

DRAFT MEMORANDUM

DATE: November 7, 2003

TO: File

FROM: Dylan MacGregor, Kelly Sexsmith

RE: **2002/2003 Seepage Surveys**

1. INTRODUCTION

Seep surveys were completed in June and September of 2002 and 2003 at the Faro, Vangorda and Grum waste rock dumps. The purpose of the surveys was to determine the water quality associated with discrete areas of seepage pathways from each of the major waste rock dumps. The seep surveys included several small seepage stations that are not sampled as part of the routine seepage monitoring programs completed by site personnel.

This memo provides an update of the 2002 seepage memo (SRK, 2003). Methods and results of the 2002/2003 seepage surveys, and an initial interpretation of the data, are included.

2. METHODS

Sample locations were established in June 2002 by walking the toes of all waste rock dumps, where the rock rests on original ground, and collecting water samples from any flowing seeps that emerged from these areas. Additional seeps were located by slowly driving along accessible roads and ramps in the Faro Pit complex that were below waste rock dumps or ore stockpiles. Most of the seeps were flowing, or had been recently flowing based on observations of moisture along flow paths, or because ponds were filled to their spill points. These stations were revisited in the September 2002, and June and September 2003 seepage surveys, and sampled where there was sufficient flow.

Some of the smaller seeps flow intermittently and provide sampling opportunities only after heavy rainfall. As a result, some additional sites were identified in the subsequent surveys, while other sites were too dry to sample.

At the request of Gartner Lee Ltd., six additional samples were collected from within the Grum Pit by SRK during the June 2003 seep survey. Samples were collected from seeps that were

accessible from the main ramp, prior to and immediately following an intense afternoon shower when some intermittent seeps are flowing.

Four additional samples were collected from the Vangorda Creek valley between the Grum and Vangorda waste dumps. The sample sites were first identified and sampled in 1997 by Environment Canada personnel, and consist of seep and surface waters downgradient of the waste dumps. SRK collected these samples to assess the influence of dump drainage closer to the receiving waters of Vangorda Creek.

Samples were collected for analyses of routine parameters (pH, conductivity, acidity, alkalinity, chloride and sulphate), and dissolved metals (dissolved metals by ICP-OES). The samples were filtered and preserved in the field according to standard methods for collection of environmental samples. Field pH, conductivity, redox, temperature measurements were taken at each station using a WTW meter. Flow estimates were made using the bucket and stopwatch method, by estimating the velocity and cross sectional area of the seep, or by visual estimation.

The sampling locations were marked for later reference with flagging tape and surveyed using a hand-held GPS. The locations are shown in Figures 1 through 3. Photographs were taken to document the general appearance of the station, and any precipitates along the flow paths.

Duplicates and field blanks were collected as a check on the quality of the field methods and laboratory results.

3. RESULTS

The results of the 2002 and 2003 seepage surveys are provided in Attachment A. Select parameters (ranges of pH, conductivity, flow, sulphate and zinc concentrations for the period of record) are presented in Figures 1 and 2.

4. DISCUSSION

4.1 Faro Waste Rock Dumps

4.1.1 Water Types

Seepage from the Faro Waste Rock Dumps can be divided into three distinct types on the basis of pH and zinc concentrations (Table 1):

- Type 1 seeps had pH's of greater than 6.5 (typically greater than 7), and zinc concentrations of less than 5 mg/L. Other trace metals (eg. aluminum, iron, manganese) were low or below detection limits.
- Type 2 seeps had pH's typically between 6 and 7, and variable zinc concentrations ranging from 4 to 595 mg/L. Cadmium, cobalt, iron, manganese, and nickel were also elevated in several of the samples.
- Type 3 seeps typically had pH's of less than 6, and zinc concentrations typically greater than 40 mg/L and as high as 10,900 mg/L (exceptions include SRK-FD20 samples of June 2002 and June and September 2003, with 2.2 to 13.4 mg/L Zn, the September 2002 SRK-FD21B sample, with 17 mg/L Zn, and the September 2002 SRK-FD24 sample, with 13.3 mg/L Zn.). Aluminum, cadmium, cobalt, copper, iron, manganese, and nickel concentrations were also high in several of these samples.

The summary of Faro water type characteristics in Table 1 was prepared from a modified data set. Where values were reported as less than detection, the detection limit was inserted as the analytical value for the purposes of the statistical calculations. Method detection limits are listed in Table 1; these limits were taken from the non-detect results of blank submissions. Any non-detect result that specified a detection limit more than 10X the method detection limit was excluded from the statistical calculations. This arose in cases where samples had high ionic strength. The variation in the number of samples used in the statistical summary is a reflection of this exclusion.

TABLE 1
Characteristics of Faro Water Types

Parameter	Detection Limits	Type 1					Type 2					Type 3				
		Average	Median	Min	Max	N	Average	Median	Min	Max	N	Average	Median	Min	Max	N
pH		7.85	7.85	7.32	8.37	25	7.14	7.32	4.86	7.76	36	100.56	3.51	2.33	2710	28
Acidity pH 8.3	mg/L	11	11	1	29	25	204	61	15	2160	36	6272	545	27	49500	28
Alkalinity Total a	mg/L	137	155	30	242	25	167	84	4	407	36	12	1	1	92	28
Chloride	mg/L	1.3	1.1	0.5	2.7	25	4.4	1.8	0.5	17.5	36	51.3	0.6	0.5	1050	28
Sulphate	mg/L	467	382	5	2470	25	2280	1905	334	4600	36	7701	2190	69	59000	28
Calcium	mg/L	105	104	10.0	263	25	344	311	49	628	36	225	240	6.5	504	28
Magnesium	mg/L	74	53	1.5	378	25	307	215	37	694	36	384	201	3.8	3210	28
Potassium	mg/L	4.9	3.0	2	24	25	9.3	9.0	2	17	36	6.9	5.0	2	20	23
Sodium	mg/L	19.2	6.0	2	122	25	25	17	3	122	36	11	5.5	2	50	24
Aluminum	mg/L	0.2	0.2	0.2	0.2	25	0.3	0.2	0.2	1.6	36	90	9.2	0.2	986	28
Cadmium	mg/L	0.01	0.01	0.01	0.01	25	0.07	0.02	0.01	0.62	36	2.6	0.23	0.01	15.5	28
Cobalt	mg/L	0.01	0.01	0.01	0.01	25	0.15	0.06	0.01	0.53	36	2.1	0.3	0.01	20	28
Copper	mg/L	0.01	0.01	0.01	0.01	25	0.05	0.02	0.01	0.5	36	39	2.4	0.03	559	27
Iron	mg/L	0.03	0.03	0.03	0.03	25	11	1.16	0.03	89.9	36	1136	37	0.03	15100	28
Lead	mg/L	0.05	0.05	0.05	0.15	25	0.07	0.05	0.05	0.23	36	0.52	0.27	0.05	2	24
Manganese	mg/L	0.07	0.01	0.005	0.42	25	16	3.8	0.04	54	36	159	13	0.16	2360	28
Nickel	mg/L	0.05	0.05	0.05	0.09	25	0.29	0.16	0.05	0.9	36	1.9	0.53	0.05	15	27
Zinc	mg/L	1.6	1.3	0.01	5	25	91	29	3.88	595	36	1740	140	2.2	10900	28

Notes:

- 1) Units in mg/L except for alkalinity in mg CaCO₃ eq/L
- 2) Detection limits were used for statistical purposes when values were less than detection. Where detection limits were elevated due to high ionic strength, non-detect results were excluded from statistical calculations.
- 3) Refer to Figure 1 for quantities of each type of water identified during each sampling round.

TABLE 2
Seepage Stations Classified by Water Type

Type 1 (pH >7, Zn <5 mg/L)		Type 2 (pH 6 – 7, Zn concentrations ranging from 4 to 595 mg/L)		Type 3 (pH <6, Zn typically >40mg/L)	
ID	Location	ID	Location	ID	Location
SRK-FD02	Upper Parking Lot Dump	SRK-FD1	Ore and Low Grade Ore Stockpiles	SRK-FD04	Oxide Fines Stockpile
SRK-FD05	Toe of Northeast Dump	SRK-FD8	East Main Dump	SRK-FD13	Intermediate Dump
SRK-FD06	Toe of Northeast Dump	SRK-FD9	Ore and Low Grade Ore Stockpiles; West Main Dump	SRK-FD20	Faro Creek Diversion
SRK-FD07	Toe of Northeast Dump	SRK-FD10	Ore and Low Grade Ore Stockpiles; West Main Dump	SRK-FD21	Northeast Dumps towards Pit
SRK-FD14	Ranch Zone Dump	SRK-FD12	Ore and Low Grade Ore Stockpiles; West Main Dump	SRK-FD22 (Sept/02 only)	Northeast Dumps towards Pit
SRK-FD16	Upper Northwest Dump	SRK-FD14 (June/03 only)	Ranch Zone Dump	SRK-FD23 (Sept/02 only)	Northeast Dumps towards Pit
SRK-FD17	Upper Northwest Dump	SRK-FD19	Lower Northwest Dump	SRK-FD24 (Sept/02 only)	Northeast Dumps towards Pit
SRK-FD18	Upper Northwest Dump	SRK-FD21 (June/02 and June/03 only)	Northeast Dumps towards Pit	SRK-FD27 (Sept/02 only)	Northeast Dumps towards Pit
SRK-FD26	Northeast Dumps towards Pit	SRK-FD22 (June/03 only)	Northeast Dumps towards Pit	SRK-FD33	Mill
		SRK-FD23 (June/02 and June/03 only)	Northeast Dumps towards Pit	SRK-FD34	Mill
		SRK-FD24 (June/02, June and Sept/03 only)	Northeast Dumps towards Pit	SRK-FD36	West Main Dump
		SRK-FD27 (June/02 and June/03 only)	Northeast Dumps towards Pit	SRK-FD37	Medium Grade Stockpile
		SRK-FD30	West Main Dump	SRK-FD38 (June/03 only)	Ore and Low Grade Ore Stockpiles
		SRK-FD31	Ore and Low Grade Ore Stockpiles, West Main Dump	SRK-FD40	Faro Valley Dump
		SRK-FD32	Mill	SRK-FD46	Oxide Fines Stockpile, Mill
		SRK-FD35	Mill		
		SRK-FD38 (Sept/02 only)	Ore and Low Grade Ore Stockpiles		
		SRK-FD40 (Sept/03 only)	Faro Valley Dump		
		SRK-FD44	Intermediate Dump		

Table 2 lists the seepage stations by each of the above types. The results boxes in Figure 1 also indicate these groupings by colour.

The Type 1 seeps included samples from below the Upper Parking Lot dump (FD02), along the toe of the Northeast Dump (FD05, 06, and 07), the Ranch Zone Dump (FD14), and the Upper Northwest Dump (FD16, 17, and 18). According to the inventory of rock types presented in the 1996 ICAP report, these dumps contained relatively low proportions of sulphide waste rock, and higher proportions of calc-silicates or intrusives compared to other parts of the Faro Dump. The seepage chemistry reflects some buffering by reactive carbonate minerals, which help to maintain neutral pH conditions.

The Type 2 seeps included samples from several different areas, including ore and low grade ore stockpiles (FD01, 10, 12, 31 and 38), the West Main Dump (FD10, 12, 30 and 31), the Lower Northwest Dump (FD19), seeps entering the pit below the Northeast Dumps (FD21, 22, 23, 24, 26 and 27; spring survey only), and seeps in the mill area (FD32 and 35). A common element of all these areas is the presence of sulphides or oxidized schist. Although the pH is in the pH 6 to 7 range, it is clear that this drainage is strongly influenced by oxidation of sulphide minerals. It is not clear why the pH of these samples is still close to neutral. However, many of these seeps contain high levels of calcium and magnesium, suggesting that there are still some carbonates present in the source materials. Samples from below the Low Grade Stockpile C (FD38, Zn = 595 mg/L), and from the mill area (FD32, Zn = 581 mg/L) contained the highest zinc concentrations. Samples from along the original Faro Creek channel (FD10, 12 and 31) had zinc concentrations in the range of 220 mg/L, and were likely influenced in part by ore stockpiles upstream of this location. Type 2 samples outside of the influence of the ore stockpiles and mill area had zinc concentrations typically below 30 mg/L.

The Type 3 seeps included samples from the Oxide Fines Stockpile (FD04, 46), the Medium Grade Stockpile (FD37), the mill area (FD33 and 34), the West Main Dump (FD36), the Intermediate Dump (FD13), the Faro Creek Diversion Dyke (FD20), the Faro Valley Dump (FD40), and, on occasion, seeps entering the pit below the Northeast Dumps (FD21, 22, 23, 24, and 27). Portions of the waste rock in all of the above areas contained sulphides or oxidized schist. The seepage quality indicates very little if any neutralizing minerals are available to control the pH and metal concentrations in these seeps. Samples from the Oxide Fines Stockpile (FD04, Zn = 1230 to 10,900 mg/L), the Medium Grade Stockpile (FD37, Zn = 6130 - 7840 mg/L), and the mill area (FD33, Zn = 1110 - 2260 mg/L) had the highest zinc concentrations. However, zinc concentrations in the remaining acidic seeps ranged from 2.2 to 751 mg/L (overall median of 140 mg/L) indicating that seeps with high zinc concentrations occur in association with the sulphide waste rock cells and other sulphidic waste rock.

4.1.2 Initial Review of Historical Data

Some of the larger seeps from the waste rock dumps have been included in the routine monitoring programs for the site over the past 10 to 15 years. This data is presented in the Baseline Studies Report prepared by Gartner Lee Limited (GLL, 2002). Results from the three most relevant seepage stations are briefly discussed below. Further interpretation of the historical data will be provided in our final report.

Station X23

This station is located east of the mill, in the original Faro Creek channel, below the East Main Dump, the Oxide Fines Stockpile, and the Medium Grade Stockpile. It includes drainage from three distinct seeps sampled during the 2002 seepage surveys (SRK-FD10, 12, and 31). In both June and September 2003, only SRK-FD31 was sampled, as flows at this site provide a composite sample that includes flows from SRK-FD10 and –FD12.

This station has been monitored for select parameters on an irregular basis since 1986, and for a full suite of parameters since 1999. Sulphate was the only parameter that has been consistently included since 1986. Sulphate concentrations increased throughout the monitoring period, reaching approximately 2000 mg/L in 1991, 3000 mg/L in 1999, and then peaking in late summer 2000 at >10,000 mg/L. Sulphate concentrations have since decreased to approximately 4500 mg/L. The increase in sulphate concentrations corresponds to a shift in the major ion chemistry from calcium exceeding magnesium to magnesium exceeding calcium, and an increase in iron concentrations. Zinc concentrations from 1989/90 were approximately 20 mg/L. In 1999 (the next period of monitoring), zinc concentrations were typically in the range of 20 to 100 mg/L, with concentrations of approximately 200 occurring during spring 1999 and spring 2000. In the fall of 2000, concentrations increased dramatically reaching a peak of 1120 mg/L by October 2000. Concentrations then decreased somewhat in 2001, and are currently in the range of 160 mg/L. pH was not consistently measured until 1996. The pH was typically close to 7 from 1996 to 1998 (inclusive), and has been in the range of 6.3 to 6.9 since early 1999.

Further information is needed to determine the history and configuration of the waste rock dumps and ore stockpiles over the monitoring period. However, the seep data indicates a small decrease in zinc and sulphate concentrations recently, suggesting that upstream release rates may have peaked.

Stations A30

Station A30 (SRK-FD40) is located along the north wall of the pit, below the Faro Valley Dump. The current location is accessed by hiking down from the Faro Valley Dump. In earlier years, the station was a sump, which may have received drainage from other seepage along the pit walls. Data is available for 1987 to 1989, and 1997 to 2001. Sulphate and zinc concentrations in the late 1980's were near 200 and 5 mg/L respectively, with near neutral pH's. In the more recent data, sulphate and zinc concentrations were in the range of 500 and 50 mg/L respectively, with acidic pH's. The changes are indicative of the strongly oxidized condition of the Faro Valley Dumps, which are some of the older dumps on site.

Station W5

Stations W5, NE1 and NE2 are located along the toe of the Northeast Dump. W5 was monitored in the late 80's, and was probably close to the toe of the dump. NE1 and NE2 are monitored in the regular seepage program, and are collected approximately 100 metres downstream of the toe. These stations are equivalent to SRK-FD05 and 06. The late 80's data from W5 indicated this seepage had a slightly alkaline pH, sulphate concentrations in the range of 300 to 800 mg/L, and zinc concentrations of 0.6 to 1.6 mg/L. The data from NE1 and NE2 indicate similar pH's, sulphate concentrations in the range of 70 to 900 mg/L, and zinc concentrations ranging from <0.01 to 2.5 mg/L. Lower zinc concentrations at this location may be due to attenuation of zinc along the seepage flow path. The 2002 seepage data had similar pH's and sulphate concentrations, and slightly higher zinc concentrations (1.1 to 2.8 mg/L). Results from 2003 again indicate similar pH and sulphate concentrations, and more varied zinc concentrations (0.5 to 4.5 mg/L).

4.2 Grum Waste Rock Dumps

4.2.1 Water Types

All of Grum seeps had neutral to slightly alkaline pH's, and would be classified as Type I seeps under the system described for Faro. However, further division is possible on the basis of sulphate and zinc concentrations.

- Type 1a seeps generally had very low sulphate (7.0 to 575 mg/L) and low zinc concentrations (<0.005 to 0.028 mg/L). These seeps reflect drainage from calcareous phyllites and till in the northwest draining portion of the dump. Surface mapping in this drainage indicated some sulphides were present in this area, but they were typically in small isolated pockets, and were surrounded by extensive areas of calcareous phyllites.

- Type 1b seeps had zinc concentrations in the range of 2 to 5 mg/L, and sulphate concentrations greater than 500 mg/L. Most of these seeps were towards the southeast, and were below the sulphide cell. However, SRK-GD11, which was theoretically upgradient of the sulphide cell, also fell into this group. Waste rock mapping completed in September 2002 indicated that significant amounts of sulphide were present above this location, and that sulphidic waste rock was not limited to the sulphide cell.

Table 3 provides a summary of key characteristics for each of the above seepage types.

TABLE 3
Characteristics of Grum Water Types

Parameter	Detection Limits	Type 1a					Type 1b				
		Average	Median	Min	Max	N	Average	Median	Min	Max	N
pH		7.46	7.47	6.87	7.85	13	7.29	7.31	6.67	7.84	18
Acidity pH 8.3	1	10	6.0	1.0	40	13	23	19	1.0	69	18
Alkalinity Total	1	325	338	186	405	13	526	546	278	700	18
Chloride	0.5	1.6	1.7	0.50	2.5	13	2.1	2.2	0.90	2.8	18
Sulphate	1	255	313	7.0	575	13	1093	1165	593	1350	18
Calcium	0.05	137	153	45	219	13	323	337	201	380	18
Magnesium	0.1	56	64	24	81	13	205	210	108	347	18
Potassium	2	2.4	2.0	2.0	4.0	13	7.1	7.0	3.0	10	18
Sodium	2	2.6	3.0	2.0	4.0	13	10	11	4.0	16	18
Aluminum	0.2	0.20	0.20	0.20	0.20	13	0.20	0.20	0.20	0.20	18
Cadmium	0.01	0.01	0.01	0.01	0.01	13	0.01	0.01	0.01	0.01	18
Cobalt	0.01	0.01	0.01	0.01	0.01	13	0.01	0.01	0.01	0.03	18
Copper	0.01	0.01	0.01	0.01	0.01	13	0.01	0.01	0.01	0.01	18
Iron	0.03	0.03	0.03	0.03	0.03	13	0.03	0.03	0.03	0.03	18
Lead	0.05	0.05	0.05	0.05	0.05	13	0.05	0.05	0.05	0.05	18
Manganese	0.005	0.16	0.005	0.005	1.9	13	0.10	0.056	0.005	0.43	18
Nickel	0.05	0.05	0.05	0.05	0.07	13	0.38	0.38	0.22	0.59	18
Zinc	0.005	0.009	0.005	0.005	0.028	13	3.0	2.7	1.7	5.1	18

Notes:

- 1) Units in mg/L except for alkalinity in mg CaCO₃ eq/L
- 2) Refer to Figure 2 for quantities of each type of water identified during each sampling round.

4.2.2 Initial Review of Historical Data

The routine monitoring stations at Grum are shown in Figure 2. Station V2 has been monitored on a regular basis since 1988, at V2A since 1997, and at V15 since 1995. The routine stations are located along the road access, and are between 200 and 800 metres below the toe of the dumps. All three stations had lower concentrations than measured at the toes of the dumps, indicating there is some dilution and/or attenuation of zinc along the flow paths.

Total and dissolved zinc concentrations at V2 have remained generally very low (<0.5 mg/L) throughout the monitoring period. However, in the past two years, a greater proportion of the samples has had higher concentrations than in earlier years, and sulphate concentrations have risen from typically <200 mg/L to between 200 and 800 mg/L.

Station V15, which is above Station V2, and closer to the Waste Rock Dump has shown similar results, with sulphate concentration increased from typically <100 mg/L in 1995, 1997, and early 1998, to 200 to 300 in 1998 and 1999, and to as high as 1067 mg/L in 2002.

Total and dissolved zinc concentrations at V2A were very low (<0.1 mg/L) from 1997 through to 1999. In 2001 and 2002, concentrations were in the range of 0.12 to 3.4 mg/L. This change also corresponds to an increase in sulphate concentrations.

4.3 Vangorda Waste Rock Dumps

4.3.1 Water Types

All of the seeps associated with the Vangorda Waste Rock Dump had very high zinc concentrations (23 to 6990 mg/L). Four of the seeps had pH's between 6 and 7, four were acidic, with pH's of less than 6, and one was pH neutral during the spring survey, but acidic during the fall survey.

- The seeps with pH's between 6 and 7 can be classified as Type 2 seeps following the system described for the Faro seeps (Section 4.1.1). At Vangorda, these seeps tended to have higher zinc concentrations (23 to 412 mg/L) than at Faro, reflecting the high proportion of sulphidic waste rock in the Vangorda Dumps. These seeps also had elevated concentrations of cobalt, iron, manganese, and nickel. Cobalt and nickel concentrations were substantially higher than in Type 2 seeps at Faro.
- The acidic seeps can be classified as Type 3 following the system described for Faro. As for the Type 2 seeps, these tended to have higher zinc concentrations than at Faro, ranging from 352 to 6990 mg/L. Aluminum, cadmium, cobalt, copper, iron, manganese and nickel concentrations were also generally very high.

Table 4 provides a summary of key characteristics for each of the above seepage types.

TABLE 4
Characteristics of the Vangorda Water Types

Parameter	Detection Limits	Type 2					Type 3				
		Average	Median	Min	Max	N	Average	Median	Min	Max	N
pH		6.44	6.34	6.03	7.08	10	4.08	3.67	2.55	6.21	13
Acidity pH 8.3	1	352	203	53	755	10	6279	2550	581	16500	13
Alkalinity Total	1	134	144	27	289	10	26	3.0	1.0	160	13
Chloride	0.5	0.77	0.60	0.50	1.3	10	1.4	0.50	0.50	11	13
Sulphate	1	2878	2785	766	4440	10	15482	13100	2470	33400	13
Calcium	0.05	351	399	199	436	10	432	445	196	528	13
Magnesium	0.1	374	389	54	602	10	1624	721	105	3490	13
Potassium	2	9.0	11	2.0	13	10	12	10	4.0	20	7
Sodium	2	8.2	10	2.0	13	10	8.7	4.0	4.0	20	7
Aluminum	0.2	0.28	0.20	0.20	0.40	10	40	14	0.40	339	12
Cadmium	0.01	0.11	0.09	0.05	0.28	10	3.5	1.2	0.45	8.5	13
Cobalt	0.01	1.4	0.85	0.06	3.0	10	9.5	6.0	0.75	22	13
Copper	0.01	0.01	0.01	0.01	0.02	10	29	0.69	0.07	180	7
Iron	0.03	40	2.9	0.03	127	10	706	243	0.12	3040	13
Lead	0.05	0.08	0.09	0.05	0.10	10	1.0	0.70	0.10	2.5	7
Manganese	0.005	67	39	3.7	139	10	996	232	18	2600	13
Nickel	0.05	2.6	2.0	0.14	5.3	10	8.0	7.0	1.1	17	13
Zinc	0.005	184	107	23	412	10	2948	1650	352	6990	13

Notes:

- 1) Units in mg/L except for alkalinity in mg CaCO₃ eq/L
- 2) Detection limits were used for statistical purposes when values were less than detection. Where detection limits were elevated due to high ionic strength, non-detect results were excluded from statistical calculations.
- 3) Refer to Figure 1 for quantities of each type of water identified during each sampling round.

4.3.1 Initial Review of Historical Data

Three of the drains (Drain 3, 5 and 6) at Vangorda have been monitored as part of the routine monitoring programs. Metal data is available for 1994 to 1997, and data for routine parameters have been collected regularly since 1994. The locations of these drains are shown in Figure 3.

Station V30 (Drain 3, SRK-VD03) has had zinc concentrations in the range of 200 to 500 mg/L since 1994. pH's have been close to 6 throughout that period, and sulphate concentrations have increased from 2500 in 1994 to 4000 mg/L in the more recent data.

Station V32 (Drain 5, SRK-VD04) had pH's in the range of 4 to 5, sulphate concentrations of 3000 to 7000 mg/L, and zinc concentrations of 700 to 1700 mg/L in the 1994 to 1997 data. From 1997 to 2002, the pH continued to decrease, and sulphate and zinc concentrations increased, reaching pH's of 3.3, sulphate concentration of 30,000 mg/L, and zinc concentrations of almost 7000 mg/L. Data from 2002 and 2003 showed a levelling off of sulphate and zinc

concentrations, with ranges of 30 500 to 33 400 mg/L for sulphate and 5850 to 6990 mg/L for zinc over the four sampling rounds. This data suggests a stabilising of processes upstream of the sample location.

Station V33 (Drain 6, SRK-FD05) has consistently had pH's in the 6 to 7 range, but has showed an increasing trend in sulphate concentrations since 1994 from 3000 to 10000 in the 1994 to 1999 data to greater than 13000 mg/L in data from late 1999 to present. Zinc concentrations have also increased from 400 to 800 mg/L in the 1994 to 1997 data to 1650 to 2850 mg/L in the more recent data. Drain 6 was not flowing during either June or September sampling rounds in 2003, and no samples were collected.

4.4 Grum Pit Seepage

Six seep samples, including one duplicate sample, were collected from within Grum Pit by SRK at the request of Gartner Lee. All samples were collected along the main ramp leading into Grum Pit on the afternoon of June 9, 2003. Complete water quality results for these samples are provided in Attachment B, and the parameters of greatest interest are summarised in Table 5. A map of the Grum Pit provides sample locations (Figure 3).

All samples were slightly alkaline, with pH's ranging from 7.28 to 8.36. Sulphate concentrations ranged from 627 to 1050 mg/L, and zinc concentrations were from <0.005 to 14.7 mg/L. Minor nickel, manganese and cobalt were also present in some samples.

4.5 Vangorda Creek Valley Seepage

Four additional water samples were collected in September 2003 at six sites previously sampled by Environment Canada. These sites were located down gradient from the Grum and Vangorda waste rock dumps. Water quality at these sites should reflect any influence of surface or ground waters by seepage from the respective dumps. Seeps were sampled at points of emergence and surface waters were sampled at the downstream limit of surface flow.

The first two sites were located close to the toe of the Grum dump. Figure 2 shows the locations of Environment Canada sample sites. "Seep 1" was found, however no water was found to be flowing on surface. This lack of flow is consistent with Environment Canada observations from early September 2003. "Seep 2" corresponded to SRK-GD5, which has been sampled all of the SRK seep surveys. A discussion of this and other samples from the Grum dump is provided in Section 4.2.

TABLE 5
Summary of Grum Pit Seepage Water Quality

Sample ID	SRK-GP01	SRK-GP02	SRK-GP02	SRK-GP04	SRK-GP05	SRK-GP06
Parameters			duplicate			
pH	8.05	7.28	7.28	8.21	7.88	8.36
Acidity pH 8.3	-'	'.'	'.'	'.'	'.'	'.'
Alkalinity Total	373	189	193	266	223	264
Chloride	<0.5	<0.5	<0.5	<0.5	<0.5	2.7
Sulphate	989	932	920	1050	627	995
Calcium	239	197	199	268	158	90
Magnesium	167	112	113	144	96.9	235
Potassium	3	3	3	5	3	4
Sodium	6	8	8	6	5	5
Aluminum	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.01	0.1	0.1	0.02	0.02	<0.01
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Manganese	0.015	0.224	0.229	0.013	<0.005	<0.005
Nickel	0.51	1.03	1.03	0.17	0.07	<0.05
Zinc	6.69	14.3	14.7	0.073	0.03	<0.005

Notes:

1) Units in mg/L except for alkalinity in mg CaCO₃ eq/L

1) '-': Acidity values reported are not in agreement with other analyses. Verification of results is in progress.

The remaining four sites were distinct from those sites typically sampled during SRK's dump toe seep survey. Field observations and results from this sampling are summarised in tabular form in Attachment C, Table C.1. All samples were found to be slightly alkaline, with pH values greater than 7.3. Metals were generally at or near detection limits; slightly elevated zinc (0.036 mg/L) was found at SRK-Little Creek Seep. Elevated sulphate was present in all seeps, with concentrations ranging from 54 mg/L to 972 mg/L. These water quality of these samples corresponds to Grum Type 1a water quality, with the SRK-GD05d/s sample having elevated sulphate concentration.

5. CONCLUSIONS

Seeps associated with the Faro Waste Rock Dumps showed a wide range of pH and zinc concentrations. The highest zinc concentrations (>200 mg/L, as high as 10,900) were associated with the ore stockpiles and mill area. High zinc concentrations were also associated with the sulphide cells on the Main Dumps (up to 600 mg/L). A large number of seeps associated with the waste rock were acidic or partially buffered, and had zinc concentrations in the range of 20 to 100 mg/L. A moderate number of seeps at Faro had alkaline pH's, and zinc concentrations of less than 5 mg/L. These were associated with dumps that contained relatively little sulphide

waste rock. Cadmium, cobalt, copper, iron, manganese and nickel concentrations in some of the seeps are at concentrations that significantly exceed receiving water quality criteria.

Seeps associated with the Grum Waste Rock Dumps had consistently neutral to alkaline pH's. Seeps draining to the Southeast had zinc concentrations ranging from 2 to 5 g/L and elevated sulphate concentrations. Seeps draining to the Northwest had zinc concentrations ranging from undetectable to 0.028 mg/L, and generally lower sulphate concentrations. The seeps to the Southeast were located below the sulphide cell, or below sulphidic waste identified in the SRK September 2002 surface mapping programs. A brief review of routine monitoring data from Grum suggests that zinc and sulphate concentrations along the Southeast side of the dump have increased in the past few years. No other trace metals of concern have been detected in the Grum seepage to date.

Seeps associated with the Vangorda Waste Rock Dumps were acidic to partially buffered, and contained high to very high zinc concentrations (from 23 to 6990 mg/L). Sulphate and zinc concentrations have increased since the routine seepage monitoring programs were initiated in 1994. Other trace metals significantly exceeding receiving water quality criteria in the Vangorda seepage include cadmium, cobalt, copper, iron, manganese and nickel. Cobalt and nickel are notably higher compared to acidic seeps at Faro.

The final report on geochemical characterization of the Anvil Range Mining Complex will include a thorough review of historical water quality data. This data is expected to provide longer term trends in seepage water quality at select locations and should provide additional insight into processes controlling water quality.

REFERENCES

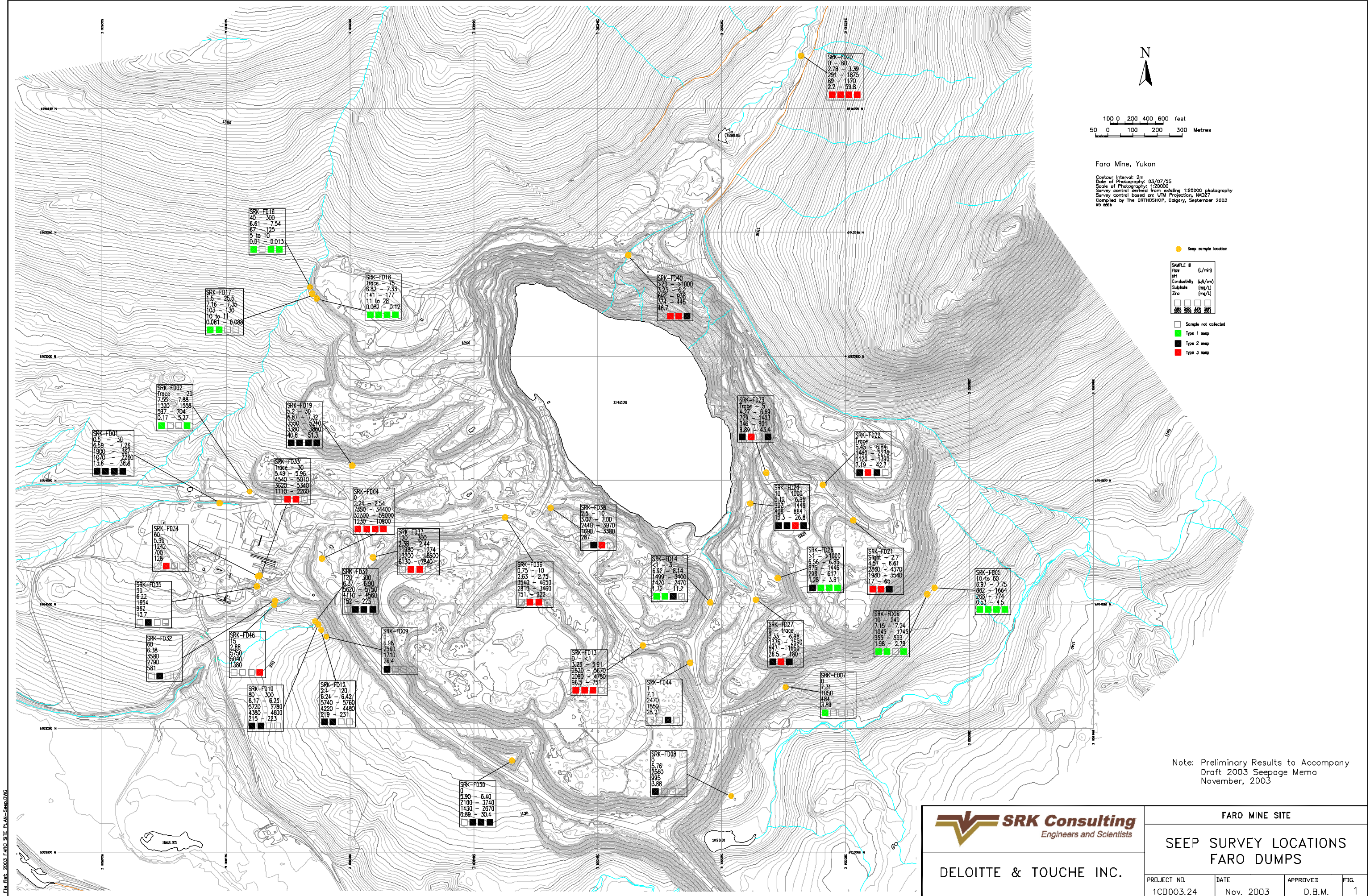
Environment Canada. 2003. "Grum Seeps", September 5, 2003 email memo from Vic Enns (Environment Canada) to Daryl Hockley and Cam Scott, SRK.

Gartner Lee Ltd. 2002. Baseline Studies Report.

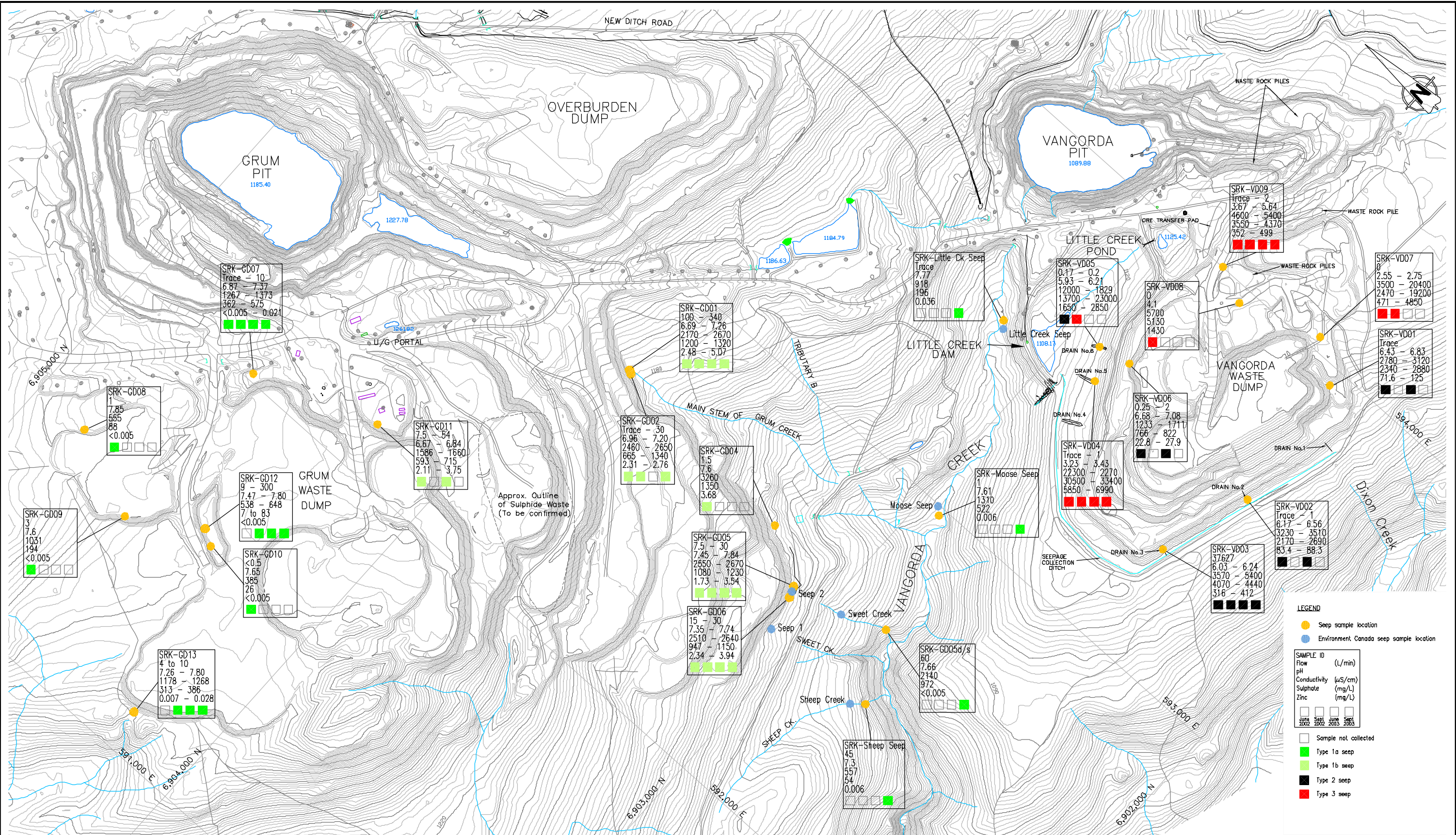
SRK, 2003. Memorandum: 2002 Seepage Surveys. *In* "1CD003.11 Geochemical Studies Of Faro And Vangorda/Grum Waste Rock: Progress Report On Phase 1 And 2", April 2003.

FIGURES

FILE REF: 2003 FARO SITE PLAN-SEEP.DWG

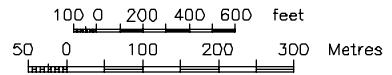


File Ref: Sample_Plan-NAD27.dwg



Faro Mine, Yukon

Contour Interval: 2m
Date of Photography: 03/07/25
Scale of Photography: 1:20000
Survey control derived from existing 1:20000 photography
Survey control based on: UTM Projection, NAD27
Compiled by The ORTHOSHOP, Calgary, September 2003
WO 8856

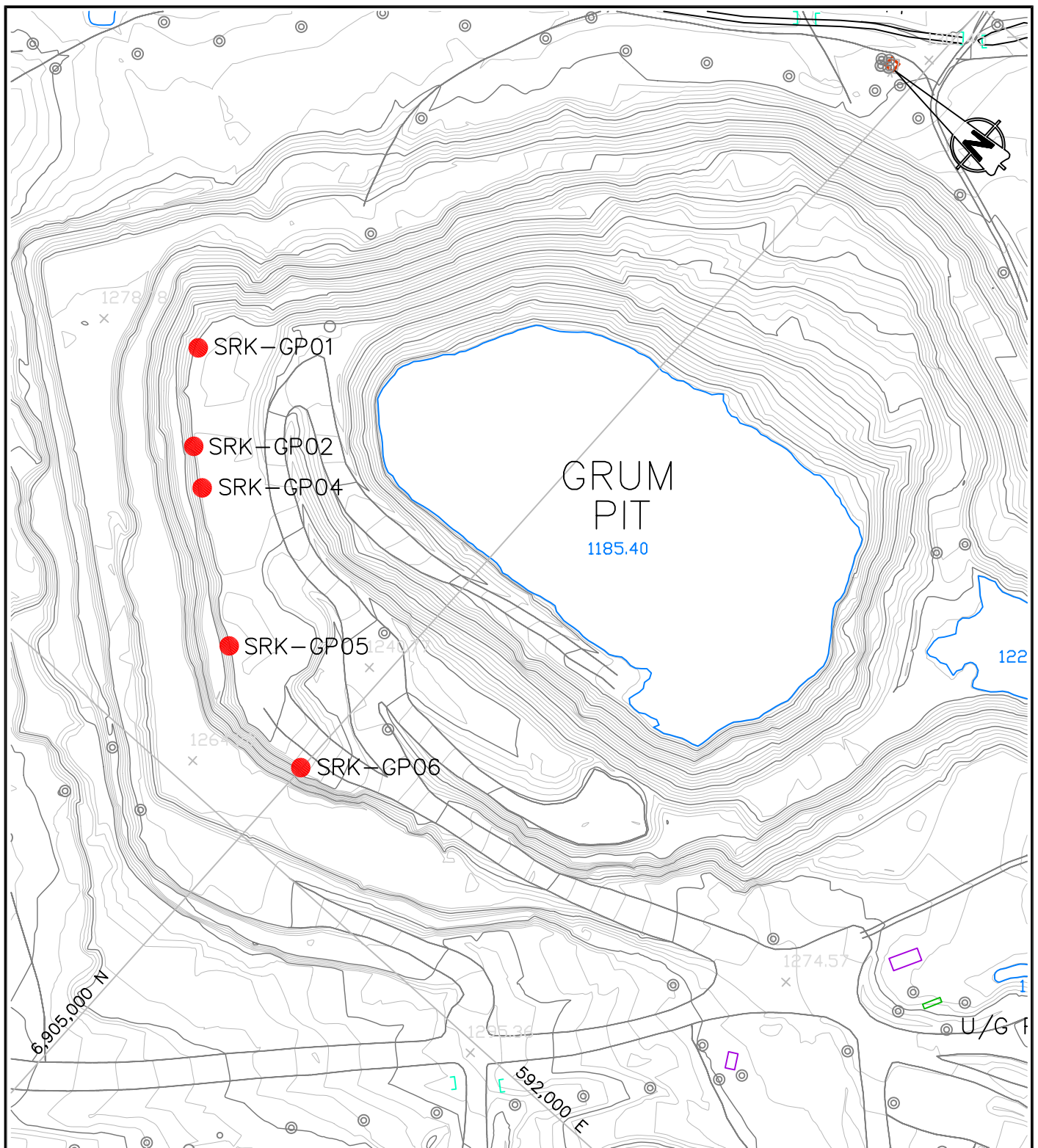


DELOITTE & TOUCHE INC.

VANGORDA PLATEAU MINE

SEEP SURVEY LOCATIONS
VANGORDA & GRUM WASTE DUMPS

PROJECT NO.	DATE	APPROVED	FIGURE
1CD003.11	Nov. 2003	D.B.M.	2



Faro Mine, Yukon

Map Scale: 1:5000
 Contour Interval: 2m
 Date of Photography: 03/07/25
 Scale of Photography: 1:20000
 Survey control derived from existing 1:20000 photography
 Survey control based on: UTM Projection, NAD27
 Compiled by The ORTHOSHOP, Calgary, September 2003
 wo 8856

0 50 100 150 200 250 metres
 1:5000

Note: Preliminary Results to Accompany
 Draft 2003 Seepage Memo
 November, 2003



DELOITTE & TOUCHE INC.

VANGORDA PLATEAU MINE

SEEP SURVEY LOCATIONS
 GRUM PIT

PROJECT NO. 1CD003.24	DATE Nov. 2003	APPROVED D.B.M.	FIGURE 3
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ATTACHMENT A

Seep Survey Results

Sample ID	FARO DUMP									
	SRK-FD01	SRK-FD01	SRK-FD01	SRK-FD01 dup	SRK-FD01 dup	SRK-FD02	SRK-FD02 Duplicate	SRK-FD02B	SRK-FD04	SRK-FD04
Label Sample ID		SRK-FD01		11	14			12		SRK-FD04
Date	10-Jun-02	11-Sep-02	4-Jun-03	13-Sep-03	13-Sep-03	10-Jun-02	10-Jun-02	13-Sep-03	10-Jun-02	11-Sep-02
Label Date		09/11/2002								09/11/2002
Time	15:45	9:40				16:15	16:30		17:20	11:00
Field Parameters										
pH	6.69	6.59	7.26	6.97		7.88	7.88	7.55	2.32	2.54
Conductivity $\mu\text{S/cm}$	3670	1900	3340	3180		1558	1558	1320	23500	7350
Redox mV	139	212	198	312		248	248	421	460	460
Temp $^{\circ}\text{C}$	13.2	4.2	13.2	3.4		1.6	1.6	5.9	17.3	6.2
Flow L/min	6	0.5	-	30		20	20	Trace	No Flow	ponded
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	7.55	7.41	7.76	7.48	7.37	8.2	8.21	8	2.33	2.7
Conductivity $\mu\text{S/cm}$	3560	1800	3230	3050	3070	1520	1530	1230	22600	6370
Dissolved Anions										
Acidity pH 8.3 mg/L	72	22	36	70	61	4	3	14	39900	5780
Alkalinity Total as CaCO_3 mg/L	365	97	297	223	224	165	166	155	-1	-1
Chloride mg/L	4.5	4.3	4.6	3.9	3.9	1.2	1.2	0.9	240	78
Sulphate mg/L	2220	1070	2260	1960	2030	704	831	597	43300	7490
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	857	137
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-8	-1
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	87	9
Barium mg/L	0.02	0.02	0.02	0.03	0.04	0.03	0.03	0.03	-0.4	-0.05
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.2	-0.03
Bismuth mg/L	-2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-10	-1
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-4	-0.5
Cadmium mg/L	0.02	0.02	0.02	0.05	0.05	-0.01	-0.01	0.01	14.4	1.68
Calcium mg/L	543	272	492	463	472	248	232	223	504	160
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	1.1	0.22
Cobalt mg/L	0.02	0.02	0.03	0.03	0.03	-0.01	-0.01	-0.01	9.8	1.38
Copper mg/L	-0.01	-0.01	-0.01	0.03	0.03	-0.01	-0.01	0.01	559	55.4
Iron mg/L	0.36	0.38	5.02	2.53	2.52	-0.03	-0.03	-0.03	9170	1420
Lead mg/L	0.23	0.07	-0.05	0.06	-0.05	-0.05	-0.05	0.15	-2	-0.3
Lithium mg/L	0.03	0.02	0.02	0.03	0.02	-0.01	0.01	0.01	0.8	0.2
Magnesium mg/L	244	87.4	241	214	220	40.5	38.1	26.8	1000	190
Manganese mg/L	3.41	2.06	3.94	3.09	3.02	0.028	0.026	0.422	811	125
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-2	-0.2
Nickel mg/L	0.08	0.05	0.06	0.08	0.08	-0.05	-0.05	-0.05	6	0.8
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-20	-2
Potassium mg/L	11	6	10	7	8	5	5	4	-80	-10
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-8	-1
Silicon mg/L	5.91	2.94	5.46	4.6	4.71	4.5	4.28	3.92	82	16.4
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.6	-0.05
Sodium mg/L	30	17	25	28	30	96	91	28	-80	-10
Strontium mg/L	2.86	1.11	2.35	2.27	2.34	1.4	1.31	0.927	0.5	0.22
Thallium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-20	-1
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-2	-0.2
Titanium mg/L	-0.04	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.4	-0.05
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-2	-0.2
Zinc mg/L	34.6	13.6	21.9	36.8	36.3	0.166	0.153	5.27	9210	1230
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	52	24	52	45	46	17	20	15	909	158
cations (meq)	51	23	48	45	47	20	19	15	1017	159
%diff	1.1%	3.0%	4.1%	0.1%	-0.6%	-7.6%	2.7%	0.0%	-5.6%	-0.2%
Type	2	2	2	2	2	1	1	1	3	3

Sample ID	FARO DUMP									
	SRK-FD04	SRK-FD04B	SRK-FD05	SRK-FD05	SRK-FD05B	SRK-FD05C dup	SRK-FD05C dup	SRK-FD06	SRK-FD06B	SRK-FD06C
Label Sample ID	13			SRK-FD05		4	3		SRK-FD06B	5
Date	13-Sep-03	6-Jun-03	12-Jun-02	10-Sep-02	5-Jun-03	12-Sep-03	12-Sep-03	12-Jun-02	10-Sep-02	12-Sep-03
Label Date				09/10/2002					09/10/2002	
Time			10:30	13:20				11:00	13:50	
Field Parameters										
pH	2.39	2.24	7.23	6.97	7.1	7.75		7.21	7.24	7.15
Conductivity $\mu\text{S/cm}$	34400	22000	1252	882	1664	1161		1118	1045	1745
Redox mV	600	613	317	225	473	361		217	324	412
Temp $^{\circ}\text{C}$	5	15.6	1.2	1.9	1.3	8.8		1.5	2.2	2
Flow L/min	None	0	10	60	Abundant	30		10	240	120
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	2.38	2.4	7.87	7.65	7.72	8.2	8.15	7.97	7.85	8.1
Conductivity $\mu\text{S/cm}$	32300	21900	1240	875	1590	1150	1140	1110	1020	1410
Dissolved Anions										
Acidity pH 8.3 mg/L	49500	28700	16	18	17	3	4	12	14	7
Alkalinity Total as CaCO_3 mg/L	-1	-1	215	172	241	190	187	209	191	211
Chloride mg/L	1050	-0.5	2.4	1.3	2	1.9	2.1	2.4	1.1	2.1
Sulphate mg/L	59000	32300	440	266	774	427	428	382	355	593
Dissolved Metals*										
Aluminum mg/L	986	27	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony mg/L	-10	-10	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	17	-10	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium mg/L	-0.5	-0.5	0.03	0.02	0.04	0.04	0.04	0.02	0.01	0.03
Beryllium mg/L	-0.3	-0.3	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth mg/L	-10	-10	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-5	-5	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	15.5	7	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium mg/L	398	449	151	104	174	153	153	112	95.7	138
Chromium mg/L	0.9	-0.5	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt mg/L	11.3	20	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Copper mg/L	132	-0.5	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron mg/L	15100	1300	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Lead mg/L	-3	-3	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium mg/L	1.3	-0.5	0.03	0.02	0.03	0.02	0.02	0.03	0.02	0.03
Magnesium mg/L	2220	3210	90	53.4	150	68.9	69	85.3	86.9	131
Manganese mg/L	448	2360	0.057	-0.005	0.193	-0.005	-0.005	0.036	-0.005	-0.005
Molybdenum mg/L	-2	-2	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	9	15	0.06	-0.05	0.06	-0.05	-0.05	-0.05	-0.05	-0.05
Phosphorus mg/L	22	-20	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium mg/L	-100	-100	5	3	5	3	3	4	3	4
Selenium mg/L	-10	-10	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	39	23	5.74	5.29	5.48	5.29	5.3	5.3	5.37	5.45
Silver mg/L	-0.5	-0.5	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium mg/L	-100	-100	8	5	9	7	6	7	5	7
Strontium mg/L	-0.3	0.9	0.64	0.439	0.734	0.701	0.695	0.466	0.42	0.637
Thallium mg/L	-10	-10	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin mg/L	-2	-2	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.5	-0.5	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium mg/L	-2	-2	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	10900	6380	2.15	1.08	4.51	0.526	0.525	2.79	2.04	1.98
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	1259	673	13	8	20	12	12	11	11	16
cations (meq)	1490	662	16	10	22	14	14	14	13	19
%diff	-8.4%	0.8%	-11.1%	-9.7%	-5.4%	-7.6%	-7.6%	-8.3%	-9.3%	-8.4%
Type	3	3	1	1	1	1	1	1	1	1

Sample ID	FARO DUMP									
	SRK-FD07	SRK-FD08	SRK-FD09	SRK-FD10	SRK-FD10	SRK-FD10 duplicate	SRK-FD12	SRK-FD12	SRK-FD13	SRK-FD13
Label Sample ID					SRK-FD10			SRK-FD12B		SRK-FD13
Date	12-Jun-02	12-Jun-02	12-Jun-02	12-Jun-02	10-Sep-02	12-Jun-02	12-Jun-02	10-Sep-02	12-Jun-02	12-Sep-02
Label Date					09/10/2002			09/10/2002		09/12/2002
Time	11:30	12:30	16:00	16:30	16:00	17:00	17:30	16:30	18:10	14:30
Field Parameters										
pH	7.31	5.76	6.98	6.17	6.25		6.42	6.24	3.23	4.52
Conductivity $\mu\text{S}/\text{cm}$	1050	2560	2560	5720	7780		5760	5740	5670	2990
Redox mV	260	188	235	87	145		81	173	382	400
Temp $^{\circ}\text{C}$	2.4	8.9	5.9	4.9	5.3		5.5	5.2	15.5	8.1
Flow L/min	No Flow	No Flow	No Flow	80	300		2.4	120	-1	slight
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	7.89	7.32	7.12	6.36	6.58	6.9	6.98	6.91	3.36	4.72
Conductivity $\mu\text{S}/\text{cm}$	1020	1540	2450	5440	5440	5580	5560	5400	5460	2960
Dissolved Anions										
Acidity pH 8.3 mg/L	13	24	61	434	578	432	420	519	1720	200
Alkalinity Total as CaCO_3 mg/L	125	22	54	350	319	350	338	320	-1	12
Chloride mg/L	0.8	0.8	1.8	17.5	17.5	17.6	15	14.4	0.7	-0.5
Sulphate mg/L	484	995	1710	4380	4600	4340	4480	4220	4780	2090
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4	21.7	0.3
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4	-0.6	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4	-0.6	-0.2
Barium mg/L	-0.01	0.02	0.02	0.02	-0.02	0.02	0.02	-0.02	-0.03	-0.01
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.01	-0.005	-0.005	-0.01	0.02	-0.005
Bismuth mg/L	-0.2	-0.2	-0.2	-0.3	-0.4	-0.3	-0.3	-0.4	-0.9	-0.6
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.3	-0.1
Cadmium mg/L	-0.01	-0.01	0.01	0.05	0.02	0.05	0.16	0.08	0.85	0.1
Calcium mg/L	97.8	166	216	538	552	531	542	563	299	268
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.03	-0.01
Cobalt mg/L	0.01	-0.01	0.03	0.47	0.45	0.47	0.47	0.43	1.53	0.28
Copper mg/L	-0.01	-0.01	0.01	-0.01	-0.02	-0.02	0.3	0.11	4.54	0.12
Iron mg/L	-0.03	0.07	0.05	37	57.8	36.7	23.4	35.7	284	0.45
Lead mg/L	-0.05	-0.05	0.1	-0.05	-0.1	-0.05	-0.05	-0.1	1.6	0.31
Lithium mg/L	0.13	-0.01	0.08	0.18	0.13	0.18	0.15	0.12	0.29	0.18
Magnesium mg/L	69.8	114	284	686	630	677	682	627	502	319
Manganese mg/L	0.278	0.188	0.844	54	53.9	53.3	50.4	49.1	64.3	12.6
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.06	-0.03	-0.03	-0.06	-0.09	-0.03
Nickel mg/L	-0.05	0.06	0.16	0.66	0.6	0.65	0.72	0.7	3.2	0.76
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.6	-0.3	-0.3	-0.6	-0.9	-0.3
Potassium mg/L	8	3	13	17	15	18	16	13	12	13
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4	-0.6	-0.2
Silicon mg/L	1.15	6.27	3.07	7.59	7.3	7.46	7.46	7.3	7.8	1.76
Silver mg/L	-0.01	-0.01	-0.01	-0.02	-0.02	-0.01	-0.02	-0.02	-0.03	-0.01
Sodium mg/L	25	5	7	69	60	68	57	50	12	36
Strontium mg/L	1.06	0.473	0.758	3.86	3.67	3.8	3.55	3.48	0.69	1.01
Thallium mg/L	-0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.3	-0.4	-0.6	-0.2
Tin mg/L	-0.03	-0.03	-0.03	0.03	-0.06	-0.03	0.03	-0.06	-0.09	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02	-0.03	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.06	-0.03	-0.03	-0.06	-0.09	-0.03
Zinc mg/L	3.89	3.88	26.4	215	223	211	231	219	751	96.5
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	12	21	37	97	102	97	99	94	100	44
cations (meq)	12	19	37	101	97	100	99	96	102	47
%diff	-1.0%	6.2%	-0.6%	-1.5%	2.1%	-1.8%	-0.1%	-1.1%	-1.4%	-3.0%
Type	1	2	2	2	2	2	2	2	3	3

Sample ID	FARO DUMP									
	SRK-FD13	SRK-FD14	SRK-FD14	SRK-FD14B	SRK-FD16	SRK-FD16	SRK-FD16	SRK-FD17	SRK-FD17	SRK-FD18
Label Sample ID										
Date	5-Jun-03	12-Jun-02	12-Sep-02	6-Jun-03	13-Jun-02	5-Jun-03	11-Sep-03	13-Jun-02	12-Sep-02	13-Jun-02
Label Date			09/12/2002						09/12/2002	
Time		18:30	14:55		9:00			9:25	16:15	9:45
Field Parameters										
pH	5.91	8.14	7.78	6.92	6.61	7.42	7.54	7.16	7.35	6.98
Conductivity $\mu\text{S/cm}$	2820	2740	3400	1499	84	67	125	103	130	177
Redox mV	477	241	275	643	298	508	505	321	316	307
Temp $^{\circ}\text{C}$	12.8	15.3	9.4	8.8	2.1	1.4	4.1	1.6	3.5	1.6
Flow L/min	0	-1	3	0.6	300	40	240	25.5	1.5	
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	6.93	7.7	8.23	7.7	7.79	7.32	8.37	8	7.68	8.01
Conductivity $\mu\text{S/cm}$	2710	2860	3360	2030	82	64	126	101	130	173
Dissolved Anions										
Acidity pH 8.3 mg/L	177	24	8	15	9	3	-1	7	4	11
Alkalinity Total as CaCO_3 mg/L	21	112	137	85	37	30	60	42	54	55
Chloride mg/L	-0.5	1.3	-0.5	-0.5	-0.5	0.7	0.8	0.6	-0.5	0.5
Sulphate mg/L	2290	2260	2470	1420	10	5	7	10	11	28
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium mg/L	-0.01	0.01	-0.01	0.01	0.02	0.02	0.05	0.03	0.04	0.06
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth mg/L	-0.2	-0.2	-0.8	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	0.12	-0.01	-0.01	0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium mg/L	277	223	263	146	12.9	9.97	19.6	15.3	19.1	26.4
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt mg/L	0.3	-0.01	-0.01	0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Copper mg/L	0.04	-0.01	-0.01	0.06	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron mg/L	0.13	-0.03	-0.03	0.89	-0.03	-0.03	0.03	-0.03	-0.03	-0.03
Lead mg/L	0.24	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium mg/L	0.14	0.23	0.2	0.11	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Magnesium mg/L	255	314	378	156	1.9	1.5	2.8	2.6	3.1	4.6
Manganese mg/L	14.9	0.041	0.014	0.363	-0.005	-0.005	0.018	-0.005	-0.005	-0.005
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	0.68	0.07	0.09	0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium mg/L	12	24	21	9	-2	-2	-2	-2	2	-2
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	2.43	0.8	0.87	1.08	5.9	5.41	6.75	5.5	6.22	5.35
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium mg/L	13	122	119	122	-2	-2	-2	-2	-2	-2
Strontium mg/L	0.811	3.32	3.75	1.23	0.045	0.037	0.071	0.046	0.076	0.095
Thallium mg/L	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	112	1.72	4.95	11.2	0.01	0.01	0.013	0.081	0.088	0.102
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	48	49	54	31	1	1	1	1	1	1
cations (meq)	41	44	52	27	1	1	1	1	1	2
%diff	8.1%	4.8%	1.7%	7.2%	-8.0%	-12.5%	-9.2%	-11.7%	-10.4%	-11.4%
Type	3	1	1	2	1	1	1	1	1	1

Sample ID	FARO DUMP									
	SRK-FD18	SRK-FD18	SRK-FD18	SRK-FD19	SRK-FD19	SRK-FD19	SRK-FD19 Duplicate	SRK-FD19B	SRK-FD20	SRK-FD20
Label Sample ID	SRK-FD18		2		SRK-FD19		SRK-FD03	16		SRK-FD20
Date	12-Sep-02	5-Jun-03	11-Sep-03	13-Jun-02	11-Sep-02	6-Jun-03	11-Sep-02	13-Sep-03	13-Jun-02	13-Sep-02
Label Date	09/12/2002				09/11/2002		09/11/2002		09/13/2002	
Time	16:05			11:00	11:30		11:40		14:00	9:10
Field Parameters										
pH	7.33	7.12	6.82	6.98	6.87	7.32		7.25	3.18	2.78
Conductivity $\mu\text{S/cm}$	173	152	141	5030	5110	3550		5240	555	1875
Redox mV	334	515	536	259	283	444		470	492	586
Temp $^{\circ}\text{C}$	3.2	1.1	4	0	0.2	1.3		0.3	8.2	0.9
Flow L/min	1.5	75	Trace	30	30	30		5.2	0.5	60
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	7.72	7.51	8.15	7.52	7.21	7.76	7.27	7.75	3.18	2.82
Conductivity $\mu\text{S/cm}$	170	151	142	4710	4900	4710	5000	5070	572	1820
Dissolved Anions										
Acidity pH 8.3 mg/L	4	5	2	91	115	68	119	67	135	8750
Alkalinity Total as CaCO_3 mg/L	65	57	61	394	386	407	362	403	-1	12
Chloride mg/L	-0.5	1.1	0.8	2	1.6	2.3	1.5	2.5	0.6	-0.5
Sulphate mg/L	19	21	11	3380	3810	3670	3720	3860	193	1170
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.4	-0.2	9.1	46.8
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.4	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.4	-0.2	-0.2	-0.2
Barium mg/L	0.06	0.06	0.08	0.04	0.04	0.04	0.04	0.05	0.03	0.04
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.01	-0.005	-0.01	-0.005	-0.005	0.006
Bismuth mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.5	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1
Cadmium mg/L	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.02	-0.01	-0.01	0.08
Calcium mg/L	26.3	22	21.9	595	628	584	604	598	10.2	35.2
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.02	-0.01	0.01	0.07
Cobalt mg/L	-0.01	-0.01	-0.01	0.06	0.06	0.04	0.06	0.06	0.05	0.25
Copper mg/L	-0.01	-0.01	-0.01	-0.01	0.12	-0.01	-0.02	-0.01	0.99	8.06
Iron mg/L	-0.03	-0.03	-0.03	0.06	2.94	0.07	0.09	0.07	16.9	173
Lead mg/L	-0.05	-0.05	-0.05	-0.05	-0.1	-0.05	-0.1	-0.05	-0.05	-0.05
Lithium mg/L	-0.01	-0.01	-0.01	0.03	0.03	0.03	0.03	0.02	0.01	0.08
Magnesium mg/L	4.3	4	3.4	584	574	536	555	538	9.1	35.8
Manganese mg/L	-0.005	-0.005	-0.005	16.5	19.3	16.1	18.4	19.2	0.603	2.31
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.06	-0.03	-0.06	-0.03	-0.03	-0.03
Nickel mg/L	-0.05	-0.05	-0.05	0.35	0.3	0.27	0.3	0.3	0.06	0.24
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.6	-0.3	-0.6	-0.3	-0.3	0.7
Potassium mg/L	-2	-2	-2	11	10	9	10	8	-2	-2
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.4	-0.2	-0.2	-0.2
Silicon mg/L	6.21	5.04	6.55	6.44	6.3	5.95	6.1	6.23	10.8	16.7
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.02	-0.02	-0.01	-0.01
Sodium mg/L	2	-2	-2	22	20	18	19	18	2	4
Strontium mg/L	0.099	0.084	0.083	3.28	3.29	2.95	3.18	3.02	0.046	0.145
Thallium mg/L	-0.2	-0.2	-0.2	-0.3	-0.4	-0.2	-0.4	-0.2	-0.2	-0.2
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.06	-0.03	-0.06	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.02	-0.01	-0.01	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.06	-0.03	-0.06	-0.03	-0.03	-0.03
Zinc mg/L	0.101	0.082	0.119	43.9	51.3	40.8	46.8	44.9	7.93	59.8
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	1	1	1	77	86	83	83	87	4	25
cations (meq)	2	2	2	84	85	79	83	80	4	22
%diff	-11.4%	-6.9%	-10.8%	-4.2%	0.5%	2.8%	0.5%	4.4%	5.6%	6.7%
Type	1	1	1	2	2	2	2	2	3	3

Sample ID	FARO DUMP									
	SRK-FD20	SRK-FD20	SRK-FD21	SRK-FD21B	SRK-FD21B	SRK-FD22	SRK-FD22B	SRK-FD22B	SRK-FD23	SRK-FD23B
Label Sample ID		6		SRK-FD21B			SRK-FD22B			SRK-FD23B
Date	5-Jun-03	12-Sep-03	13-Jun-02	13-Sep-02	5-Jun-03	13-Jun-02	12-Sep-02	8-Jun-03	13-Jun-02	13-Sep-02
Label Date				09/13/2002			09/12/2002			09/13/2002
Time			15:10	9:30		15:30	17:20		15:50	9:50
Field Parameters										
pH	3.39	2.93	4.57	5.21	6.61	6.59	5.45	6.84	6.39	4.27
Conductivity $\mu\text{S/cm}$	291	834	4370	2860	3270	2270	1766	1460	729	1403
Redox mV	723	778	418	371	372	271	288	632	113	235
Temp $^{\circ}\text{C}$	2.3	2.2	7.1	1.6	11.5	13.4	12	8.1	19.4	36.9
Flow L/min	0	2	1.5	slight	2.7	Trace Flow	slight	Trace	Trace Flow	5
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	4.2	3.66	4.51	5.37	7.51	7.72	6.7	7.48	7.42	4.46
Conductivity $\mu\text{S/cm}$	189	771	4130	2820	3220	2150	1740	1520	708	1450
Dissolved Anions										
Acidity pH 8.3 mg/L	28	176	283	35	40	25	70	65	27	227
Alkalinity Total as CaCO_3 mg/L	-1	-1	8	8	21	179	15	47	31	92
Chloride mg/L	0.6	-0.5	0.8	-0.5	-0.5	0.7	-0.5	-0.5	2.1	0.7
Sulphate mg/L	69	248	3540	1980	2650	1390	1130	1120	346	801
Dissolved Metals*										
Aluminum mg/L	1.8	11.3	27.3	1.5	-0.2	-0.2	1.4	1.6	-0.2	0.6
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium mg/L	0.03	0.04	-0.01	-0.01	0.01	-0.01	0.01	0.03	-0.01	-0.01
Beryllium mg/L	-0.005	-0.005	0.009	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth mg/L	-0.2	-0.2	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	-0.01	0.02	0.17	0.05	0.08	0.01	0.07	0.07	0.08	0.22
Calcium mg/L	6.45	18	410	322	378	346	239	235	49.1	73.5
Chromium mg/L	-0.01	0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt mg/L	-0.01	0.06	0.28	0.03	0.06	0.02	0.04	0.06	0.13	0.38
Copper mg/L	0.24	1.94	2.59	0.3	0.12	-0.01	0.45	0.5	-0.01	0.2
Iron mg/L	1.45	32.2	0.06	-0.03	-0.03	-0.03	0.07	0.07	2.14	50
Lead mg/L	-0.05	-0.05	0.09	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium mg/L	-0.01	0.03	0.11	0.03	0.04	0.07	0.07	0.07	0.04	0.06
Magnesium mg/L	3.8	13.2	504	256	358	158	88.2	91.2	53.6	104
Manganese mg/L	0.161	0.672	6.79	1.26	2.06	1.24	2.37	3.71	2.84	7.44
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	-0.05	0.08	0.53	0.18	0.25	0.07	0.06	0.09	0.13	0.37
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium mg/L	-2	-2	14	10	11	9	9	8	3	3
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	9.49	13.9	8.54	3.15	4.02	2.51	3.37	3.5	3.65	5.21
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium mg/L	2	3	14	8	10	4	5	5	3	3
Strontium mg/L	0.044	0.095	1.73	1.02	1.35	1.23	0.816	0.836	0.183	0.23
Thallium mg/L	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	2.2	13.4	65	17	26.2	7.19	41	42.7	8.89	43.4
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	1	5	74	41	56	32	24	24	8	18
cations (meq)	1	6	71	40	52	32	22	22	8	17
%diff	12.6%	-4.2%	2.3%	2.1%	3.7%	0.3%	4.9%	5.2%	-0.4%	2.6%
Type	3	3	3	3	2	2	3	2	2	3

Sample ID	FARO DUMP									
	SRK-FD23B	SRK-FD24	SRK-FD24	SRK-FD24	SRK-FD24	SRK-FD24 Duplicate	SRK-FD24 Duplicate	SRK-FD26	SRK-FD26	SRK-FD26
Label Sample ID	7		SRK-FD24		8		SRK-FD25		SRK-FD26	
Date	12-Sep-03	13-Jun-02	13-Sep-02	5-Jun-03	12-Sep-03	13-Jun-02	13-Sep-02	13-Jun-02	12-Sep-02	5-Jun-03
Label Date			09/13/2002				09/13/2002		09/12/2002	
Time		16:25	10:10			16:35	10:20	16:45	15:20	
Field Parameters										
pH	6.19	6.95	5.12	6.46	6.85			6.76	6.56	6.78
Conductivity $\mu\text{S/cm}$	772	1323	902	1335	1446			875	1117	1209
Redox mV	299	71	196	325	331			212	345	418
Temp $^{\circ}\text{C}$	8.8	8.4	3.2	13.5	2.6			2.7	2.6	2.9
Flow L/min	Trace	300	1000	10	21			Good Flow	>1000	400
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	5.47	7.32	7.32	7.42	6.91	7.43	7.84	7.68	7.51	7.62
Conductivity $\mu\text{S/cm}$	723	1310	884	1370	921	1280	883	797	1030	1160
Dissolved Anions										
Acidity pH 8.3 mg/L	50	46	27	38	45	44	26	17	15	17
Alkalinity Total as CaCO_3 mg/L	4	88	90	59	82	88	93	163	198	229
Chloride mg/L	1.3	2	1	0.8	1.3	1.9	0.6	1.8	1.2	2.3
Sulphate mg/L	378	710	406	864	444	793	400	298	391	501
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium mg/L	0.01	-0.01	0.01	-0.01	0.02	-0.01	0.01	0.02	0.03	0.03
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	0.09	0.03	0.02	0.02	0.02	0.03	0.02	-0.01	-0.01	-0.01
Calcium mg/L	50.7	138	77.7	169	92.4	135	80.2	82.2	116	127
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt mg/L	0.15	0.06	0.04	0.06	0.05	0.06	0.03	-0.01	-0.01	-0.01
Copper mg/L	0.05	0.03	0.03	0.02	0.04	0.03	0.02	-0.01	-0.01	-0.01
Iron mg/L	20.2	2.47	2.51	5.35	3.47	2.39	2.61	-0.03	-0.03	-0.03
Lead mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium mg/L	0.05	0.04	0.03	0.04	0.03	0.04	0.03	0.02	0.03	0.03
Magnesium mg/L	57.5	90.4	52.2	99.2	65.6	88	54.1	51.4	76.3	95.2
Manganese mg/L	3.31	2.46	1.21	2.79	1.65	2.41	1.26	0.081	0.151	0.088
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	0.14	0.11	0.05	0.12	0.07	0.11	0.06	-0.05	-0.05	-0.05
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium mg/L	3	4	4	5	3	4	2	3	4	4
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	4	5.1	4.22	6.07	5.44	4.95	4.37	4.9	5.79	5.79
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium mg/L	3	4	3	5	4	4	3	4	6	7
Strontium mg/L	0.185	0.449	0.252	0.494	0.309	0.438	0.26	0.32	0.461	0.529
Thallium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	15.9	26.8	13.3	25.2	18.9	26.3	13.8	1.28	2.02	1.49
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	8	16	10	19	11	18	10	9	11	14
cations (meq)	9	16	9	19	11	17	11	9	13	15
%diff	-8.5%	0.6%	3.6%	1.0%	-3.6%	3.7%	-3.2%	0.2%	-6.0%	-2.9%
Type	2	2	3	2	2	2	3	1	1	1

Sample ID	FARO DUMP									
	SRK-FD26	SRK-FD26 Duplicate	SRK-FD26 Duplicate	SRK-FD27	SRK-FD27	SRK-FD27	SRK-FD30	SRK-FD30	SRK-FD30	SRK-FD31
Label Sample ID	9	SRK-FD29	duplicate		SRK-FD27		SRK-FD30		17	SRK-FD31
Date	12-Sep-03	12-Sep-02	5-Jun-03	13-Jun-02	12-Sep-02	5-Jun-03	10-Sep-02	6-Jun-03	13-Sep-03	10-Sep-02
Label Date		09/12/2002			09/12/2002		09/10/2002			09/10/2002
Time		15:30		17:15	15:10		15:05			16:45
Field Parameters										
pH	6.85		#N/A	6.98	3.33	6.91	6.4	6.09	5.9	6.37
Conductivity $\mu\text{S/cm}$	1446		#N/A	1552	2590	1375	3740	2100	3330	5750
Redox mV	331		#N/A	237	392	369	360	657	423	181
Temp $^{\circ}\text{C}$	2.6		#N/A	18.8	11.6	17.3	6.6	11.9	5.8	6.2
Flow L/min	21		#N/A	Trace Flow	slight	0	ponded	0	None	300
Notes										
Easting							584166			na
Northing							6913360			
Photo							steve			
Laboratory Parameters										
pH	7.48	7.33	7.57	7.46	3.86	7.55	6.91	7.7	7.68	6.46
Conductivity $\mu\text{S/cm}$	1410	1020	1160	1510	2350	1350	3590	1850	2600	5420
Dissolved Anions										
Acidity pH 8.3 mg/L	29	27	16	48	350	37	60	37	21	585
Alkalinity Total as CaCO_3 mg/L	242	199	222	43	-1	52	36	25	61	333
Chloride mg/L	2.7	1.3	2.3	0.5	-0.5	-0.5	0.9	0.5	1.4	15
Sulphate mg/L	617	383	457	1050	1650	847	2670	1430	1800	4350
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	9.2	-0.2	-0.4	-0.2	-0.2	-0.4
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4
Barium mg/L	0.03	0.03	0.03	-0.01	-0.01	0.01	-0.02	0.02	0.02	-0.02
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	0.005	-0.005	-0.01	-0.005	-0.005	-0.01
Bismuth mg/L	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.4	-0.2	-0.2	-0.4
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2
Cadmium mg/L	-0.01	-0.01	-0.01	0.04	0.25	0.04	-0.02	-0.01	-0.01	0.08
Calcium mg/L	151	113	128	140	240	133	261	199	218	576
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02
Cobalt mg/L	-0.01	-0.01	-0.01	0.03	0.2	0.02	0.09	0.01	0.1	0.44
Copper mg/L	-0.01	-0.01	-0.01	-0.01	3.3	0.02	-0.02	-0.01	-0.01	0.12
Iron mg/L	-0.03	-0.03	-0.03	-0.03	40.4	0.06	-0.06	0.17	2.54	36.7
Lead mg/L	-0.05	-0.05	-0.05	-0.05	0.81	-0.05	-0.1	-0.05	-0.05	-0.1
Lithium mg/L	0.04	0.02	0.03	0.09	0.11	0.07	0.22	0.09	0.17	0.12
Magnesium mg/L	114	74	96.3	123	166	110	472	195	317	640
Manganese mg/L	0.351	0.144	0.087	1.46	9.38	1.55	7.52	0.566	6.72	50.3
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.06	-0.03	-0.03	-0.06
Nickel mg/L	-0.05	-0.05	-0.05	0.11	0.35	0.1	0.6	0.21	0.33	0.7
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.6	-0.3	-0.3	-0.6
Potassium mg/L	4	3	4	8	8	8	12	7	11	13
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4
Silicon mg/L	5.34	5.63	5.81	1.69	6.66	1.95	2.6	4.08	6.29	7.5
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02
Sodium mg/L	8	6	8	3	4	3	14	12	17	51
Strontium mg/L	0.632	0.448	0.527	0.617	0.731	0.581	1.56	0.819	1.16	3.56
Thallium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.06	-0.03	-0.03	-0.06
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.06	-0.03	-0.03	-0.06
Zinc mg/L	3.81	1.96	1.5	29.4	180	26.5	30.4	26.1	6.89	223
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	17	11	13	23	34	19	56	30	39	97
cations (meq)	18	14	16	19	36	17	56	28	40	98
%diff	-3.3%	-9.0%	-10.4%	8.6%	-2.1%	3.0%	0.0%	3.0%	-2.0%	-0.6%
Type	1	1	1	2	3	2	2	2	2	2

Sample ID	FARO DUMP									
	SRK-FD31	SRK-FD31	SRK-FD31 Duplicate	SRK-FD32	SRK-FD33	SRK-FD33	SRK-FD34	SRK-FD35	SRK-FD36	SRK-FD36
Label Sample ID		18	SRK-FD11	SRK-FD32	SRK-FD33		SRK-FD34	SRK-FD35	SRK-FD36	
Date	6-Jun-03	09/13/2003	10-Sep-02	10-Sep-02	11-Sep-02	8-Jun-03	11-Sep-02	11-Sep-02	11-Sep-02	8-Jun-03
Label Date			09/10/2002	09/10/2002	09/11/2002		09/11/2002	09/11/2002	09/11/2002	
Time			17:00	17:00	8:20		8:35	9:00	10:20	
Field Parameters										
pH	6.82	6.9		6.38	5.96	5.49	5.95	6.22	2.75	2.63
Conductivity $\mu\text{S/cm}$	5490	5620		3580	4540	5010	1242	1654	3540	4650
Redox mV	201	230		81	85	524	152	266	521	752
Temp $^{\circ}\text{C}$	10.4	6.4		9.6	6.2	10.9	4.6	7	5.5	7.6
Flow L/min	120	120		60	30	Trace	60	30	10	0.75
Notes										
Easting				na	583129		583136	583124	584126	
Northing					6914113		6914116	6914072	6914351	
Photo					yes		yes	yes (x2)	yes	
Laboratory Parameters										
pH	7.16	7.2	6.52	4.86	5.36	5.82	6.63	6.54	2.78	2.72
Conductivity $\mu\text{S/cm}$	5260	5430	5410	3410	4250	5210	1190	1600	3410	4250
Dissolved Anions										
Acidity pH 8.3 mg/L	274	207	567	2160	1590	2780	227	37	1530	2500
Alkalinity Total as CaCO_3 mg/L	301	331	330	13	31	14	8	33	-1	-1
Chloride mg/L	16.7	16.1	14.6	2.6	2.9	4.7	0.5	1.7	19.4	23.8
Sulphate mg/L	4560	4110	4300	2790	3620	5340	700	962	2810	3460
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.4	-0.6	-1	4	-0.2	0.3	38.9	73
Antimony mg/L	-0.2	-0.2	-0.4	-0.6	-1	-4	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.4	-0.6	-1	-4	-0.2	-0.2	-0.2	-0.2
Barium mg/L	0.02	0.02	0.02	-0.03	-0.05	-0.2	0.03	0.01	-0.01	-0.01
Beryllium mg/L	-0.005	-0.005	-0.01	-0.02	-0.03	-0.1	-0.005	-0.005	0.011	0.021
Bismuth mg/L	-0.6	-0.9	-0.4	-0.6	-1	-4	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.2	-0.3	-0.5	-2	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	0.06	0.03	0.08	0.46	0.88	6.9	0.12	-0.01	0.23	0.37
Calcium mg/L	517	519	567	322	355	475	107	272	250	361
Chromium mg/L	-0.01	-0.01	-0.02	-0.03	-0.05	-0.2	-0.01	-0.01	0.12	0.2
Cobalt mg/L	0.38	0.41	0.45	0.5	0.9	1.7	0.08	0.03	0.52	0.87
Copper mg/L	0.04	0.03	0.12	-0.03	0.34	3.1	0.14	0.07	4.2	6.75
Iron mg/L	28.2	22.9	36.2	89.9	236	1.3	33.9	1.42	274	416
Lead mg/L	-0.05	-0.05	-0.1	-0.2	-0.3	2	0.36	-0.05	1.17	1.37
Lithium mg/L	0.12	0.13	0.13	0.07	0.12	-0.2	0.02	0.03	0.14	0.25
Magnesium mg/L	655	694	629	168	221	211	38.8	51.1	120	216
Manganese mg/L	48.6	49.9	49.3	36.5	63.4	64.2	5.67	3.84	13.6	25
Molybdenum mg/L	-0.03	-0.03	-0.06	-0.09	-0.2	-0.6	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	0.58	0.58	0.7	0.6	0.8	-1	0.08	-0.05	1.05	1.6
Phosphorus mg/L	-0.3	-0.3	-0.6	-0.9	-2	-6	-0.3	-0.3	-0.3	0.6
Potassium mg/L	14	15	13	8	-10	-40	3	7	5	7
Selenium mg/L	-0.2	-0.2	-0.4	-0.6	-1	-4	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	6.93	7.21	7.4	4.2	6.5	9	2.06	11.9	23.3	29.6
Silver mg/L	-0.01	-0.01	-0.02	-0.03	-0.05	-0.2	-0.01	-0.01	-0.01	-0.01
Sodium mg/L	56	58	50	42	50	46	14	34	6	8
Strontium mg/L	3.41	3.76	3.47	1.25	1.54	0.7	0.347	0.715	0.7	1.01
Thallium mg/L	0.2	-0.3	0.5	-0.6	-1	-4	-0.2	-0.2	-0.3	0.4
Tin mg/L	-0.03	-0.03	-0.06	-0.09	-0.2	-0.6	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.02	-0.03	-0.05	-0.2	-0.01	-0.01	-0.01	0.01
Vanadium mg/L	-0.03	-0.03	-0.06	-0.09	-0.2	-0.6	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	162	152	220	581	1110	2260	128	13.7	151	222
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	100	92	95	58	76	112	15	21	59	73
cations (meq)	94	97	97	57	88	117	15	20	47	76
%diff	3.4%	-2.9%	-0.9%	1.5%	-7.6%	-2.4%	-2.1%	0.6%	10.9%	-1.8%
Type	2	2	2	2	3	3	3	2	3	3

Sample ID	FARO DUMP							GRUM DUMP		
	SRK-FD37	SRK-FD37	SRK-FD38	SRK-FD38B	SRK-FD40	SRK-FD40	SRK-FD40 (A30)	SRK-FD44	SRK-FD46	SRK-GD01
Label Sample ID	SRK-FD37		SRK-FD38			10	SRK-FD40		19	
Date	11-Sep-02	8-Jun-03	12-Sep-02	8-Jun-03	6-Jun-03	12-Sep-03	13-Sep-02	8-Jun-03	13-Sep-03	11-Jun-02
Label Date	09/11/2002		09/12/2002				09/13/2002			
Time	10:40		16:55				8:45			10:10
Field Parameters										
pH	2.44	2.38	7	3.07	3.35	6.2	3.23	7.1	2.88	6.69
Conductivity $\mu\text{S}/\text{cm}$	12740	11980	3970	2440	789	692	938	2470	5750	2170
Redox mV	438	663	313	689	738	494	540	621	652	272
Temp $^{\circ}\text{C}$	10.1	7.8	8.6	6.8	1.4	3.1	4.9	7.7	5.6	1.8
Flow L/min	300	120	2.5	10	Abundant	120	>1000	1	15	100
Notes										
Easting	583591		584310				na			
Northing	6914218		6914389				na			
Photo	yes		yes (x2)							
Laboratory Parameters										
pH	2.66	2.59	6.83	3.21	3.5	7.24	3.52	6.84	2.8	7.66
Conductivity $\mu\text{S}/\text{cm}$	12700	10300	3830	2240	780	676	877	2290	5670	2080
Dissolved Anions										
Acidity pH 8.3 mg/L	12500	10900	792	740	117	43	135	99	6550	38
Alkalinity Total as CaCO_3 mg/L	-1	-1	83	-1	-1	29	-1	83	-1	337
Chloride mg/L	-0.5	-0.5	0.7	-0.5	0.7	0.5	-0.5	-0.5	5.5	1.7
Sulphate mg/L	16500	13200	3380	1690	379	334	445	1850	5040	1220
Dissolved Metals*										
Aluminum mg/L	117	71.1	-0.6	9.1	4.1	-0.2	4	-0.2	71	-0.2
Antimony mg/L	-6	0.3	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2
Arsenic mg/L	28	9.7	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2
Barium mg/L	-0.3	-0.01	-0.03	-0.01	0.03	0.02	0.02	0.01	-0.1	0.03
Beryllium mg/L	-0.2	0.009	-0.02	0.005	-0.005	-0.005	-0.005	-0.005	-0.05	-0.005
Bismuth mg/L	-6	-0.2	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2
Boron mg/L	-3	0.5	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	-1	-0.1
Cadmium mg/L	12.6	10	0.62	0.45	0.06	0.02	0.07	0.04	1.8	-0.01
Calcium mg/L	268	216	504	235	23.2	69.7	33.6	300	190	283
Chromium mg/L	-0.3	-0.01	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	-0.1	-0.01
Cobalt mg/L	4.8	3.23	0.53	0.26	0.12	-0.01	0.13	0.12	1.2	-0.01
Copper mg/L	133	120	0.06	2.38	0.53	0.01	0.58	-0.01	7.8	-0.01
Iron mg/L	1780	1040	-0.09	33.8	3.91	-0.03	2.51	0.04	385	-0.03
Lead mg/L	-2	0.6	-0.2	1.78	0.08	-0.05	0.1	-0.05	0.9	-0.05
Lithium mg/L	-0.3	0.13	0.13	0.06	0.01	0.01	0.02	0.16	0.2	0.02
Magnesium mg/L	310	235	215	67.9	47.1	37	52.5	215	293	141
Manganese mg/L	166	132	44.4	16	3.19	0.037	3.79	5.73	78.4	0.059
Molybdenum mg/L	-0.9	-0.03	-0.09	-0.03	-0.03	-0.03	-0.03	-0.03	-0.3	-0.03
Nickel mg/L	5	3.17	0.9	0.32	0.1	0.06	0.12	0.16	1.5	0.26
Phosphorus mg/L	-9	3.2	-0.9	-0.3	-0.3	-0.3	-0.3	-0.3	-3	-0.3
Potassium mg/L	-60	-2	10	4	-2	-2	-2	15	-20	5
Selenium mg/L	-6	0.7	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2
Silicon mg/L	29	16.7	6.3	5.51	5.82	9.25	8.02	1.18	3.7	3.98
Silver mg/L	-0.3	0.1	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	-0.1	-0.01
Sodium mg/L	-60	-2	11	3	2	3	3	11	-20	7
Strontium mg/L	0.5	0.283	1.78	0.499	0.118	0.19	0.154	1.68	0.33	0.914
Thallium mg/L	-6	0.6	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2
Tin mg/L	-0.9	-0.03	-0.09	-0.03	-0.03	-0.03	-0.03	-0.03	-0.3	-0.03
Titanium mg/L	-0.3	-0.01	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	0.1	-0.01
Vanadium mg/L	-0.9	-0.03	-0.09	-0.03	-0.03	-0.03	-0.03	-0.03	-0.3	-0.03
Zinc mg/L	6130	7840	595	287	38.9	20.7	46.7	28.2	1380	5.07
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	344	275	72	35	8	7	9	40	105	31
cations (meq)	347	340	65	30	7	8	9	36	110	27
%diff	-0.4%	-10.5%	5.3%	7.9%	3.7%	-0.6%	4.1%	5.6%	-2.2%	6.8%
Type	3	3	2	3	3	2	3	2	3	1b

Sample ID	GRUM DUMP									
	SRK-GD01	SRK-GD01	SRK-GD01	SRK-GD01 dup	SRK-GD02	SRK-GD02	SRK-GD02	SRK-GD02 duplicate	SRK-GD04	SRK-GD05
Label Sample ID	SRK-GD01		26	31		SRK-GD02	27			
Date	11-Sep-02	4-Jun-03	09/14/2003	14-Sep-03	11-Jun-02	11-Sep-02	14-Sep-03	11-Jun-02	11-Jun-02	11-Jun-02
Label Date	09/11/2002					09/11/2002				
Time	14:50				10:40	14:35		11:10	11:30	12:00
Field Parameters										
pH	6.91	6.93	7.26		7.02	6.96	7.2		7.6	7.74
Conductivity $\mu\text{S}/\text{cm}$	2490	2670	2610		2460	2540	2650		3260	2670
Redox mV	272	488	459		235	298	444		248	273
Temp $^{\circ}\text{C}$	2.5	2.4	2.5		3.2	4	2.2		2.5	3.1
Flow L/min	340	105	150		30	2	Trace		1.5	7.5
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	7.27	7.82	8.09	8.04	8.02	7.56	8.07	7.85	8.06	8.14
Conductivity $\mu\text{S}/\text{cm}$	2460	2530	2530	2520	2430	1580	2580	2400	3220	2570
Dissolved Anions										
Acidity pH 8.3 mg/L	69	25	16	18	19	27	16	30	18	13
Alkalinity Total as CaCO_3 mg/L	497	534	559	556	494	278	574	494	477	527
Chloride mg/L	1.5	2.2	2.4	2.3	1.8	0.9	2.4	1.9	1.9	2.2
Sulphate mg/L	1200	1320	1210	1330	1100	665	1340	1130	1350	1220
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium mg/L	0.06	0.05	0.05	0.05	0.04	0.04	0.06	0.04	0.02	0.03
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth mg/L	-0.4	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium mg/L	351	316	367	351	302	335	380	296	352	358
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01	0.03	-0.01
Copper mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Lead mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium mg/L	0.02	0.03	0.02	0.02	0.02	0.01	0.01	0.02	0.04	0.04
Magnesium mg/L	216	223	233	228	206	213	251	200	347	211
Manganese mg/L	0.062	0.044	0.053	0.051	0.121	0.114	-0.005	0.159	0.207	0.189
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	0.29	0.43	0.34	0.32	0.34	0.32	0.29	0.32	0.42	0.59
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium mg/L	8	8	8	8	8	7	8	7	10	8
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	4.09	4.36	4.46	4.32	3.74	3.89	4.45	3.66	3.65	5.66
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01
Sodium mg/L	9	10	10	9	10	9	10	9	16	14
Strontium mg/L	1.31	1.3	1.48	1.36	1.2	1.26	1.58	1.17	1.59	1.52
Thallium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	2.48	4.58	2.98	2.94	2.76	2.31	2.31	2.77	3.68	3.54
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	33	36	34	37	31	18	37	32	36	34
cations (meq)	37	36	39	39	34	36	42	34	49	37
%diff	-5.5%	0.4%	-6.7%	-2.9%	-4.2%	-32.2%	-5.3%	-3.3%	-15.2%	-4.3%
Type	1b	1b	1b	1b	1b	1b	1b	1b	1b	1b

Sample ID	GRUM DUMP									
	SRK-GD05	SRK-GD05B	SRK-GD05B	SRK-GD06	SRK-GD06	SRK-GD06	SRK-GD06	SRK-GD07	SRK-GD07	SRK-GD07
Label Sample ID	SRK-GD05B		24		SRK-GD06		25			28
Date	11-Sep-02	4-Jun-03	09/14/2003	11-Jun-02	11-Sep-02	4-Jun-03	14-Sep-03	11-Jun-02	4-Jun-03	14-Sep-03
Label Date	09/11/2002				09/11/2002					
Time	14:00			13:00	13:50			14:00		
Field Parameters										
pH	7.45	7.8	7.84	7.62	7.35	7.67	7.74	7.24	7.37	6.97
Conductivity $\mu\text{S/cm}$	2550	2550	2610	2640	2540	2510	2540	1267	1328	1373
Redox mV	292	421	402	269	314	473	486	254	424	
Temp $^{\circ}\text{C}$	3.7	3.9	1.7	3.5	3.1	3.1	3.1	3.1	2.4	5
Flow L/min	30	20	21	15	30	-	15	5	10	Trace
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	7.88	8.04	8.11	8.1	8	8.02	8.28	8.18	7.73	8.08
Conductivity $\mu\text{S/cm}$	2470	2480	2510	2540	2480	2430	2500	1210	1300	1360
Dissolved Anions										
Acidity pH 8.3 mg/L	28	15	14	17	26	18	1	6	15	9
Alkalinity Total as CaCO_3 mg/L	600	638	627	557	700	643	646	336	338	405
Chloride mg/L	1.9	2.4	2.8	2.5	1.8	2.6	2.5	2	1.9	2.5
Sulphate mg/L	1080	1230	1180	947	1040	1150	1120	413	575	455
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium mg/L	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.07	0.05	0.06
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth mg/L	-0.3	-0.2	-0.2	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium mg/L	349	312	337	361	348	337	325	178	194	219
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Copper mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Lead mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium mg/L	0.03	0.03	0.03	0.04	0.02	0.03	0.03	-0.01	-0.01	-0.01
Magnesium mg/L	199	199	212	209	196	214	199	69.6	79.1	74.1
Manganese mg/L	0.008	0.007	0.013	0.23	0.008	0.011	0.008	-0.005	-0.005	0.007
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	0.51	0.38	0.44	0.52	0.42	0.38	0.41	-0.05	-0.05	-0.05
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium mg/L	7	7	7	9	7	7	7	4	3	3
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	6.06	5.51	5.66	5.87	6.07	6.15	5.64	3.79	4	5.08
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium mg/L	11	12	11	14	11	13	11	3	3	3
Strontium mg/L	1.41	1.36	1.48	1.56	1.39	1.49	1.41	0.604	0.656	0.75
Thallium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin mg/L	-0.03	-0.03	-0.03	0.04	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	2.65	1.73	2.02	3.94	2.73	2.39	2.34	0.021	0.008	-0.005
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	32	36	35	29	33	35	34	14	18	16
cations (meq)	36	34	36	37	35	36	34	15	17	18
%diff	-4.6%	3.5%	-1.5%	-12.5%	-2.9%	-2.4%	-0.5%	-3.5%	2.2%	-4.2%
Type	1b	1b	1b	1b	1b	1b	1b	1a	1a	1a

Sample ID	GRUM DUMP									
	SRK-GD07B	SRK-GD09	SRK-GD10	SRK-GD11	SRK-GD11	SRK-GD12	SRK-GD12	SRK-GD12	SRK-GD13	SRK-GD13
Label Sample ID	SRK-GD07B					SRK-GD12		29	SRK-GD13	
Date	11-Sep-02	11-Jun-02	11-Jun-02	11-Jun-02	4-Jun-03	11-Sep-02	4-Jun-03	14-Sep-03	12-Sep-02	4-Jun-03
Label Date	09/11/2002					09/11/2002			09/12/2002	
Time	17:00	15:05	15:30	16:30		16:05			13:15	
Field Parameters										
pH	6.87	7.6	7.65	6.67	6.84	7.47	7.76	7.8	7.8	7.35
Conductivity $\mu\text{S}/\text{cm}$	1332	1031	385	1586	1660	648	538	621	1190	1178
Redox mV	2.45	238	256	232	434	335	379	475	201	414
Temp $^{\circ}\text{C}$	3.7	4.6	5.6	2.5	3.2	2.8	1.7	3.6	4.6	1.5
Flow L/min	2	3	-0.5	54	7.5	300	-	9	10	4
Notes										
Easting						na				
Northing						na				
Photo										
Laboratory Parameters										
pH	7.51	8.22	8.3	7.69	7.59	7.87	7.95	8.31	7.73	8.05
Conductivity $\mu\text{S}/\text{cm}$	1250	999	384	1570	1610	6300	517	618	1190	1150
Dissolved Anions										
Acidity pH 8.3 mg/L	40	3	-1	31	23	13	5	-1	29	7
Alkalinity Total as CaCO_3 mg/L	405	379	186	371	413	268	227	289	388	402
Chloride mg/L	1.8	2.1	1.3	2.1	2.3	-0.5	1.3	1.7	0.9	1.4
Sulphate mg/L	362	194	26	593	715	83	7	81	386	313
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium mg/L	0.11	0.11	0.05	0.05	0.03	0.1	0.07	0.09	0.11	0.09
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium mg/L	205	142	45.4	201	208	86.3	60.9	75.5	168	153
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Copper mg/L	-0.01	-0.01	-0.01	0.01	0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Lead mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium mg/L	-0.01	-0.01	-0.01	0.02	0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Magnesium mg/L	63.6	54.5	24.2	108	121	40.4	34.2	39	71.4	70.6
Manganese mg/L	1.92	-0.005	-0.005	0.26	0.425	0.028	-0.005	-0.005	0.007	0.053
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	-0.05	-0.05	-0.05	0.22	0.28	-0.05	-0.05	-0.05	-0.05	0.07
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium mg/L	2	-2	-2	4	3	-2	-2	-2	3	-2
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	4.61	3.23	3.32	3.39	3.83	4.02	3.34	4.23	5.69	5.05
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium mg/L	3	-2	-2	4	5	2	-2	-2	3	3
Strontium mg/L	0.719	0.492	0.205	0.815	0.864	0.329	0.256	0.322	0.823	0.788
Thallium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	0.01	-0.005	-0.005	2.11	3.75	-0.005	-0.005	-0.005	0.028	0.007
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	14	10	4	18	22	6	4	6	14	13
cations (meq)	16	12	5	20	21	8	6	7	15	14
%diff	-6.0%	-7.6%	-11.1%	-3.4%	0.8%	-13.1%	-22.6%	-6.2%	-1.4%	-3.1%
Type	1a	1a	1a	1b	1b	1a	1a	1a	1a	1a

Sample ID	GRUM DUMP		VANGORDA DUMP							
	SRK-GD13	SRK-GD13 duplicate	SRK-VD01	SRK-VD01	SRK-VD02	SRK-VD02- Drain 2	SRK-VD03	SRK-VD03 duplicate	SRK-VD03	SRK-VD03- Drain 3
Label Sample ID	30	duplicate						duplicate	20	
Date	14-Sep-03	4-Jun-03	10-Jun-02	6-Jun-03	6-Jun-03	10-Jun-02	6-Jun-03	6-Jun-03	14-Sep-03	10-Jun-02
Label Date										
Time			10:30			11:00				11:30
Field Parameters										
pH	7.26	#N/A	6.43	6.83	6.56	6.17	6.14	#N/A	6.24	6.03
Conductivity $\mu\text{S/cm}$	1268	#N/A	3120	2780	3510	3230	5020	#N/A	3570	5350
Redox mV	418	#N/A	136	390	352	112	242	#N/A	245	97
Temp $^{\circ}\text{C}$	1.6	#N/A	10	11.4	16	8.8	13.3	#N/A	5	7.3
Flow L/min	9	#N/A	Trace Flow	Trace	Trace	1	2.1	#N/A	1	6
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	8.24	8.08	7.23	6.62	7.03	7.07	6.72	6.52	6.28	6.84
Conductivity $\mu\text{S/cm}$	1230	1160	3080	3210	3270	3180	4580	4670	5180	5220
Dissolved Anions										
Acidity pH 8.3 mg/L	2	6	115	224	182	171	661	655	581	719
Alkalinity Total as CaCO_3 mg/L	392	399	38	27	258	289	192	184	164	187
Chloride mg/L	1.6	1.7	-0.5	-0.5	-0.5	1.2	-0.5	-0.5	1.2	1.3
Sulphate mg/L	338	323	2340	2880	2690	2170	4200	4390	4440	4400
Dissolved Metals*										
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4
Barium mg/L	0.11	0.1	-0.01	-0.01	0.02	0.02	-0.02	-0.02	-0.02	0.02
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.01	-0.01	-0.01	-0.01
Bismuth mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.4	-0.4	-0.4	-0.6
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2
Cadmium mg/L	-0.01	-0.01	0.12	0.28	0.12	0.08	0.08	0.08	0.05	0.11
Calcium mg/L	178	164	261	329	436	393	414	423	404	435
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02
Cobalt mg/L	-0.01	-0.01	0.23	0.49	0.88	0.81	2.72	2.78	2.53	2.99
Copper mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02
Iron mg/L	-0.03	-0.03	0.25	0.12	0.21	5.48	69.2	71.3	108	93.7
Lead mg/L	-0.05	-0.05	0.1	0.07	-0.05	-0.05	-0.1	-0.1	-0.1	-0.1
Lithium mg/L	-0.01	-0.01	0.07	0.07	0.04	0.05	0.08	0.08	0.06	0.1
Magnesium mg/L	80.8	74	370	408	329	257	553	563	602	551
Manganese mg/L	-0.005	0.059	16.4	31.2	42.2	36	135	137	130	139
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.06	-0.06	-0.06	-0.06
Nickel mg/L	-0.05	0.07	0.78	1.2	1.98	2	4.6	4.7	4.5	5.3
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.6	-0.6	-0.6	-0.6
Potassium mg/L	-2	-2	8	6	12	11	13	12	11	13
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4
Silicon mg/L	5.32	5.47	1.73	1.75	5.85	5.25	7.4	7.5	7.3	7.5
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02
Sodium mg/L	4	3	5	3	10	10	12	11	12	13
Strontium mg/L	0.9	0.869	1.69	1.89	1.61	1.48	1.69	1.74	1.59	1.87
Thallium mg/L	-0.2	-0.2	-0.3	-0.2	0.2	-0.3	-0.4	0.4	0.4	-0.4
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	0.04	-0.06	-0.06	-0.06	-0.06
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.06	-0.06	-0.06	-0.06
Zinc mg/L	0.007	0.007	71.6	125	83.4	88.3	345	351	316	412
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	14	13	49	60	60	50	91	94	95	95
cations (meq)	16	15	48	57	55	47	89	90	94	93
%diff	-9.0%	-5.4%	0.9%	2.8%	4.3%	3.0%	1.0%	2.2%	0.9%	0.8%
Type	1a	1a	2	2	2	2	2	2	2	2

Sample ID	VANGORDA DUMP									
	SRK-VD03- Drain 3	SRK-VD04	SRK-VD04	SRK-VD04- Drain 5	SRK-VD04- Drain 5	SRK-VD05- Drain 6	SRK-VD05- Drain 6	SRK-VD06	SRK-VD06	SRK-VD07
Label Sample ID	SRK-VD03		21	SRK-VD04 Drain 5		SRK-VD05 Drain 6				
Date	12-Sep-02	6-Jun-03	14-Sep-03	10-Jun-02	12-Sep-02	10-Jun-02	12-Sep-02	10-Jun-02	6-Jun-03	10-Jun-02
Label Date	09/12/2002			09/12/2002			09/12/2002			
Time	9:20			12:00	9:50	12:45	10:00	13:30		14:30
Field Parameters										
pH	6.22	3.25	3.23	3.3	3.43	6.21	5.93	7.08	6.68	2.75
Conductivity $\mu\text{S/cm}$	5400	22100	22700	22000	22300	12000	18290	1233	1711	3500
Redox mV	65	538	534	334	344	15	62	106	427	498
Temp $^{\circ}\text{C}$	4.4	7.9	2.9	9.9	5.8	13.5	4.6	10	12.7	15.5
Flow L/min	1.5	0.2	1	0.75	slight	0.17	0.2	0.25	2	No Flow
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	6.39	3.53	3.27	3.57	3.52	6.17	5.4	7.39	6.91	2.79
Conductivity $\mu\text{S/cm}$	5140	18800	21700	21400	22300	11700	1730	1200	1240	3420
Dissolved Anions										
Acidity pH 8.3 mg/L	755	15400	10600	12300	12500	2550	5490	53	56	1400
Alkalinity Total as CaCO_3 mg/L	124	-1	-1	-1	7	160	119	30	28	-1
Chloride mg/L	0.8	-0.5	-0.5	-0.5	-0.5	1	0.7	0.7	-0.5	0.7
Sulphate mg/L	4070	33400	30800	30500	33100	13700	23000	766	822	2470
Dissolved Metals*										
Aluminum mg/L	-0.4	30	27	20	22	-2	-4	-0.2	-0.2	27.9
Antimony mg/L	-0.4	-8	-10	-8	-6	-2	-4	-0.2	-0.2	-0.4
Arsenic mg/L	-0.4	-8	-10	-8	-6	-2	-4	-0.2	-0.2	-0.5
Barium mg/L	-0.02	-0.4	-0.5	-0.4	-0.3	-0.1	-0.2	0.02	0.02	-0.02
Beryllium mg/L	-0.01	-0.2	-0.3	-0.2	-0.2	-0.05	-0.1	-0.005	-0.005	-0.01
Bismuth mg/L	-0.4	-8	-10	-20	-6	-4	-4	-0.2	-0.2	-0.4
Boron mg/L	-0.2	-4	-5	-4	-3	-1	-2	-0.1	-0.1	-0.2
Cadmium mg/L	0.06	6.8	6	6.8	8.1	0.7	1.1	0.08	0.09	1.19
Calcium mg/L	431	428	445	467	456	442	440	207	199	196
Chromium mg/L	-0.02	-0.4	-0.5	-0.4	-0.3	-0.1	-0.2	-0.01	-0.01	0.03
Cobalt mg/L	2.86	19.2	17	22.3	22.3	10.3	15.6	0.1	0.06	0.75
Copper mg/L	-0.02	-0.4	-0.5	-0.4	-0.3	-0.2	-0.2	0.01	-0.01	11.2
Iron mg/L	127	1270	1240	1160	1030	243	807	-0.03	-0.03	240
Lead mg/L	-0.1	-2	-3	-2	-2	-0.5	-1	-0.05	-0.05	0.6
Lithium mg/L	0.07	0.5	-0.5	-0.4	0.4	0.2	0.3	0.02	0.02	0.08
Magnesium mg/L	558	3090	3300	3180	3490	1880	3170	54.2	59	105
Manganese mg/L	135	2280	2340	2350	2600	1000	1600	4.8	3.65	17.6
Molybdenum mg/L	-0.06	-2	-2	-2	-0.9	-0.3	-0.6	-0.03	-0.03	-0.06
Nickel mg/L	5	15	12	17	17	7.2	12	0.18	0.14	1.1
Phosphorus mg/L	-0.6	-20	-20	-20	-9	-3	-6	-0.3	-0.3	-0.6
Potassium mg/L	12	-80	-100	-80	-60	-20	-40	2	-2	-4
Selenium mg/L	-0.4	-8	-10	-8	-6	-2	-4	-0.2	-0.2	-0.4
Silicon mg/L	7.8	22	23	21	20	9.5	11	0.87	0.79	12.4
Silver mg/L	-0.02	-0.4	-0.5	-0.4	-0.3	-0.1	-0.2	-0.01	-0.01	-0.02
Sodium mg/L	13	-80	-100	-80	-60	-20	-40	-2	-2	-4
Strontium mg/L	1.77	0.9	1	1	1.1	2.15	3	0.517	0.498	0.45
Thallium mg/L	-0.4	-8	-10	-8	-6	-2	-4	-0.2	-0.2	-0.4
Tin mg/L	-0.06	-2	-2	-2	-0.9	-0.4	-0.6	-0.03	-0.03	-0.06
Titanium mg/L	-0.02	-0.4	-0.5	-0.4	-0.3	-0.1	-0.2	-0.01	-0.01	-0.02
Vanadium mg/L	-0.06	-2	-2	-2	-0.9	-0.3	-0.6	-0.03	-0.03	-0.06
Zinc mg/L	350	6070	5850	6370	6990	1650	2850	27.9	22.8	471
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)	87	696	642	635	690	288	481	16	18	51
cations (meq)	93	636	650	650	696	287	490	16	16	50
%diff	-3.6%	4.5%	-0.6%	-1.1%	-0.5%	0.2%	-0.9%	0.7%	4.5%	1.2%
Type	2	3	3	3	3	2	3	2	2	3

Sample ID	VANGORDA DUMP					
	SRK-VD07	SRK-VD08	SRK-VD09	SRK-VD09B	SRK-VD09C	SRK-VD09C
Label Sample ID	SRK-VD07			SRK-VD09B		22
Date	12-Sep-02	10-Jun-02	11-Jun-02	12-Sep-02	6-Jun-03	14-Sep-03
Label Date	09/12/2002			09/12/2002		
Time	11:00	15:15	8:30	10:30		
Field Parameters						
pH	2.55	4.1	5.64	4.45	3.67	4.54
Conductivity $\mu\text{S/cm}$	20400	5700	4600	5400	4790	4740
Redox mV	431	377	145	341	537	522
Temp $^{\circ}\text{C}$	7.1	16.5	6.3	5.4	17.9	0.7
Flow L/min	ponded	No Flow	Trace Flow	slight	2	Trace
Notes						
Easting						
Northing						
Photo						
Laboratory Parameters						
pH	2.55	3.85	6.36	4.18	3.74	5.03
Conductivity $\mu\text{S/cm}$	14600	5620	4610	5190	4620	4550
Dissolved Anions						
Acidity pH 8.3 mg/L	16500	1840	764	836	860	581
Alkalinity Total as CaCO_3 mg/L	-1	3	11	14	-1	12
Chloride mg/L	11	0.5	0.8	-0.5	-0.5	0.8
Sulphate mg/L	19200	5130	3550	4370	4340	3810
Dissolved Metals*						
Aluminum mg/L	339	7	-0.4	0.4	2.5	1.5
Antimony mg/L	-4	-2	-0.4	-0.4	-0.4	-0.4
Arsenic mg/L	19	-2	-0.4	-0.4	-0.4	-0.4
Barium mg/L	-0.2	-0.1	-0.02	-0.02	-0.02	-0.02
Beryllium mg/L	-0.1	-0.05	-0.01	-0.01	-0.01	-0.01
Bismuth mg/L	-4	-2	-0.6	-0.4	-0.4	-0.4
Boron mg/L	-2	-1	-0.2	-0.2	-0.2	-0.2
Cadmium mg/L	8.5	4.1	0.83	0.56	0.73	0.45
Calcium mg/L	457	528	444	467	446	402
Chromium mg/L	0.3	-0.1	-0.04	-0.02	-0.02	-0.02
Cobalt mg/L	6	2.1	1.72	2.45	2.2	1.84
Copper mg/L	180	9.2	0.37	0.07	0.69	0.67
Iron mg/L	3040	14.8	35.3	25.5	68.5	0.12
Lead mg/L	-1	2.5	0.1	0.7	1.8	1
Lithium mg/L	0.5	0.1	0.12	0.19	0.18	0.19
Magnesium mg/L	721	346	371	514	464	487
Manganese mg/L	232	122	79.7	126	103	99.6
Molybdenum mg/L	-0.6	-0.3	-0.06	-0.06	-0.06	-0.06
Nickel mg/L	7	3.3	2.8	3.7	3.5	2.8
Phosphorus mg/L	-6	-3	-2	-0.6	-0.6	-0.6
Potassium mg/L	-40	-20	11	10	9	7
Selenium mg/L	-4	-2	-0.4	-0.4	-0.4	-0.4
Silicon mg/L	74	11.2	4.3	5.9	8.7	5.4
Silver mg/L	-0.2	-0.1	-0.02	-0.02	-0.02	-0.02
Sodium mg/L	-40	-20	-4	5	-4	4
Strontium mg/L	0.7	0.9	1.78	1.9	1.59	1.85
Thallium mg/L	-4	-2	-0.4	-0.4	-0.4	-0.4
Tin mg/L	-0.6	-0.3	-0.06	-0.06	-0.06	-0.06
Titanium mg/L	-0.2	-0.1	-0.02	-0.02	-0.02	-0.02
Vanadium mg/L	-0.6	-0.3	-0.06	-0.06	-0.06	-0.06
Zinc mg/L	4850	1430	499	474	474	352
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.						
anions (meq)	400	107	74	91	90	80
cations (meq)	446	108	75	89	85	77
%diff	-5.4%	-0.3%	-0.6%	1.3%	3.0%	1.4%
Type	3	3	3	3	3	3

		BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	
Sample ID		SRK-Field Blank (SRK)	SRK-Field Blank (SRK)	SRK-GD12	Travel Blank A*	Travel Blank B*	Travel Blank C*	Travel Blank*	Blank	Blank	Method Blank
Label Sample ID											
Date		11-Jun-02	13-Jun-02	13-Jun-02	Sept	Sept	June	Sept	SRK-VD10 12-Sep-02 09/12/2002 10:45	SRK-GD14 12-Sep-02 09/11/2002 13:10	SRK-FD39 12-Sep-02 09/12/2002 17:45
Label Date		14:30	8:30	19:00							
Time											
Field Parameters											
pH		7.85	-	-	-	-	-	-	-	-	-
Conductivity	μS/cm	555	-	-	-	-	-	-	-	-	-
Redox	mV	235	-	-	-	-	-	-	-	-	-
Temp	°C	0.8	-	-	-	-	-	-	-	-	-
Flow	L/min	1	-	-	-	-	-	-	-	-	-
Notes											
Easting											
Northing											
Photo											
Laboratory Parameters											
pH		8.31	8.2	8.31	6.7	6.09	-	-	6.14	7.75	7.88
Conductivity	μS/cm	542	-2	-2	-2	877	-	-	2	-2	-2
Dissolved Anions											
Acidity pH 8.3	mg/L	-1	-1	-1	-1	-1	-	-	-1	11	2
Alkalinity Total as CaCO3	mg/L	209	-1	-1	-1	-1	-	-	1	1	1
Chloride	mg/L	2.3	-0.5	-0.5	-0.5	-0.5	-	-	-0.5	-0.5	-0.5
Sulphate	mg/L	88	-1	2	-1	-1	-	-	-1	-1	-1
Dissolved Metals*					Total Metals	Total Metals	Total Metals	Total Metals			
Aluminum	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium	mg/L	0.08	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Beryllium	mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boron	mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium	mg/L	75.3	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chromium	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Copper	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron	mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Lead	mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Magnesium	mg/L	26.8	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Manganese	mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Molybdenum	mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel	mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Phosphorus	mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium	mg/L	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Selenium	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon	mg/L	3.64	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Silver	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium	mg/L	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Strontium	mg/L	0.365	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Thallium	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin	mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium	mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc	mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
		Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.									
anions (meq)											
cations (meq)					Note: * Travel blank results are for <i>total</i> metals						
%diff											
Type											

Sample ID	BLANK							
	Method Blank	SRK-FD41	SRK-FD11	SRK-VD11	SRK-FD45	SRK-FD15	SRK-GD03	SRK-GD15
Label Sample ID	SRK-FD41	blank	blank	blank	blank	15	23	32
Date	13-Sep-02	4-Jun-03	5-Jun-03	6-Jun-03	8-Jun-03	13-Sep-03	14-Sep-03	15-Sep-03
Label Date	09/13/2002							
Time	10:30							
Field Parameters								
pH		-	-	-	-	-	-	-
Conductivity $\mu\text{S/cm}$		-	-	-	-	-	-	-
Redox mV		-	-	-	-	-	-	-
Temp $^{\circ}\text{C}$		-	-	-	-	-	-	-
Flow L/min		-	-	-	-	-	-	-
Notes								
Easting								
Northing								
Photo								
Laboratory Parameters								
pH	7.74	5.72	5.79	7.08	7.6	5.24	6.99	8.18
Conductivity $\mu\text{S/cm}$	-2	-2	-2	-2	-2	-2	7	2
Dissolved Anions								
Acidity pH 8.3 mg/L	-1	2	-1	2	-1	2	4	-1
Alkalinity Total as CaCO_3 mg/L	-1	-1	-1	-1	-1	-1	-1	1
Chloride mg/L	-0.5	0.7	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Sulphate mg/L	-1	1	2	1	-1	-1	-1	-1
Dissolved Metals*								
Aluminum mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Beryllium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boron mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chromium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Copper mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Lead mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Magnesium mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Manganese mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Molybdenum mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Phosphorus mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium mg/L	-2	-2	-2	-2	-2	-2	-2	-2
Selenium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Silver mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium mg/L	-2	-2	-2	-2	-2	-2	-2	-2
Strontium mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Thallium mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
anions (meq)	Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.							
cations (meq)								
%diff								
Type								

ATTACHMENT B

Grum Pit Seepage Results

GRUM PIT SEEP SAMPLES						
Sample ID	SRK-GP01	SRK-GP02	SRK-GP02 duplicate	SRK-GP04	SRK-GP05	SRK-GP06
Date	9-Jun-03	9-Jun-03	9-Jun-03	9-Jun-03	9-Jun-03	9-Jun-03
Label Date						
Time						
Field Parameters						
pH	8.05	7.28		8.21	7.88	8.36
Conductivity	1928	1456		1896	1289	1755
Redox	635	622		617	586	462
Temp	12.7	13.7		15.4	3.7	11.2
Flow	2	Trace		1	3	Trace
Notes						
Easting (NAD 27)	592306	592241		592220	592123	592081
Northing (NAD 27)	6905309	6905243		6905228	6905120	6905001
Laboratory Parameters						
pH	7.8	7.51	7.6	8.08	7.65	8.13
Conductivity	1850	1550	1510	1780	1240	1660
Dissolved Anions						
Acidity pH 8.3	37	51	48	20	36	11
Alkalinity Total as CaCO3	373	189	193	266	223	264
Chloride	-0.5	-0.5	-0.5	-0.5	-0.5	2.7
Sulphate	989	932	920	1050	627	995
Dissolved Metals						
Aluminum	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium	0.01	0.01	0.01	0.01	0.01	0.01
Beryllium	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boron	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium	239	197	199	268	158	90
Chromium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt	0.01	0.1	0.1	0.02	0.02	-0.01
Copper	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Lead	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium	0.02	0.02	0.02	0.03	0.03	0.05
Magnesium	167	112	113	144	96.9	235
Manganese	0.015	0.224	0.229	0.013	-0.005	-0.005
Molybdenum	-0.03	-0.03	-0.03	0.06	-0.03	-0.03
Nickel	0.51	1.03	1.03	0.17	0.07	-0.05
Phosphorus	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium	3	3	3	5	3	4
Selenium	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon	2.37	3.46	3.5	1.94	1.78	1.21
Silver	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium	6	8	8	6	5	5
Strontium	1.14	1.41	1.42	1.78	1.47	0.403
Thallium	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc	6.69	14.3	14.7	0.073	0.03	-0.005
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.						
anions (meq)	27	23	22	26	17	25
cations (meq)	27	20	21	26	17	25
%diff	-0.6%	4.8%	3.9%	-0.2%	0.3%	-0.3%

ATTACHMENT C

Vangorda Creek Valley Seepage Results

Table C.1
Summary of additional seep sample sites from the Vangorda Creek valley

SRK Sample ID	Location	Description	Environment Canada Equivalent	Notes
SRK-GD5d/s	Downstream of SRK-GD5	Flow on surface and through shallow subsurface. Sampled at furthest downstream point	Sweet Creek	SRK sample site 130 m downstream from EC sample site
SRK- Moose Seep	Below Moose Pond	Flow on surface and through moss. Wide area of saturated moss; sampled largest pool, with trickling flow	Moose Seep	Sites considered equivalent
SRK-Sheep Seep	Sheep Creek	Flow in a choked channel, upstream of confluence with Vangorda Creek	Sheep Creek	SRK sample site 30 m downstream from EC sample site
SRK-Little Creek Seep	Below Little Creek Dam	Water seeping very slowly from exposed saturated mineral soil; flow evident only from water filling fresh footprints over a 10 minute period	Little Creek Seep	Sites considered equivalent

Sample ID	GD5d/s	Moose Seep	Sheep Seep	Little Creek Seep
Date Sampled	09/15/2003	09/15/2003	09/15/2003	09/15/2003
ALS Sample ID	8	9	10	11
Field Parameters				
pH	7.66	7.61	7.3	7.77
Conductivity	2140	1310	557	918
Redox	424	406	450	415
Temp	3.7	3.4	2.4	1.2
Flow	60	1	45	Trace
Physical Tests				
Conductivity (uS/cm)	2070	1280	539	863
pH	8.11	8.2	8.36	8.23
Dissolved Anions				
Acidity (to pH 8.3) CaCO3	15	5	<1	3
Alkalinity-Total CaCO3	421	288	262	323
Chloride Cl	2.4	1.5	0.7	1
Sulphate SO4	972	522	54	196
Dissolved Metals				
Aluminum D-Al	<0.2	<0.2	<0.2	<0.2
Antimony D-Sb	<0.2	<0.2	<0.2	<0.2
Arsenic D-As	<0.2	<0.2	<0.2	<0.2
Barium D-Ba	0.06	0.05	0.17	0.04
Beryllium D-Be	<0.005	<0.005	<0.005	<0.005
Bismuth D-Bi	<0.2	<0.2	<0.2	<0.2
Boron D-B	<0.1	<0.1	<0.1	<0.1
Cadmium D-Cd	<0.01	<0.01	<0.01	<0.01
Calcium D-Ca	277	174	88.5	131
Chromium D-Cr	<0.01	<0.01	<0.01	<0.01
Cobalt D-Co	<0.01	<0.01	<0.01	<0.01
Copper D-Cu	<0.01	<0.01	<0.01	<0.01
Iron D-Fe	<0.03	<0.03	<0.03	<0.03
Lead D-Pb	<0.05	<0.05	<0.05	<0.05
Lithium D-Li	0.01	<0.01	<0.01	0.02
Magnesium D-Mg	166	72.9	21	42.4
Manganese D-Mn	<0.005	<0.005	<0.005	0.012
Molybdenum D-Mo	<0.03	<0.03	<0.03	<0.03
Nickel D-Ni	<0.05	<0.05	<0.05	<0.05
Phosphorus D-P	<0.3	<0.3	<0.3	<0.3
Potassium D-K	3	2	<2	3
Selenium D-Se	<0.2	<0.2	<0.2	<0.2
Silicon D-Si	5.84	4.84	4.73	6.37
Silver D-Ag	<0.01	<0.01	<0.01	<0.01
Sodium D-Na	10	7	2	8
Strontium D-Sr	1.04	0.491	0.369	0.802
Thallium D-Tl	<0.2	<0.2	<0.2	<0.2
Tin D-Sn	<0.03	<0.03	<0.03	<0.03
Titanium D-Ti	<0.01	<0.01	<0.01	<0.01
Vanadium D-V	<0.03	<0.03	<0.03	<0.03
Zinc D-Zn	<0.005	0.006	0.006	0.036