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Sotkamo Silver, Silver Mine Infill Drilling Program 2013

Nine sludge drill holes were run from the mine decline of the Sotkamo Silver Mine to complement diamond drilling programs. The optimal length to reach all targets varied from 55 to 60 m, but it was not achieved by all holes due to technical issues. However, new infill information gathered was enough to confirm existing mining plans for first year of underground mining.

Sampling was carried in 1.5 m long portions. Samples were analysed by Kemian Tutkimuspalvelut Oy (Anttila & Mäkelä, 2013). Silver, lead, zinc, sulphur and antimony were assayed using ICP-OES analysis. Gold was assayed by acid digestion followed by liquid-liquid extraction and AAS. Results are in Tables 1-9.

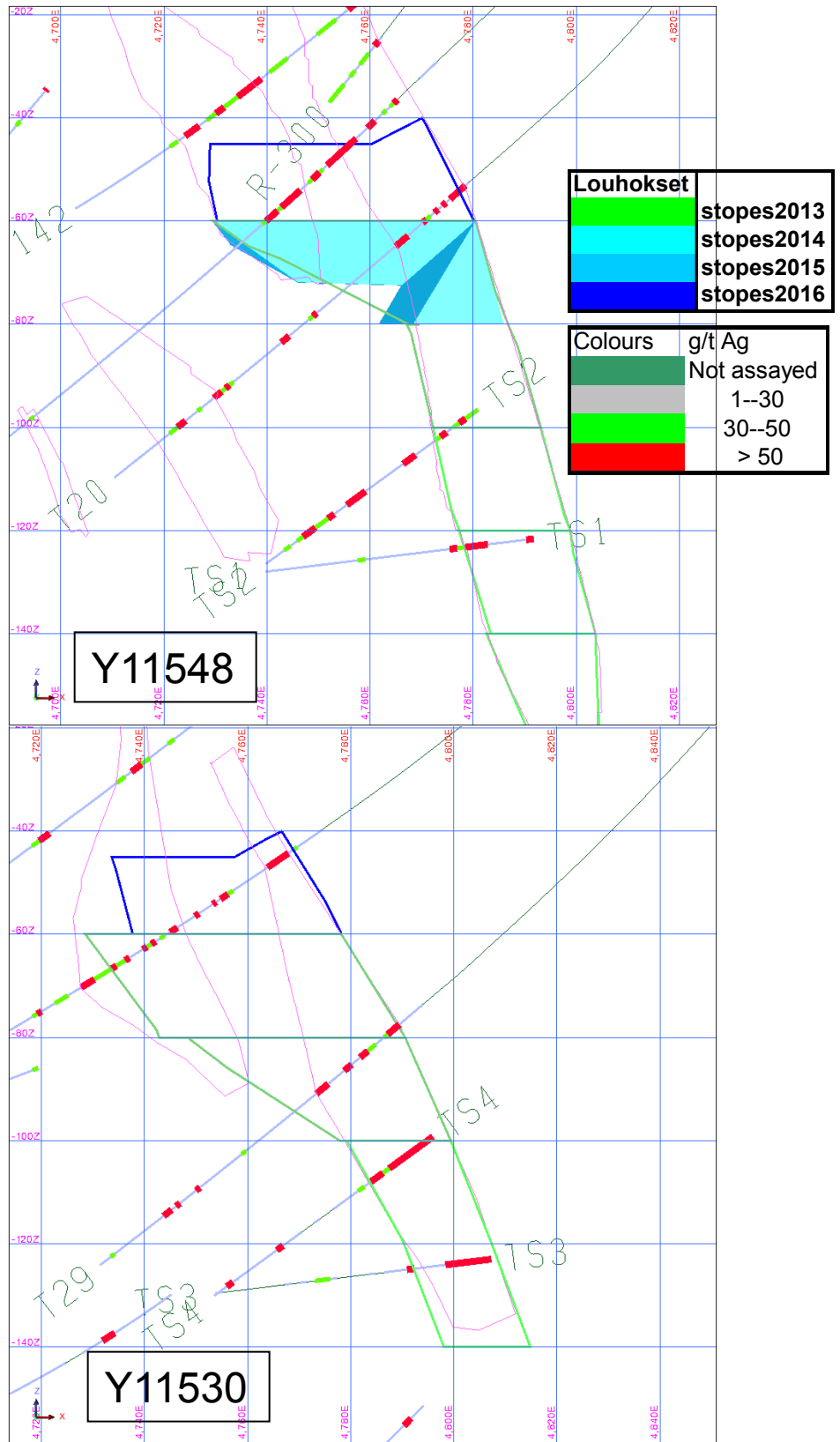
Four previously by Labtium analysed samples were used as reference samples during the analytical process. The reference samples were treated and analysed among the regular test samples. Each reference sample was analysed 2-4 times during the project. Comparison of the results with those of Labtium shows good correspondence. Sulphur and antimony were not analysed by Labtium, thus there is no comparison for them.

Information about the within-batch precision was obtained by running duplicate analyses in each sample batch. In each batch 1-3 samples were analyzed in duplicate. Control charts show differences from 5 to 9 % on an average which is acceptable. Only silver charts show a few several peaks possibly resulting from the nugget phenomenon causing some unpredictability in results.

As shown in Figures 1-5 the results were fairly good and support the existing mining plans with minor adjustments. Directly from 1,5 meters rod lengths calculated best intersections were in holes TS 3 with 7.5 meters Ag 153 g/t; TS4 with 15 meters Ag 269 g/t, TS5 with 10.5 meters Ag 304 g/t and TS6 with 7.5 meters Ag 267 g/t.

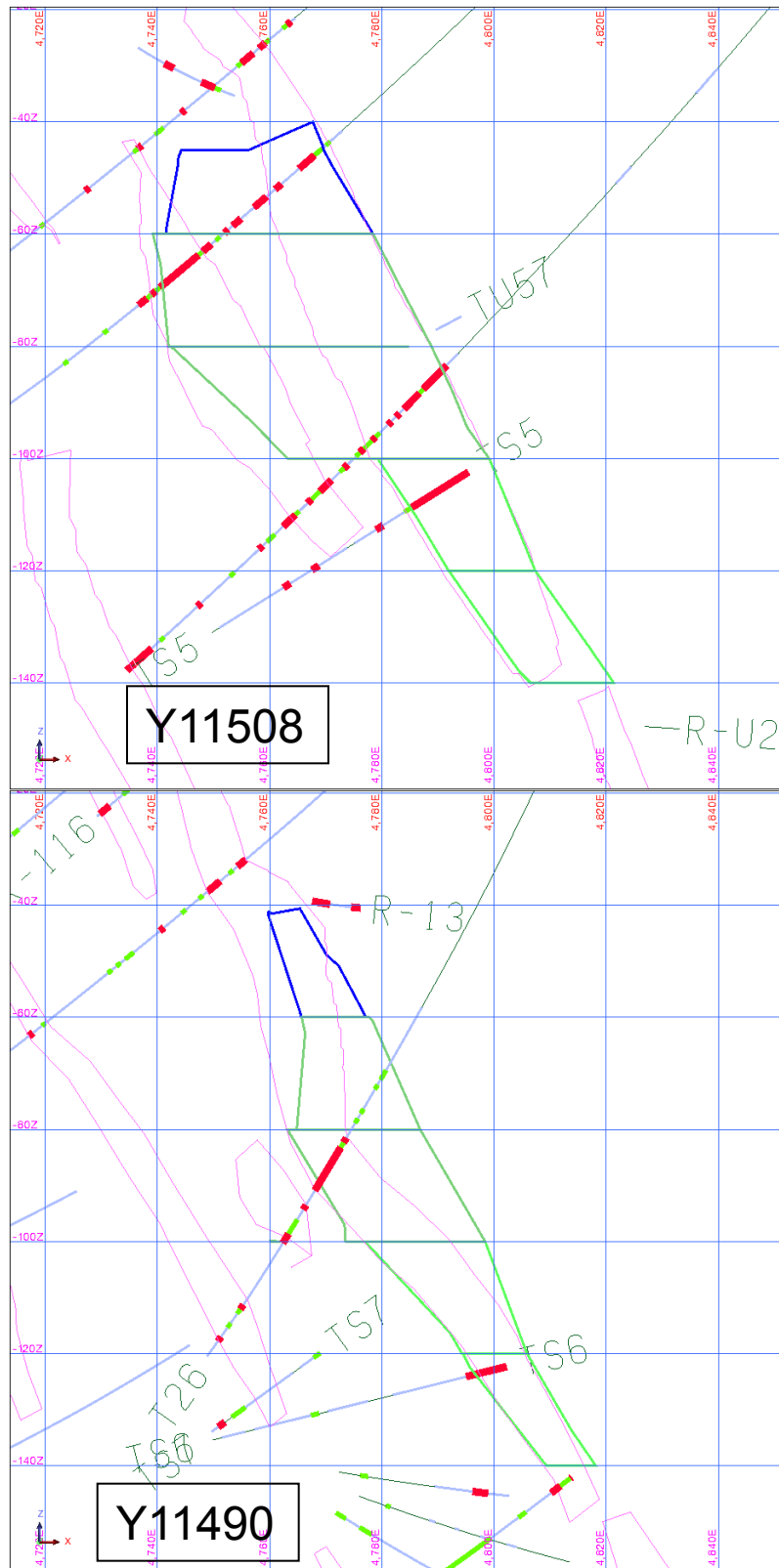
Reference

Anttila R. and Mäkelä A. 2013. Determination of Ag, Au, Pb, Zn, S and Sb in Geological samples of Sotkamo Silver Oy. Kemian tutkimuspalvelut Oy.



Figures 1 / 2

In Y=11548 drill holes TS1-2 did not reach the “back line” of an ore solid but they indicate the presence of it. They also indicate the presence of an extra solid or the re-modelling need of an existing one. In Y=11530 drill holes TS3-4 succeeded to confirm the solid perfectly.



Figures 3 / 4

In Y=11508 drill hole TS5 is a success though a bit short.

In Y=11490 drill hole TS6 succeeds to find the modelled solid but it is too short to confirm the back line. TS7 is a failure.

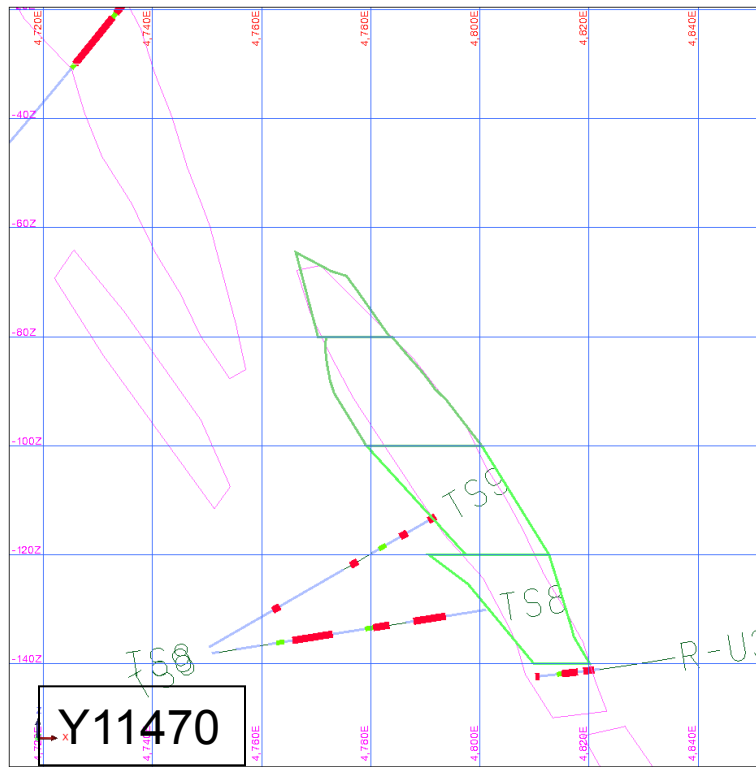


Figure 5

In Y=11470 drill holes TS8-9 did not reach the “back line” of an ore solid but TS9 may indicate the presence of it. They also indicate the presence of an extra solid or the re-modelling need of existing ones.

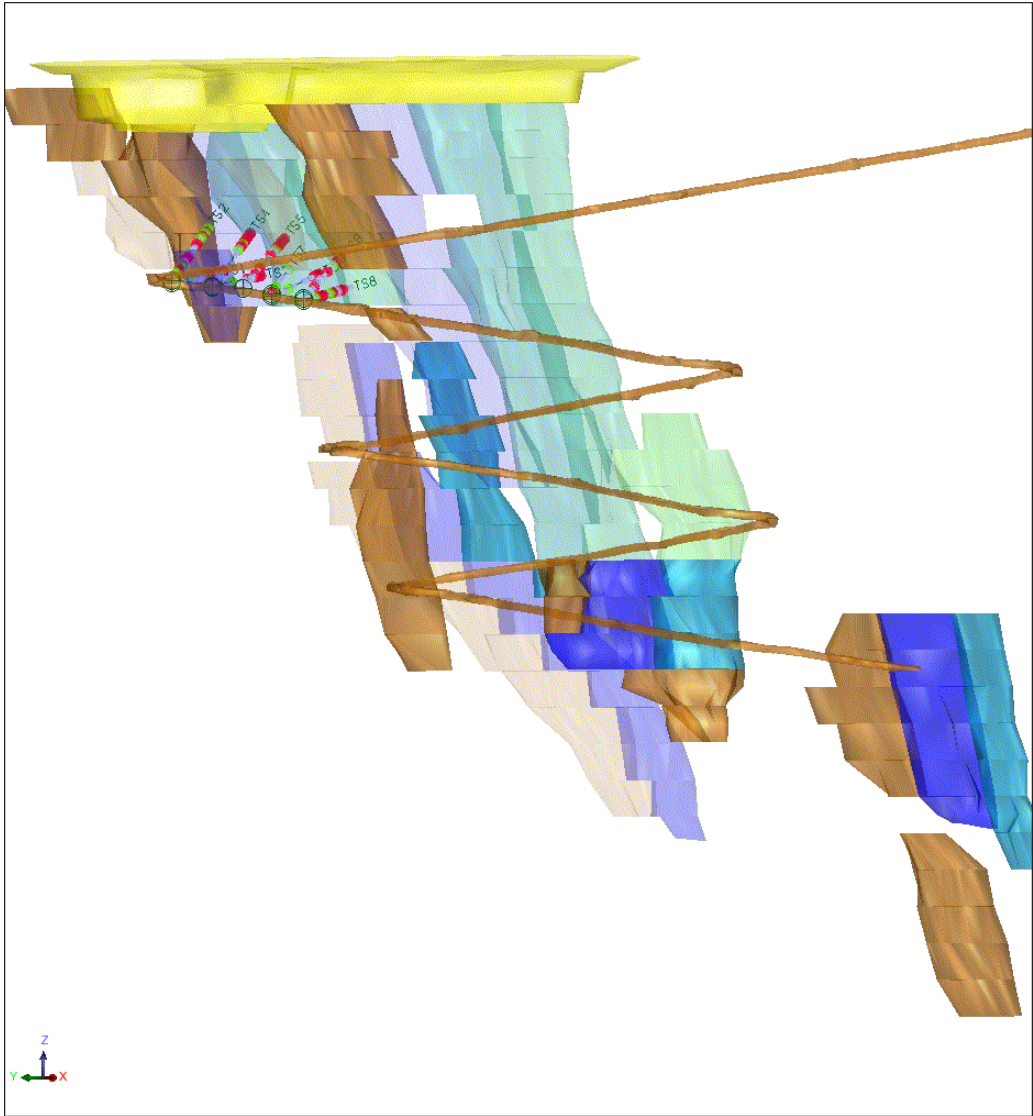


Figure 6
Oblique view to the Sotkamo Mine Plan and infill drill holes.

Table 1
Assays of drill holes TS1 , TS2 / TS3 , TS4

TS 1						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1	2	159	175	4985	5	<0,1
2	10	475	350	6141	13	<0,1
3	6	505	298	13196	7	<0,1
4	4	224	369	8439	6	<0,1
5	6	443	309	13999	7	<0,1
6	3	233	233	12349	6	<0,1
7	18	572	1317	6930	14	<0,1
8	27	1309	1797	9461	22	<0,1
9	17	1138	934	14897	18	<0,1
10	10	715	285	14250	12	<0,1
11	5	346	411	8462	8	<0,1
12	10	117	379	10545	9	<0,1
13	44	907	5215	5090	16	<0,1
14	8	389	989	5551	22	<0,1
15	12	661	3280	6212	24	<0,1
16	18	1457	9614	9553	20	<0,1
17	22	1940	13329	12099	22	<0,1
18	13	1292	9505	7086	15	<0,1
19	3	707	2042	8630	8	<0,1
20	11	668	3807	10084	14	<0,1
21	27	976	3872	14147	20	0.1
22	29	960	3550	10230	22	0.2
23	16	1112	3073	14648	18	<0,1
24	21	1480	3025	31740	20	0.3
25	60	8149	16154	16930	47	0.2
26	42	3221	21588	8054	33	0.1
27	72	4265	26730	8211	53	0.2
28	85	5724	25419	19299	69	0.3
29	71	7787	36714	17648	62	0.2
30	22	3187	8382	18008	22	0.3
31	4	829	929	20584	8	<0,1
32	9	513	844	14806	10	<0,1
33	14	681	2206	8611	13	<0,1
34	11	677	3613	18165	13	<0,1
35	73	1830	6930	30930	48	0.1

TS 2						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1	8	697	3649	3252	8	<0,1
2	10	910	1815	30815	11	<0,1
3	19	1501	3506	33340	21	<0,1
4	35	1116	1146	16028	19	0.2
5	9	423	661	17829	7	<0,1
6	38	1789	3153	14830	29	<0,1
7	60	1525	5960	15620	25	0.6
8	72	1326	5493	20106	29	0.6
9	30	1893	4739	8796	25	<0,1
10	36	1456	10387	20923	21	0.2
11	56	3384	16852	7497	38	<0,1
12	28	1703	6892	7314	23	<0,1
13	18	1373	5763	8386	20	<0,1
14	945	39270	21910	10240	870	1.1
15	106	5658	10329	6690	88	0.1
16	441	9995	86740	5115	413	2.5
17	26	2475	4805	5140	29	<0,1
18	19	1419	4126	24120	19	<0,1
19	9	355	5323	2589	8	<0,1
20	5	464	3385	28316	9	<0,1
21	20	1435	9253	22209	20	<0,1
22	16	1560	5701	29758	20	<0,1
23	225	8600	14970	29050	125	0.5
24	290	10910	17190	34850	274	0.6
25	2	634	1393	57037	12	<0,1
26	6	640	3740	22320	12	<0,1
27	2	360	1140	24070	6	<0,1
28	41	1964	6683	21998	33	0.4
29	103	6370	7490	33513	85	0.5
30	1	215	895	3880	8	<0,1
31	40	2294	7857	20874	3	0.2
32	75	4318	13232	9410	52	0.2
33	46	2810	22440	22110	34	0.2
34	44	2292	2435	20142	75	0.1

TS 3						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1	3	1871	4297	8633	8	<0,1
2	1	103	565	11696	8	<0,1
3						
4						
5						
6						
7						
8						
9						
10	11	394	419	9159	7	<0,1
11	1	102	475	16078	5	<0,1
12	12	486	7141	< 10	9	<0,1
13						
14	30	1180	4348	16225	23	<0,1
15	40	905	2315	19390	21	0.2
16	8	328	282	28356	8	<0,1
17	< 1	32	107	19487	2	<0,1
18	< 1	32	89	18404	1	<0,1
19	< 1	26	114	10141	2	<0,1
20	1	25	182	12800	3	<0,1
21	3	157	2210	13420	6	<0,1
22	< 1	136	2448	17567	3	<0,1
23	15	330	6560	21080	8	<0,1
24	3	115	1223	18820	5	<0,1
25	7	577	3984	20382	8	<0,1
26	87	1937	5245	13100	36	0.2
27	14	905	2350	9110	12	<0,1
28	6	352	1175	10060	9	<0,1
29	7	495	1558	17758	8	<0,1
30	24	958	1549	20315	16	<0,1
31	77	644	1395	18750	19	0.4
32	122	2218	2321	33065	46	0.3
33	101	1188	2260	24270	28	0.1
34	270	3190	5825	18235	57	0.6
35	182	4439	8010	43413	73	1.1
36	89	2416	5109	41954	45	0.3

TS 4						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1	14	440	800	16770	9	<0,1
2	24	580	1990	20290	15	<0,1
3	216	166	1955	29110	65	1.0
4	1	76	204	11405	4	<0,1
5	19	425	384	5327	11	0.1
6	4	82	142	4890	4	<0,1
7	22	71	272	3413	6	<0,1
8	4	139	98	2905	4	<0,1
9	2	86	158	3390	3	<0,1
10	5	241	360	18440	6	<0,1
11	70	1538	31838	14790	54	0.1
12	4	160	106	15609	7	<0,1
13	1	139	449	11128	4	<0,1
14	6	312	957	9048	7	<0,1
15	< 1	69	128	11997	4	<0,1
16	< 1	248	126	15172	6	<0,1
17	3	59	149	11155	5	<0,1
18	< 1	22	117	5912	3	<0,1
19	< 1	26	52	59319	2	<0,1
20	16	586	474	13036	14	<0,1
21	11	448	403	6412	10	<0,1
22	14	875	351	6800	13	<0,1
23	17	439	539	8710	9	<0,1
24	40	569	321	27510	16	<0,1
25	25	480	584	34443	12	<0,1
26	734	557	1773	14420	325	1.2
27	357	1504	3585	23812	151	0.3
28	41	1041	1229	26993	20	<0,1
29	66	1842	1896	26826	31	<0,1
30	163	1036	916	24950	31	0.2
31	54	350	803	15795	13	<0,1
32	788	7148	5035	22684	249	0.3
33	105	1369	1027	33845	41	<0,1
34	178	2630	5600	19760	72	0.3
35	201	5370	10820	36760	115	0.2

Table 2
Assays of drill holes TS5 , TS6 / TS7 , TS8

TS 5						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1						
2	2	94	80	12 370	3	<0,1
3	3	115	128	2 060	3	<0,1
4	6	290	152	1 640	7	<0,1
5	21	948	978	810	13	<0,1
6	3	183	353	895	5	<0,1
7	11	336	603	1 050	8	<0,1
8	22	756	571	1 335	14	<0,1
9	12	461	426	1 212	9	<0,1
10	11	479	529	3 722	10	<0,1
11	60	584	484	4 210	18	<0,1
12	11	300	291	7 646	9	<0,1
13	7	173	263	4 485	5	<0,1
14	8	229	438	9 218	7	<0,1
15	249	204	1 260	8 137	25	0,4
16	6	180	385	9 881	5	<0,1
17	4	212	197	6 060	5	<0,1
18	2	130	155	9 865	5	<0,1
19	1	63	184	8 792	4	<0,1
20	< 1	39	572	10 282	3	<0,1
21	1	139	318	1 720	2	<0,1
22	14	210	319	834	5	<0,1
23	6	256	497	9 691	6	<0,1
24	316	1 395	2 411	20 885	110	1,4
25	11	250	497	13 576	8	<0,1
26	18	971	1 495	26 382	9	0,1
27	27	1 452	1 675	31 768	15	<0,1
28	34	1 241	1 680	32 273	25	0,1
29	61	1 972	4 238	22 503	36	0,1
30	1 030	2 458	1 205	25 772	252	1,5
31	546	961	408	23 110	52	0,3
32	96	2 545	992	2 584	36	0,2
33	100	1 480	1 054	27 599	29	0,2
34	209	3 657	1 474	13 952	81	0,4
35	56	1 484	1 056	25 250	21	<0,1
36	91	1 135	3 091	32 746	35	0,2

TS 6						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1	< 1	85	1 080	1 100	3	<0,1
2	11	916	2 230	1 520	19	0,2
3	17	925	1 938	2 939	21	<0,1
4	6	617	443	3 635	12	<0,1
5	1	245	344	3 177	5	0,3
6	8	328	492	2 793	7	<0,1
7	3	62	434	3 052	4	<0,1
8	5	287	302	2 452	7	<0,1
9	15	621	431	864	14	<0,1
10	11	596	213	10 589	12	<0,1
11	11	410	737	5 453	11	<0,1
12	15	652	583	6 835	15	<0,1
13	39	993	306	4 850	26	<0,1
14	< 1	83	305	10 864	3	<0,1
15	4	138	528	7 838	6	<0,1
16	9	243	634	8 930	9	<0,1
17	16	64	1 986	12 235	6	0,6
18	6	255	960	19 601	7	<0,1
19	8	69	244	15 040	6	<0,1
20	< 1	21	212	17 193	2	<0,1
21	< 1	15	153	14 391	4	<0,1
22	< 1	57	265	20 770	56	<0,1
23	10	116	1 041	12 466	20	<0,1
24	12	332	830	10 562	10	<0,1
25	13	337	1 835	16 200	11	<0,1
26	21	724	2 327	13 597	19	<0,1
27	8	304	858	28 073	10	<0,1
28	10	471	610	24 600	9	<0,1
29	1	252	791	16 845	5	<0,1
30	4	197	6 267	14 522	6	0,2
31	15	677	7 192	18 900	16	<0,1
32	308	13 224	21 721	23 357	25	0,4
33	63	3 641	1 509	17 895	49	<0,1
34	102	1 675	929	20 258	35	0,2
35	727	2 188	795	37 596	180	1,3
36	135	986	575	31 876	31	0,2

TS 7						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1	13	740	3636	7360	19	0,1
2	67	714	1255	14215	13	0,2
3	< 1	135	479	37562	7	<0,1
4	49	3329	1749	18156	42	0,2
5	38	1764	359	8427	23	0,2
6	2	244	302	3467	5	<0,1
7	7	579	280	3913	9	<0,1
8	7	496	325	1912	8	<0,1
9	8	423	361	1426	6	<0,1
10	10	558	1306	2801	10	<0,1
11	13	827	839	5047	14	<0,1
12	7	520	723	5191	10	<0,1
13	< 1	81	272	4432	7	<0,1
14	5	136	179	3599	6	<0,1
15	23	578	198	3613	13	<0,1
16	37	820	1152	11888	31	<0,1

TS 8						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1	9	1085	2790	592	11	<0,1
2	< 1	1048	575	459	2	<0,1
3	< 1	106	1674	650	1	<0,1
4	19	918	1234	11772	16	0,1
5	26	1877	2086	25067	21	0,1
6	2	476	1624	1035	5	<0,1
7	< 1	146	3128	42980	3	<0,1
8	20	1917	34342	13122	13	0,1
9	46	12299	68249	16668	35	0,7
10	18	1399	7038	2438	1	0,1
11	132	9377	47331	1212	83	0,6
12	97	7094	25354	9606	67	0,4
13	82	6244	17831	6399	63	0,5
14	99	4972	9543	6098	70	0,6
15	109	7609	15464	9866	80	0,7
16	17	844	3534	6710	14	<0,1
17	10	409	538	10079	10	<0,1
18	12	135	301	4647	3	<0,1
19	11	443	657	10146	17	<0,1
20	50	1284	5165	14610	27	0,1
21	819	8756	17767	36852	243	1,8
22	56	1693	2841	30979	33	<0,1
23	< 1	124	445	6580	5	<0,1
24	< 1	96	424	18730	2	<0,1
25	30	924	4311	21079	18	<0,1
26	158	3258	13629	25583	79	0,1
27	58	3638	8438	46973	29	0,3
28	60	971	3482	5794	27	0,1
29	58	1870	4855	28020	36	<0,1
30	30	1560	1716	23448	25	<0,1
31	8	377	1329	22926	9	<0,1
32	18	745	874	27636	16	<0,1
33	5	100	754	11609	8	<0,1
34	20	485	38	17771	24	0,1

Table 3
Assays of drill hole TS9

TS 9						
Sample ID	Ag mg/kg	Pb mg/kg	Zn mg/kg	S mg/kg	Sb mg/kg	Au mg/kg
1	16	984	1608	<10	<2	1.1
2	20	1760	2073	532	15	<0,1
3	8	601	449	408	8	<0,1
4	7	499	1011	402	6	<0,1
5	3	352	2580	1220	4	<0,1
6	1	339	1555	3425	4	<0,1
7	1	726	1740	1757	<2	0.2
8	12	495	3194	2235	<2	<0,1
9	11	795	4463	239	<2	<0,1
10	73	1531	3580	1480	14	<0,1
11	26	2731	6282	1131	22	<0,1
12	5	631	2885	441	6	<0,1
13	14	1831	5538	1969	14	<0,1
14	8	795	3744	658	8	<0,1
15	27	2110	4440	1115	21	<0,1
16	4	2893	3744	6566	26	0.2
17	6	704	4241	16295	8	0.1
18	4	589	4107	22669	7	0.1
19	3	398	1081	10802	13	0.1
20	< 1	290	1615	895	4	<0,1
21	107	7787	16472	18728	96	0.5
22	< 1	280	924	9587	5	<0,1
23	< 1	313	3751	9831	5	<0,1
24	24	842	1035	13502	18	0.2
25	42	822	1211	21071	21	0.2
26	27	1511	2916	24326	25	<0,1
27	2	192	1029	20775	5	<0,1
28	135	6925	31464	36136	93	0.1
29	16	1220	2105	26685	15	<0,1
30	6	385	1787	28366	8	<0,1
31	11	670	2381	26906	12	<0,1
32	834	891	4853	23027	242	3.7

Table 4
Starting coordinates and directions of Dill holes TS1-TS9.
Length stands for optimal lengths.

Hole_id	Y	X	Z	Length	Azimuth	Dip
TS1	7093800	4453621	-128	55	136	7
TS2	7093800	4453621	-126.5	60	136	36
TS3	7093777	4453618	-129.6	55	136	7
TS4	7093777	4453617	-130.1	55	136	36
TS5	7093765	4453599	-131	55	136	32
TS6	7093752	4453586	-135.4	55	136	14
TS7	7093752	4453586	-134	55	136	36
TS8	7093737	4453573	-138.1	55	136	9
TS9	7093738	4453572	-137	55	136	30