

## APPENDIX B

### GROUNDWATER QUALITY SUMMARY

The following groundwater quality summary is a composite of sampling data collected in 1987 and 1988. This data was collected on and off the mine site from the glacial overburden, shallow Precambrian (labeled Shallow PC), deep Precambrian (labeled Deep PC) and private wells (labeled Pvt. Wells). NA stands for not applicable and indicates sampling for this parameter was not conducted.

<u>Alkalinity</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	260	340	260	370
Minimum	14	81	150	17
Median	60	170	180	170
Mean	74	172	186	159
# of Tests	126	60	5	97
# of Detects	126	60	5	97
% of Detects	100.0%	100.0%	100.0%	100.0%
<u>Aluminum</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.337	0.158	NA	NA
Minimum	0.034	0.034	NA	NA
Median	0.078	0.086	NA	NA
Mean	0.086	0.084	NA	NA
# of Tests	40	20	NA	NA
# of Detects	40	20	NA	NA
% of Detects	100.0%	100.0%	NA	NA
<u>Arsenic</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.021	0.003	0.022	0.0015
Minimum	0.003	0.003	0.003	0.0015
Median	0.021	0.003	0.010	0.0015
Mean	0.003	0.003	0.010	0.0015
# of Tests	126	60	5	8
# of Detects	1	0	4	0
% of Detects	0.8%	0.0%	80.0%	0.0%
<u>Barium</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.50	0.50	0.25	0.04
Minimum	0.25	0.25	0.25	0.04
Median	0.25	0.25	0.25	0.04
Mean	0.27	0.27	0.25	0.04
# of Tests	126	60	5	8
# of Detects	0	0	0	0
% of Detects	0.0%	0.0%	0.0%	0.0%
<u>Beryllium</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.0010	0.0005	NA	NA

Minimum	0.0005	0.0005	NA	NA
Median	0.0005	0.0005	NA	NA
Mean	0.0005	0.0005	NA	NA
# of Tests	40.00	20.00	NA	NA
# of Detects	1	0	NA	NA
% of Detects	2.5%	0.0%	NA	NA
<u>Cadmium</u>	<u>Overburden</u>	<u>Shallow PC</u>	<u>Deep PC</u>	<u>Pvt. Wells</u>
Maximum	0.0170	0.0240	0.0045	0.0002
Minimum	0.0002	0.0002	0.0035	0.0002
Median	0.0010	0.0012	0.0039	0.0002
Mean	0.0016	0.0025	0.0040	0.0002
# of Tests	126	60	5	8
# of Detects	96	37	5	0
% of Detects	76.2%	61.7%	100.0%	0.0%
<u>Calcium</u>	<u>Overburden</u>	<u>Shallow PC</u>	<u>Deep PC</u>	<u>Pvt. Wells</u>
Maximum	95	56	52	47
Minimum	8	17	31	15
Median	13	36	35	35
Mean	25	35	38	32
# of Tests	126	60	5	8
# of Detects	126	60	5	8
% of Detects	100.0%	100.0%	100.0%	100.0%
<u>Chloride</u>	<u>Overburden</u>	<u>Shallow PC</u>	<u>Deep PC</u>	<u>Pvt. Wells</u>
Maximum	230.0	6.0	9.0	81.0
Minimum	0.5	0.5	2.0	1.2
Median	3.0	1.0	3.0	8.0
Mean	24.1	1.8	5.0	16.7
# of Tests	126	60	5	97
# of Detects	83	27	5	83
% of Detects	65.9%	45.0%	100.0%	85.6%
<u>Chromium</u>	<u>Overburden</u>	<u>Shallow PC</u>	<u>Deep PC</u>	<u>Pvt. Wells</u>
Maximum	0.0025	0.0025	0.0025	0.008
Minimum	0.0025	0.0025	0.0025	0.001
Median	0.0025	0.0025	0.0025	0.002
Mean	0.0025	0.0025	0.0025	0.003
# of Tests	126	60	5	8
# of Detects	0	0	0	4
% of Detects	0.0%	0.0%	0.0%	50.0%
<u>Cobalt</u>	<u>Overburden</u>	<u>Shallow PC</u>	<u>Deep PC</u>	<u>Pvt. Wells</u>
Maximum	0.025	0.025	NA	NA
Minimum	0.025	0.025	NA	NA
Median	0.025	0.025	NA	NA
Mean	0.025	0.025	NA	NA
# of Tests	40	20	NA	NA
# of Detects	0	0	NA	NA

% of Detects	0.0%	0.0%	NA	NA
<u>COD</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	90.0	85.0	5.0	130.0
Minimum	2.5	2.5	2.5	2.5
Median	10.0	10.0	2.5	6.0
Mean	13.2	16.1	3.0	10.1
# of Tests	126	60	5	97
# of Detects	84	44	1	52
% of Detects	66.7%	73.3%	20.0%	53.6%
<u>Copper</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.046	0.085	0.031	0.068
Minimum	0.003	0.003	0.010	0.005
Median	0.005	0.005	0.011	0.021
Mean	0.009	0.013	0.015	0.026
# of Tests	126	60	5	8
# of Detects	48	22	5	7
% of Detects	38.1%	36.7%	100.0%	87.5%
<u>Fluoride</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	2.50	0.60	0.30	0.2
Minimum	0.05	0.05	0.20	0.1
Median	0.20	0.20	0.30	0.1
Mean	0.35	0.26	0.26	0.1
# of Tests	126	60	5	4
# of Detects	68	51	5	3
% of Detects	54.0%	85.0%	100.0%	75.0%
<u>Hardness</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	400	240	1,137	390
Minimum	2	63	143	1
Median	68	150	150	170
Mean	111	145	369	168
# of Tests	126	60	5	97
# of Detects	126	60	5	96
% of Detects	100.0%	100.0%	100.0%	99.0%
<u>Iron</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	21.00	0.95	0.05	830.00
Minimum	0.05	0.05	0.05	0.03
Median	0.05	0.14	0.05	3.30
Mean	1.43	0.22	0.05	18.82
# of Tests	126	60	5	97
# of Detects	53	35	0	91
% of Detects	42.1%	58.3%	0.0%	93.8%
<u>Lead</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.0025	0.0025	0.0025	0.004

Minimum	0.0025	0.0025	0.0025	0.001
Median	0.0025	0.0025	0.0025	0.003
Mean	0.0025	0.0025	0.0025	0.003
# of Tests	126	60	5	8
# of Detects	0	0	0	6
% of Detects	0.0%	0.0%	0.0%	75.0%
<u>Magnesium</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	41.0	24.0	19.0	15.0
Minimum	2.4	5.4	11.0	3.4
Median	5.7	14.0	13.0	10.5
Mean	9.7	13.9	13.8	9.9
# of Tests	126	60	5	8
# of Detects	126	60	5	8
% of Detects	100.0%	100.0%	100.0%	100.0%
<u>Manganese</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	1.40	0.75	0.29	0.6300
Minimum	0.03	0.03	0.03	0.0055
Median	0.09	0.36	0.23	0.2550
Mean	0.25	0.35	0.19	0.2171
# of Tests	126	60	5	8
# of Detects	74	58	4	5
% of Detects	58.7%	96.7%	80.0%	62.5%
<u>Mercury</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.00240	0.00025	0.00025	0.00025
Minimum	0.00025	0.00025	0.00025	0.00025
Median	0.00025	0.00025	0.00025	0.00025
Mean	0.00027	0.00025	0.00025	0.00025
# of Tests	126	60	5	8
# of Detects	2	0	0	0
% of Detects	1.6%	0.0%	0.0%	0.0%
<u>Molybdenum</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.08	0.06	NA	NA
Minimum	0.01	0.01	NA	NA
Median	0.01	0.01	NA	NA
Mean	0.02	0.03	NA	NA
# of Tests	40	20	NA	NA
# of Detects	13	8	NA	NA
% of Detects	32.5%	40.0%	NA	NA
<u>Nickel</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.067	0.028	NA	NA
Minimum	0.004	0.004	NA	NA
Median	0.015	0.015	NA	NA
Mean	0.018	0.012	NA	NA
# of Tests	94	45	NA	NA
# of Detects	29	9	NA	NA

% of Detects	30.9%	20.0%	NA	NA
<u>NO3+NO2-N</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	2.90	0.42	0.15	3.5
Minimum	0.03	0.03	0.07	0.1
Median	0.30	0.35	0.10	2.0
Mean	0.56	0.08	0.10	1.9
# of Tests	126	60	5	4
# of Detects	105	21	5	4
% of Detects	83.3%	35.0%	100.0%	100.0%
<u>pH</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	7.07	7.38	7.04	6.93
Minimum	5.25	5.78	6.56	4.78
Median	6.21	6.52	6.93	6.16
Mean	6.24	6.58	6.86	6.12
# of Tests	126	60	5	97
# of Detects	126	60	5	97
% of Detects	100.0%	100.0%	100.0%	100.0%
<u>Selenium</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.0025	0.0025	0.0025	0.0015
Minimum	0.0025	0.0025	0.0025	0.0015
Median	0.0025	0.0025	0.0025	0.0015
Mean	0.0025	0.0025	0.0025	0.0015
# of Tests	126	60	5	8
# of Detects	0	0	0	0
% of Detects	0.0%	0.0%	0.0%	0.0%
<u>Silver</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.0073	0.0070	0.0002	0.0002
Minimum	0.0002	0.0002	0.0002	0.0002
Median	0.0002	0.0002	0.0002	0.0002
Mean	0.0009	0.0009	0.0002	0.0002
# of Tests	126	60	5	8
# of Detects	10	5	0	0
% of Detects	7.9%	8.3%	0.0%	0.0%
<u>Sodium</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	30.0	33.0	14.0	6.6
Minimum	1.2	1.4	9.6	3.0
Median	6.1	14.0	11.0	4.9
Mean	7.7	14.1	11.3	4.8
# of Tests	126	60	5	8
# of Detects	126	60	5	8
% of Detects	100.0%	100.0%	100.0%	100.0%
<u>Spec. Cond.</u>	Shallow PC	Deep PC	Pvt. Wells	
Maximum	954	876	439	716

Minimum	84	128	298	30
Median	159	315	339	260
Mean	245	324	344	284
# of Tests	126	60	5	97
# of Detects	126	60	5	97
% of Detects	100.0%	100.0%	100.0%	100.0%

<u>Sulfate</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	46.0	48.0	10.0	25.0
Minimum	2.5	2.5	2.5	5.3
Median	11.0	8.0	5.0	6.0
Mean	11.3	9.9	5.8	10.6
# of Tests	126	60	5	4
# of Detects	96	45	3	4
% of Detects	76.2%	75.0%	60.0%	100.0%

<u>TDS</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	1,400	350	280	NA
Minimum	14	67	180	NA
Median	130	200	200	NA
Mean	247	213	210	NA
# of Tests	126	60	5	NA
# of Detects	126	60	5	NA
% of Detects	100.0%	100.0%	100.0%	NA

<u>Thallium</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.0025	0.0025	NA	NA
Minimum	0.0025	0.0025	NA	NA
Median	0.0025	0.0025	NA	NA
Mean	0.0025	0.0025	NA	NA
# of Tests	40	20	NA	NA
# of Detects	0	0	NA	NA
% of Detects	0.0%	0.0%	NA	NA

<u>Tin</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.136	0.285	NA	NA
Minimum	0.034	0.034	NA	NA
Median	0.034	0.034	NA	NA
Mean	0.042	0.068	NA	NA
# of Tests	40	20	NA	NA
# of Detects	4	7	NA	NA
% of Detects	10.0%	35.0%	NA	NA

<u>Titanium</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.028	0.004	NA	NA
Minimum	0.002	0.002	NA	NA
Median	0.002	0.002	NA	NA
Mean	0.004	0.002	NA	NA
# of Tests	40	20	NA	NA
# of Detects	8	1	NA	NA

% of Detects	20.0%	5.0%	NA	NA
<u>Uranium</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.017	0.011	0.007	NA
Minimum	0.001	0.001	0.004	NA
Median	0.002	0.003	0.006	NA
Mean	0.002	0.003	0.006	NA
# of Tests	126	60	5	NA
# of Detects	81	45	5	NA
% of Detects	64.3%	75.0%	100.0%	NA
<u>Zinc</u>	Overburden	Shallow PC	Deep PC	Pvt. Wells
Maximum	0.320	1.800	0.070	0.1200
Minimum	0.005	0.005	0.025	0.0055
Median	0.025	0.025	0.025	0.0205
Mean	0.036	0.080	0.039	0.0464
# of Tests	126	60	5	8
# of Detects	31	12	2	6
% of Detects	24.6%	20.0%	40.0%	75.0%