Appendix A: Troxler Data

Sacramento, CA

Time	Date	Box ID	Depth	Lat1	Long1	Lat2	Long2	Dry Den	Wet Den	Moist Cont	% Moist	Box	Tree Dist	Remarks 1	Remarks 2	
1	27-Oct-09	10	12	38 29 20.87	-121 33 4.66	38.48913	-121.55129	102.40	111.90	9.40	9.22	10	34.00	Box 10	Toe	
1	27-Oct-09	10	10	38 29 20.79	-121 33 4.64	38.48911	-121.55129	101.20	110.50	9.20	9.12	10	34.00	Box 10	Toe	
1	27-Oct-09	10	8	38 29 20.77	-121 33 4.69	38.48910	-121.55130	98.10	107.20	9.10	9.31	10	34.00	Box 10	Toe	
1	27-Oct-09	10	6	38 29 20.76	-121 33 4.7	38.48910	-121.55131	95.50	104.50	8.90	9.35	10	34.00	Box 10	Toe	
1	27-Oct-09	10	4	38 29 20.76	-121 33 4.69	38.48910	-121.55130	91.20	100.70	9.50	10.46	10	34.00	Box 10	Toe	
1	27-Oct-09	10	2	38 29 20.75	-121 33 4.7	38.48910	-121.55131	87.70	96.70	9.00	10.24	10	34.00	Box 10	Toe	
1	27-Oct-09	10	1	38 29 20.75	-121 33 4.7	38.48910	-121.55131	77.70	86.90	9.20	11.82	10	34.00	Box 10	Toe	
1	27-Oct-09	10	1	38 29 20.74	-121 33 4.66	38.48909	-121.55129	79.20	87.60	8.40	10.60	10	34.00	Box 10	Toe	
1	27-Oct-09	6	12	38 29 20.67	-121 33 4.85	38.48908	-121.55135	95.80	105.70	10.00	10.39	6	27.00	Box 6	Mid Slope	
1	27-Oct-09	6	10	38 29 20.63	-121 33 4.84	38.48906	-121.55134	93.40	103.10	9.70	10.34	6	27.00	Box 6	Mid Slope	
1	27-Oct-09	6	8	38 29 20.63	-121 33 4.86	38.48906	-121.55135	93.30	103.00	9.70	10.41	6	27.00	Box 6	Mid Slope	
1	27-Oct-09	6	6	38 29 20.6	-121 33 4.83	38.48906	-121.55134	90.20	100.30	10.10	11.16	6	27.00	Box 6	Mid Slope	
1	27-Oct-09	6	4	38 29 20.58	-121 33 4.81	38.48905	-121.55134	82.80	93.20	10.30	12.47	6	27.00	Box 6	Mid Slope	
1	27-Oct-09	6	2	38 29 20.59	-121 33 4.85	38.48905	-121.55135	75.70	85.60	9.90	13.07	6	27.00	Box 6	Mid Slope	
1	27-Oct-09	6	1	38 29 20.61	-121 33 4.79	38.48906	-121.55133	56.00	66.20	10.20	18.27	6	27.00	Box 6	Mid Slope	
1	27-Oct-09	1	12	38 29 20.65	-121 33 4.95	38.48907	-121.55137	88.50	105.30	16.80	18.98	1	28.00	Box 1	Ls Crest	
1	27-Oct-09	1	10	38 29 20.67	-121 33 4.97	38.48908	-121.55138	88.90	105.30	16.40	18.46	1	28.00	Box 1	Ls Crest	
1	27-Oct-09	1	8	38 29 20.65	-121 33 4.89	38.48907	-121.55136	89.50	105.50	16.00	17.86	1	28.00	Box 1	Ls Crest	
1	27-Oct-09	1	6	38 29 20.67	-121 33 4.95	38.48908	-121.55137	85.90	102.60	16.80	19.51	1	28.00	Box 1	Ls Crest	
1	27-Oct-09	1	4	38 29 20.66	-121 33 4.96	38.48907	-121.55138	85.50	102.10	16.60	19.38	1	28.00	Box 1	Ls Crest	
1	27-Oct-09	1	2	38 29 20.66	-121 33 4.96	38.48907	-121.55138	84.30	100.80	16.50	19.59	1	28.00	Box 1	Ls Crest	
1	27-Oct-09	1	1	38 29 20.68	-121 33 5.02	38.48908	-121.55139	80.90	97.70	16.80	20.74	1	28.00	Box 1	Ls Crest	
1	28-Oct-09	141	12	38 29 20.23	-121 33 4.74	38.48895	-121.55132	106.60	117.20	10.50	9.89	141	24.00	Box 141	Ls Crest	
1	28-Oct-09	141	10	38 29 20.24	-121 33 4.83	38.48896	-121.55134	108.20	118.90	10.70	9.86	141	24.00	Box 141	Ls Crest	
1	28-Oct-09	141	8	38 29 20.24	-121 33 4.76	38.48896	-121.55132	107.40	117.40	10.00	9.34	141	24.00	Box 141	Ls Crest	
1	28-Oct-09	141	6	38 29 20.26	-121 33 4.76	38.48896	-121.55132	102.70	114.20	11.50	11.18	141	24.00	Box 141	Ls Crest	
1	28-Oct-09	141	4	38 29 20.23	-121 33 4.76	38.48895	-121.55132	102.60	112.70	10.10	9.83	141	24.00	Box 141	Ls Crest	

Time	Date	Box ID	Depth	Lat1	Long1	Lat2	Long2	Dry Den	Wet Den	Moist Cont	% Moist	Box	Tree Dist	Remarks 1	Remarks 2	
1	28-Oct-09	141	2	38 29 20.17	-121 33 4.73	38.48894	-121.55131	97.60	108.00	10.30	10.60	141	24.00	Box 141	Ls Crest	
1	28-Oct-09	141	1	38 29 20.18	-121 33 4.72	38.48894	-121.55131	93.40	103.60	10.10	10.84	141	24.00	Box 141	Ls Crest	
1	28-Oct-09	145	12	38 29 20.27	-121 33 4.57	38.48896	-121.55127	80.60	95.90	15.30	18.98	145	21.00	Box 145	Box 145	
1	28-Oct-09	145	10	38 29 20.31	-121 33 4.55	38.48898	-121.55126	79.10	94.40	15.30	19.39	145	21.00	Box 145	Box 145	
1	28-Oct-09	145	8	38 29 20.3	-121 33 4.56	38.48897	-121.55127	74.40	90.20	15.80	21.22	145	21.00	Box 145	Box 145	
1	28-Oct-09	145	6	38 29 20.3	-121 33 4.54	38.48897	-121.55126	72.90	88.00	15.20	20.80	145	21.00	Box 145	Box 145	
1	28-Oct-09	145	2	38 29 20.3	-121 33 4.54	38.48897	-121.55126	64.30	79.50	15.30	23.79	145	21.00	Box 145	Box 145	
1	28-Oct-09	145	1	38 29 20.29	-121 33 4.53	38.48897	-121.55126	51.40	66.70	15.30	29.74	145	21.00	Box 145	Box 145	
1	28-Oct-09	145	2	38 29 20.29	-121 33 4.53	38.48897	-121.55126	64.10	79.90	15.90	24.82	145	21.00	Box 145	Box 145	
1	28-Oct-09	150	12	38 29 20.39	-121 33 4.39	38.48900	-121.55122	95.40	109.00	13.50	14.15	150	31.00	Box 150	Toe	
1	28-Oct-09	150	10	38 29 20.43	-121 33 4.42	38.48901	-121.55123	94.40	107.80	13.40	14.22	150	31.00	Box 150	Toe	
1	28-Oct-09	150	8	38 29 20.45	-121 33 4.4	38.48901	-121.55122	92.60	106.50	14.00	15.10	150	31.00	Box 150	Toe	
1	28-Oct-09	150	6	38 29 20.44	-121 33 4.4	38.48901	-121.55122	89.50	103.80	14.30	16.01	150	31.00	Box 150	Toe	
1	28-Oct-09	150	4	38 29 20.44	-121 33 4.4	38.48901	-121.55122	87.90	100.70	12.90	14.65	150	31.00	Box 150	Toe	
1	28-Oct-09	150	2	38 29 20.42	-121 33 4.4	38.48901	-121.55122	79.50	92.80	13.40	16.83	150	31.00	Box 150	Toe	
1	28-Oct-09	150	1	38 29 20.47	-121 33 4.33	38.48902	-121.55120	67.90	81.90	14.00	20.54	150	31.00	Box 150	Toe	
1	28-Oct-09	140	10	38 29 19.65	-121 33 4.19	38.48879	-121.55116	92.70	103.60	10.80	11.70	140	28.00	140 Pit	Toe	
1	28-Oct-09	140	8	38 29 20.36	-121 33 4.28	38.48899	-121.55119	89.50	100.50	10.90	12.22	140	28.00	Box 140	Toe	
1	28-Oct-09	140	6	38 29 20.38	-121 33 4.31	38.48899	-121.55120	86.60	98.00	11.40	13.11	140	28.00	Box 140	Toe	
1	28-Oct-09	140	4	38 29 20.38	-121 33 4.33	38.48899	-121.55120	92.60	103.50	10.90	11.79	140	28.00	Box 140	Toe	
1	28-Oct-09	140	2	38 29 20.37	-121 33 4.14	38.48899	-121.55115	89.60	100.60	11.00	12.33	140	28.00	Box 140	Toe	
1	28-Oct-09	140	1	38 29 20.37	-121 33 4.18	38.48899	-121.55116	82.60	92.90	10.40	12.54	140	28.00	Box 140	Toe	
1	28-Oct-09	50	10	38 29 20.67	-121 33 4.61	38.48908	-121.55128	91.90	105.40	13.50	14.70	50	25.00	Box 50	Toe, next pit	
1	28-Oct-09	50	8	38 29 20.67	-121 33 4.61	38.48908	-121.55128	91.00	104.40	13.40	14.74	50	25.00	Box 50	Toe, next pit	
1	28-Oct-09	50	6	38 29 20.67	-121 33 4.6	38.48908	-121.55128	86.60	99.90	13.40	15.45	50	25.00	Box 50	Toe, next pit	
1	28-Oct-09	50	4	38 29 20.67	-121 33 4.6	38.48908	-121.55128	82.10	95.10	13.00	15.86	50	25.00	Box 50	Toe, next pit	
1	28-Oct-09	50	2	38 29 20.68	-121 33 4.6	38.48908	-121.55128	72.10	85.90	13.80	19.18	50	25.00	Box 50	Toe, next pit	
1	28-Oct-09	50	1	38 29 20.68	-121 33 4.6	38.48908	-121.55128	61.90	74.90	13.00	20.99	50	25.00	Box 50	Toe, next pit	

Time	Date	Box ID	Depth	Lat1	Long1	Lat2	Long2	Dry Den	Wet Den	Moist Cont	% Moist	Box	Tree Dist	Remarks 1	Remarks 2	
1	28-Oct-09	60	12	38 29 20.6	-121 33 4.59	38.48906	-121.55127	92.00	102.40	10.40	11.26	60	24.00	60 Pit	Toe	
1	28-Oct-09	60	10	38 29 20.63	-121 33 4.64	38.48906	-121.55129	89.90	100.20	10.30	11.47	60	24.00	60 Pit	Toe	
1	28-Oct-09	60	8	38 29 20.62	-121 33 4.65	38.48906	-121.55129	87.40	98.10	10.70	12.23	60	24.00	60 Pit	Toe	
1	28-Oct-09	60	6	38 29 20.66	-121 33 4.63	38.48907	-121.55129	86.00	96.70	10.80	12.55	60	24.00	60 Pit	Toe	
1	28-Oct-09	60	4	38 29 20.67	-121 33 4.62	38.48907	-121.55128	83.40	93.50	10.10	12.09	60	24.00	60 Pit	Toe	
1	28-Oct-09	60	2	38 29 20.71	-121 33 4.58	38.48909	-121.55127	74.10	84.00	9.90	13.38	60	24.00	60 Pit	Toe	
1	28-Oct-09	60	1	38 29 20.71	-121 33 4.58	38.48909	-121.55127	65.80	76.70	10.80	16.47	60	24.00	60 Pit	Toe	
1	28-Oct-09	96	12	38 29 20.37	-121 33 4.6	38.48899	-121.55128	85.60	98.60	12.90	15.10	96	8.00	Box 96	Mid Slope	
1	28-Oct-09	96	10	38 29 20.43	-121 33 4.61	38.48901	-121.55128	85.40	97.50	12.10	14.17	96	8.00	Box 96	Mid Slope	
1	28-Oct-09	96	8	38 29 20.45	-121 33 4.6	38.48901	-121.55128	85.00	97.80	12.80	15.11	96	8.00	Box 96	Mid Slope	
1	28-Oct-09	96	6	38 29 20.47	-121 33 4.63	38.48902	-121.55129	82.80	95.60	12.80	15.45	96	8.00	Box 96	Mid Slope	
1	28-Oct-09	96	4	38 29 20.47	-121 33 4.63	38.48902	-121.55129	80.30	93.30	13.00	16.16	96	8.00	Box 96	Mid Slope	
1	28-Oct-09	96	2	38 29 20.47	-121 33 4.64	38.48902	-121.55129	74.70	87.80	13.10	17.53	96	8.00	Box 96	Mid Slope	
1	28-Oct-09	96	1	38 29 20.29	-121 33 4.28	38.48897	-121.55119	61.20	73.40	12.30	20.07	96	8.00	Box 96	Mid Slope	
2	5-May-10	10	12	38 29 20.82	-121 33 4.69	38.489117	-121.551303	105.30	110.10	4.70	4.47	10	40.0	1	Open	
2	5-May-10	10	10	38 29 20.82	-121 33 4.69	38.489117	-121.551303	104.90	110.20	5.30	5.02	10	40.0	1	Open	
2	5-May-10	10	8	38 29 20.82	-121 33 4.69	38.489117	-121.551303	101.60	107.00	5.40	5.28	10	40.0	1	Open	
2	5-May-10	10	6	38 29 20.82	-121 33 4.69	38.489117	-121.551303	95.00	99.90	4.90	5.20	10	40.0	1	Open	
2	5-May-10	10	4	38 29 20.82	-121 33 4.69	38.489117	-121.551303	84.90	90.00	5.20	6.09	10	40.0	1	Open	
2	5-May-10	10	2	38 29 20.82	-121 33 4.69	38.489117	-121.551303	85.20	90.10	4.80	5.68	10	40.0	1	Open	
2	5-May-10	10	1	38 29 20.82	-121 33 4.69	38.489117	-121.551303	77.70	82.90	5.20	6.70	10	40.0	1	Open	
2	5-May-10		12	38 29 20.75	-121 33 4.66	38.489097	-121.551294	98.90	101.20	2.30	2.30	10	34.5	1	Open	
2	5-May-10		10	38 29 20.75	-121 33 4.66	38.489097	-121.551294	93.50	95.80	2.30	2.44	10	34.5	1	Open	
2	5-May-10		8	38 29 20.75	-121 33 4.66	38.489097	-121.551294	87.70	89.70	2.00	2.29	10	34.5	1	Open	
2	5-May-10		6	38 29 20.75	-121 33 4.66	38.489097	-121.551294	79.00	80.90	1.90	2.47	10	34.5	1	Open	
2	5-May-10		4	38 29 20.75	-121 33 4.66	38.489097	-121.551294	63.80	65.70	2.00	3.08	10	34.5	1	Open	
2	5-May-10		2	38 29 20.75	-121 33 4.66	38.489097	-121.551294	59.90	61.80	1.90	3.15	10	34.5	1	Open	
2	5-May-10		1	38 29 20.75	-121 33 4.66	38.489097	-121.551294	55.80	57.70	1.90	3.38	10	34.5	1	Open	

Time	Date	Box ID	Depth	Lat1	Long1	Lat2	Long2	Dry Den	Wet Den	Moist Cont	% Moist	Box	Tree Dist	Remarks 1	Remarks 2	
2	5-May-10		12	38 29 20.72	-121 33 4.63	38.489089	-121.551286	101.10	103.90	2.80	2.81	19	29.5	1	Open	
2	5-May-10		10	38 29 20.72	-121 33 4.63	38.489089	-121.551286	98.00	101.30	3.40	3.43	19	29.5	1	Open	
2	5-May-10		8	38 29 20.72	-121 33 4.63	38.489089	-121.551286	94.70	97.90	3.20	3.35	19	29.5	1	Open	
2	5-May-10		6	38 29 20.72	-121 33 4.63	38.489089	-121.551286	89.90	92.90	3.00	3.34	19	29.5	1	Open	
2	5-May-10		4	38 29 20.72	-121 33 4.63	38.489089	-121.551286	86.30	89.50	3.20	3.76	19	29.5	1	Open	
2	5-May-10		2	38 29 20.72	-121 33 4.63	38.489089	-121.551286	81.40	84.40	3.00	3.67	19	29.5	1	Open	
2	5-May-10		1	38 29 20.72	-121 33 4.63	38.489089	-121.551286	71.00	74.40	3.40	4.79	19	29.5	1	Open	
2	5-May-10		12	38 29 20.66	-121 33 4.67	38.489072	-121.551297	91.60	95.80	4.20	4.56	28	25.0	1	Drip Line	
2	5-May-10		10	38 29 20.66	-121 33 4.67	38.489072	-121.551297	88.10	91.70	3.60	4.05	28	25.0	1	Drip Line	
2	5-May-10		8	38 29 20.66	-121 33 4.67	38.489072	-121.551297	83.00	86.90	3.90	4.72	28	25.0	1	Drip Line	
2	5-May-10		6	38 29 20.66	-121 33 4.67	38.489072	-121.551297	78.20	82.70	4.50	5.75	28	25.0	1	Drip Line	
2	5-May-10		4	38 29 20.66	-121 33 4.67	38.489072	-121.551297	72.50	77.40	4.90	6.77	28	25.0	1	Drip Line	
2	5-May-10		2	38 29 20.66	-121 33 4.67	38.489072	-121.551297	65.80	69.70	3.90	5.91	28	25.0	1	Drip Line	
2	5-May-10		1	38 29 20.66	-121 33 4.67	38.489072	-121.551297	52.60	57.00	4.40	8.42	28	25.0	1	Drip Line	
2	5-May-10		12	38 29 20.61	-121 33 4.63	38.489058	-121.551286	80.20	95.00	14.80	18.46	38	20.0	1	Canopy	
2	5-May-10		10	38 29 20.61	-121 33 4.63	38.489058	-121.551286	76.60	91.20	14.60	19.03	38	20.0	1	Canopy	
2	5-May-10		8	38 29 20.61	-121 33 4.63	38.489058	-121.551286	72.50	86.80	14.30	19.71	38	20.0	1	Canopy	
2	5-May-10		6	38 29 20.61	-121 33 4.63	38.489058	-121.551286	67.80	82.10	14.30	21.09	38	20.0	1	Canopy	
2	5-May-10		4	38 29 20.61	-121 33 4.63	38.489058	-121.551286	56.90	71.80	14.90	26.18	38	20.0	1	Canopy	
2	5-May-10		2	38 29 20.61	-121 33 4.63	38.489058	-121.551286	47.00	62.80	15.80	33.73	38	20.0	1	Canopy	
2	5-May-10		1	38 29 20.61	-121 33 4.63	38.489058	-121.551286	31.30	45.60	14.40	45.86	38	20.0	1	Canopy	
2	5-May-10		12	38 29 20.65	-121 33 4.69	38.489069	-121.551303	65.70	77.20	11.50	17.50	47	15.0	1	Canopy	
2	5-May-10		10	38 29 20.65	-121 33 4.69	38.489069	-121.551303	71.30	89.30	17.90	25.11	47	15.0	1	Canopy	
2	5-May-10		8	38 29 20.65	-121 33 4.69	38.489069	-121.551303	68.40	86.60	18.20	26.59	47	15.0	1	Canopy	
2	5-May-10		8	38 29 20.65	-121 33 4.69	38.489069	-121.551303	69.50	86.60	17.10	24.56	47	15.0	1	Canopy	
2	5-May-10		6	38 29 20.65	-121 33 4.69	38.489069	-121.551303	65.20	82.80	17.60	26.93	47	15.0	1	Canopy	
2	5-May-10		4	38 29 20.65	-121 33 4.69	38.489069	-121.551303	57.30	74.70	17.30	30.26	47	15.0	1	Canopy	
2	5-May-10		2	38 29 20.65	-121 33 4.69	38.489069	-121.551303	43.60	61.50	17.80	40.80	47	15.0	1	Canopy	

Time	Date	Box ID	Depth	Lat1	Long1	Lat2	Long2	Dry Den	Wet Den	Moist Cont	% Moist	Box	Tree Dist	Remarks 1	Remarks 2	
2	5-May-10		1	38 29 20.65	-121 33 4.69	38.489069	-121.551303	40.80	60.00	19.20	47.16	47	15.0	1	Canopy	
2	5-May-10		12	38 29 20.44	-121 33 4.77	38.489011	-121.551325	91.00	95.70	4.80	5.25	65	7.0	1	Canopy	
2	5-May-10		10	38 29 20.44	-121 33 4.77	38.489011	-121.551325	89.80	95.50	5.70	6.34	65	7.0	1	Canopy	
2	5-May-10		8	38 29 20.44	-121 33 4.77	38.489011	-121.551325	89.80	94.90	5.20	5.75	65	7.0	1	Canopy	
2	5-May-10		6	38 29 20.44	-121 33 4.77	38.489011	-121.551325	81.20	86.70	5.50	6.77	65	7.0	1	Canopy	
2	5-May-10		4	38 29 20.44	-121 33 4.77	38.489011	-121.551325	75.60	80.70	5.10	6.80	65	7.0	1	Canopy	
2	5-May-10		2	38 29 20.44	-121 33 4.77	38.489011	-121.551325	69.60	74.50	5.00	7.15	65	7.0	1	Canopy	
2	5-May-10		1	38 29 20.44	-121 33 4.77	38.489011	-121.551325	58.70	64.20	5.60	9.47	65	7.0	1	Canopy	
2	5-May-10		12	38 29 20.63	-121 33 4.63	38.489064	-121.551286	84.90	91.20	6.30	7.45	75	4.0	1	Canopy	
2	5-May-10		12	38 29 20.63	-121 33 4.63	38.489064	-121.551286	85.60	91.20	5.60	6.53	75	4.0	1	Canopy	
2	5-May-10		10	38 29 20.63	-121 33 4.63	38.489064	-121.551286	83.80	90.10	6.30	7.47	75	4.0	1	Canopy	
2	5-May-10		8	38 29 20.63	-121 33 4.63	38.489064	-121.551286	86.10	92.40	6.30	7.29	75	4.0	1	Canopy	
2	5-May-10		6	38 29 20.63	-121 33 4.63	38.489064	-121.551286	87.70	93.50	5.80	6.62	75	4.0	1	Canopy	
2	5-May-10		4	38 29 20.63	-121 33 4.63	38.489064	-121.551286	87.50	93.20	5.60	6.44	75	4.0	1	Canopy	
2	5-May-10		2	38 29 20.63	-121 33 4.63	38.489064	-121.551286	80.90	86.80	5.90	7.32	75	4.0	1	Canopy	
2	5-May-10		1	38 29 20.63	-121 33 4.63	38.489064	-121.551286	76.10	81.80	5.80	7.59	75	4.0	1	Canopy	
2	5-May-10		12	38 29 20.57	-121 33 4.79	38.489047	-121.551331	85.20	89.70	4.50	5.31	84	1.0	1 and 2	Canopy	
2	5-May-10		12	38 29 20.57	-121 33 4.79	38.489047	-121.551331	85.10	89.40	4.30	5.02	84	1.0	1 and 2	Canopy	
2	5-May-10		10	38 29 20.57	-121 33 4.79	38.489047	-121.551331	83.90	88.70	4.80	5.71	84	1.0	1 and 2	Canopy	
2	5-May-10		8	38 29 20.57	-121 33 4.79	38.489047	-121.551331	83.70	87.60	3.80	4.60	84	1.0	1 and 2	Canopy	
2	5-May-10		6	38 29 20.57	-121 33 4.79	38.489047	-121.551331	78.90	83.50	4.60	5.89	84	1.0	1 and 2	Canopy	
2	5-May-10		4	38 29 20.57	-121 33 4.79	38.489047	-121.551331	76.90	81.30	4.40	5.78	84	1.0	1 and 2	Canopy	
2	5-May-10		2	38 29 20.57	-121 33 4.79	38.489047	-121.551331	72.70	77.20	4.40	6.10	84	1.0	1 and 2	Canopy	
2	5-May-10		1	38 29 20.57	-121 33 4.79	38.489047	-121.551331	56.10	60.90	4.70	8.39	84	1.0	1 and 2	Canopy	
2	5-May-10		12	38 29 20.8	-121 33 5.02	38.489111	-121.551394	93.90	99.20	5.30	5.66	1	35.0	2	Open	
2	5-May-10		10	38 29 20.8	-121 33 5.02	38.489111	-121.551394	92.90	98.60	5.70	6.16	1	35.0	2	Open	
2	5-May-10		8	38 29 20.8	-121 33 5.02	38.489111	-121.551394	93.00	98.70	5.70	6.12	1	35.0	2	Open	
2	5-May-10		6	38 29 20.8	-121 33 5.02	38.489111	-121.551394	91.70	97.00	5.30	5.83	1	35.0	2	Open	

Time	Date	Box ID	Depth	Lat1	Long1	Lat2	Long2	Dry Den	Wet Den	Moist Cont	% Moist	Box	Tree Dist	Remarks 1	Remarks 2	
2	5-May-10		4	38 29 20.8	-121 33 5.02	38.489111	-121.551394	88.60	94.40	5.90	6.62	1	35.0	2	Open	
2	5-May-10		2	38 29 20.8	-121 33 5.02	38.489111	-121.551394	83.10	88.30	5.30	6.33	1	35.0	2	Open	
2	5-May-10		1	38 29 20.8	-121 33 5.02	38.489111	-121.551394	74.30	79.60	5.30	7.07	1	35.0	2	Open	
2	5-May-10		12	38 29 20.74	-121 33 4.95	38.489094	-121.551375	91.40	98.60	7.20	7.91	1	30.0	2	Open	
2	5-May-10		10	38 29 20.74	-121 33 4.95	38.489094	-121.551375	88.90	95.90	7.10	7.96	1	30.0	2	Open	
2	5-May-10		8	38 29 20.74	-121 33 4.95	38.489094	-121.551375	86.30	93.50	7.20	8.33	1	30.0	2	Open	
2	5-May-10		6	38 29 20.74	-121 33 4.95	38.489094	-121.551375	84.20	91.20	7.00	8.28	1	30.0	2	Open	
2	5-May-10		4	38 29 20.74	-121 33 4.95	38.489094	-121.551375	80.60	88.00	7.40	9.15	1	30.0	2	Open	
2	5-May-10		2	38 29 20.74	-121 33 4.95	38.489094	-121.551375	70.70	77.80	7.10	10.01	1	30.0	2	Open	
2	5-May-10		1	38 29 20.74	-121 33 4.95	38.489094	-121.551375	60.80	67.80	7.00	11.47	1	30.0	2	Open	
2	5-May-10		12	38 29 20.66	-121 33 4.9	38.489072	-121.551361	92.80	100.30	7.40	8.03	11	25.0	2	Open	
2	5-May-10		10	38 29 20.66	-121 33 4.9	38.489072	-121.551361	90.60	97.30	6.70	7.38	11	25.0	2	Open	
2	5-May-10		8	38 29 20.66	-121 33 4.9	38.489072	-121.551361	87.50	94.50	7.00	8.02	11	25.0	2	Open	
2	5-May-10		6	38 29 20.66	-121 33 4.9	38.489072	-121.551361	83.60	90.90	7.20	8.66	11	25.0	2	Open	
2	5-May-10		2	38 29 20.66	-121 33 4.9	38.489072	-121.551361	69.60	77.70	8.10	11.70	11	25.0	2	Open	
2	5-May-10		6	38 29 20.66	-121 33 4.9	38.489072	-121.551361	85.00	92.60	7.60	8.93	11	25.0	2	Open	
2	5-May-10		1	38 29 20.66	-121 33 4.9	38.489072	-121.551361	51.00	60.10	9.20	17.98	11	25.0	2	Open	
2	5-May-10		4	38 29 20.66	-121 33 4.9	38.489072	-121.551361	70.40	78.00	7.60	10.73	11	25.0	2	Open	
2	6-May-10		12	38 29 20.55	-121 33 4.89	38.489042	-121.551358	87.70	97.30	9.60	10.91	22	20.0	2	Drip Line	
2	6-May-10		10	38 29 20.55	-121 33 4.89	38.489042	-121.551358	85.90	95.00	9.10	10.59	22	20.0	2	Drip Line	
2	6-May-10		8	38 29 20.55	-121 33 4.89	38.489042	-121.551358	82.70	92.40	9.60	11.65	22	20.0	2	Drip Line	
2	6-May-10		8	38 29 20.55	-121 33 4.89	38.489042	-121.551358	82.60	91.90	9.30	11.22	22	20.0	2	Drip Line	
2	6-May-10		6	38 29 20.55	-121 33 4.89	38.489042	-121.551358	81.10	90.80	9.80	12.03	22	20.0	2	Drip Line	
2	6-May-10		4	38 29 20.55	-121 33 4.89	38.489042	-121.551358	79.30	88.70	9.40	11.82	22	20.0	2	Drip Line	
2	6-May-10		2	38 29 20.55	-121 33 4.89	38.489042	-121.551358	74.20	83.20	9.00	12.14	22	20.0	2	Drip Line	
2	6-May-10		1	38 29 20.55	-121 33 4.89	38.489042	-121.551358	73.30	83.30	10.00	13.65	22	20.0	2	Drip Line	
2	6-May-10		12	38 29 20.56	-121 33 4.92	38.489044	-121.551367	83.40	93.00	9.60	11.45	42	15.0	2	Canopy	
2	6-May-10		10	38 29 20.56	-121 33 4.92	38.489044	-121.551367	81.10	90.80	9.70	12.01	42	15.0	2	Canopy	

Time	Date	Box ID	Depth	Lat1	Long1	Lat2	Long2	Dry Den	Wet Den	Moist Cont	% Moist	Box	Tree Dist	Remarks 1	Remarks 2	
2	6-May-10		8	38 29 20.56	-121 33 4.92	38.489044	-121.551367	79.00	89.00	10.00	12.71	42	15.0	2	Canopy	
2	6-May-10		6	38 29 20.56	-121 33 4.92	38.489044	-121.551367	75.80	85.50	9.70	12.81	42	15.0	2	Canopy	
2	6-May-10		4	38 29 20.56	-121 33 4.92	38.489044	-121.551367	71.30	80.80	9.40	13.24	42	15.0	2	Canopy	
2	6-May-10		2	38 29 20.56	-121 33 4.92	38.489044	-121.551367	60.10	69.60	9.50	15.77	42	15.0	2	Canopy	
2	6-May-10		1	38 29 20.56	-121 33 4.92	38.489044	-121.551367	41.80	51.40	9.60	22.98	42	15.0	2	Canopy	
2	6-May-10		12	38 29 20.54	-121 33 4.88	38.489039	-121.551356	83.30	90.00	6.80	8.14	63	10.0	2	Canopy	
2	6-May-10		10	38 29 20.54	-121 33 4.88	38.489039	-121.551356	81.50	88.30	6.80	8.32	63	10.0	2	Canopy	
2	6-May-10		8	38 29 20.54	-121 33 4.88	38.489039	-121.551356	80.60	86.90	6.30	7.88	63	10.0	2	Canopy	
2	6-May-10		6	38 29 20.54	-121 33 4.88	38.489039	-121.551356	81.60	88.10	6.50	8.01	63	10.0	2	Canopy	
2	6-May-10		4	38 29 20.54	-121 33 4.88	38.489039	-121.551356	71.00	77.70	6.70	9.40	63	10.0	2	Canopy	
2	6-May-10		2	38 29 20.54	-121 33 4.88	38.489039	-121.551356	66.90	73.10	6.20	9.28	63	10.0	2	Canopy	
2	6-May-10		1	38 29 20.54	-121 33 4.88	38.489039	-121.551356	56.10	62.30	6.10	10.93	63	10.0	2	Canopy	
2	6-May-10		12	38 29 20.47	-121 33 4.83	38.489019	-121.551342	81.70	88.60	6.80	8.36	71	5.0	2	Canopy	
2	6-May-10		10	38 29 20.47	-121 33 4.83	38.489019	-121.551342	80.10	87.20	7.10	8.92	71	5.0	2	Canopy	
2	6-May-10		8	38 29 20.47	-121 33 4.83	38.489019	-121.551342	78.10	85.30	7.20	9.21	71	5.0	2	Canopy	
2	6-May-10		6	38 29 20.47	-121 33 4.83	38.489019	-121.551342	76.20	83.60	7.40	9.71	71	5.0	2	Canopy	
2	6-May-10		4	38 29 20.47	-121 33 4.83	38.489019	-121.551342	74.30	81.10	6.80	9.22	71	5.0	2	Canopy	
2	6-May-10		2	38 29 20.47	-121 33 4.83	38.489019	-121.551342	66.70	73.90	7.20	10.81	71	5.0	2	Canopy	
2	6-May-10		1	38 29 20.47	-121 33 4.83	38.489019	-121.551342	55.70	62.70	7.00	12.50	71	5.0	2	Canopy	

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Date	Site	Depth	Distance	Lat1	Long1	Lat2	Long2	Dry	Wet	Water	Percent	Remark
7-Apr-10	1	10	51.0	35 08 33.82	-106 40 35.86	35.1427278	-106.6766278	84.60	93.00	8.40	9.91	Open area, flood plain
7-Apr-10	1	8	51.0	35 08 33.82	-106 40 35.85	35.1427278	-106.6766250	84.80	93.00	8.10	9.59	
7-Apr-10	1	6	51.0	35 08 33.82	-106 40 35.84	35.1427278	-106.6766222	84.70	93.20	8.50	10.09	
7-Apr-10	1	4	51.0	35 08 33.8	-106 40 35.84	35.1427222	-106.6766222	83.10	91.20	8.10	9.69	
7-Apr-10	1	2	51.0	35 08 33.81	-106 40 35.83	35.1427250	-106.6766194	73.40	81.50	8.20	11.14	
7-Apr-10	1	1	51.0	35 08 33.8	-106 40 35.83	35.1427222	-106.6766194	66.30	74.80	8.50	12.87	
7-Apr-10	1	12	37.0	35 08 33.83	-106 40 35.65	35.1427306	-106.6765694	79.30	86.90	7.60	9.64	Open area, flood plain
7-Apr-10	1	10	37.0	35 08 33.83	-106 40 35.68	35.1427306	-106.6765778	78.60	85.70	7.10	9.03	
7-Apr-10	1	8	37.0	35 08 33.8	-106 40 35.66	35.1427222	-106.6765722	78.00	85.30	7.30	9.35	
7-Apr-10	1	6	37.0	35 08 33.79	-106 40 35.65	35.1427194	-106.6765694	75.10	82.30	7.20	9.61	
7-Apr-10	1	4	37.0	35 08 33.78	-106 40 35.65	35.1427167	-106.6765694	68.00	75.30	7.20	10.64	
7-Apr-10	1	2	37.0	35 08 33.77	-106 40 35.65	35.1427139	-106.6765694	63.00	70.20	7.20	11.47	
7-Apr-10	1	1	37.0	35 08 33.77	-106 40 35.65	35.1427139	-106.6765694	50.70	57.80	7.10	13.94	
7-Apr-10	1	12	15.0	35 08 33.7	-106 40 35.44	35.1426944	-106.6765111	84.20	94.50	10.20	12.14	Open area, flood plain
7-Apr-10	1	10	15.0	35 08 33.69	-106 40 35.41	35.1426917	-106.6765028	81.40	92.40	11.00	13.46	
7-Apr-10	1	8	15.0	35 08 33.68	-106 40 35.4	35.1426889	-106.6765000	79.90	91.00	11.10	13.88	
7-Apr-10	1	6	15.0	35 08 33.68	-106 40 35.4	35.1426889	-106.6765000	79.10	90.00	10.90	13.81	
7-Apr-10	1	4	15.0	35 08 33.68	-106 40 35.4	35.1426889	-106.6765000	74.50	84.80	10.30	13.83	
7-Apr-10	1	2	15.0	35 08 33.68	-106 40 35.4	35.1426889	-106.6765000	60.00	70.40	10.50	17.44	
7-Apr-10	1	1	15.0	35 08 33.68	-106 40 35.41	35.1426889	-106.6765028	51.60	62.50	11.00	21.25	
7-Apr-10	1	12	4.5	35 08 33.58	-106 40 35.4	35.1426611	-106.6765000	69.30	77.70	8.40	12.08	South of stump
7-Apr-10	1	10	4.5	35 08 33.59	-106 40 35.39	35.1426639	-106.6764972	66.60	75.50	9.00	13.46	
7-Apr-10	1	8	4.5	35 08 33.61	-106 40 35.39	35.1426694	-106.6764972	64.10	73.10	8.90	13.95	
7-Apr-10	1	6	4.5	35 08 33.61	-106 40 35.4	35.1426694	-106.6765000	58.30	67.10	8.80	15.12	
7-Apr-10	1	4	4.5	35 08 33.61	-106 40 35.4	35.1426694	-106.6765000	48.10	56.70	8.60	17.90	
7-Apr-10	1	2	4.5	35 08 33.61	-106 40 35.4	35.1426694	-106.6765000	44.50	52.90	8.40	18.89	
7-Apr-10	1	1	4.5	35 08 33.6	-106 40 35.39	35.1426667	-106.6764972	39.80	48.90	9.10	22.75	
7-Apr-10	1	10	6.0	35 08 33.59	-106 40 35.27	35.1426639	-106.6764639	88.50	91.10	2.60	2.95	East of stump

Date	Site	Depth	Distance	Lat1	Long1	Lat2	Long2	Dry	Wet	Water	Percent	Remark
7-Apr-10	1	8	6.0	35 08 33.61	-106 40 35.27	35.1426694	-106.6764639	86.90	89.90	2.90	3.37	
7-Apr-10	1	6	6.0	35 08 33.61	-106 40 35.27	35.1426694	-106.6764639	83.20	86.10	3.00	3.55	
7-Apr-10	1	4	6.0	35 08 33.62	-106 40 35.27	35.1426722	-106.6764639	79.00	81.50	2.50	3.13	
7-Apr-10	1	2	6.0	35 08 33.59	-106 40 35.3	35.1426639	-106.6764722	76.70	80.30	3.60	4.75	
7-Apr-10	1	1	6.0	35 08 33.67	-106 40 35.28	35.1426861	-106.6764667	72.00	74.60	2.60	3.61	
7-Apr-10	1	12	24.0	35 08 33.56	-106 40 35.17	35.1426556	-106.6764361	80.00	88.50	8.50	10.64	East stump
7-Apr-10	1	10	24.0	35 08 33.55	-106 40 35.12	35.1426528	-106.6764222	77.00	85.60	8.60	11.16	
7-Apr-10	1	8	24.0	35 08 33.56	-106 40 35.11	35.1426556	-106.6764194	71.70	80.60	8.80	12.29	
7-Apr-10	1	6	24.0	35 08 33.56	-106 40 35.1	35.1426556	-106.6764167	62.90	71.20	8.30	13.27	
7-Apr-10	1	4	24.0	35 08 33.56	-106 40 35.09	35.1426556	-106.6764139	53.40	62.40	9.10	16.99	
7-Apr-10	1	2	24.0	35 08 33.56	-106 40 35.08	35.1426556	-106.6764111	45.30	54.00	8.70	19.18	
7-Apr-10	1	1	24.0	35 08 33.57	-106 40 35.07	35.1426583	-106.6764083	41.50	50.20	8.70	20.84	
8-Apr-10	1	10	50.0	35 08 33.52	-106 40 34.81	35.1426444	-106.6763361	87.40	91.00	3.60	4.16	Levee toe
8-Apr-10	1	8	50.0	35 08 33.51	-106 40 34.81	35.1426417	-106.6763361	86.30	89.70	3.40	3.92	
8-Apr-10	1	6	50.0	35 08 33.49	-106 40 34.8	35.1426361	-106.6763333	82.20	85.70	3.50	4.26	
8-Apr-10	1	4	50.0	35 08 33.5	-106 40 34.79	35.1426389	-106.6763306	79.60	82.90	3.30	4.11	
8-Apr-10	1	2	50.0	35 08 33.5	-106 40 34.79	35.1426389	-106.6763306	73.30	77.40	4.10	5.61	
8-Apr-10	1	1	50.0	35 08 33.5	-106 40 34.79	35.1426389	-106.6763306	71.30	74.60	3.30	4.57	
8-Apr-10	1	10	58.0	35 08 33.43	-106 40 34.75	35.1426194	-106.6763194	93.90	98.70	4.80	5.09	Mid slope
8-Apr-10	1	8	58.0	35 08 33.41	-106 40 34.73	35.1426139	-106.6763139	94.10	98.10	4.00	4.30	
8-Apr-10	1	6	58.0	35 08 33.44	-106 40 34.67	35.1426222	-106.6762972	89.60	93.90	4.30	4.81	
8-Apr-10	1	4	58.0	35 08 33.45	-106 40 34.64	35.1426250	-106.6762889	86.00	90.50	4.40	5.17	
8-Apr-10	1	2	58.0	35 08 33.31	-106 40 34.73	35.1425861	-106.6763139	78.60	83.10	4.50	5.67	
8-Apr-10	1	1	58.0	35 08 33.32	-106 40 34.73	35.1425889	-106.6763139	63.60	67.80	4.20	6.60	
8-Apr-10	1	10	65.0	35 08 33.36	-106 40 34.62	35.1426000	-106.6762833	108.60	114.80	6.20	5.67	Crest - edge
8-Apr-10	1	8	65.0	35 08 33.39	-106 40 34.62	35.1426083	-106.6762833	106.70	113.10	6.40	6.00	
8-Apr-10	1	6	65.0	35 08 33.4	-106 40 34.63	35.1426111	-106.6762861	104.60	111.10	6.50	6.22	
8-Apr-10	1	4	65.0	35 08 33.39	-106 40 34.63	35.1426083	-106.6762861	100.10	106.90	6.70	6.69	
8-Apr-10	1	2	65.0	35 08 33.39	-106 40 34.63	35.1426083	-106.6762861	94.80	101.20	6.30	6.68	

Date	Site	Depth	Distance	Lat1	Long1	Lat2	Long2	Dry	Wet	Water	Percent	Remark
8-Apr-10	1	1	65.0	35 08 33.38	-106 40 34.62	35.1426056	-106.6762833	87.80	94.40	6.60	7.52	
8-Apr-10	1	12	16.0	35 08 30.87	-106 40 38.15	35.1419083	-106.6772639	77.90	90.00	12.10	15.49	Clearing woods
8-Apr-10	1	10	16.0	35 08 30.88	-106 40 38.12	35.1419111	-106.6772556	77.30	89.30	12.10	15.63	
8-Apr-10	1	10	16.0	35 08 30.91	-106 40 38.12	35.1419194	-106.6772556	76.80	89.10	12.30	16.03	
8-Apr-10	1	8	16.0	35 08 30.91	-106 40 38.12	35.1419194	-106.6772556	77.30	89.40	12.00	15.56	
8-Apr-10	1	6	16.0	35 08 30.91	-106 40 38.11	35.1419194	-106.6772528	76.60	89.10	12.40	16.22	
8-Apr-10	1	4	16.0	35 08 30.91	-106 40 38.11	35.1419194	-106.6772528	72.70	85.00	12.30	16.99	
8-Apr-10	1	2	16.0	35 08 30.91	-106 40 38.11	35.1419194	-106.6772528	64.80	76.70	11.90	18.35	
8-Apr-10	1	1	16.0	35 08 30.91	-106 40 38.11	35.1419194	-106.6772528	49.40	61.80	12.40	25.09	
8-Apr-10	1	12	8.0	35 08 30.91	-106 40 38.03	35.1419194	-106.6772306	75.20	81.20	6.00	8.00	Woods
8-Apr-10	1	10	8.0	35 08 31.01	-106 40 38.03	35.1419472	-106.6772306	73.30	79.50	6.20	8.45	
8-Apr-10	1	8	8.0	35 08 31.01	-106 40 38.03	35.1419472	-106.6772306	71.70	78.00	6.30	8.75	
8-Apr-10	1	6	8.0	35 08 31.01	-106 40 38.03	35.1419472	-106.6772306	65.00	71.20	6.20	9.46	
8-Apr-10	1	4	8.0	35 08 31.01	-106 40 38.03	35.1419472	-106.6772306	52.80	58.90	6.20	11.68	
8-Apr-10	1	2	8.0	35 08 31.01	-106 40 38.03	35.1419472	-106.6772306	50.30	56.80	6.50	12.88	
8-Apr-10	1	1	8.0	35 08 31.01	-106 40 38.03	35.1419472	-106.6772306	40.80	47.80	7.00	17.21	
8-Apr-10	1	12	3.5	35 08 31.09	-106 40 37.99	35.1419694	-106.6772194	70.80	80.70	9.90	13.92	Woods
8-Apr-10	1	12	3.5	35 08 31.09	-106 40 37.99	35.1419694	-106.6772194	71.10	80.80	9.60	13.52	
8-Apr-10	1	10	3.5	35 08 31.09	-106 40 38.05	35.1419694	-106.6772361	71.20	80.60	9.30	13.06	
8-Apr-10	1	8	3.5	35 08 31.09	-106 40 37.99	35.1419694	-106.6772194	71.60	81.10	9.50	13.31	
8-Apr-10	1	6	3.5	35 08 31.09	-106 40 37.99	35.1419694	-106.6772194	69.40	79.90	10.50	15.10	
8-Apr-10	1	4	3.5	35 08 31.09	-106 40 37.99	35.1419694	-106.6772194	64.10	73.30	9.20	14.35	
8-Apr-10	1	2	3.5	35 08 31.09	-106 40 37.99	35.1419694	-106.6772194	50.60	60.10	9.50	18.69	
8-Apr-10	1	1	3.5	35 08 31.09	-106 40 37.99	35.1419694	-106.6772194	34.00	43.50	9.50	27.76	
8-Apr-10	1	12	45.0	35 08 30.91	-106 40 38.29	35.1419194	-106.6773028	88.20	96.80	8.60	9.75	Open area, flood plain
8-Apr-10	1	12	45.0	35 08 30.91	-106 40 38.29	35.1419194	-106.6773028	88.50	97.00	8.50	9.66	
8-Apr-10	1	10	45.0	35 08 30.91	-106 40 38.29	35.1419194	-106.6773028	87.50	95.90	8.40	9.60	
8-Apr-10	1	8	45.0	35 08 30.91	-106 40 38.29	35.1419194	-106.6773028	88.20	96.50	8.40	9.49	
8-Apr-10	1	6	45.0	35 08 30.91	-106 40 38.29	35.1419194	-106.6773028	87.00	95.90	8.90	10.25	

Date	Site	Depth	Distance	Lat1	Long1	Lat2	Long2	Dry	Wet	Water	Percent	Remark
8-Apr-10	1	4	45.0	35 08 30.91	-106 40 38.29	35.1419194	-106.6773028	84.90	93.40	8.50	10.01	
8-Apr-10	1	2	45.0	35 08 30.91	-106 40 38.29	35.1419194	-106.6773028	74.20	82.70	8.40	11.37	
8-Apr-10	1	1	45.0	35 08 30.91	-106 40 38.29	35.1419194	-106.6773028	57.80	66.10	8.30	14.43	
8-Apr-10	3	10	ls toe	35 09 16.87	-106 40 41.62	35.1546861	-106.6782278	92.20	94.40	2.10	2.30	Non engineered levee, west side, ls toe
8-Apr-10	3	8	ls toe	35 09 16.87	-106 40 41.62	35.1546861	-106.6782278	88.10	90.60	2.50	2.89	
8-Apr-10	3	6	ls toe	35 09 16.87	-106 40 41.62	35.1546861	-106.6782278	84.00	86.00	2.00	2.36	
8-Apr-10	3	4	ls toe	35 09 16.87	-106 40 41.62	35.1546861	-106.6782278	77.30	78.80	1.50	1.98	
8-Apr-10	3	2	ls toe	35 09 16.87	-106 40 41.62	35.1546861	-106.6782278	72.20	74.10	1.90	2.59	
8-Apr-10	3	1	ls toe	35 09 16.87	-106 40 41.62	35.1546861	-106.6782278	55.90	57.60	1.60	2.91	
8-Apr-10	3	6	ls crest	35 09 16.77	-106 40 41.48	35.1546583	-106.6781889	77.60	80.10	2.60	3.32	
8-Apr-10	3	4	ls crest	35 09 16.78	-106 40 41.49	35.1546611	-106.6781917	71.20	73.70	2.50	3.53	
8-Apr-10	3	2	ls crest	35 09 16.77	-106 40 41.49	35.1546583	-106.6781917	71.40	73.70	2.30	3.21	
8-Apr-10	3	1	ls crest	35 09 16.77	-106 40 41.49	35.1546583	-106.6781917	64.10	66.50	2.40	3.75	
8-Apr-10	3	12	rs crest	35 09 16.6	-106 40 41.42	35.1546111	-106.6781722	107.90	110.60	2.70	2.50	
8-Apr-10	3	10	rs crest	35 09 16.6	-106 40 41.42	35.1546111	-106.6781722	105.50	107.90	2.40	2.27	
8-Apr-10	3	8	rs crest	35 09 16.6	-106 40 41.42	35.1546111	-106.6781722	101.20	104.00	2.80	2.72	
8-Apr-10	3	6	rs crest	35 09 16.6	-106 40 41.42	35.1546111	-106.6781722	96.70	99.40	2.60	2.73	
8-Apr-10	3	4	rs crest	35 09 16.6	-106 40 41.42	35.1546111	-106.6781722	90.30	92.50	2.20	2.48	
8-Apr-10	3	2	rs crest	35 09 16.6	-106 40 41.42	35.1546111	-106.6781722	89.70	92.00	2.30	2.60	
8-Apr-10	3	1	rs crest	35 09 16.6	-106 40 41.42	35.1546111	-106.6781722	88.60	91.10	2.50	2.81	
8-Apr-10	2	12	crest	35 09 55.25	-106 40 1.22	35.1653472	-106.6670056	108.50	111.50	3.00	2.77	Site 1
8-Apr-10	2	12	crest	35 09 55.25	-106 40 1.22	35.1653472	-106.6670056	108.90	111.60	2.80	2.53	
8-Apr-10	2	10	crest	35 09 55.24	-106 40 1.22	35.1653444	-106.6670056	107.10	110.20	3.10	2.89	
8-Apr-10	2	10	crest	35 09 55.25	-106 40 1.22	35.1653472	-106.6670056	106.70	109.70	3.00	2.82	
8-Apr-10	2	8	crest	35 09 55.25	-106 40 1.22	35.1653472	-106.6670056	104.20	107.20	3.00	2.88	
8-Apr-10	2	6	crest	35 09 55.25	-106 40 1.22	35.1653472	-106.6670056	102.70	105.90	3.10	3.06	
8-Apr-10	2	4	crest	35 09 55.25	-106 40 1.22	35.1653472	-106.6670056	98.30	101.20	2.90	2.93	
8-Apr-10	2	2	crest	35 09 55.25	-106 40 1.22	35.1653472	-106.6670056	99.80	102.80	2.90	2.95	
8-Apr-10	2	1	crest	35 09 55.25	-106 40 1.22	35.1653472	-106.6670056	89.70	92.70	3.00	3.38	

Date	Site	Depth	Distance	Lat1	Long1	Lat2	Long2	Dry	Wet	Water	Percent	Remark
8-Apr-10	2	12	toe	35 09 55.12	-106 40 1.18	35.1653111	-106.6669944	103.10	107.60	4.50	4.41	
8-Apr-10	2	10	toe	35 09 55.12	-106 40 1.18	35.1653111	-106.6669944	100.10	104.20	4.20	4.16	
8-Apr-10	2	8	toe	35 09 55.16	-106 40 1.16	35.1653222	-106.6669889	97.00	101.00	4.10	4.18	
8-Apr-10	2	6	toe	35 09 55.12	-106 40 1.18	35.1653111	-106.6669944	95.00	99.30	4.30	4.56	
8-Apr-10	2	4	toe	35 09 55.12	-106 40 1.18	35.1653111	-106.6669944	87.40	91.60	4.10	4.71	
8-Apr-10	2	2	toe	35 09 55.12	-106 40 1.18	35.1653111	-106.6669944	82.50	86.50	4.10	4.92	
8-Apr-10	2	1	toe	35 09 55.12	-106 40 1.18	35.1653111	-106.6669944	71.60	75.20	3.60	5.07	
8-Apr-10	2	10	1.0	35 09 55.16	-106 40 0.04	35.1653222	-106.6666778	69.90	78.50	8.60	12.24	1 ft west of tree, geophyiz survey
8-Apr-10	2	12	1.0	35 09 55.16	-106 40 0.04	35.1653222	-106.6666778	69.50	79.10	9.60	13.87	
8-Apr-10	2	8	1.0	35 09 55.13	-106 40 0.06	35.1653139	-106.6666833	71.10	79.10	8.00	11.24	
8-Apr-10	2	6	1.0	35 09 55.1	-106 40 0.19	35.1653056	-106.6667194	68.80	77.70	8.90	13.00	
8-Apr-10	2	4	1.0	35 09 55.17	-106 40 0.14	35.1653250	-106.6667056	61.90	70.70	8.80	14.22	
8-Apr-10	2	2	1.0	35 09 55.2	-106 40 0.13	35.1653333	-106.6667028	59.70	68.20	8.50	14.24	
8-Apr-10	2	1	1.0	35 09 55.2	-106 40 0.12	35.1653333	-106.6667000	48.80	57.30	8.40	17.30	
8-Apr-10	2	12	25.0	35 09 55.19	-106 40 0.29	35.1653306	-106.6667472	69.20	78.20	9.00	13.03	25 ft SE tree, geophyiz survey
8-Apr-10	2	10	25.0	35 09 55.19	-106 40 0.29	35.1653306	-106.6667472	65.90	75.70	9.80	14.91	
8-Apr-10	2	8	25.0	35 09 55.19	-106 40 0.29	35.1653306	-106.6667472	65.60	74.00	8.40	12.73	
8-Apr-10	2	6	25.0	35 09 55.19	-106 40 0.29	35.1653306	-106.6667472	62.10	72.40	10.20	16.49	
8-Apr-10	2	4	25.0	35 09 55.19	-106 40 0.29	35.1653306	-106.6667472	56.30	65.50	9.20	16.39	
8-Apr-10	2	2	25.0	35 09 55.19	-106 40 0.29	35.1653306	-106.6667472	53.60	63.80	10.20	19.04	
8-Apr-10	2	12	97.0	35 09 55.04	-106 40 0.24	35.1652889	-106.6667333	71.40	83.10	11.70	16.32	
8-Apr-10	2	10	97.0	35 09 55.07	-106 40 0.24	35.1652972	-106.6667333	71.30	81.80	10.50	14.68	
8-Apr-10	2	8	97.0	35 09 55.03	-106 40 0.24	35.1652861	-106.6667333	69.50	80.00	10.50	15.18	
8-Apr-10	2	6	97.0	35 09 55.04	-106 40 0.24	35.1652889	-106.6667333	63.70	74.10	10.40	16.31	
8-Apr-10	2	6	97.0	35 09 55.04	-106 40 0.24	35.1652889	-106.6667333	63.10	74.00	10.90	17.32	
8-Apr-10	2	4	97.0	35 09 55.04	-106 40 0.24	35.1652889	-106.6667333	59.30	69.80	10.50	17.71	
8-Apr-10	2	2	97.0	35 09 55.04	-106 40 0.24	35.1652889	-106.6667333	52.60	63.10	10.50	19.99	
8-Apr-10	2	1	97.0	35 09 55.04	-106 40 0.24	35.1652889	-106.6667333	34.30	44.90	10.60	30.88	

Boca Raton, FL

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks	Remarks 2
10-Jun-10	12	26 21 18.1	-080 17 50.06	26.35503	-80.26942778	87.4	106.7	19.3	22.04	Flag 22.5 at 14	
10-Jun-10	10	26 21 18.1	-080 17 50.06	26.35503	-80.26942778	86.4	106.6	20.2	23.35		
10-Jun-10	8	26 21 18.1	-080 17 50.06	26.35503	-80.26942778	84	103.4	19.4	23.16		
10-Jun-10	6	26 21 18.1	-080 17 50.06	26.35503	-80.26942778	80.8	100.7	19.9	24.65		
10-Jun-10	4	26 21 18.1	-080 17 50.06	26.35503	-80.26942778	77.2	96.2	19	24.67		
10-Jun-10	1	26 21 18.1	-080 17 50.06	26.35503	-80.26942778	21	40.3	19.3	91.75		
10-Jun-10	1	26 21 18.1	-080 17 50.06	26.35503	-80.26942778	52.9	72.8	19.9	37.68		
10-Jun-10	10	26 21 18.07	-080 17 50.02	26.35502	-80.26943889	88.9	101	12.2	13.69	Flag 22.5 at 9	Rock - no 12" reading
10-Jun-10	8	26 21 18.07	-080 17 50.02	26.35502	-80.26943889	86.2	97.9	11.7	13.61		
10-Jun-10	6	26 21 18.07	-080 17 50.02	26.35502	-80.26943889	80.5	92.2	11.6	14.46		
10-Jun-10	4	26 21 18.07	-080 17 50.02	26.35502	-80.26943889	79	90.5	11.5	14.5		
10-Jun-10	1	26 21 18.07	-080 17 50.02	26.35502	-80.26943889	29.1	41.1	12.1	41.44		
10-Jun-10	1	26 21 18.07	-080 17 50.02	26.35502	-80.26943889	73.4	85.1	11.7	16		
10-Jun-10	10	26 21 17.99	-080 17 50.07	26.355	-80.269425	79.5	97	17.5	22.01	Adjacent to tree	Rock - no 12" reading
10-Jun-10	10	26 21 17.99	-080 17 50.07	26.355	-80.269425	80.2	97.1	16.9	21.11		
10-Jun-10	8	26 21 17.99	-080 17 50.07	26.355	-80.269425	76.9	94.2	17.3	22.47		
10-Jun-10	6	26 21 17.99	-080 17 50.07	26.355	-80.269425	73.5	90.6	17	23.15		
10-Jun-10	4	26 21 17.99	-080 17 50.07	26.355	-80.269425	70.6	87.5	16.9	23.9		
10-Jun-10	1	26 21 17.99	-080 17 50.07	26.355	-80.269425	16	33.1	17.2	107.63		
10-Jun-10	2	26 21 17.99	-080 17 50.07	26.355	-80.269425	62.8	80.7	18	28.67		
10-Jun-10	10	26 21 18.2	-080 17 50.02	26.35506	-80.26943889	101.8	116.9	15.1	14.87		15 ft from tree
10-Jun-10	8	26 21 18.2	-080 17 50.02	26.35506	-80.26943889	99.7	114.5	14.8	14.87		
10-Jun-10	6	26 21 18.2	-080 17 50.02	26.35506	-80.26943889	99	114.1	15.1	15.22		
10-Jun-10	4	26 21 18.2	-080 17 50.02	26.35506	-80.26943889	98.9	114.1	15.2	15.42		
10-Jun-10	2	26 21 18.2	-080 17 50.02	26.35506	-80.26943889	86.3	100.7	14.4	16.73		
10-Jun-10	1	26 21 18.2	-080 17 50.02	26.35506	-80.26943889	86.4	101.1	14.7	16.96		
10-Jun-10	12	26 21 18.2	-080 17 50.03	26.35506	-80.26943611	111.8	122.9	11.1	9.92		20 ft from tree
10-Jun-10	10	26 21 18.2	-080 17 50.03	26.35506	-80.26943611	107.7	119	11.4	10.54		

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks	Remarks 2
10-Jun-10	8	26 21 18.2	-080 17 50.03	26.35506	-80.26943611	106.3	118.4	12.1	11.35		
10-Jun-10	6	26 21 18.2	-080 17 50.03	26.35506	-80.26943611	104.9	116.3	11.4	10.83		
10-Jun-10	4	26 21 18.2	-080 17 50.03	26.35506	-80.26943611	98.4	109.8	11.4	11.55		
10-Jun-10	2	26 21 18.2	-080 17 50.03	26.35506	-80.26943611	92.6	103.8	11.3	12.18		
10-Jun-10	1	26 21 18.2	-080 17 50.03	26.35506	-80.26943611	76.1	88.3	12.2	16.09		
10-Jun-10	12	26 21 18.22	-080 17 50.03	26.35506	-80.26943611	115.5	125.5	9.9	8.6		25 ft from tree, 26 ft drip line
10-Jun-10	10	26 21 18.22	-080 17 50.03	26.35506	-80.26943611	113.9	123.6	9.7	8.53		
10-Jun-10	8	26 21 18.22	-080 17 50.03	26.35506	-80.26943611	113	123.1	10.1	8.96		
10-Jun-10	6	26 21 18.22	-080 17 50.03	26.35506	-80.26943611	109.1	118.7	9.6	8.82		
10-Jun-10	4	26 21 18.22	-080 17 50.03	26.35506	-80.26943611	101.8	112	10.3	10.08		
10-Jun-10	2	26 21 18.22	-080 17 50.03	26.35506	-80.26943611	96.2	106.3	10.1	10.46		
10-Jun-10	1	26 21 18.22	-080 17 50.03	26.35506	-80.26943611	88.2	98.2	9.9	11.25		
10-Jun-10	12	26 21 18.28	-080 17 50	26.35508	-80.26944444	116.8	122	5.2	4.45		30 ft from tree
10-Jun-10	10	26 21 18.28	-080 17 50	26.35508	-80.26944444	115.5	120.7	5.2	4.48		
10-Jun-10	8	26 21 18.28	-080 17 50	26.35508	-80.26944444	114.5	120	5.5	4.77		
10-Jun-10	6	26 21 18.28	-080 17 50	26.35508	-80.26944444	110.4	115.6	5.1	4.66		
10-Jun-10	4	26 21 18.28	-080 17 50	26.35508	-80.26944444	105.9	111.1	5.2	4.88		
10-Jun-10	2	26 21 18.28	-080 17 50	26.35508	-80.26944444	103.8	109	5.2	4.96		
10-Jun-10	1	26 21 18.28	-080 17 50	26.35508	-80.26944444	94.7	99.9	5.3	5.55		
10-Jun-10	12	26 21 18.41	-080 17 50.11	26.35511	-80.26941389	114.4	117.1	2.7	2.38		40 ft from tree
10-Jun-10	10	26 21 18.41	-080 17 50.11	26.35511	-80.26941389	117.1	121	3.8	3.28		
10-Jun-10	8	26 21 18.41	-080 17 50.11	26.35511	-80.26941389	114	117.7	3.7	3.22		
10-Jun-10	6	26 21 18.41	-080 17 50.11	26.35511	-80.26941389	109.5	114.7	5.2	4.75		
10-Jun-10	4	26 21 18.41	-080 17 50.11	26.35511	-80.26941389	105.8	110.8	5	4.76		
10-Jun-10	2	26 21 18.41	-080 17 50.11	26.35511	-80.26941389	103.5	106.7	3.1	3.04		
10-Jun-10	1	26 21 18.41	-080 17 50.11	26.35511	-80.26941389	99.7	103.4	3.6	3.66		
10-Jun-10	12	26 21 6.55	-080 17 51.95	26.35182	-80.26890278	85	89.8	4.8	5.59	Clear area	Levee - 30 ft us of gate
10-Jun-10	10	26 21 6.55	-080 17 51.95	26.35182	-80.26890278	82	86.8	4.8	5.84		
10-Jun-10	8	26 21 6.55	-080 17 51.95	26.35182	-80.26890278	77.2	81.8	4.6	5.96		

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks	Remarks 2
10-Jun-10	6	26 21 6.55	-080 17 51.95	26.35182	-80.26890278	69.4	74.2	4.8	6.92		
10-Jun-10	4	26 21 6.55	-080 17 51.95	26.35182	-80.26890278	56.6	61.2	4.6	8.12		
10-Jun-10	2	26 21 6.55	-080 17 51.95	26.35182	-80.26890278	54.5	59.6	5	9.26		
10-Jun-10	1	26 21 6.55	-080 17 51.95	26.35182	-80.26890278	40.7	45.9	5.2	12.77		
10-Jun-10	12	26 21 6.56	-080 17 52.1	26.35182	-80.26886111	90.7	94.8	4.1	4.56	Midslope - flood side	Shell and sandy soils
10-Jun-10	10	26 21 6.56	-080 17 52.1	26.35182	-80.26886111	87.2	92	4.8	5.47		
10-Jun-10	8	26 21 6.56	-080 17 52.1	26.35182	-80.26886111	82.7	86.8	4.1	4.93		
10-Jun-10	6	26 21 6.56	-080 17 52.1	26.35182	-80.26886111	69	73.7	4.7	6.86		
10-Jun-10	4	26 21 6.56	-080 17 52.1	26.35182	-80.26886111	51.8	56.1	4.3	8.23		
10-Jun-10	2	26 21 6.56	-080 17 52.1	26.35182	-80.26886111	46.9	51.1	4.2	8.91		
10-Jun-10	1	26 21 6.56	-080 17 52.1	26.35182	-80.26886111	32.6	36.9	4.3	13.23		
10-Jun-10	12	26 21 6.62	-080 17 52.1	26.35184	-80.26886111	82.6	88.2	5.6	6.77	Toe - flood side	
10-Jun-10	10	26 21 6.62	-080 17 52.1	26.35184	-80.26886111	80.1	86.2	6.2	7.69		
10-Jun-10	8	26 21 6.62	-080 17 52.1	26.35184	-80.26886111	71.7	77.9	6.3	8.77		
10-Jun-10	6	26 21 6.62	-080 17 52.1	26.35184	-80.26886111	63.8	69.4	5.6	8.78		
10-Jun-10	4	26 21 6.62	-080 17 52.1	26.35184	-80.26886111	52.1	58.8	6.7	12.78		
10-Jun-10	2	26 21 6.62	-080 17 52.1	26.35184	-80.26886111	48.5	55.3	6.7	13.9		
10-Jun-10	1	26 21 6.62	-080 17 52.1	26.35184	-80.26886111	36.5	42.6	6.1	16.6		
10-Jun-10	12	26 21 6.66	-080 17 51.86	26.35185	-80.26892778	91.3	94.8	3.5	3.88	Ls crest	
10-Jun-10	10	26 21 6.66	-080 17 51.86	26.35185	-80.26892778	89.6	93.6	4	4.44		
10-Jun-10	8	26 21 6.66	-080 17 51.86	26.35185	-80.26892778	86.8	90.3	3.6	4.1		
10-Jun-10	6	26 21 6.66	-080 17 51.86	26.35185	-80.26892778	84	87.2	3.3	3.89		
10-Jun-10	4	26 21 6.66	-080 17 51.86	26.35185	-80.26892778	67.2	70.9	3.7	5.52		
10-Jun-10	1	26 21 6.66	-080 17 51.86	26.35185	-80.26892778	9.8	13	3.2	32.49		
10-Jun-10	1	26 21 6.66	-080 17 51.86	26.35185	-80.26892778	48	51.8	3.8	7.94		
10-Jun-10	12	26 21 6.66	-080 17 51.75	26.35185	-80.26895833	88.6	93.8	5.2	5.87	Ls midslope	
10-Jun-10	10	26 21 6.66	-080 17 51.77	26.35185	-80.26895278	84.4	89.4	5	5.9		
10-Jun-10	8	26 21 6.66	-080 17 51.77	26.35185	-80.26895278	81.4	86.5	5.1	6.23		
10-Jun-10	6	26 21 6.66	-080 17 51.77	26.35185	-80.26895278	72.3	77.9	5.6	7.73		

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks	Remarks 2
10-Jun-10	4	26 21 6.66	-080 17 51.77	26.35185	-80.26895278	55.5	60.8	5.3	9.5		
10-Jun-10	1	26 21 6.66	-080 17 51.77	26.35185	-80.26895278	-2.3	3	5.3	-230.01		
10-Jun-10	1	26 21 6.66	-080 17 51.77	26.35185	-80.26895278	34.3	39.3	5	14.45		
10-Jun-10	12	26 21 6.74	-080 17 51.56	26.35187	-80.26901111	93.3	120	26.7	28.57	Ls toe	
10-Jun-10	10	26 21 6.74	-080 17 51.55	26.35187	-80.26901389	90.1	117.3	27.3	30.28		
10-Jun-10	8	26 21 6.74	-080 17 51.55	26.35187	-80.26901389	87.8	115	27.2	30.93		
10-Jun-10	6	26 21 6.74	-080 17 51.55	26.35187	-80.26901389	81.9	108.9	27	32.94		
10-Jun-10	4	26 21 6.74	-080 17 51.55	26.35187	-80.26901389	74.3	100.7	26.4	35.56		
10-Jun-10	1	26 21 6.74	-080 17 51.55	26.35187	-80.26901389	25.5	52	26.5	103.58		
10-Jun-10	1	26 21 6.74	-080 17 51.55	26.35187	-80.26901389	72.5	98.8	26.3	36.34		
11-Jun-10	12	26 21 18.65	-080 17 52.28	26.35518	-80.26881111	91.5	97.1	5.6	6.08	Park area - boat launch	2 ft from fig tree
11-Jun-10	10	26 21 18.65	-080 17 52.28	26.35518	-80.26881111	84.2	90.2	6	7.14		
11-Jun-10	8	26 21 18.65	-080 17 52.28	26.35518	-80.26881111	81.6	87.2	5.6	6.84		
11-Jun-10	6	26 21 18.65	-080 17 52.28	26.35518	-80.26881111	77.1	83	5.9	7.61		
11-Jun-10	4	26 21 18.65	-080 17 52.28	26.35518	-80.26881111	71.4	77.7	6.2	8.73		
11-Jun-10	2	26 21 18.65	-080 17 52.28	26.35518	-80.26881111	73.2	78.5	5.4	7.32		
11-Jun-10	1	26 21 18.65	-080 17 52.28	26.35518	-80.26881111	71.3	76.5	5.2	7.34		
11-Jun-10	12	26 21 18.61	-080 17 52.39	26.35517	-80.26878056	94.1	98.7	4.6	4.91		5 ft from fig tree
11-Jun-10	10	26 21 18.61	-080 17 52.39	26.35517	-80.26878056	91.4	96.2	4.8	5.22		
11-Jun-10	8	26 21 18.61	-080 17 52.39	26.35517	-80.26878056	87.6	92.1	4.4	5.06		
11-Jun-10	6	26 21 18.61	-080 17 52.39	26.35517	-80.26878056	83.2	87.5	4.3	5.19		
11-Jun-10	4	26 21 18.61	-080 17 52.39	26.35517	-80.26878056	76.6	81.1	4.5	5.83		
11-Jun-10	2	26 21 18.61	-080 17 52.39	26.35517	-80.26878056	76.7	81.4	4.7	6.19		
11-Jun-10	1	26 21 18.61	-080 17 52.39	26.35517	-80.26878056	61.7	66.1	4.4	7.16		
11-Jun-10	12	26 21 18.55	-080 17 52.4	26.35515	-80.26877778	91.6	93.8	2.2	2.38		10 ft from fig tree
11-Jun-10	10	26 21 18.55	-080 17 52.4	26.35515	-80.26877778	89.1	90.8	1.7	1.93		
11-Jun-10	8	26 21 18.55	-080 17 52.4	26.35515	-80.26877778	85.8	87.6	1.9	2.16		
11-Jun-10	6	26 21 18.55	-080 17 52.4	26.35515	-80.26877778	80.4	82.7	2.3	2.82		
11-Jun-10	4	26 21 18.55	-080 17 52.4	26.35515	-80.26877778	73.3	75.1	1.8	2.49		

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks	Remarks 2
11-Jun-10	2	26 21 18.55	-080 17 52.4	26.35515	-80.26877778	68.7	70.7	1.9	2.81		
11-Jun-10	1	26 21 18.55	-080 17 52.4	26.35515	-80.26877778	59.3	61.6	2.4	3.98		
11-Jun-10	12	26 21 18.51	-080 17 52.42	26.35514	-80.26877222	93.5	96.4	2.9	3.08		15 from fig tree
11-Jun-10	10	26 21 18.51	-080 17 52.42	26.35514	-80.26877222	91.4	94.7	3.3	3.64		
11-Jun-10	8	26 21 18.51	-080 17 52.42	26.35514	-80.26877222	89.9	92.5	2.5	2.84		
11-Jun-10	6	26 21 18.51	-080 17 52.42	26.35514	-80.26877222	86.6	89.3	2.6	3.04		
11-Jun-10	4	26 21 18.51	-080 17 52.42	26.35514	-80.26877222	79.6	82.2	2.6	3.32		
11-Jun-10	2	26 21 18.51	-080 17 52.42	26.35514	-80.26877222	79.7	82.5	2.8	3.47		
11-Jun-10	1	26 21 18.51	-080 17 52.42	26.35514	-80.26877222	72.3	75.1	2.8	3.83		
11-Jun-10	12	26 21 18.47	-080 17 52.37	26.35513	-80.26878611	92.6	95.7	3.1	3.32		20 ft from fig, 18 ft drip line
11-Jun-10	10	26 21 18.47	-080 17 52.37	26.35513	-80.26878611	90.3	93.3	3	3.35		
11-Jun-10	8	26 21 18.47	-080 17 52.37	26.35513	-80.26878611	88.2	91.1	2.9	3.33		
11-Jun-10	6	26 21 18.47	-080 17 52.37	26.35513	-80.26878611	83.5	87	3.5	4.18		
11-Jun-10	4	26 21 18.47	-080 17 52.37	26.35513	-80.26878611	76.8	79.5	2.8	3.63		
11-Jun-10	2	26 21 18.47	-080 17 52.37	26.35513	-80.26878611	73	75.9	2.9	3.98		
11-Jun-10	1	26 21 18.47	-080 17 52.37	26.35513	-80.26878611	58.3	60.9	2.6	4.45		
11-Jun-10	12	26 21 18.43	-080 17 52.4	26.35512	-80.26877778	81.7	90.3	8.5	10.44		25ft from fig tree
11-Jun-10	10	26 21 18.43	-080 17 52.4	26.35512	-80.26877778	79.1	87.8	8.7	11		
11-Jun-10	8	26 21 18.43	-080 17 52.4	26.35512	-80.26877778	77	85.4	8.4	10.92		
11-Jun-10	6	26 21 18.43	-080 17 52.4	26.35512	-80.26877778	73.2	81.8	8.6	11.69		
11-Jun-10	4	26 21 18.43	-080 17 52.4	26.35512	-80.26877778	65.9	75.1	9.2	14.02		
11-Jun-10	2	26 21 18.43	-080 17 52.4	26.35512	-80.26877778	66.2	75.3	9.1	13.69		
11-Jun-10	1	26 21 18.43	-080 17 52.4	26.35512	-80.26877778	57.8	66.4	8.7	14.97		
11-Jun-10	12	26 21 18.41	-080 17 52.43	26.35511	-80.26876944	80.9	88.9	8	9.85		30 ft from fig tree
11-Jun-10	10	26 21 18.41	-080 17 52.43	26.35511	-80.26876944	72.8	81.4	8.6	11.77		
11-Jun-10	8	26 21 18.41	-080 17 52.43	26.35511	-80.26876944	73.8	82	8.2	11.18		
11-Jun-10	6	26 21 18.41	-080 17 52.43	26.35511	-80.26876944	67.9	76.1	8.2	12.08		
11-Jun-10	4	26 21 18.41	-080 17 52.43	26.35511	-80.26876944	59.7	67.9	8.2	13.68		
11-Jun-10	2	26 21 18.41	-080 17 52.43	26.35511	-80.26876944	59.8	68	8.2	13.76		

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks	Remarks 2
11-Jun-10	1	26 21 18.41	-080 17 52.43	26.35511	-80.26876944	37.2	45.7	8.5	22.76		
11-Jun-10	12	26 21 18.32	-080 17 52.42	26.35509	-80.26877222	75.8	87.6	11.8	15.51		35 ft from fig tree
11-Jun-10	10	26 21 18.32	-080 17 52.42	26.35509	-80.26877222	73.8	85.5	11.7	15.88		
11-Jun-10	8	26 21 18.32	-080 17 52.42	26.35509	-80.26877222	70.6	82.3	11.7	16.53		
11-Jun-10	6	26 21 18.32	-080 17 52.42	26.35509	-80.26877222	66.4	77.7	11.3	17.04		
11-Jun-10	4	26 21 18.32	-080 17 52.42	26.35509	-80.26877222	57.8	69	11.2	19.32		
11-Jun-10	2	26 21 18.32	-080 17 52.42	26.35509	-80.26877222	55.3	66.6	11.3	20.36		
11-Jun-10	1	26 21 18.32	-080 17 52.42	26.35509	-80.26877222	36.2	47.3	11	30.45		
11-Jun-10	10	26 21 17.89	-080 17 50.05	26.35497	-80.26943056	84.3	96.1	11.8	14.03	Flag 180 at 10	
11-Jun-10	8	26 21 17.89	-080 17 50.05	26.35497	-80.26943056	81.3	93.2	11.9	14.65		
11-Jun-10	6	26 21 17.89	-080 17 50.05	26.35497	-80.26943056	73.5	85.8	12.4	16.82		
11-Jun-10	4	26 21 17.89	-080 17 50.05	26.35497	-80.26943056	67.7	80.2	12.6	18.55		
11-Jun-10	2	26 21 17.89	-080 17 50.05	26.35497	-80.26943056	68.1	80	12	17.56		
11-Jun-10	2	26 21 17.89	-080 17 50.05	26.35497	-80.26943056	68.3	79.9	11.7	17.08		
11-Jun-10	1	26 21 17.89	-080 17 50.05	26.35497	-80.26943056	57.5	70.1	12.6	21.83		
11-Jun-10	12	26 21 17.83	-080 17 50.05	26.35495	-80.26943056	89.4	100.9	11.5	12.88	Flag 202.5 at 14.5	
11-Jun-10	10	26 21 17.83	-080 17 50.05	26.35495	-80.26943056	84.7	98.8	14.1	16.63		
11-Jun-10	8	26 21 17.83	-080 17 50.05	26.35495	-80.26943056	81.4	95.7	14.3	17.55		
11-Jun-10	6	26 21 17.83	-080 17 50.05	26.35495	-80.26943056	73.4	87.6	14.2	19.29		
11-Jun-10	4	26 21 17.83	-080 17 50.05	26.35495	-80.26943056	61.3	75.4	14.1	22.98		
11-Jun-10	2	26 21 17.83	-080 17 50.05	26.35495	-80.26943056	61.8	74.8	13	21.01		
11-Jun-10	1	26 21 17.83	-080 17 50.05	26.35495	-80.26943056	46.4	60.8	14.4	30.98		
11-Jun-10	12	26 21 17.81	-080 17 49.94	26.35495	-80.26946111	92.8	103.6	10.8	11.63	Flag 157.5 at 13	
11-Jun-10	10	26 21 17.81	-080 17 49.94	26.35495	-80.26946111	88.8	99.9	11.2	12.57		
11-Jun-10	8	26 21 17.81	-080 17 49.94	26.35495	-80.26946111	85.7	96.8	11.1	12.98		
11-Jun-10	6	26 21 17.81	-080 17 49.94	26.35495	-80.26946111	81.1	92.6	11.5	14.15		
11-Jun-10	4	26 21 17.81	-080 17 49.94	26.35495	-80.26946111	71.6	83.8	12.3	17.11		
11-Jun-10	2	26 21 17.81	-080 17 49.94	26.35495	-80.26946111	66	77.7	11.7	17.77		
11-Jun-10	1	26 21 17.81	-080 17 49.94	26.35495	-80.26946111	44.4	56.6	12.2	27.42		

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks	Remarks 2
11-Jun-10	10	26 21 17.84	-080 17 49.97	26.35496	-80.26945278	90	100.8	10.8	11.96	Flag 180 at 17	
11-Jun-10	8	26 21 17.84	-080 17 49.97	26.35496	-80.26945278	85.6	96.2	10.7	12.49		
11-Jun-10	6	26 21 17.84	-080 17 49.97	26.35496	-80.26945278	82	92.6	10.6	12.97		
11-Jun-10	4	26 21 17.84	-080 17 49.97	26.35496	-80.26945278	74	84.8	10.8	14.63		
11-Jun-10	2	26 21 17.84	-080 17 49.97	26.35496	-80.26945278	73.9	84.5	10.6	14.39		
11-Jun-10	1	26 21 17.84	-080 17 49.97	26.35496	-80.26945278	54.1	65.7	11.6	21.45		
11-Jun-10	10	26 21 17.54	-080 17 50.01	26.35487	-80.26944167	102.2	108.2	6	5.9	Flag 15.5 at 13	
11-Jun-10	8	26 21 17.54	-080 17 50.01	26.35487	-80.26944167	98.8	104.3	5.5	5.57		
11-Jun-10	6	26 21 17.54	-080 17 50.01	26.35487	-80.26944167	92.9	98.7	5.8	6.26		
11-Jun-10	4	26 21 17.54	-080 17 50.01	26.35487	-80.26944167	84.4	89.9	5.4	6.44		
11-Jun-10	2	26 21 17.54	-080 17 50.01	26.35487	-80.26944167	85.5	90.6	5.1	5.94		
11-Jun-10	1	26 21 17.54	-080 17 50.01	26.35487	-80.26944167	63.3	68.7	5.4	8.46		
11-Jun-10	12	26 21 17.38	-080 17 50.01	26.35483	-80.26944167	99	105.7	6.7	6.76	Flag 180 at 17	
11-Jun-10	10	26 21 17.38	-080 17 50.01	26.35483	-80.26944167	94.6	101.9	7.3	7.74		
11-Jun-10	8	26 21 17.38	-080 17 50.01	26.35483	-80.26944167	90.4	97.6	7.2	7.95		
11-Jun-10	6	26 21 17.38	-080 17 50.01	26.35483	-80.26944167	84.6	91.6	7	8.3		
11-Jun-10	4	26 21 17.38	-080 17 50.01	26.35483	-80.26944167	73.7	80.9	7.2	9.82		
11-Jun-10	2	26 21 17.38	-080 17 50.01	26.35483	-80.26944167	71.4	77.8	6.4	8.99		
11-Jun-10	1	26 21 17.38	-080 17 50.01	26.35483	-80.26944167	53.6	60.4	6.8	12.62		
11-Jun-10	12	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	97.9	106.1	8.2	8.35	Flag 180 at 10	
11-Jun-10	12	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	97.8	106.2	8.4	8.63		
11-Jun-10	10	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	94.4	103.1	8.7	9.19		
11-Jun-10	10	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	95.3	103.3	7.9	8.33		
11-Jun-10	8	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	91.4	99.7	8.3	9.09		
11-Jun-10	6	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	86.4	94.9	8.5	9.81		
11-Jun-10	4	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	80.7	89.1	8.4	10.39		
11-Jun-10	2	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	74.5	82.9	8.4	11.25		
11-Jun-10	1	26 21 17.44	-080 17 49.92	26.35484	-80.26946667	56.7	65	8.2	14.54		

Danville, PA

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks
11-May-10	12	40 57 49.89	-076 37 39.94	40.963858	-76.627761	122.10	131.10	9.00	7.39	Crest, North end
11-May-10	10	40 57 49.89	-076 37 39.94	40.963858	-76.627761	118.20	127.50	9.30	7.86	
11-May-10	8	40 57 49.89	-076 37 39.94	40.963858	-76.627761	114.70	123.40	8.70	7.57	
11-May-10	6	40 57 49.89	-076 37 39.94	40.963858	-76.627761	111.70	121.50	9.80	8.73	
11-May-10	4	40 57 49.89	-076 37 39.94	40.963858	-76.627761	101.30	111.30	10.00	9.84	
11-May-10	2	40 57 49.89	-076 37 39.94	40.963858	-76.627761	96.80	106.70	9.90	10.24	
11-May-10	1	40 57 49.89	-076 37 39.94	40.963858	-76.627761	82.10	91.20	9.20	11.21	
11-May-10	12	40 57 49.61	-076 37 39.88	40.963781	-76.627744	86.50	94.40	7.90	9.16	Mid-slope, North end
11-May-10	10	40 57 49.61	-076 37 39.88	40.963781	-76.627744	81.00	89.80	8.80	10.86	
11-May-10	8	40 57 49.61	-076 37 39.88	40.963781	-76.627744	76.90	86.80	9.90	12.94	
11-May-10	6	40 57 49.61	-076 37 39.88	40.963781	-76.627744	80.10	91.00	10.90	13.60	
11-May-10	4	40 57 49.61	-076 37 39.88	40.963781	-76.627744	75.50	85.60	10.10	13.34	
11-May-10	2	40 57 49.61	-076 37 39.88	40.963781	-76.627744	70.80	80.50	9.70	13.68	
11-May-10	1	40 57 49.61	-076 37 39.88	40.963781	-76.627744	56.80	66.60	9.80	17.23	
11-May-10	12	40 57 49.3	-076 37 39.97	40.963694	-76.627769	108.60	126.80	18.20	16.79	Toe
11-May-10	10	40 57 49.3	-076 37 39.97	40.963694	-76.627769	104.60	123.20	18.50	17.71	
11-May-10	8	40 57 49.3	-076 37 39.97	40.963694	-76.627769	100.50	119.40	18.90	18.82	
11-May-10	6	40 57 49.3	-076 37 39.97	40.963694	-76.627769	98.20	116.70	18.50	18.83	
11-May-10	4	40 57 49.3	-076 37 39.97	40.963694	-76.627769	93.60	112.80	19.10	20.44	
11-May-10	2	40 57 49.3	-076 37 39.97	40.963694	-76.627769	79.30	96.60	17.20	21.74	
11-May-10	1	40 57 49.3	-076 37 39.97	40.963694	-76.627769	63.60	81.50	17.90	28.16	
11-May-10	12	40 57 49.3	-076 37 40.03	40.963694	-76.627786	89.00	109.30	20.40	22.87	6 ft from toe
11-May-10	10	40 57 49.3	-076 37 40.03	40.963694	-76.627786	87.70	107.30	19.70	22.43	
11-May-10	8	40 57 49.3	-076 37 40.03	40.963694	-76.627786	85.80	105.40	19.60	22.81	
11-May-10	6	40 57 49.3	-076 37 40.03	40.963694	-76.627786	81.40	101.40	20.00	24.53	
11-May-10	4	40 57 49.3	-076 37 40.03	40.963694	-76.627786	77.60	99.20	21.60	27.84	
11-May-10	2	40 57 49.3	-076 37 40.03	40.963694	-76.627786	74.60	98.40	23.80	31.90	
11-May-10	1	40 57 49.3	-076 37 40.03	40.963694	-76.627786	58.70	83.50	24.80	42.17	

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks
11-May-10	12	40 57 49.32	-076 37 40.11	40.963700	-76.627808	83.80	99.70	15.90	18.91	11 ft from toe
11-May-10	10	40 57 49.32	-076 37 40.11	40.963700	-76.627808	83.30	104.20	20.90	25.13	
11-May-10	8	40 57 49.32	-076 37 40.11	40.963700	-76.627808	80.30	101.50	21.20	26.43	
11-May-10	6	40 57 49.32	-076 37 40.11	40.963700	-76.627808	76.90	99.10	22.20	28.83	
11-May-10	4	40 57 49.32	-076 37 40.11	40.963700	-76.627808	72.10	94.40	22.30	30.90	
11-May-10	2	40 57 49.32	-076 37 40.11	40.963700	-76.627808	70.10	92.00	21.90	31.26	
11-May-10	1	40 57 49.32	-076 37 40.11	40.963700	-76.627808	49.80	72.00	22.20	44.58	
11-May-10	12	40 57 49.39	-076 37 40.15	40.963719	-76.627819	77.70	93.80	16.00	20.63	15 from toe
11-May-10	10	40 57 49.39	-076 37 40.15	40.963719	-76.627819	75.50	98.30	22.80	30.25	
11-May-10	8	40 57 49.39	-076 37 40.15	40.963719	-76.627819	75.00	97.50	22.60	30.09	
11-May-10	6	40 57 49.39	-076 37 40.15	40.963719	-76.627819	72.80	97.60	24.70	33.96	
11-May-10	4	40 57 49.39	-076 37 40.15	40.963719	-76.627819	72.50	96.10	23.60	32.54	
11-May-10	2	40 57 49.39	-076 37 40.15	40.963719	-76.627819	66.50	90.40	23.90	35.95	
11-May-10	1	40 57 49.39	-076 37 40.15	40.963719	-76.627819	56.10	80.40	24.30	43.40	
11-May-10	12	40 57 49.32	-076 37 40.24	40.963700	-76.627844	71.60	88.30	16.70	23.37	20 ft toe
11-May-10	10	40 57 49.32	-076 37 40.24	40.963700	-76.627844	69.80	87.30	17.50	25.09	
11-May-10	8	40 57 49.32	-076 37 40.24	40.963700	-76.627844	69.60	86.40	16.80	24.16	
11-May-10	6	40 57 49.32	-076 37 40.24	40.963700	-76.627844	67.20	84.10	16.80	25.05	
11-May-10	4	40 57 49.32	-076 37 40.24	40.963700	-76.627844	64.00	80.50	16.50	25.76	
11-May-10	2	40 57 49.32	-076 37 40.24	40.963700	-76.627844	60.80	77.20	16.40	27.04	
11-May-10	1	40 57 49.32	-076 37 40.24	40.963700	-76.627844	54.60	71.00	16.40	29.95	
12-May-10	12	40 57 49.46	-076 37 38.03	40.963739	-76.627231	112.30	129.40	17.10	15.22	LS edge of road, city park
12-May-10	10	40 57 49.46	-076 37 38.03	40.963739	-76.627231	105.10	122.00	17.00	16.15	
12-May-10	8	40 57 49.46	-076 37 38.03	40.963739	-76.627231	101.20	117.60	16.40	16.21	
12-May-10	6	40 57 49.46	-076 37 38.03	40.963739	-76.627231	94.60	111.20	16.70	17.60	
12-May-10	4	40 57 49.46	-076 37 38.03	40.963739	-76.627231	86.70	103.90	17.20	19.85	
12-May-10	2	40 57 49.46	-076 37 38.03	40.963739	-76.627231	76.40	93.10	16.70	21.83	
12-May-10	1	40 57 49.46	-076 37 38.03	40.963739	-76.627231	70.00	86.80	16.80	24.03	
12-May-10	12	40 57 49.64	-076 37 39.56	40.963789	-76.627656	123.80	136.10	12.30	9.96	Transect 1, edge of concrete for closure gate

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks
12-May-10	10	40 57 49.64	-076 37 39.56	40.963789	-76.627656	116.00	128.30	12.30	10.61	
12-May-10	8	40 57 49.64	-076 37 39.56	40.963789	-76.627656	108.70	121.50	12.90	11.83	
12-May-10	6	40 57 49.64	-076 37 39.56	40.963789	-76.627656	106.50	119.40	12.90	12.13	
12-May-10	4	40 57 49.64	-076 37 39.56	40.963789	-76.627656	107.50	119.80	12.40	11.52	
12-May-10	2	40 57 49.64	-076 37 39.56	40.963789	-76.627656	99.90	112.00	12.10	12.10	
12-May-10	1	40 57 49.64	-076 37 39.56	40.963789	-76.627656	91.90	103.60	11.70	12.69	
12-May-10	12	40 57 49.01	-076 37 38.3	40.963614	-76.627306	103.90	124.10	20.20	19.45	Transect 2, opposite telephone pole
12-May-10	10	40 57 49.01	-076 37 38.3	40.963614	-76.627306	103.40	122.90	19.50	18.85	
12-May-10	8	40 57 49.01	-076 37 38.3	40.963614	-76.627306	99.10	120.50	21.40	21.62	
12-May-10	6	40 57 49.01	-076 37 38.3	40.963614	-76.627306	100.60	122.70	22.10	22.00	
12-May-10	4	40 57 49.01	-076 37 38.3	40.963614	-76.627306	99.60	121.00	21.40	21.47	
12-May-10	2	40 57 49.01	-076 37 38.3	40.963614	-76.627306	88.80	110.50	21.80	24.51	
12-May-10	1	40 57 49.01	-076 37 38.3	40.963614	-76.627306	75.10	97.20	22.10	29.41	
12-May-10	12	40 57 48.83	-076 37 38.33	40.963564	-76.627314	96.40	113.90	17.50	18.15	RS, midslope
12-May-10	10	40 57 48.83	-076 37 38.33	40.963564	-76.627314	93.60	111.30	17.70	18.95	
12-May-10	8	40 57 48.83	-076 37 38.33	40.963564	-76.627314	89.00	107.10	18.10	20.33	
12-May-10	6	40 57 48.83	-076 37 38.33	40.963564	-76.627314	85.70	104.20	18.40	21.51	
12-May-10	4	40 57 48.83	-076 37 38.33	40.963564	-76.627314	80.30	99.00	18.70	23.31	
12-May-10	2	40 57 48.83	-076 37 38.33	40.963564	-76.627314	73.20	91.10	18.00	24.54	
12-May-10	1	40 57 48.83	-076 37 38.33	40.963564	-76.627314	61.20	80.20	19.00	31.07	
12-May-10	12	40 57 48.59	-076 37 38.58	40.963497	-76.627383	98.20	122.30	24.10	24.54	levee toe, transect 2
12-May-10	10	40 57 48.59	-076 37 38.58	40.963497	-76.627383	95.00	118.90	23.90	25.11	
12-May-10	8	40 57 48.59	-076 37 38.58	40.963497	-76.627383	91.40	114.40	23.00	25.16	
12-May-10	6	40 57 48.59	-076 37 38.58	40.963497	-76.627383	87.90	111.00	23.20	26.36	
12-May-10	4	40 57 48.59	-076 37 38.58	40.963497	-76.627383	81.80	106.00	24.20	29.54	
12-May-10	2	40 57 48.59	-076 37 38.58	40.963497	-76.627383	76.10	99.20	23.10	30.31	
12-May-10	1	40 57 48.59	-076 37 38.58	40.963497	-76.627383	69.80	93.80	24.00	34.36	
12-May-10	12	40 57 48.61	-076 37 38.63	40.963503	-76.627397	102.60	127.10	24.50	23.91	5 ft from toe
12-May-10	10	40 57 48.61	-076 37 38.63	40.963503	-76.627397	96.10	119.70	23.60	24.56	

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks
12-May-10	8	40 57 48.61	-076 37 38.63	40.963503	-76.627397	93.90	118.90	25.10	26.72	
12-May-10	6	40 57 48.61	-076 37 38.63	40.963503	-76.627397	90.70	116.60	25.90	28.56	
12-May-10	4	40 57 48.61	-076 37 38.63	40.963503	-76.627397	85.30	111.20	25.80	30.28	
12-May-10	2	40 57 48.61	-076 37 38.63	40.963503	-76.627397	79.10	104.90	25.90	32.71	
12-May-10	1	40 57 48.61	-076 37 38.63	40.963503	-76.627397	75.00	100.80	25.80	34.44	
12-May-10	12	40 57 48.58	-076 37 38.62	40.963494	-76.627394	94.70	119.70	25.00	26.40	10 ft toe
12-May-10	10	40 57 48.58	-076 37 38.62	40.963494	-76.627394	94.00	118.80	24.80	26.37	
12-May-10	8	40 57 48.58	-076 37 38.62	40.963494	-76.627394	89.70	115.30	25.60	28.55	
12-May-10	6	40 57 48.58	-076 37 38.62	40.963494	-76.627394	87.70	113.10	25.50	29.05	
12-May-10	4	40 57 48.58	-076 37 38.62	40.963494	-76.627394	83.40	108.20	24.90	29.81	
12-May-10	2	40 57 48.58	-076 37 38.62	40.963494	-76.627394	76.20	101.60	25.40	33.38	
12-May-10	1	40 57 48.58	-076 37 38.62	40.963494	-76.627394	67.60	92.10	24.50	36.32	
12-May-10	12	40 57 48.49	-076 37 38.76	40.963469	-76.627433	83.40	103.00	19.60	23.55	15 from toe, 5 ft from stump
12-May-10	10	40 57 48.49	-076 37 38.76	40.963469	-76.627433	83.70	102.70	19.00	22.75	
12-May-10	8	40 57 48.49	-076 37 38.76	40.963469	-76.627433	84.10	107.60	23.50	27.95	
12-May-10	6	40 57 48.49	-076 37 38.76	40.963469	-76.627433	83.20	106.20	23.00	27.69	
12-May-10	4	40 57 48.49	-076 37 38.76	40.963469	-76.627433	80.80	105.20	24.40	30.16	
12-May-10	2	40 57 48.49	-076 37 38.76	40.963469	-76.627433	75.60	99.60	24.00	31.68	
12-May-10	1	40 57 48.49	-076 37 38.76	40.963469	-76.627433	68.20	91.50	23.30	34.20	
12-May-10	12	40 57 19.03	-076 36 51.57	40.955286	-76.614325	91.80	109.10	17.30	18.88	Transect 3, ls levee toe
12-May-10	10	40 57 19.03	-076 36 51.57	40.955286	-76.614325	86.20	104.00	17.80	20.63	
12-May-10	8	40 57 19.03	-076 36 51.57	40.955286	-76.614325	81.80	99.20	17.40	21.33	
12-May-10	6	40 57 19.03	-076 36 51.57	40.955286	-76.614325	75.10	92.60	17.50	23.35	
12-May-10	4	40 57 19.03	-076 36 51.57	40.955286	-76.614325	65.70	84.20	18.40	28.06	
12-May-10	2	40 57 19.03	-076 36 51.57	40.955286	-76.614325	55.80	73.80	18.10	32.40	
12-May-10	1	40 57 19.03	-076 36 51.57	40.955286	-76.614325	45.10	63.60	18.50	41.05	
12-May-10	12	40 57 18.53	-076 36 51.58	40.955147	-76.614328	118.40	137.00	18.60	15.67	Transect 3, levee cl
12-May-10	10	40 57 18.53	-076 36 51.58	40.955147	-76.614328	115.70	133.80	18.00	15.59	
12-May-10	8	40 57 18.53	-076 36 51.58	40.955147	-76.614328	113.80	132.00	18.20	16.02	

Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks
12-May-10	6	40 57 18.53	-076 36 51.58	40.955147	-76.614328	114.10	132.10	18.00	15.80	
12-May-10	4	40 57 18.53	-076 36 51.58	40.955147	-76.614328	113.30	131.10	17.70	15.65	
12-May-10	2	40 57 18.53	-076 36 51.58	40.955147	-76.614328	106.50	124.50	18.00	16.88	
12-May-10	1	40 57 18.53	-076 36 51.58	40.955147	-76.614328	88.50	106.50	18.00	20.29	
12-May-10	12	40 57 18.59	-076 36 51.63	40.955164	-76.614342	105.80	120.50	14.70	13.89	Transect 3, rs midslope
12-May-10	10	40 57 18.59	-076 36 51.63	40.955164	-76.614342	101.80	117.40	15.60	15.32	
12-May-10	8	40 57 18.59	-076 36 51.63	40.955164	-76.614342	96.90	112.70	15.80	16.35	
12-May-10	8	40 57 18.59	-076 36 51.63	40.955164	-76.614342	97.50	113.00	15.50	15.86	
12-May-10	6	40 57 18.59	-076 36 51.63	40.955164	-76.614342	93.20	108.30	15.20	16.26	
12-May-10	4	40 57 18.59	-076 36 51.63	40.955164	-76.614342	87.00	102.50	15.50	17.81	
12-May-10	2	40 57 18.59	-076 36 51.63	40.955164	-76.614342	75.80	91.80	16.00	21.06	
12-May-10	1	40 57 18.59	-076 36 51.63	40.955164	-76.614342	62.90	79.20	16.30	25.92	
12-May-10	12	40 57 18.43	-076 36 52.02	40.955119	-76.614450	87.90	102.40	14.50	16.49	Transect 3, rs toe
12-May-10	10	40 57 18.41	-076 36 52.01	40.955114	-76.614447	83.30	98.50	15.20	18.27	
12-May-10	8	40 57 18.41	-076 36 52.01	40.955114	-76.614447	79.40	95.30	15.90	20.05	
12-May-10	6	40 57 18.41	-076 36 52.01	40.955114	-76.614447	77.40	92.30	14.90	19.25	
12-May-10	4	40 57 18.41	-076 36 52.01	40.955114	-76.614447	70.30	85.60	15.20	21.68	
12-May-10	2	40 57 18.41	-076 36 52.01	40.955114	-76.614447	59.50	75.30	15.80	26.56	
12-May-10	1	40 57 18.41	-076 36 52.01	40.955114	-76.614447	42.80	58.80	16.00	37.36	
12-May-10	12	40 57 18.31	-076 36 52.13	40.955086	-76.614481	85.40	104.50	19.10	22.32	Transect 3, 5 ft from toe
12-May-10	10	40 57 18.31	-076 36 52.13	40.955086	-76.614481	83.60	102.30	18.60	22.29	
12-May-10	8	40 57 18.31	-076 36 52.13	40.955086	-76.614481	79.10	98.50	19.40	24.57	
12-May-10	6	40 57 18.31	-076 36 52.13	40.955086	-76.614481	75.80	95.00	19.10	25.26	
12-May-10	4	40 57 18.31	-076 36 52.13	40.955086	-76.614481	71.40	90.00	18.60	26.05	
12-May-10	2	40 57 18.31	-076 36 52.13	40.955086	-76.614481	57.40	76.70	19.30	33.68	
12-May-10	1	40 57 18.31	-076 36 52.13	40.955086	-76.614481	35.10	53.70	18.60	53.14	
12-May-10	12	40 57 18.28	-076 36 52.03	40.955078	-76.614453	87.30	106.20	18.90	21.69	Transect 3, 10 ft from toe
12-May-10	10	40 57 18.28	-076 36 52.03	40.955078	-76.614453	82.30	101.70	19.40	23.55	
12-May-10	8	40 57 18.28	-076 36 52.03	40.955078	-76.614453	81.10	99.70	18.60	22.98	

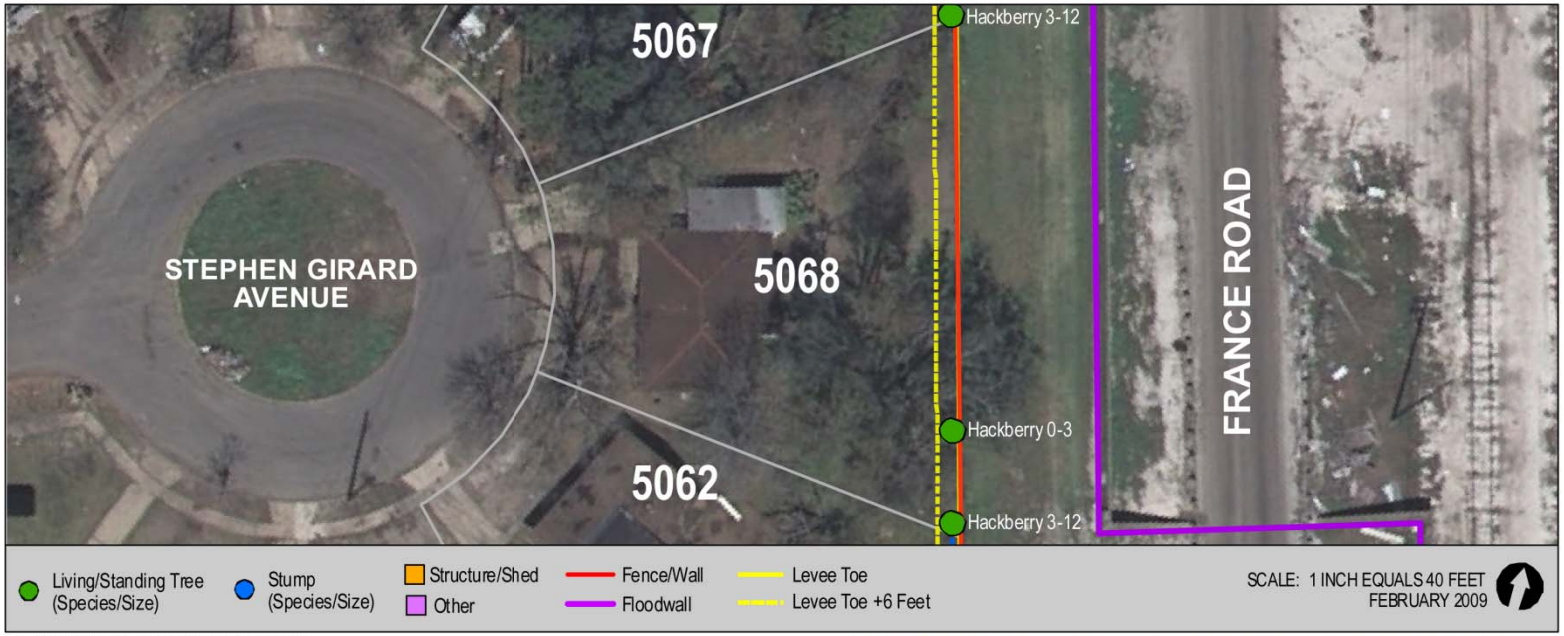
Date	Depth	Lat1	Long1	Lat2	Long2	Dry	Wet	Moist	Percent	Remarks
12-May-10	6	40 57 18.28	-076 36 52.03	40.955078	-76.614453	76.90	96.20	19.20	25.02	
12-May-10	4	40 57 18.28	-076 36 52.03	40.955078	-76.614453	71.80	90.40	18.60	25.93	
12-May-10	2	40 57 18.28	-076 36 52.03	40.955078	-76.614453	64.40	83.30	18.90	29.35	
12-May-10	1	40 57 18.28	-076 36 52.03	40.955078	-76.614453	42.60	62.50	19.90	46.55	
12-May-10	12	40 57 18.25	-076 36 52.21	40.955069	-76.614503	89.60	108.60	19.00	21.15	Transect 3, 15 ft from toe
12-May-10	10	40 57 18.25	-076 36 52.21	40.955069	-76.614503	83.60	105.10	21.50	25.77	
12-May-10	8	40 57 18.25	-076 36 52.21	40.955069	-76.614503	83.70	105.20	21.50	25.65	
12-May-10	6	40 57 18.25	-076 36 52.21	40.955069	-76.614503	82.40	104.60	22.20	26.98	
12-May-10	4	40 57 18.25	-076 36 52.21	40.955069	-76.614503	82.00	104.70	22.80	27.76	
12-May-10	2	40 57 18.25	-076 36 52.21	40.955069	-76.614503	78.00	101.60	23.60	30.19	
12-May-10	1	40 57 18.25	-076 36 52.21	40.955069	-76.614503	72.90	96.70	23.80	32.61	
12-May-10	12	40 57 18.35	-076 36 52.28	40.955097	-76.614522	95.20	117.70	22.50	23.58	Transect 3, 20 ft from toe
12-May-10	10	40 57 18.35	-076 36 52.28	40.955097	-76.614522	88.50	110.20	21.70	24.52	
12-May-10	10	40 57 18.35	-076 36 52.28	40.955097	-76.614522	88.90	110.10	21.30	23.94	
12-May-10	8	40 57 18.35	-076 36 52.28	40.955097	-76.614522	81.40	103.10	21.80	26.75	
12-May-10	4	40 57 18.35	-076 36 52.28	40.955097	-76.614522	66.60	88.80	22.20	33.32	
12-May-10	2	40 57 18.35	-076 36 52.28	40.955097	-76.614522	59.80	82.50	22.80	38.09	
12-May-10	1	40 57 18.35	-076 36 52.28	40.955097	-76.614522	49.40	71.50	22.10	44.69	
12-May-10	12	40 57 18.26	-076 36 52.33	40.955072	-76.614536	92.50	108.10	15.60	16.89	Transect 3, 25 ft from toe
12-May-10	10	40 57 18.26	-076 36 52.33	40.955072	-76.614536	87.90	103.20	15.30	17.40	
12-May-10	8	40 57 18.26	-076 36 52.33	40.955072	-76.614536	79.70	96.20	16.50	20.72	
12-May-10	6	40 57 18.26	-076 36 52.33	40.955072	-76.614536	73.40	93.00	19.60	26.66	
12-May-10	4	40 57 18.26	-076 36 52.33	40.955072	-76.614536	67.60	88.60	21.00	31.15	
12-May-10	2	40 57 18.26	-076 36 52.33	40.955072	-76.614536	57.60	80.50	22.90	39.66	
12-May-10	1	40 57 18.26	-076 36 52.33	40.955072	-76.614536	44.90	67.00	22.10	49.25	

Vicksburg, MS

Date	Depth	Distance	Lat1	Long2	Lat2	Long2	Dry	Wet	Water	Percent
18-Mar-10	12.0	115.0	32 12 41.32	-090 48 21.47	32.2114778	-90.8059639	92.60	114.80	22.20	24.00
18-Mar-10	10.0	115.0	32 12 41.31	-090 48 21.46	32.2114750	-90.8059611	90.20	111.40	21.20	23.51
18-Mar-10	8.0	115.0	32 12 41.32	-090 48 21.45	32.2114778	-90.8059583	88.90	110.70	21.80	24.58
18-Mar-10	6.0	115.0	32 12 41.32	-090 48 21.45	32.2114778	-90.8059583	87.90	108.70	20.80	23.67
18-Mar-10	4.0	115.0	32 12 41.31	-090 48 21.44	32.2114750	-90.8059556	84.30	106.00	21.80	25.84
18-Mar-10	2.0	115.0	32 12 41.31	-090 48 21.44	32.2114750	-90.8059556	82.80	103.70	20.80	25.18
18-Mar-10	1.0	115.0	32 12 41.32	-090 48 21.44	32.2114778	-90.8059556	64.70	86.60	21.90	33.78
18-Mar-10	12.0	75.0	32 12 41.4	-090 48 21.32	32.2115000	-90.8059222	87.90	111.30	23.40	26.63
18-Mar-10	10.0	75.0	32 12 41.38	-090 48 21.33	32.2114944	-90.8059250	86.00	109.40	23.30	27.13
18-Mar-10	8.0	75.0	32 12 41.38	-090 48 21.32	32.2114944	-90.8059222	82.50	105.90	23.40	28.29
18-Mar-10	4.0	75.0	32 12 41.38	-090 48 21.31	32.2114944	-90.8059194	73.00	96.60	23.60	32.38
18-Mar-10	2.0	75.0	32 12 41.38	-090 48 21.31	32.2114944	-90.8059194	64.20	87.70	23.50	36.56
18-Mar-10	1.0	75.0	32 12 41.38	-090 48 21.31	32.2114944	-90.8059194	39.50	62.90	23.30	58.98
18-Mar-10	12.0	30.0	32 12 41.44	-090 48 21.26	32.2115111	-90.8059056	89.50	112.10	22.60	25.22
18-Mar-10	10.0	30.0	32 12 41.35	-090 48 21.25	32.2114861	-90.8059028	88.20	110.10	21.90	24.86
18-Mar-10	8.0	30.0	32 12 41.38	-090 48 21.26	32.2114944	-90.8059056	84.40	107.80	23.40	27.68
18-Mar-10	6.0	30.0	32 12 41.39	-090 48 21.26	32.2114972	-90.8059056	82.00	105.00	23.00	28.04
18-Mar-10	4.0	30.0	32 12 41.4	-090 48 21.26	32.2115000	-90.8059056	78.90	101.00	22.10	27.96
18-Mar-10	2.0	30.0	32 12 41.39	-090 48 21.27	32.2114972	-90.8059083	73.30	95.20	21.90	29.94
18-Mar-10	1.0	30.0	32 12 41.41	-090 48 21.28	32.2115028	-90.8059111	57.00	79.30	22.30	39.03
18-Mar-10	12.0	15.5	32 12 41.47	-090 48 21.25	32.2115194	-90.8059028	96.70	115.10	18.30	18.94
18-Mar-10	10.0	15.5	32 12 41.51	-090 48 21.28	32.2115306	-90.8059111	93.90	112.10	18.20	19.37
18-Mar-10	8.0	15.5	32 12 41.49	-090 48 21.28	32.2115250	-90.8059111	91.80	110.20	18.40	20.03
18-Mar-10	6.0	15.5	32 12 41.48	-090 48 21.25	32.2115222	-90.8059028	89.90	108.50	18.60	20.67
18-Mar-10	4.0	15.5	32 12 41.48	-090 48 21.23	32.2115222	-90.8058972	87.00	105.50	18.50	21.25
18-Mar-10	2.0	15.5	32 12 41.48	-090 48 21.23	32.2115222	-90.8058972	83.50	101.30	17.70	21.23
18-Mar-10	1.0	15.5	32 12 41.48	-090 48 21.23	32.2115222	-90.8058972	64.70	83.70	18.90	29.20
18-Mar-10	10.0	5.0	32 12 41.53	-090 48 21.18	32.2115361	-90.8058833	93.80	108.80	15.00	15.99

Date	Depth	Distance	Lat1	Long2	Lat2	Long2	Dry	Wet	Water	Percent
18-Mar-10	8.0	5.0	32 12 41.53	-090 48 21.18	32.2115361	-90.8058833	92.90	108.10	15.20	16.32
18-Mar-10	6.0	5.0	32 12 41.52	-090 48 21.16	32.2115333	-90.8058778	90.40	105.80	15.40	17.01
18-Mar-10	4.0	5.0	32 12 41.51	-090 48 21.16	32.2115306	-90.8058778	86.80	102.80	16.00	18.44
18-Mar-10	2.0	5.0	32 12 41.53	-090 48 21.16	32.2115361	-90.8058778	80.60	96.20	15.60	19.35
18-Mar-10	1.0	5.0	32 12 41.53	-090 48 21.16	32.2115361	-90.8058778	65.00	79.80	14.80	22.79
18-Mar-10	12.0	3.0	32 12 41.5	-090 48 21.1	32.2115278	-90.8058611	87.40	106.20	18.80	21.56
18-Mar-10	10.0	3.0	32 12 41.53	-090 48 21.1	32.2115361	-90.8058611	82.20	103.10	20.80	25.36
18-Mar-10	8.0	3.0	32 12 41.53	-090 48 21.11	32.2115361	-90.8058639	79.90	101.10	21.20	26.60
18-Mar-10	6.0	3.0	32 12 41.54	-090 48 21.1	32.2115389	-90.8058611	80.50	100.80	20.40	25.34
18-Mar-10	4.0	3.0	32 12 41.53	-090 48 21.1	32.2115361	-90.8058611	81.80	103.60	21.80	26.65
18-Mar-10	2.0	3.0	32 12 41.5	-090 48 21.08	32.2115278	-90.8058556	78.40	98.40	20.00	25.54
18-Mar-10	1.0	3.0	32 12 41.49	-090 48 21.08	32.2115250	-90.8058556	60.50	81.80	21.20	35.12
18-Mar-10	10.0	2.0	32 12 41.57	-090 48 21.13	32.2115472	-90.8058694	95.70	113.90	18.30	19.09
18-Mar-10	8.0	2.0	32 12 41.57	-090 48 21.13	32.2115472	-90.8058694	93.80	111.50	17.70	18.92
18-Mar-10	6.0	2.0	32 12 41.56	-090 48 21.13	32.2115444	-90.8058694	89.60	107.10	17.40	19.46
18-Mar-10	4.0	2.0	32 12 41.56	-090 48 21.13	32.2115444	-90.8058694	87.60	106.20	18.60	21.24
18-Mar-10	2.0	2.0	32 12 41.56	-090 48 21.13	32.2115444	-90.8058694	79.90	99.50	19.50	24.45
18-Mar-10	1.0	2.0	32 12 41.56	-090 48 21.13	32.2115444	-90.8058694	61.10	79.70	18.50	30.29

Appendix B: IHNC Levee Report



PLAN/AERIAL PROPERTY VIEW

2. 5068 STEPHEN GIRARD AVENUE

NUMBER OF OBSTRUCTIONS: 3

OBSTRUCTION DETAILS:

1. Hackberry, 0 - 3 inch
2. Hackberry, 3 - 12 inch
3. Chain Link Fence

NOTES/COMMENTS:

The provisions of Louisiana R.S. 38:225 apply to this property.

REAR PROPERTY VIEW FROM THE SOUTHEAST

Lake Pontchartrain and Vicinity Hurricane Protection Project
Emergency Restoration, IHNC West--Orleans Parish, Louisiana
OBSTRUCTION/ITEM INVENTORY

IHNC Levee, New Orleans, LA
2, 5068 Stephen Girard Ave

Lat: N30° 00.566'
Long: W90° 01.836'

Tree type: Hackberry

Tree diameter: ~10 in. at 51 in. ht

Main root ball diameter: < 5 ft

Root ball depth: ~ 1.5 ft

Tap root: none visible

Root extent > ½ in: ~18 ft on levee side

Levee depth: max is 27 in. at 18 ft

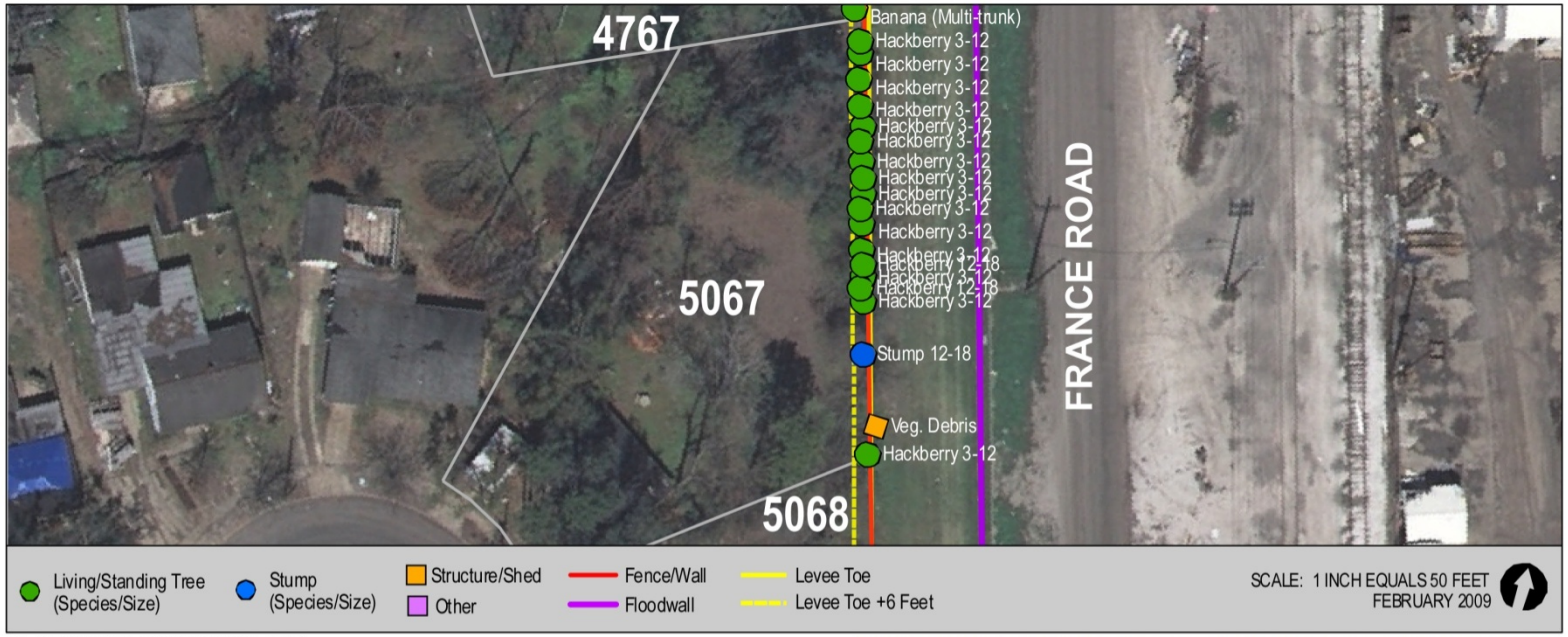
Levee Slope: 1v:3h

Levee soil: Dry Clay (CL-CH)

Approx. impact area into levee toe: 12 ft horizontal

Remarks: Large diameter roots appear to be uniformly distributed along the circumference of the tree as opposed to concentrated along any principal direction – i.e., parallel with levee, property side, levee side

Levee impact area from tree at SE corner of property 2.
One of 2 areas excavated.



PLAN/AERIAL PROPERTY VIEW

3. 5067 STEPHEN GIRARD AVENUE

NUMBER OF OBSTRUCTIONS: 18

OBSTRUCTION DETAILS:

1. Hackberry, 3 - 12 inch (x13)
2. Hackberry, 12 -18 inch (x2)
3. Stump, 12 -18 inch
4. Veg. Debris
5. Chain Link Fence

NOTES/COMMENTS:

The provisions of Louisiana R.S. 38:225 apply to this property.

REAR PROPERTY VIEW FROM THE SOUTHEAST

Lake Pontchartrain and Vicinity Hurricane Protection Project
Emergency Restoration, IHNC West--Orleans Parish, Louisiana
OBSTRUCTION/ITEM INVENTORY

IHNC Levee, New Orleans, LA
3, 5067 Stephen Girard Ave

Lat: N30° 00.593'
Long: W90° 01.843'

Tree type: Hackberry

Tree diameter:
~12 in. at 51 in. ht

Main root ball
diameter: ~ 7 ft

Root ball depth:
~24 in.

Tap root: none visible

Root extent > ½ in: ~19 ft on land owner's side, 15 ft on levee side

Levee depth: max is 23 in. at 15 ft

Levee Slope: 1v:3h

Levee soil: Dry Clay (CL-CH)

Approx. impact area into levee toe: ~12 ft horizontal

Remarks: Large diameter roots appear to be evenly distributed along the circumference of the tree base. Intact root was removed from the land owner side that was about 19 ft in length.

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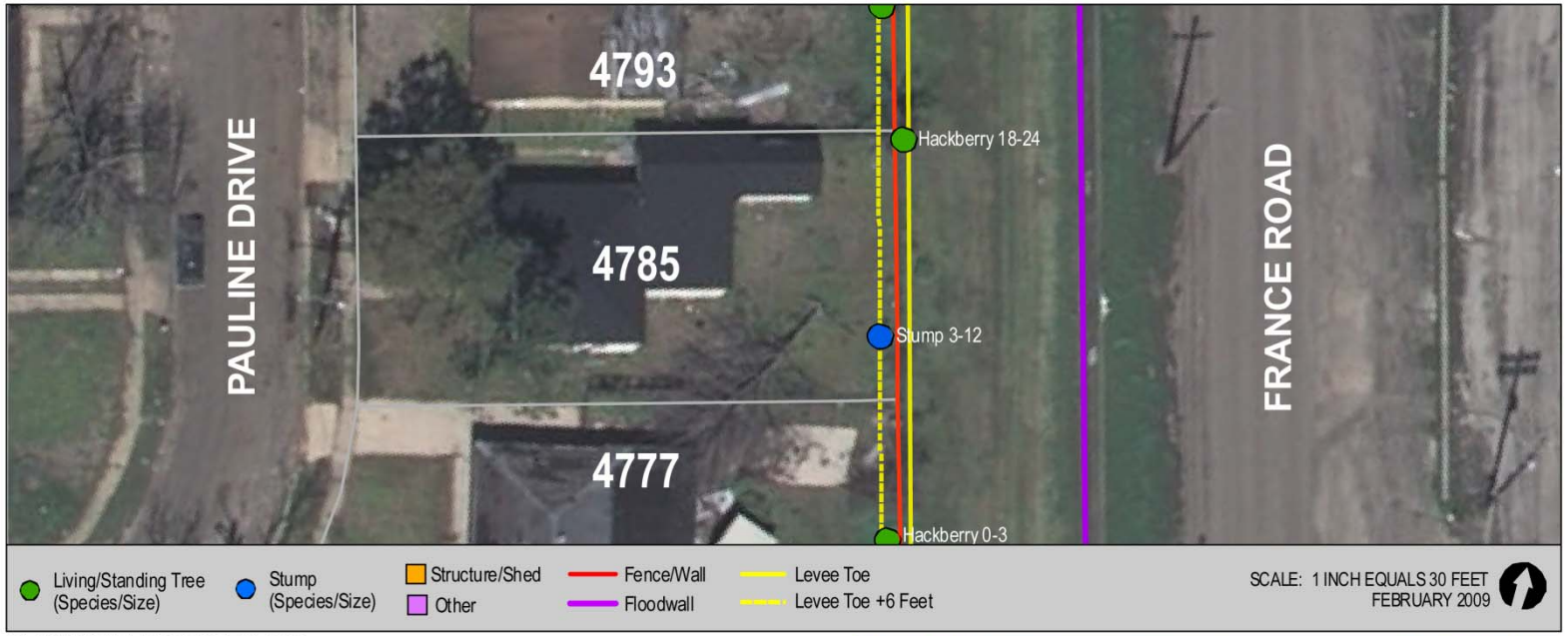


PLAN/AERIAL PROPERTY VIEW

6. 4785 PAULINE DRIVE

NUMBER OF OBSTRUCTIONS: 3

OBSTRUCTION DETAILS:

1. Hackberry, 18 - 24 inch
2. Stump, 3 - 12 inch
3. Chain Link Fence

NOTES/COMMENTS:

The provisions of Louisiana R.S. 38:225 apply to this property.

REAR PROPERTY VIEW FROM THE SOUTHEAST

Lake Pontchartrain and Vicinity Hurricane Protection Project
Emergency Restoration, IHNC West--Orleans Parish, Louisiana
OBSTRUCTION/ITEM INVENTORY

PLAN/AERIAL PROPERTY VIEW

7. 4793 PAULINE DRIVE

NUMBER OF OBSTRUCTIONS: 3

OBSTRUCTION DETAILS:

1. Hackberry, 0 - 3 inch
2. Stump, 0 - 3 inch
3. Chain Link Fence

NOTES/COMMENTS:

The provisions of Louisiana R.S. 38:225 apply to this property.

REAR PROPERTY VIEW FROM THE SOUTHEAST

Lake Pontchartrain and Vicinity Hurricane Protection Project
Emergency Restoration, IHNC West--Orleans Parish, Louisiana
OBSTRUCTION/ITEM INVENTORY

IHNC Levee, New Orleans, LA
6, 4785 Pauline Drive

Lat: N30° 00.649'
Long: W90° 01.867'

Tree type: Hackberry

Tree diameter: ~19 in. at 51 in. ht
22 in. at base

Main root ball diameter: ~ undetermined, tree had wood rot in center

Root ball depth: ~ 36 in. based on depth of bucket

Drip Line: South side ~20 ft

Tap root: none visible

Root extent along levee > ½ in: ~15 ft on the levee side,

Levee depth: max is 30 in. deep at 15 ft

Levee Slope: 1v:3h

Levee soil: Dry Clay (CL-CH)

Approx. impact area into levee toe: ~15 ft SE and NE horizontal

Remarks: Large diameter roots appear to be oriented in two zones at NE and SE of the tree base nearly parallel with the levee—see figures below.

PLAN/AERIAL PROPERTY VIEW

18. 4901 PAULINE DRIVE

NUMBER OF OBSTRUCTIONS: 5

OBSTRUCTION DETAILS:

1. Hackberry, 3 - 12 inch (x4)
2. Chain Link Fence

NOTES/COMMENTS:

The provisions of Louisiana R.S. 38:225 apply to this property.

REAR PROPERTY VIEW FROM THE SOUTHEAST

Lake Pontchartrain and Vicinity Hurricane Protection Project
Emergency Restoration, IHNC West--Orleans Parish, Louisiana
OBSTRUCTION/ITEM INVENTORY

IHNC Levee, New Orleans, LA
18, 4901 Pauline Drive

Lat: N30° 00.739
Long: W90° 01.894

Tree type: Hackberry

Tree diameter: ~13 in. stump base

Main root ball diameter: ~ 12 ft

Root ball depth: ~ 36 in. based on depth of bucket

Drip Line:

Tap root: none visible

Root extent along levee > ½ in: ~12 ft parallel with levee – south side

Levee depth: max is <30 in. deep at 12 ft

Levee Slope: 1v:3h

Levee soil: Dry Clay (CL-CH)

Approx. impact area into levee toe: ~15 ft S sidel

Remarks: Minimal impact to levee area. Stump is on the limit of the ROW area

Appendix C: Geophysical Data

Quasi 3D Depth Slices – Site B, Sacramento, CA

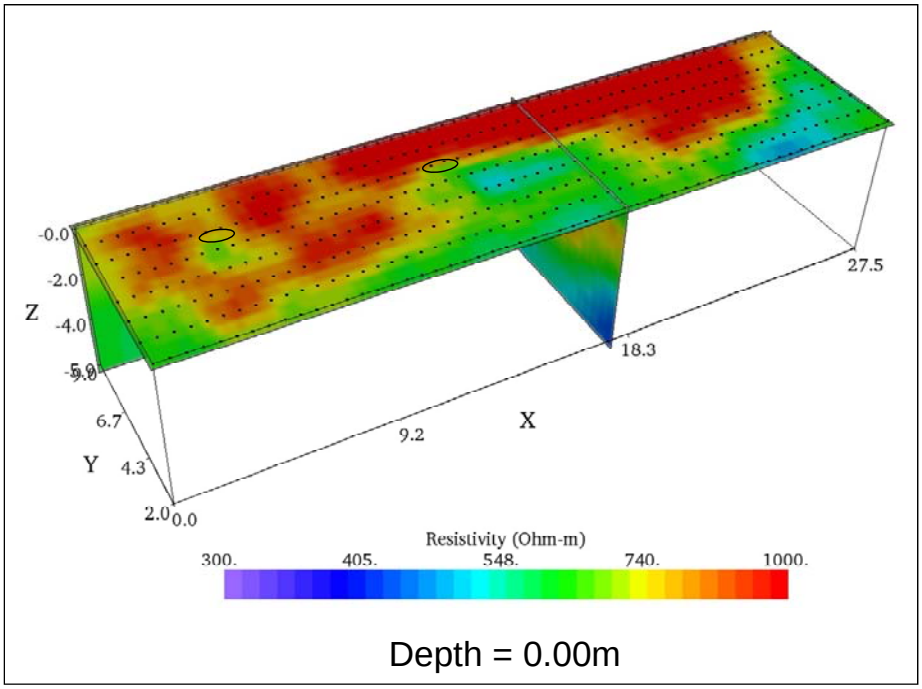


Figure C1. Depth slice at Z=0.00 m, quasi 3D processing, Site B, Sacramento, CA.

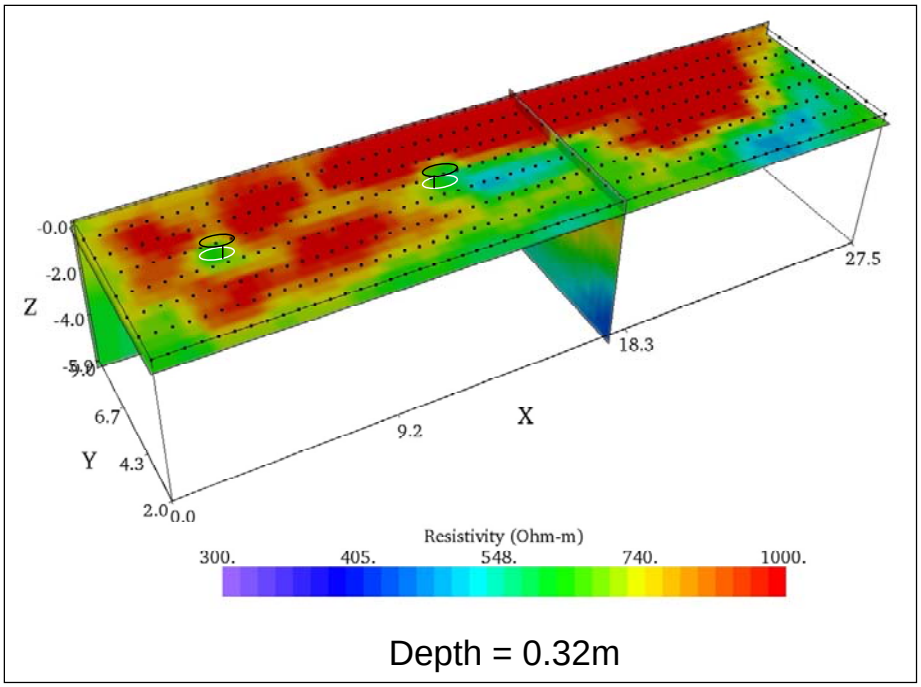


Figure C2. Depth slice at Z=0.32 m, quasi 3D processing, Site B, Sacramento, CA.

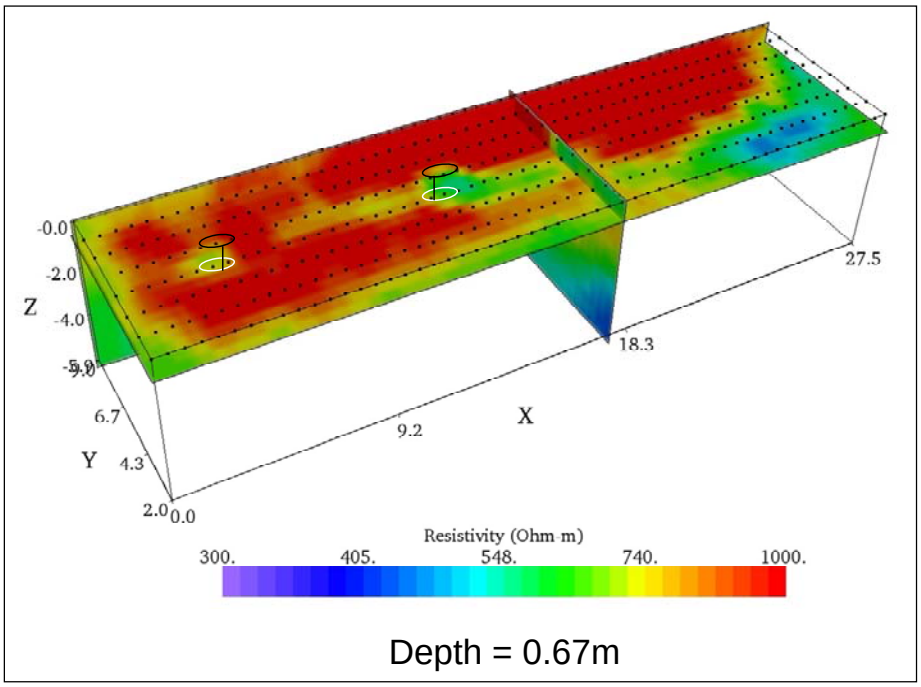


Figure C3. Depth slice at Z=0.67 m, quasi 3D processing, Site B, Sacramento, CA.

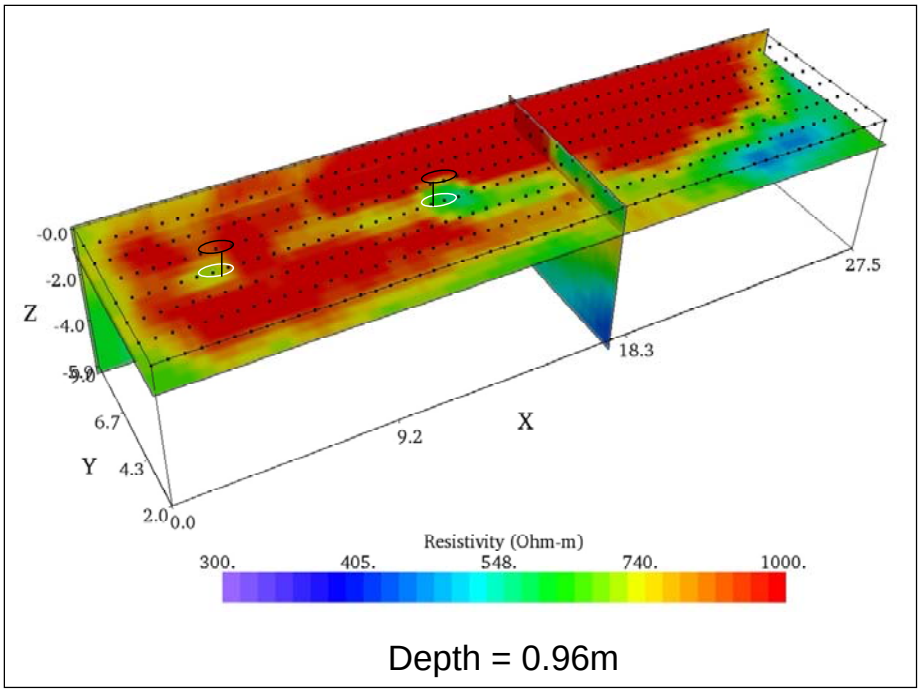


Figure C4. Depth slice at Z=0.96 m, quasi 3D processing, Site B, Sacramento, CA.

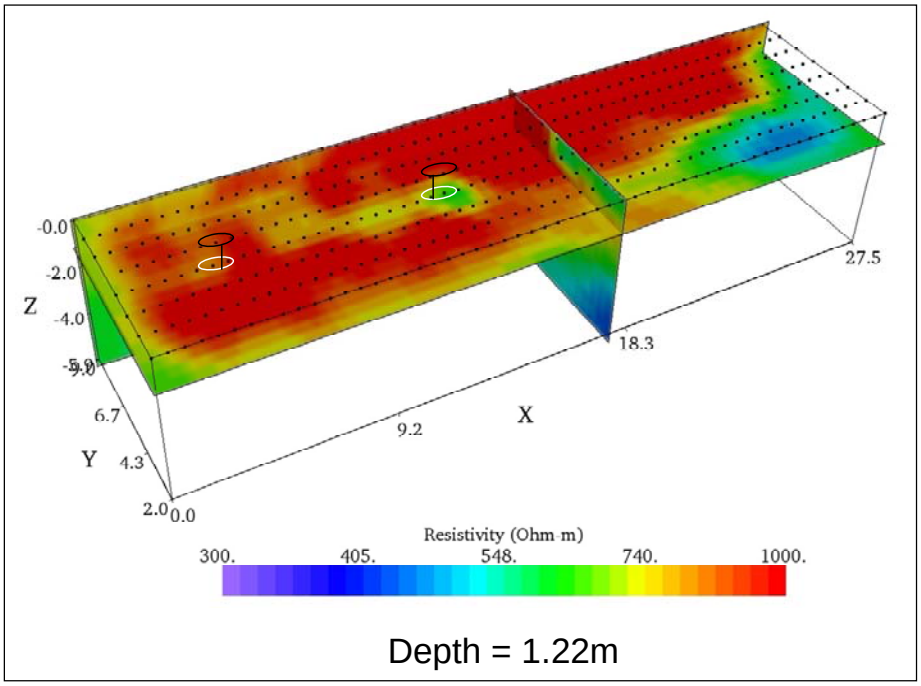


Figure C5. Depth slice at Z=1.22 m, quasi 3D processing, Site B, Sacramento, CA.

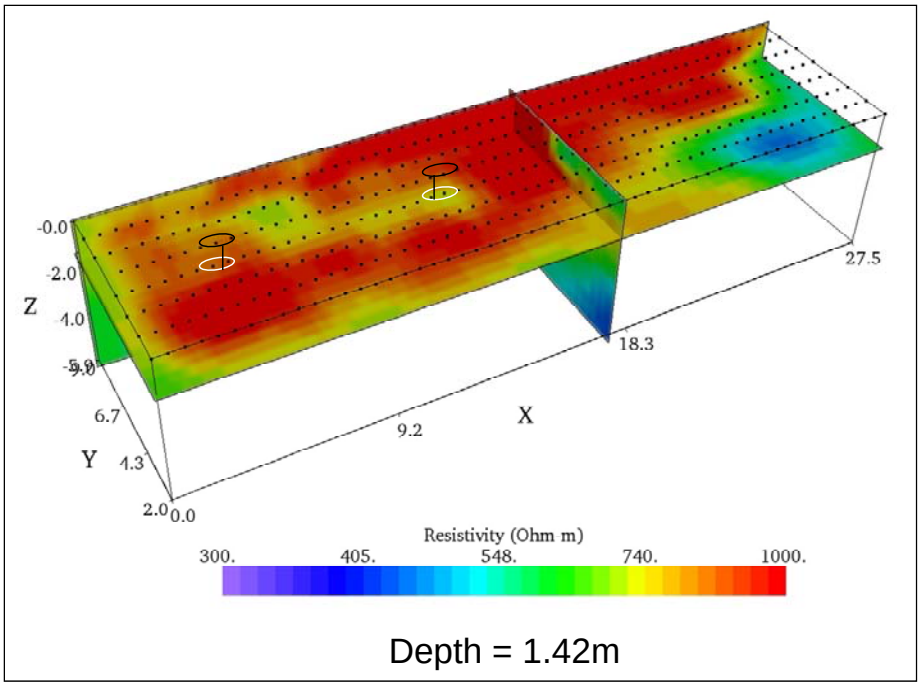


Figure C6. Depth slice at Z=1.42 m, quasi 3D processing, Site B, Sacramento, CA.

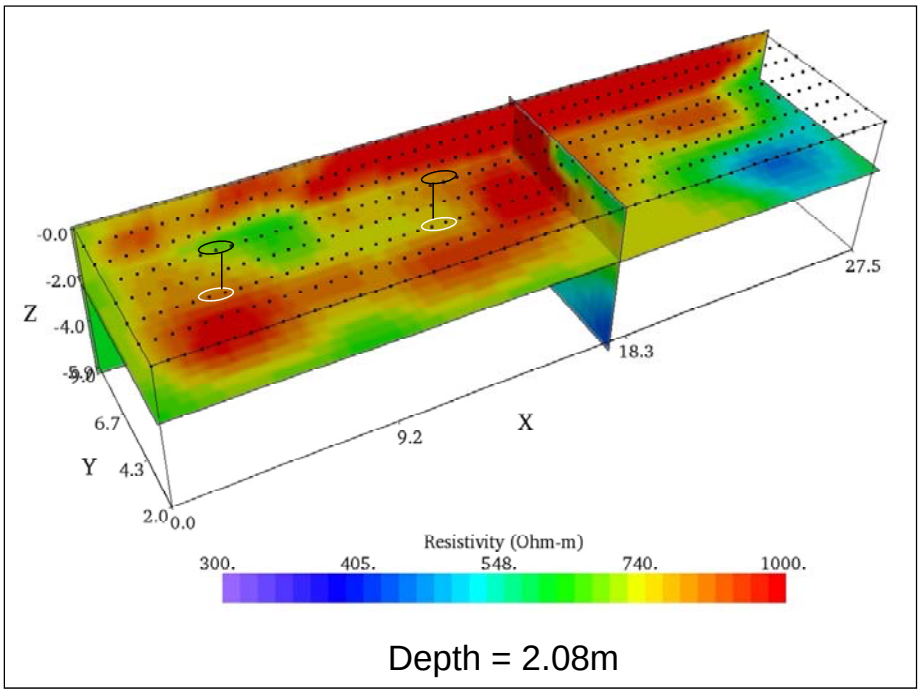


Figure C7. Depth slice at Z=2.08 m, quasi 3D processing, Site B, Sacramento, CA.

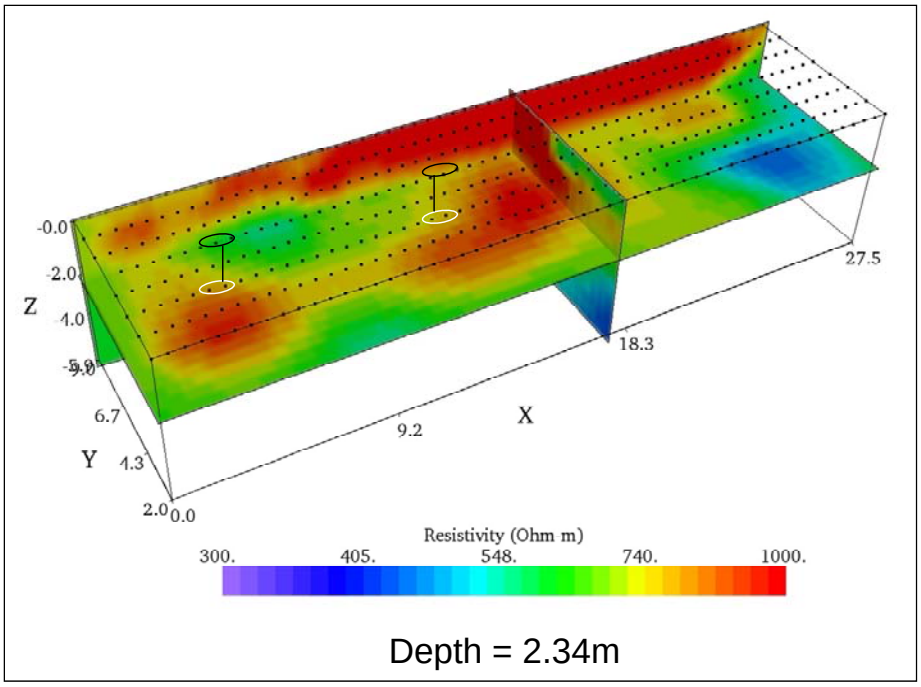


Figure C8. Depth slice at Z=2.34 m, quasi 3D processing, Site B, Sacramento, CA.

Quasi 3D Slices Taken Parallel to the X-axis – Site B, Sacramento, CA

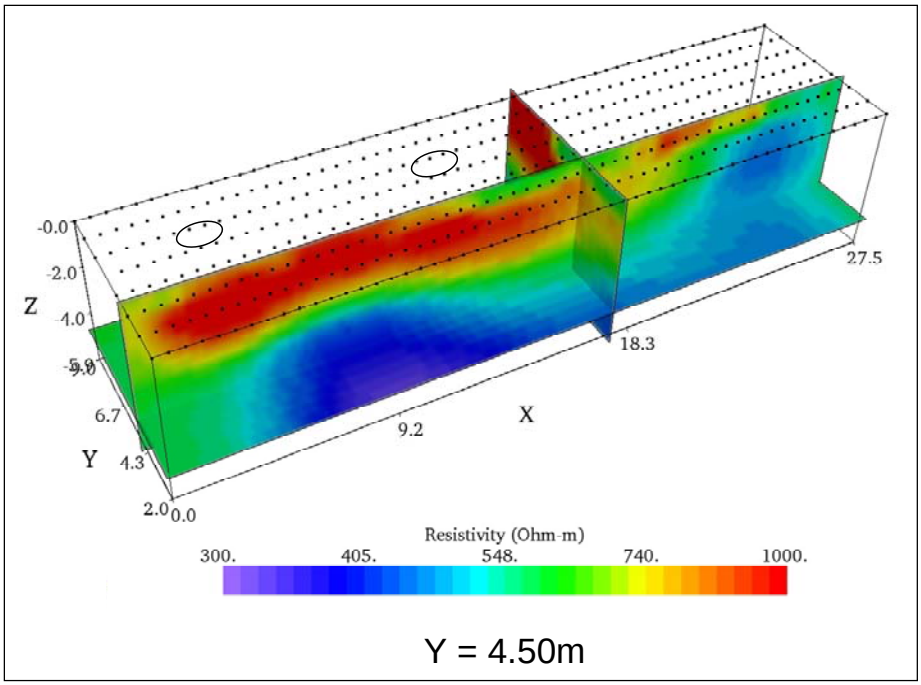


Figure C9. Slice taken along Y=4.50 m, quasi 3D processing, Site B, Sacramento, CA.

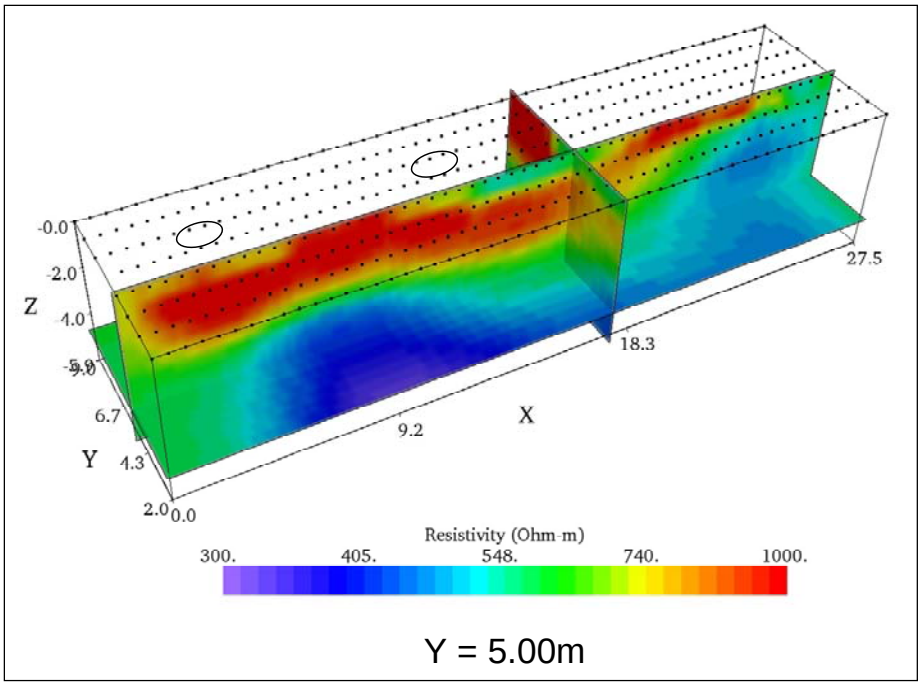


Figure C10. Slice along Y=5.00 m, quasi 3D processing, Site B, Sacramento, CA.

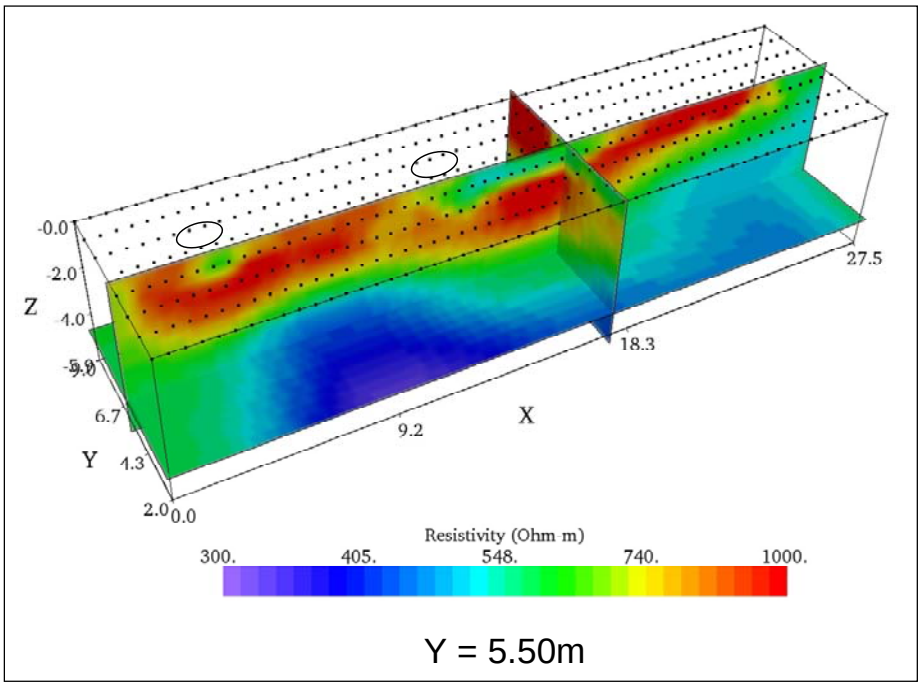


Figure C11. Slice along Y=5.50 m, quasi 3D processing, Site B, Sacramento, CA.

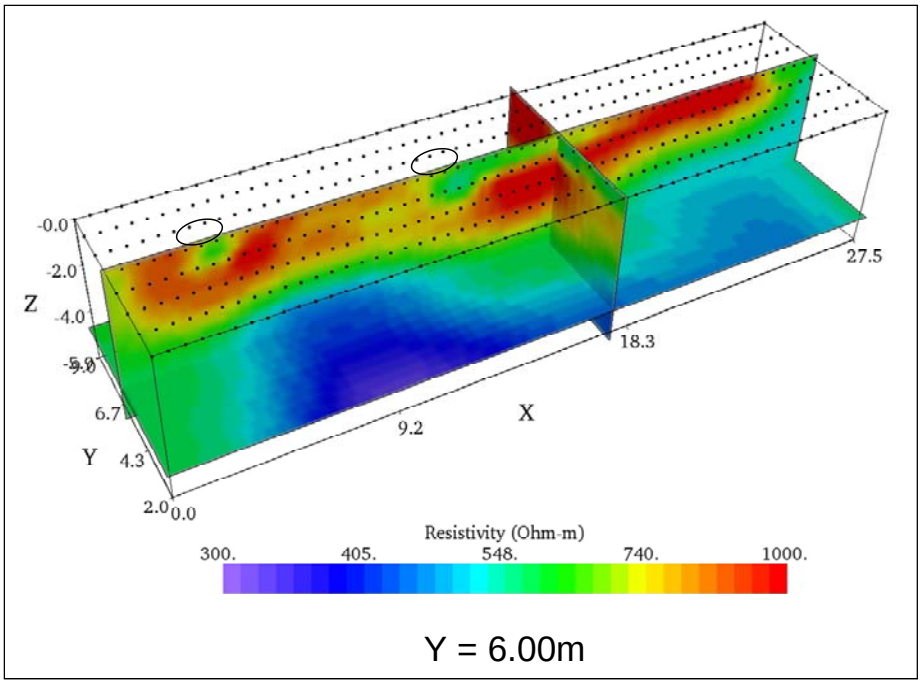


Figure C12. Slice along Y=6.00 m, quasi 3D processing, Site B, Sacramento, CA.

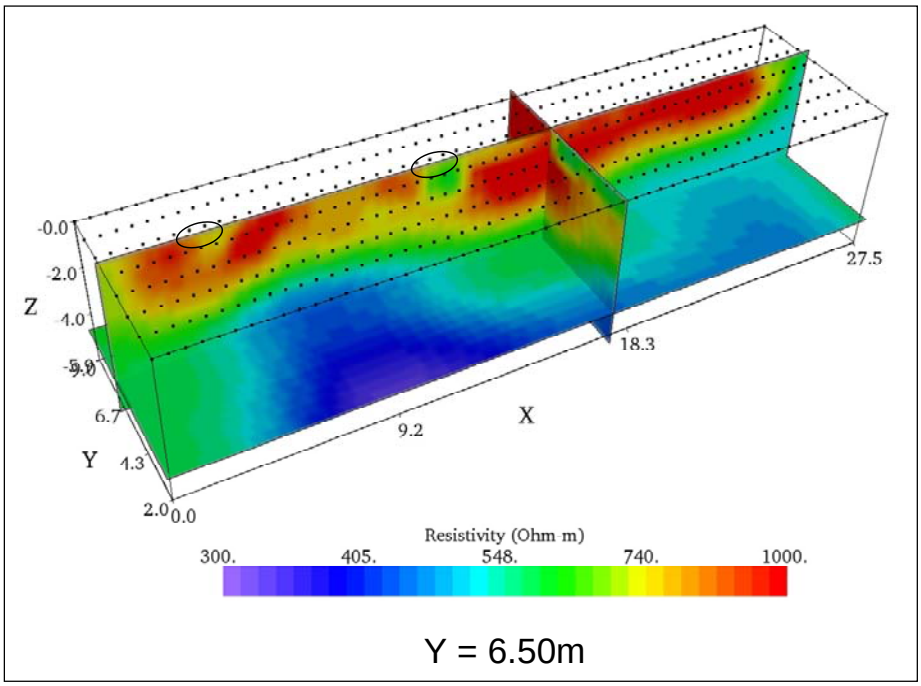


Figure C13. Slice along Y=6.50 m, quasi 3D processing, Site B, Sacramento, CA.

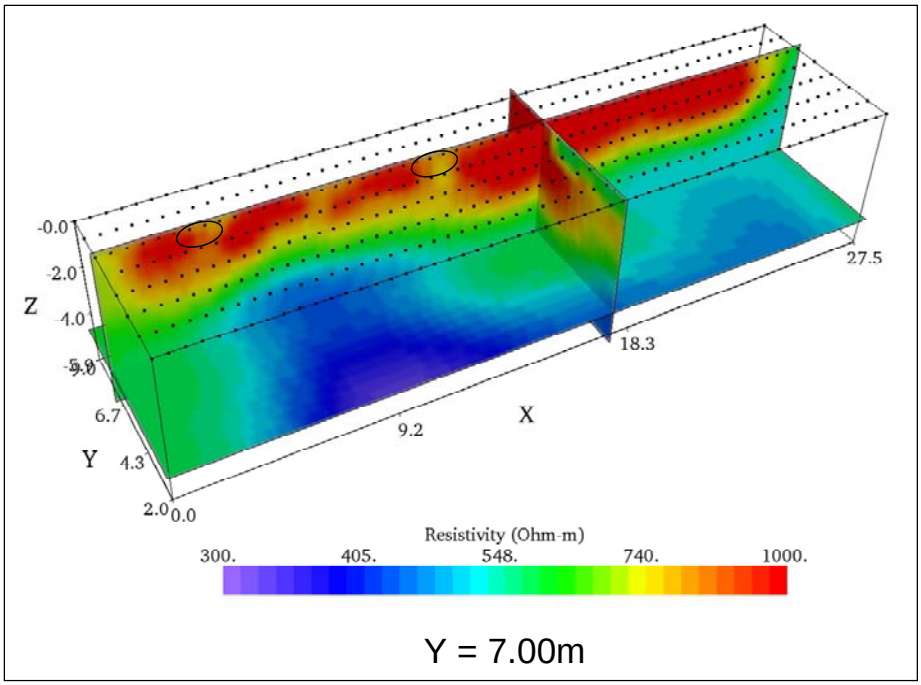


Figure C14. Slice along Y=7.00 m, quasi 3D processing, Site B, Sacramento, CA.

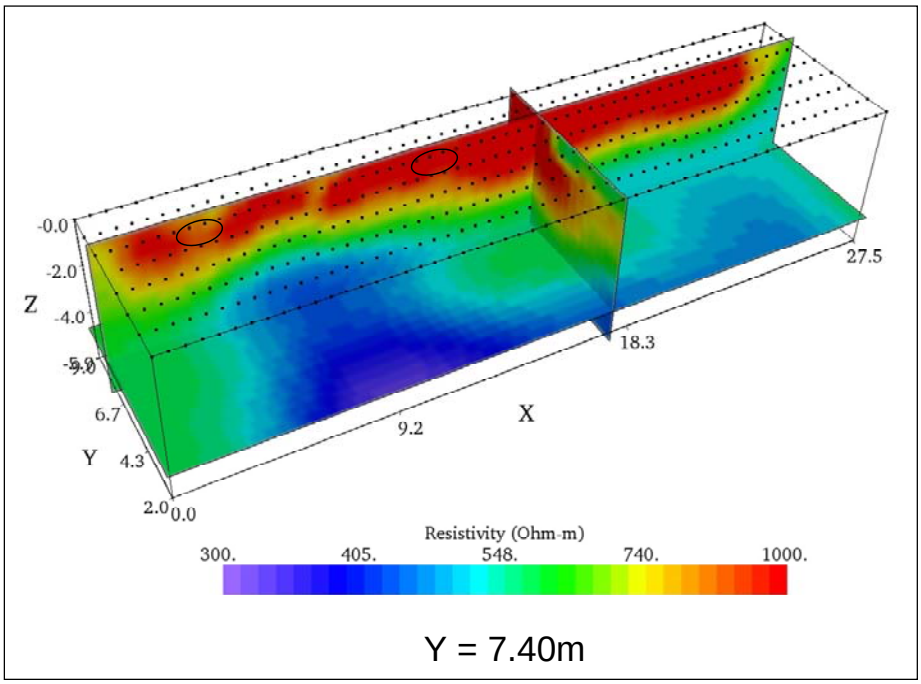


Figure C15. Slice along Y=7.40 m, quasi 3D processing, Site B, Sacramento, CA.

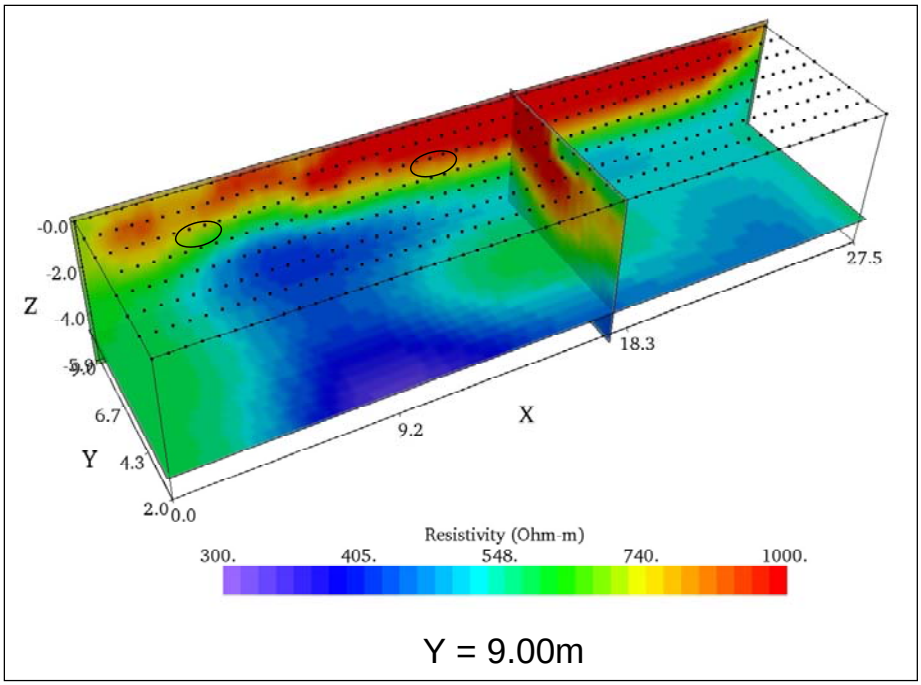


Figure C16. Slice along Y-axis, Y=9.00 m, quasi 3D processing, Site B, Sacramento, CA.

3D Depth Slices – Site B, Sacramento, CA

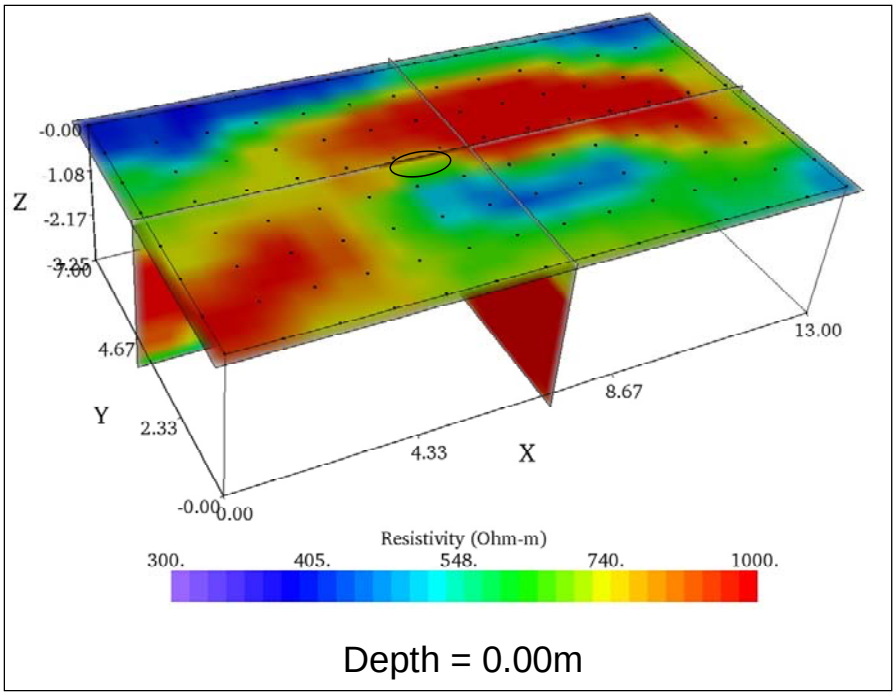


Figure C17. Depth slice at Z=0.00 m, 3D inversion, Site B, Sacramento, CA.

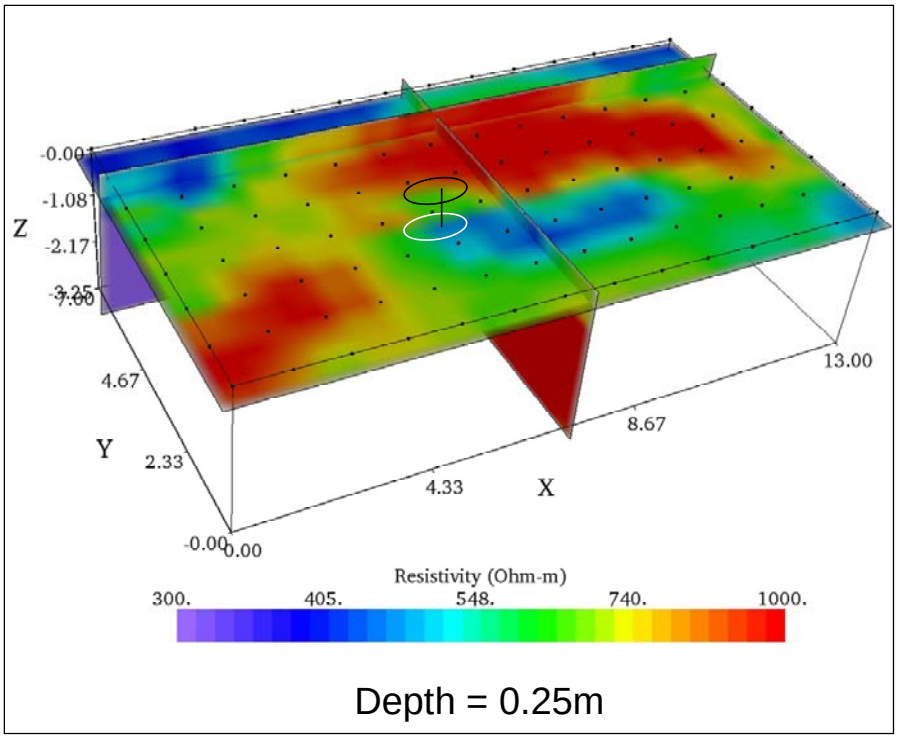


Figure C18. Depth slice at Z=0.25 m, 3D processing, Site B, Sacramento, CA.

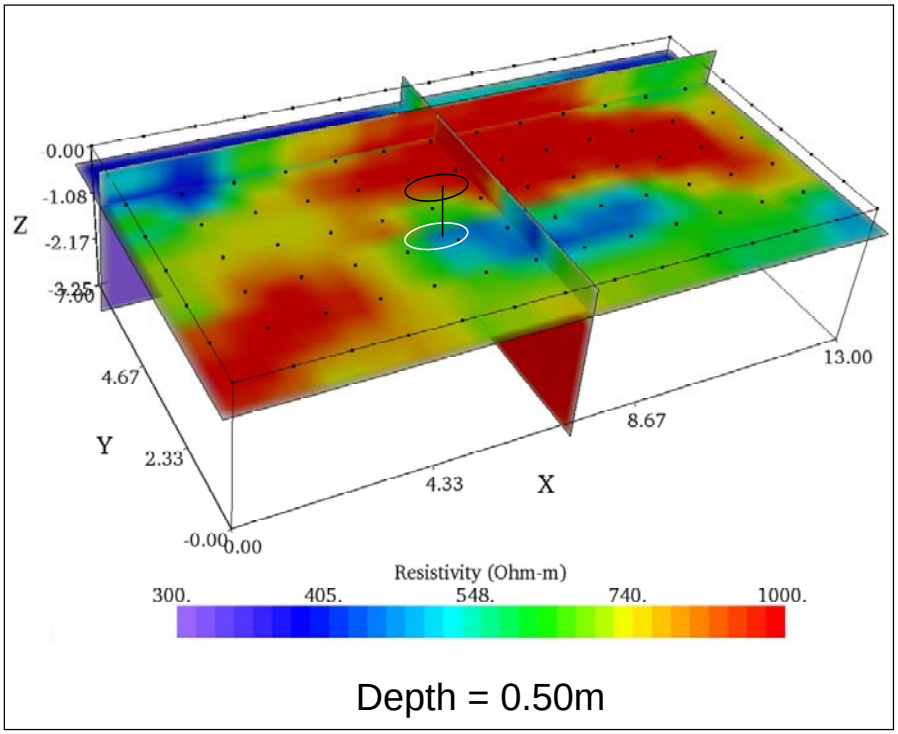


Figure C19. Depth slice at Z=0.50 m, 3D processing, Site B, Sacramento, CA.

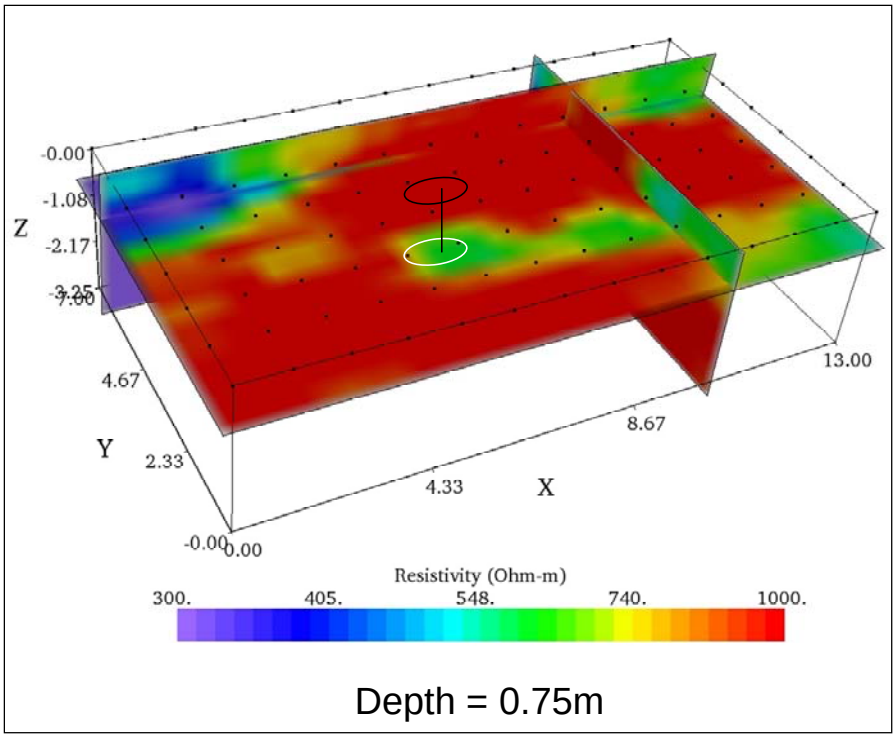


Figure C20. Depth slice at Z=0.75 m, 3D processing, Site B, Sacramento, CA.

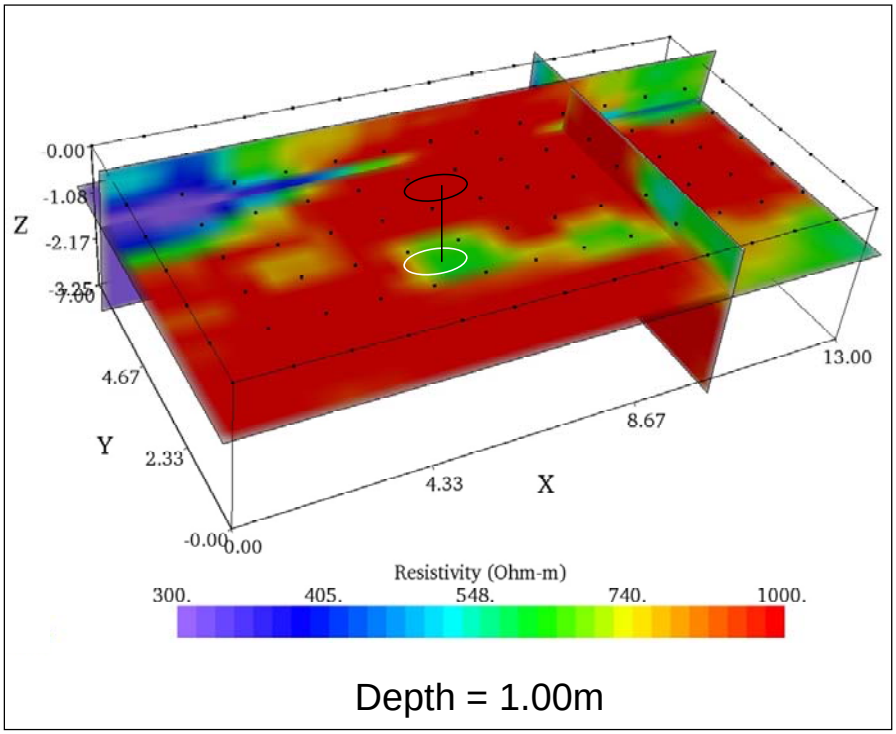


Figure C21. Depth slice at Z=1.00 m, 3D processing, Site B, Sacramento, CA.

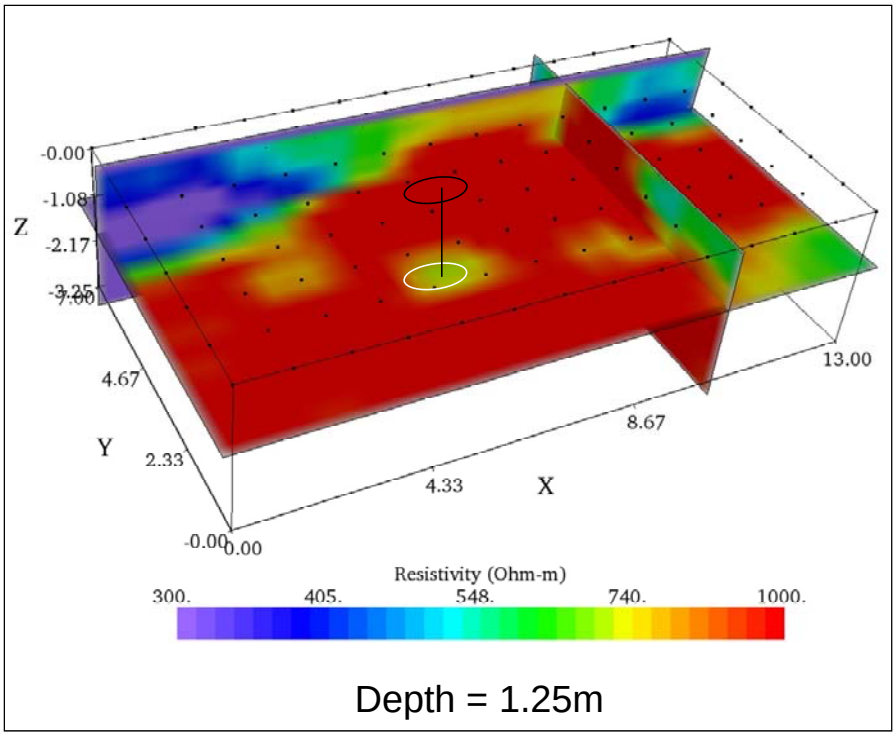


Figure C22. Depth slice at Z=1.25 m, 3D processing, Site B, Sacramento, CA.

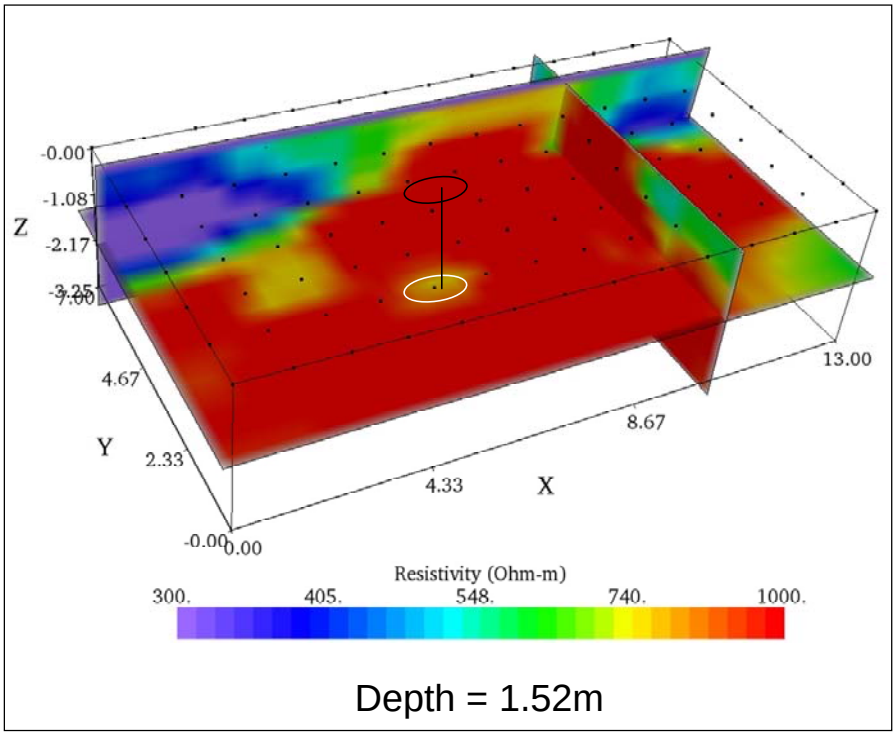


Figure C23. Depth slice at Z=1.52m, 3D processing, Site B, Sacramento, CA.

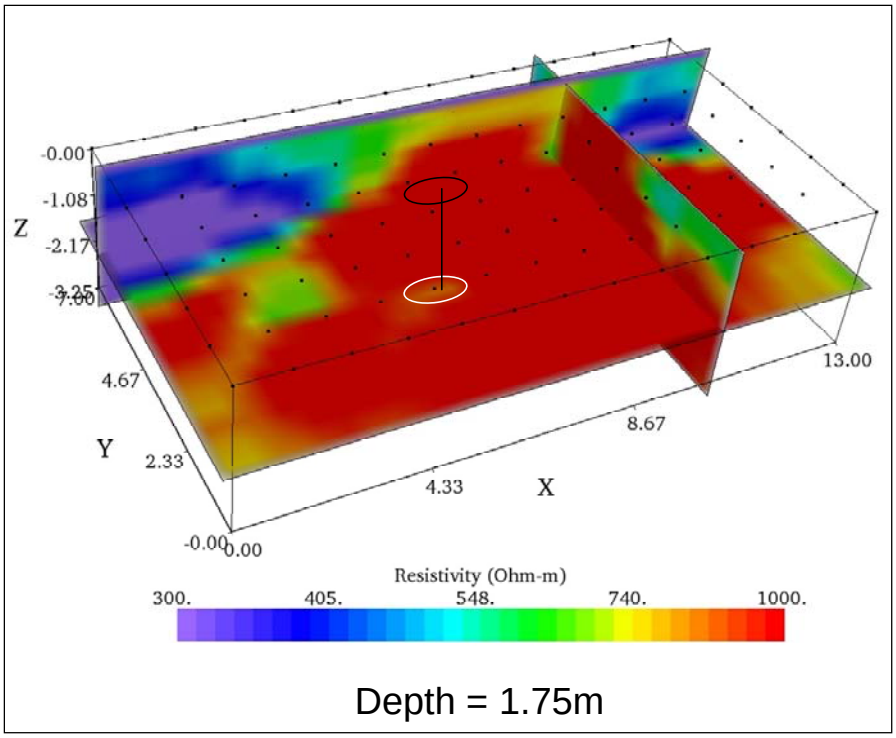


Figure C24. Depth slice at Z=1.75 m, 3D processing, Site B, Sacramento, CA.

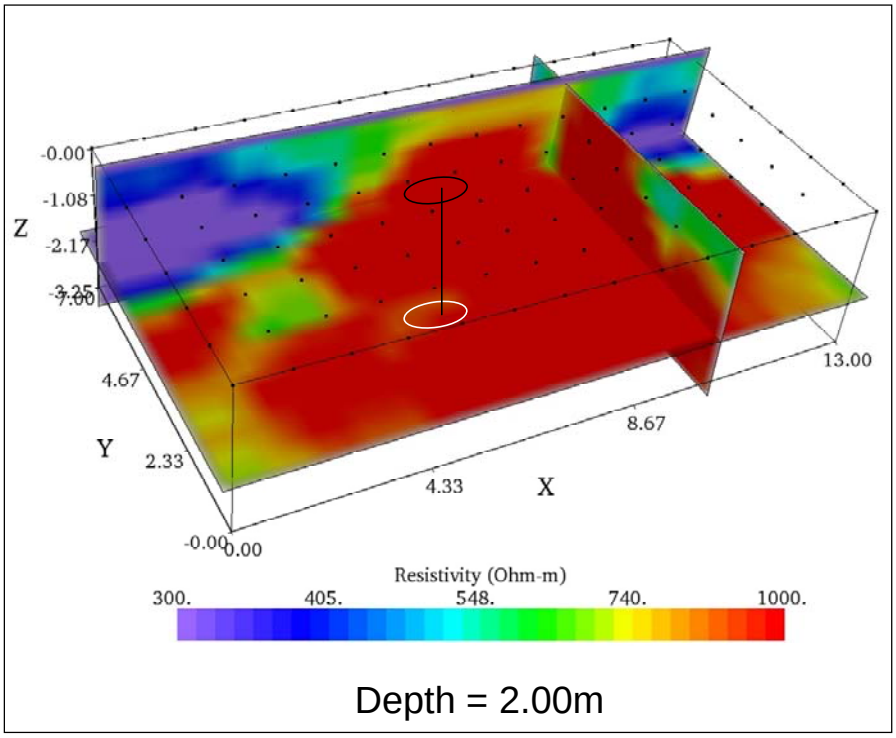


Figure C25. Depth slice at 2.00 m, 3D processing, Site B, Sacramento, CA.

3D Slices Taken Parallel to the X-axis – Site B, Sacramento, CA

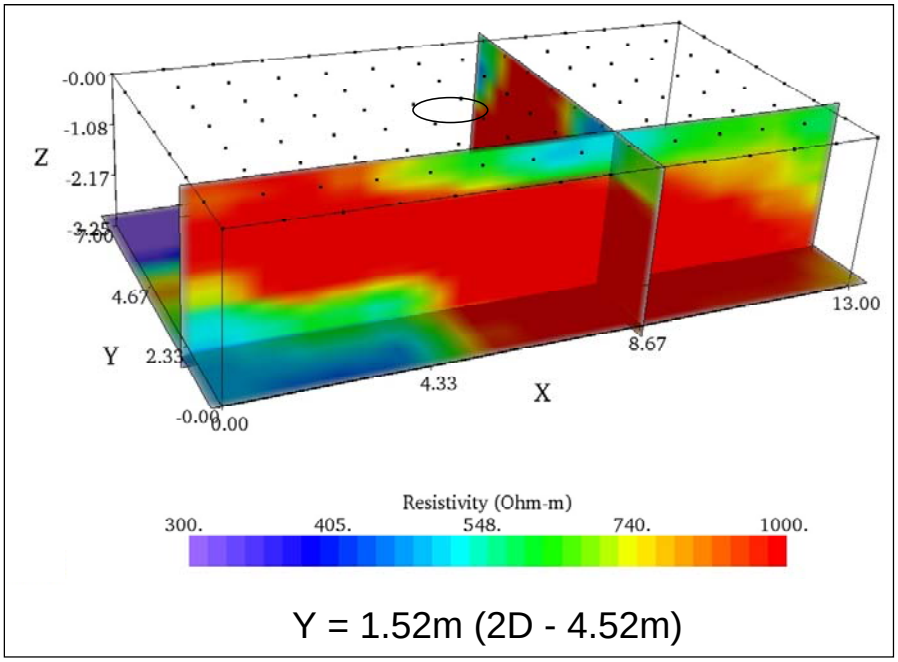


Figure C26. Slice along Y=1.52 m, 3D processing, corresponding to 2D grid line Y=4.52 m, Site B, Sacramento, CA.

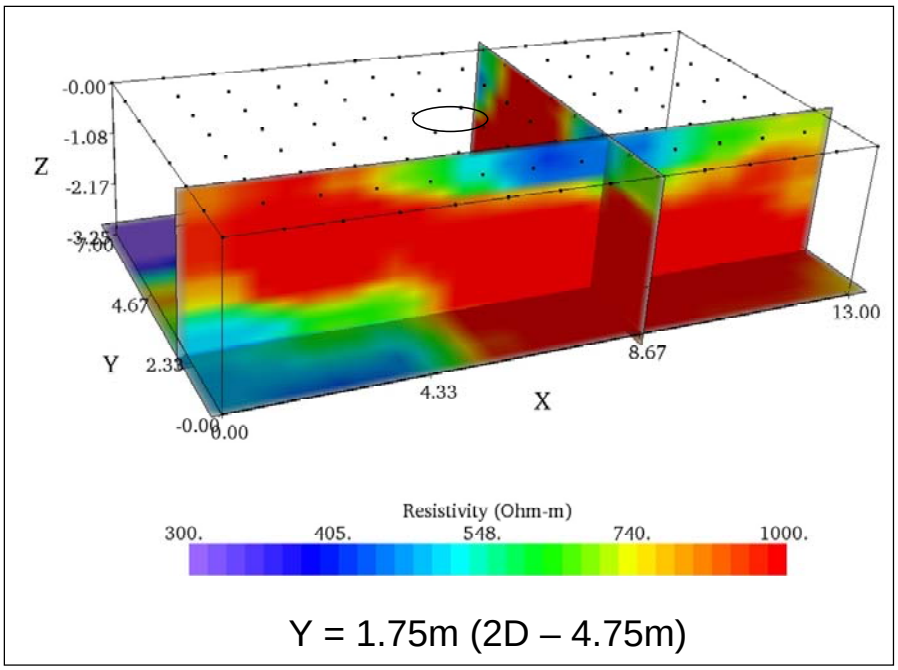


Figure C27. Slice along Y=1.75 m, 3D processing, corresponding to 2D grid line 4.75 m, Site B, Sacramento, CA.

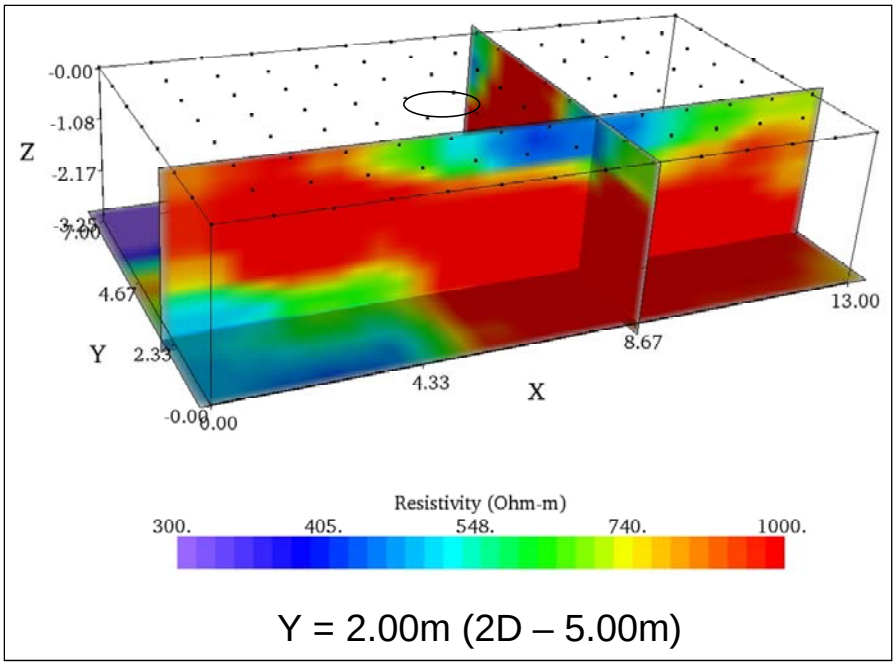


Figure C28. Slice along Y=2.00 m, 3D processing, corresponding to 2D grid line 5.00 m, Site B, Sacramento, CA.

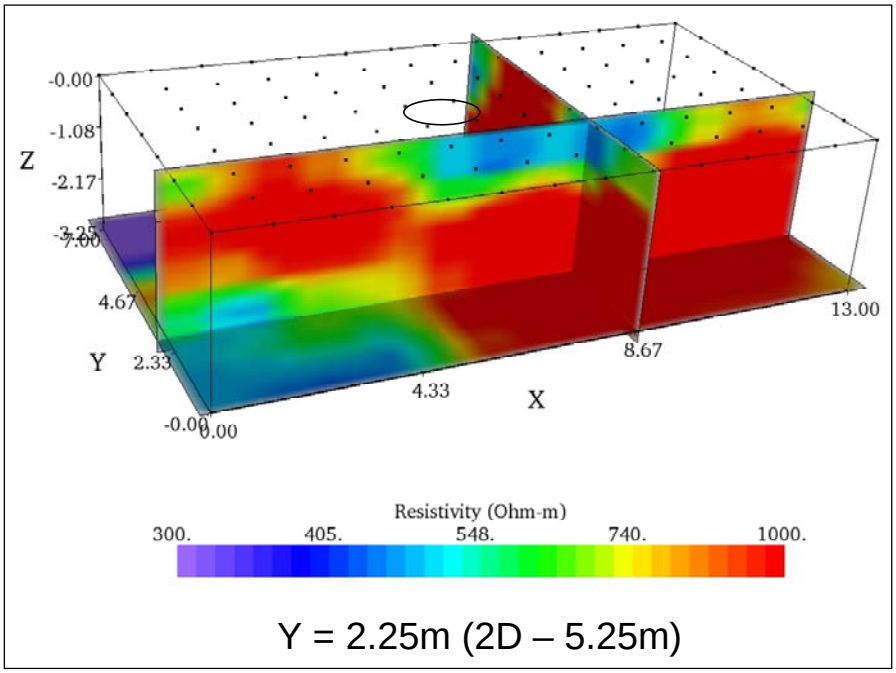


Figure C29. Slice along Y=2.25 m, 3D processing, corresponding to 2D grid line 5.25 m, Site B, Sacramento, CA.

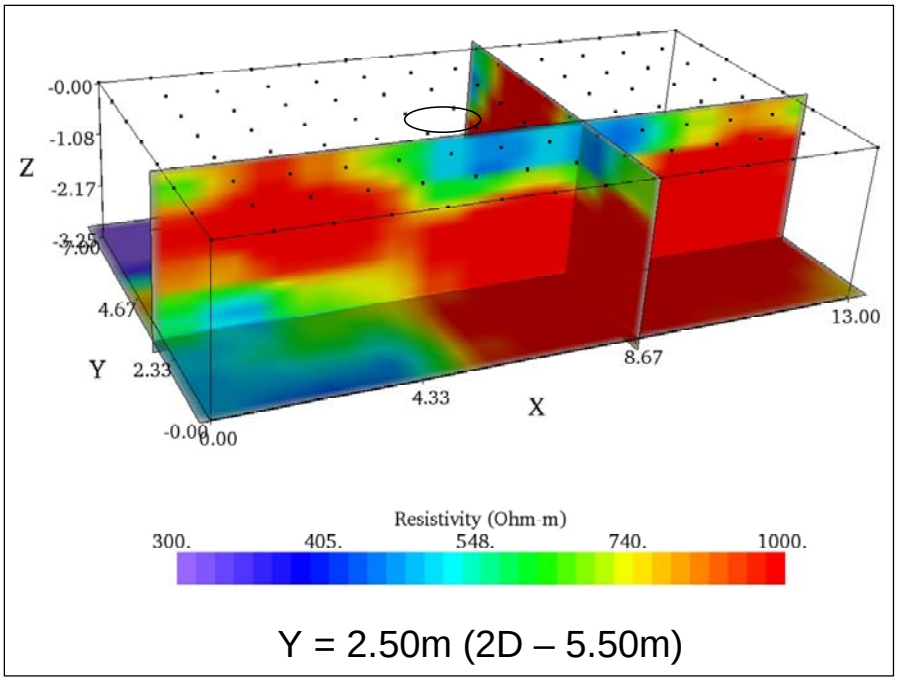


Figure C30. Slice along Y=2.50 m, 3D processing, corresponding to 2D grid line 5.50 m, Site B, Sacramento, CA.

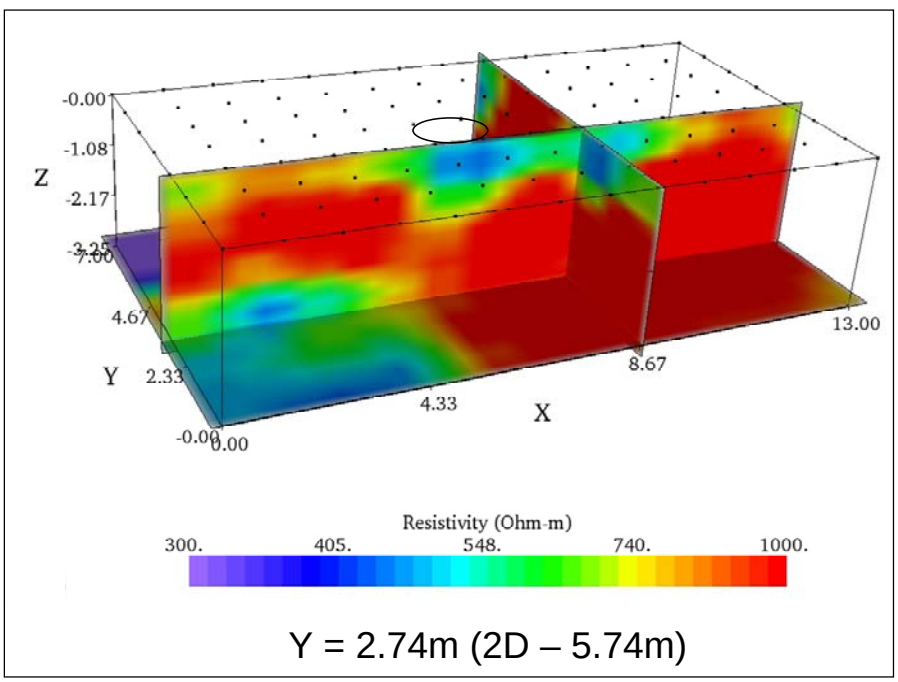


Figure C31. Slice along Y=2.74 m, 3D processing, corresponding to 2D grid line 5.74 m, Site B, Sacramento, CA.

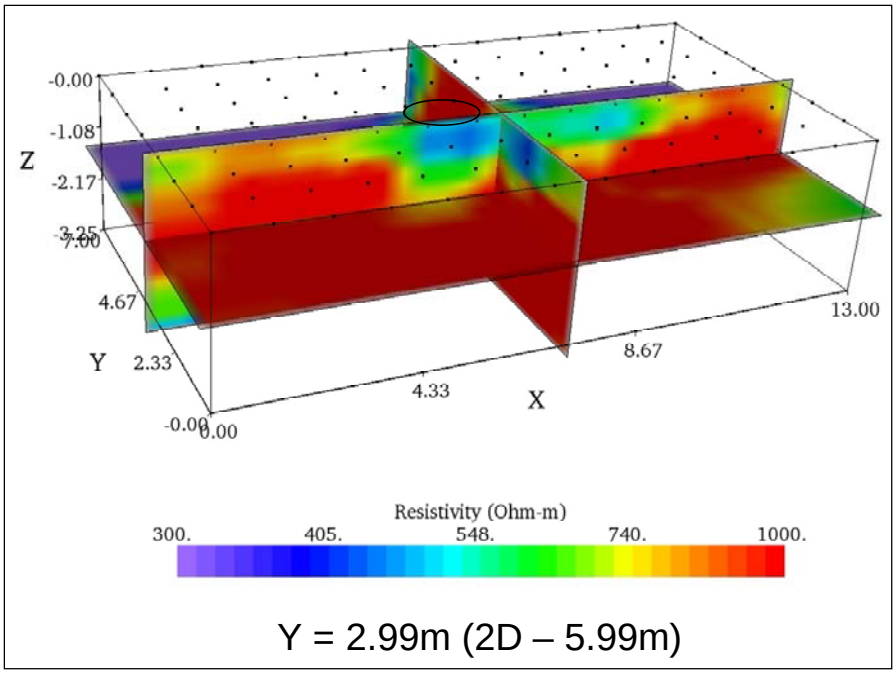


Figure C32. Slice along Y=2.99 m, 3D processing, corresponding to 2D grid line 5.99 m, Site B, Sacramento, CA.

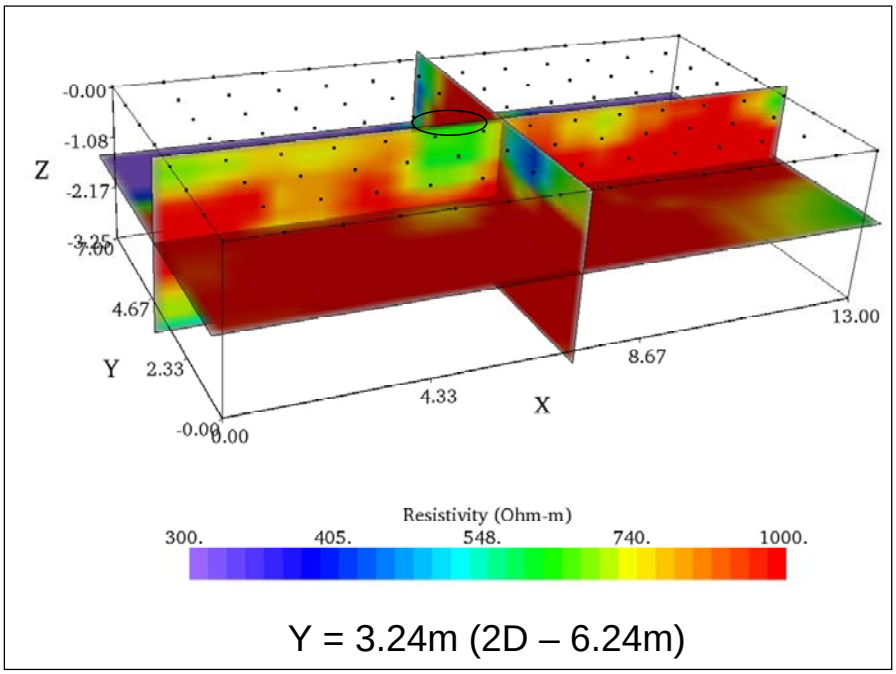


Figure C33. Slice along Y=3.24 m, 3D processing, corresponding to 2D grid line 6.24 m, Site B, Sacramento, CA.

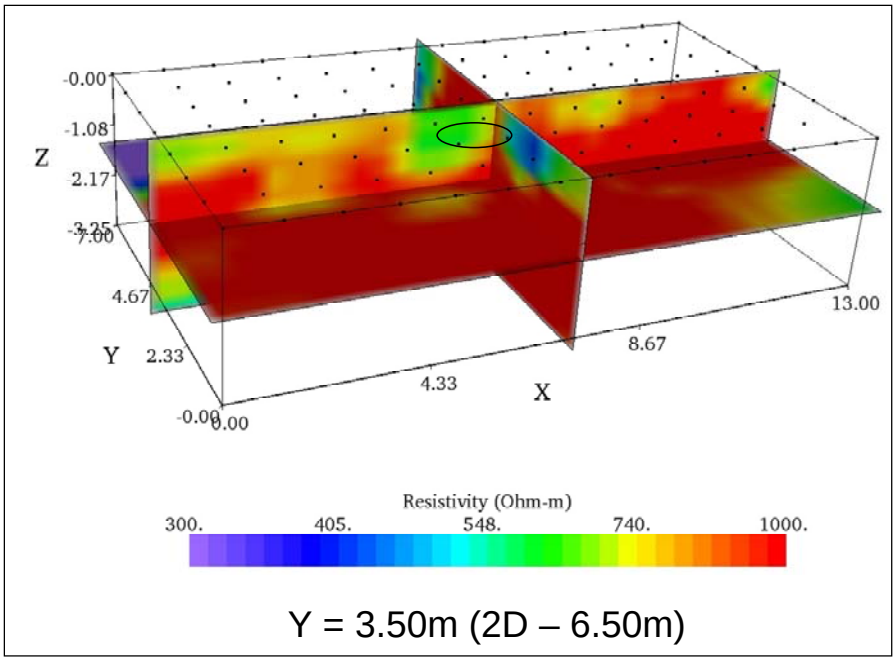


Figure C34. Slice along Y=3.50 m, 3D processing, corresponding to 2D grid line 6.50 m, Site B, Sacramento, CA.

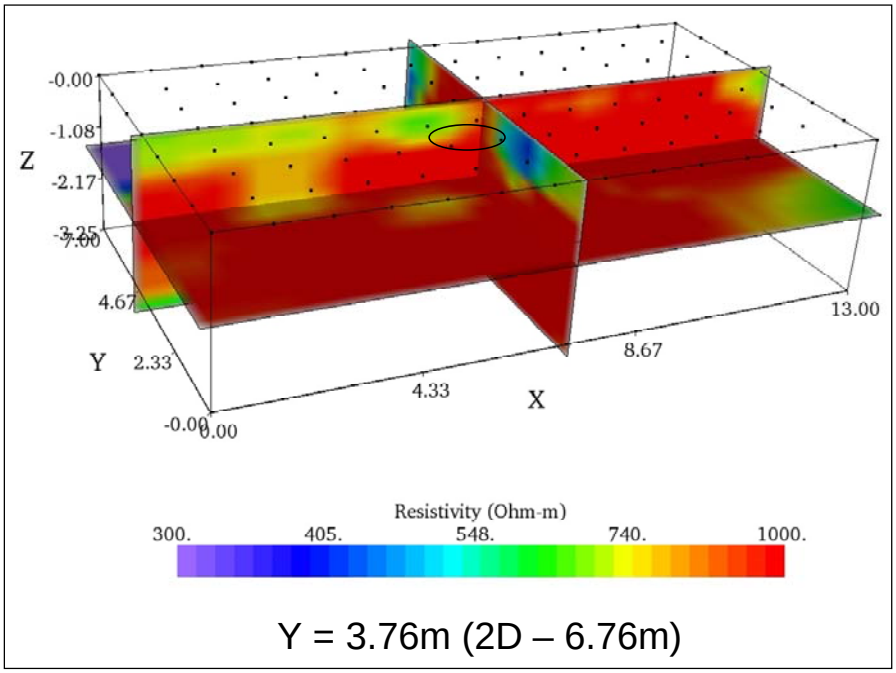


Figure C35. Slice along Y=3.76 m, 3D processing, corresponding to 2D grid line 6.76 m, Site B, Sacramento, CA.

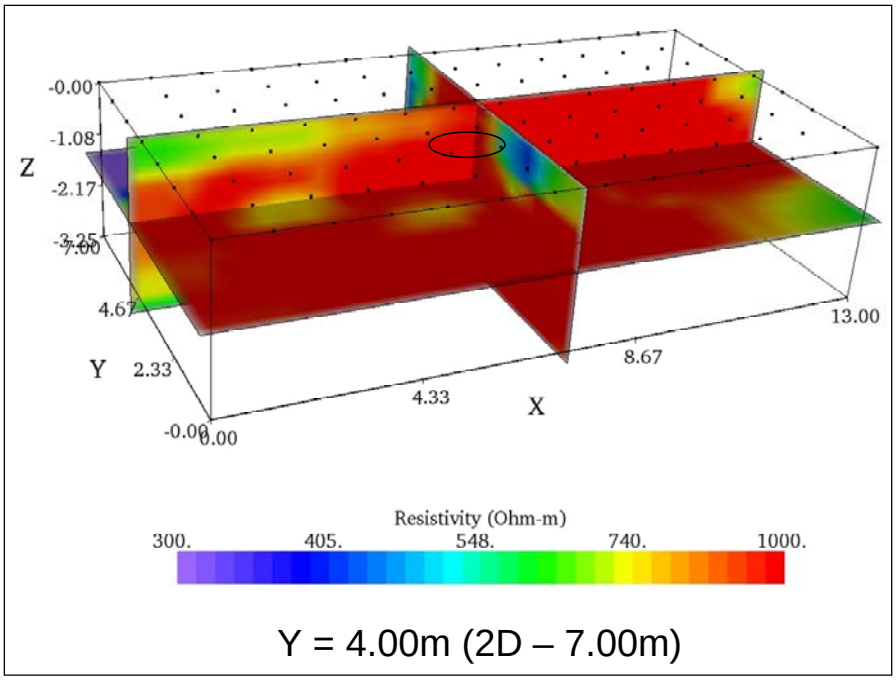


Figure C36. Slice along Y=4.00 m, 3D processing, corresponding to 2D grid line 7.00 m, Site B, Sacramento, CA.

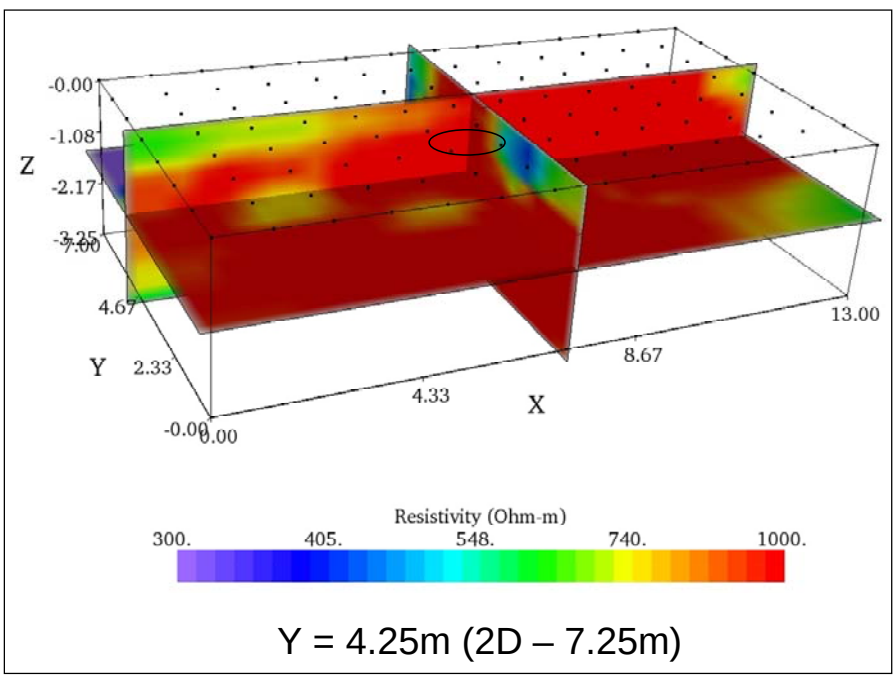


Figure C37. Slice along Y=4.25 m, 3D processing, corresponding to 2D grid line 7.25 m, Site B, Sacramento, CA.

Quasi 3D Depth Slices – Portland, OR

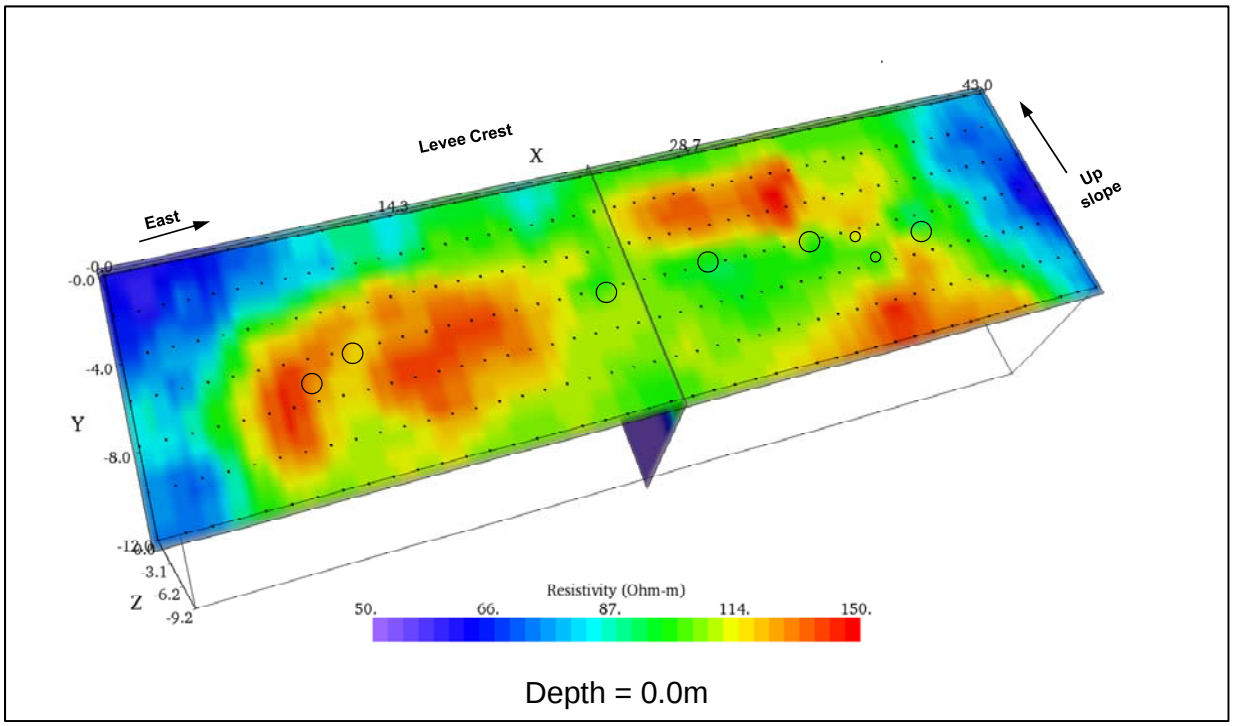


Figure C38. Depth slice at Z=0.00 m, quasi 3D processing, Portland, OR.

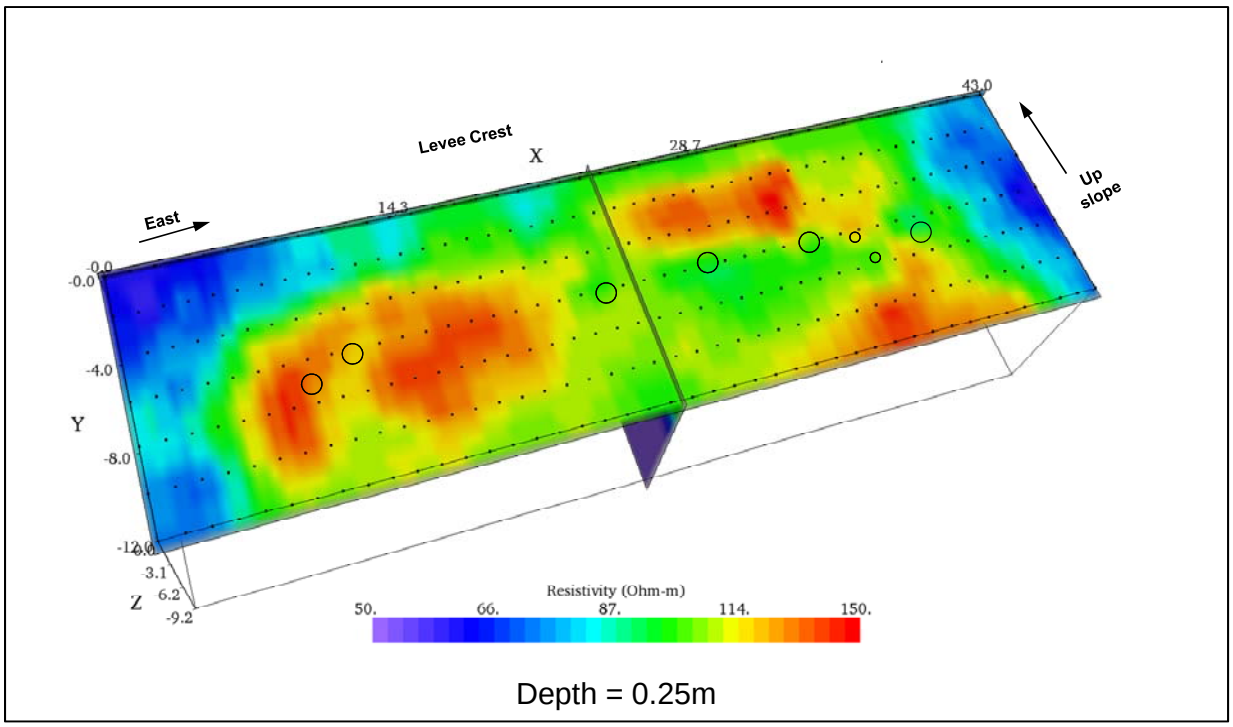


Figure C39. Depth slice at Z=0.25 m, quasi 3D processing, Portland, OR.

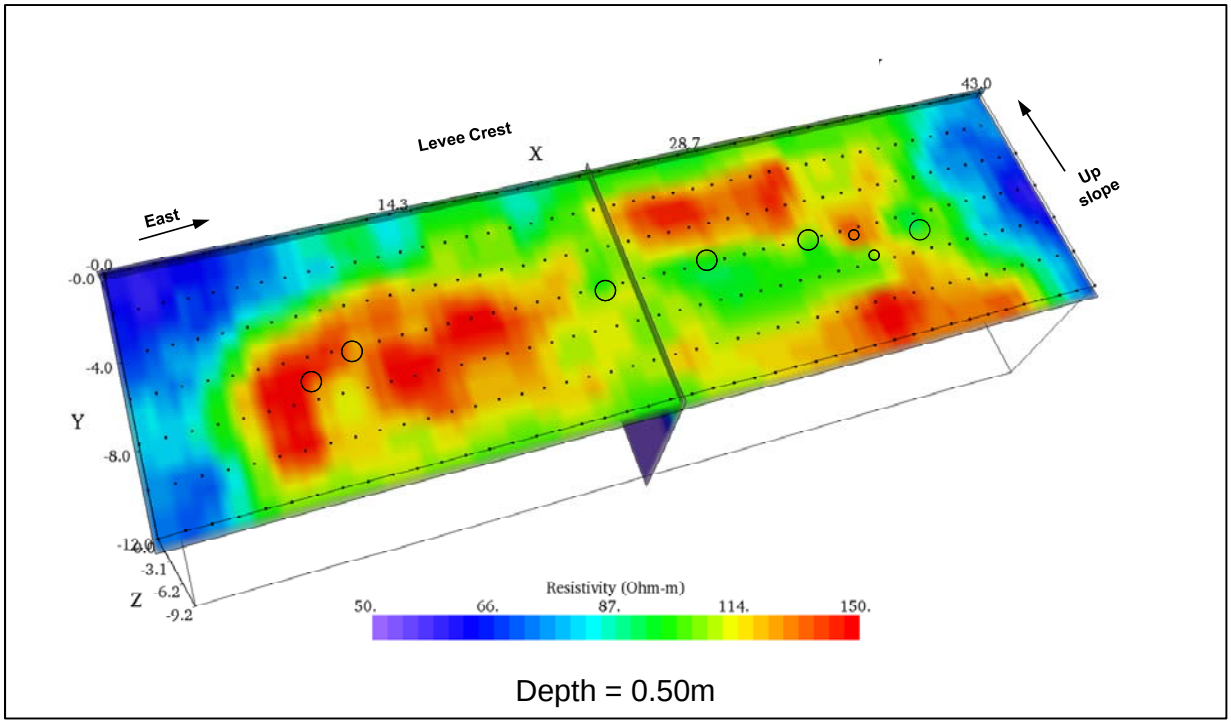


Figure C40. Depth slice at Z=0.50 m, quasi 3D processing, Portland, OR.

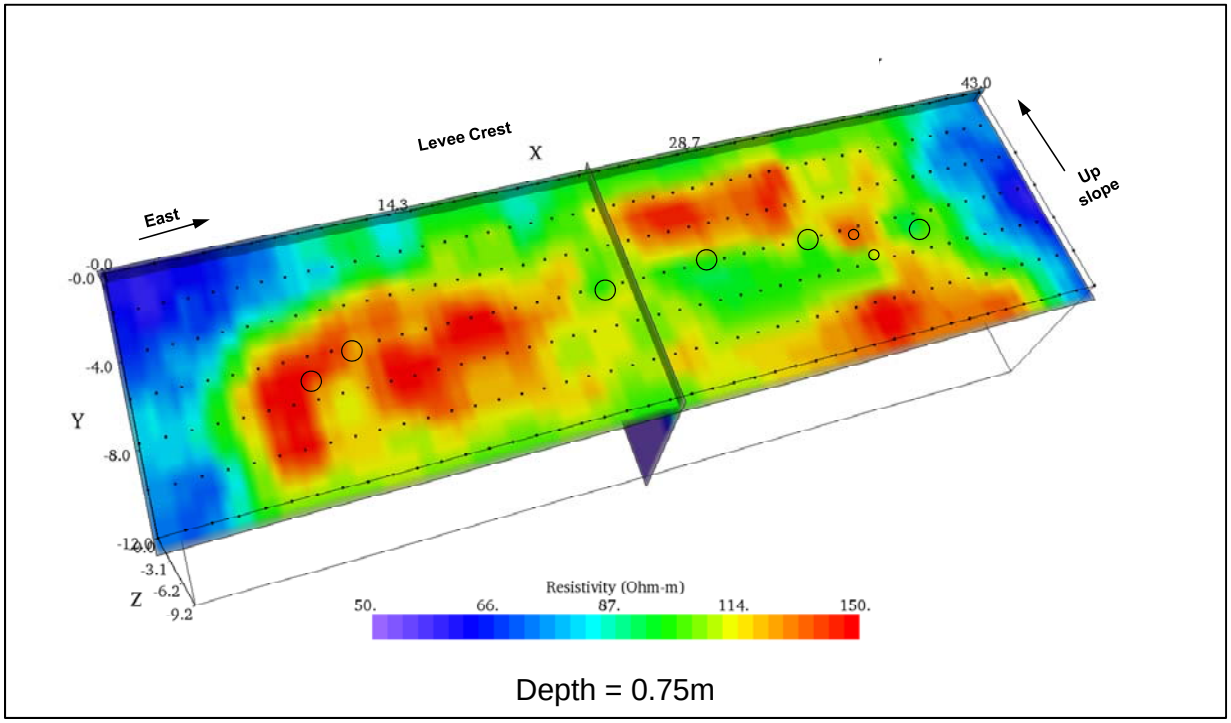


Figure C41. Depth slice at Z=0.75 m, quasi 3D processing, Portland, OR.

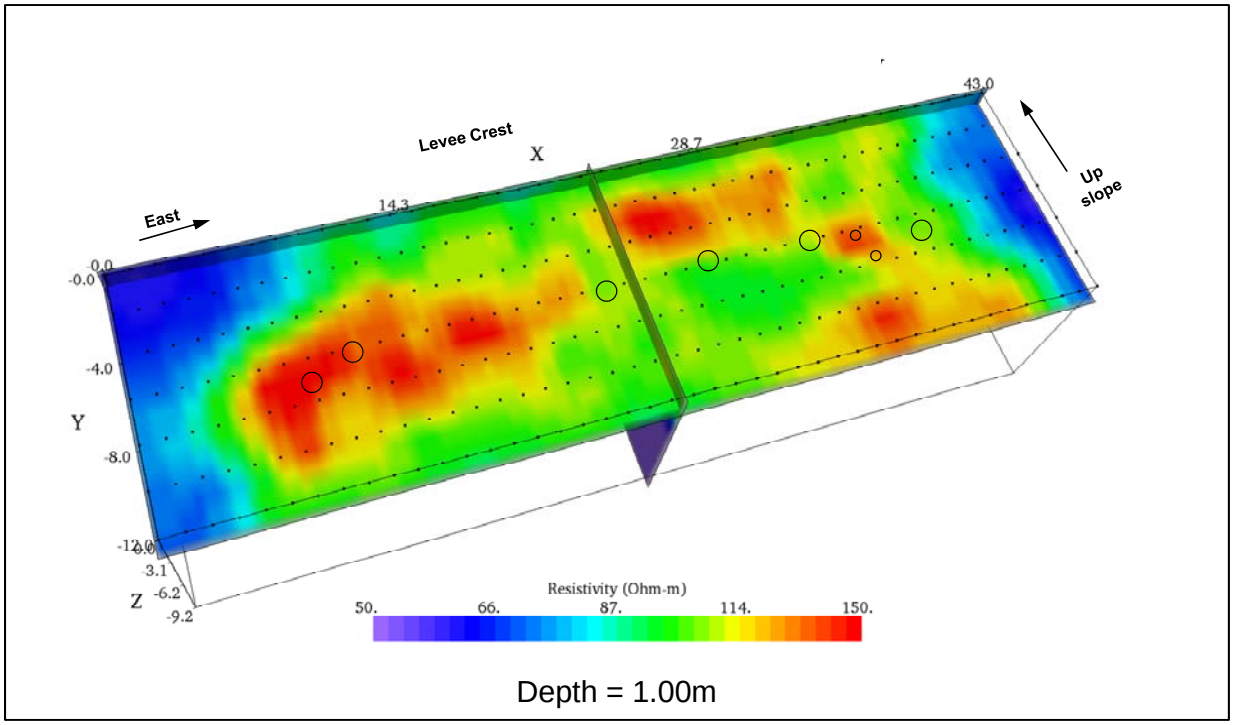


Figure C42. Depth slice at Z=1.00 m, quasi 3D processing, Portland, OR.

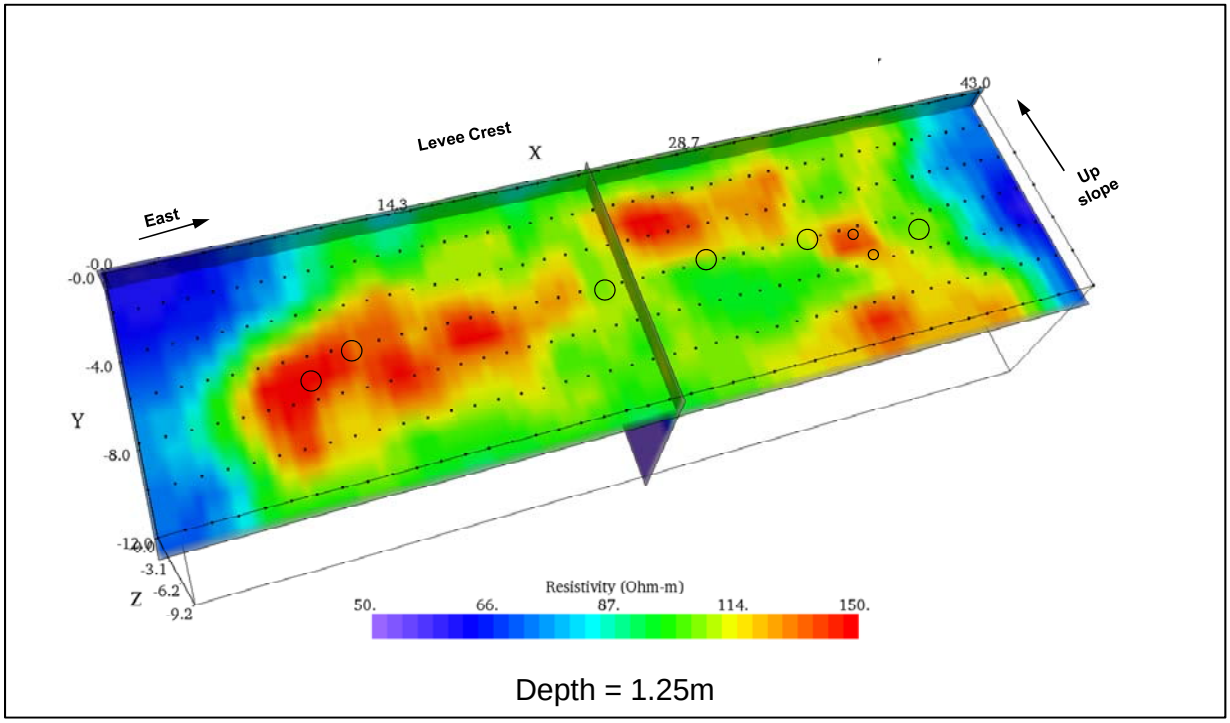


Figure C43. Depth slice at Z=1.25 m, quasi 3D processing, Portland, OR.

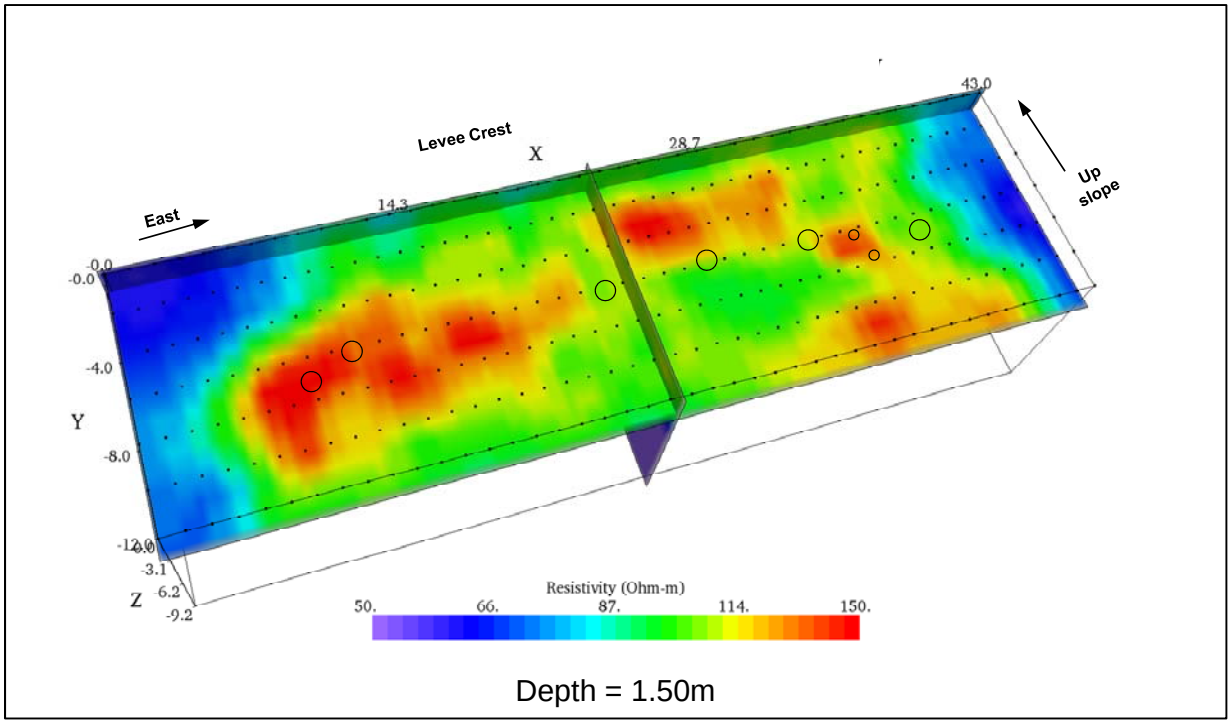


Figure C44. Depth slice at Z=1.50 m, quasi 3D processing, Portland, OR.

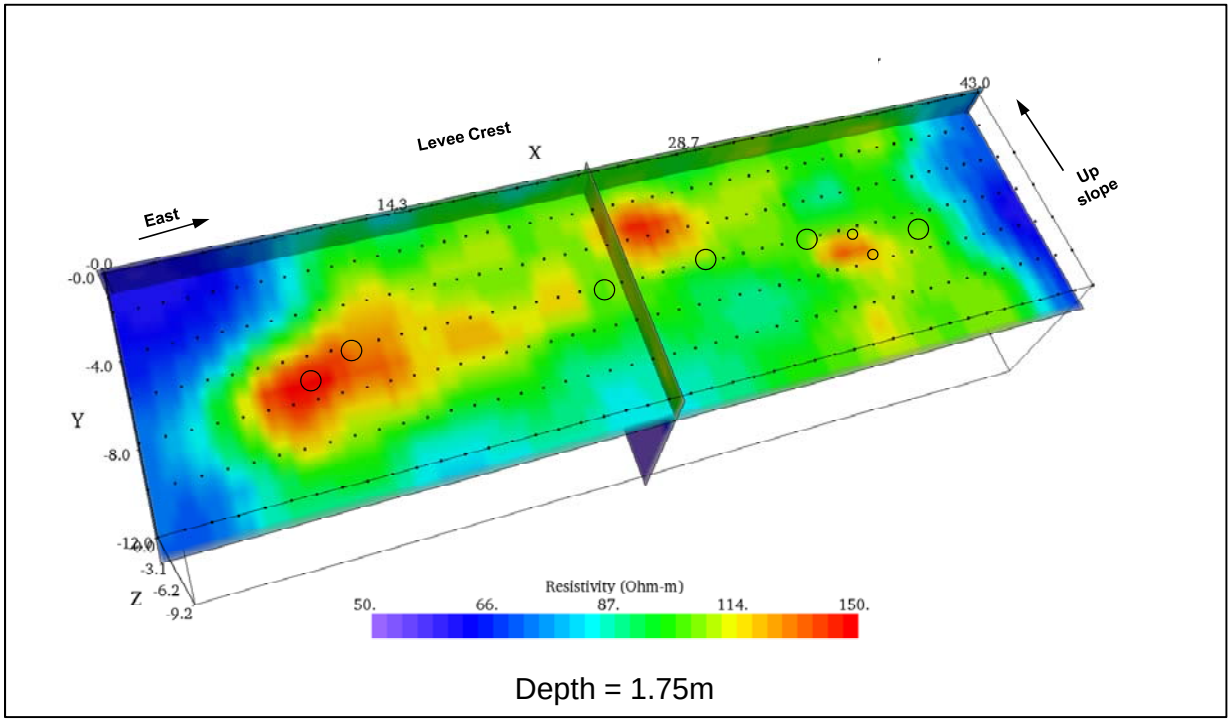


Figure C45. Depth slice at Z=1.75 m, quasi 3D processing, Portland, OR.

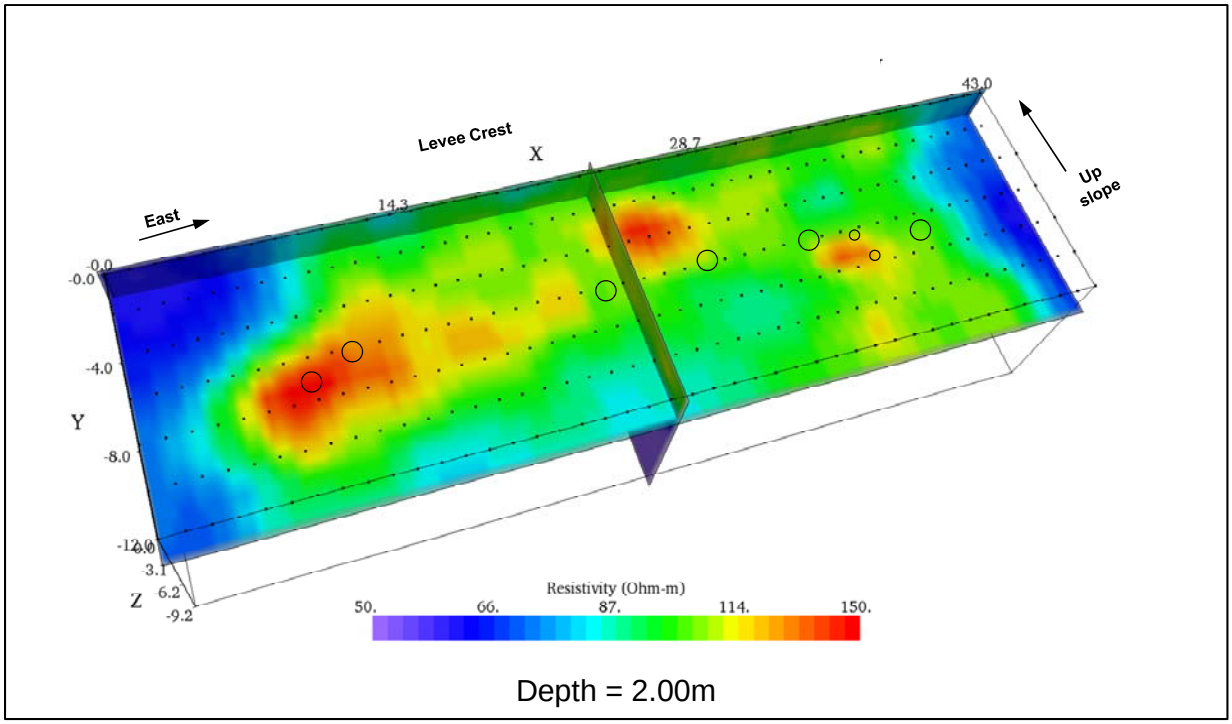


Figure C46. Depth slice at Z=2.00 m, quasi 3D processing, Portland, OR.

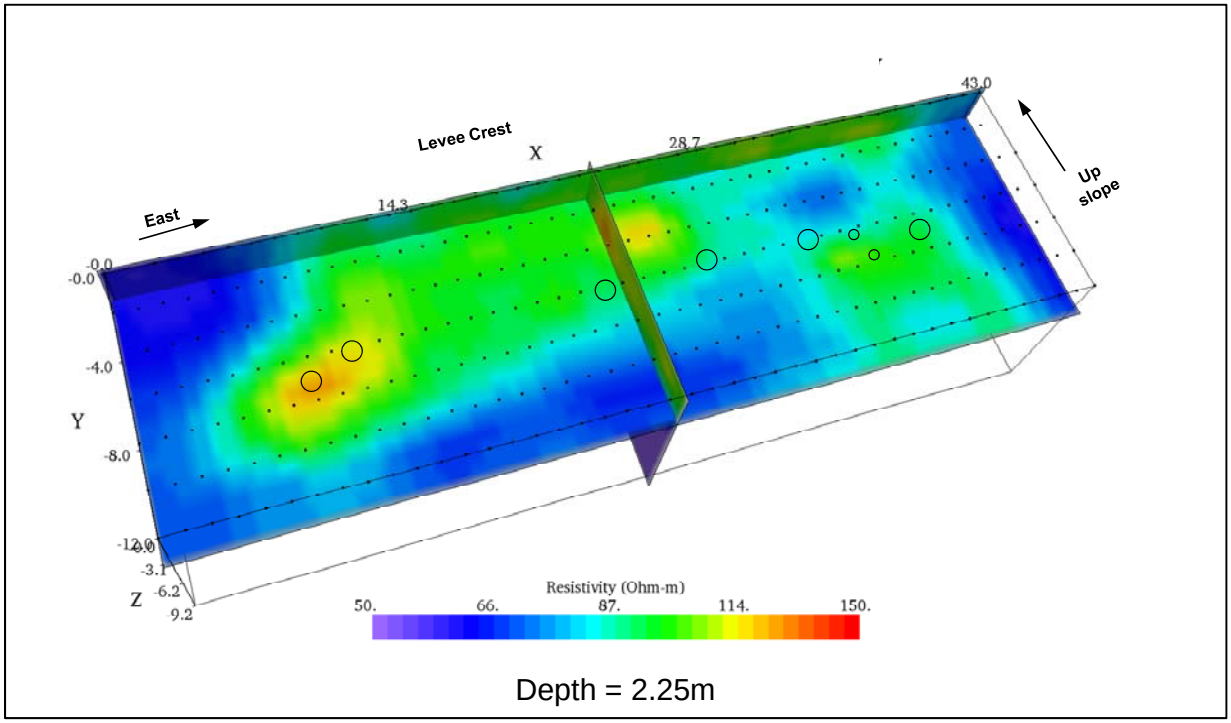


Figure C47. Depth slice at Z=2.25 m, quasi 3D processing, Portland, OR.

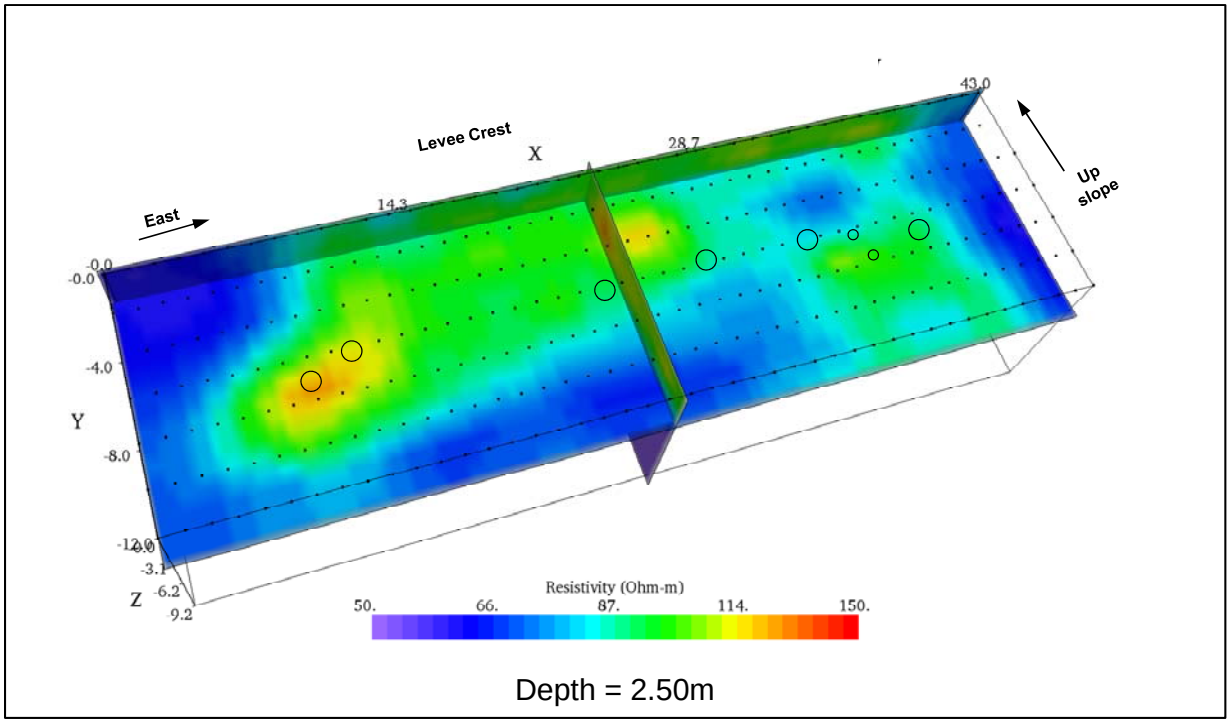


Figure C48. Depth slice at Z=2.50 m, quasi 3D processing, Portland, OR.

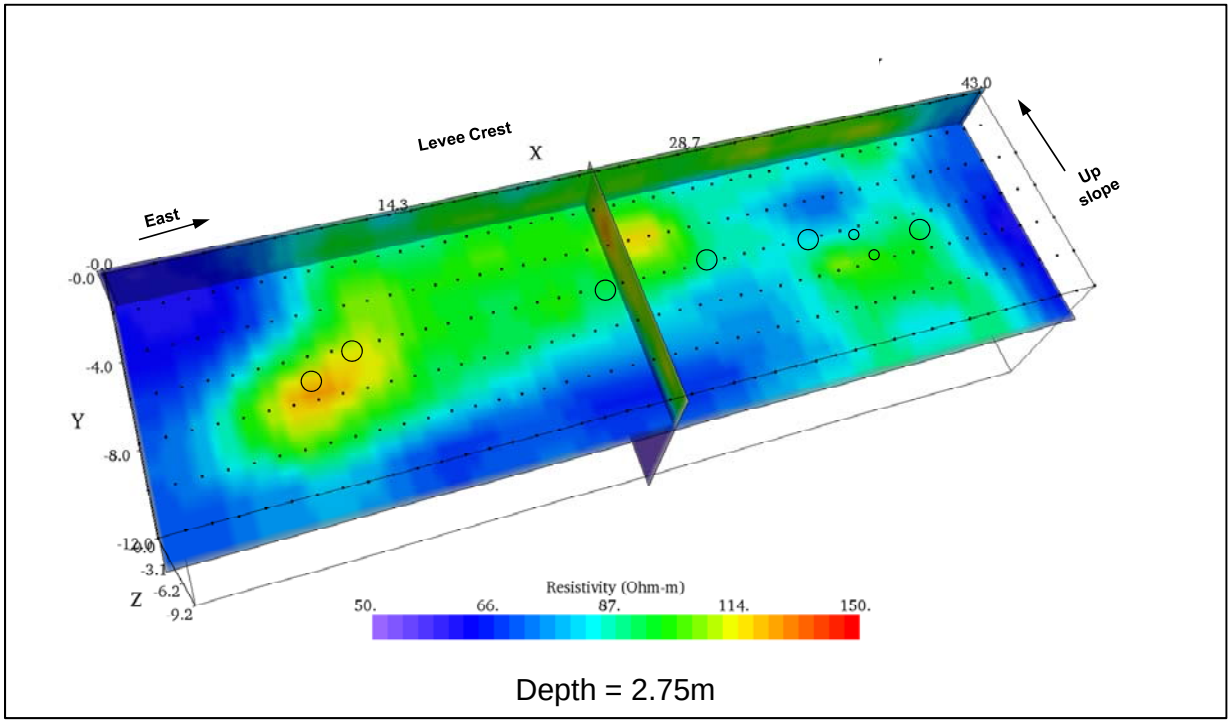


Figure C49. Depth slice at Z=2.75 m, quasi 3D processing, Portland, OR.

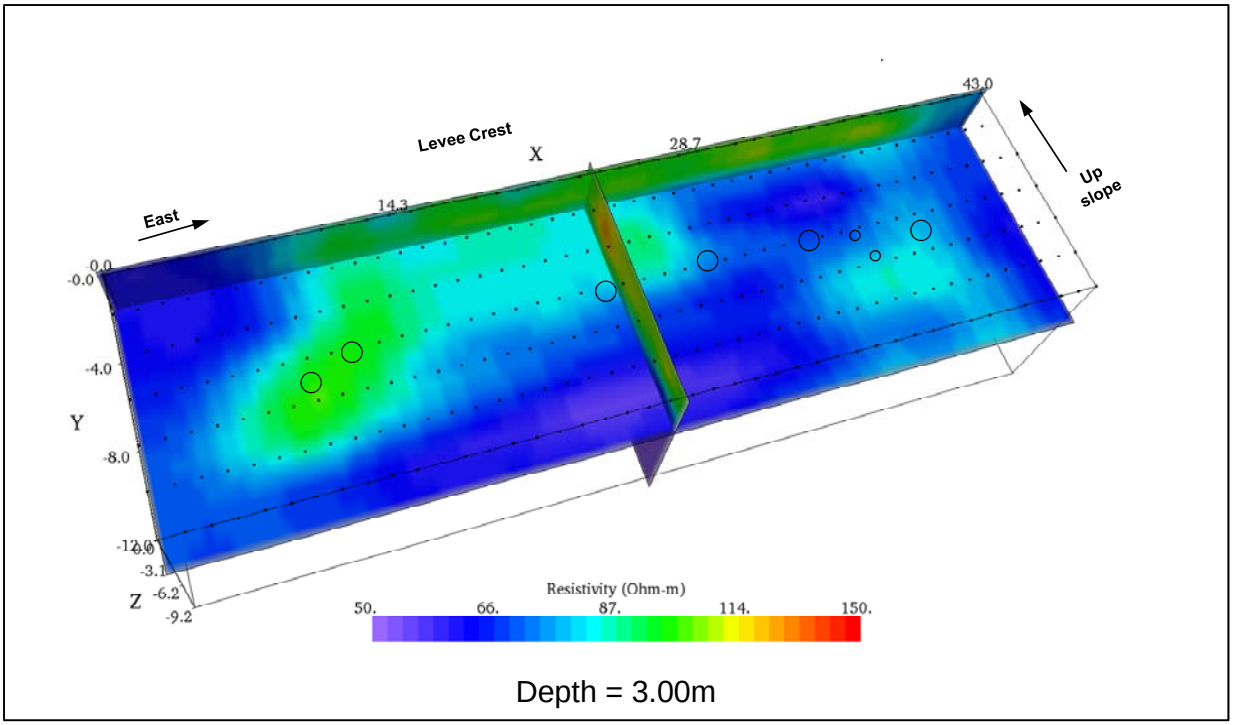


Figure C50. Depth slice at Z=3.00 m, quasi 3D processing, Portland, OR.

Quasi 3D Slices Taken Parallel to the X-axis – Portland, OR

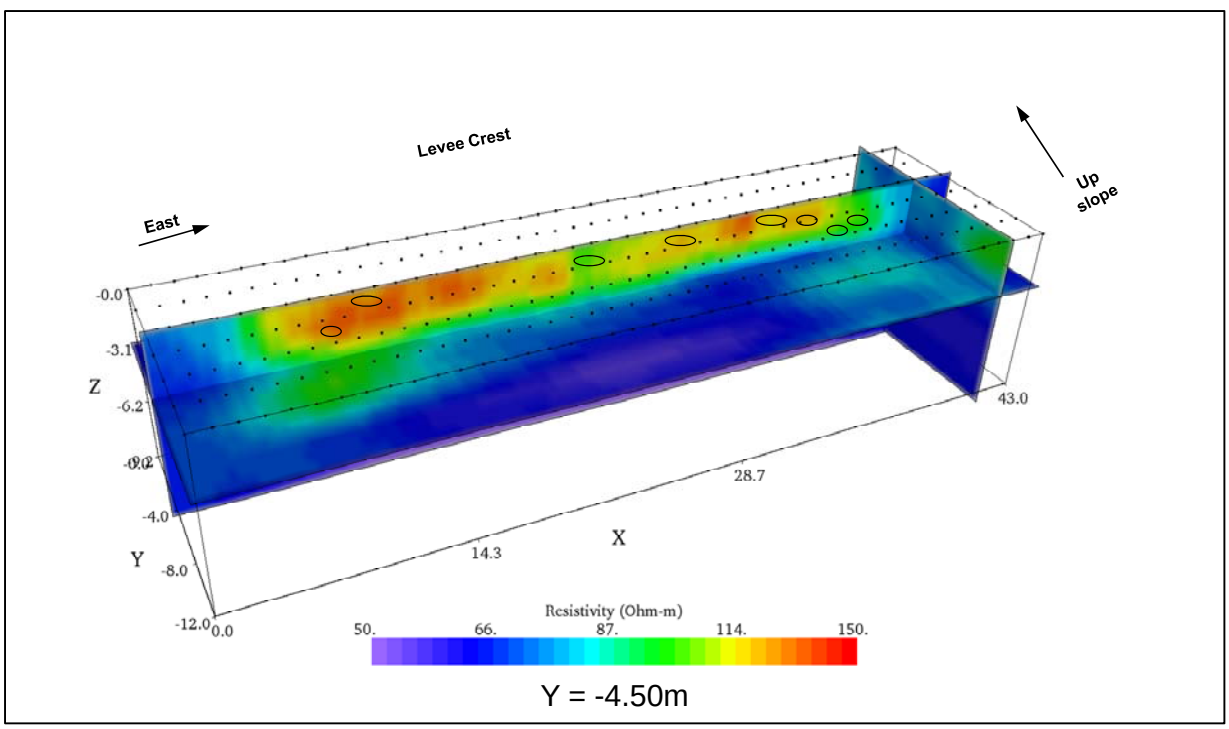


Figure C51. Slice along Y=-4.50 m, Quasi 3D processing, Portland, OR.

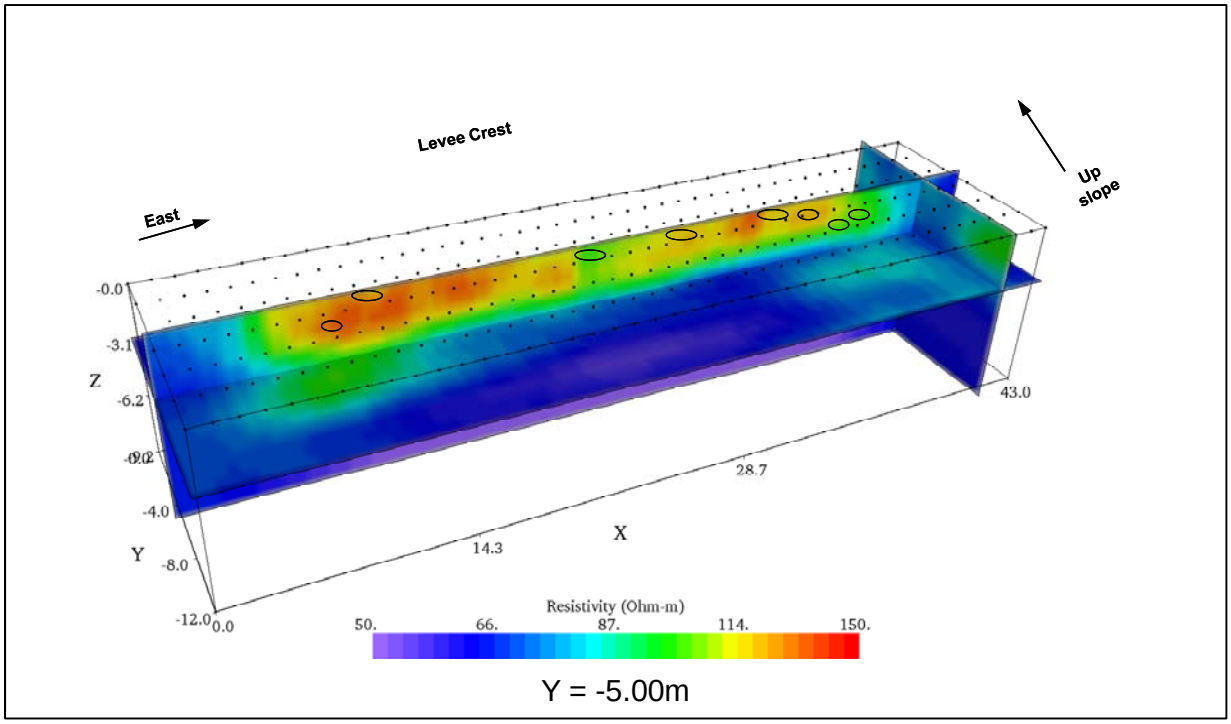


Figure C52. Slice along Y=-5.00m, Quasi 3D processing, Portland, OR.

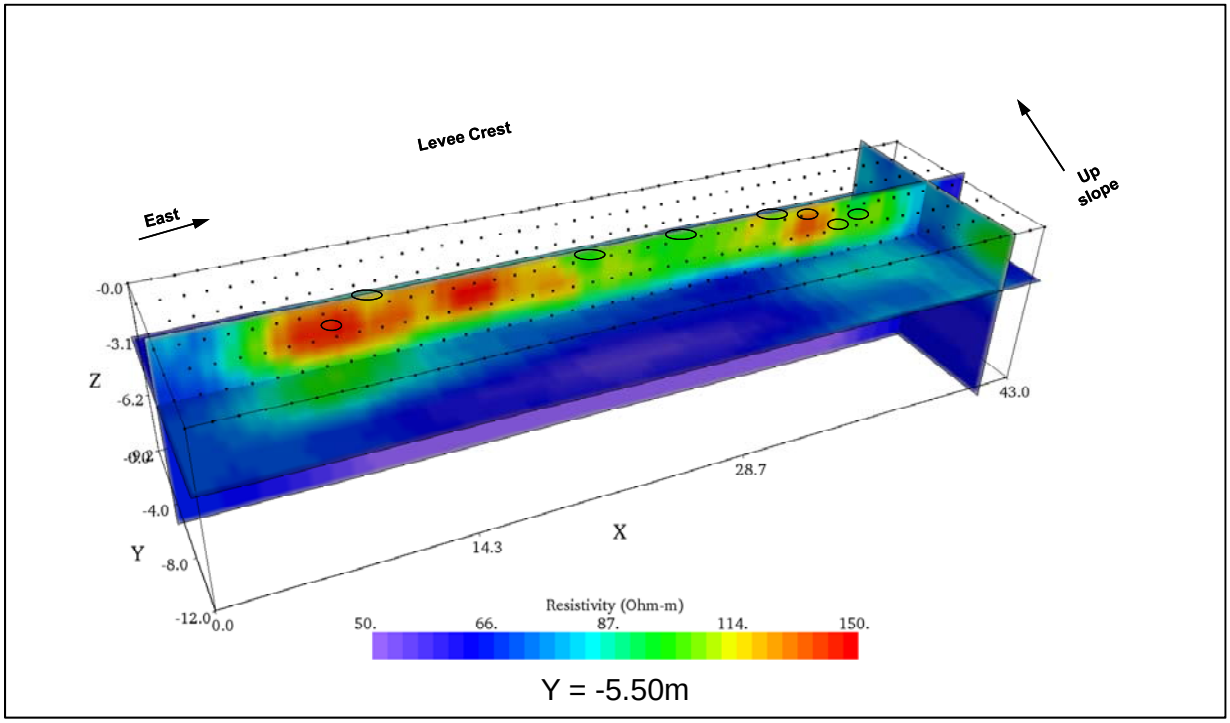


Figure C53. Slice along Y=-5.50m, Quasi 3D processing, Portland, OR.

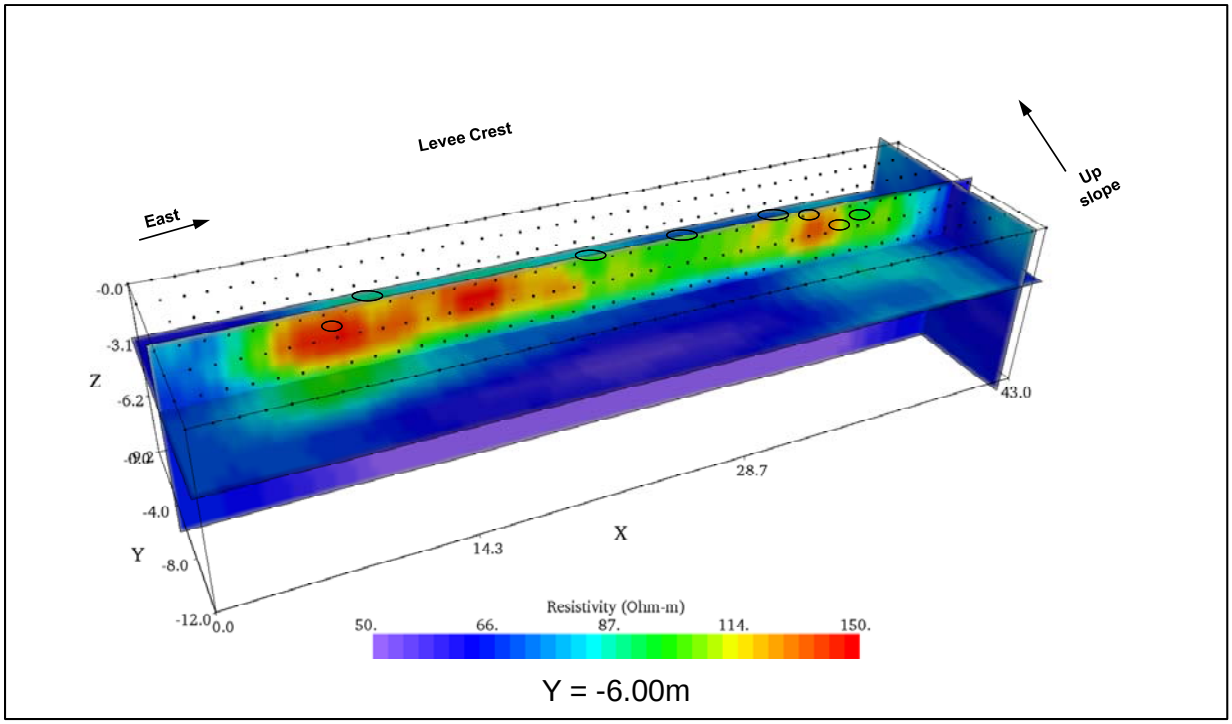


Figure C54. Slice along Y=-6.00m, Quasi 3D processing, Portland, OR.

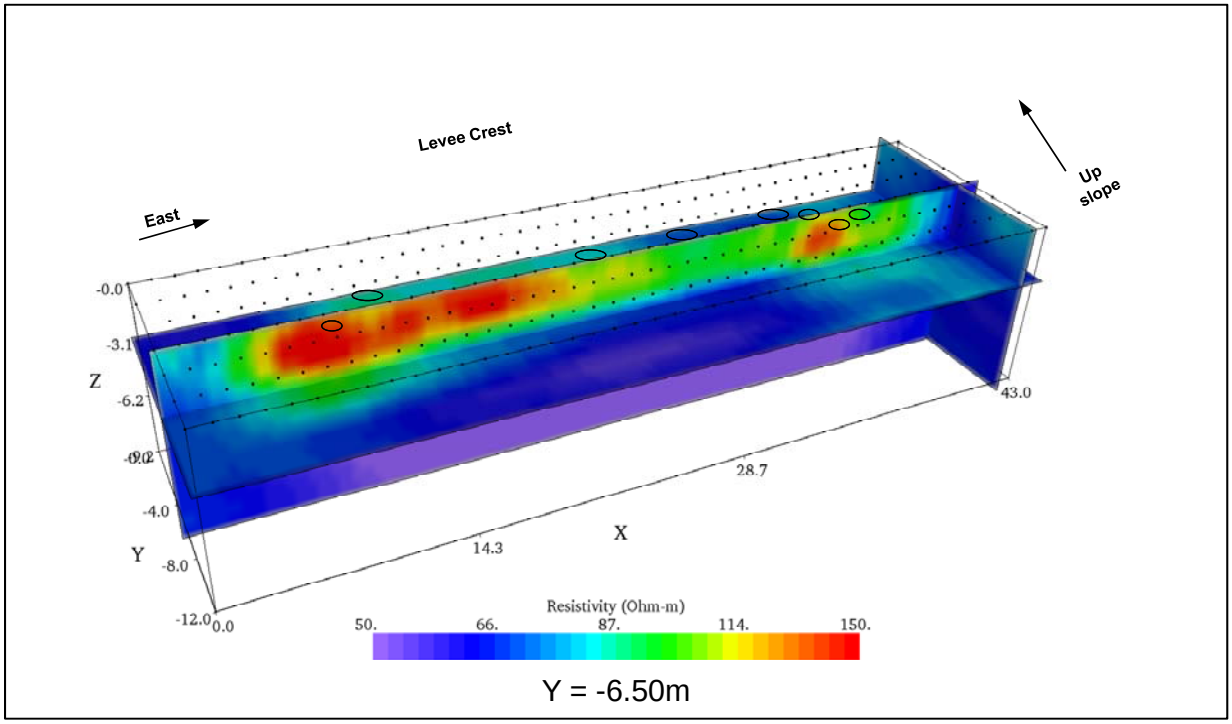


Figure C55. Slice along Y=-6.50m, Quasi 3D processing, Portland, OR.

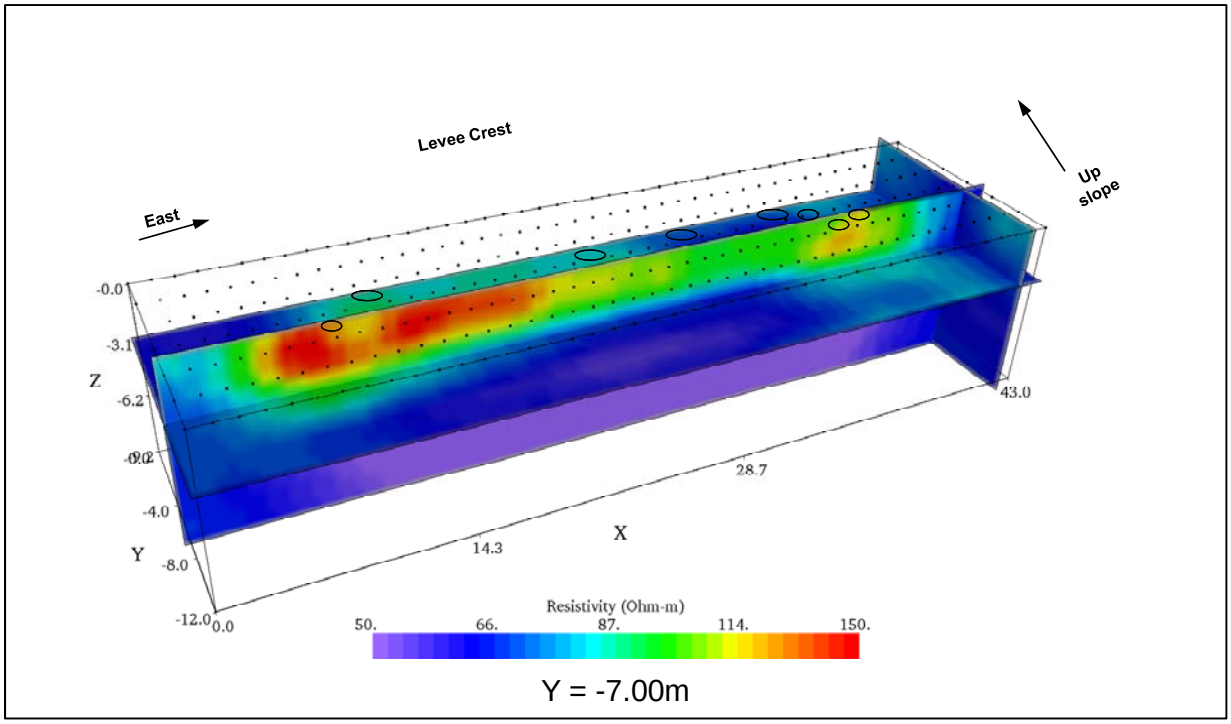


Figure C56. Slice along Y=-7.00m, Quasi 3D processing, Portland, OR.

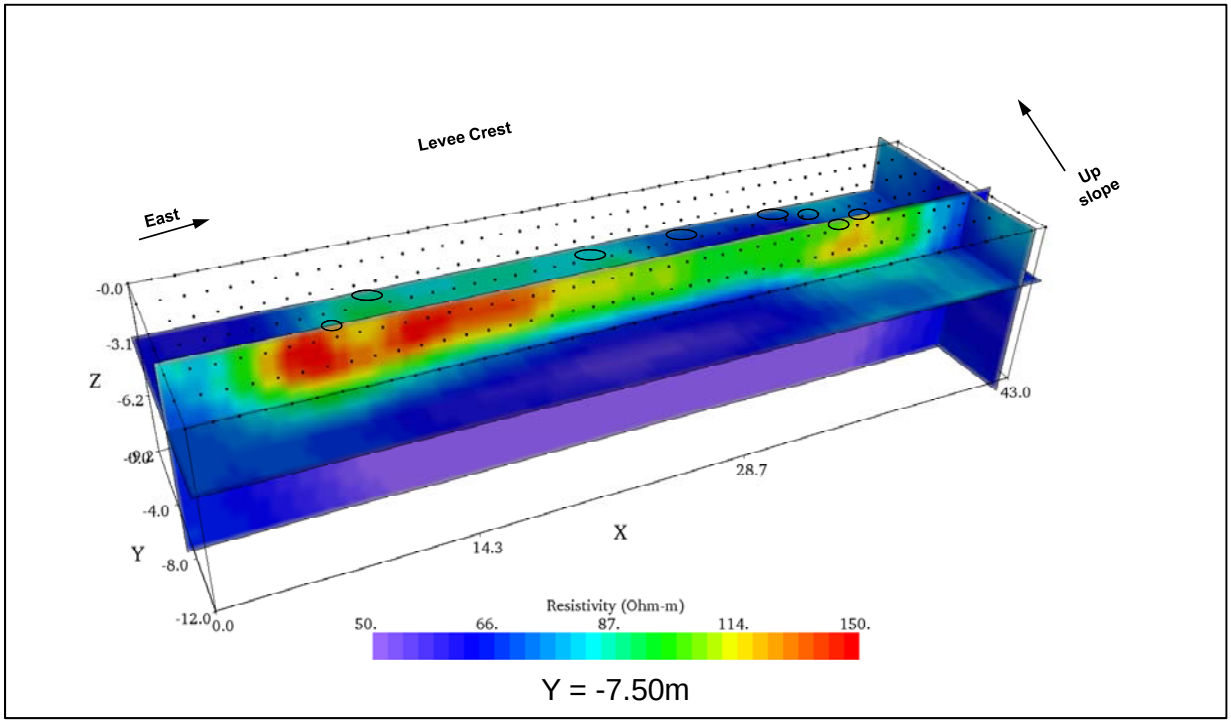


Figure C57. Slice along Y=-7.50m, Quasi 3D processing, Portland, OR.

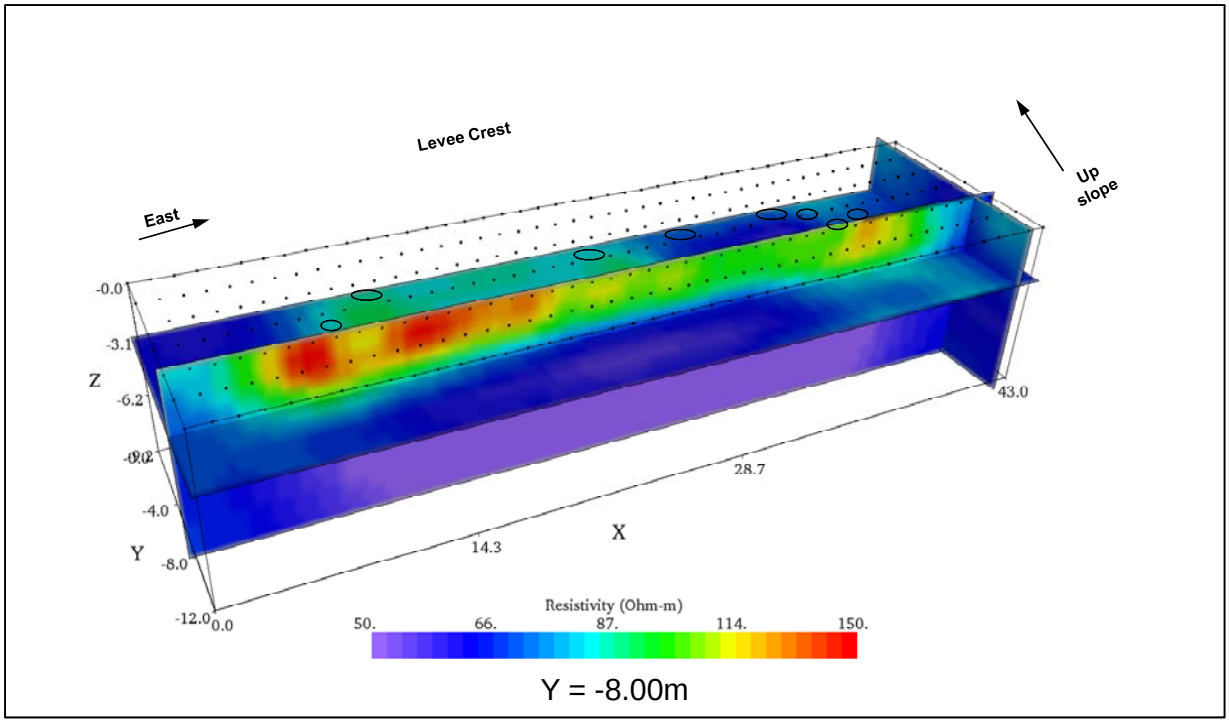


Figure C58. Slice along Y=-8.00m, Quasi 3D processing, Portland, OR.

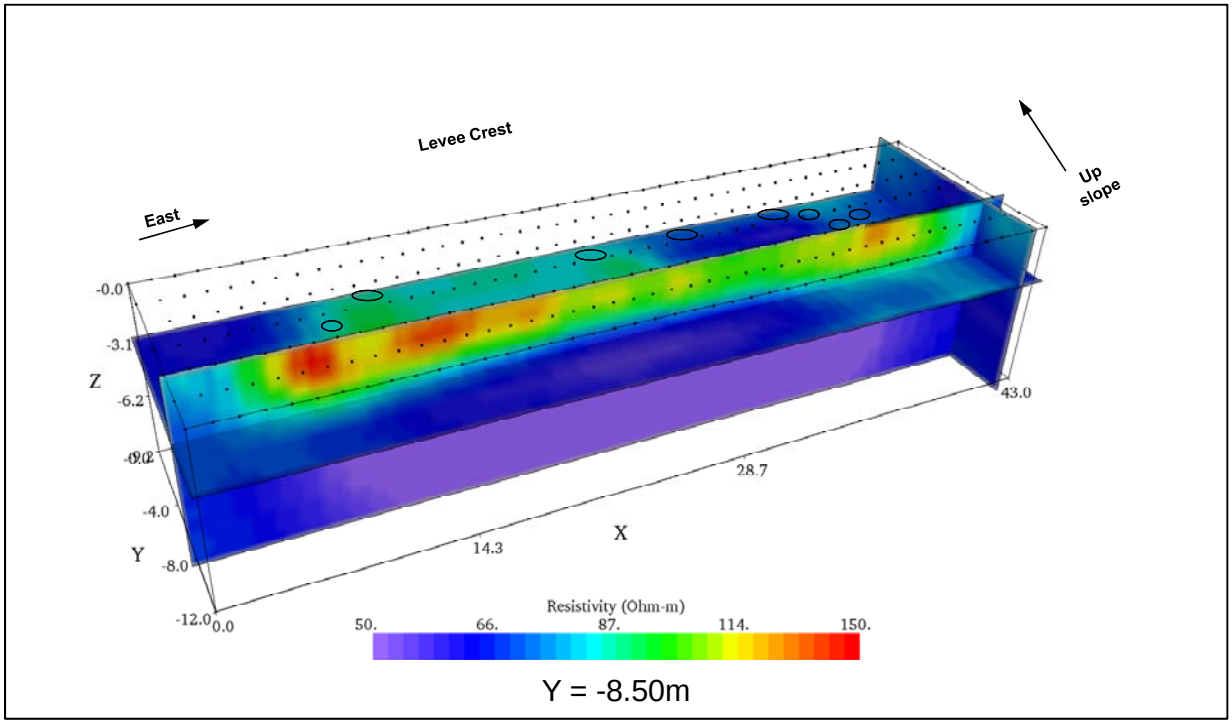


Figure C59. Slice along Y=-8.50m, Quasi 3D processing, Portland, OR.

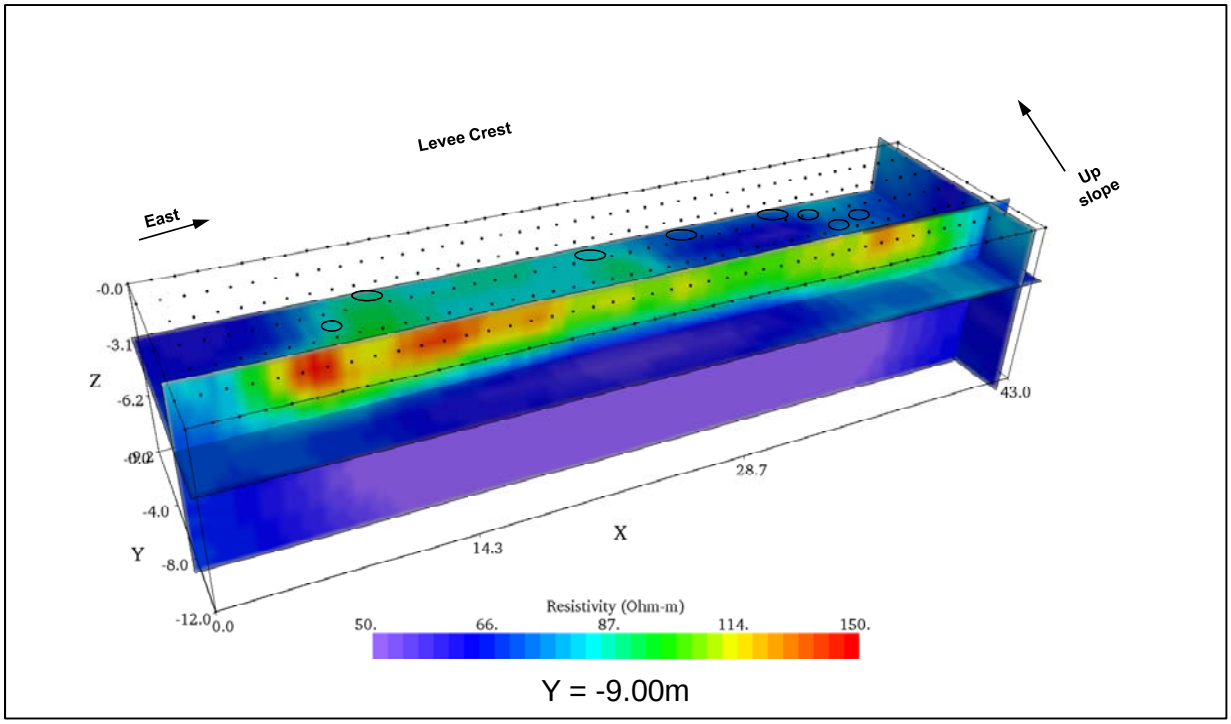


Figure C60. Slice along Y=-9.00m, Quasi 3D processing, Portland, OR.

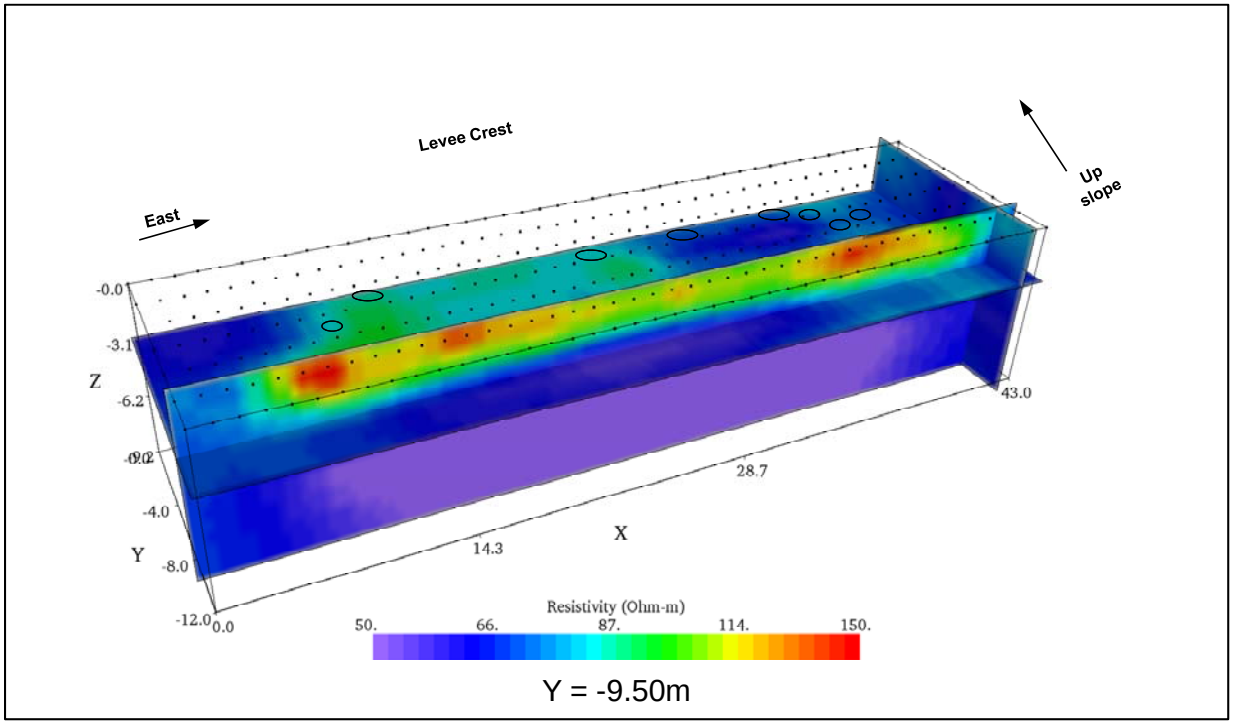


Figure C61. Slice along Y=-9.50m, Quasi 3D processing, Portland, OR.

3D Depth Slices, Portland, OR

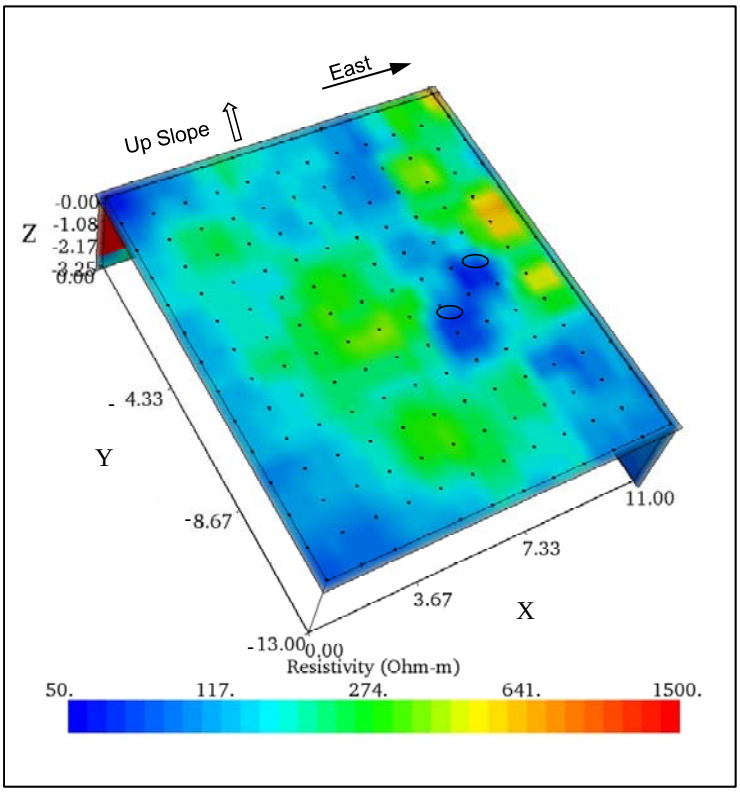


Figure C62. Depth slice at 0.00 m, 3D processing, Portland, OR.

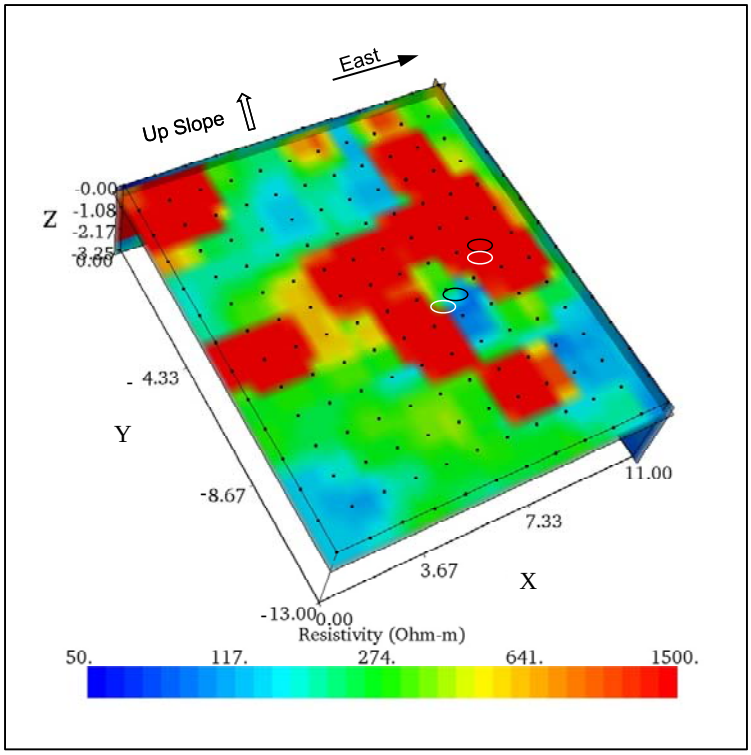


Figure C63. Depth slice at 0.50 m, 3D processing, Portland, OR.

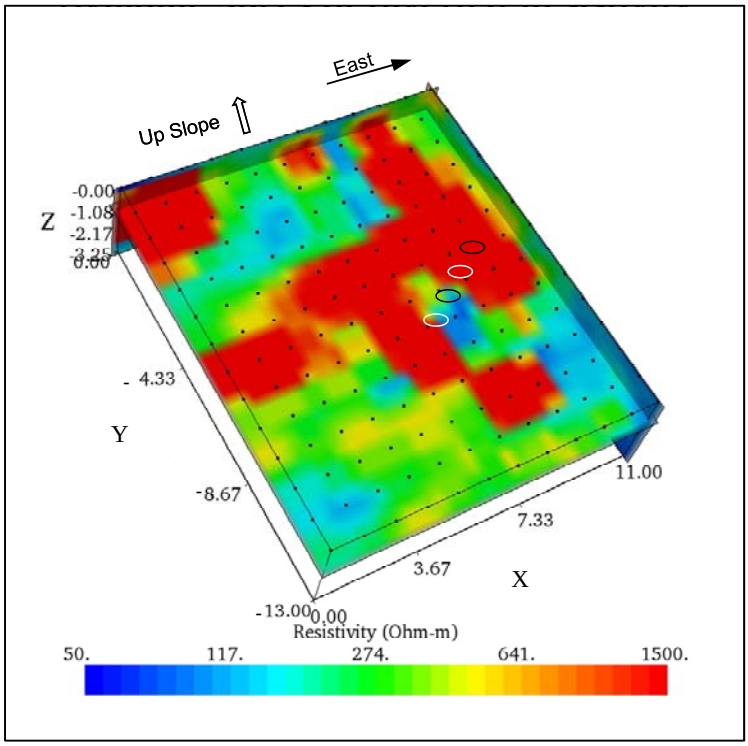


Figure C64. Depth slice at 1.00 m, 3D processing, Portland, OR.

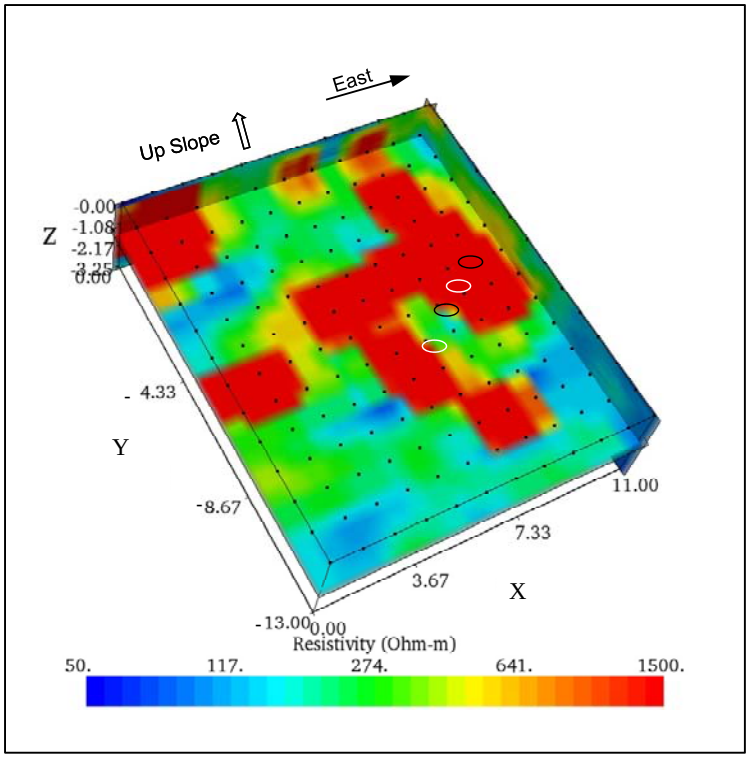


Figure C65. Depth slice at 1.50 m, 3D processing, Portland, OR.

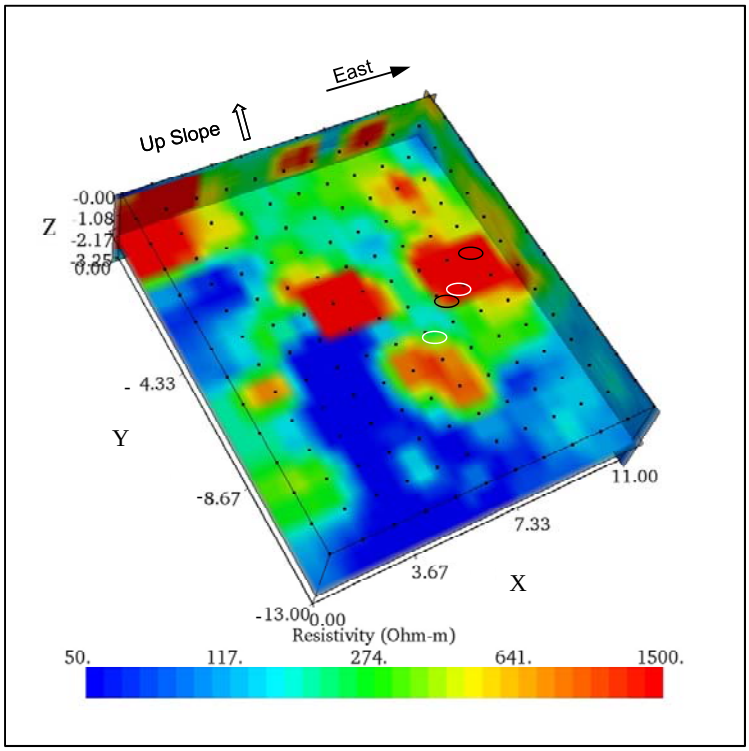


Figure C66. Depth slice at 2.00 m, 3D processing, Portland, OR.

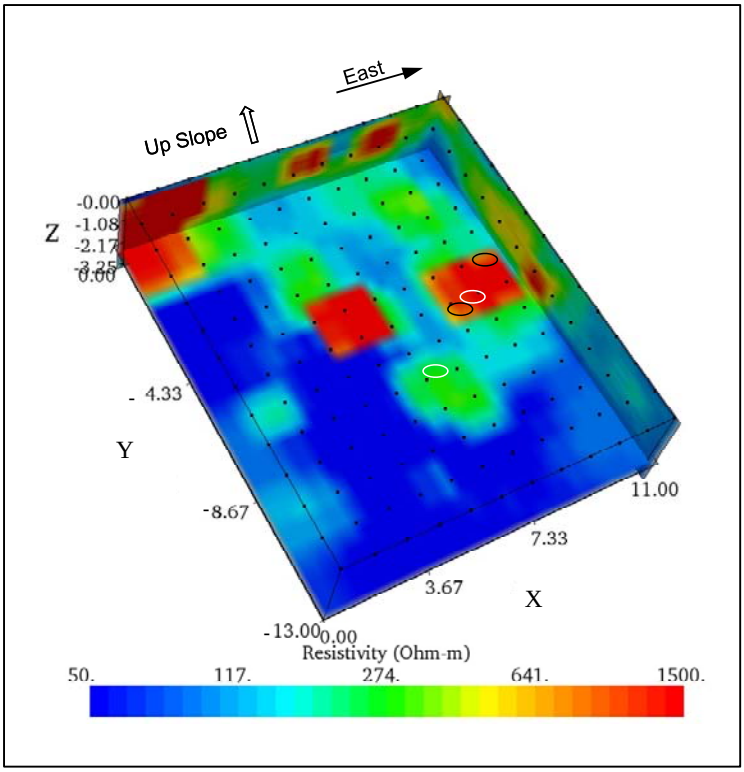


Figure C67. Depth slice at 2.50 m, 3D processing, Portland, OR.

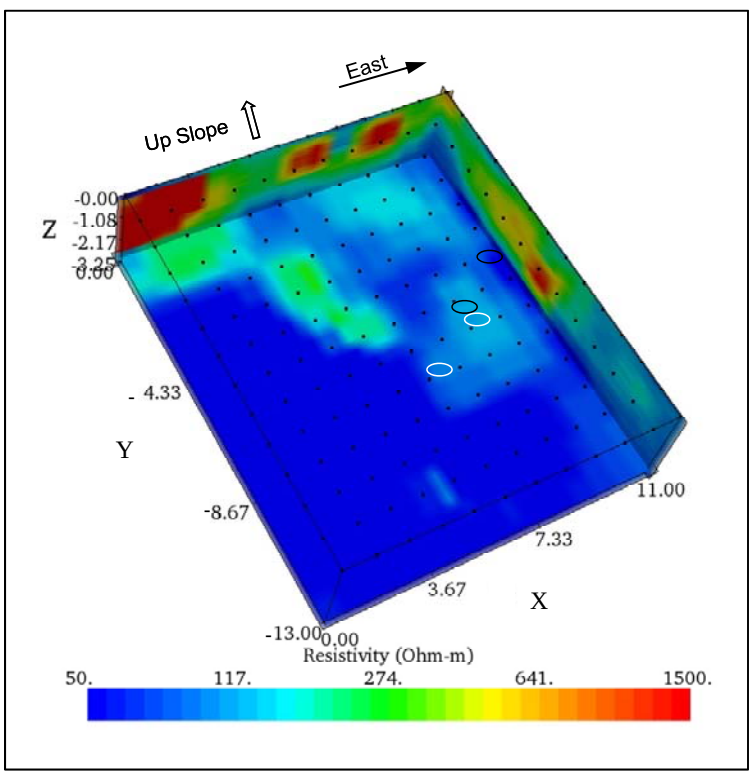


Figure C68. Depth slice at 3.00 m, 3D processing, Portland, OR.

3D Slices Taken Parallel to the X-axis – Portland, OR

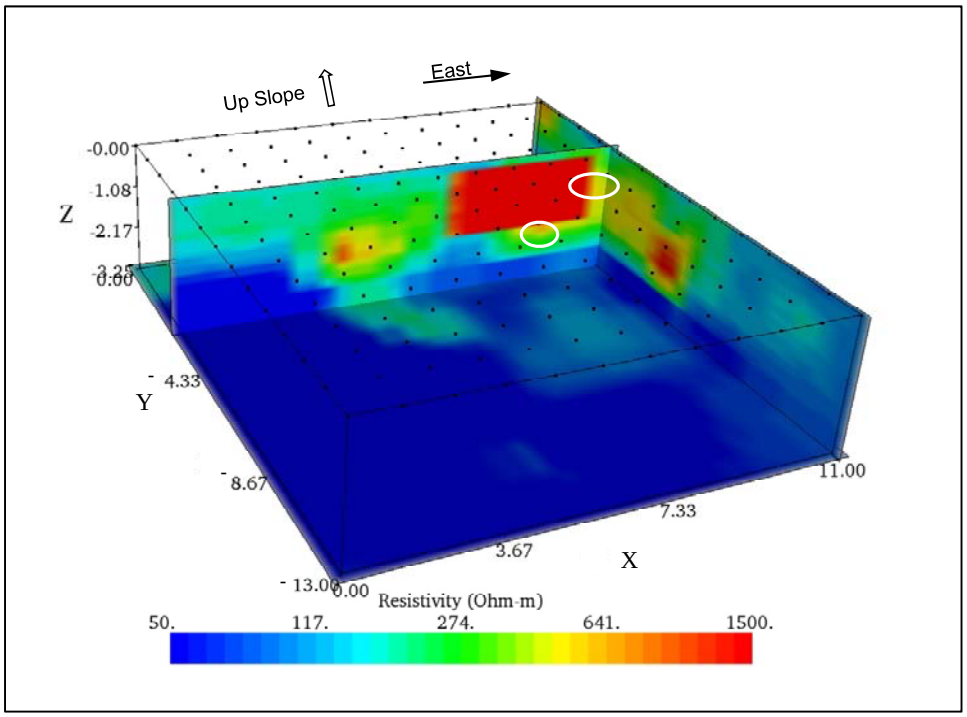


Figure C69. Slice along Y=-3.50 m, 3D processing, Portland, OR.

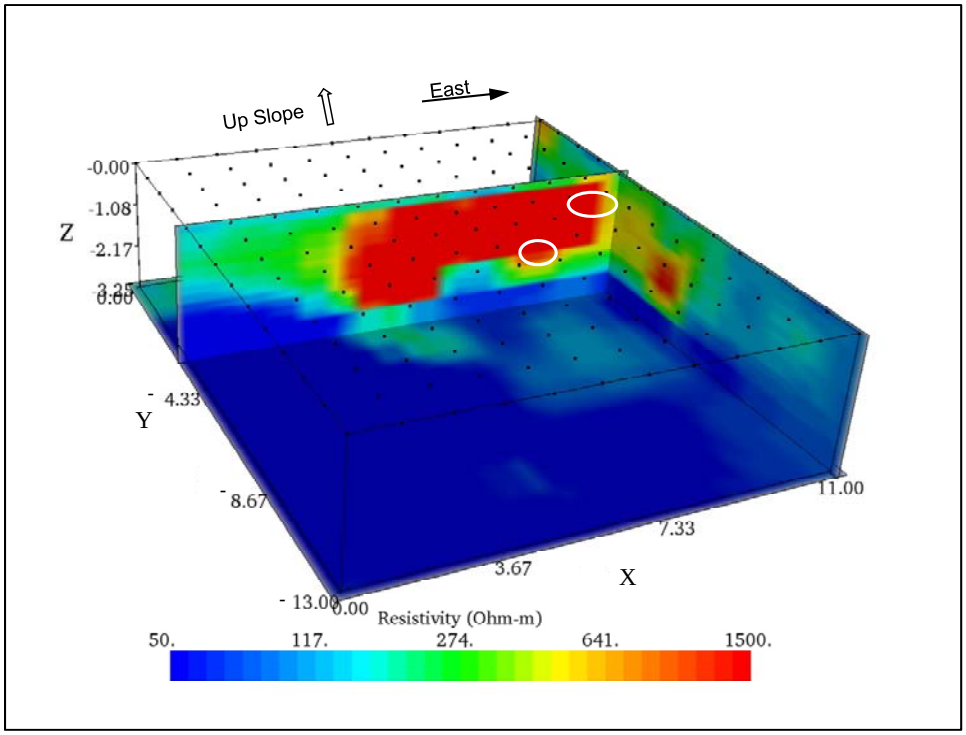


Figure C70. Slice along Y=-4.00 m, 3D processing, Portland, OR.

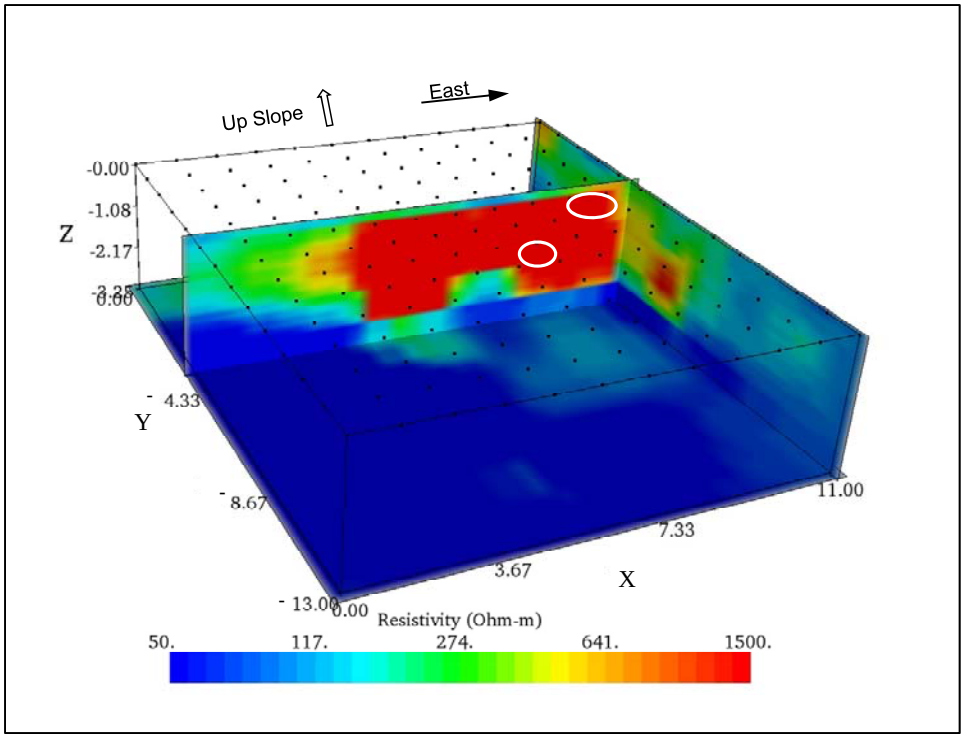


Figure C71. Slice along Y=-4.50 m, 3D processing, Portland, OR.

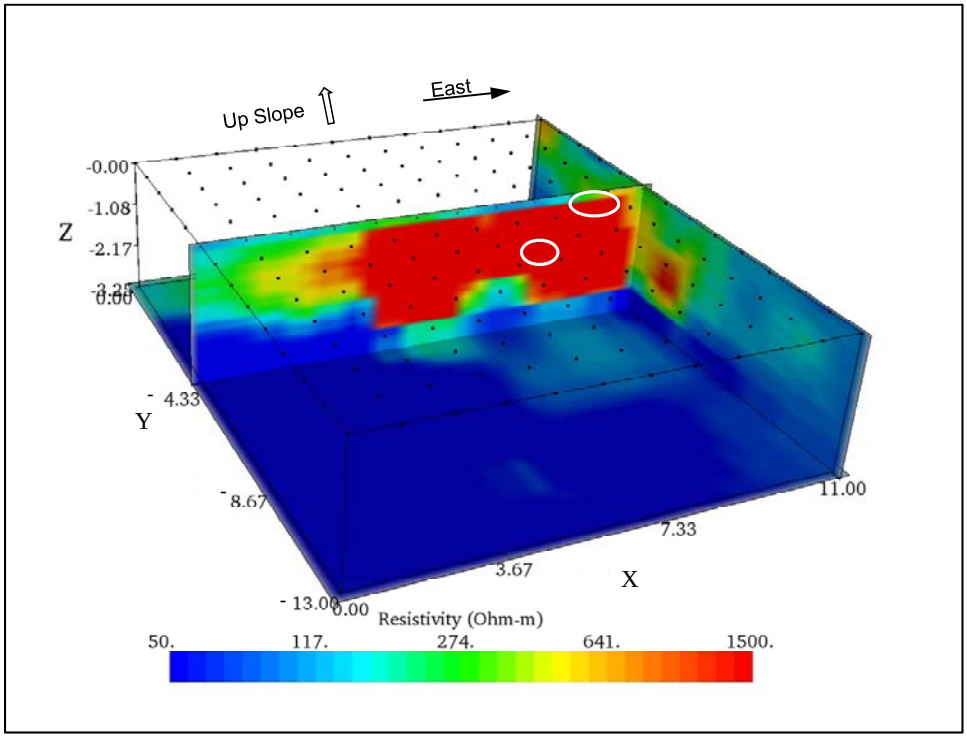


Figure C72. Slice along Y=-5.00 m, 3D processing, Portland, OR.

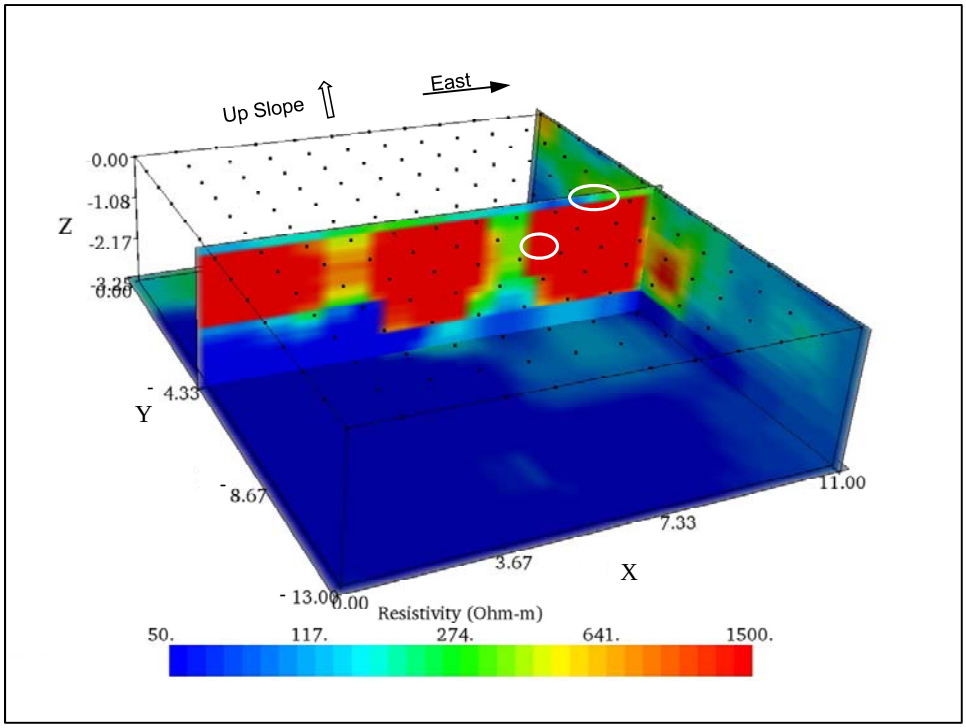


Figure C73. Slice along Y=-5.50 m, 3D processing, Portland, OR.

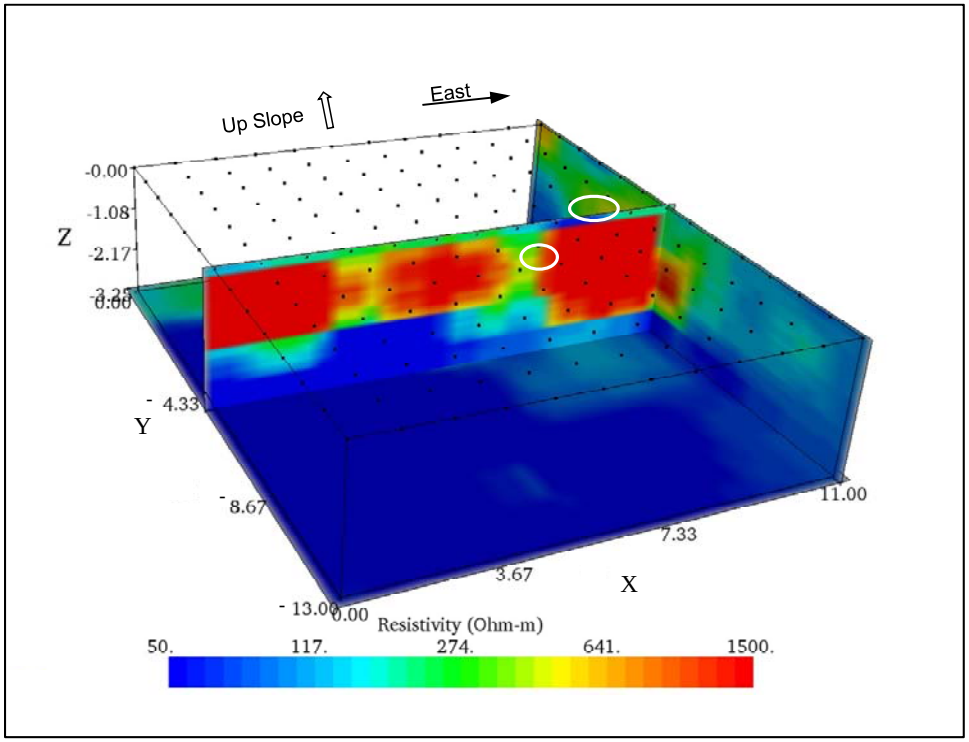


Figure C74. Slice along Y=-6.00 m, 3D processing, Portland, OR.

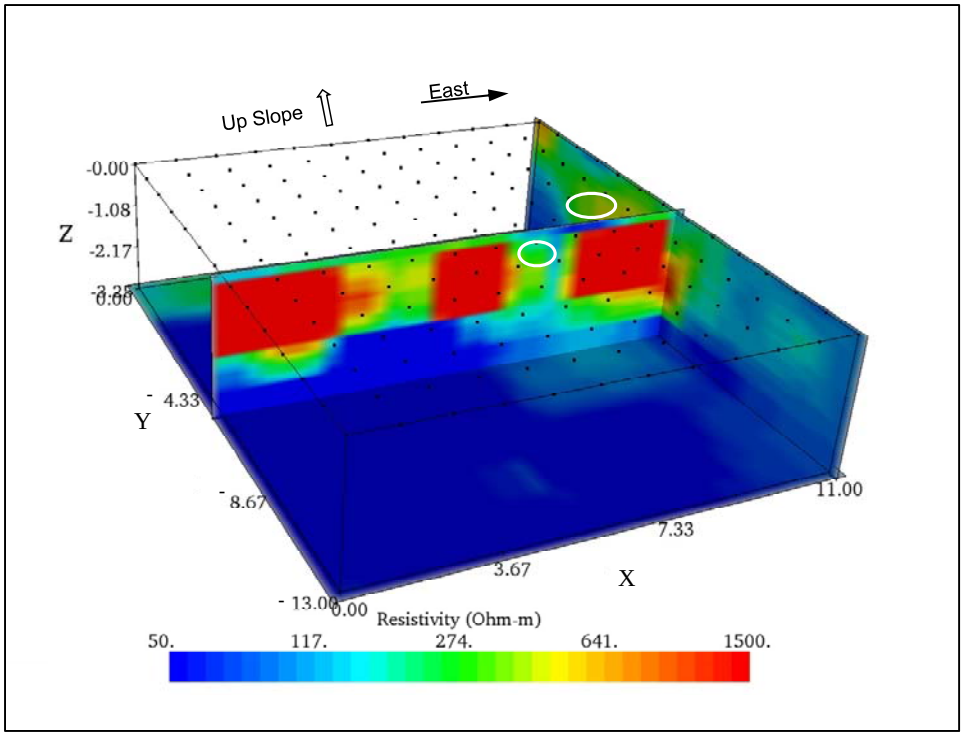


Figure C75. Slice along Y=-6.50 m, 3D processing, Portland, OR.

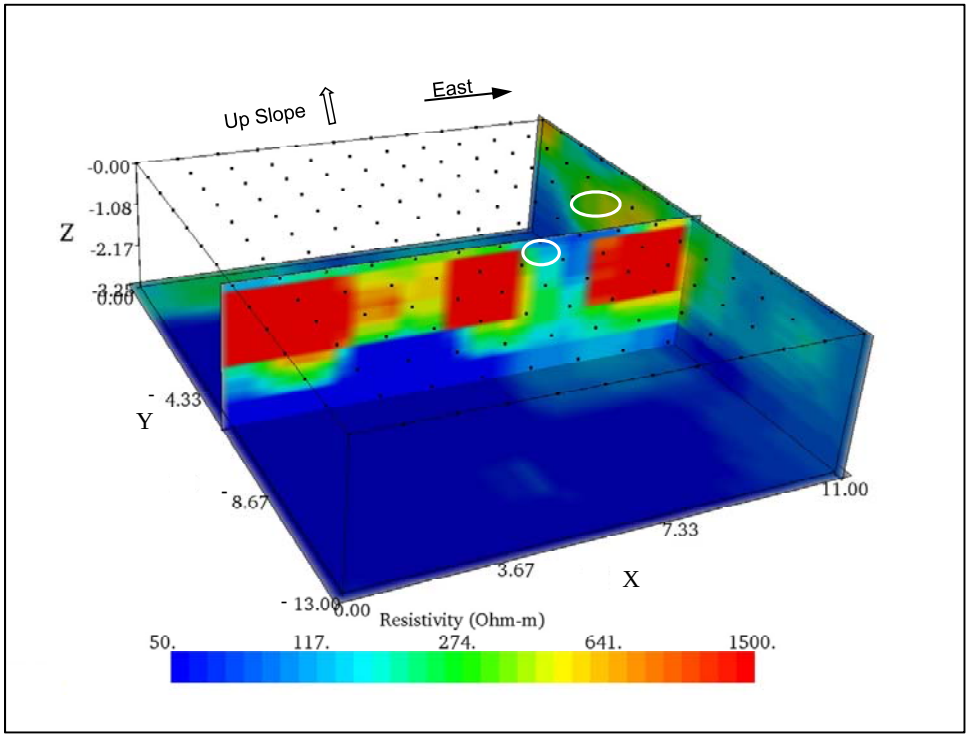


Figure C76. Slice along Y=-7.00 m, 3D processing, Portland, OR.

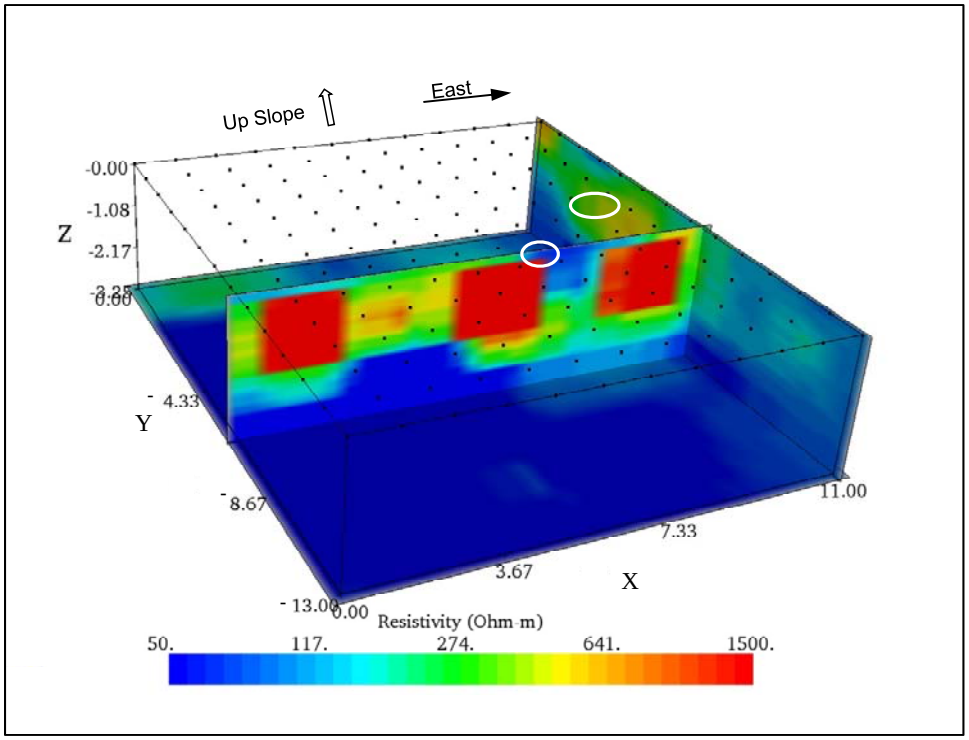


Figure C77. Slice along Y=-7.50 m, 3D processing, Portland, OR.

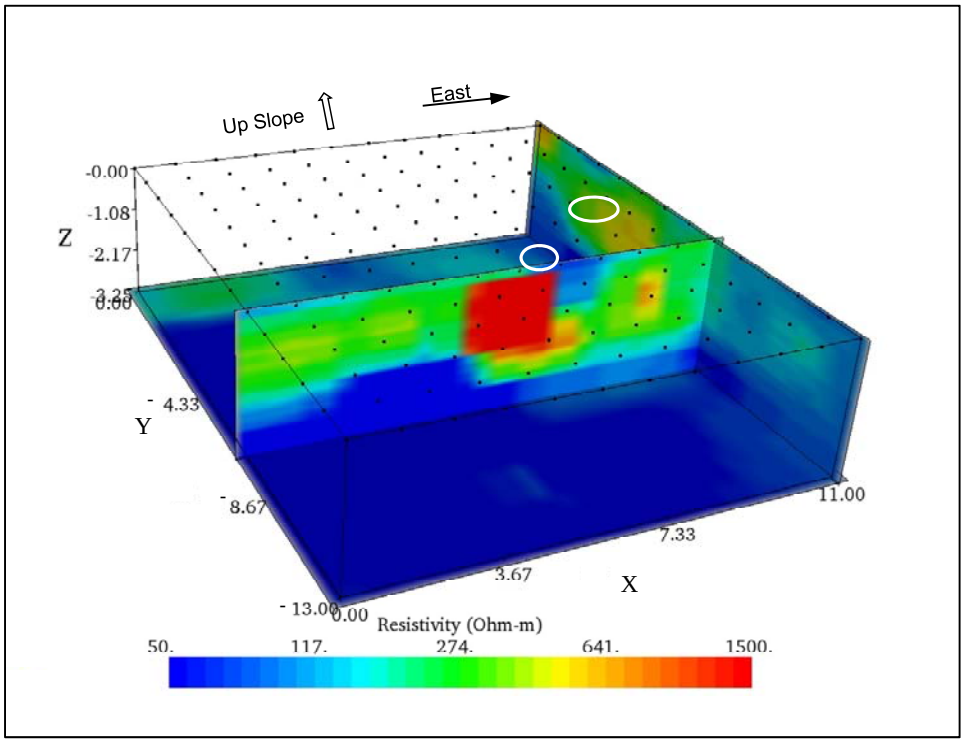


Figure C78. Slice along Y=-8.00 m, 3D processing, Portland, OR.

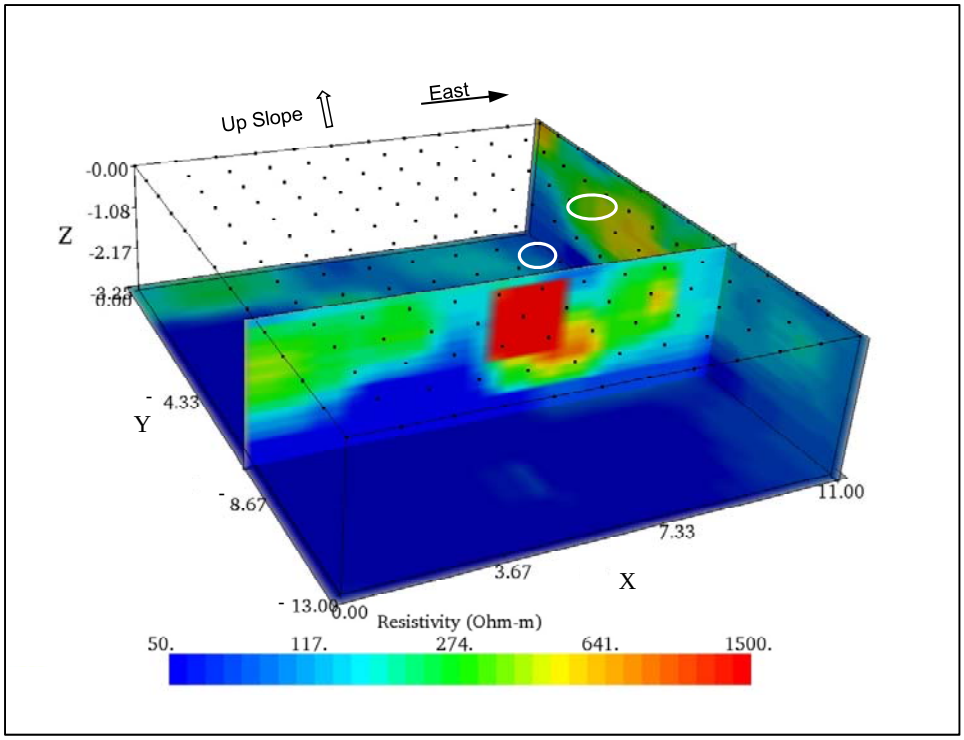


Figure C79. Slice along Y=-8.50 m, 3D processing, Portland, OR.

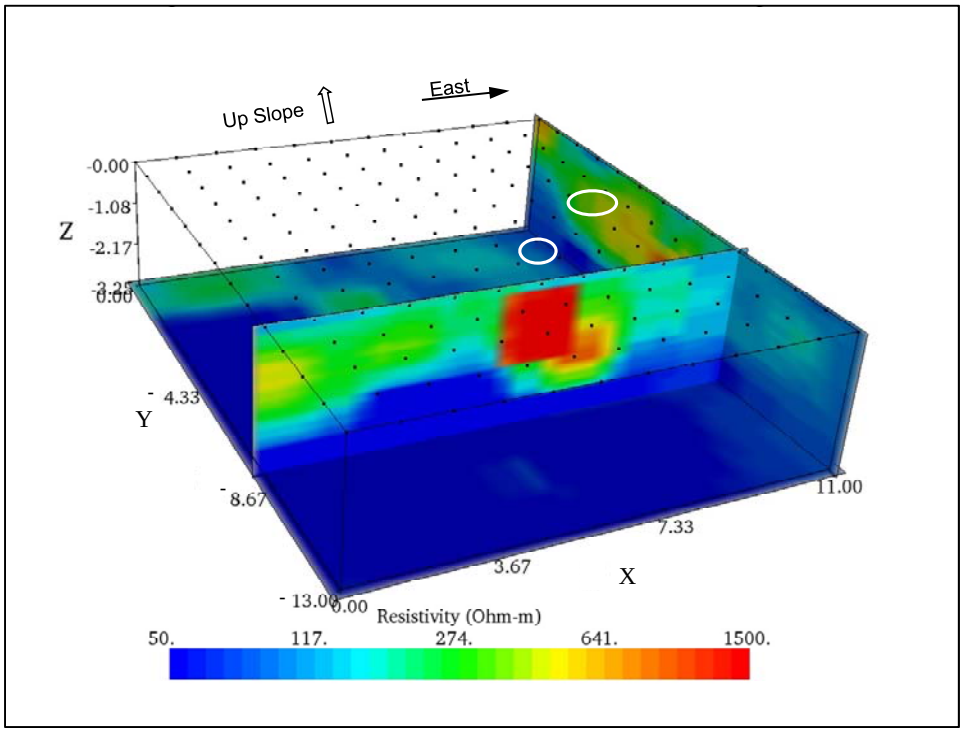


Figure C80. Slice along Y=-9.00 m, 3D processing, Portland, OR.

Quasi 3D Depth Slices, Burlington, WA

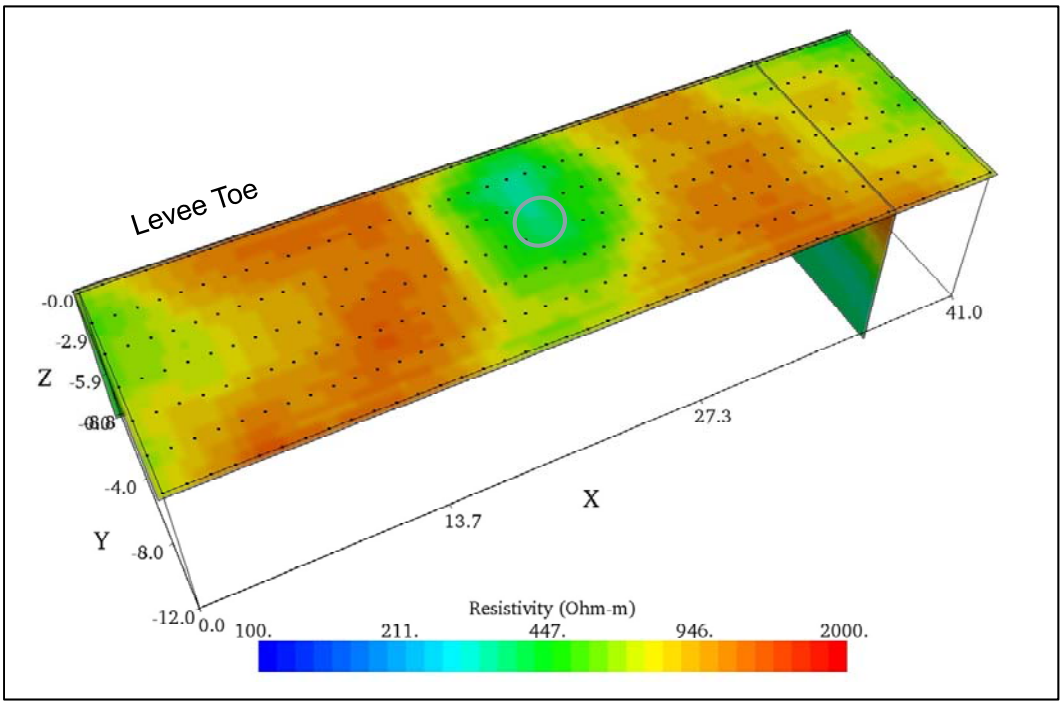


Figure C81. Depth slice at Z=0.00 m, quasi 3D processing, Burlington, WA.

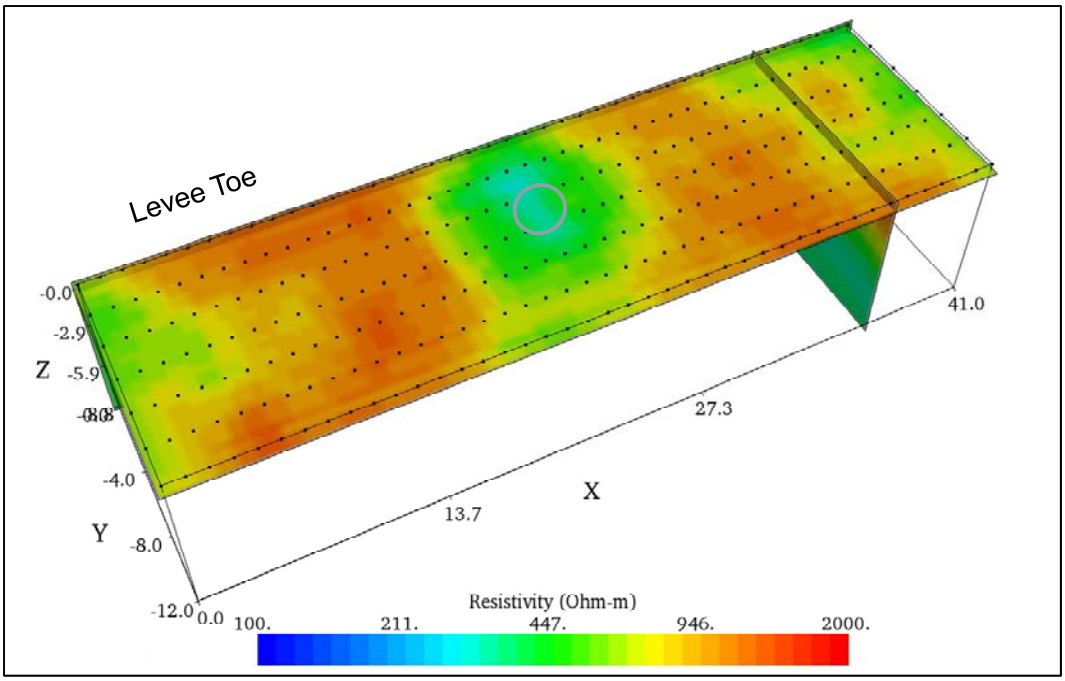


Figure C82. Depth slice at Z=0.50 m, quasi 3D processing, Burlington, WA.

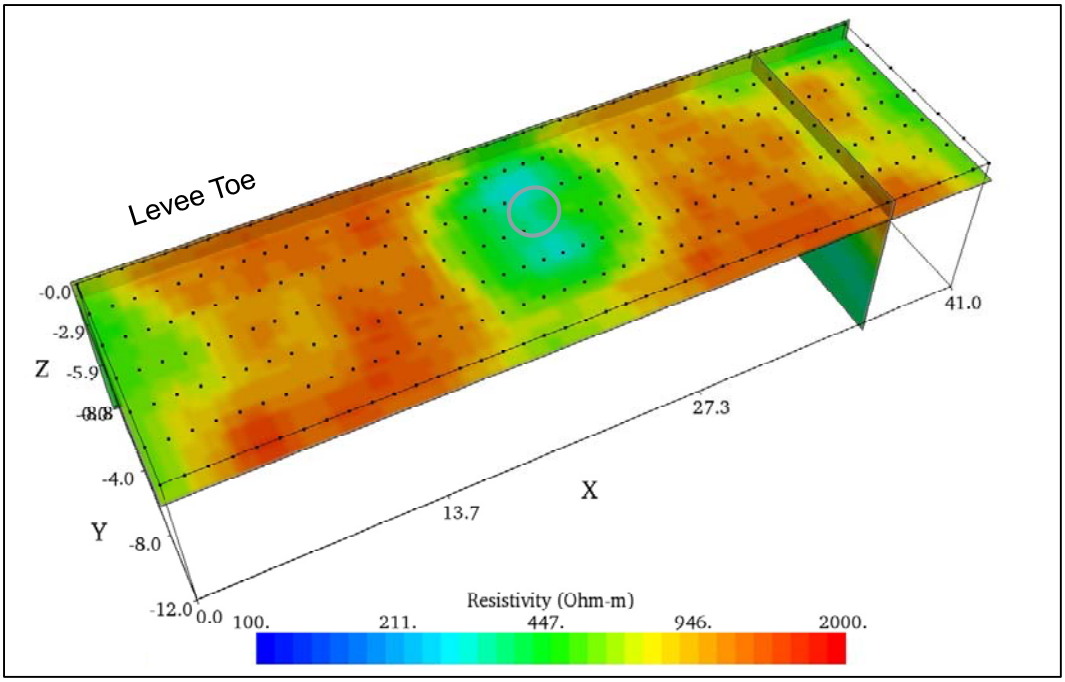


Figure C83. Depth slice at Z=1.00 m, quasi 3D processing, Burlington, WA.

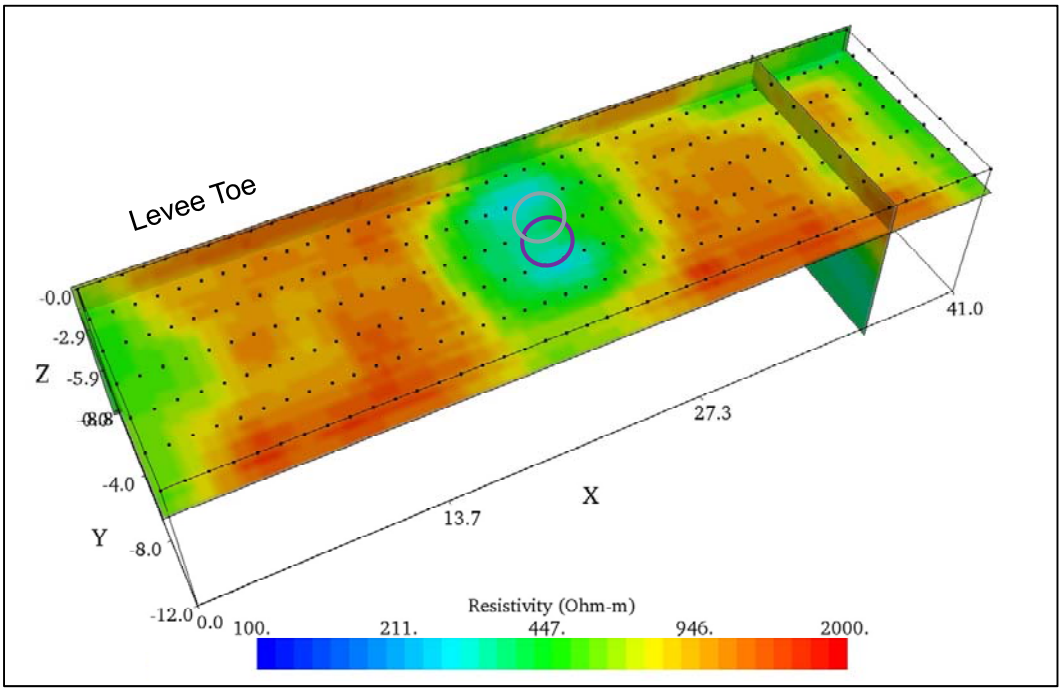


Figure C84. Depth slice at Z=1.50 m, quasi 3D processing, Burlington, WA.

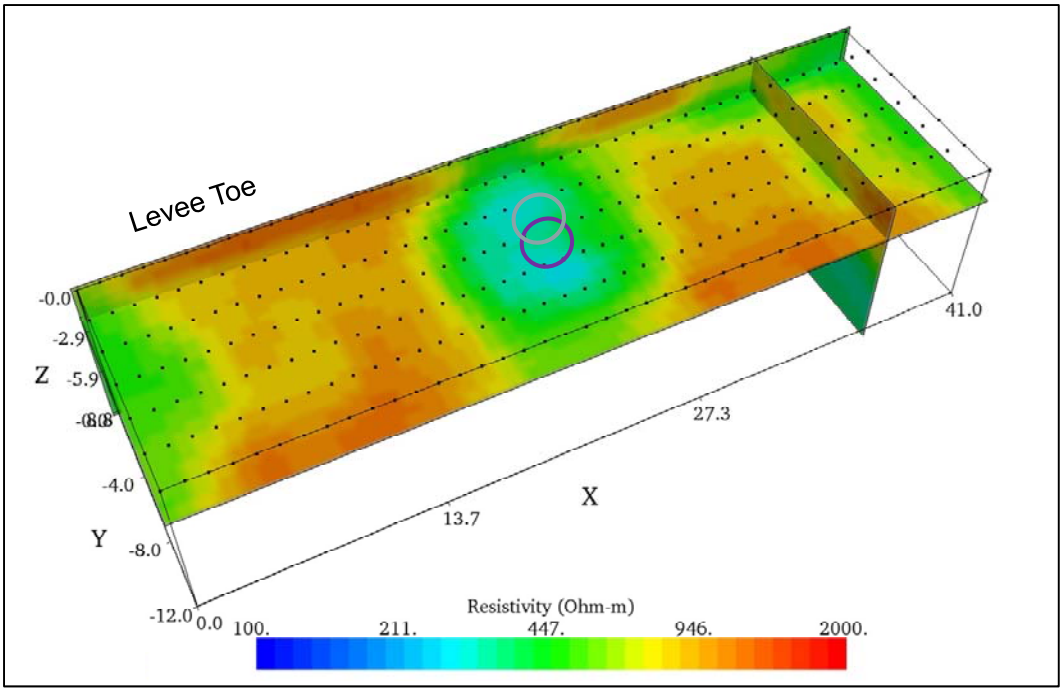


Figure C85. Depth slice at Z=2.00 m, quasi 3D processing, Burlington, WA.

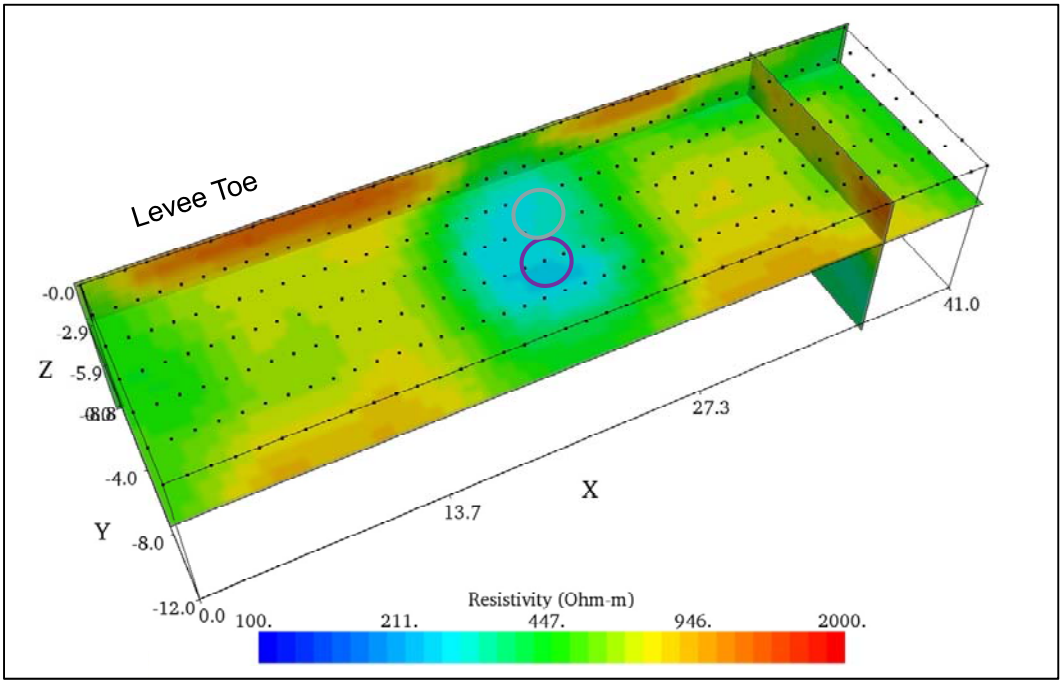


Figure C86. Depth slice at Z=2.50 m, quasi 3D processing, Burlington, WA.

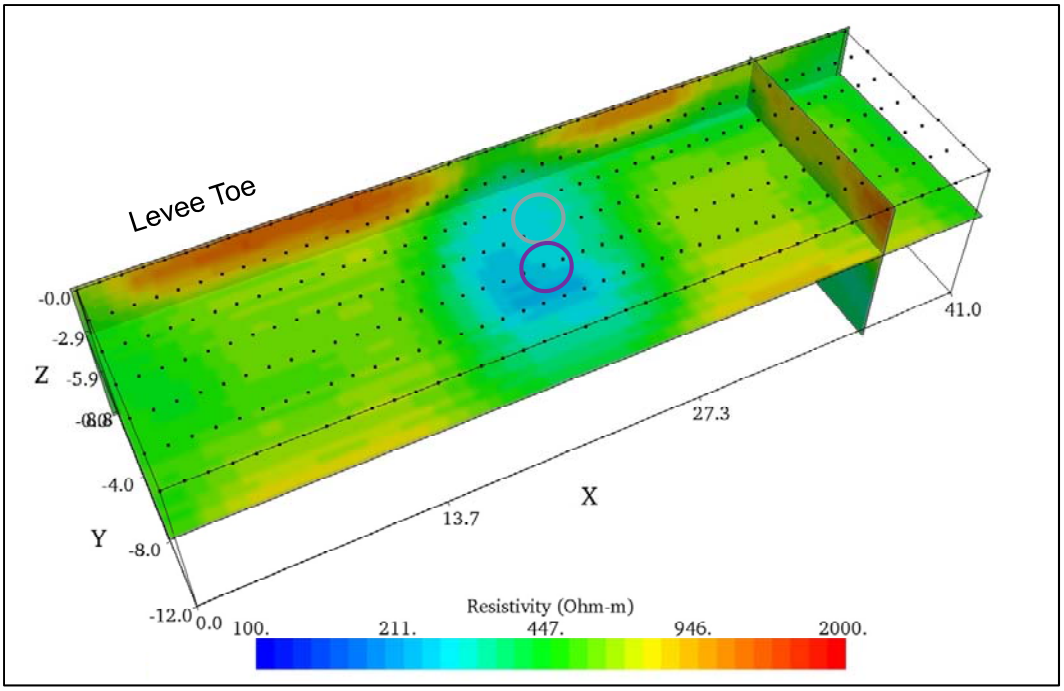


Figure C87. Depth slice at Z=3.00 m, quasi 3D processing, Burlington, WA.

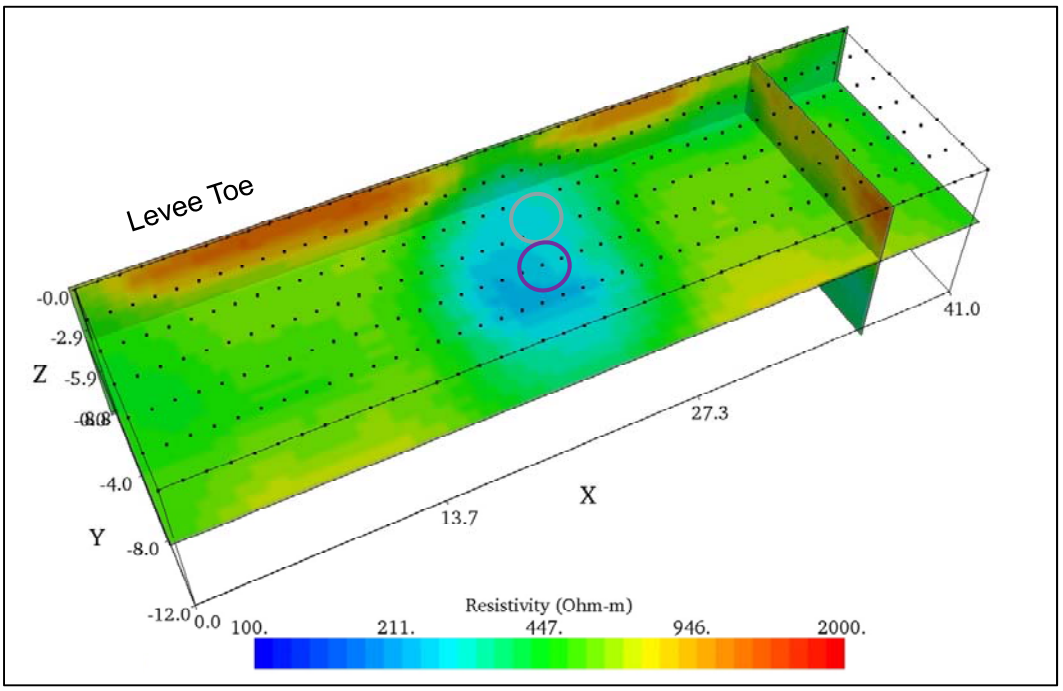


Figure C88. Depth slice at Z=3.50 m, quasi 3D processing, Burlington, WA.

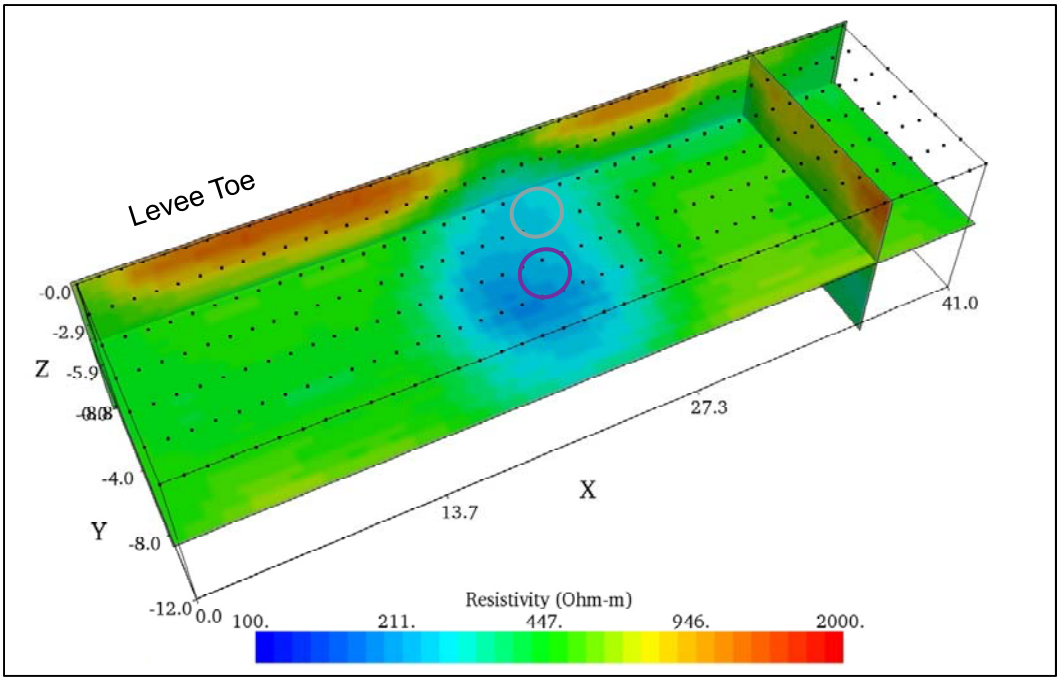


Figure C89. Depth slice at Z=4.00 m, quasi 3D processing, Burlington, WA.

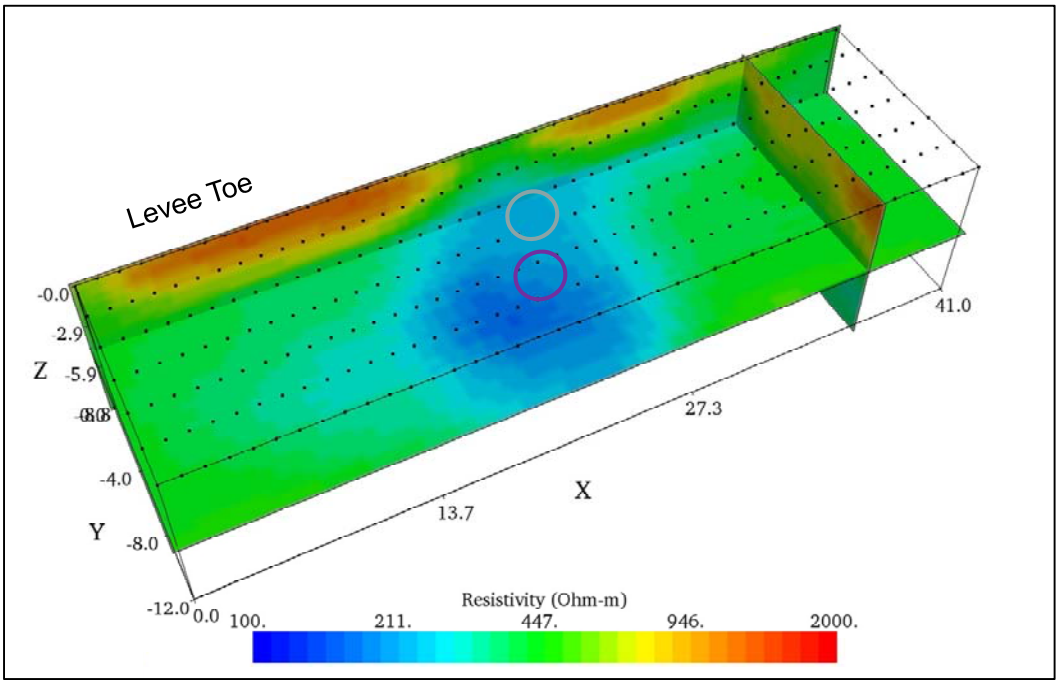


Figure C90. Depth slice at Z=4.50 m, quasi 3D processing, Burlington, WA.

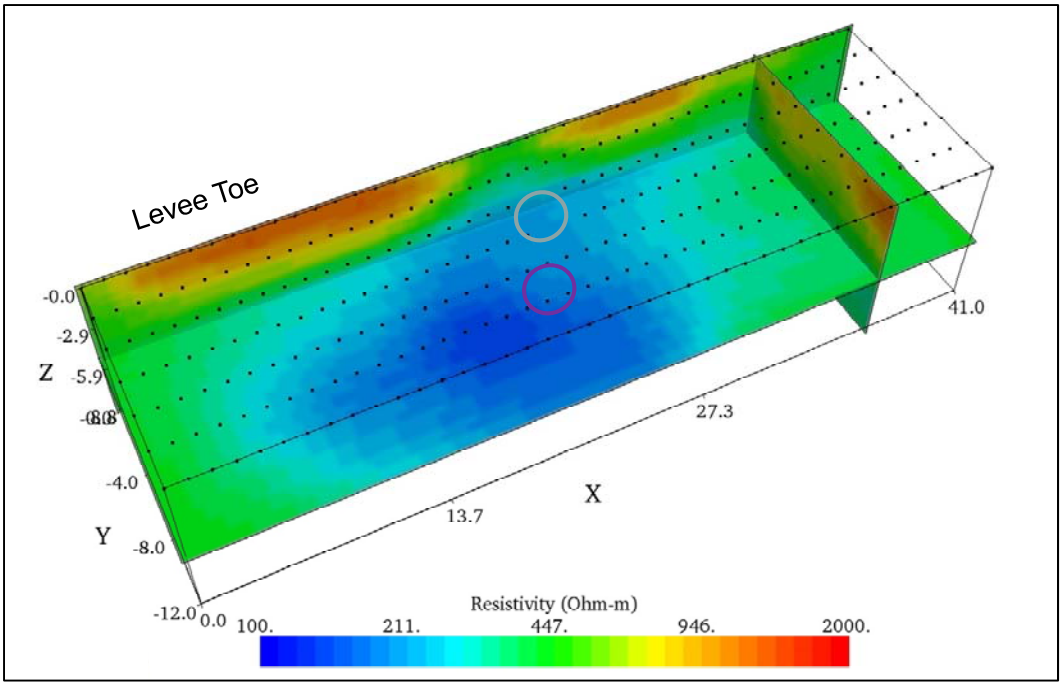


Figure C91. Depth slice at Z=5.00 m, quasi 3D processing, Burlington, WA.

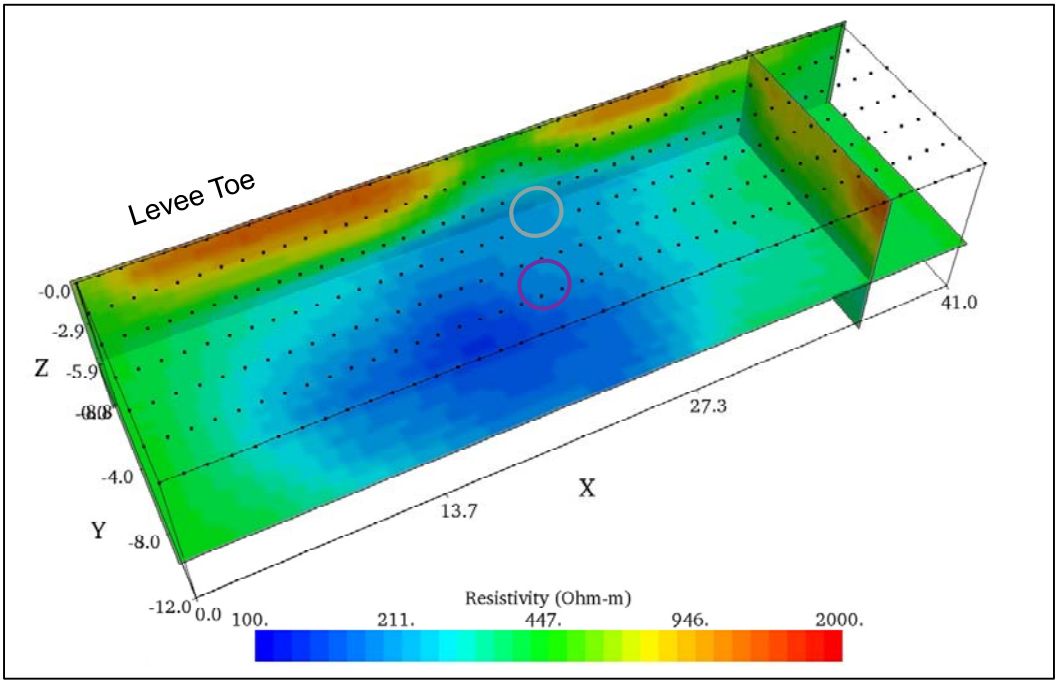


Figure C92. Depth slice at Z=5.50 m, quasi 3D processing, Burlington, WA.

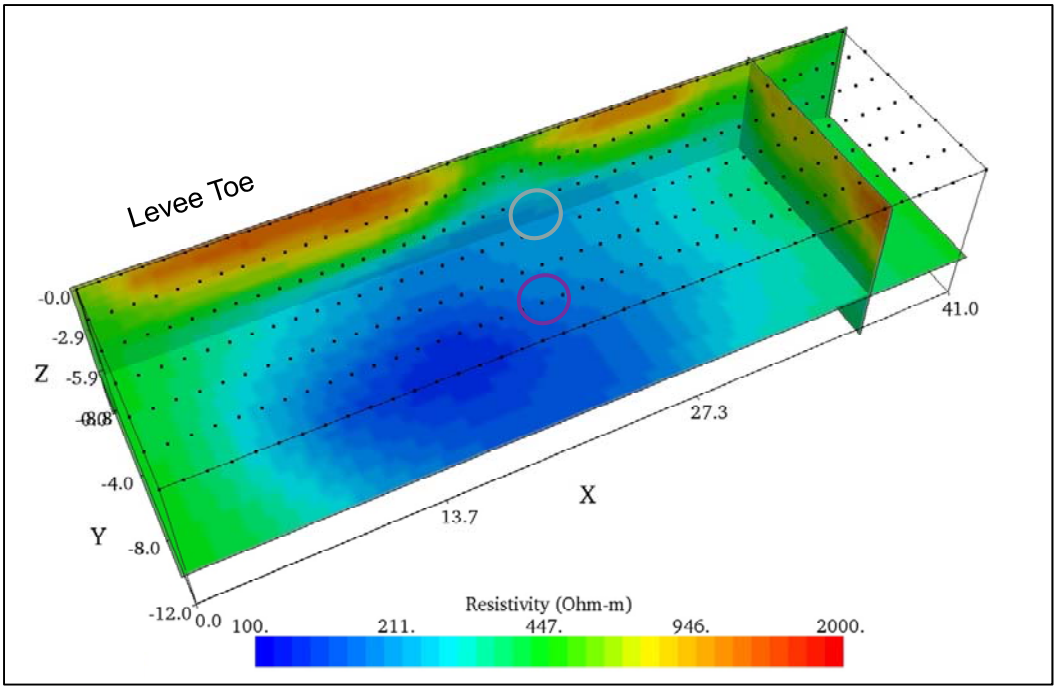


Figure C93. Depth slice at Z=6.00 m, quasi 3D processing, Burlington, WA.

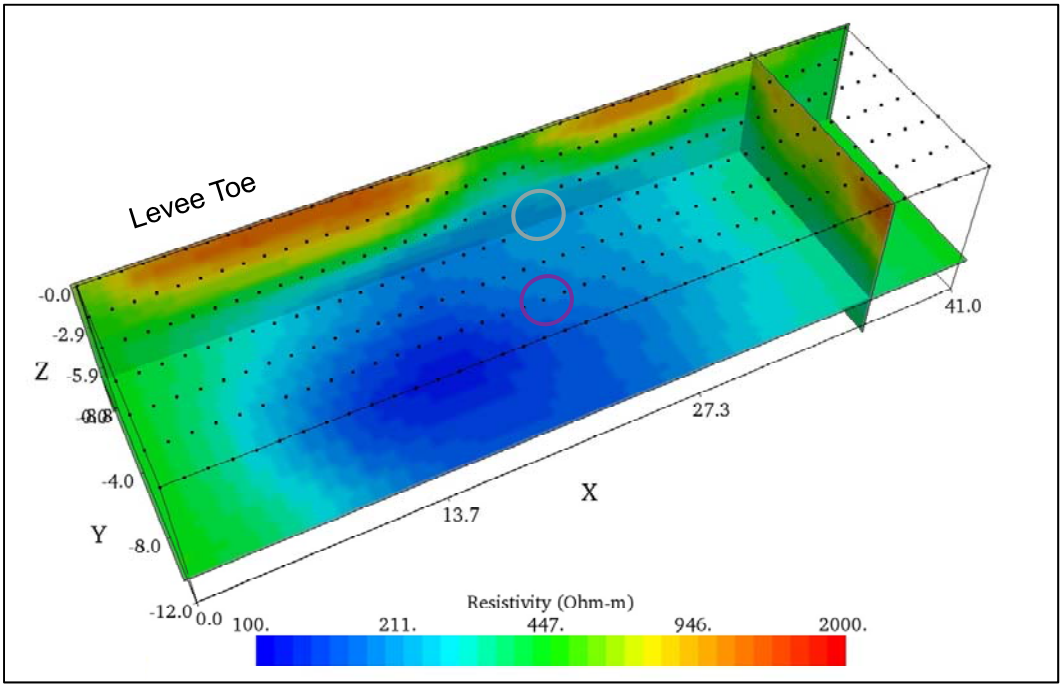


Figure C94. Depth slice at Z=6.50 m, quasi 3D processing, Burlington, WA.

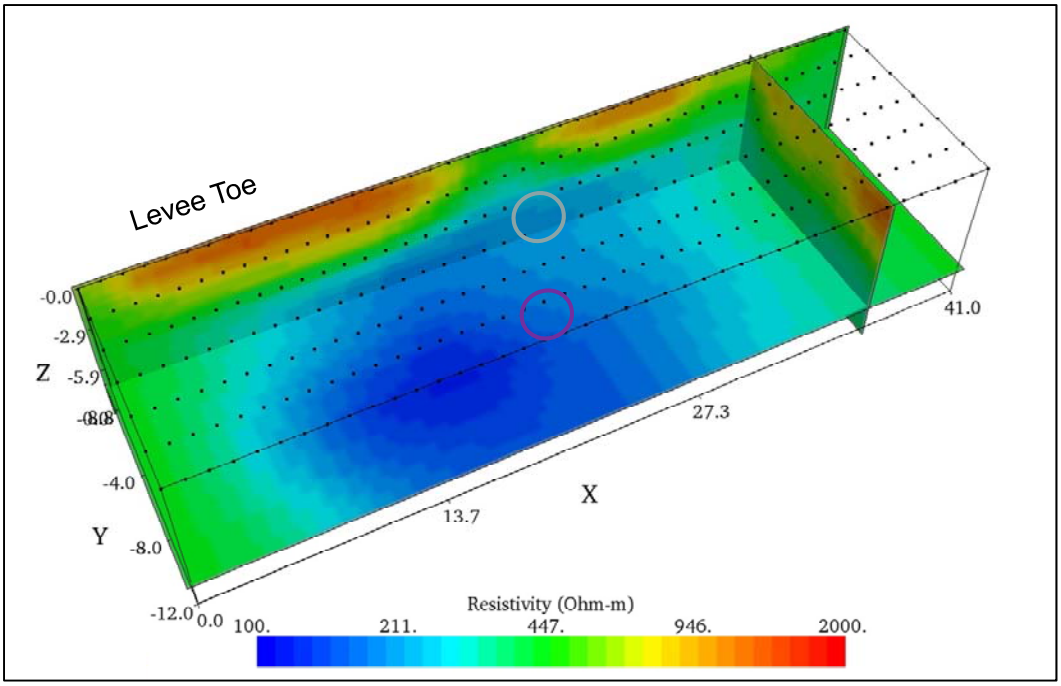


Figure C95. Depth slice at Z=7.00 m, quasi 3D processing, Burlington, WA.

Quasi 3D Slices Taken Parallel to the X-axis – Burlington, WA

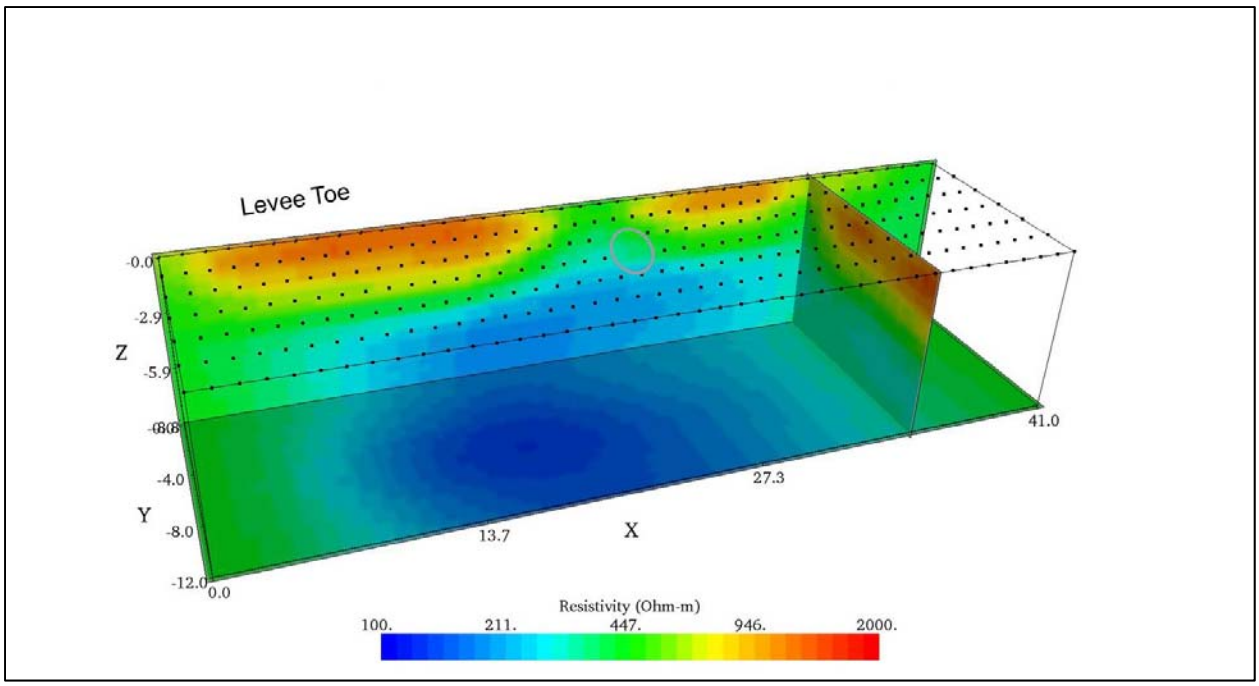


Figure C96. Slice along Y=0.00 m, Quasi 3D processing, Burlington, WA.

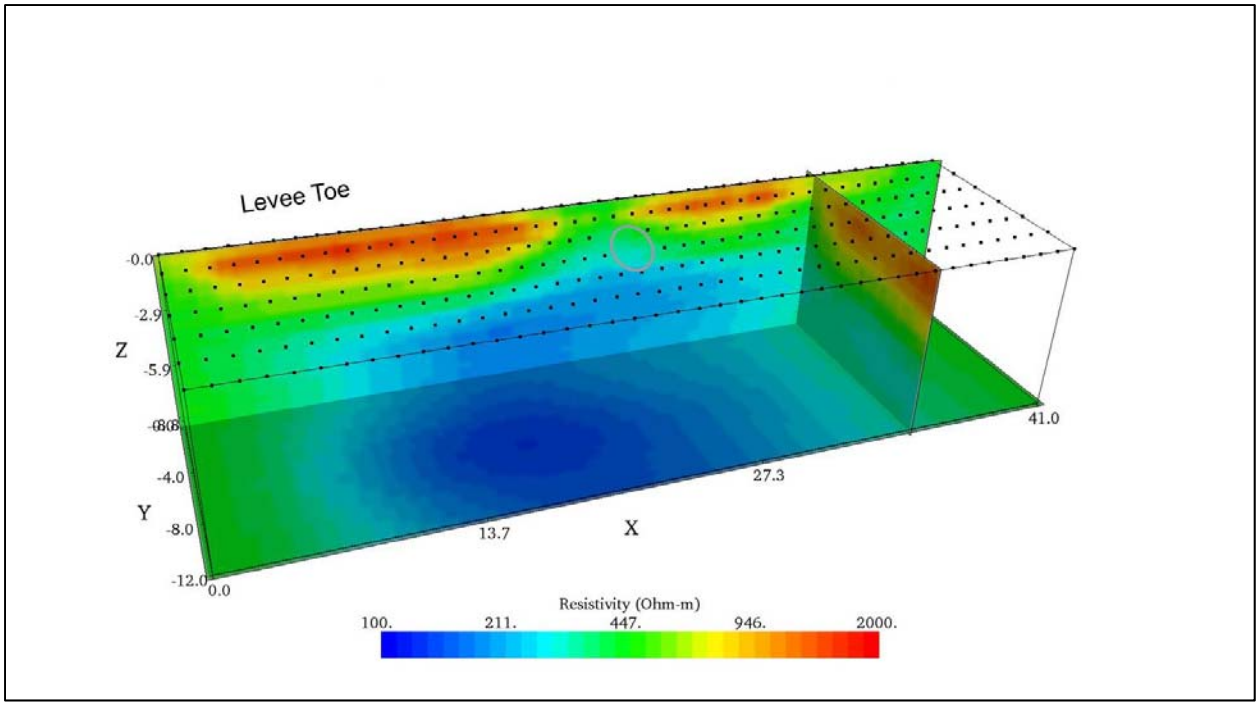


Figure C97. Slice along Y=-0.50 m, Quasi 3D processing, Burlington, WA.

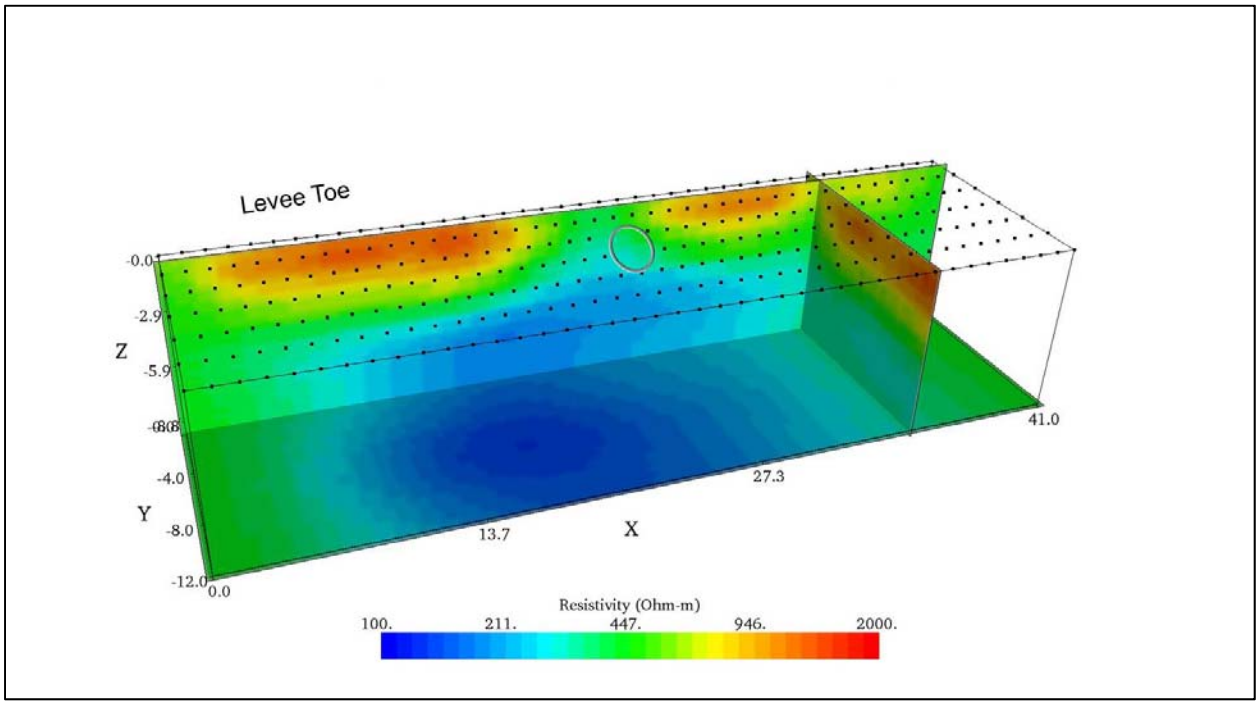


Figure C98. Slice along Y=-1.00 m, Quasi 3D processing, Burlington, WA.

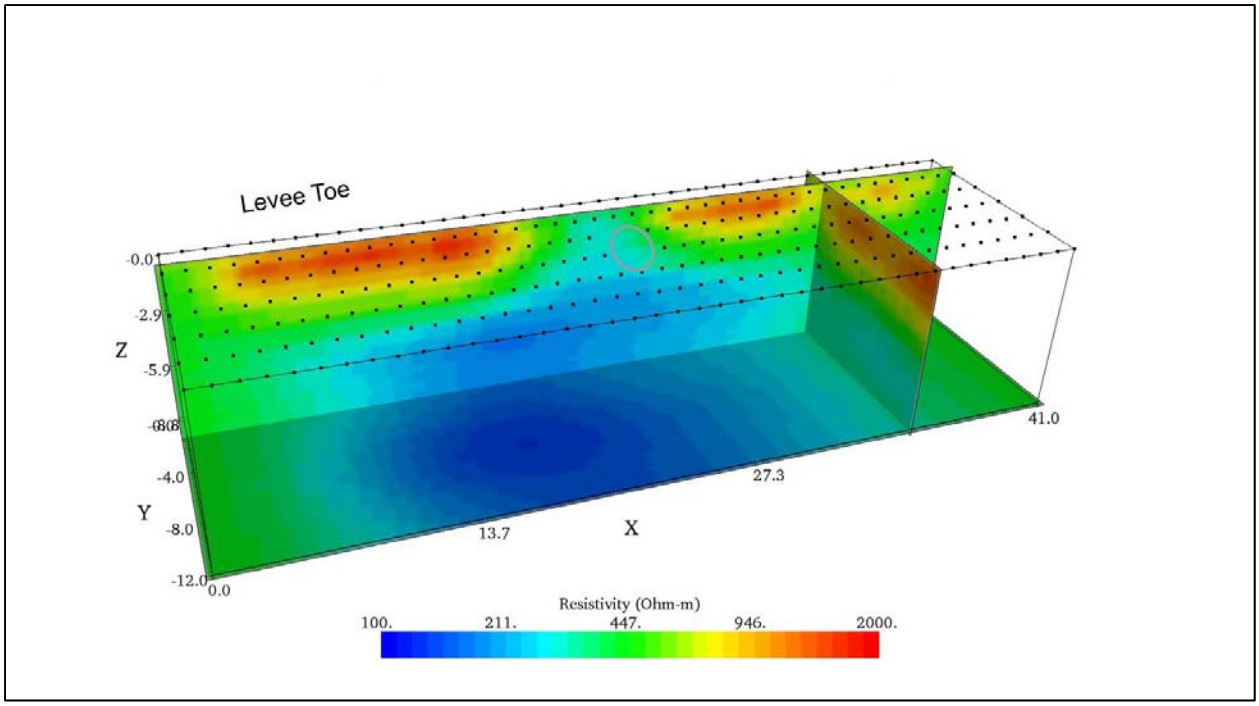


Figure C99. Slice along Y=-1.50 m, Quasi 3D processing, Burlington, WA.

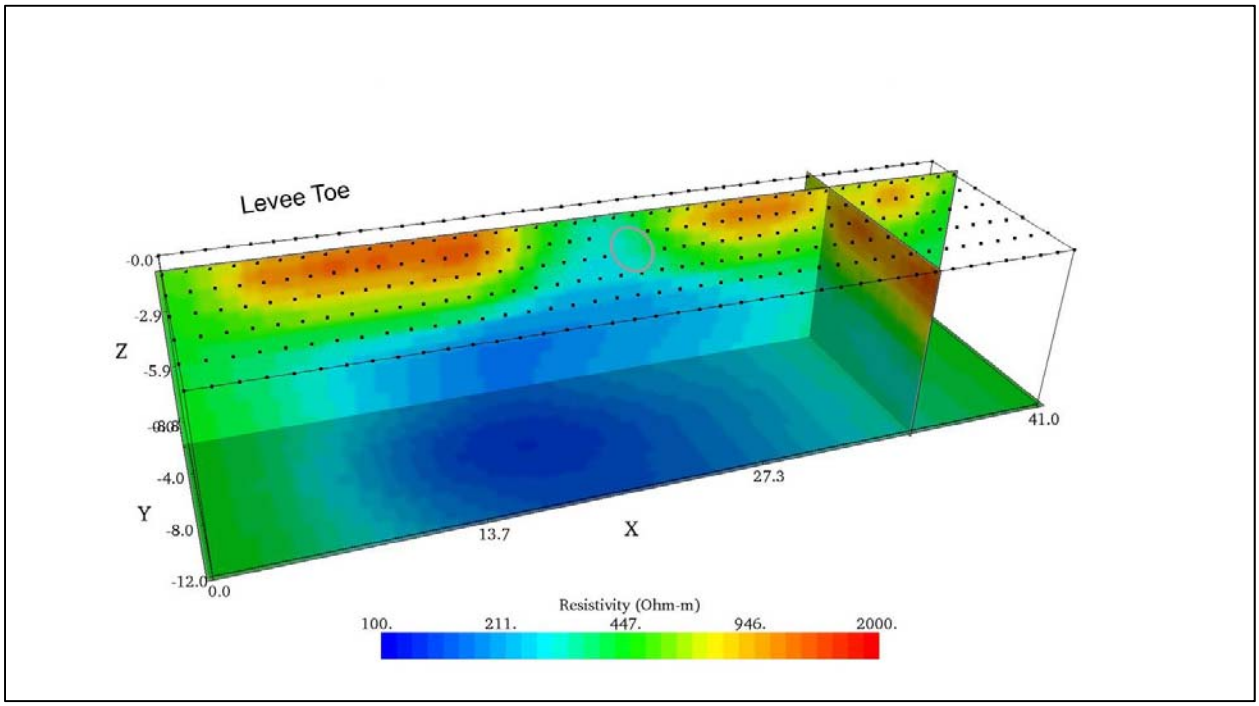


Figure C100. Slice along Y=-2.00 m, Quasi 3D processing, Burlington, WA.

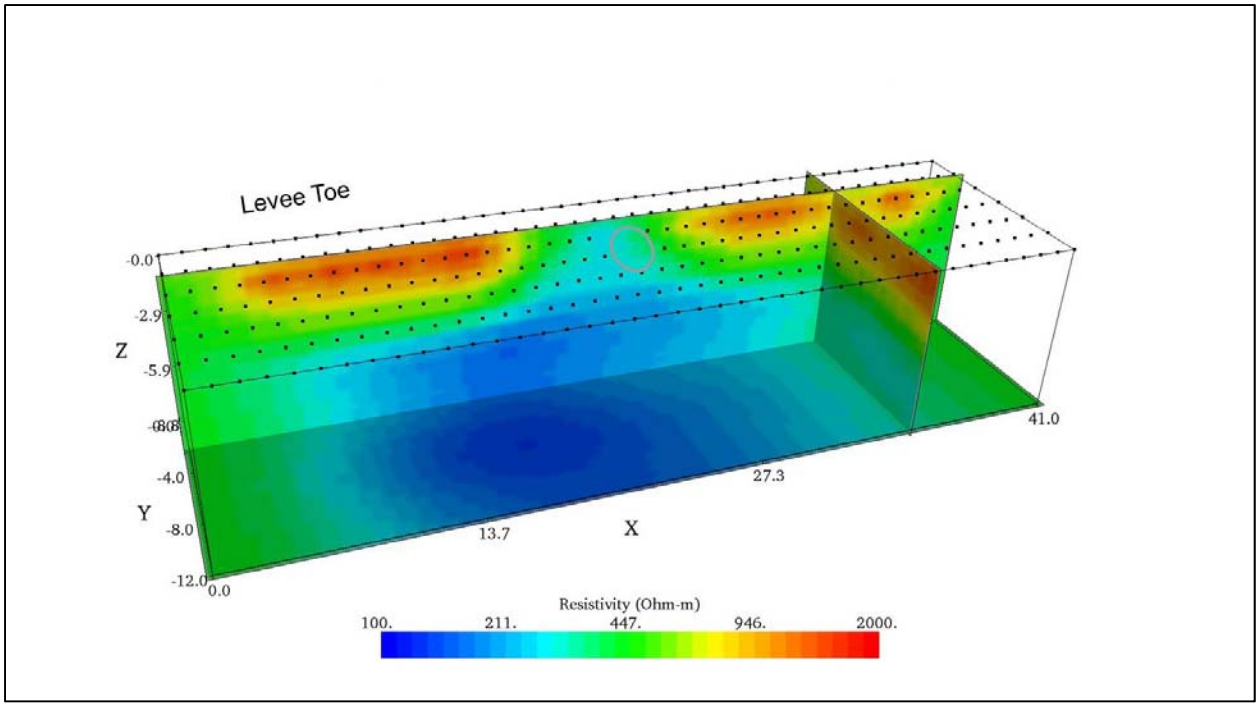


Figure C101. Slice along Y=-2.50 m, Quasi 3D processing, Burlington, WA.

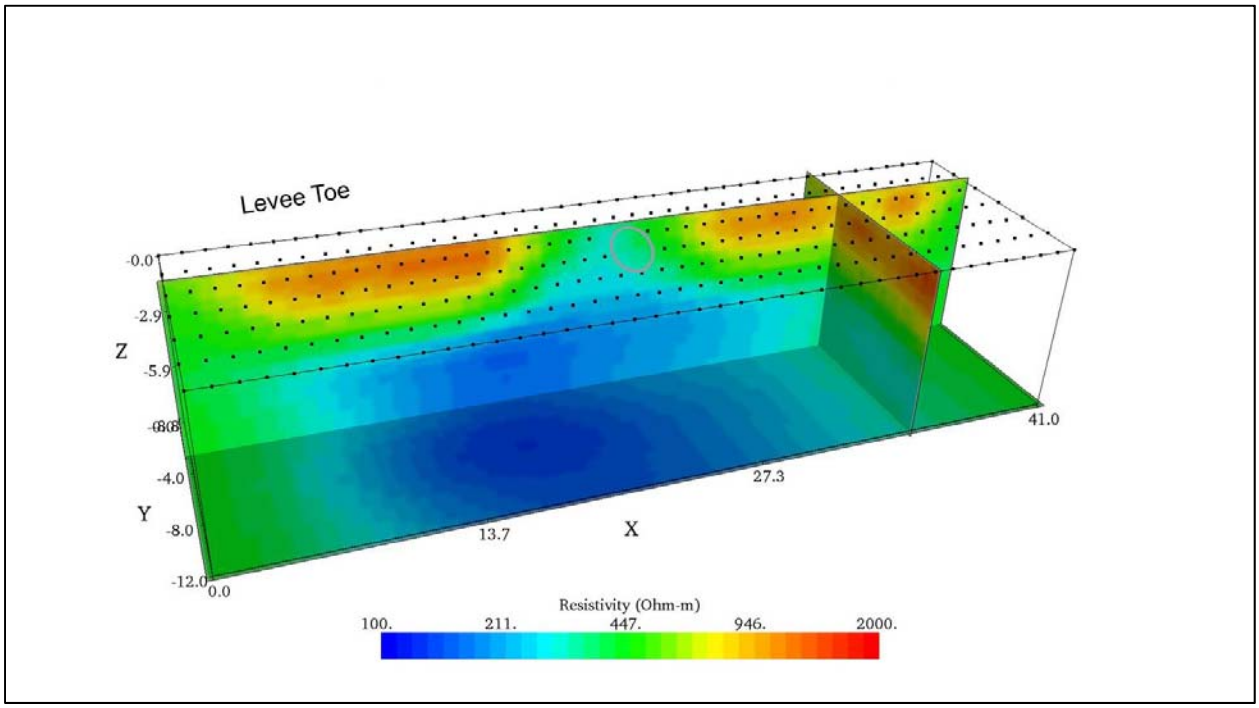


Figure C102. Slice along Y=-3.00 m, Quasi 3D processing, Burlington, WA.

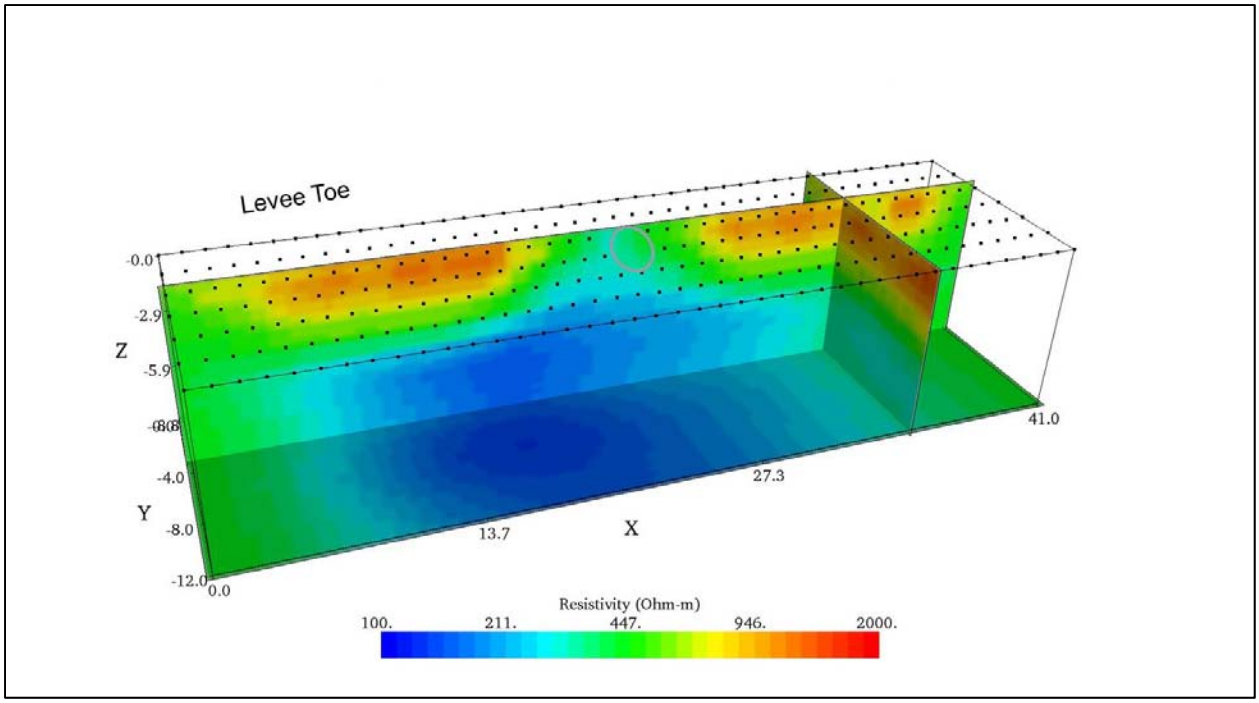


Figure C103. Slice along Y=-3.50 m, Quasi 3D processing, Burlington, WA.

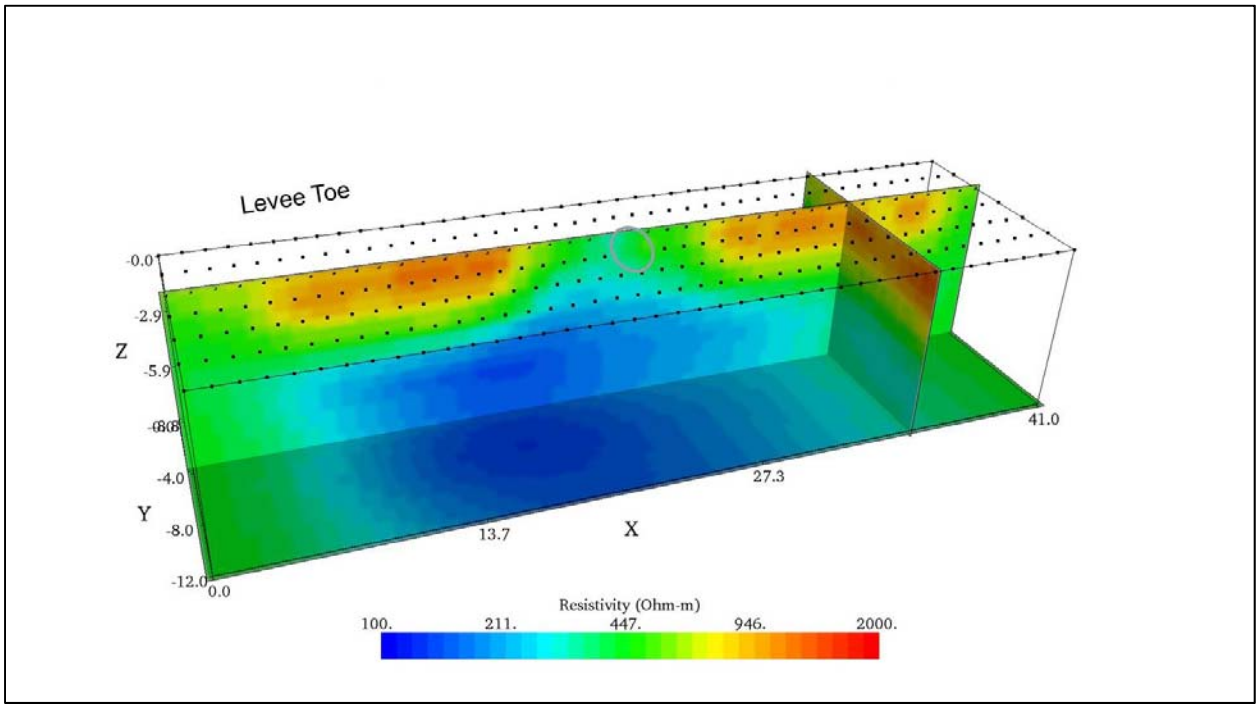


Figure C104. Slice along Y=-4.00 m, Quasi 3D processing, Burlington, WA.

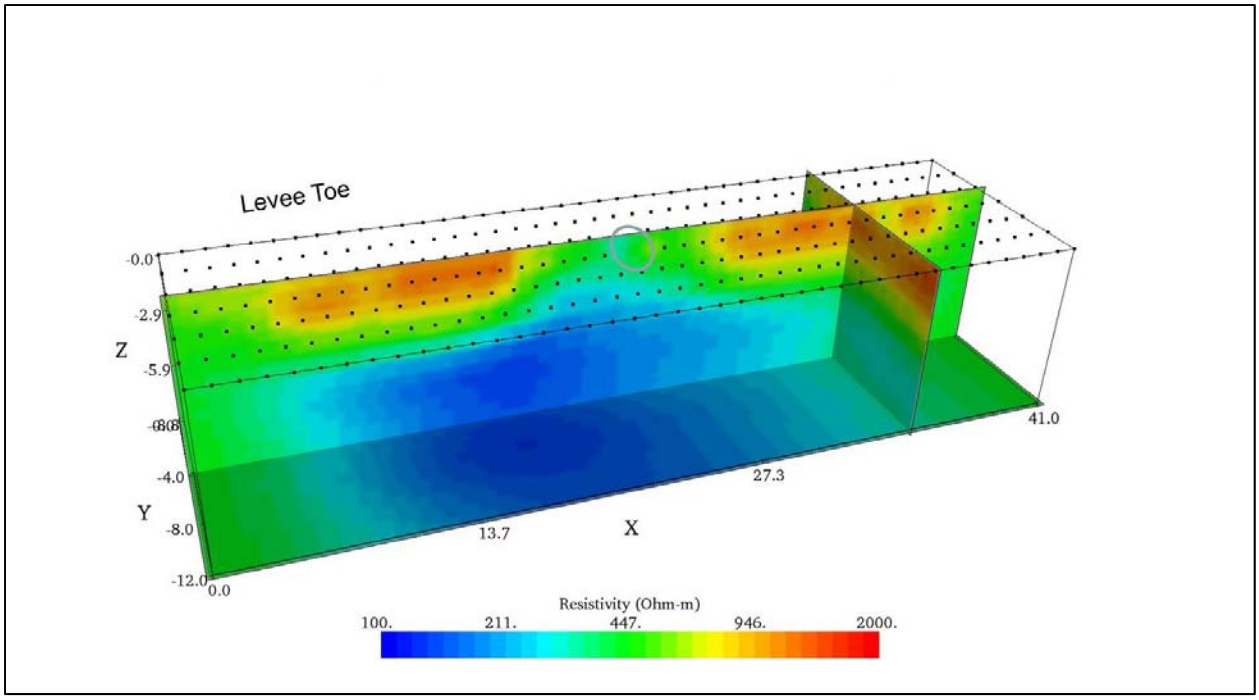


Figure C105. Slice along Y=-4.50 m, Quasi 3D processing, Burlington, WA.

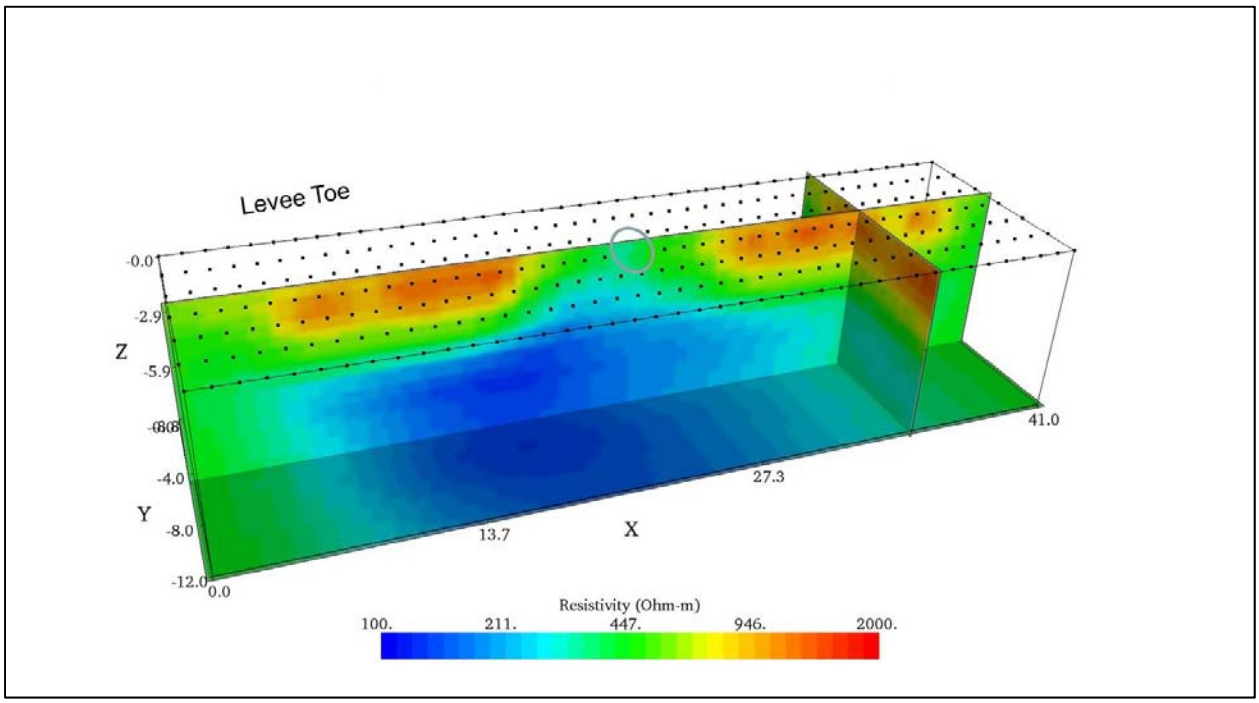


Figure C106. Slice along Y=-5.00 m, Quasi 3D processing, Burlington, WA.

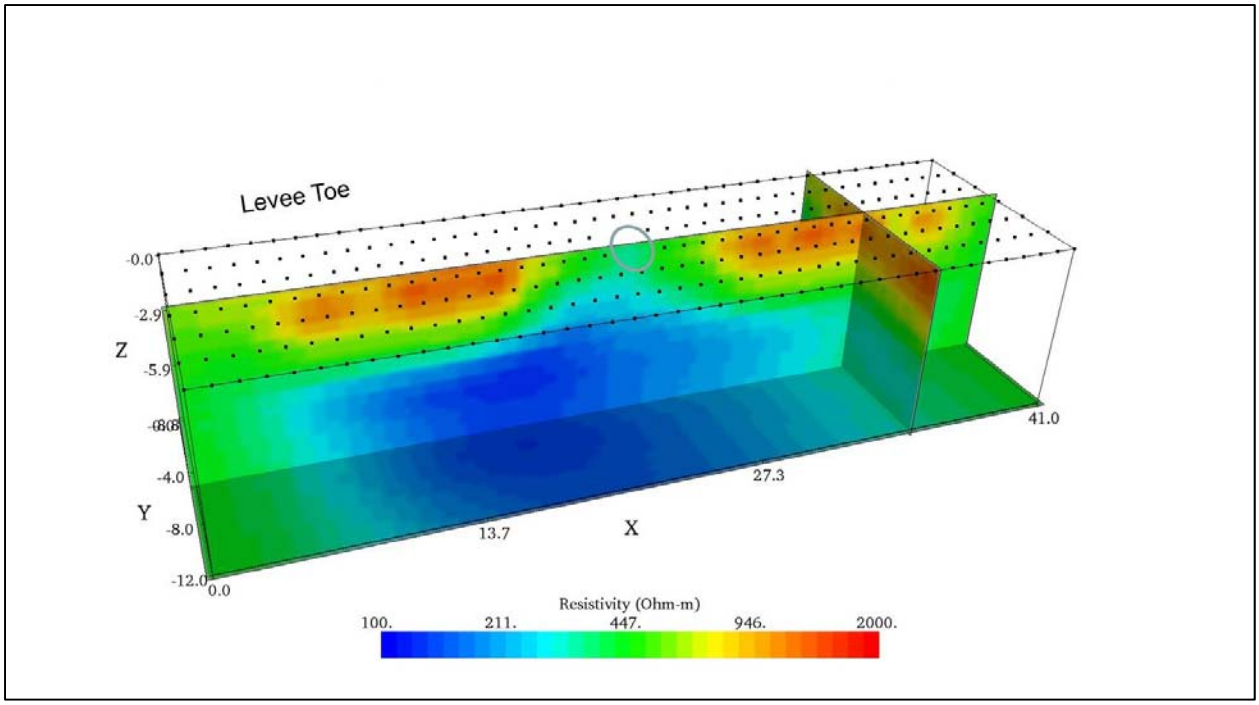


Figure C107. Slice along Y=-5.50 m, Quasi 3D processing, Burlington, WA.

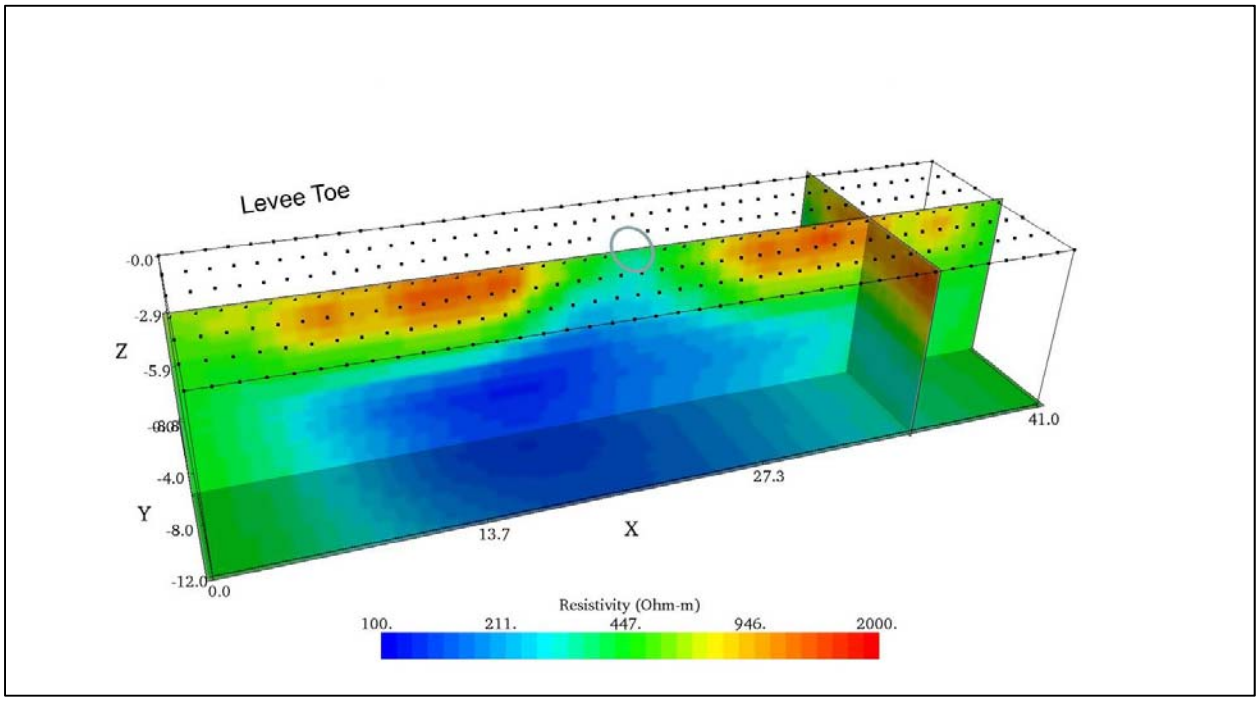


Figure C108. Slice along Y=-6.00 m, Quasi 3D processing, Burlington, WA.

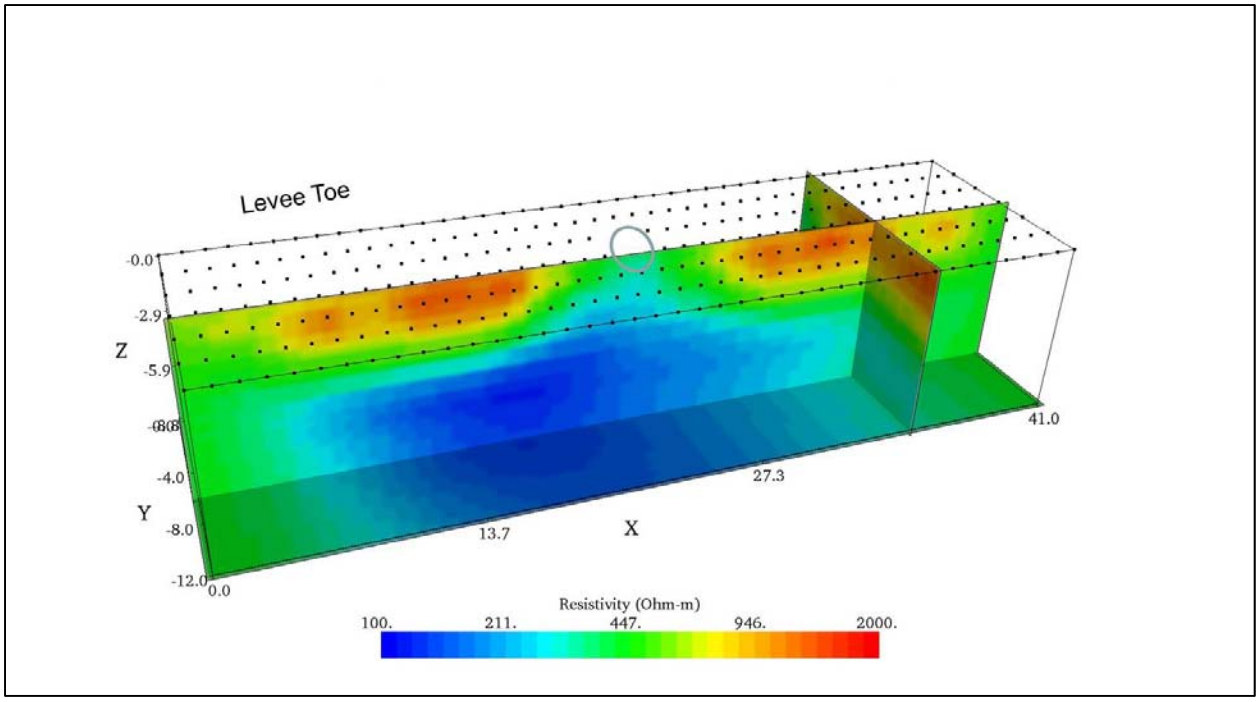


Figure C109. Slice along Y=-6.50 m, Quasi 3D processing, Burlington, WA.

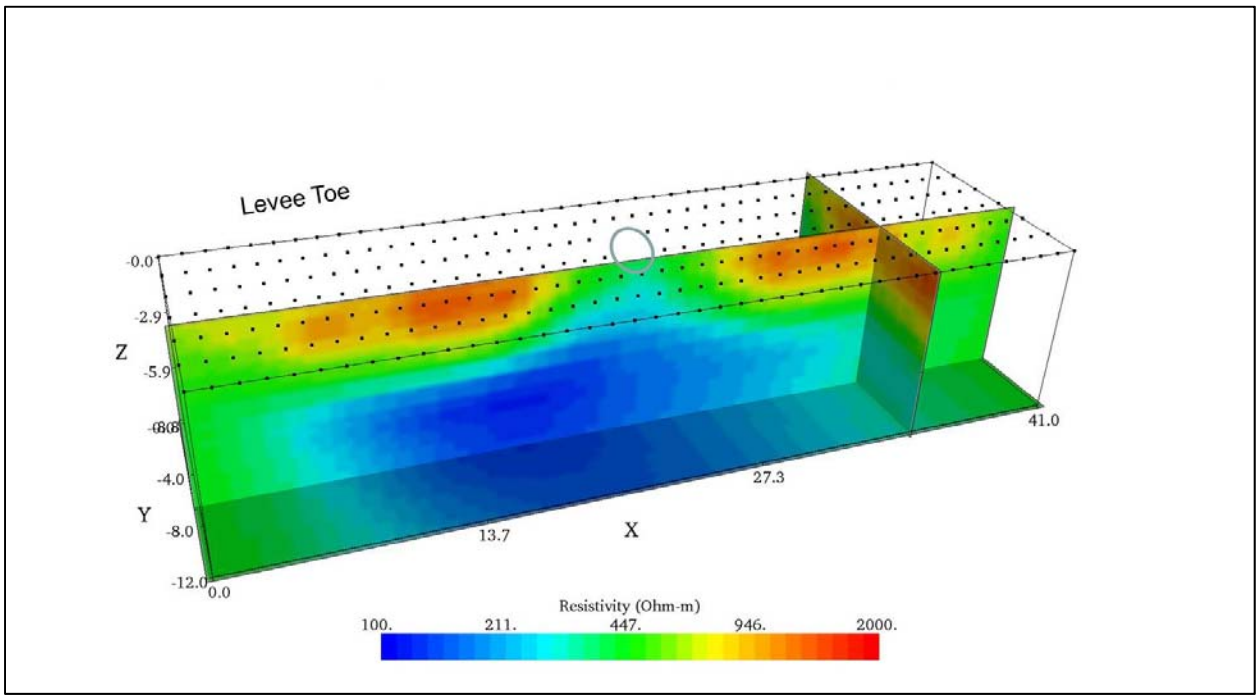


Figure C110. Slice along Y=-7.00 m, Quasi 3D processing, Burlington, WA.

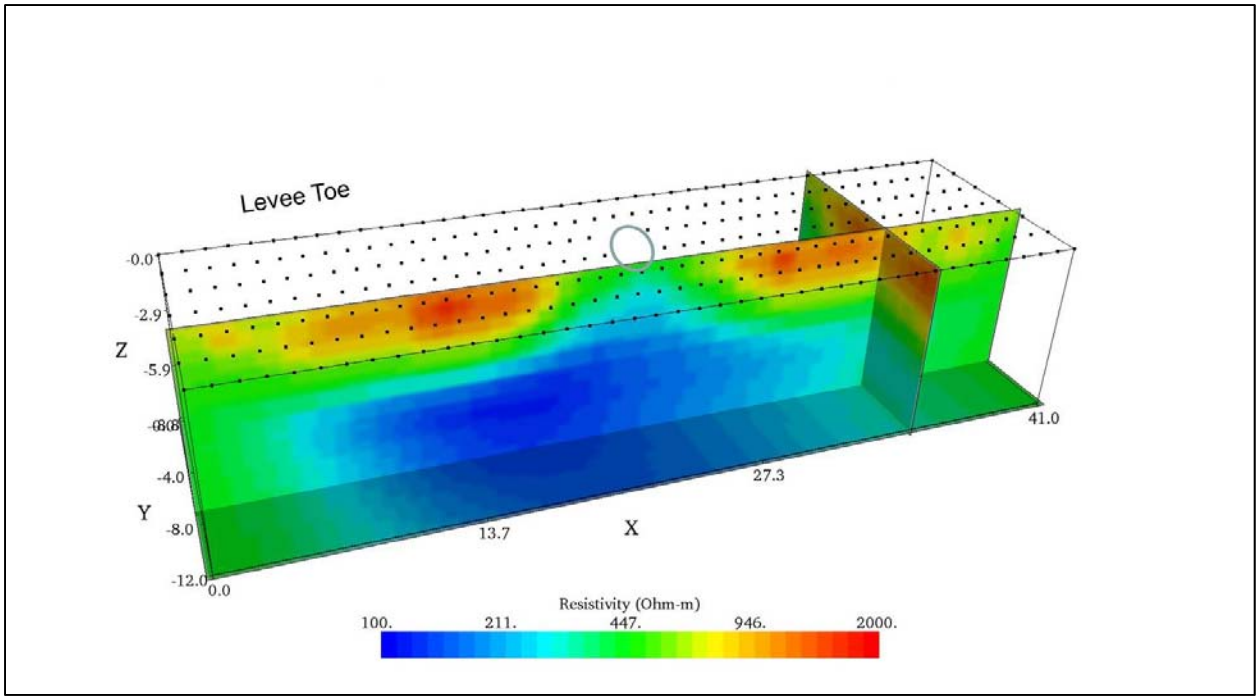


Figure C111. Slice along Y=-7.50 m, Quasi 3D processing, Burlington, WA.

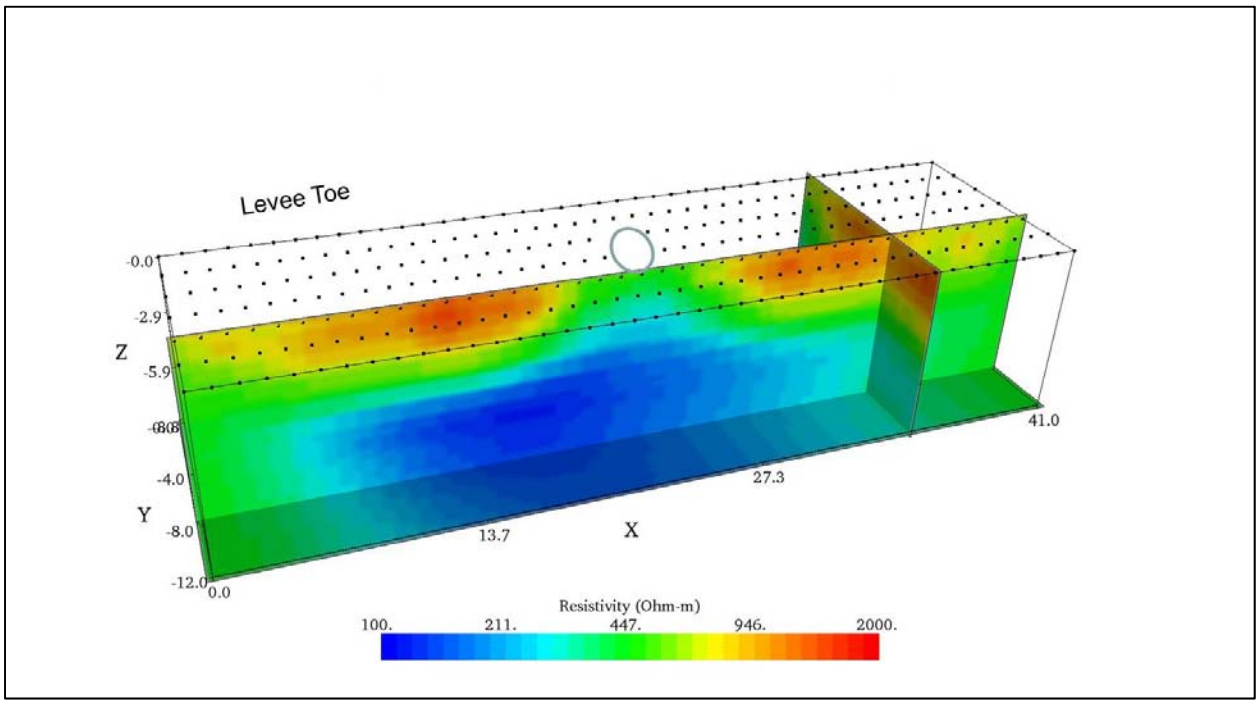


Figure C112. Slice along Y=-8.00 m, Quasi 3D processing, Burlington, WA.

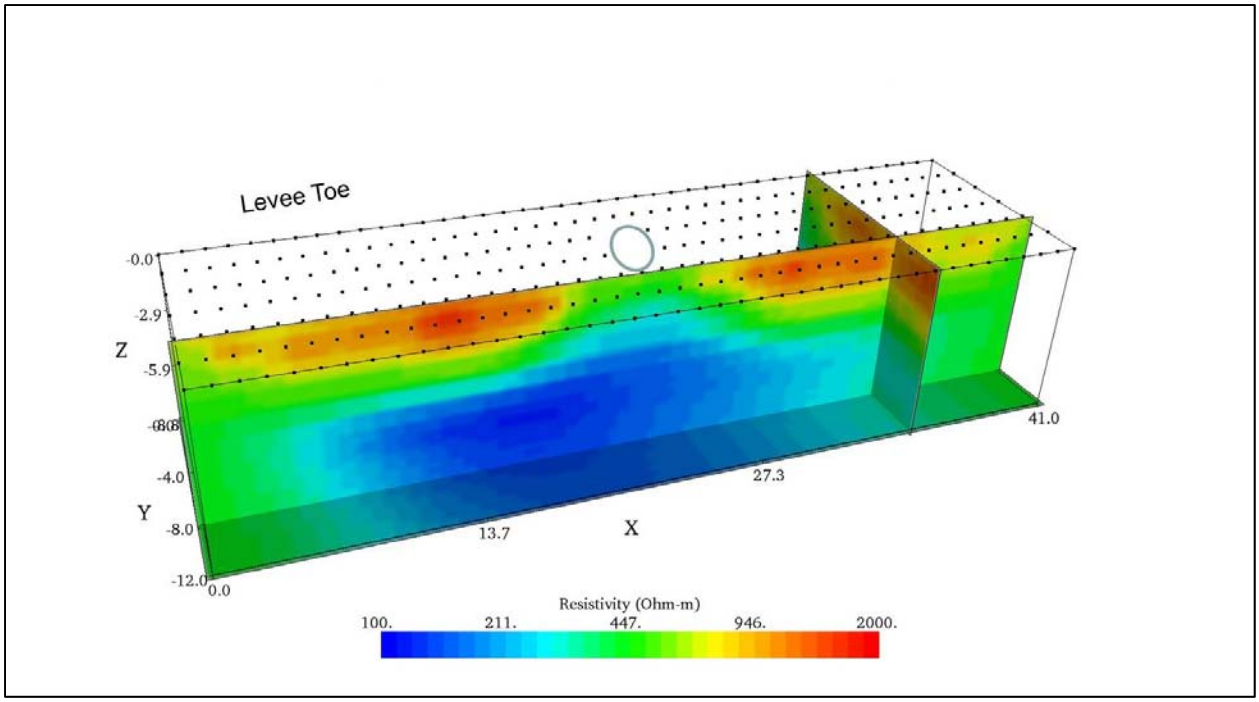


Figure C113. Slice along Y=-8.50 m, Quasi 3D processing, Burlington, WA.

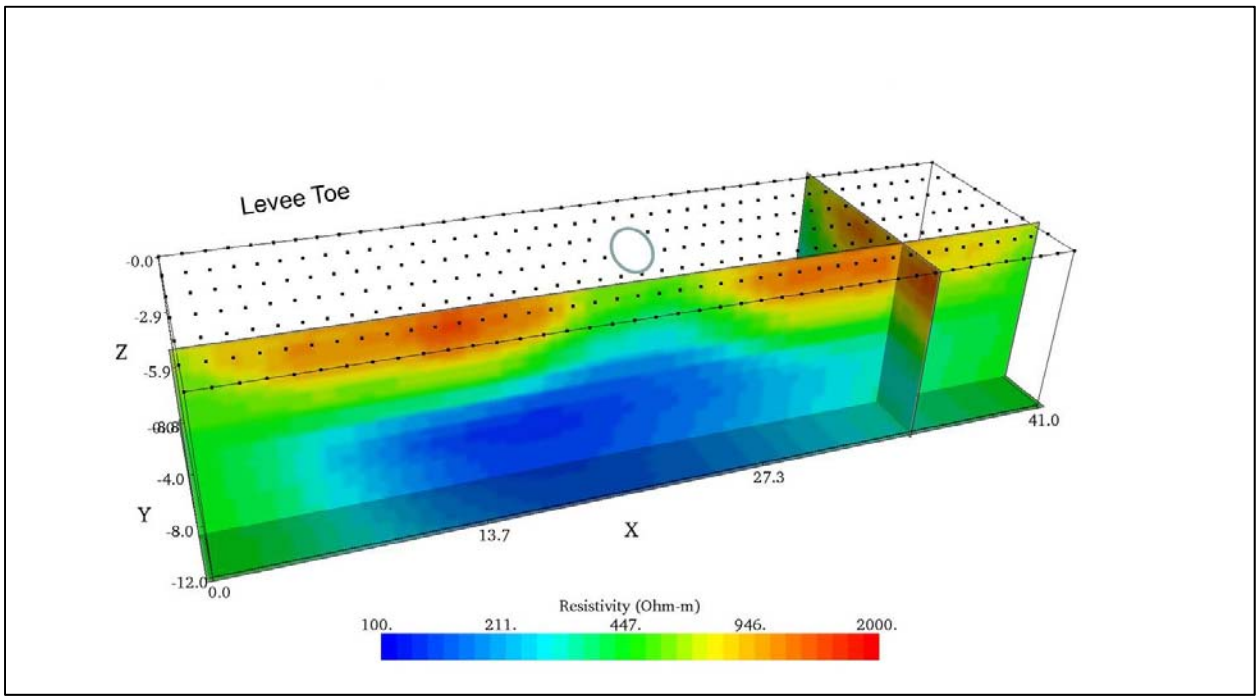


Figure C114. Slice along Y=-9.00 m, Quasi 3D processing, Burlington, WA.

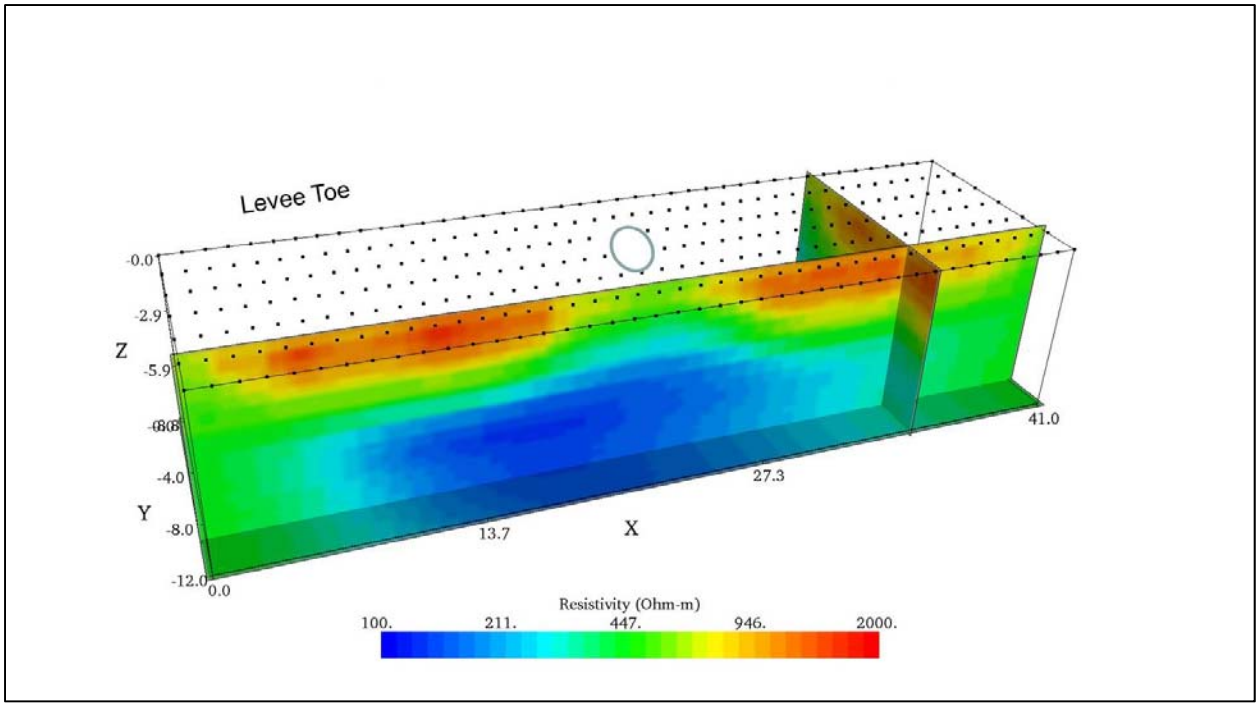


Figure C115. Slice along Y=-9.50 m, Quasi 3D processing, Burlington, WA.

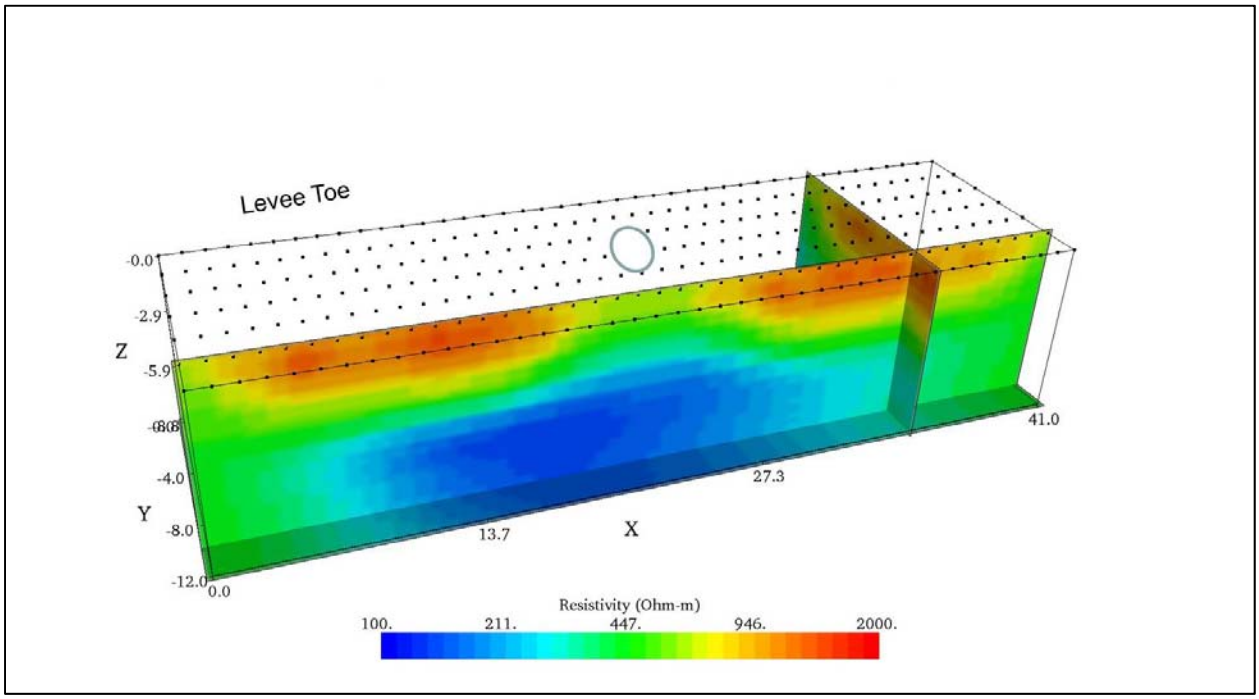


Figure C116. Slice along Y=-10.00 m, Quasi 3D processing, Burlington, WA.

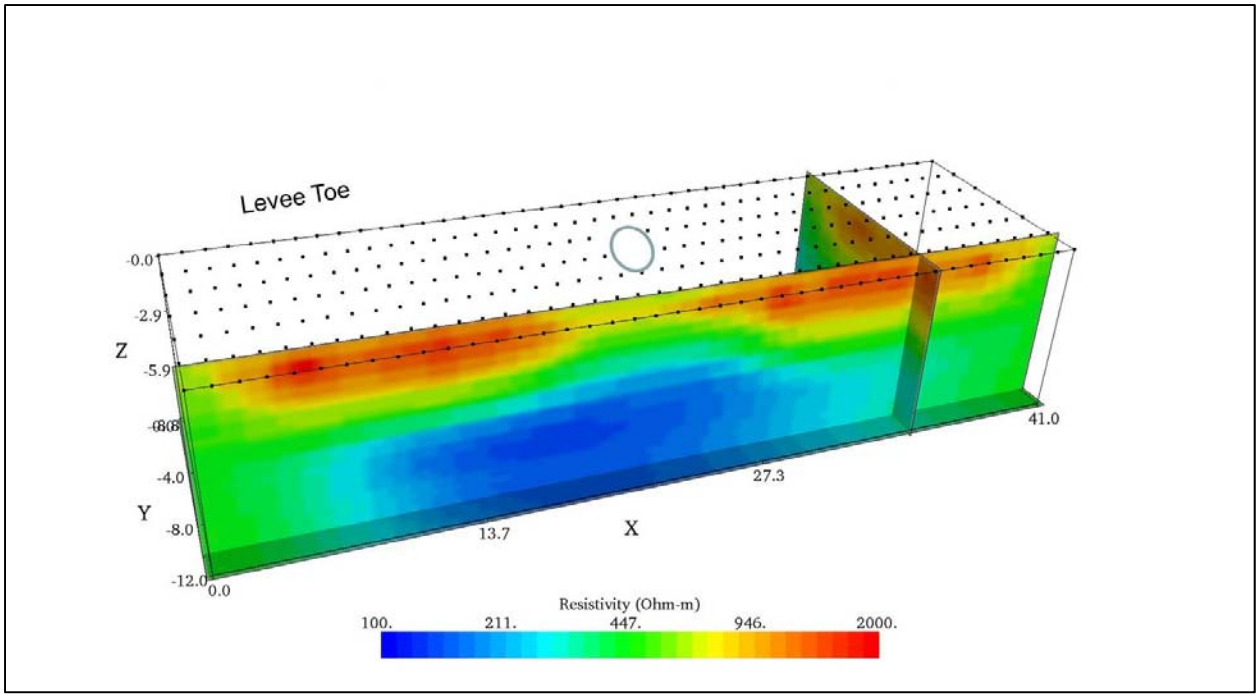


Figure C117. Slice along Y=-10.50 m, Quasi 3D processing, Burlington, WA.

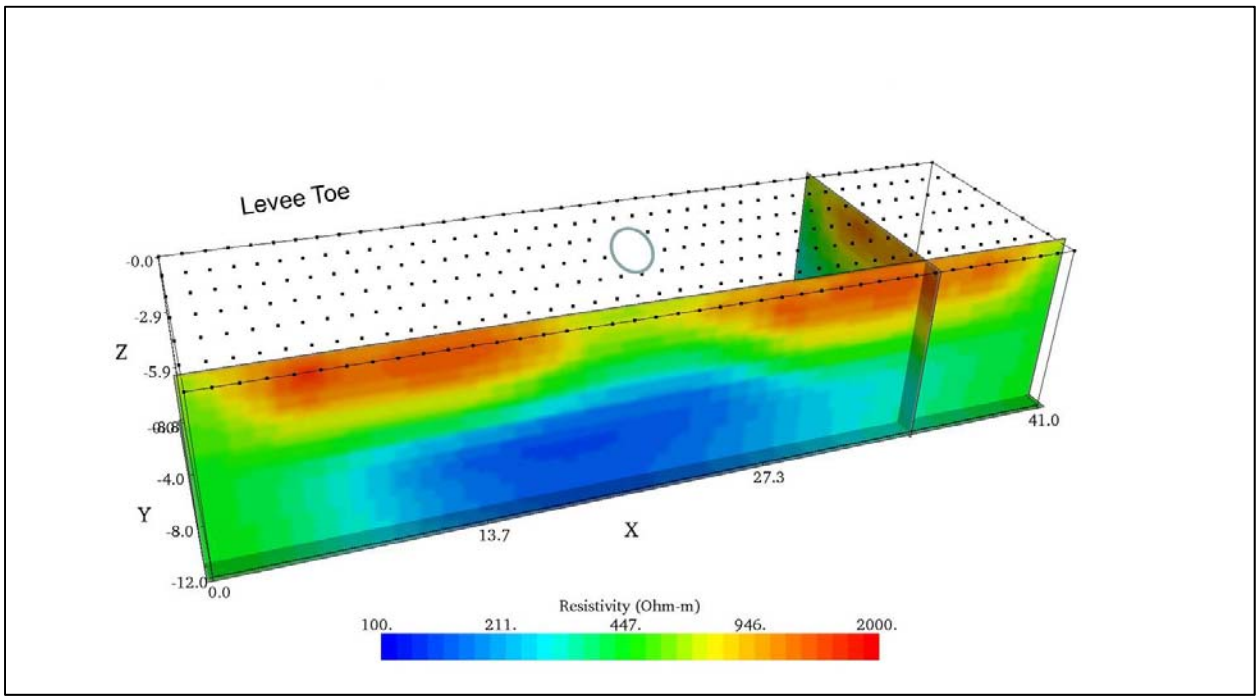


Figure C118. Slice along Y=-11.00 m, Quasi 3D processing, Burlington, WA.

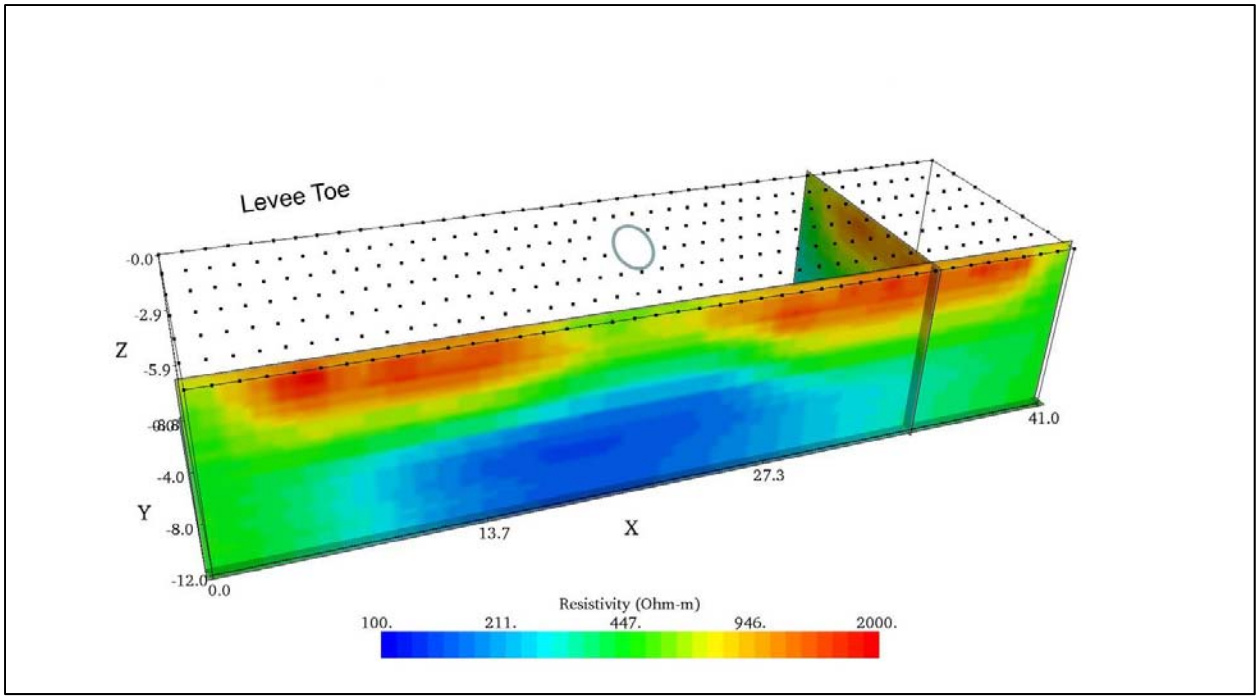


Figure C119. Slice along Y=-11.50 m, Quasi 3D processing, Burlington, WA.

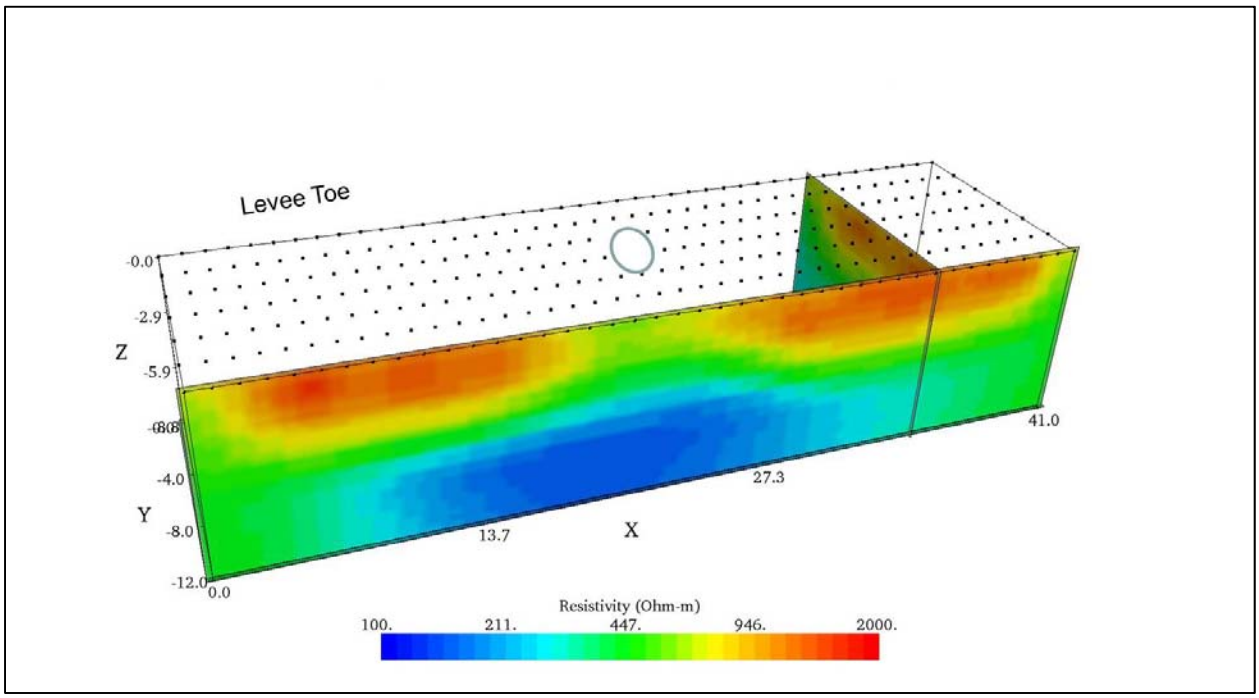


Figure C120. Slice along Y=-12.00 m, Quasi 3D processing, Burlington, WA.

3D Depth Slices, Burlington, WA

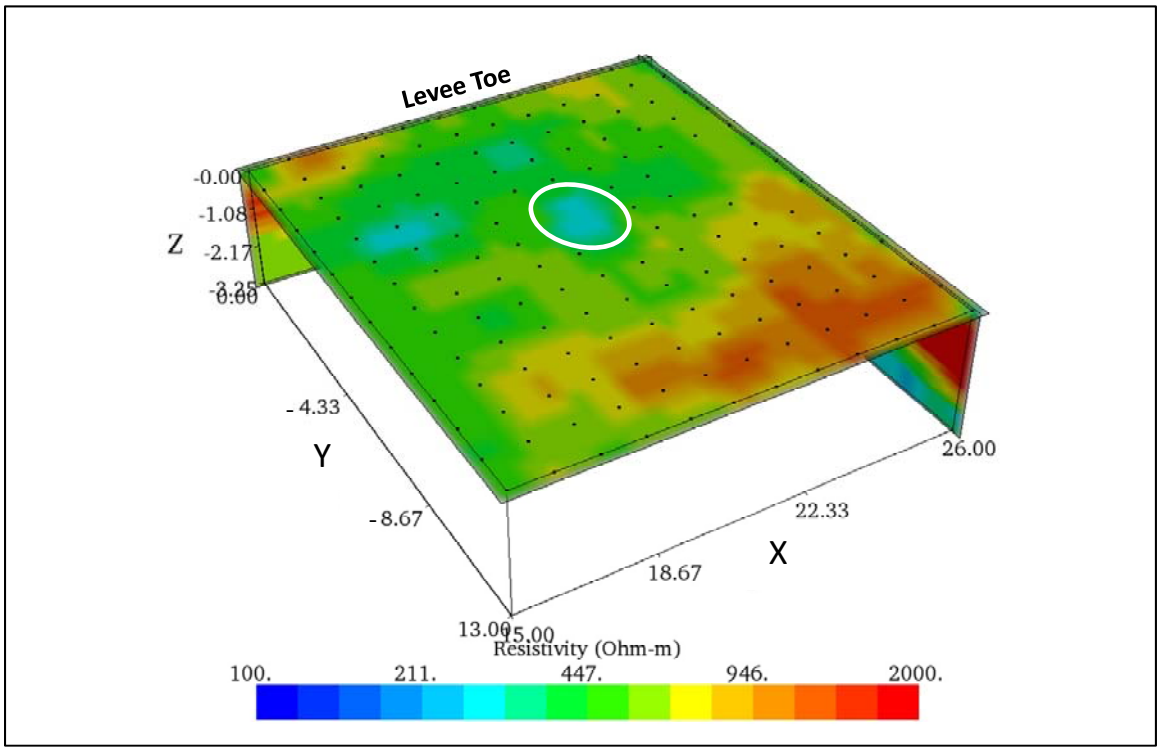


Figure C121. Depth slice at Z=0.00 m, 3D processing, Burlington, WA.

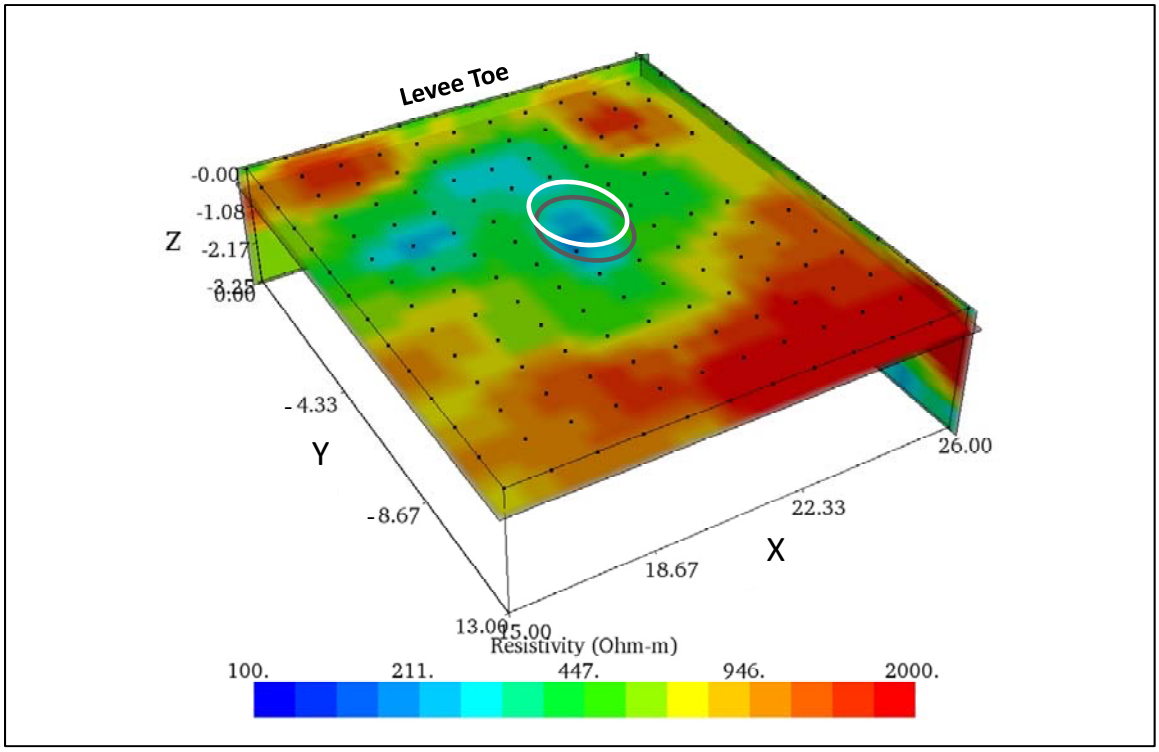


Figure C122. Depth slice at Z=0.50 m, 3D processing, Burlington, WA.

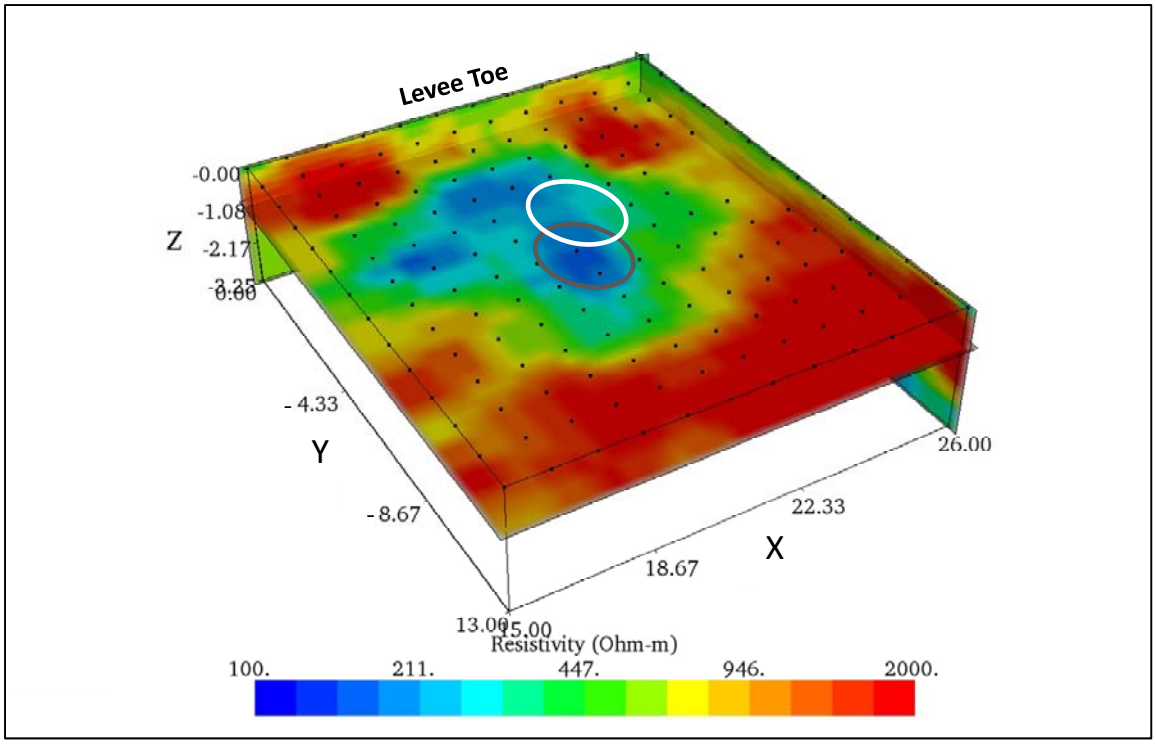


Figure C123. Depth slice at Z=1.00 m, 3D processing, Burlington, WA

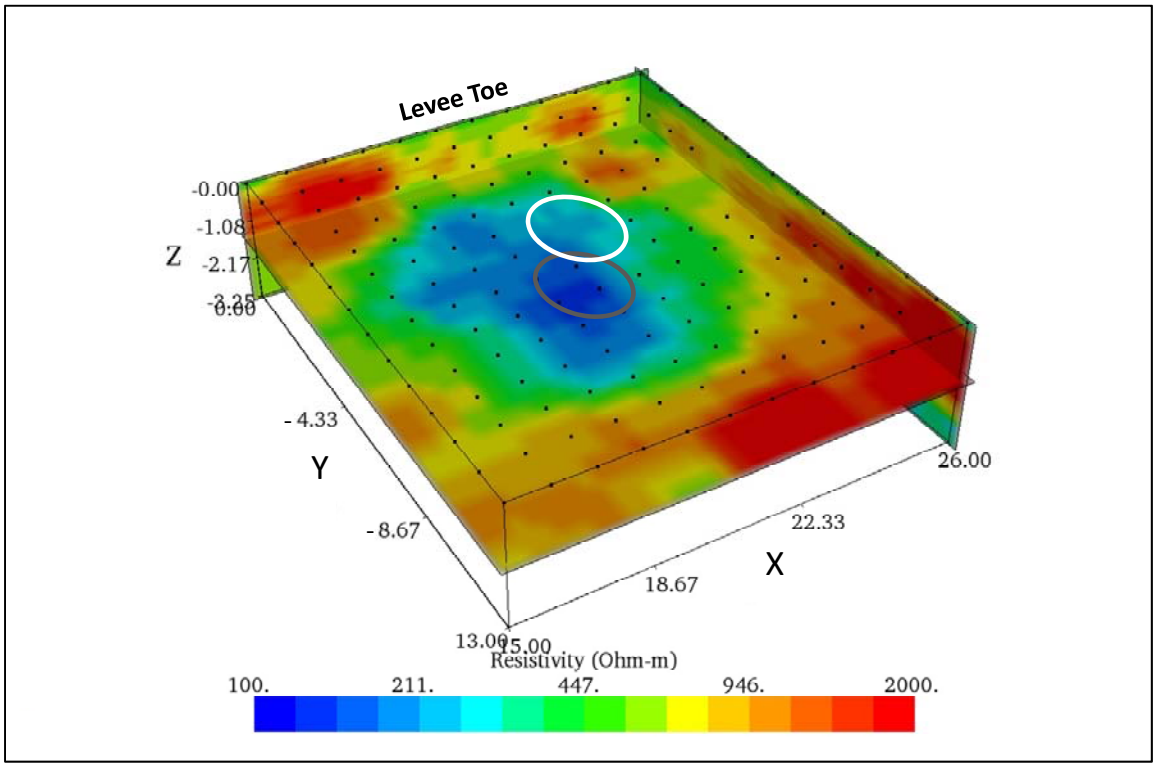


Figure C124. Depth slice at Z=1.50 m, 3D processing, Burlington, WA.

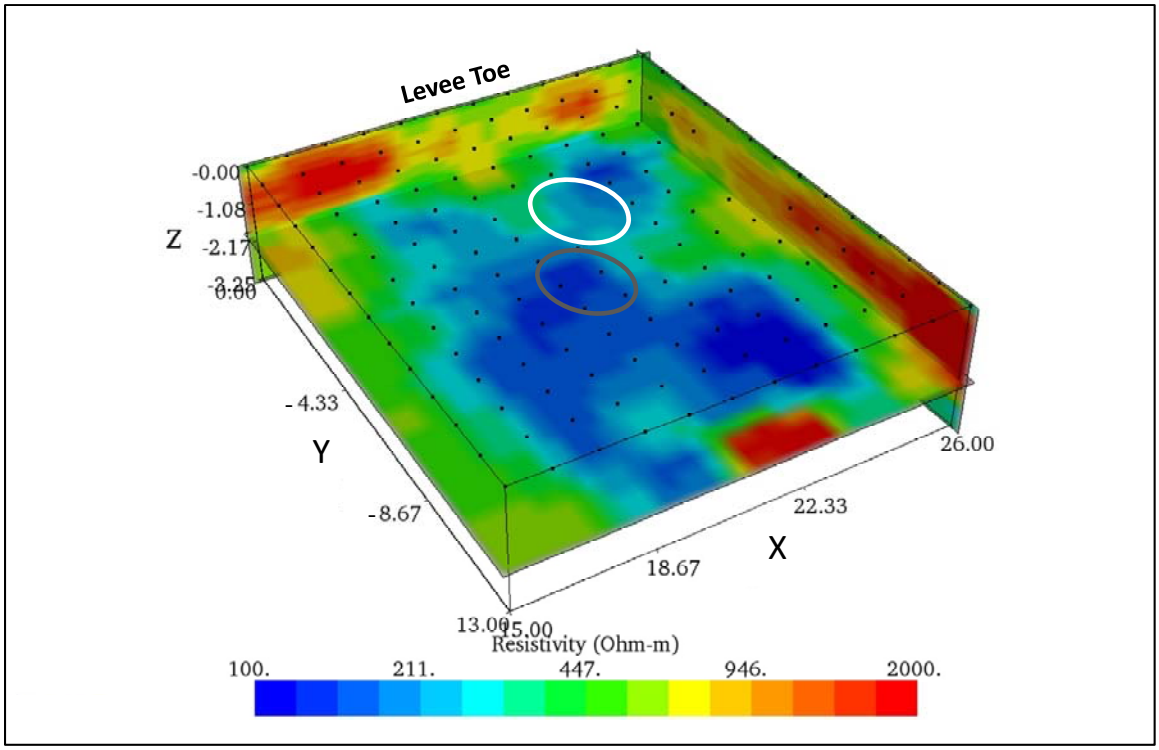


Figure C125. Depth slice at Z=2.00 m, 3D processing, Burlington, WA.

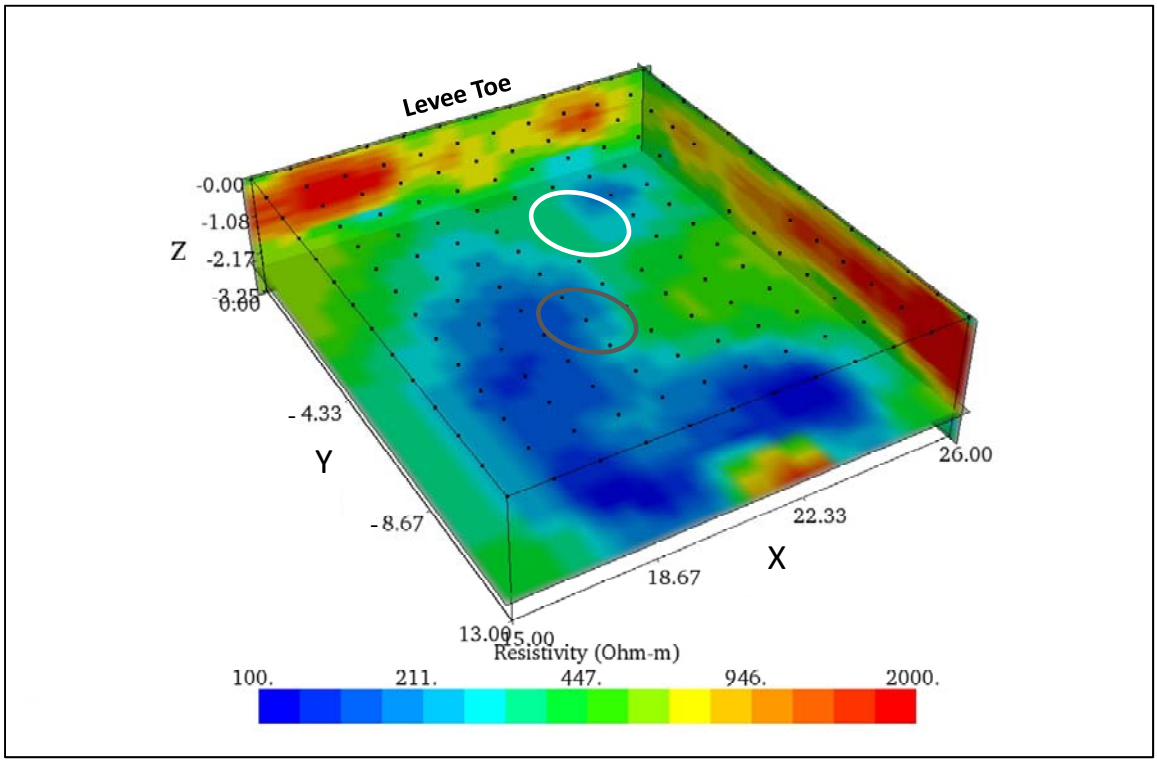


Figure C126. Depth slice at Z=2.50 m, 3D processing, Burlington, WA.

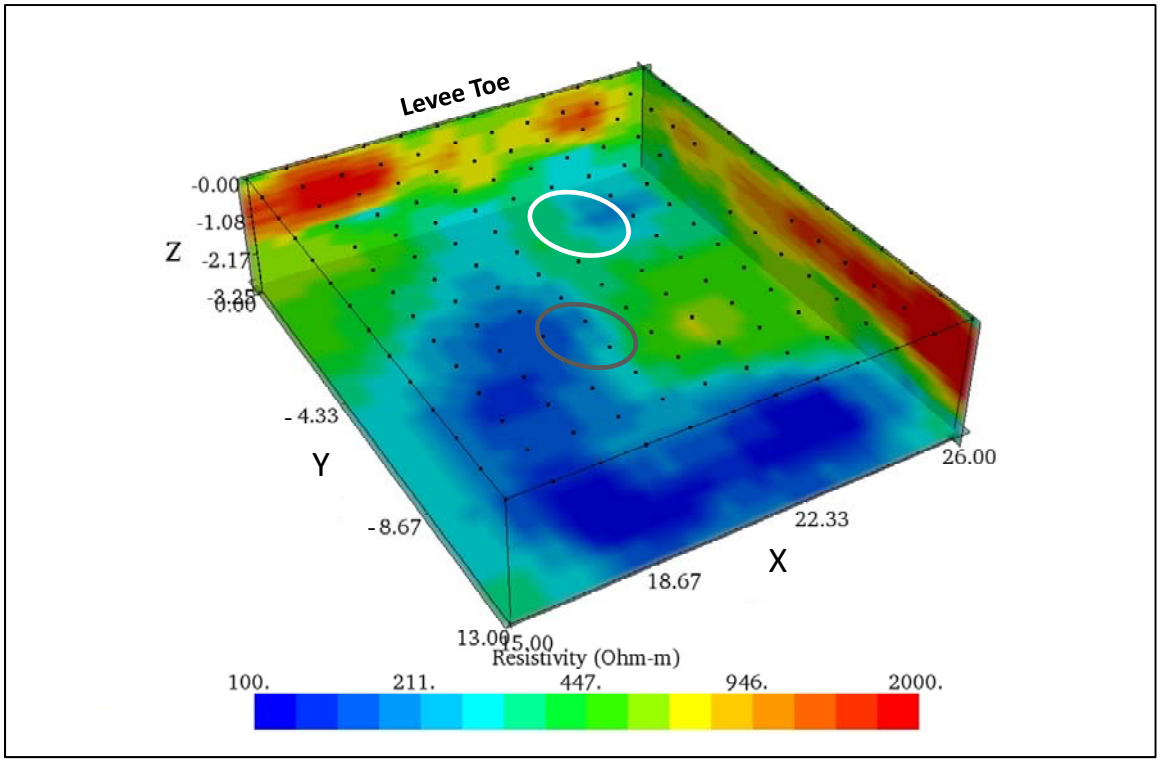


Figure C127. Depth slice at Z=3.00 m, 3D processing, Burlington, WA.

3D Slices Taken Parallel to the X-axis – Burlington, WA

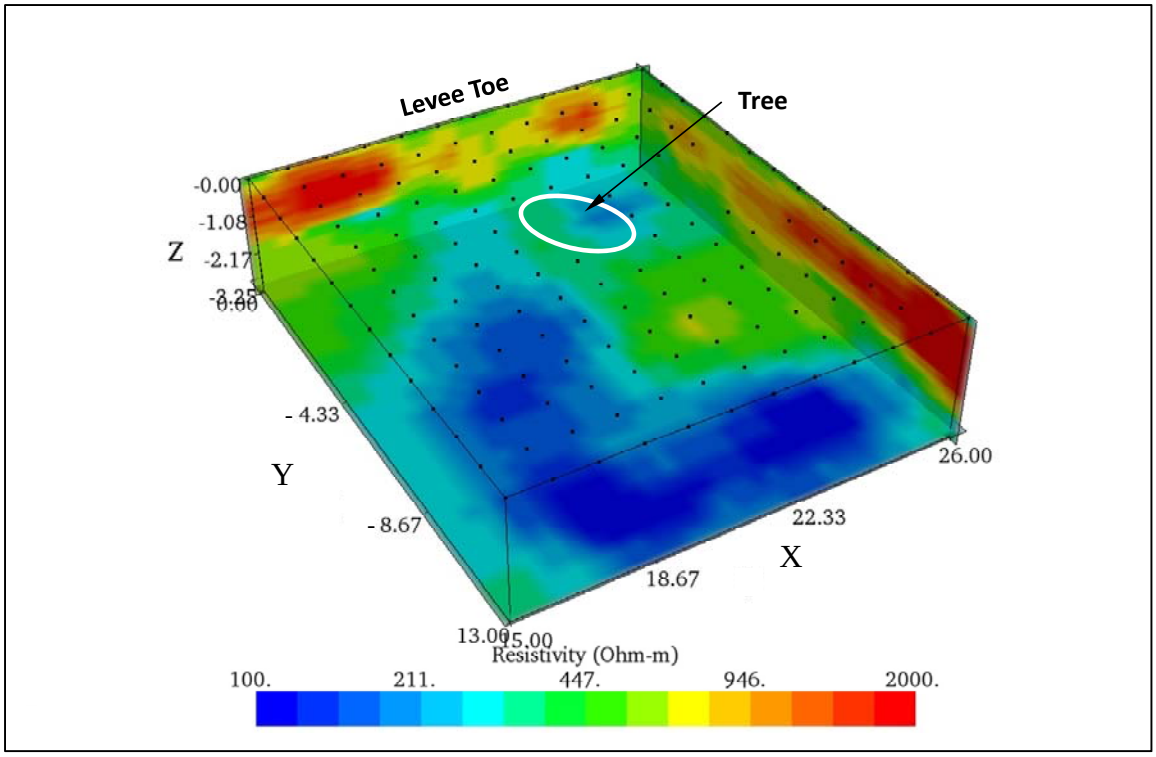


Figure C128. Slice along Y=0.00 m, 3D processing, Burlington, WA.

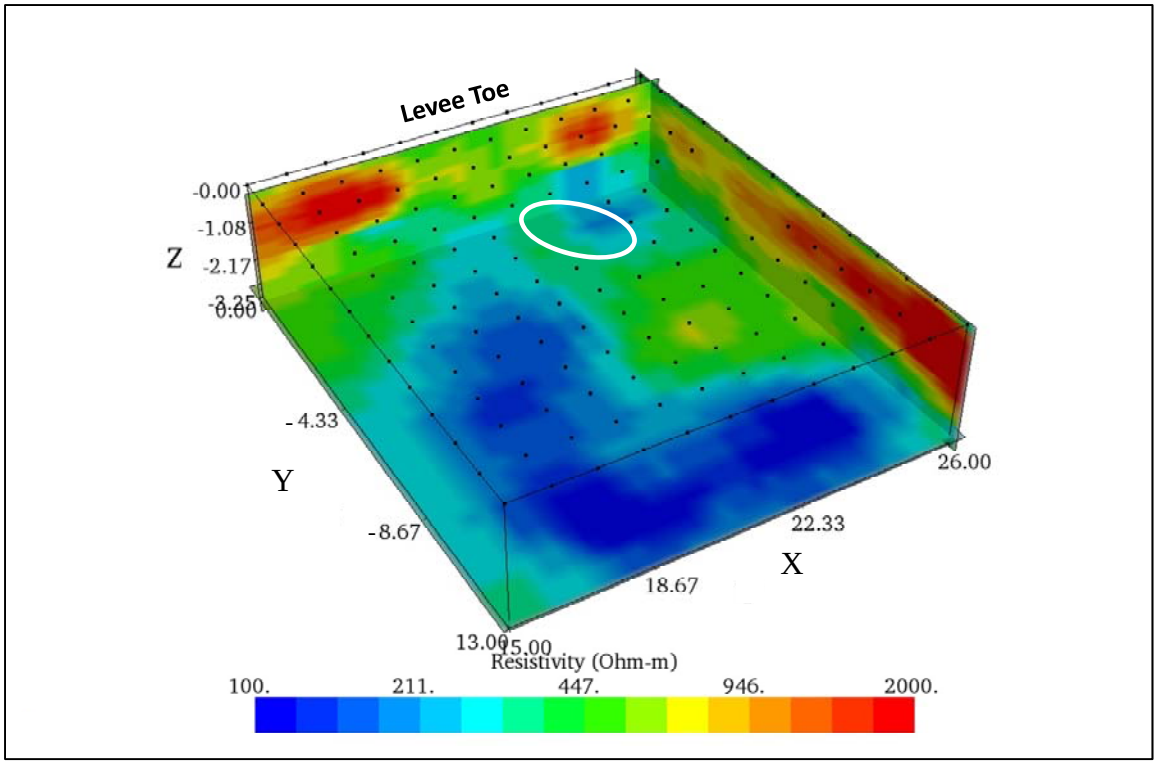


Figure C129. Slice along Y=-0.50 m, 3D processing, Burlington, WA.

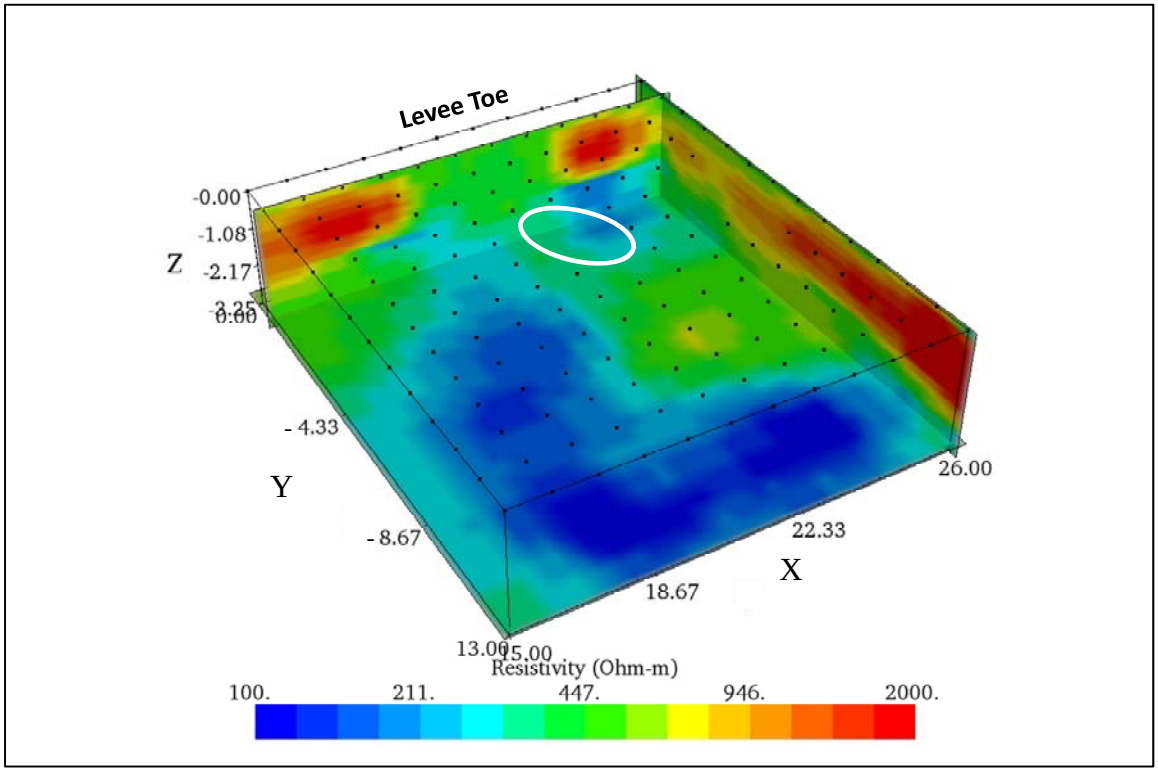


Figure C130. Slice along Y=-1.00 m, 3D processing, Burlington, WA.

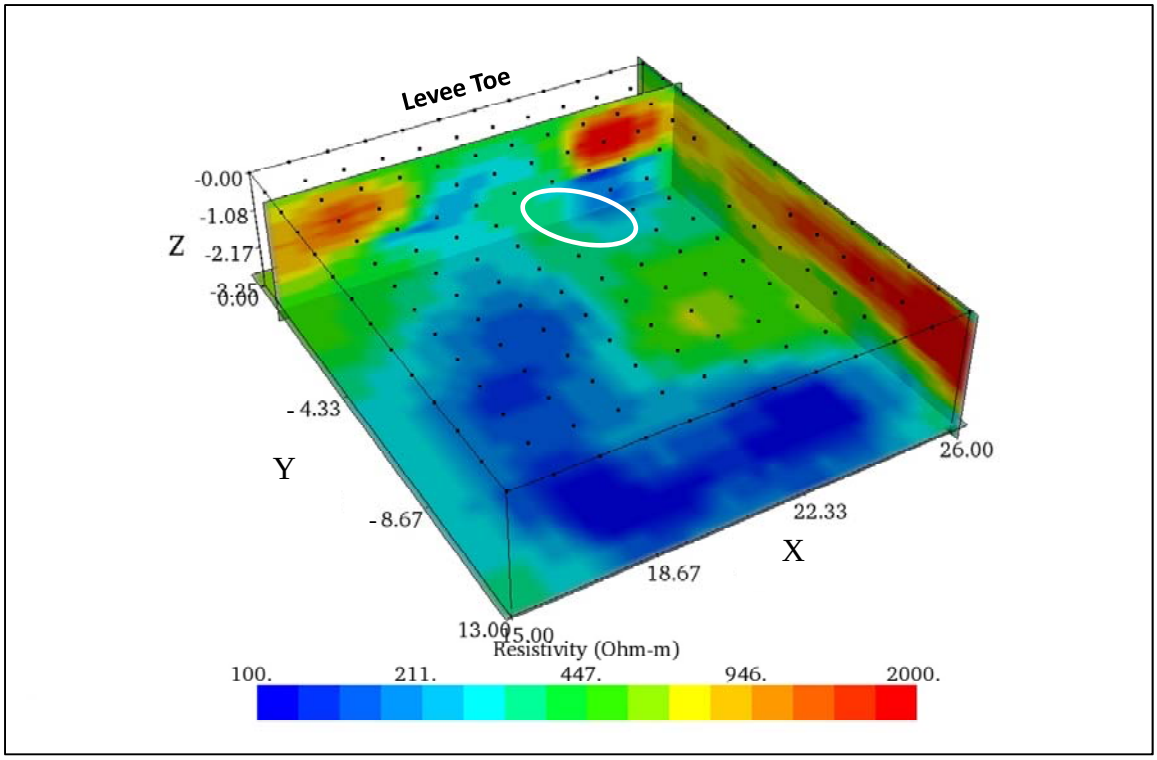


Figure C131. Slice along Y=-1.50 m, 3D processing, Burlington, WA.

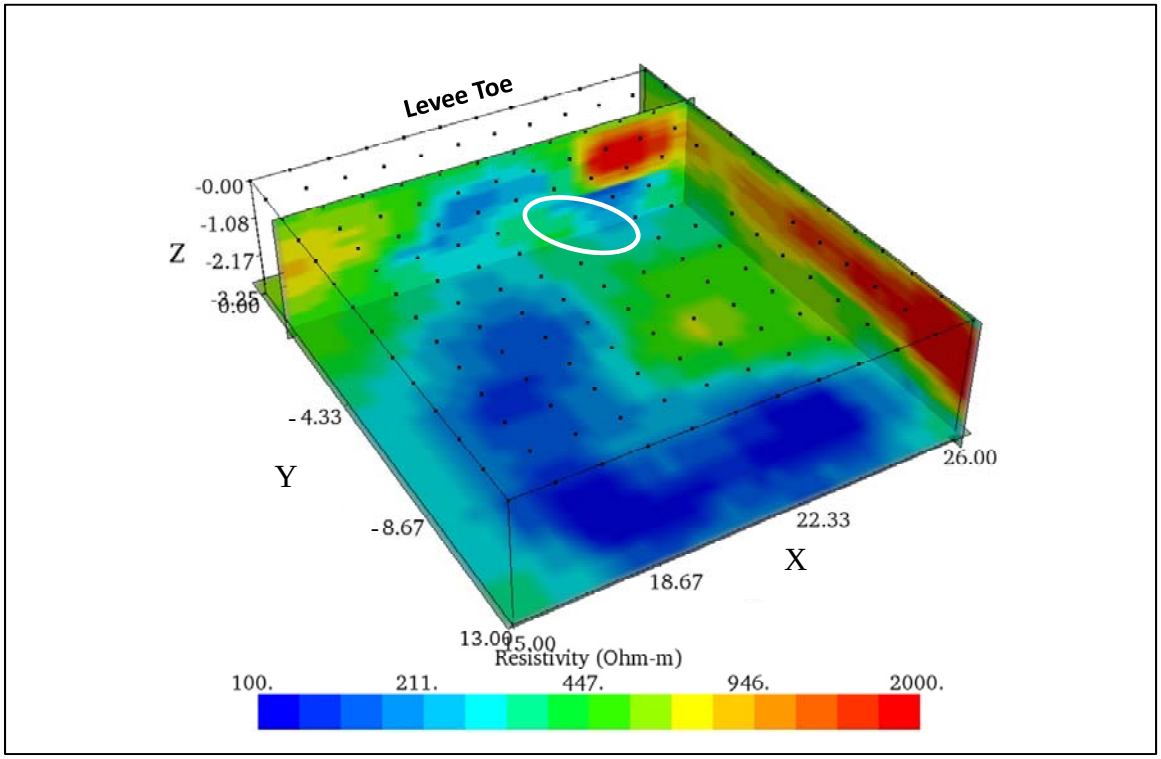


Figure C132. Slice along Y=-2.00 m, 3D processing, Burlington, WA.

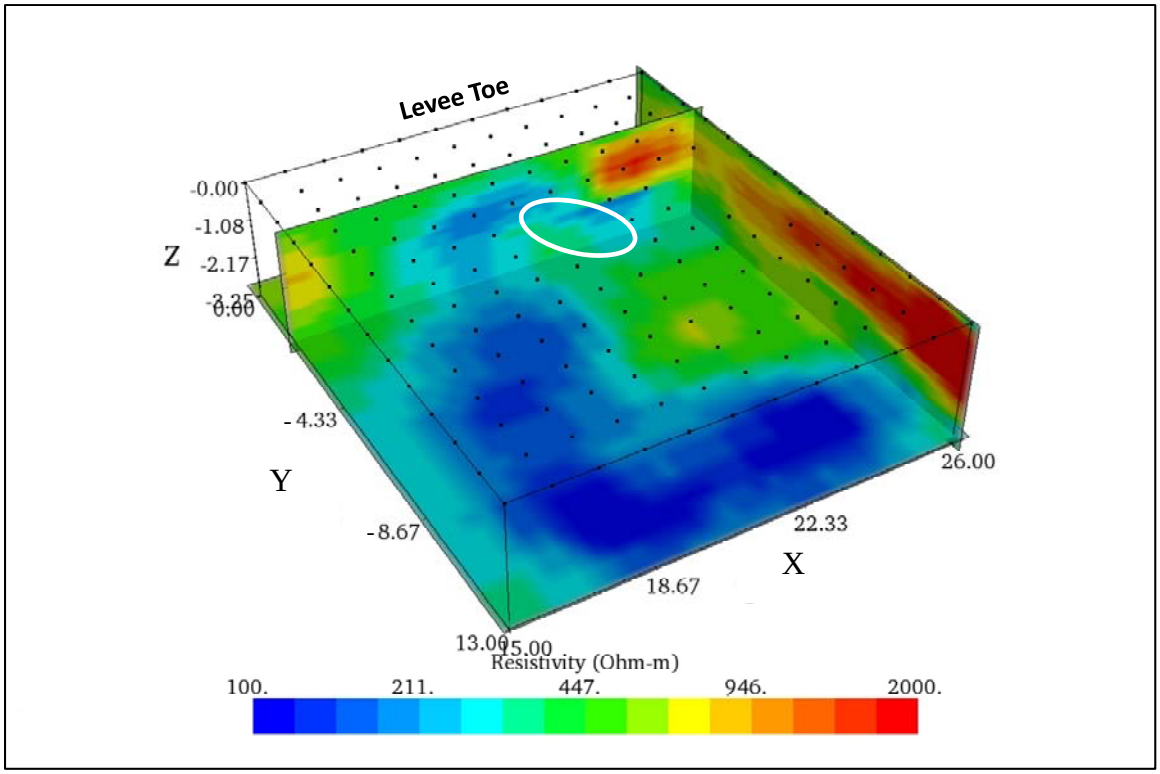


Figure C133. Slice along Y=-2.50 m, 3D processing, Burlington, WA.

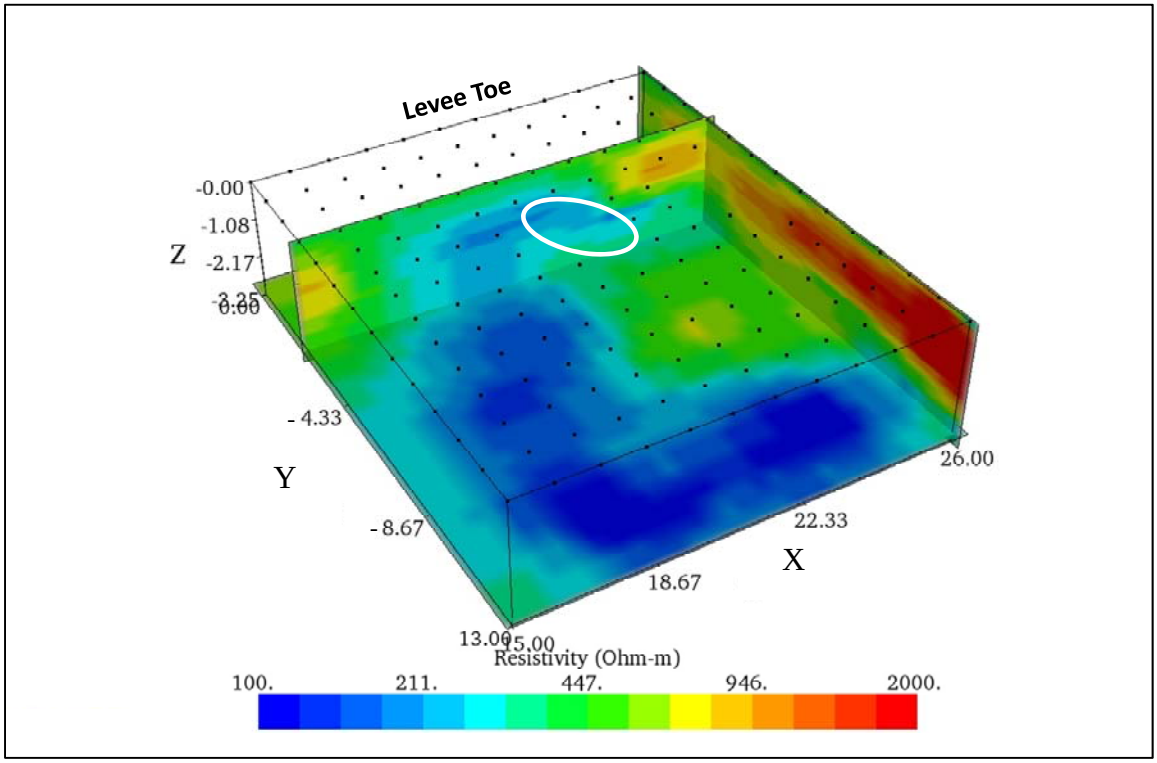


Figure C134. Slice along Y=-3.00 m, 3D processing, Burlington, WA.

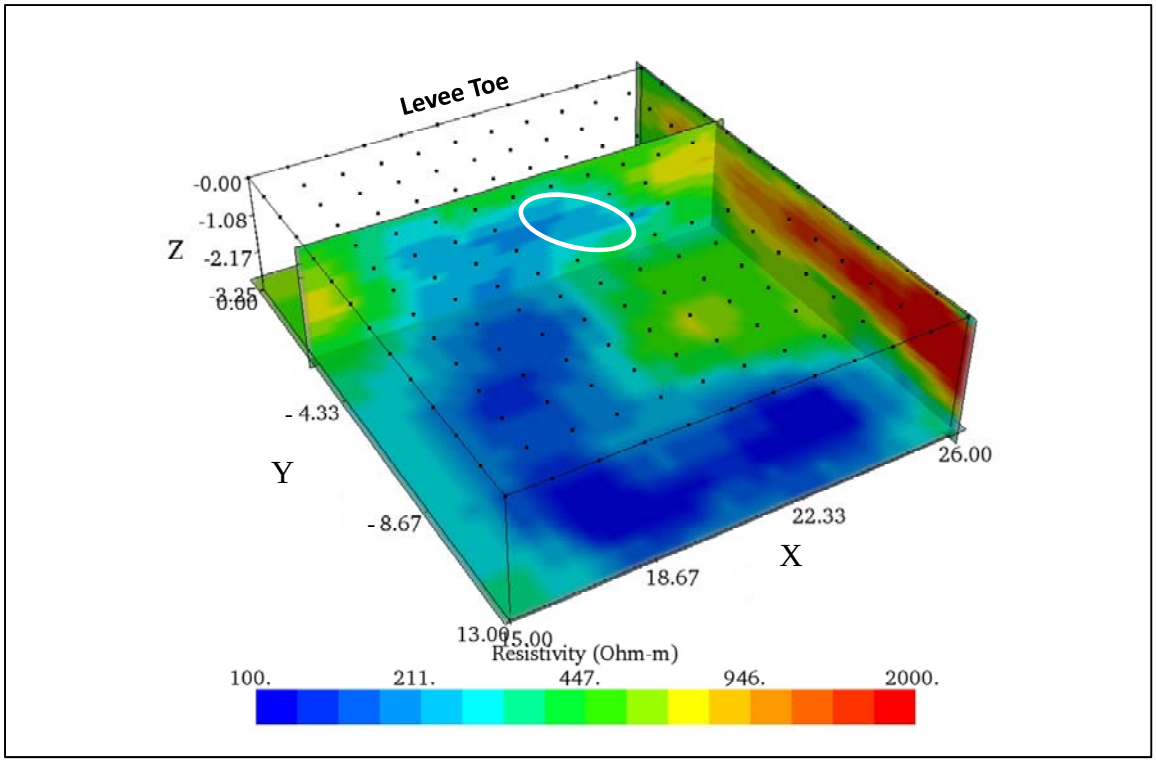


Figure C135. Slice along Y=-3.50 m, 3D processing, Burlington, WA.

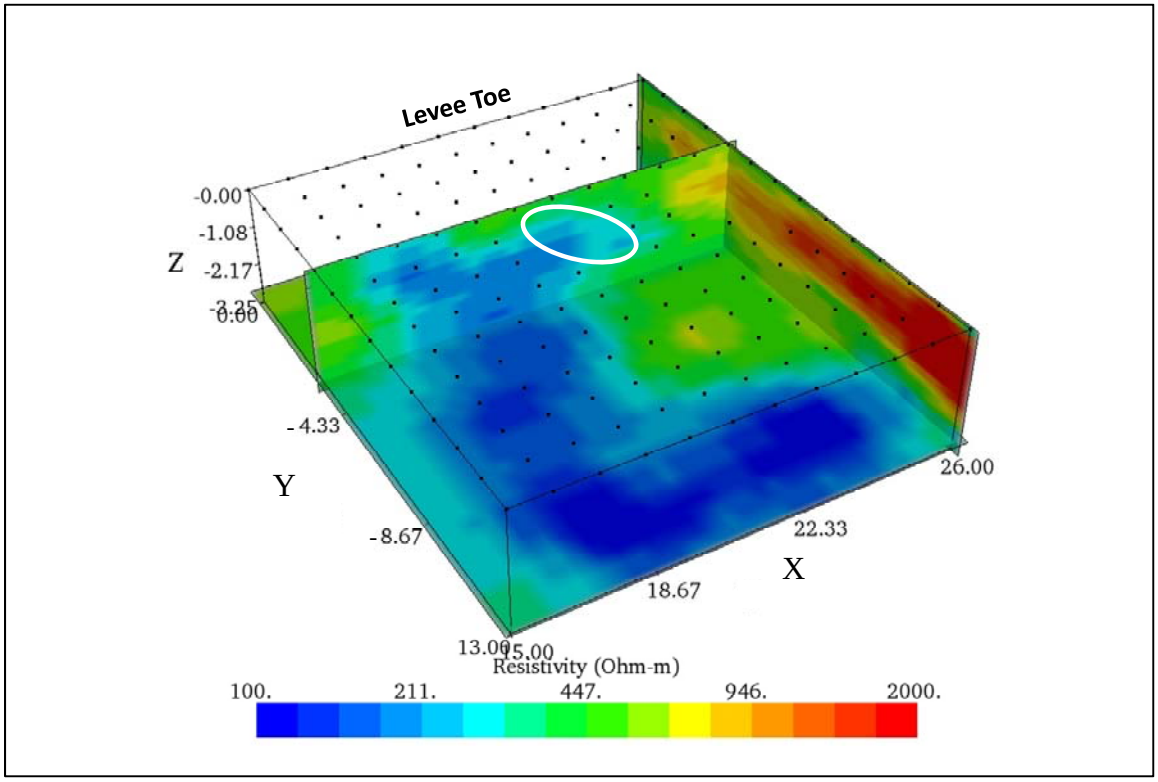


Figure C136. Slice along Y=-4.00 m, 3D processing, Burlington, WA.

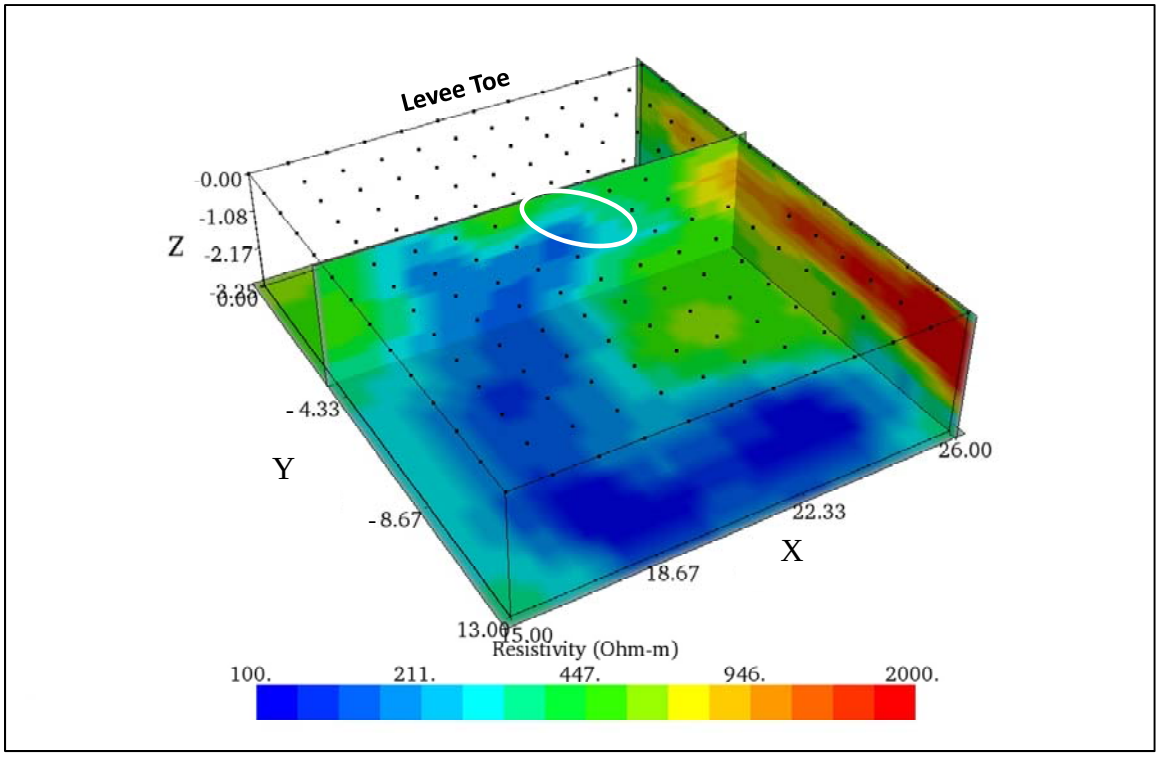


Figure C137. Slice along Y=-4.50 m, 3D processing, Burlington, WA.

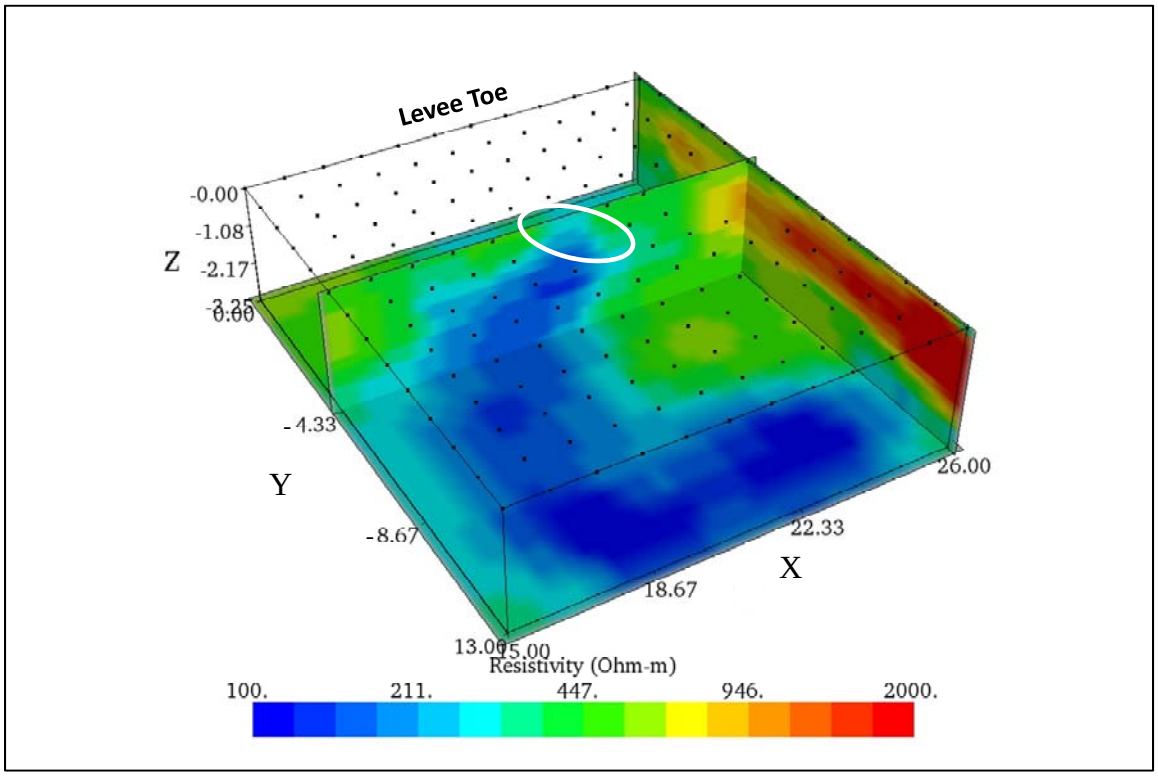


Figure C138. Slice along Y=-5.00 m, 3D processing, Burlington, WA.

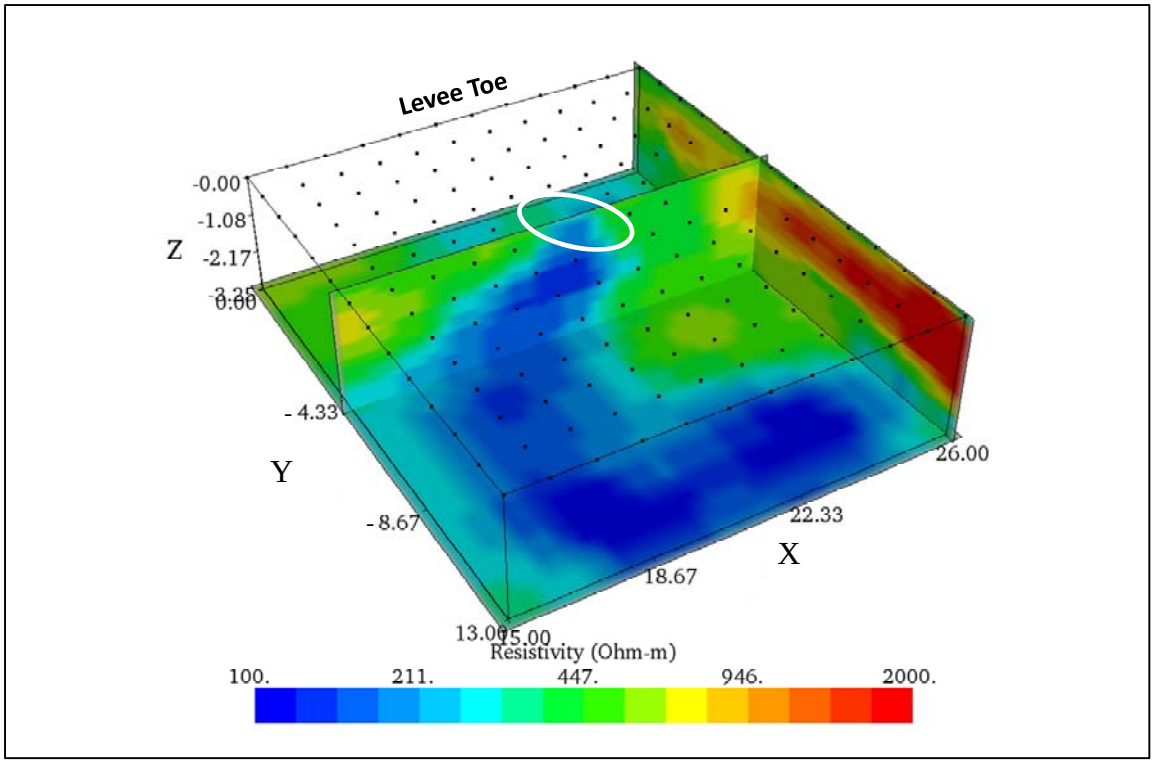


Figure C139. Slice along Y=-5.50 m, 3D processing, Burlington, WA.

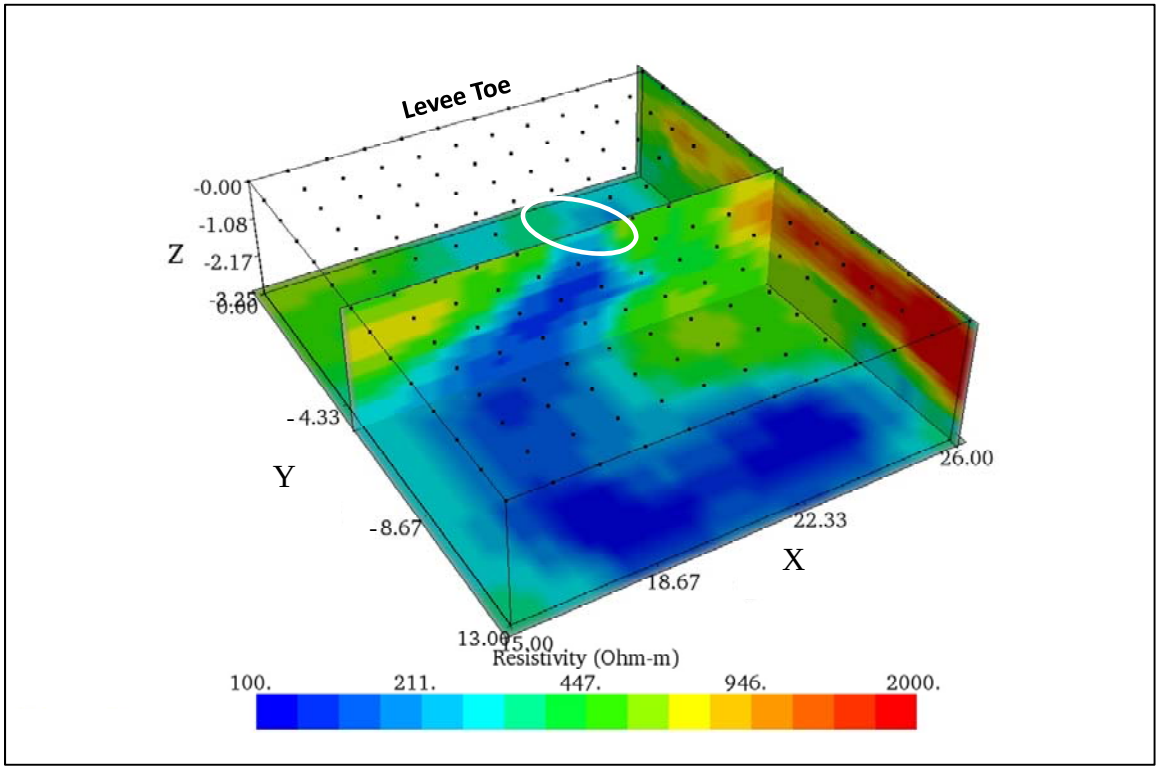


Figure C140. Slice along Y=-6.00 m, 3D processing, Burlington, WA.

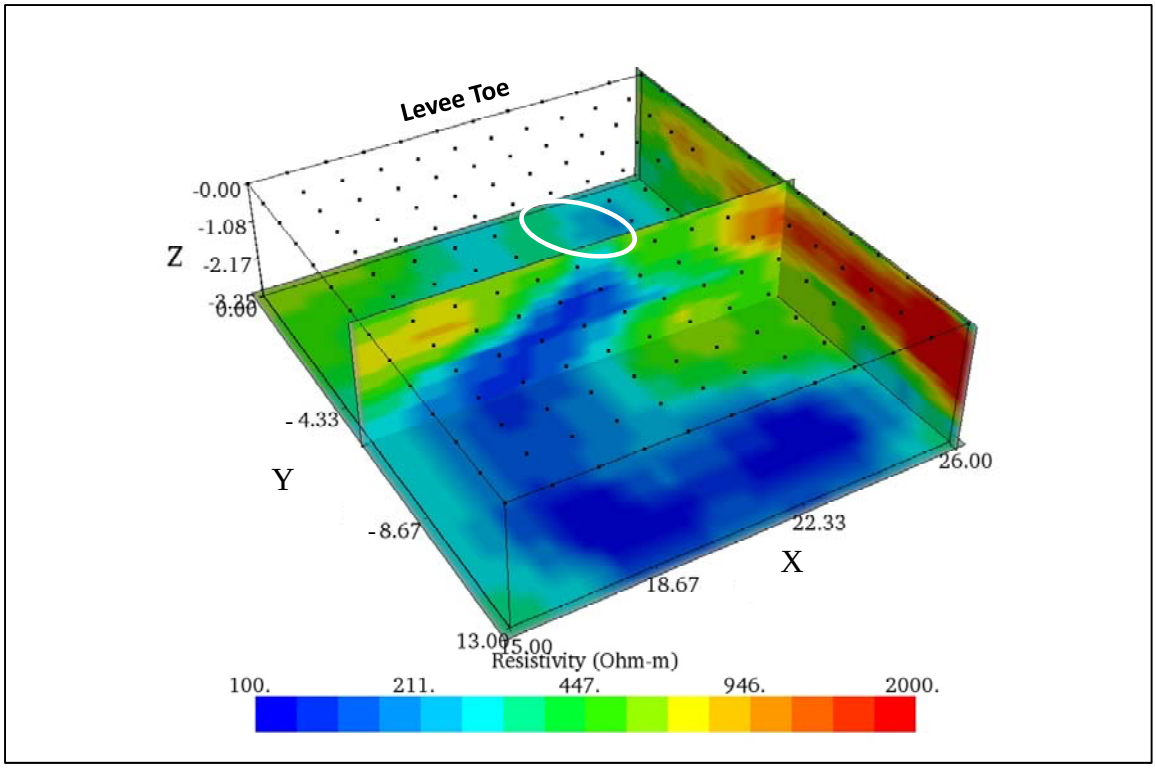


Figure C141. Slice along Y=-6.50 m, 3D processing, Burlington, WA.

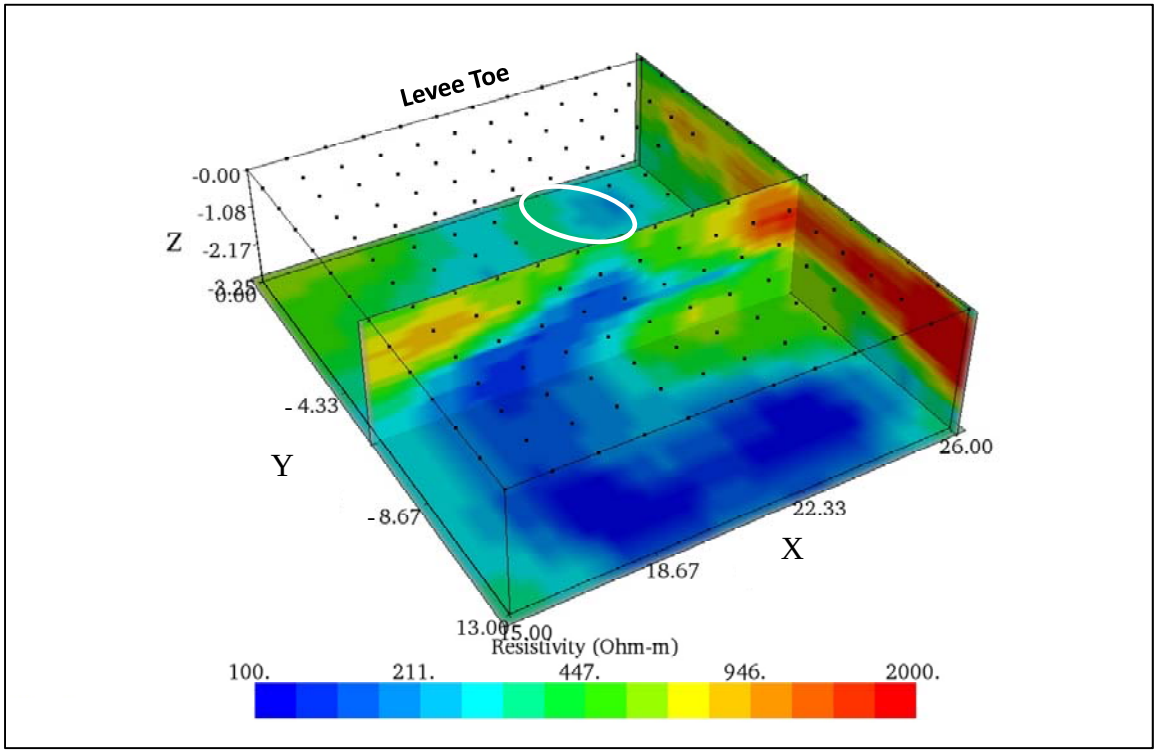


Figure C142. Slice along Y=-7.00 m, 3D processing, Burlington, WA.

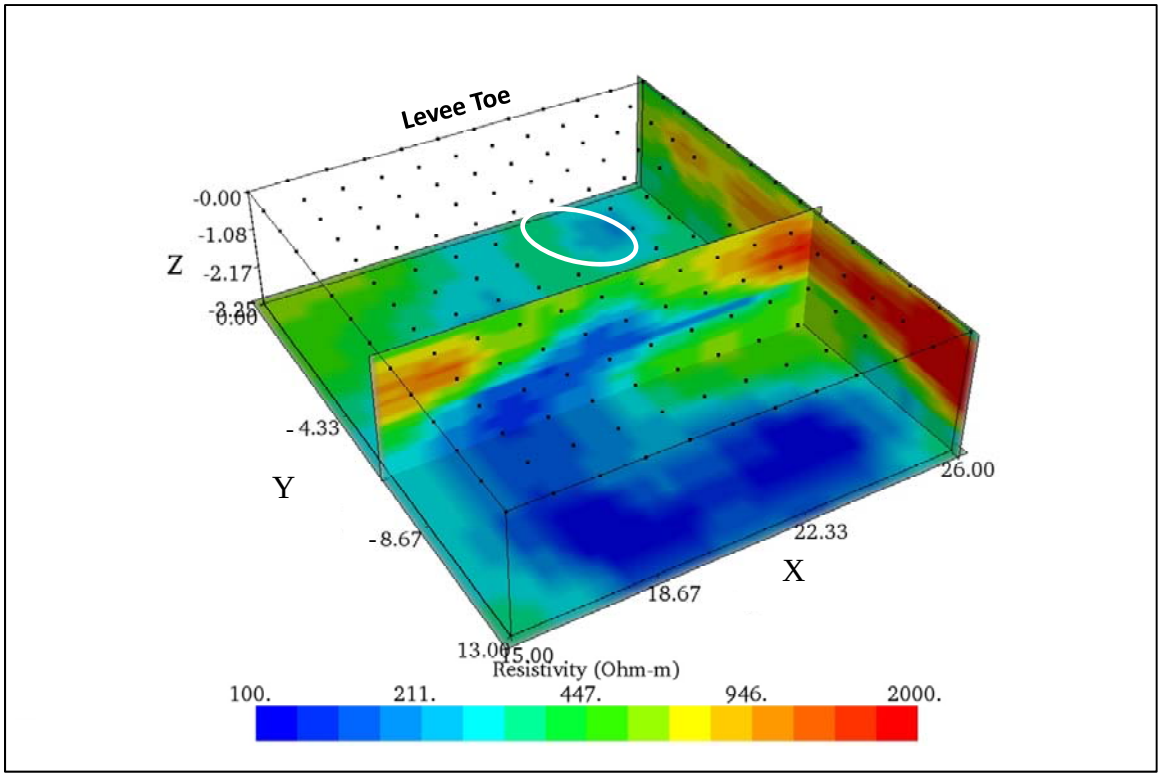


Figure C143. Slice along Y=-7.50 m, 3D processing, Burlington, WA.

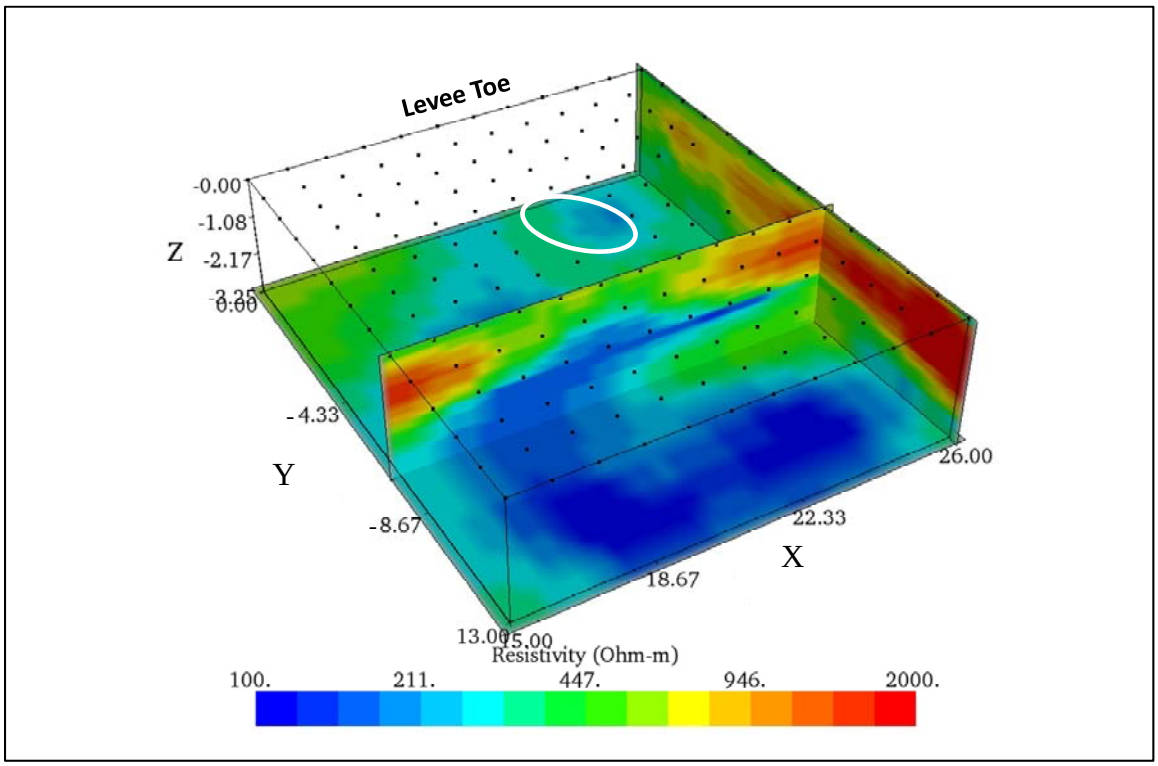


Figure C144. Slice along Y=-8.00 m, 3D processing, Burlington, WA.

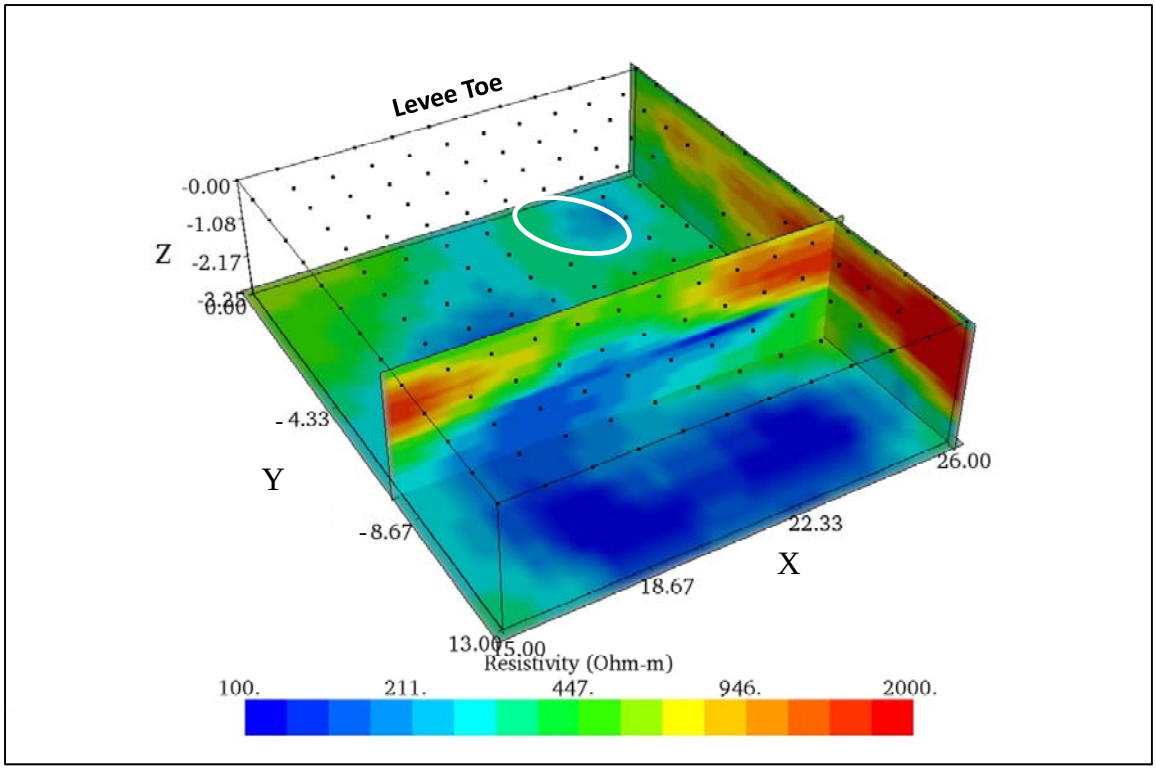


Figure C145. Slice along Y=-8.50 m, 3D processing, Burlington, WA.

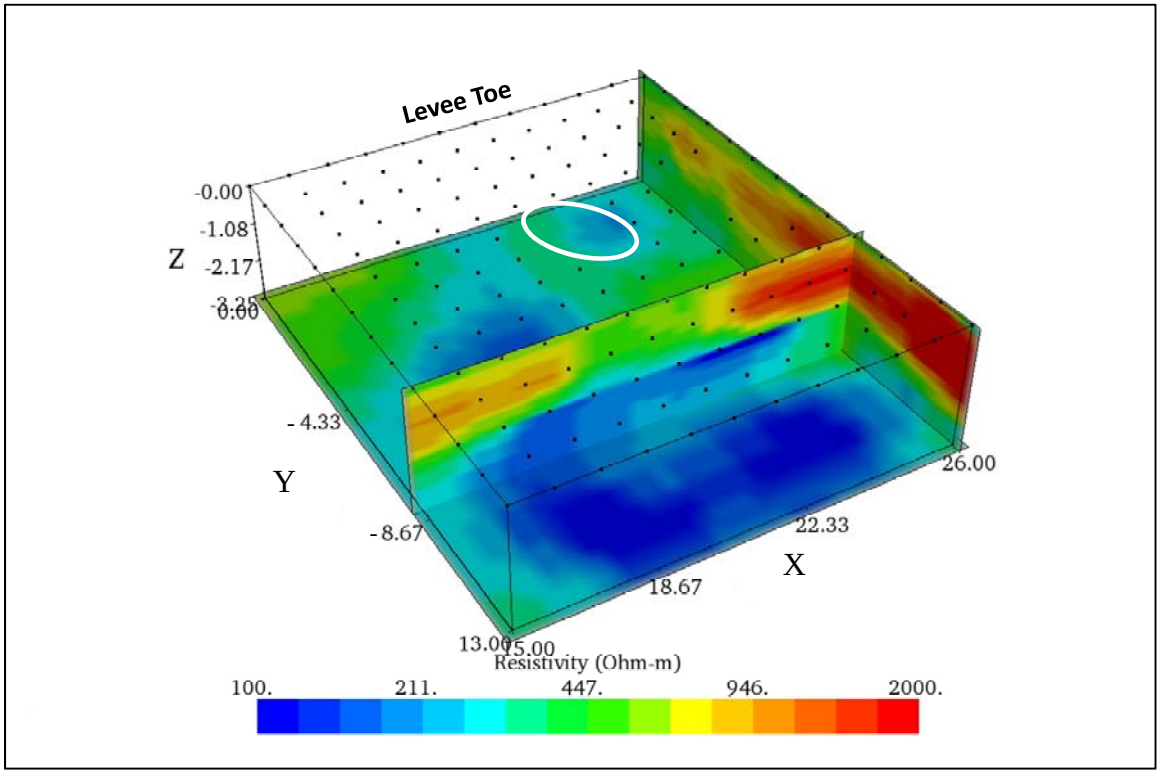


Figure C146. Slice along Y=-9.00 m, 3D processing, Burlington, WA.

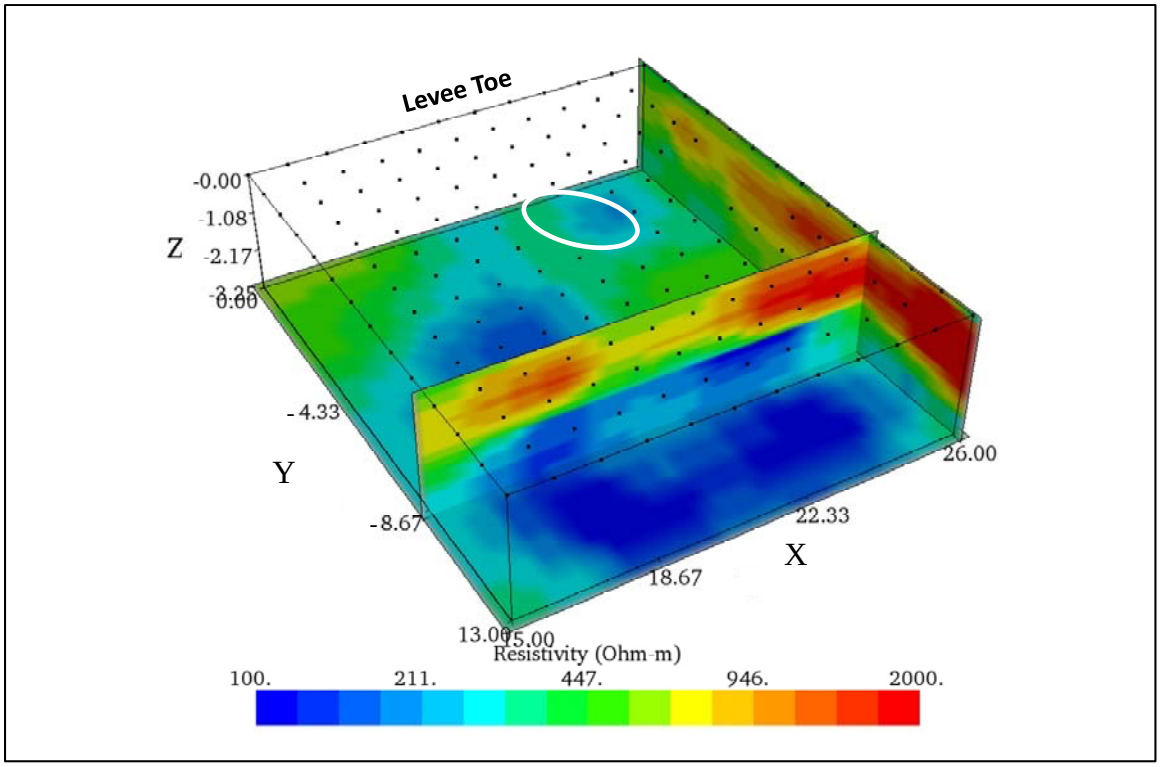


Figure C147. Slice along Y=-9.50 m, 3D processing, Burlington, WA.

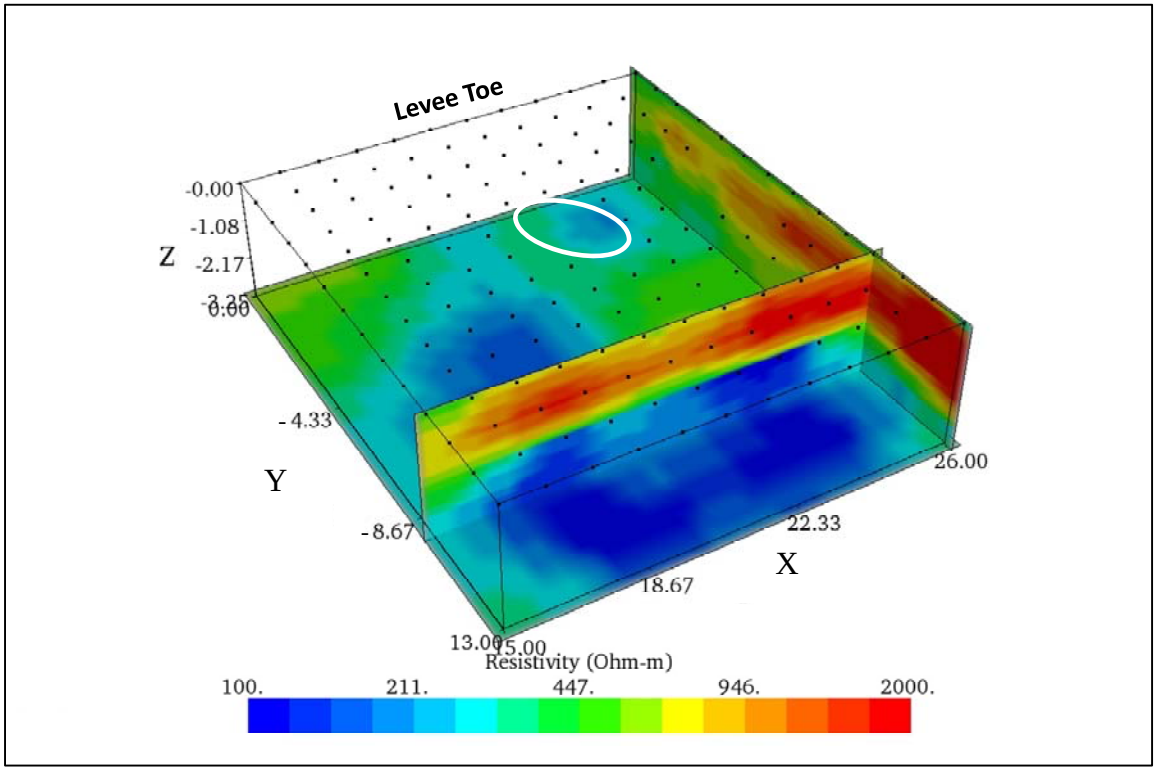


Figure C148. Slice along Y=-10.00 m, 3D processing, Burlington, WA.

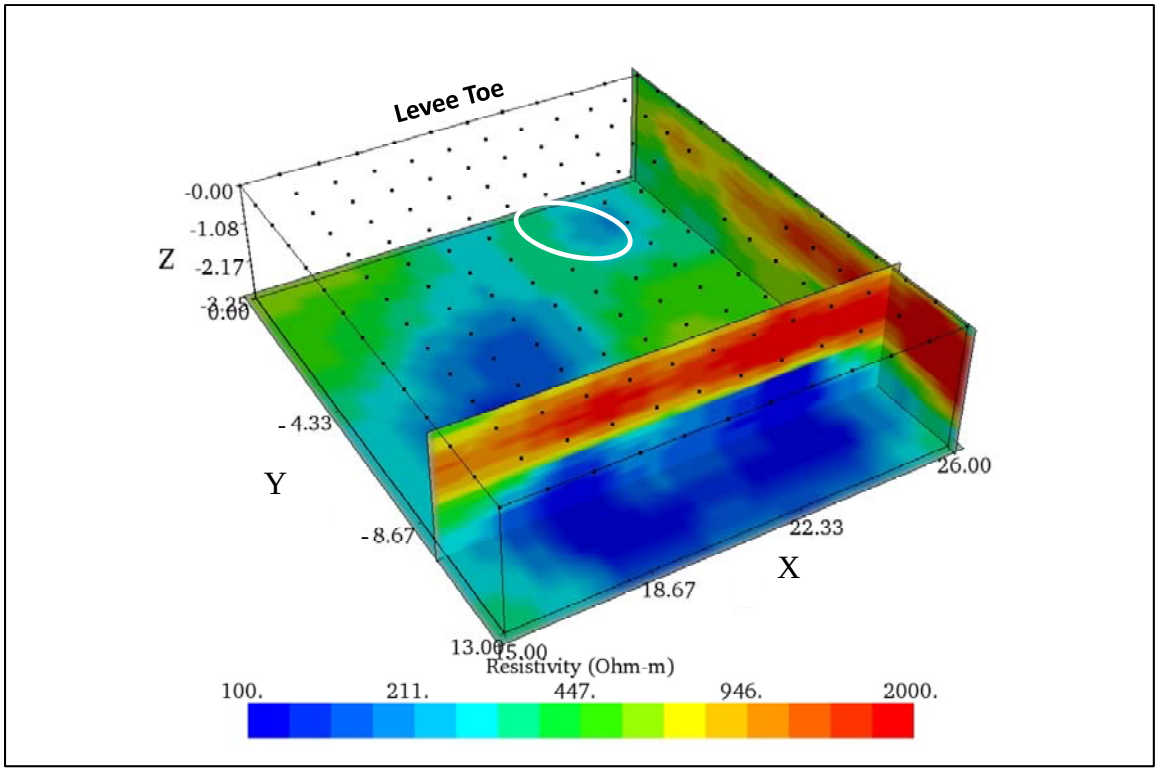


Figure C149. Slice along Y=-10.50 m, 3D processing, Burlington, WA.

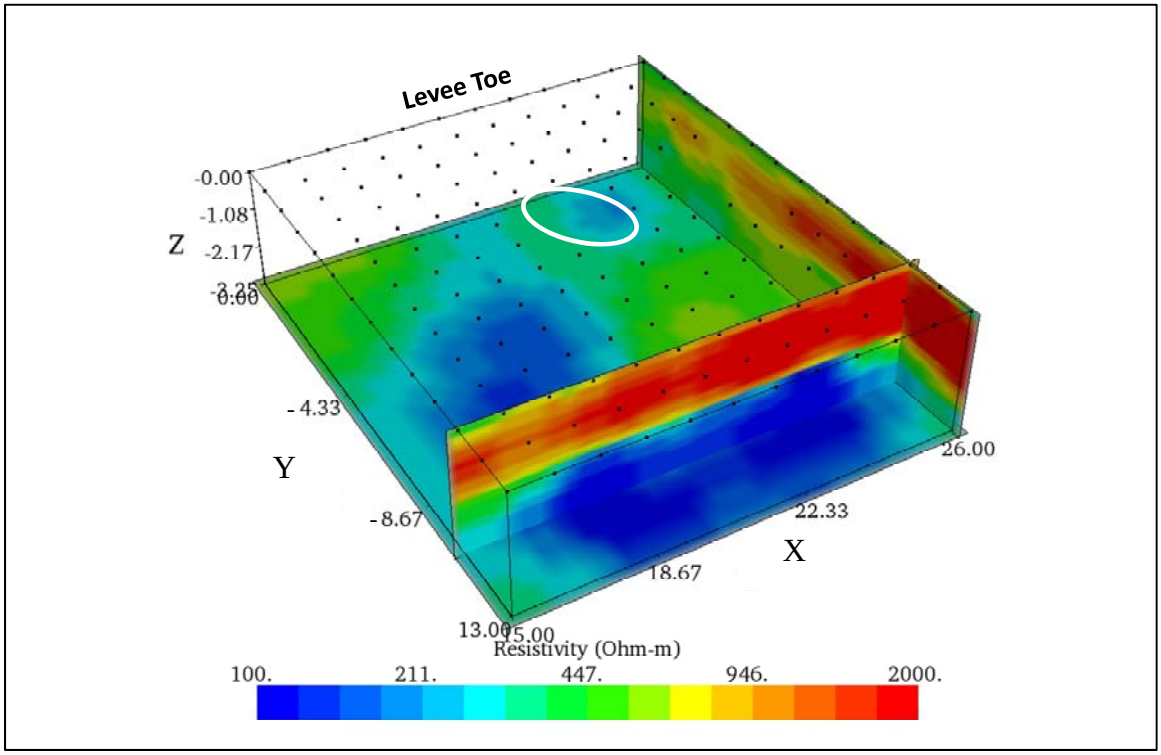


Figure C150. Slice along Y=11.00 m, 3D processing, Burlington, WA.

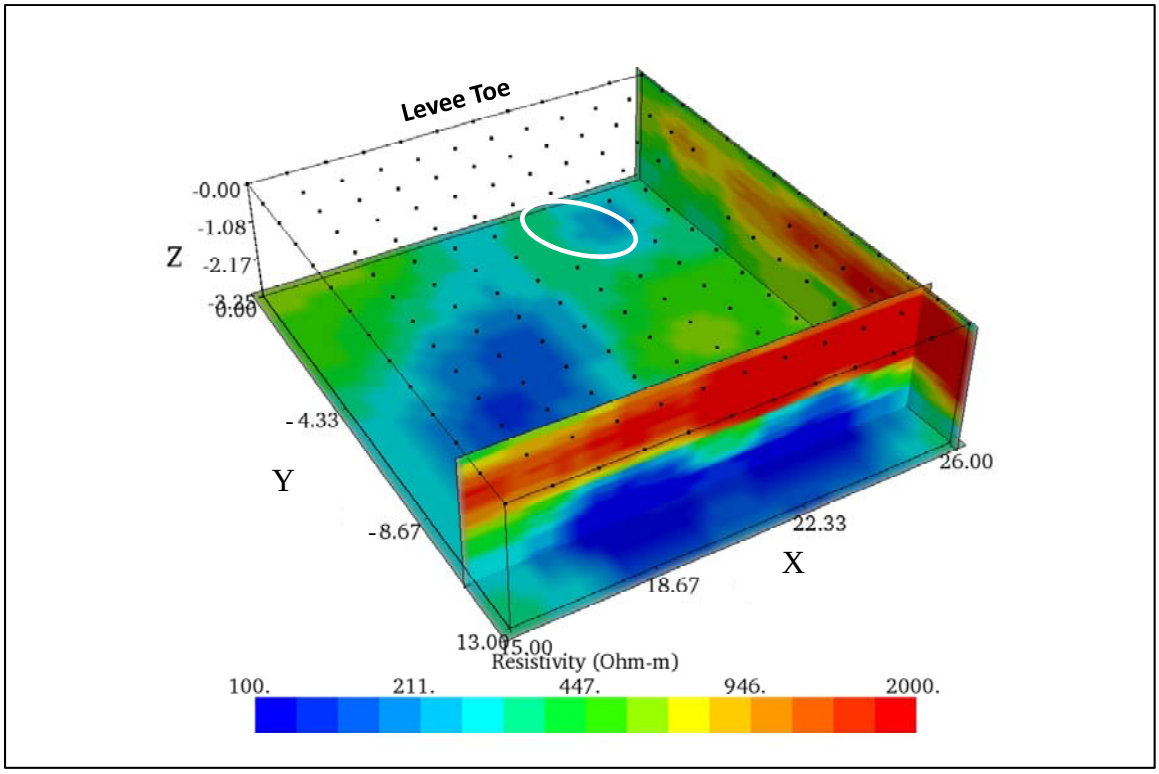


Figure C151. Slice along Y=-11.50 m, 3D processing, Burlington, WA.

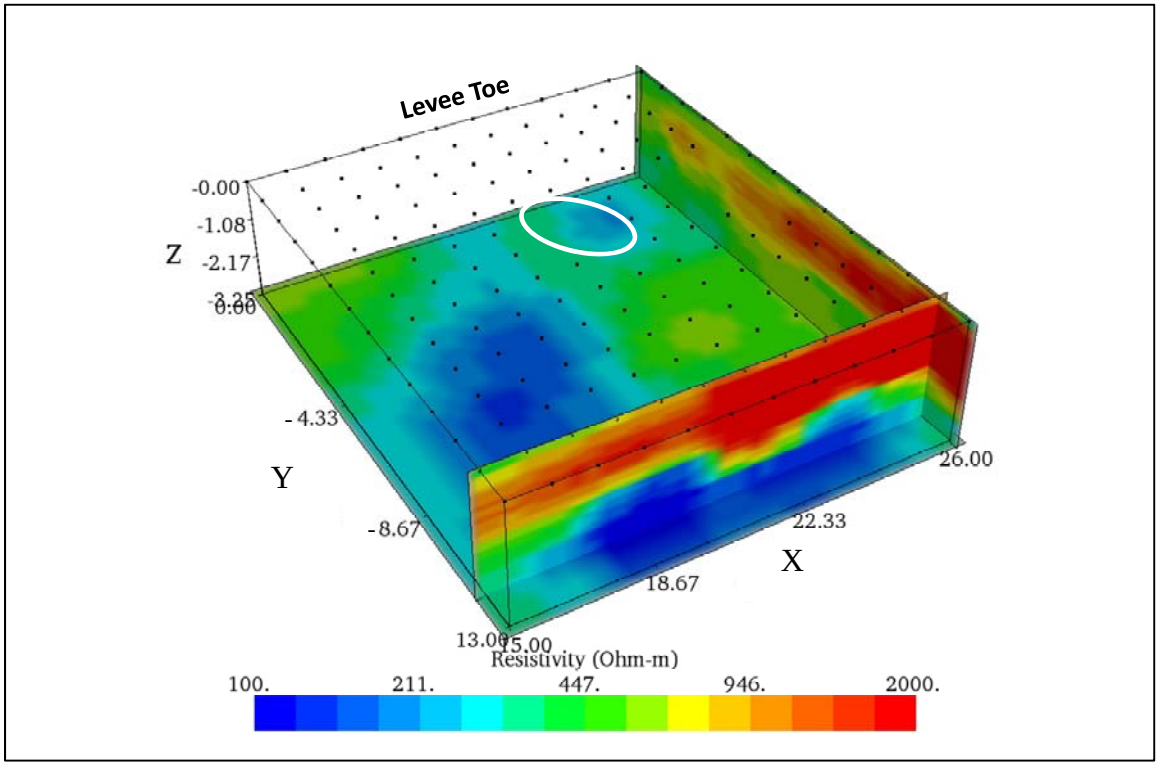


Figure C152. Slice along Y=-12.00 m, 3D processing, Burlington, WA.

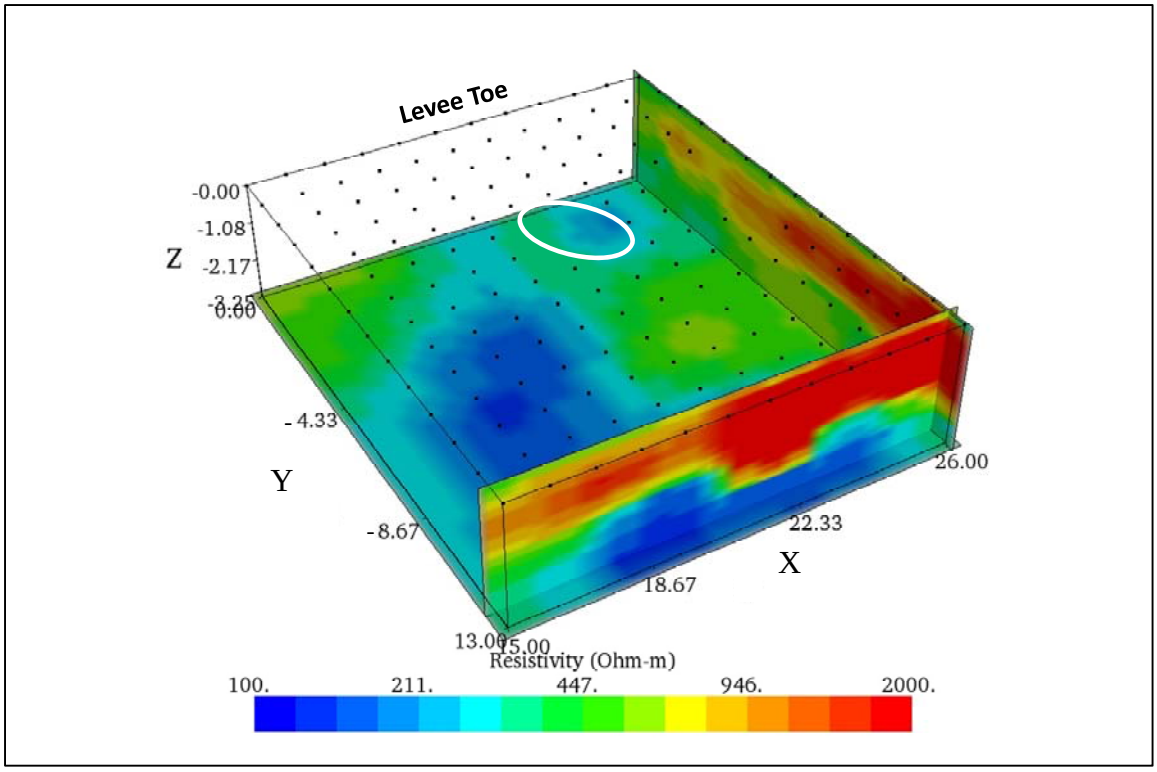


Figure C153. Slice along Y=-12.50 m, 3D processing, Burlington, WA.

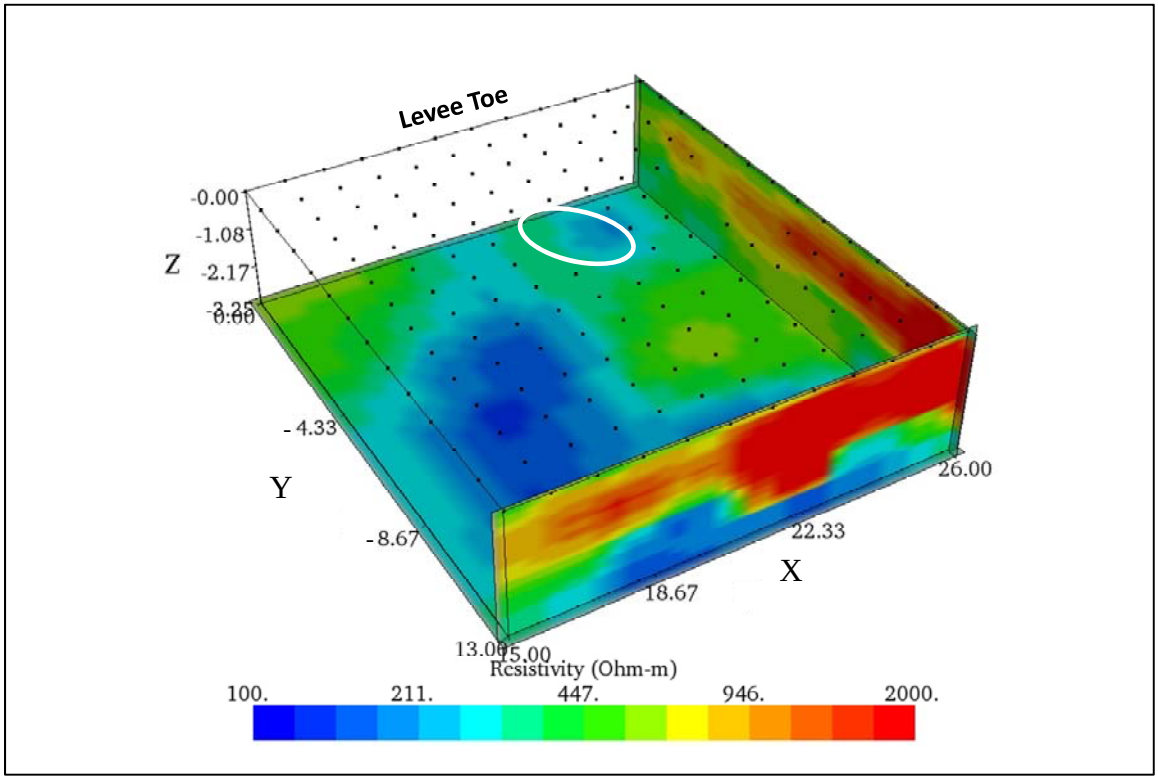


Figure C154. Slice along Y=-13.00 m, 3D processing, Burlington, WA.

3D Depth Slices, Lewisville Dam, Lewisville, TX

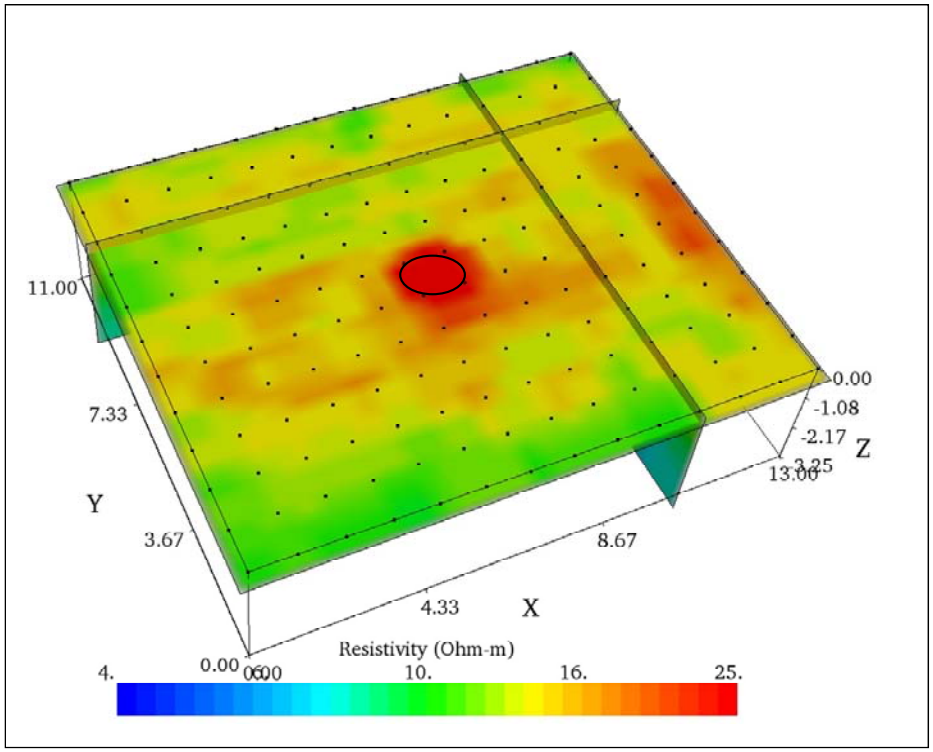


Figure C155. Depth slice at Z=-0.25 m, 3D inversion, Lewisville Dam, Lewisville, TX.

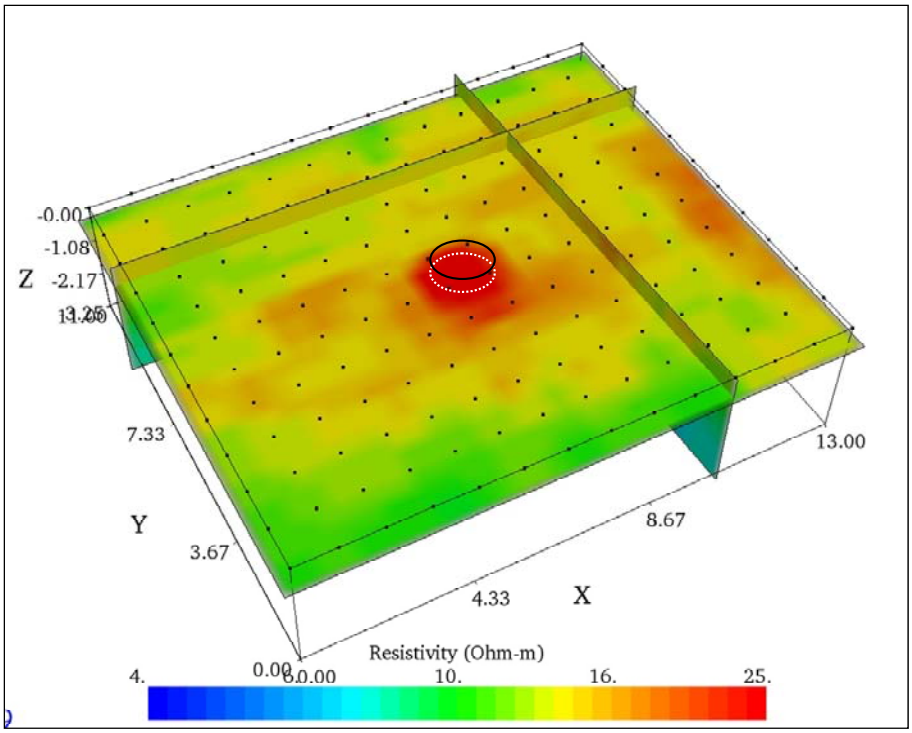


Figure C156. Depth slice at Z=-0.50 m, 3D inversion, Lewisville Dam, Lewisville, TX.

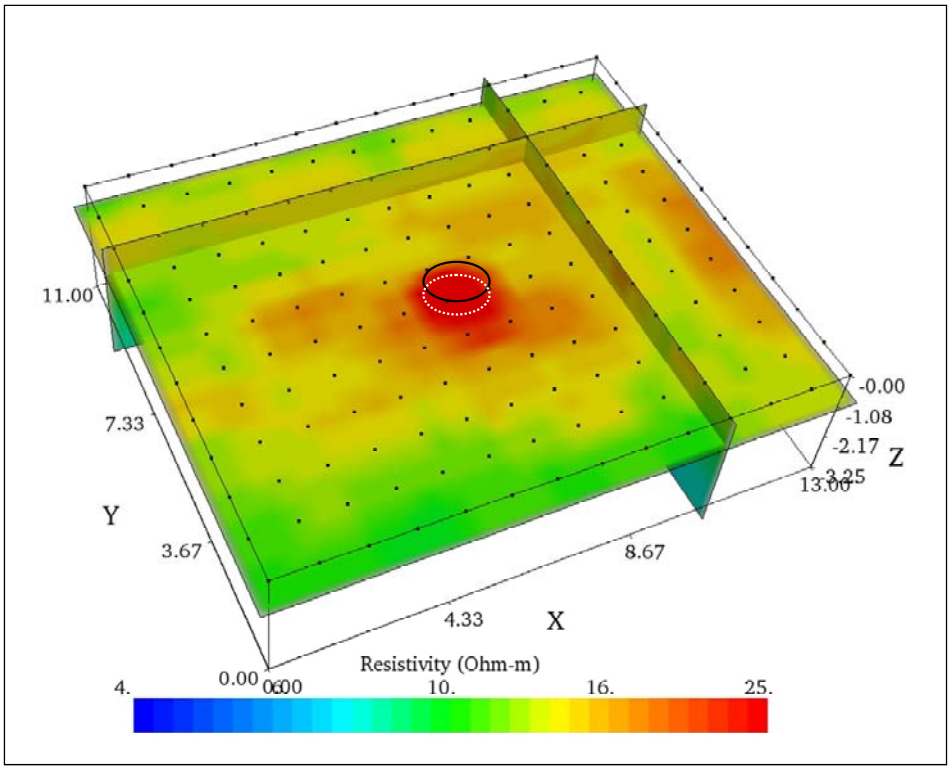


Figure C157. Depth slice at Z=0.75 m, 3D inversion, Lewisville Dam, Lewisville, TX.

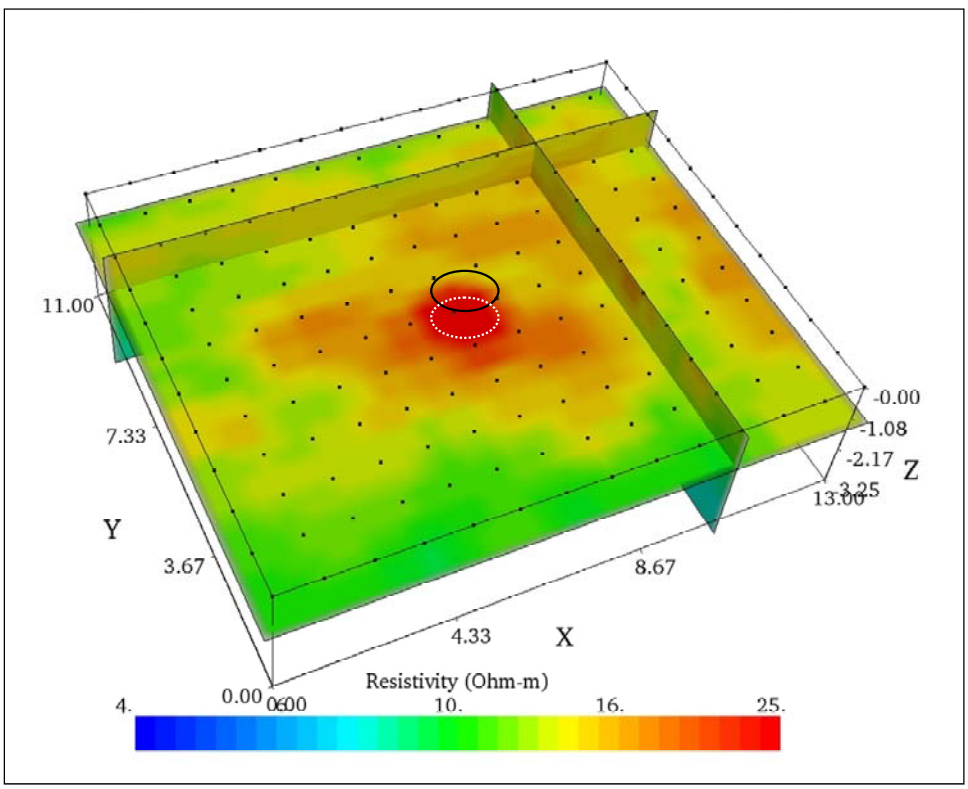


Figure C158. Depth slice at Z=-1.00 m, 3D inversion, Lewisville Dam, Lewisville, TX.

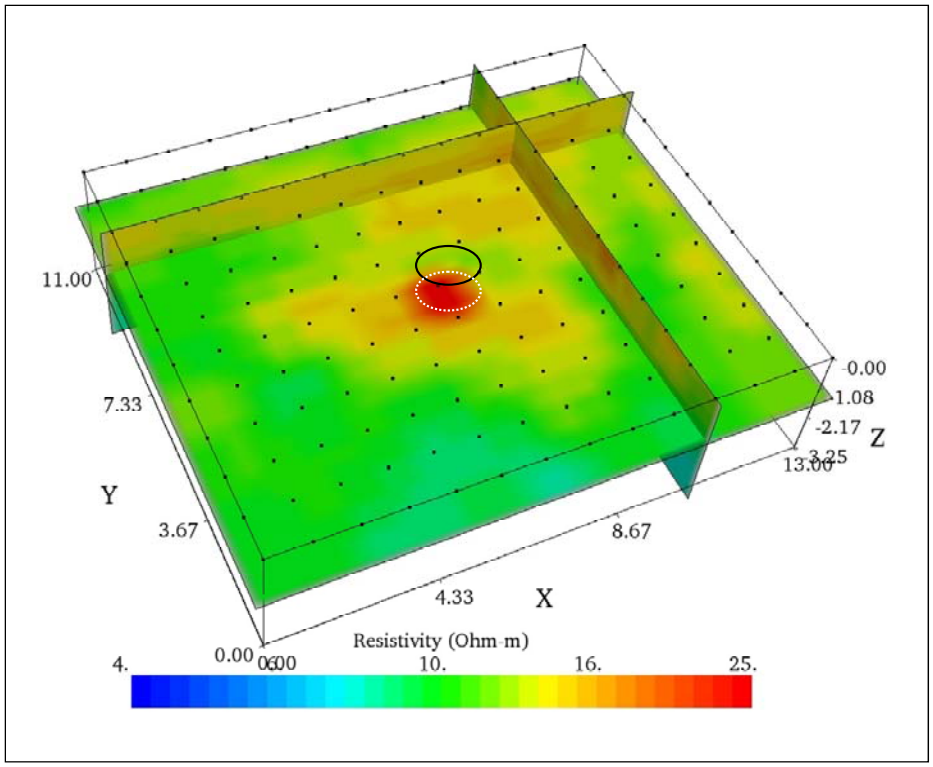


Figure C159. Depth slice at Z=1.25 m, 3D inversion, Lewisville Dam, Lewisville, TX.

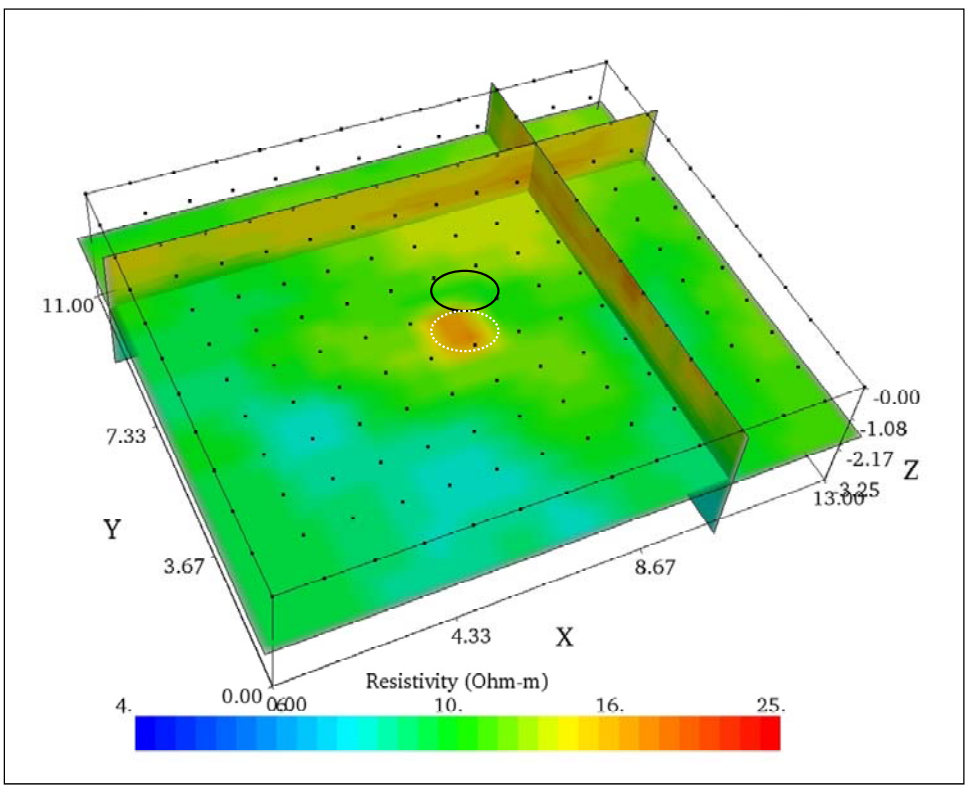


Figure C160. Depth slice at Z=-1.50 m, 3D inversion, Lewisville Dam, Lewisville, TX.

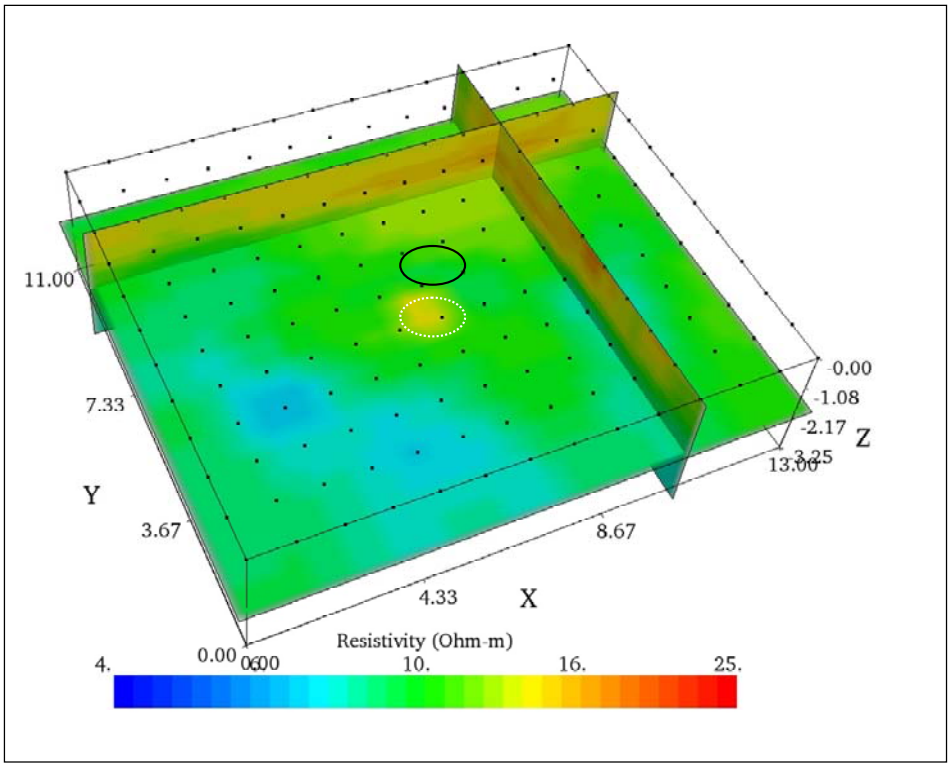


Figure C161. Depth slice at Z=1.75 m, 3D inversion, Lewisville Dam, Lewisville, TX.

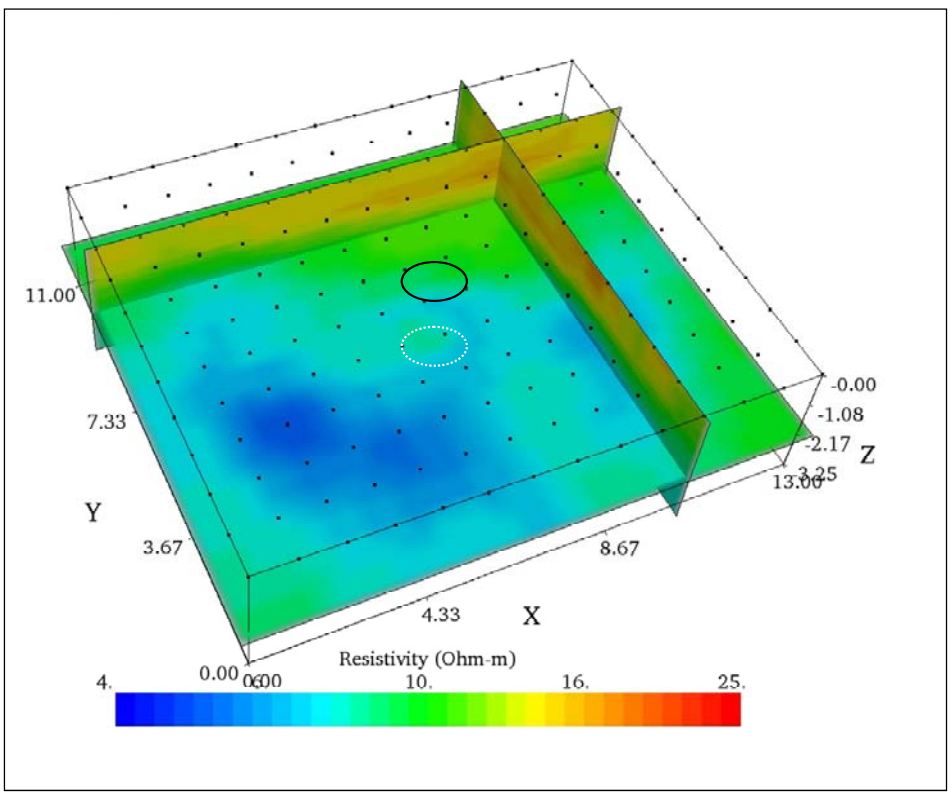


Figure C162. Depth slice at Z=-2.00 m, 3D inversion, Lewisville Dam, Lewisville, TX.

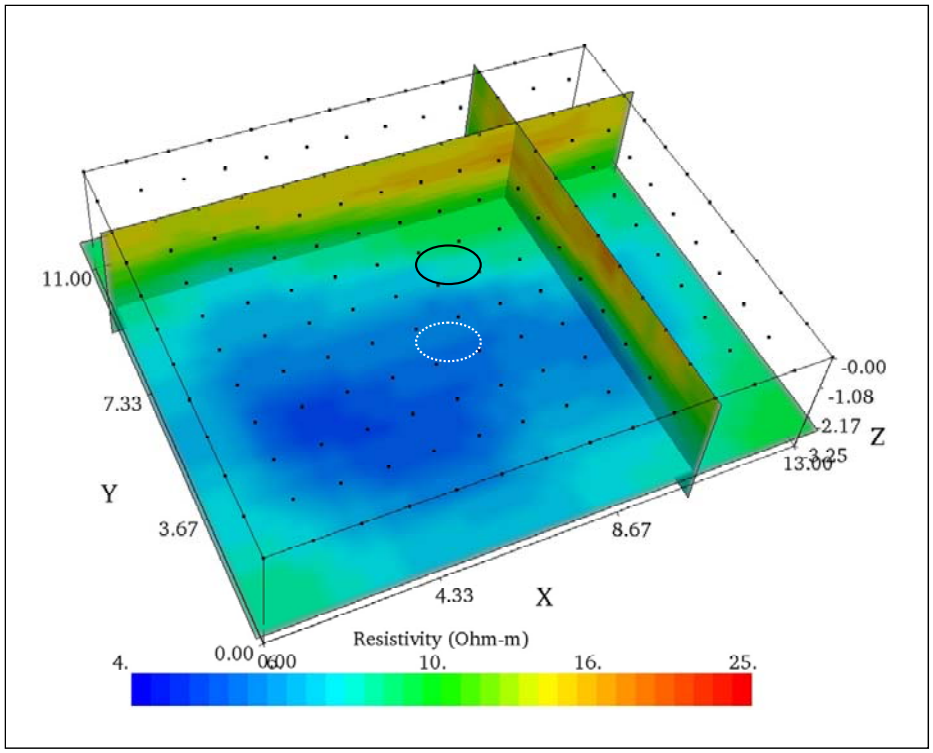


Figure C163. Depth slice at Z=2.50 m, 3D inversion, Lewisville Dam, Lewisville, TX.

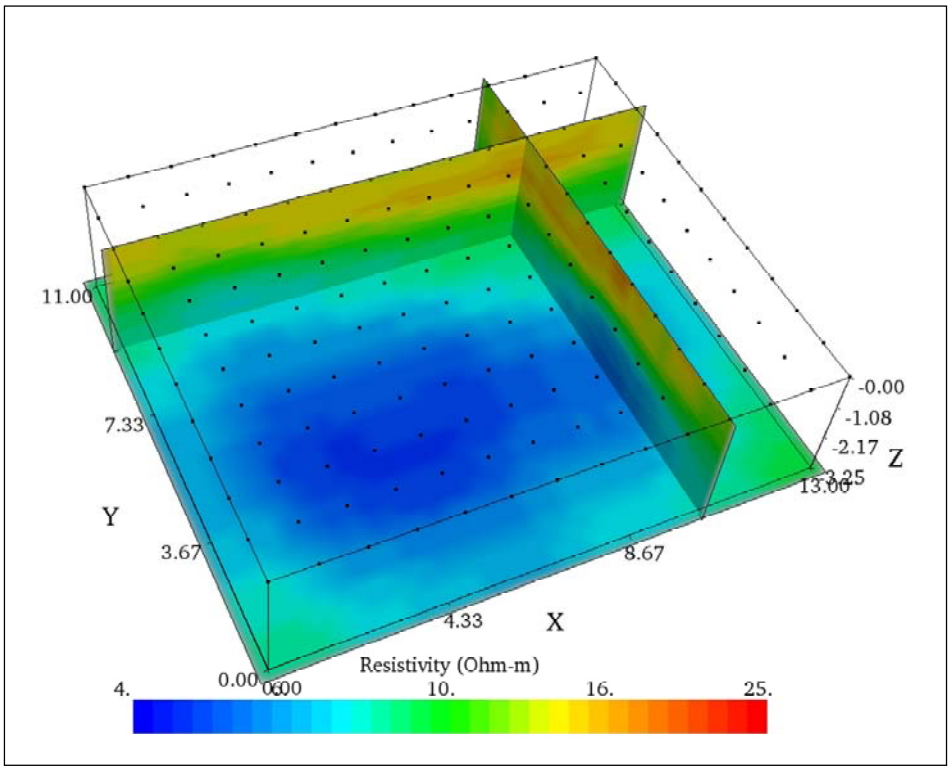


Figure C164. Depth slice at Z=-3.25 m, 3D inversion, Lewisville Dam, Lewisville, TX.

Slices Taken Parallel to the Y-Axis, Lewisville Dam, Lewisville, TX

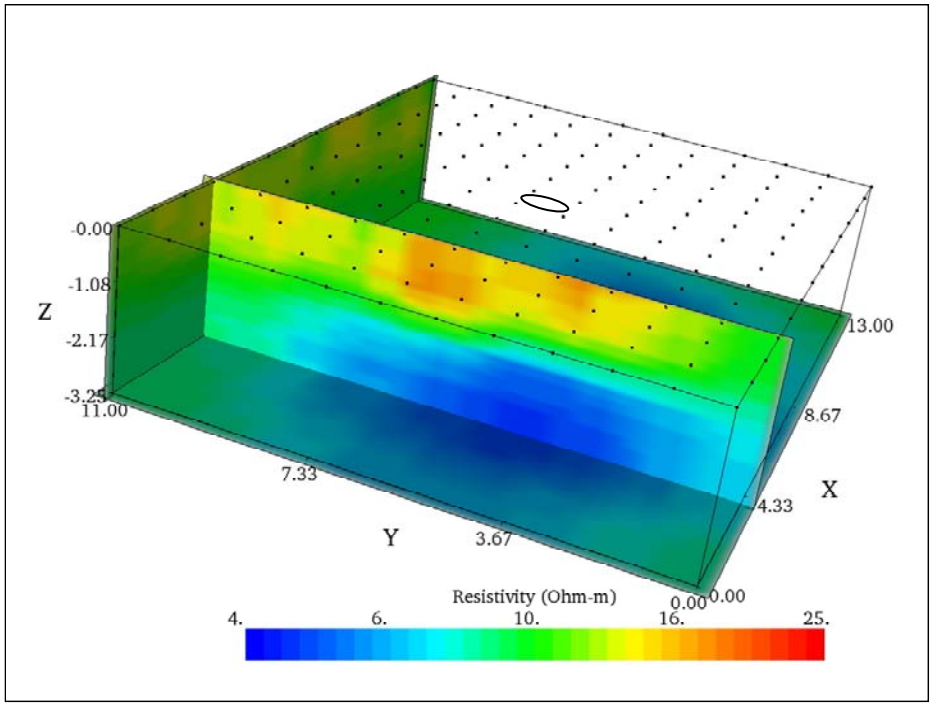


Figure C165. Slice along X=3.00 m, 3D processing, Lewisville Dam, Lewisville, TX.

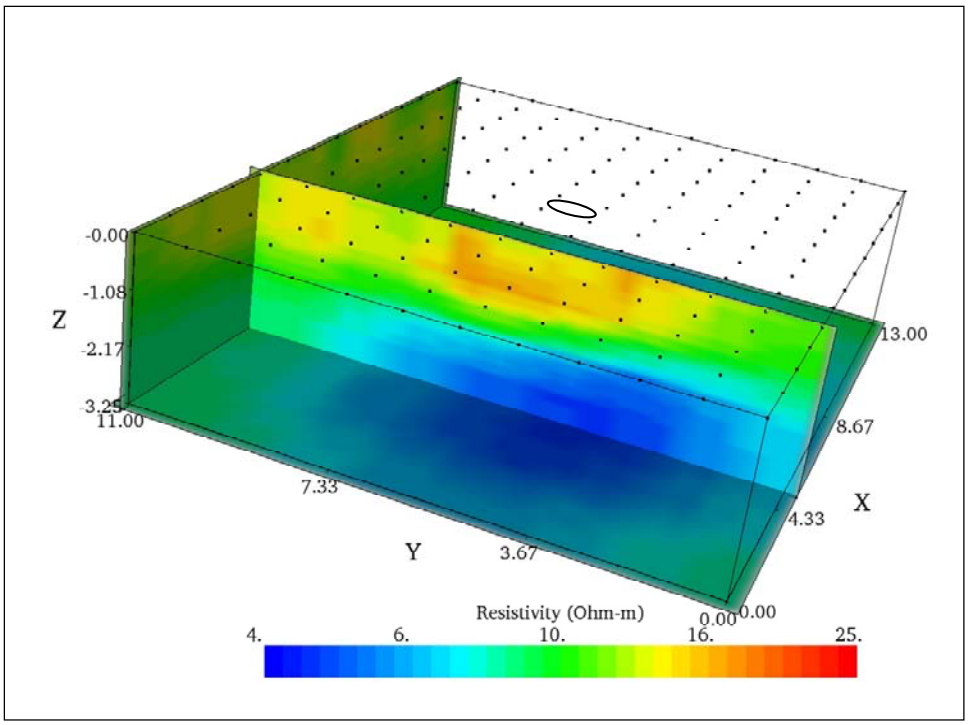


Figure C166. Slice along X=4.00 m, 3D processing, Lewisville Dam, Lewisville, TX.

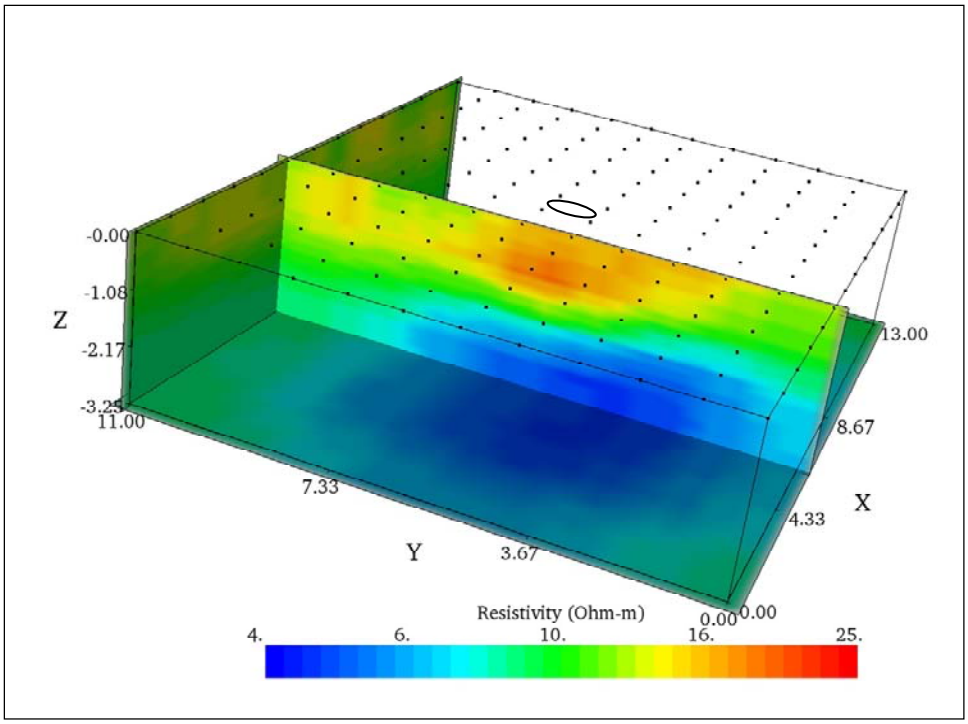


Figure C167. Slice along X=5.00 m, 3D processing, Lewisville Dam, Lewisville, TX.

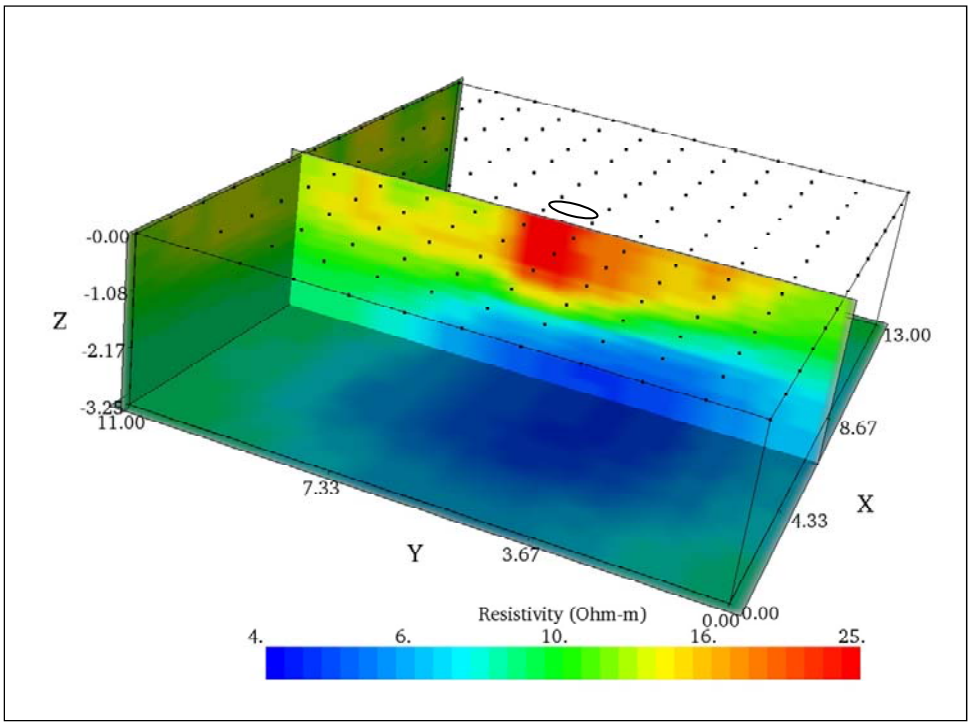


Figure C168. Slice along X=5.50 m, 3D processing, Lewisville Dam, Lewisville, TX.

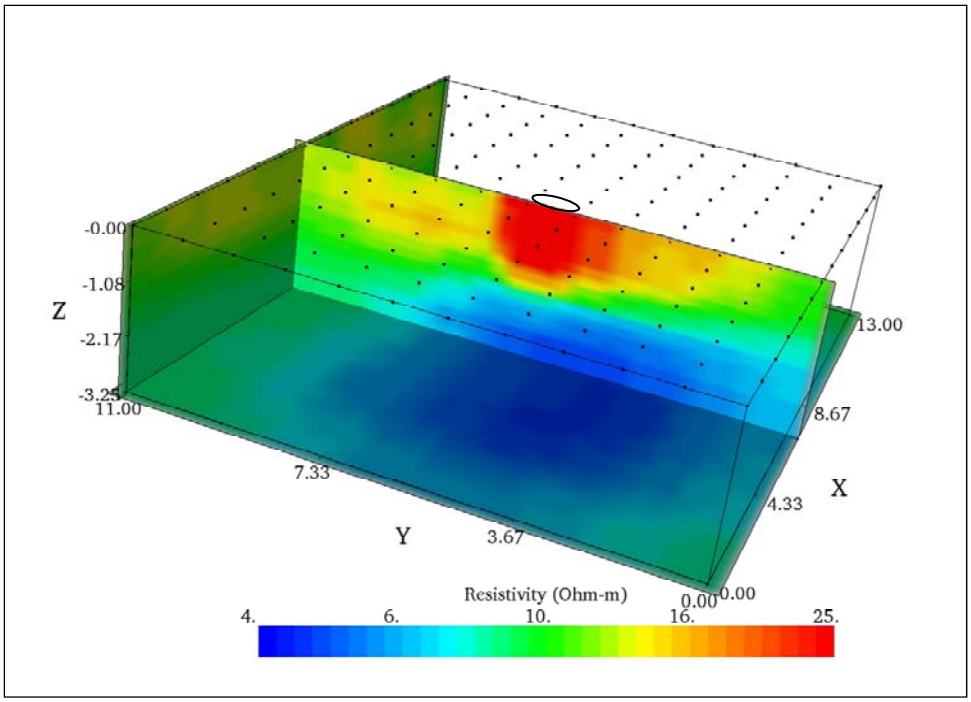


Figure C169. Slice along X=6.00 m, 3D processing, Lewisville Dam, Lewisville, TX.

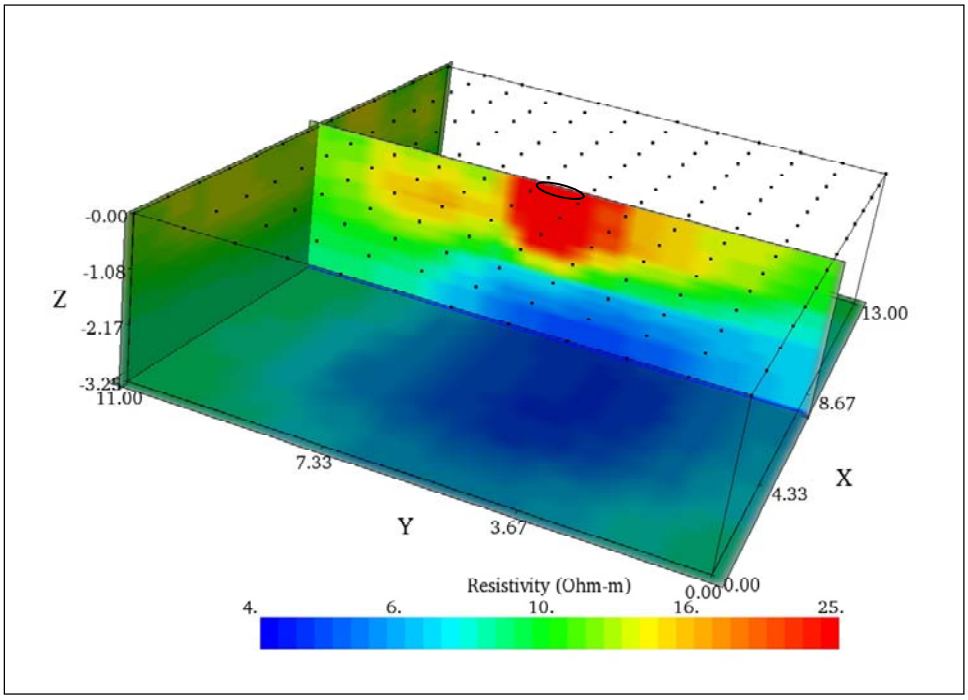


Figure C170. Slice along X=6.50 m, 3D processing, Lewisville Dam, Lewisville, TX.

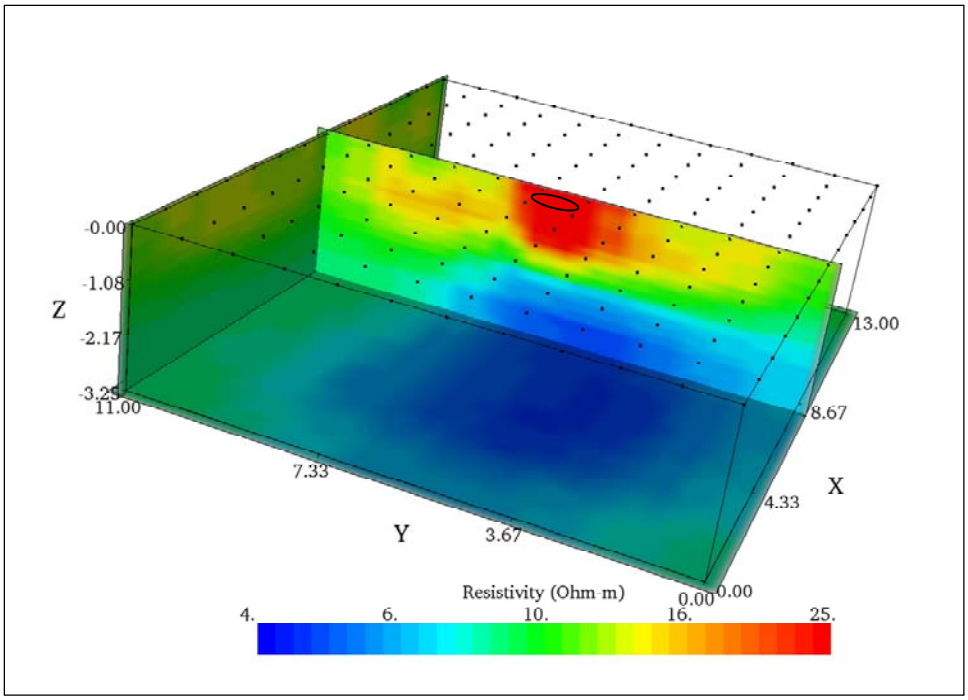


Figure C171. Slice along X=7.00 m, 3D processing, Lewisville Dam, Lewisville, TX.

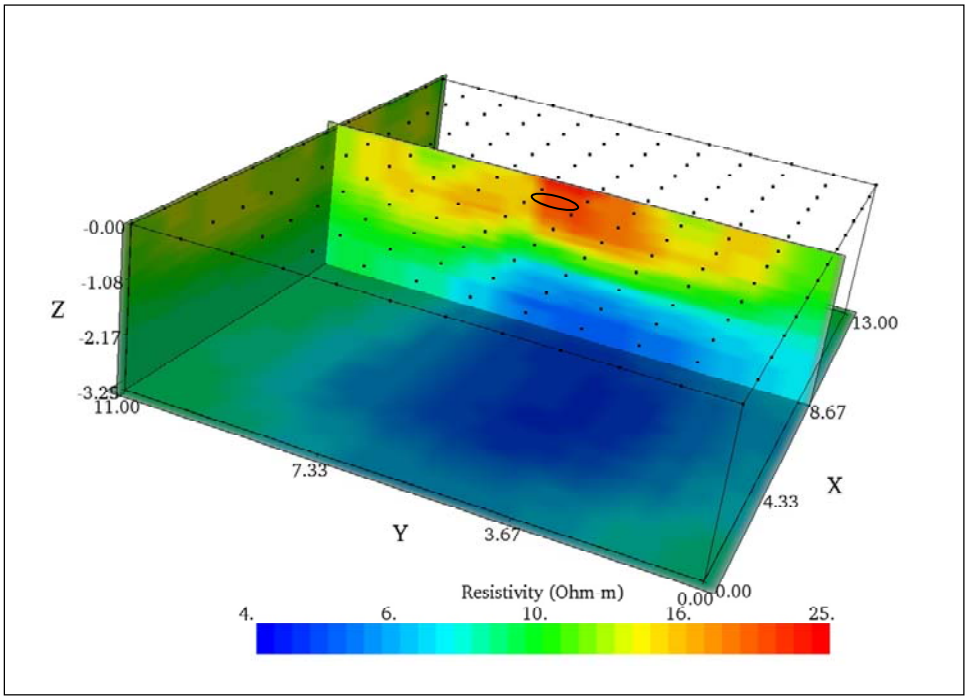


Figure C172. Slice along X=7.50 m, 3D processing, Lewisville Dam, Lewisville, TX.

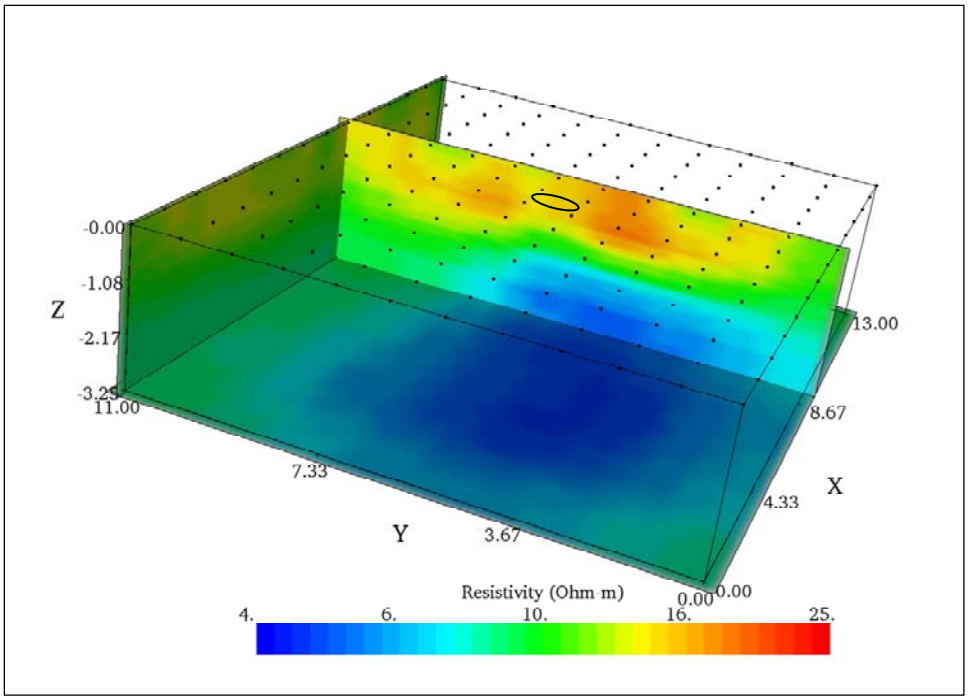


Figure C173. Slice along X=8.00 m, 3D processing, Lewisville Dam, Lewisville, TX.

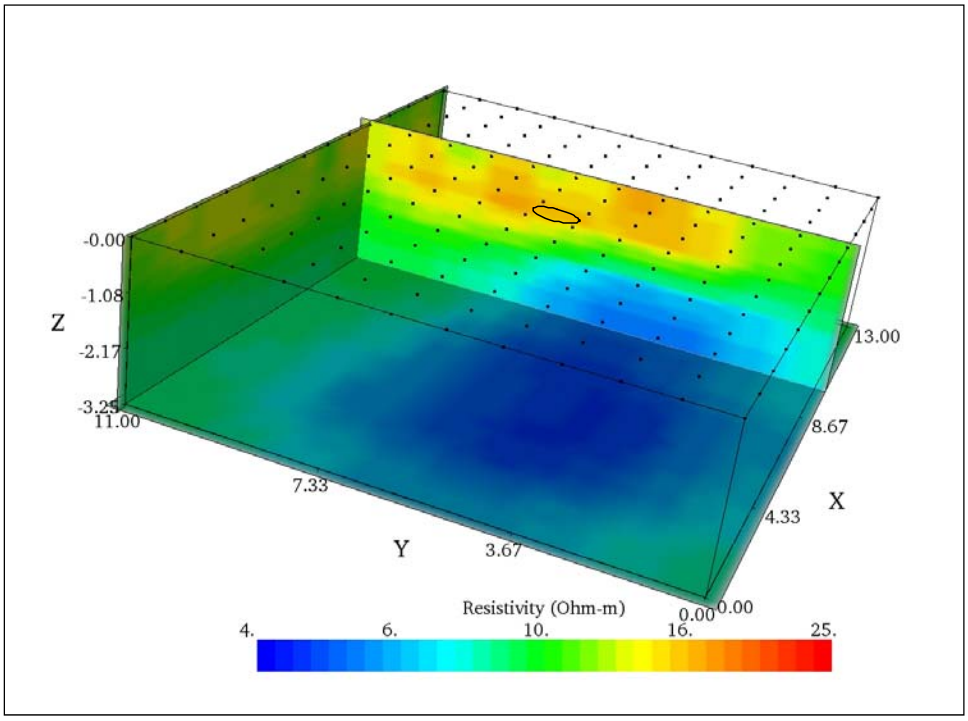


Figure C174. Slice along X=9.00 m, 3D processing, Lewisville Dam, Lewisville, TX.

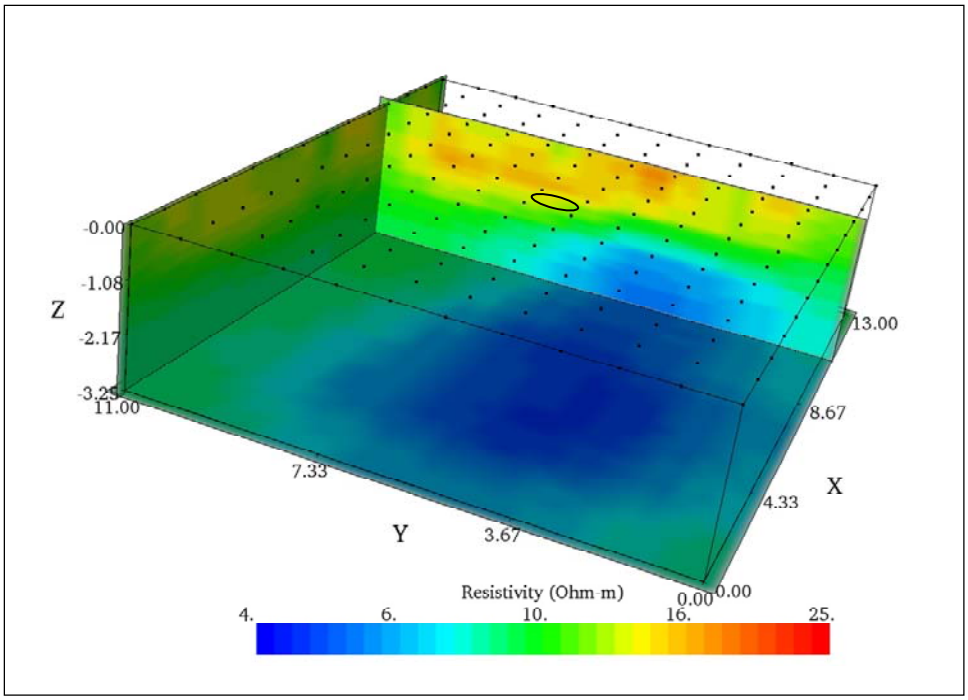


Figure C175. Slice along X=10.00 m, 3D processing, Lewisville Dam, Lewisville, TX.

3D Depth Slices, Vicksburg, MS

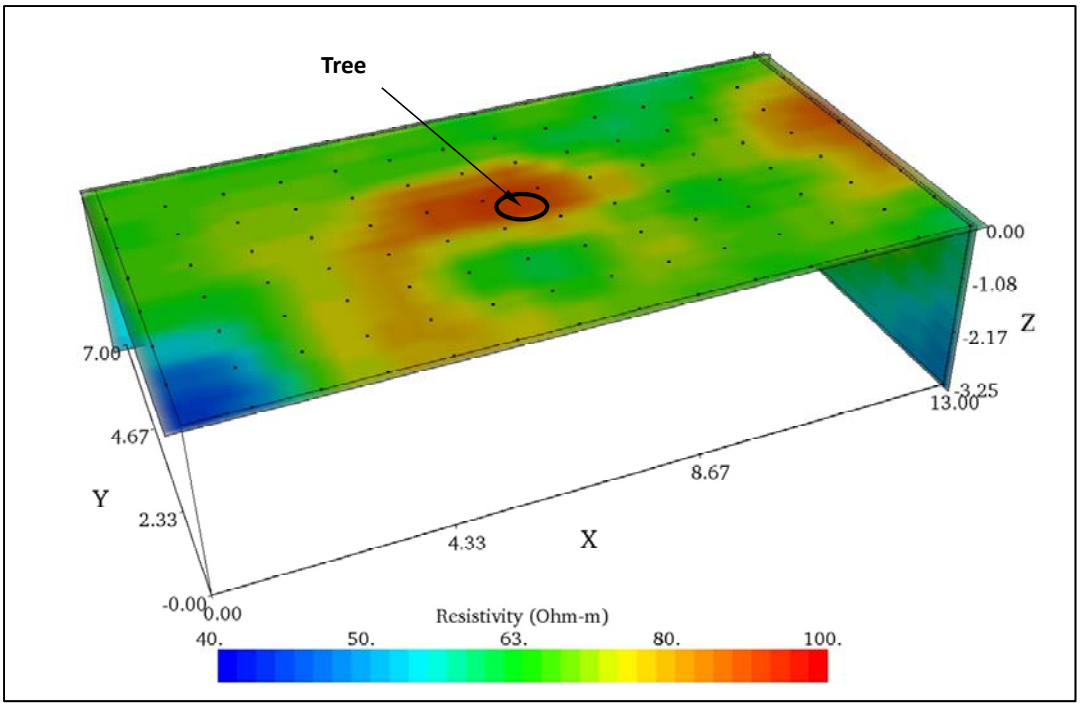


Figure C176. Depth slice at Z=0.00 m, 3D inversion, Vicksburg, MS.

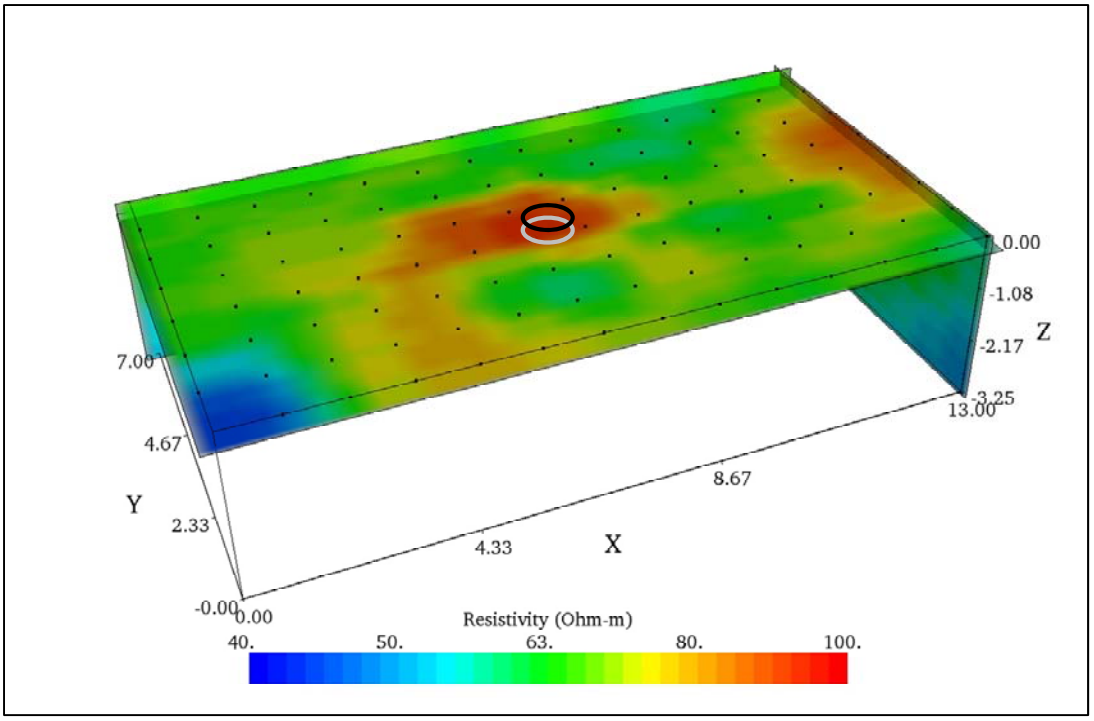


Figure C177. Depth slice at Z=-0.25 m, 3D inversion, Vicksburg, MS.

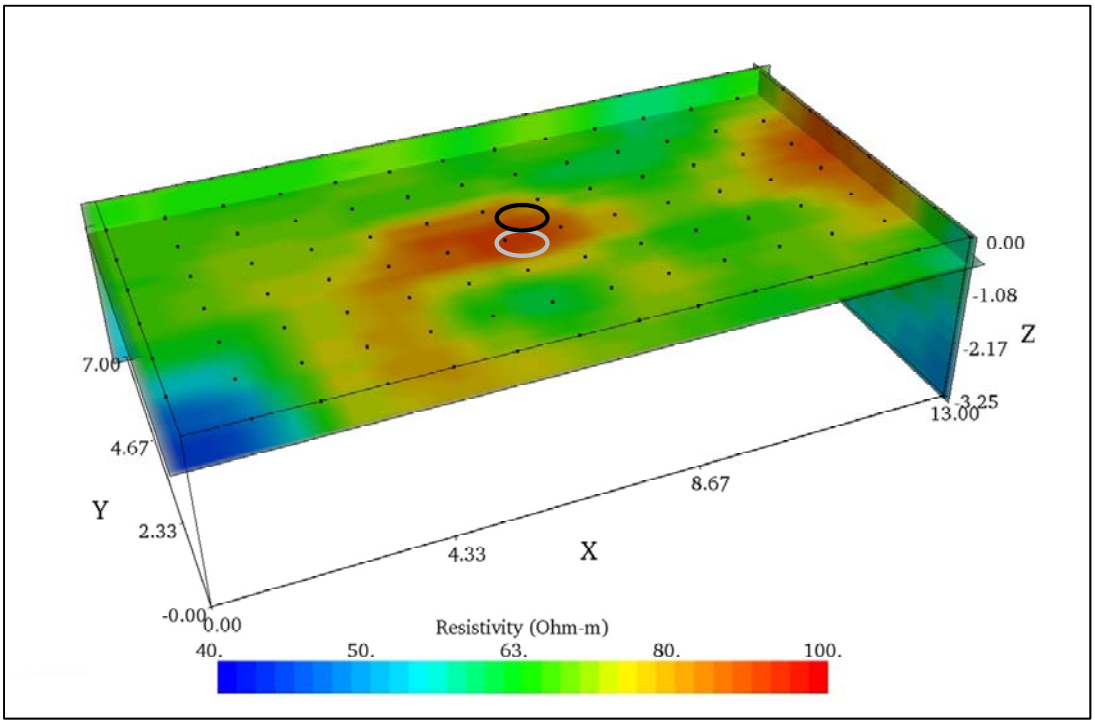


Figure C178. Depth slice at Z=-0.50 m, 3D inversion, Vicksburg, MS.

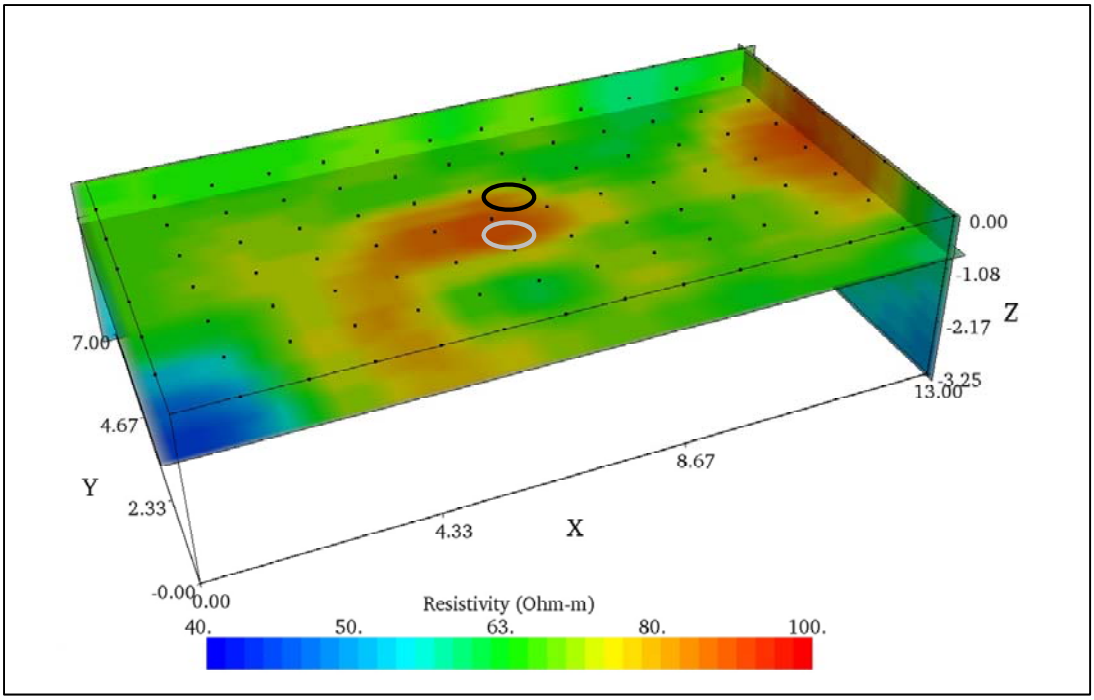


Figure C179. Depth slice at Z=-0.75 m, 3D inversion, Vicksburg, MS.

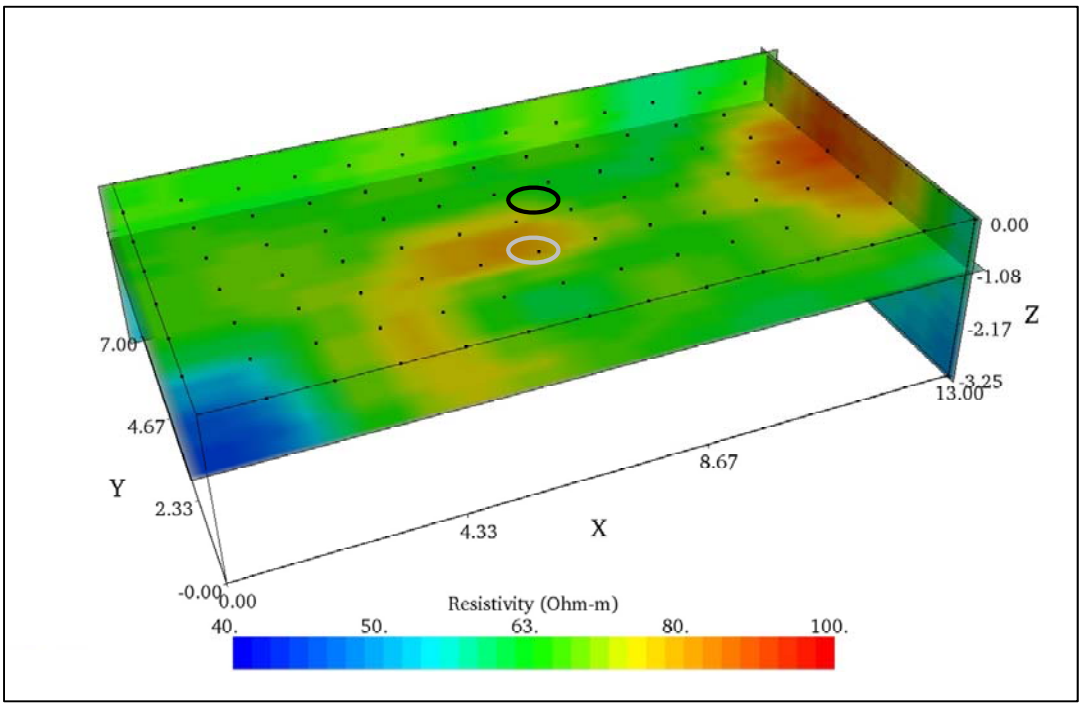


Figure C180. Depth slice at Z=-1.00 m, 3D inversion, Vicksburg, MS.

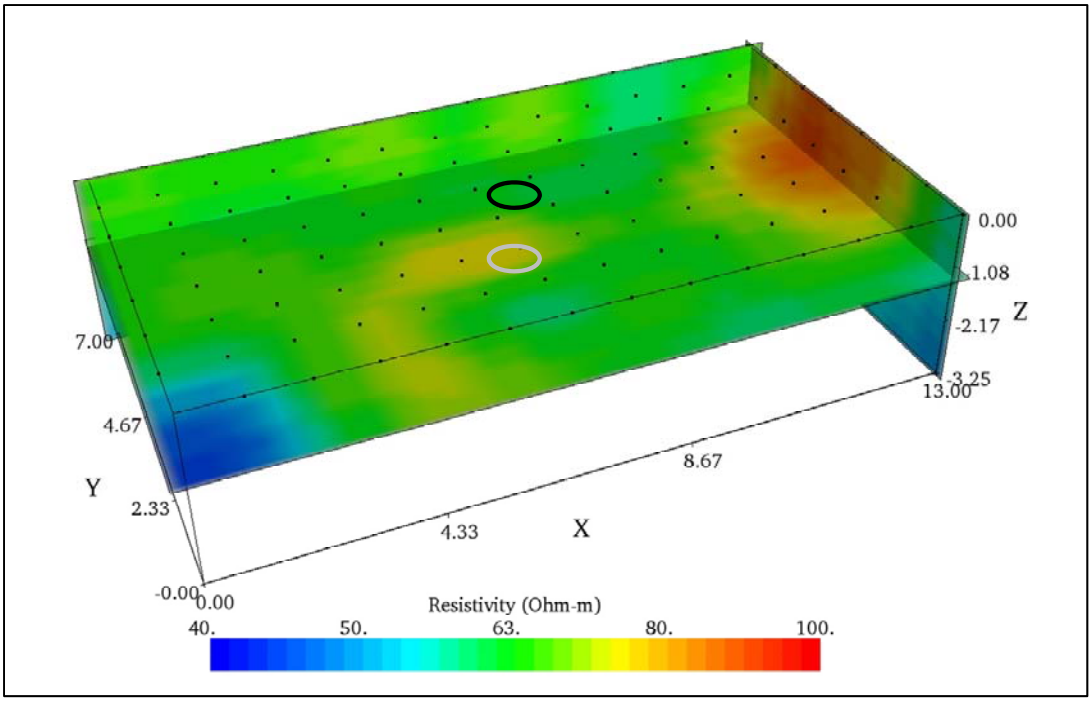


Figure C181. Depth slice at Z=-1.25 m, 3D inversion, Vicksburg, MS.

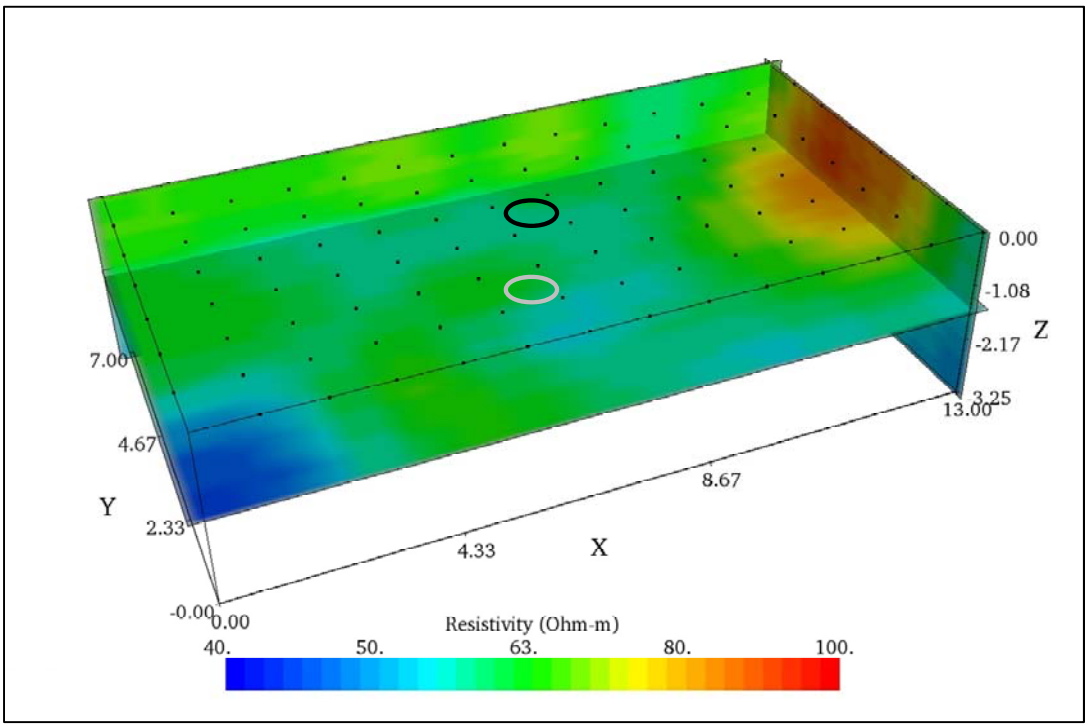


Figure C182. Depth slice at Z=-1.50 m, 3D inversion, Vicksburg, MS.

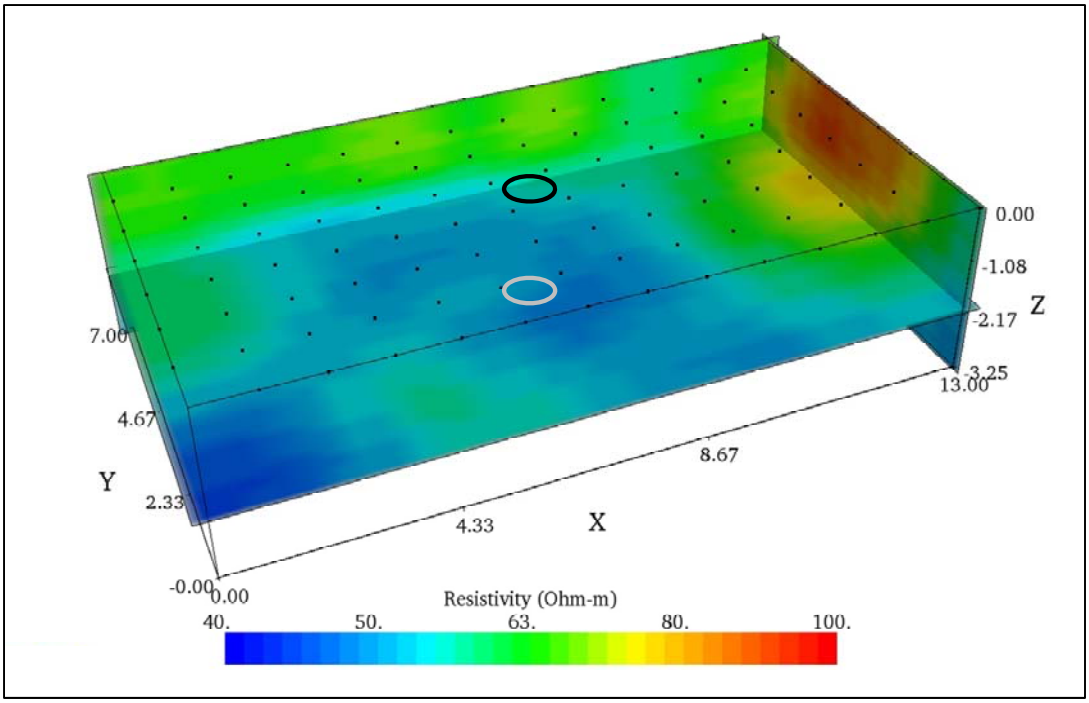


Figure C183. Depth slice at Z=-2.00 m, 3D inversion, Vicksburg, MS.

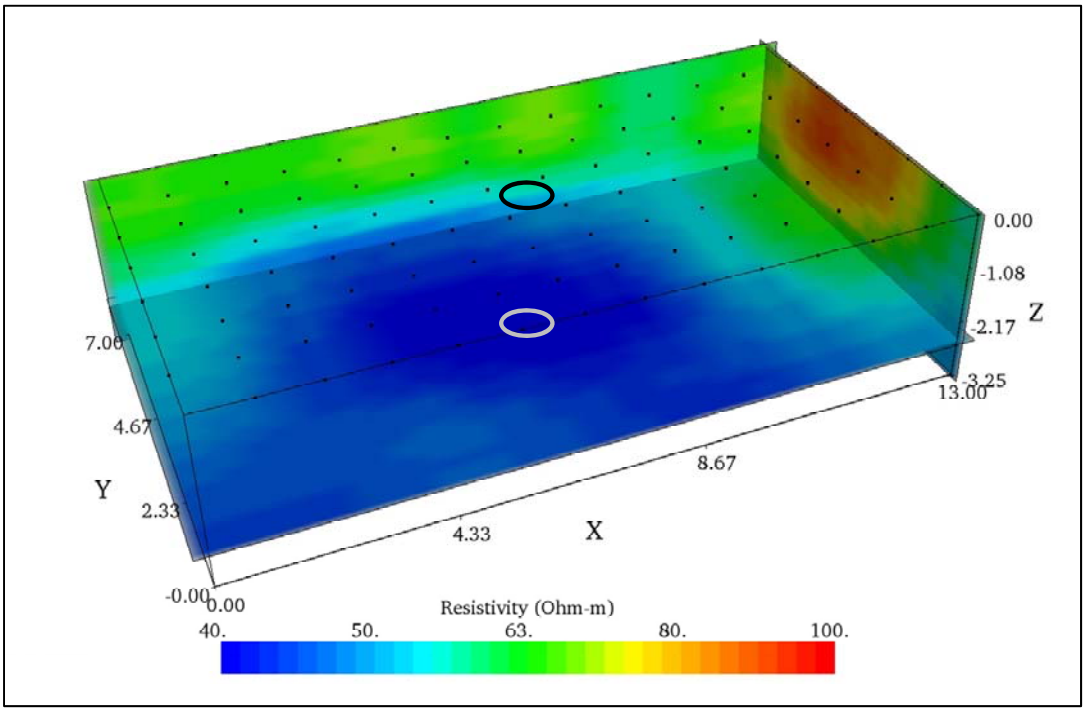


Figure C184. Depth slice at Z=-2.50 m, 3D inversion, Vicksburg, MS.

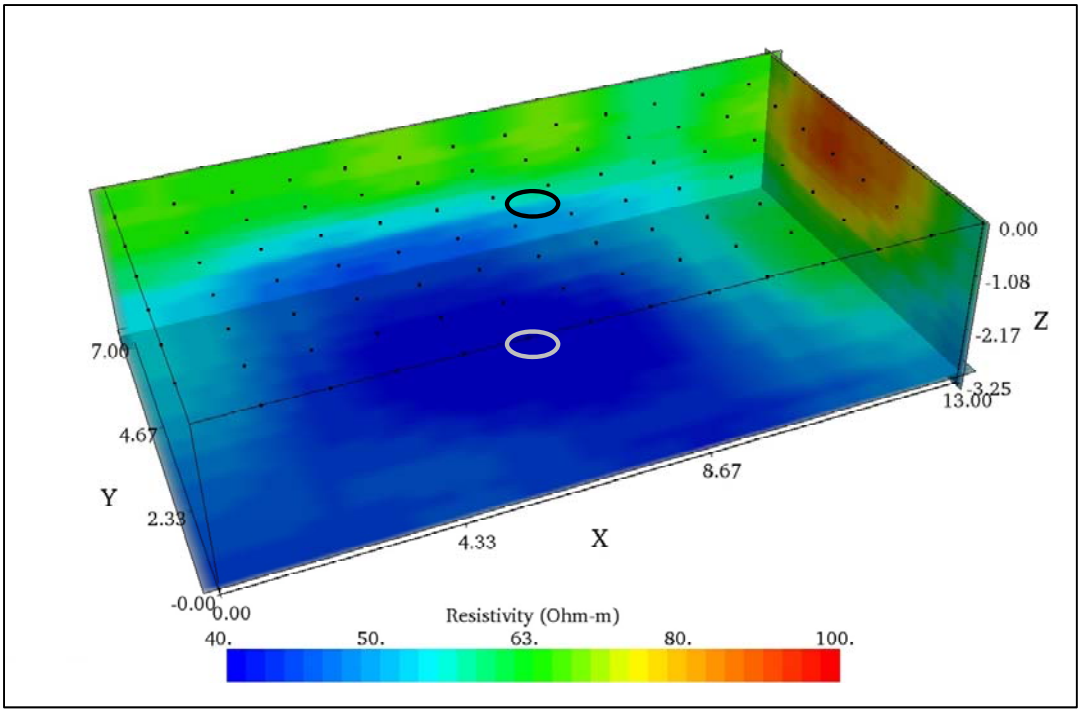


Figure C185. Depth slice at Z=-3.00 m, 3D inversion, Vicksburg, MS.

Slices Taken Parallel to the X-Axis, Vicksburg, MS

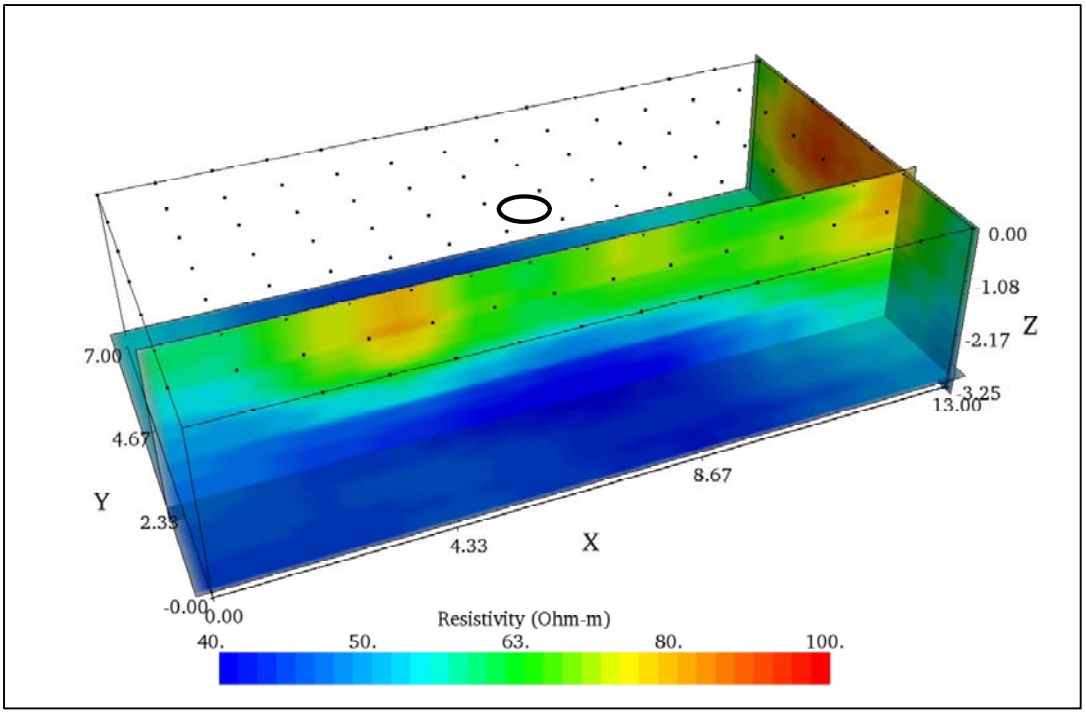


Figure C186. Slice along Y=2.00 m, 3D processing, Vicksburg, MS.

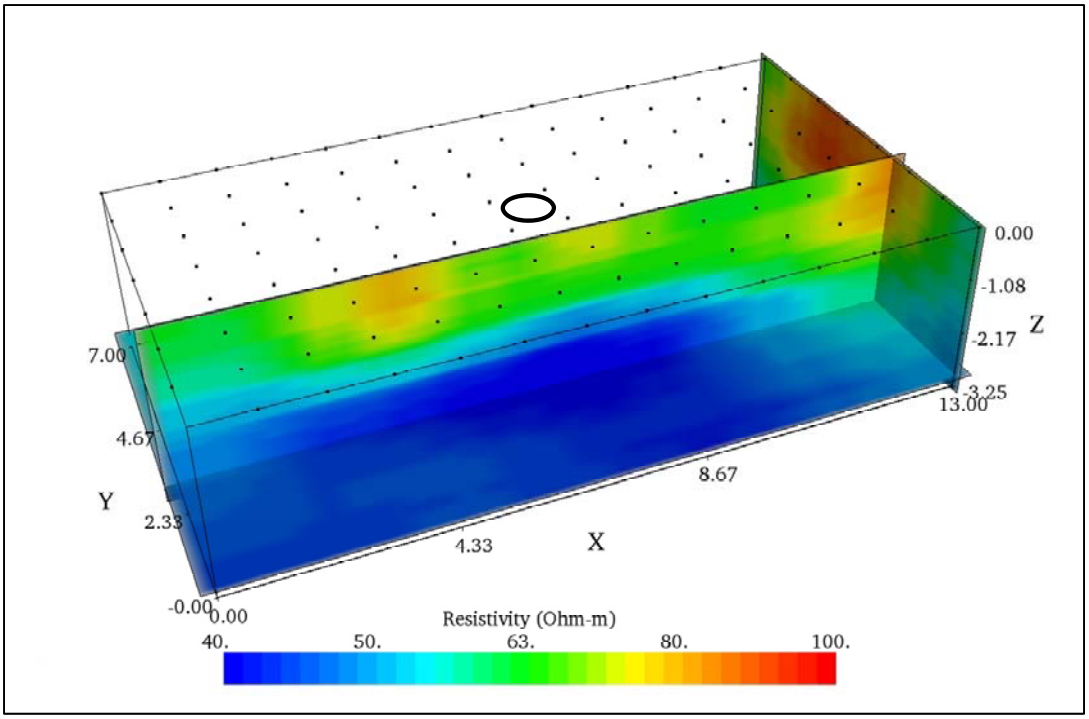


Figure C187. Slice along Y=2.50 m, 3D processing, Vicksburg, MS.

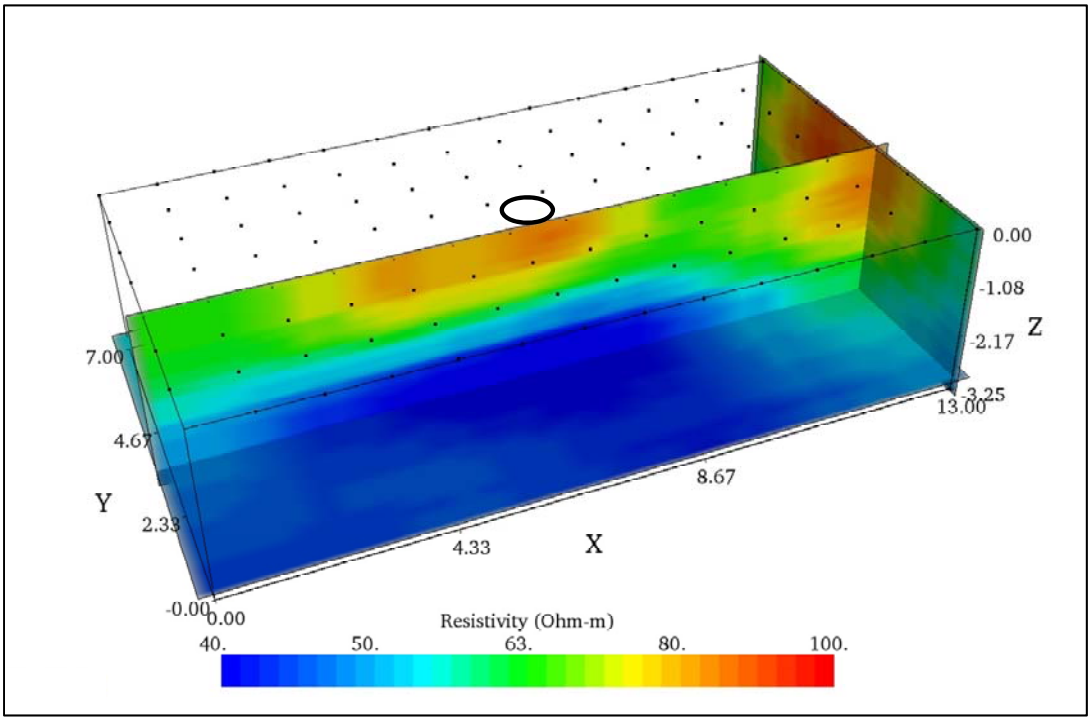


Figure C188. Slice along Y=3.00 m, 3D processing, Vicksburg, MS.

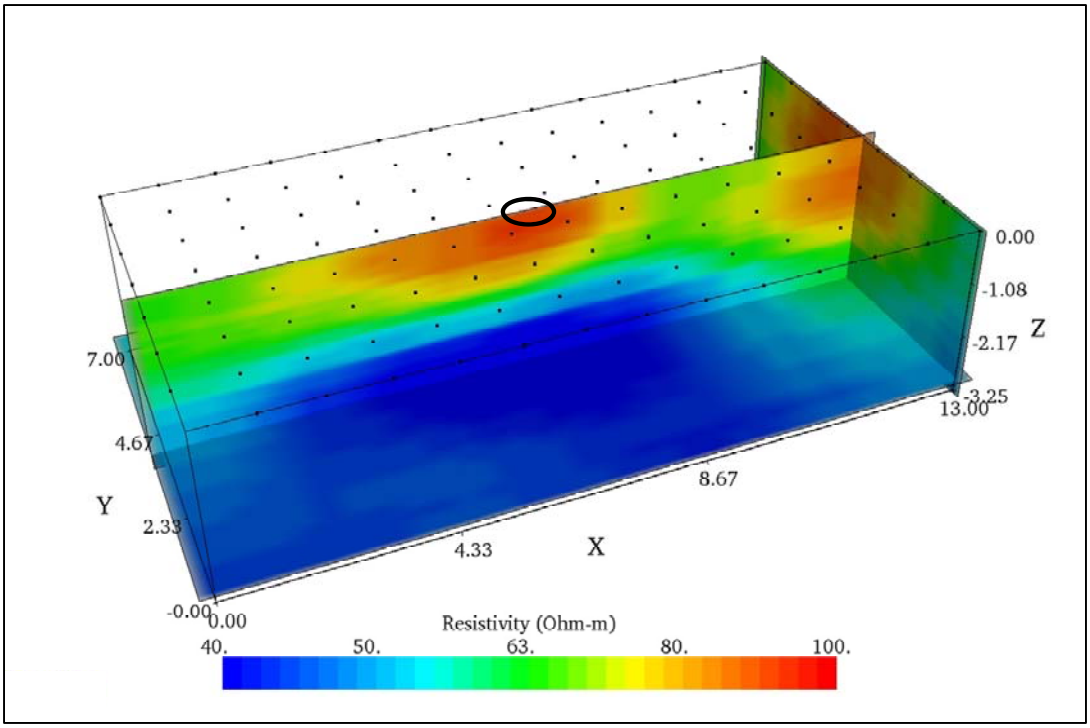


Figure C189. Slice along Y=3.50 m, 3D processing, Vicksburg, MS.

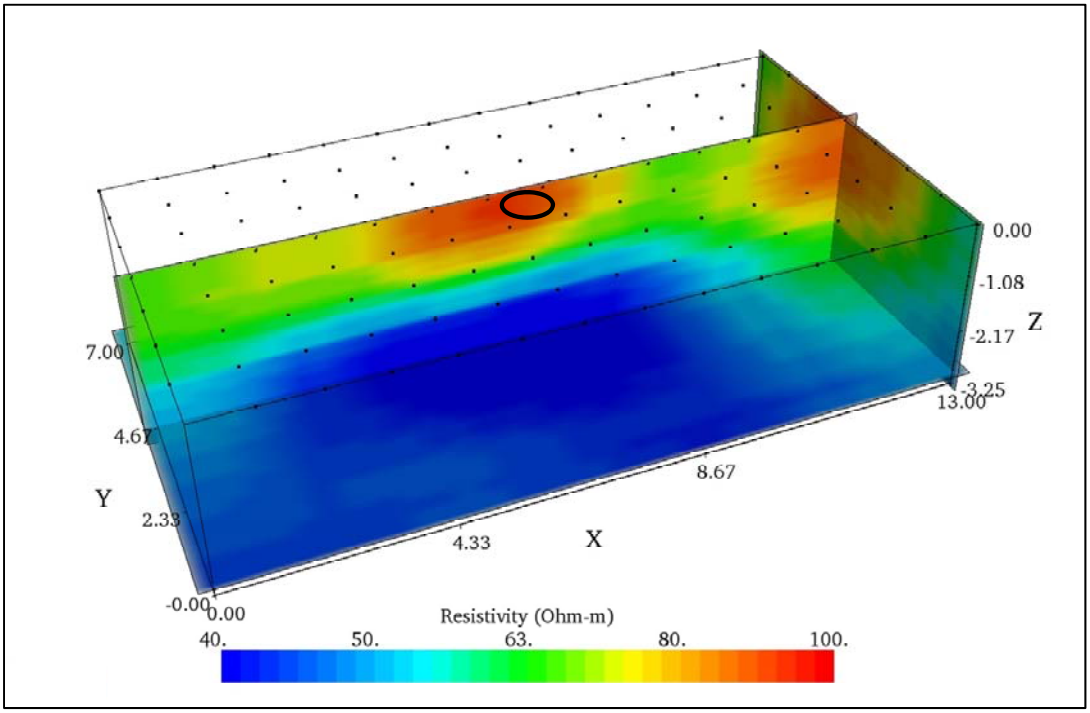


Figure C190. Slice along Y=4.00 m, 3D processing, Vicksburg, MS.

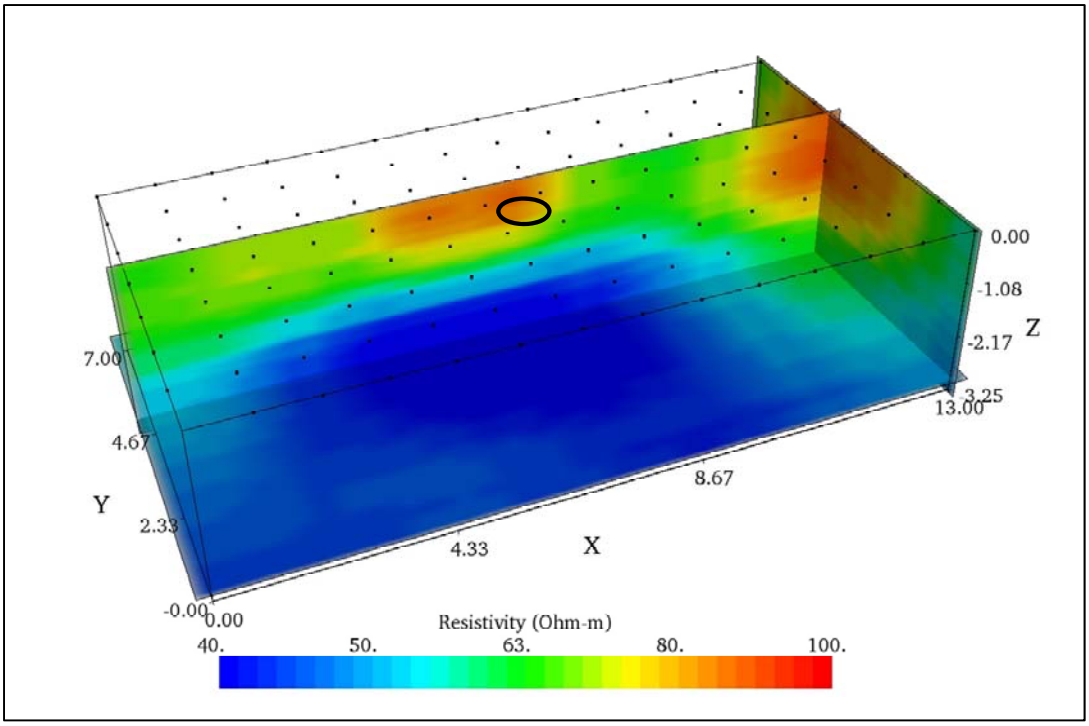


Figure C191. Slice along Y=4.50 m, 3D processing, Vicksburg, MS.

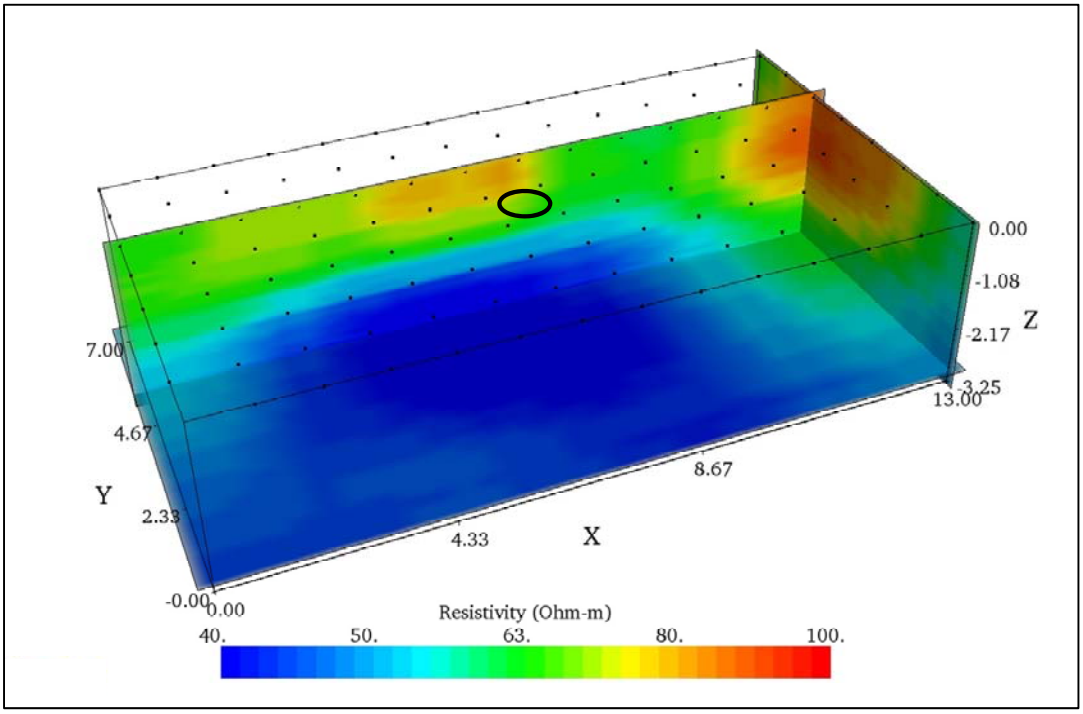


Figure C192. Slice along Y=5.00 m, 3D processing, Vicksburg, MS.

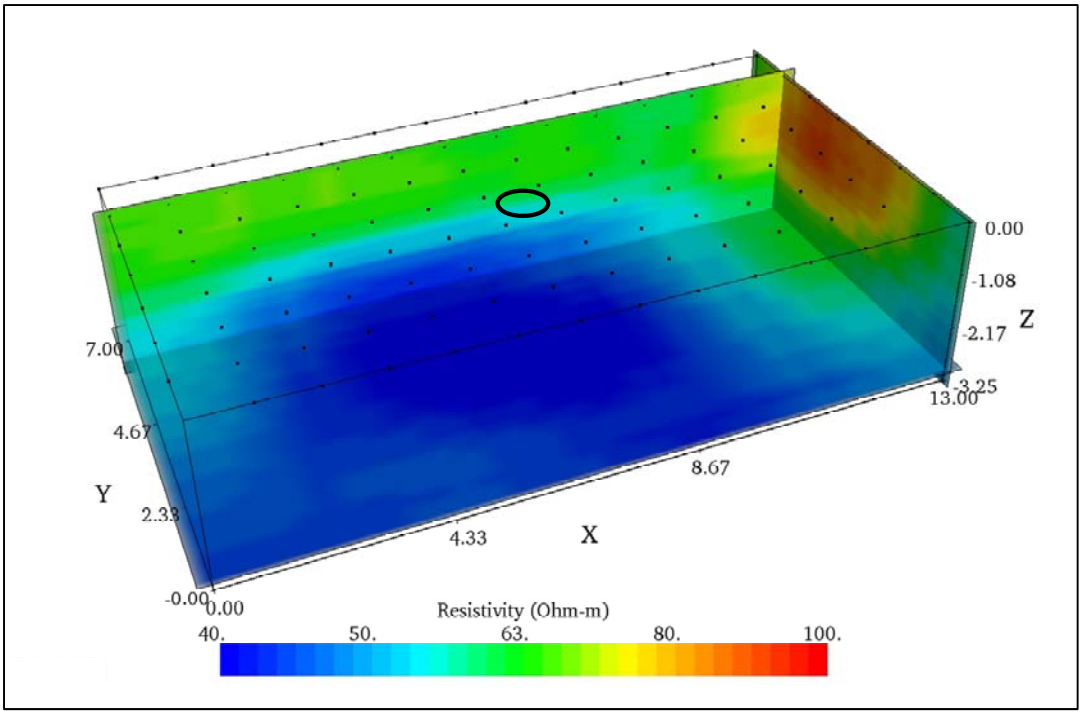


Figure C193. Slice along Y=6.00 m, 3D processing, Vicksburg, MS.

GPR Results, 450 MHz Antenna, Vicksburg, MS

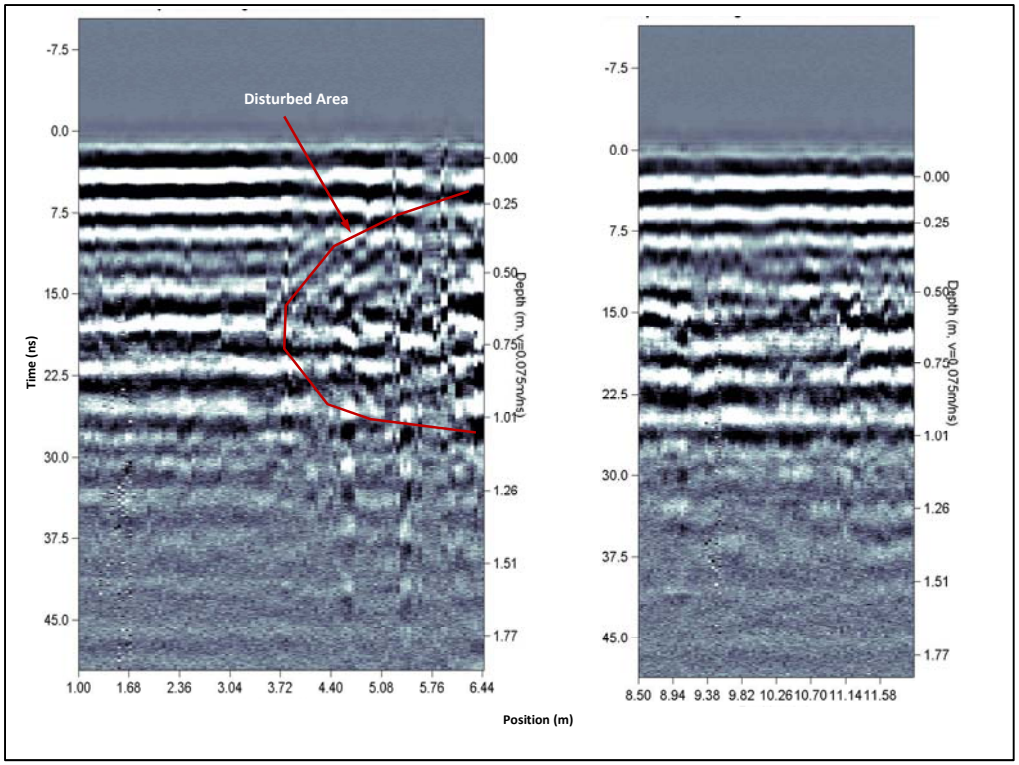


Figure C194. GPR results, Line 3.5 m, 450 MHz antenna, Vicksburg, MS.

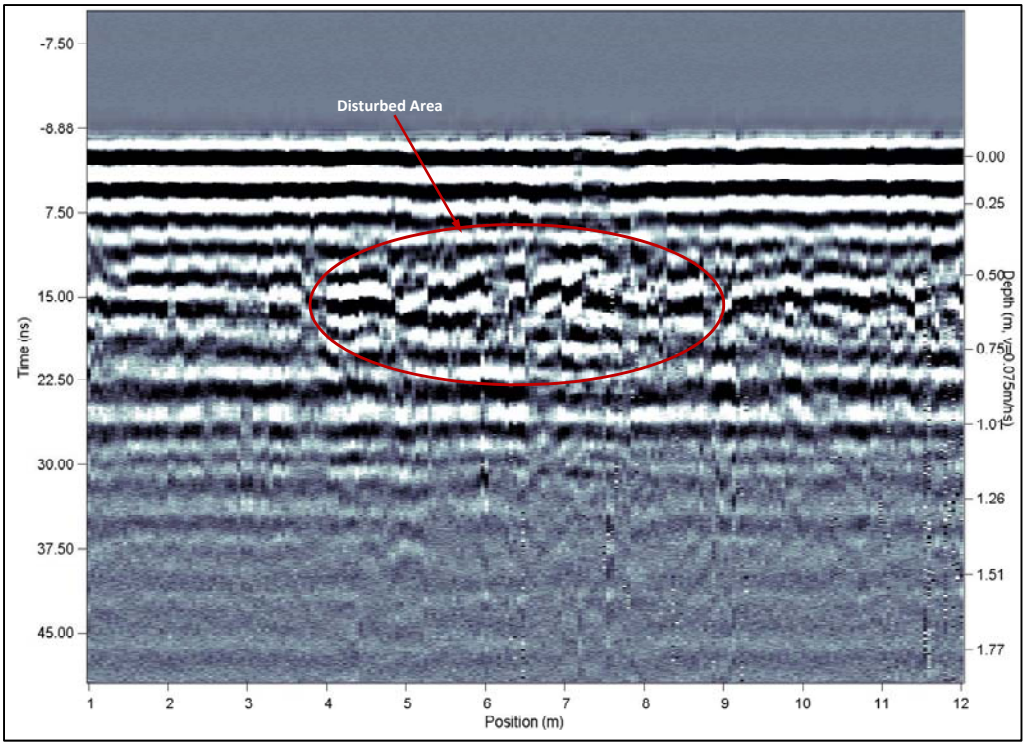


Figure C195. GPR results, Line 4.0 m, 450 MHz antenna, Vicksburg, MS.

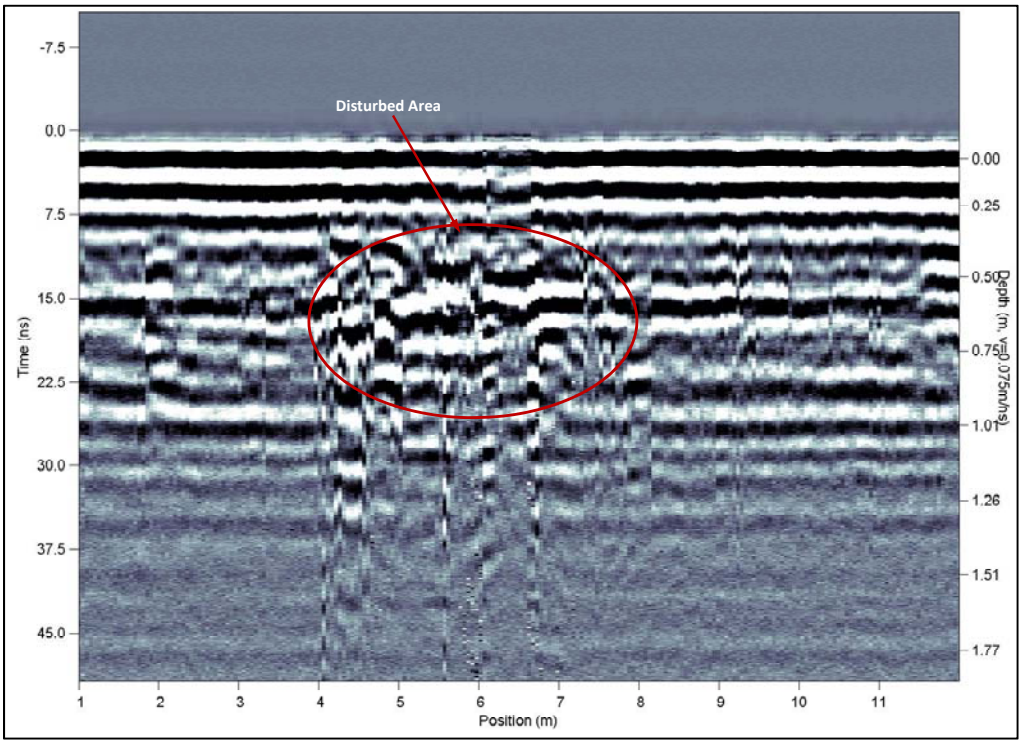


Figure C196. GPR results, Line 4.5 m, 450 MHz antenna, Vicksburg, MS.

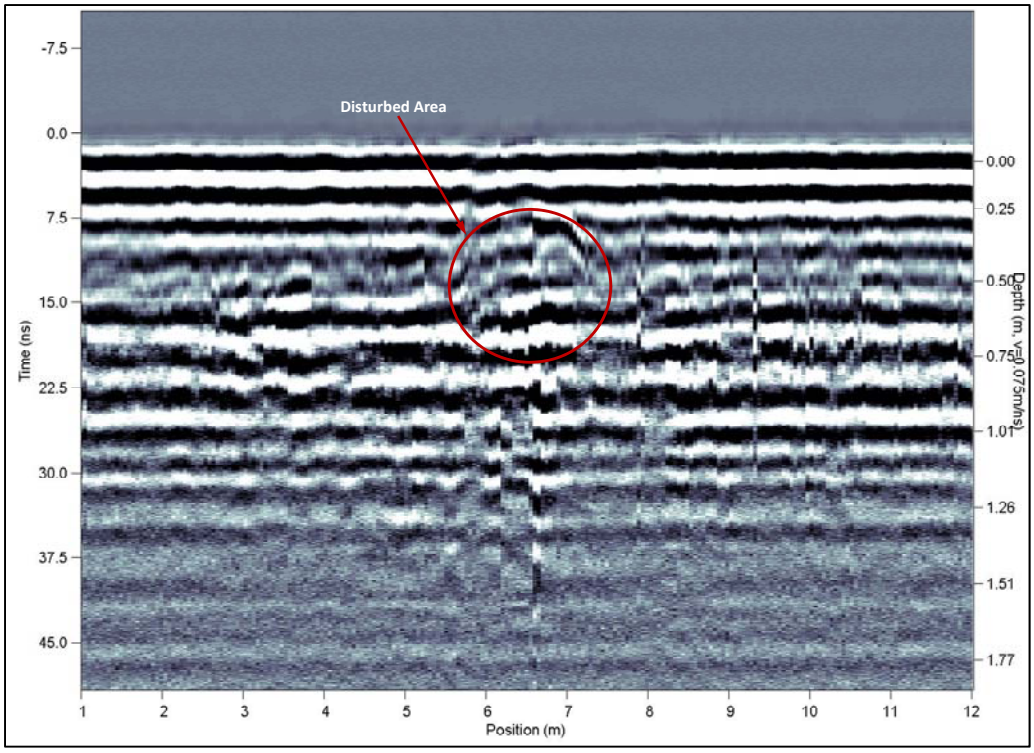


Figure C197. GPR results, Line 5.0 m, 450 MHz antenna, Vicksburg, MS.

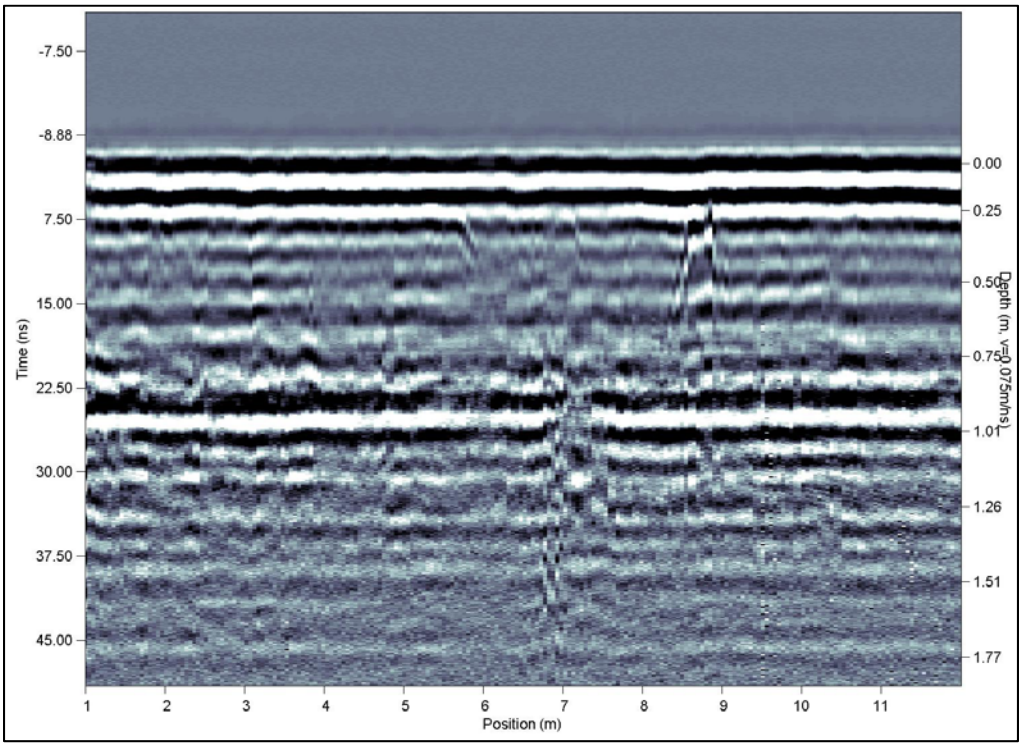


Figure C198. GPR results, Line 5.5 m, 450 MHz antenna, Vicksburg, MS.

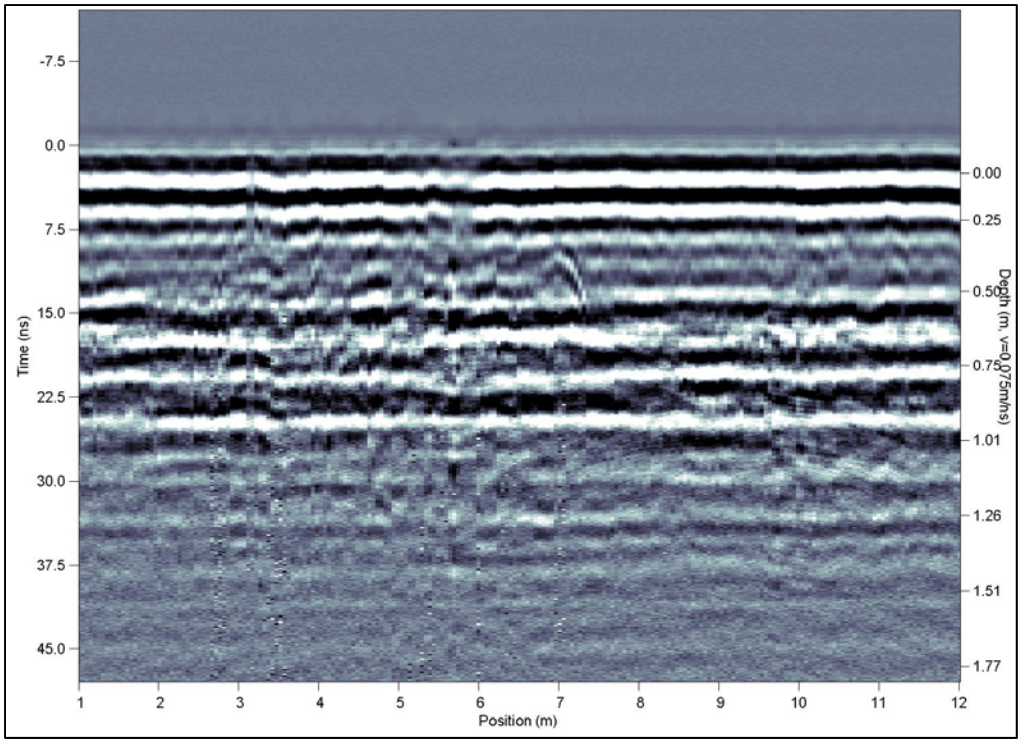


Figure C199. GPR results, Line 6.0 m, 450 MHz antenna, Vicksburg, MS.

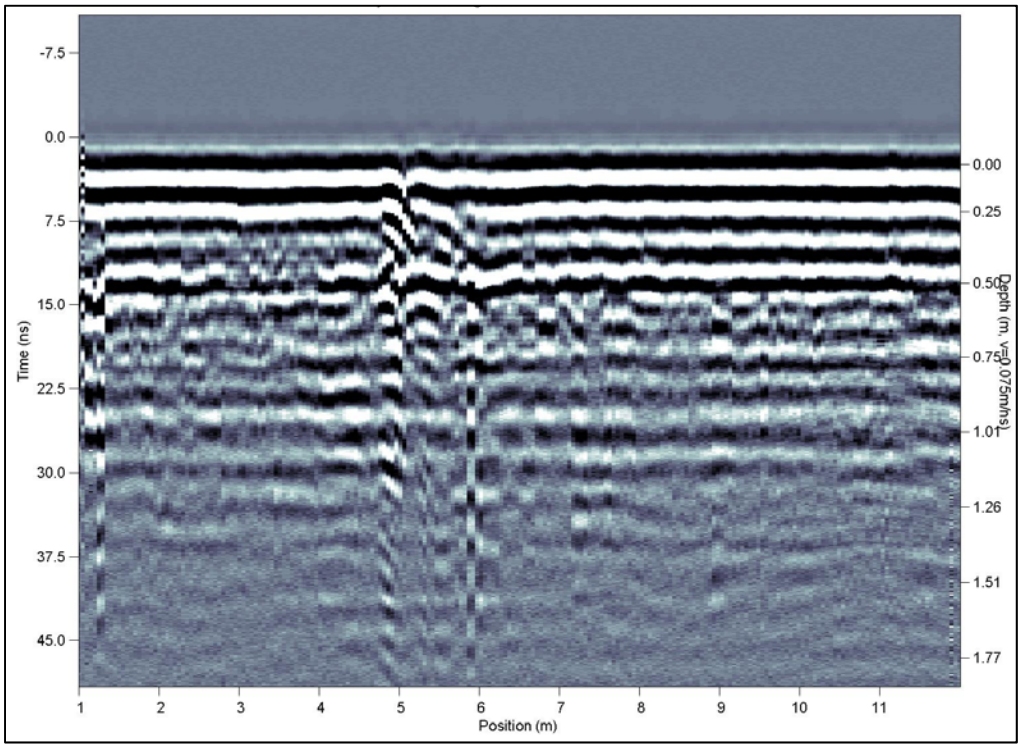


Figure C200. GPR results, Line 6.5 m, 450 MHz antenna, Vicksburg, MS.

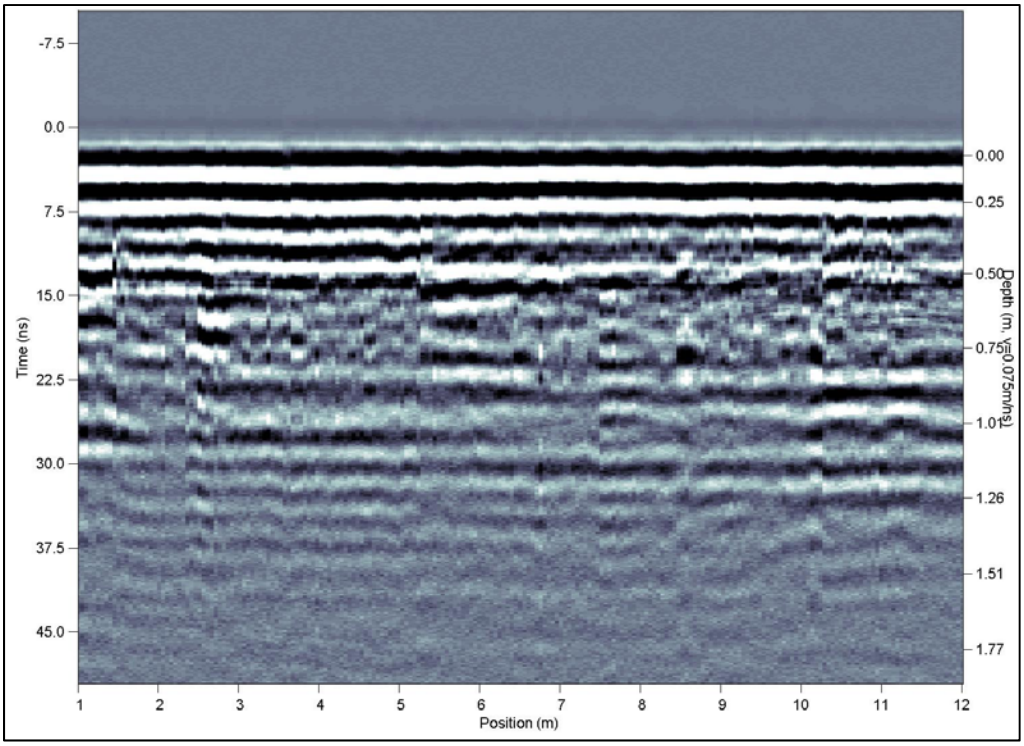


Figure C201. GPR results, Line 7.0 m, 450 MHz antenna, Vicksburg, MS.

GPR Results, 900 MHz Antenna, Vicksburg, MS

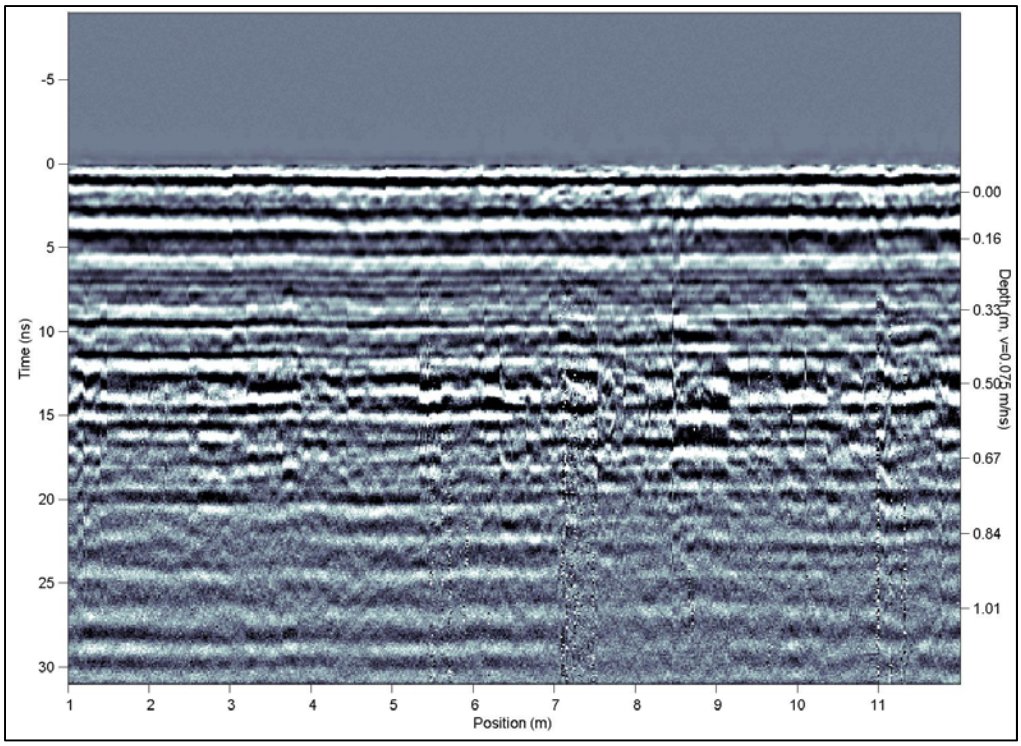


Figure C202. GPR results, Line 1.0 m, 900 MHz antenna, Vicksburg, MS.

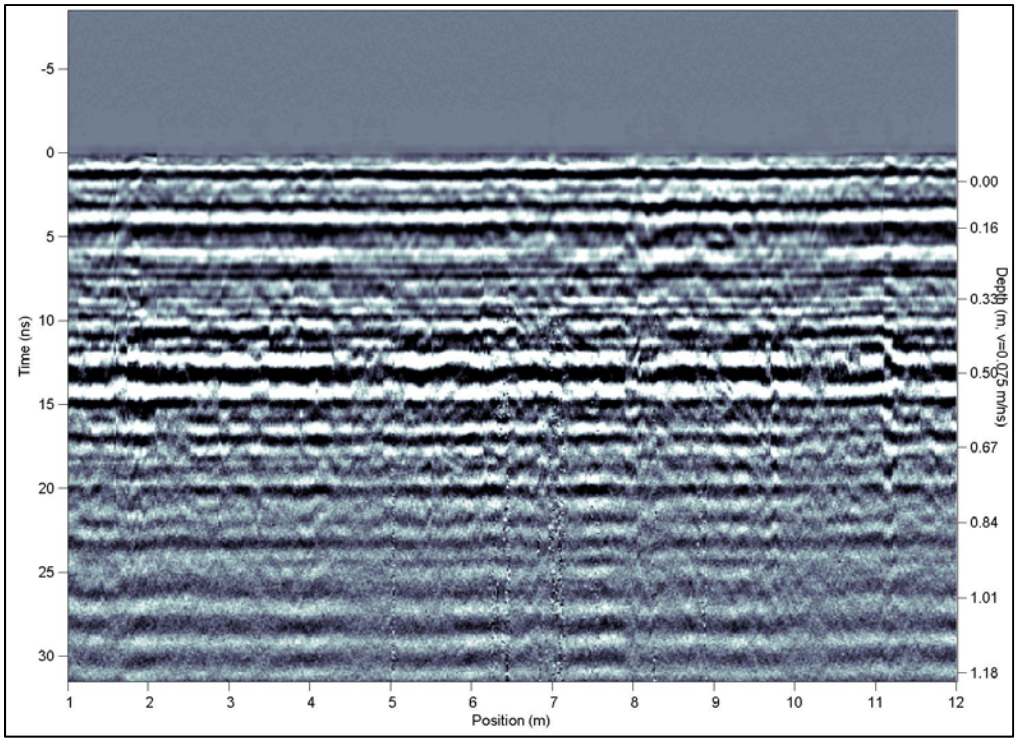


Figure C203. GPR results, Line 1.5 m, 900 MHz antenna, Vicksburg, MS.

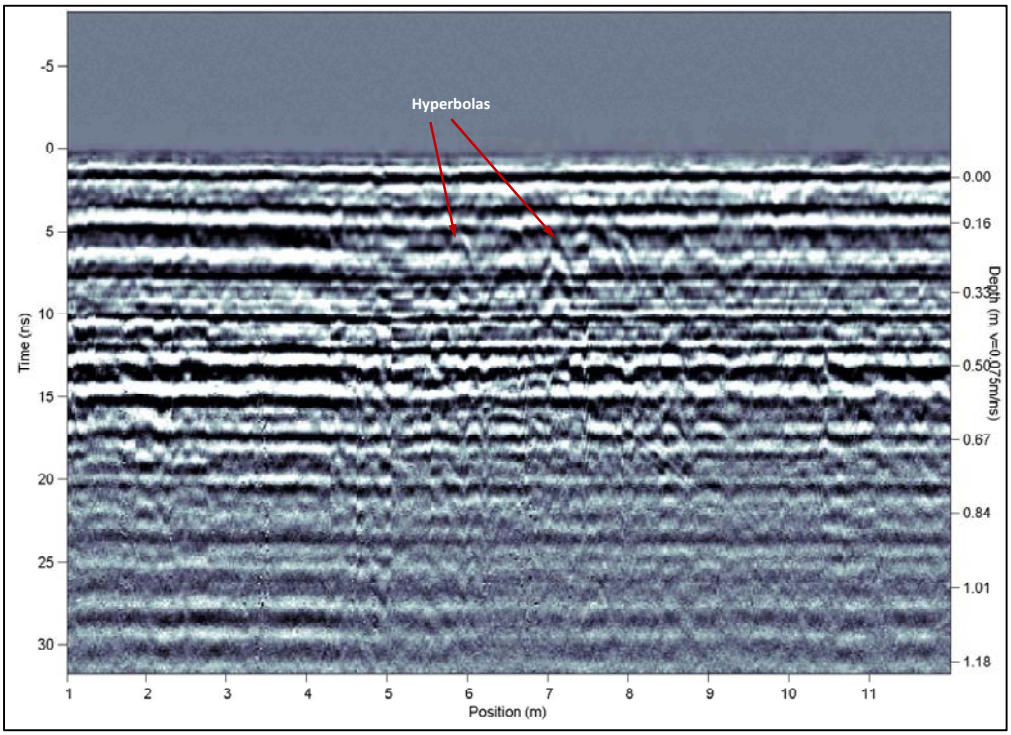


Figure C204. GPR results, Line 2.0 m, 900 MHz antenna, Vicksburg, MS.

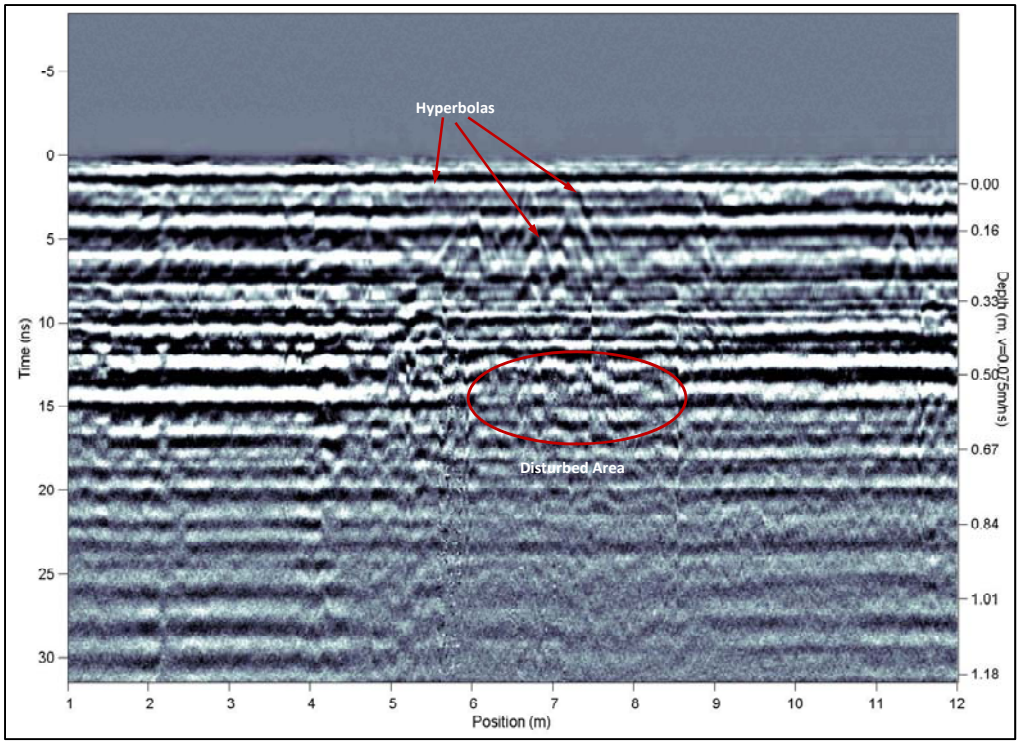


Figure C205. GPR results, Line 2.5 m, 900 MHz antenna, Vicksburg, MS.

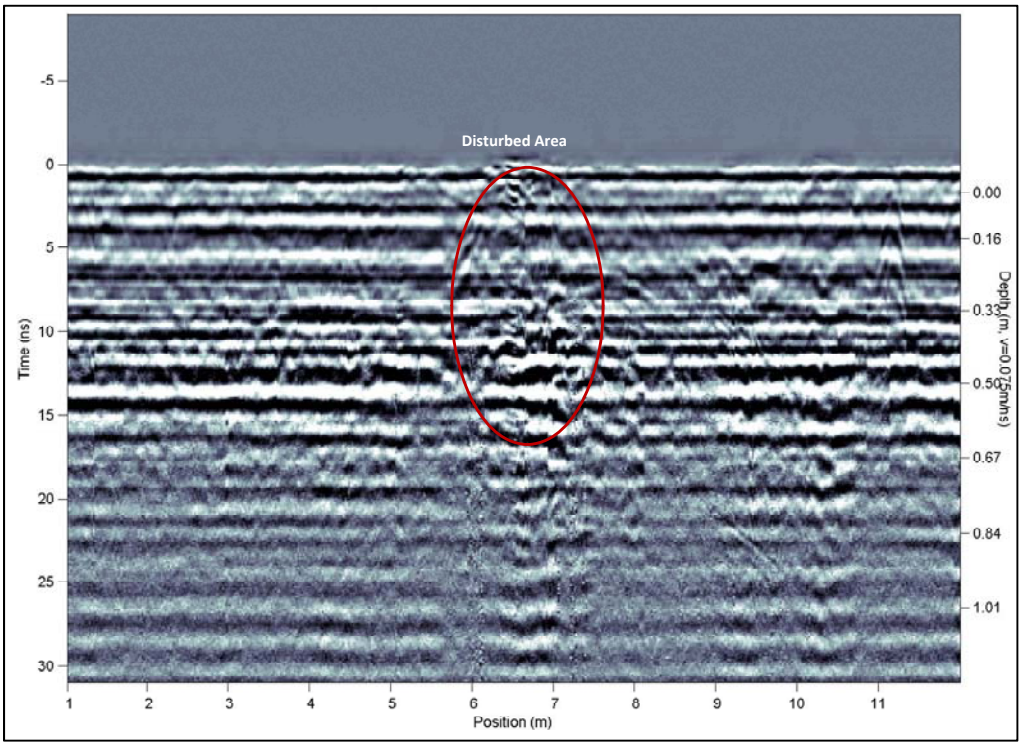


Figure C206. GPR results, Line 3.0 m, 900 MHz antenna, Vicksburg, MS.

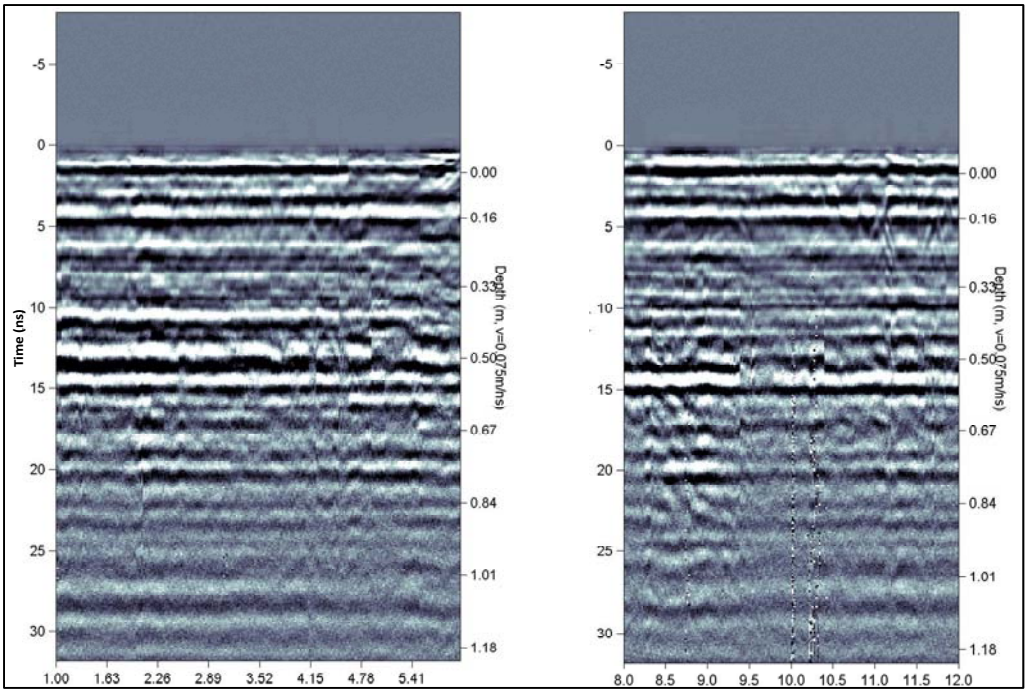


Figure C207. GPR results, Line 3.5 m, 900 MHz antenna, Vicksburg, MS.

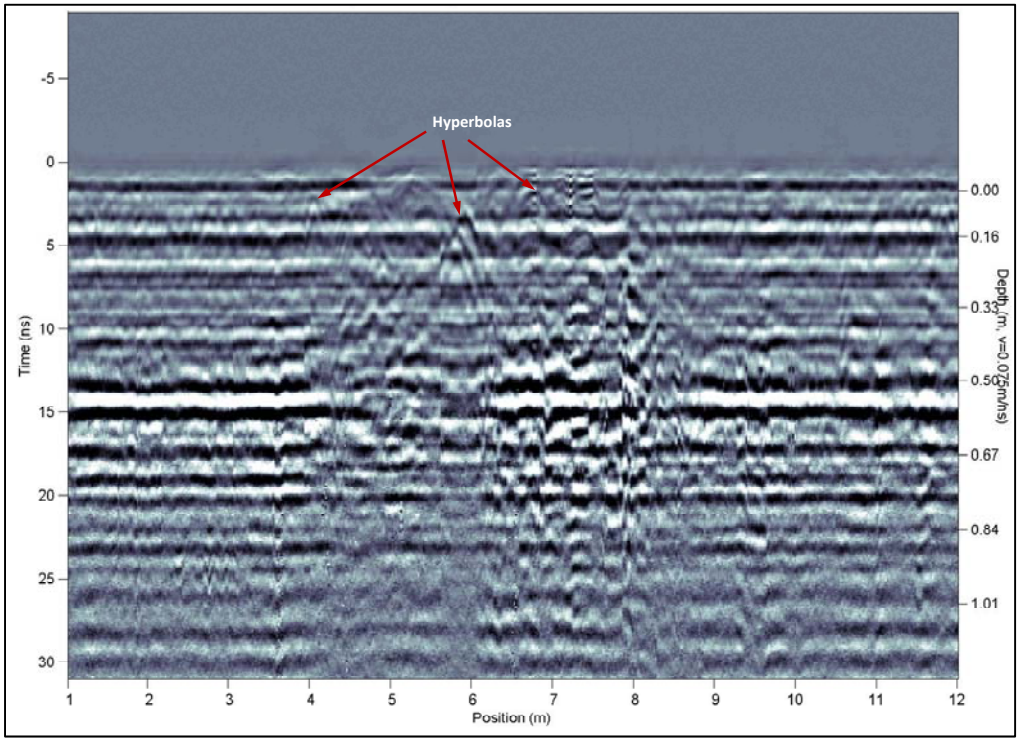


Figure C208. GPR results, Line 4.0 m, 900 MHz antenna, Vicksburg, MS.

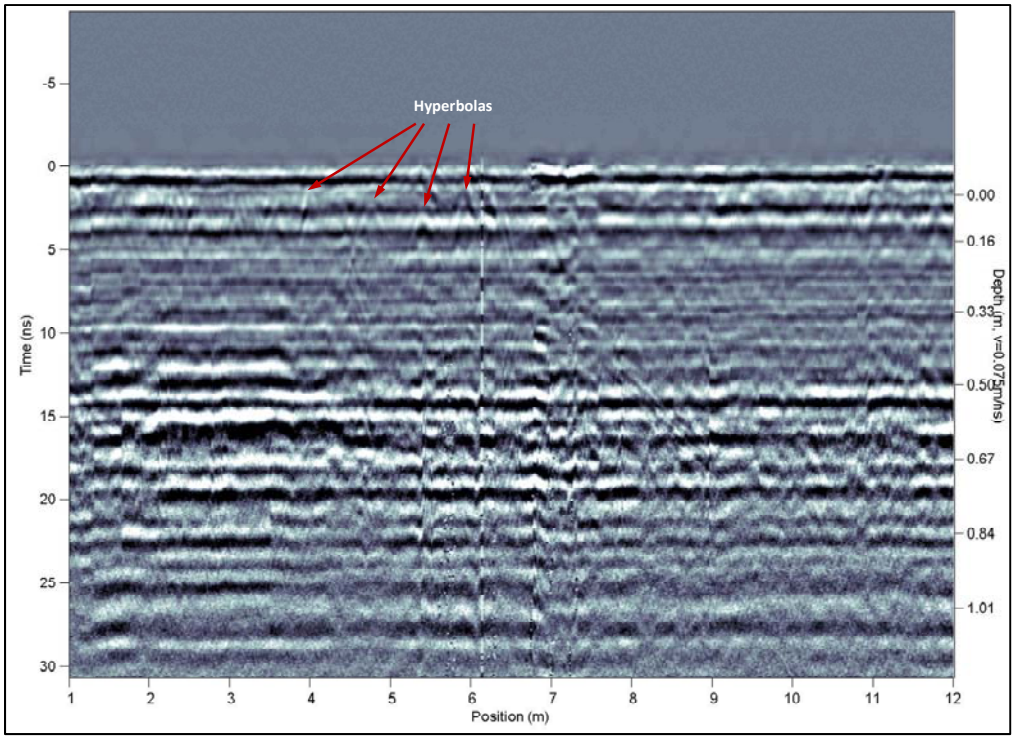


Figure C209. GPR results, Line 4.5 m, 900 MHz antenna, Vicksburg, MS.

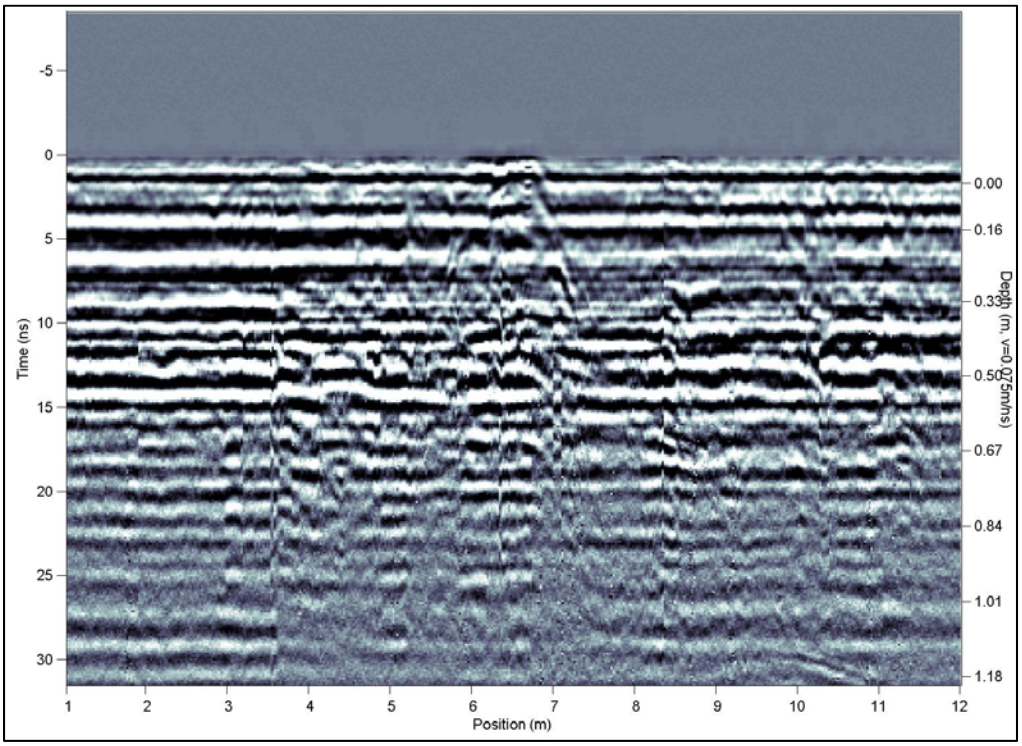


Figure C210. GPR results, Line 5.0 m, 900 MHz antenna, Vicksburg, MS.

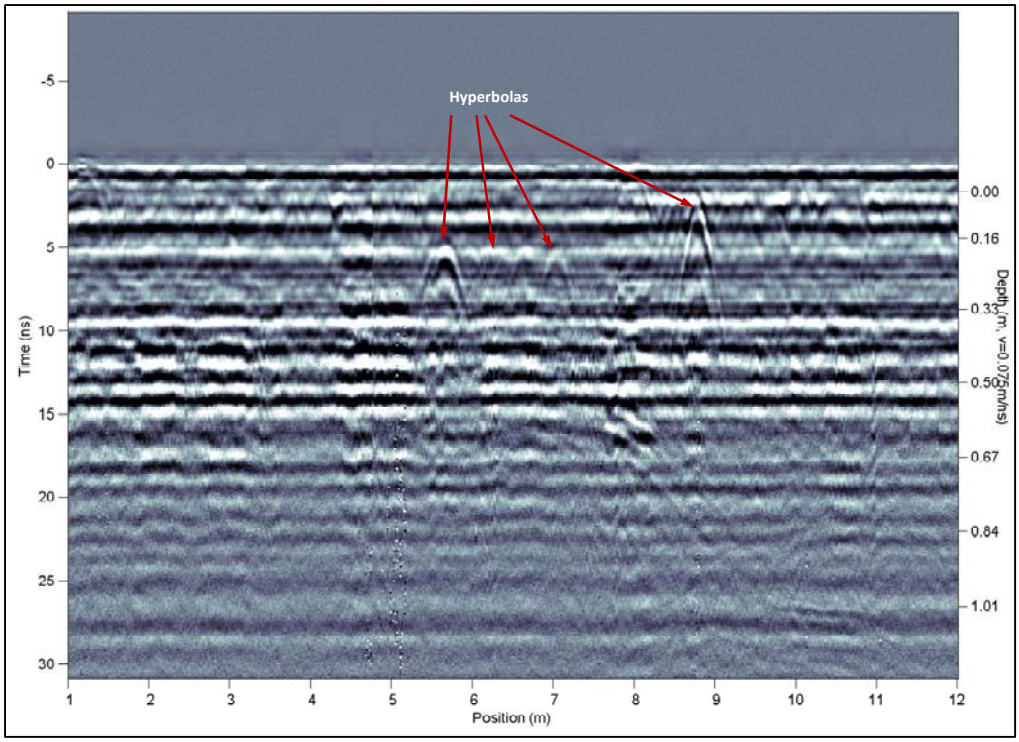


Figure C211. GPR results, Line 5.5 m, 900 MHz antenna, Vicksburg, MS.

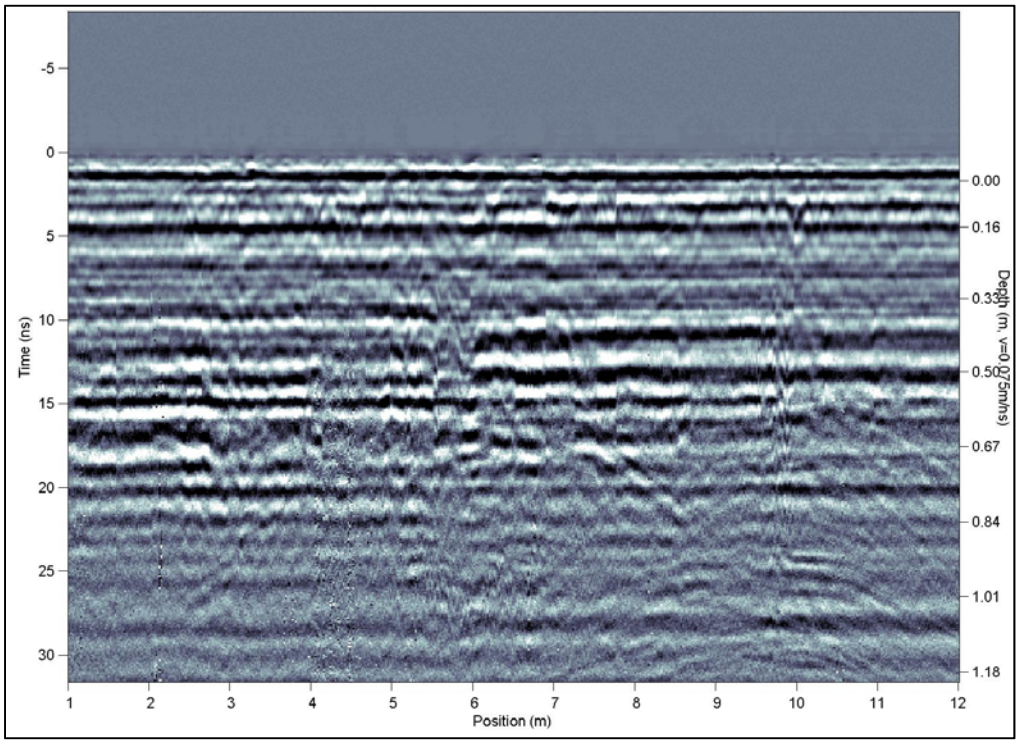


Figure C212. GPR results, Line 6.0 m, 900 MHz antenna, Vicksburg, MS.

3D Depth Slices, Site 1, Albuquerque, NM

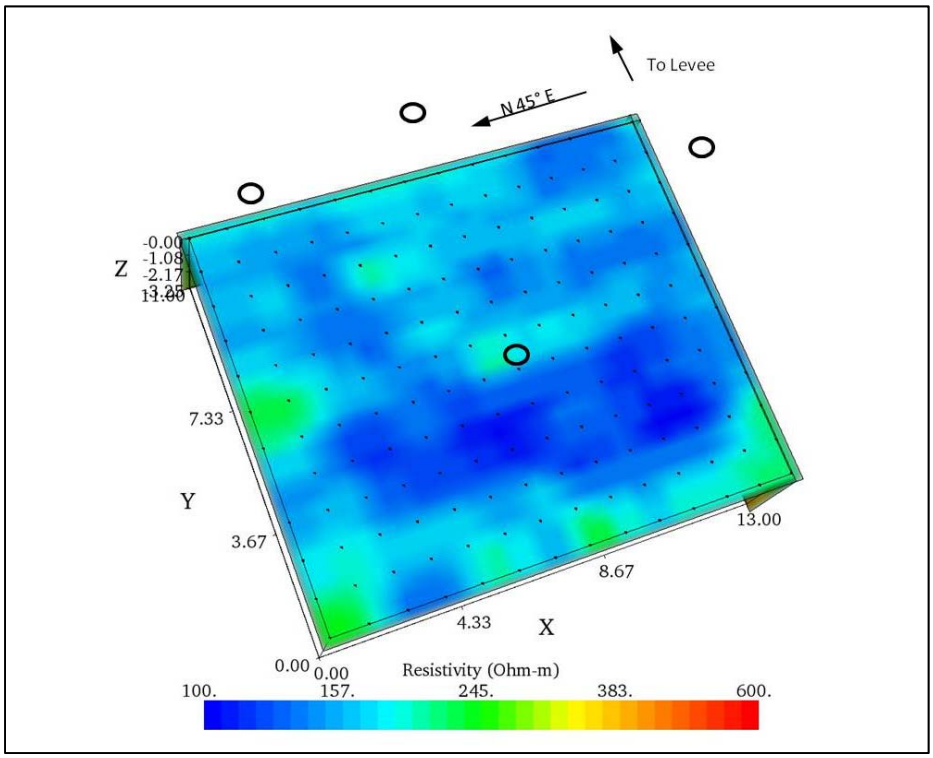


Figure C213. Depth slice at Z=0.00 m, 3D inversion, Site 1, Albuquerque, NM.

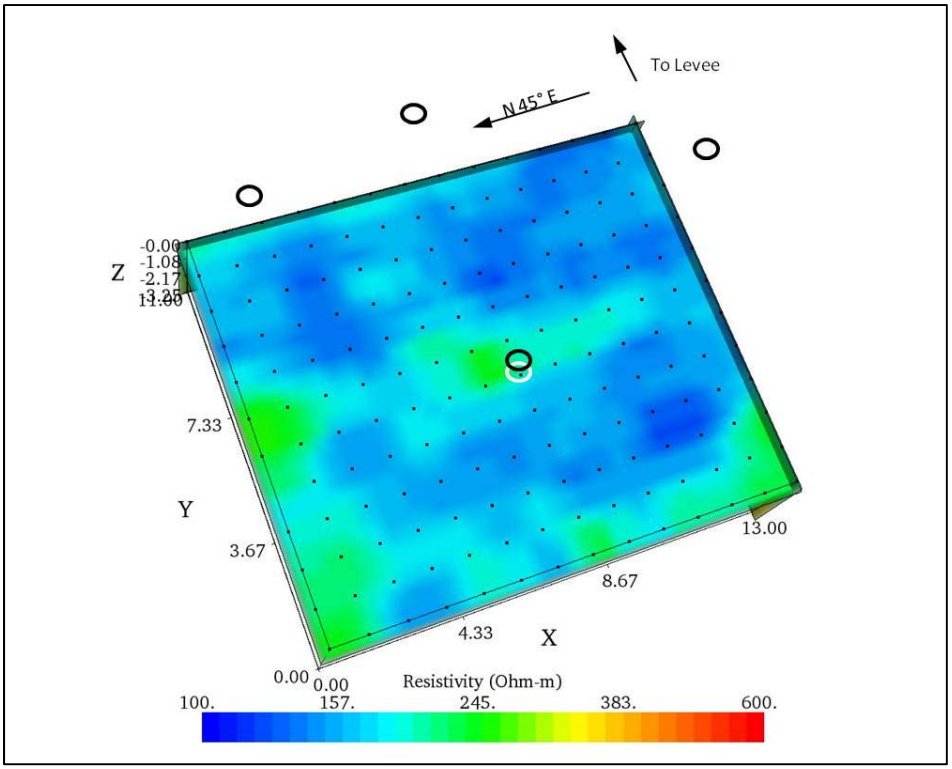


Figure C214. Depth slice at Z=-0.50 m, 3D inversion, Site 1, Albuquerque, NM.

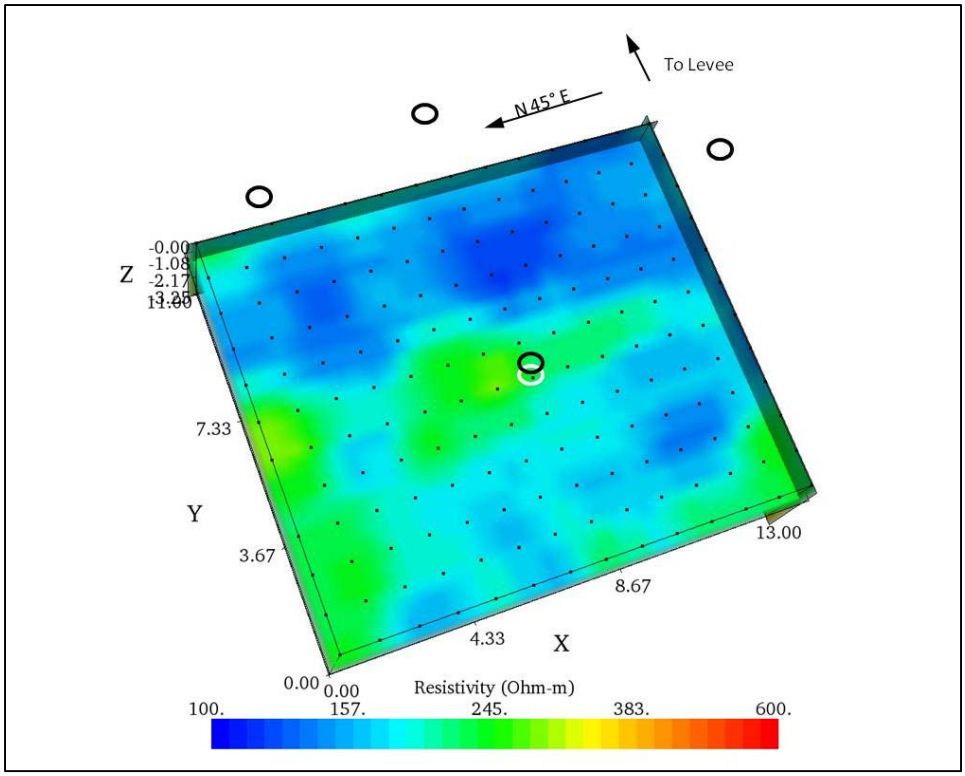


Figure C215. Depth slice at Z=-1.00 m, 3D inversion, Site 1, Albuquerque, NM.

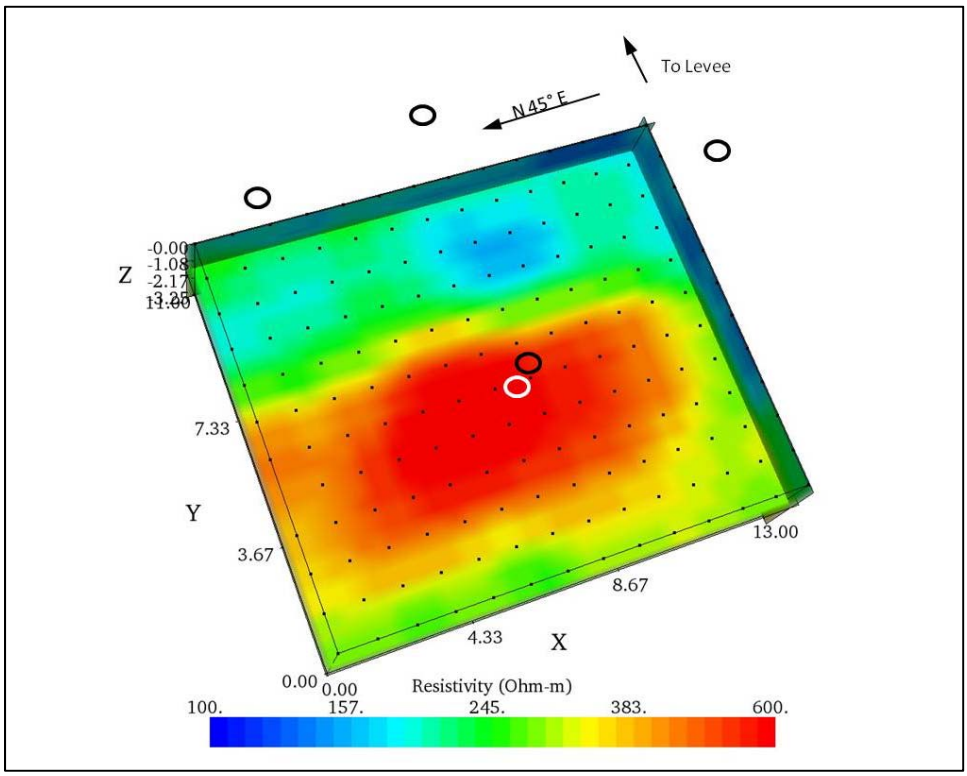


Figure C216. Depth slice at Z=-1.50 m, 3D inversion, Site 1, Albuquerque, NM.

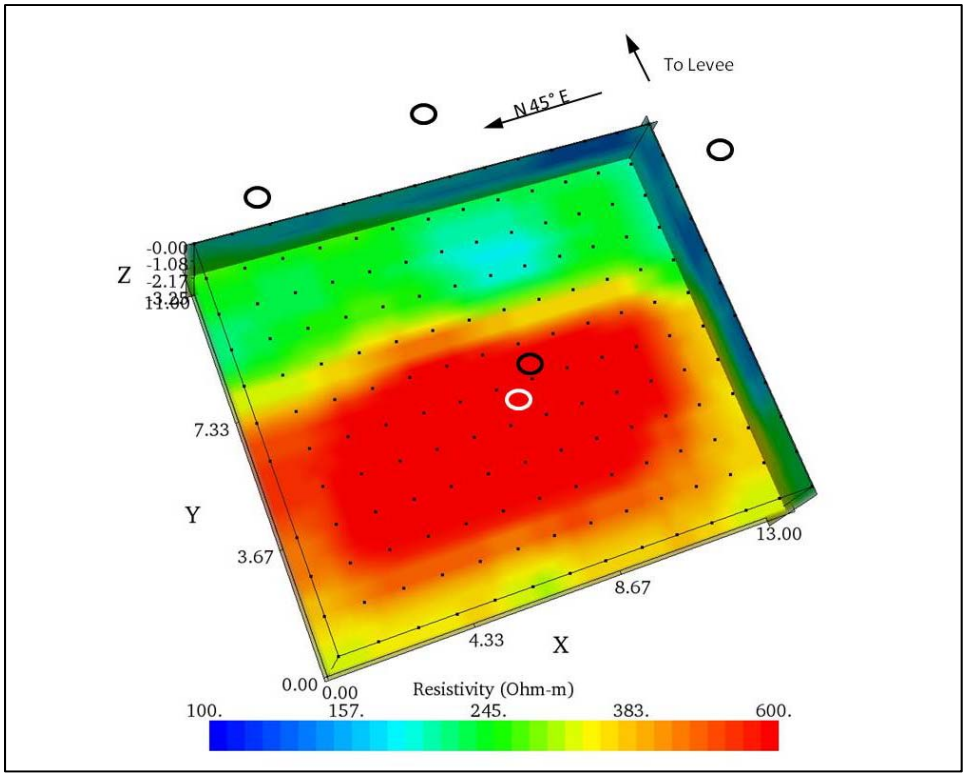


Figure C217. Depth slice at Z=-2.00 m, 3D inversion, Site 1, Albuquerque, NM.

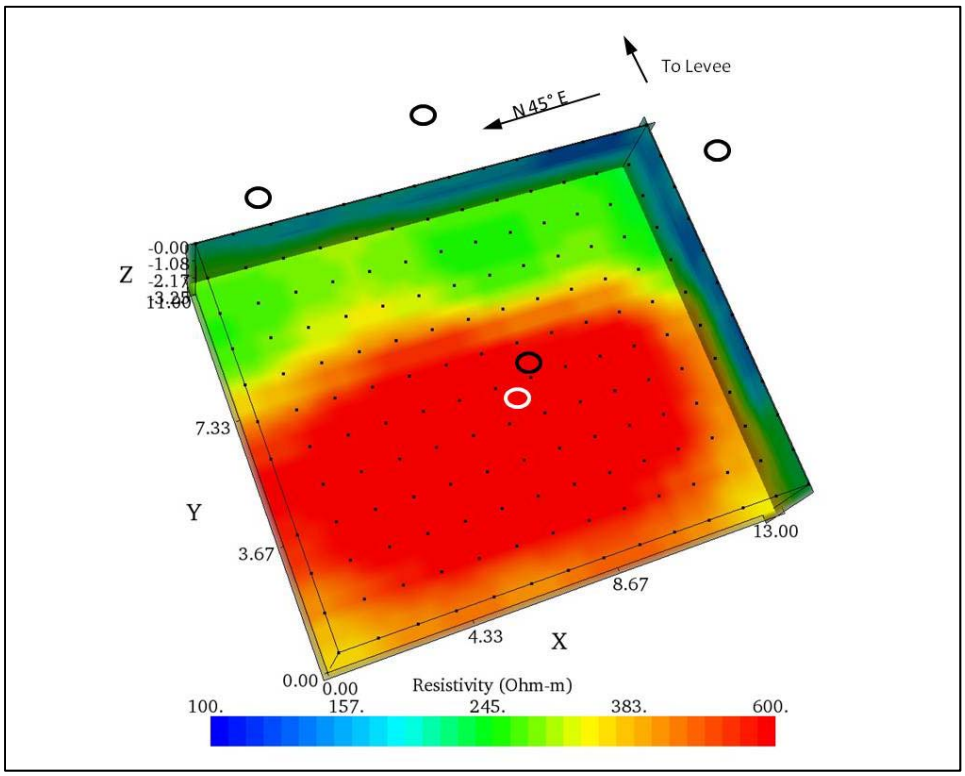


Figure C218. Depth slice at Z=-2.50 m, 3D inversion, Site 1, Albuquerque, NM.

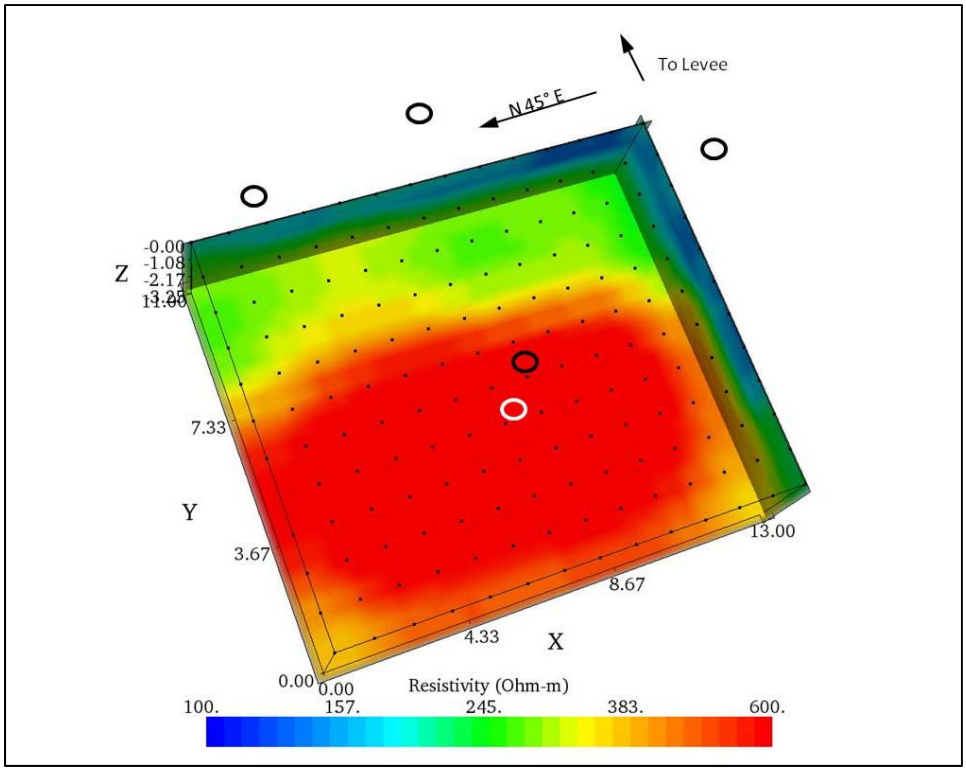


Figure C219. Depth slice at Z=-3.00 m, 3D inversion, Site 1, Albuquerque, NM.

Slices Taken Parallel to the X-Axis, Site 1, Albuquerque, NM

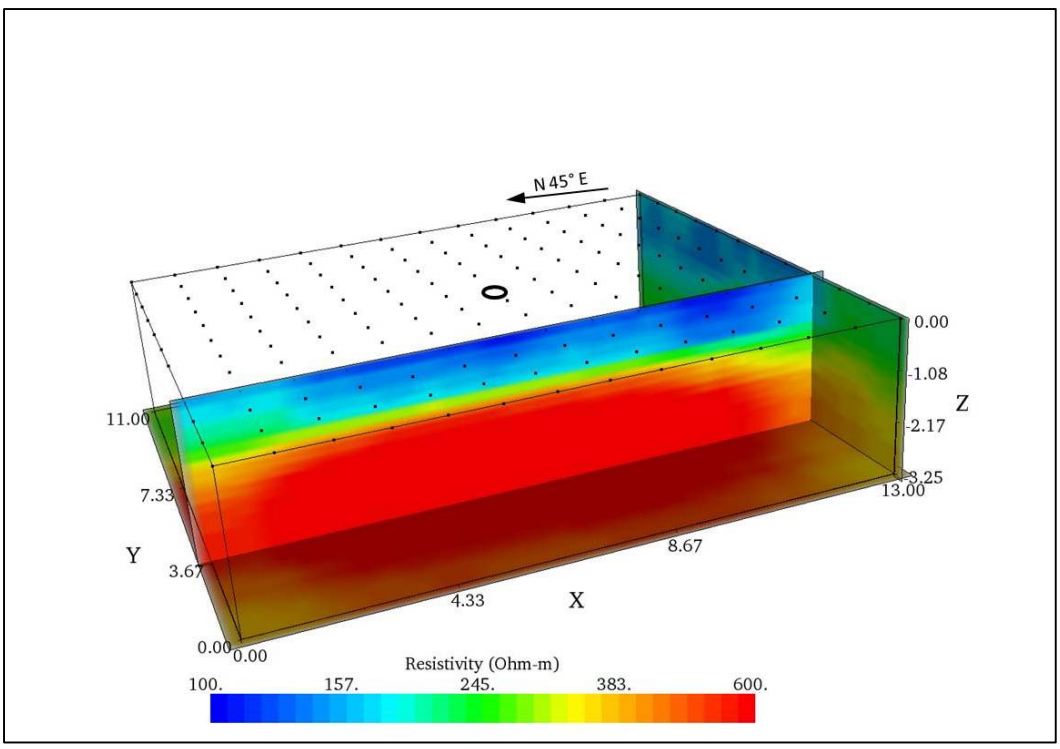


Figure C220. Slice along Y=3.00 m, 3D processing, Site 1, Albuquerque, NM.

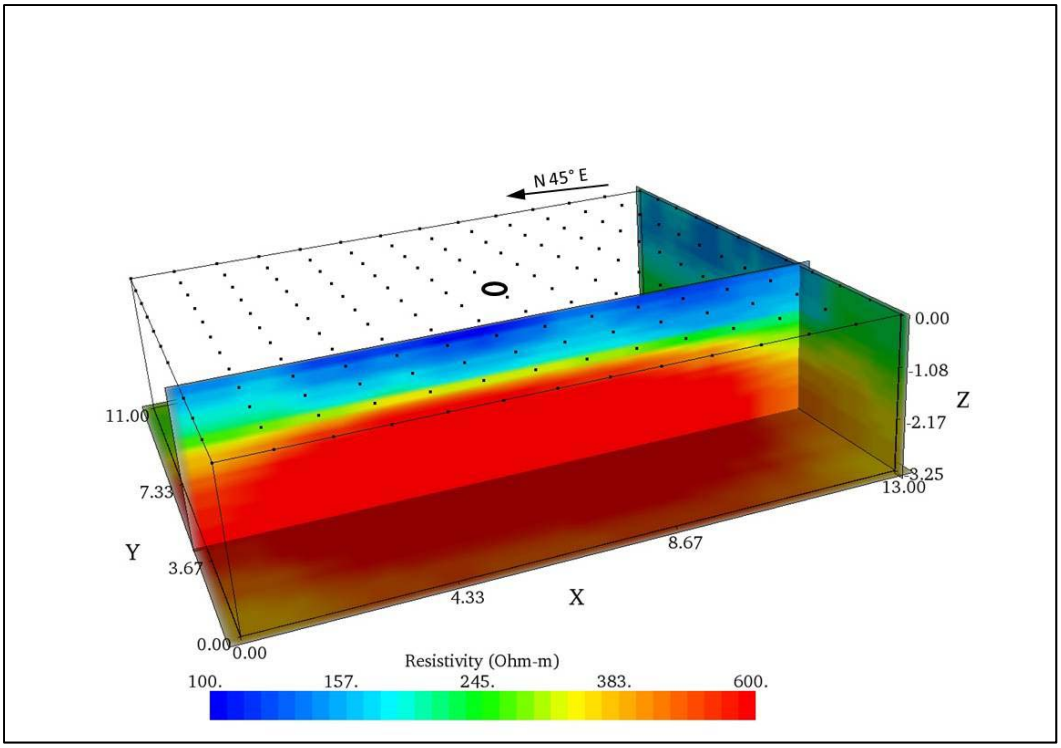


Figure C221. Slice along Y=3.50 m, 3D processing, Site 1, Albuquerque, NM.

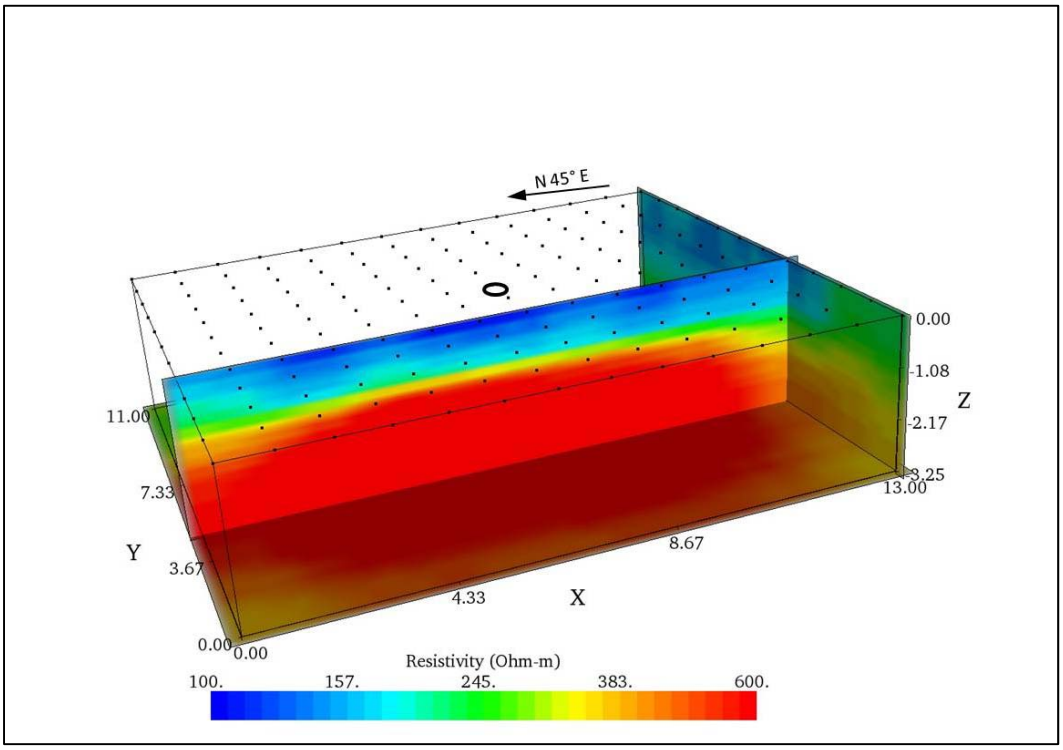


Figure C222. Slice along Y=4.00 m, 3D processing, Site 1, Albuquerque, NM.

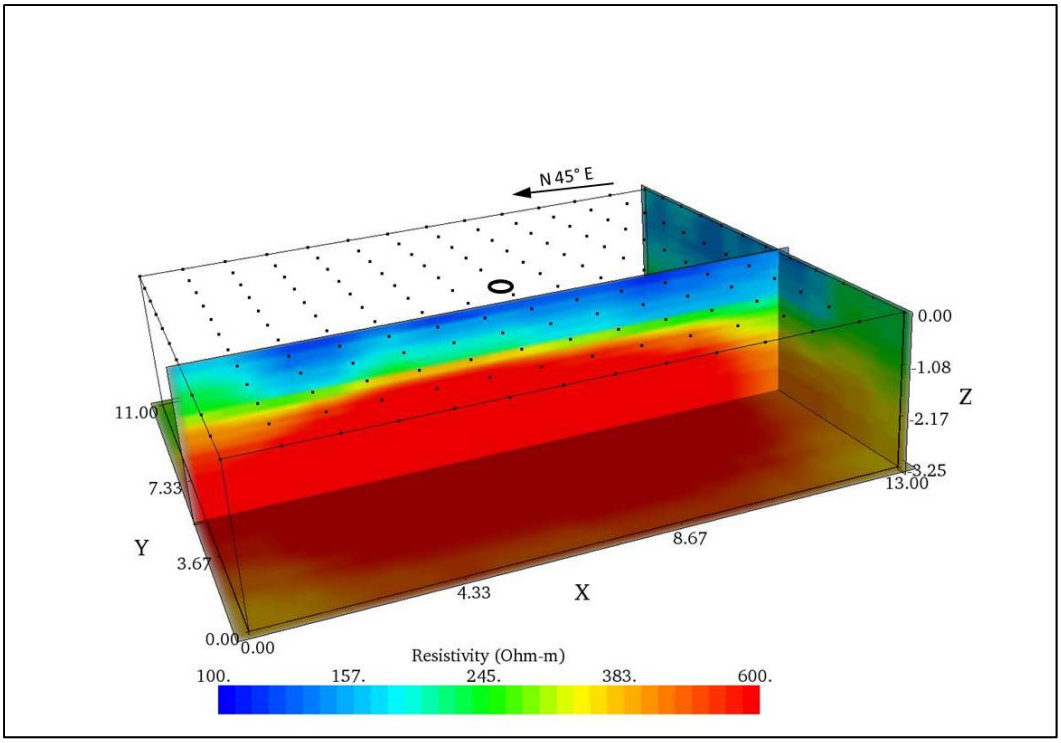


Figure C223. Slice along Y=4.50 m, 3D processing, Site 1, Albuquerque, NM.

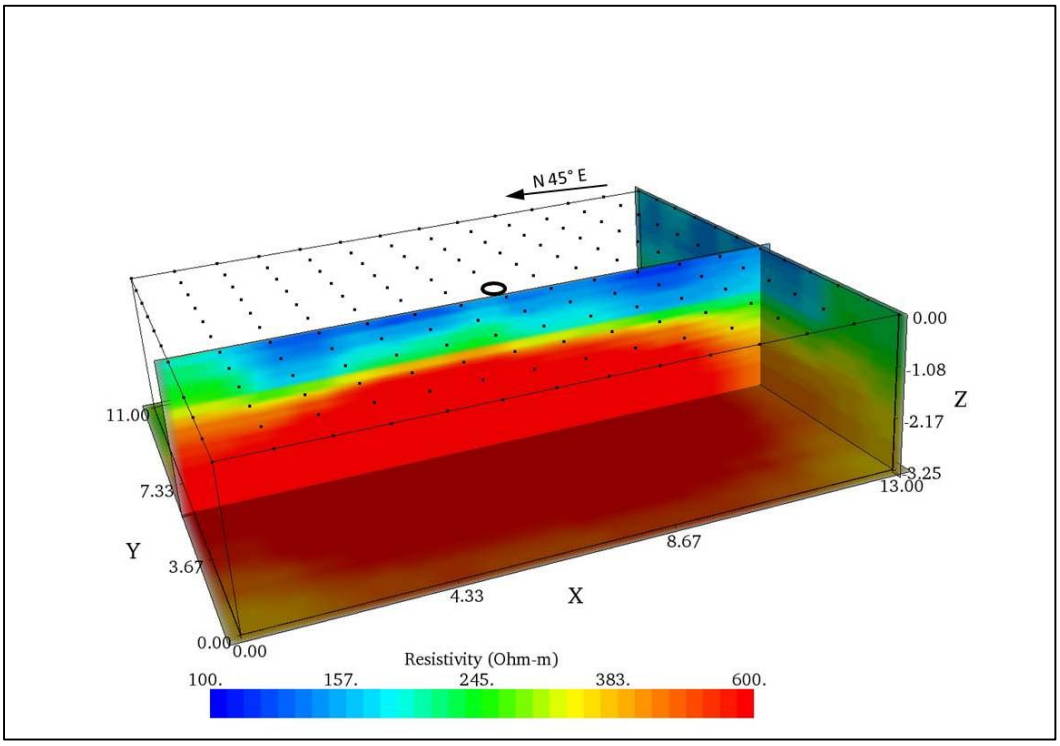


Figure C224. Slice along Y=5.00 m, 3D processing, Site 1, Albuquerque, NM.

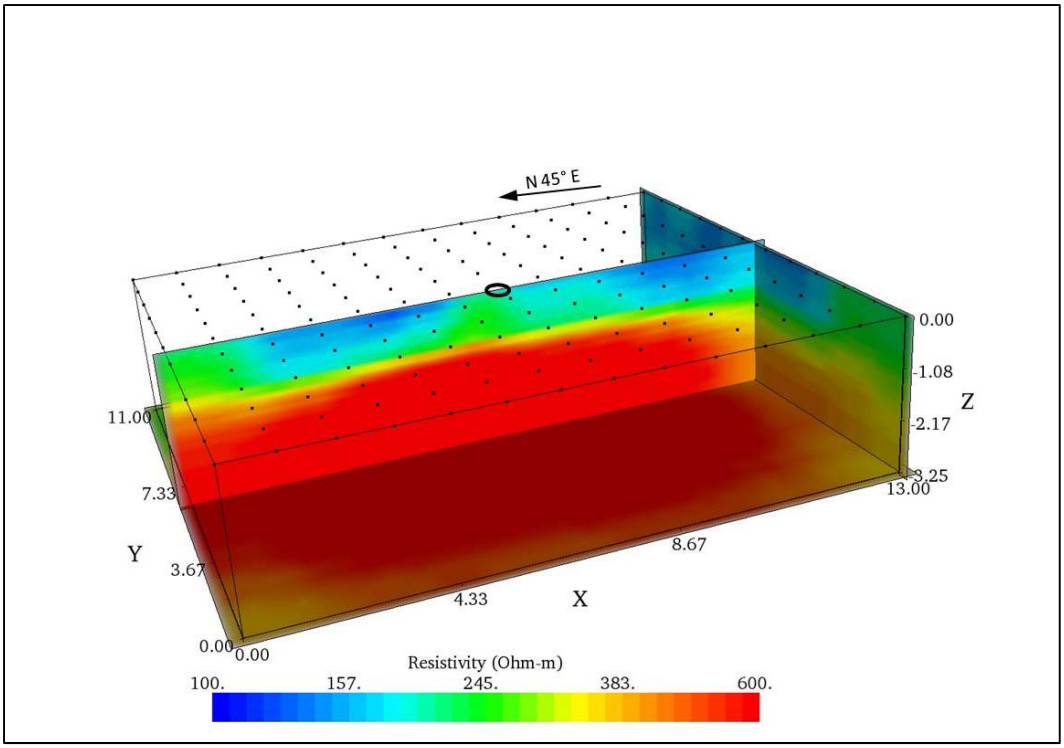


Figure C225. Slice along Y=5.50 m, 3D processing, Site 1, Albuquerque, NM.

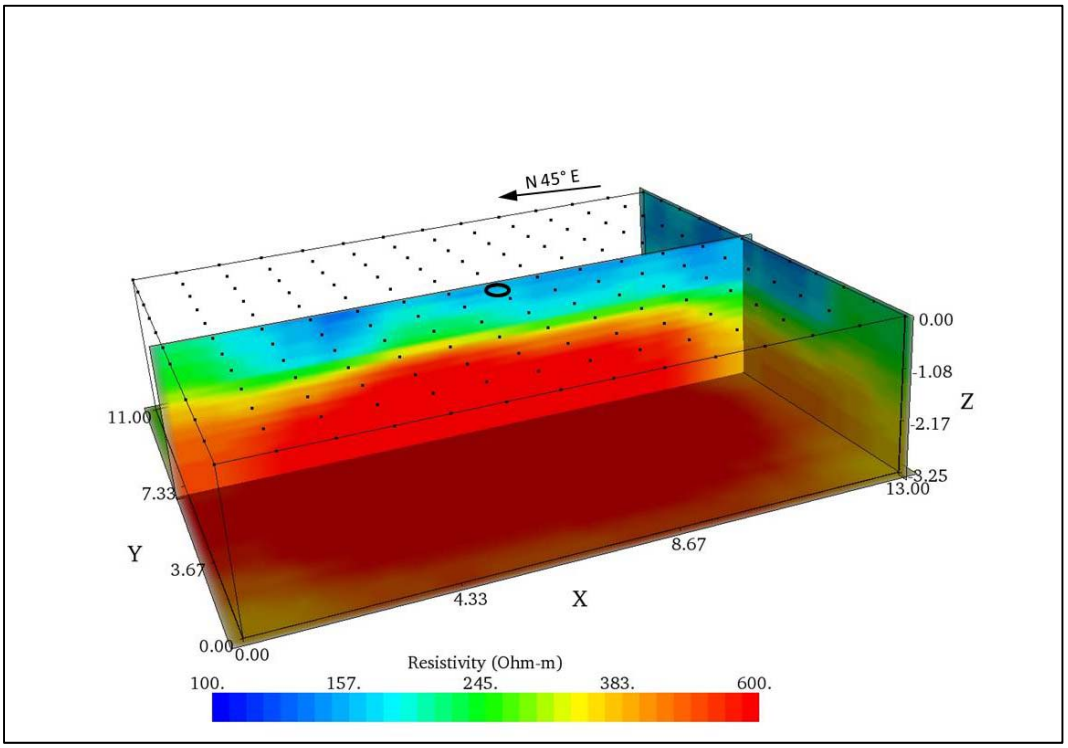


Figure C226. Slice along Y=6.00 m, 3D processing, Site 1, Albuquerque, NM.

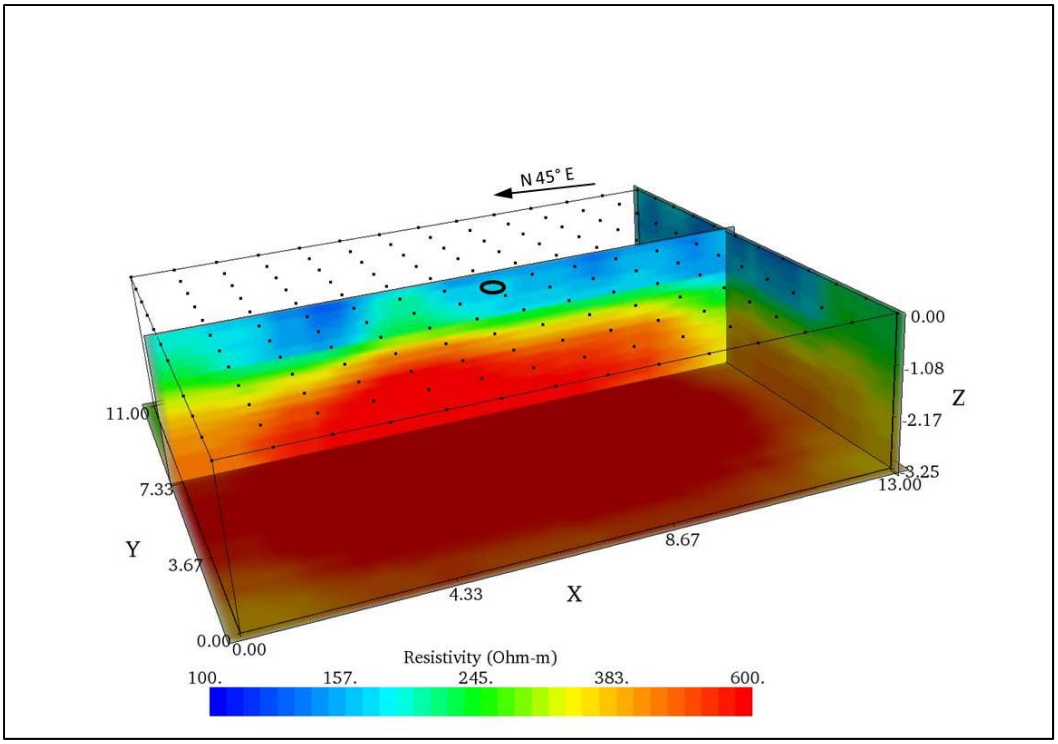


Figure C227. Slice along Y=6.50 m, 3D processing, Site 1, Albuquerque, NM.

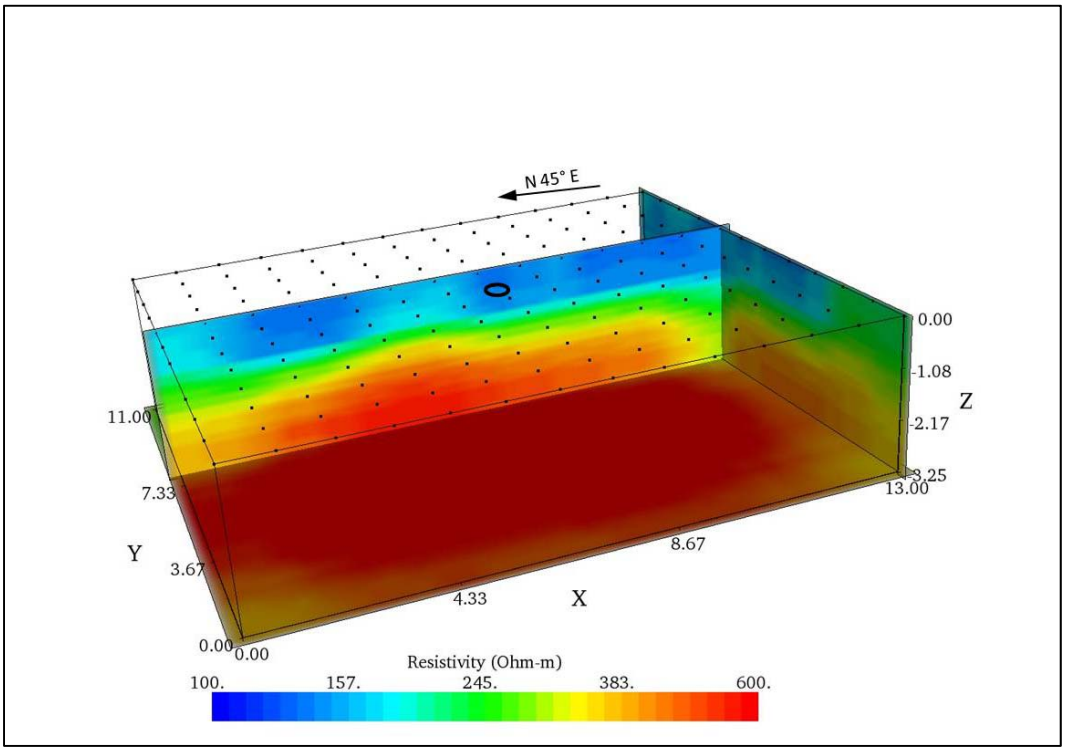


Figure C228. Slice along Y=7.00 m, 3D processing, Site 1, Albuquerque, NM.

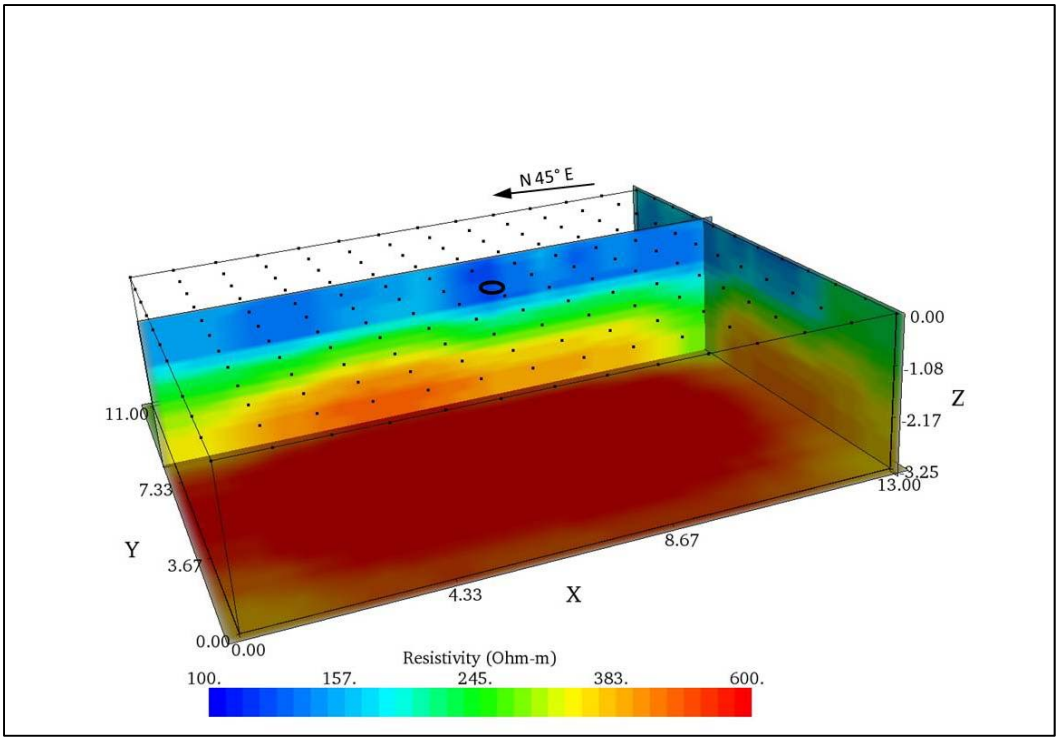


Figure C229. Slice along Y=7.50 m, 3D processing, Site 1, Albuquerque, NM.

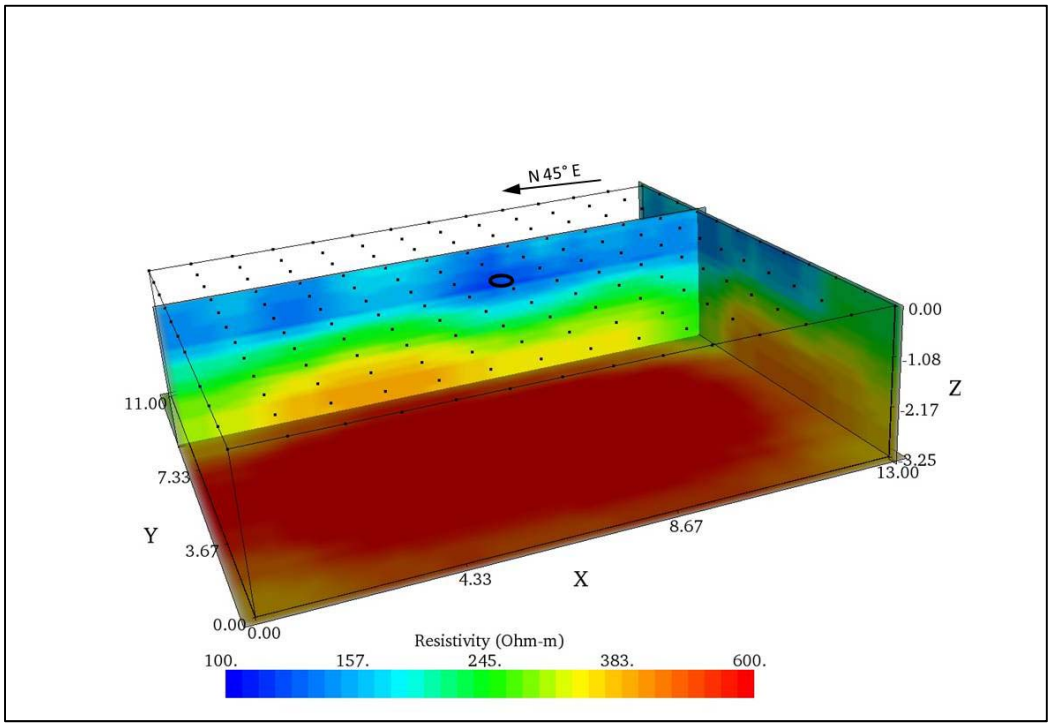


Figure C230. Slice along Y=8.00 m, 3D processing, Site 1, Albuquerque, NM.

3D Depth Slices, Site 2, Albuquerque, NM

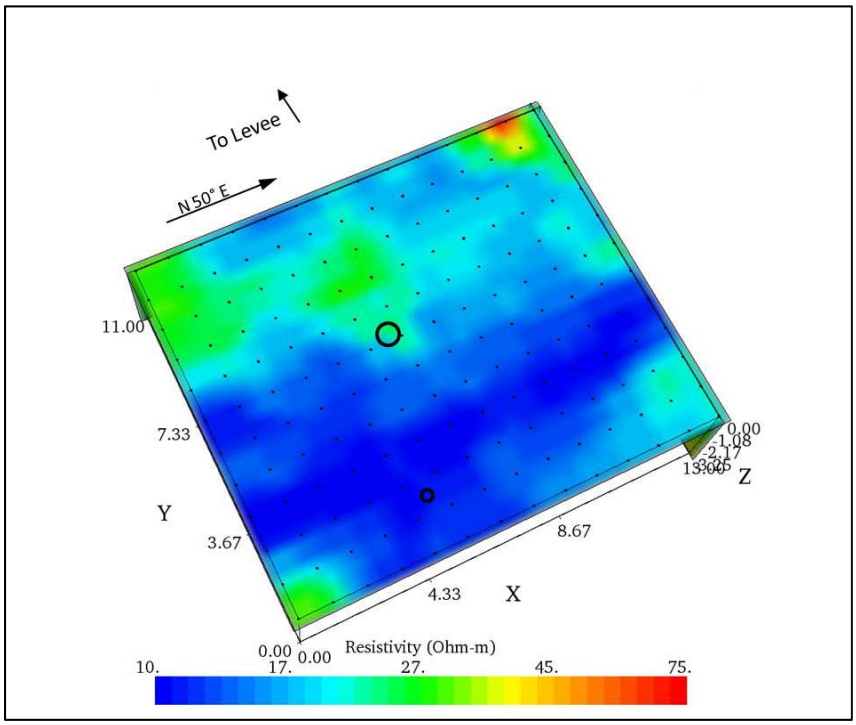


Figure C231. Depth slice at Z=0.00 m, 3D inversion, Site 2, Albuquerque, NM.

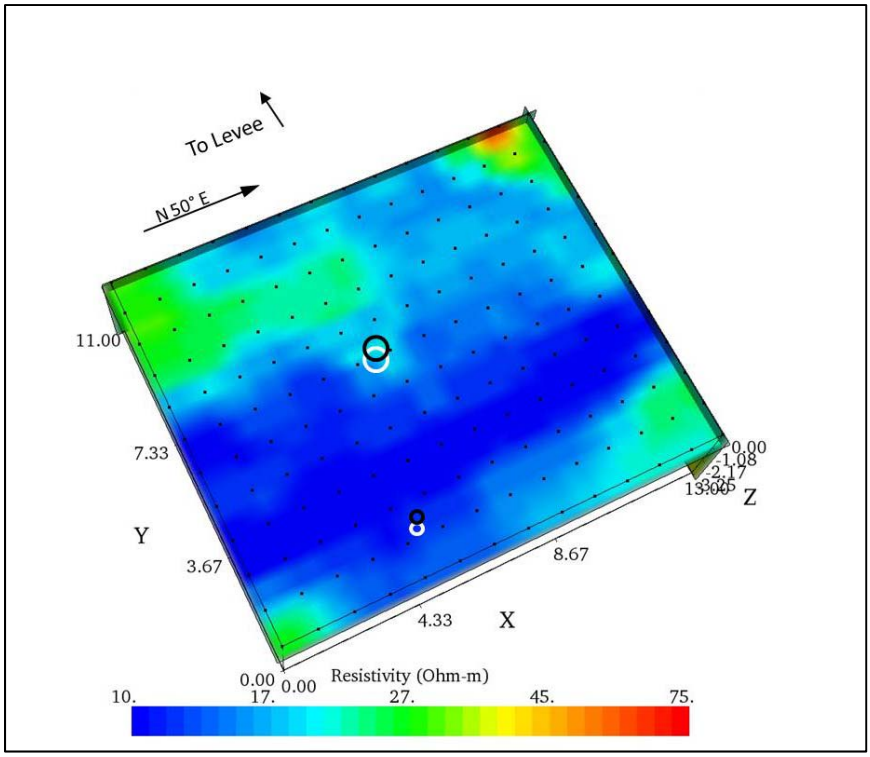


Figure C232. Depth slice at Z=-0.50 m, 3D inversion, Site 2, Albuquerque, NM.

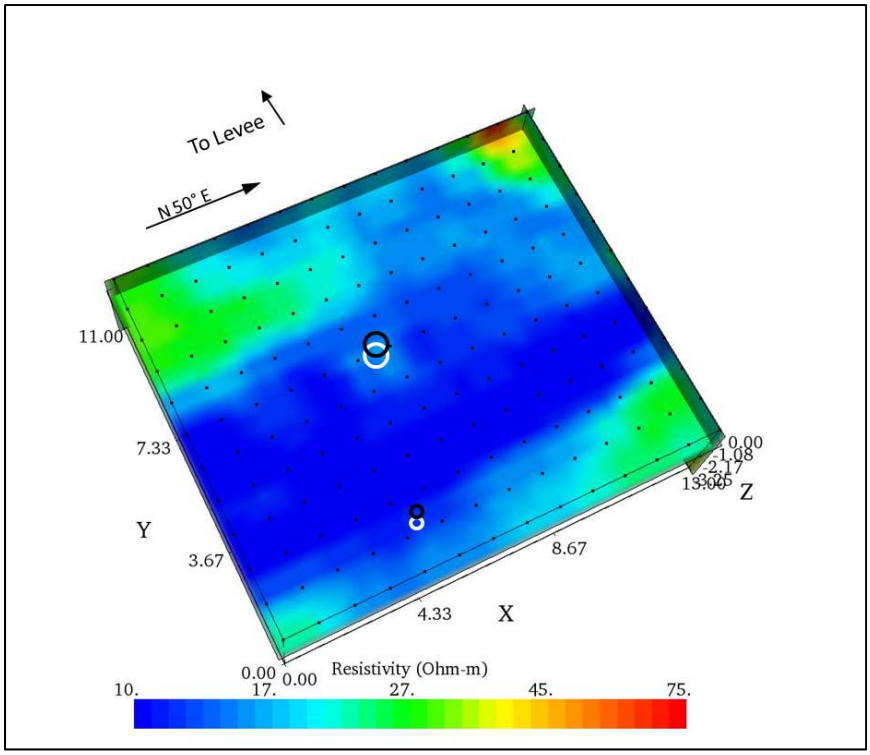


Figure C233. Depth slice at Z=-1.00 m, 3D inversion, Site 2, Albuquerque, NM.

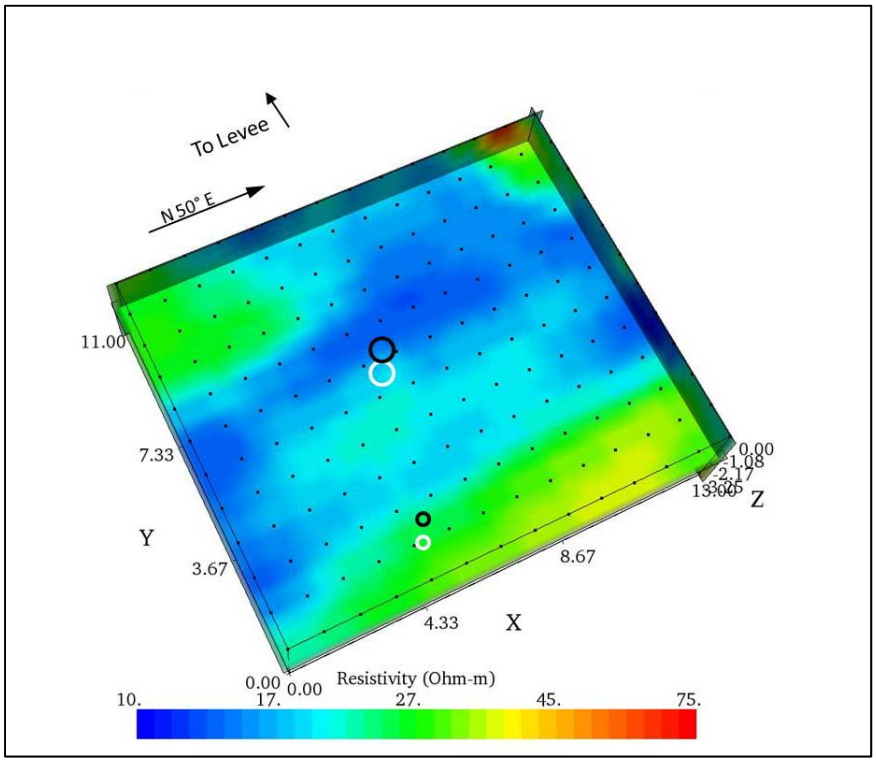


Figure C234. Depth slice at Z=-1.50 m, 3D inversion, Site 2, Albuquerque, NM.

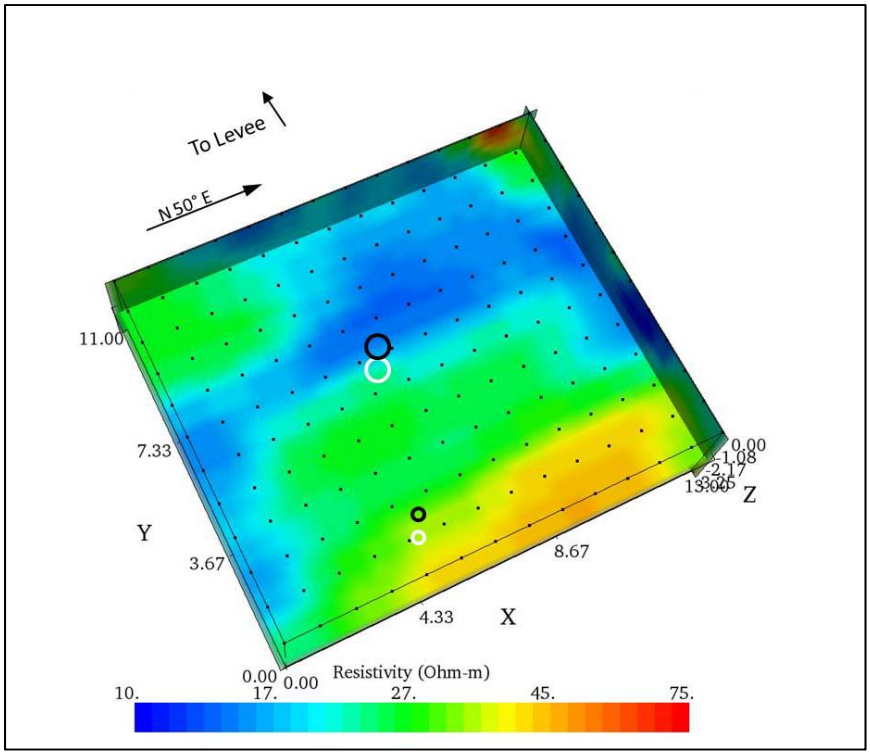


Figure C235. Depth slice at Z=-2.00 m, 3D inversion, Site 2, Albuquerque, NM.

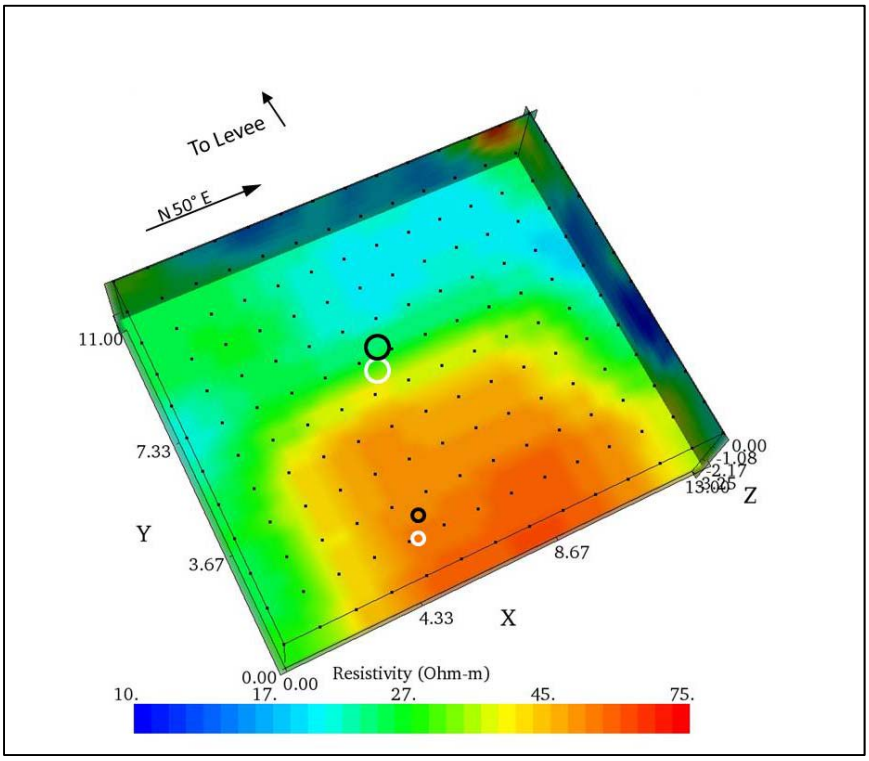


Figure C236. Depth slice at Z=-2.50 m, 3D inversion, Site 2, Albuquerque, NM.

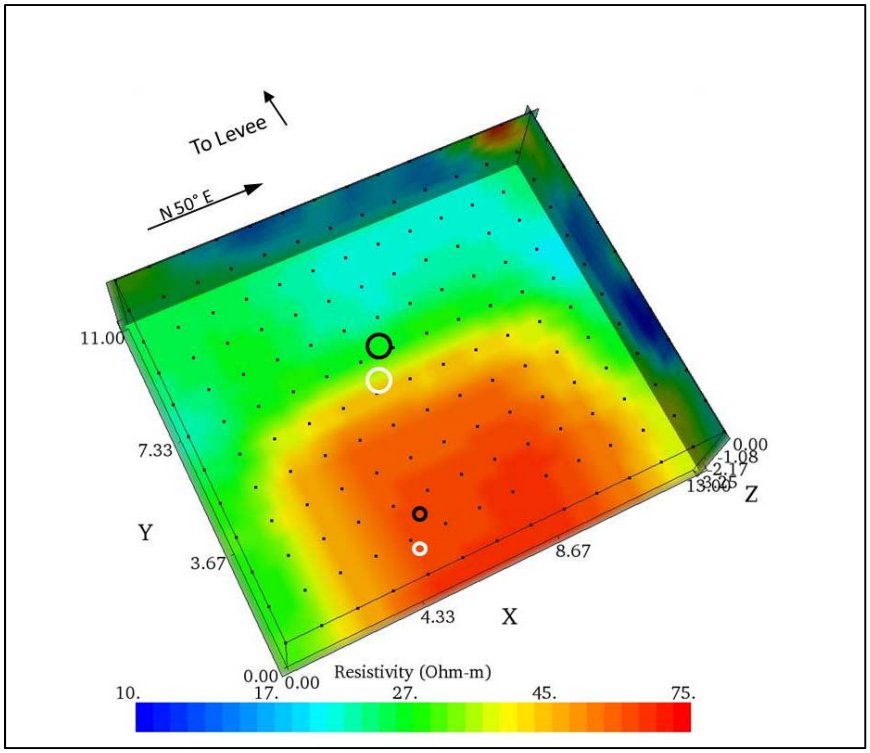


Figure C237. Depth slice at Z=-3.00 m, 3D inversion, Site 2, Albuquerque, NM.

Slices Taken Parallel to the X-Axis, Site 2, Albuquerque, NM

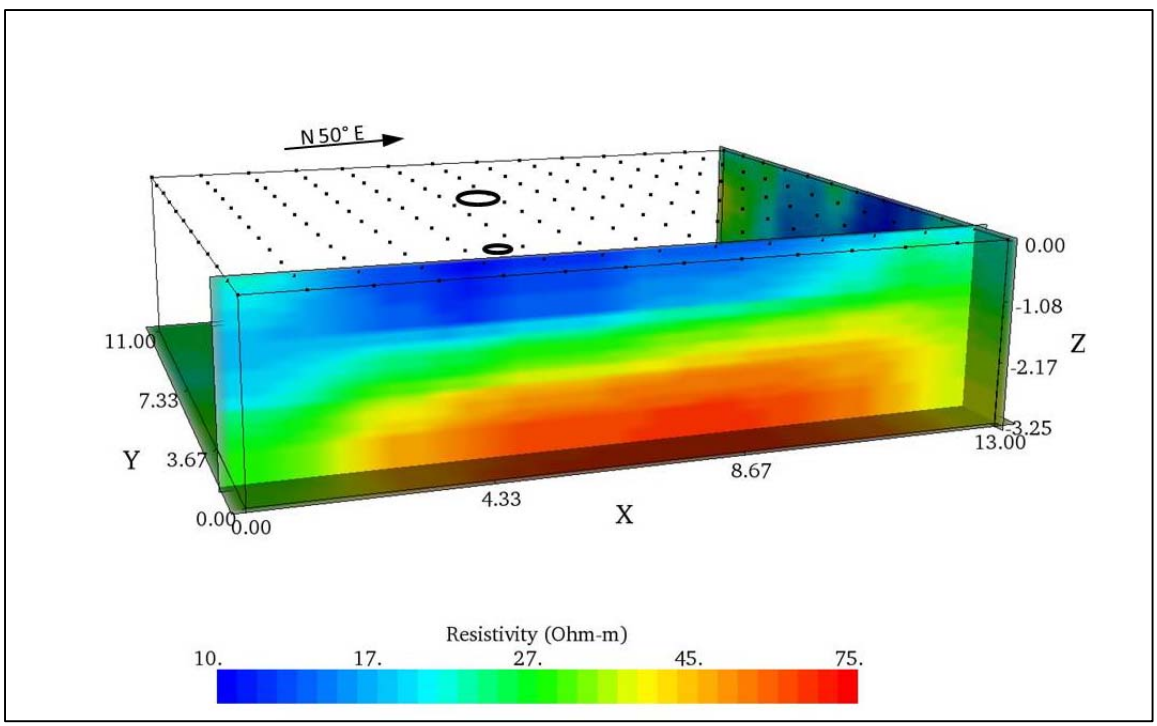


Figure C238. Slice along Y=1.00 m, 3D processing, Site 2, Albuquerque, NM.

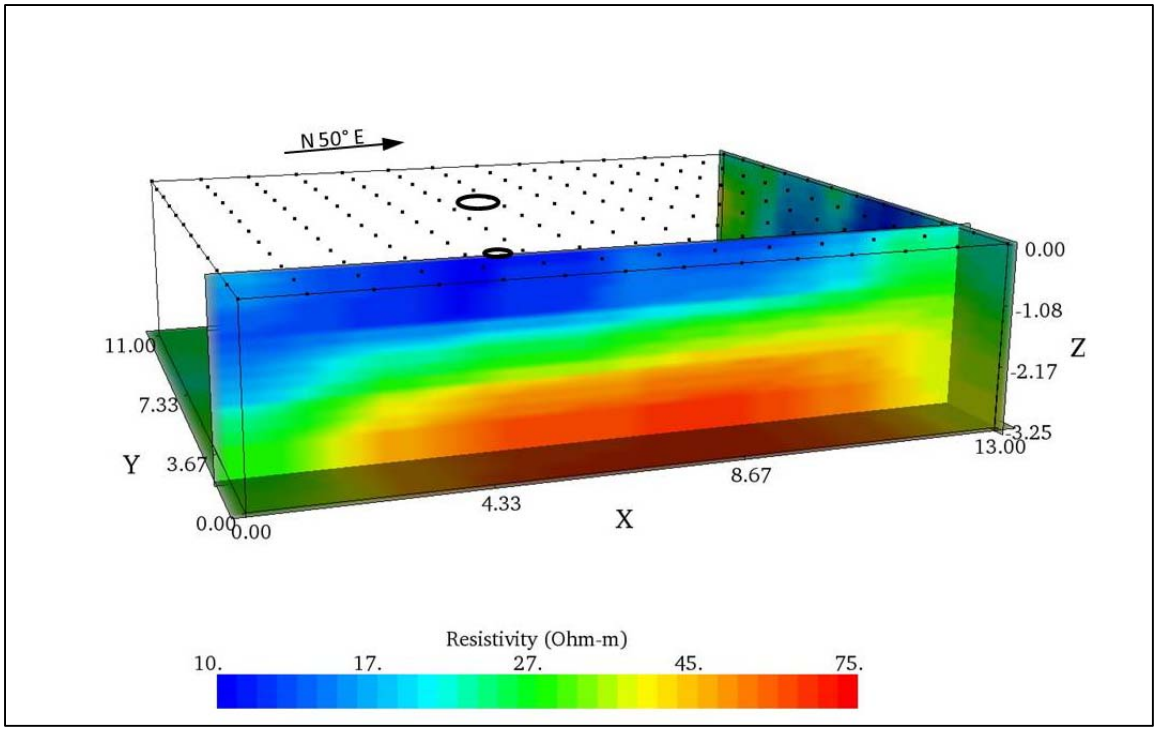


Figure C239. Slice along Y=1.50 m, 3D processing, Site 2, Albuquerque, NM.

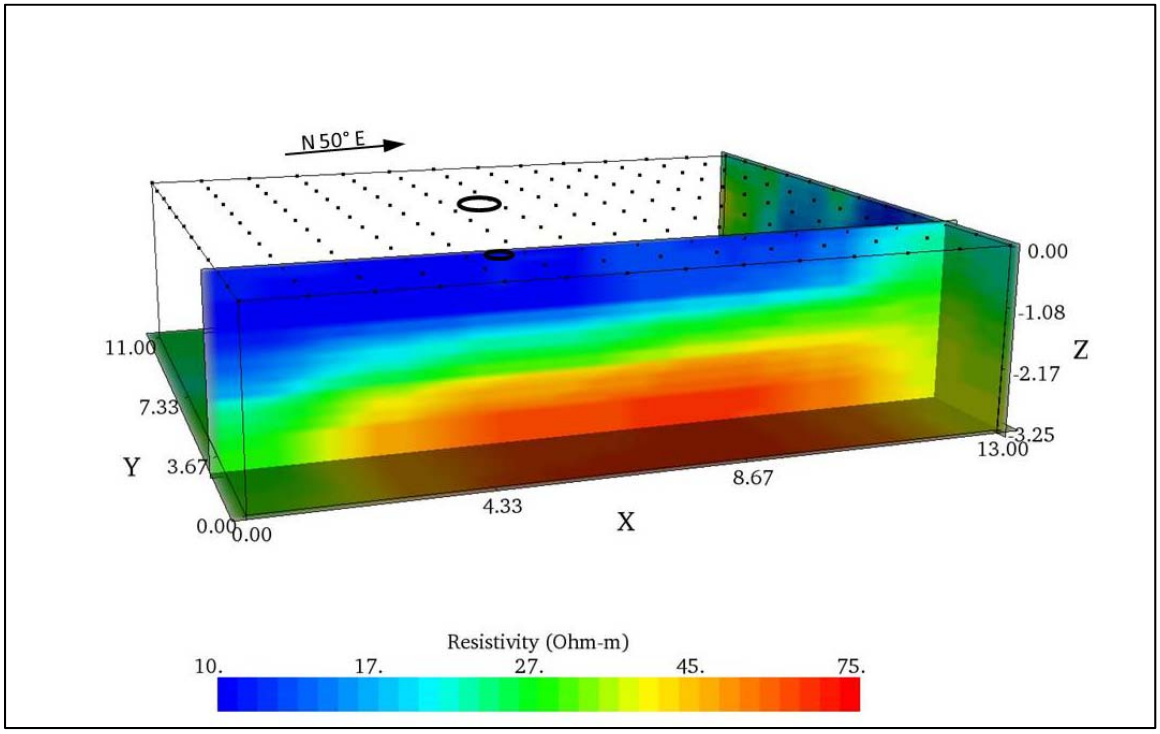


Figure C240. Slice along Y=2.00 m, 3D processing, Site 2, Albuquerque, NM.

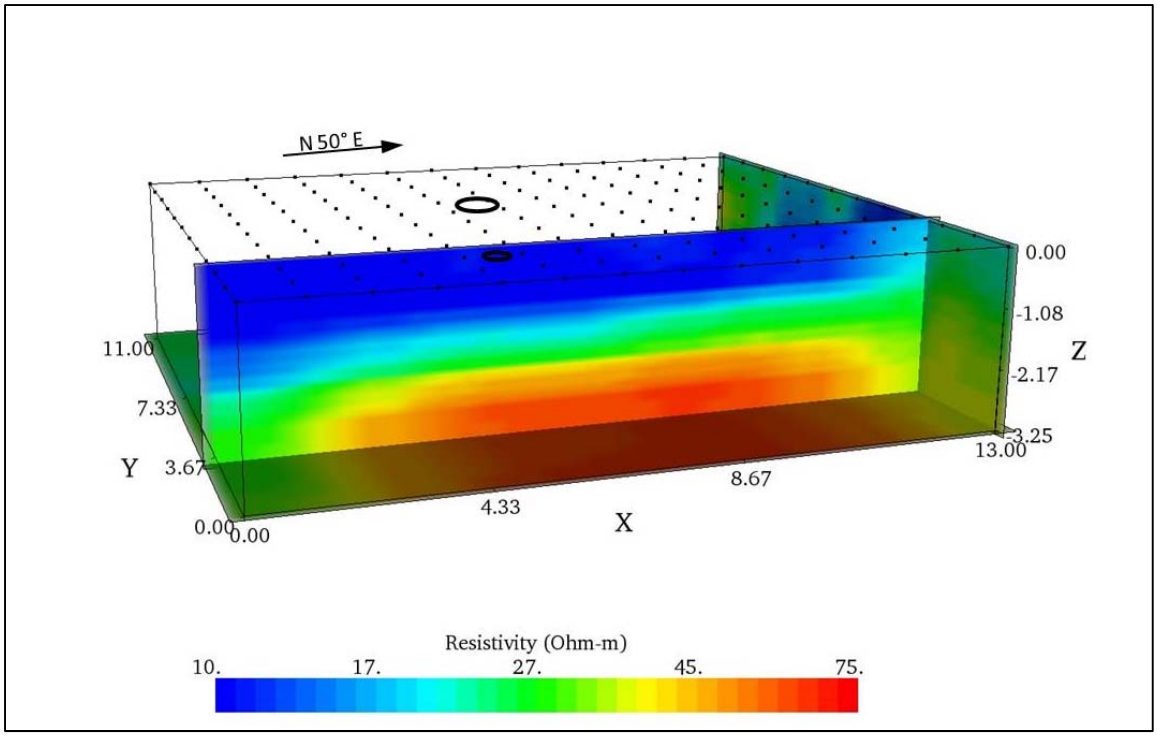


Figure C241. Slice along Y=2.50 m, 3D processing, Site 2, Albuquerque, NM.

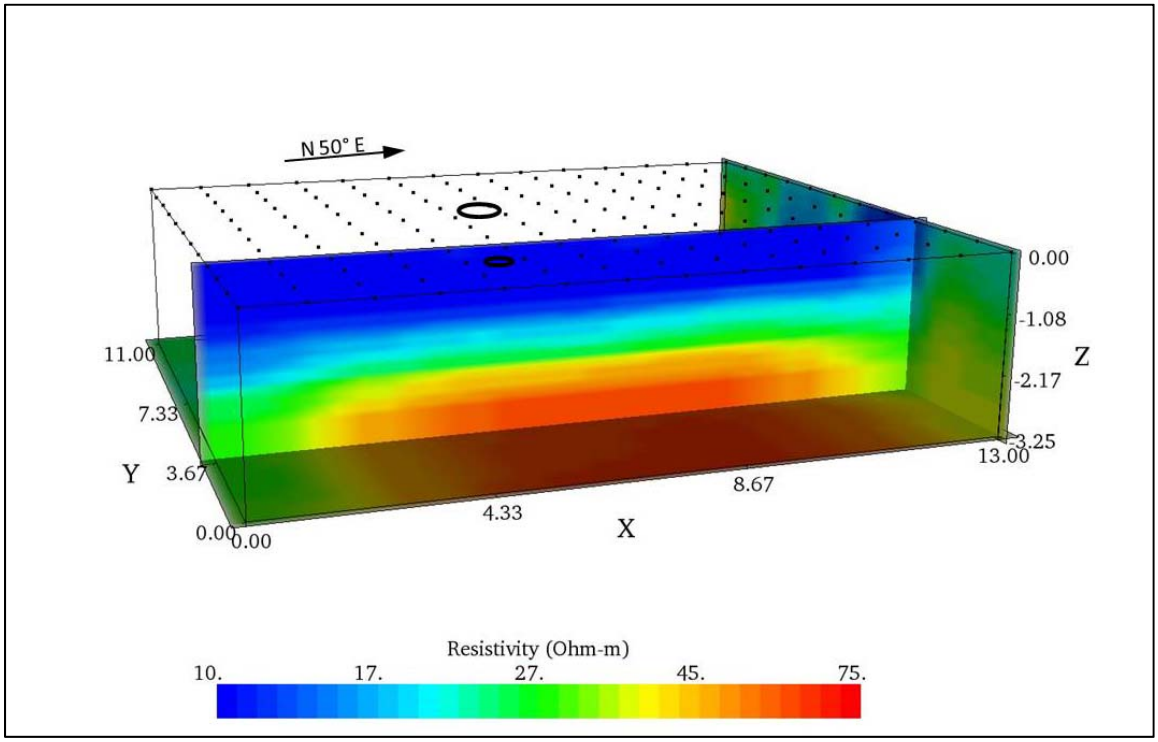


Figure C242. Slice along Y=3.00 m, 3D processing, Site 2, Albuquerque, NM.

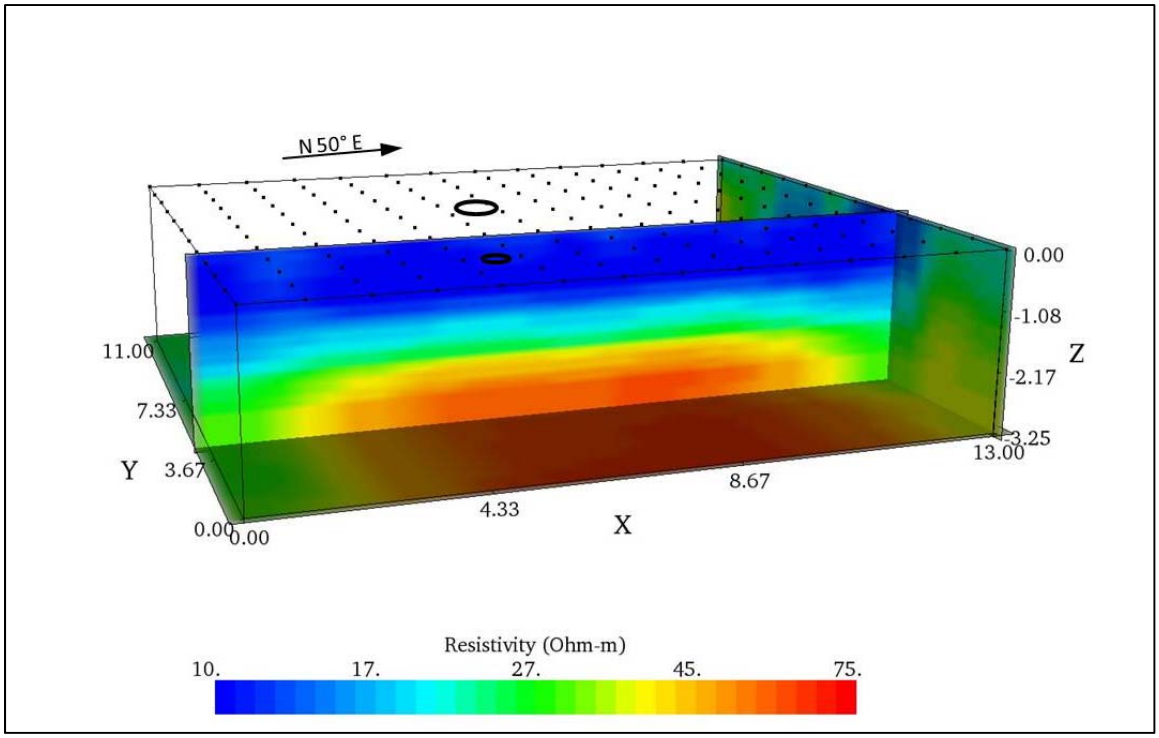


Figure C243. Slice along Y=3.50 m, 3D processing, Site 2, Albuquerque, NM.

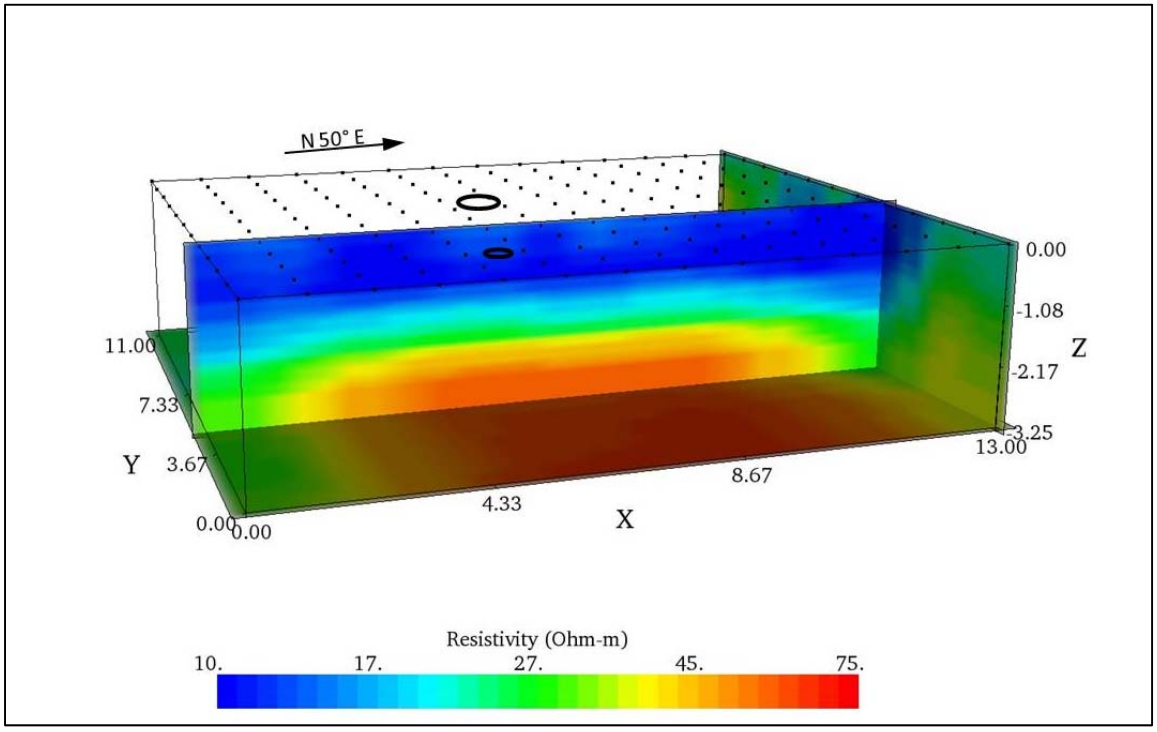


Figure C244. Slice along Y=4.00 m, 3D processing, Site 2, Albuquerque, NM.

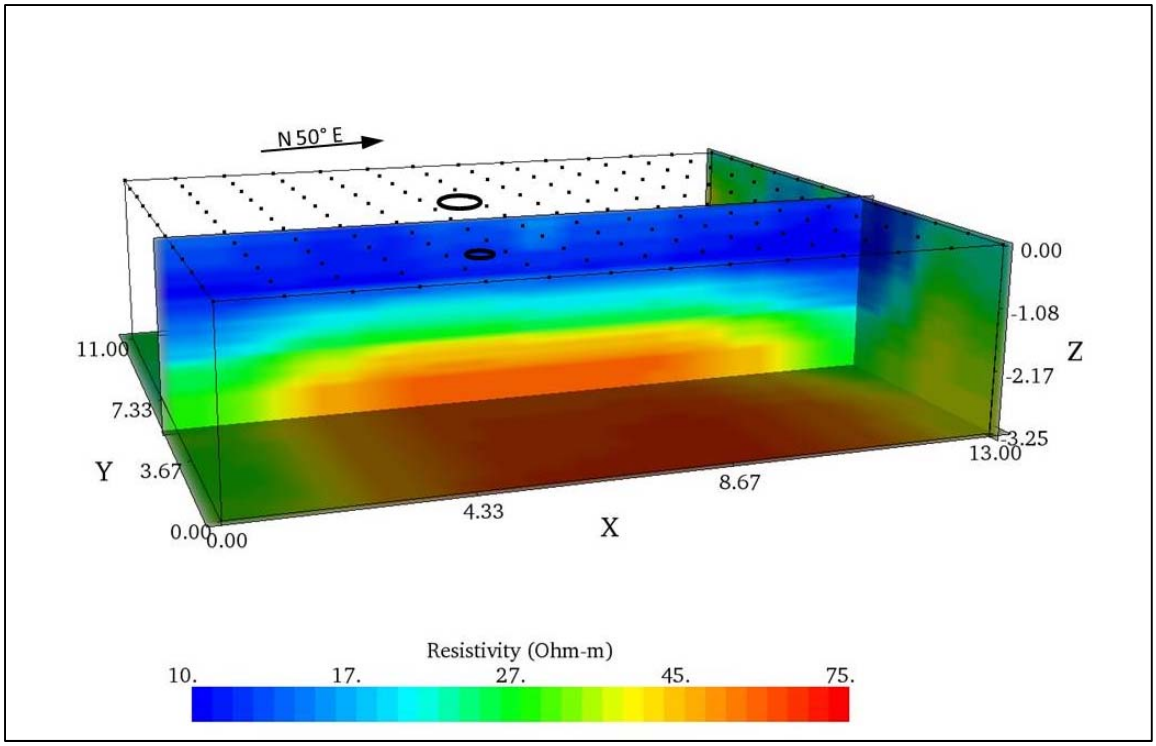


Figure C245. Slice along Y=4.50 m, 3D processing, Site 2, Albuquerque, NM.

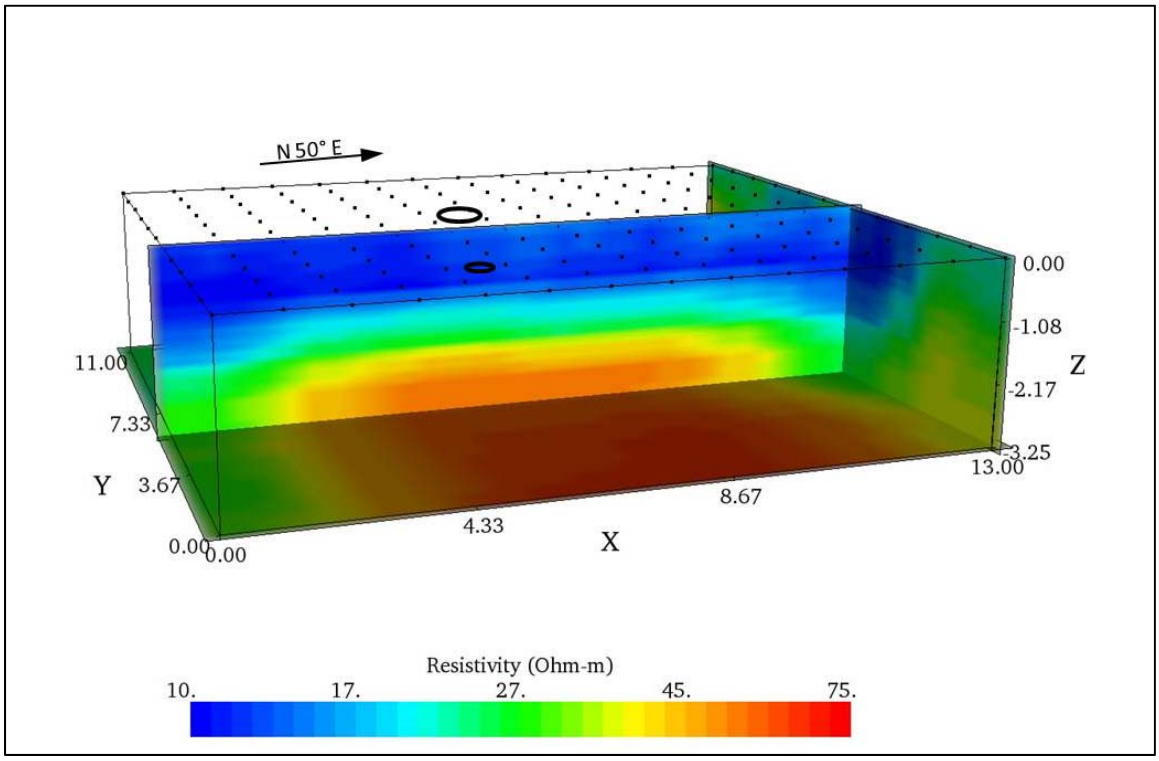


Figure C246. Slice along Y=5.00 m, 3D processing, Site 2, Albuquerque, NM.

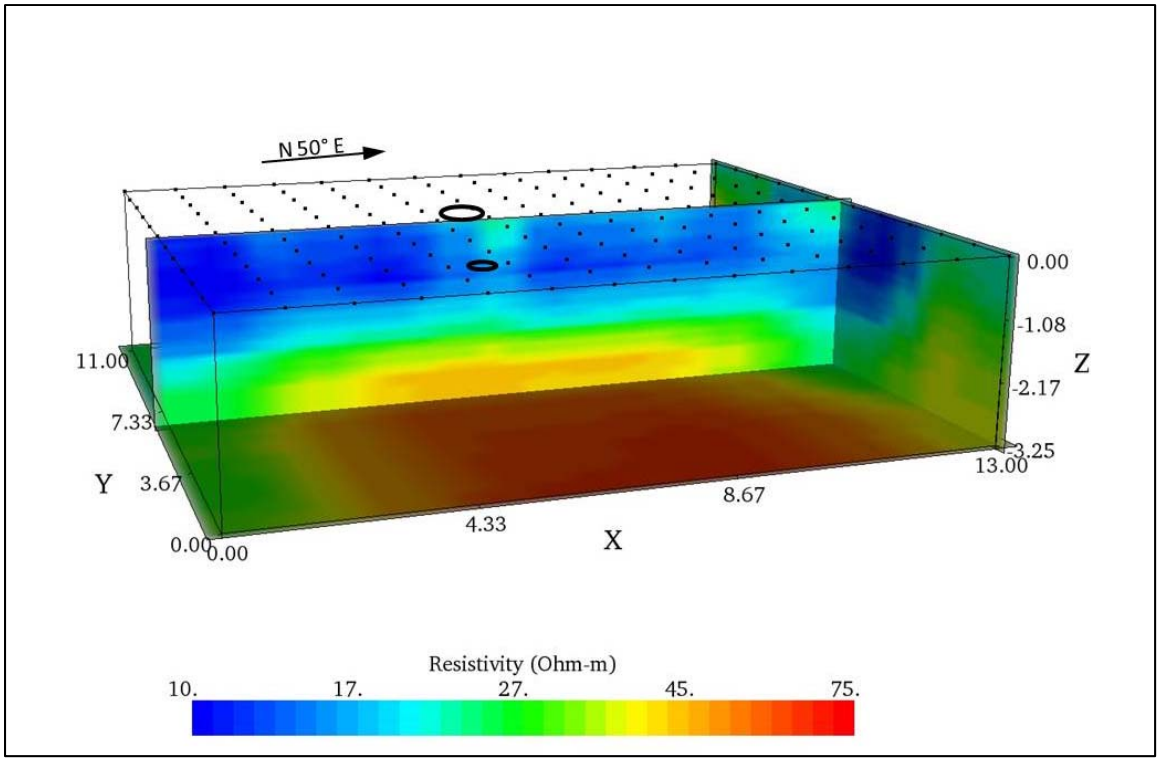


Figure C247. Slice along Y=5.50 m, 3D processing, Site 2, Albuquerque, NM.

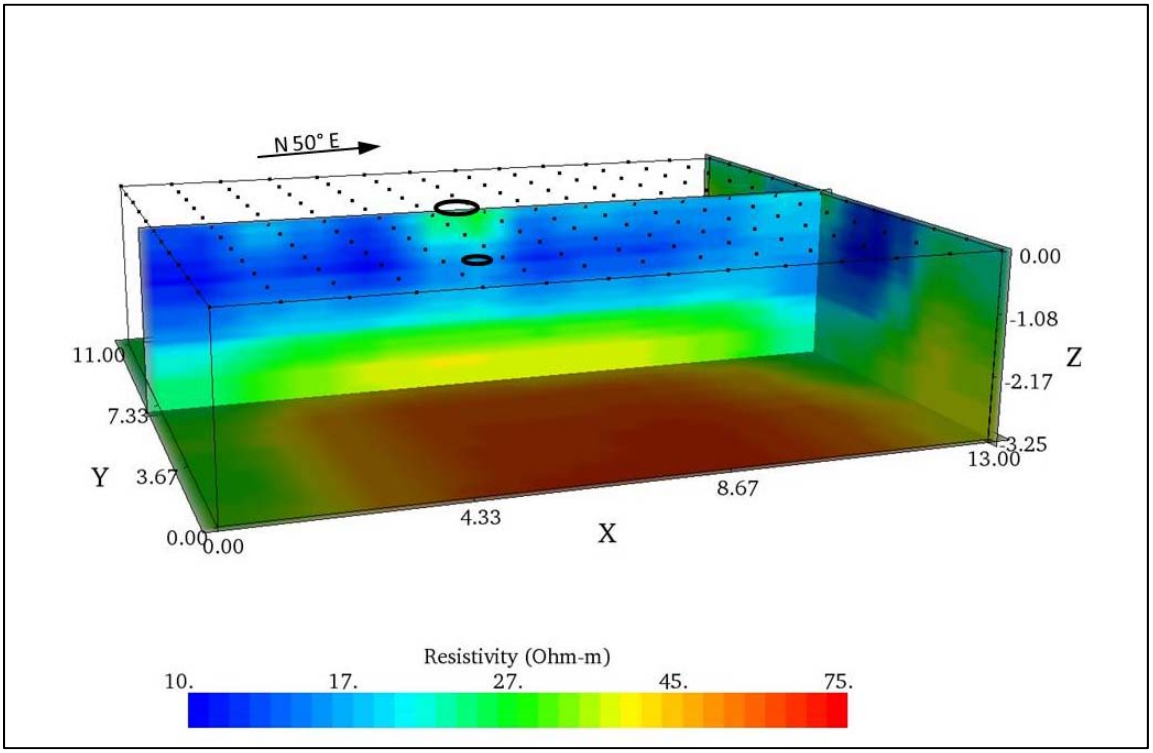


Figure C248. Slice along Y=6.00 m, 3D processing, Site 2, Albuquerque, NM.

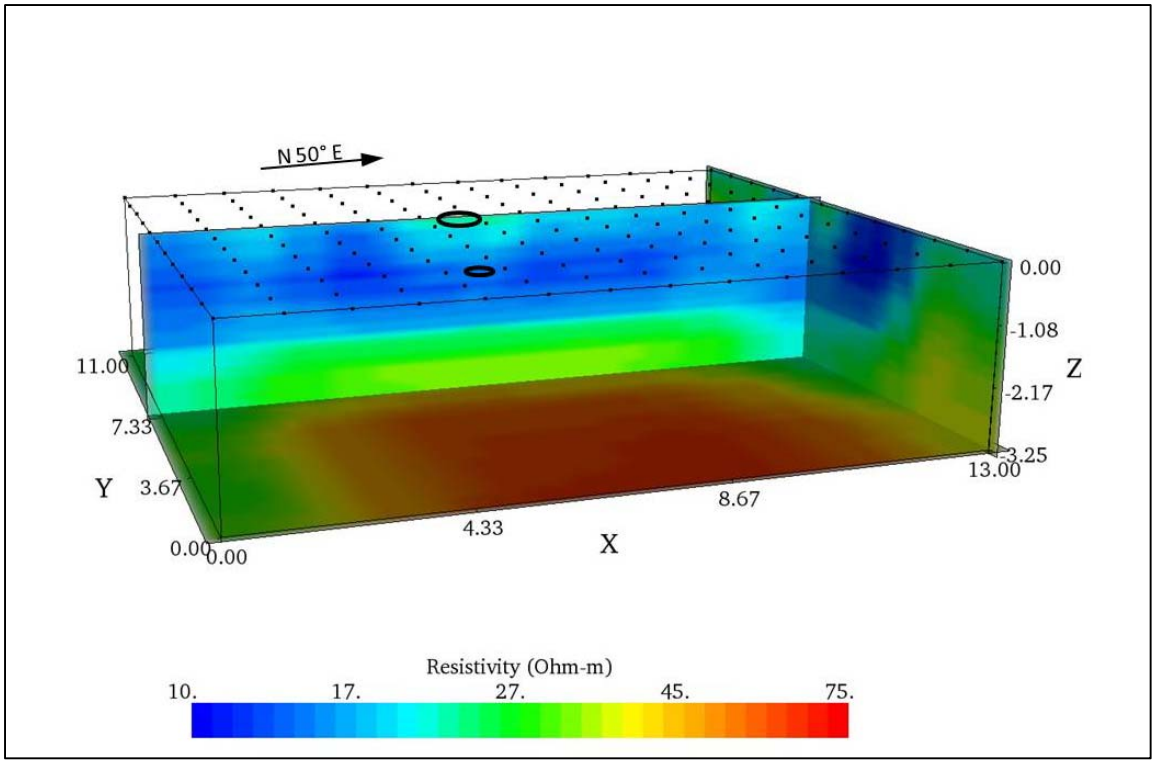


Figure C249. Slice along Y=6.50 m, 3D processing, Site 2, Albuquerque, NM.

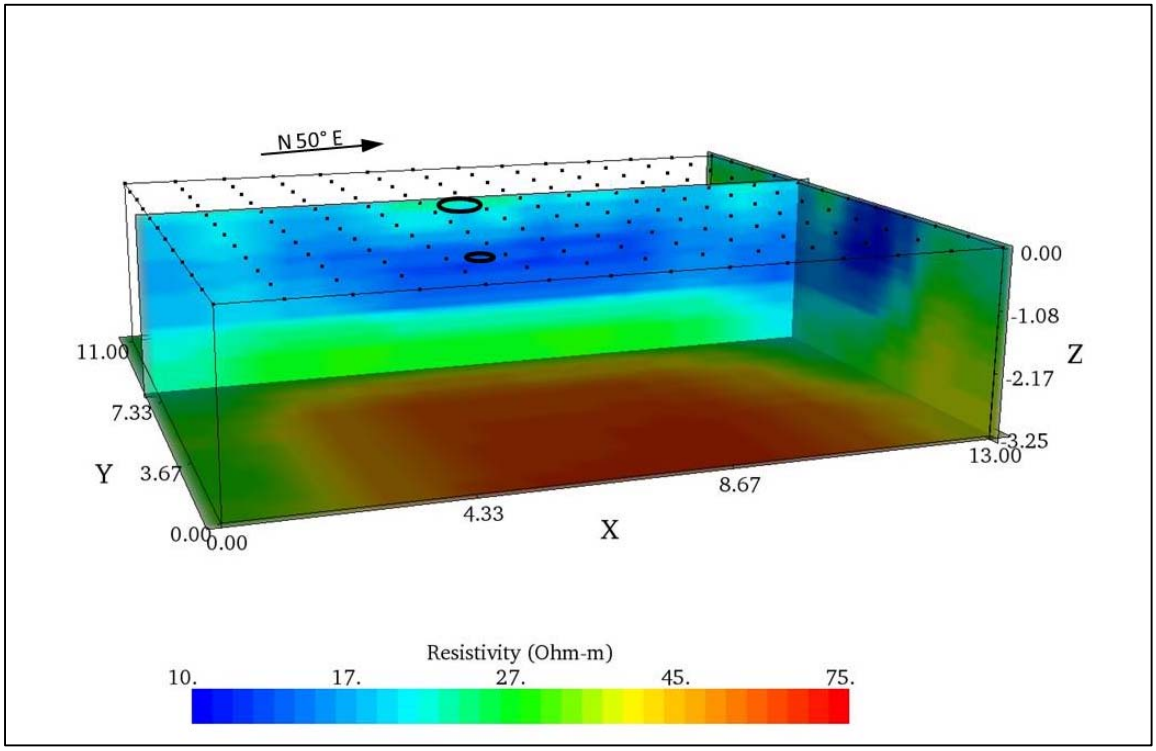


Figure C250. Slice along Y=7.00 m, 3D processing, Site 2, Albuquerque, NM.

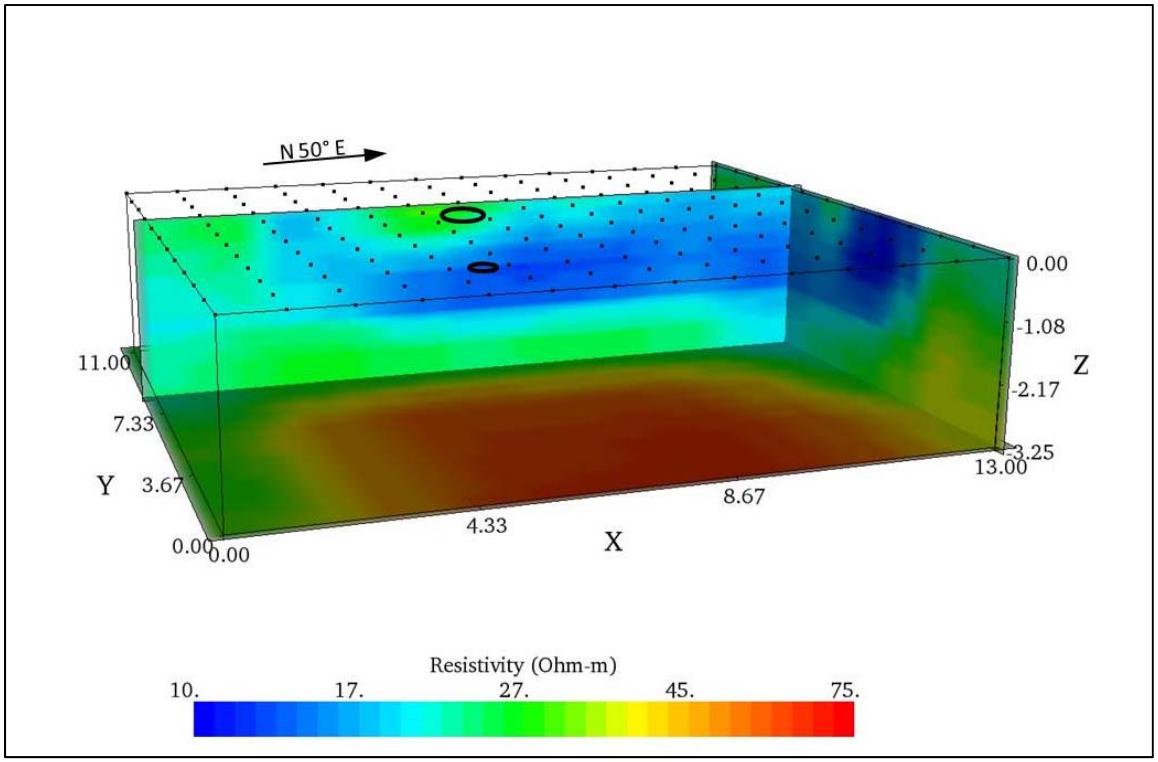


Figure C251. Slice along Y=7.50 m, 3D processing, Site 2, Albuquerque, NM.

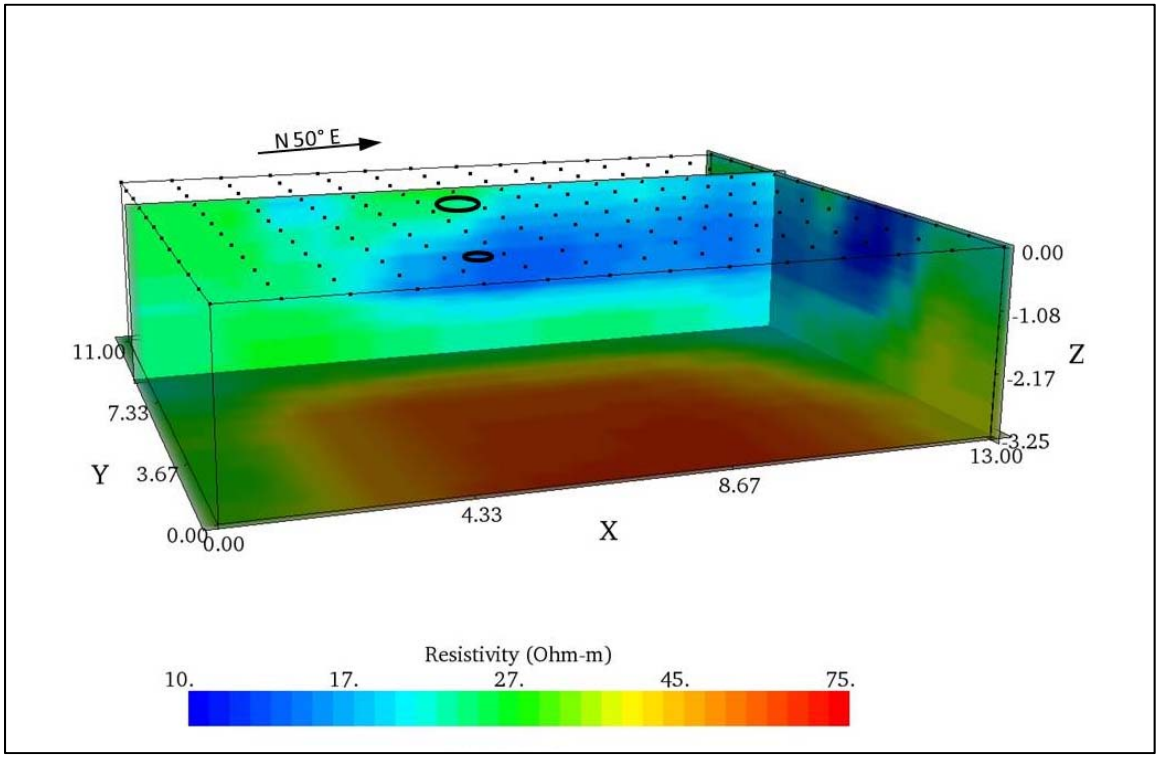


Figure C252. Slice along Y=8.00 m, 3D processing, Site 2, Albuquerque, NM.

Appendix D: Hydraulic Conductivity Values for Test Sites

Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)		Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)
Burlington, WA										
Tree	BT022.5_20	20	3	0.000371861		Control	BC022.5_20	20	3	0.000278896
Tree	BT045.0_19	19	3	0.000247907		Control	BC045.0_19	19	3	0.000247907
Tree	BT067.5_14	14	3	0.000123954		Control	BC067.5_14	14	3	0.000743722
Tree	BT090.0_08	8	3	0.000185930		Control	BC090.0_08	8	3	0.000929652
Tree	BT135.0_15	15	3	0.000371861		Control	BC135.0_15	15	3	0.001735350
Tree	BT157.5_22	22	3	0.000495814		Control	BC157.5_22	22	3	0.001549420
Tree	BT180.0_11	11	3	0.000495814		Control	BC180.0_11	11	3	0.000619768
Tree	BT180.0_17	17	3	0.001363490		Control	BC180.0_17	17	3	0.001425466
Tree	BT270.0_11	11	3	0.000011098		Control	BC270.0_11	11	3	0.001270524
Tree	BT270.0_17	17	3	0.000075667		Control	BC270.0_17	17	3	0.001921281
Tree	BT270.0_22	22	3	0.000247907		Control	BC270.0_22	22	3	0.000309884
Tree	BT292.5_08	8	3	0.000247907		Control	BC292.5_08	8	3	0.001270524
Tree	BT022.5_20	20	5	0.001859304		Control	BC022.5_20	20	5	0.000123954
Tree	BT045.0_19	19	5	0.000247907		Control	BC045.0_19	19	5	0.000123954
Tree	BT067.5_14	14	5	0.000309884		Control	BC067.5_14	14	5	0.000247907
Tree	BT090.0_08	8	5	0.000247907		Control	BC090.0_08	8	5	0.000185930
Tree	BT135.0_15	15	5	0.000037834		Control	BC135.0_15	15	5	0.000185930
Tree	BT157.5_22	22	5	0.000123954		Control	BC157.5_22	22	5	0.000619768
Tree	BT180.0_11	11	5	0.001363490		Control	BC180.0_11	11	5	0.000247907
Tree	BT180.0_17	17	5	0.000247907		Control	BC180.0_17	17	5	0.000309884
Tree	BT270.0_11	11	5	0.001301513		Control	BC270.0_11	11	5	0.000123954
Tree	BT270.0_17	17	5	0.000371861		Control	BC270.0_17	17	5	0.000619768
Tree	BT270.0_22	22	5	0.000132418		Control	BC270.0_22	22	5	0.000123954
						Control	BC292.5_08	8	5	0.000185930
Portland, OR										
Tree	FT000.0_32	32	3	0.000000908		Control	FC000.0_32	32	3	0.029254291
Tree	FT022.5_18	18	3	0.000000454		Control	FC022.5_18	18	3	0.014874433
Tree	FT045.0_19	19	3	0.001238297		Control	FC045.0_19	19	3	0.005051183
Tree	FT112.5_11	11	3	0.000029749		Control	FC112.5_11	11	3	0.001982018
Tree	FT112.5_33	33	3	0.003718608		Control	FC112.5_33	33	3	0.000743722
Tree	FT180.0_14	14	3	0.000018841		Control	FC180.0_07	7	3	0.004462330
Tree	FT180.0_7	7	3	0.000063216		Control	FC180_14	14	3	0.001534453
Tree	FT202.5_13	13	3	0.000000000		Control	FC202.5_13	13	3	0.009123010
Tree	FT202.5_33	33	3	0.000185930		Control	FC292.5_15	15	3	0.037006920
Tree	FT292.5_15	15	3	0.000185930		Control	FC292.5_20	20	3	0.032179930
Tree	FT292.5_20	20	3	0.000000681		Control	FC337.5_31	31	3	0.000707958
Tree	FT337.5_31	31	3	0.000015209		Control	FC022.5_18	18	5	0.000000000
Tree	FT000.0_32	32	5	0.009296521		Control	FC045.0_19	19	5	0.000028375

Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)		Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)
Tree	FT022.5_18	18	5	0.000007491		Control	FC112.5_11	11	5	0.001115582
Tree	FT045.0_19	19	5	0.000000227		Control	FC112.5_33	33	5	0.004585044
Tree	FT112.5_11	11	5	0.001982018		Control	FC202.5_13	13	5	0.000000000
Tree	FT180.0_14	14	5	0.000007491		Control	FC292.5_15	15	5	0.005309688
Tree	FT180.0_7	7	5	0.000003859		Control	FC292.5_20	20	5	0.024134948
Tree	FT202.5_13	13	5	0.000003859		Control	FC337.5_31	31	5	0.000567505
Tree	FT202.5_33	33	5	0.006589370						
Tree	FT292.5_15	15	5	0.000009534						
Tree	FT292.5_20	20	5	0.000415369						
Vicksburg, MS										
Tree	VT000.00_5	5	3	0.000004946		Control	VC000.00_16	16	3	0.000024732
Tree	VT000.00_6	16	3	0.000039571		Control	VC000.00_3	3	3	0.000037834
Tree	VT000.00_8	8	3	0.000045400		Control	VC000.00_8	8	3	0.000052967
Tree	VT022.5_11	11	3	0.000083234		Control	VC022.5_11	11	3	0.000052967
Tree	VT022.5_3	3	3	0.000030267		Control	VC022.5_3	3	3	0.000015133
Tree	VT045_11	11	3	0.000060534		Control	VC045.0_11	11	3	0.000013242
Tree	VT112.5_5	5	3	0.000003783		Control	VC067.5_4	4	3	0.000037834
Tree	VT202.5_8	8	3	0.000007567		Control	VC112.5_5	5	3	0.000018917
Tree	VT247.5_3	3	3	0.000007420		Control	VC202.5_8	8	3	0.000015133
Tree	VT270_11	11	3	0.000024732		Control	VC270.0_11	11	3	0.000030267
Tree	VT315.0_3	3	3	0.000049184		Control	VC315_3	3	3	0.000007567
Tree	VT0.00_5	5	5	0.000030267		Control	VC247.5_3	3	4	0.000022700
Tree	VT0.00_6	16	5	0.000052967		Control	VC000.00_16	16	5	0.000037834
Tree	VT0.00_8	8	5	0.000030267		Control	VC000.00_3	3	5	0.000045400
Tree	VT022.5_11	11	5	0.000030267		Control	VC000.00_8	8	5	0.000075667
Tree	VT022.5_3	3	5	0.058191914		Control	VC022.5_11	11	5	0.000037834
Tree	VT045_11	11	5	0.000034050		Control	VC022.5_3	3	5	0.000060534
Tree	VT067.5_14	14	5	0.000034050		Control	VC045.0_11	11	5	0.000045400
Tree	VT112.5_5	5	5	0.000075667		Control	VC067.5_4	4	5	0.000075667
Tree	VT202.5_8	8	5	0.000011129		Control	VC112.5_5	5	5	0.000068101
Tree	VT247.5_3	3	5	0.000015133		Control	VC202.5_8	8	5	0.000045400
Tree	VT270_11	11	5	0.000037834		Control	VC247.5_3	3	5	0.000037834
Tree	VT315.0_3	3	5	0.000052967		Control	VC270.0_11	11	5	0.000045400
						Control	VC315_3	3	5	0.000045400
Albuquerque, NM (1)										
Tree	AB045_13	13	1.5	0.008570106		Control	AC045_17	17	1.5	0.004826990
Tree	AB045_17	17	1.5	0.008044983		Control	AC045_13	13	1.5	0.000536332
Tree	AB045_7	7	1.5	0.010726643		Control	AC045_7	7	1.5	0.006435986
Tree	AB157.5_5	5	1.5	0.005899654		Control	AC157.5_9	9	1.5	0.006435986

Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)		Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)
Tree	AB157.5_9	9	1.5	0.004290657		Control	AC157.5_5	5	1.5	0.006435986
Tree	AB180_12	12	1.5	0.005631488		Control	AC180_12	12	1.5	0.007508650
Tree	AB180_6	6	1.5	0.015058515		Control	AC270_4	4	1.5	0.003754325
Tree	AB270_4	4	1.5	0.006435986		Control	AC315_4	4	1.5	0.002681661
Tree	AB270_9	9	1.5	0.016974173		Control	AC315_8	8	1.5	0.008581315
Tree	AB315_4	4	1.5	0.004826990		Control	AC337.5	5	1.5	0.008044983
Tree	AB315_8	8	1.5	0.008044983		Control	AC225_18	18	1.5	0.008044983
Tree	AB325_18	18	1.5	0.002681661		Control	AC225_9	9	1.5	0.011799308
Tree	AB325_9	9	1.5	0.004826990		Control	AC090_7	7	1.5	0.006776332
Tree	AB337.5_18	18	1.5	0.012871972		Control	AC180_6	6	1.5	0.003011703
Tree	AB337.5_7	7	1.5	0.010540961		Control	AC337.5_7	7	1.5	0.027775920
Tree	AB045_13	13	2.5	0.001340830		Control	AC270_9	9	1.5	0.012344853
Tree	AB045_17	17	2.5	0.001072664		Control	AC045_17	17	2.5	0.008044983
Tree	AB045_7	7	2.5	0.000670415		Control	AC045_13	13	2.5	0.006972318
Tree	AB090_7	7	2.5	0.009258640		Control	AC045_7	7	2.5	0.016089965
Tree	AB157.5_5	5	2.5	0.005095156		Control	AC157.5_9	9	2.5	0.009117647
Tree	AB157.5_9	9	2.5	0.000987845		Control	AC157.5_5	5	2.5	0.024246631
Tree	AB180_12	12	2.5	0.002681661		Control	AC180_12	12	2.5	0.009117647
Tree	AB180_6	6	2.5	0.024689707		Control	AC270_4	4	2.5	0.002681661
Tree	AB270_10	9	2.5	0.003011703		Control	AC315_4	4	2.5	0.029095957
Tree	AB270_4	4	2.5	0.001608997		Control	AC315_8	8	2.5	0.012871972
Tree	AB315_4	4	2.5	0.002413495		Control	AC337.5	5	2.5	0.016089965
Tree	AB315_8	8	2.5	0.000804498		Control	AC225_18	18	2.5	0.003754325
Tree	AB325_18	18	2.5	0.001877163		Control	AC225_9	9	2.5	0.003754325
Tree	AB325_9	9	2.5	0.001340830		Control	AC090_7	7	2.5	0.030117031
Tree	AB337.5_18	18	2.5	0.004022491		Control	AC180_6	6	2.5	0.092586400
Tree	AB337.5_7	7	2.5	0.003879461		Control	AC337.5_7	7	2.5	0.009035109
						Control	AC270_9	9	2.5	0.029319027
Albuquerque, NM (2)										
Tree 2	AB2000.0_16	16	1.5	0.010726643		Control 2	AC2000.0_16	16	1.5	0.033948347
Tree 2	AB2022.5_5	5	1.5	0.007508650		Control 2	AC2022.5_5	5	1.5	0.023146600
Tree 2	AB2045_13	13	1.5	0.001097606		Control 2	AC2045_13	13	1.5	0.061724267
Tree 2	AB2045_15	15	1.5	0.002681661		Control 2	AC2045_15	15	1.5	0.033948347
Tree 2	AB2067.5_4	4	1.5	0.002278895		Control 2	AC2067.5_4	4	1.5	0.024689707
Tree 2	AB2067.5_9	9	1.5	0.012608248		Control 2	AC2067.5_9	9	1.5	0.018517280
Tree 2	AB2157.5_9	9	1.5	0.013578113		Control 2	AC2157.5_9	9	1.5	0.074069120
Tree 2	AB2180_13	13	1.5	0.014547979		Control 2	AC2180_13	13	1.5	0.083327760
Tree 2	AB2225_6	6	1.5	0.000804498		Control 2	AC2225_6	6	1.5	0.052465627
Tree 2	AB2315_5	5	1.5	0.046293200		Control 2	AC2315_5	5	1.5	0.061724267

Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)		Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)
Tree 2	AB2337.5_18	18	1.5	0.048493262		Control 2	AC2337.5_18	18	1.5	0.030862133
Tree 2	AB2360_8	8	1.5	0.002681661		Control 2	AC2360_8	8	1.5	0.052465627
Tree 2	AB2000.0_16	16	2.5	0.010726643		Control 2	AC2000.0_16	16	2.5	0.200603867
Tree 2	AB2022.5_5	5	2.5	0.006972318		Control 2	AC2022.5_5	5	2.5	0.077155334
Tree 2	AB2045_13	13	2.5	0.013408304		Control 2	AC2045_13	13	2.5	0.029498269
Tree 2	AB2045_15	15	2.5	0.005363322		Control 2	AC2045_15	15	2.5	0.077155334
Tree 2	AB2067.5_4	4	2.5	0.003217993		Control 2	AC2067.5_4	4	2.5	0.123448534
Tree 2	AB2067.5_9	9	2.5	0.000619768		Control 2	AC2067.5_9	9	2.5	0.092586400
Tree 2	AB2157.5_9	9	2.5	0.003798158		Control 2	AC2157.5_9	9	2.5	0.154310667
Tree 2	AB2180_13	13	2.5	0.000439042		Control 2	AC2180_13	13	2.5	0.092586400
Tree 2	AB2225_6	6	2.5	0.004849326		Control 2	AC2225_6	6	2.5	0.185172801
Tree 2	AB2315_5	5	2.5	0.012344853		Control 2	AC2315_5	5	2.5	0.123448534
Tree 2	AB2337.5_18	18	2.5	0.000201010		Control 2	AC2337.5_18	18	2.5	0.200603867
Tree 2	AB2360_8	8	2.5	0.004826990		Control 2	AC2360_8	8	2.5	0.067896694
Sacramento, CA										
Tree	ST022_14.5	14.5	3	0.004629320		Control	SC022_14.5	14.5	3	0.004517555
Tree	ST076_16	16	3	0.006172427		Control	SC076_16	16	3	0.061724267
Tree	ST101_5	5	3	0.012344853		Control	SC101_5	5	3	0.030862133
Tree	ST169_4	4	3	0.027775920		Control	SC123_4	4	3	0.037034560
Tree	ST175_16	16	3	0.056469432		Control	SC169_4	4	3	0.018517280
Tree	ST183_6	6	3	0.052465627		Control	SC175_16	16	3	0.030862133
Tree	ST247_5	5	3	0.040120773		Control	SC183_6	6	3	0.052465627
Tree	ST267_5	5	3	0.020060387		Control	SC247_5	5	3	0.033948347
Tree	ST269_3	3	3	0.027105328		Control	SC267_5	5	3	0.049379413
Tree	ST291_6	6	3	0.024689707		Control	SC269_3	3	3	0.018517280
Tree	ST319_15	15	3	0.092586400		Control	SC291_6	6	3	0.046293200
Tree	ST022_14.5	14.5	5	0.030862133		Control	SC319_15	15	3	0.077155334
Tree	ST076_16	16	5	0.000752926		Control	SC022_14.5	14.5	5	0.027775920
Tree	ST101_5	5	5	0.046293200		Control	SC076_16	16	5	0.027775920
Tree	ST123_4	4	5	0.018517280		Control	SC101_5	5	5	0.024689707
Tree	ST169_4	4	5	0.027775920		Control	SC123_4	4	5	0.009258640
Tree	ST175_16	16	5	0.052465627		Control	SC169_4	4	5	0.024689707
Tree	ST183_6	6	5	0.018517280		Control	SC175_16	16	5	0.074069120
Tree	ST247_5	5	5	0.001838490		Control	SC183_6	6	5	0.024689707
Tree	ST267_5	5	5	0.004629320		Control	SC247_5	5	5	0.077155334
Tree	ST269_3	3	5	0.043206987		Control	SC267_5	5	5	0.010801747
Tree	ST291_6	6	5	0.018517280		Control	SC269_3	3	5	0.030862133
Tree	ST319_15	15	5	0.009258640		Control	SC291_6	6	5	0.074069120
						Control	SC319_15	15	5	0.000148079

Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)		Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)
Boca Raton, FL										
Tree	JT022.5_14	14	1	0.005363322		Control	JC022.5_14	14	1	0.015407241
Tree	JT022.5_9	9	1	0.013036896		Control	JC022.5_9	9	1	0.018962758
Tree	JT045_8	8	1	0.013036896		Control	JC045_8	8	1	0.009481379
Tree	JT090_14	14	1	0.005925862		Control	JC090_14	14	1	0.014222068
Tree	JT112.5_15	15	1	0.003217993		Control	JC112.5_15	15	1	0.005925862
Tree	JT157.5_13	13	1	0.013408304		Control	JC157.5_13	13	1	0.008296207
Tree	JT157.5_7	7	1	0.010666551		Control	JC157.5_7	7	1	0.008296207
Tree	JT180_10	10	1	0.011851724		Control	JC180_10	10	1	0.015407241
Tree	JT180_17	17	1	0.018962758		Control	JC180_17	17	1	0.005925862
Tree	JT202.5_14	14	1	0.008296207		Control	JC202.5_14	14	1	0.007111034
Tree	JT225_12	12	1	0.013036896		Control	JC225_12	12	1	0.005925862
Tree	JT270_10	10	1	0.005925862		Control	JC270_10	10	1	0.004740689
Tree	JT022.5_14	14	2	0.003217993		Control	JC022.5_14	14	2	0.000126552
Tree	JT022.5_9	9	2	0.001608997		Control	JC022.5_9	9	2	0.000268166
Tree	JT045_8	8	2	0.002681661		Control	JC045_8	8	2	0.004290657
Tree	JT090_14	14	2	0.000592586		Control	JC090_14	14	2	0.000216946
Tree	JT112.5_15	15	2	0.000804498		Control	JC112.5_15	15	2	0.000163702
Tree	JT157.5_13	13	2	0.000268166		Control	JC157.5_13	13	2	0.000536332
Tree	JT157.5_7	7	2	0.004022491		Control	JC157.5_7	7	2	0.000261580
Tree	JT180_10	10	2	0.001072664		Control	JC180_10	10	2	0.000642758
Tree	JT180_17	17	2	0.006972318		Control	JC180_17	17	2	0.000053603
Tree	JT202.5_14	14	2	0.001340830		Control	JC202.5_14	14	2	0.000536332
Tree	JT225_12	12	2	0.000804498		Control	JC225_12	12	2	0.002681661
Tree	JT270_10	10	2	0.002413495		Control	JC270_10	10	2	0.002681661
Danville, PA										
Tree	DT022.5_14	14	3	0.047836307		Control	DC022.5_14	14	3	0.037034560
Tree	DT022.5_9	9	3	0.067896694		Control	DC022.5_9	9	3	0.013552664
Tree	DT067.5_5	5	3	0.006023406		Control	DC045_8	8	3	0.043206987
Tree	DT135_6	6	3	0.012344853		Control	DC067.5_5	5	3	0.043206987
Tree	DT157.5_12	12	3	0.009258640		Control	DC135_6	6	3	0.024689707
Tree	DT157.5_6	6	3	0.003011703		Control	DC157.5_12	12	3	0.015431067
Tree	DT225_14	14	3	0.010030193		Control	DC157.5_6	6	3	0.015431067
Tree	DT225_6	6	3	0.006023406		Control	DC225_14	14	3	0.021081921
Tree	DT315_10	10	3	0.023146600		Control	DC225_6	6	3	0.015431067
Tree	DT315_5	5	3	0.006023406		Control	DC315_10	10	3	0.027775920
Tree	DT337.5_9	9	3	0.006172427		Control	DC315_5	5	3	0.009258640
Tree	DT022.5_14	14	5	0.023146600		Control	DC337.5_9	9	3	0.046293200
Tree	DT022.5_9	9	5	0.018517280		Control	DC022.5_14	14	5	0.011293886

Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)		Tree/Control	Sample Name	Distance (ft)	Max Depth (ft)	$K_{sg\ (Glover)}$ (cm/s)
Tree	DT045_8	8	5	0.061724267		Control	DC022.5_9	9	5	0.010540961
Tree	DT067.5_5	5	5	0.052465627		Control	DC045_8	8	5	0.004517555
Tree	DT135_6	6	5	0.033948347		Control	DC067.5_5	5	5	0.050922520
Tree	DT157.5_12	12	5	0.043206987		Control	DC135_6	6	5	0.024689707
Tree	DT157.5_6	6	5	0.002258777		Control	DC157.5_12	12	5	0.030862133
Tree	DT225_14	14	5	0.006023406		Control	DC157.5_6	6	5	0.043206987
Tree	DT225_6	6	5	0.002635240		Control	DC225_14	14	5	0.013552664
Tree	DT315_10	10	5	0.077155334		Control	DC225_6	6	5	0.015431067
Tree	DT315_5	5	5	0.016974173		Control	DC315_10	10	5	0.009258640
Tree	DT337.5_9	9	5	0.111103680		Control	DC315_5	5	5	0.003011703
						Control	DC337.5_9	9	5	0.010540961
Lewisville, TX										
Tree	LC000.00-8	8	3	0.000000757		Control	LC000.00-16 A	16	3	0.000001513
Tree	LT000.00-16	16	3	0.000037834		Control	LC022.5-11	11	3	0.000000757
Tree	LT000.00-5	5	3	0.000026484		Control	LC045-11	11	3	0.000001892
Tree	LT000.00-8	8	3	0.000021754		Control	LC067.5-14	14	3	0.000008828
Tree	LT022.5-11	11	3	0.000018917		Control	LC112.5-5	5	3	0.000001892
Tree	LT022.5-3	3	3	0.000005044		Control	LC202.5-8	8	3	0.000000605
Tree	LT045-11	11	3	0.000176683		Control	LC270-11	11	3	0.000000000
Tree	LT067.5-14	14	3	0.000154942		Control	LC000.00-16 B	16	5	0.000001589
Tree	LT112.5-5	5	3	0.000016268		Control	LC022.5-11	11	5	0.000000757
Tree	LT202.5-8	8	3	0.000004540		Control	LC045-11	11	5	0.000001513
Tree	LT247.5-3	3	3	0.000001892		Control	LC067.5-14	14	5	0.000001817
Tree	LT270-11	11	3	0.000071884		Control	LC112.5-5	5	5	0.000000757
Tree	LT315-3	3	3	0.000115393		Control	LC202.5-8	8	5	0.000001009
Tree	LT000.00-16	16	5	0.000001362						
Tree	LT000.00-5	5	5	0.000001513						
Tree	LT000.00-8	8	5	0.000003216						
Tree	LT022.5-11	11	5	0.000001513						
Tree	LT022.5-3	3	5	0.000002270						
Tree	LT045-11	11	5	0.000002951						
Tree	LT067.5-14	14	5	0.000015133						
Tree	LT112.5-5	5	5	0.000002522						
Tree	LT202.5-8	8	5	0.000000000						
Tree	LT247.5-3	3	5	0.001239536						
Tree	LT270-11	11	5	0.000116149						
Tree	LT315-3	3	5	0.000000946						

Appendix E: Field Trip Reports

Field investigation: Albuquerque, NM

Date: 19 April 2010

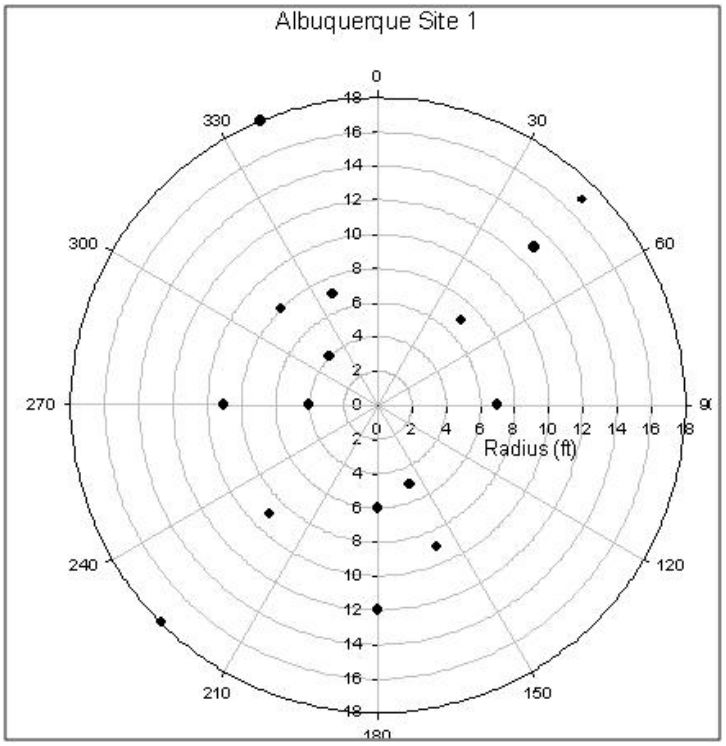
1. Field work was conducted at two sites during the period of 12 to 18 April 2010 in Albuquerque, NM, on the Rio Grande east (Site 1) and west (Corrales, Site 2) levees. Both sites (Figure D1) are near the Montano Bridge that crosses the Rio Grande in Albuquerque, NM. The field work included in situ soil permeability testing with a Guelph Permeameter and collection of grab samples for soil classification.
2. The field team was granted access to the site on 12 April 2010. The subject trees were cottonwood. Tree 1 (Figure D2) was growing approximately 69 ft from the toe of the levee on the riverside. The tree is located at longitude -106 deg 40.62512 min, latitude 35 deg 08.521218 min. The control for Site 1 (longitude -106 deg 40.60137 min, and latitude 35 deg 08.550693 min) was selected approximately 218 ft to the north of Tree 1 and parallel to the levee, also approximately 69 ft from the levee toe.
3. Tree 2 (Figure D3) was located on the west side of the river, 65 ft from the toe of the levee and on the riverside. The is located at coordinates longitude -106 deg 40.998 min, latitude 35 deg 09.9219 min. Field tests around Tree 2 were completed on 14 April 2010. The control site was selected approximately 200 ft east (toward the river) of Tree 2. Because there were trees both north and south of Tree 2 parallel to the levee, a control site at the same distance from the toe as the tree was not plausible.
4. Twelve boring locations for Sites 1 and 2 with polar coordinates were randomly generated using Microsoft Excel's random function (Figure D4). The polar plot's origin coincides with the trees' location. The bounds of the random sample search were 0 to 360 deg in 22.5 increments for the azimuth and 4 to 18 ft for the radii for both plots. Sample locations for both study sites and the control site are shown in Figure D4.
5. Each test boring was drilled by hand auger or hand rotary-drill. A soil (grab) sample was collected using a 2-in.-diam manual auger sampler and sealed in plastic bags. The boring was cleaned of debris and the bottom and sides of the borehole was prepared for the permeameter test using a special augering tool called a spoon. The constant head permeability test was conducted at 1.5- and 2.5-ft depths below the ground surface. Grab samples were collected approximately 3 to 6 in. above the permeameter test intervals. Core samples were not collected at this site, because the soil was extremely loose and undisturbed sampling was not possible.
   Figures D5 and D6 show the sandy composition of the soil at Albuquerque.

6. Samples were secured in containers, and labeled with the field site, depth collected, and sample number. The samples were shipped to ERDC for laboratory analyses and storage.

Figure E1. Location of Sites 1 and 2, south and north of Montano Bridge, Albuquerque, NM.

Figure E2. View of Site 1, Albuquerque, NM, east side Rio Grande.

Figure E3. View of Site 2, Corrales Levee (west side of the Rio Grande) Albuquerque, NM.



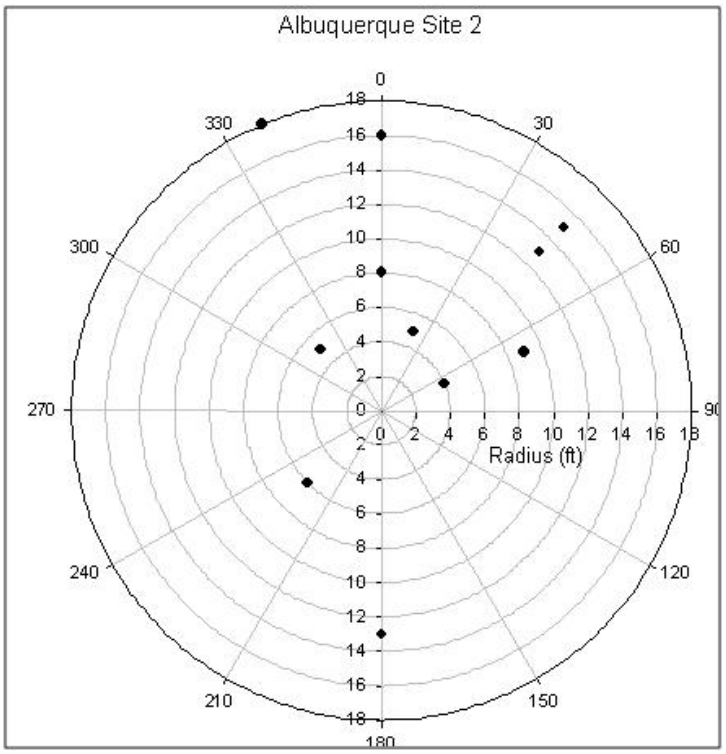


Figure E4. Sample boring plot for Albuquerque Sites 1 and 2. The tree is located at the plot's origin. Boring locations were randomly generated using Microsoft Excel random sample function. Boring locations were identically matched for the control site.

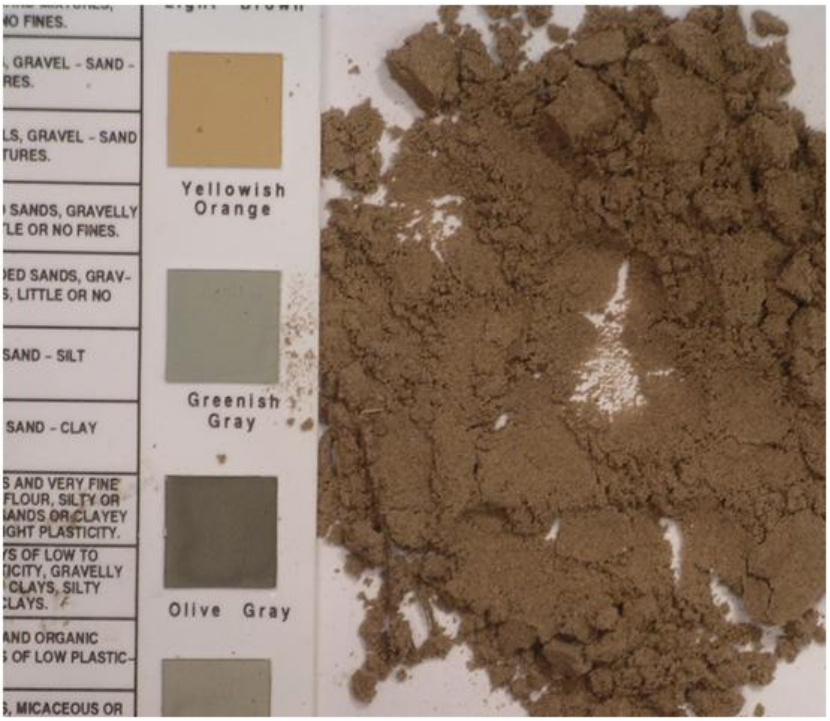


Figure E5. Photo of soil typical of Albuquerque Site 1 (East Levee), 2.5-ft depth, silt with sand.

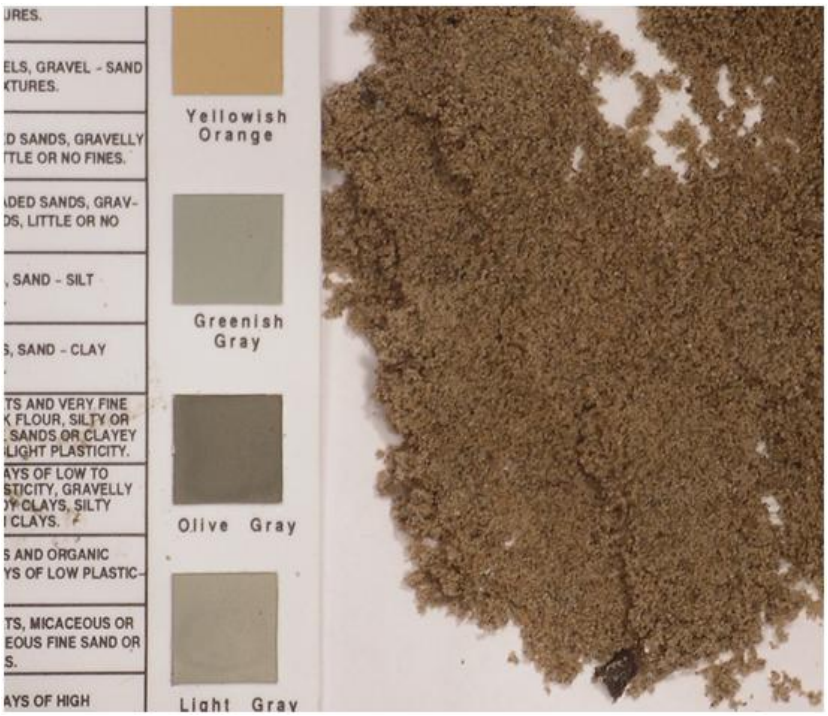


Figure E6. Photo of soil typical of Albuquerque Site 2 (Corrales), 2.5-ft depth, silty sand.

Trip Report – Boca Raton, FL

Date: 15 June 2010

1. To support the ERDC study on the effects of woody vegetation on levees, field tests were conducted 125 ft east of the second levee, near Boca Raton, FL, (Figure D7) during the week of 8 through 12 June 2010. The field work included in situ soil permeability testing with a Guelph Permeameter and collection of grab samples for soil classification.
2. The field team was granted access to the site on 8 June 2010 by Krista Gentile, Vegetation Management, South Florida Water Management District. The subject tree is a Strangler Fig Tree (*Ficus aurea*) growing across the canal from the levee and approximately 125 ft from its toe (Figure D8). This tree was chosen because it was easily accessible, unlike most sites in southern Florida considered for this study. The tree has a circumference of 9 ft, and diameter of 2.4 ft and is located at coordinates: Longitude -80 deg 17.830317 min and latitude 26 deg 21.292603 min.
3. Twelve boring locations for the tree site (polar coordinates) were randomly generated using Microsoft Excel's random sample function. The bounds of the random sample search were 0 to 360 deg in 22.5 increments for the azimuth and 4 to 18 ft for the radii. The plot's origin coincides with the tree's location. The identical test plot was used for the control site, except the center of the control plot was selected in an area without vegetation. The randomly generated sample locations for the tree and control sites are shown in Figure D9. The control site location was selected approximately 40 ft west of the subject site approximately 125 ft from the toe of the levee.
4. Each test boring (tree site and control) was investigated by collecting a grab sample, and performing a constant head permeability test using a Guelph Permeameter at 1-ft and 2-ft depths below the ground surface. Grab samples were taken approximately 6 in. above the permeameter tests. The test intervals at this site were shallow because the ground was mostly sandy calcareous rock and difficult to excavate. The rock broke up into gravelly sands while drilling and sampling (Figure D10). Undisturbed samples were not plausible in this soil type therefore no core samples were collected.
5. Grab samples were secured in plastic bags and labeled with field site, depth collected, and sample number. Samples were shipped to ERDC for laboratory analyses.

Figure E7. Location map for Boca Raton tree site. Tree is located southeast of the intersection of County Hwy 827 and the second levee. Control area is 40 ft south of the tree site.

Figure E8. Image of Strangler Fig Tree, Boca Raton, FL.

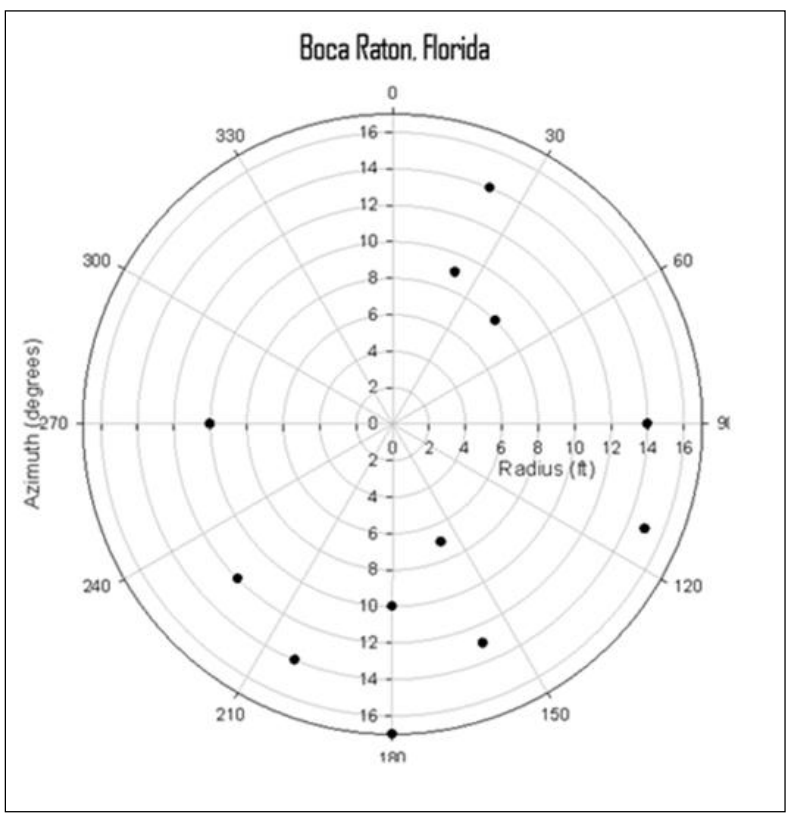


Figure E9. Polar plot of boring locations for tree and control site, Boca Raton, FL.

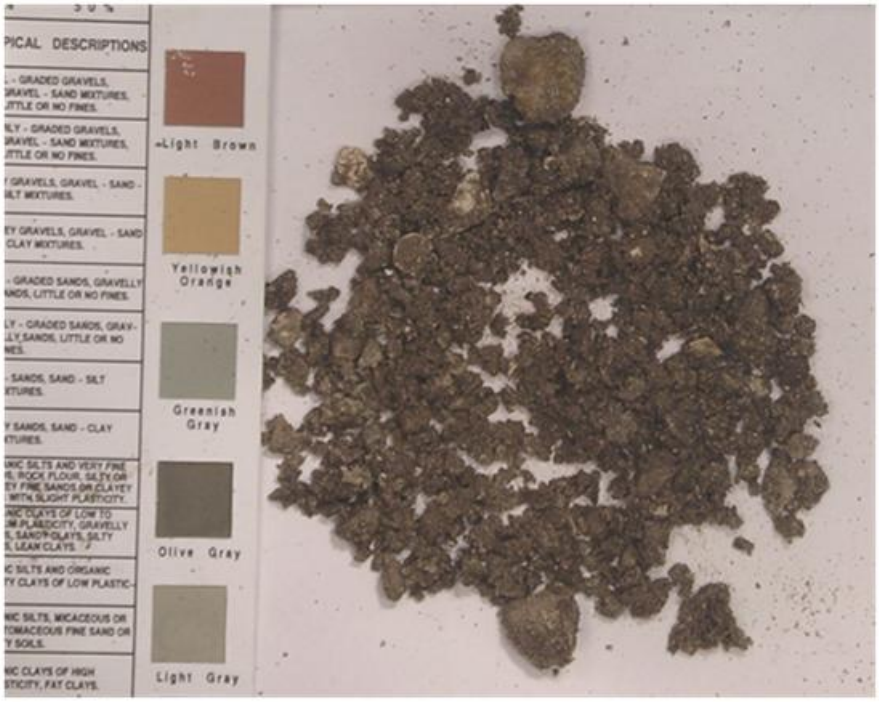


Figure E10. Sample of broken calcareous rock and sand, from 1.5 ft L-36, Boca Raton, FL.

Trip Report – Burlington, WA

1. Field work was conducted during 25 February 2010 to 4 March 2010 in Burlington, WA. Burlington is approximately 65 miles north of Seattle, WA, and the Skagit River flows north to south through the city (Figure D11). The field work included in situ soil permeability testing with a Guelph Permeameter and collection of grab samples for soil classification. Undisturbed core samples were also collected.
2. The field team arrived at the Skagit River Levee and was granted access to the site by the POC, Burlington Dike District on 25 February 2010. The subject of the investigation was a Western Red Cedar growing 15 ft from the riverside toe in the floodplain, on the riverside of the west Skagit levee (Figure D12). Tree coordinates are longitude -122 deg 18.79635 min, and latitude 48 deg 27.7778 min. The control site was located approximately 60 ft south of the tree site at the same distance from the toe as the tree.
3. Twelve boring locations for the tree site (polar coordinates) were randomly generated using Microsoft Excel's random sample function. The bounds of the random sample search were 0 to 360 deg in 22.5 increments for the azimuth and 4 to 22 ft for the radii. The plot's origin coincides with the tree's center. The identical test plot was used for the control site in an area without vegetation. The randomly generated sample locations for the tree and control sites are shown in Figure D9.
4. Each test boring (tree site and control) was investigated by collecting a grab sample, performing a constant head permeability test using a Guelph Permeameter at 3- and 5-ft depths and collecting an undisturbed core sample within the permeameter test interval. Grab samples were taken approximately 6 in. above the permeameter tests. The material at the site was mostly silty sand. Figure D10 illustrates the soil type found at the Burlington site.
5. The tree site, Burlington, WA, was completed on 28 February 2010. The control site was completed on 4 March 2010. Soil samples were secured in containers, and labeled by site name, depth collected, and sample number. Samples were shipped to ERDC for analyses.

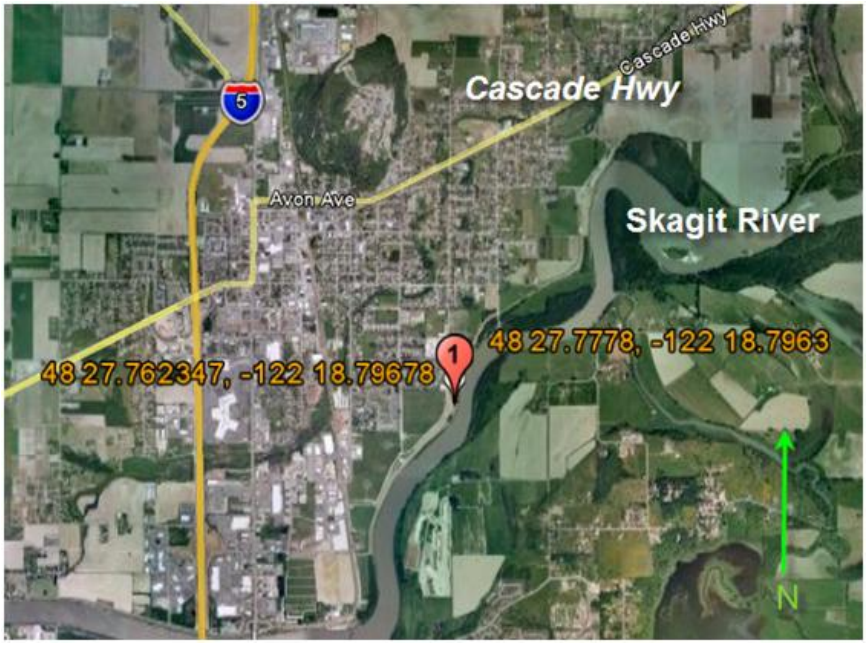


Figure E11. Location map for Burlington, WA, showing tree (red icon) at latitude 48 deg 27.7778 min and longitude -122 deg 18.7963 min. Control site is 60 ft south of the tree site.

Figure E12. Western Cedar Tree site at Burlington, WA, on the west side of the Skagit River, and on the riverside of the levee.

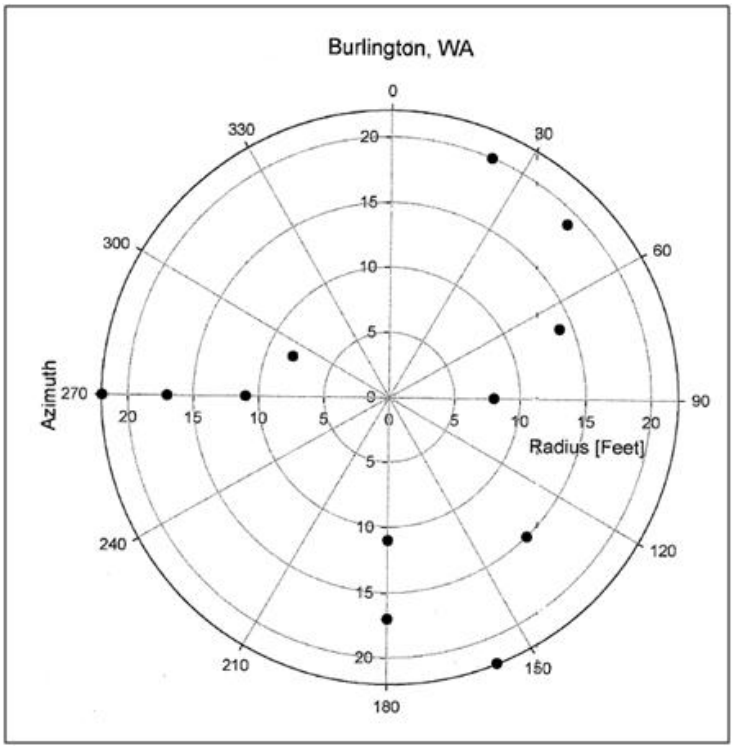


Figure E13. Boring plot showing randomly generated test boring locations for the tree and control sites, Burlington, WA.

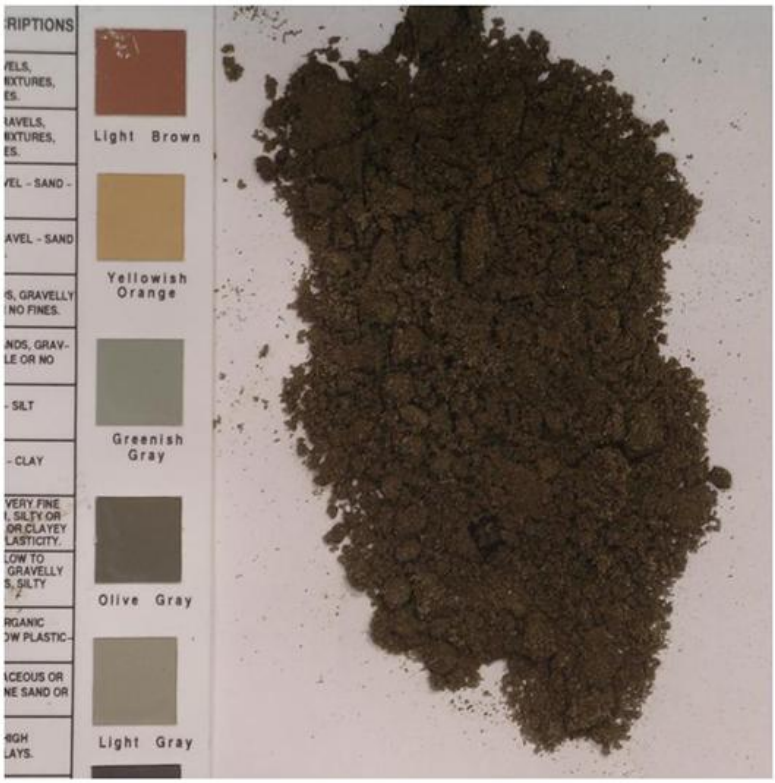


Figure E14. Photo of dark brown, silty sand at Burlington, WA.

Trip Report – Danville, PA

1. Permeability field tests were conducted on the Susquehanna Levee, Danville, PA, (Figure D15) during the week 7 to 12 July 2010. The field work included in situ soil permeability testing with a Guelph Permeameter and collection of grab samples and undisturbed samples for soil classification.
2. The field team arrived at the Lower Susquehanna Levee, and was granted access to the site on 7 July 2010 by Tom Graham, Danville Bureau Secretary. The tree used in this investigation was a tree stump located approximately 17 ft from the toe of the levee on the riverside of the levee (Figure D16). Although the focus of the ERDC research does not involve decaying tree roots, this was an opportunity to collect data that may be useful in future research. The stump had a circumference of 7.6 ft and 1.2-ft radius, and is positioned at coordinates Longitude -76 deg 37.6502 min and Latitude 40 deg 57.8102 min. The tree type was a silver maple.
3. Twelve boring locations for the tree site (polar coordinates) were randomly generated using Microsoft Excel's random sample function. The bounds of the random sample search were 0 to 360 deg in 22.5 increments for the azimuth and 3 to 14 ft for the radii. The plot's origin coincides with the tree's center. The identical test plot was used for the control site, except the center was selected in an area without vegetation. The randomly generated sample locations for the tree and control sites are shown in Figure D17. The control site location was selected approximately 250 ft southeast of the tree site and at approximately the same distance (17 ft) from the riverside toe.
4. Each test boring (tree site and control) was investigated by collecting a grab sample, and performing a constant head permeability test using a Guelph Permeameter at 3- and 5-ft depths below the ground surface. Grab samples were taken approximately 6 in. above the permeameter tests. Undisturbed core samples were collected just below the top of the permeameter test interval at approximately 3.3 and 5.3 ft. The soil type at this site was mainly sandy clay (Figure D18).
5. Field tests for the tree were completed on 9 July 2010, and the control site was completed on 12 July 2010. Soil samples were secured in containers and plastic bags, and labeled with site name, depth collected, and sample number. Samples were shipped to ERDC for laboratory analyses.

Figure E15. Location map for Danville Site, showing tree (red icon) and control site (white icon) coordinates.

Figure E16. Tree stump at Danville Site, flags indicate randomly generated boring locations.

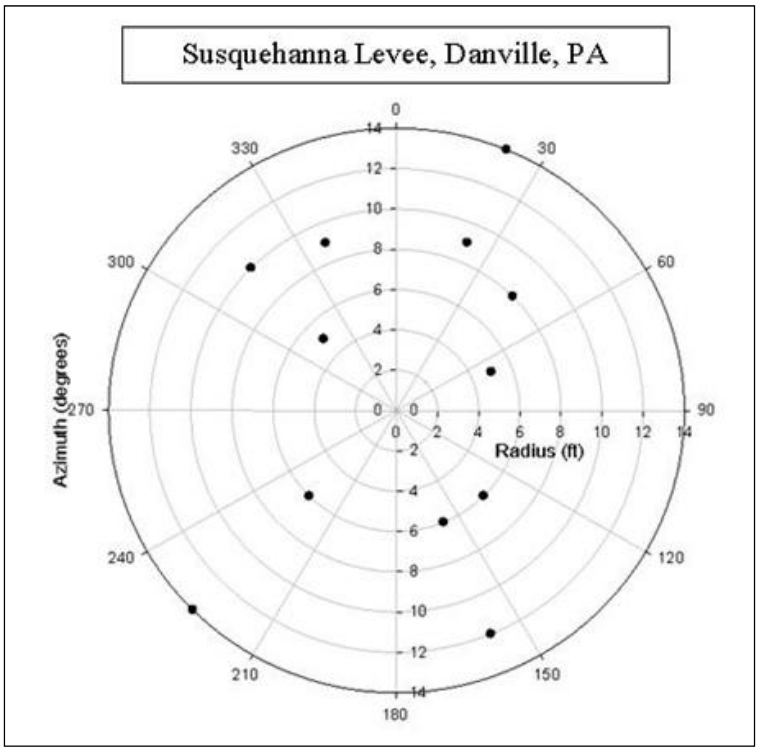


Figure E17. Polar plot showing test boring locations for the Danville tree and control sites. Locations randomly generated using Microsoft Excel's random sampling function.

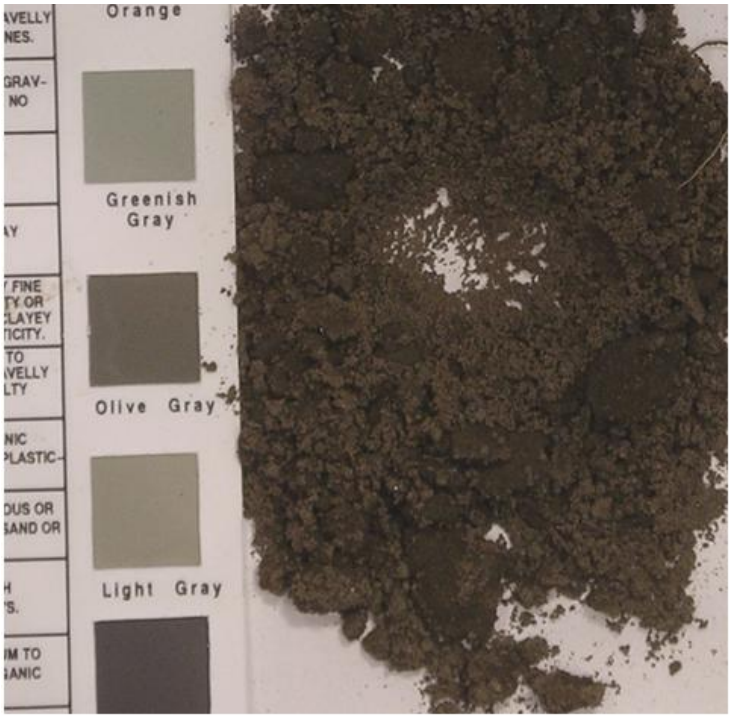


Figure E18. Photo showing typical soil sample from Danville, PA tree site.

Trip Report – Portland, OR

Date: March 2010

1. Field work was conducted at Fairview, OR, near Portland during 5 March 2010 to 11 March 2010. Fairview (Figure D19) is approximately 12 miles east of Portland located along the Columbia River. The field work included in situ soil permeability testing with a Guelph Permeameter and collection of grab samples for soil classification. In addition, undisturbed core samples were taken for further analysis if warranted.
2. The field team arrived at the Columbia River Levee and was granted access to the site by local Multnomah County Drainage District employees on 5 March 2010. Two cottonwood trees (Figure D20) located approximately 50 ft from the landside toe were selected for the tree test site. There were no single trees available for testing therefore the center of the two cottonwood trees was selected as the center for the tree site. The average DBH for both trees is 3 ft (91 cm). Their combined driplines are 20.7 m (68 ft) in diameter and average height is approximately 21.3 m (70 ft).
3. Twelve test cell locations were randomly generated using polar coordinates. The bounds of the random sample location were 0 to 360 deg in 22.52 deg increments for the azimuth and 3 to 34 ft for the radius (Figure D21). Each test boring was investigated by collecting a grab sample, performing a constant head permeability test at 3- and 5-ft depths and collecting an undisturbed core sample within the permeameter test interval. Grab samples were retrieved prior to the permeameter tests, collected approximately 6 in. above the permeameter test interval.
4. The same suite of tests just described were conducted at the control site; area without woody vegetation. The control site was located approximately 100 ft west of the tree site and 50 ft from the levee toe. The material at the control site was mostly sands with almost no fines, (Figure D22) except one sample of clay that was assumed to be part of the existing levee berm. The tree site soils had considerably more fines than the control site. Grain size analyses conducted at ERDC on samples collected at the tree site showed a 30 to 90% fines content. The difference in materials was noted during the field investigation.
5. The Portland site investigation was completed on 28 February 2010. Soil samples were secured in containers, and labeled with field site, depth collected, and sample number. Samples were shipped to ERDC for analyses.

Figure E19. Location of Portland, OR, tree and control test sites.
The control site is 100 ft to the west of the tree site.

Figure E20. Tree site (two cottonwood trees) at Portland, OR,
landside of the levee.

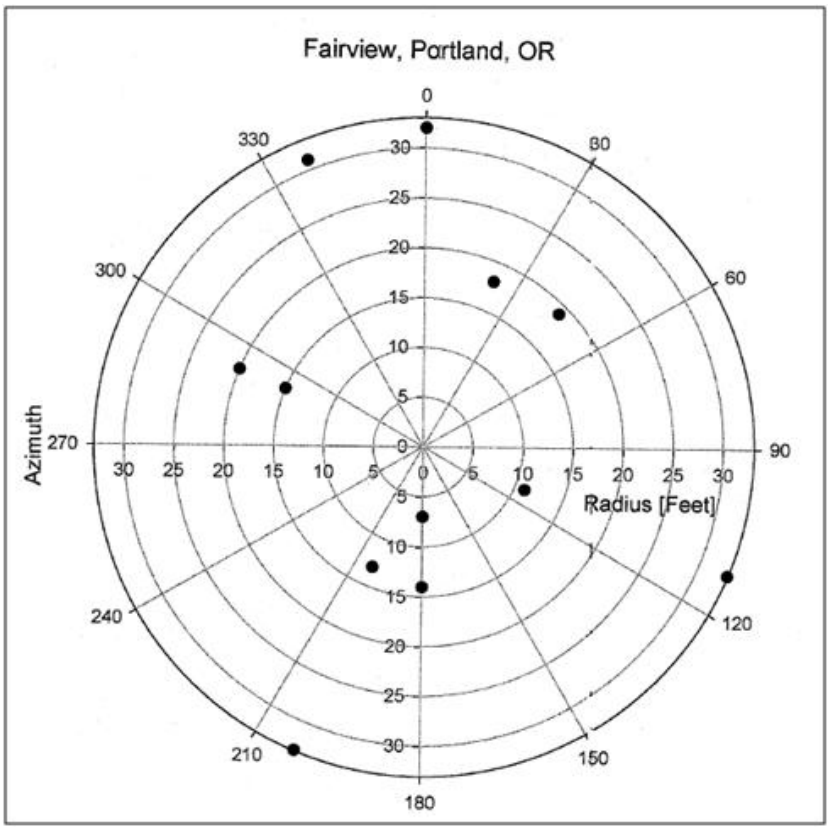


Figure E21. Test boring layout around tree center at Portland, OR. Identical pattern used for control site with no vegetation.

Figure E22. Photo showing dark brown loose, sandy soil at Portland tree site.

Trip Report – Lewisville, TX

Subject: Lewisville Dam, Woody Vegetation Study, Lewisville, TX

1. Field tests were conducted at the Lewisville Dam in Lewisville, (Figure D23) during the week 17 to 24 March 2010. The field work included in situ soil permeability testing with a Guelph Permeameter and collection of grab and undisturbed soil samples.
2. The field team (R. Strange, D. Leavell and C. Forsha) arrived at the USACE, Ft. Worth District field-office, Lewisville Dam, and was granted access to the site on 17 March 2010. The team met with Fort Worth POC R. Gardner from the Department of Public Works. The tree selected for investigation was an Oak Tree growing approximately 18 ft from the toe of the dam; Longitude -96 deg 59.2558 min, Latitude 33 deg 03.8600 min. Tree circumference and DBH are 11.2 ft (3.4 m) and 3.6 ft (110 cm), respectively. Figure D24 illustrates the tree site with test locations surveyed. The roadway lies 10 ft south of the tree.
3. Twelve boring locations for the tree site (polar coordinates) were randomly generated using Microsoft Excel's random sample function. The bounds of the random sample search were 0 to 360 deg in 22.5 increments for the azimuth and 3 to 18 ft for the radii. The plot's origin coincides with the tree's center. The identical test plot was used for the control site in an area without vegetation. The control site is approximately 300 ft west of the tree location and is approximately the same distance (18 ft) from the downstream toe. The control location is shown as the white icon in Figure D23. The test plot of randomly generated sample locations is shown in Figure D25.
4. Each test boring (tree site and control) was investigated by collecting a grab sample, and performing a constant head permeability test using a Guelph Permeameter at 3- and 5-ft depths below the ground surface. Grab samples were taken approximately 6 in. above the permeameter tests. Undisturbed core samples were collected just below the top of the permeameter test interval at approximately 3.5 and 5.5 ft. The core samples were collected if further analysis was warranted. The soil type at this site was mostly clay, with some sandy silt (Figure D26).
5. The time needed for the permeameter to reach a constant flux were highly variable between test borings, indicating high variability in soil type or possibly highly variable field water content. Some tests were run overnight, while others needed only 10 min to reach a constant flow rate. It was assumed that the overnight test locations were within a clay berm at the toe of the dam. During the test period two inches of rainfall occurred

overnight (19 March 2010) causing new test borings to infill with water. Only 13 out of a possible 24 tests were conducted at the control site, because of the low permeability soils at the site and difficulties associated with testing and precipitation.

6. Field tests were completed on 23 March 2010. Soil samples were secured in containers and plastic bags and labeled with the site name, depth collected, and sample number. Samples were shipped to ERDC for later laboratory analyses.

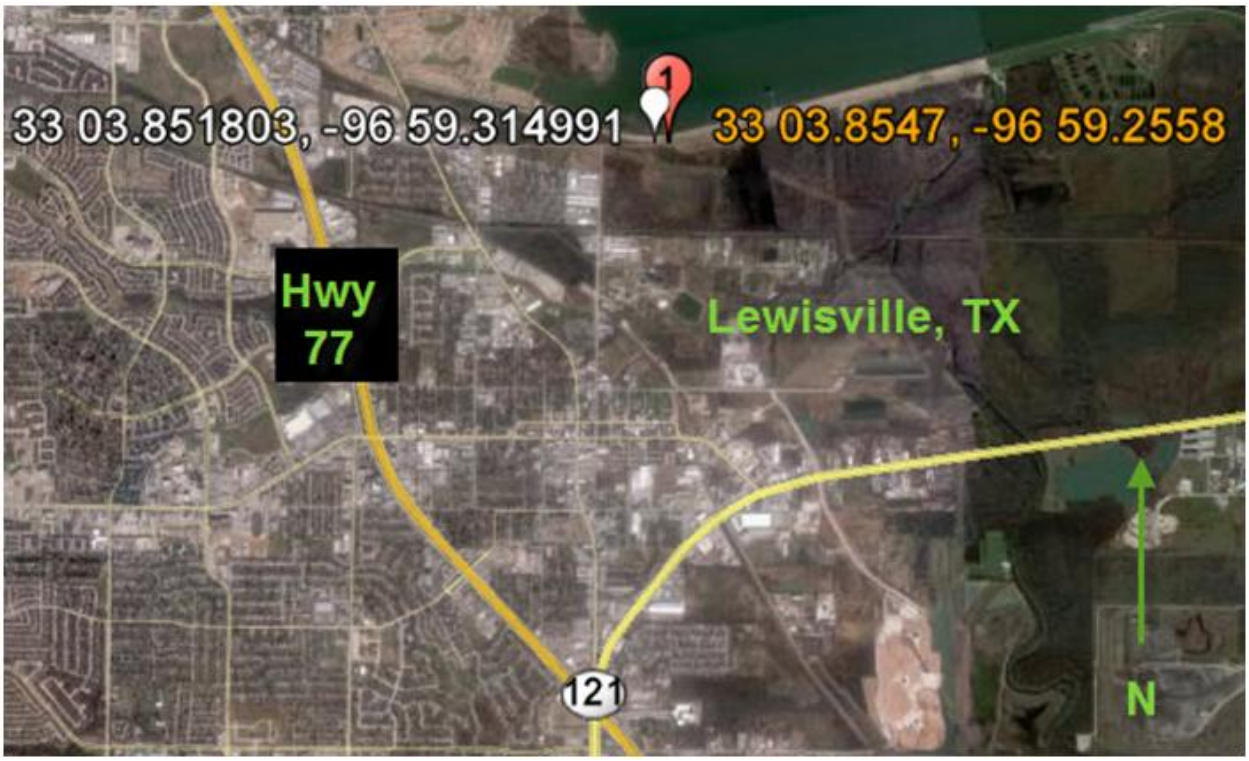


Figure E23. Location map for Lewisville, TX, showing tree (red icon) and control (white icon) sites on the downstream side of the dam, near the right abutment of Lewisville Dam. Lewisville is approximately 25 miles from Dallas, TX.

Figure E24. View of Lewisville Dam oak tree, located 18 ft from the downstream toe of the dam. The tree was 10 ft from the roadway.

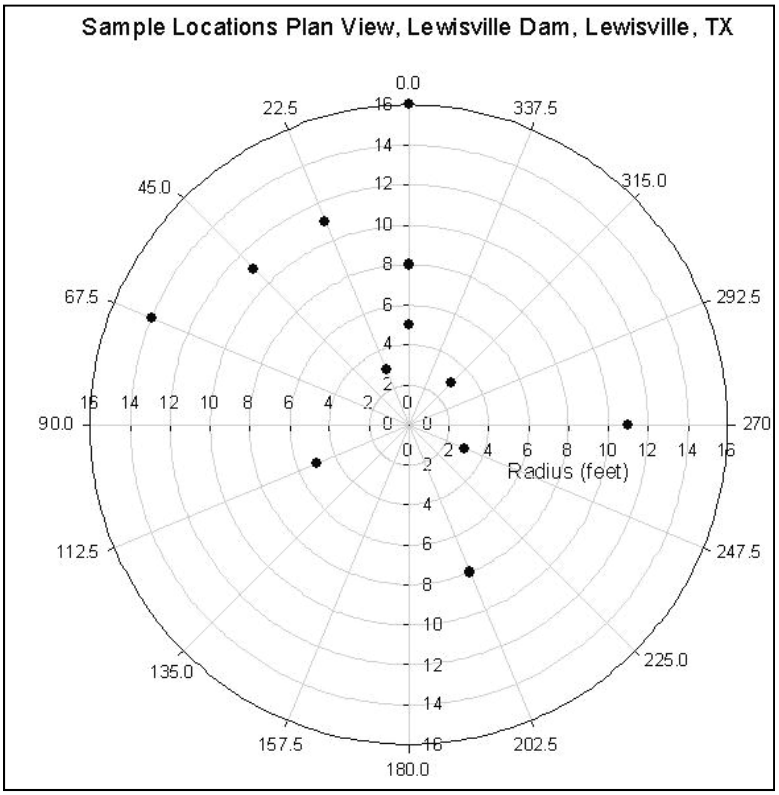


Figure E25. Boring test plot for Lewisville Dam, points randomly generated using Microsoft Excel (2007) random sample function.

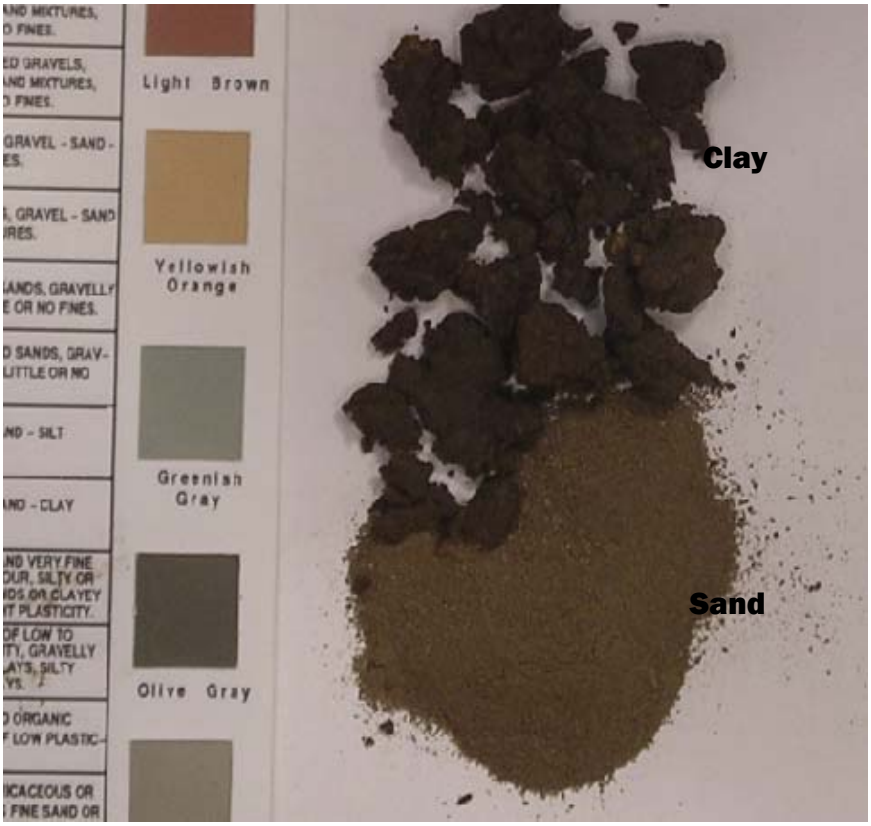


Figure E26. Photo showing two soil types from Lewisville Dam tree site; clay and silty sand.

Trip Report – Sacramento, CA

Date: 16 May 2010

1. Field tests were conducted on the Sacramento River Pocket Levee, Sacramento, CA (Figure D27) during the week 8 to 15 May 2010. The field work included in situ soil permeability testing with a Guelph Permeameter, and collection of core and grab samples for soil classification.
2. The field team (R. Strange, C. Thomas and R. Kala) arrived at the Pocket Levee and was granted access to the site by the POC, John D. Gilbert, on 10 May 2010. The tree was a Valley Oak tree (*Quercus lobata*) located mid-slope between the toe and the crest of the levee as shown in Figure D28. The tree is located in Figure D27 at the latitude 38 deg 29.339927 min, and longitude -121 deg 33.07409 min represents the tree location.
3. Twelve boring locations for the tree site (polar coordinates) were randomly generated using Microsoft Excel's random sample function. The bounds of the random sample search were 0 to 360 deg in 22.5 increments for the azimuth and from 3 to 16 ft for the radii. The plot's origin coincides with the tree's center. The identical test plot was used for the control site in an area without vegetation. The randomly generated sample locations for the tree and control sites are shown in Figure D29. The control site location was selected approximately 60 ft north of the tree site and at approximately the same distance from the crest as the tree.
4. Each test boring (tree site and control) was investigated by collecting a grab sample, and performing a constant head permeability test using a Guelph Permeameter at 3 and 5-ft depths below the ground surface. Grab samples were taken approximately 6 in. above the permeameter tests. Undisturbed core samples were collected just below the top of the permeameter test interval at approximately 3.5 and 5.5 ft. Core samples were collected in case further analysis was warranted after completion of the permeability data analysis. The soil type at this site was mainly silty sand as shown in Figure D30.
5. Field tests for the tree were completed on 14 May. Soil samples were secured in containers and plastic bags, and labeled with site name, depth collected, and sample number. Samples were shipped to ERDC for laboratory analyses.

Figure E27. Photo of Sacramento River, Pocket Levee tree site (red icon) and control site (white icon).

Figure E28. Photo of Valley Oak Tree on Pocket Levee adjacent to Sacramento River. Survey flags denote test boring locations. Tree is on the landside midslope of the levee.

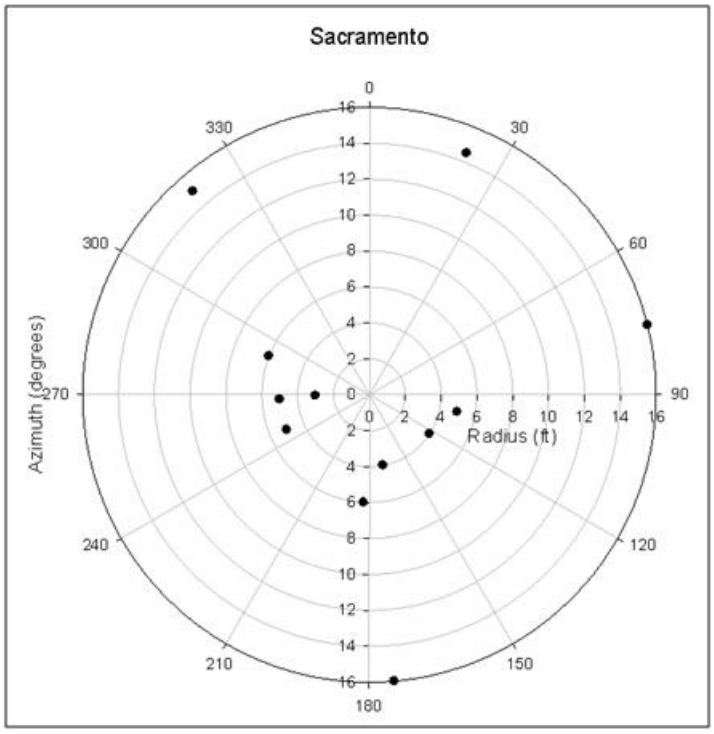


Figure E29. Boring test plan for Sacramento Pocket Levee tree and control sites.

Figure E30. Photo showing typical sandy silt found at the tree and control site, Sacramento Pocket Levee.

Trip Report Vicksburg, MS

Date: 4 April 2010

Subject: Woody Vegetation Study, Gravel Pit -Vicksburg, MS

1. Field tests were conducted in a normally consolidated loess (wind blown deposits) near the Vicksburg Gravel Pit, 10 miles south of Vicksburg, MS, (Figure D31) during the week of 30 March 2010. The field work included in situ soil permeability testing with a Guelph Permeameter and collection of core and grab samples for soil classification.
2. The field team (R. Strange, C. Thomas and D. Leavell) arrived at the Vicksburg Gravel Pit and was granted access to the site by the Gravel Pit personnel on 30 March 2010. The subject of the investigation was a Red Oak Tree shown in Figure D32. The tree is on a gentle slope; dipping east approximately 5 deg. The latitude and longitude of the tree is 32 deg 21.2694 min and -90 deg 48.3512 min, respectively. The tree was topped before testing and its roots were excavated by an air lance after permeability testing.
3. Twelve boring locations (expressed in polar coordinates) for the tree site were randomly generated using Microsoft Excel's random sample function. The bounds of the random sample search were 0 to 360 deg in 22.5 increments for the azimuth and from 3 to 16 ft for the radii. The plot's origin represents the tree's center. The identical test plot was used for the control site in an area without vegetation. The randomly generated sample locations for the tree and control sites are shown in Figure D33. The control site location was selected approximately 100 ft south of the tree site, approximately on the same contour as the tree.
4. Each test boring (tree site and control) was investigated by collecting a grab sample, and performing a constant head permeability test at 3- and 5-ft depths below the ground surface. Grab samples were taken approximately 6 in. above the permeameter tests. Undisturbed core samples were collected just below the top of the permeameter test interval at approximately 3.5 and 5.5 ft. The core samples were collected in case further analysis was warranted after completion of the permeability data analysis. The soil type at this site was mainly silty clay (CL) to clayey silt (ML) as shown in Figure D34.
5. Field tests for the tree at the Vicksburg Gravel Pit were completed on 3 April 2010. Soil samples were secured in containers and plastic bags, and labeled with site name, depth collected, and sample number. The samples

were transported by the field team to ERDC for laboratory analyses and storage.

Figure E31. Location of Vicksburg Gravel Pit is 15 miles south of Vicksburg at the end of Halls Ferry Road. Approximately 7 miles from the intersection of Halls Ferry and Fisher Ferry Roads.

Figure E32. Vicksburg tree during excavation of root system. Most of the shallow roots are narrow and extend to the drip line. Deeper roots stay closer to the tree trunk. The soil is a silty clay.

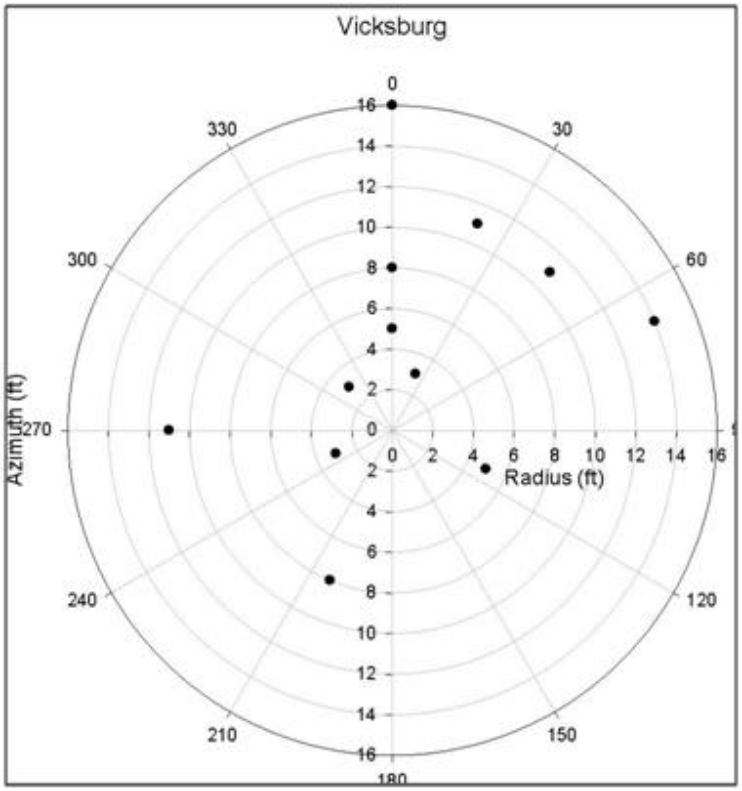


Figure E33. Polar plot of test borings for Vicksburg Gravel Pit, tree and control sites.

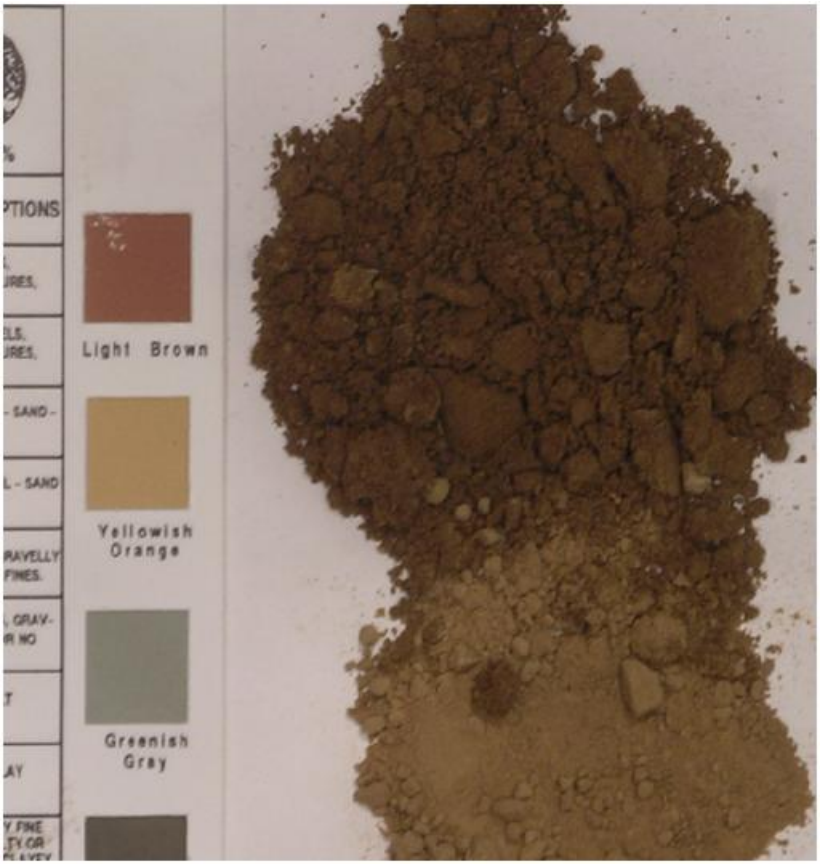
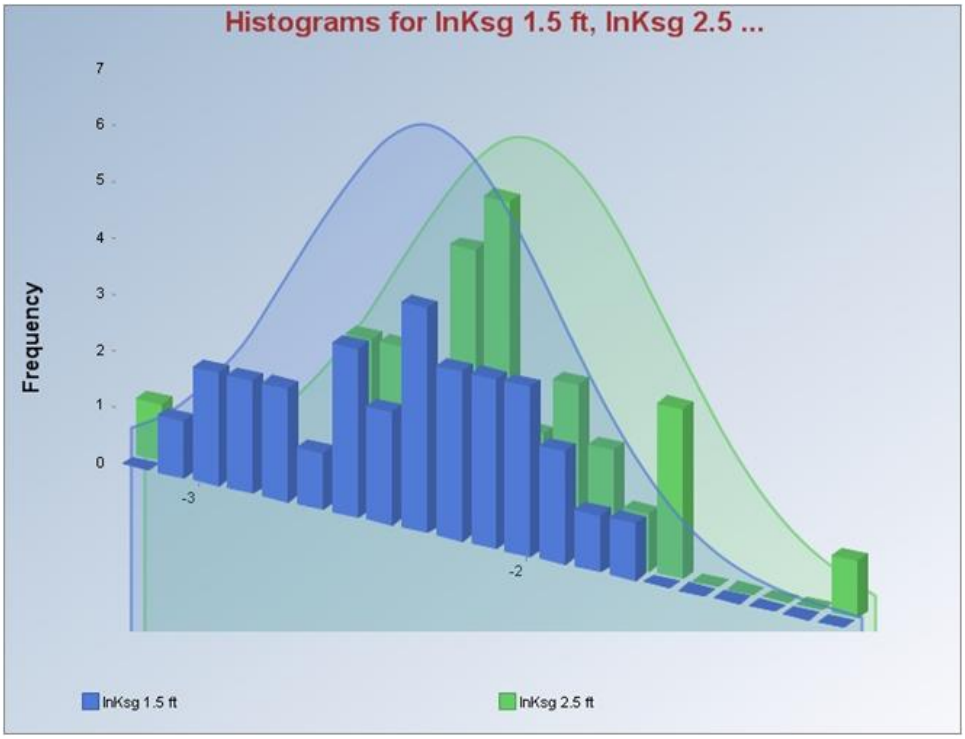
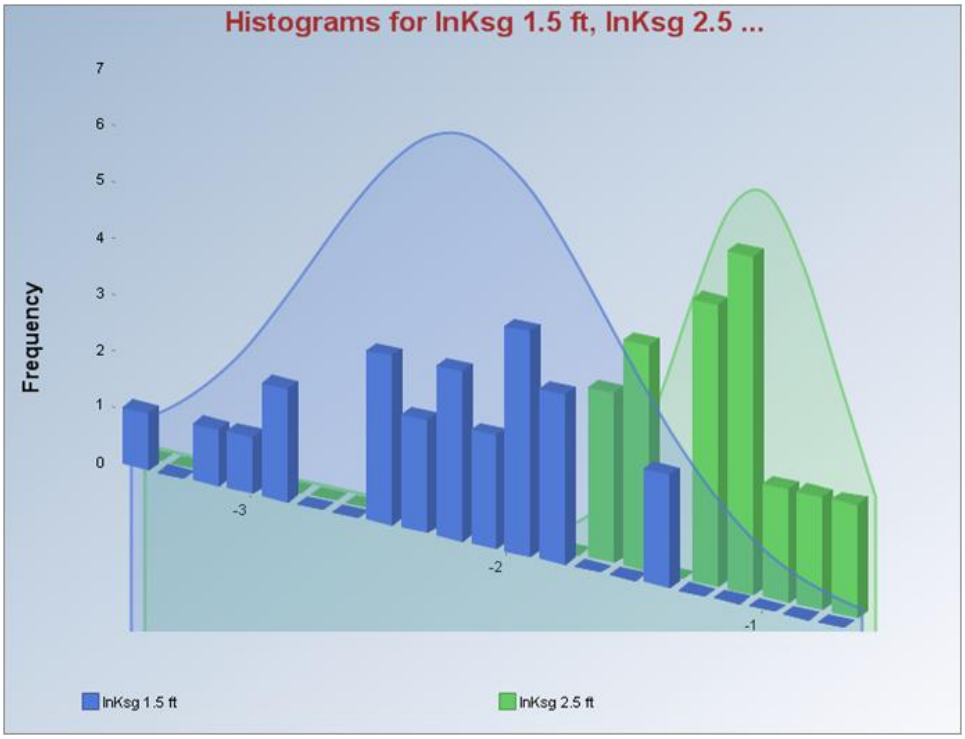


Figure E34. Vicksburg Gravel Pit soils. Top soil sample is silty clay (ML) and the lower sample is yellowish silt. The majority of the soil was low plasticity clay.

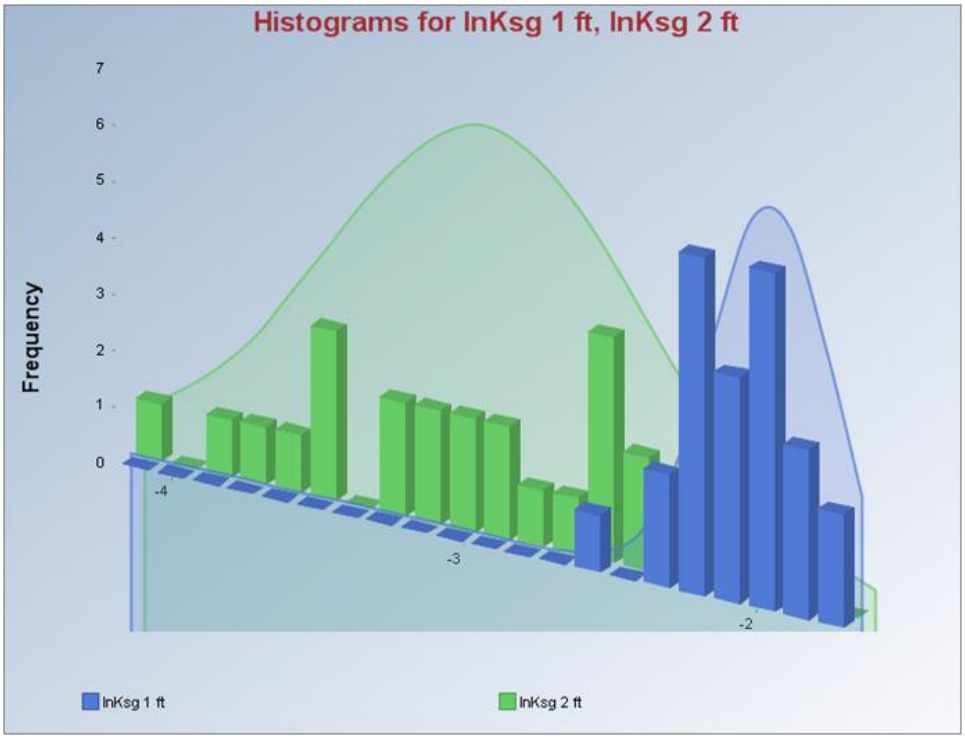
Appendix F: Histograms of In situ Permeability Data Sets



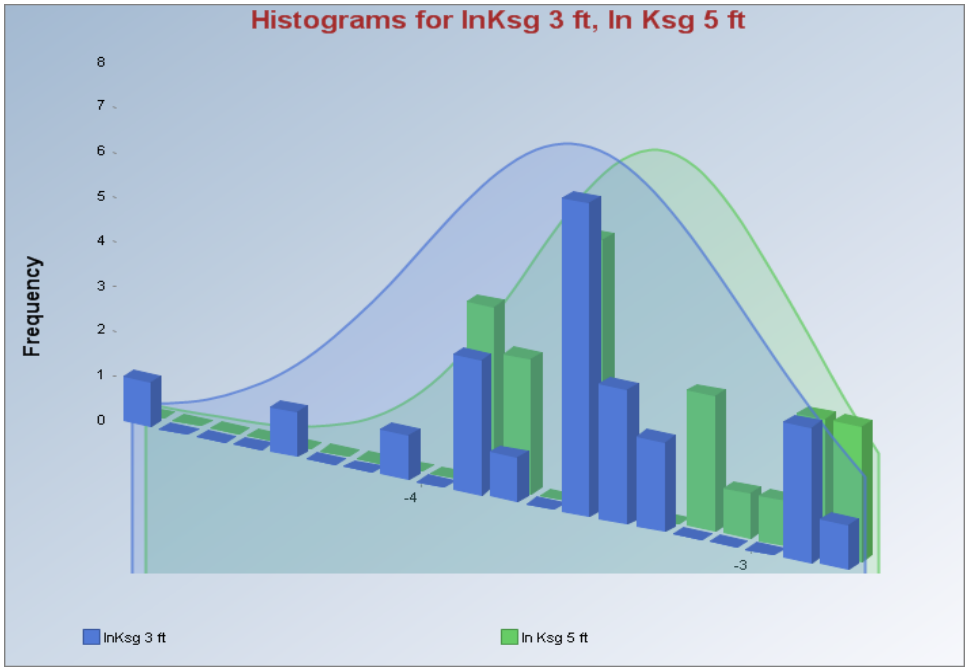
Natural log histogram for Albuquerque Site 1 depths 1.5 ft and 2.5 ft.



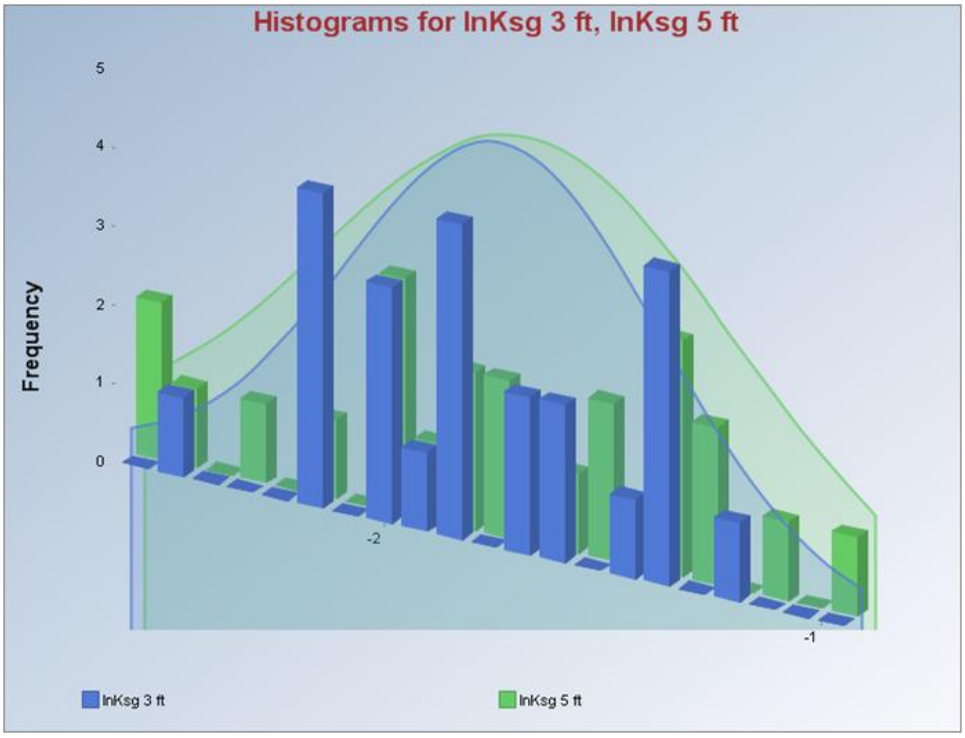
Natural log histogram for Albuquerque Site 2 depths 1.5 and 2.5.



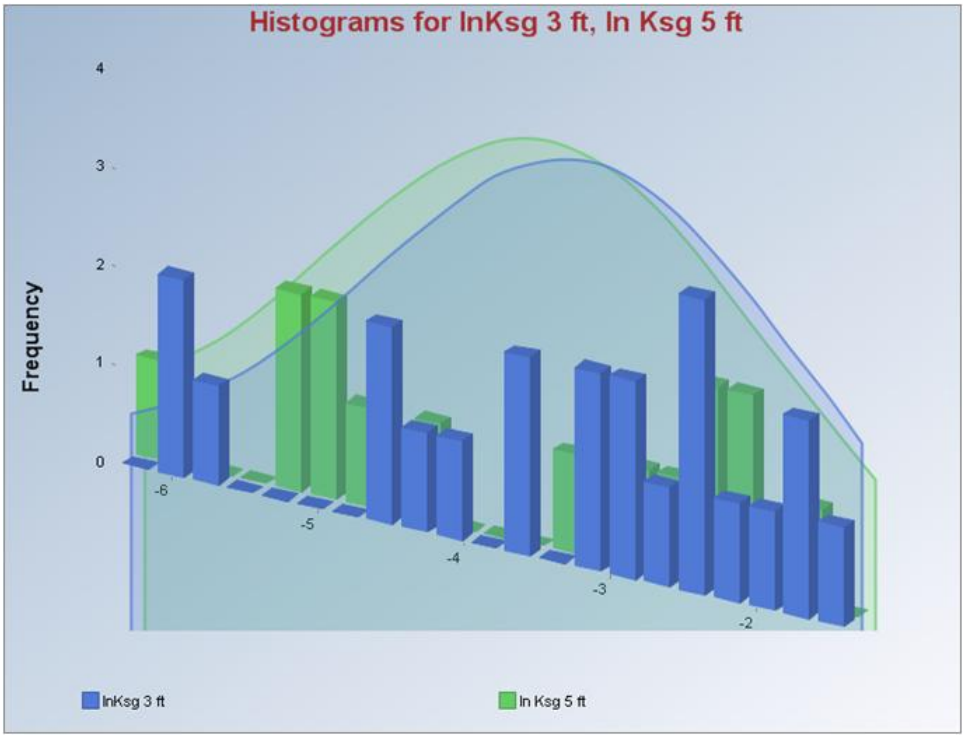
Natural log histogram for Boca Raton 1 ft and 2 ft depths.



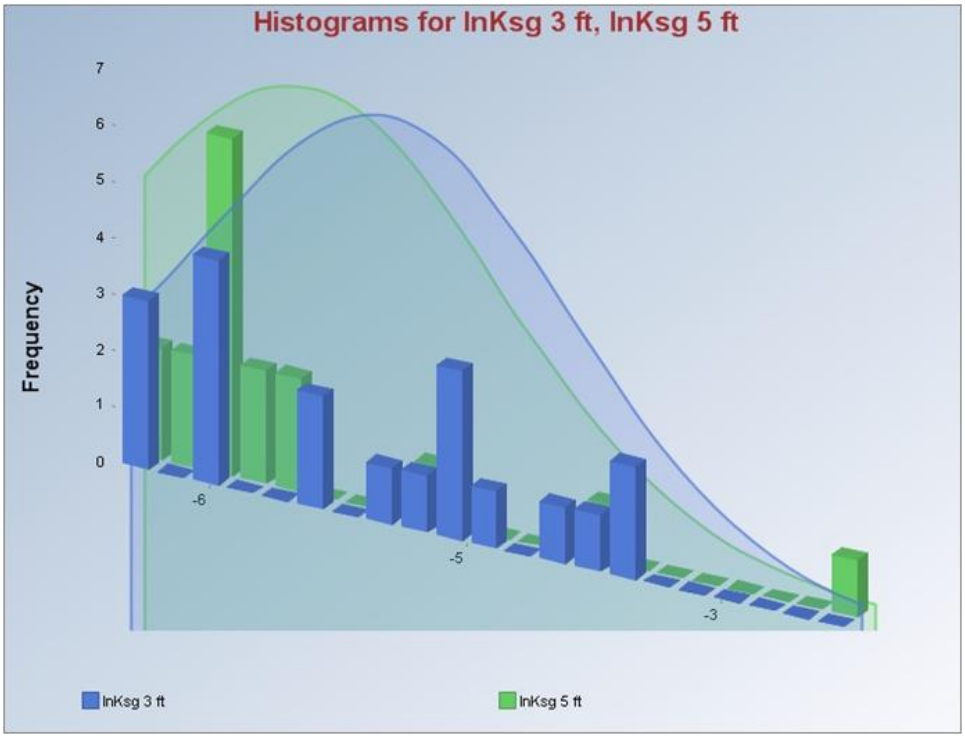
Natural log histogram of Burlington 3 ft and 5 ft depths.



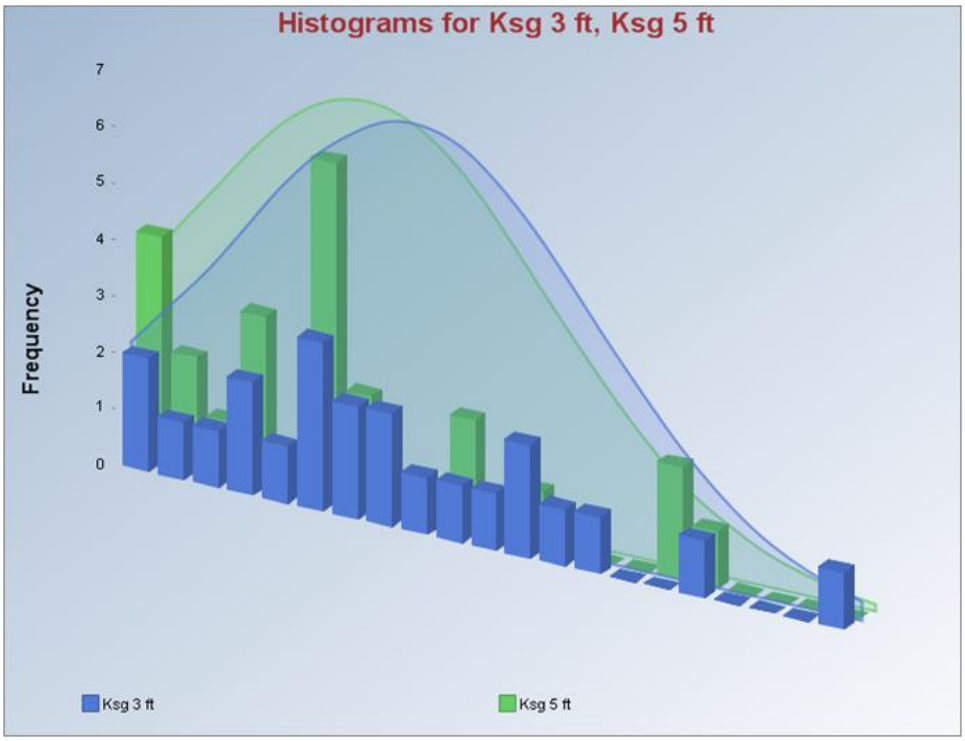
Natural log histogram of Dansville 3 ft and 5 ft data.



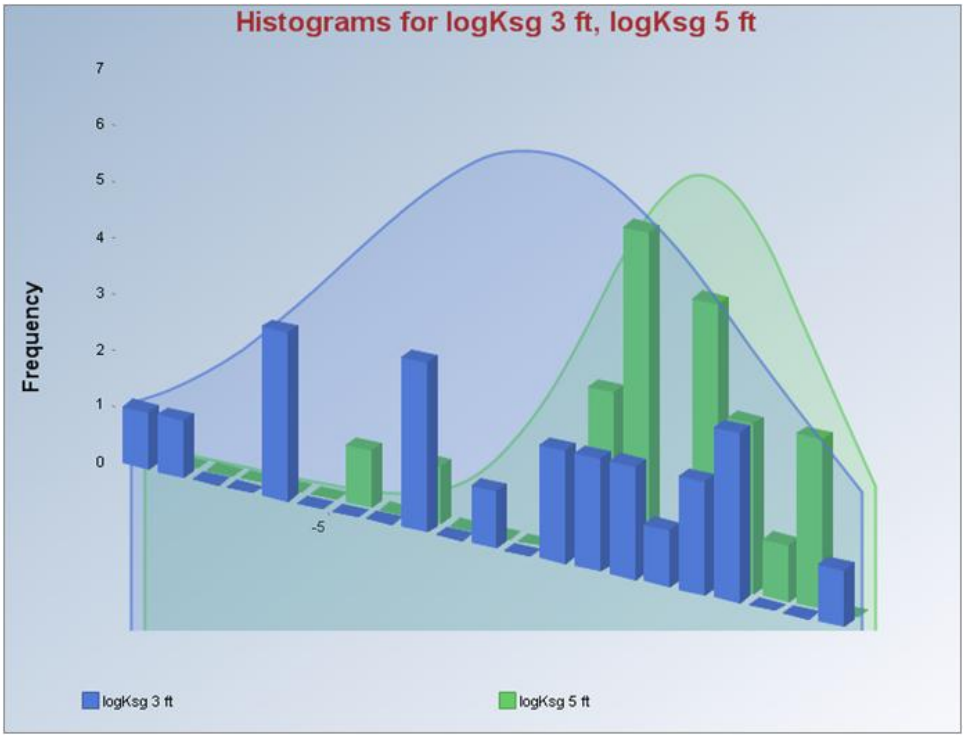
Natural log histogram of Fairview 3 ft and 5 ft data.



Natural log histograms of Lewisville 3 ft and 5 ft data.
Used non-parametric tests for 5 ft.



Arithmetic histogram for Sacramento, 3 and 5 ft.



Log Histogram of Vicksburg 3 ft and 5 ft data.

Appendix G: Root Pullout Test Results

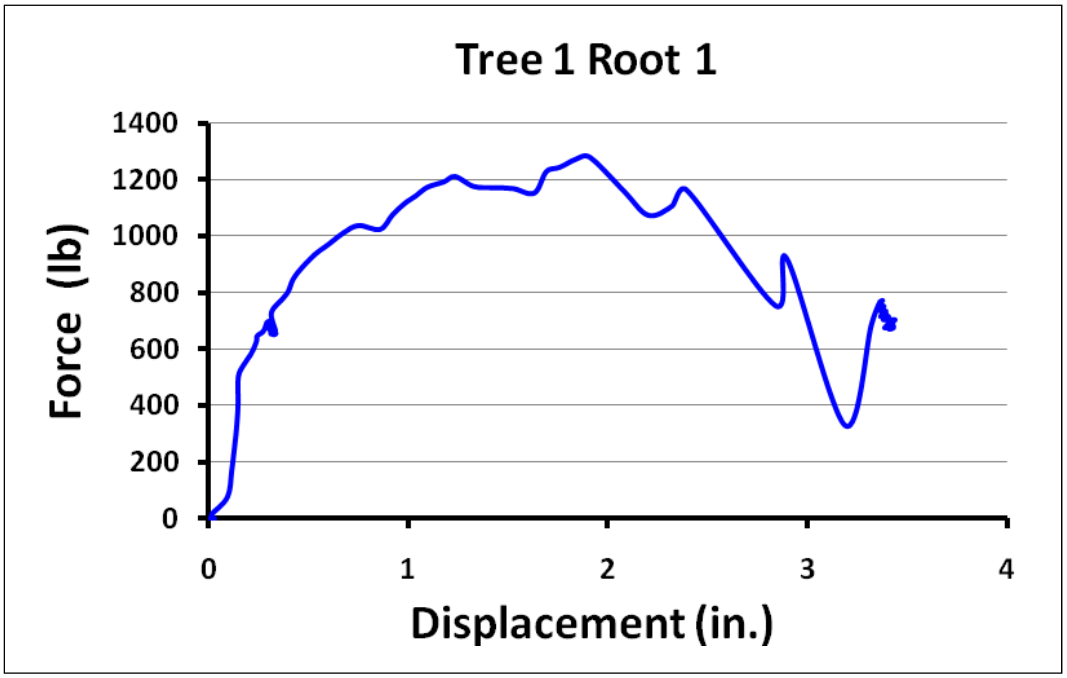


Figure G1. Pullout force vs. displacement of a cottonwood root (Tree 1, Root 1) in Portland, OR.

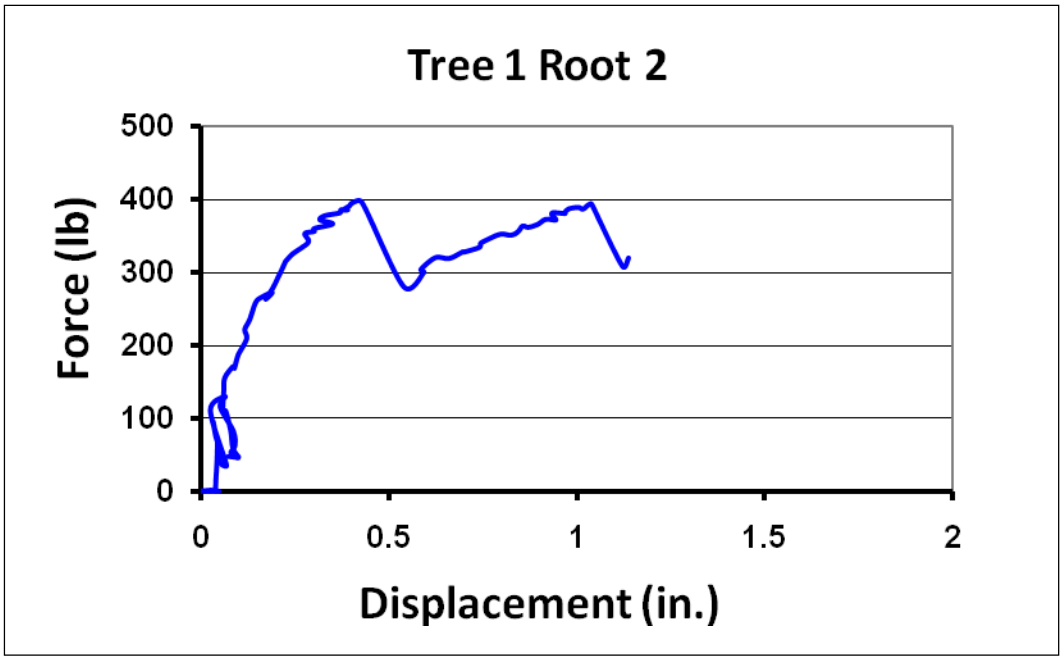


Figure G2. Pullout force vs. displacement of a cottonwood root (Tree 1, Root 2) in Portland, OR.

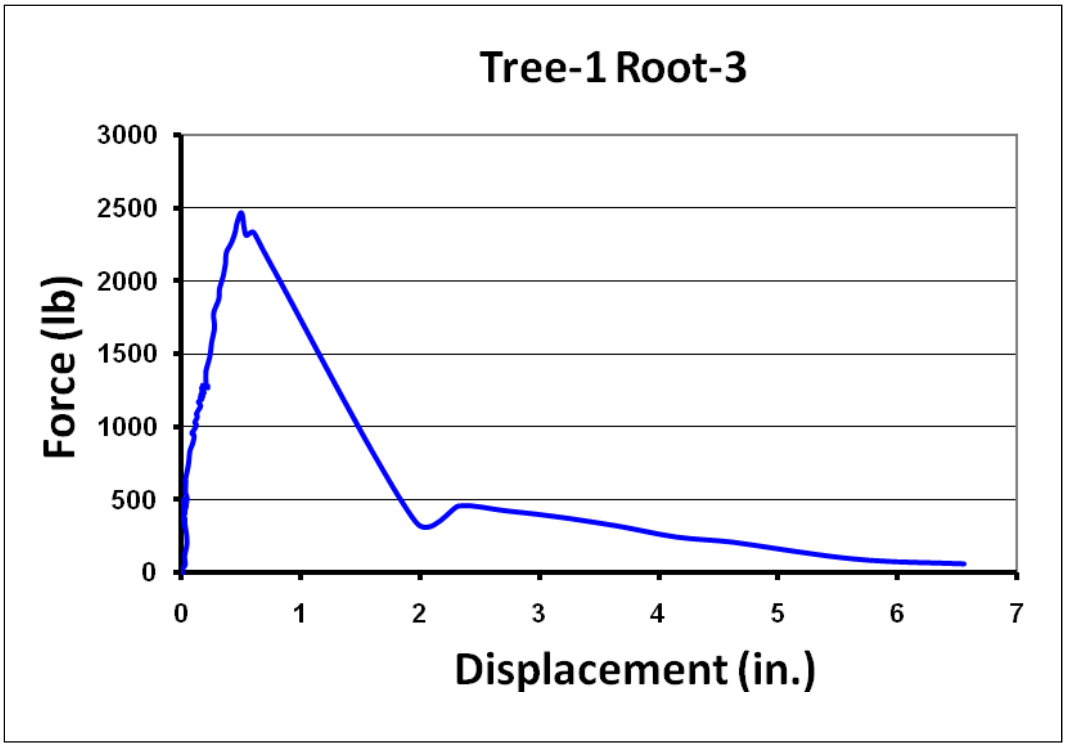


Figure G3. Pullout force vs. displacement of a cottonwood root (Tree 1, Root 3) in Portland OR.

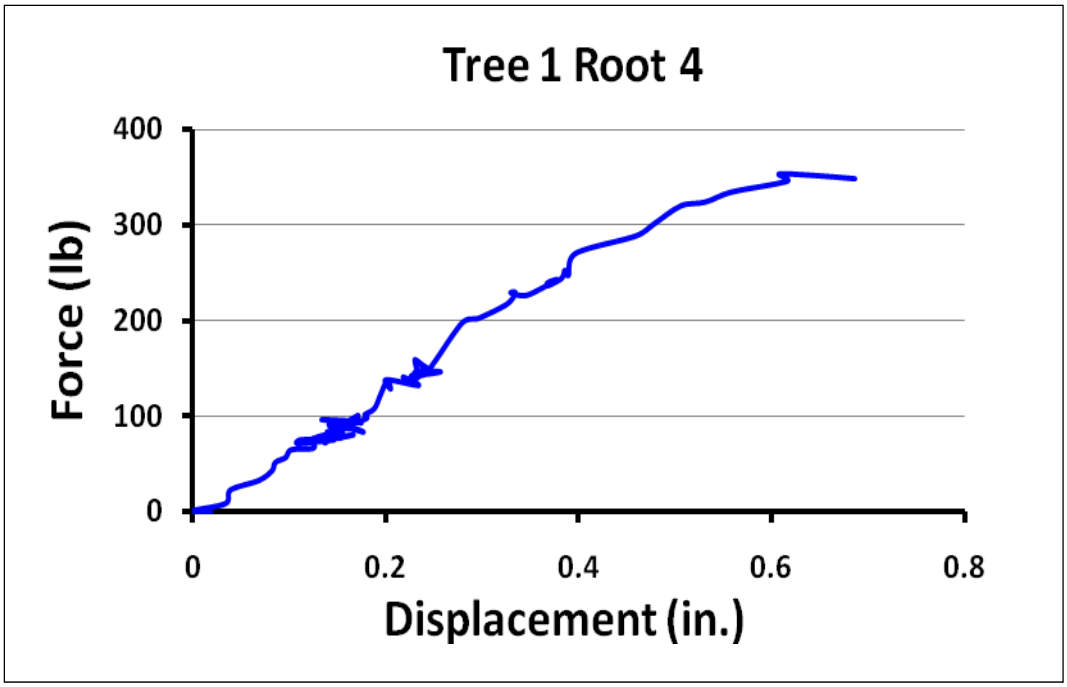


Figure G4. Pullout force vs. displacement of a cottonwood root (Tree 1, Root 4) in Portland OR.

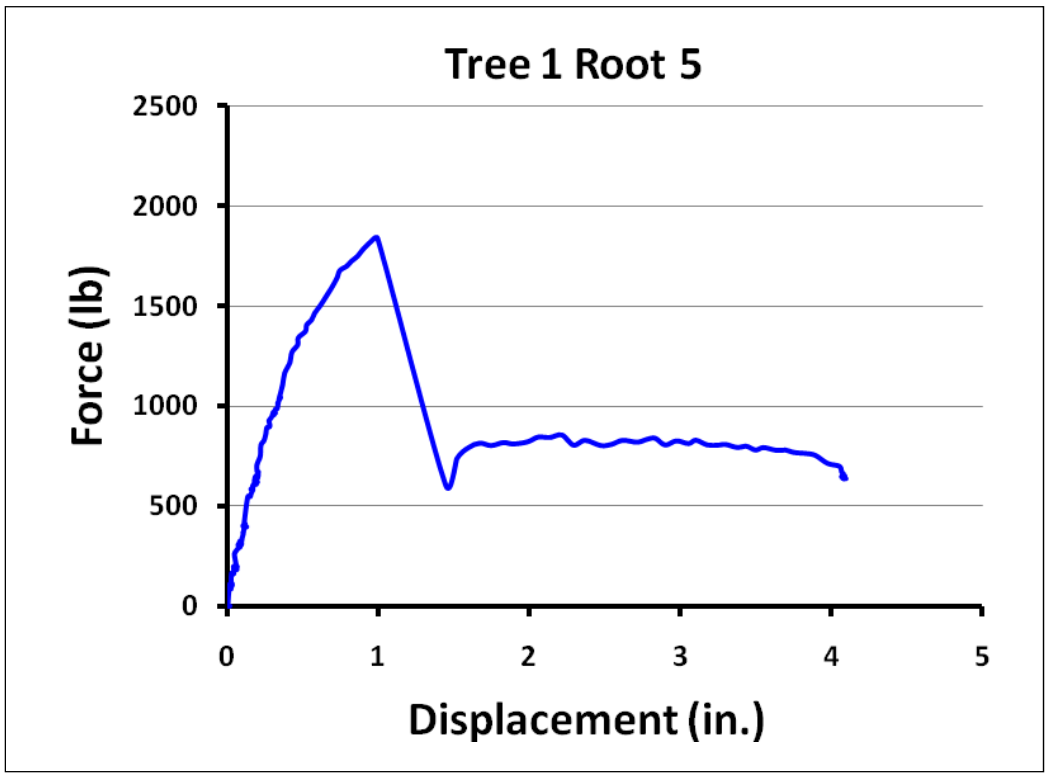


Figure G5. Pullout force vs. displacement of a cottonwood root (Tree 1, Root 5) in Portland OR.

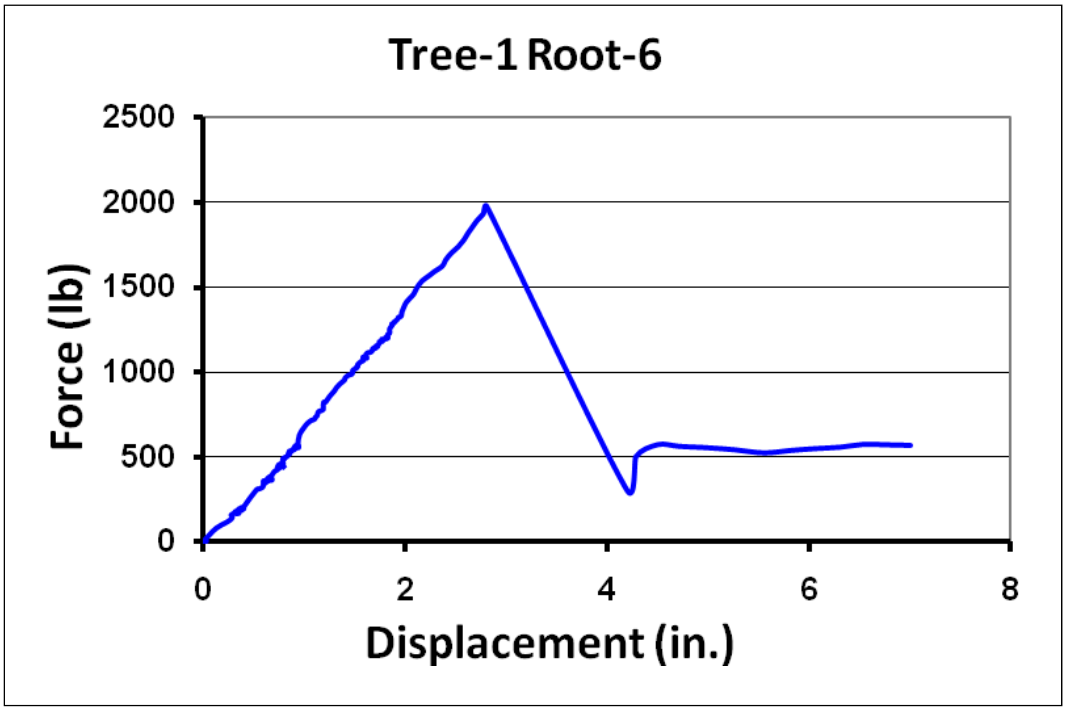


Figure G6. Pullout force vs. displacement of a cottonwood root (Tree 1, Root 6) in Portland OR.

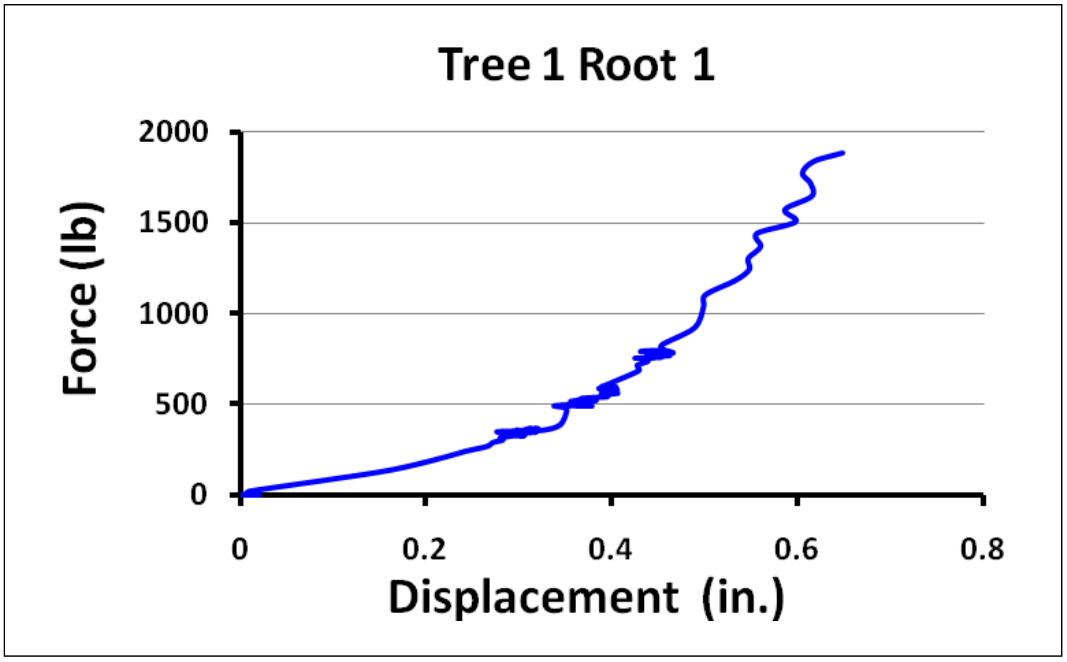


Figure G7. Pullout force vs. displacement of an Oregon ash root (Tree 1, Root 1) in Portland OR.

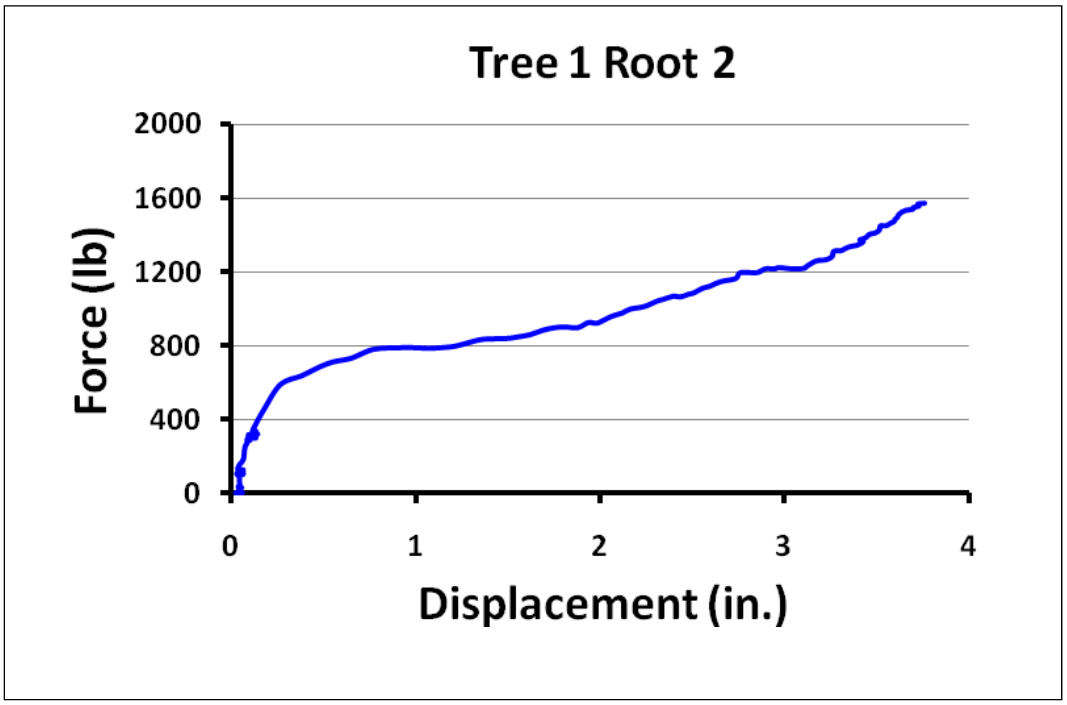


Figure G8. Pullout force vs. displacement of an Oregon ash root (Tree 1, Root 2) in Portland OR.

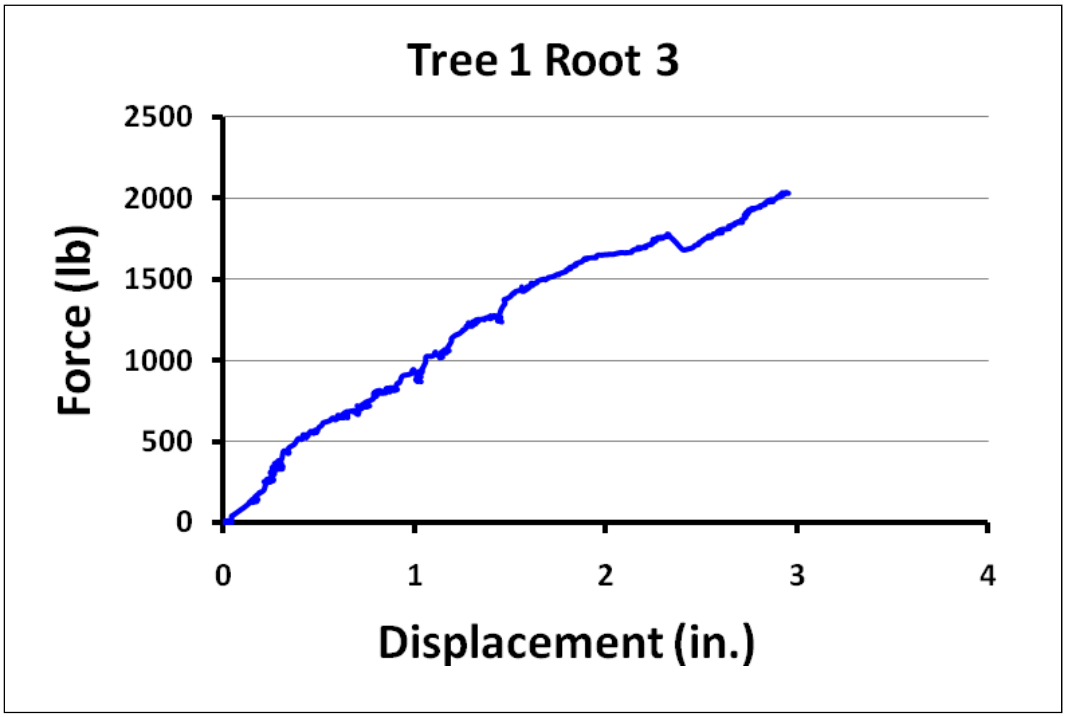


Figure G9. Pullout force vs. displacement of an Oregon ash root (Tree 1, Root 3) in Portland OR.

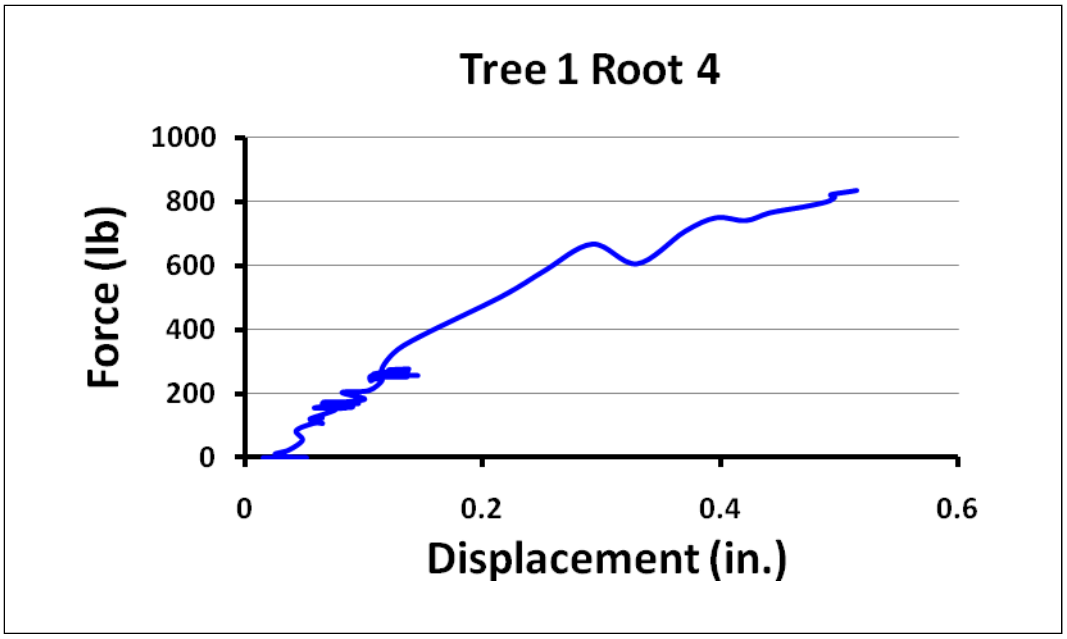


Figure G10. Pullout force vs. displacement of an Oregon ash root (Tree 1, Root 4) in Portland OR.

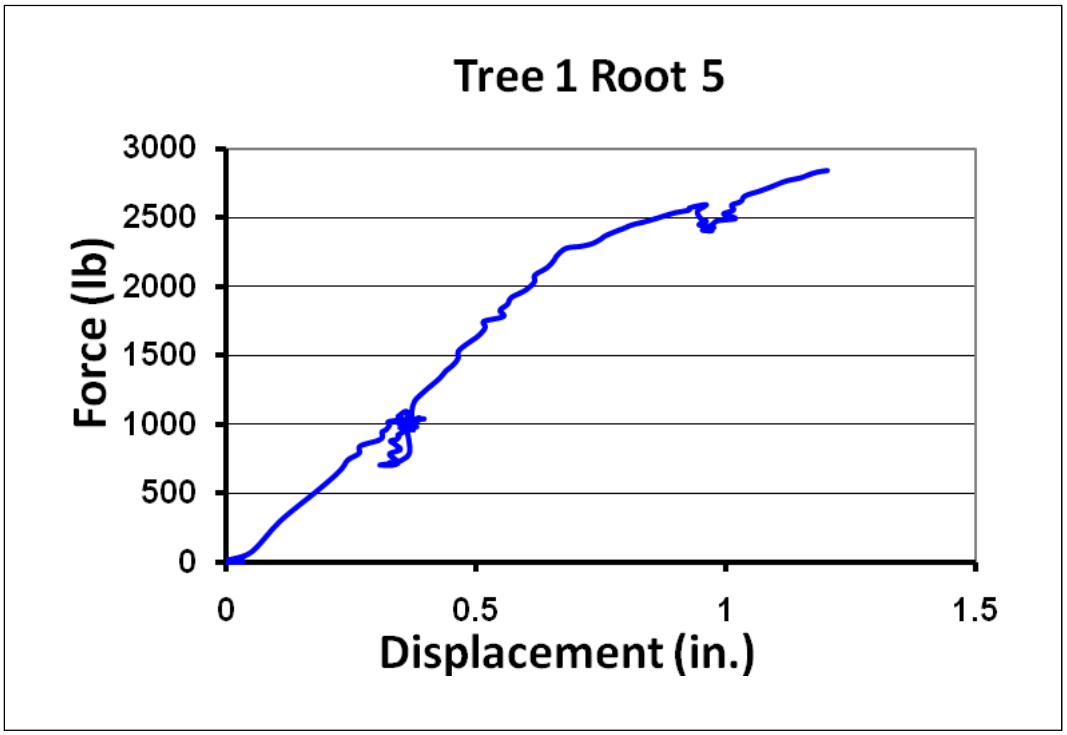


Figure G11. Pullout force vs. displacement of an Oregon ash root (Tree 1, Root 5) in Portland OR.

Appendix H: Glossary[1]

A

Alluvial Deposit
Clay, silt, sand, gravel, or other sediment deposited by the action of runing or receding water.

Alluvium
A general term for all detrital deposits resulting directly or indirectly from the sediment transported by (modern) streams; thus including the sediments laid down in river beds, floodplains, lakes, fans, and estuaries.

B

Bank
The rising ground bordering a lake, river, or sea; or of a river or channel, for which it is designated as right or left as the observer is facing downstream.

Baseline
The primary reference line defining a construction coordinate system.

Bathymetry
The measurement of water depths in oceans, seas, and lakes; also information derived from such measurements.

Bed
The bottom of a watercourse, or any body of water.

Bedrock
The solid rock that underlies gravel, soil, and other superficial material. Bedrock may be exposed at the surface (an outcrop) or it may be buried under a few centimeters to thousands of meters of unconsolidated material.

Bench Mark
A permanently fixed point of known elevation. A primary bench mark is one close to a tide station to which the tide staff and tidal datum originally are referenced.

Berm
On a structure: a nearly horizontal area, often built to support or key-in an armor layer.

Boil
An upward flow of water in a sandy formation due to an unbalanced hydrostatic pressure resulting from a rise in a nearby stream, or from removing the overburden in making excavations.

Boring
A hole advanced into the ground by means of a drilling rig.

Breaching
(1) Formation of a channel through a barrier spit or island by storm waves, tidal action, or river flow. Usually occurs after a greater than normal flow, such as during a hurricane. (2) Failure of a dike, levee, or dam allowing flooding.

Bulk density
Bulk density is the mass of material per unit volume.

C

Channel
A natural or artificial waterway of perceptible extent which either periodically or continuously contains moving water, or which forms a connecting link between two bodies of water.

Clay
A fine grained, plastic, sediment with a typical grain size less than 0.004 mm. Possesses electromagnetic properties which bind the grains together to give a bulk strength or cohesion.

Cohesive Sediment
Sediment containing significant proportion of clays, the electromagnetic properties of which cause the sediment to bind together.

D

Datum
A horizontal or vertical reference system for making survey measurements and computations. The vertical datum used in the United States is the National Geodetic Vertical Datum of 1929 (NGVD 29), formerly referred to as the Sea Level Datum of 1929. This datum has been upgraded to the North American Vertical Datum of 1988 (NAVD 88).

Degradation
The geologic process by means of which various parts of the surface of the earth are worn away and their general level lowered, by the action of wind and water.

Dike
In most areas of the United States, a structure (earth, rock, or timber) built part way across a river for the purpose of maintaining a navigation channel. In other areas, the term is used synonymously with levee. Generally constructed of earth, stone, timber, concrete, or similar material.

Discharge
The discharge, usually abbreviated as "Q", is the volume of a fluid or solid passing a cross section of a stream per unit time.

E

Embankment
Fill material, usually earth or rock, placed with sloping sides and with a length greater than its height. Usually an embankment is wider than a dike.

Eolian (also Aeolian)
Pertaining to the wind especially used with deposits such as loess and dune sand, and sedimentary structures like wind formed ripple marks.

Erosion
The wearing away of land by the action of natural forces. On a beach, the carrying away of beach material by wave action, tidal currents, littoral currents, or by deflation.

F

Flood
Abnormally high water flows or water level that overtops the natural or artificial confining boundaries of a waterway. A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of river and/or tidal waters and/or the unusual accumulations of waters from any sources.

Floodplain
A flat tract of land bordering a river consisting of alluvium deposited by the river when the river overflows its banks.

Flood Stage
The water surface elevation of a river, stream, or body of water, above which flooding and damages normally begin to occur, normally measured with respect to a specific reference gage. Flood stage is normally the level at which a river overflows its banks. Flood stage for any particular geographic area is unique to that geographic area.

Fluvial
Of or pertaining to rivers; produced by the action of a river or stream (e.g., fluvial sediment).

G

Geographical Information System (GIS)
Database of information which is geographically referenced, usually with an associated visualization system.

Geotechnical Investigations
Subsurface investigation of soils, rock, and other strata for the purposes of engineering design.

Global Positioning System (GPS)
A navigational and positioning system developed by the U.S. Department of Defense, by which the location of a position on or above the earth can be determined by a special receiver at that point interpreting signals received simultaneously from several of a constellation of special satellites.

Gradient
A measure of slope (soil- or water-surface) in meters of rise or fall per meter of horizontal distance.

Gravel
Unconsolidated natural accumulation of rounded rock fragments coarser than sand but finer than pebbles (2 to 4 mm diam).

Ground-penetrating radar (GPR)
The use of high frequencies of electromagnetic waves which are propagated in a straight line into the ground to depths which vary from a few feet to tens of feet, depending on the electrical conductivity of the terrain. The use of GPR is similar to the seismic reflection technique because both methods record the time required for a wave to travel to an interface between two formations and then reflect to the surface.

Groundwater
The water contained in interconnected pores located below the water table.

H

Head, Total Hydraulic
The sum of the elevation head, the pressure head, and the velocity head at a given point in an aquifer.

Headwaters
A continuous graph showing the properties of stream flow with respect to time.

Hydrograph
A continuous graph showing the properties of stream flow with respect to time.

Hydraulic Conductivity
The rate at which water of a specified density and kinematic viscosity can move through a permeable medium.

Hydraulic Gradient
The change in total head with a change in distance in a given direction which yields a maximum rate of decrease in head.

I

Infiltration
Water entering the groundwater system throughout the land surface.

J K

L

Levee
An embankment raised along a river to protect adjoining lands from inundation.

Light Detection And Ranging (LIDAR)
Laser range and distance measurements of the earth from an aircraft; can be used to generate a dense grid of elevation points for various mapping products to include DEM, and DTM data sets.

Load
The quantity of sediment transported by a current. It includes the suspended load of small particles and the bed load of large particles that move along the bottom.

M

Mean Sea Level (MSL)
A tidal datum that is the mean of hourly water elevations observed over a specific 19-year metonic cycle (the National Tidal Datum Epoch). The abbreviation amsl refers to annual mean sea level.

Mud
A fluid-to-plastic mixture of finely divided particles of solid material and water.

N

Natural Levee

A natural embankment that parallels the course of a river. A natural levee is built up over time by sediment deposition associated with seasonal flooding.

O

Overtopping

Passing of water over the top of a structure as a result of wave runup or surge action.

P

Permeability

The property of bulk material (sand, crushed rock, soft rock in situ) which permit movement of water through its pores.

Piezometer

A nonpumping well, generally of small diameter, that is used to measure the elevation of the water table or potentiometric surface. A piezometer generally has a short well screen through which water can enter.

Piping

Erosion of closed flow channels (tunnels) by the passage of water through soil; flow underneath structures, carrying away particles, may endanger the stability of the structure.

Pore Pressure

The interstitial pressure of water within a mass of soil or rock.

Porosity

Percentage of the total volume of a soil sample not occupied by solid particles but by air and water, = Vv/VT × 100.

Q R

S

Sand

Sediment particles, often largely composed of quartz, with a diameter of between 0.062 mm and 2 mm, generally classified as fine, medium, coarse or very coarse. Beach sand may sometimes be composed of organic sediments such as calcareous reef debris or shell fragments.

Saturation

(1) Soil Saturation. A condition in soil in which all spaces between the soil particles are filled with water. Such conditions normally occur after prolonged periods of rainfall and/or snowmelt. (2) Levee saturation. Soil saturation that has occurred in an earthen levee because of floodwaters remaining above flood stage for extremely long periods of time. This condition can lead to catastrophic failure of the levee.

Sediment

(1) Loose, fragments of rocks, minerals or organic material which are transported from their source for varying distances and deposited by air, wind, ice and water. Other sediments are precipitated from the overlying water or form chemically, in place. Sediment includes all the unconsolidated materials on the sea floor. (2) The fine grained material deposited by water or wind.

Seepage

The movement of water through small cracks, pores, interstices, out of a body of surface of subsurface water. The loss of water by infiltration from a canal, reservoir or other body of water or from a field. It is generally expressed as flow volume per unit of time.

Seepage Velocity

Also known as pore water velocity. The rate of movement of fluid particles through porous media along a line from one point to another.

Silt

Sediment particles with a grain size between 0.004 mm and 0.062 mm, i.e., coarser than clay particles but finer than sand.

Soil

A layer of weathered, unconsolidated material on top of bedrock; in geologic usage, usually defined as containing organic matter and being capable of supporting plant growth.

Stage

The elevation of a river or confined water area, usually referred to a low water datum plane.

T

Thalweg

The line following the lowest part of a valley, whether under water or not. Usually the line following the deepest part, or middle, of the bed or channel of a river.

U

Unconsolidated

In referring to sediment grains, loose, separate, or unattached to one another.

Universal Transverse Mercator (UTM) Coordinate System

A worldwide metric military coordinate system rarely used for civil works applications.

Unsaturated Zone

Also known as the zone of aeration and the vadose zone. The zone between the land surface and the water table. It includes the root zone, intermediate zone, and capillary fringe. The pore spaces contain water at less than atmospheric pressure, as well as air and other gases. Saturated bodies, such as perched groundwater, may exist in the unsaturated zone.

V

W

Water Level

Elevation of still water level relative to some datum.

Water Table

The surface in an unconfined aquifer or confining bed at which the pore water pressure is atmospheric. It can be measured by installing shallow wells extending just into the zone of saturation and then measuring the water level in those wells.

X Y Z

[1]The definitions in this glossary are from the following references:

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