U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Topographic Surveys of Selected Mine Dumps Near Silverton and Leadville, Colorado

by

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INTRODUCTION

Topographic surveys of abandoned, acid producing mine dumps were performed at four sites in Colorado to provide reference maps for U.S. Geological Survey research projects for geochemical and geophysical characterization of mine dumps. Two of the sites are located in southwestern Colorado near the town of Silverton, and the other two sites are located in central Colorado near the town of Leadville. The sites have been named for the mines located on them. The sites near Silverton are located along Cement Creek just north of town, and have been named the May Day (also known as BLM60) and Yukon (also known as Gold Hub) sites (Figure 1). Those near Leadville are located east of town on Ball Mountain and are named the Venir Pile and Sunday #2 (Figure 2).

The topographic base maps resulting from these surveys contain information useful to ongoing research. Included in the maps are topographical features such as roads and hills, geophysical profile locations and grids, some geochemical sampling cells, biochemical sampling points, and other pertinent features such as vegetation "dead zones" produced by acid runoff from the dumps. The goal in producing these maps was to tie sample sites to topography, in some cases helping to interpret data. Many of the sites may need to be reoccupied in the future, accordingly steel pins (12" nails) were placed in the ground at all EDM locations to facilitate surveying of additional points or measuring changes of features such as vegetation boundaries with time.

EQUIPMENT

A Sokkisha Set 2 electronic distance meter (EDM) was used for surveying. A a HP-71B handheld computer was used for data logging. Digital surveying data were transferred directly from the EDM to the HP-71B. A corner reflector, tripod, barometer, thermometer and notebook completed the field equipment. The computer program used to record and download of data from the EDM to the HP-71B is described in Lucius (1997). Distances are estimated to be accurate to 1-2 cm, and elevation differences accurate to 2-4 cm. While this instrumentation is capable of much more precise surveying, this was not warranted for our purposes. Absolute positioning of the survey points was done using a military GPS receiver (Rockwell Precison Lightweight GPS Receiver or PLGR). Absolute horizontal and vertical positioning are generally estimated to be better than $\pm$ 15 and $\pm$ 5 meters respectively as indicated by the PLGR.

DATA PROCESSING

After data were transferred from the HP-71B to a minicomputer they were converted to ASCII text files and manually editted to remove any erroneous points. The data were collected along geographic features such as the edges of roads, breaks in slope, and grid points to allow plotting of these features to provide points of reference. Data points are given as (x,y,z) coordinates relative to a local reference point (REF) for each site. These data are tabulated in the Appendices. All of the data points for each site were gridded using gdminc (Webring, 1981) to produce elevation grids. Maps were produced from the elevation grid and

topographic feature files using gdclrx, a display program written by Robert Simpson (U.S. Geological Survey, Menlo Park). Figures 3 through 7 show the completed topographic maps.

DISCUSSION

The May Day (BLM 60) site (Figure 3) is characterized by a series of slopes and benches, the main road runs diagonally from the southeast corner of the map to the north end of the map, and is marked by a dashed line. A spur road (dashed) branches off from the main road and follows the first bench northwest towards the top of the mine. A geophysical and geochemical grid is marked on the site, along with the location of a geophysical transect. Well locations and bench edges are also included. Instrument points EDM1, EMD2, and EDM3 were located using GPS (see Table 1).

The Yukon site, also known as Gold Hub, (see Figure 4) is characterized by a large upper bench, one major slope, and several buildings and other permanent features. The road on the north side of the site is used to gain access to the upper bench. The outline of two buildings are shown on the upper bench: a garage and a collapsed shed. The location of the mill below the upper bench is shown, while its extension to the upper bench is not because of siting problems. Railroad tracks and geophysical transects are included, as well as the grid system laid out for geophysical and geochemical work. The location of spring to the west of and below the mill were not measured with the EDM, but rather sited on the map (W. Wright, written commun., 1998). The GPS coordinates were obtained for points EDM1, EDM2, and EDM3.

The Venir Pile (Figure 5) is characterized by a series of lobes that extend out from a level bench, then drop off a steep slope to a lower bench. Geophysical lines and DC resistivity sounding locations, and geochemical sampling points are shown on the map. The leader identifying the various geophysical lines points to the zero end of the lines. The geophysical lines were named LB1, LB2, LB3, LB5, and MLB for the various lobes and mini-lobe of the pile. EDM locations and reference points are marked. GPS locations were obtained for the west end of geophysical line MLB and the east of geophysical line LB2.

The Sunday #2 site (Figure 6) is characterized by a medium sized mine waste pile, a long gentle down sloping trend to a road, then a steep descent into a ravine below. Numerous pits surround the site as well as smaller waste piles. Roads, the vegetation "dead zone", upper and lower surfaces of the main pile and surrounding features are all included. The grid system laid out for geophysical and geochemical work is marked, along with geochemical sampling cells and the biochemical sample sites. The location of DC resistivity soundings are shown. These locations were measured relative to grid markers using a tape. EDM locations are labeled. GPS coordinates for several points are given in Table 1. Only the locations of EDM1 and BIO2 are marked as GPS locations in Figure 7. Figure 7 is an enlarged view of the main pile and its immediate surroundings showing the geophysical grid and geochemical sampling cellss in more detail.

SUMMARY

Topographic surveys of the four mine dumps in Leadville and Silverton, Colorado, resulted in topographic base maps that will be used for current and future studies by the U.S. Geological Survey. Key points such as sampling sites and fixed features are included on the maps to aid in reoccupation and interpretation of data. GPS coordinates enable the maps to be accurately tied into a global coordinate system.

ACKNOWLEDGMENTS

We would like to thank Jeff Lucius for his assistance in operation of the Sokkisha Set 2 laser theotolite and HP-71B computer program, John Shary and Mike Singleton for their assistance in fieldwork. Mike Powers and Robert Horton we would like to thank for data contribution and Dave Campbell for support and advice.

REFERENCES

Lucius, Jeffrey E , 1997, Topographic surveying using the Sokkisha SET2 electronic total station with the HP-71B computer: U.S. Geological Survey Open-File Report 97-528, 22 p.

Webring, Michel, 1981, MINC: a gridding program based on minimum curvature: U.S. Geological Survey Open-File Report 81-1224, 41 p.

Table 1 GPS coordinates for selected points.

Site	Station ID	Lattitude	Longitude	GPS Error [ft]	Elevation [ft]
May Day	EDM2	N 37° 50' 50.38"	W 107° 40' 44.11"	±27	9978
	REF2	N 37° 50' 51.14"	W 107° 40' 42.57"	±35	9912
Yukon	EDM1	N 37° 50' 59.58"	W 107° 40' 33.27"	±60	10028
	EDM2	N 37° 50' 27.64"	W 107° 40' 33.30"	±33	9989
	EDM3	N 37° 50' 58.79"	W 107° 40' 35.28"	±58	9996
Venir Pile	LB2:30	N 39° 14' 18.60"	W 106° 14' 13.56"	±23	11718
	MLB-0	N 39° 14' 19.08"	W 106° 14' 13.74"	±27	11704
Sunday #2	EDM1	N 39° 14' 08.61"	W 106° 13' 38.99"	±36	11966
	BIO2	N 39° 14' 07.86"	W 106° 13' 41.33"	±39	11901
	0N 0E	N 39° 14' 08.83"	W 106° 13' 38.86"	±17	11977
	60N 20W	N39° 14' 10.57"	W 106° 13' 37.56"	±16	11977
	100N 0E	N39° 14' 11.07"	W 106° 13' 36.07"	±16	11981
	100N 60E	N39° 14' 09.37"	W 106° 13' 33.41"	±17	11956
	100N 60W	N39° 14' 12.43"	W 106° 13' 37.44"	±22	11963
	160S 60E	N39° 14' 04.08"	W 106° 13' 41.82"	±17	11865
	160S 0E	N39° 14' 05.43"	W 106° 13' 43.54"	±17	11838
	160S 60W	N39° 14' 06.78"	W 106° 13' 45.29"	±16	11845
	200S 60W	N39° 14' 05.91"	W 106° 13' 46.44"	±17	11805
	200S 0N	N39° 14' 04.54"	W 106° 13' 44.71"	±17	11801
	200S 60E	N39° 14' 03.05"	W 106° 13' 42.97"	±21	11811

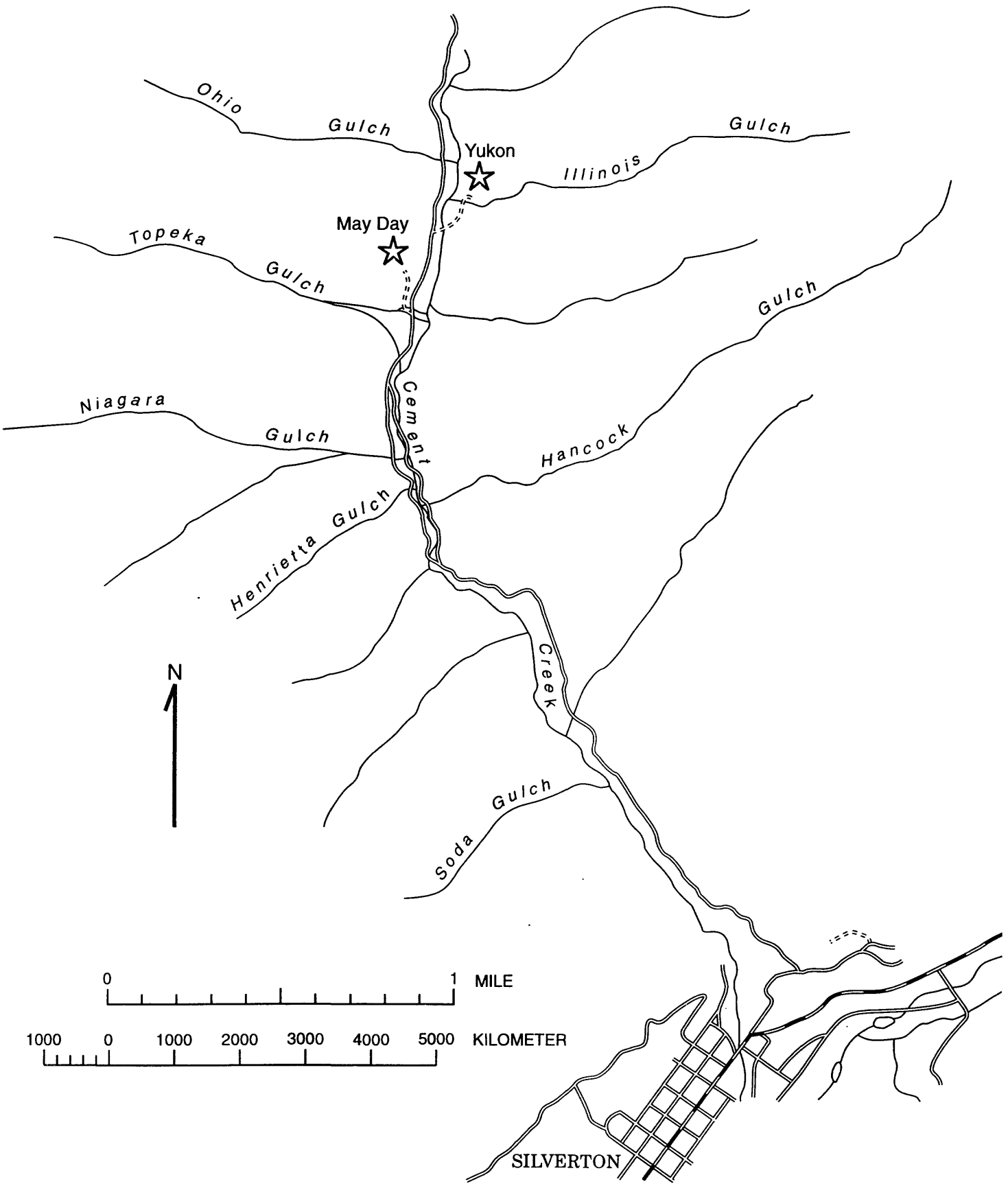


Figure 1 Location of May Day (BLM60) and Yukon (Gold Hub) sites near Silverton, Colorado. (Source USGS 7.5-minute Silverton quadrangle.)

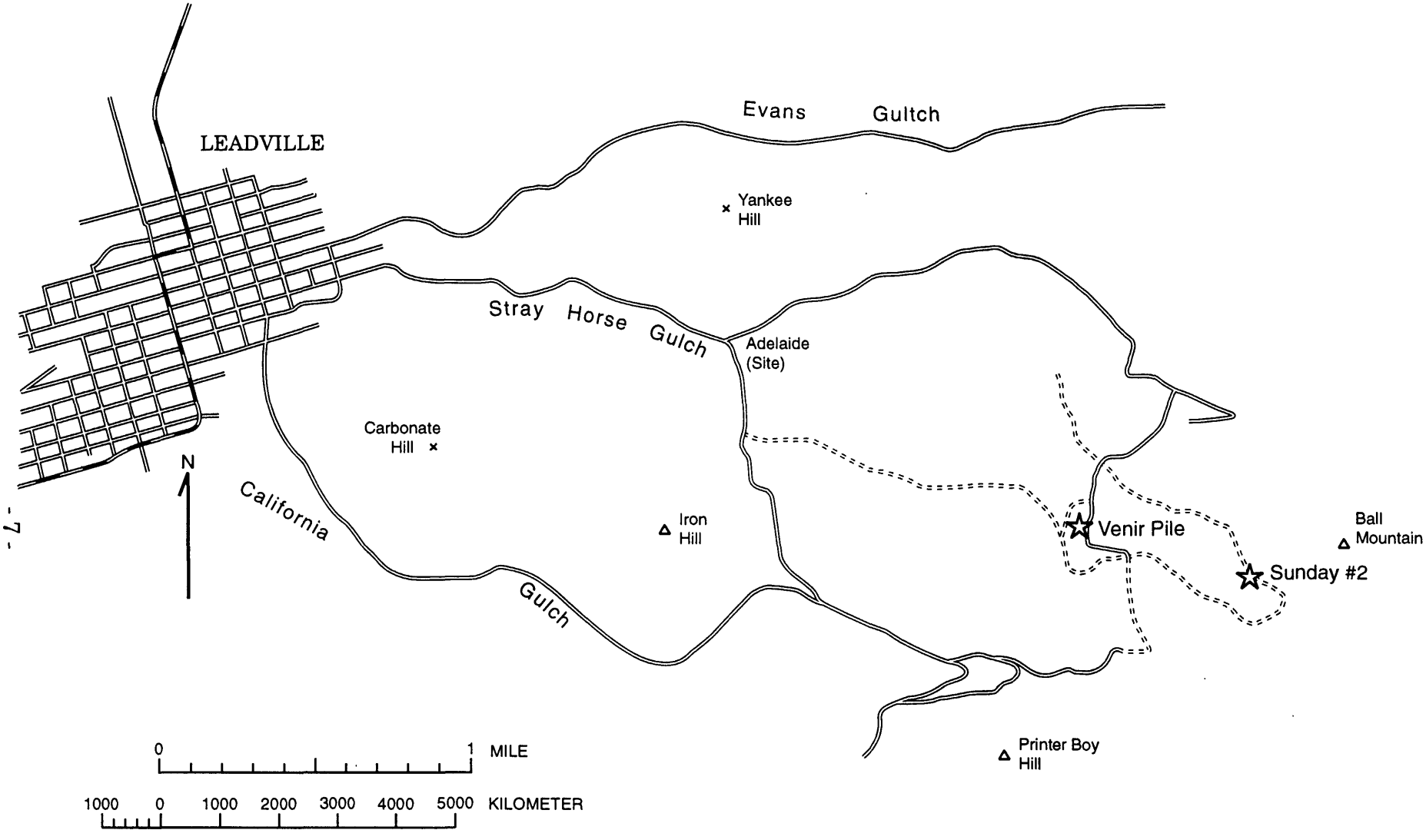
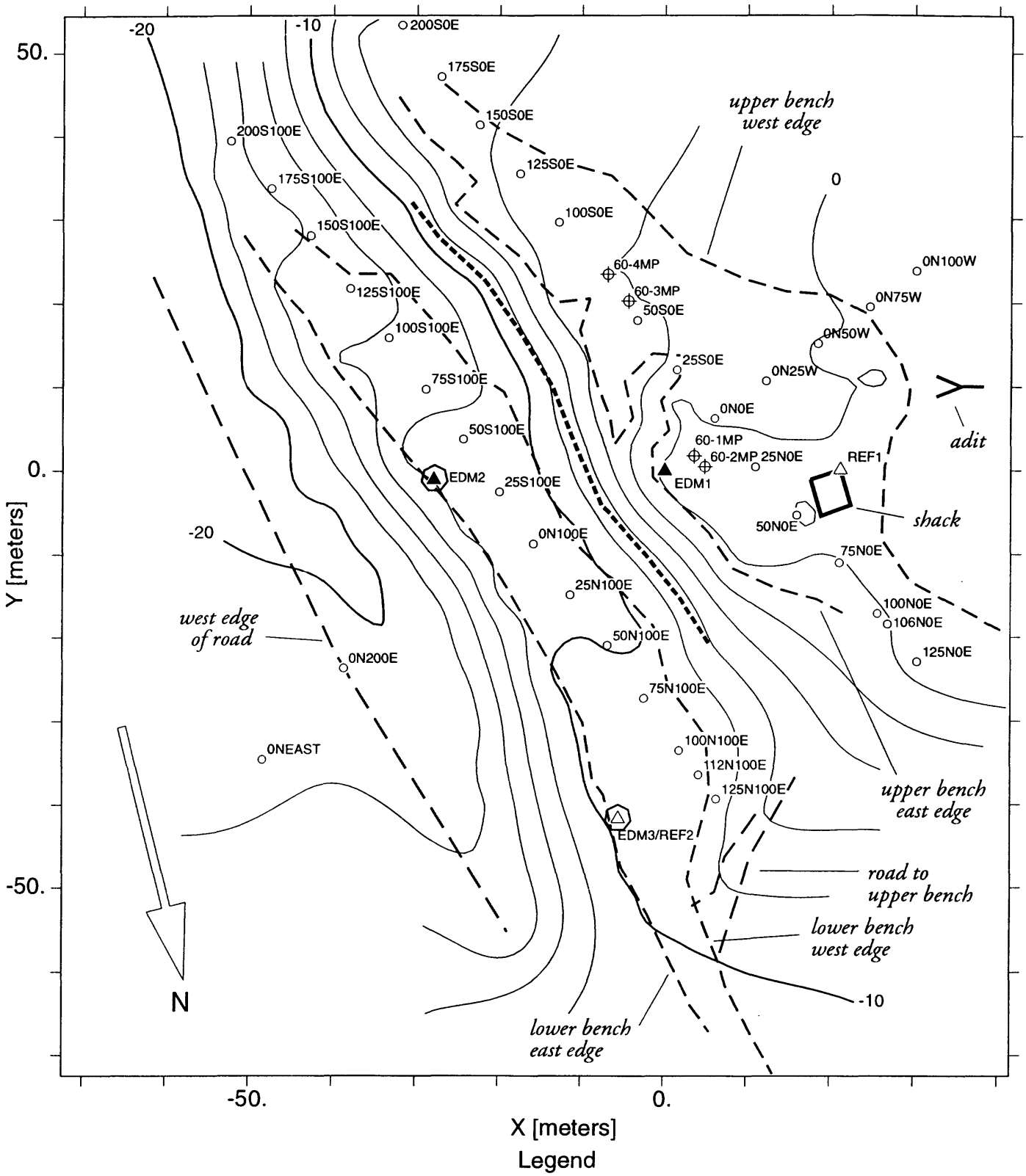


Figure 2 Location of Venir Pile and Sunday #2 sites near Leadville, Colorado. (Source USGS Leadville South and Mount Sherman 7.5-minute quadrangles.)

May Day (BLM 60) Site, Silverton, Colorado



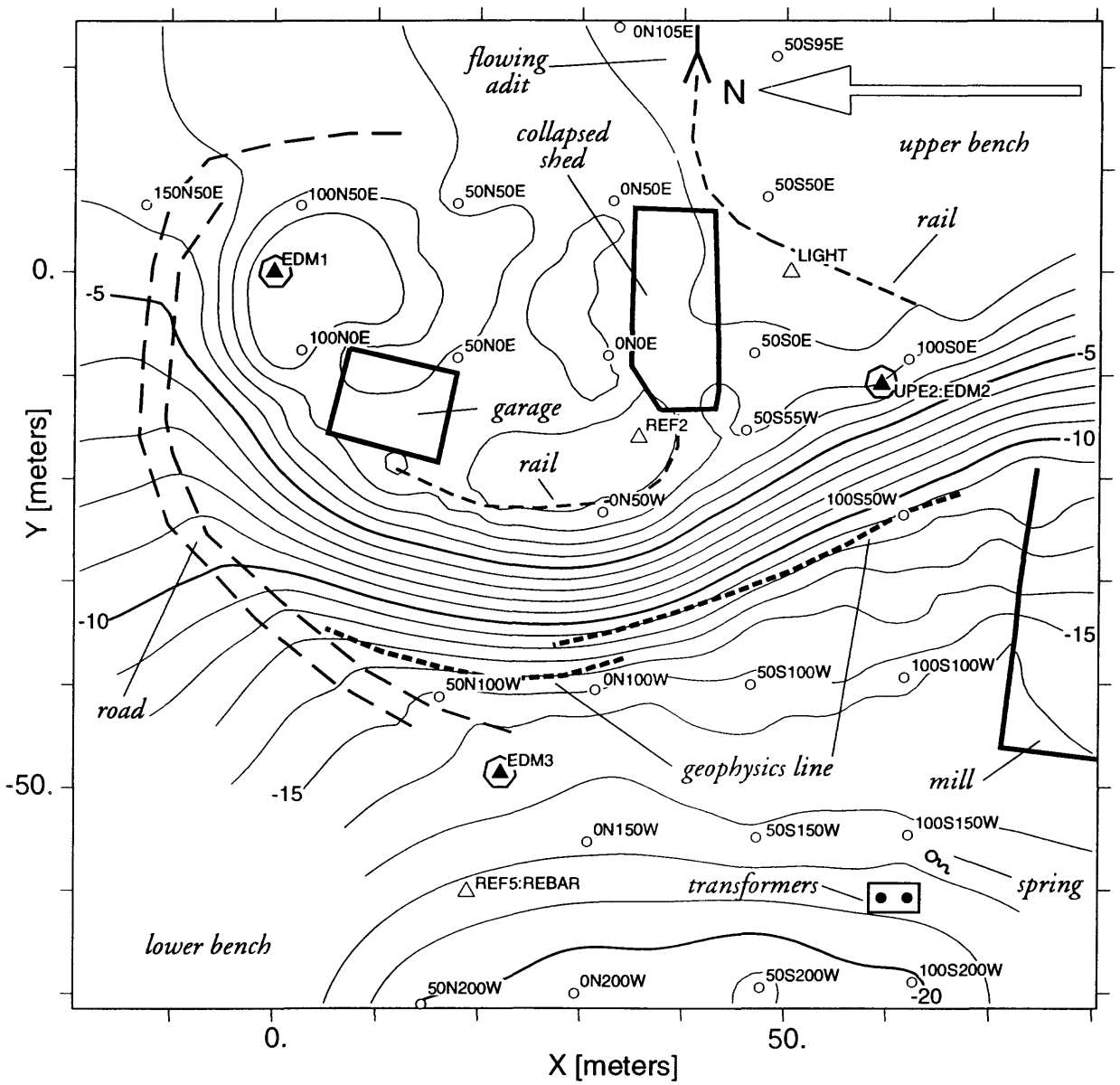
Legend

175S0E	geophysical grid location	REF1	reference point location
EDM1	EDM location	60-1MP	observation well
	geophysical line		GPS location

Figure 3

contour interval 1 meter

Yukon (Gold Hub) Site, Silverton, Colorado



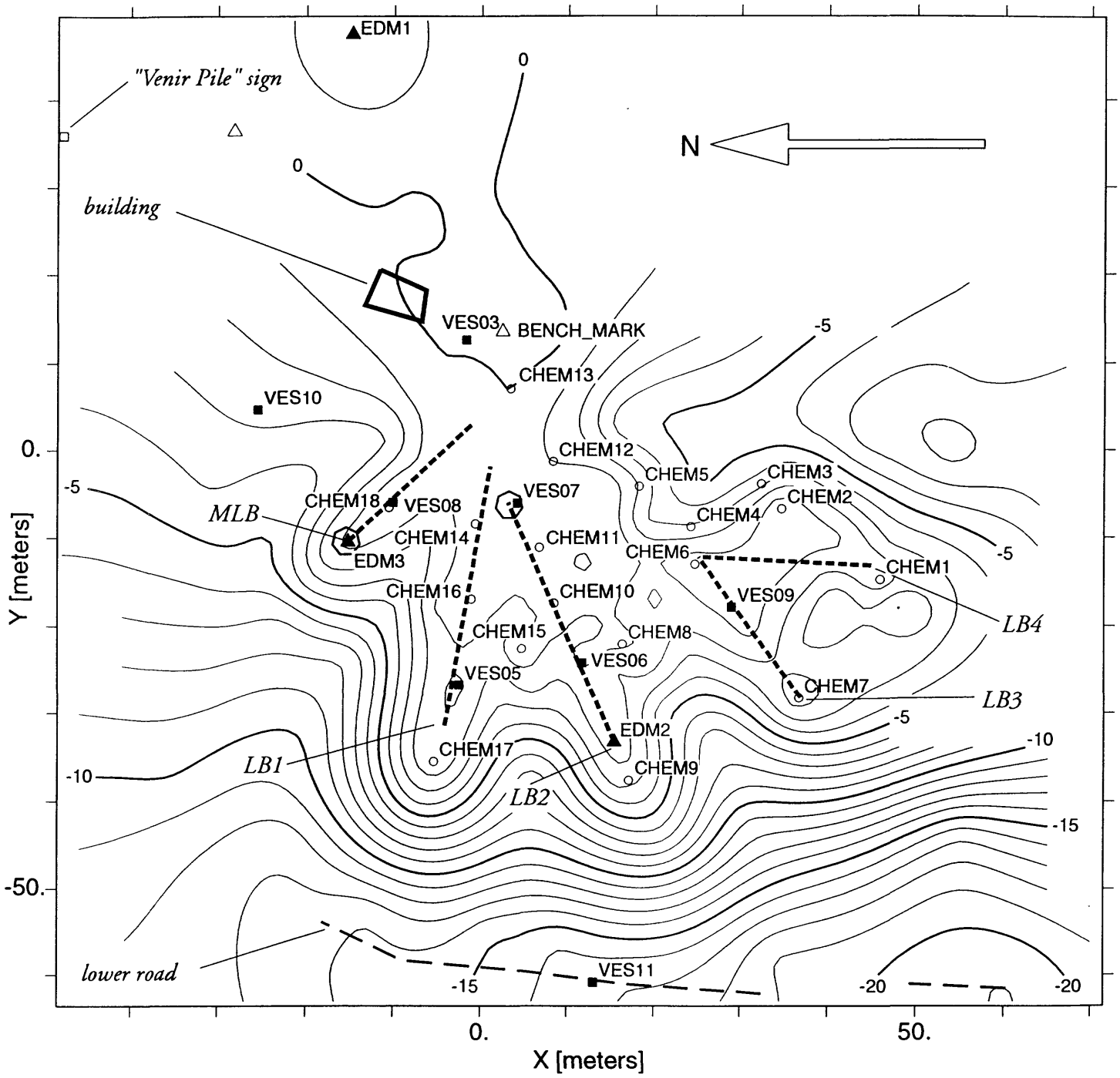
Legend

▲ EDM1	EDM location	○ 175S0E	geophysical grid location
△ REF1	EDM reference point	⬡	GPS location
- - -	geophysical line		

Figure 4

contour interval 1 meter

Venir Pile, Leadville, Colorado



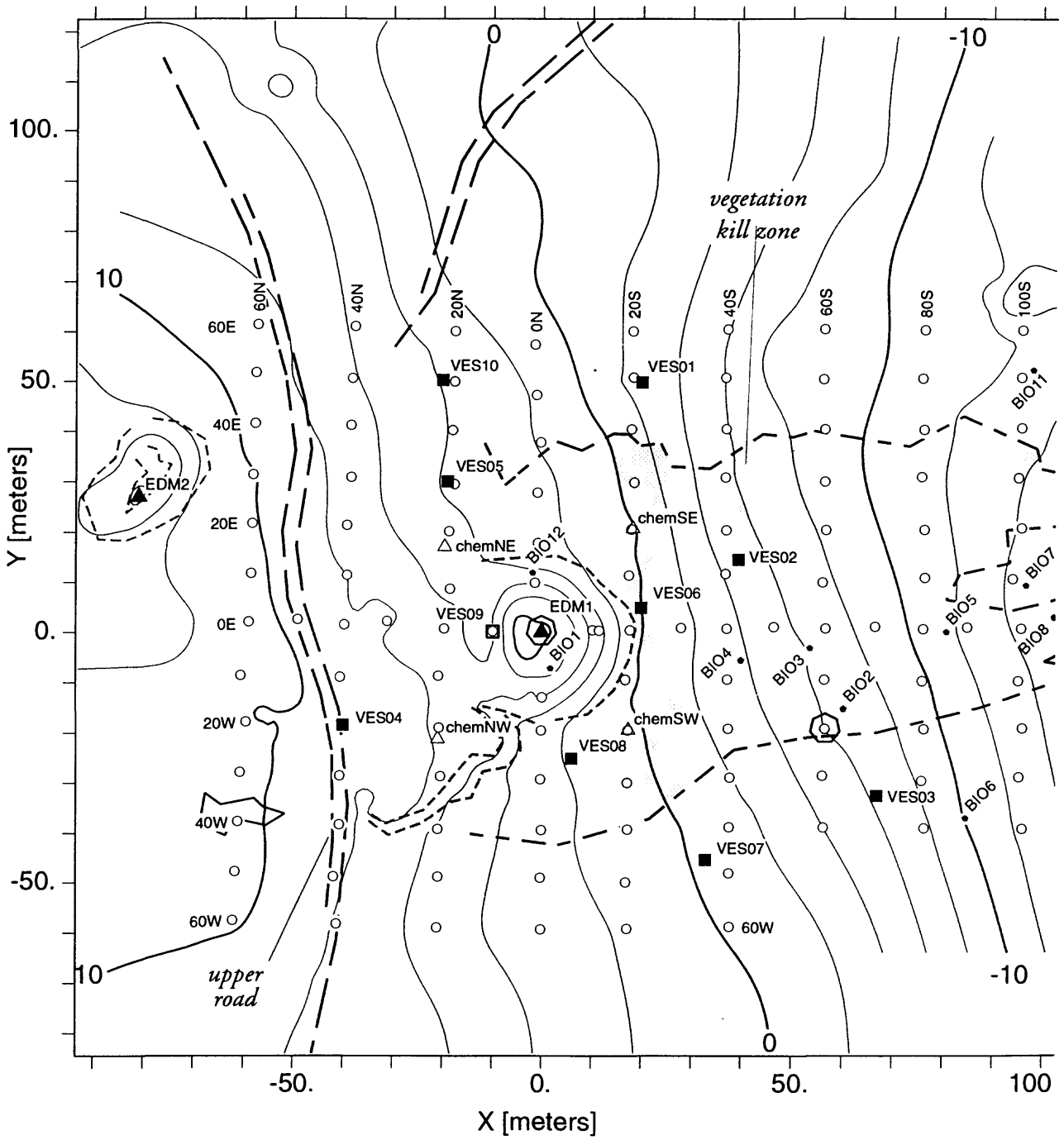
Legend

▲ EDM1	EDM location	■ VES08	geophysical sounding site
△ REF1	EDM reference point	○ CHEM7	geochemical sampling site
- - -	geophysical line	⬡	GPS location

contour interval 1 meter

Figure 5

Sunday #2 Site, Leadville, Colorado



Legend

▲ EDM1	EDM location	○ 40S	geophysical grid
△ REF1	EDM reference point	■ VES08	DC resistivty sounding site
△ chemNE	geochemical grid	• BIO2	biological sampling site
contour interval 1 meter		⬡	GPS location

Figure 6a

Sunday #2 Site, Leadville, Colorado

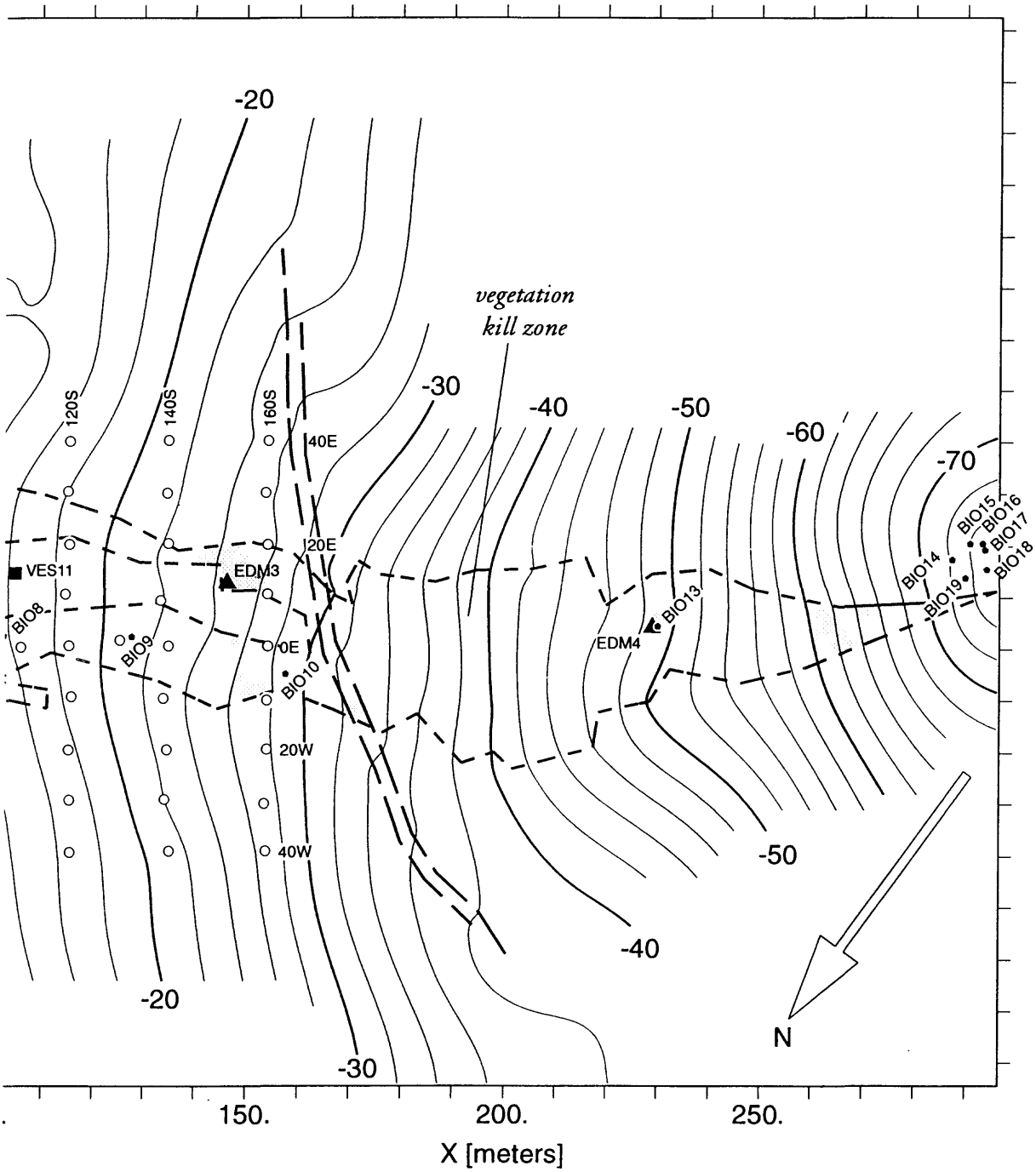


Figure 6b

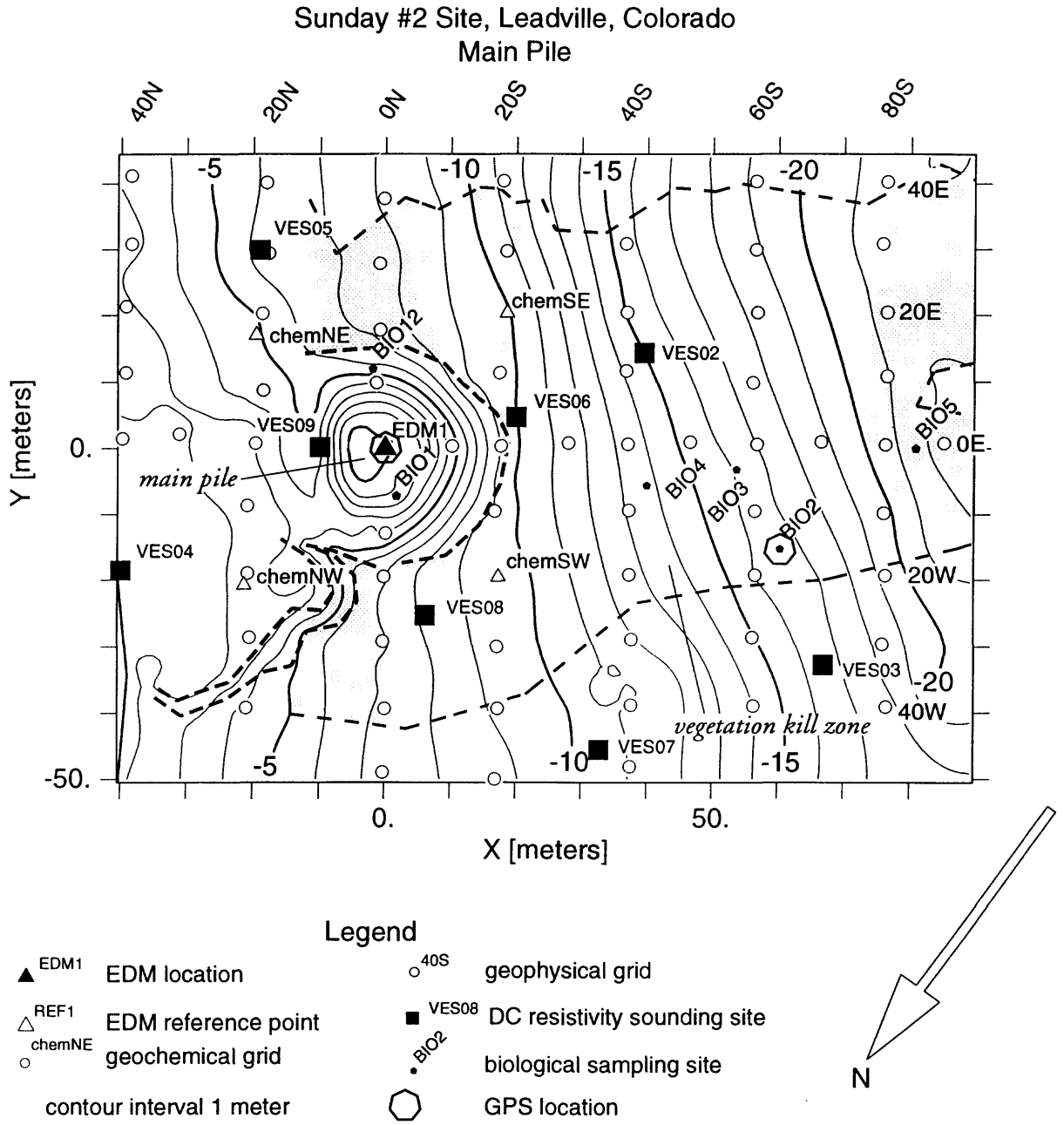

Sunday #2 Site, Leadville, Colorado
Main Pile
40N
20N
0N
20S
40S
60S
80S
-5
-10
-15
-20
40E
20E
0E
20W
40W
VES05
chemNE
BIO12
chemSE
VES02
VES06
VES09
EDM1
BIO1
BIO5
main pile
BIO4
BIO3
BIO2
VES04
chemNW
chemSW
VES08
VES03
vegetation kill zone
VES07
Y [meters]
0.
-50.
X [meters]
50.
Legend
EDM location
EDM reference point
geochemical grid
contour interval 1 meter
geophysical grid
DC resistivity sounding site
biological sampling site
GPS location
N

Figure 7

APPENDIX

This appendix contains tabulations of surveying data for the four dump sites. Included in the data are a location identifier, (x,y,z) position relative to the reference point, and a comment. The distances are given in meters relative to the first surveying instrument site (EDM1). The direction of the x-axis is the line running from EDM1 a reference point (REF). The reference point was usually taken as some fixed and easily recognizable feature. In some instances a steel pin placed in the ground and used for the reference.

MAY DAY SITE

ID	X [m]	Y [m]	Z [m]	Comment
REF1	21.118	0.108	0.147	Surveying reference points
REF2	-5.496	-41.664	-9.662	GPS point
EDM2	-27.912	-1.107	-11.574	GPS point
200S 0E	-31.838	53.349	-5.359	Line 0 East
195S 0E	-30.863	51.835	-5.130	
190S 0E	-29.999	50.652	-4.985	
185S 0E	-29.094	49.538	-4.815	
180S 0E	-28.103	48.421	-4.629	
175S 0E	-27.153	47.186	-4.628	
170S 0E	-26.254	46.053	-4.599	
165S 0E	-25.265	44.854	-4.547	
160S 0E	-24.250	43.703	-4.480	
155S 0E	-23.331	42.513	-4.354	
150S 0E	-22.496	41.401	-4.226	
145S 0E	-21.449	40.190	-4.073	
140S 0E	-20.410	39.041	-3.946	
135S 0E	-19.506	37.821	-3.815	
130S 0E	-18.527	36.652	-3.718	
125S 0E	-17.547	35.489	-3.665	
120S 0E	-16.598	34.310	-3.584	
115S 0E	-15.602	33.146	-3.471	
110S 0E	-14.658	31.953	-3.409	
105S 0E	-13.696	30.839	-3.349	
100S 0E	-12.824	29.639	-3.304	
95S 0E	-11.802	28.486	-3.185	
90S 0E	-10.844	27.307	-3.110	
85S 0E	-9.872	26.131	-3.062	
80S 0E	-8.922	24.934	-2.876	
75S 0E	-7.977	23.751	-2.775	
70S 0E	-7.021	22.588	-2.677	
65S 0E	-6.068	21.371	-2.635	
60S 0E	-5.196	20.151	-2.611	
55S 0E	-4.255	18.964	-2.668	
50S 0E	-3.328	18.043	-2.701	
45S 0E	-2.236	16.682	-2.708	
40S 0E	-1.272	15.422	-2.576	
35S 0E	-0.383	14.346	-2.372	
30S 0E	0.602	13.247	-1.880	
25S 0E	1.465	12.071	-1.050	
20S 0E	2.293	10.988	-0.382	
15S 0E	3.235	9.767	-0.206	
10S 0E	4.160	8.590	-0.098	
5S 0E	5.125	7.405	-0.141	
0N 0E	6.061	6.196	-0.109	Geophysical grid origin
25N 0E	10.987	0.466	0.131	
50N 0E	15.957	-5.294	-0.035	
75N 0E	20.996	-11.019	-0.048	
100N 0E	25.559	-17.110	-0.16	
106N 0E	26.793	-18.416	-0.132	
106N 0E	30.310	-22.930	0.676	
125N 0E	30.324	-22.940	0.677	
145S 50E	-30.846	32.328	-9.426	Line 50 East
125S 50E	-27.439	27.893	-8.609	
100S 50E	-21.837	22.828	-9.087	
75S 50E	-17.478	16.563	-8.299	

May Day Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
50S 50E	-13.534	9.975	-7.780	
25S 50E	-10.768	3.042	-7.094	
0N 50E	-7.609	-3.992	-7.010	
25N 50E	-2.684	-9.596	-6.691	
50N 50E	2.022	-15.438	-6.727	
70N 50E	5.402	-20.689	-6.131	
200S 100E	-52.308	39.478	-16.624	Line 100 East
175S 100E	-47.416	33.703	-15.830	
150S 100E	-42.722	28.099	-15.648	
125S 100E	-37.952	21.802	-14.785	
100S 100E	-33.282	15.920	-13.780	
75S 100E	-28.863	9.761	-12.772	
50S 100E	-24.303	3.737	-11.626	
25S 100E	-19.949	-2.484	-11.356	
0N 100E	-15.777	-8.722	-11.018	
25N 100E	-11.343	-14.848	-10.558	
50N 100E	-6.826	-20.967	-10.078	
75N 100E	-2.415	-27.254	-9.500	
100N 100E	1.891	-33.458	-9.488	
112N 100E	4.170	-36.411	-9.627	
125N 100E	6.369	-39.300	-9.055	
0N 100W	30.125	23.900	3.397	Line 0 North
0N 75W	24.560	19.588	0.458	
0N 50W	18.392	15.230	0.023	
0N 25W	12.223	10.735	-0.052	
0N 25E	0.063	1.699	-0.187	
0N 30E	-1.133	0.730	-0.148	
0N 150E	-27.912	-1.107	-12.302	
0N 200E	-38.646	-23.701	-19.124	
0N EAST	-48.337	-34.533	-18.860	E side of road along 0 North
UBT1	-32.738	53.665	-5.752	Back edge of upper bench
UBT2	-26.772	46.273	-4.739	
UBT3	-20.079	40.839	-3.948	
UBT4	-13.099	37.124	-3.281	
UBT5	-6.480	35.251	-2.843	
UBT6	-2.498	31.261	-2.041	
UBT7	2.622	26.004	-1.213	
UBT8	9.767	22.891	-0.613	
UBT9	14.502	21.461	-0.296	
UBT10	19.767	21.059	0.005	
UBT11	24.345	18.714	0.241	
UBT12	28.369	12.661	0.216	
UBT13	29.421	9.617	0.303	
UBT14	29.048	6.793	0.533	
UBT15	27.270	4.197	0.311	
UBT16	26.390	0.439	0.365	
UBT17	26.072	-8.098	0.487	
UBT18	29.393	-13.216	0.843	
UBT19	34.843	-16.066	1.896	
UBT20	40.430	-19.206	3.218	
UBE1	-37.095	51.732	-5.947	Front edge of upper bench
UBE2	-32.167	44.749	-5.065	

May Day Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
UBE3	-28.962	40.037	-4.905	
UBE4	-25.074	36.745	-4.663	
UBE5	-22.881	34.489	-4.429	
UBE6	-25.412	31.839	-5.265	
UBE7	-20.478	27.849	-5.047	
UBE8	-17.393	25.438	-4.802	
UBE9	-14.716	21.960	-4.078	
UBE10	-12.878	20.187	-3.346	
UBE11	-9.063	20.574	-3.209	
UBE12	-10.233	16.798	-3.341	
UBE13	-8.174	10.299	-3.295	
UBE14	-6.594	6.303	-2.945	
UBE15	-6.073	3.068	-3.150	
UBE16	-3.828	6.309	-2.889	
UBE17	-4.862	10.710	-2.903	
UBE18	-1.499	14.043	-2.777	
UBE19	2.146	13.791	-1.021	
UBE20	1.776	11.170	-0.487	
UBE21	-0.447	8.366	-0.276	
UBE22	0.548	4.810	-0.324	
UBE23	-1.517	2.670	-0.498	
UBE24	-1.391	-0.781	-0.290	
UBE25	1.955	-3.973	0.028	
UBE26	5.428	-7.430	-0.348	
UBE27	8.129	-11.580	-0.396	
UBE28	13.668	-14.164	-0.706	
UBE29	18.332	-15.376	-0.589	
UBE30	21.447	-17.022	-0.506	
SHKNE	18.860	-5.409	0.023	Mine shack corners
SHKSE	17.583	-1.044	0.117	
SHKSW	21.102	0.114	0.157	
SHKNW	22.343	-4.115	0.849	
ADIT1	32.675	11.372	1.734	Adit
ADIT2	34.706	11.342	1.003	
ADIT3	34.624	9.363	0.864	
ADIT4	33.969	8.570	1.124	
LBT1	-54.485	38.822	-18.309	Back edge of lower bench
LBT2	-44.614	28.774	-16.404	
LBT3	-38.215	23.559	-14.915	
LBT4	-33.161	23.559	-13.889	
LBT5	-28.557	18.487	-13.357	
LBT6	-23.349	12.010	-12.182	
LBT7	-19.454	9.427	-11.597	
LBT9	-11.453	-7.835	-10.644	
LBT10	-6.147	-13.338	-10.135	
LBT11	-1.271	-18.649	-9.726	
LBT12	0.490	-25.656	-9.350	
LBT13	5.132	-31.809	-9.399	
LBT14	5.552	-38.495	-9.673	
LBT15	4.441	-42.701	-9.707	
LBT16	2.877	-48.993	-9.814	
LBT17	3.978	-52.351	-9.642	
LBT18	6.893	-59.239	-10.057	
LBT19	7.486	-61.597	-10.284	

May Day Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
LBT20	10.773	-67.769	-10.706	
LBT21	13.230	-72.228	-10.969	
LBE1	-54.421	34.641	-18.056	Front edge of lower bench
LBE2	-50.678	28.129	-16.918	
LBE3	-46.728	22.408	-15.790	
LBE4	-42.872	17.858	-15.228	
LBE5	-40.157	12.639	-14.167	
LBE7	-31.134	1.753	-11.695	
LBE8	-23.667	-6.728	-11.400	
LBE9	-19.039	-13.978	-10.867	
LBE10	-13.325	-23.736	-9.726	
LBE11	-9.773	-30.210	-9.530	
LBE12	-8.600	-36.914	-9.558	
LBE13	-7.297	-38.780	-9.383	
LBE14	-5.113	-47.528	-9.840	
LBE15	-1.929	-53.207	-9.886	
LBE17	3.452	-64.176	-10.521	
LBE18	5.582	-67.163	-10.447	
RT1	-71.208	42.119	-22.168	Toe of lower bench near road
RT2	-65.976	35.367	-21.852	
RT3	-61.866	33.732	-21.467	
RT4	-58.038	31.443	-21.286	
RT5	-56.645	25.028	-21.294	
RT6	-53.104	16.049	-21.228	
RT7	-47.026	4.922	-20.695	
RT8	-39.327	-4.088	-19.830	
RT9	-33.121	-10.893	-19.442	
RT10	-28.111	-17.246	-18.858	
RT11	-24.367	-25.538	-18.522	
RT12	-22.713	-31.050	-18.348	
RT13	-21.435	-40.132	-18.015	
RT14	-20.075	-47.406	-17.575	
RT15	-17.285	-53.184	-17.216	
RDW1	-70.575	39.714	-22.161	West side of road
RDW2	-61.523	23.225	-21.545	
RDW3	-53.634	6.024	-20.720	
RDW4	-43.241	-14.595	-19.620	
RDW5	-38.651	-23.634	-19.125	
	-27.180	-41.819	-18.419	
RDW7	-18.883	-55.209	-17.709	
PRD1	7.043	-57.844	-9.862	Road from lower to upper bench
PRD3	10.418	-46.293	-7.355	
PRD4	15.989	-36.721	-5.061	
PRD5	10.092	-41.076	-6.460	
PRD6	7.575	-46.550	-7.599	
PRD7	5.988	-50.453	-8.500	
PRD8	3.685	-52.146	-9.654	
60-1MP	3.548	1.760	0.656	Wells
60-2MP	4.884	0.484	0.636	
60-3MP	-4.397	20.324	-2.013	
60-4MP	-6.906	23.500	-2.034	

May Day Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
STREAM1	-145.559	25.550	-28.604	West edge of Cement Creek
STREAM2	-149.286	15.147	-28.099	
STREAM3	-107.711	-11.327	-26.561	
STREAM4	-101.419	-38.884	-25.617	
STREAM5	-102.717	-42.853	-26.185	
STREAM6	-100.660	-61.438	-25.077	

YUKON SITE

ID	X [m]	Y [m]	Z [m]	Comment
EDM1	0.000	0.000	0.000	Coordinate zero, GPS
REF2	35.597	-15.983	-0.838	
UPE2:EDM2	59.386	-10.803	-2.013	GPS point
MILL5:REF4	71.136	-46.309	-16.351	Point on mill, ref pt 4
EDM3	22.202	-48.605	-16.285	GPS point
MILL5:REF4	71.106	-46.094	-16.344	
REF5:REBAR	18.923	-60.201	-18.290	
0N 105E	33.517	23.835	-0.827	Line 0 North
0N 0E	32.577	-8.089	-1.045	Geophysical grid origin
0N 50W	32.112	-23.309	-1.267	
150N 50E	-12.513	6.579	-3.794	Line 50 East
100N 50E	2.568	6.480	-1.590	
50N 50E	17.785	6.667	-1.903	
0N 50E	33.038	6.952	-1.271	
50S 50E	48.188	7.384	-0.795	
100S 0E	62.049	-8.411	-1.985	Line 0 East
50N 0E	17.809	-8.288	-1.910	
100N 0E	2.637	-7.558	-0.590	
50S 95E	49.019	21.034	-0.062	Line 50 South
50S 50E	48.163	7.382	-0.789	
50S 0E	46.925	-7.793	-1.275	
50S 55W	46.192	-15.294	-1.829	
50S 100W	46.679	-39.987	-15.147	
50S 150W	47.282	-54.899	-17.191	
50S 200W	47.668	-69.488	-21.240	
120S 50W	67.005	-21.466	-11.235	Line 50 West
100S 50W	61.772	-23.243	-11.019	
80S 50W	56.079	-26.447	-11.454	
60S 50W	50.590	-29.044	-11.590	
40S 50W	44.851	-31.170	-11.894	
20S 50W	39.059	-33.134	-11.687	
0N 50W	33.227	-34.885	-11.602	
20N 50W	27.336	-36.219	-11.369	
0N 60W	34.168	-37.516	-13.670	Line 60 West
20N 60W	28.379	-39.153	-13.732	
40N 60W	22.242	-39.535	-13.443	
60N 60W	16.358	-38.348	-13.282	
80N 60W	10.487	-36.824	-13.076	
100N 60W	5.081	-34.638	-12.833	
0N 100W	31.435	-40.527	-14.963	Line 100 West
50N 100W	16.162	-41.203	-15.215	
0S 150W	62.649	-68.946	-20.128	Line 150 West
50S 150W	62.150	-54.670	-17.636	
100S 100W	61.735	-39.293	-15.545	
100S 50W	61.619	-23.595	-11.093	
0N 200W	29.502	-70.032	-20.750	Line 200 West

Yukon Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
50N 200W	14.493	-71.101	-20.094	
BCT1	-18.651	13.960	-3.709	Bench cut toe (pile back edge)
BCT2	-4.336	15.964	-2.525	
BCT3	6.590	18.178	-2.265	
BCT4	11.850	20.026	-2.086	
BCT5	21.367	21.440	-1.456	
BCT6	33.373	23.751	-0.832	
BCT7	38.886	24.660	-0.529	
BCT8	43.387	23.924	-0.536	
BCT9	48.704	20.196	-0.483	
BCT10	61.262	17.971	-0.253	
BCT11	63.057	17.490	-0.133	
NPT1	0.339	-8.288	-0.396	North pile top
NPT2	-1.250	-1.458	-0.125	
NPT3	2.069	3.474	-0.312	
NPT4	7.224	3.551	-0.199	
NPT5	10.183	-1.160	-0.252	
NPT6	9.567	-3.910	-0.325	
NPT7	6.560	-1.710	0.041	
NPT8	3.394	-5.029	-0.222	
NPT9	1.579	-7.975	-0.256	
NPB1	1.961	-11.811	-2.211	North pile bottom
NPB2	6.507	-6.621	-2.097	
NPB3	11.184	-7.002	-2.006	
NPB4	15.606	-4.715	-2.070	
NPB5	13.594	2.423	-2.014	
NPB6	8.723	7.919	-2.193	
NPB7	0.995	8.515	-2.584	
NPB8	-4.751	4.982	-3.308	
NPB9	-7.827	-2.223	-4.543	
NPB10	-8.397	-12.275	-6.371	
NPB11	-4.314	-12.163	-4.806	
NPB12	-0.324	-12.828	-3.414	
MP1	33.208	6.056	-1.255	Middle pile edge
MP2	33.372	2.022	-1.341	
MP3	31.673	0.701	-1.392	
MP4	32.628	-2.336	-1.405	
MP5	31.389	-4.231	-1.433	
MP6	33.243	-9.256	-1.161	
MP7	31.609	-12.194	-1.092	
MP8	28.348	-12.597	-1.477	
MP9	26.521	-8.983	-1.681	
MP10	23.344	-6.838	-1.602	
MP11	23.105	-3.214	-1.720	
MP12	24.734	0.581	-1.688	
MP13	27.377	2.067	-1.546	
MP14	28.885	5.414	-1.453	
MP15	30.420	5.467	-1.355	
MP16	32.457	6.417	-1.268	
MPT1	32.051	3.864	-0.371	Middle pile top
MPT2	30.350	3.023	-0.336	
MPT3	30.130	-1.702	-0.227	

Yukon Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
MPT4	29.515	-6.096	-0.317	
MPT5	30.432	-8.076	-0.204	
MPT6	30.833	-9.722	-0.163	
MPT7	26.538	-6.403	-0.562	
MPT8	25.585	-4.080	-0.502	
MPT9	27.093	-2.775	-0.307	
MPT10	27.151	-0.913	-0.395	
UPE1	67.610	-5.935	-1.338	Main pile front edge edge
UPE2:EDM2	59.386	-10.803	-2.013	
UPE3	48.784	-15.270	-2.152	
UPE4	43.206	-19.508	-2.582	
UPE5	40.906	-21.691	-3.110	
UPE6	1.917	-11.989	-2.251	
UPE7	2.542	-15.144	-2.257	
UPE8	4.072	-15.707	-2.270	
UPE9	5.410	-16.294	-2.057	
UPE10	35.836	-22.794	-1.524	
UPE11	29.492	-24.305	-1.453	
UPE12	23.833	-24.022	-1.630	
UPE13	20.051	-23.498	-2.135	
UPE14	16.264	-22.296	-2.182	
CSH1	37.697	-13.332	-0.928	Collapsed shed
CSH2	34.829	-9.070	-1.010	
CSH3	35.123	6.252	-1.245	
CSH4	43.063	5.974	-0.894	
CSH5	43.384	-4.102	-0.913	
CSH6	43.460	-11.451	-2.156	
CSH7	43.150	-13.200	-2.478	
GARAGENW	5.226	-15.585	-2.061	Garage
GARAGENE	7.281	-7.409	-1.985	
GARAGESE	17.776	-9.779	-1.834	
GARAGESW	15.934	-18.426	-1.874	
OFT1	56.151	15.340	-0.305	Office building
OFT2	53.683	9.612	-0.686	
OFT3	67.059	3.296	0.187	
RRN1	11.859	-19.082	-0.756	Rail line north
RRN2	17.300	-21.553	-0.867	
RRN3	20.521	-22.691	-0.906	
RRN4	25.693	-22.917	-0.900	
RRN5	31.759	-22.378	-1.130	
RRN6	35.497	-21.759	-1.124	
RRN7	38.008	-19.935	-1.121	
RRN8	39.487	-16.866	-1.076	
RRN9	39.459	-13.762	-0.995	
RRS1	41.182	19.466	-0.734	Rail line, south
RRS2	40.725	13.009	-0.868	
RRS3	42.176	8.181	-0.856	
RRS4	45.369	4.798	-0.827	
RRS5	48.400	3.079	-0.881	
RRS6	62.604	-3.054	-1.009	

Yukon Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
LIGHT	50.475	-0.028	-0.914	Light pole
RD1	2.331	10.107	-2.605	Road to top of main pile
RD2	-4.929	7.109	-3.277	
RD3	-9.220	0.915	-4.281	
RD4	-10.545	-14.098	-6.855	
RD5	-9.124	-20.224	-8.164	
RD6	-7.152	-24.649	-9.287	
RD7	-7.162	-28.822	-9.847	
RD8	-11.558	-21.620	-8.233	
RD9	-13.107	-14.750	-6.783	
RD10	-12.738	-7.590	-5.837	
RD11	-11.828	0.775	-4.279	
RD12	-9.859	7.518	-3.569	
RD13	-6.393	11.058	-3.110	
RD14	0.153	12.603	-2.793	
RD15	7.110	13.496	-2.516	
RD16	13.457	13.518	-2.228	
RD17	25.478	-48.425	-16.542	
RD18	13.455	-44.014	-15.053	
RD19	5.859	-39.765	-13.846	
RD20	-1.619	-33.717	-11.690	
RD21	-10.253	-24.493	-8.810	
RD22	-13.106	-15.976	-7.047	
RD23	-9.824	-17.610	-7.557	
RD24	-6.415	-25.492	-9.531	
RD25	1.419	-32.565	-11.958	
RD26	8.583	-38.409	-14.014	
RD27	15.214	-42.059	-15.260	
RD28	23.629	-44.739	-16.074	
UPT1:MILL	74.487	-19.012	-11.548	Main pile toe, point on mill
UPT2	72.245	-18.859	-11.218	
UPT3	64.593	-23.902	-12.069	
UPT4	55.672	-29.984	-13.526	
UPT5	47.627	-34.704	-14.420	
UPT6	36.923	-40.054	-15.520	
UPT7	26.705	-42.983	-15.981	
UPT8	35.545	-40.456	-15.55	
UPT9	28.321	-42.769	-15.899	
UPT10	20.392	-42.894	-15.874	
UPT11	12.827	-40.077	-14.689	
UPT12	6.868	-37.008	-13.546	
DWA1:MILL2	73.853	-23.514	-11.537	Mill upper driveway
DWA2	66.394	-27.483	-12.358	
DWA3	59.994	-31.869	-13.338	
DWA4	51.715	-36.683	-14.568	
DWA5	58.312	-34.426	-14.308	
DWA6	64.763	-31.130	-14.004	
DWA7	70.662	-27.218	-13.525	
DWB1:MILL3	72.830	-30.513	-13.651	Mill middle driveway
DWB2	65.390	-35.137	-14.363	
DWB3	56.387	-39.209	-14.790	
DWB4	48.443	-42.137	-15.148	
DWB5	40.112	-45.740	-16.230	

Yukon Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
DWB6	49.704	-44.029	-16.323	
DWB7	57.875	-41.833	-16.236	
DWB8	64.674	-39.022	-16.240	
DWB9:MILL4	72.450	-35.006	-15.886	Point on mill
DWC1	72.697	-52.000	-16.748	Mill upper driveway
DWC2	63.324	-53.183	-16.904	
DWC3	46.386	-54.713	-17.139	
DWC4	40.388	-51.668	-16.979	
UPT1:MILL1	74.487	-19.012	-11.548	Points on mill
DWA1:MILL2	73.853	-23.514	-11.537	
DWB1:MILL3	72.830	-30.513	-13.651	
DWB9:MILL4	72.450	-35.006	-15.886	
MILL5:REF4	71.136	-46.309	-16.351	
MILL6	80.913	-47.304	-15.956	

SUNDAY #2 SITE

ID	X [m]	Y [m]	Z [m]	Comment
EDM1	0.000	0.000	0.000	Coordinate zero, GPS point
EDM2	-80.948	27.029	6.351	
EDM3	146.388	13.137	-34.402	
EDM4	228.929	4.436	-58.604	
REF2	-31.312	-10.146	-1.587	
REF3	134.883	20.799	-32.190	
60N 60W	-62.110	-57.513	0.223	Line 60 North
60N 50W	-61.648	-47.786	0.512	
60N 40W	-61.133	-37.636	0.664	
60N 30W	-60.701	-27.759	0.815	
60N 20W	-59.536	-17.790	0.636	
60N 10W	-60.526	-8.522	1.155	
60N 0E	-58.948	2.074	0.754	
60N 10E	-58.499	11.781	0.444	
60N 20E	-58.301	21.729	0.156	
60N 30E	-58.131	31.394	0.096	
60N 40E	-57.773	41.593	-0.396	
60N 50E	-57.588	51.727	-0.632	
60N 60E	-57.253	61.441	-1.310	
40N 60E	-37.712	61.105	-4.293	Line 40 North
40N 50E	-38.235	50.565	-3.839	
40N 40E	-38.494	41.209	-3.144	
40N 30E	-38.402	30.799	-2.757	
40N 20E	-39.244	21.337	-2.879	
40N 10E	-39.217	11.405	-2.006	
40N 0E	-39.753	1.485	-1.512	
40N 10W	-40.545	-8.952	-1.238	
40N 20W	-40.313	-18.318	-1.161	
40N 30W	-40.681	-28.565	-1.234	
40N 40W	-40.687	-38.317	-1.489	
40N 50W	-41.849	-48.800	-1.716	
40N 60W	-41.272	-58.246	-2.160	
20N 60W	-21.084	-58.928	-5.265	Line 20 North
20N 50W	-20.902	-48.825	-4.516	
20N 40W	-20.906	-39.200	-4.085	
20N 30W	-20.415	-28.626	-2.538	
20N 20W	-20.729	-18.960	-2.393	
20N 10W	-20.822	-8.668	-2.315	
20N 0E	-19.614	0.715	-2.891	
20N 10E	-18.496	8.749	-4.297	
20N 20E	-18.661	20.222	-5.130	
20N 30E	-17.666	29.450	-6.523	
20N 40E	-18.056	40.155	-6.124	
20N 50E	-17.639	49.895	-6.368	
20N 60E	-17.550	60.063	-7.123	
0N 60E	-1.472	57.418	-8.952	Line 0 North
0N 50E	-1.105	47.239	-8.204	
0N 40E	-0.252	37.725	-8.172	
0N 30E	-0.887	27.857	-7.485	
0N 20E	-0.791	17.801	-7.069	
0N 10E	-1.349	9.913	-4.063	
20S 60E	18.147	60.080	-12.323	Line 20 South

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
20S 50E	18.276	50.718	-12.214	
20S 40E	17.920	40.359	-11.332	
20S 30E	18.481	29.759	-10.679	
20S 20E	17.960	20.479	-9.790	
20S 10E	17.514	11.363	-9.500	
20S 10W	16.805	-9.471	-9.077	
20S 20W	17.280	-19.476	-9.233	
20S 30W	17.153	-29.953	-9.459	
20S 40W	17.276	-39.294	-9.179	
20S 50W	16.878	-49.946	-8.579	
20S 60W	17.141	-59.189	-8.271	
0N 60W	-0.119	-59.283	-7.089	Line 0 North
0N 50W	-0.263	-48.973	-7.374	
0N 40W	-0.015	-39.303	-7.216	
0N 30W	-0.234	-29.222	-6.916	
0N 20W	-0.103	-19.505	-6.858	
0N 10W	0.097	-12.905	-3.950	
40S 60W	37.686	-58.821	-10.187	Line 40 South
40S 50W	37.551	-48.108	-11.064	
40S 40W	37.685	-38.818	-11.201	
40S 30W	37.744	-28.914	-11.926	
40S 20W	37.349	-19.159	-12.637	
40S 10W	37.294	-9.357	-13.112	
40S 0E	37.118	0.670	-13.432	
40S 10E	36.856	11.665	-14.150	
40S 20E	36.969	20.398	-15.085	
40S 30E	36.771	30.871	-15.666	
40S 40E	36.925	40.399	-15.906	
40S 50E	36.798	50.693	-16.024	
40S 60E	37.164	60.440	-15.843	
60S 60E	56.357	60.503	-18.514	Line 60 South
60S 50E	56.220	50.376	-18.630	
60S 40E	56.520	40.338	-19.163	
60S 30E	56.566	29.957	-18.893	
60S 20E	56.822	20.397	-18.308	
60S 10E	56.150	9.899	-17.607	
60S 0E	56.747	0.624	-17.036	
60S 10W	56.515	-9.464	-16.480	
60S 20W	56.560	-19.227	-16.053	
60S 30W	56.165	-28.621	-14.940	
60S 40W	56.327	-38.923	-14.010	
80S 40W	76.436	-39.110	-17.630	Line 80 South
80S 30W	75.914	-29.610	-18.283	
80S 20W	76.343	-19.304	-19.283	
80S 10W	76.052	-9.790	-19.698	
80S 0E	76.231	0.548	-20.627	
80S 10E	76.525	10.839	-20.942	
80S 20E	76.483	20.402	-21.289	
80S 30E	75.825	30.871	-21.512	
80S 40E	76.371	40.225	-21.364	
80S 50E	76.029	50.534	-20.811	
80S 60E	76.421	60.263	-20.083	

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
100S 60E	95.981	60.360	-22.355	Line 100 South
100S 50E	95.792	50.775	-22.486	
100S 40E	95.864	40.604	-22.851	
100S 30E	95.232	30.663	-23.719	
100S 20E	95.872	20.759	-24.221	
100S 10E	94.069	10.597	-24.340	
100S 0E	95.842	0.644	-24.401	
100S 10W	95.234	-9.688	-23.466	
100S 20W	96.018	-19.145	-23.047	
100S 30W	95.373	-28.844	-22.562	
100S 40W	96.044	-39.168	-22.411	
120S 40W	115.637	-39.114	-26.532	Line 120 South
120S 30W	115.487	-28.982	-26.889	
120S 20W	115.298	-19.196	-27.580	
120S 10W	115.874	-8.973	-28.482	
120S 0E	115.395	0.930	-28.717	
120S 10E	114.674	10.987	-28.416	
120S 20E	115.475	20.589	-28.503	
120S 30E	115.191	30.831	-27.993	
120S 40E	115.588	40.449	-26.913	
140S 40E	134.935	40.671	-31.048	Line 140 South
140S 30E	134.640	30.419	-31.472	
140S 20E	134.884	20.796	-32.195	
140S 10E	133.323	9.800	-31.881	
140S 0E	134.847	0.917	-32.696	
140S 10W	133.897	-9.262	-32.966	
140S 20W	134.526	-19.119	-32.616	
140S 30W	134.161	-28.751	-32.016	
140S 40W	135.038	-38.793	-31.041	
160S 40W	153.847	-38.852	-36.614	Line 160 South
160S 30W	153.530	-29.653	-37.001	
160S 20W	154.021	-19.099	-37.736	
160S 10W	154.000	-9.699	-37.719	
160S 0E	154.175	0.805	-37.579	
160S 10E	154.071	10.962	-36.542	
160S 20E	154.175	20.514	-35.605	
160S 30E	153.712	30.467	-35.606	
160S 40E	154.262	40.504	-34.474	
150S 0E	154.156	0.803	-37.574	Line 0 East
130S 0E	125.338	2.028	-30.668	
110S 0E	105.883	0.677	-26.388	
90S 0E	84.987	0.817	-22.451	
70S 0E	66.581	0.964	-18.770	
50S 0E	46.534	0.969	-15.386	
30S 0E	27.986	0.795	-11.376	
10S 0E	11.514	0.286	-5.289	
30N 0E	-31.124	2.168	-1.762	
50N 0E	-49.084	2.574	-0.564	
10N 0E;VES09	-9.909	0.153	-4.275	
20S 0E	17.683	0.357	-9.083	
10S 0E	10.228	0.341	-4.603	

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
VES01	50.	-20.		VES locations taped to
VES02	14.	-40.		grid points. No elevations
VES03	-33.	-67.		measured.
VES04	-19.	40.		
VES05	30.	19.		
VES06	5.	-20.		
VES07	-46.	-33.		
VES08	-25.	-6.		
VES09;10N 0E	-9.909	0.153	-4.275	
VES10	50.	20.		
VES11	105.	15.		
UPT1	-81.713	34.520	5.284	Upper pile top
UPT2	-79.299	36.999	5.088	
UPT3	-77.098	36.272	5.102	
UPT4	-76.920	34.022	5.283	
UPT5	-74.478	33.414	5.021	
UPT6	-76.638	29.181	5.523	
UPT7	-79.570	26.838	5.818	
UPT8	-83.492	23.772	5.720	
UPT9	-82.825	26.854	5.908	
UPT10	-81.600	29.883	5.758	
UPT11	-79.233	31.711	5.484	
UPT12	-81.607	34.448	5.269	
UPB1	-82.080	41.295	2.908	Upper pile base
UPB2	-78.262	42.494	2.552	
UPB3	-73.413	41.828	1.863	
UPB4	-67.845	38.392	1.214	
UPB5	-66.782	32.359	1.173	
UPB6	-69.740	27.959	1.692	
UPB7	-72.869	23.236	2.077	
UPB8	-77.964	20.435	2.600	
UPB9	-83.562	18.276	3.145	
UPB10	-89.114	18.595	3.868	
UPB11	-91.144	24.524	4.110	
UPB12	-92.252	26.987	4.043	
UPB13	-89.583	31.299	3.663	
UPB14	-85.705	34.691	3.160	
UPB15	-84.890	38.410	3.004	
UPB16	-81.953	41.203	2.579	
RR1	-75.763	5.616	2.239	Rock rectangle
RR2	-73.283	1.121	2.179	
RR3	-66.786	4.619	1.780	
RR4	-68.919	9.157	1.636	
UAE1	-61.876	-15.831	0.985	Upper adit edge
UAE2	-61.399	-19.723	1.187	
UAE3	-56.468	-19.046	0.400	
UAE4	-55.168	-22.291	0.112	
UAE5	-47.485	-19.367	-0.192	
UAE6	-50.018	-12.968	0.340	
UAE7	-55.140	-12.975	0.522	
UA1	-52.357	-17.140	0.057	Upper adit
UA2	-54.391	-18.052	0.043	

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
UA3	-53.586	-20.202	0.050	
UA4	-51.432	-19.279	0.024	
UAB1	-55.133	-17.895	-0.119	Upper adit base
UAB2	-57.836	-17.919	0.085	
UAB3	-58.026	-16.362	0.009	
UAB4	-55.966	-15.375	-0.130	
UAB5	-52.105	-16.662	-0.227	
UAB6	-48.766	-15.740	-0.198	
UAB7	-47.988	-18.288	-0.282	
UAB8	-50.798	-19.198	-0.286	
UDZ1	-51.629	-36.096	-0.380	Upper dead zone
UDZ2	-55.989	-34.783	0.041	
UDZ3	-57.868	-33.022	0.180	
UDZ4	-64.479	-34.311	0.854	
UDZ5	-67.621	-32.015	1.117	
UDZ6	-68.674	-38.128	1.128	
UDZ7	-63.573	-40.500	0.590	
UDZ8	-62.037	-37.047	0.583	
UDZ9	-55.436	-38.489	-0.077	
URN1	-45.654	-68.763	-2.003	Upper road north
URN2	-43.209	-55.023	-1.691	
URN3	-41.943	-41.379	-1.415	
URN4	-42.226	-23.430	-0.900	
URN5	-44.370	-12.449	-0.789	
URN6	-51.083	6.577	-0.470	
URN7	-52.231	20.216	-0.627	
URN8	-49.615	36.165	-1.551	
URN9	-51.626	51.150	-1.823	
URN10	-59.464	79.440	-2.408	
URN11	-76.436	114.759	-3.349	
URS1	-73.239	115.734	-3.386	Upper road south
URS2	-60.297	87.319	-2.696	
URS3	-55.335	75.035	-2.434	
URS4	-47.799	46.110	-2.064	
URS6	-49.400	17.273	-0.759	
URS7	-47.830	5.633	-0.581	
URS8	-40.840	-15.230	-1.078	
URS9	-38.996	-34.302	-1.591	
URS10	-41.220	-61.419	-2.202	
URS11	-46.164	-83.959	-2.33	
URSN1	-32.070	58.583	-4.971	Upper road spur north
URSN2	-24.415	67.644	-7.100	
URSN3	-16.523	93.684	-9.245	
URSN4	-10.192	103.830	-10.268	
URSN5	10.144	122.167	-12.396	
URSS1	13.680	121.544	-12.767	Upper road spur south
URSS2	-4.898	105.368	-10.626	
URSS3	-13.168	93.779	-9.502	
URSS4	-21.776	67.696	-7.344	
URSS5	-29.756	56.906	-5.308	
URSS6	-42.833	45.068	-2.785	

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
URS5	-46.411	36.355	-1.689	
PLT1	-36.131	-29.665	-1.670	Parking lot top
PLT2	-34.214	-36.311	-1.869	
PLT3	-31.411	-38.100	-2.036	
PLT4	-28.201	-36.886	-1.906	
PLT5	-23.671	-35.389	-2.431	
PLT6	-20.083	-31.423	-2.655	
PLT7	-17.207	-27.882	-2.746	
PLT8	-14.022	-24.296	-2.665	
PLT9	-9.649	-24.578	-3.763	
PLT10	-7.743	-21.801	-3.952	
PLT11	-9.525	-19.041	-3.412	
PLT12	-12.421	-16.010	-3.575	
PLT13	-15.714	-13.785	-2.403	
PLT14	-10.863	-12.724	-3.508	
PLT15	-4.965	-13.954	-4.122	
PLT16	-1.354	-14.234	-4.297	
PLT17	0.470	-12.751	-3.889	
PLT18	-2.290	-11.812	-4.121	
PLD1	-19.127	-16.020	-2.447	Parking lot depression
PLD2	-19.594	-19.739	-2.459	
PLD3	-17.244	-22.714	-2.789	
PLD4	-14.781	-20.587	-3.545	
PLD5	-16.472	-18.692	-3.414	
PLD6	-15.228	-16.913	-3.358	
PLB1	-36.006	-33.232	-2.338	Parking lot base
PLB2	-34.755	-37.631	-2.316	
PLB3	-30.781	-40.417	-2.760	
PLB4	-23.942	-37.927	-3.614	
PLB5	-18.106	-33.739	-4.331	
PLB6	-14.117	-32.909	-4.793	
PLB7	-11.815	-27.698	-5.167	
PLB8	-6.886	-26.746	-5.903	
PLB9	-4.165	-23.338	-6.291	
PLB10	-4.598	-19.334	-6.159	
PLB11	-7.528	-16.440	-5.567	
PLB12	-11.846	-14.695	-4.677	
PLB13	-7.789	-15.587	-5.377	
PLB14	-1.355	-18.000	-6.665	
MPT1;BIO1	1.747	-7.255	-1.187	Main pile top, bio marker
MPT2	-0.911	-7.899	-1.348	
MPT3	-4.124	-6.546	-0.533	
MPT4	-5.619	-3.641	-0.269	
MPT5	-5.784	0.462	0.019	
MPT6	-5.749	2.601	-0.103	
MPT7	-2.592	2.879	0.070	
MPT8	-1.177	2.879	-0.386	
MPT9	-0.214	4.253	-0.315	
MPT10	1.651	3.131	-0.466	
MPT11	4.543	-0.088	-0.560	
MPT12	2.359	-4.332	-1.390	
AD1	-31.557	-12.764	-1.423	Adit

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
AD2	-29.985	-11.824	-1.485	
AD3	-31.285	-8.291	-1.663	
AD4	-32.795	-8.942	-1.432	
ADW1	-31.397	-9.826	-1.450	Adit well
ADW2	-31.304	-10.173	-1.587	
ADW3	-30.987	-10.962	-1.501	
JPT1	-18.085	-5.980	-2.848	Junk pile top
JPT2	-18.414	-0.303	-3.107	
JPT3	-19.741	3.674	-3.029	
JPT4	-22.603	3.395	-2.631	
JPT5	-23.998	1.423	-2.357	
JPT6	-22.647	-1.051	-2.518	
JPT7	-24.746	-2.504	-2.530	
JPT8	-23.433	0.057	-2.919	
JPT9	-25.536	0.848	-2.657	
JPT10	-23.595	4.782	-3.195	
JPT11	-26.888	4.226	-2.652	
JPT12	-31.082	3.997	-1.378	
JPT13	-32.677	5.872	-1.680	
JPT14	-33.109	2.707	-1.505	
JPB1	-37.114	4.511	-2.076	Junk pile botttom
JPB2	-35.948	7.079	-2.339	
JPB3	-32.209	8.476	-3.080	
JPB4	-30.075	6.817	-3.359	
JPB5	-25.696	6.387	-3.720	
JPB5	-18.641	6.665	-4.295	
JPB6	-17.573	0.344	-3.811	
WELL1	-29.111	10.174	-3.251	well
WELL3	16.129	50.019	-12.063	
WELL4	63.668	93.788	-17.097	
WELL5	78.791	55.234	-20.526	
WELL6	106.496	57.378	-22.914	
WELL7	196.758	-12.339	-49.665	
ORN1	-36.255	26.530	-3.384	Old road north
ORN2	-29.718	35.868	-4.501	
ORN3	-26.298	51.821	-5.455	
ORS1	-22.073	56.966	-6.122	Old road south
ORS2	-23.753	45.549	-5.494	
ORS3	-27.457	34.099	-4.652	
ORS4	-35.115	22.531	-3.446	
MDZ1	-21.589	34.799	-5.743	Main dead zone
MDZ2	-11.634	37.578	-6.769	
MDZ3	-7.540	29.330	-6.943	
MDZ4	2.906	37.879	-8.511	
MDZ5	7.919	36.121	-8.896	
MDZ6	14.273	39.453	-10.357	
MDZ7	17.268	39.329	-11.065	
MDZ8	19.799	37.078	-11.498	
MDZ9	23.818	37.588	-12.701	
MDZ10	25.900	32.962	-12.889	

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
MDZ11	33.633	32.499	-14.786	
MDZ12	44.230	39.366	-17.140	
MDZ13	50.296	38.784	-18.115	
MDZ14	54.334	39.949	-18.893	
MDZ15	73.384	36.898	-21.181	
MDZ16	84.190	42.947	-22.143	
MDZ17	98.933	36.436	-23.576	
MDZ18	99.936	32.416	-24.614	
MDZ19	110.609	30.183	-27.229	
MDZ20	125.228	25.575	-30.201	
MDZ21	136.863	19.477	-32.936	
MDZ22	151.250	21.026	-34.851	
MDZ23	159.247	18.771	-37.153	
MDZ24	166.933	10.752	-39.943	
MDZ25	171.765	17.299	-41.405	
MDZ26	248.887	11.683	-66.076	
MDZ27	240.173	15.719	-62.649	
MDZ28	228.999	14.796	-58.734	
MDZ29	219.907	8.738	-55.827	
MDZ30	215.905	18.006	-54.966	
MDZ31	205.489	15.743	-51.908	
MDZ32	194.608	15.494	-49.130	
MDZ33	186.665	13.290	-46.790	
MDZ34	175.966	14.688	-43.467	
MDZ35	171.694	17.358	-41.745	
MDZ36	169.427	13.091	-41.212	
MDZ37	170.499	9.009	-41.915	
ISL1	161.354	6.698	-39.014	Island in dead zone
ISL2	151.668	11.734	-35.747	
ISL3	145.353	11.556	-34.415	
ISL4	145.087	16.693	-34.131	
ISL5	129.282	17.150	-31.509	
ISL6	116.085	21.996	-28.601	
ISL7	92.838	20.303	-23.643	
ISL8	93.530	13.780	-24.113	
ISL9	83.450	11.530	-22.066	
ISL10	80.844	6.396	-21.594	
ISL11	94.053	4.277	-24.290	
ISL12	106.151	7.297	-26.479	
ISL13	132.947	9.337	-31.824	
ISL14	145.339	3.596	-34.456	
ISL15	162.419	-0.620	-39.996	
MDZW1	166.804	-11.493	-41.553	Main dead zone west
MDZW2	156.610	-7.501	-38.403	
MDZW3	144.409	-11.302	-35.498	
MDZW4	132.984	-5.928	-32.771	
MDZW5	111.901	-0.397	-27.809	
MDZW6	100.525	-5.881	-24.688	
MDZW7	111.169	-7.557	-27.219	
MDZW8	111.051	-11.178	-27.078	
MDZW9	103.667	-9.625	-25.225	
MDZW10	87.145	-15.158	-21.755	
MDZW11	66.961	-20.001	-17.087	
MDZW12	52.437	-21.046	-14.868	
MDZW13	38.617	-23.399	-12.568	

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
MDZW14	21.592	-37.180	-9.618	
MDZW15	3.318	-42.398	-7.672	
MDZW16	-14.323	-40.169	-4.983	
MDZW17	-30.116	-41.384	-2.935	
MDZW18	176.418	-15.899	-43.703	
MDZW19	183.130	-12.370	-45.916	
MDZW20	191.724	-21.808	-48.455	
MDZW21	197.976	-19.678	-50.128	
MDZW22	201.396	-23.019	-51.147	
MDZW23	217.396	-18.766	-55.969	
MDZW24	218.447	-12.008	-56.628	
MDZW25	228.416	-9.952	-60.186	
MDZW26	232.389	-3.762	-60.618	
MDZW27	246.192	-6.426	-64.862	
MDZW28	258.973	-3.432	-69.007	
MDZW29	295.946	11.330	-85.937	
MDZW30	282.188	9.159	-79.642	
MDZW31	265.499	8.389	-72.558	
MDZW29	295.946	11.330	-85.937	
MDZW30	282.188	9.159	-79.642	
MDZW31	265.499	8.389	-72.558	
BIO1	1.747	-7.255	-1.187	Biological site markers
BIO2	60.366	-15.329	-16.549	GPS point
BIO3	53.664	-3.246	-16.078	
BIO4	39.977	-5.632	-13.715	
BIO5	80.789	-0.065	-21.572	
BIO6	84.677	-37.104	-20.094	
BIO7	96.749	9.236	-24.905	
BIO8	102.479	2.874	-25.811	
BIO9	127.670	2.663	-31.136	
BIO10	157.589	-4.602	-38.847	
BIO11	98.172	52.275	-22.685	
BIO12	-1.868	11.944	-5.669	
BIO13	230.035	4.630	-58.885	
BIO14	287.351	17.447	-82.191	
BIO15	290.854	20.514	-83.990	
BIO16	293.284	20.508	-85.065	
BIO17	293.761	19.273	-85.160	
BIO18	294.091	15.521	-85.170	
BIO19	289.884	13.896	-83.218	
EP1	-49.345	106.626	-5.219	East pile
EP2	-55.296	105.035	-4.480	
EP3	-58.089	110.185	-4.746	
EP4	-53.080	113.694	-4.860	
EP5	-48.739	111.267	-4.955	
EP6	-53.092	109.167	-7.248	
EP7	-52.858	117.090	-6.129	
EP8	-46.500	119.154	-7.292	
EP9	-37.411	114.274	-7.737	
EP10	-38.887	107.804	-7.286	
EP11	-45.086	106.890	-6.285	
PIT1	-9.947	79.435	-9.247	Pit
PIT2	-6.133	77.832	-9.255	
PIT3	-6.554	74.829	-9.313	

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
PIT4	-8.948	76.383	-9.954	
PIT5	-8.374	77.658	-10.114	
PIT6	-7.514	76.855	-10.129	
PITB1	4.770	73.619	-11.253	
PITC1	51.269	55.333	-19.658	Center of pit C
W5T1	79.831	56.067	-20.957	Well 5 tailings
W5T2	82.908	59.281	-21.219	
W5T3	80.446	62.662	-20.944	
W5T4	76.407	62.164	-20.552	
W5T5	73.744	58.879	-20.363	
W5T6	76.284	56.143	-20.496	
W5T7	77.986	57.995	-19.917	
W5T8	77.851	59.574	-19.974	
PITD1	88.824	63.794	-21.842	Pit D
PITD2	101.590	62.975	-22.671	
PITD3	107.179	70.423	-22.852	
PITD4	103.233	74.421	-22.596	
PITD5	91.443	71.925	-21.749	
PITD6	102.724	70.011	-25.601	
PITD7	98.821	66.408	-25.775	
PITD8	98.003	69.081	-25.452	
PITD9	95.195	67.989	-25.345	
PITD10	93.208	65.235	-24.765	
PITE1	34.682	-39.016	-10.815	Pit E
PITE2	36.569	-36.720	-10.647	
PITE3	35.108	-33.849	-10.744	
PITE4	31.363	-34.419	-10.653	
PITE5	33.724	-32.232	-11.160	
PITE6	38.008	-34.220	-11.530	
PITE7	36.018	-39.652	-11.026	
PITE8	33.825	-36.642	-12.096	
PITE9	34.138	-35.670	-12.047	
PITE10	30.822	-37.815	-10.453	
PITF1	1.382	-35.532	-7.319	Pit F
PITF2	0.903	-33.686	-7.974	
PITF3	0.713	-31.429	-7.099	
PITF4	-1.574	-33.509	-6.773	
PITF5	2.680	-33.617	-7.357	
MPB1	-8.496	-8.245	-3.988	Main pile base
MPB2	-10.606	-2.162	-4.519	
MPB3	-11.122	5.862	-5.319	
MPB4	-12.150	14.281	-5.932	
MPB5	-4.040	14.947	-6.700	
MPB6	3.220	15.207	-7.564	
MPB7	9.073	12.703	-8.215	
MPB8	11.789	9.757	-8.664	
MPB9	16.974	5.301	-9.222	
MPB10	18.875	1.347	-9.541	
MPB111	17.569	-5.433	-9.416	
MPB12	14.368	-11.686	-9.128	

Sunday #2 Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
MPB13	9.282	-16.275	-8.494	
MPB14	2.681	-17.414	-7.446	
LRDN1	196.017	-56.407	-48.466	Lower road north
LRDN2	193.887	-53.246	-48.076	
LRDN3	184.675	-44.367	-46.595	
LRDN4	179.881	-37.022	-45.526	
LRDN5	175.058	-23.120	-44.327	
LRDN6	164.946	-0.812	-41.336	
LRDN7	162.138	16.327	-39.185	
LRDN8	158.670	37.350	-37.163	
LRDN9	157.927	46.736	-35.690	
LRDN10	157.747	62.318	-34.265	
LRDN11	156.698	77.871	-32.244	
LRDS1	159.525	78.462	-32.251	Lower road south side
LRDS2	160.381	63.510	-34.223	
LRDS3	160.996	49.847	-35.881	
LRDS4	161.387	37.726	-37.352	
LRDS5	164.423	19.531	-39.006	
LRDS6	167.278	1.777	-41.248	
LRDS7	176.105	-18.789	-43.787	
LRDS8	182.207	-35.464	-45.748	
LRDS9	186.936	-43.047	-46.826	
LRDS10	195.265	-50.846	-47.993	
LRDS11	200.425	-58.839	-49.084	

VENIR PILE SITE

ID	X [m]	Y [m]	Z [m]	Comment
EDM1	-14.782	47.449	1.834	EDM1 site, ML200
EDM2:LB20	15.424	-33.350	-1.402	EDM2 site
EDM3:MLB0	-15.146	-10.419	-0.860	EDM3 site, GPS point
BMARK	2.442	13.556	0.243	Bench mark
LB1:0	-4.096	-31.434	-1.062	Geophysical lines
LB1:30	1.039	-1.946	-0.154	
LB2:0	15.424	-33.350	-1.402	
LB2:30	3.139	-6.093	-0.036	GPS point
LB3:0	36.872	-28.255	-1.672	
LB3:30	25.124	-12.255	-0.733	
LB4:0	44.887	-13.204	-1.437	
LB4:20	25.489	-12.232	-0.721	
MLB0:EDM3	-15.146	-10.419	-0.860	EDM3 site, GPS point
MLB20	-0.846	3.197	-0.440	Point on mini-lobe 2
VES03	-1.748	12.635	0.039	Schlumberger sounding sites
VES05	-2.487	-26.797	-0.834	
VES06	11.693	-24.302	-0.789	
VES07	4.221	-6.125	-0.074	
VES08	-10.072	-6.049	-0.189	
VES09	28.953	-17.927	-0.784	
VES10	-25.473	4.649	-2.620	
VES11	13.067	-60.829	-16.512	
CHEM1	45.916	-14.793	-1.357	Geochemical cell points
CHEM2	34.679	-6.800	-0.584	
CHEM3	32.360	-3.956	-3.327	
CHEM4	24.232	-8.818	-2.904	
CHEM5	18.221	-4.235	-2.029	
CHEM6	24.696	-13.048	-0.728	
CHEM7	36.679	-28.325	-1.656	
CHEM8	16.356	-22.123	-0.802	
CHEM9	17.121	-37.686	-2.793	
CHEM10	8.509	-17.464	-0.473	
CHEM11	6.770	-11.121	0.131	
CHEM12	8.349	-1.361	-1.057	
CHEM13	3.407	7.016	0.023	
CHEM14	-0.641	-8.478	-0.180	
CHEM15	4.764	-22.646	-0.538	
CHEM16	-1.086	-16.974	-0.427	
CHEM17	-5.355	-35.560	-1.254	
CHEM18	-10.515	-6.636	-0.180	
INRD	-60.146	75.842	4.264	Inner curve of road
INRD	-45.850	69.849	3.855	
INRD	-29.681	60.419	3.017	
INRD	-31.853	54.180	2.673	
INRD	-46.170	46.151	2.074	
INRD	-63.155	43.883	1.600	
WESTRD	-63.619	37.613	1.507	West edge of road
WESTRD	-50.094	38.879	1.646	
RD SIGN	-47.750	36.297	1.338	Venir Pile sign on road
WESTRD	-36.121	39.802	1.847	

Venir Pile Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
RDWELL	-25.276	50.357	2.362	Well near road
EASTRD	-17.517	60.438	2.431	East edge of road
EASTRD	-29.598	66.719	3.174	
EASTRD	-41.691	72.732	3.802	
EASTRD	-52.413	78.115	4.217	
BASE	-23.915	-17.294	-6.360	Base of pile
BASE	-23.405	-7.252	-4.697	
BASE	-18.346	-3.620	-3.919	
BASE	-15.031	-1.745	-3.457	
BASE	1.181	-55.352	-14.825	
BASE	-12.328	-52.745	-13.540	
BASE	34.230	-57.557	-18.905	
BASE	51.190	-53.382	-19.483	
BASE	54.529	-44.399	-16.907	
NBLDG	-13.293	16.551	-0.545	North building
NBLDG	-11.551	20.532	-0.080	
NBLDG	-6.334	18.225	0.274	
NBLDG	-6.795	14.731	0.275	
SBLDG	-2.972	26.381	0.080	South building
SBLDG	-2.752	31.098	0.124	
SBLDG	4.425	32.769	-0.127	
SBLDG	8.946	32.722	-0.433	
SBLDG	15.424	-33.350	-2.032	
SBLDG	9.554	26.365	-0.699	
SBLDG	5.310	25.905	-0.122	
TOP1	-3.957	0.821	0.067	Edge of top of pile
TOP2	-17.393	-11.840	-1.301	
TOP3	-15.944	-12.881	-1.630	
TOP4	-3.028	0.176	-0.010	
TOP5	-0.377	-1.987	-0.078	
TOP6	-4.668	-18.069	-0.674	
TOP7	-3.542	-18.895	-0.790	
TOP8	-1.837	-19.429	-0.506	
TOP9	-6.120	-35.449	-1.383	
TOP10	-4.560	-35.446	-1.296	
TOP11	0.588	-15.549	-0.470	
TOP12	4.235	-24.334	-0.824	
TOP13	5.742	-23.372	-0.665	
TOP14	1.143	-9.277	-0.284	
TOP15	7.439	-18.143	-0.534	
TOP16	16.173	-38.170	-2.753	
TOP17	17.838	-37.475	-2.731	
TOP18	9.242	-16.324	-0.529	
RDMTOP	12.721	-8.158	-0.169	Random topographic points
RDMTOP	16.305	-14.063	-0.506	
RDMTOP	14.191	-3.750	-0.420	
RDMTOP	10.261	-9.196	-0.799	
RDMTOP	12.098	-12.917	-1.228	
RDMTOP	17.288	-16.873	-1.368	
RDMTOP	19.500	-16.700	-2.172	

Venir Pile Surveying Data

ID	X [m]	Y [m]	Z [m]	Comment
RDMTOP	21.372	-19.898	-1.801	
RDMTOP	23.880	-22.594	-2.766	
RDMTOP	19.297	-24.735	-1.615	
EASTOP1	21.959	-13.353	-0.626	Top of pile, south side
EASTOP2	32.209	-7.710	-1.099	
EASTOP3	33.753	-6.802	-0.607	
EASTOP4	35.654	-6.317	-0.606	
EASTOP5	46.193	-14.412	-1.388	
EASTOP6	45.568	-15.165	-1.387	
EASTOP7	39.312	-13.846	-1.897	
EASTOP8	32.236	-20.616	-1.075	
EASTOP9	37.286	-28.292	-1.749	
EASTOP10	36.075	-28.572	-1.682	
EASTOP11	30.740	-21.400	-0.972	
BIG X	37.007	-14.897	-1.419	Aerial photo marker & well
DRAINAGE	25.077	-26.501	-4.306	Drainages between lobes
DRAINAGE	20.613	-29.672	-4.241	
DRAINAGE	27.118	-33.140	-7.526	
DRAINAGE	31.237	-42.342	-11.160	
DRAINAGE	-5.342	-7.284	-1.433	
DRAINAGE	-8.397	-14.226	-2.826	
DRAINAGE	1.322	-20.556	-1.251	
DRAINAGE	1.969	-28.054	-2.765	
DRAINAGE	4.557	-16.631	-1.015	
DRAINAGE	8.517	-25.158	-1.662	
DRAINAGE	5.754	-37.155	-7.268	
DRAINAGE	4.335	-46.389	-10.473	
DRAINAGE	9.294	-55.727	-15.655	
LRW1	60.264	-61.515	-21.043	Lower road west
LRW2	49.350	-61.017	-20.378	
LRW3	32.455	-62.124	-18.598	
LRW4	16.713	-61.054	-16.894	
LRW5	3.902	-59.431	-15.299	
LRW6	-8.949	-58.338	-14.178	
LRW7	-18.107	-53.840	-13.443	