

Mr. John Butler, P.E.
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Subject:

Monthly Settlement Monitoring Report for the Waste Slope in the Vicinity of Gas Extraction Well W-135, Rumpke Sanitary Landfill, Inc.

Environmental

Dear Mr. Butler:

Date:
March 12, 2010

ARCADIS is pleased to present the report presenting the results of the settlement monitoring surveys in the vicinity of gas extraction well W-135 at the Rumpke Sanitary Landfill, Inc. (Rumpke) facility in Hamilton County, Ohio. This report presents the data obtained from the topographic and movement monitoring surveys performed on February 26, 2010 and March 9, 2010.

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OBSERVED SETTLEMENT

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Tecumseh Surveying performed the monthly topographic survey on February 26, 2010. Figure 1 presents the existing topography developed by merging the ground survey of February 26, 2010 with the aerial topographic survey of November 28, 2009. The surveyors recorded the ground elevation at random points, and along obvious slope breaks (toe of slope, flow-line and crest of bench, etc.). These data were then input into AutoCAD Civil3D software. The software is then used to generate a 3-dimensional surface representing the ground topography by triangulating between the surveyed points. The software then generated the contours shown. It should be noted that some variation will occur between surveys of irregular slopes due to variations in locations of the surveyed points used to develop the surfaces, even when there is no significant change in elevation between the surveys. These variations are most significant near changes in slope angle or direction.

Our ref:
HA100158.0000

Settlement

Figure 2 presents the settlement calculated between the topography based on the ground survey of January 29, 2010 (by Rumpke) and the topography based on the ground survey of February 26, 2010. These data indicate that there has been up to

4.5 feet of settlement between January 29, 2010 and February 26, 2010. Some increase in elevation is shown, primarily below the existing bench, of up to 3.3 feet during this same time period. Most of this difference can be attributed to on-going maintenance work at the site. Some of the apparent settlement or rise can also be attributed to the precision of the surveys and to the manner in which the modeling software interprets contour between surveyed points.

Figure 3 presents the annualized settlement rate between January 29, 2010 and February 26, 2010 expressed as a percentage of the original waste thickness. To develop this data, it was necessary to evaluate the settlement at specific points. In this case, the survey points that Rumpke used during the initial slope monitoring surveys for this project were utilized. They do not necessarily correlate to specific points from the recent ground surveys.

For each of the points shown on Figure 3, the initial waste depth was established by sampling the as-built top of liner surface (developed from the as-built certification surveys) and the ground elevations based on the October 31, 2008 aerial topographic survey. Then, for each point, the ground surface for each survey date was sampled. Once these data were collected and tabulated, the annualized settlement, expressed as a percentage of the original waste thickness, was calculated for each point as follows:

- Step 1 – Calculate settlement (ft) for the period being evaluated.
- Step 2 – Calculate the daily rate of settlement (ft/day) by dividing the settlement (ft) by the number of days (day) in the period.
- Step 3 – Calculate the annualized rate of settlement (ft/yr) by multiplying the daily settlement rate (ft/day) by 365 days/yr.
- Step 4 – Divide the annualized settlement rate (ft/yr) by the initial waste thickness (ft) at the point and report as a percentage of original waste thickness (%/yr).

As discussed above, some of the calculated settlement is attributable to variations inherent in the generation of the surface models, particularly where there are changes in slope. These changes are amplified when expressed as an annualized settlement rate as a percentage of waste thickness. These changes are further amplified for points with a lower initial waste thickness.

Some of the apparently large settlement rates at the edges of the isopach, particularly at the north-east corner, the middle portion of the east slope and the south-west corner of the survey area are due to the proximity of these points to slope breaks and irregularities of the contours (corners). The magnitude of the annualized settlement rates in these areas are magnified because the initial waste thickness (approximately 50 feet) is relatively thin in these areas. Therefore, it is our opinion that the relatively high annualized settlement rates in these areas are not representative of an expansion of the active reaction area.

Lateral Movement

Lateral movement of the slope is being monitored at several points in the area of concern (Figure 4). At each of these locations a survey hub was driven into the ground, and the top of the stake was surveyed. These hubs have generally been surveyed on a bi-weekly basis. A summary of the survey data to date is presented on Tables 1 and 2.

The overall rate for horizontal displacement from for points 203 – 205 (those historically exhibiting the most movement) was approximately 0.85 inches/day from 2-4-10 through 3-9-10. This rate is lower than recent periods.

Vertical movement has reduced, with mostly downward movement from 2-4-10 through 3-9-10. The observed vertical movement ranged from +0.22 feet to -0.48 feet for these points.


For the higher-numbered points, past evaluations have focused on points within the primary settlement area: 536, 567, 656, 674, 703 and 839. The overall horizontal displacement rate for these points averaged 0.56 inches/day from 2-4-10 through 3-9-10. Settlement at these points ranged from -0.81 feet to -4.13 feet.

Please note that points 200, and 206 through 209 were buried by the initial buttress construction and therefore not included in this survey. They were replaced by points 212 through 216.

CLOSING

ARCADIS appreciates the opportunity to provide this geotechnical evaluation. Should you have any questions or require additional information, please feel free to contact us at (513)860-8700.

Sincerely,


John W. Holm, P.E.
Senior Engineer



Richard J. Kenter, CPG
Principal Geologist

Table 1A
Movement Monitoring Points 502 - 839
10-25-2009 through 12-17-09

Name	10/25/2009		10/27/2009		Movement From 10/25/2009 to 10/27/2009 (ft)			
	North	East	North	East	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
502	474,000.00	1,406,100.00	473,999.97	1,406,100.07	-0.03	0.07	0.08	0.46
532	474,000.00	1,406,250.01	474,000.01	1,406,249.90	0.01	-0.11	0.12	0.69
536	474,250.01	1,406,250.01	474,250.03	1,406,249.94	0.02	-0.07	0.07	0.43
562	474,000.00	1,406,400.01	473,999.95	1,406,400.08	-0.05	0.07	0.09	0.52
567	474,250.01	1,406,400.01	474,250.01	1,406,400.03	0.00	0.02	0.02	0.11
610	474,000.00	1,406,600.02	473,999.96	1,406,599.95	-0.04	-0.07	0.08	0.49
620	474,250.01	1,406,600.02	474,250.08	1,406,600.07	0.07	0.05	0.08	0.49
633	474,450.02	1,406,600.02	474,450.01	1,406,600.08	-0.01	0.06	0.06	0.39
656	474,450.02	1,406,400.01	474,449.98	1,406,400.03	-0.04	0.01	0.04	0.26
674	474,450.02	1,406,250.01	474,449.90	1,406,249.92	-0.12	-0.09	0.15	0.90
691	474,850.04	1,406,200.00	474,850.04	1,406,200.15	0.00	0.15	0.15	0.88
698	474,700.03	1,406,150.00	474,700.04	1,406,149.94	0.01	-0.06	0.06	0.35
703	474,450.02	1,406,100.00	474,449.99	1,406,100.10	-0.03	0.10	0.10	0.61
705	474,550.03	1,406,100.00	474,550.12	1,406,100.02	0.09	0.02	0.10	0.57
722	475,050.04	1,406,250.01	475,050.09	1,406,249.98	0.04	-0.02	0.05	0.30
734	474,700.03	1,406,350.01	474,699.96	1,406,349.92	-0.07	-0.09	0.11	0.68
755	474,800.04	1,406,450.01	474,800.07	1,406,450.09	0.04	0.07	0.08	0.50
839	474,250.01	1,406,075.00	474,249.98	1,406,075.10	-0.03	0.10	0.11	0.63

Average of 536, 567, 656, 674, 703 and 839 0.49

Name	11/3/2009		Movement From 10/27/2009 to 11/3/2009 (ft)				Total Movement From 10/25/2009 to 11/3/2009 (ft)		
	North	East	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)
502	474,000.04	1,406,100.05	0.06	-0.02	0.07	0.11	0.04	0.05	0.06
532	474,000.03	1,406,249.91	0.03	0.01	0.03	0.05	0.03	-0.10	0.11
536	474,250.23	1,406,249.88	0.20	-0.07	0.21	0.36	0.22	-0.13	0.25
562	473,999.99	1,406,400.09	0.04	0.00	0.04	0.06	-0.02	0.07	0.08
567	474,250.16	1,406,400.06	0.15	0.03	0.15	0.26	0.15	0.05	0.16
610	474,000.00	1,406,599.95	0.03	0.01	0.03	0.06	0.00	-0.07	0.07
620	474,250.03	1,406,600.16	-0.04	0.10	0.11	0.18	0.02	0.14	0.14
633	474,450.07	1,406,600.38	0.06	0.30	0.30	0.52	0.05	0.36	0.37
656	474,450.21	1,406,400.29	0.23	0.26	0.35	0.60	0.19	0.28	0.34
674	474,449.84	1,406,249.94	-0.07	0.02	0.07	0.11	-0.18	-0.07	0.20
691	474,850.06	1,406,200.04	0.02	-0.10	0.11	0.18	0.02	0.04	0.05
698	474,700.03	1,406,150.07	-0.01	0.13	0.13	0.22	0.00	0.07	0.07
703	474,450.01	1,406,100.25	0.03	0.15	0.15	0.26	-0.01	0.25	0.25
705	474,550.15	1,406,100.03	0.02	0.01	0.03	0.05	0.12	0.03	0.12
722	475,050.07	1,406,250.02	-0.02	0.04	0.04	0.08	0.02	0.02	0.03
734	474,700.04	1,406,350.11	0.08	0.18	0.20	0.34	0.01	0.09	0.10
755	474,800.11	1,406,450.09	0.03	0.01	0.03	0.06	0.07	0.08	0.11
839	474,250.15	1,406,075.40	0.17	0.30	0.35	0.59	0.14	0.40	0.42

Average of 536, 567, 656, 674, 703 and 839 0.36

Name	11/10/2009		Movement From 11/3/2009 to 11/10/2009 (ft)				Total Movement From 10/25/2009 to 11/10/2009 (ft)		
	North	East	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)
502	474,000.06	1,406,100.06	0.02	0.01	0.03	0.05	0.06	0.06	0.09
532	474,000.12	1,406,249.84	0.08	-0.07	0.11	0.18	0.12	-0.17	0.21
536	474,250.38	1,406,249.99	0.15	0.11	0.19	0.33	0.37	-0.02	0.37
562	473,999.98	1,406,400.15	-0.01	0.07	0.07	0.12	-0.02	0.14	0.14
567	474,250.33	1,406,399.99	0.16	-0.06	0.17	0.30	0.32	-0.02	0.32
610	473,999.93	1,406,599.92	-0.07	-0.03	0.07	0.13	-0.07	-0.10	0.12
620									
633	474,450.15	1,406,600.52	0.08	0.14	0.16	0.27	0.13	0.50	0.52
656									
674	474,449.75	1,406,249.98	-0.09	0.04	0.10	0.17	-0.27	-0.03	0.27
691	474,850.14	1,406,200.06	0.08	0.02	0.08	0.14	0.10	0.06	0.12
698	474,700.20	1,406,150.01	0.17	-0.06	0.18	0.31	0.17	0.01	0.17
703	474,449.97	1,406,100.56	-0.05	0.31	0.31	0.54	-0.05	0.56	0.56
705	474,550.13	1,406,100.09	-0.02	0.06	0.06	0.11	0.10	0.09	0.13
722	475,050.10	1,406,249.99	0.03	-0.03	0.04	0.07	0.05	-0.01	0.05
734	474,700.24	1,406,350.04	0.20	-0.07	0.21	0.37	0.21	0.03	0.21
755	474,800.06	1,406,450.02	-0.05	-0.07	0.08	0.15	0.02	0.01	0.02
839	474,250.35	1,406,075.70	0.20	0.30	0.36	0.62	0.33	0.70	0.78

Average of 536, 567, 656, 674, 703 and 839 0.39

Table 1A
Movement Monitoring Points 502 - 839
10-25-2009 through 12-17-09

Name	11/17/2009		Movement From 11/10/2009 to 11/17/2009 (ft)				Total Movement From 10/25/2009 to 11/17/2009 (ft)		
	North	East	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)
502	474,000.07	1,406,100.05	0.01	-0.01	0.01	0.02	0.07	0.05	0.08
532	474,000.18	1,406,249.91	0.07	0.06	0.09	0.16	0.18	-0.10	0.21
536	474,250.43	1,406,249.96	0.05	-0.03	0.06	0.10	0.42	-0.05	0.42
562	473,999.98	1,406,400.18	0.00	0.02	0.03	0.04	-0.03	0.17	0.17
567	474,250.53	1,406,399.93	0.21	-0.07	0.22	0.37	0.52	-0.08	0.53
610	473,999.96	1,406,599.94	0.03	0.02	0.03	0.06	-0.04	-0.08	0.09
620									
633	474,450.24	1,406,600.73	0.09	0.21	0.22	0.38	0.22	0.71	0.74
656									
674	474,449.77	1,406,249.93	0.02	-0.05	0.05	0.09	-0.25	-0.08	0.26
691	474,850.26	1,406,200.06	0.12	0.00	0.12	0.20	0.22	0.06	0.22
698	474,700.14	1,406,149.96	-0.06	-0.05	0.08	0.13	0.11	-0.04	0.12
703	474,449.92	1,406,100.73	-0.04	0.18	0.18	0.31	-0.10	0.73	0.74
705	474,550.20	1,406,100.13	0.08	0.04	0.08	0.14	0.17	0.13	0.21
722	475,050.13	1,406,250.02	0.04	0.02	0.04	0.08	0.09	0.01	0.09
734	474,700.39	1,406,350.06	0.14	0.02	0.14	0.25	0.35	0.04	0.36
755	474,800.01	1,406,450.11	-0.04	0.09	0.10	0.17	-0.02	0.10	0.10
839	474,250.54	1,406,075.99	0.20	0.29	0.35	0.60	0.53	0.99	1.12

Average of 536, 567, 656, 674, 703 and 839 0.29

Name	11/25/2009		Movement From 11/17/2009 to 11/25/2009 (ft)				Total Movement From 10/25/2009 to 11/25/2009 (ft)		
	North	East	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)
502	474,000.09	1,406,100.05	0.03	0.00	0.03	0.04	0.09	0.05	0.11
532									
536	474,250.60	1,406,250.11	0.17	0.15	0.23	0.34	0.59	0.10	0.60
562	474,000.01	1,406,400.13	0.03	-0.05	0.06	0.09	0.01	0.12	0.12
567	474,250.72	1,406,400.07	0.18	0.15	0.24	0.35	0.71	0.06	0.71
610	473,999.96	1,406,599.95	0.00	0.01	0.01	0.01	-0.04	-0.07	0.08
620									
633	474,450.40	1,406,600.97	0.16	0.25	0.30	0.44	0.38	0.95	1.03
656									
674	474,449.68	1,406,250.05	-0.09	0.12	0.15	0.22	-0.34	0.04	0.34
691	474,850.30	1,406,200.03	0.04	-0.04	0.05	0.08	0.26	0.03	0.26
698	474,700.29	1,406,149.94	0.15	-0.02	0.16	0.23	0.26	-0.06	0.27
703	474,449.99	1,406,101.03	0.06	0.29	0.30	0.45	-0.04	1.02	1.03
705	474,550.22	1,406,100.19	0.01	0.07	0.07	0.10	0.19	0.19	0.27
722	475,050.09	1,406,249.96	-0.04	-0.05	0.07	0.10	0.05	-0.05	0.07
734	474,700.61	1,406,350.12	0.22	0.06	0.23	0.35	0.58	0.11	0.59
755	474,800.19	1,406,450.11	0.18	0.00	0.18	0.27	0.16	0.10	0.19
839	474,250.77	1,406,076.34	0.23	0.35	0.42	0.62	0.75	1.34	1.54

Average of 536, 567, 656, 674, 703 and 839 0.40

Name	12/1/2009		Movement From 11/25/2009 to 12/1/2009 (ft)				Total Movement From 10/25/2009 to 12/1/2009 (ft)		
	North	East	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)
502	474,000.12	1,406,100.08	0.03	0.03	0.04	0.08	0.12	0.08	0.14
532									
536	474,250.76	1,406,250.22	0.16	0.10	0.19	0.38	0.75	0.21	0.77
562	473,999.96	1,406,400.17	-0.05	0.05	0.07	0.14	-0.04	0.16	0.17
567	474,250.91	1,406,400.10	0.19	0.03	0.19	0.39	0.90	0.09	0.90
610	473,999.91	1,406,599.98	-0.04	0.03	0.05	0.10	-0.09	-0.04	0.10
620									
633	474,450.50	1,406,601.32	0.10	0.35	0.36	0.72	0.48	1.30	1.39
656									
674	474,449.67	1,406,250.14	-0.01	0.09	0.09	0.18	-0.35	0.13	0.37
691	474,850.26	1,406,200.00	-0.04	-0.03	0.05	0.09	0.22	0.00	0.22
698	474,700.33	1,406,149.90	0.04	-0.04	0.05	0.11	0.30	-0.10	0.32
703	474,449.95	1,406,101.29	-0.04	0.27	0.27	0.54	-0.07	1.29	1.29
705	474,550.19	1,406,100.32	-0.03	0.13	0.14	0.27	0.16	0.32	0.36
722	475,050.09	1,406,249.94	0.00	-0.02	0.02	0.04	0.04	-0.07	0.08
734	474,700.75	1,406,350.15	0.14	0.03	0.15	0.30	0.72	0.14	0.73
755	474,800.15	1,406,450.11	-0.05	0.00	0.05	0.09	0.11	0.10	0.15
839	474,250.98	1,406,076.64	0.21	0.30	0.37	0.73	0.97	1.64	1.90

Average of 536, 567, 656, 674, 703 and 839 0.44

Table 1A
Movement Monitoring Points 502 - 839
10-25-2009 through 12-17-09

Name	12/10/2009		Movement From 12/1/2009 to 12/10/2009 (ft)				Total Movement From 10/25/2009 to 12/10/2009 (ft)		
	North	East	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)	Total Movement		Net Horizontal Movement (ft)
502	474,000.16	1,406,099.91	0.04	-0.17	0.17	0.23	0.16	-0.09	0.18
532									
536	474,251.09	1,406,250.23	0.33	0.02	0.33	0.44	1.08	0.22	1.10
562	473,999.98	1,406,400.19	0.02	0.01	0.02	0.03	-0.02	0.18	0.18
567									
610	473,999.91	1,406,600.00	0.00	0.02	0.02	0.03	-0.09	-0.02	0.09
620									
633									
656									
674	474,449.75	1,406,250.09	0.08	-0.05	0.10	0.13	-0.27	0.08	0.28
691	474,850.43	1,406,199.98	0.17	-0.01	0.17	0.22	0.39	-0.02	0.39
698	474,700.50	1,406,149.82	0.17	-0.08	0.19	0.25	0.47	-0.18	0.50
703	474,449.97	1,406,101.57	0.02	0.28	0.28	0.37	-0.05	1.57	1.57
705	474,550.14	1,406,100.33	-0.04	0.01	0.04	0.06	0.11	0.33	0.35
722	475,050.16	1,406,249.95	0.07	0.01	0.08	0.10	0.12	-0.05	0.13
734	474,701.11	1,406,350.17	0.36	0.02	0.36	0.48	1.08	0.16	1.09
755	474,800.34	1,406,450.21	0.19	0.10	0.22	0.29	0.30	0.20	0.36
839	474,251.09	1,406,077.01	0.11	0.37	0.38	0.51	1.07	2.01	2.28

Average of 536, 567, 656, 674, 703 and 839 0.36

Name	12/17/2009		Movement From 12/10/2009 to 12/17/2009 (ft)				Total Movement From 10/25/2009 to 12/17/2009 (ft)			
	North	East	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Rate (in/day)
502	474,000.16	1,406,100.09	0.00	0.18	0.18	0.31	0.16	0.09	0.18	0.04
532										
536	474,251.13	1,406,250.40	0.04	0.17	0.18	0.31	1.12	0.39	1.19	0.27
562	474,000.03	1,406,400.19	0.05	0.00	0.05	0.09	0.03	0.18	0.18	0.04
567										
610	473,999.92	1,406,599.95	0.01	-0.05	0.05	0.08	-0.08	-0.07	0.11	0.02
620										
633	474,450.83	1,406,601.79					0.81	1.77	1.95	0.44
656										
674	474,449.75	1,406,250.26	0.00	0.17	0.17	0.28	-0.27	0.25	0.37	0.08
691	474,850.45	1,406,199.98	0.02	0.00	0.02	0.03	0.41	-0.02	0.41	0.09
698	474,700.51	1,406,149.87	0.01	0.06	0.06	0.10	0.48	-0.13	0.50	0.11
703	474,449.99	1,406,101.91	0.02	0.34	0.34	0.58	-0.03	1.91	1.91	0.43
705	474,550.24	1,406,100.51	0.09	0.18	0.20	0.34	0.20	0.51	0.55	0.12
722	475,050.08	1,406,249.93	-0.08	-0.02	0.09	0.15	0.03	-0.07	0.08	0.02
734	474,701.19	1,406,350.20	0.08	0.03	0.08	0.14	1.16	0.19	1.17	0.27
755	474,800.28	1,406,450.25	-0.06	0.03	0.07	0.12	0.24	0.23	0.34	0.08
839	474,251.26	1,406,077.32	0.17	0.31	0.36	0.62	1.25	2.32	2.64	0.60

Average of 536, 567, 656, 674, 703 and 839 0.45

0.35

Note: The original lath used for the survey monitoring included in this table were replaced with wood hubs on 12-22-09. Table 2B presents the survey data from that point forward.

Table 1B
Movement Monitoring Points 502 - 839
12/22/200/ through 1/18/2010

Name	12/22/2009			1/5/2010			Movement From 12/22/2009 to 1/5/2010 (ft)					Total Movement From 10/25/2009 to 1/5/2010 (ft)			
	Measured North	Measured East	Measured Elev	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
502	474,000.26	1,406,100.05	954.35	474,000.31	1,406,100.08	954.10	0.04	0.03	-0.25	0.05	0.04	0.20	0.11	0.23	0.04
532	474,000.09	1,406,249.85	938.48	474,000.15	1,406,249.89	938.32	0.06	0.04	-0.16	0.07	0.06				
536	474,251.24	1,406,250.58	924.31	474,251.52	1,406,250.91	922.32	0.28	0.33	-1.98	0.43	0.37	1.40	0.72	1.58	0.26
562	473,999.90	1,406,400.20	906.63	473,999.95	1,406,400.19	906.60	0.05	-0.01	-0.03	0.05	0.04	0.08	0.17	0.18	0.03
567	474,250.13	1,406,400.05	905.95	474,250.46	1,406,400.26	904.93	0.33	0.21	-1.03	0.39	0.33				
610	473,999.99	1,406,599.93	856.95	473,999.93	1,406,599.96	856.95	-0.06	0.02	0.00	0.06	0.05	-0.14	-0.05	0.15	0.03
620	474,250.07	1,406,600.21	860.52	474,250.03	1,406,600.60	860.59	-0.04	0.38	0.06	0.38	0.33				
633	474,450.79	1,406,601.79	857.15	474,451.16	1,406,602.36	857.25	0.36	0.57	0.09	0.68	0.58	1.18	2.34	2.62	0.44
656	474,450.07	1,406,400.27	882.12	474,450.43	1,406,400.77	881.92	0.36	0.50	-0.20	0.62	0.53				
674	474,449.68	1,406,250.33	901.29	474,449.82	1,406,250.42	900.01	0.14	0.09	-1.28	0.17	0.14	-0.13	0.34	0.36	0.06
691	474,850.45	1,406,199.97	851.01	474,850.66	1,406,199.97	850.92	0.21	-0.01	-0.09	0.21	0.18	0.62	-0.02	0.62	0.10
698	474,700.66	1,406,149.78	883.96	474,700.74	1,406,149.72	883.91	0.07	-0.06	-0.06	0.09	0.08	0.55	-0.19	0.58	0.10
703	474,450.11	1,406,101.92	928.43	474,450.10	1,406,102.44	927.37	-0.01	0.53	-1.06	0.53	0.45	-0.04	2.44	2.44	0.41
705	474,550.13	1,406,100.61	915.12	474,550.17	1,406,100.79	914.73	0.04	0.17	-0.39	0.18	0.15	0.25	0.68	0.73	0.12
722	475,050.11	1,406,249.95	802.30	475,050.10	1,406,249.98	802.23	-0.01	0.03	-0.07	0.03	0.02	0.02	-0.05	0.05	0.01
734	474,701.51	1,406,350.27	852.52	474,701.96	1,406,350.36	852.60	0.46	0.08	0.08	0.46	0.40	1.61	0.27	1.64	0.27
755	474,800.37	1,406,450.19	819.45	474,800.36	1,406,450.22	819.42	-0.02	0.03	-0.03	0.03	0.03	0.23	0.26	0.35	0.06
839	474,251.38	1,406,077.41	945.94	474,251.75	1,406,078.23	944.86	0.37	0.82	-1.09	0.89	0.77	1.62	3.14	3.53	0.59

Average of 536, 567, 656, 674, 703 and 839 0.43

Name	1/18/2010			Movement From 1/5/2010 to 1/18/2010 (ft)					Total Movement From 12/22/2009 to 1/18/2010 (ft)					Total Movement From 10-25-09 to 1/18/2010 (ft)			
	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
502	474,000.32	1,406,100.06	953.95	0.01	-0.02	-0.15	0.03	0.02	0.05	0.01	-0.40	0.06	0.02	0.21	0.09	0.23	0.03
532	474,000.10	1,406,249.89	938.32	-0.05	0.00	0.00	0.05	0.05	0.01	0.04	-0.16	0.04	0.02				
536	474,252.00	1,406,251.27	920.64	0.48	0.36	-1.69	0.60	0.55	0.76	0.69	-3.67	1.03	0.46	1.88	1.08	2.17	0.31
562	474,000.00	1,406,400.23	906.61	0.05	0.04	0.01	0.07	0.06	0.10	0.03	-0.02	0.11	0.05	0.13	0.21	0.25	0.03
567	474,250.84	1,406,400.42	903.91	0.38	0.16	-1.02	0.41	0.38	0.71	0.37	-2.05	0.80	0.36				
610	473,999.94	1,406,599.99	856.98	0.01	0.03	0.02	0.04	0.03	-0.05	0.06	0.03	0.08	0.03	-0.13	-0.01	0.13	0.02
620	474,250.06	1,406,601.06	860.74	0.02	0.46	0.15	0.46	0.43	-0.01	0.84	0.22	0.84	0.37				
633	474,451.47	1,406,602.93	857.28	0.31	0.56	0.03	0.64	0.59	0.68	1.14	0.12	1.32	0.59	1.49	2.91	3.27	0.46
656	474,450.98	1,406,401.32	881.60	0.54	0.55	-0.32	0.78	0.72	0.90	1.05	-0.52	1.39	0.62	0.10	0.61	0.62	0.09
674	474,450.05	1,406,250.70	898.67	0.23	0.27	-1.34	0.36	0.33	0.37	0.36	-2.63	0.52	0.23				
691	474,850.73	1,406,199.88	850.90	0.06	-0.08	-0.02	0.10	0.10	0.27	-0.09	-0.11	0.29	0.13	0.68	-0.11	0.69	0.10
698	474,700.86	1,406,149.68	883.94	0.13	-0.05	0.03	0.13	0.12	0.20	-0.11	-0.02	0.22	0.10	0.68	-0.23	0.72	0.10
703	474,450.15	1,406,102.99	926.43	0.05	0.55	-0.94	0.55	0.51	0.04	1.07	-2.00	1.07	0.48	0.01	2.98	2.98	0.42
705	474,550.20	1,406,101.00	914.39	0.03	0.21	-0.34	0.21	0.20	0.07	0.38	-0.72	0.39	0.17	0.28	0.90	0.94	0.13
722	475,050.13	1,406,249.99	802.20	0.03	0.02	-0.03	0.03	0.03	0.02	0.04	-0.10	0.05	0.02	0.05	-0.03	0.06	0.01
734	474,702.32	1,406,350.51	852.60	0.36	0.16	0.00	0.39	0.36	0.82	0.24	0.07	0.85	0.38	1.97	0.43	2.02	0.29
755	474,800.37	1,406,450.21	819.51	0.01	-0.01	0.10	0.01	0.01	-0.01	0.02	0.06	0.02	0.01	0.24	0.25	0.35	0.05
839	474,252.20	1,406,078.97	943.70	0.45	0.74	-1.16	0.86	0.80	0.82	1.56	-2.24	1.76	0.78	2.06	3.88	4.39	0.62

Average of 536, 567, 656, 674, 703 and 839 0.55

0.49

Name	2/4/2010			Movement From 1/18/2010 to 2/4/2010 (ft)					Total Movement From 12/22/2009 to 2/4/2010 (ft)					Total Movement From 10-25-09 to 2/4/2010 (ft)			
	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
502	474,000.51	1,406,100.19	953.72	0.19	0.14	-0.23	0.23	0.16	0.24	0.14	-0.64	0.28	0.08	0.40	0.23	0.46	0.05
532	474,000.24	1,406,249.93	938.11	0.14	0.04	-0.21	0.14	0.10	0.15	0.08	-0.36	0.17	0.05				
536	474,252.47	1,406,251.75	918.41	0.47	0.47	-2.23	0.67	0.47	1.23	1.16	-5.90	1.69	0.46	2.35	1.56	2.82	0.33
562	473,999.96	1,406,400.22	906.53	-0.04	-0.01	-0.08	0.04	0.03	0.06	0.03	-0.10	0.07	0.02	0.09	0.20	0.22	0.03
567	474,251.41	1,406,400.84	902.48	0.57	0.42	-1.42	0.70	0.50	1.28	0.79	-3.47	1.50	0.41				
610	473,999.95	1,406,600.02	857.01	0.01	0.03	0.04	0.03	0.02	-0.04	0.08	0.07	0.09	0.03	-0.12	0.02	0.13	0.01
620	474,250.04	1,406,601.68	860.95	-0.01	0.63	0.21	0.63	0.44	-0.03	1.47	0.43	1.47	0.40				
633	474,452.00	1,406,603.72	857.33	0.53	0.79	0.05	0.95	0.67	1.21	1.93	0.17	2.27	0.62	2.02	3.70	4.21	0.50
656	474,451.48	1,406,401.96	881.27	0.51	0.63	-0.33	0.81	0.57	1.41	1.69	-0.85	2.20	0.60				
674	474,450.42	1,406,250.98	896.93	0.37	0.28	-1.74	0.46	0.33	0.74	0.65	-4.36	0.98	0.27	0.47	0.90	1.01	0.12
691	474,850.91	1,406,199.92	850.93	0.18	0.04	0.02	0.18	0.13	0.45	-0.05	-0.08	0.46	0.12	0.86	-0.07	0.86	0.10
698	474,701.08	1,406,149.65	883.82	0.22	-0.03	-0.12	0.22	0.16	0.42	-0.13	-0.14	0.44	0.12	0.90	-0.26	0.93	0.11
703	474,450.29	1,406,103.71	925.02	0.14	0.72	-1.41	0.74	0.52	0.18	1.79	-3.40	1.80	0.49	0.15	3.70	3.71	0.44
705	474,550.21	1,406,101.39	913.83	0.01	0.40	-0.56	0.40	0.28	0.08	0.78	-1.29	0.78	0.21	0.28	1.29	1.32	0.16
722	475,050.16	1,406,249.99	802.24	0.03	-0.01	0.04	0.03	0.02	0.04	0.04	-0.06	0.06	0.02	0.08	-0.04	0.08	0.01
734	474,702.82	1,406,350.66	852.78	0.50	0.15	0.18	0.52	0.37	1.31	0.39	0.25	1.37	0.37	2.47	0.58	2.54	0.30
755	474,800.40	1,406,450.31	819.46	0.04	0.10	-0.05	0.11	0.08	0.03	0.12	0.01	0.12	0.03	0.27	0.35	0.45	0.05
839	474,252.76	1,406,079.85	942.07	0.57	0.88	-1.63	1.05	0.74	1.38	2.44	-3.88	2.80	0.76	2.63	4.76	5.44	0.64

Average of 536, 567, 656, 674, 703 and 839 0.52

0.50

Table 1B
Movement Monitoring Points 502 - 839
12/22/200/ through 1/18/2010

Name	2/26/2010			Movement From 2/4/2010 to 2/26/2010 (ft)					Total Movement From 12/22/2009 to 2/26/2010 (ft)					Total Movement From 10-25-09 to 2/26/2010 (ft)			
	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
502																	
532	474,000.53	1,406,249.99	937.69	0.29	0.06	-0.43	0.30	0.16	0.43	0.14	-0.79	0.46	0.08				
536	474,253.15	1,406,252.46	915.30	0.67	0.71	-3.10	0.98	0.54	1.91	1.88	-9.00	2.67	0.49	3.02	2.27	3.78	0.37
562	474,000.10	1,406,400.34	906.17	0.14	0.11	-0.36	0.18	0.10	0.20	0.14	-0.46	0.24	0.04	0.23	0.32	0.39	0.04
567	474,252.19	1,406,401.57	900.45	0.78	0.73	-2.03	1.07	0.58	2.06	1.52	-5.50	2.56	0.47				
610	473,999.92	1,406,600.14	856.78	-0.02	0.12	-0.24	0.12	0.07	-0.06	0.21	-0.17	0.22	0.04	-0.15	0.14	0.20	0.02
620	474,250.13	1,406,602.51	860.93	0.09	0.83	-0.03	0.83	0.45	0.06	2.29	0.40	2.30	0.42				
633	474,453.12	1,406,605.26	856.60	1.12	1.54	-0.73	1.90	1.04	2.32	3.47	-0.56	4.17	0.76	3.13	5.24	6.10	0.59
656	474,452.24	1,406,402.94	880.45	0.76	0.99	-0.82	1.25	0.68	2.17	2.68	-1.67	3.44	0.63				
674																	
691	474,851.26	1,406,200.11	850.58	0.36	0.19	-0.34	0.40	0.22	0.81	0.14	-0.42	0.82	0.15	1.22	0.12	1.22	0.12
698																	
703																	
705																	
722	475,050.24	1,406,250.00	801.84	0.08	0.01	-0.40	0.08	0.04	0.12	0.05	-0.46	0.13	0.02	0.16	-0.02	0.16	0.02
734																	
755	474,800.48	1,406,450.42	819.10	0.08	0.11	-0.37	0.14	0.07	0.11	0.23	-0.35	0.26	0.05	0.35	0.47	0.58	0.06
839																	

Average of 536, 567, 656, 674, 703 and 839 0.60

0.53

Name	3/9/2010			Movement From 2/26/2010 to 3/09/2010 (ft)					Total Movement From 12/22/2009 to 3/09/2010 (ft)					Total Movement From 10-25-09 to 3/09/2010 (ft)			
	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
502	474,000.76	1,406,100.18	953.18						0.50	0.12	-1.17	0.51	0.08	0.65	0.21	0.69	0.06
532	474,000.53	1,406,249.93	937.77	0.01	-0.06	0.08	0.07	0.07	0.44	0.08	-0.71	0.45	0.07				
536	474,253.29	1,406,252.67	914.28	0.14	0.21	-1.02	0.25	0.28	2.04	2.09	-10.03	2.92	0.46	3.16	2.48	4.02	0.36
562	474,000.12	1,406,400.27	906.47	0.02	-0.07	0.30	0.07	0.08	0.22	0.08	-0.15	0.23	0.04	0.25	0.25	0.35	0.03
567	474,252.48	1,406,401.78	899.86	0.28	0.21	-0.59	0.35	0.38	2.34	1.73	-6.09	2.91	0.45				
610	473,999.92	1,406,600.03	856.89	0.00	-0.11	0.11	0.11	0.12	-0.06	0.09	-0.06	0.11	0.02	-0.15	0.03	0.15	0.01
620	474,250.17	1,406,602.98	861.22	0.04	0.47	0.30	0.47	0.52	0.10	2.77	0.70	2.77	0.43				
633	474,453.37	1,406,605.38	856.63	0.25	0.12	0.03	0.28	0.30	2.57	3.59	-0.53	4.42	0.69	3.38	5.36	6.34	0.56
656	474,452.59	1,406,403.23	880.42	0.35	0.29	-0.03	0.45	0.49	2.51	2.97	-1.70	3.89	0.61				
674																	
691	474,851.33	1,406,199.94	850.82	0.07	-0.17	0.24	0.18	0.20	0.88	-0.03	-0.18	0.88	0.14	1.28	-0.05	1.28	0.11
698	474,701.46	1,406,149.63	883.70						0.79	-0.16	-0.26	0.81	0.13	1.27	-0.28	1.31	0.12
703	474,450.39	1,406,105.17	922.02						0.28	3.25	-6.41	3.26	0.51	0.25	5.16	5.17	0.46
705																	
722	475,050.22	1,406,249.97	802.25	-0.01	-0.03	0.41	0.03	0.04	0.11	0.02	-0.05	0.11	0.02	0.14	-0.05	0.15	0.01
734																	
755	474,800.51	1,406,450.39	819.50	0.04	-0.03	0.40	0.05	0.05	0.14	0.20	0.05	0.24	0.04	0.39	0.43	0.58	0.05
839	474,253.80	1,406,081.76	938.15						2.41	4.34	-7.80	4.97	0.77	3.66	6.67	7.61	0.68

Average of 536, 567, 656, 674, 703 and 839 0.38

0.56

Note: Total movement since 12-22-09 is calculated by comparing the current day survey to the survey on 12/22/09.

Note: Total movement since 10-25-09 is calculated by adding the total movement between the survey date and 12/22/09 to the total movement from 10-25-09 through 12-17-09 (Table 1A). Movement between 12-17-09 and 12-22-09 was not monitored for these points.

Table 2A
Movement Monitoring Points - 200 Series
11-17-2009 through 12-21-2009

Name	11/17/2009			11/19/2009		Movement From 11/17/2009 to 11/19/2009 (ft)				
	Measured North	Measured East	Code	Measured North	Measured East	North	East	Direction	Net Horizontal Movement (ft)	Daily Rate (in/day)
200	474,470.85	1,406,695.32	hoz pnt	474,470.90	1,406,695.28	0.05	-0.04	nw	0.06	0.35
201	474,457.45	1,406,647.77	hoz pnt	474,457.45	1,406,647.78	0.00	0.00		0.00	0.03
202	474,499.39	1,406,607.58	hoz pnt	474,499.40	1,406,607.71	0.01	0.14	ne	0.14	0.82
203	474,534.54	1,406,558.25	hoz pnt	474,534.52	1,406,558.33	-0.01	0.08	se	0.08	0.50
204	474,565.77	1,406,513.76	hoz pnt	474,565.79	1,406,513.89	0.03	0.12	ne	0.13	0.76
205	474,601.22	1,406,464.45	hoz pnt	474,601.18	1,406,464.46	-0.04	0.02	se	0.04	0.25
206	474,652.31	1,406,507.65	hoz pnt	474,652.29	1,406,507.70	-0.02	0.05	se	0.05	0.30
207	474,610.94	1,406,553.70	hoz pnt	474,610.88	1,406,553.72	-0.06	0.02	se	0.06	0.36
208	474,578.58	1,406,594.35	hoz pnt	474,578.49	1,406,594.39	-0.09	0.04	se	0.10	0.62
209	474,543.17	1,406,637.83	hoz pnt	474,543.12	1,406,637.89	-0.04	0.06	se	0.07	0.44

Avg. 203-207 0.07 0.44

Name	11/23/2009		Movement From 11/19/2009 to 11/23/09(ft)					Total Movement From 11/17/2009 to 11/23/2009 (ft)		
	Measured North	Measured East	North	East	Direction	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Direction
200	474,470.82	1,406,695.36	-0.08	0.08	se	0.11	0.33	-0.03	0.04	se
201	474,457.44	1,406,647.86	-0.01	0.08	se	0.09	0.26	-0.01	0.09	se
202	474,499.45	1,406,607.77	0.05	0.06	ne	0.08	0.23	0.06	0.19	ne
203	474,534.68	1,406,558.45	0.16	0.12	ne	0.20	0.60	0.15	0.21	ne
204	474,565.98	1,406,514.01	0.19	0.13	ne	0.23	0.68	0.21	0.25	ne
205	474,601.38	1,406,464.60	0.20	0.14	ne	0.24	0.72	0.16	0.16	ne
206	474,652.49	1,406,507.88	0.20	0.18	ne	0.27	0.82	0.18	0.23	ne
207	474,610.96	1,406,553.75	0.08	0.03	ne	0.09	0.26	0.03	0.05	ne
208	474,578.60	1,406,594.47	0.11	0.07	ne	0.13	0.40	0.02	0.12	ne
209	474,543.17	1,406,637.91	0.05	0.02	ne	0.05	0.16	0.01	0.08	ne

Avg. 203-207 0.21 0.62

Name	11/25/2009		Movement From 11/23/2009 to 11/25/2009 (ft)					Total Movement From 11/17/2009 to 11/25/2009 (ft)		
	Measured North	Measured East	North	East	Direction	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Direction
200										
201	474,457.43	1,406,647.89	-0.01	0.03	se	0.03	0.16	-0.02	0.11	se
202	474,499.50	1,406,607.86	0.05	0.09	ne	0.11	0.63	0.11	0.28	ne
203	474,534.79	1,406,558.54	0.10	0.09	ne	0.14	0.81	0.25	0.29	ne
204	474,566.02	1,406,514.03	0.04	0.02	ne	0.04	0.26	0.25	0.27	ne
205	474,601.53	1,406,464.65	0.15	0.04	ne	0.16	0.94	0.31	0.20	ne
206										
207	474,610.94	1,406,553.77	-0.02	0.02	se	0.03	0.19	0.00	0.07	ne
208	474,578.59	1,406,594.48	-0.01	0.01	se	0.02	0.10	0.01	0.13	ne
209	474,543.15	1,406,637.88	-0.02	-0.02	sw	0.03	0.18	-0.01	0.05	se

Avg. 203-207 0.09 0.55

Name	12/1/2009		Movement From 11/25/2009 to 12/1/2009 (ft)					Total Movement From 11/17/2009 to 12/1/2009 (ft)		
	Measured North	Measured East	North	East	Direction	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Direction
200										
201	474,457.47	1,406,647.93	0.04	0.04	ne	0.06	0.12	0.02	0.16	ne
202	474,499.63	1,406,608.02	0.13	0.16	ne	0.20	0.40	0.23	0.44	ne
203	474,535.00	1,406,558.72	0.22	0.18	ne	0.28	0.56	0.47	0.47	ne
204	474,566.32	1,406,514.29	0.29	0.26	ne	0.39	0.79	0.55	0.53	ne
205	474,601.69	1,406,464.83	0.17	0.18	ne	0.25	0.49	0.47	0.38	ne
206										
207	474,611.12	1,406,553.90	0.18	0.13	ne	0.22	0.44	0.18	0.20	ne
208	474,578.66	1,406,594.64	0.07	0.17	ne	0.18	0.36	0.08	0.29	ne
209	474,543.16	1,406,637.95	0.00	0.07	ne	0.07	0.13	-0.01	0.12	se

Avg. 203-207 0.29 0.57

Note: Total Movement is calculated by comparing the current day survey to the original survey on 11-17-09.

Table 2A
Movement Monitoring Points - 200 Series
11-17-2009 through 12-21-2009

Name	12/10/2009		Movement From 12/1/2009 to 12/10/2009 (ft)					Total Movement From 11/17/2009 to 12/10/2009 (ft)		
	Measured North	Measured East	North	East	Direction	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Direction
200										
201	474,457.54	1,406,648.05	0.07	0.12	ne	0.14	0.19	0.09	0.28	ne
202	474,499.83	1,406,608.34	0.20	0.33	ne	0.38	0.51	0.43	0.77	ne
203	474,535.28	1,406,559.13	0.28	0.41	ne	0.50	0.66	0.74	0.88	ne
204	474,566.75	1,406,514.56	0.43	0.27	ne	0.51	0.68	0.98	0.80	ne
205	474,602.18	1,406,465.01	0.48	0.19	ne	0.52	0.69	0.95	0.57	ne
206										
207	474,611.49	1,406,554.22	0.37	0.32	ne	0.49	0.65	0.56	0.51	ne
208	474,578.97	1,406,594.98	0.31	0.34	ne	0.46	0.61	0.39	0.63	ne
209	474,543.30	1,406,638.02	0.14	0.07	ne	0.16	0.22	0.13	0.19	ne
Avg. 203-207						0.50	0.67			

Name	12/17/2009		Movement From 12/10/2009 to 12/17/2009 (ft)					Total Movement From 11/17/2009 to 12/17/2009 (ft)		
	Measured North	Measured East	North	East	Direction	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Direction
200										
201	474,457.56	1,406,648.21	0.02	0.15	ne	0.15	0.27	0.11	0.43	ne
202	474,499.88	1,406,608.56	0.05	0.21	ne	0.22	0.37	0.48	0.98	ne
203	474,535.47	1,406,559.42	0.18	0.29	ne	0.35	0.59	0.93	1.18	ne
204	474,567.02	1,406,514.87	0.27	0.31	ne	0.41	0.70	1.25	1.11	ne
205	474,602.49	1,406,465.25	0.31	0.24	ne	0.39	0.67	1.26	0.80	ne
206										
207	474,611.71	1,406,554.42	0.22	0.20	ne	0.30	0.52	0.78	0.72	ne
208	474,579.09	1,406,594.98	0.12	0.00	n	0.12	0.20	0.51	0.63	ne
209	474,543.29	1,406,638.03	-0.01	0.01	se	0.02	0.03	0.12	0.20	ne
Avg. 203-207						0.36	0.62			

Name	12/21/2009		Movement From 12/17/2009 to 12/21/2009 (ft)					Total Movement From 11/17/2009 to 12/21/2009 (ft)		
	Measured North	Measured East	North	East	Direction	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Direction
200										
201	474,457.63	1,406,648.26	0.07	0.05	ne	0.09	0.26	0.18	0.49	ne
202	474,500.03	1,406,608.76	0.16	0.20	ne	0.26	0.77	0.64	1.18	ne
203	474,535.72	1,406,559.53	0.26	0.11	ne	0.28	0.84	1.19	1.29	ne
204	474,567.29	1,406,515.06	0.27	0.19	ne	0.33	0.99	1.52	1.30	ne
205	474,602.63	1,406,465.39	0.15	0.14	ne	0.20	0.61	1.41	0.94	ne
206										
207	474,611.90	1,406,554.66	0.18	0.24	ne	0.30	0.90	0.96	0.96	ne
208	474,579.04	1,406,594.96	-0.05	-0.02	sw	0.06	0.17	0.46	0.61	ne
209	474,543.34	1,406,638.10	0.05	0.07	ne	0.09	0.26	0.17	0.27	ne
Avg. 203-207						0.28	0.83			

Note: The original lath used for the survey monitoring included in this table were replaced with wood hubs on 12-22-09. Table 2B presents the survey data from that point forward.

Table 2B
Movement Monitoring Points - 200 Series
12/22/2009 through 1/18/2010

Name	12/22/2009			1/5/2010			Movement From 12/22/2009 to 1/5/2010 (ft)					Total Horizontal Movement From 11/17/2009 to 1/5/2010 (ft)			
	Measured North	Measured East	Measured Elev	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
200	474,470.78	1,406,695.31	835.03	474,470.83	1,406,695.45	835.01	0.05	0.14	-0.01	0.15	0.13				
201	474,457.64	1,406,648.23	845.46	474,457.81	1,406,648.65	845.49	0.17	0.42	0.03	0.45	0.39	0.35	0.90	0.97	0.24
202	474,500.10	1,406,608.82	846.46	474,500.49	1,406,609.35	846.56	0.39	0.53	0.11	0.66	0.57	1.03	1.71	2.00	0.49
203	474,535.66	1,406,559.59	845.65	474,536.41	1,406,560.16	845.75	0.75	0.57	0.11	0.94	0.81	1.94	1.86	2.68	0.66
204	474,567.34	1,406,514.99	844.88	474,568.13	1,406,515.52	844.99	0.79	0.53	0.11	0.95	0.82	2.31	1.83	2.94	0.72
205	474,602.90	1,406,465.43	844.86	474,603.71	1,406,465.96	844.98	0.81	0.53	0.12	0.96	0.83	2.22	1.47	2.66	0.65
206	474,652.57	1,406,507.89	827.92	474,653.30	1,406,508.40	828.02	0.73	0.51	0.09	0.89	0.77				
207	474,611.97	1,406,554.50	829.02	474,612.63	1,406,555.13	829.30	0.65	0.63	0.28	0.90	0.78	1.62	1.58	2.26	0.55
208	474,578.96	1,406,595.01	830.54	474,579.12	1,406,595.17	830.69	0.16	0.16	0.15	0.22	0.19	0.61	0.77	0.98	0.24
209	474,543.25	1,406,638.00	832.74	474,543.39	1,406,638.17	832.77	0.14	0.17	0.03	0.22	0.19	0.31	0.45	0.55	0.13
210	474,480.94	1,406,440.32	870.62	474,481.64	1,406,440.89	870.58	0.70	0.57	-0.04	0.90	0.77				
211	474,518.13	1,406,471.25	862.27	474,518.93	1,406,471.75	862.27	0.80	0.49	0.00	0.94	0.81				

Avg. 203-207 0.94 0.80

Name	1/18/2010			Movement From 1/5/2010 to 1/18/2010 (ft)					Movement From 12/22/2009 to 1/18/2010 (ft)					Total Horizontal Movement From 11/17/2009 to 1/18/2010 (ft)			
	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
200	474,470.81	1,406,695.44	835.01	-0.02	-0.01	-0.01	0.02	0.02	0.03	0.13	-0.02	0.13	0.06				
201	474,457.89	1,406,649.08	845.59	0.07	0.43	0.10	0.43	0.40	0.24	0.84	0.13	0.88	0.39	0.42	1.33	1.40	0.27
202	474,500.96	1,406,609.92	846.75	0.47	0.57	0.18	0.74	0.68	0.86	1.11	0.29	1.40	0.62	1.50	2.29	2.73	0.53
203	474,537.12	1,406,560.84	845.97	0.71	0.67	0.22	0.98	0.91	1.46	1.24	0.32	1.92	0.85	2.65	2.53	3.66	0.71
204	474,568.94	1,406,516.05	845.13	0.81	0.52	0.13	0.97	0.89	1.60	1.05	0.25	1.92	0.85	3.12	2.35	3.91	0.76
205	474,604.44	1,406,466.51	845.11	0.73	0.56	0.13	0.92	0.85	1.54	1.08	0.25	1.88	0.84	2.95	2.03	3.58	0.69
206	474,654.25	1,406,508.94	828.18	0.94	0.53	0.16	1.08	1.00	1.67	1.05	0.26	1.97	0.88				
207	474,613.71	1,406,555.91	829.48	1.08	0.78	0.18	1.33	1.23	1.73	1.40	0.46	2.23	0.99	2.70	2.36	3.58	0.69
208	474,579.37	1,406,595.35	830.69	0.25	0.18	0.00	0.31	0.28	0.41	0.34	0.15	0.53	0.24	0.86	0.95	1.28	0.25
209	474,543.53	1,406,638.41	832.81	0.14	0.24	0.04	0.28	0.25	0.28	0.41	0.08	0.50	0.22	0.45	0.68	0.82	0.16
210																	
211	474,519.70	1,406,472.37	862.26	0.76	0.62	-0.01	0.98	0.91	1.56	1.11	-0.01	1.92	0.85				

Avg. 203-207 0.99 0.91 1.92 0.85 3.72 0.72

Name	2/4/2010			Movement From 1/18/2010 to 2/4/2010 (ft)					Movement From 12/22/2009 to 2/4/2010 (ft)					Total Horizontal Movement From 11/17/2009 to 2/4/2010 (ft)			
	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
200	Point Buried by Berm Construction																
201	474,458.08	1,406,649.47	845.79	0.20	0.39	0.19	0.44	0.31	0.44	1.24	0.33	1.31	0.36	0.62	1.72	1.83	0.28
202	474,501.43	1,406,610.71	846.99	0.47	0.78	0.25	0.91	0.64	1.33	1.89	0.53	2.31	0.63	1.97	3.07	3.64	0.55
203	474,538.00	1,406,561.64	846.10	0.87	0.81	0.13	1.19	0.84	2.34	2.05	0.45	3.11	0.85	3.52	3.34	4.85	0.74
204	474,569.86	1,406,516.83	845.06	0.91	0.78	-0.07	1.20	0.85	2.51	1.83	0.18	3.11	0.85	4.03	3.13	5.10	0.78
205	474,605.40	1,406,467.24	845.18	0.96	0.72	0.07	1.20	0.85	2.49	1.81	0.32	3.08	0.84	3.91	2.75	4.78	0.73
206	Point Buried by Berm Construction																
207	Point Buried by Berm Construction																
208	Point Buried by Berm Construction																
209	Point Buried by Berm Construction																
210																	
211	474,520.65	1,406,473.11	862.15	0.95	0.74	-0.11	1.21	0.85	2.52	1.86	-0.12	3.13	1.39				
212	474,647.39	1,406,503.30	836.22														
213	474,605.10	1,406,548.54	837.78														
214	474,572.98	1,406,590.56	837.78														
215	474,538.54	1,406,635.23	839.28														
216	474,468.06	1,406,685.81	841.04														

Avg. 203-205 1.20 0.84 3.10 0.85 4.91 0.75

Table 2B
Movement Monitoring Points - 200 Series
12/22/2009 through 1/18/2010

Name	2/26/2010			Movement From 2/4/2010 to 2/26/2010 (ft)					Movement From 12/22/2009 to 2/26/2010 (ft)					Total Horizontal Movement From 11/17/2009 to 2/26/2010 (ft)			
	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
200	Point Buried by Berm Construction																
201	474,458.45	1,406,650.28	845.68	0.37	0.81	-0.10	0.89	0.48	0.81	2.04	0.23	2.20	0.40	0.99	2.53	2.72	0.32
202	474,502.47	1,406,611.92	846.94	1.04	1.22	-0.05	1.60	0.87	2.36	3.11	0.49	3.90	0.71	3.00	4.29	5.23	0.62
203	474,539.25	1,406,562.84	845.93	1.25	1.19	-0.18	1.73	0.94	3.59	3.24	0.28	4.84	0.88	4.78	4.53	6.58	0.78
204	474,571.26	1,406,517.96	844.53	1.41	1.14	-0.52	1.81	0.99	3.92	2.97	-0.35	4.92	0.89	5.44	4.26	6.91	0.82
205	474,606.61	1,406,468.37	844.74	1.22	1.14	-0.44	1.67	0.91	3.71	2.94	-0.12	4.74	0.86	5.12	3.89	6.43	0.76
211																	
212	474,648.35	1,406,504.16	835.99	0.96	0.86	-0.24	1.29	0.70									
213	474,606.30	1,406,549.57	837.18	1.19	1.04	-0.60	1.58	0.86									
214																	
215	474,539.00	1,406,635.84	839.06	0.46	0.61	-0.22	0.77	0.42									
216	474,468.32	1,406,686.38	840.60	0.26	0.57	-0.45	0.62	0.34									

Avg. 203-205 1.73 0.95 4.83 0.88 6.64 0.79

Name	3/9/2010			Movement From 2/26/2010 to 3/9/2010 (ft)					Movement From 12/22/2009 to 3/9/2010 (ft)					Total Horizontal Movement From 11/17/2009 to 3/9/2010 (ft)			
	Measured North	Measured East	Measured Elev	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Elev	Net Horizontal Movement (ft)	Daily Rate (in/day)	North	East	Net Horizontal Movement (ft)	Daily Rate (in/day)
200	Point Buried by Berm Construction																
201	474,458.41	1,406,650.39	846.00	-0.04	0.12	0.32	0.12	0.14	0.77	2.16	0.54	2.29	0.36	0.95	2.65	2.81	0.30
202	474,502.84	1,406,612.26	847.20	0.38	0.34	0.25	0.51	0.55	2.74	3.45	0.74	4.41	0.69	3.38	4.63	5.73	0.61
203	474,539.76	1,406,563.14	846.15	0.51	0.30	0.22	0.59	0.64	4.10	3.54	0.50	5.42	0.84	5.28	4.83	7.16	0.77
204	474,571.78	1,406,518.35	844.58	0.51	0.39	0.04	0.64	0.70	4.43	3.36	-0.30	5.56	0.87	5.95	4.65	7.55	0.81
205	474,607.04	1,406,468.74	844.79	0.42	0.37	0.05	0.56	0.61	4.13	3.31	-0.07	5.30	0.83	5.55	4.25	6.99	0.75
211																	
212	474,648.66	1,406,504.35	836.16	0.31	0.19	0.17	0.36	0.39									
213	474,606.64	1,406,549.80	837.30	0.34	0.23	0.12	0.41	0.45									
214	474,574.01	1,406,591.44	837.68														
215	474,539.14	1,406,635.95	839.32	0.14	0.10	0.26	0.18	0.19									
216	474,468.37	1,406,686.55	840.93	0.06	0.17	0.34	0.18	0.20									

Avg. 203-205 0.60 0.65 5.42 0.85 7.23 0.78

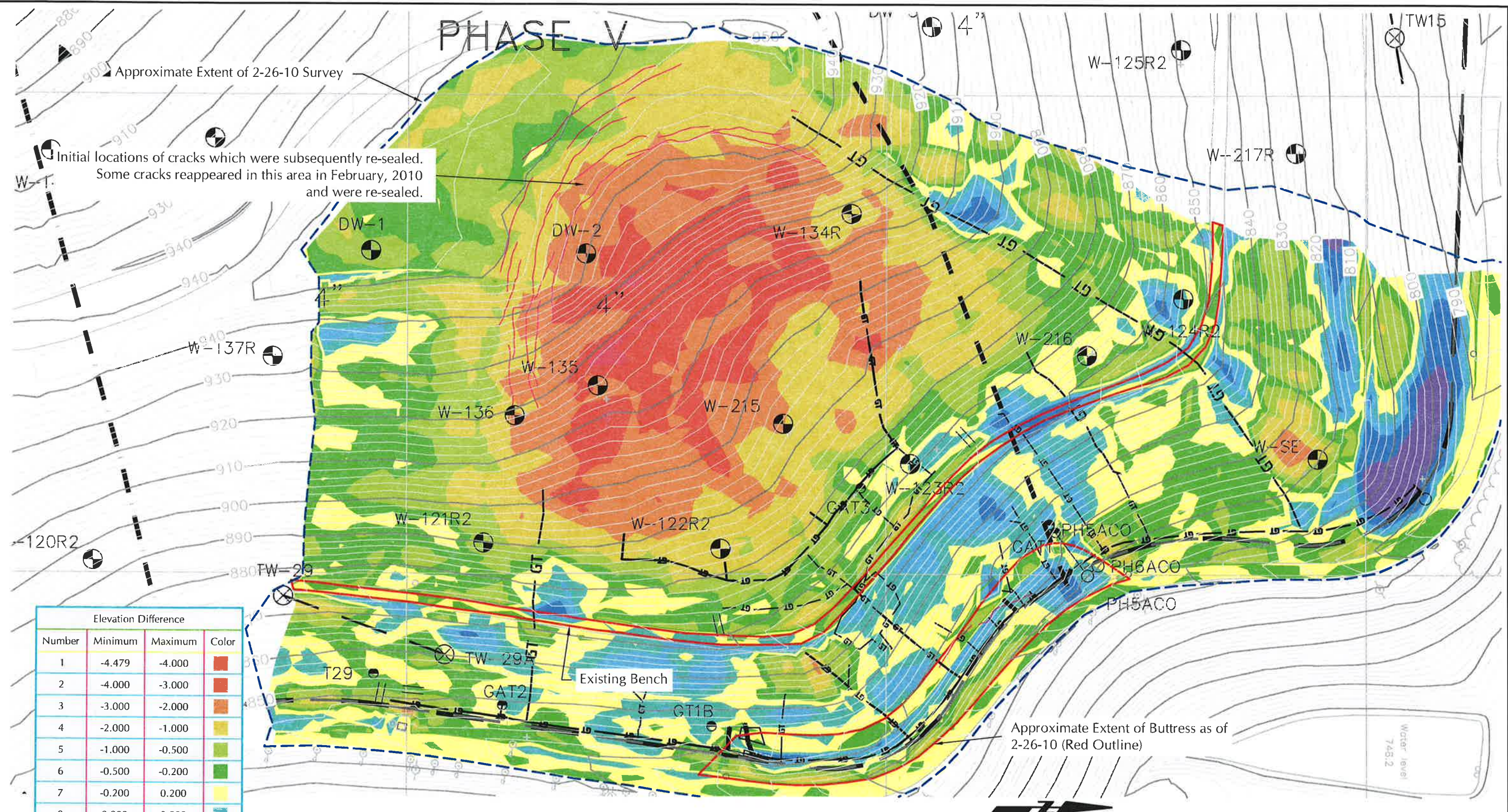
Note: Total movement since 12-22-09 is calculated by comparing the current day survey to the survey on 12/22/09.

Note: Total movement since 11-17-09 is calculated by adding the total movement between the survey date and 12/22/09 to the total movement from 11-17-09 through 12-21-09 (Table 2A).

0 100 FEET

FIGURE
1

G:\LFR\Projects\034-00156-00_Rumpke_RSL - North End Engineering Support\Technical\Figures\settlement monitoring 20-02-26.dwg LAYOUT: FIG 2 SAVED: 3/10/2010 9:49 AM ACADVER: 17.1 (LMS TECH) PAGES: 17 PLOTTED: 3/11/2010 10:05 AM BY: HOLM, JOHN



Elevation Difference			
Number	Minimum	Maximum	Color
1	-4.479	-4.000	Red
2	-4.000	-3.000	Dark Red
3	-3.000	-2.000	Orange
4	-2.000	-1.000	Light Orange
5	-1.000	-0.500	Yellow
6	-0.500	-0.200	Light Green
7	-0.200	0.200	Yellow-Green
8	0.200	0.500	Green
9	0.500	1.000	Light Blue
10	1.000	2.000	Blue
11	2.000	3.000	Dark Blue
12	2.000	3.265	Purple

Note: The topography shown is a composite of the 2-26-10 ground survey and the 11-28-09 aerial survey.

RUMPKE SANITARY LANDFILL, INC.
HAMILTON COUNTY, OHIO
SETTLEMENT MONITORING

Surveyed Settlement 2-26-10 Ground Survey vs. 1-29-10 Ground Survey

 **ARCADIS**

FIGURE
2

PHASE V

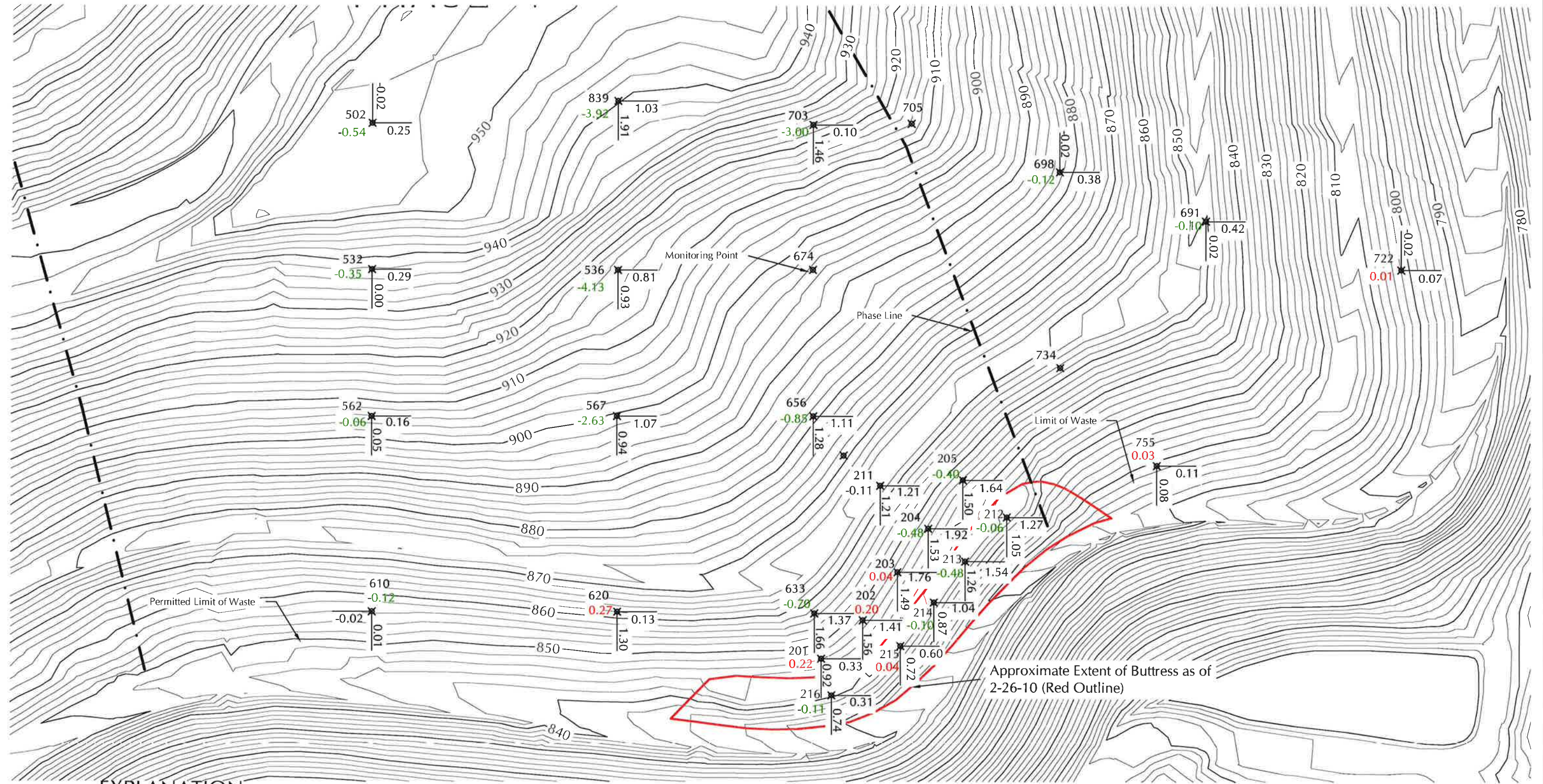
Approximate Extent of Buttress as of 2-26-10 (Outlined in Red)

Water Elev: 743.2

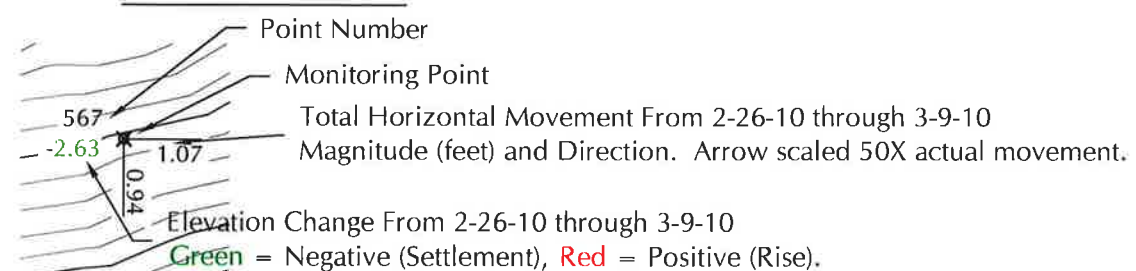
Note: The topography shown is a composite of the 2-26-10 ground survey and the 11-28-09 aerial survey.

**Annualized Settlement Rate as % of
Original Waste Thickness Based on
Settlement From 1-29-2010 to 2-26-2010**





EXPLANATION



Note:
Displacements shown on this figure are the total lateral displacement between February 26, 2010 and March 9, 2010.
Topography shown is a composite of the ground survey of 2-26-10 and the aerial topography of 11-28-09.



RUMPKE SANITARY LANDFILL, INC.
HAMILTON COUNTY, OHIO
SLOPE STABILITY ANALYSIS

Horizontal Movement Monitoring Points
Total Horizontal Movement From
2-26-2010 to 3-9-2010

