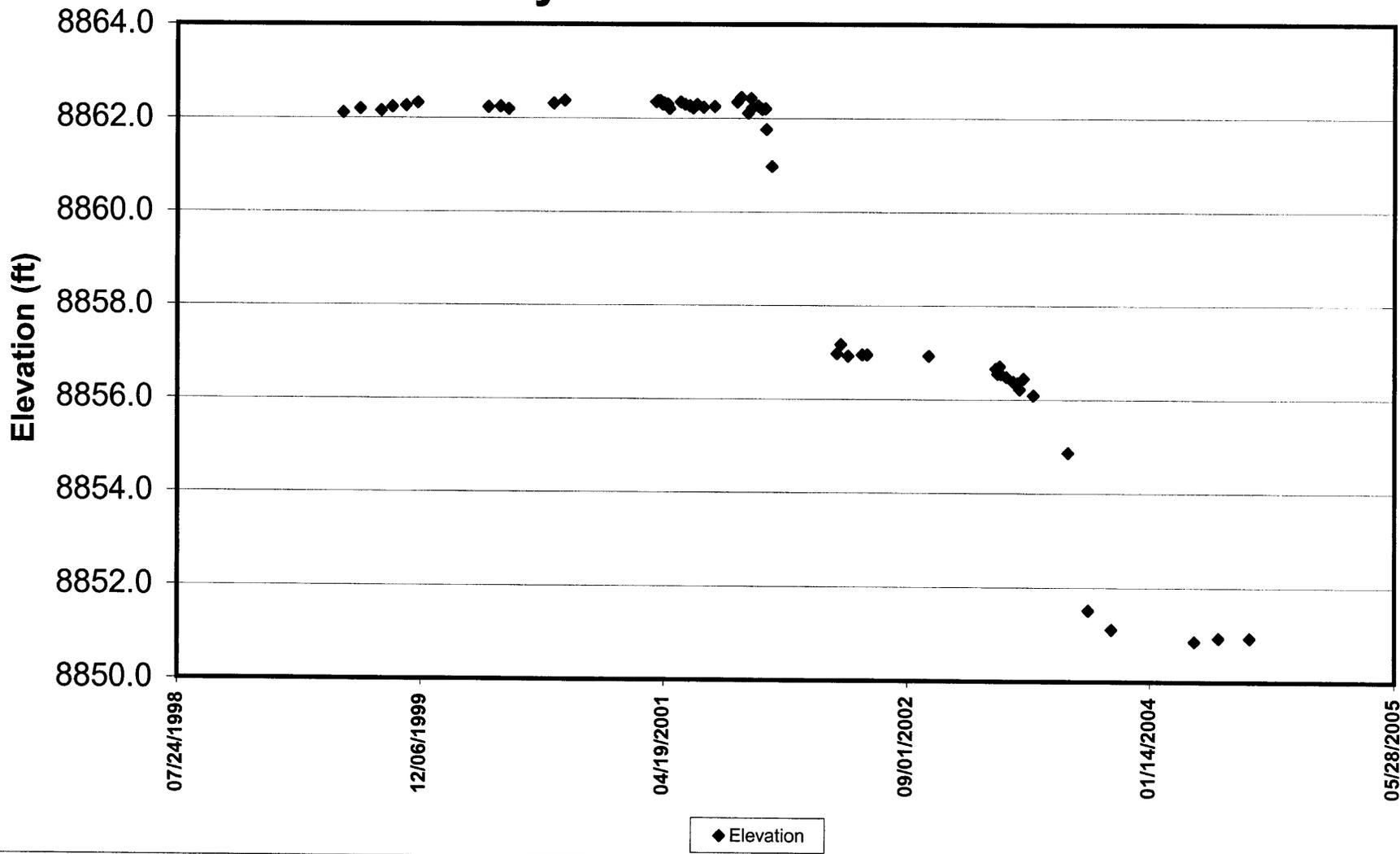
Energy West 2004 Subsidence Report

Rilda Canyon Prism #6 - Northing



Energy West 2004 Subsidence Report

Rilda Canyon Prism #6 - Elevation



RILDA CANYON PRISMS

Prisms 4-6 Installed on JUNE 21, 1999

Baseline Data

PRISM 6

Date	Northing		Easting		Elevation	
	Reading	Variance	Reading	Variance	Reading	Variance
06/29/1999	391,695.08		2,097,768.41		8862.11	
08/03/1999	391,695.11		2,097,768.49		8862.19	
09/15/1999	391,694.89		2,097,768.38		8862.15	
10/08/1999	391,695.05		2,097,768.60		8862.23	
11/05/1999	391,695.03		2,097,768.53		8862.26	
11/29/1999	391,694.93		2,097,768.37		8862.32	
04/24/2000	391,694.85		2,097,768.35		8862.23	
05/19/2000	391,694.90		2,097,768.35		8862.24	
06/05/2000	391,695.15		2,097,768.53		8862.19	
09/05/2000	391,695.02		2,097,768.47		8862.31	
09/27/2000	391,695.22		2,097,768.68		8862.37	
04/03/2001	391,694.84		2,097,768.38		8862.34	
04/06/2001	391,695.14		2,097,768.49		8862.37	
04/11/2001	391,695.19		2,097,768.54		8862.37	
04/16/2001	391,695.20		2,097,768.53		8862.29	
04/19/2001	391,695.04		2,097,768.36		8862.32	
04/24/2001	391,695.04		2,097,768.66		8862.28	
04/26/2001	391,695.07		2,097,768.42		8862.30	
04/30/2001	391,695.18		2,097,768.45		8862.20	
05/23/2001	391,695.06		2,097,768.45		8862.34	
06/01/2001	391,695.10		2,097,768.43		8862.29	
06/11/2001	391,695.15		2,097,768.51		8862.26	
06/18/2001	391,695.26		2,097,768.59		8862.22	
06/26/2001	391,695.18		2,097,768.54		8862.29	
07/09/2001	391,695.12		2,097,768.41		8862.23	
08/01/2001	391,695.10		2,097,768.39		8862.25	
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09/17/2001	391,694.94	-0.13	2,097,768.32	-0.15	8862.34	0.07
09/25/2001	391,695.04	-0.03	2,097,768.37	-0.10	8862.44	0.17
10/30/2001	391,694.92	-0.15	2,097,768.12	-0.35	8862.26	-0.01
10/09/2001	391,694.98	-0.09	2,097,768.06	-0.41	8862.11	-0.16
10/15/2001	391,694.78	-0.29	2,097,768.12	-0.35	8862.42	0.15
10/17/2001	391,694.80	-0.28	2,097,768.15	-0.33	8862.22	-0.05
11/07/2001	391,694.67	-0.40	2,097,768.10	-0.37	8862.19	-0.08
11/14/2001	391,694.34	-0.73	2,097,768.16	-0.31	8862.20	-0.07
<hr/>						
11/16/2001	391,694.21	-0.86	2,097,768.28	-0.19	8861.76	-0.51
11/27/2001	391,693.58	-1.49	2,097,768.60	0.13	8860.97	-1.30
04/09/2002	391,691.79	-3.28	2,097,766.48	-1.99	8856.97	-5.30
04/17/2002	391,691.87	-3.21	2,097,766.69	-1.79	8857.17	-5.10

AVERAGE SURVEY PRIOR TO UNDER MINING

Cutoff Date	08/01/2001
Northing	391,695.07
Easting	2,097,768.47
Elevation	8,862.27

Average Cutoff

MINED UNDER #6 PRISM - Blind Canyon Seam

RILDA CANYON MONITORING ABOVE 5TH NORTH												
DRILL HOLE AREA												
	RC1			RC2			RC3			RC4		
	top end									btm end		
DATE	N	E	ELEV.	N	E	ELEV.	N	E	ELEV.	N	E	ELEV.
06/25/1998	392182.738	2093512.401	8161.66	392322.121	2092965.037	8208.760	392421.14	2092750.953	8231.12	392536.814	2092275.445	8296.77
08/12/1998	392184.166	2093512.369	8162.87	392322.947	2092965.38	8209.12	392421.687	2092751.055	8231.47	392536.82	2092275.433	8296.21
08/14/1998			8162.34			8209.27			8231.57			8296.22
10/01/1998			8162.33			8209.21			8231.51			8296.19
05/26/1999			8162.30			8209.16			8231.46			8296.18
07/06/1999			8162.47			8209.61			8231.97			8296.00
08/25/1999			8162.35			8209.50			8231.37			8296.18
06/23/2000			8162.35			8208.28			8231.66			8296.11
10/17/2000			8162.15			8209.05			8231.38			8296.16
06/05/2001			8162.38			8209.29			8231.59			8296.18
07/09/2002			8162.27			8209.23			8231.51			8296.22
05/28/2003			8161.95			8208.68			8231.08			8295.96
07/26/2004		0	8161.99			8208.96			8231.35			8296.14
Average			8162.327			8209.1127			8231.495			8296.14

RAW DATA ON COMPACT DISK