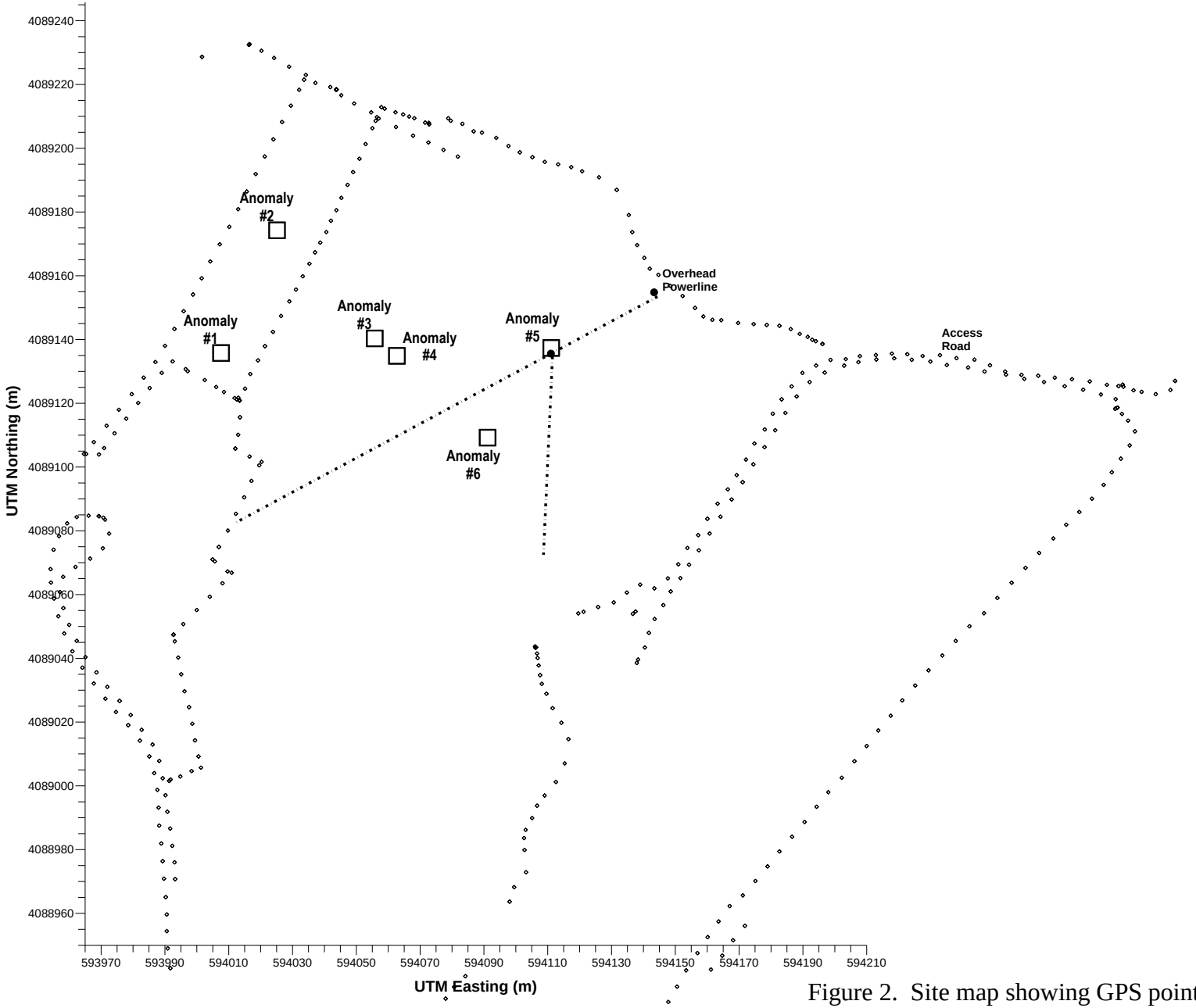


Figure 2. Site map showing GPS points along the perimeter of the field, and access roads. Also shown are the 6 Anomalies identified in the 2001 geophysical survey, and the positions of overhead powerlines. The Anomalies and overhead powerlines will be shown on subsequent figures for reference.

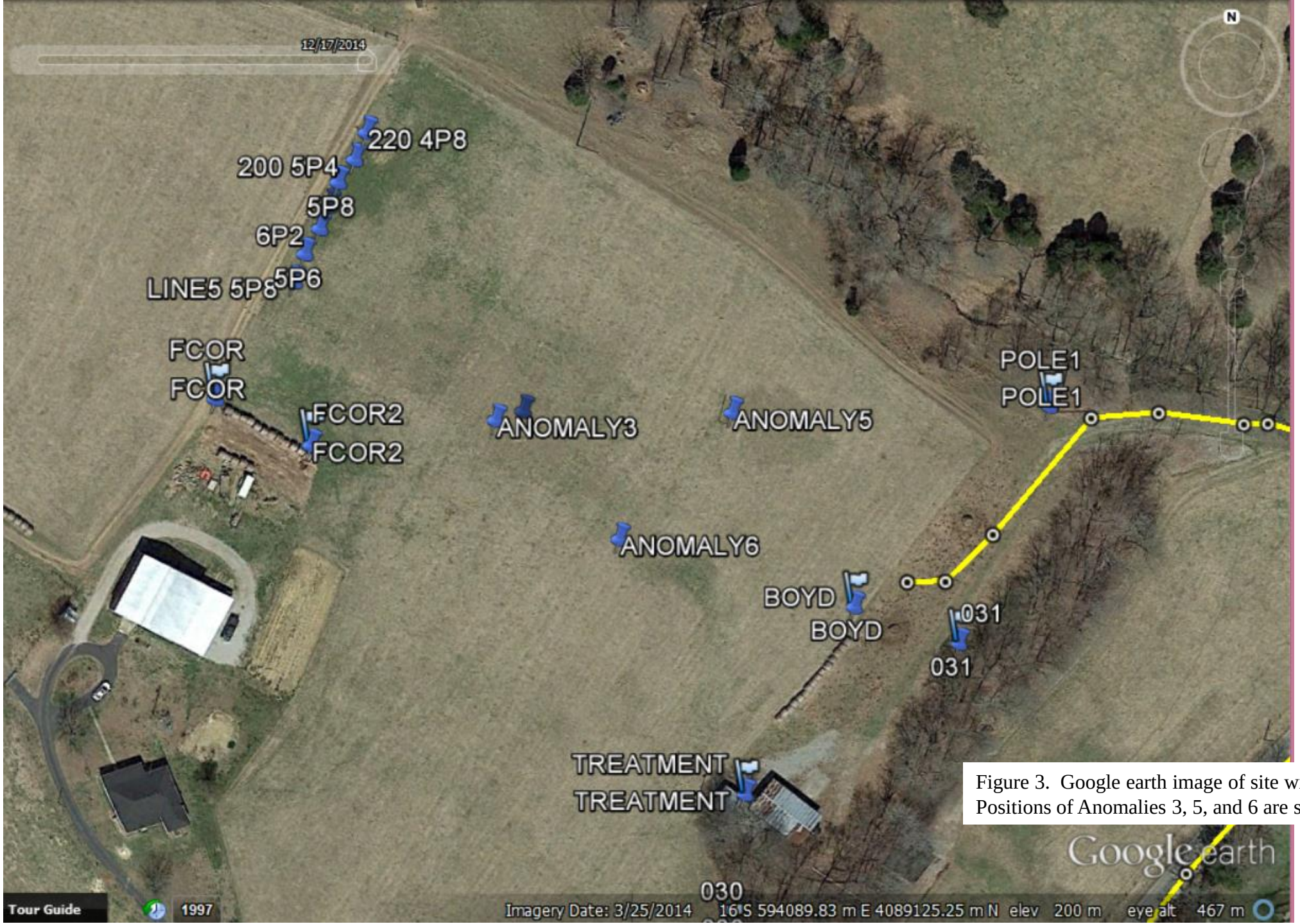


Figure 3. Google earth image of site with GPS positions overlain. Positions of Anomalies 3, 5, and 6 are shown.

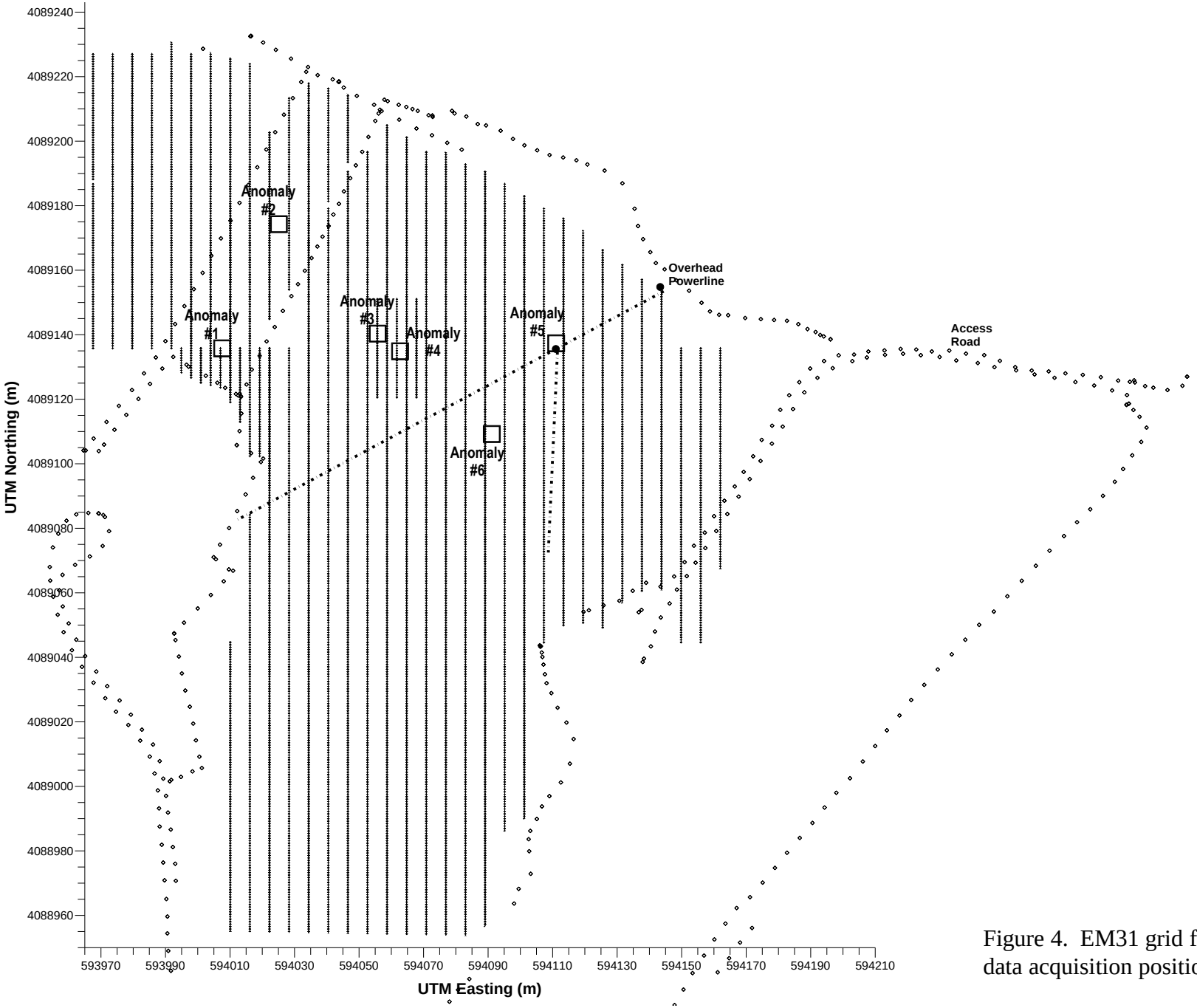


Figure 4. EM31 grid from the 2001 survey, showing approximate data acquisition positions.

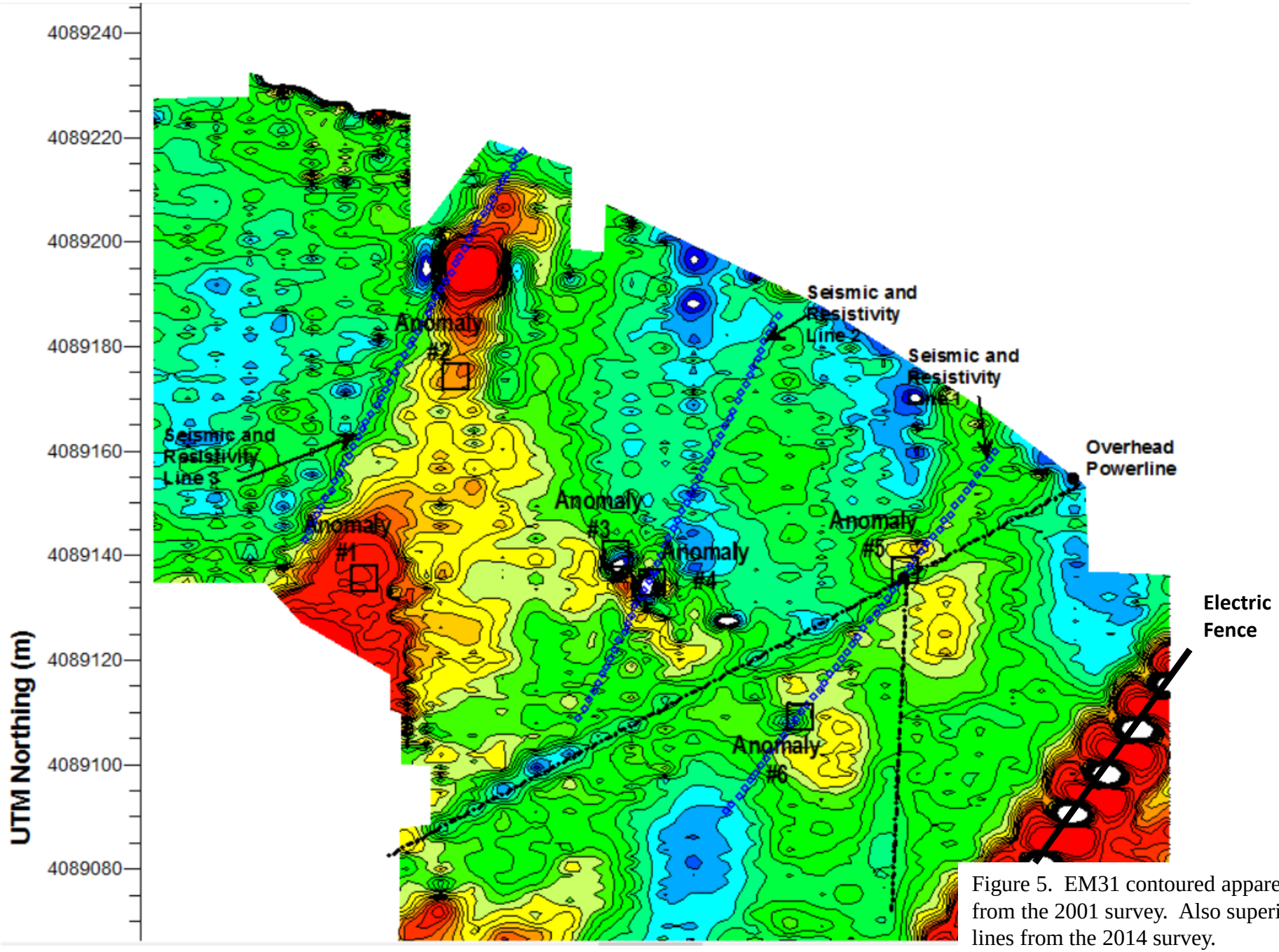


Figure 5. EM31 contoured apparent conductivity in the northern area from the 2001 survey. Also superimposed are the seismic and resistivity lines from the 2014 survey.

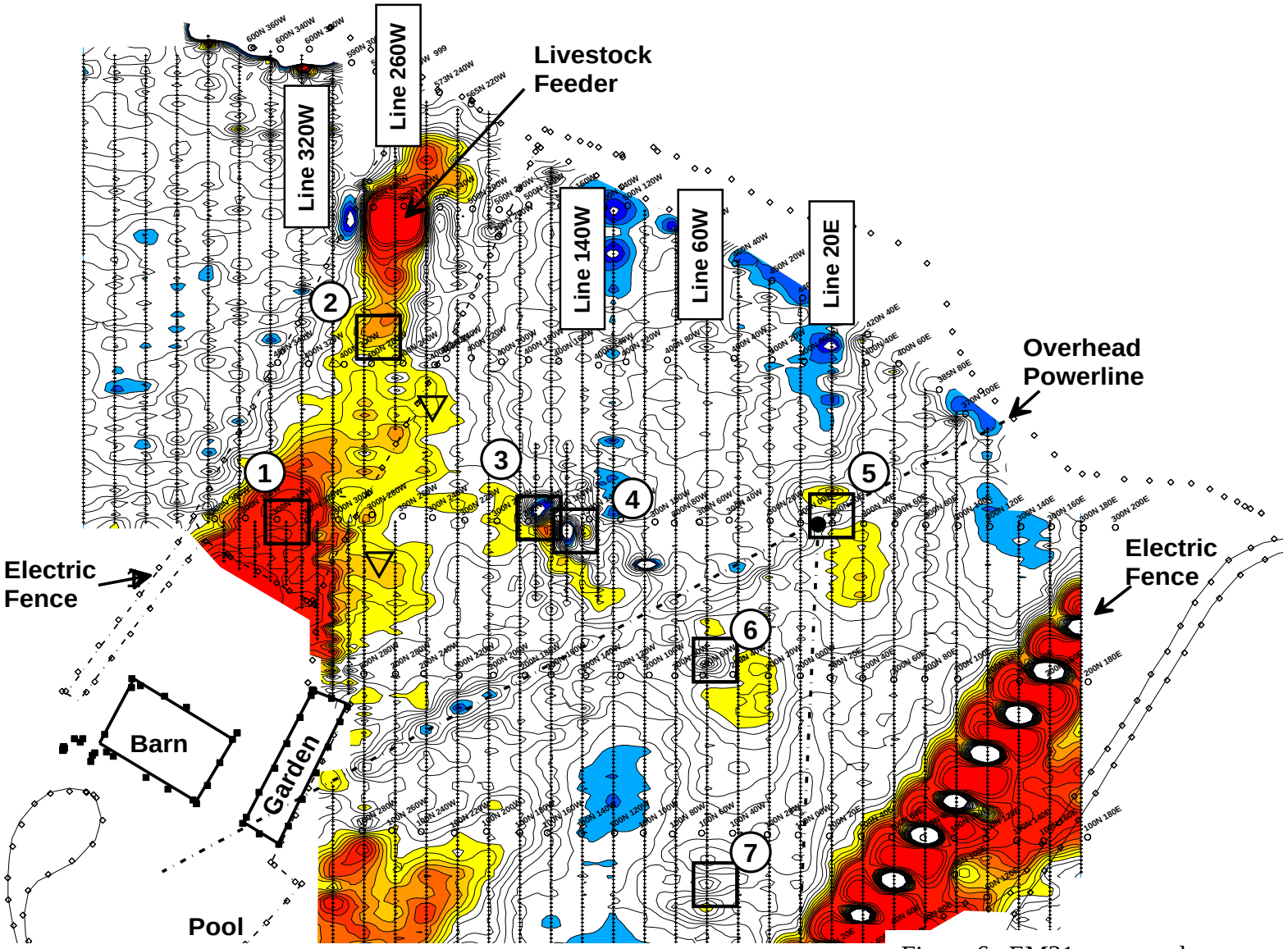


Figure 6. EM31 contoured apparent conductivity figure from from the 2001 survey report.

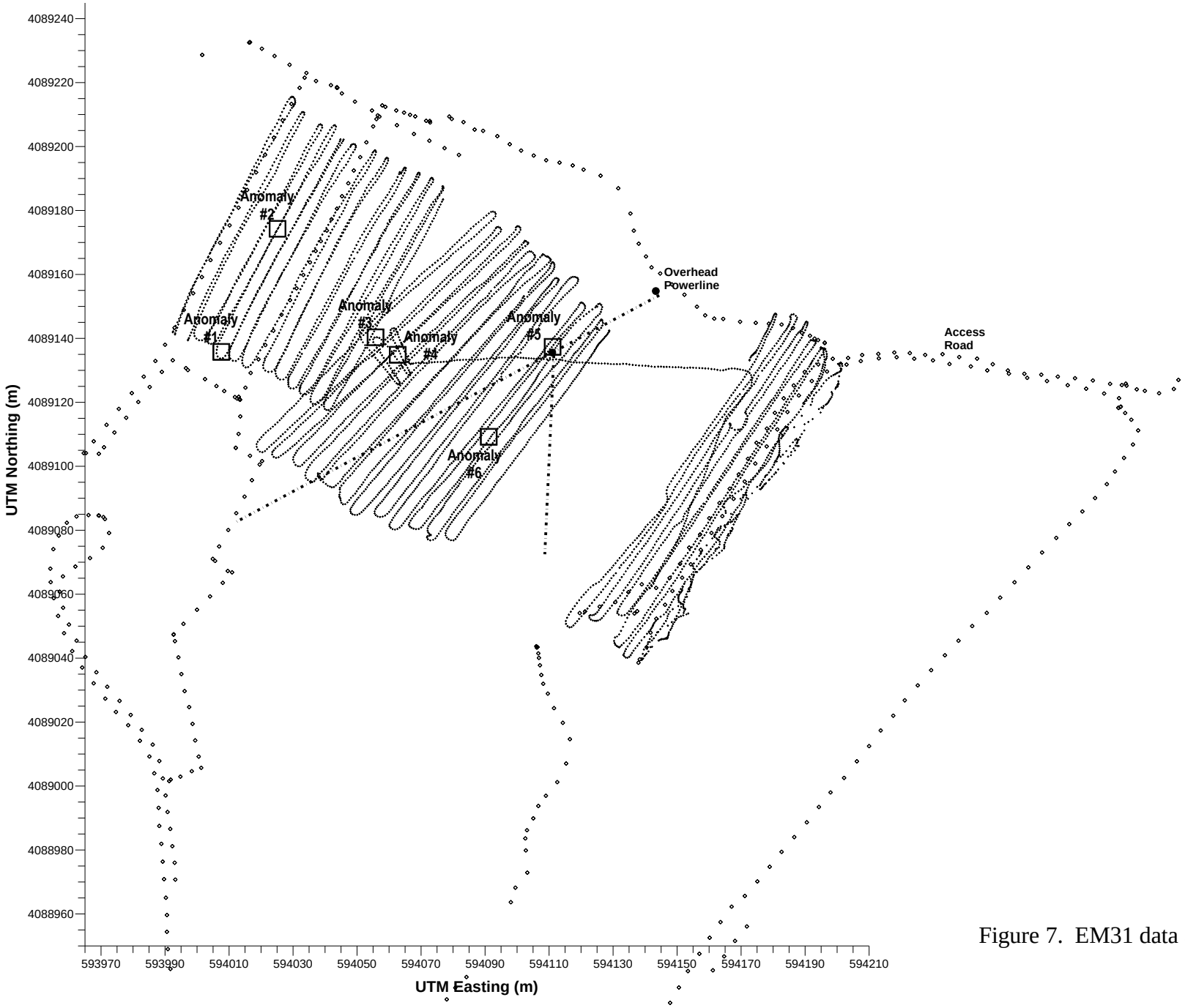


Figure 7. EM31 data acquisition positions from this survey.

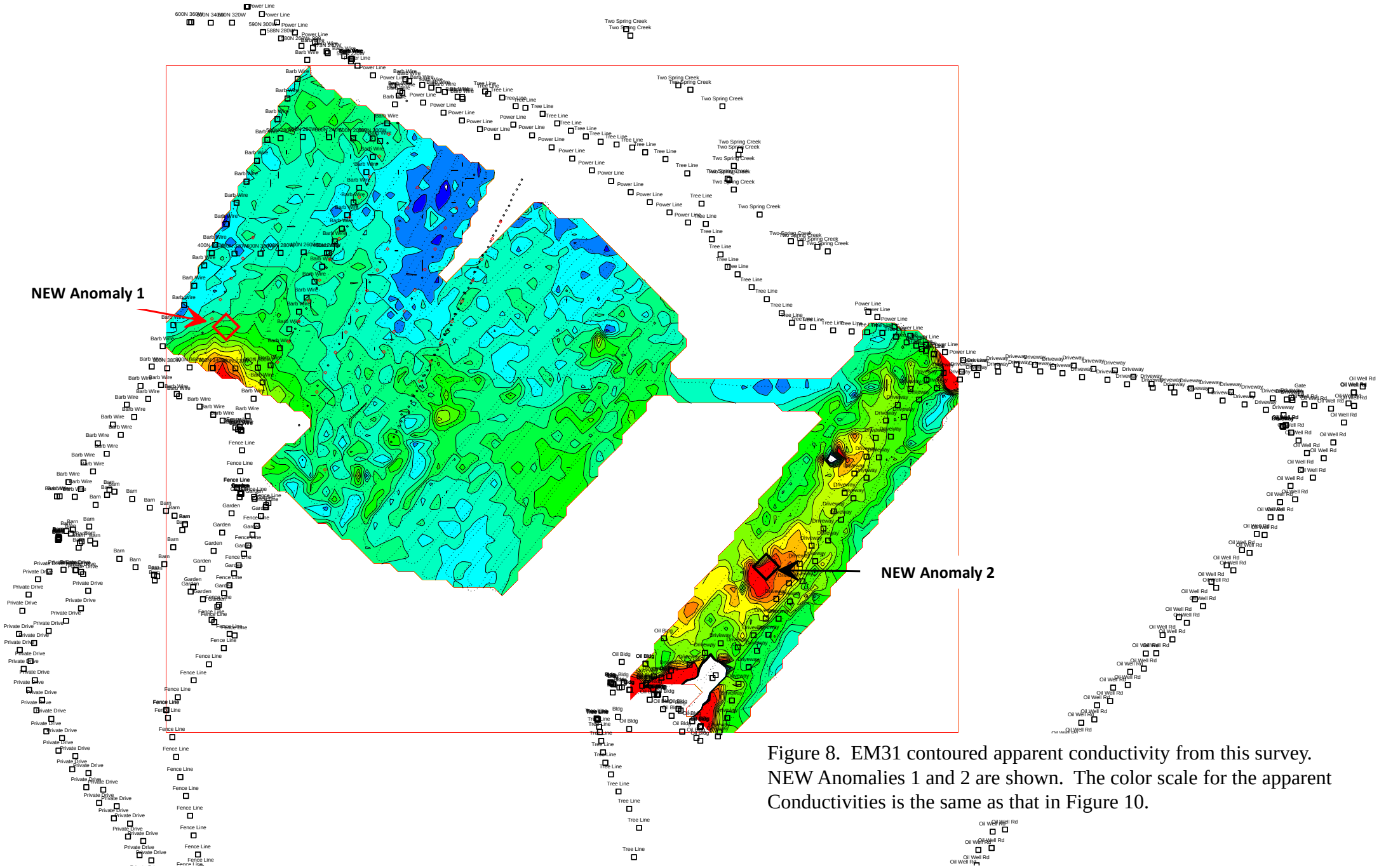


Figure 8. EM31 contoured apparent conductivity from this survey. NEW Anomalies 1 and 2 are shown. The color scale for the apparent Conductivities is the same as that in Figure 10.

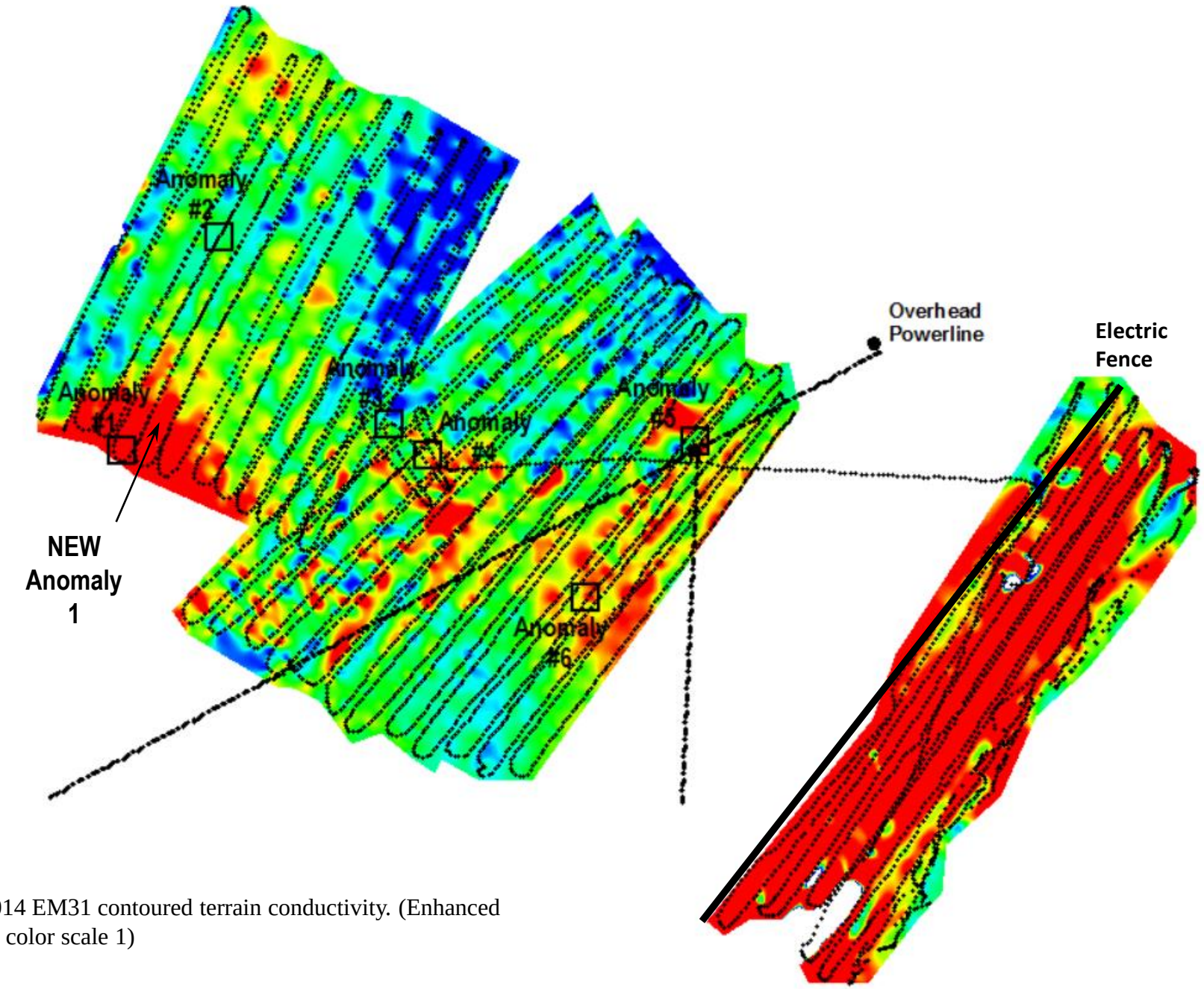


Figure 9. 2014 EM31 contoured terrain conductivity. (Enhanced conductivity color scale 1)

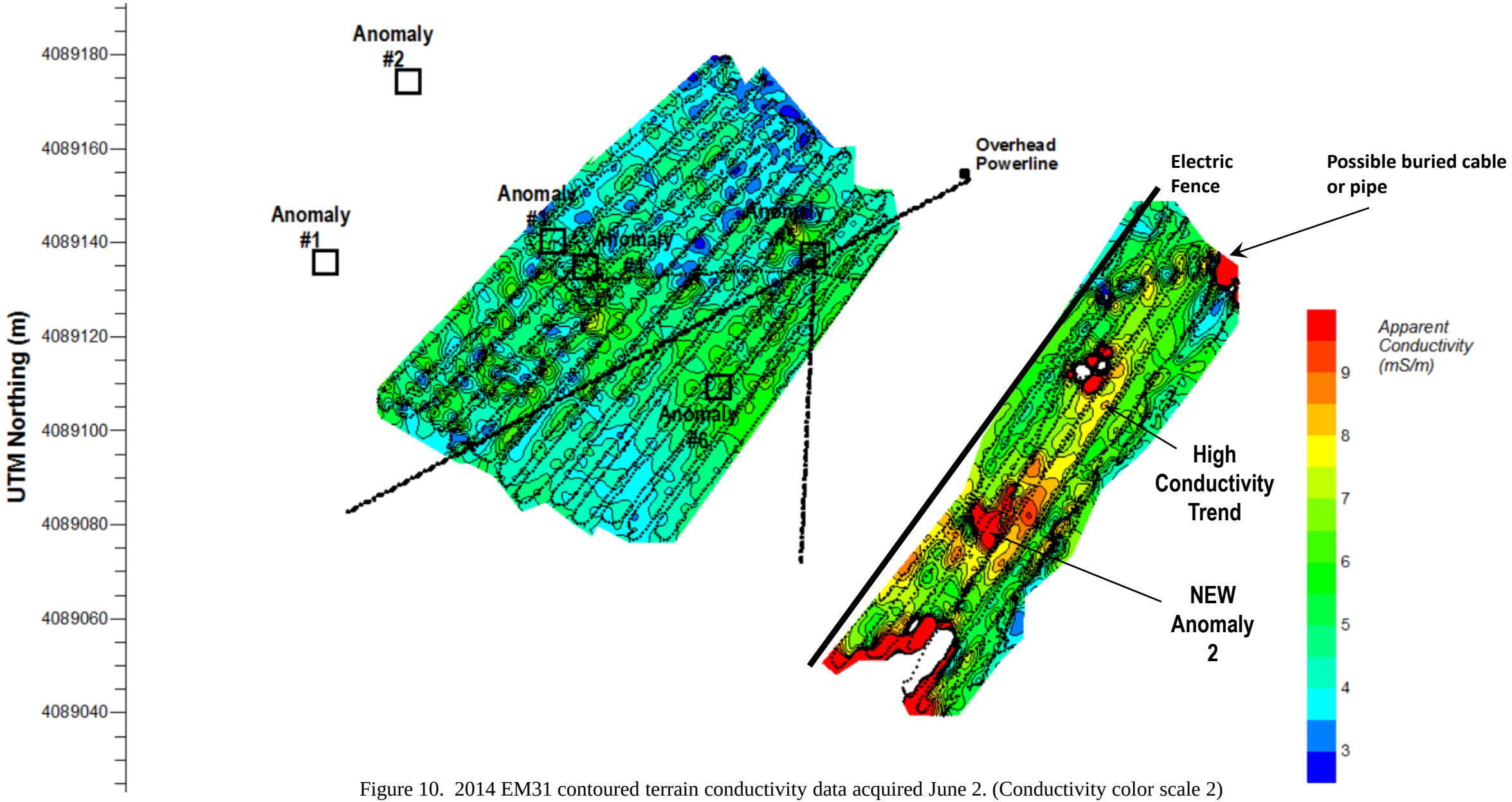


Figure 10. 2014 EM31 contoured terrain conductivity data acquired June 2. (Conductivity color scale 2)

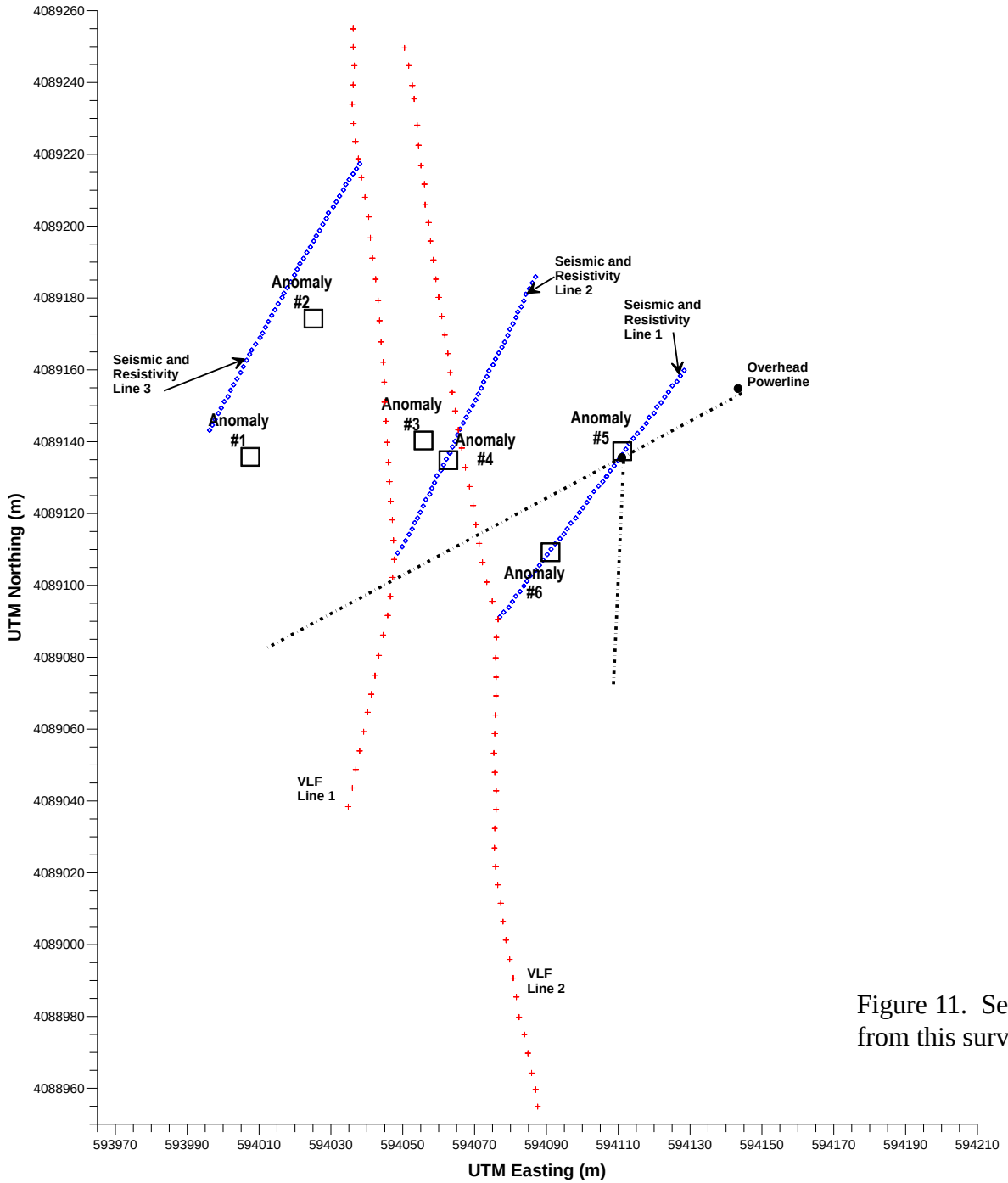


Figure 11. Seismic and multi-electrode resistivity data acquisition positions from this survey. Also shown are VLF station positions and Line numbers.

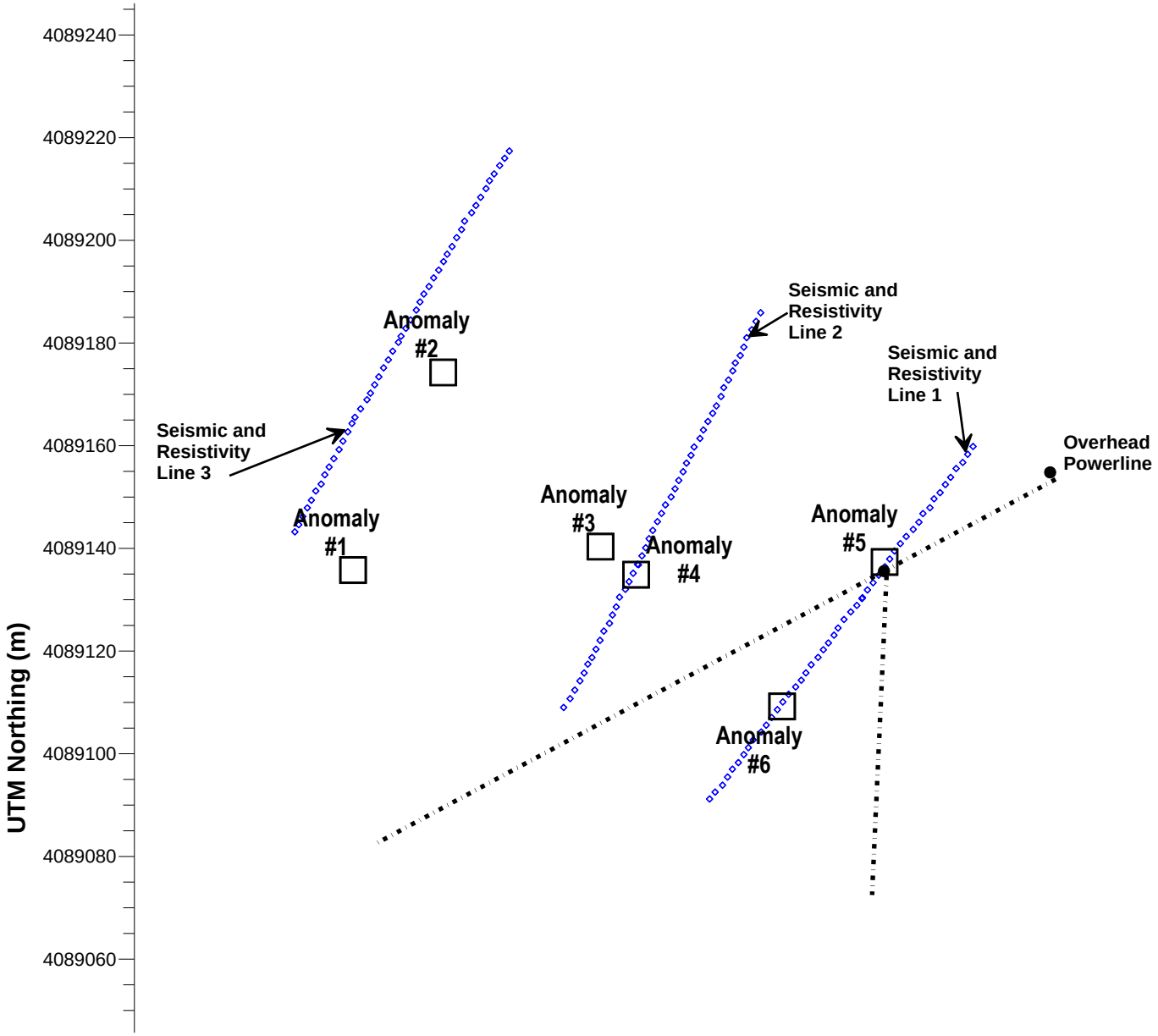


Figure 12. Seismic and multi-electrode resistivity data acquisition positions from this survey.

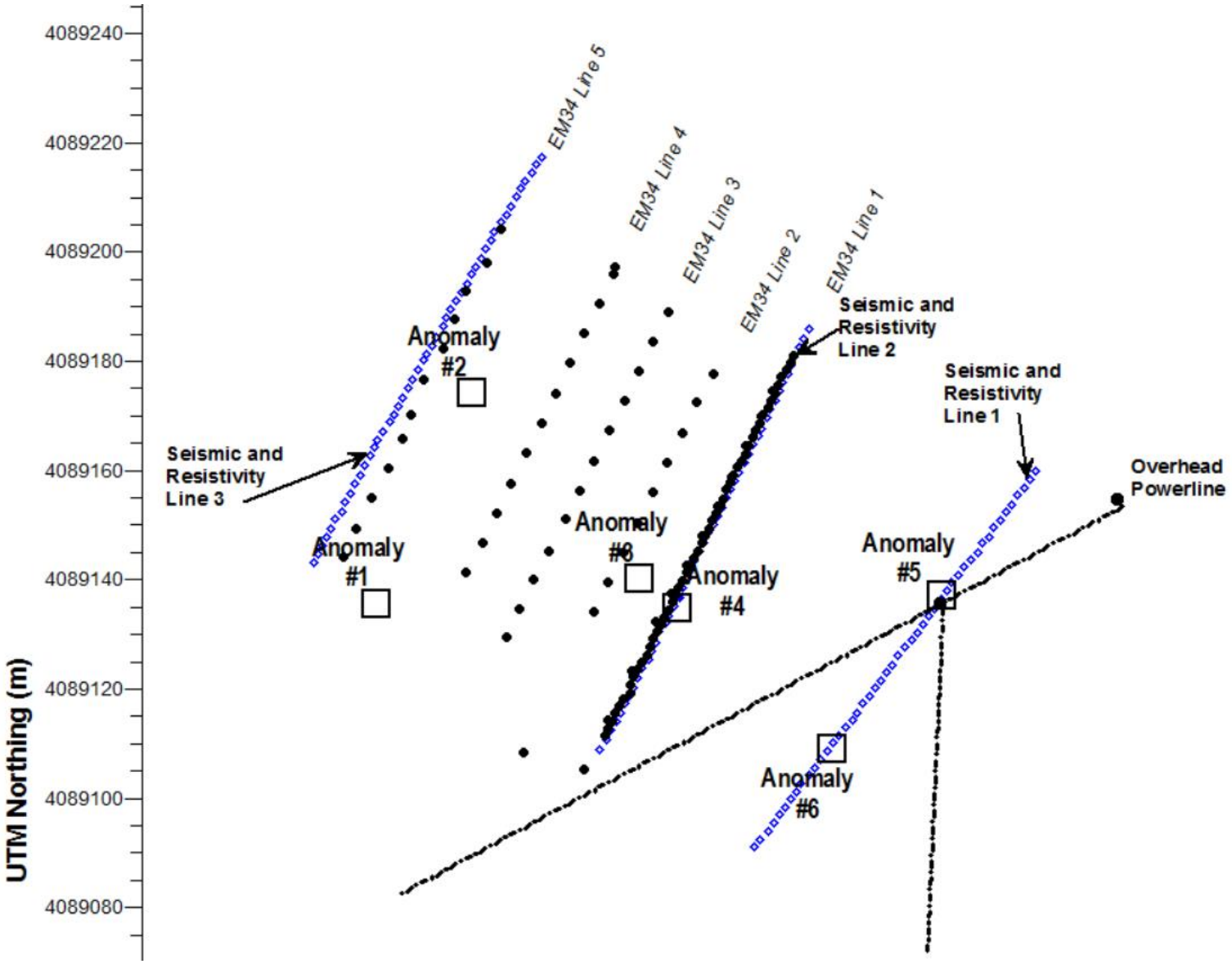


Figure 13. Seismic, multi-electrode resistivity, and EM34 data acquisition positions from this survey.

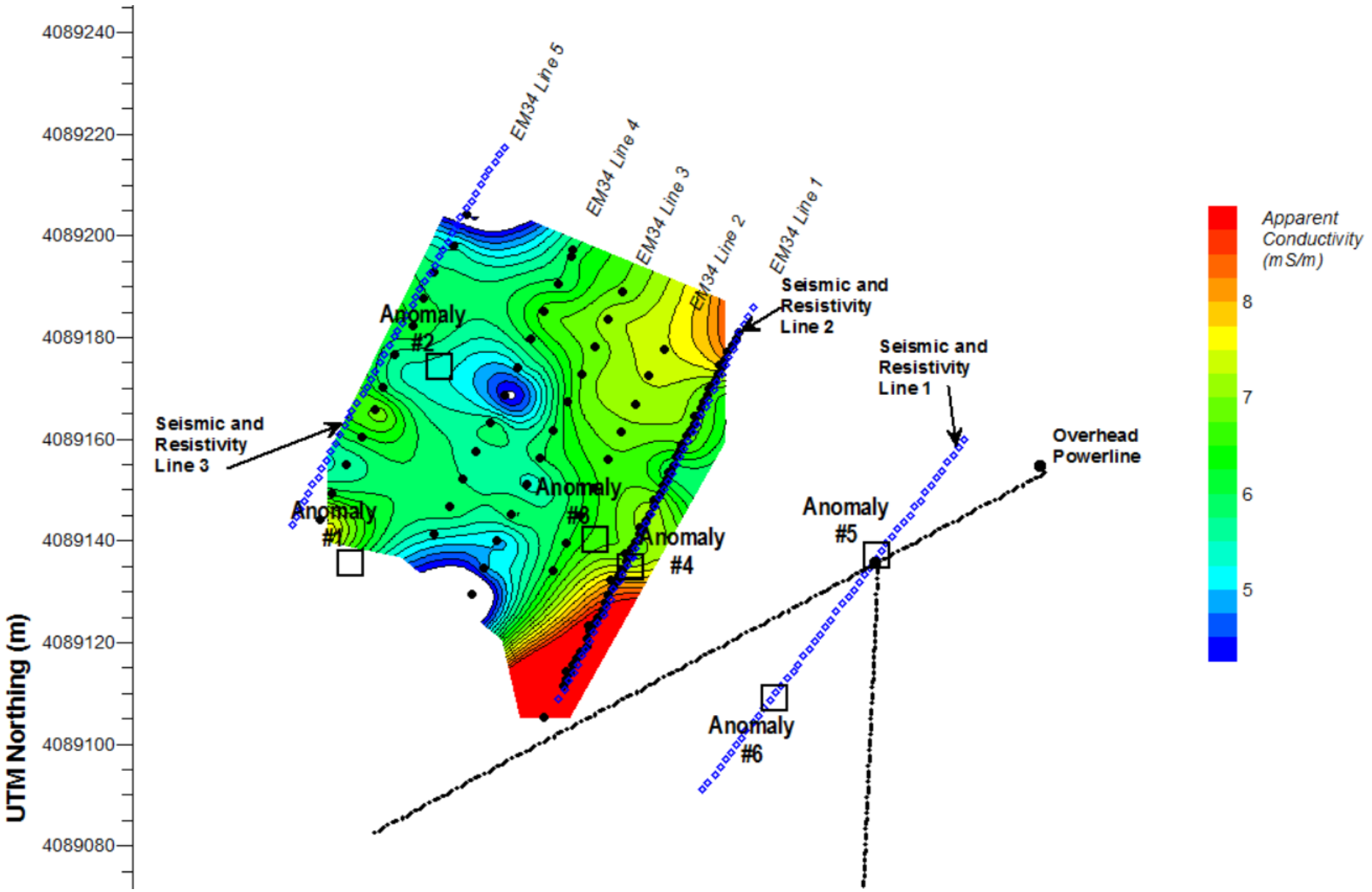


Figure 14. Contoured EM34 terrain conductivity.

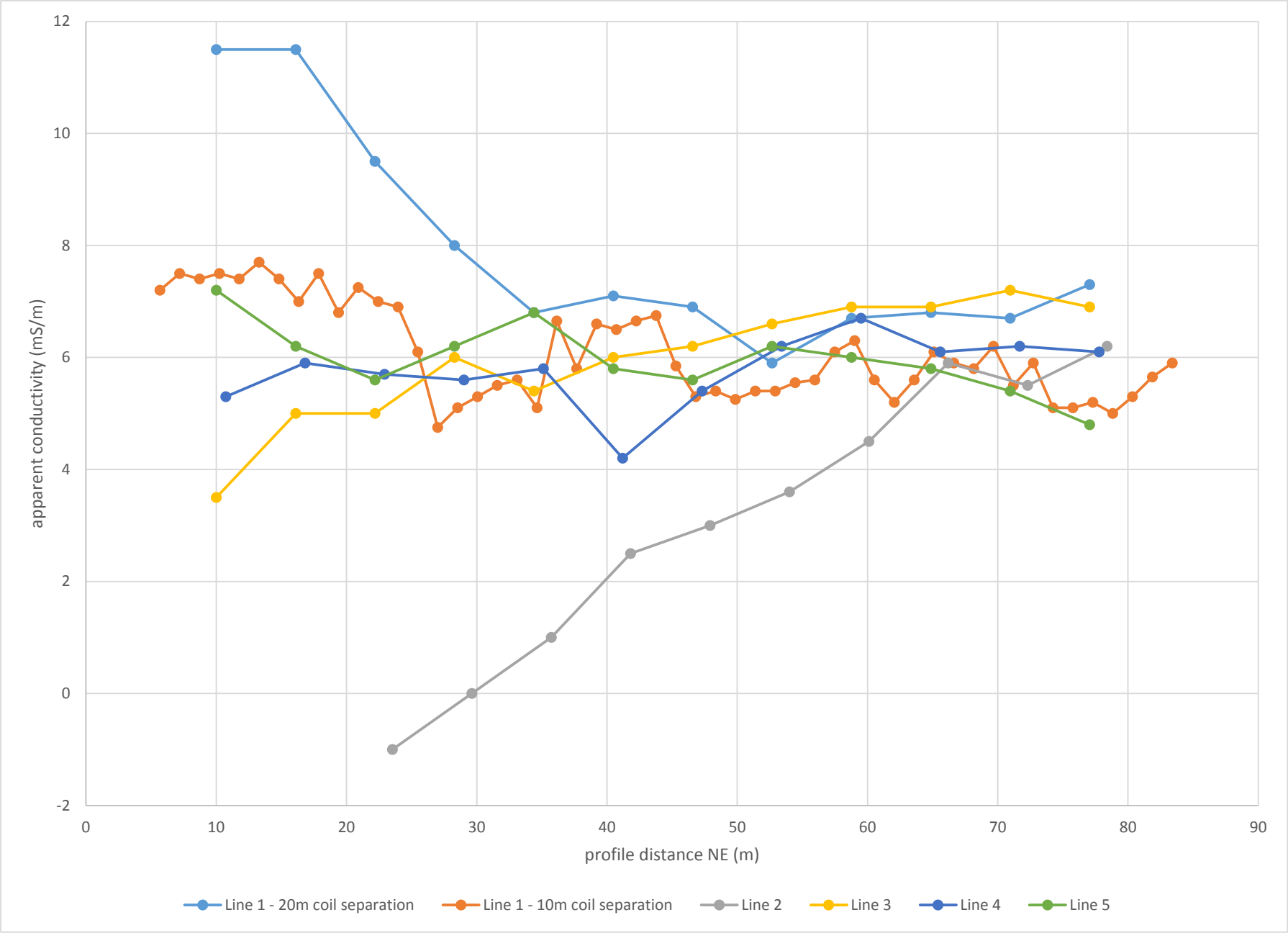


Figure 15. EM34 profile plots of conductivity vs distance toward the northeast.

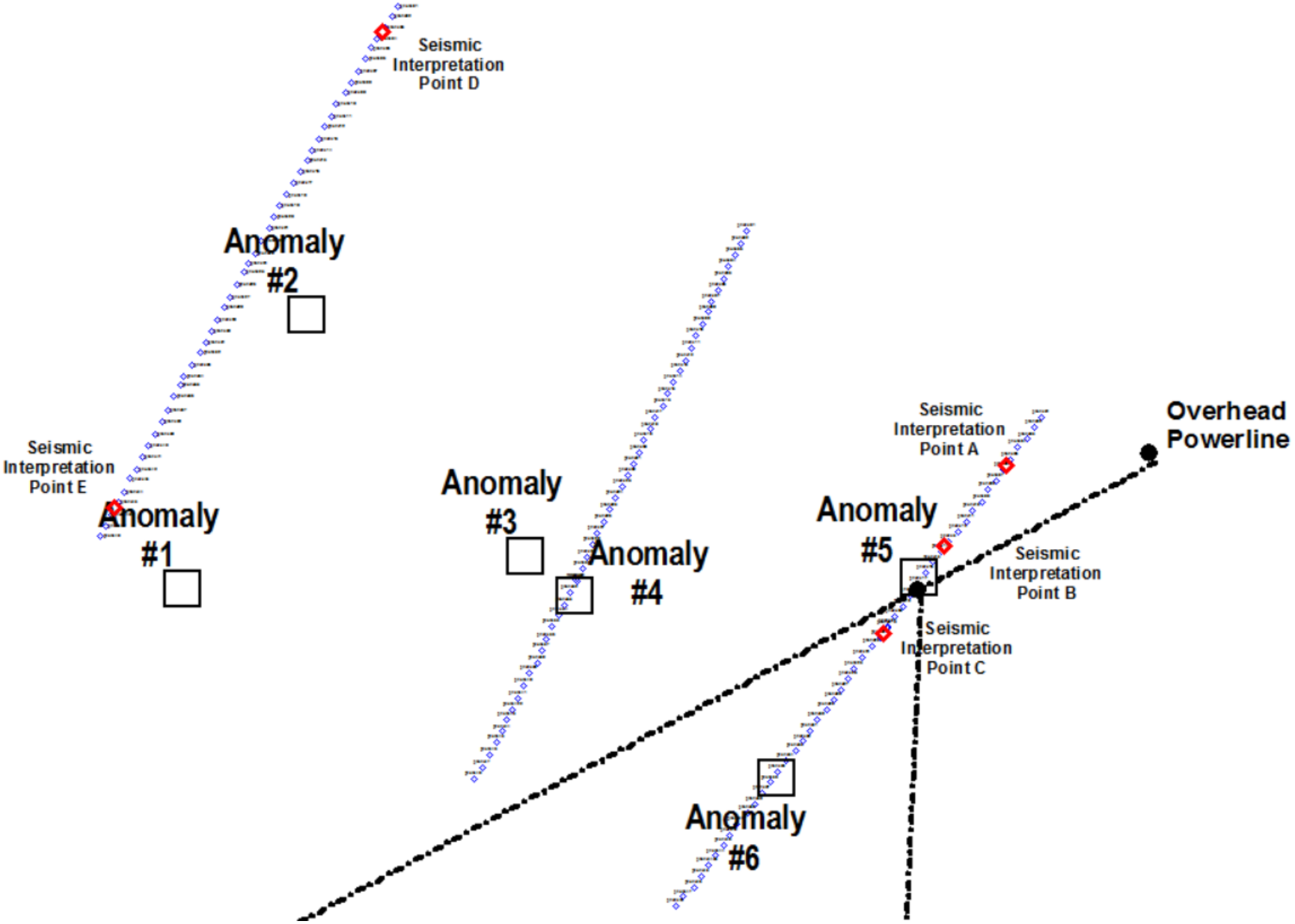


Figure 16. Seismic data-acquisition profiles showing interpretation points A, B, C, D, and E.

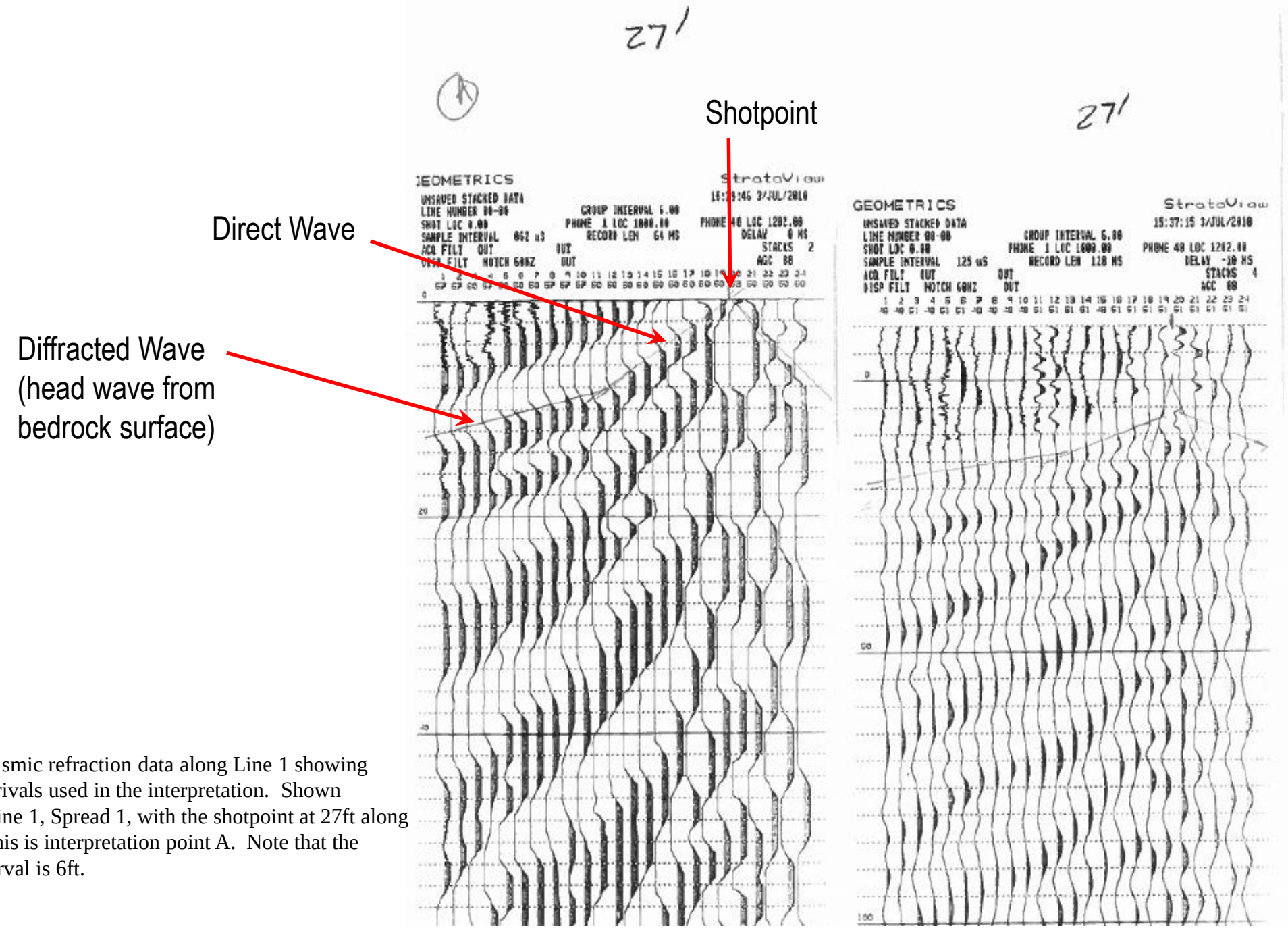


Figure 17. Seismic refraction data along Line 1 showing picked first arrivals used in the interpretation. Shown is data from Line 1, Spread 1, with the shotpoint at 27ft along the profile. This is interpretation point A. Note that the geophone interval is 6ft.

Seismic

LINE 1

		Interpretation Results			
shotpoint	depth (ft)	depth (m)	velocity 1 (ft/s)	velocity 2 (ft/s)	intercept t (s)
A	15.0	4.6	5379.2	15528.0	0.00522
interpretation			soil	bedrock	
	A	shot at	27	ft along line	
	geophone	dist. (ft)	time (ms)		
	19	3	0.4		
	18	9	1.2		
	17	15	2		
	16	21	2.5		
	15	27	4.6		
	14	33	5.5		
	13	39	6.5		
	12	45	8.2		
	11	51	8.6		
	10	57	9.1		
	9	63	9		
	8	69	9.6		
	7	75	10		
	6	81	10.4		
	5	87	10.7		
	4	93	11.2		
	3	99	12		
	2	105	12		
	1	111	12.2		

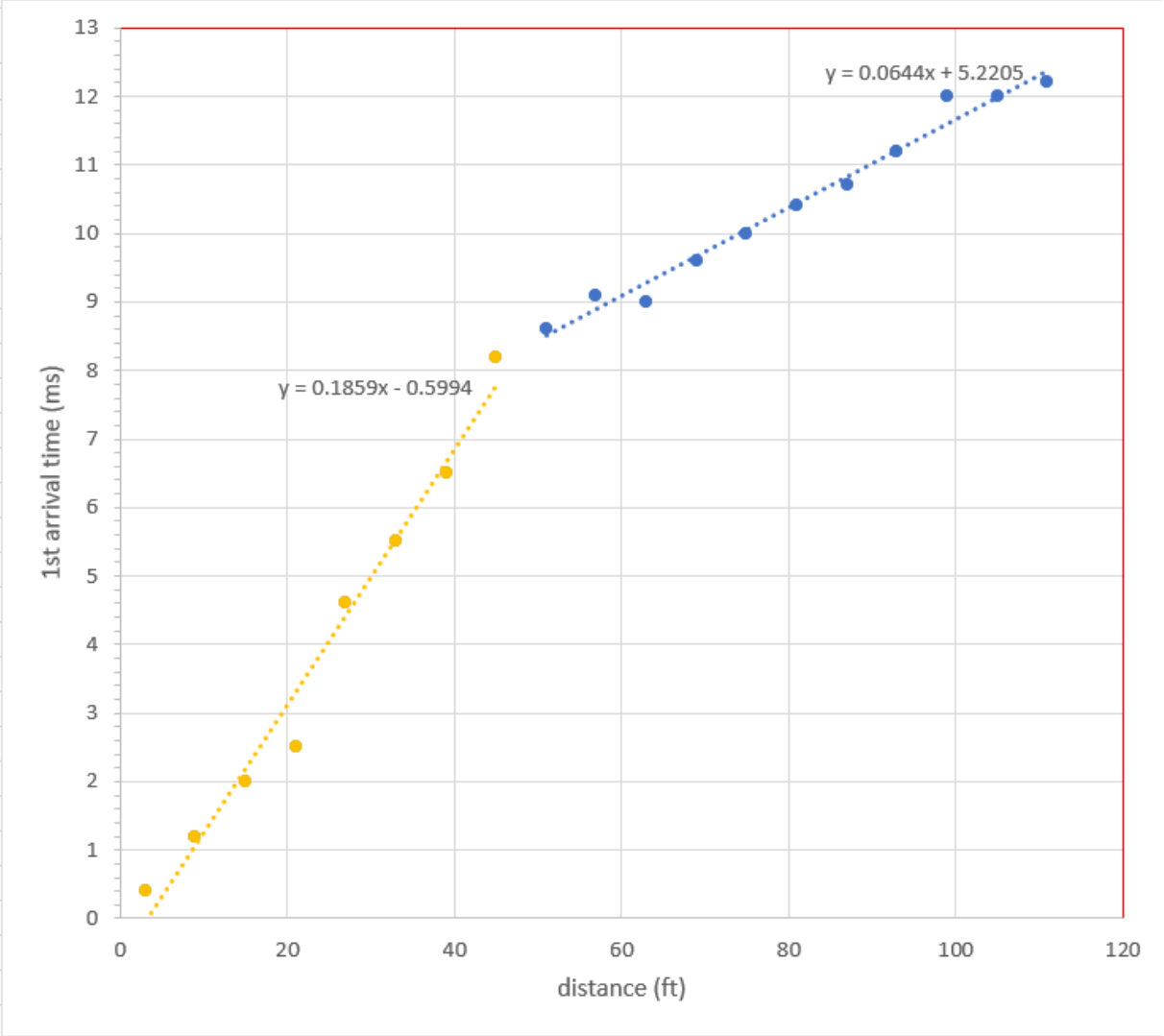


Figure 18. Seismic picked first arrivals and interpreted slopes and y-intercepts used in the refraction model for Interpretation Point A. Also shown are calculated layer velocities and depths.

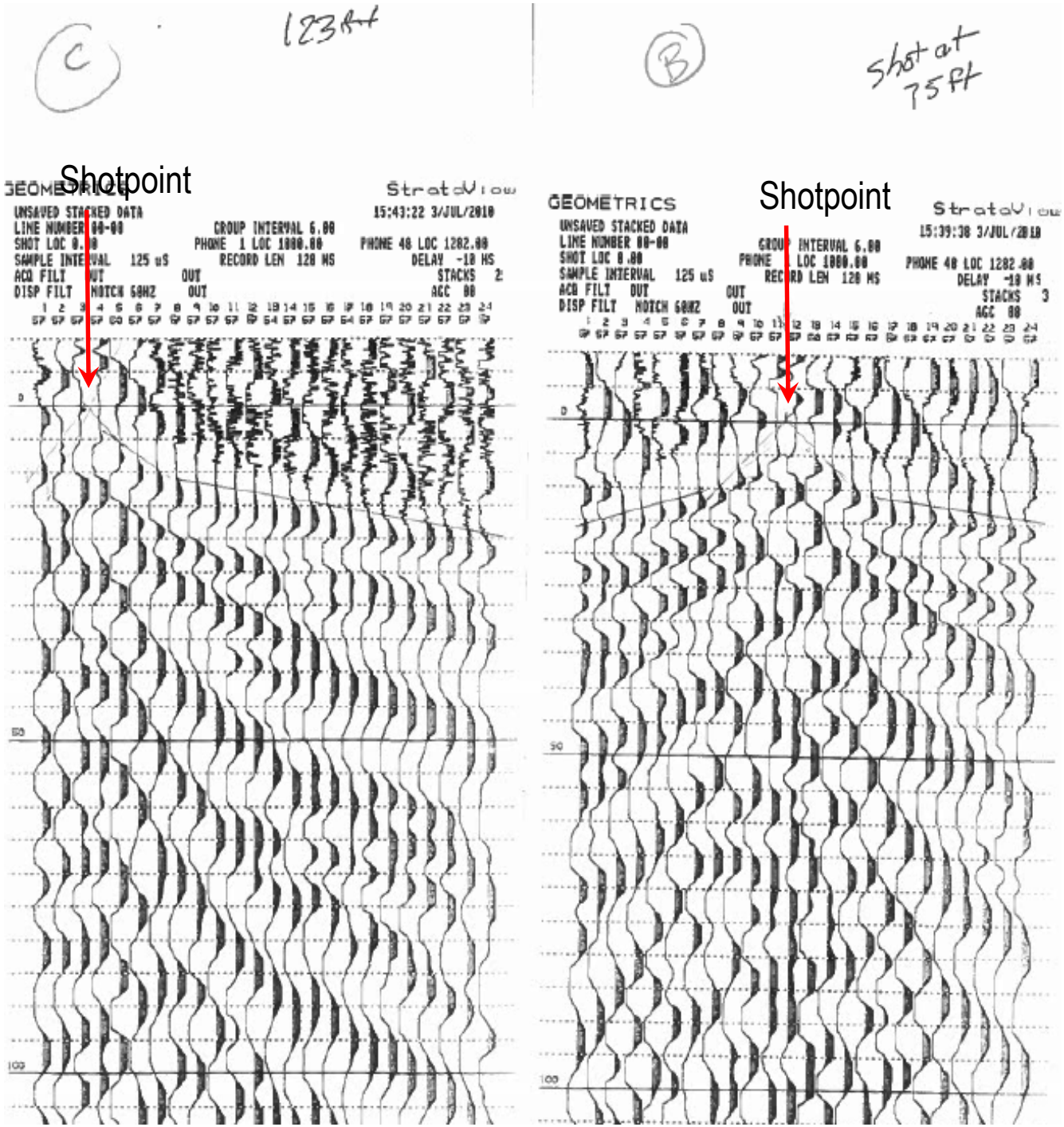


Figure 19. Seismic refraction data along Line 1 showing data used in interpretation points B and C. Shown is data from Line 1, Spread 1, with shotpoints at 75ft and 123ft along the profile.

Seismic

LINE 1

		Interpretation Results			
shotpoint	depth (ft)	depth (m)	velocity 1 (ft/s)	velocity 2 (ft/s)	intercept t (s)
B	13.0	4.0	2727.0	14814.8	0.009357
interpretation			soil	bedrock	
	B	shot at	75	ft along line	
	geophone	dist. (ft)	time (ms)		
	24	-75	14.5		
	23	-69	14		
	22	-63	13.5		
	21	-57	13		
	20	-51	13		
	19	-45	12.5		
	18	-39	12		
	17	-33	11.5		
	16	-27	11		
	15	-21	8		
	14	-15	7		
	13	-9	4		
	12	-3	2		
	11	3	2		
	10	9	6		
	9	15	7		
	8	21	9		
	7	27	11		
	6	33	12		
	5	39	12		
	4	45	13		
	3	51	13.5		
	2	57	16		
	1	63	16		

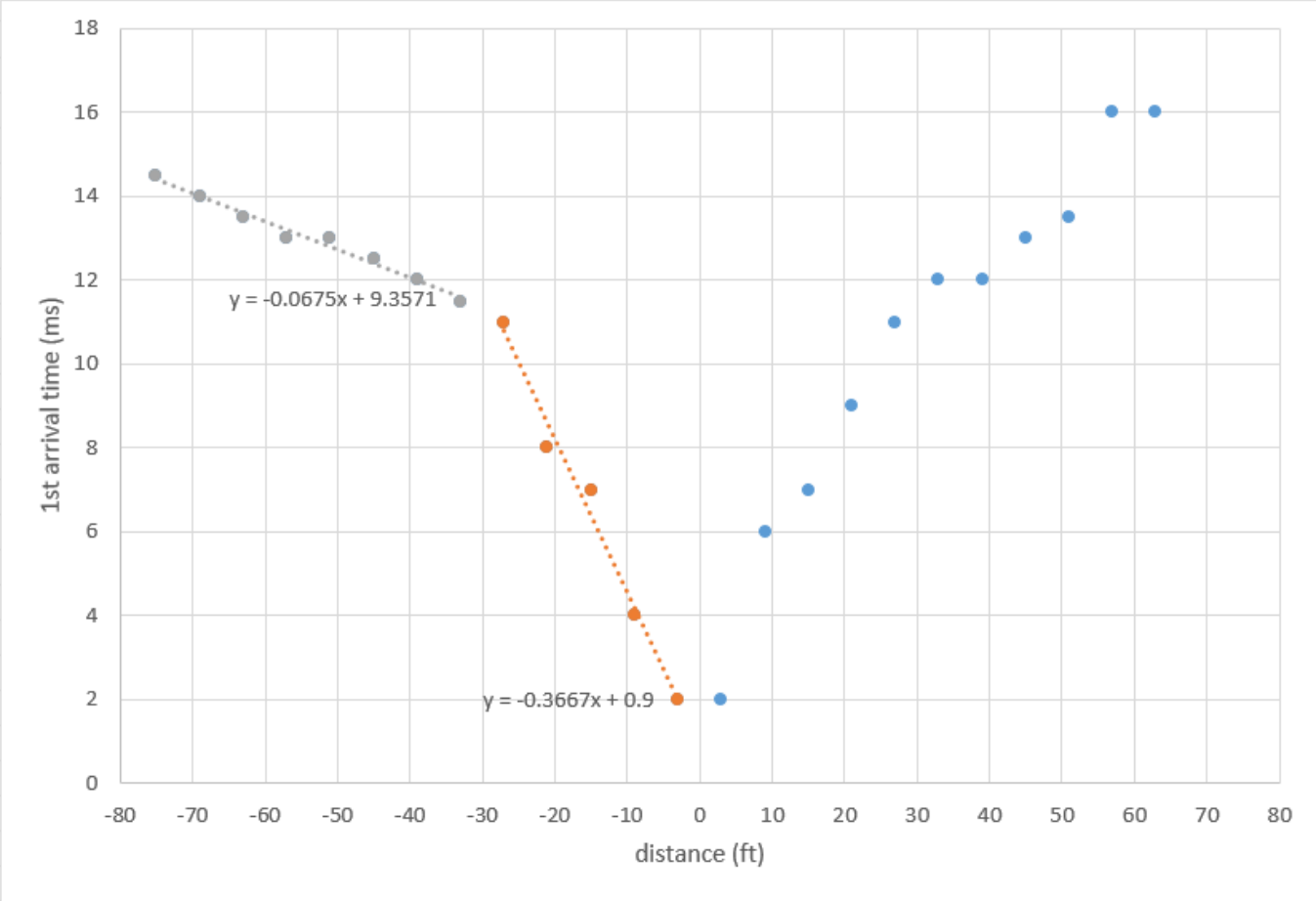


Figure 20. Seismic picked first arrivals and interpreted slopes and y-intercepts used in the refraction model for Interpretation Point B. Also shown are calculated layer velocities and depths.

LINE 1

Seismic

		Interpretation Results				
shotpoint	depth (ft)	depth (m)	velocity 1 (ft/s)	velocity 2 (ft/s)	intercept t (s)	
C	12.1	3.7	2610.3	12033.7	0.0090594	bedrock
	4.7	1.4	1853.6	4000.0	0.0045	saturated zone, unsatura
interpretation			soil	bedrock		
	C	shot at	123	ft along line		
	geophone	dist. (ft)	time (ms)			
	24	-123	20			
	23	-117	18.5			
	22	-111	18			
	21	-105	17.5			
	20	-99	17			
	19	-93	16.5			
	18	-87	17			
	17	-81	16			
	16	-75	15.5			
	15	-69	15			
	14	-63	14			
	13	-57	13.5			
	12	-51	13			
	11	-45	12.5			
	10	-39	12.5			
	9	-33	12			
	8	-27	11.5			
	7	-21	9.5			
	6	-15	8			
	5	-9	7			
	4	-3	3.5			
		0	0			
	3	3	1.5			
	2	9	5			
	1	15	8			

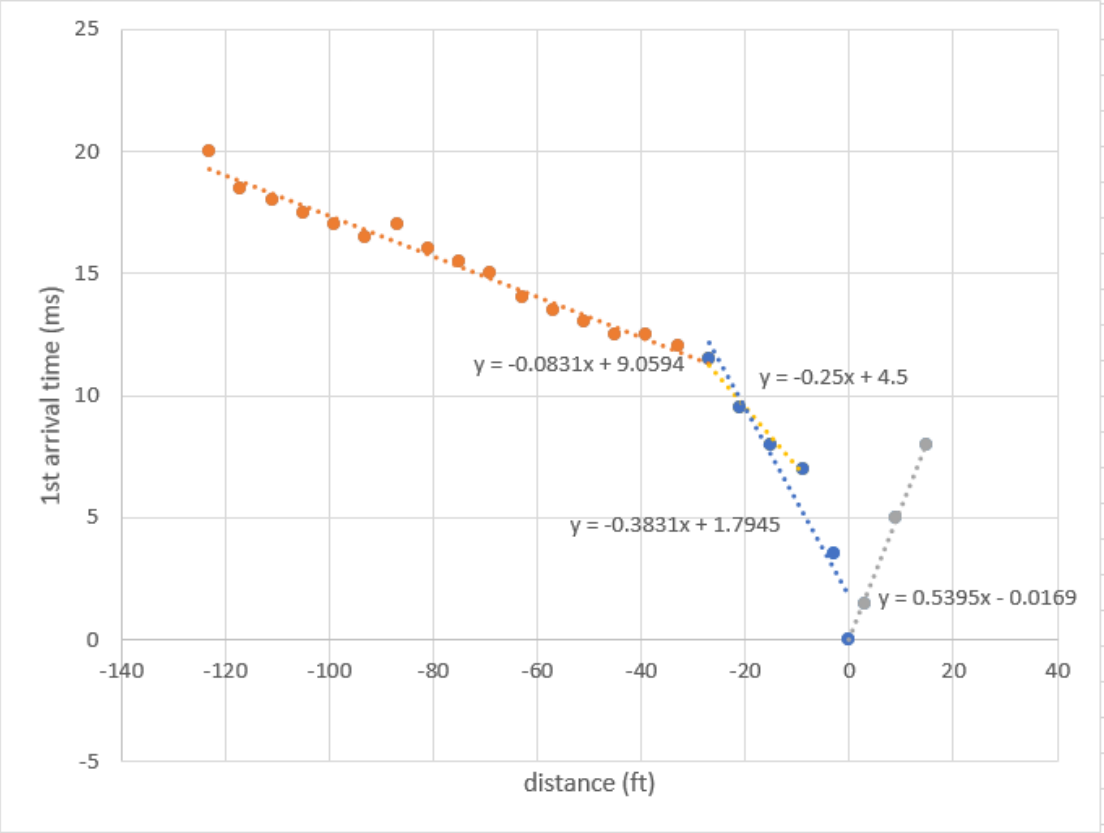


Figure 21. Seismic picked first arrivals and interpreted slopes and y-intercepts used in the refraction model for Interpretation Point C. Also shown are calculated layer velocities and depths.

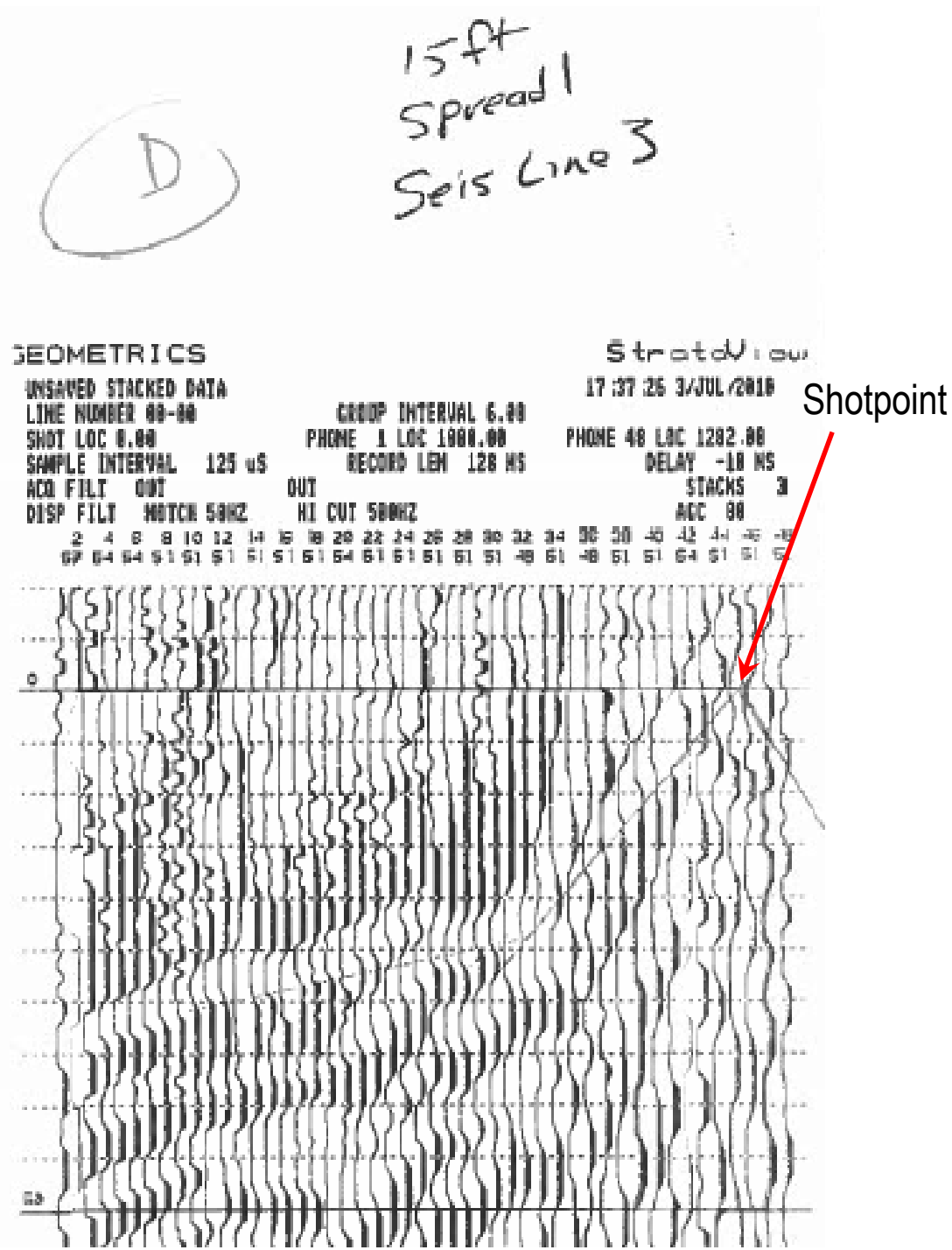


Figure 22. Seismic refraction data along Line 3 showing data used in interpretation point D. Shown is data from Line 3, Spread 1, with shotpoint at 15ft along the profile.

LINE 3

Seismic

		Interpretation Results			
shotpoint	depth (ft)	depth (m)	velocity 1 (ft/s)	velocity 2 (ft/s)	intercept t (s)
D	36.9	11.2	3562.5	20876.8	0.020385

interpretation			soil	bedrock
	D	shot at	15	ft along line
	geophone	dist. (ft)	time (ms)	
	48	15	7.5	
	47	9	4	
	46	3	2	
	45	-3	1.5	
	44	-9	4	
	43	-15	4	
	42	-21	6	
	41	-27	8	
	40	-33	10	
	39	-39	10.5	
	38	-45	13	
	37	-51	15	
	36	-57	17.5	
	35	-63	18	
	34	-69	18	
	33	-75	23	
	32	-81	24	
	31	-87	24.5	
	30	-93	25	
	29	-99	25	
	28	-105	26	
	27	-111	26.5	
	26	-117	26.5	
	25	-123	27	
	24	-129	27	

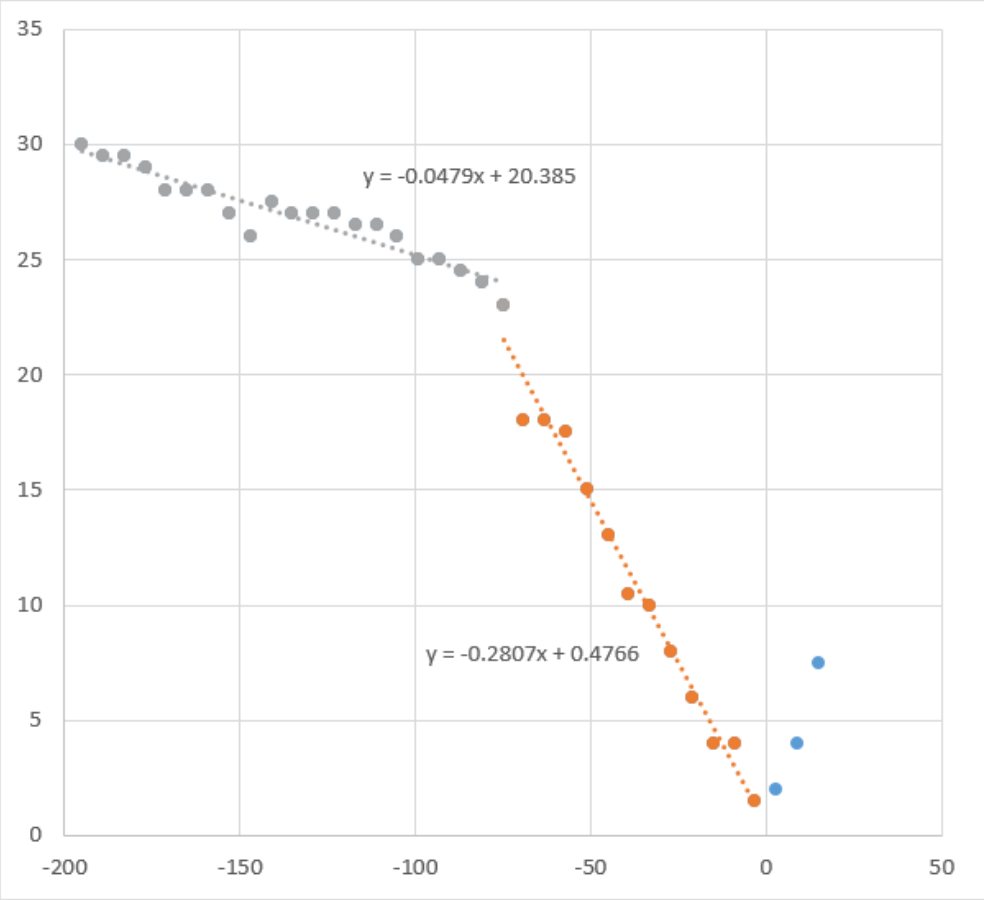


Figure 23. Seismic picked first arrivals and interpreted slopes and y-intercepts used in the refraction model for Interpretation Point D. Also shown are calculated layer velocities and depths.

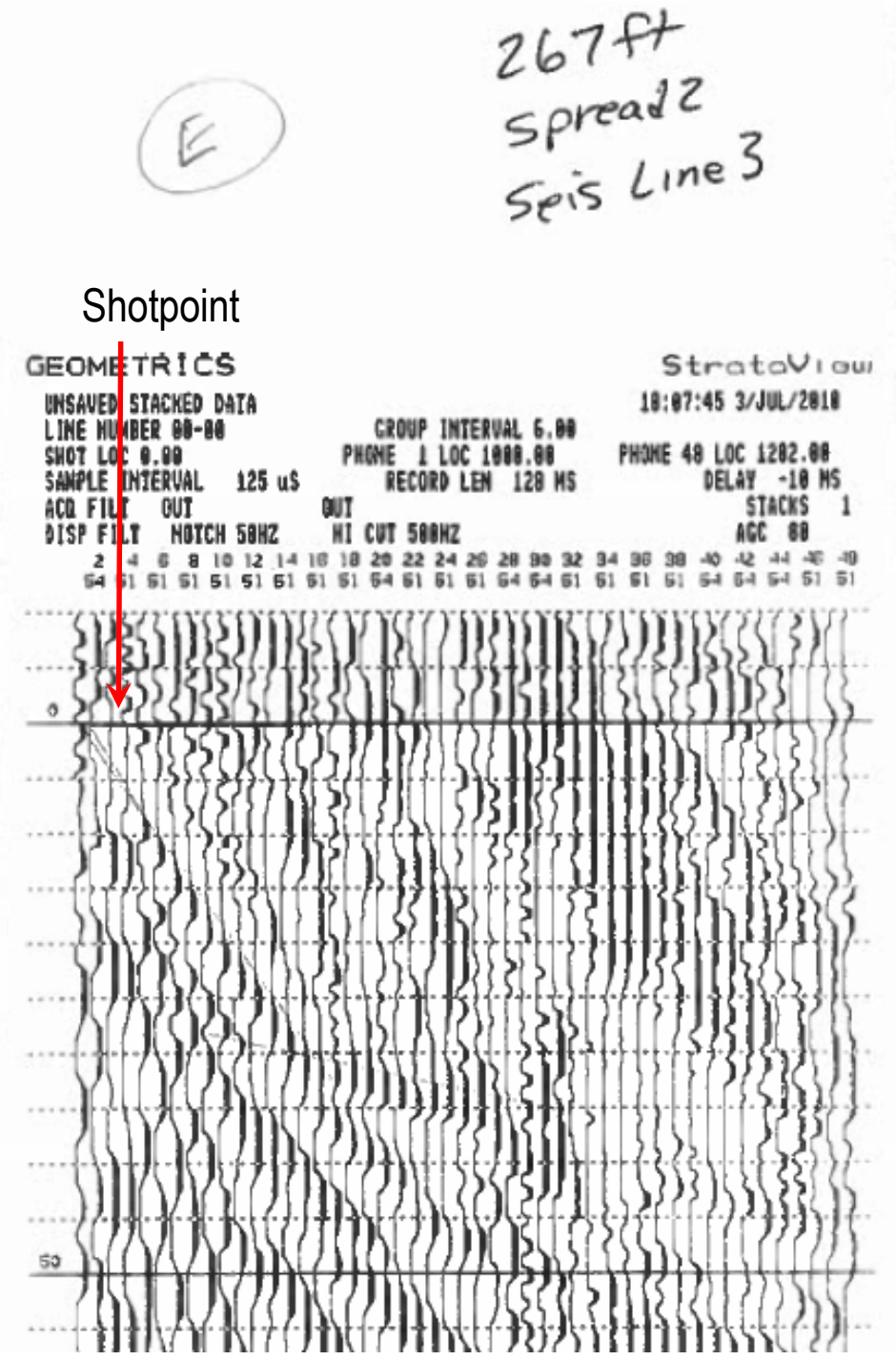


Figure 24. Seismic refraction data along Line 3 showing data used in interpretation point E. Shown is data from Line 3, Spread 2, with shotpoint at 267ft.

LINE 3

		Interpretation Results				
shotpoint	depth (ft)	depth (m)	velocity 1 (ft/s)	velocity 2 (ft/s)	intercept t (s)	
E	4.2	1.3	1346.1	2865.3	0.00549	water table
	29.6	9.0	2865.3	17574.7	0.020385	bedrock

interpretation			soil	bedrock
	E	shot at	267	ft along line
	geophone	dist. (ft)	time (ms)	
	1	-15	11.5	
	2	-9	8	
	3	-3	3	
	4	3	3	
	5	9	7.5	
	6	15	10.5	
	7	21	13	
	8	27	15	
	9	33	17	
	10	39	18.5	
	11	45	22	
	12	51	23.5	
	13	57	25	
	14	63	27.5	
	15	69	29.5	
	16	75	30.5	
	17	81	31	
	18	87	31.5	
	19	93	32	
	20	99	32.2	
	21	105	32.5	
	22	111	32.6	
	23	117	33	

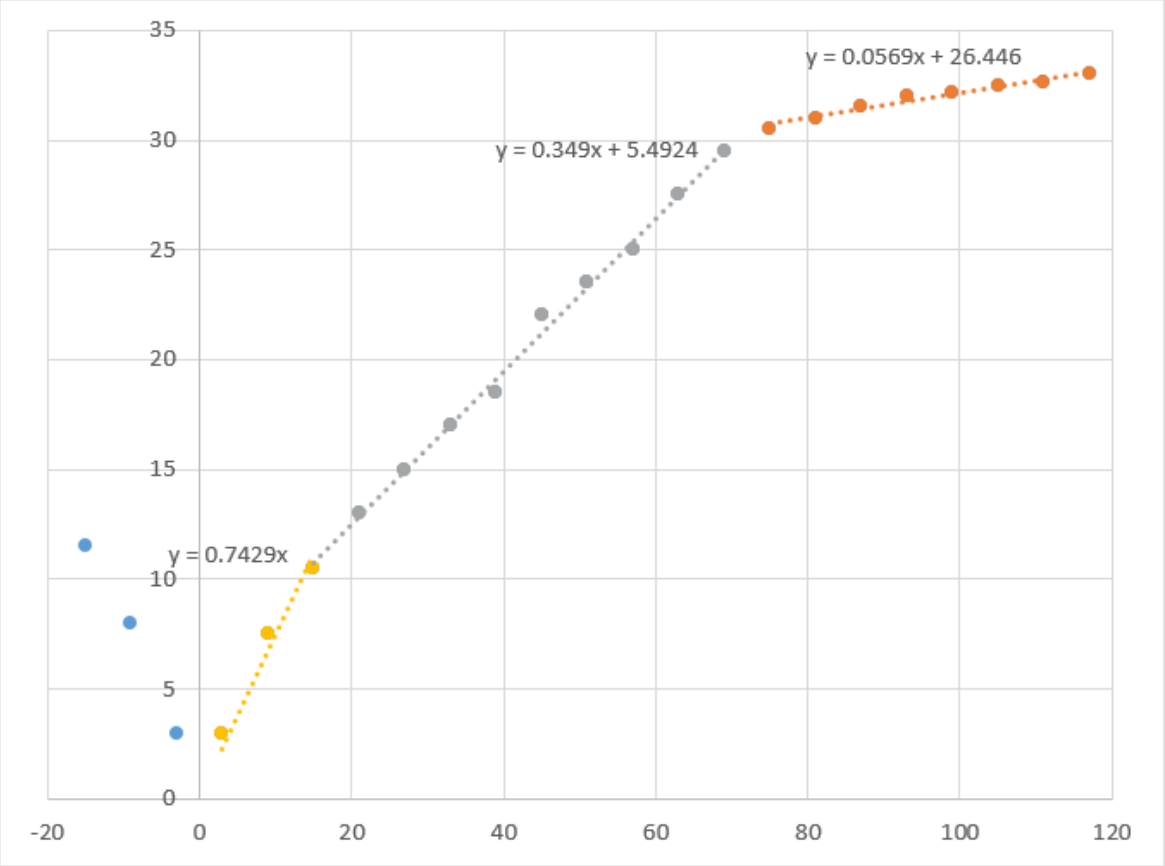


Figure 25. Seismic picked first arrivals and interpreted slopes and y-intercepts used in the refraction model for Interpretation Point E. Also shown are calculated layer velocities and depths.

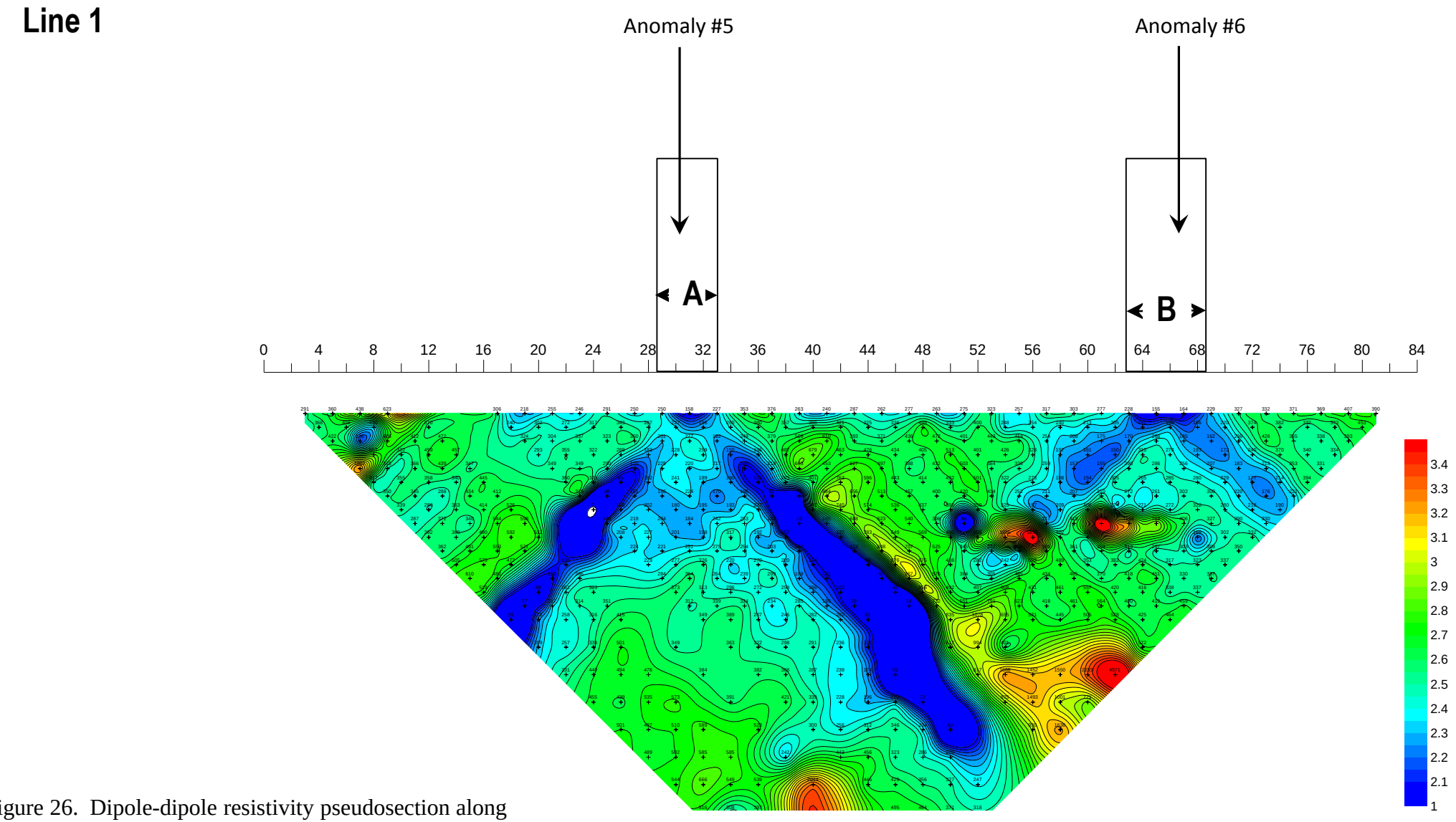


Figure 26. Dipole-dipole resistivity pseudosection along Line 1. The positions of stakes referred-to as Anomaly #5 and Anomaly #6 are located where the line passed those positions.

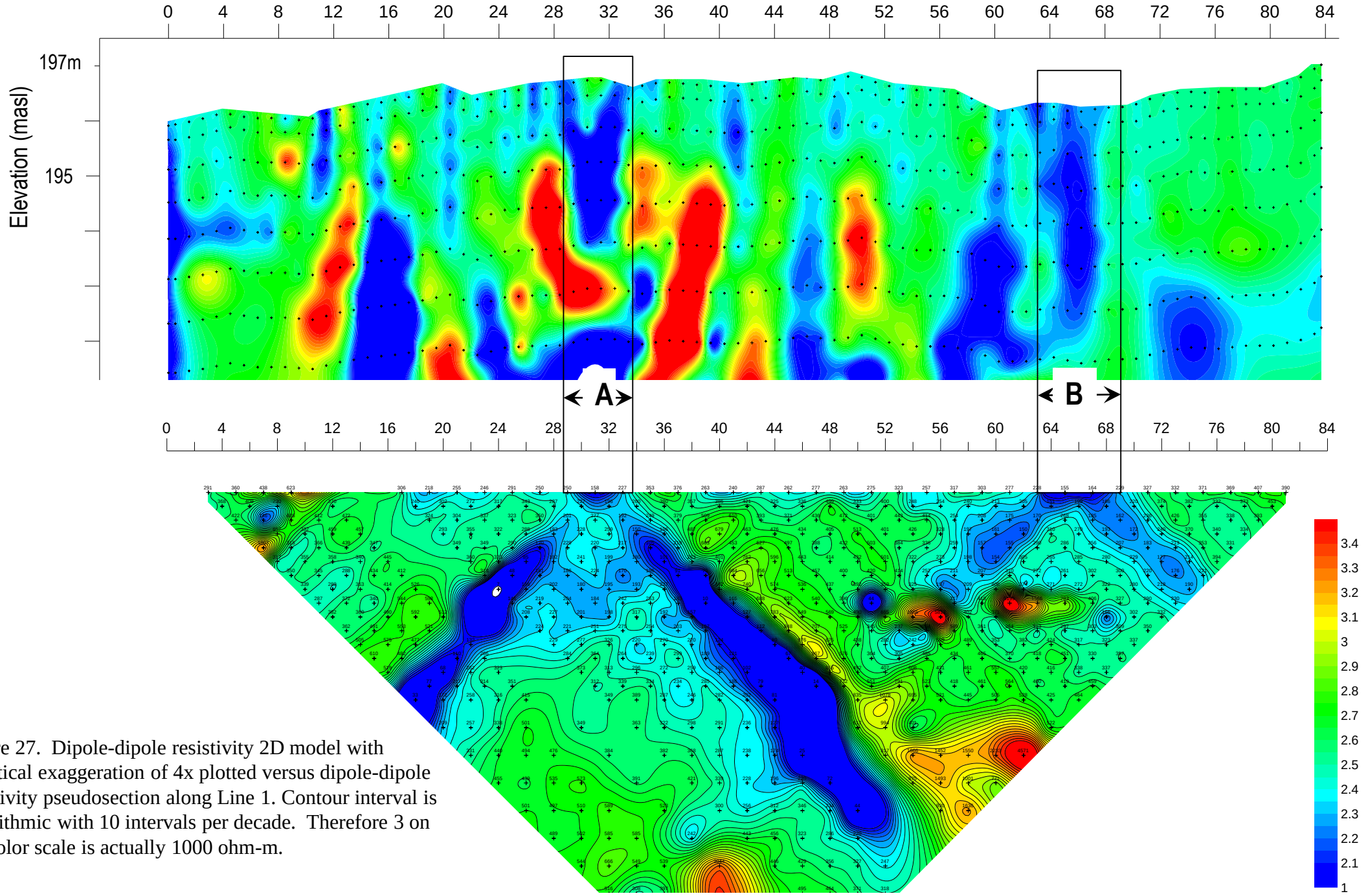


Figure 27. Dipole-dipole resistivity 2D model with a vertical exaggeration of 4x plotted versus dipole-dipole resistivity pseudosection along Line 1. Contour interval is logarithmic with 10 intervals per decade. Therefore 3 on the color scale is actually 1000 ohm-m.

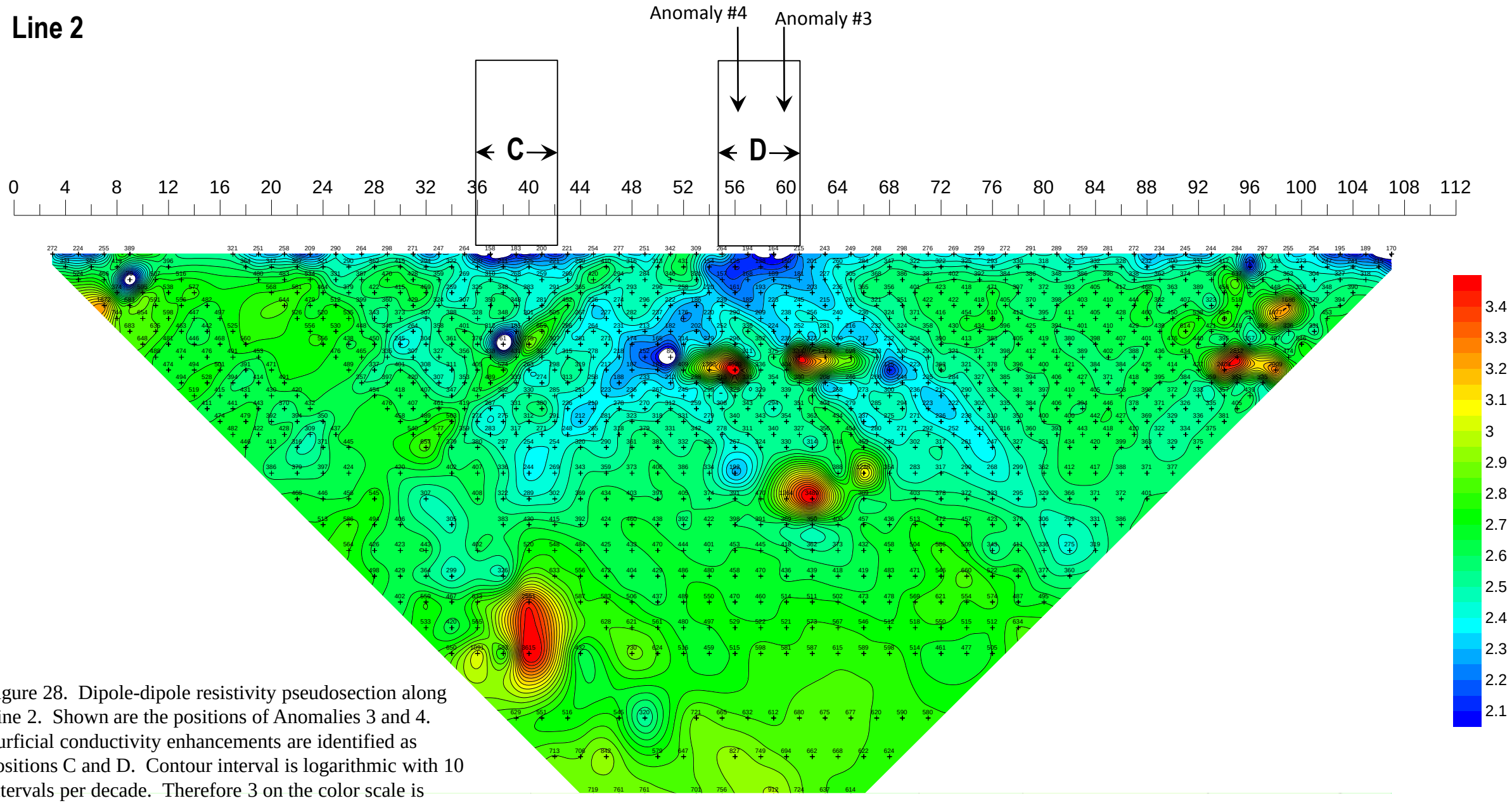
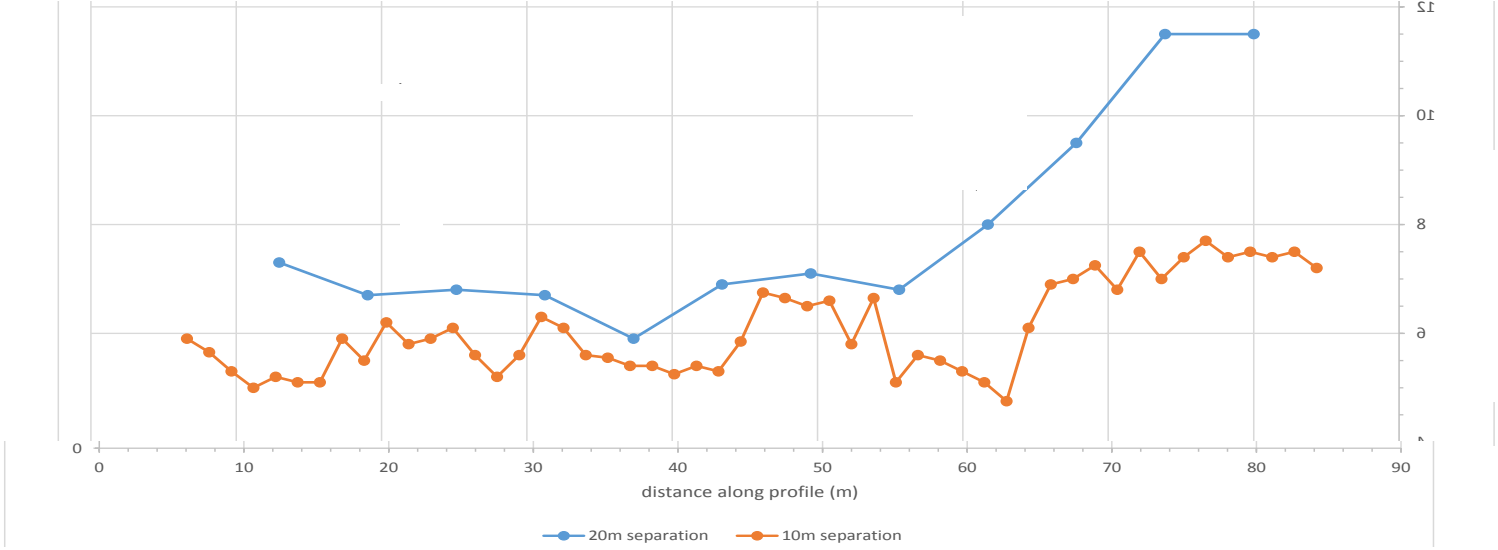


Figure 28. Dipole-dipole resistivity pseudosection along Line 2. Shown are the positions of Anomalies 3 and 4. Surficial conductivity enhancements are identified as positions C and D. Contour interval is logarithmic with 10 intervals per decade. Therefore 3 on the color scale is actually 1000 ohm-m.

Line 2



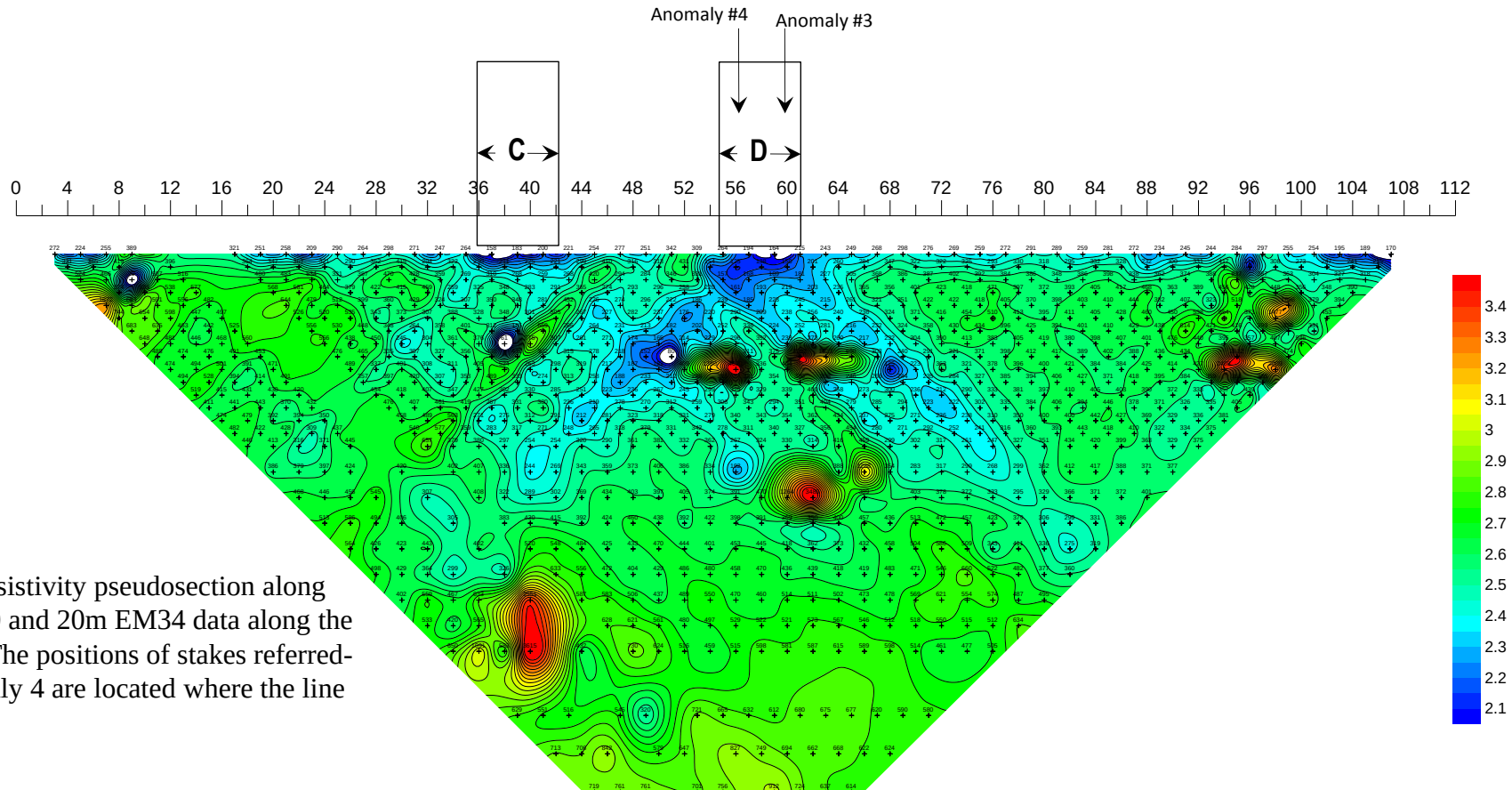


Figure 29. Dipole-dipole resistivity pseudosection along Line 2 plotted along with 10 and 20m EM34 data along the same line (EM34 Line 1). The positions of stakes referred-to as Anomaly 3 and Anomaly 4 are located where the line passed those positions.

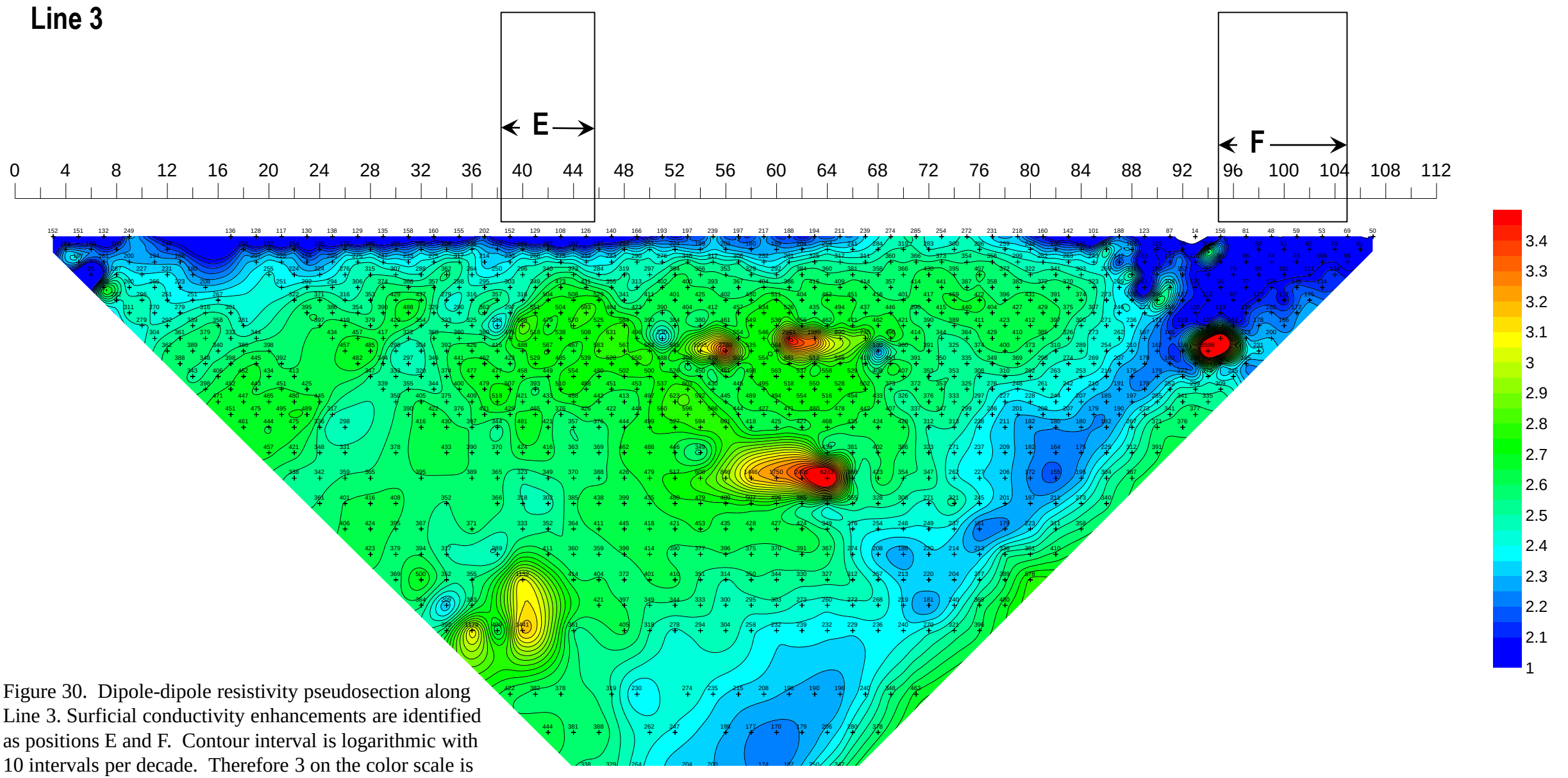


Figure 30. Dipole-dipole resistivity pseudosection along Line 3. Surficial conductivity enhancements are identified as positions E and F. Contour interval is logarithmic with 10 intervals per decade. Therefore 3 on the color scale is actually 1000 ohm-m.

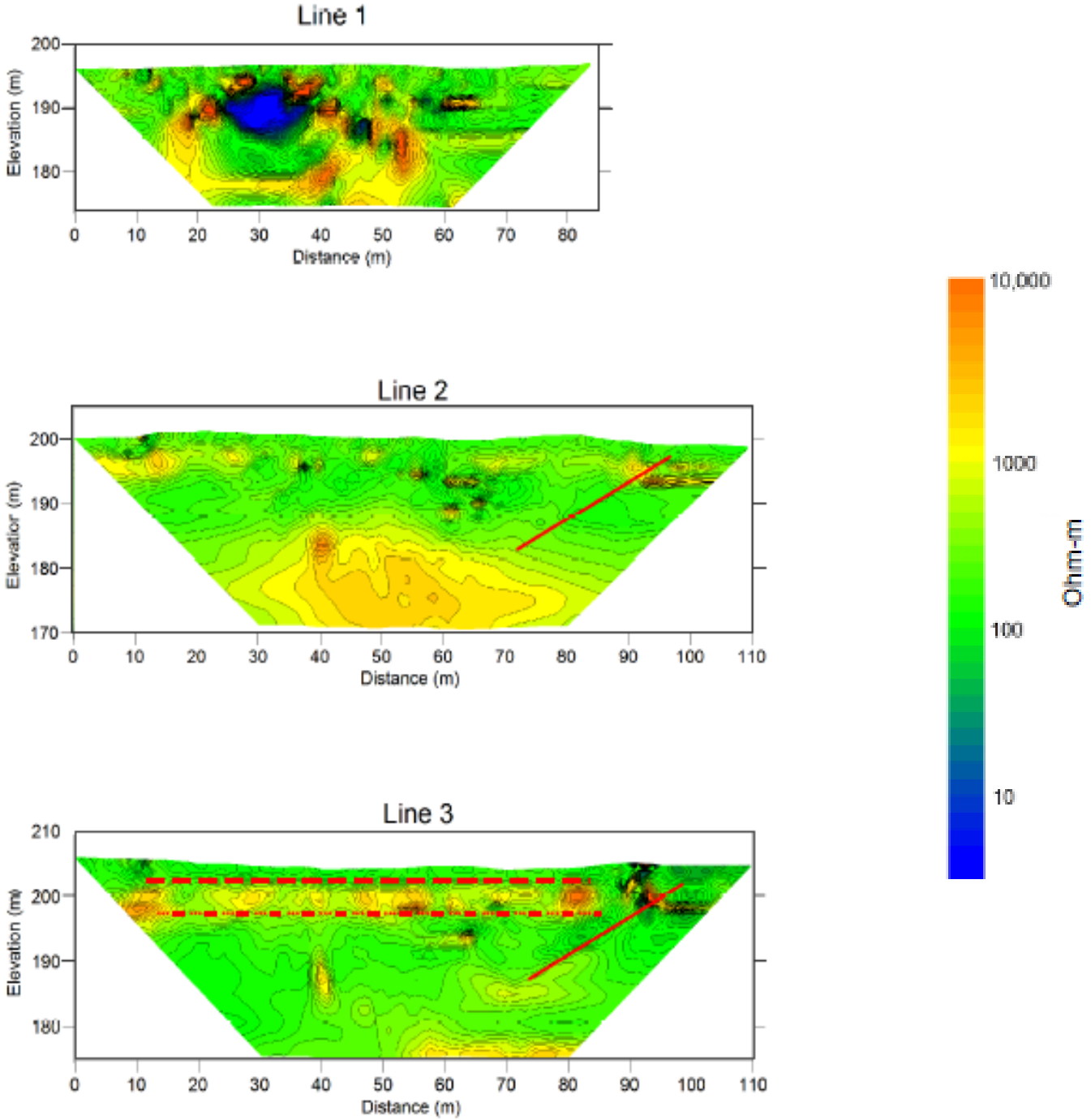


Figure 31. Dipole-dipole resistivity 2D modeling results for Lines 1, 2, and 3.

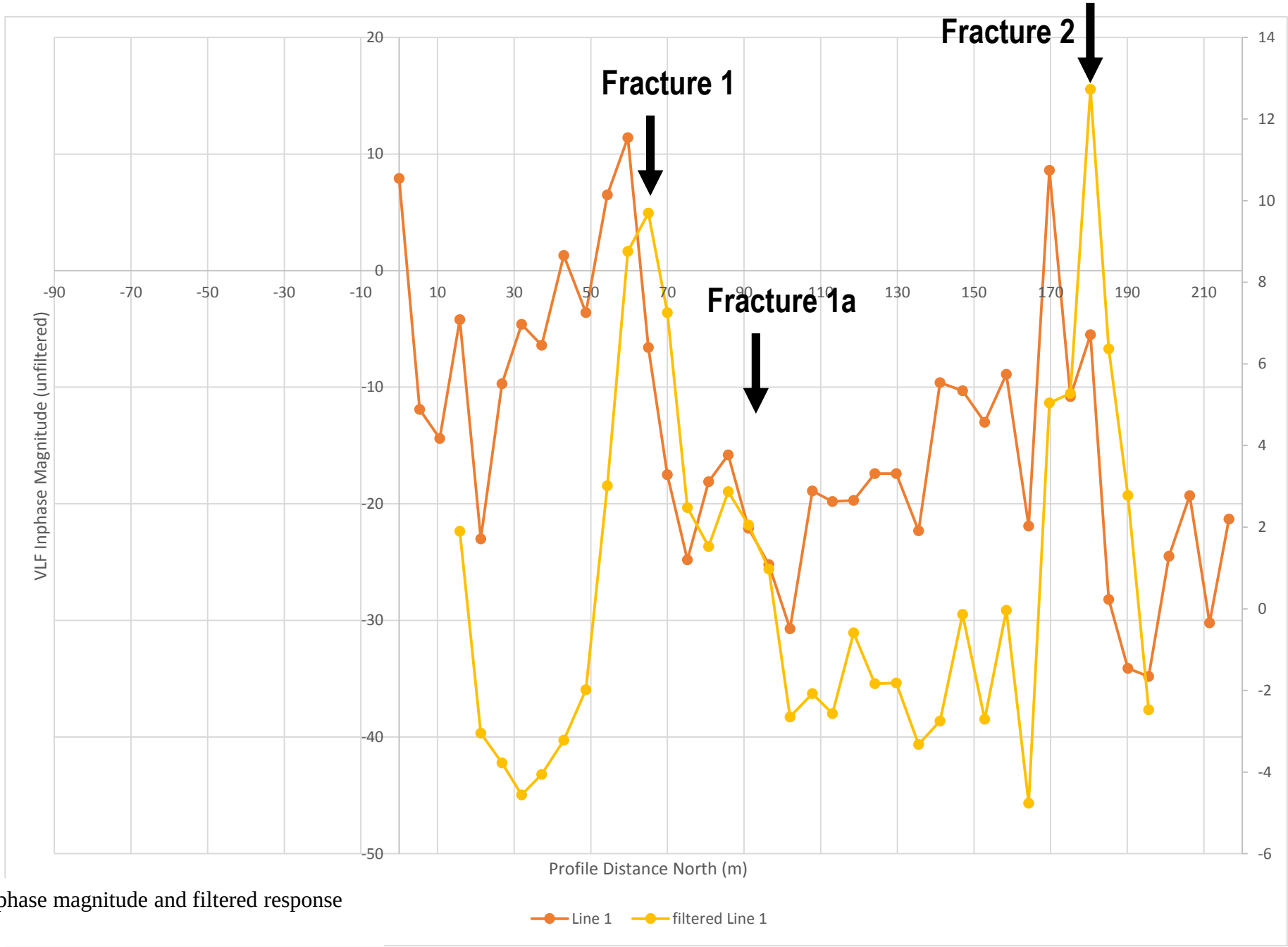


Figure 32. VLF inphase magnitude and filtered response for Line 1.

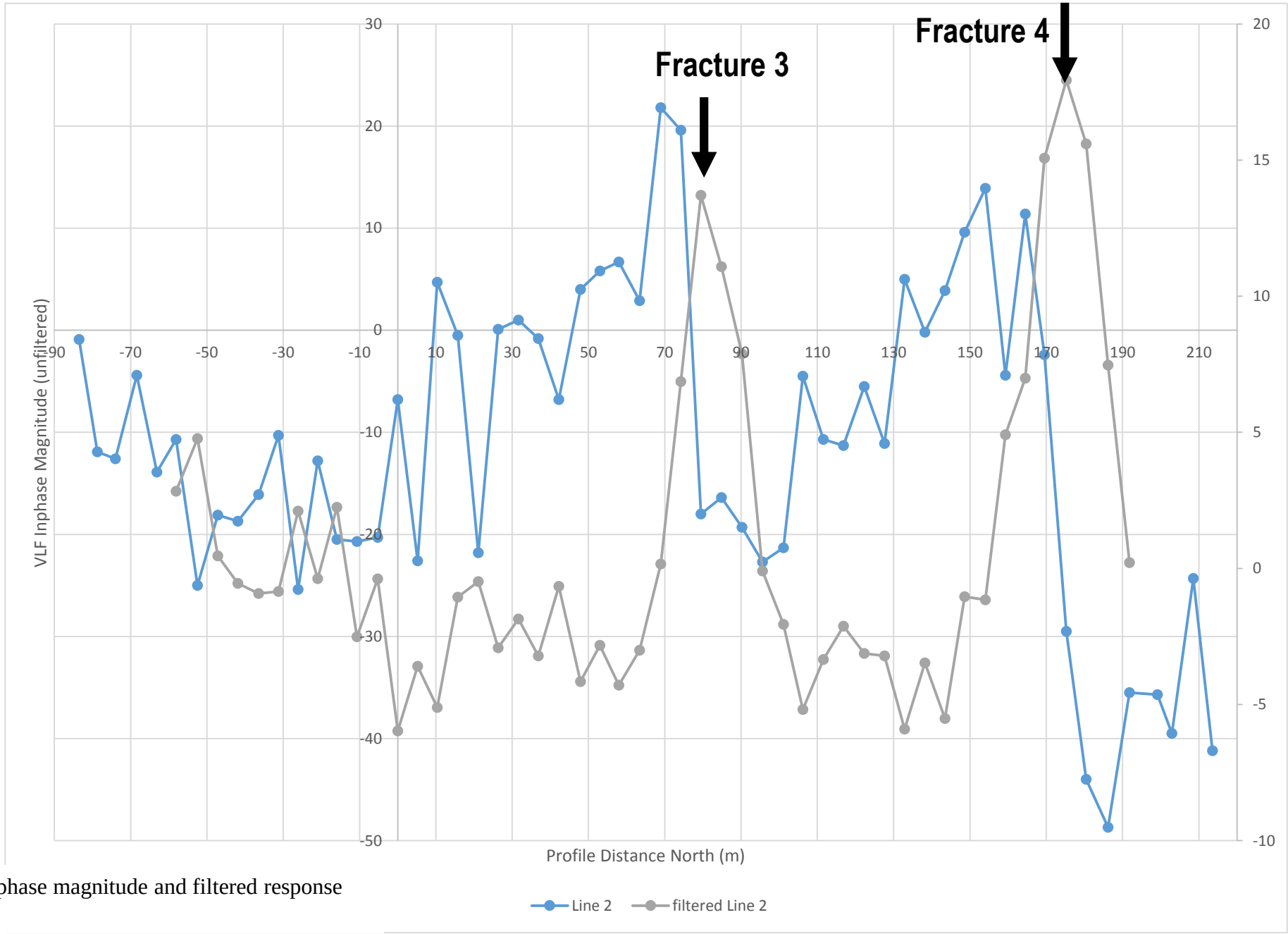


Figure 33. VLF inphase magnitude and filtered response for Line 2.

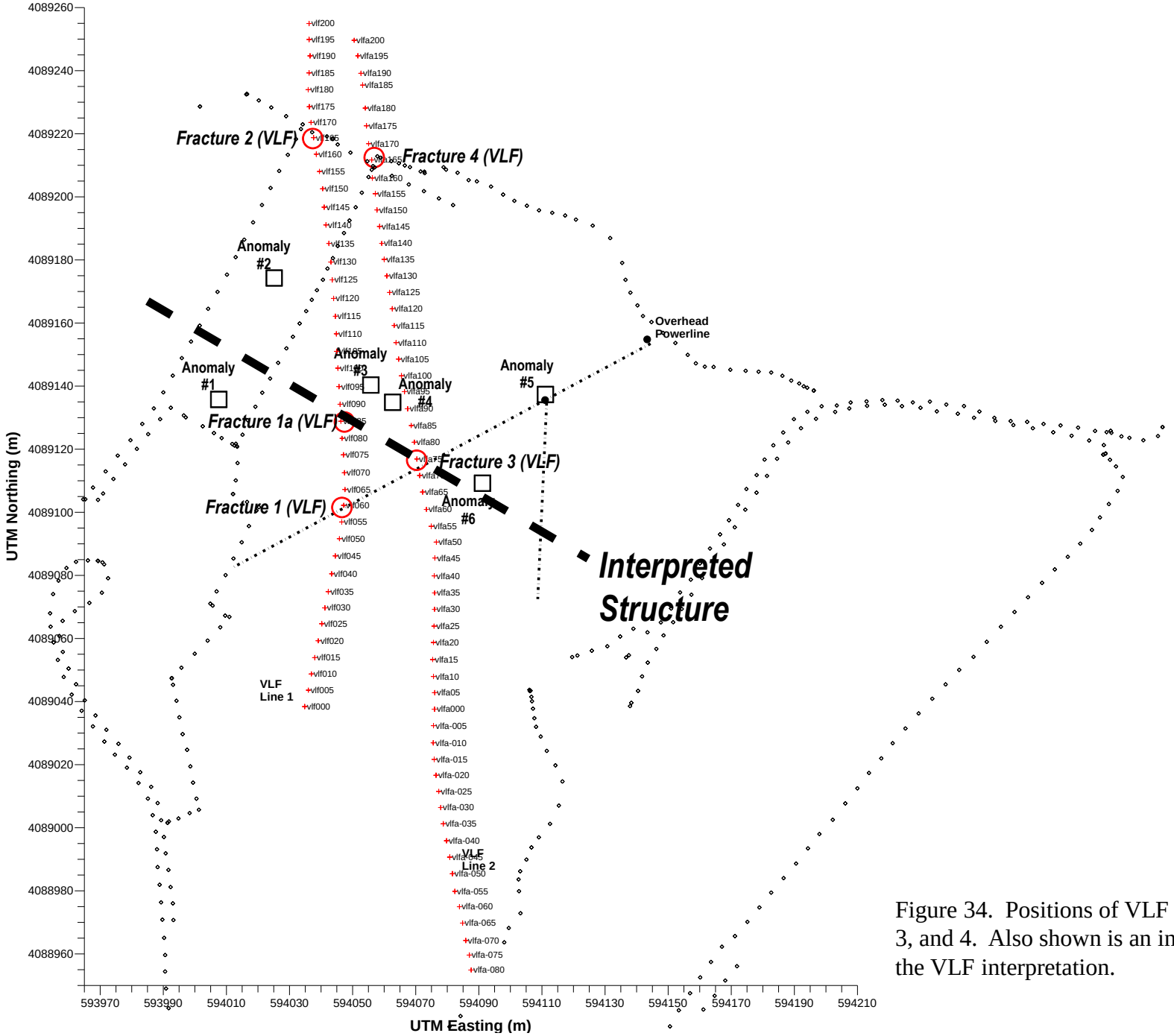


Figure 34. Positions of VLF interpreted Fractures 1, 1a, 2, 3, and 4. Also shown is an interpreted structure based on the VLF interpretation.