



Faro Mine Complex 2008 Waste Rock and Seepage Monitoring Report

2008/09 Task 13 - FINAL



Prepared for:

DELOITTE & TOUCHE INC.

On behalf of

Faro Project Management Team



Prepared by:



Project Reference Number:
SRK 1CD003.113

February 2009

**Faro Mine Complex
2008 Waste Rock and Seepage
Monitoring Report
2008/09 Task 13 - FINAL**

Report prepared for

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SRK Project Number 1CD003.113

February 2009

Executive Summary

<u>Title:</u>	Faro Mine Complex: 2008 Waste Rock and Seepage Monitoring Report – 2008/09 Task 13- FINAL
<u>Consultant:</u>	SRK Consulting (Canada) Inc.
<u>Status:</u>	Final
<u>Date:</u>	February 2009
<u>Size:</u>	31 Pages of text (including cover, introductory and reference list); 20 Pages of Figures (including one flysheet), 3 Appendices containing 21 pages (including 17 non-standard 11 x 17 pages and 4 flysheets).
<u>Digital File:</u>	PDF format; 9.50 MB

Objectives and Primary Findings:

This report summarizes the waste rock and seepage monitoring results from the 2008 monitoring program and compares the current year's results with results from previous monitoring.

Water quality at toe seepage and select routine monitoring stations indicates that water quality in drainage from the Faro and Vangorda waste rock dumps appears generally to have stabilized year-over-year, with considerable seasonal variation evident at several monitoring stations.

Grum Dump toe seepage water quality also appears to be reasonably stable, although sulphate concentrations at several stations have shown gradual increase over the 2002 through 2008 period. Dissolved zinc concentrations at most stations have been typically within stable ranges of up to 7 mg/L over the past several years, although isolated ephemeral samples have returned dissolved zinc concentrations up to 139 mg/L. The partial diversion of water from station V15 to station V2A via the Grum Creek diversion appears to have been successful in controlling the amount of zinc reporting to station V2; however, concentrations at Station V2A in Grum Creek have begun to increase in corresponding fashion. In 2006 through early 2008, dissolved zinc concentrations at V2A have typically been below 0.2 mg/L, but since June 2008, zinc concentrations have increased dramatically to between 1 and 2 mg/L.

Future Work Recommendations:

It is recommended that waste rock and seepage monitoring be continued at the same level as carried out since 2005.

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1 Introduction

Waste rock and pit seepage surveys, and monitoring of waste rock thermal conditions and pore gas oxygen concentrations were continued in 2008. In addition, routine monitoring of selected waste rock and pit seepage stations was carried out by site environmental staff as a requirement of the water licence. This report presents the results of the 2008 seep surveys, a review of the 2008 and historical routine seepage monitoring data, and the results of the 2008 thermal and oxygen monitoring.

This report has been prepared as part of the ongoing technical investigations in support of closure planning for the Anvil Range Mining Complex.

2 Methods

2.1 Waste Rock Seepage Surveys

Sample locations were established in June 2002 by walking the toes of all waste rock dumps where the rock rests on original ground, and looking for 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 were inferred to have been recently flowing based on observations of moisture along flow paths, or based on ponded water surfaces that were at the elevation of pond spill points.

Subsequent seep surveys at each of the waste rock dumps were carried out in September 2002, and in both spring and fall of 2003 and 2004. Stations established in June 2002 were revisited and sampled as appropriate. Some seeps were found to flow intermittently, and new intermittent seeps were located during the follow-up surveys. At the end of 2004, there were approximately 80 seep locations that had been sampled at least once during the 2002-2004 waste rock seepage monitoring program (SRK 2006a).

As part of planning for 2005 monitoring, the waste rock seepage working group discussed the value of continuing to monitor waste rock seepage at the established stations. On the basis of these discussions, SRK carried out a review of previously-sampled seepage stations to assess which stations should continue to be monitored on a twice-yearly basis. Summaries of the rationale for maintaining or eliminating each station from the monitoring program were compiled in a draft memorandum that was circulated and subsequently revised to reflect feedback from the working group (see Appendix A in SRK 2006b). Sites identified for continued monitoring were visited in May and September of 2005 to 2008, and samples were collected as flow conditions permitted.

Several sites where waste rock seepage stations coincided with water licence sampling stations were identified for elimination pending review of sampling practices employed by site staff. These sites

were reviewed at the beginning of May during the 2005 through 2008 field visits, but it was found that field filtration of dissolved metal samples was not being carried out as part of water licence sampling. As the protocol for the waste rock seepage survey includes field filtration of dissolved metal samples, it was decided that the water licence stations would continue to be sampled on an interim basis as part of the waste rock seepage monitoring program.

The review of monitoring stations also recommended allowance for a limited number of supplementary samples, to be collected at the investigator's discretion, to characterize intermittent surface flows that daylight only under ideal flow conditions.

From 2002 through 2006, laboratory analysis of seepage samples has been carried out by ICP-OES. During planning meetings for 2007 monitoring, a need was identified to obtain lower detection limits for several trace parameters. It was decided by the various technical working groups that the added cost was justified, and all 2007 and 2008 samples were analyzed using a combination of ICP-OES and ICP-MS.

Samples were collected for analyses of routine parameters (pH, conductivity, acidity, alkalinity, chloride and sulphate), and dissolved metals (dissolved metals by ICP-MS/OES). The samples were filtered and preserved in the field according to standard methods for collection of environmental samples. Field pH, conductivity, redox, and temperature measurements were taken at each station using a WTW meter or Oakton pen meters. 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 were surveyed using a hand-held GPS. The locations are shown in Figures 1 and 2. Photographs were taken to document the general appearance of the station, as well as 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.

Ion balances were calculated for all samples to ensure total anions were in balance with total cations in solution; this has been standard practice over the history of the Anvil Range waste rock seepage surveys. During evaluation of September 2008 water analyses, it was found that ion balances were very poor when they were calculated using reported sulphate concentrations. The balances were greatly improved when sulphate was calculated from total dissolved sulphur concentrations reported in the ICP dissolved metals analyses; therefore, reported sulphate concentrations were replaced with calculated sulphate values for the September 2008 sampling round.

2.2 Pit Seepage Surveys

Monitoring of seepage and wall rock runoff in the Faro, Grum, and Vangorda pits was carried out in 2003 and 2004 as part of studies relating to future pit lake water quality and treatment requirements. Beginning in 2005, seepage monitoring has also been carried out in the pits as part of the ARD

monitoring program, as recommended by the technical working group. It was felt that permanent monitoring stations should be established to allow pit seepage water quality trends to be tracked over time.

Pit seepage surveys were carried out in Faro and Grum pits in May 2008 and in all three pits (Faro, Grum and Vangorda) in September 2008. Pit seep locations are shown in Figures 3 through 5.

Pit seep samples were collected and analysed in the manner described for waste rock seeps in Section 2.1.

2.3 Routine Monitoring

Waste rock seep surveys have been completed both by the operator, as prescribed in water licences, and by various regulatory authorities since approximately 1986 at the routine sample locations shown in Figures 1 and 2. Deloitte & Touche has continued to collect seep samples on a regular basis as part of water licence routine monitoring programs.

The historical water quality database was transferred to a Microsoft Access platform, to allow distribution of results to other users. The development of the Access database was coordinated by Gartner Lee Limited (GLL), who report the compiled results in the annual monitoring reports (e.g. GLL 2007) and who continue to maintain the database. Quality assurance and validation of reported historical monitoring results is undertaken as issues are raised.

2.4 Temperature and Oxygen Monitoring of Waste Rock

Waste rock temperature and oxygen monitoring has been carried out intermittently beginning in February 2003 at seven instrumented drillholes on the Faro, Grum, and Vangorda waste rock dumps (SRK, 2004a). In each drill hole, a thermistor string was installed that measures temperature at discrete locations down hole. In addition, each hole has several plastic tubes installed that permit pore gas to be extracted from discrete locations. The installation of these monitoring facilities is described in detail in SRK 2004a.

In the past, erratic results from some individual monitoring ports have raised the question of whether the ports were blocked or pinched. Prior to sampling, a hand-operated vacuum pump was used to test whether pore gas was able to move freely through each monitoring tube. Those tubes which allowed a vacuum to develop were inferred as being blocked in some fashion, and the previous results from the blocked ports are considered questionable.

Pore gas oxygen content was measured directly using a Servomex Oxygen Analyser. This instrument was calibrated on a daily basis using ambient air (20.9% oxygen) and pure nitrogen gas (0% oxygen). The instrument was connected to each monitoring tube by means of silicone tubing, and pore gas was drawn through the instrument by means of an integrated pump within the instrument. The oxygen analyser produced a direct real-time readout of oxygen content which was then manually recorded.

Temperature measurements were collected by connecting an Omega thermistor reader to a switch box at the terminal end of each installed RST Instruments thermistor string. Temperature at individual monitoring points was collected by selecting the appropriate channel on the switch box. The Omega thermistor reader measured resistance across each monitoring point and converted this measured resistance to temperature. The calculated temperature was then displayed on a digital readout, and was manually recorded. During September 2008, the resistance on each channel was read with an ohmmeter and resistance was converted to temperature according to the formula supplied by the manufacturer.

In the 2008 field program, monitoring of pore gas oxygen content and waste rock temperature was carried out in March, June and September 2008.

3 Results

3.1 Waste Rock Seepage Surveys

The results of the 2002 through 2008 waste rock seepage surveys are provided in Appendix A. Locations and select parameters (ranges of pH, conductivity, flow, sulphate and zinc concentrations for the period of record) are presented in Figures 1 and 2.

3.2 Pit Seepage Surveys

Locations of the 2008 pit seepage monitoring stations are shown in Figures 3 to 5. Results of the 2003 to 2008 pit seepage surveys are included in Appendix B. The purpose of these surveys has been to provide inputs for updates to water quality predictions (such as those presented in SRK 2004b) and to monitor changes in pit seepage water quality over time. Pit seep locations are less consistent than waste rock seep locations, necessitating the establishment of several unique stations to sample available flows. However, there are some stations that have been sampled over several monitoring rounds at locations where seepage has been consistently available. In some areas, for comparison of year-over-year seepage chemistry results, it is necessary to group stations where seepage water interacts with similar pit wall rock types. Pit seepage chemistry is monitored for input to assessments of pit lake chemistry, and the monitoring results are not discussed further here.

3.3 Routine Monitoring

Locations of the routine seepage monitoring stations are shown in Figures 1 and 2. Analytical data for the routine monitoring stations are stored on the Anvil Range water quality database and are not reproduced here. Summary results of the historical seepage monitoring are provided in Figures 8 through 19. The time series shown in these figures provide a graphical summary of the data that allows trends to be easily identified.

3.4 Temperature and Oxygen Monitoring of Waste Rock

The results of temperature and oxygen monitoring are provided in Appendix C. Waste rock temperatures recorded in 2008 were generally within the range of those recorded previously. Measured 2008 pore gas oxygen concentrations were also similar to those previously measured.

Vacuum testing of all individual sampling tubes has indicated that several monitoring ports are blocked. Many of the blocked ports had a paired port at the same elevation that remained functional at the time of testing; however, three monitoring elevations (1.4, 5.6 and 10 m below surface) at installation 10M3 (Grum Dump) had pairs of monitoring tubes blocked at each elevation.

Installation 30M4 (Vangorda Dump) was found to have blockages in both monitoring ports at 1.4 m depth, however ports sampling both higher and lower elevations appeared to be functioning properly.

Installation 30M1 (Faro Dump) was found to have a blockage in the 30 m monitoring port. This port was not installed in duplicate and may not provide any further data. However, ports sampling both higher and lower elevations appeared to be functioning properly.

4 Discussion

4.1 2002 to 2008 Waste Rock Seepage Surveys

4.1.1 Sampling Conditions

The spring waste rock survey took place in mid-May. In some locations there were remnant snow drifts on the rock dumps and there were other areas which were not accessible due to snow cover. The 2008 freshet occurred in early June, which is later than usual based on monitoring since 2002.

Fall runoff conditions were wetter than average, based on the number of flowing seeps and the size of previously observed flows, likely due to the high rainfall experienced in the region over the preceding months. A total of 4 new seeps were identified in September 2008.

4.1.2 Faro Waste Rock Dumps- 2008

Two new seeps were identified at Faro during the 2008 surveys. Station FD51 is a seep entering the pit below the Northeast Dumps. Station FD52 is located at the toe of the Intermediate Dump (see Figure 1 for sample locations).

The previously-developed grouping of seeps into water types continues to be a useful tool for summarizing the monitoring results and for tracking the evolution of dump seepage chemistry.

Water Types

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

- Type 1 seeps typically had pHs greater than 6.5, and zinc concentrations less than 6 mg/L. Other trace metals (e.g. aluminum, iron, manganese) were low or below detection limits.
- Type 2 seeps had pHs typically between 6 and 7, and zinc concentrations from 4 to 595 mg/L. Cadmium, cobalt, iron, manganese, and nickel were also elevated in several of the samples.
- Type 3 seeps had pHs of less than 6, and zinc concentrations typically greater than 10 mg/L and as high as 21,100 mg/L. Aluminum, cadmium, cobalt, copper, iron, manganese, and nickel concentrations were also high in several of these samples. Samples with zinc concentrations greater than 900 mg/L are sourced from oxide fines, ore stockpiles, or the immediate area around the mill.

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 minimum method detection limit was excluded from the statistical calculations. The need for this exclusion arose in cases where samples had high ionic strength, and in cases where detection limits changed significantly over time. The variation in the number of samples used in the statistical summary is a reflection of this exclusion.

Table 2 lists the seepage stations by each of the three water 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), a seep entering the pit below the Northeast Dumps FD 26), the Zone II East Dump (FD50), the Ramp Zone Dump (FD14), and the Upper Northwest Dump (FD16 and 18). According to the inventory of rock types presented in the 1996 ICAP report (RGI, 1996), these dumps generally contained relatively low proportions of sulphide waste rock, and higher proportions of calc-silicate or intrusive rock compared to other parts of the Faro Dump. The Intermediate Dump contains higher proportions of sulphide material. The seepage chemistry reflects some buffering by reactive carbonate minerals, which help to maintain neutral pH conditions.

The Type 2 seeps have included samples from several different areas, including ore and low grade ore stockpiles (FD01, 09, 10, 12, 31 and 38), the Main Dump West (FD30), the Main Dump East (FD08), the Intermediate Dump (FD44, 48 and 49), the Lower Northwest Dump (FD19), seeps entering the pit below the Northeast Dumps (FD21, 22, 23, 24, 26 and 27) the Ramp Zone Dump (FD14), seeps in the mill area (FD32 and 35), and seeps from below the Faro Valley Dumps (FD40). The 2 new seeps identified in 2008, FD51 and FD52 (located below the Northeast Dump and Intermediate Dump, respectively), were also classified as Type 2. A common element of all these

areas is the presence of sulphides or oxidized schist. Although the pH is typically in the pH 6 to 7 range, it is clear that this drainage is strongly influenced by oxidation of sulphide minerals. 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 Main Dump West (FD12 and FD31) typically contain the highest zinc concentrations of Type 2 seeps and are likely influenced in part by ore stockpiles upgradient of this location. Zinc concentrations at FD12 and FD31 were higher during 2008 sampling periods compared to previous years. In May 2008, the zinc concentration at FD12 was 655 mg/L and is considered transitional between Type 2 and Type 3 waters; the concentration of zinc at FD12 in September 2008 was 723 mg/L and has been classified as Type 3 water. In May 2008, zinc concentrations at FD31 were 967 mg/L with a pH of 5.8 and this water was classified as Type 3; in September 2008 the zinc concentration at FD31 was slightly lower (720 mg/L) and the pH had increased to 6.9 but it is still classified as Type 3. Water quality trends at FD31 are included in Section 4.2.1 under X23 (equivalent station). FD01 and FD19 also had higher zinc concentrations in fall 2008 than previously reported (100 and 166 mg/L, respectively).

Table 1: Characteristics of Faro Water Types

Parameter	Detection Limit	Type 1					Type 2					Type 3				
		Average	Median	Min	Max	N	Average	Median	Min	Max	N	Average	Median	Min	Max	N
Field pH (s.u.)	0.01	7.12	7.12	6.02	8.14	73	6.63	6.62	5.72	7.83	97	3.88	3.49	0.9	7.59	76
Acidity pH 8.3	1	10	8	1	34.4	73	215	78	14	2160	97	6201	478	27	53100	77
Alkalinity Total	0.5	139	137	19	322	73	162	103	2	445	97	13	2	0.5	310	77
Chloride	0.5	1.1	0.8	0.28	2.7	70	4.8	2.1	0.5	25	77	26.0	0.9	0.46	1050	60
Sulphate	0.5	487	391	3.1	2667	73	2726	2370	334	10920	97	8393	2090	69	67200	77
Calcium	0.05	100	96	7.5	279	73	362	434	49	675	97	235	235	6.5	545	77
Magnesium	0.1	84	70	1.09	397	73	394	281	35.3	2040	97	391	214	3.8	3210	77
Potassium	0.05	6.0	4.2	0.56	24	53	9.5	9.1	0.2	29	93	7.2	6.1	0.01	20	47
Sodium	2	17	5.7	1.5	150	73	24	19	2	79	97	17	5.4	1.6	216	66
Aluminum	0.002	0.034	0.0058	0.0016	0.35	18	0.44	0.24	0.002	3.6	31	87	11.3	0.037	986	71
Cadmium	0.00002	0.0039	0.0023	0.00004	0.020	20	0.075	0.042	0.0025	0.65	84	4.7	0.21	0.018	57	75
Cobalt	0.00003	0.0053	0.00024	0.00003	0.029	22	0.22	0.065	0.01	1.1	93	2.2	0.35	0.030	20	76
Copper	0.0005	0.0090	0.0040	0.0011	0.060	23	0.14	0.040	0.0034	2.4	74	49	1.6	0.030	559	76
Iron	0.0002	0.087	0.032	0.0002	0.89	21	20	4.6	0.02	135	78	974	57	0.042	15100	76
Lead	0.0002	0.0091	0.0003	0.0002	0.15	19	0.048	0.044	0.0002	0.23	33	0.82	0.42	0.0003	4.92	55
Manganese	0.005	0.11	0.008	0.005	0.69	73	20	5.0	0.037	85	97	114	11.9	0.16	2360	77
Nickel	0.00002	0.045	0.051	0.00041	0.14	30	0.39	0.22	0.014	1.8	94	2.2	0.62	0.050	16	75
Zinc	0.005	2.1	1.5	0.01	14	73	115	44	3.9	655	97	2492	128	2.2	34800	77

Note: Units in mg/L except for acidity/ alkalinity in mg CaCO₃ eq/L.

Note 2: Detection limits were used for statistical purposes when values were less than detection.

Where detection limits were greater than 10x the minimum detection limit due to high ionic strength, non-detect results were excluded from statistical calculations.

The Type 3 seeps have included samples from the Oxide Fines Stockpile (FD04 and 46), low grade ore stockpiles (FD12 and 38), the Medium Grade Stockpile (FD37), the mill area (FD33, 34 and 35), the West Main Dump (FD30 and 36), the Intermediate Dump (FD13, 47 and 49), the Faro Creek Diversion dyke (FD20), and, on occasion, seeps entering the pit below the Faro Valley Dump (FD40), or the Northeast Dumps (FD21, 22, 23, 24 and 27). Portions of the waste rock or pit benches in all of the above areas contained sulphides or oxidized schist. The seepage quality indicates very little to no availability of neutralizing minerals 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 to 34,800 mg/L), and the mill area (FD33, Zn = 1110 to 6770 mg/L) had the highest zinc concentrations. Zinc concentrations at Station FD13 were much higher in 2008 ranging from 3880 to 4480 mg/L compared to concentrations ranging from 60 to 880 in previous years (likely reflecting an increased flow from the Intermediate Dump sulphide cell under the wet conditions experienced in 2008). Zinc concentrations in the remaining acidic seeps ranged from 2.2 to 1660 mg/L indicating that seeps with high zinc concentrations occur in association with the sulphide waste rock cells and other sulphidic waste rock.

Table 2: Seepage Stations Classified By Water Type

Type 1		Type 2		Type 3	
(pH typically >6.5, Zn <6 mg/L)		(pH typically between 6 and 7, Zn concentrations typically ranging from 4 to 595 mg/L)		(pH <6, Zn typically >10mg/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-FD12 (2 of 10)	Ore and Low Grade Ore Stockpiles; West Main Dump
SRK-FD06	Toe of Northeast Dump	SRK-FD9	Ore and Low Grade Ore Stockpiles; West Main Dump	SRK-FD13	Intermediate Dump
SRK-FD07	Toe of Northeast Dump	SRK-FD10	Ore and Low Grade Ore Stockpiles; West Main Dump	SRK-FD20	Faro Creek Diversion
SRK-FD14	Ramp Zone Dump	SRK-FD12 (8 of 10)	Ore and Low Grade Ore Stockpiles; West Main Dump	SRK-FD21 (6 of 11)	Northeast Dumps towards Pit
SRK-FD16	Upper Northwest Dump	SRK-FD19	Lower Northwest Dump	SRK-FD22 (1 of 3)	Northeast Dumps towards Pit
SRK-FD17	Upper Northwest Dump	SRK-FD21 (5 of 11)	Northeast Dumps towards Pit	SRK-FD23 (6 of 9)	Northeast Dumps towards Pit
SRK-FD18	Upper Northwest Dump	SRK-FD22 (2 of 3)	Northeast Dumps towards Pit	SRK-FD24 (2 of 14)	Northeast Dumps towards Pit
SRK-FD26 (13 of 14)	Northeast Dumps towards Pit	SRK-FD23 (3 of 9)	Northeast Dumps towards Pit	SRK-FD27 (1 of 4)	Northeast Dumps towards Pit
SRK-FD44 (1 of 4)	Intermediate Dump	SRK-FD24 (12 of 14)	Northeast Dumps towards Pit	SRK-FD30 (3 of 8)	West Main Dump
SRK-FD50	Zone II East	SRK-FD26 (1 of 14)	Northeast Dumps Towards Pit	SRK-FD33	Mill
		SRK-FD27 (3 of 4)	Northeast Dumps towards Pit	SRK-FD34	Mill
		SRK-FD30 (5 of 8)	West Main Dump	SRK-FD35 (2 of 4)	Mill
		SRK-FD31 (11 of 13)	Ore + Low Grade Ore Stockpiles, West Main Dump	SRK-FD36	West Main Dump
		SRK-FD32	Mill	SRK-FD37	Medium Grade Stockpile
		SRK-FD35 (3 of 4)	Mill	SRK-FD38 (1 of 2)	Ore and Low Grade Ore Stockpiles
		SRK-FD38 (1 of 2)	Ore + Low Grade Ore Stockpiles	SRK-FD40 (8 of 13)	Faro Valley Dump
		SRK-FD40 (5 of 13)	Faro Valley Dump	SRK-FD46	Oxide Fines Stockpile, Mill
		SRK-FD44 (2 of 4)	Intermediate Dump	SRK-FD47	Intermediate Dump
		SRK-FD48	Intermediate Dump	SRK-FD49 (1 of 2)	Intermediate Dump
		SRK-FD49 (1 of 2)	Intermediate Dump	SRK-FD31 (2 of 13)	Ore + Low Grade Ore Stockpiles, West Main Dump
		SRK-FD51	Northeast Dumps towards Pit		
		SRK-FD52	Intermediate Dump		

Note: Where water type at a sampling station was variable over time, the number of samples of each type is shown, along with the total number of samples collected at a particular station. For example, eight samples have been collected at SRK-FD14, with seven samples having Type 1 water quality, and one sample having Type 2 water quality.

4.1.3 Grum Waste Rock Dumps - 2008

The 2008 Grum Dump seepage surveys were conducted by walking or driving the external toe of the dump and selected internal dump toes and looking for toe seeps, as previously described. Two new seeps were identified in 2008. GD22 is located at the toe of the waste rock dump upslope of the riprap quarry, west of former station GD17. GD23 is located at the toe on the east side of the Grum Ore Transfer Pad.

Figure 2 shows the location of seep sampling stations, and provides a graphical summary of the distribution of the different seepage types. Table 3 provides a summary of key characteristics for each of the above seepage types. Full seepage monitoring results are included in Appendix A.

Water Types

Most Grum toe seeps sampled in previous years had neutral to slightly alkaline pHs, 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 had low to intermediate sulphate (7.0 to 840 mg/L) and low zinc concentrations (<0.005 to 0.45 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.
 - o Station SRK-GD18 returned a field pH of 6.7 and a zinc concentration of 0.39 mg/L in May 2005. These May 2005 results represent the lowest pH and the highest zinc concentrations observed to date in seepage from the northwest portion of the dump. In May 2006 and 2007, SRK-GD18 returned higher pH values (7.1 and 7.7, respectively) and lower zinc concentrations (0.13 and 0.03 mg/L, respectively). No flow was observed at GD18 during the May and September monitoring rounds in 2008.
 - o An adjacent seep (SRK-GD13) has demonstrated a weak trend of increasing sulphate concentrations over the 2002 (313 to 386 mg/L) through 2006 (649 to 731 mg/L) period (Figure 6). Sulphate concentrations since September 2006 have remained at approximately 650 mg/L except for a peak value of 836 mg/L during September 2007 monitoring. Magnesium and calcium concentrations show a similar pattern, with concentrations increasing over the 2002-2006 monitoring period and remaining relatively stable since that time. Zinc concentrations have ranged from 0.007 to 0.026 mg/L with the exception of the September 2008 recorded value of 0.11 mg/L. Nickel concentrations up to 0.13 mg/L have been observed at SRK-GD13, which is the maximum nickel concentration observed from Type 1a seeps at Grum.
 - o The new station SRK-GD23 was classified as a Type 1a seep with a zinc concentration of 0.45 mg/L, sulphate concentration of 550 mg/L and field pH of 6.8. This station is located northeast of the Grum ore transfer pad, and was observed as a trickling flow that infiltrated into the ground within 2 to 3 m of the dump toe.

- Type 1b seeps generally had zinc concentrations in the range of 2 to 7 mg/L, and sulphate concentrations greater than 500 mg/L. Most of these seeps were towards the southeast, and were below the sulphide cell.
 - o Station SRK-GD11, however, which is located upgradient of the mapped sulphide cell, also fell into this group until 2005. 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. In May 2006, SRK-GD11 returned a dissolved zinc concentration of 17.4 mg/L and a field pH of 6.45 and was reclassified as Type 2 using the Faro system. The May 2007 sample also had Type 1b water chemistry, with a zinc concentration of 8 mg/L and a field pH of 6.9. In September 2008, SRK-GD11 returned a lower zinc concentration of 2.2 mg/L and was reclassified as Type 1b (although it should be noted that the September 2008 field pH was 6.3, the lowest on record).
 - o Station SRK-GD01 returned dissolved zinc concentrations of 17 mg/L and 11 mg/L in Spring 2004 and Spring 2005 respectively (Figure 7). These spring results are elevated over previously observed zinc concentrations at this station, although sulphate concentrations and field pH were within the range of previous results. Since the Fall of 2005 until the Spring of 2008, SRK-GD01 returned zinc concentrations between 2.6 and 3.1 mg/L which are more typical zinc concentrations at SRK-GD01 for the 2002-2008 monitoring period. The September 2008, sample, however returned a zinc concentration of 6.7 mg/L and a sulphate concentration of 1686 mg/L, the highest sulphate concentration recorded at this station. As the flow at SRK-GD01 is the single largest source of seepage from Grum Dump, water quality at this station will continue to be closely monitored.
 - o The new station SRK-GD22 was classified as a Type 1b seep with a zinc concentration of 3.96 mg/L, a sulphate concentration of 1743 mg/L, and a field pH of 6.8. This station is located west, and outside the surface catchment, of the mapped Grum sulphide cell.
- Station SRK-GD16, which flows intermittently, was sampled in May of 2004, 2005, 2007 and 2008. The May 2008 sample returned the highest zinc concentration (139 mg/L) and sulphate concentration (4100 mg/L) observed from the Grum Dump to date. Despite the high zinc concentration, the classification of Type 2 water chemistry is maintained due to the neutral pH of the seep.
- One sample of Type 3 water (SRK-GD19) was collected in Spring 2004 from the toe of an internal lift. Under the Faro system, this sample would be considered transitional between Type 2 and Type 3, based on a dissolved zinc concentration of 107 mg/L and a field pH of 5.7. This station had been dry during subsequent surveys until Spring 2007 when the reported zinc concentration was significantly lower (9.23 mg/L) and was reclassified as Type 2 for that sampling round. SRK-GD19 was flowing again in September 2008 with a zinc concentration of 14.2 mg/L, a sulphate concentration of 804 mg/L and a field pH of about 6. The water chemistry at this station appears to be similar to that observed at the adjacent SRK-GD20 station, and in future surveys consideration should be given to sampling only one of these stations (with priority given to sampling SRK-GD20 if flow conditions allow).

Table 3: Characteristics of Grum Water Types

Parameter	Detection Limits	Type 1a					Type 1b					Type 2			Type3	
		Average	Median	Min	Max	N	Average	Median	Min	Max	N	Min	Max	N	Value	N
Field pH (s.u.)	0.01	7.39	7.37	6.73	7.93	30	7.43	7.54	6.32	8.35	50	6.03	7.63	14	5.73	1
Acidity pH 8.3	1	11	8.8	1.0	40	30	25	22	0.5	69	50	7.0	198	14	238	1
Alkalinity Total	1	314	334	108	474	30	509	540	255	701	50	109	659	14	39	1
Chloride	0.5	1.4	1.3	0.50	2.5	27	1.9	1.9	0.50	2.8	37	0.52	2.8	13	0.58	1
Sulphate	0.5	390	416	7.0	836	30	1367	1345	332	2496	50	566	4100	14	1710	1
Calcium	0.05	157	167	42	286	30	336	348	115	477	50	170	462	14	321	1
Magnesium	0.1	77	71	23	179	30	246	237	70	438	50	106	570	14	167	1
Potassium	0.05	2.9	3.0	1.8	4.1	19	7.0	7.0	1.8	12	50	2.7	20	14	6.5	1
Sodium	2	3.2	3.0	2.0	5.9	30	11	11	2.0	18	50	2.3	15	14	4.5	1
Aluminum	0.002	0.0072	0.0050	0.0020	0.014	5	0.0027	0.0020	0.001	0.0050	15	0.0010	0.004	7	0.28	1
Cadmium	0.00002	0.00011	0.00007	0.00002	0.00029	4	0.00159	0.00146	0.00028	0.0050	15	0.0024	0.089	11	0.18	1
Cobalt	0.00003	0.0033	0.0014	0.0001	0.012	5	0.010	0.0044	0.00040	0.050	21	0.0084	0.45	14	0.70	1
Copper	0.0005	0.0020	0.0010	0.0008	0.0038	5	0.008	0.0024	0.0014	0.041	19	0.0015	0.12	10	2.1	1
Iron	0.0002	0.19	0.21	0.0080	0.43	5	0.234	0.015	0.00	0.80	13	0.015	27	8	46	1
Lead	0.0002	0.00018	0.0002	0.0002	0.0003	5	0.0061	0.0013	0.0002	0.0721	15	0.0012	0.0082	7	0.14	1
Manganese	0.005	0.10	0.0070	0.005	1.9	30	0.13	0.056	0.0016	1.0	50	0.11	6.6	14	7.5	1
Nickel	0.00002	0.085	0.085	0.016	0.13	13	0.40	0.35	0.09	1.42	50	0.10	1.5	14	2.7	1
Zinc	0.005	0.050	0.011	0.005	0.45	30	3.7	2.9	1.1	17	50	7.7	139	14	107	1

Note: Units in mg/L except for acidity/ alkalinity in mg CaCO₃ eq/L.

Note 2: Detection limits were used for statistical purposes when values were less than detection.

Where detection limits were greater than 10x the minimum detection limit due to high ionic strength, non-detect results were excluded from statistical calculations.

4.1.4 Vangorda Waste Rock Dumps - 2008

No new seeps were identified at Vangorda in 2008. The previously-developed grouping of seeps into water types continues to be a useful tool for summarizing the monitoring results and for tracking the evolution of dump seepage chemistry.

Figure 2 shows the location of seep sampling stations, and provides a graphical summary of the distribution of the different seepage types. Table 4 provides a summary of key characteristics for each of the above seepage types. Full seepage monitoring results are included in Appendix A. Trends in water quality from the Vangorda dump drains sampled as part of the routine monitoring program carried out by site staff are discussed in Section 4.2.

Water Types

All of the seeps associated with the Vangorda Waste Rock Dump had very high concentrations of zinc and other metals. Two of the seeps sampled in 2008 had pHs between 6 and 7, and six of the seeps were acidic, with pHs of less than 6.

- The seeps with pHs 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 (13 to 2580 mg/L) than Faro waste rock seeps, reflecting the high proportion of sulphidic waste rock in the Vangorda Dumps. These seeps also had elevated concentrations of cadmium, 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. These seeps also tended to have higher zinc concentrations than observed in waste rock seeps at Faro, with values ranging from 87 to 16,700 mg/L. Aluminum, cadmium, cobalt, copper, iron, manganese and nickel concentrations were also generally very high.

Table 4: Characteristics of Vangorda Water Types

Parameter	Detection Limits	Type 2					Type 3				
		Average	Median	Min	Max	N	Average	Median	Min	Max	N
Field pH (s.u.)	0.01	6.36	6.34	5.89	7.08	33	4.30	4.05	2.04	5.93	46
Acidity pH 8.3	1	637	312	35	6230	33	10803	5695	213	41600	46
Alkalinity Total	1	131	150	5	351	33	23	2.0	0.5	127	46
Chloride	0.5	1.11	0.80	0.40	4.0	25	1.9	0.50	0.50	11	22
Sulphate	0.5	3589	2880	323	18600	33	24343	16400	1550	88800	46
Calcium	0.05	331	393	69	534	33	430	445	196	603	46
Magnesium	0.1	481	398	27	2790	33	2488	1905	105	8410	46
Potassium	0.05	9.3	11	0.92	14	26	10	10	3.0	28	22
Sodium	2	7.6	9	0.30	16	31	6.6	5.0	1.3	15	25
Aluminum	0.002	0.042	0.026	0.004	0.10	7	108	29	0.40	687	34
Cadmium	0.00002	0.13	0.080	0.028	1.1	33	4.5	1.5	0.14	23	44
Cobalt	0.00003	1.8	0.91	0.029	10	33	13	7.4	0.30	38	46
Copper	0.0005	0.027	0.015	0.0010	0.072	12	11	0.69	0.032	180	26
Iron	0.0002	91	7.9	0.060	1070	31	1538	959	0.12	8350	46
Lead	0.0002	0.041	0.006	0.0008	0.11	10	1.0	1.0	0.0007	2.5	25
Manganese	0.005	136	45	2.4	1200	33	1455	973	18	4830	46
Nickel	0.00002	2.7	2.4	0.065	7.2	33	11	6.6	0.75	38	46
Zinc	0.005	310	129	13	2580	33	4572	2650	87	16700	46

Note: Units in mg/L except for acidity/ alkalinity in mg CaCO₃ eq/L.

Note 2: Detection limits were used for statistical purposes when values were less than detection.

Where detection limits were greater than 10x the minimum detection limit due to high ionic strength, non-detect results were excluded from statistical calculations.

4.2 Routine Monitoring

4.2.1 Faro Site

Locations of the routine seepage monitoring stations are shown in Figure 1. Data for these stations are available in the Anvil Range master water quality database maintained by GLL. Graphs of key parameters are provided in Figures 8 through 13. Plotted values typically represent dissolved concentrations; where only total concentration was reported, this value was used for plotting purposes. Where reported concentrations were below method detection levels, the detection level values were plotted; this causes plotted values for some trace metals to decline over time as lower detection levels were achieved, and is not necessarily indicative of declining concentrations of these parameters.

Station X23

Station X23 is located east of the mill, in the original Faro Creek channel, below the eastern portion of the Main Dump, the Oxide Fines Stockpile, and the Medium Grade Stockpile. Interpretation of trends in this data is complicated by the deposition and removal of some of the stockpiled ore, and by leakage of pit water into the old Faro Creek channel from a drainage ditch during operations (RGI 1996).

This station has been monitored for select parameters since 1986, and for a full suite of parameters since 1989. The data are summarized in Figure 8.

Sulphate concentrations increased in stages, from less than 2000 mg/L in 1986 to approximately 6000 mg/L in 2000/2001, followed by a slight decrease to approximately 4000 mg/L in 2002 and 2003. Since mid-2004 sulphate concentrations at X23 have varied between approximately 5000 and 7000 mg/L. The higher sulphate concentrations observed since 2004 correspond to a slight decrease in pH from an average of approximately 7 to an average of approximately 6.5, and changes in the major ion chemistry from calcium-dominated to magnesium-dominated. Peak or near-peak concentrations of dissolved iron (279 mg/L), zinc (857 mg/L), and several other metals (e.g. aluminum, cadmium, cobalt, copper, and nickel) were also observed during this period. These observations indicate that the seepage chemistry continues to be in a state of transition, and that concentrations could continue to increase over time. However, concentrations of most parameters have exhibited similar seasonal patterns and magnitudes since 2004.

Station X26

Station X26 is the discharge from the dewatering sump for the Zone II pit, which is completely filled in and buried by waste rock. The sump is operated over an approximately 3 month period during the summer, and water levels are allowed to fluctuate between depths of 60 and 52 metres below the current ground surface. The variable water table in the backfilled Zone II pit causes repeated wetting and submergence of backfill and former pit walls, and sulphides in the former pit walls and backfill may contribute oxidation products to the water sampled at X26. Results from this station are shown in Figure 9.

Monitoring data showed an initial decrease in sulphate concentrations over the first few years of monitoring (1991 to 1995), followed by a gradual and relatively steady increase with concentrations reaching a maximum of 3400 mg/L in 2005, and then beginning to decrease to approximately 2400 mg/L in 2008. pHs have been relatively stable, in the range of 6 to 6.5. Zinc concentrations also peaked in 2005 at 130 mg/L and have since decreased slightly. Iron concentrations followed a similar trend.

There is a seasonal pattern in metal concentrations, with generally higher concentrations occurring later in the summer, when dewatering levels are at a minimum. Based on this variation, it is possible that there is some stratification of concentrations in the flooded zone of the pit, or that oxidation products leached from backfill and pit walls are responsible for this increase.

Station FCO/A30

Station A30 (near 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. Station FCO is located immediately upstream of the Faro Valley Dump, and maybe somewhat influenced by leakage through mineralized rock in the road and berm that comprise the Faro Creek

Diversion. Both stations have relatively high flows, and these flows contact waste rock along the flowpath between A30 and FCO. Results for these two stations are provided in Figure 10.

Sulphate concentrations at A30 increased from approximately 200 mg/L in 1989 to 600 mg/L in 1997, and ranged from 100 to 600 mg/L for the subsequent period through 2003. Average and peak sulphate concentrations at A30 increased significantly beginning in 2004, with a peak concentration of 1340 mg/L recorded in May 2005 before demonstrating a decreasing trend to approximately 400 mg/L by the end of 2007. Sulphate concentrations in 2008 were higher and more variable than the past few years, ranging from 750 to 2000 mg/L. pHs decreased from pH 7.5 in 1989 to pH 3 in 1998. Monitoring from 2001 through 2006 recorded fluctuating pHs, with several pH values near 3 and several in the range of 5.6 to 7.5. 2007 and 2008 pH values were all in the 2.7 to 3.6 range. Zinc concentrations followed similar trends to sulphate, reaching peaks of approximately 100 mg/L in 1998, and then varying from approximately 10 to 100 mg/L until 2008 when sulphate values ranged from 66 to 200 mg/L. The wide variations in seepage chemistry may reflect differences in the amount of vertical versus lateral flow through the pile. In addition, interpretation of water quality results (particularly relating to calcium concentrations) for FCO since 2006 may be confounded by alkaline additions from placement of limestone upgradient during summer 2006.

Station SP5/6

Station SP5/6 (equivalent to SRK-FD26) is located below the Upper North East Dump. Flows at this station are substantial, and may be derived from leakage from the Faro Creek Diversion. Results for this station are provided in Figure 11.

Historically, sulphate concentrations have ranged from 200 mg/L to 1000 mg/L, and have been quite variable. Samples collected in 2008 had typical (461 mg/L- June 2008) to near maximum (938 mg/L- September 2008) sulphate concentrations compared to previous SP 5/6 monitoring. The high September 2008 sulphate concentration corresponded to the maximum observed zinc concentration for this station (6.4 mg/L), while the June dissolved zinc concentration was a more typical 1.7 mg/L. In general, calcium, magnesium, and zinc concentrations have been strongly correlated with sulphate. Variations in concentrations appear to be correlated to flows, with lower concentrations occurring in the June samples (high flow), and higher concentrations occurring in the fall samples (low flow). Monitoring of pH has shown typical values ranging from pH 7 to 8, and 2008 monitoring showed that pH conditions continue to be stable at SP 5/6.

Stations NE1, NE2 and W5

Stations W5, NE1 and NE2 are located along the toe of the Northeast Dump. W5 was monitored from 1989 to 1991, and then again since 2004, and was probably sampled close to the toe of the dump. Therefore, it is likely that this station is equivalent to SRK-FD05 and -FD06. NE1 and NE2 are monitored in the regular seepage program, but are collected approximately 100 metres downstream of the toe, and may be influenced by interaction with the overburden in that area.

Results for all three stations are provided in Figure 12. Data from SRK-FD05 and FD06 are shown in the W5 graphs.

Sulphate concentrations in W5 increased from approximately 300 mg/L in 1987 to 1989 to approximately 400 mg/L in the more recent samples. One sample collected from SRK-FD06B had a peak value of 1160 mg/L sulphate in spring 2006. Sulphate concentrations in 2008 samples ranged from 330 to 630 mg/L. Zinc concentrations increased from much less than 1 mg/L in 1989/90 to seasonably-variable concentrations of 0.5 to 14 mg/L for the period 2002 through 2008. Field pHs during this period were neutral, and concentrations of other metals were generally low.

Sulphate concentrations at NE1 were stable within the range of 70 to 130 mg/L from 1997 through 2003, and then increased to range between 100 and 290 mg/L since 2004. Metal concentrations at this station were low and pH values were neutral throughout the monitoring period.

Sulphate concentrations in NE2 increased from approximately 100 mg/L in 1997 to variable concentrations between 400 and 900 mg/L since mid-2000. Metal concentrations at this station were low and pH values were neutral throughout the monitoring period.

Station W8/W10

Station W8 is located in Upper Guardhouse Creek, which flows under and alongside an approximately 50 metre section of the Northwest Dump. This station is equivalent to SRK-FD16. Station W10 is located approximately 100 metres upstream from this station and is unaffected by mining activities. Results for W8 (including data from SRK-FD16), and W10 are provided in Figure 13.

Results for both stations indicate consistently neutral pHs, low sulphate and low metal concentrations. There is little if any increase in concentration between W10 and W8.

4.2.2 Grum Site

The routine monitoring stations at Grum are shown in Figure 2. Station V2 has been monitored on a regular basis since 1988, with monitoring 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, where dilution of toe seepage by surface water and interaction of toe seepage with soils along the flow-paths could be expected. As such, monitoring results from these stations are not directly comparable to seepage at the toes of the dumps. The routine seepage monitoring data were available from the Anvil Range master water quality database maintained by GLL. Graphs of key parameters are provided in Figures 14 and 15. Plotted values represent dissolved concentrations; where only total concentration was reported, this value was used for plotting purposes. Where reported concentrations were below method detection levels, the detection level values were plotted, causing plotted values for some trace metals to decline over time as lower detection levels were achieved. As such, these changes are not necessarily indicative of declining concentrations of these parameters.

Results from these stations have also been discussed as part of the 2008 Adaptive Management Plan (AMP) Event #4 report (SRK 2008a).

Stations V15 and V2

Station V15 represents surface runoff and groundwater seepage discharging from a sedimentation pond below the toe of the waste dump at the upper limit of Tributary A. The area immediately upgradient is a groundwater discharge zone for one of the Grum Dump catchments, and toe seeps at stations SRK-GD04 and SRK-GD21 are intermittently present as surface discharges upgradient of V15. Water at station V15 has been in close contact with soils and sediments, and chemical interaction with these materials is likely significant. Results for these stations are provided in Figure 14.

Sulphate concentrations at Station V15 increased gradually between 1996 and 2000 (from 100 mg/L to 300 mg/L), and then more rapidly in 2000 and 2001, reaching levels in the range of 1000 mg/L by June 2001. Sulphate concentrations remained at approximately 1000 mg/L until 2004, and then increased to approximately 2000 mg/L by fall of 2005, with a March 2005 spike to approximately 3000 mg/L. Sulphate concentrations remained at approximately 2000 mg/L through 2006 and generally ranged from 1400 to 1900 mg/L through 2007 and 2008. The 2004 through 2005 increase in sulphate concentrations corresponded to increases in calcium and magnesium concentrations, with calcium concentrations generally exceeding magnesium concentrations. pH values had been stable in the range of 7.5 to 8 from 2000 through 2005, then steadily declined through 2006 and 2007 to a minimum pH value of 6.3 in September 2007. pH values then steadily increased, with 2008 pH values varying from 6.7 to 7.6. There has been a broad correlation between pH and zinc concentrations from 2006 through 2008, with higher zinc concentrations typically occurring at lower pH values. Zinc concentrations in 2008 ranged from 0.2 to 1.2 mg/L. Over the 2004 to 2005 time period when sulphate increased markedly, nickel concentrations increased from 0.01 mg/L to approximately 0.05 mg/L and cadmium concentrations have increased from <0.0002 mg/L to 0.001 mg/L. Since 2005, nickel at V15 has ranged from 0.012 to 0.085 mg/L, and cadmium has typically ranged from 0.0005 to 0.0013 mg/L, with 2008 concentrations within these respective ranges

Station V2 is located upstream of Vangorda Creek in the original Grum Creek channel, and is fed by discharge from the sedimentation pond at V15, as well as by seepage losses from the Grum Creek diversion and local runoff. Since 2007, discharge from V15 has been diverted by a ditch to Moose Pond via Grum Creek. Minor seepage losses from the ditch continue to report to V2.

Sulphate concentrations at V2 increased from less than 50 mg/L in the late 1980s (i.e. prior to dump construction) to approximately 150 mg/L in 1998. In 1998, concentrations started to increase rapidly, reaching 600 to 700 mg/L by 2000. Sulphate concentrations remained between 600 and 700 mg/L from 2000 through mid-2004 then increased to approximately 1000 mg/L from 2005 through to May 2007. Since May 2007 sulphate concentrations have generally ranged between 640 and 770 mg/L. pHs were in the range of 7 to 8.5 throughout this period. Calcium and magnesium

concentrations have followed the same pattern as sulphate concentrations. Calcium remained the dominant cation. Zinc concentrations at station V2 have been highly variable, with typical concentrations ranging from less than 0.01 to 1 mg/L prior to 2002, and from 0.005 to 0.05 mg/L since 2002. Concentrations of other metals (e.g. cadmium, iron, cobalt, copper, and nickel) were variable, but generally low, and have remained constant or declined in recent years.

Station V2A

Station V2A represents the downstream extent of the largest seepage flows that originate at the toe of the Grum dump, at stations SRK-GD01 and SRK-GD02. In addition, diverted water from Station V15 began reporting to Grum Creek above the sampling point in mid-2007. Station V2A is sampled where water diverted from Grum Creek discharges into Moose Pond via a culvert. Sample frequency was irregular at this station prior to 2002. Results for this station are provided in Figure 15.

Sulphate concentrations at Station V2A increased erratically between 1996 and 1999 (from 100 mg/L to 400 mg/L). No monitoring was conducted at V2A during 2000, and although initial monitoring in 2001 showed similar concentrations (380 mg/L, March 2001) sulphate concentrations had jumped to 800 mg/L by June 2001. Sulphate concentrations at V2A then varied seasonally between 300 and 1000 mg/L from 2001 to late 2008, demonstrating a slightly increasing trend over time (2008 samples ranged from 610 to 1050 mg/L, with the highest sulphate concentrations likely influenced by the diversion of water from V15). The seasonally-fluctuating sulphate concentrations were mirrored by calcium and magnesium concentrations over the 2001-2008 period. pH values were stable in the range of 7.5 to 8.6 throughout the monitoring period.

Zinc concentrations at Station V2A were highly variable from initial 1997 monitoring through 2007, with typical concentrations ranging from less than 0.01 to 0.1 mg/L prior to 2000, and from 0.01 to 1 mg/L from 2001 through 2007. Zinc concentrations from 2001 to 2007 appeared to follow a pattern of annual peaks during June freshet (0.2 to 1 mg/L) and lows associated with late winter flows (0.05 to 0.08 mg/L). In 2008, zinc concentrations did not show the same degree of seasonal variation, with zinc concentrations ranging from 0.9 to 1.7 mg/L during the June through September period- the higher zinc concentrations at V2A in 2008 correspond to the diversion of water from V15 to Grum Creek above the V2A sampling location.

Nickel concentrations at V2A have followed the same trend as zinc concentrations with elevated concentrations (seasonal variation of 2 orders of magnitude) from 2001 through 2007, with less variation in 2008 with nickel concentrations ranging from 0.08 to 0.12 during the June through September monitoring period. Cadmium concentrations were typically near or below detection levels from 2001 through 2007, but cadmium concentrations increased to routinely detectable levels ranging from 0.0002 to 0.0006 mg/L in 2008. Other metal concentrations (e.g. iron, cobalt, and copper) were variable, but generally low, and did not change significantly over time.

4.2.3 Vangorda Site

The routine seepage monitoring stations at Vangorda are the three drains shown in Figure 2, as well as a Vangorda Creek monitoring station below all mine inputs (not shown on Figure 2). Results for these stations were available from the Anvil Range master water quality database maintained by GLL. Graphs of key parameters are provided in Figures 16 to 19. Plotted values represent dissolved concentrations; where only total concentration was reported, this value was used for plotting purposes. Where reported concentrations were below method detection levels, the detection level values were plotted; this causes plotted values for some trace metals to decline over time as lower detection levels were achieved, and is not necessarily indicative of declining concentrations of these parameters.

Drains 3, 5 and 6 (Stations V30, V32 and V33)

Three of the drains (Drain 3, 5 and 6) at Vangorda have been monitored as part of the routine monitoring programs since 1994. The other drains (Drains 1, 2 and 4) have historically been consistently dry. Results are shown in Figures 16 through 18.

Results for station V30 (Drain 3, SRK-VD03) are provided in Figure 16. Seepage from this station has had pHs close to 6 throughout the monitoring period. One lower pH value of 5.2 was recorded in September 2008. Sulphate concentrations increased from 2500 mg/L in 1994 to a peak concentration of 6200 mg/L in fall 2004 and had decreased to approximately 4200 mg/L in 2007. Sulphate concentrations in 2008 further increased, ranging from 4400 to 7500 mg/L. Zinc concentrations were highly variable in the range of 150 to 600 mg/L from 1994 through spring 2000. Station V30 was not monitored again until spring 2002 and zinc concentrations were more stable until 2007, in the range of 200 to 450 mg/L (with one peak value of 612 mg/L recorded in May 2004). Concentrations in 2008, however, were higher than previous years, ranging from 340 to 860 mg/L. High concentrations of sulphate, zinc and other metals in 2008 may reflect a higher than normal degree of flushing of oxidation products arising from the unusual amount of rain experienced at the site in 2008.

Results for station V32 (Drain 5, SRK-VD04) are provided in Figure 17. pHs at this station have decreased from approximately 5 in 1994 to approximately 3 over the 2003 through 2008 period, with one value of 2.2 reported. 2008 pH values in 2007 ranged from 2.7 to 3.7. Sulphate concentrations increased substantially during this period from approximately 5000 mg/L in 1994 to typically 50,000 to 80,000 mg/L since 2004, with a peak of 93,000 mg/L reported in September 2004. The high sulphate concentrations were supported by a similar magnitude of increase in magnesium concentrations (from approximately 500 mg/L in 1994 to 5500 mg/L in 2007/2008) as well as substantial increases in iron, manganese and zinc concentrations. Recent iron and manganese concentrations have been in the range of 2500 to 5000 mg/L, and zinc concentrations have been in the range of 10,000 to 16,000 mg/L. Concentrations of aluminum increased until 2005 and fluctuated between 150 and 690 mg/L throughout 2006 to 2008. Cadmium increased to a peak concentration of 23 mg/L in 2004 and ranged between 6.4 and 15 mg/L in 2008 (similar to the range

of observed from 2005 through 2007). Cobalt (approximately 30 mg/L) and nickel (approximately 20 mg/L) concentrations were relatively stable over the 2002 through 2008 monitoring period. Concentrations of copper have fluctuated between 0.02 and 1 mg/L since 1996 with a peak value of 2 mg/L recorded in October 2007. Lead concentrations were highest between 1997 and 2000 (10 mg/L) and have decreased to approximately 1 mg/L since 2005 with one value of 3 mg/L recorded in October 2007.

Results from Station V33 (Drain 6, SRK-FD05) are provided in Figure 18. pHs were in the range of 6 to 7 from 1994 to 1999, dropped to approximately 6 in the 2000 to 2002 samples, and typically ranged between 5 and 6 from 2004 until 2007. 2008 pH values were slightly lower, ranging from 4.5 to 4.9, suggesting that buffering processes in the upgradient rock are evolving. Sulphate concentrations were in the range of 2000 to 5000 mg/L from 1994 to 2000, and then increased to a peak of approximately 90,000 mg/L in 2004, before decreasing to concentrations of approximately 50,000 mg/L in 2006/2007. Sulphate concentrations increased in 2008 to approximately 88,000 mg/L. Magnesium concentrations have been correlated with sulphate concentrations, beginning to increase in 2001 to approximately 7000 mg/L in 2006 and having remained relatively stable since that time. Concentrations of iron, zinc and several other metals have increased slightly since 2000, with zinc concentrations generally in the range of 3000 to 10,000 mg/L in recent years. Maximum aluminum concentrations of 168 mg/L were observed in September 2008, likely due to the lower pH conditions.

Station V27

Station V27 is the first routine monitoring station in Vangorda Creek downstream of the Vangorda and Grum Waste Rock dumps and other mine-related sources. Although interpretation of the surface water sampling stations is not directly relevant to the seepage monitoring program, the low flows observed in seeps from the Vangorda Dump suggest that some water could be leaving the system via the subsurface. Station V27 is sufficiently lower in elevation that it could be reasonably expected to reflect any contaminants that are transported via the groundwater system.

However, Vangorda Creek flows are very large, so significant changes in loading would be needed before any changes from the dumps could be observed. One consideration for interpretation of the V27 monitoring data is that arrival of Vangorda Dump contaminants at Vangorda Creek may not yet have occurred, as groundwater movement in the soils underlying the dump is expected to be slow. A second consideration is that any loading entering the creek from the Grum dump or other sources in the upgradient catchment would contribute to loads at this location, and thus the portion of load observed at V27 that is sourced from Vangorda dump will be difficult to quantify. Results for station V27 are presented in Figure 19.

Results for this station indicated consistently neutral pHs, and generally low sulphate concentrations (<50 mg/L) from 1991 to 2001. Sulphate concentrations since 2002 have typically ranged from about 25 to 90 mg/L, with a peak value of 250 mg/L reported for August 2008. Elevated sulphate concentrations are routinely experienced during the summer when the Vangorda water treatment

plant is discharging effluent to Vangorda Creek. Metal concentrations at V27 were generally very low, and have exhibited stable or slightly decreasing trends since 2002. Copper and zinc concentrations in Vangorda Creek were near or above CCME guidelines for aquatic life, and detection limits for several other parameters were too high to evaluate whether they meet CCME criteria.

4.3 Temperature and Oxygen Monitoring of Waste Rock

There were no significant changes in the temperature and oxygen monitoring data compared to data from previous years (see SRK 2008). Therefore, additional interpretation of the data has not been conducted- see SRK (2004a) for a detailed interpretation of results of thermal and oxygen monitoring.

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 34,800 mg/L) were associated with the ore and oxide fines stockpiles and the mill area. Zinc concentrations at SRK-FD13 (Intermediate Dump) were nearly an order of magnitude higher in 2008 than previously observed, with concentrations ranging from 3880 to 4480 mg/L, and likely reflect increased flushing from the upgradient sulphide cell due to the unusually high rainfall experienced in the region during 2008. No other stations draining from the Intermediate Dump were sampled in 2008. High zinc concentrations were also associated with the Main Dump sulphide cell (up to 1000 mg/L). Away from the known sulphide cells, many seeps were acidic or partially buffered, and had zinc concentrations in the range of 5 to 600 mg/L. A moderate number of seeps at Faro had alkaline pHs, and zinc concentrations of less than 5 mg/L. These were associated with dumps that contained waste rock with relatively low sulphide content. Cadmium, cobalt, copper, iron, manganese and nickel concentrations in some of the seeps are at concentrations that significantly exceed receiving water quality criteria.

Faro waste rock seepage chemistry appears to be remaining within a stable range at most stations. Seepage from the Main Dump, the Oxide Fines stockpile and the Medium Grade Ore Stockpile (as monitored at routine monitoring station X23, and SRK seep survey stations SRK-FD12 and SRK-FD31) has had sulphate, major ion, and zinc and other trace metal concentrations that have remained stable within seasonal ranges over the period from 2004 through 2008. The surface water at X23 represents the largest known source of loading from the Faro waste dumps, and as such the evolution of water chemistry at this station provides a critical link in understanding the progress of weathering within the Faro dumps.

Seeps associated with the Grum Waste Rock Dumps had consistently neutral to alkaline pHs. Seeps draining to the southeast had zinc concentrations generally in the range of 2 to 7 mg/L and elevated sulphate concentrations in 2008. The seeps to the Southeast were located below the sulphide cell, or

below sulphidic waste identified in the SRK September 2002 surface mapping programs. Zinc concentrations remained within stable ranges at all southeast draining seeps in 2008. Over the 2002 to 2008 monitoring period, seeps draining to the northwest have had zinc concentrations ranging from <0.005 to 0.4 mg/L, dissolved nickel concentrations up to 0.13 mg/L, and generally lower, but increasing sulphate concentrations ranging up to 836 mg/L.

Grum waste rock seepage chemistry at most locations appears to have gradually increasing sulphate concentrations and stable or gradually increasing zinc concentrations. Isolated ephemeral seeps with high zinc concentrations (e.g. SRK-GD16 (139 mg/L, May 2008)) show that, at least at a local scale, waste rock at Grum has the potential to generate higher loads than are presently observed at the seepage stations with larger and more consistent flows. The increase in sulphate and zinc concentrations observed at station V15 over the 2004 to 2006 period appears to have stabilized, but demonstrates how order of magnitude increases in aqueous zinc concentrations can develop over a modest time period.

Seeps associated with the Vangorda Waste Rock Dumps were acidic to partially buffered, and contained high to very high zinc concentrations (from 10 to 16,700 mg/L). In general, pH conditions have been stable in recent years, however in 2008 pH values at both Drain 3 (Station V30) and Drain 6 (Station V33) were lower than previously observed and seepage at these stations may reflect depletion of upgradient buffering capacity. Sulphate and zinc concentrations have increased since the routine seepage monitoring programs were initiated in 1994, but concentrations appear to have stabilized within broad ranges of seasonal variation since 2004. Other trace metals significantly exceeding receiving water quality criteria in the Vangorda seepage include aluminum cadmium, cobalt, copper, iron, manganese and nickel. Cobalt and nickel are notably higher compared to acidic seeps at Faro.

This report, “**1CD003.113 – Faro Mine Complex- 2008 Waste Rock and Seepage Monitoring Report: 2008/09 Task 13 – FINAL**”, was prepared by SRK Consulting (Canada) Inc.

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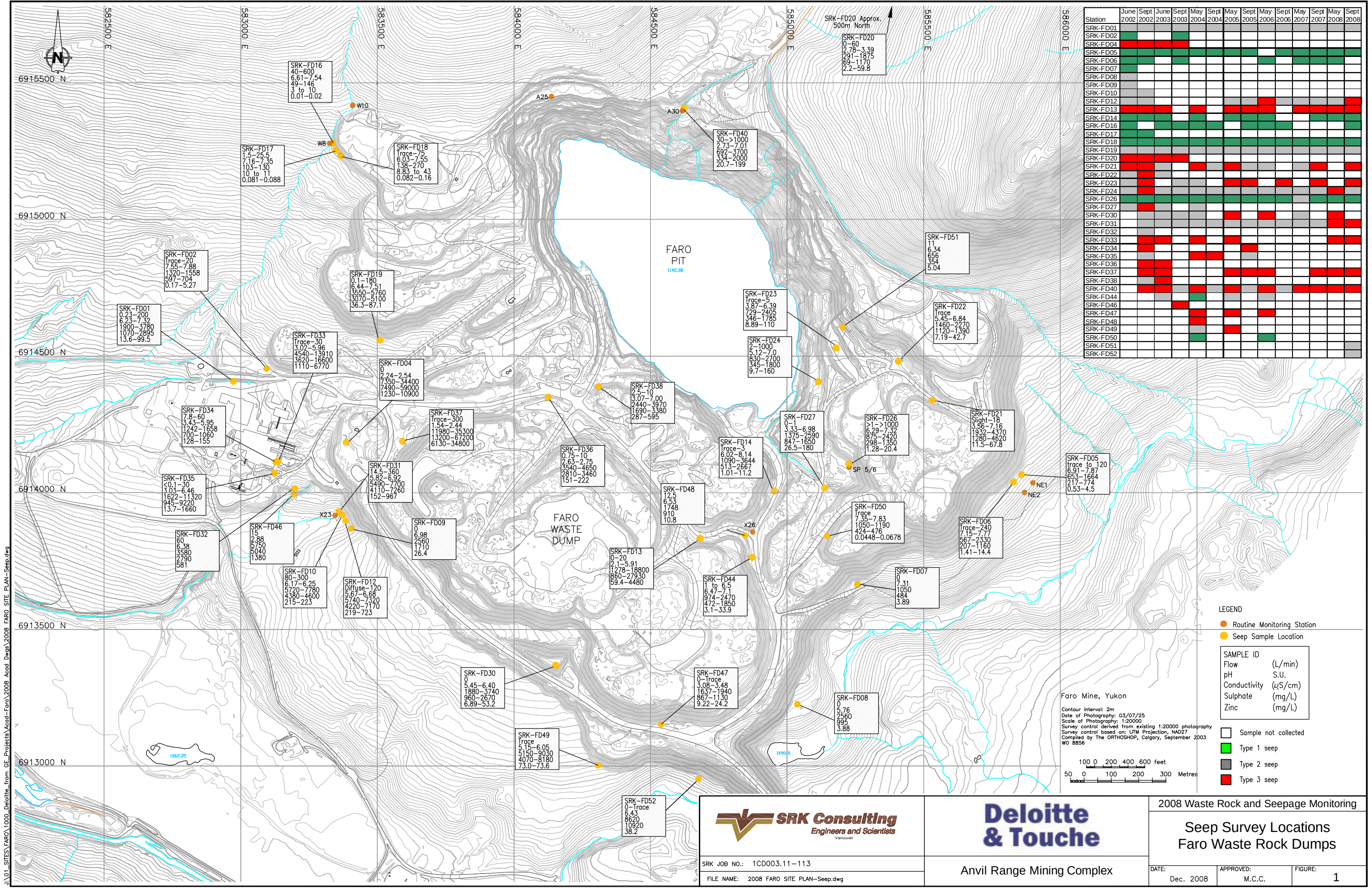
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AND STAMPED

Kelly Sexsmith, P.Geo. (B.C.)
Principal Environmental Geochemist

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Figures



Station	June 2002	Sept 2002	June 2003	Sept 2003	May 2004	Sept 2004	May 2005	Sept 2005	May 2006	Sept 2006	May 2007	Sept 2007	May 2008	Sept 2008
SRK-FD01														
SRK-FD02														
SRK-FD04														
SRK-FD05														
SRK-FD06														
SRK-FD07														
SRK-FD08														
SRK-FD09														
SRK-FD10														
SRK-FD12														
SRK-FD13														
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SRK-FD37														
SRK-FD38														
SRK-FD40														
SRK-FD44														
SRK-FD46														
SRK-FD47														
SRK-FD48														
SRK-FD49														
SRK-FD50														
SRK-FD51														
SRK-FD52														

LEGEND

- Routine Monitoring Station
- Seep Sample Location

SAMPLE ID	
Flow	(L/min)
pH	S.U.
Conductivity	(µS/cm)
Sulphate	(mg/L)
Zinc	(mg/L)

- Sample not collected
- Type 1 seep
- Type 2 seep
- Type 3 seep



SRK Consulting
Engineers and Scientists
Vancouver



Deloitte
& Touche

SRK JOB NO.: 1CD003.11-113

FILE NAME: 2008 FARO SITE PLAN-Seep.dwg

Anvil Range Mining Complex

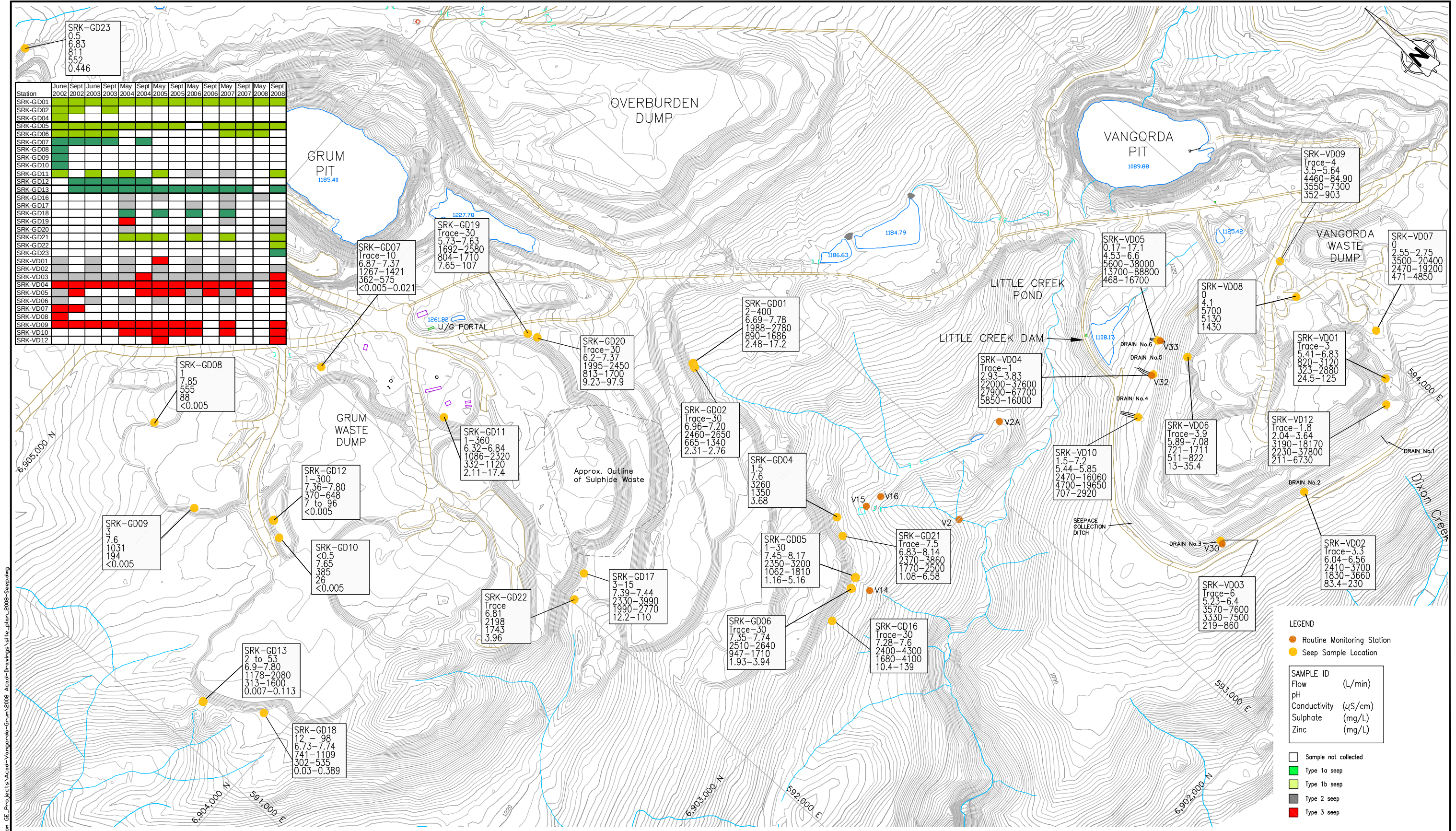
2008 Waste Rock and Seepage Monitoring

Seep Survey Locations
Faro Waste Rock Dumps

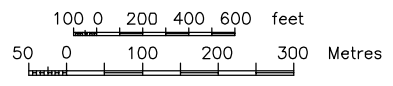
DATE: Dec. 2008

APPROVED: M.C.C.

FIGURE: 1



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



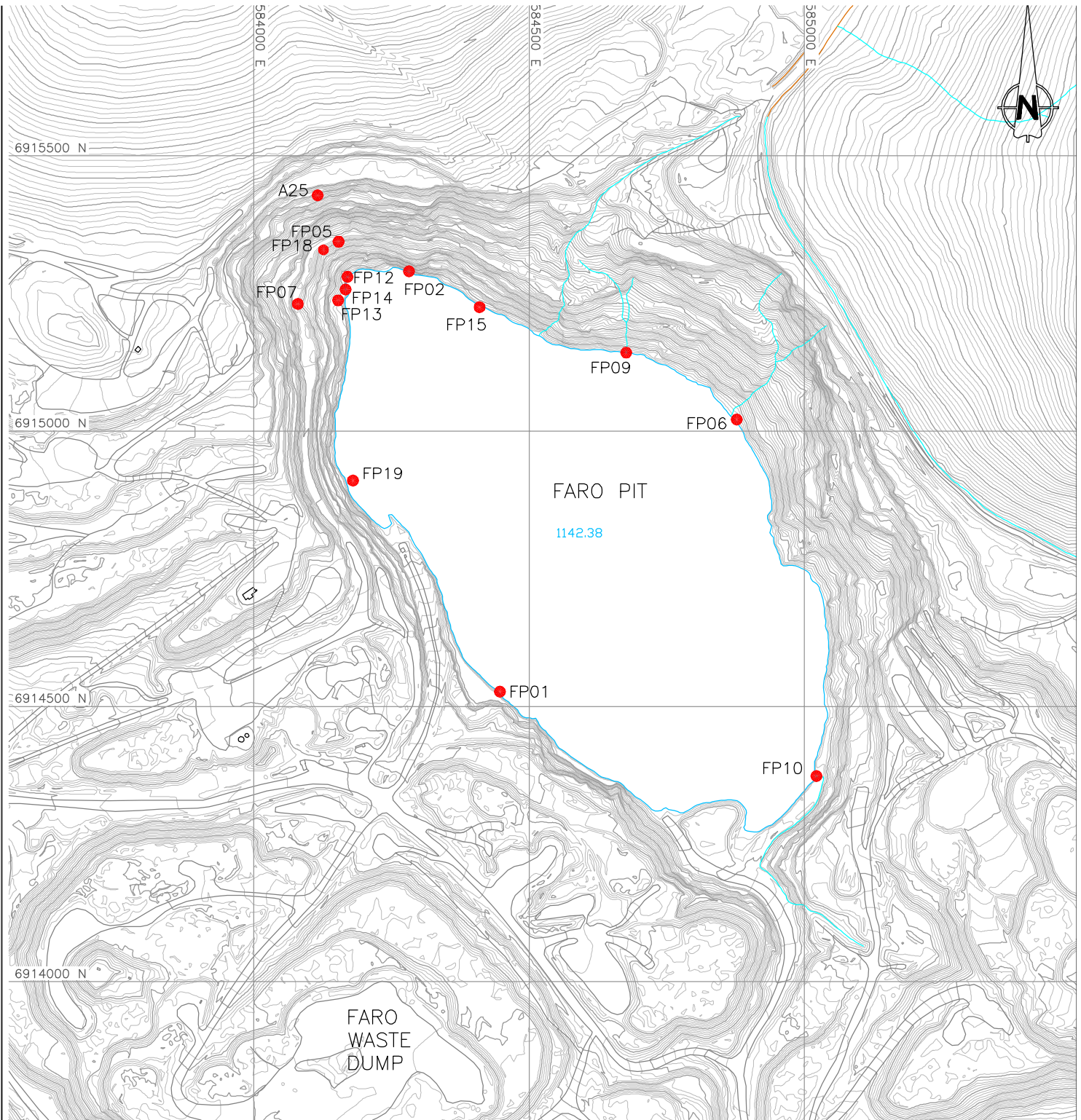
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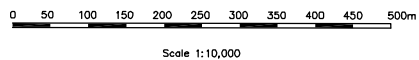
Anvil Range Mining Complex

2008 Waste Rock and Seepage Monitoring
**Seep Survey Locations
Vangorda & Grum
Waste Rock Dumps**

DATE: Dec. 2008 APPROVED: M.C.C. FIGURE: 2



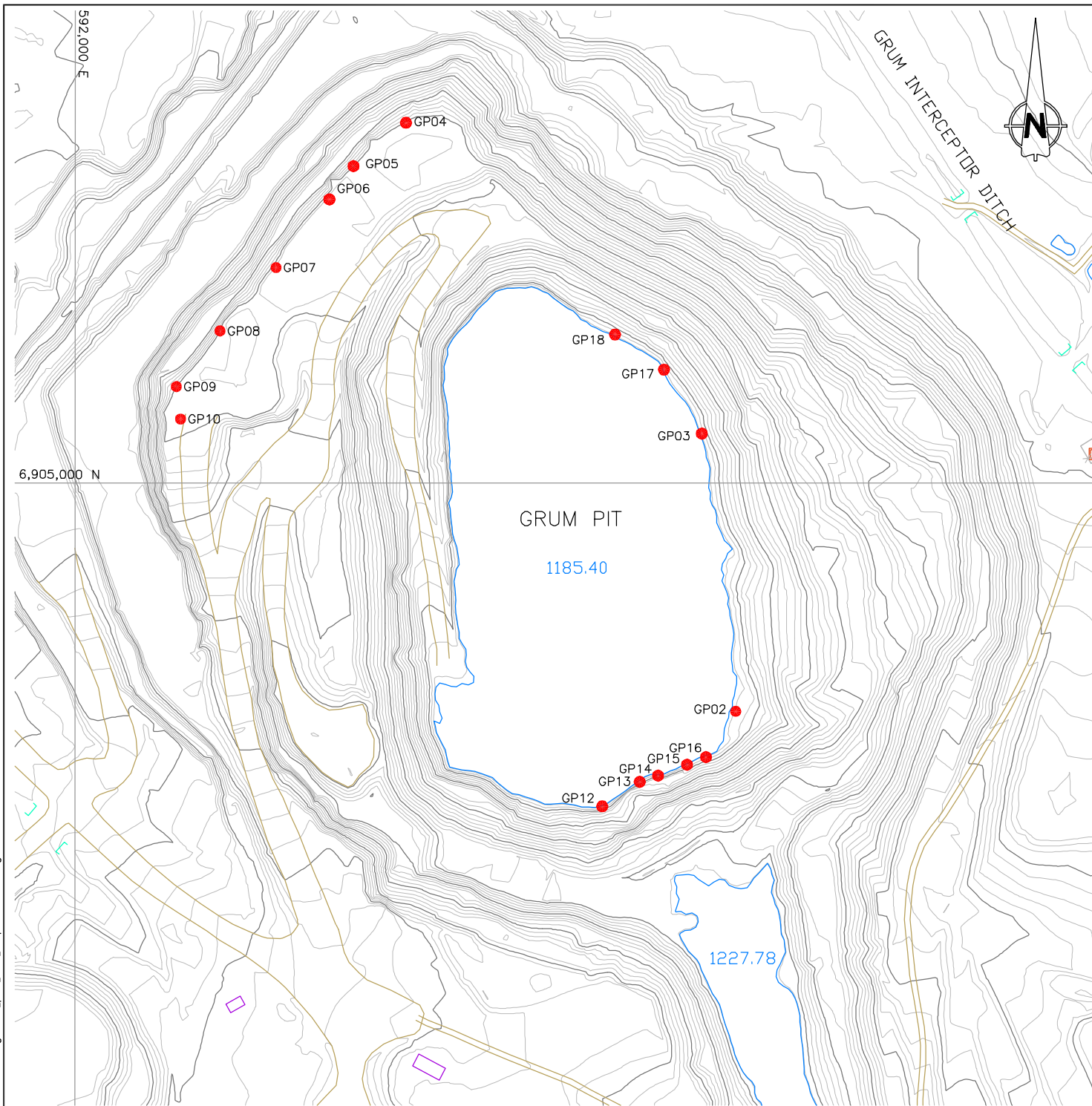
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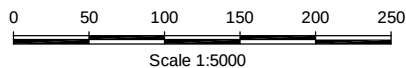
● Seep Sample Location

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 SRK Consulting Engineers and Scientists Vancouver	 Deloitte & Touche	2008 Waste Rock and Seepage Monitoring		
		Seep Survey Locations Faro Pit		
SRK JOB NO.: 1CD003.113	Anvil Range Mining Complex	DATE:	APPROVED:	FIGURE:
FILE NAME: 2008 Seep survey locations.dwg		Dec. 2008	DBM	3



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 Compiled by The ORTHOSHOP, Calgary, September 2003
 WO 8856



● Seep Sample Location



2008 Waste Rock and Seepage Monitoring

Seep Survey Locations Grum Pit

SRK JOB NO.: 1CD003.113

Anvil Range Mining Complex

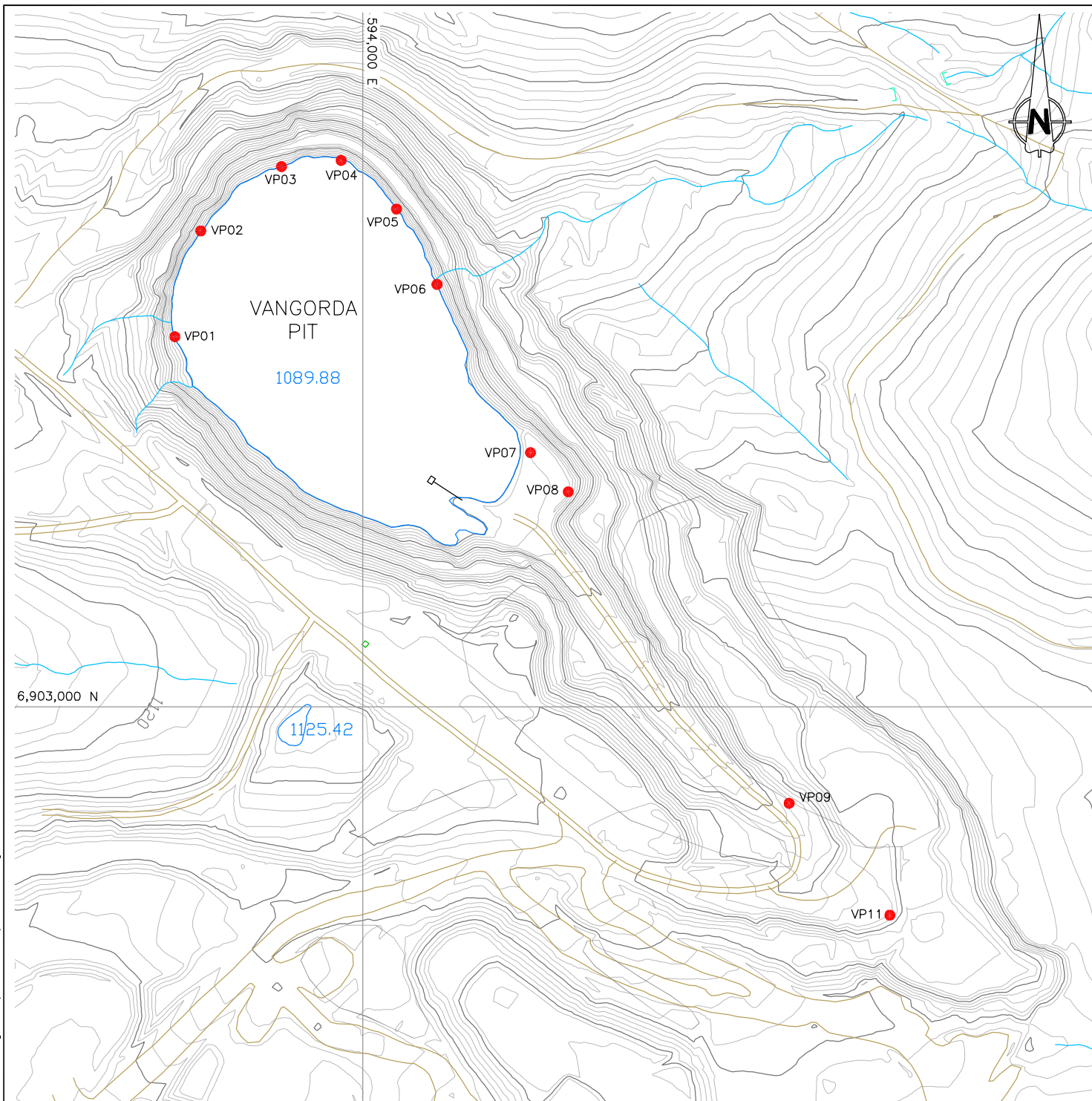
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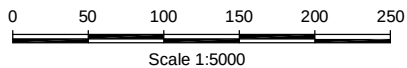
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 Compiled by The ORTHOSHOP, Calgary, September 2003
 WO 8856



● Seep Sample Location

NOTE:

No sample VP10 collected Sep. 2008



2008 Waste Rock and Seepage Monitoring

Seep Survey Locations Vangorda Pit

SRK JOB NO.: 1CD003.113

Anvil Range Mining Complex

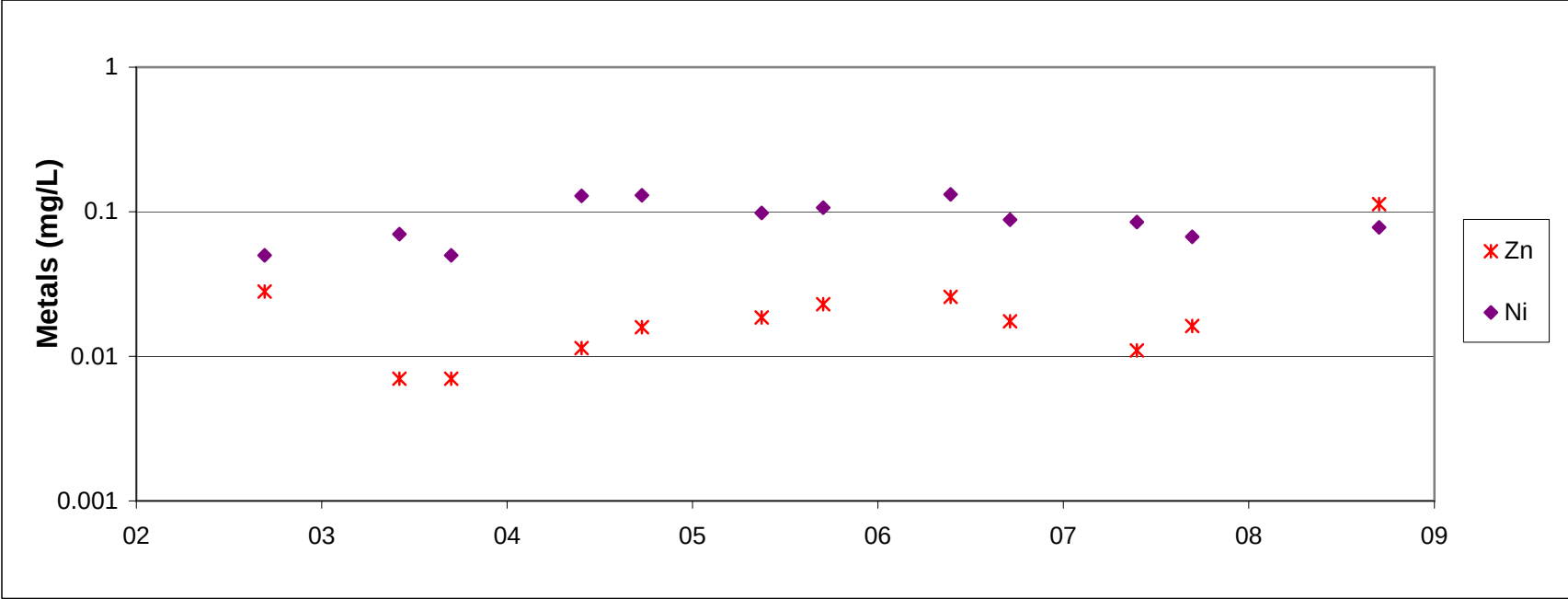
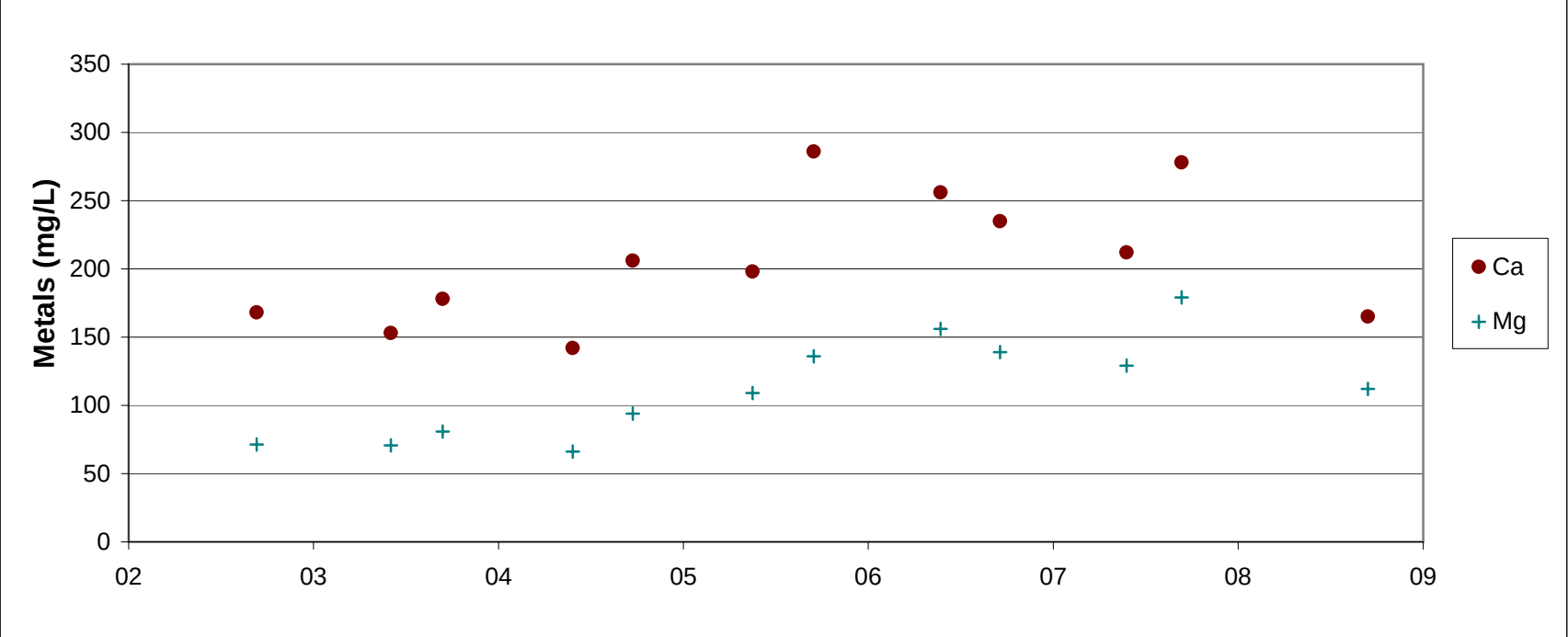
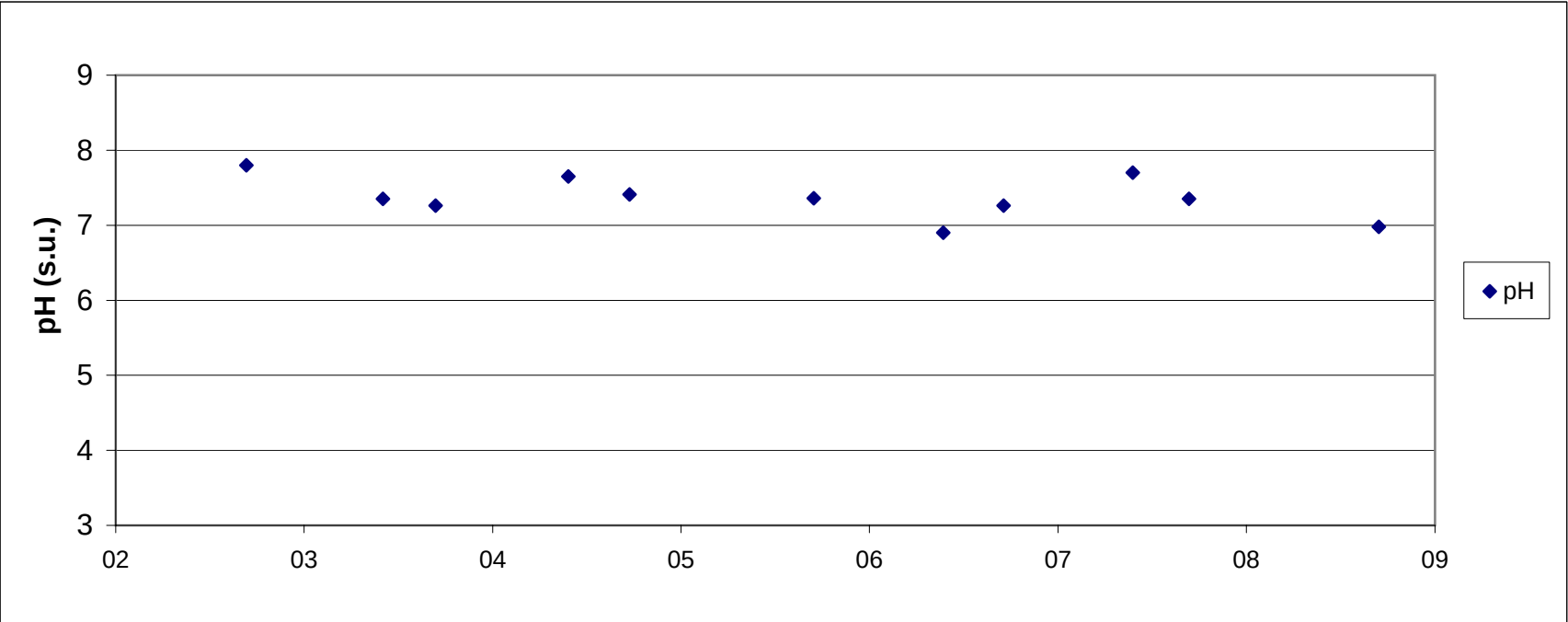
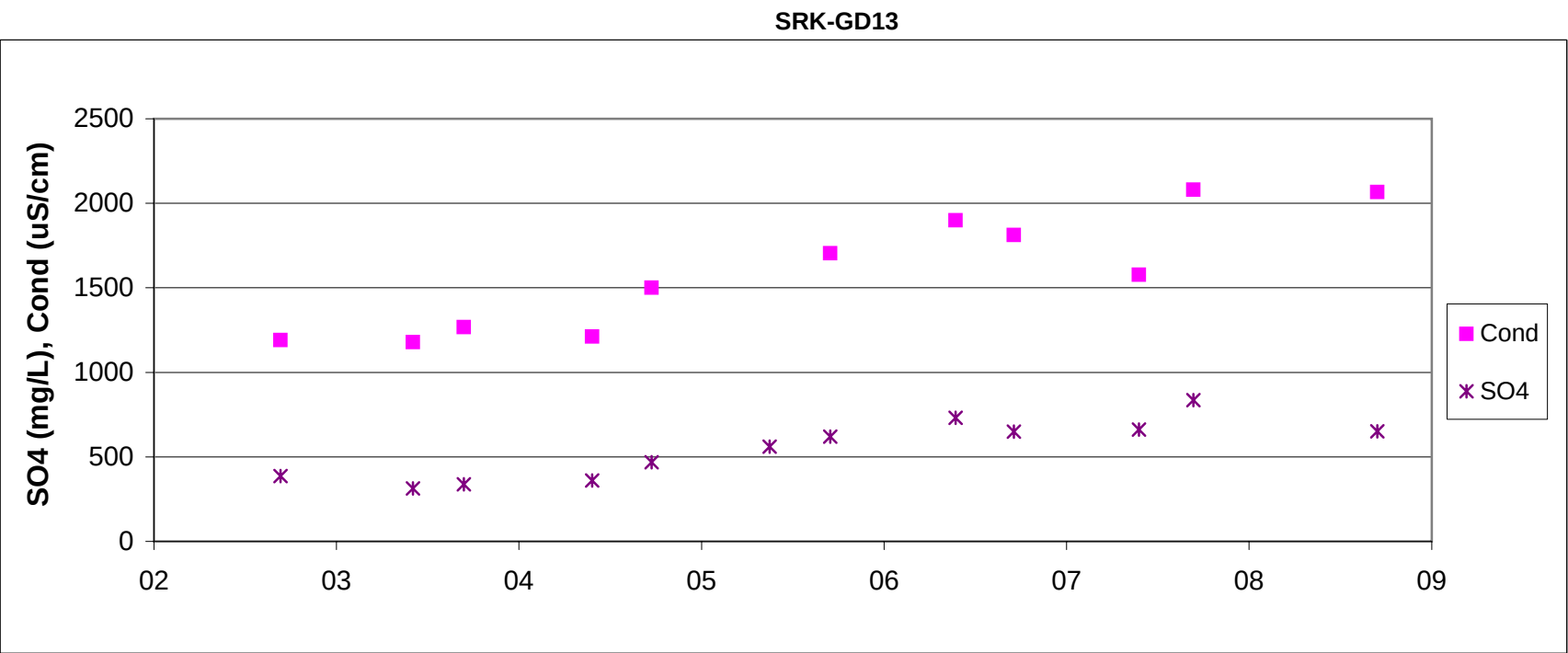
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FIGURE:
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Anvil Range Mining Complex
2008 Waste Rock and Seepage Monitoring Report

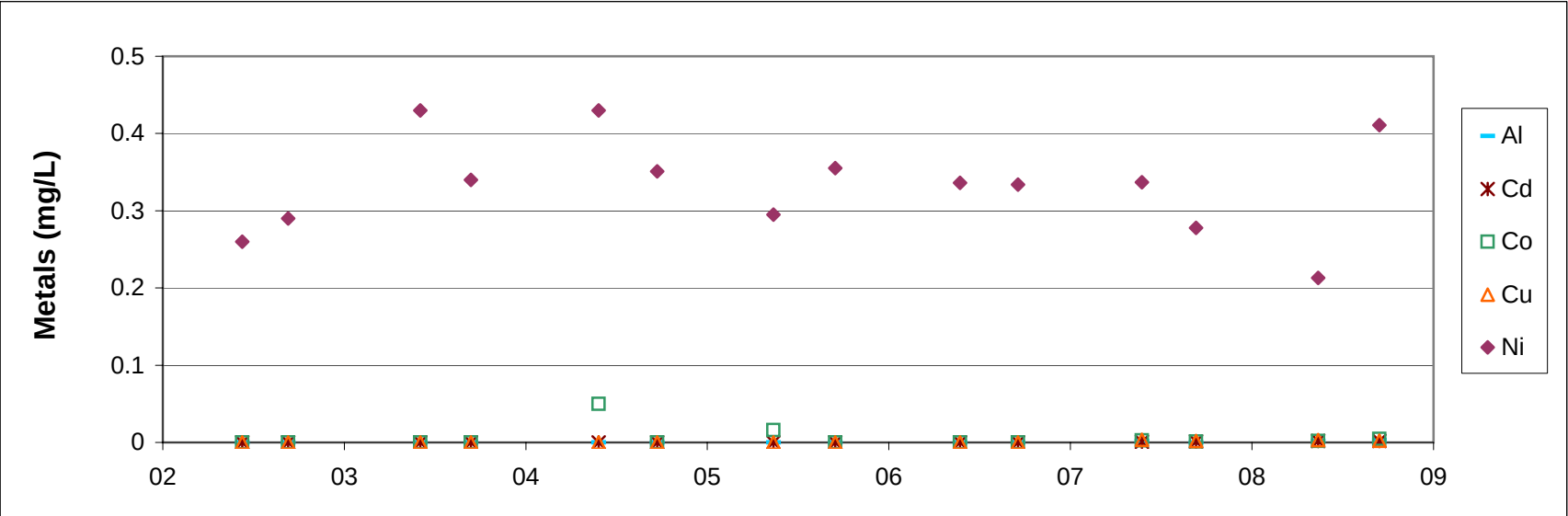
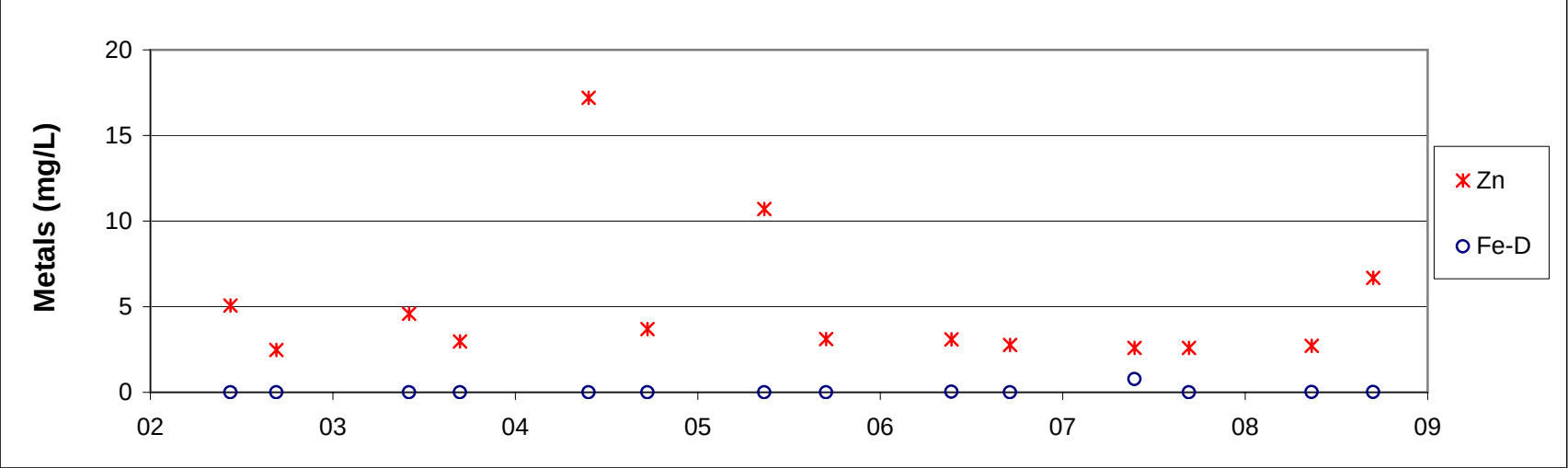
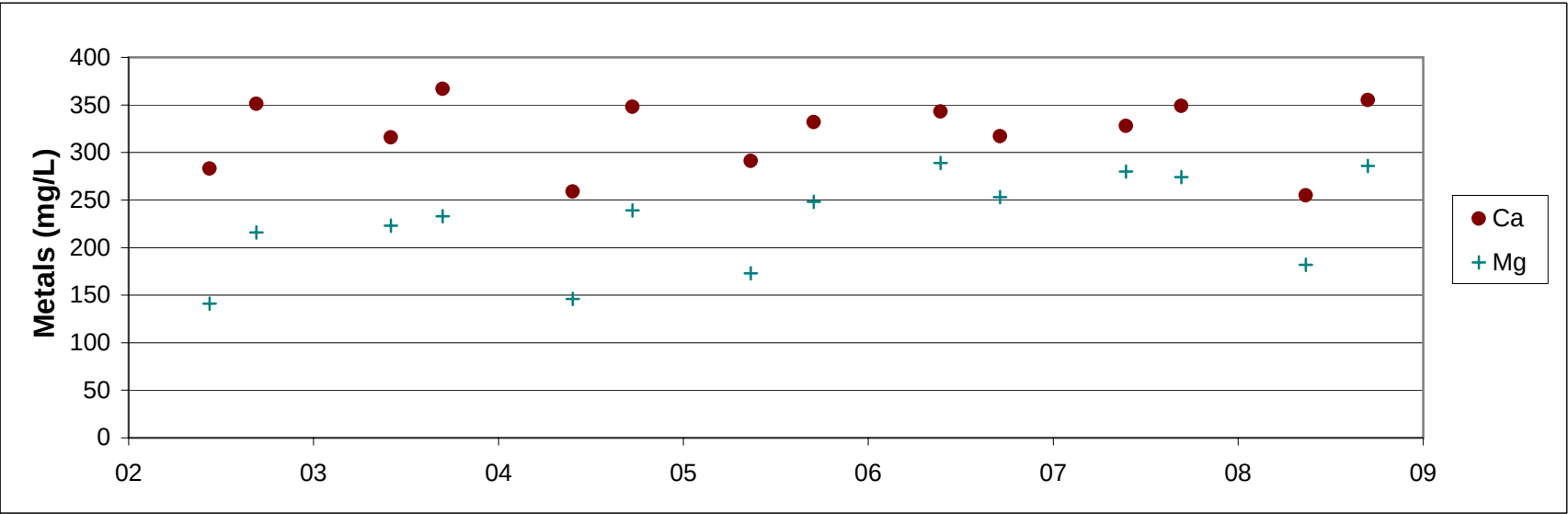
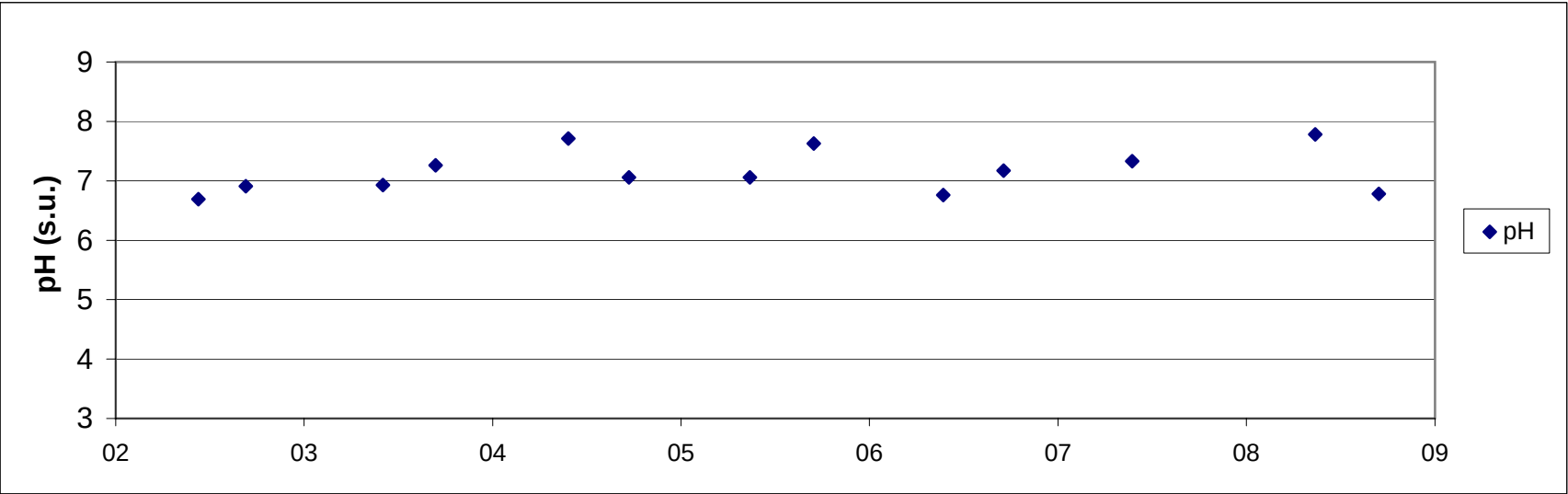
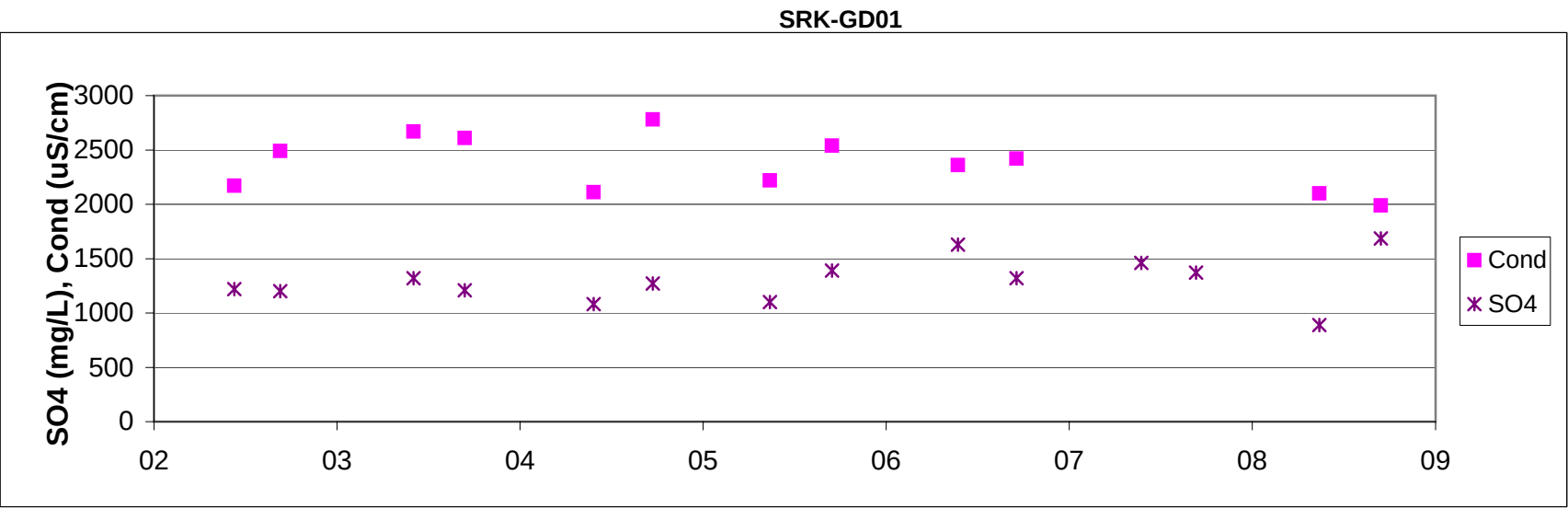
Grum Seepage Station
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FIGURE
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2008 Waste Rock and Seepage Monitoring Report

Grum Seepage Station
SRK-GD01

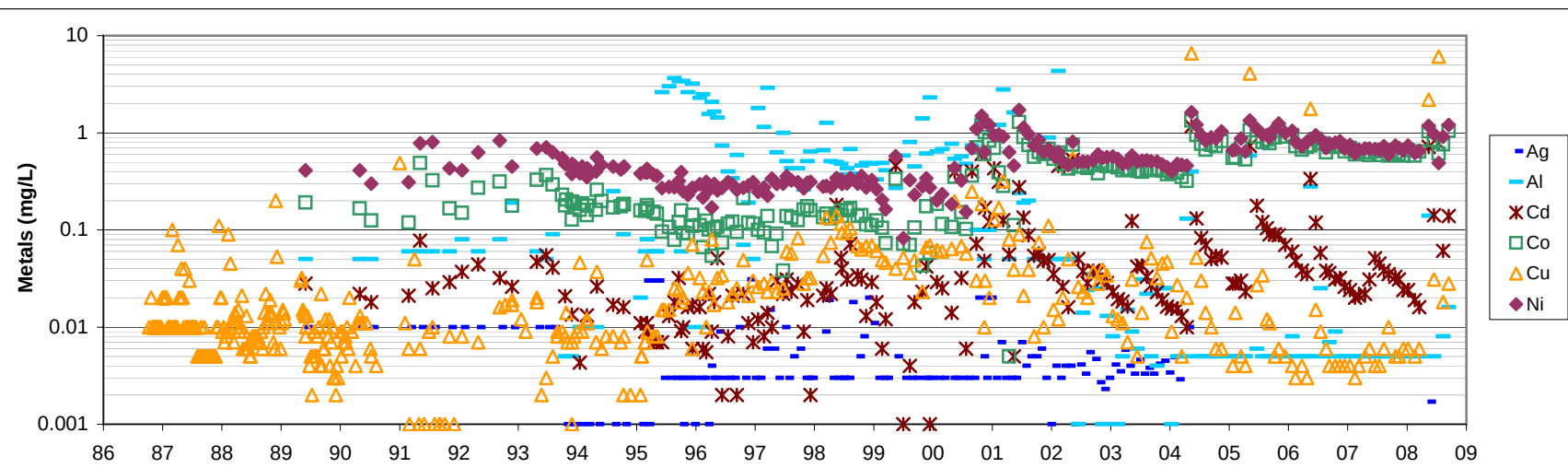
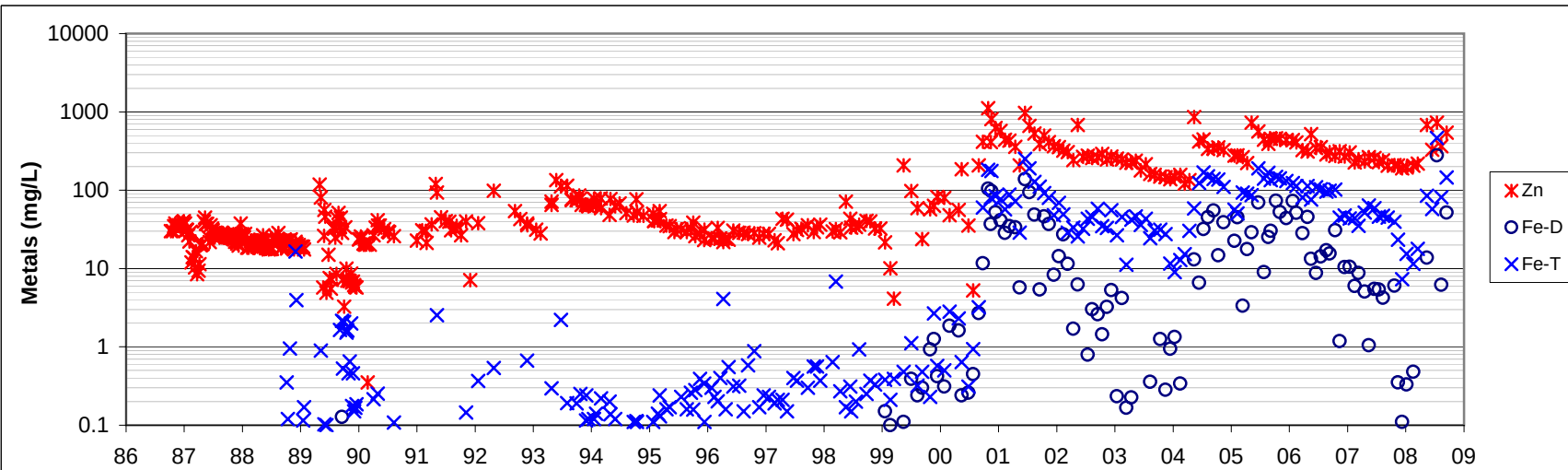
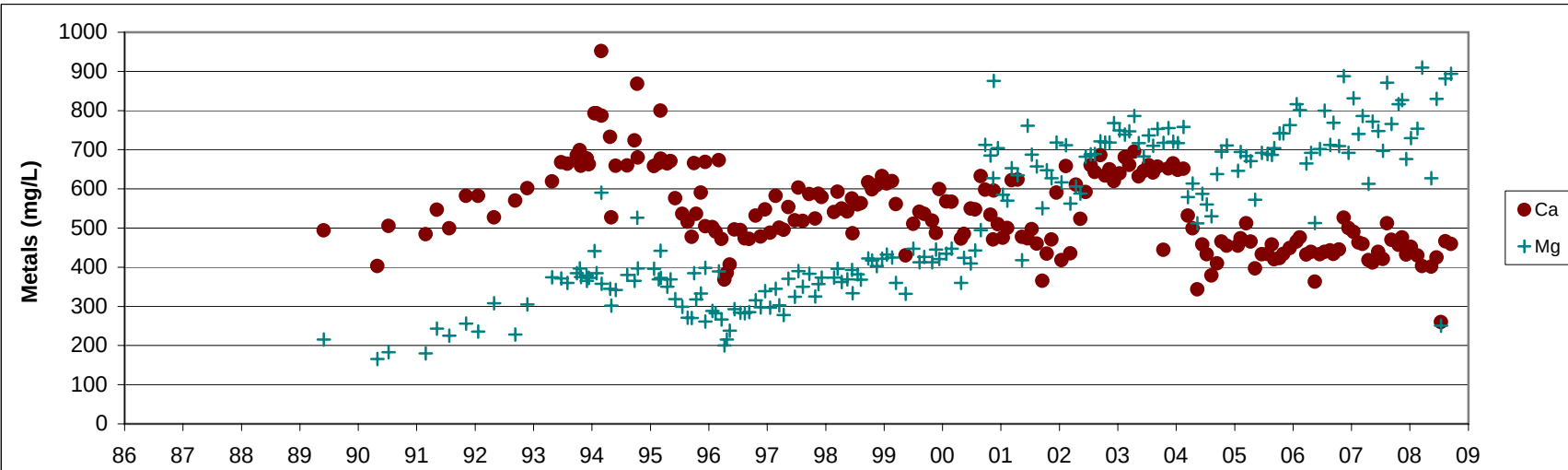
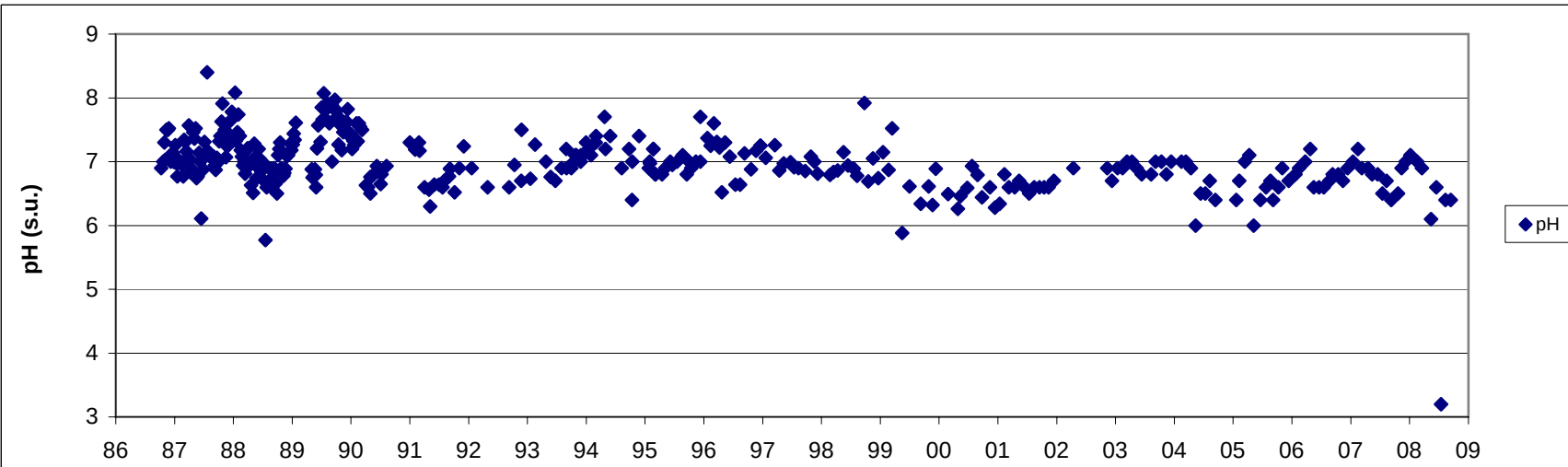
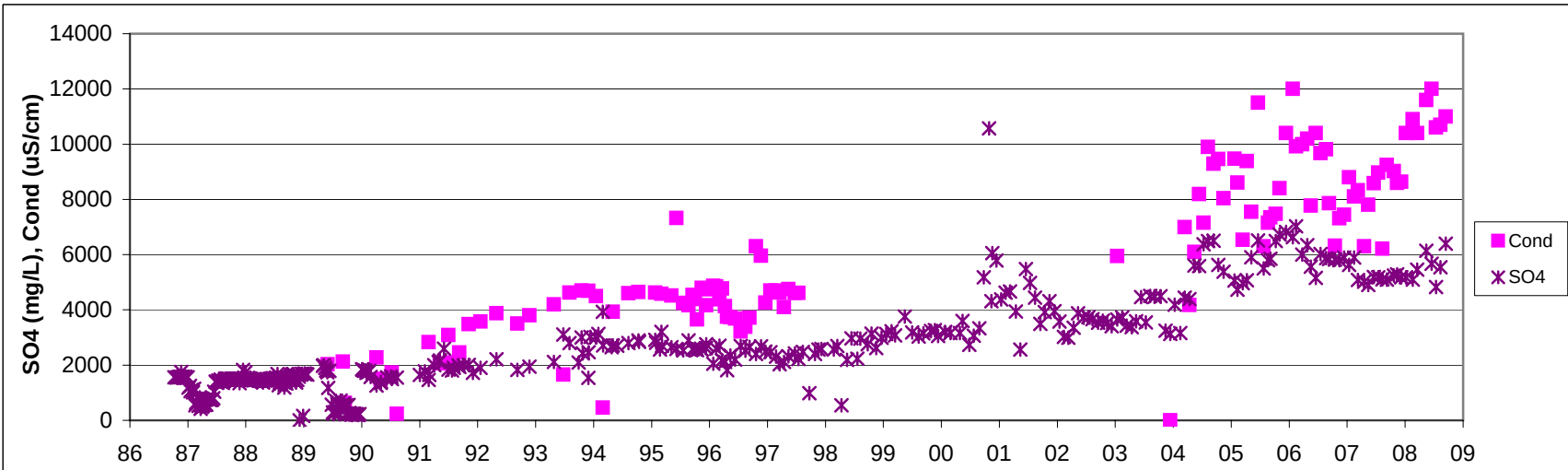
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FIGURE
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Anvil Range Mining Complex
2008 Waste Rock and Seepage Monitoring Report

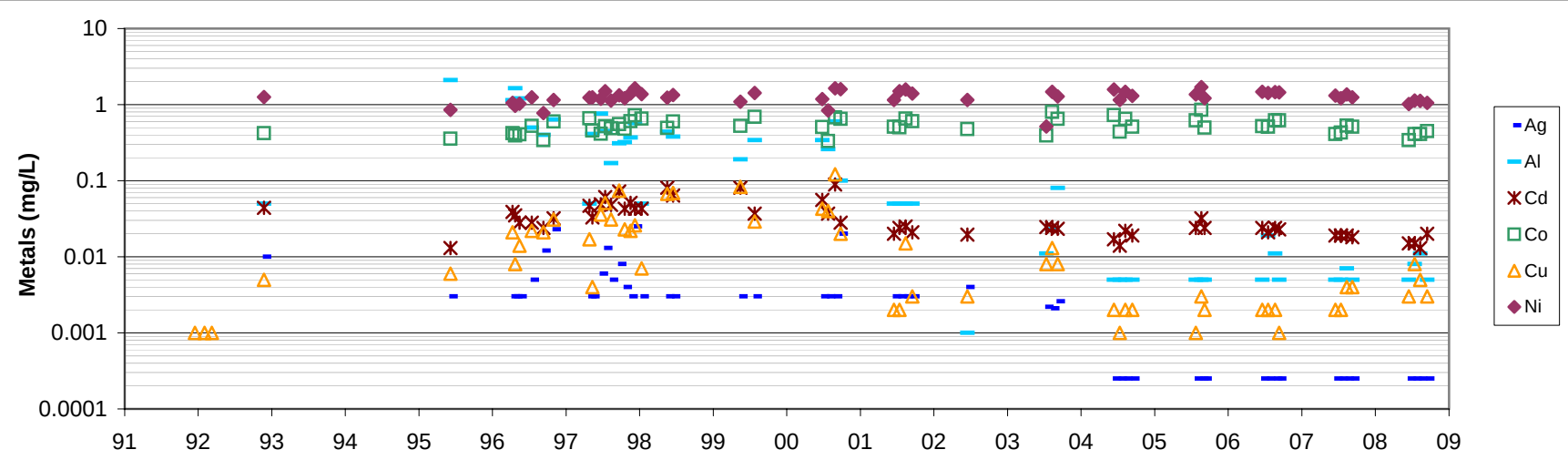
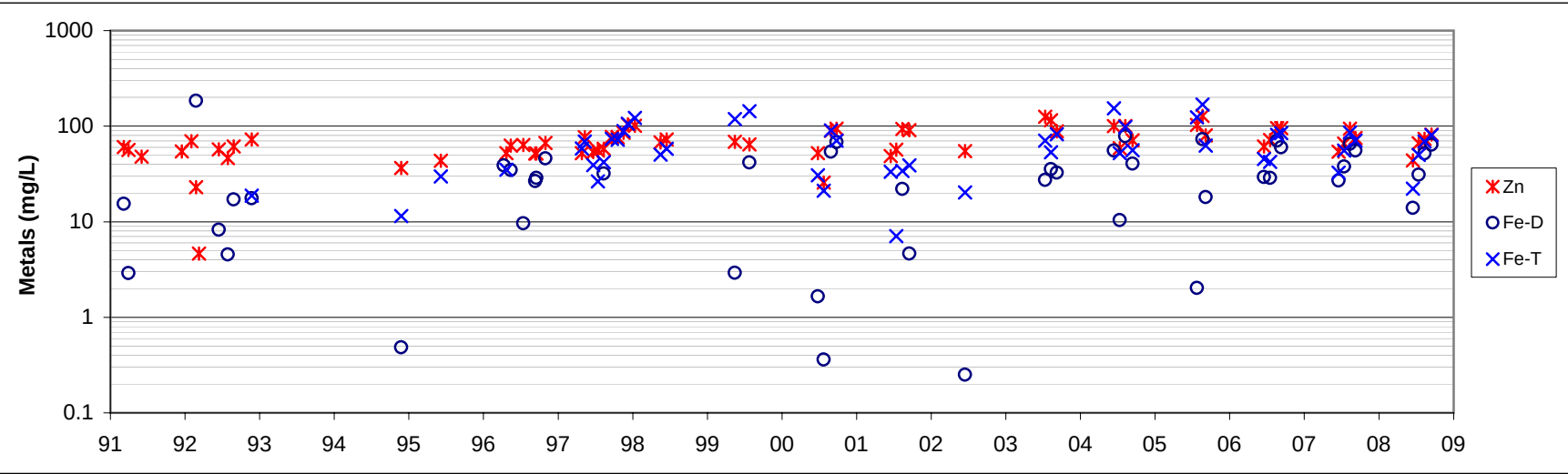
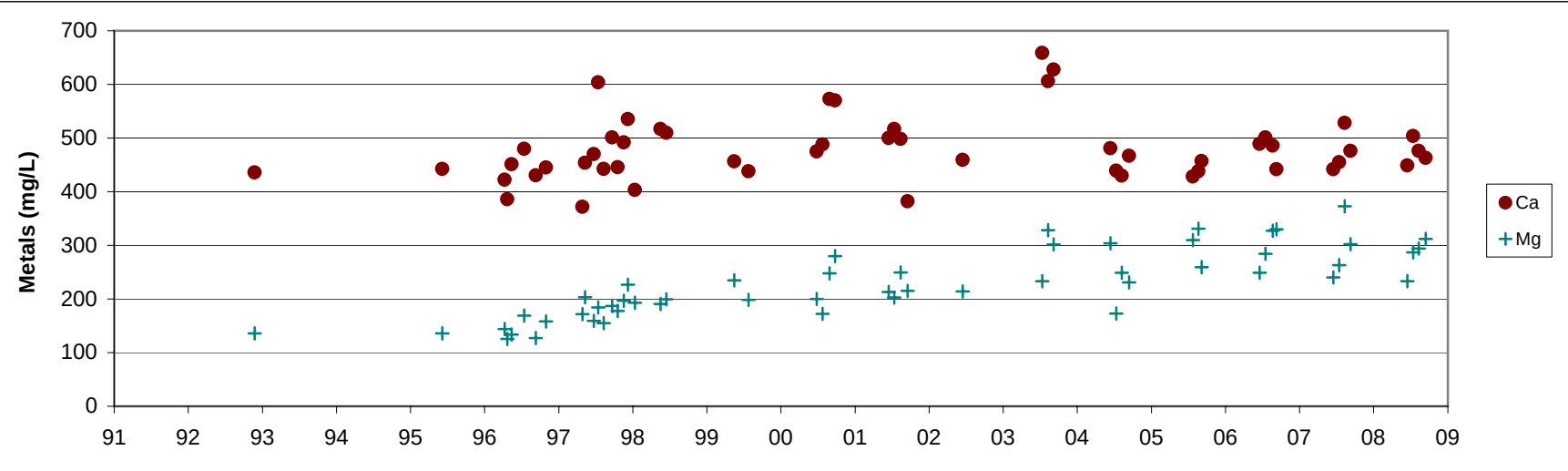
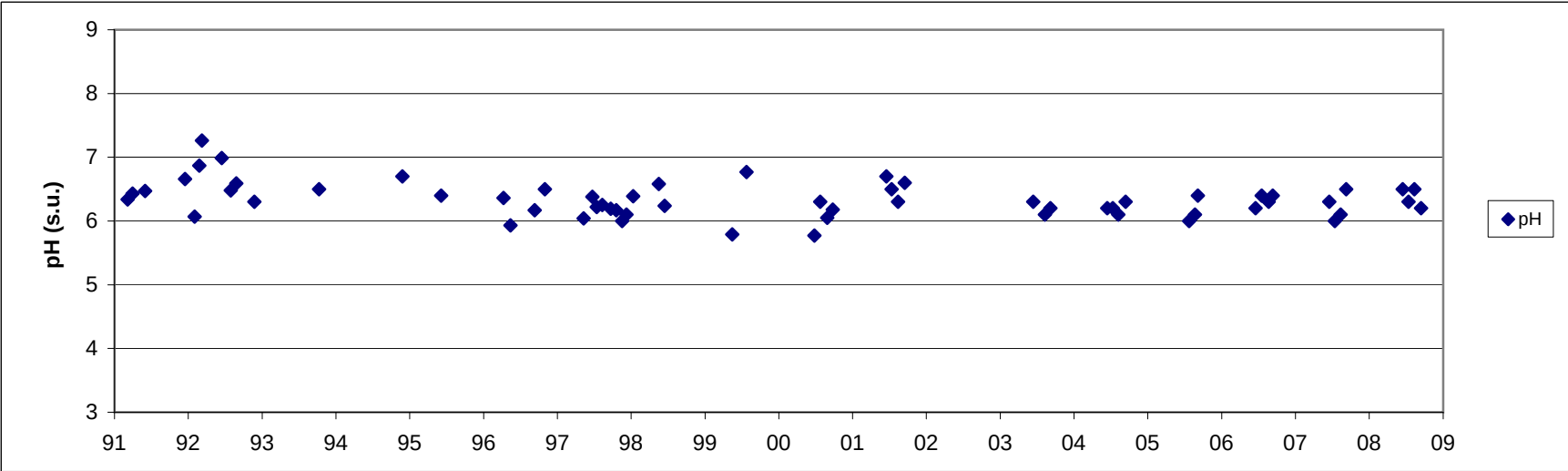
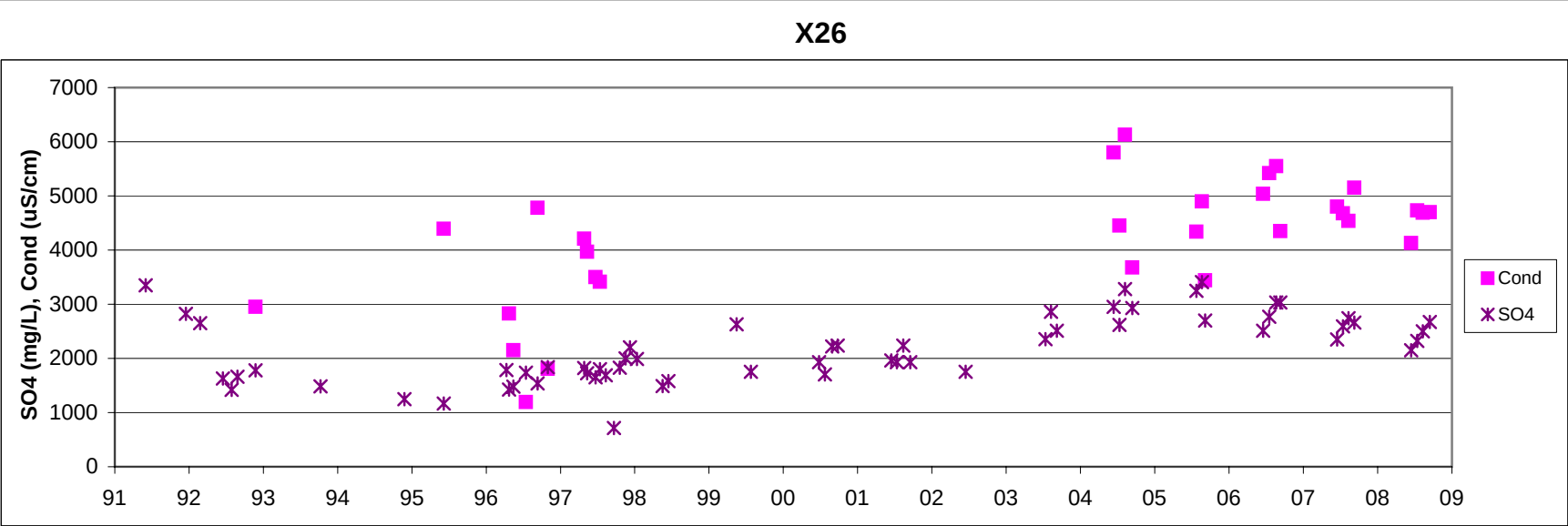
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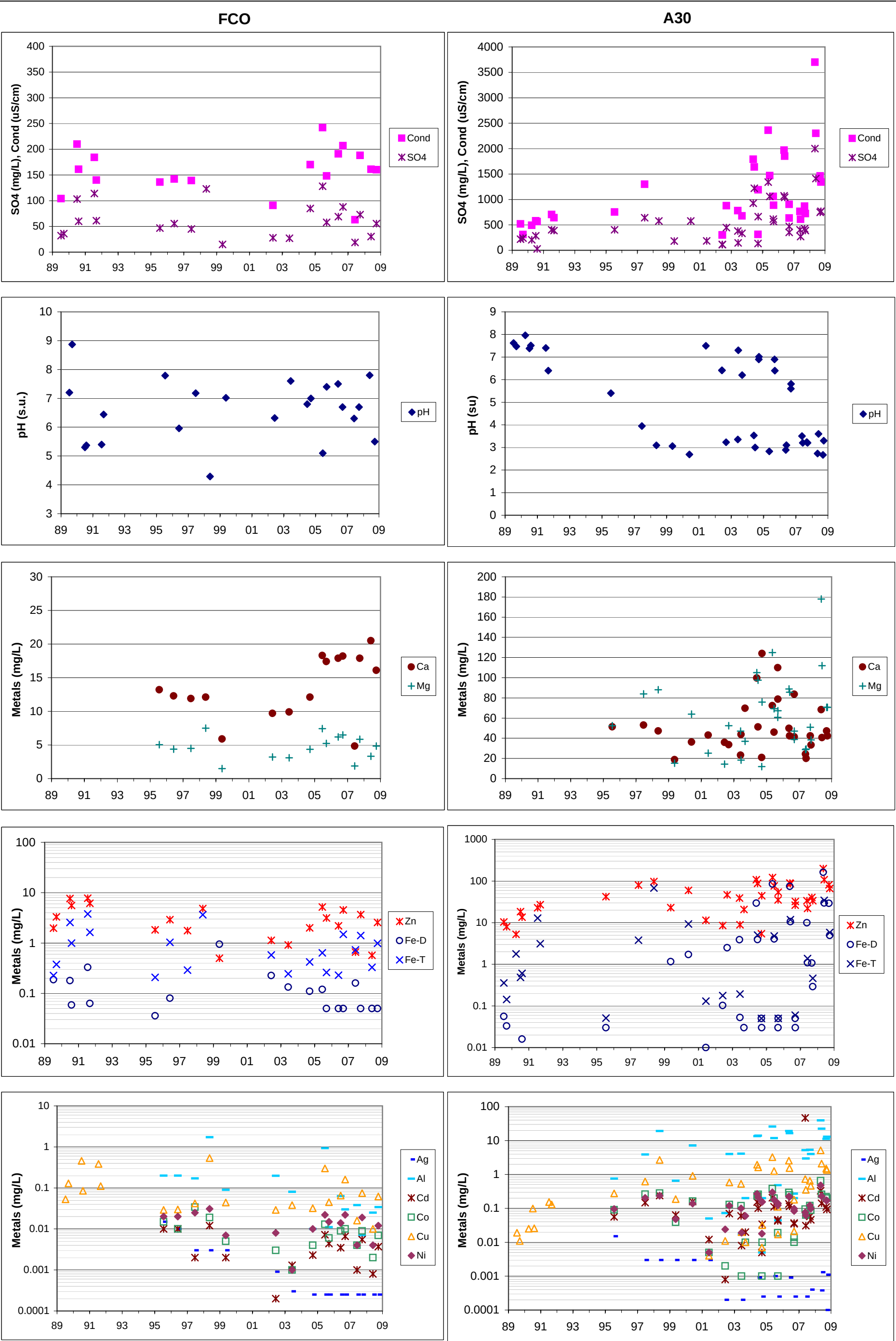
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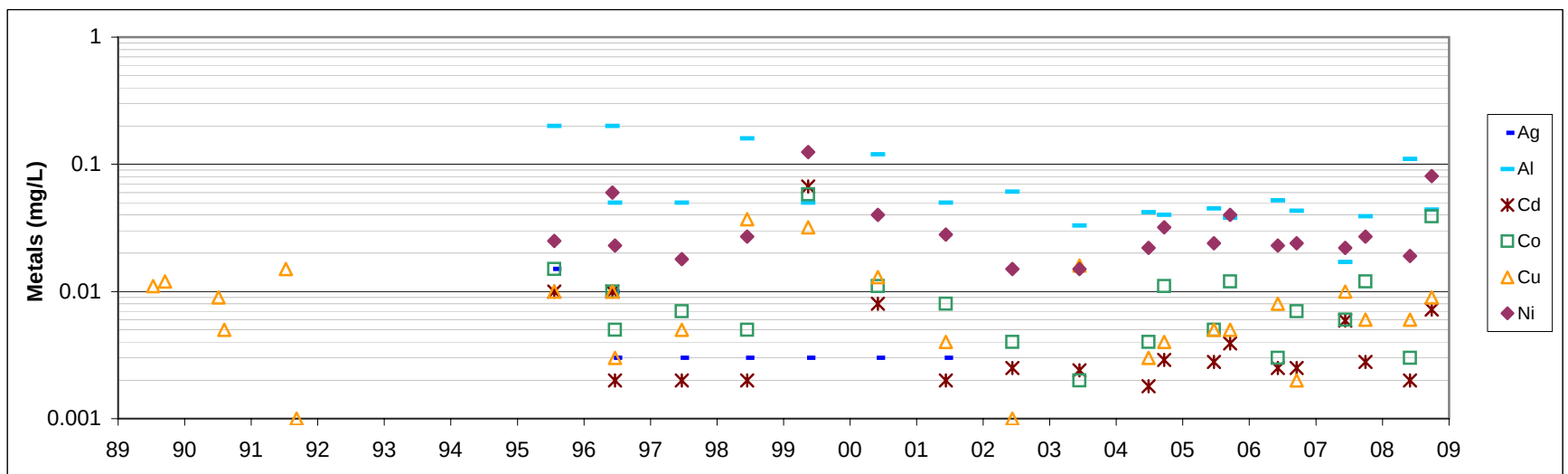
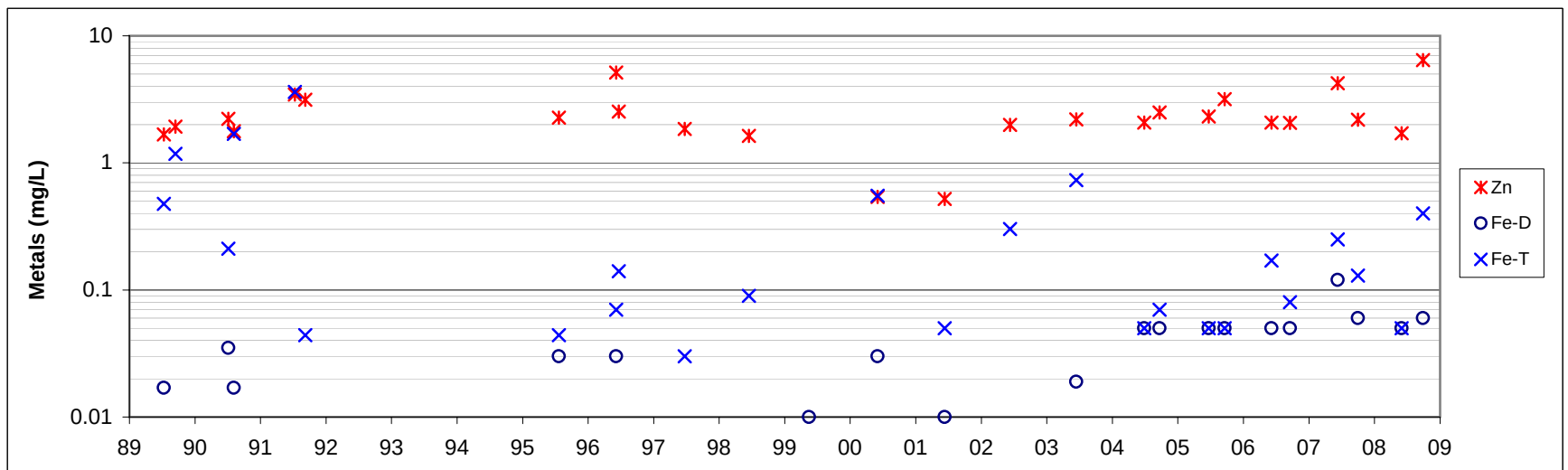
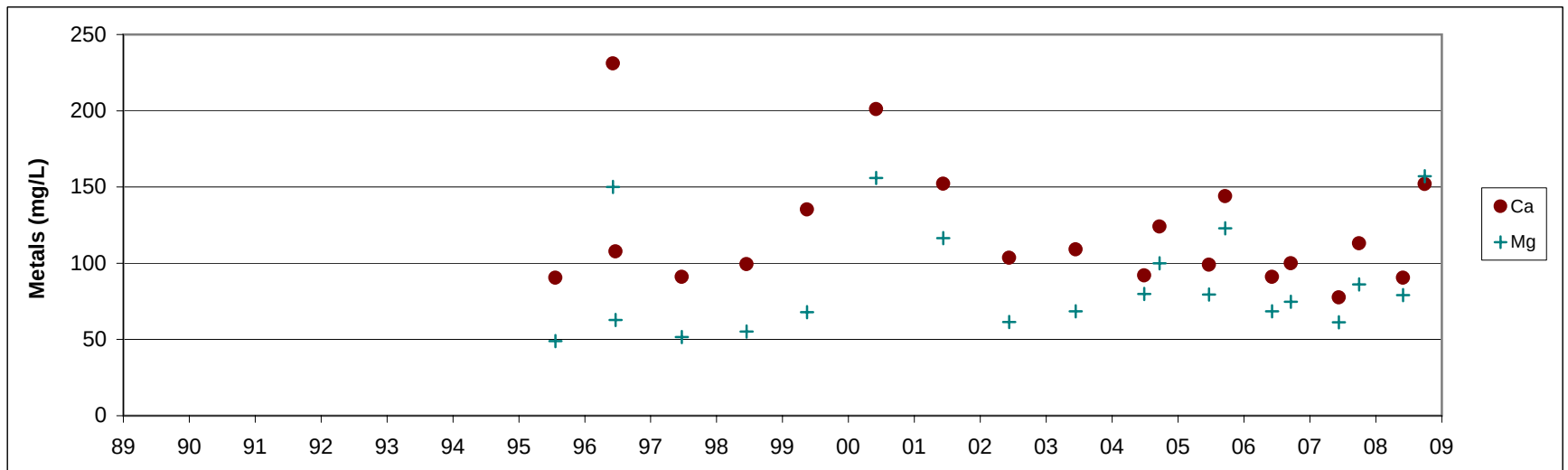
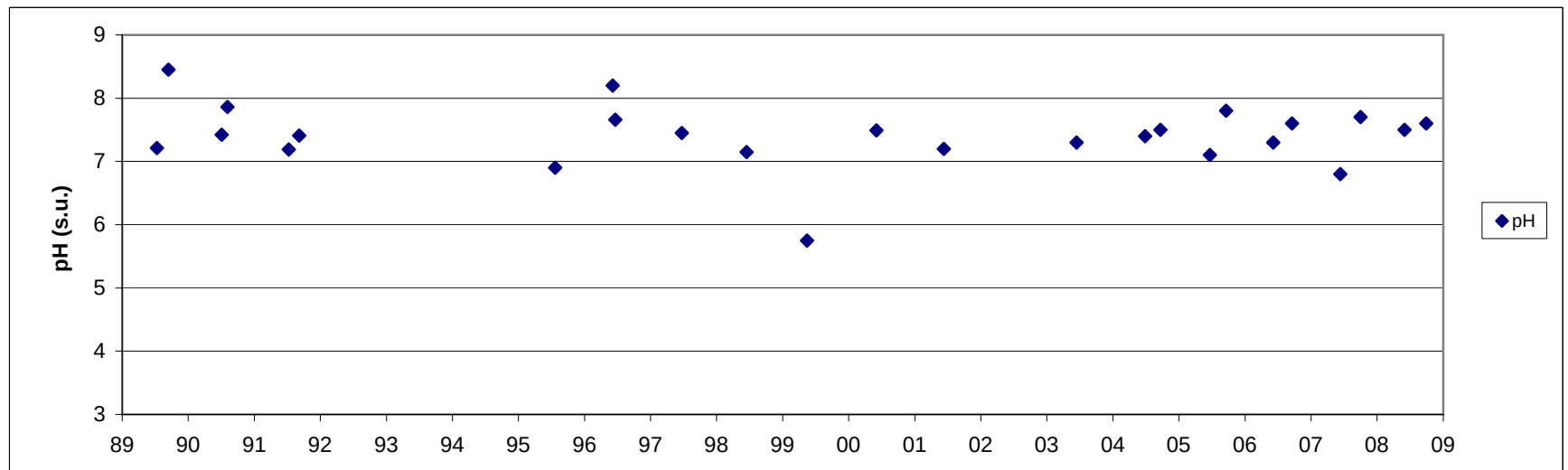
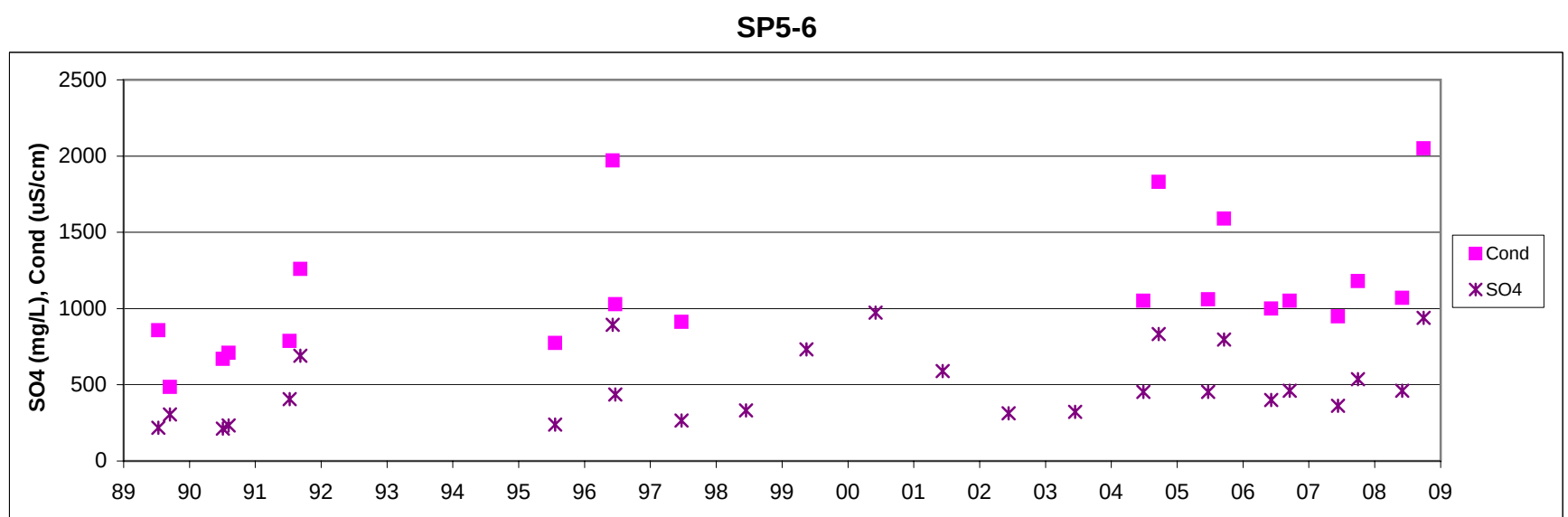
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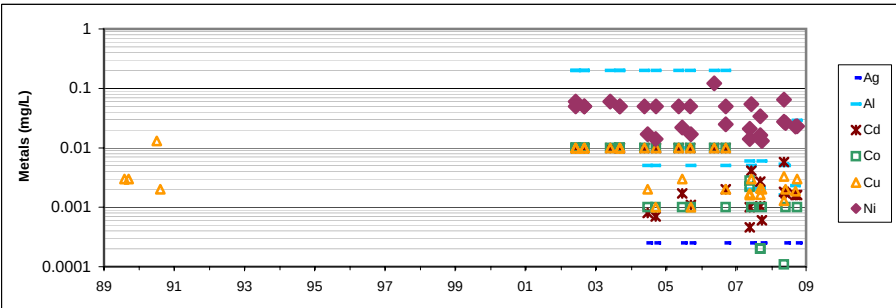
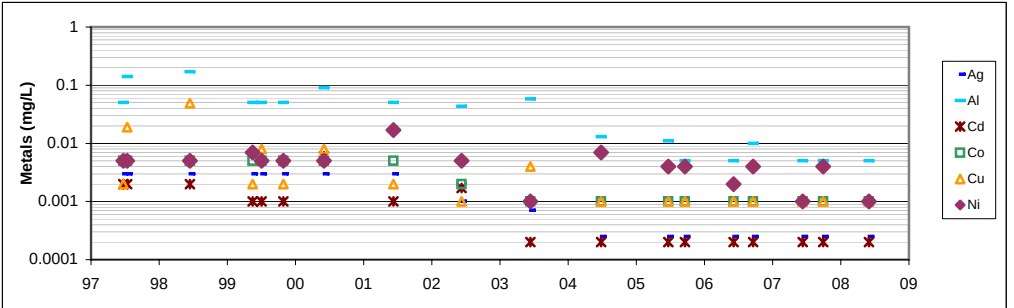
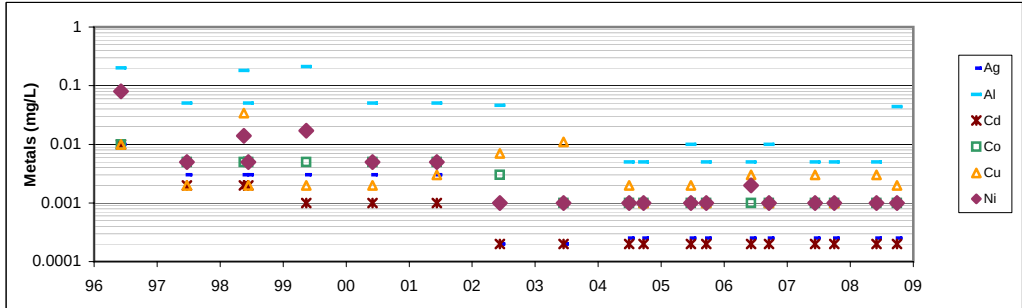
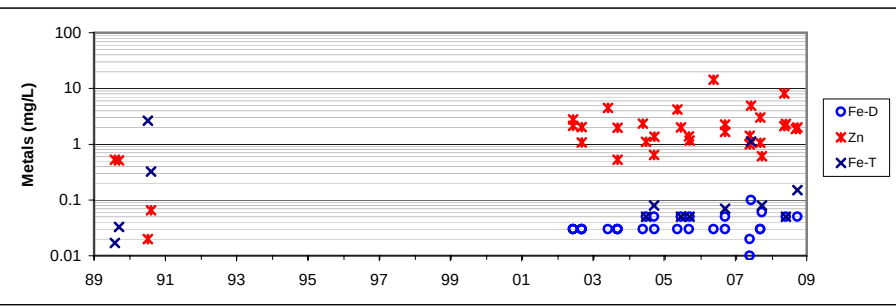
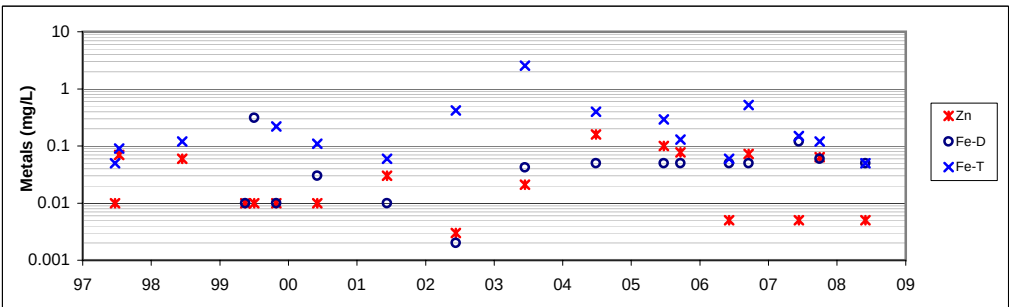
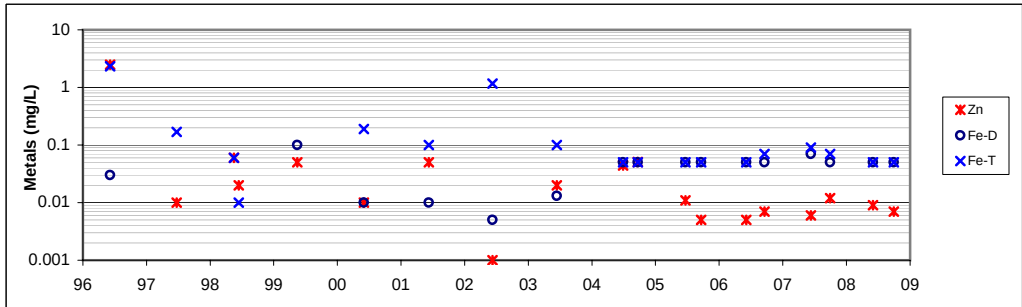
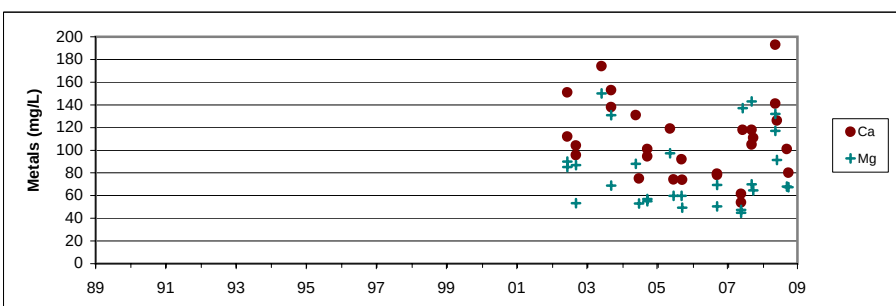
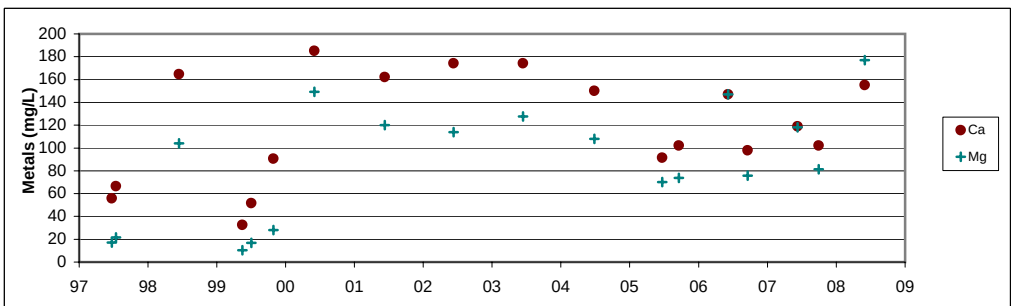
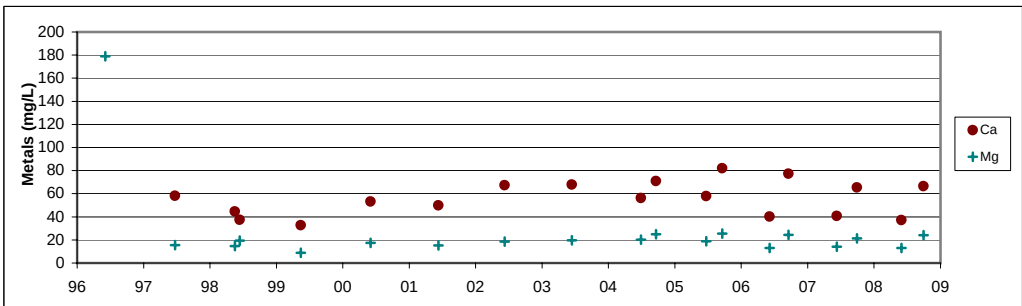
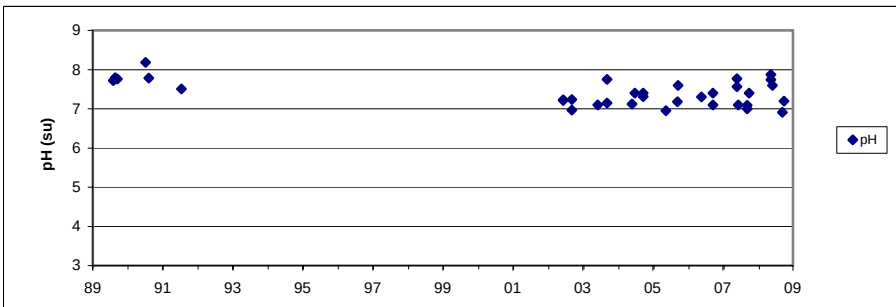
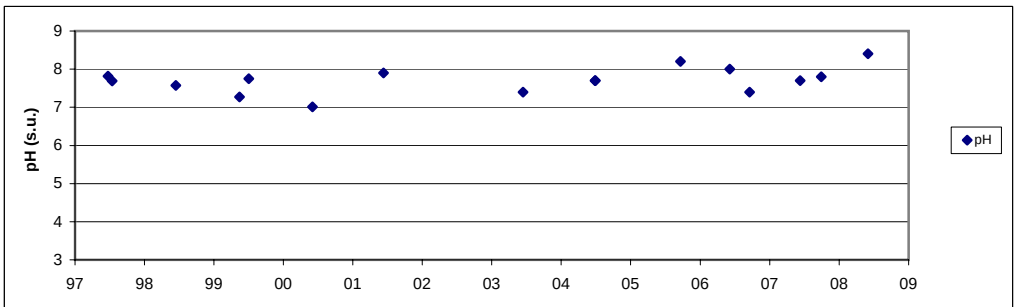
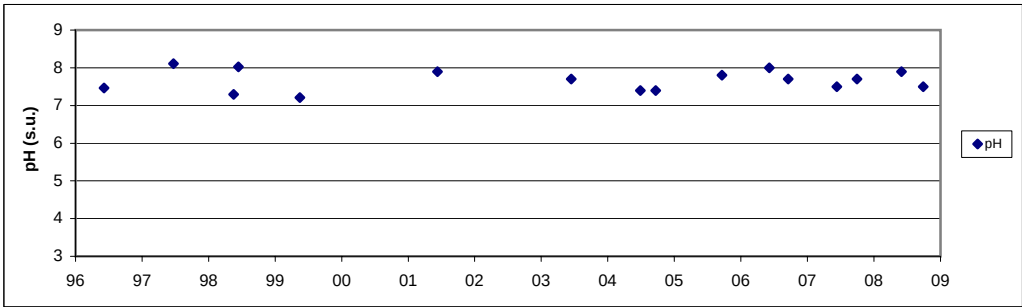
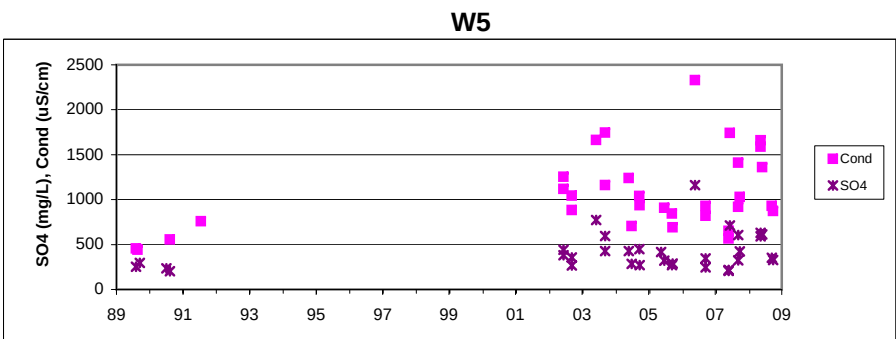
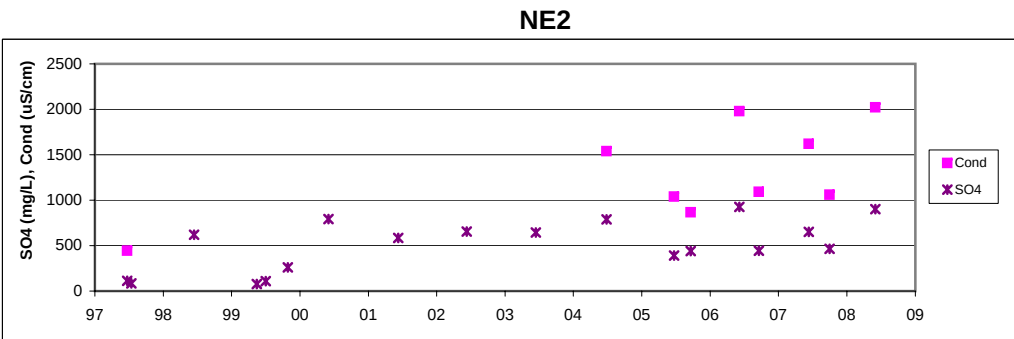
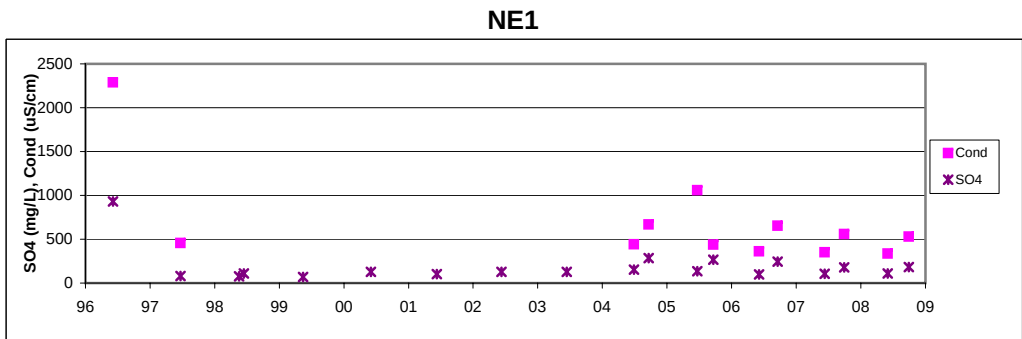
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DELOITTE & TOUCHE INC.

Anvil Range Mining Complex
2008 Waste Rock and Seepage Monitoring Report

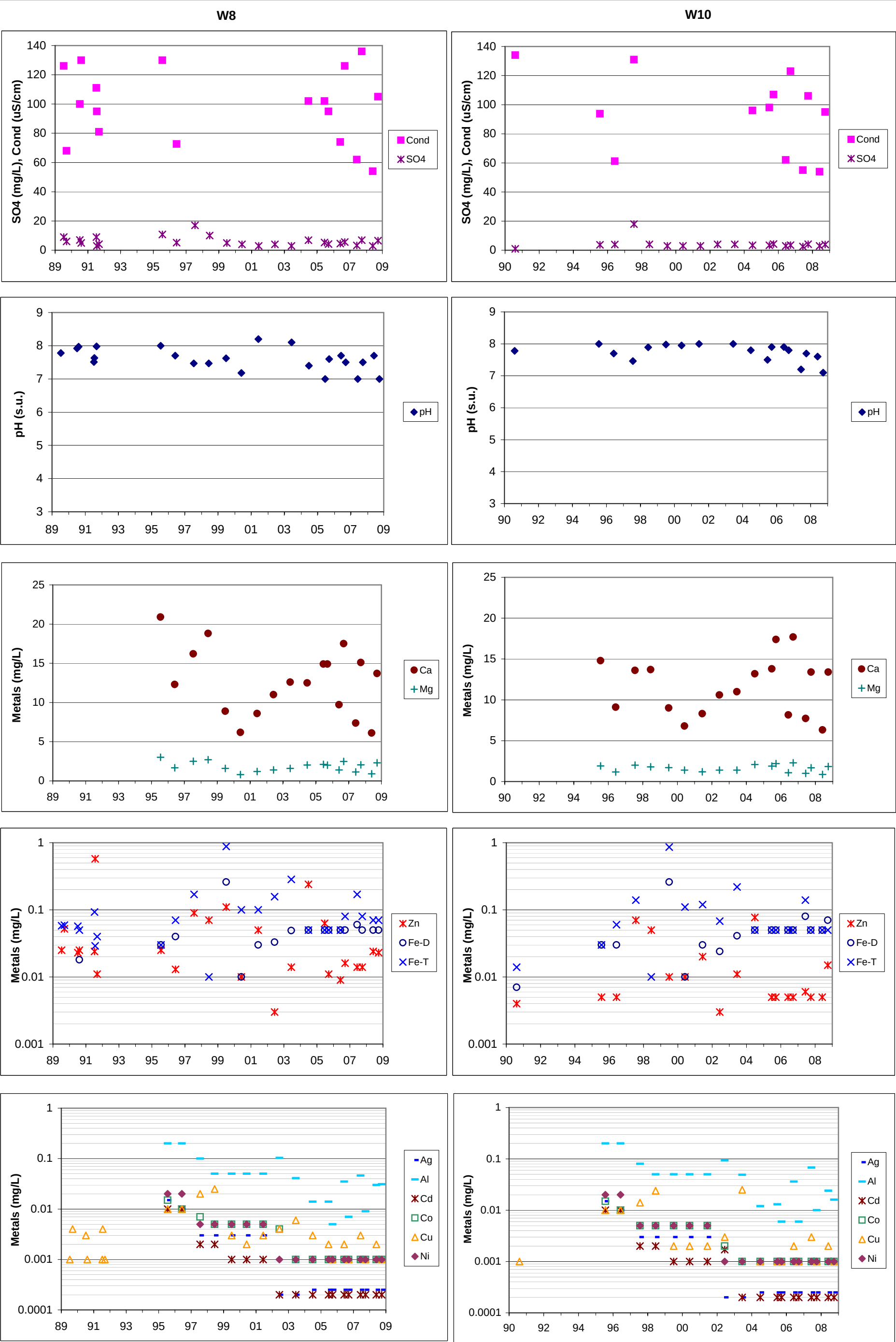
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NE1, NE2, and W5

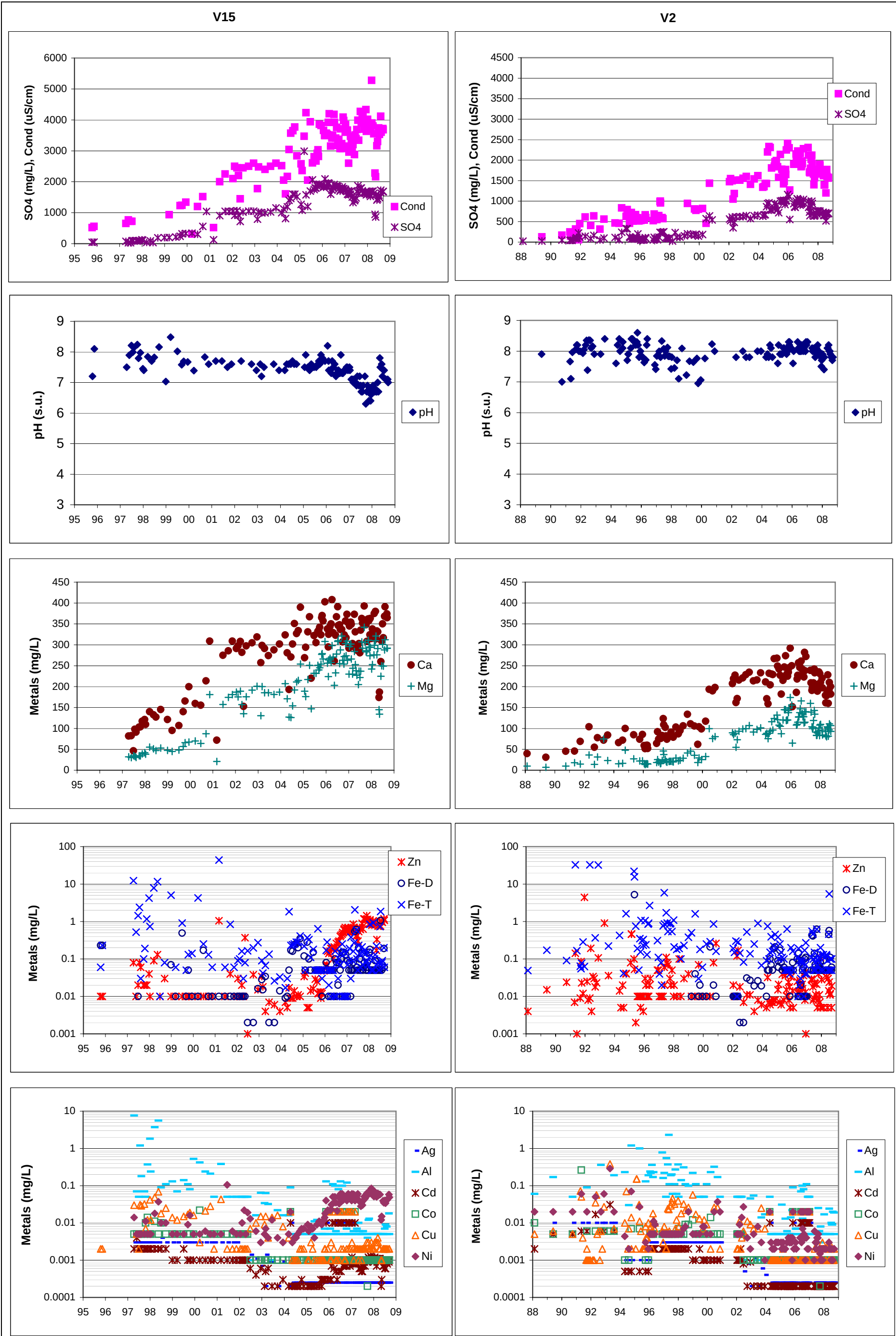
PROJECT
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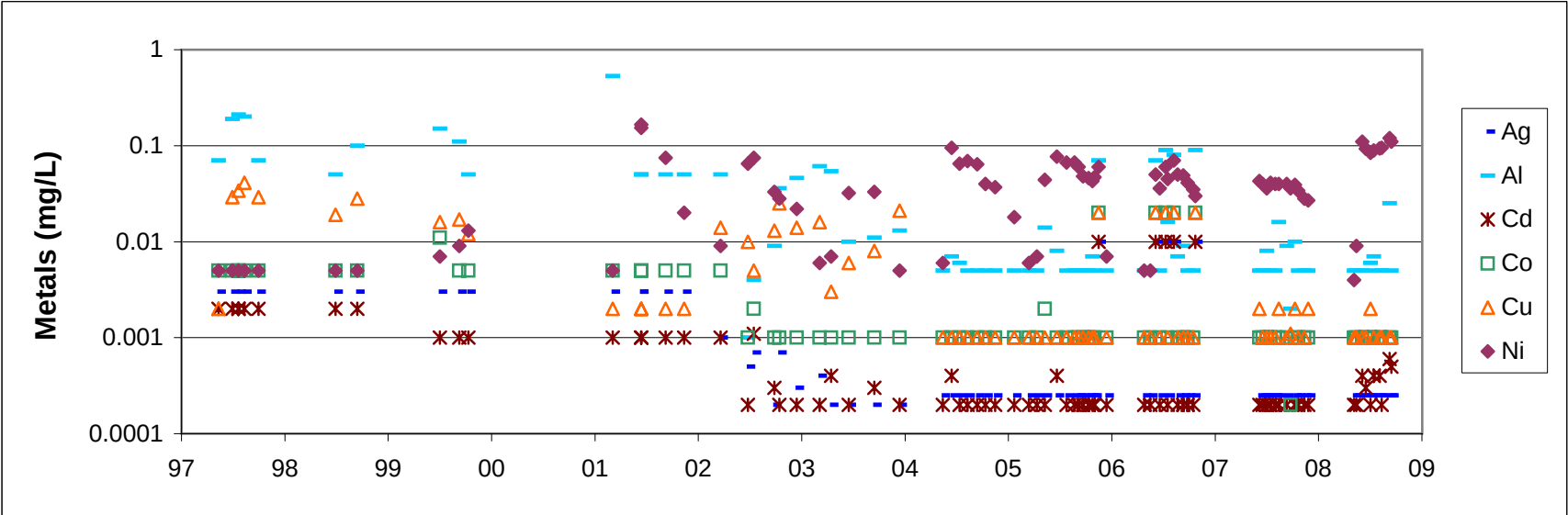
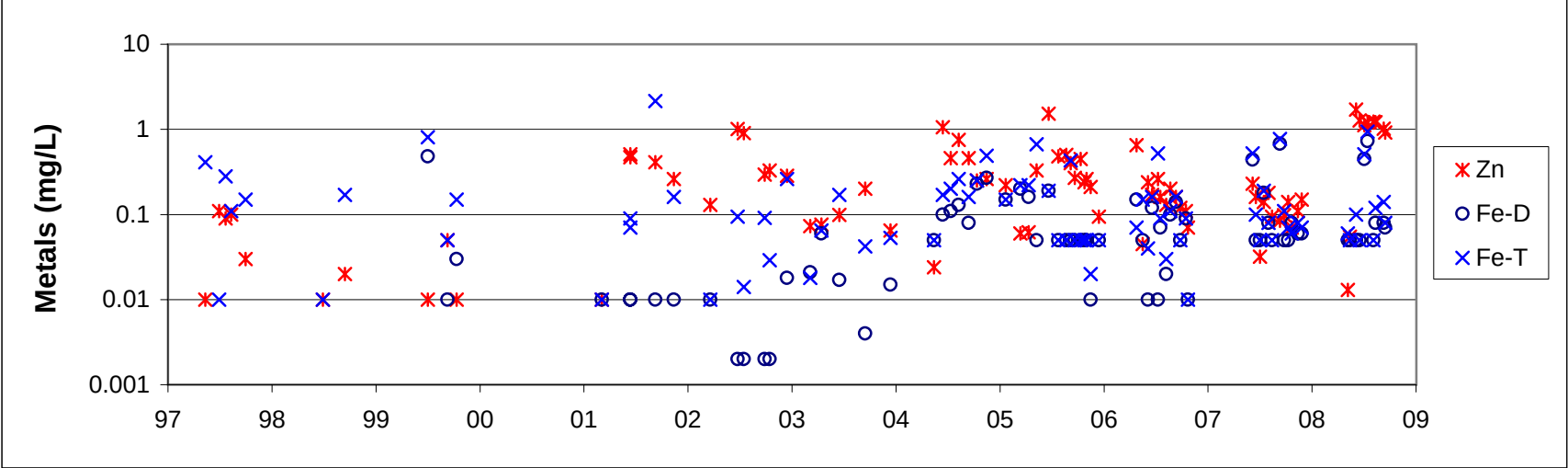
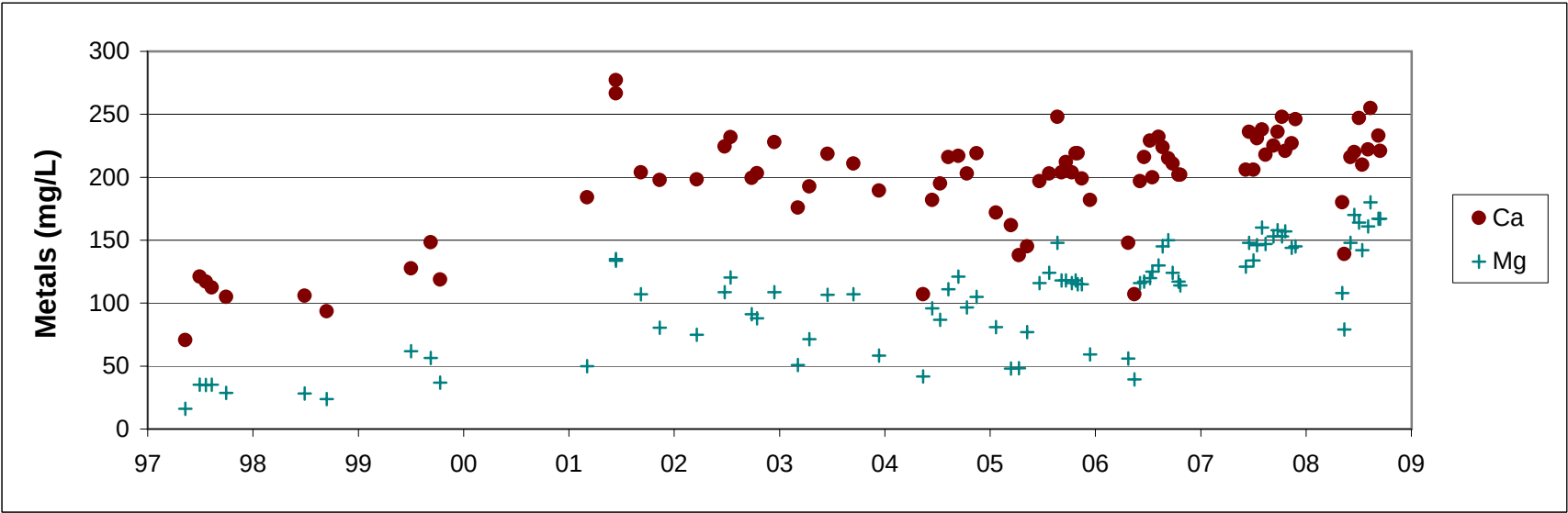
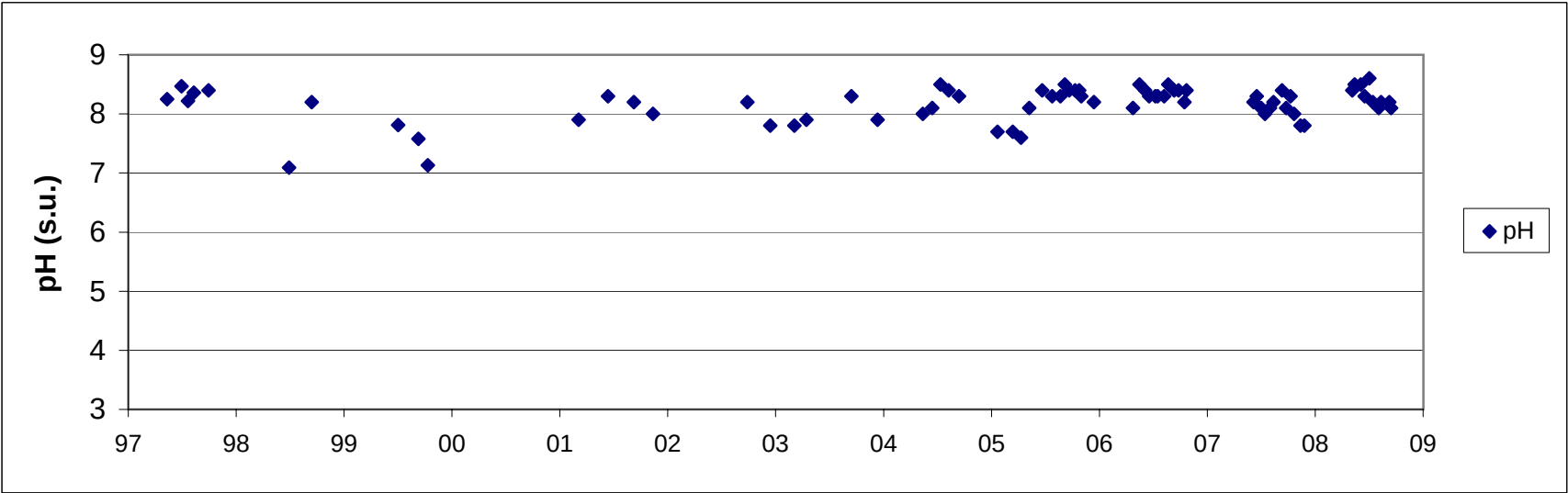
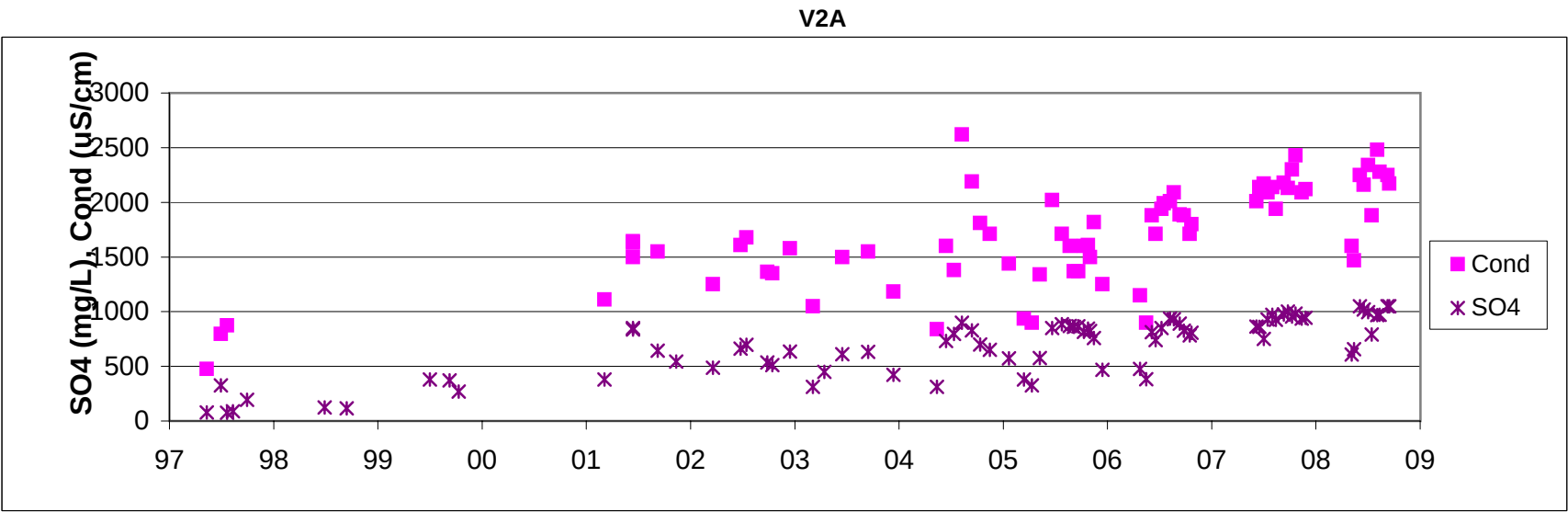
DATE
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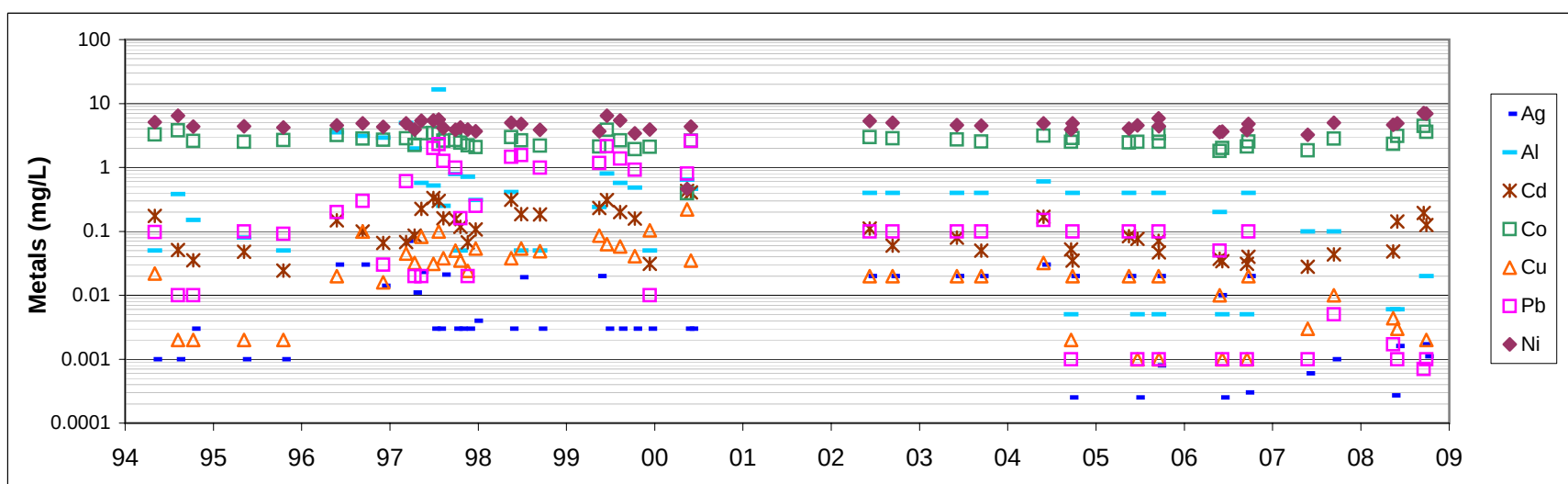
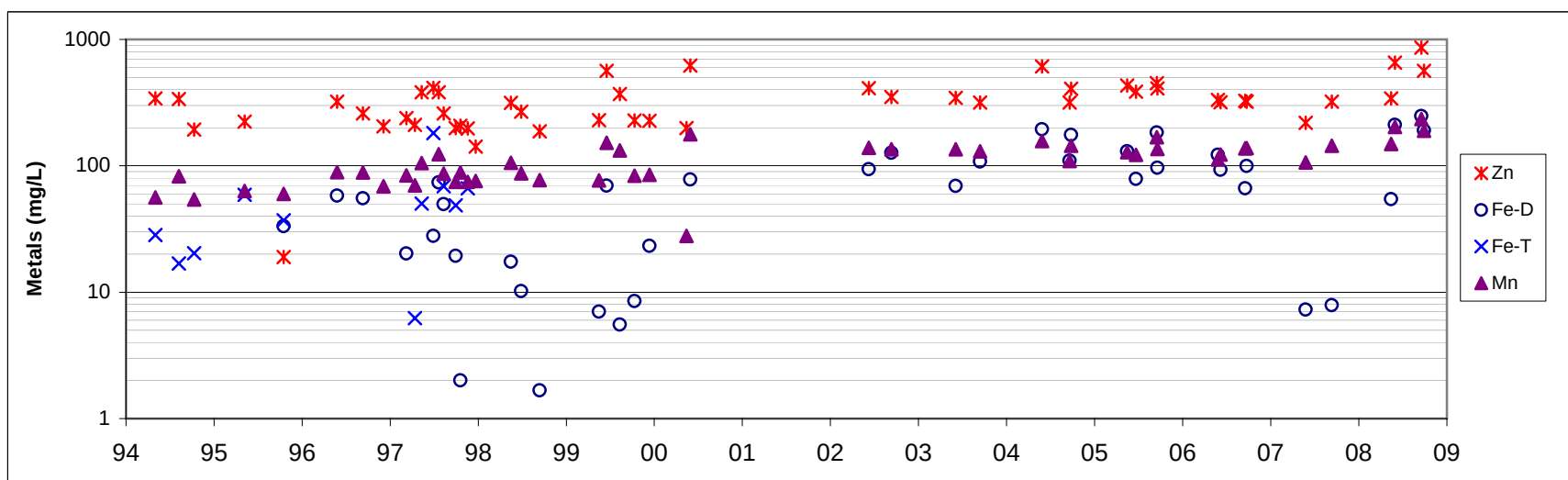
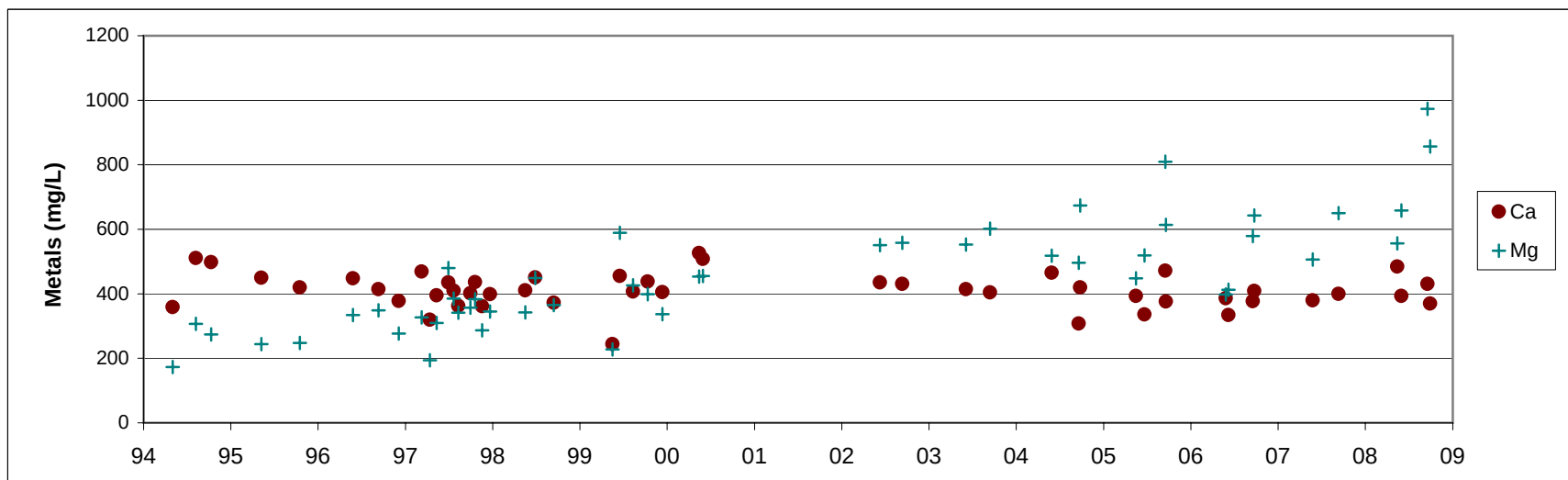
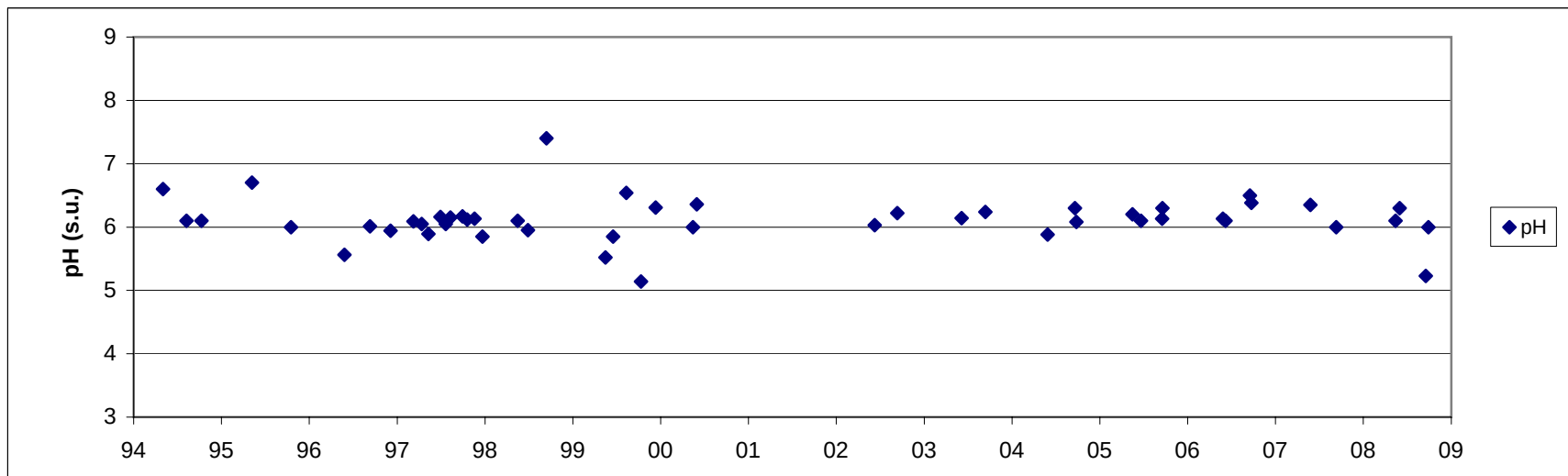
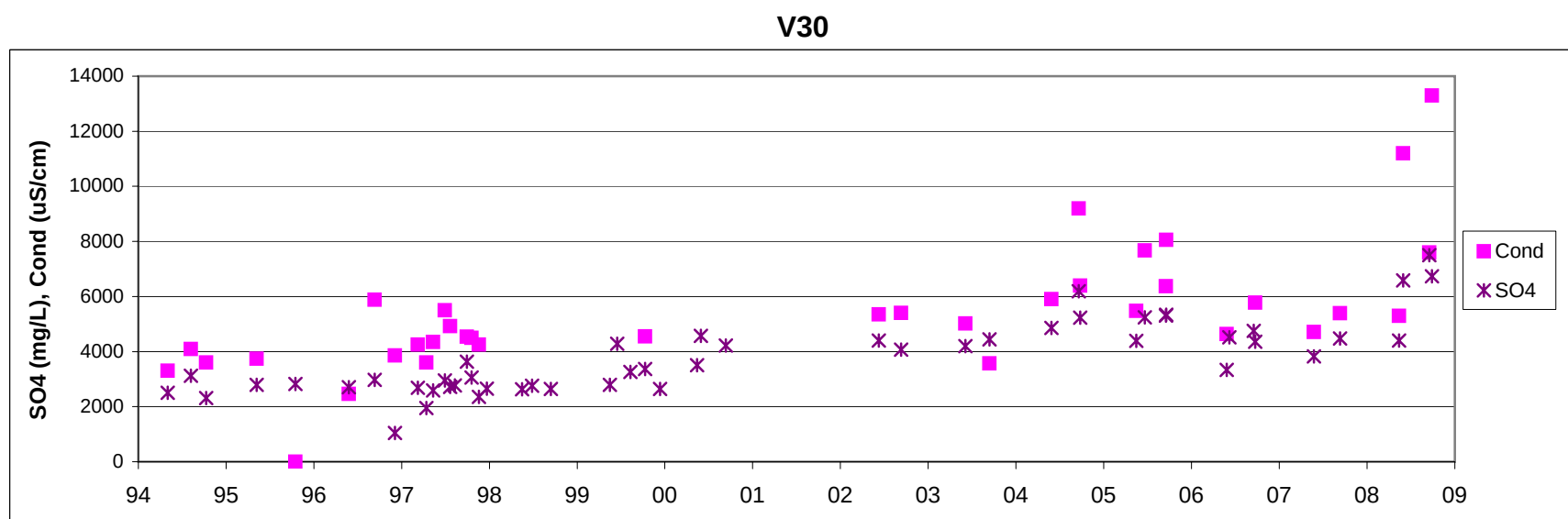
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FIGURE
12

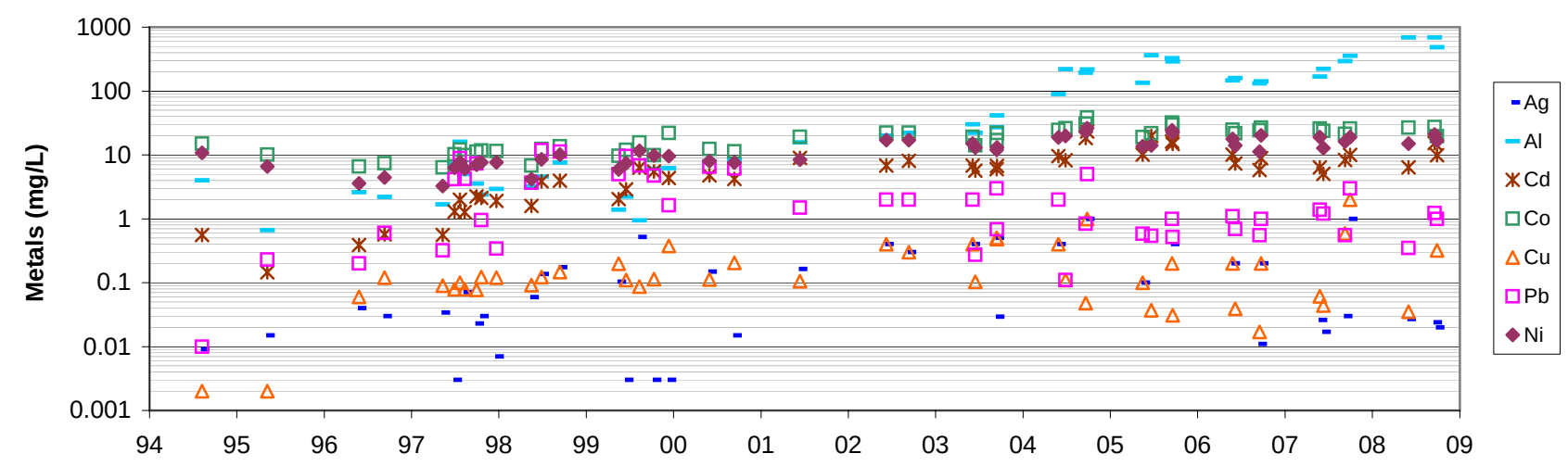
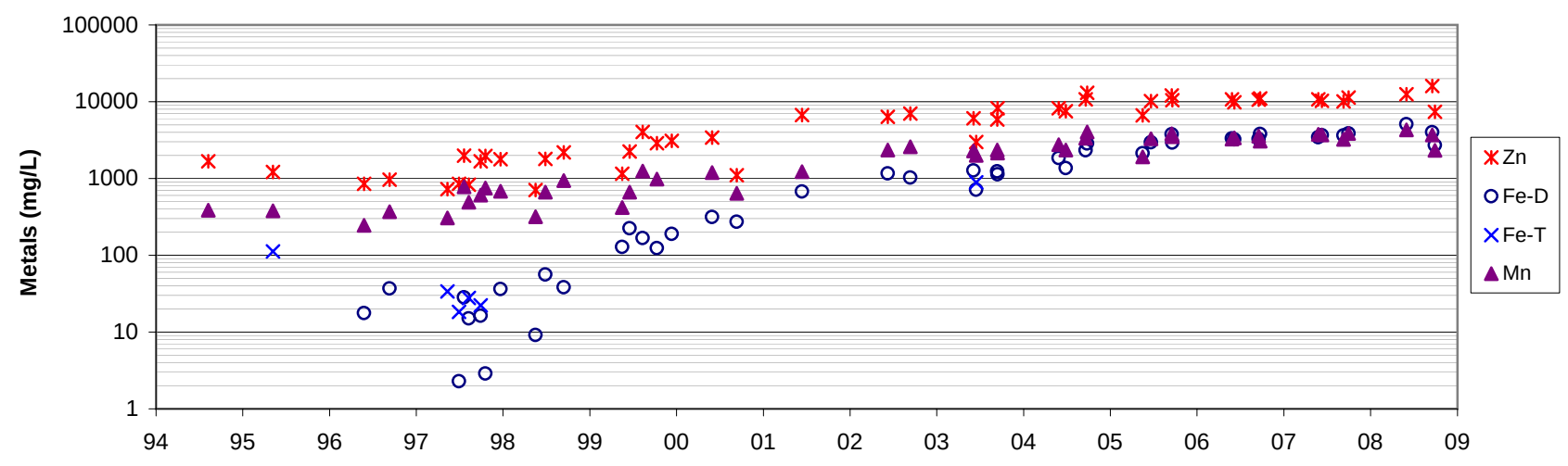
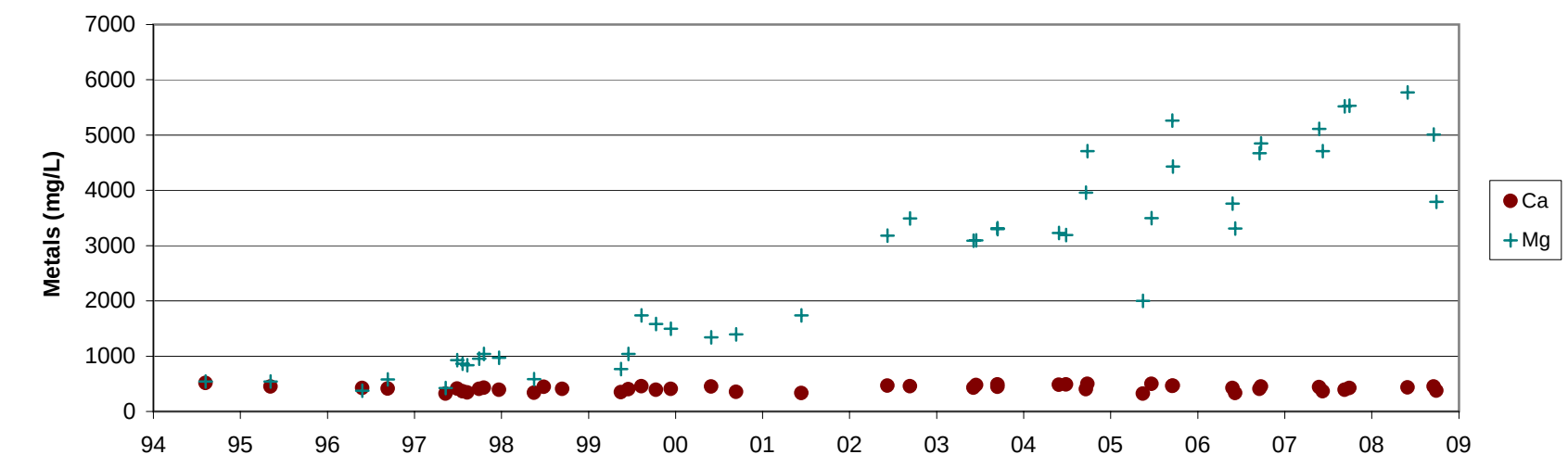
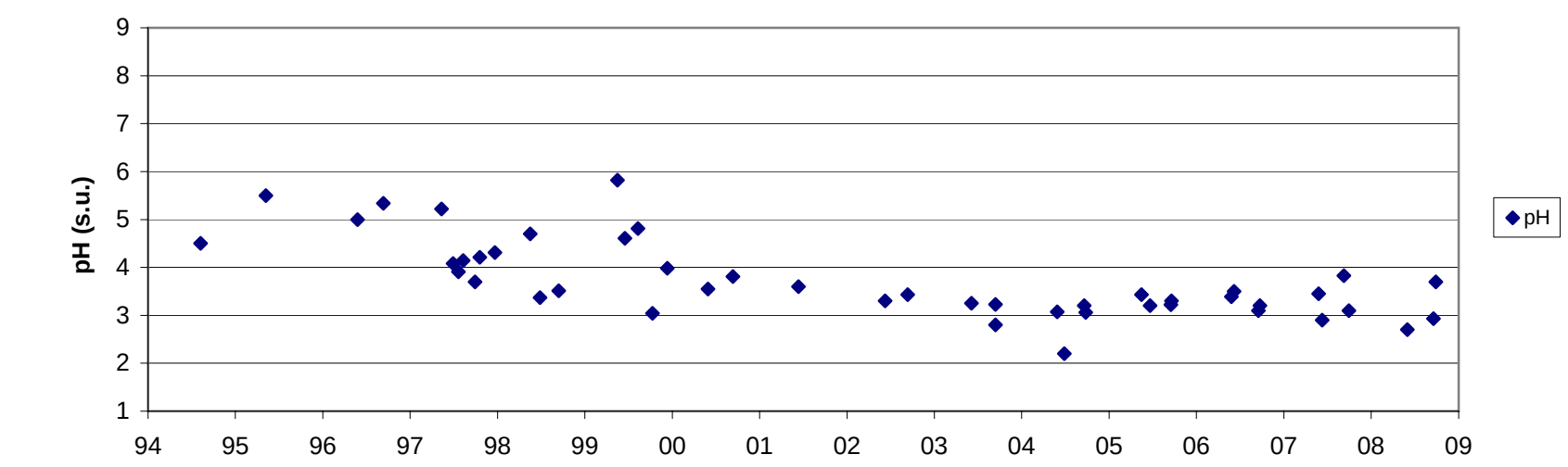
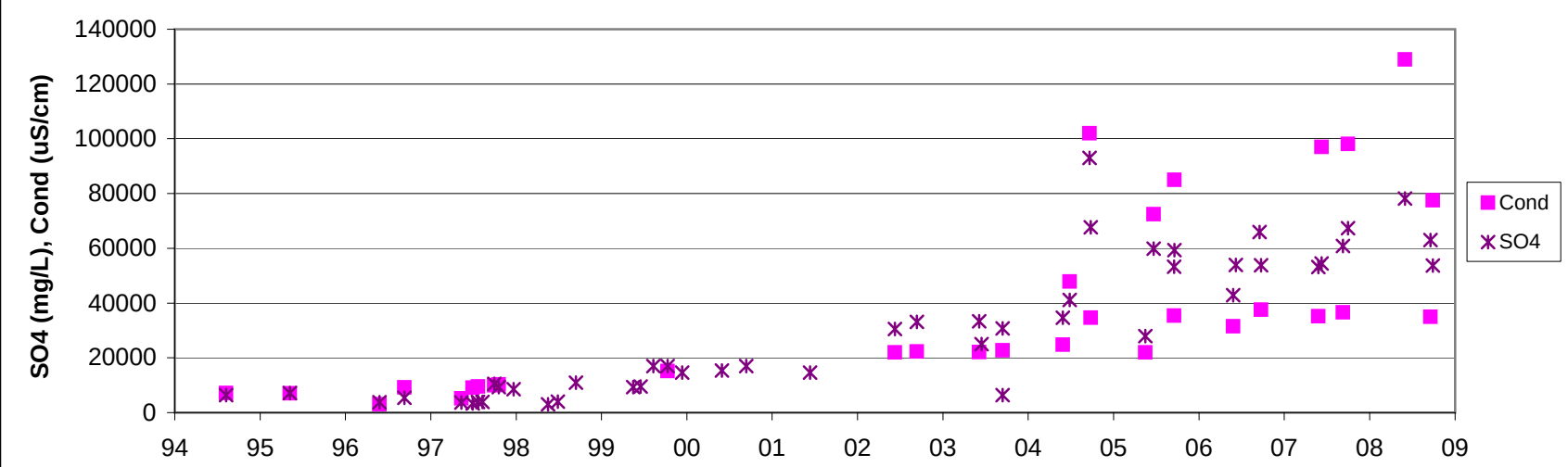








V32



DELOITTE & TOUCHE INC.

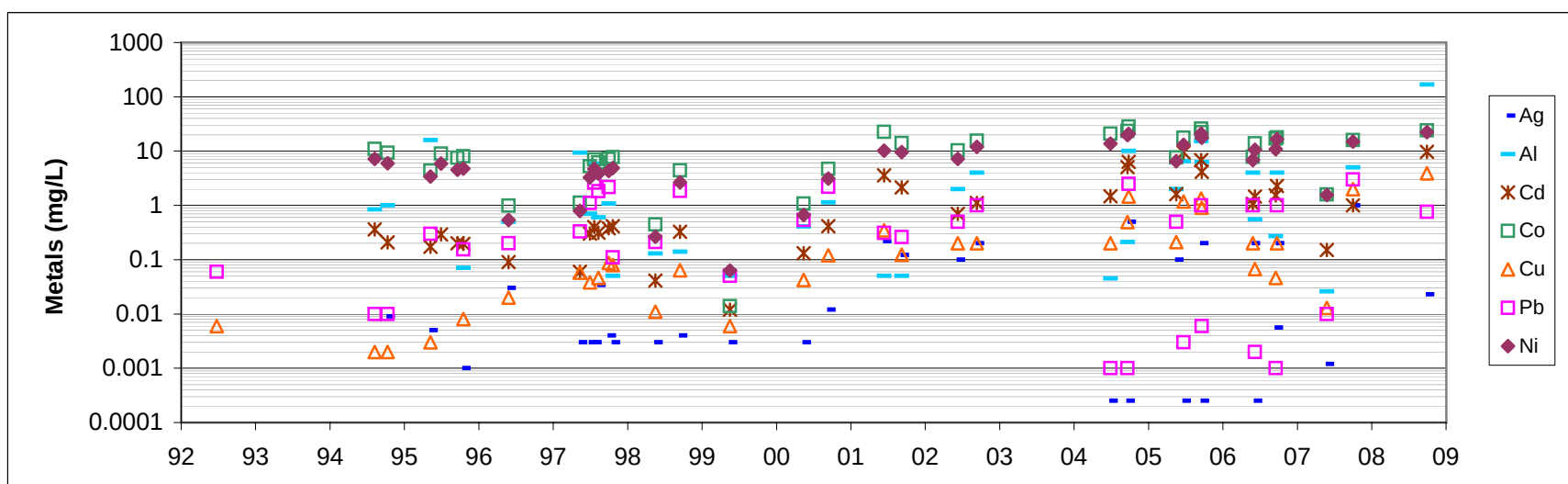
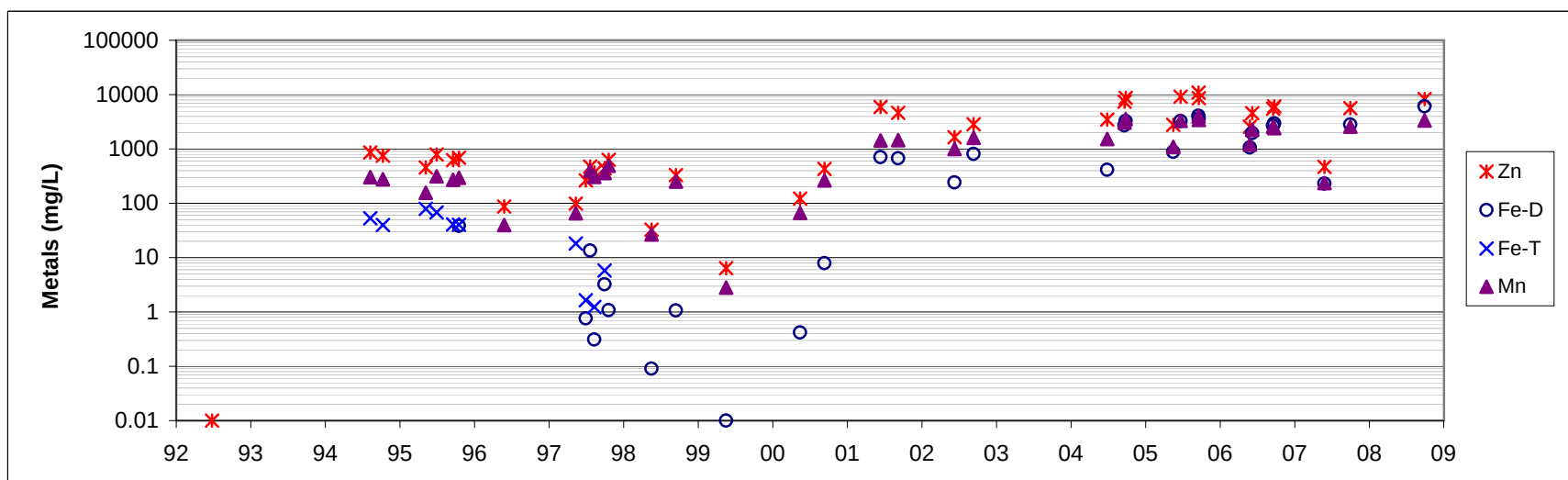
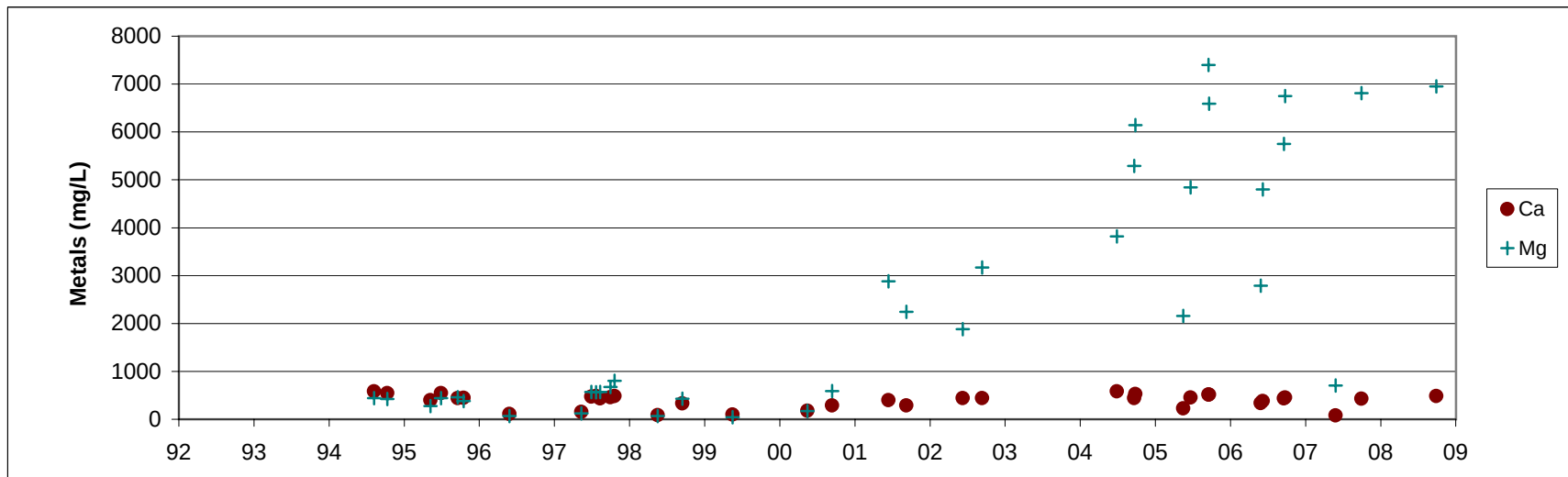
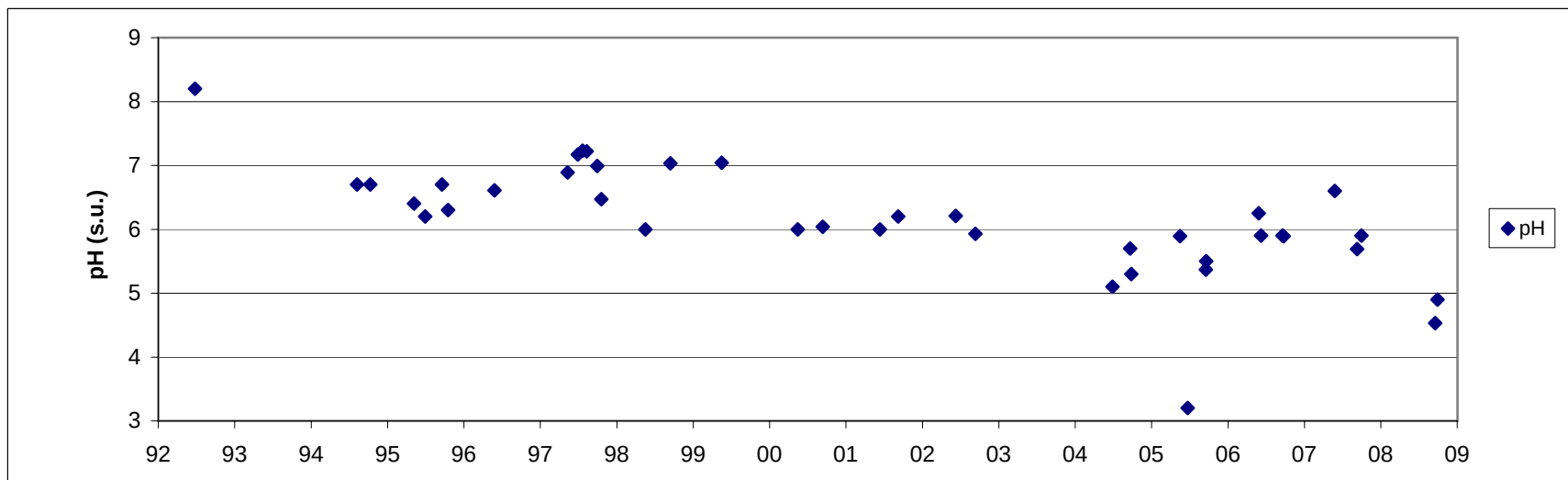
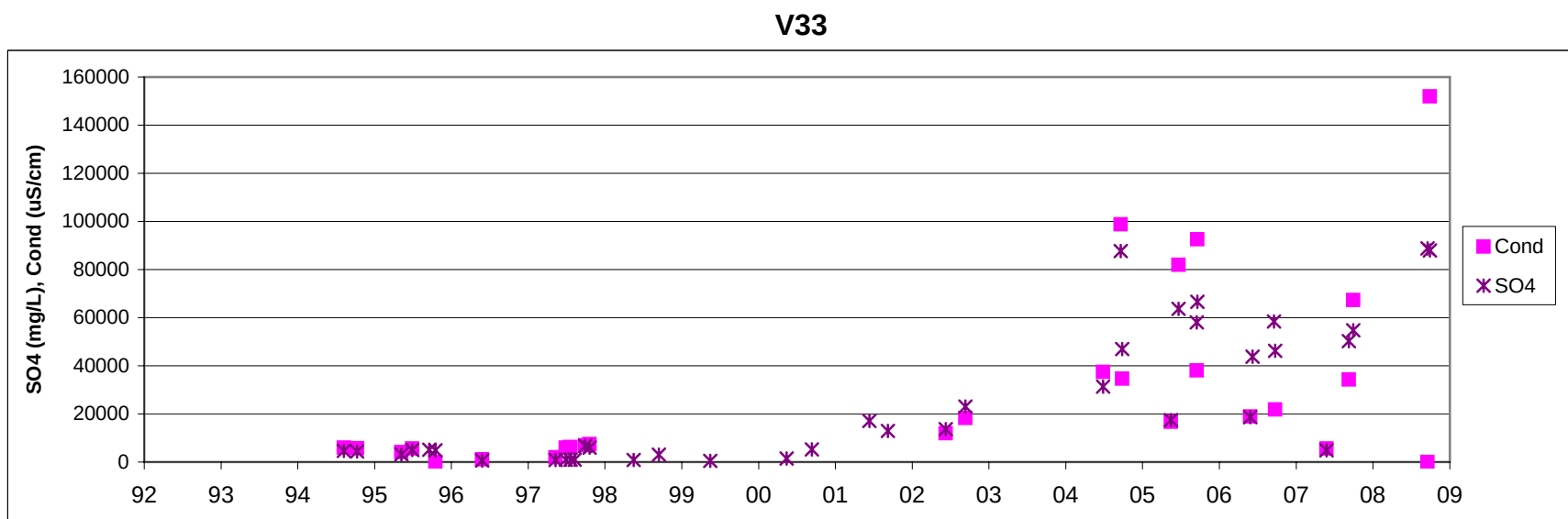
Anvil Range Mining Complex
2008 Waste Rock and Seepage Monitoring Report
Vangorda Routine Monitoring Station
V32

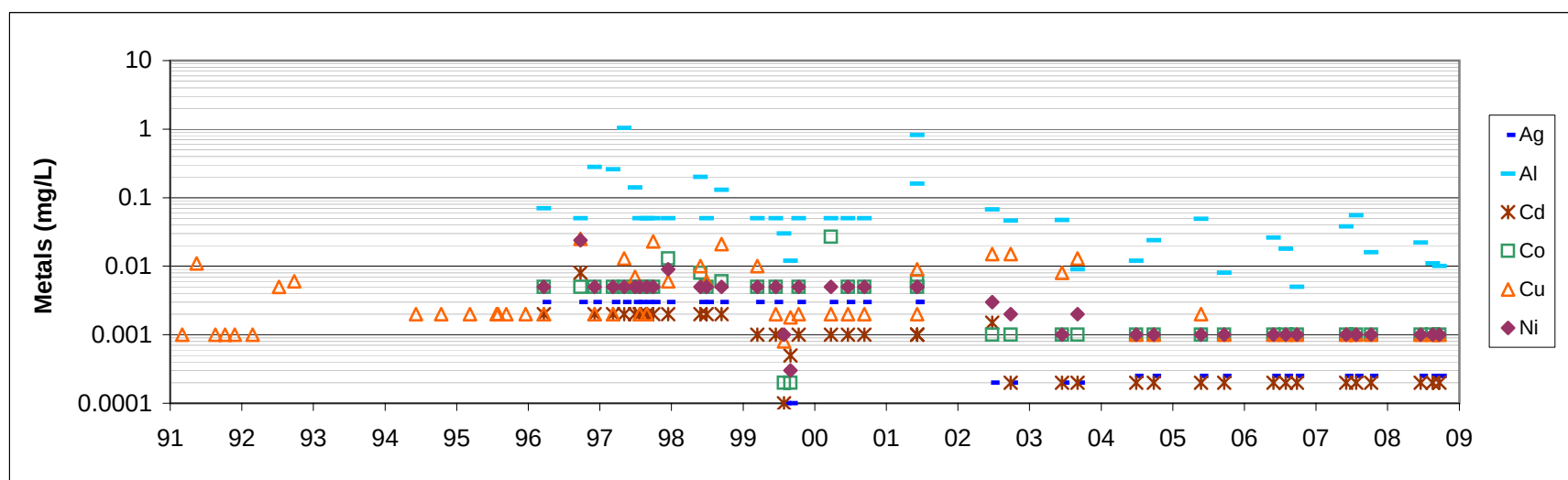
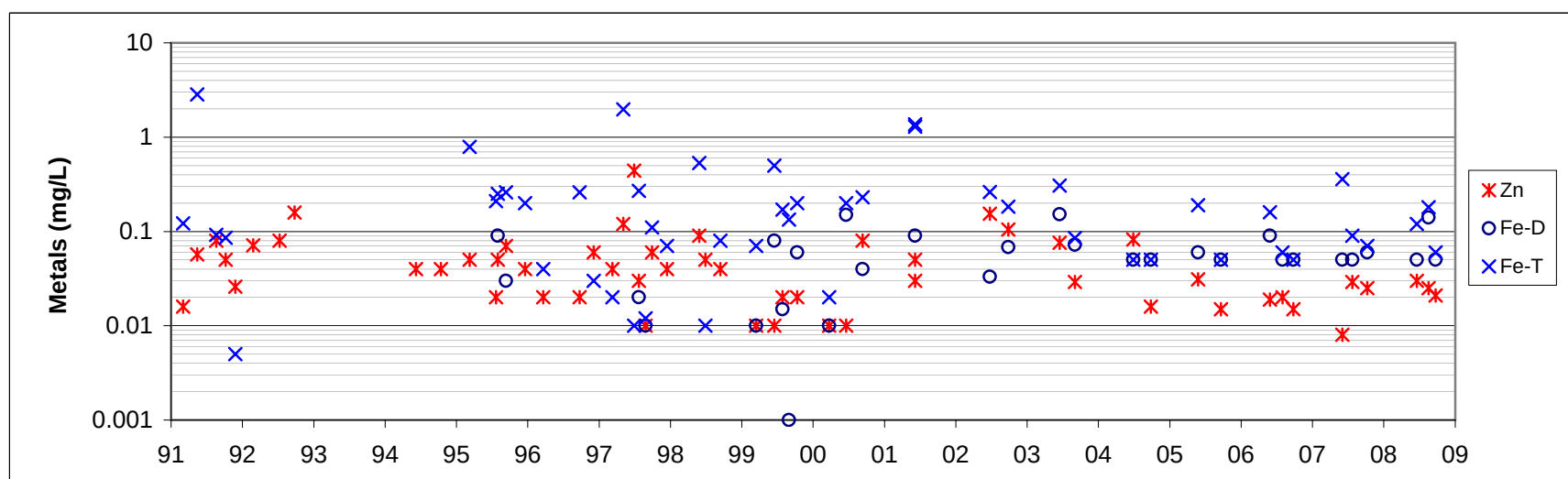
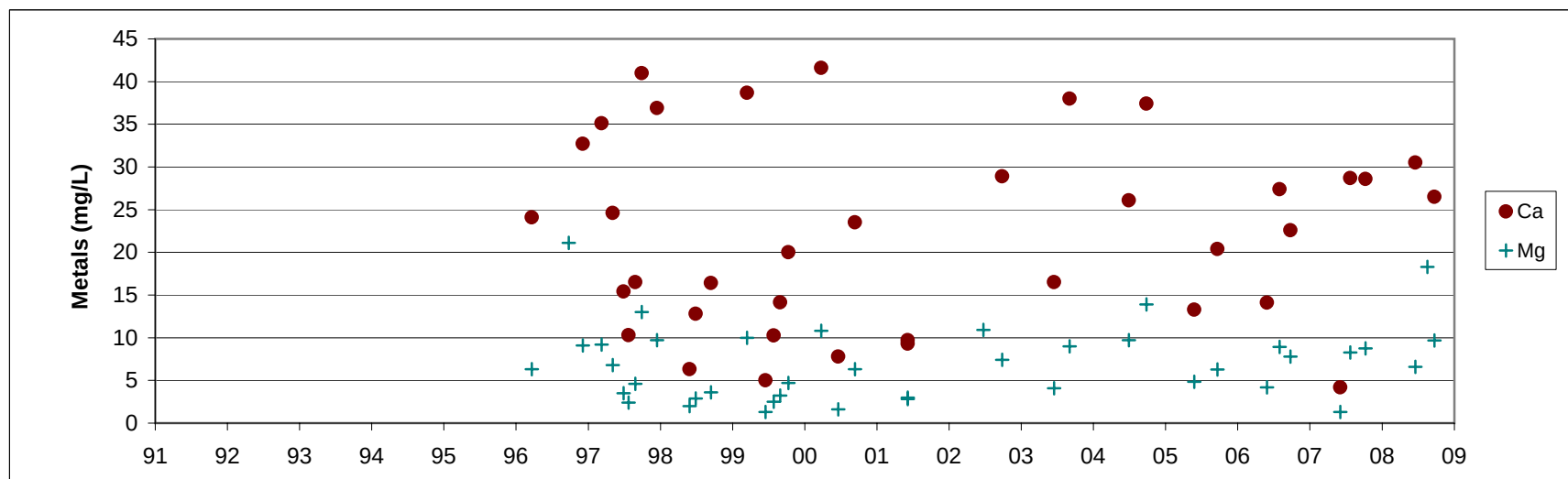
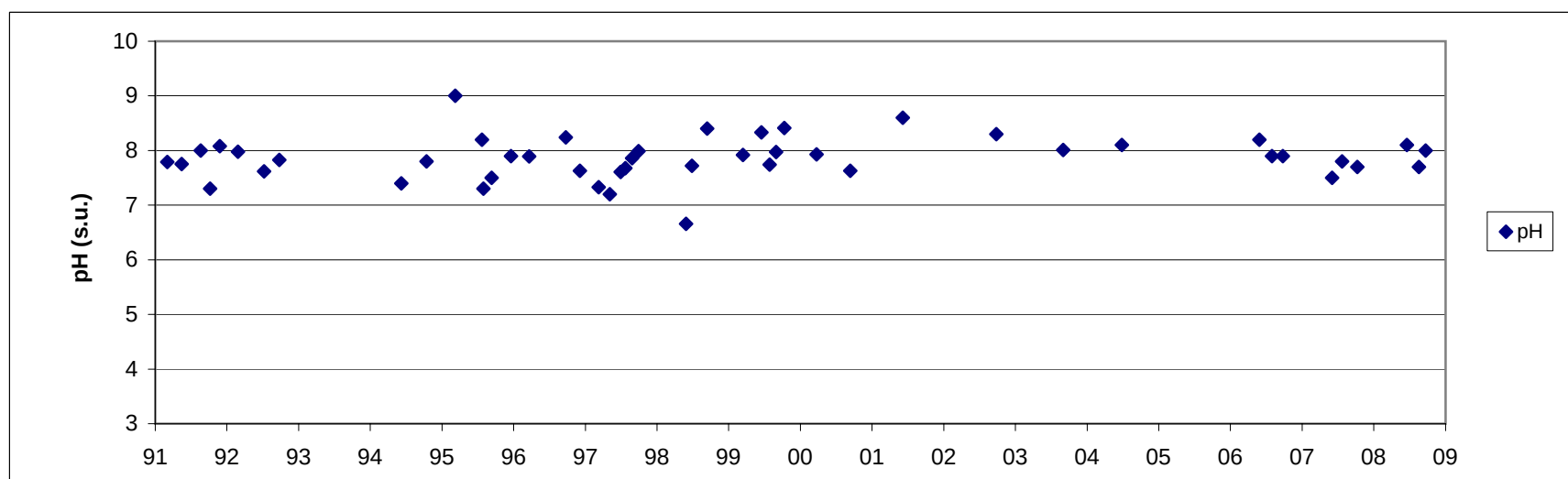
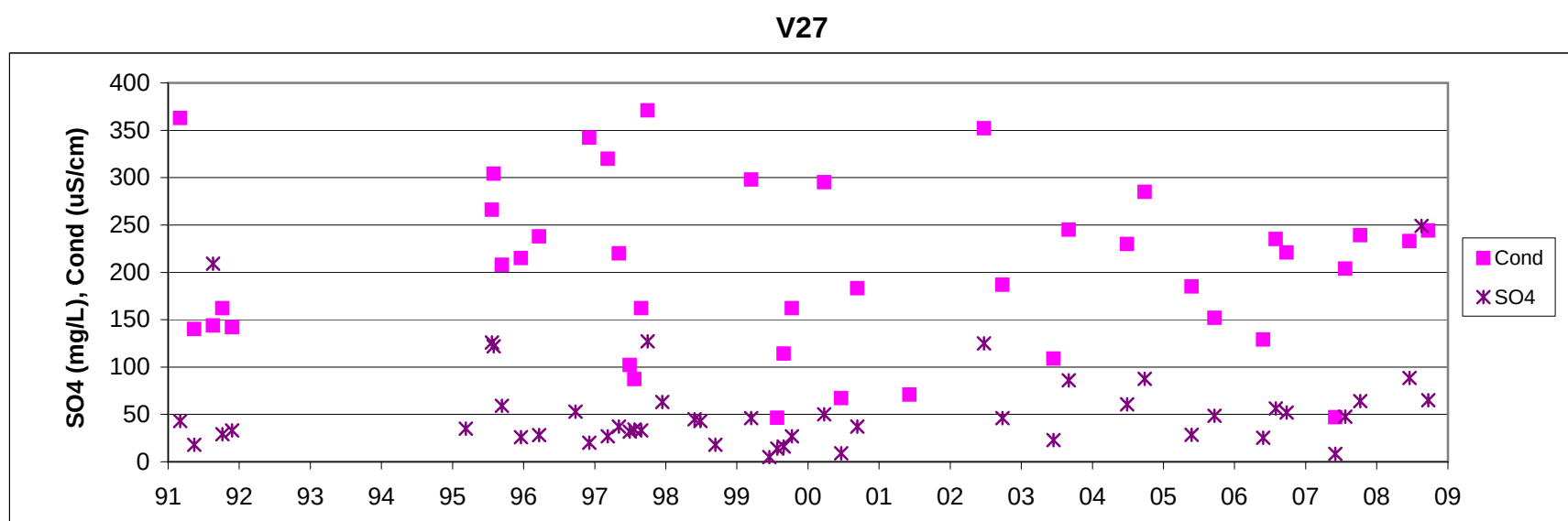
PROJECT
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DATE
December 2008

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17





Appendix A
Waste Rock Seepage Monitoring Results

Sample ID	Date Sampled	pH (WTW)	Cond		Temp (C)	ORP (mV)	Flow (L/min)	Cond		Lab pH	Acidity (to pH 8.3)		Alkalinity		Cl	SO4	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Mo	Ni	P	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	U	V	Zn	Zr	Water Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
			uS/cm	uS/cm				2	0.01		1	0.5	0.5	0.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
			Min. detection level	Units				s.u.	uS/cm		OC	mV	L/min	uS/cm																																					s.u.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

SRK.Seepage.Survey.Summary.Tables.2002-2008

SRK.Seepage.Survey.Summary.Tables.2002-2008

SRK.Seepage.Survey.Summary.Tables.2002-2008

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				pH 8.3) CaCO3	Total CaCO3			Cl	SO4	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Mo		Ni	P	K	Se	Si	Ag	Na	Sr	Ti	Sn	Ti	U	V	Zn
	Min. detection level	2	0.01	1	0.5	0.5	0.5	0.002	0.0001	0.0002	0.01	0.00001	5E-06	0.01	0.00002	0.05	0.0001	0.00003	0.0005	0.0002	0.0002	0.003	0.1	0.005	5E-05	2E-05	0.03	0.05	0.0002	0.05	0.000005	2	0.3	0.0001	0.00001	0.0002	2E-06	0.0002	0.005	0.0001		
	Units	uS/cm	s.u.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SRK-GD01	6/11/2002	2080	7.66	38	337	1.7	1220	<0.2	<0.2	<0.2	0.03	<0.005	<0.2	<0.1	<0.01	283	<0.01	<0.01	<0.01	<0.03	<0.05	0.02	141	0.059	<0.03	0.26	<0.3	5	<0.2	3.98	<0.01	7	0.914	<0.2	<0.03	<0.01	<0.03	5.07		1b		
SRK-GD01	9/11/2002	2460	7.27	69	497	1.5	1200	<0.2	<0.2	<0.2	0.06	<0.005	<0.4	<0.1	<0.01	351	<0.01	<0.01	<0.01	<0.03	<0.05	0.02	216	0.062	<0.03	0.29	<0.3	8	<0.2	4.09	<0.01	9	1.31	<0.2	<0.03	<0.01	<0.03	2.48		1b		
SRK-GD01	6/4/2003	2530	7.82	25	534	2.2	1320	<0.2	<0.2	<0.2	0.05	<0.005	<0.2	<0.1	<0.01	316	<0.01	<0.01	<0.01	<0.03	<0.05	0.03	223	0.044	<0.03	0.43	<0.3	8	<0.2	4.36	<0.01	10	1.3	<0.2	<0.03	<0.01	<0.03	4.58		1b		
SRK-GD01	09/14/2003	2530	8.09	16	559	2.4	1210	<0.2	<0.2	<0.2	0.05	<0.005	<0.2	<0.1	<0.01	367	<0.01	<0.01	<0.01	<0.03	<0.05	0.02	233	0.053	<0.03	0.34	<0.3	8	<0.2	4.46	<0.01	10	1.48	<0.2	<0.03	<0.01	<0.03	2.98		1b		
SRK-GD01	5/28/2004	2030	7.44	44.2	255	1.17	1080	<0.2	<0.2	<0.2	0.037	<0.005	<0.2	<0.1	<0.01	259	<0.01	0.05	<0.01	<0.03	<0.05	0.018	146	0.998	<0.03	0.43	<0.3	5.4	<0.2	2.83	<0.01	5	0.912	<0.2	<0.03	<0.01	<0.03	17.2		1b		
SRK-GD01	9/23/2004	2700	7.77	23	583	<5	1270	<0.2	<0.2	<0.2	0.043	<0.005	<0.2	<0.1	<0.01	348	<0.01	<0.01	<0.01	<0.03	<0.05	0.027	239	0.056	<0.03	0.351	<0.3	8.3	<0.2	4.08	<0.01	10.1	1.36	<0.2	<0.03	<0.01	<0.03	3.69		1b		
SRK-GD01	5/15/2005	2170	7.69	21.8	290	<5.0	1100	<0.20	<0.20	<0.20	0.051	<0.0050	<0.20	<0.10	<0.010	291	<0.010	0.016	<0.010	<0.030	<0.050	0.022	173	0.353	<0.030	0.295	<0.30	4.2	<0.20	2.93	<0.010	5.3	0.897	<0.20	<0.030	<0.010	0.037	10.7		1b		
SRK-GD01	9/16/2005	2730	7.79	19.1	566	<5.0	1390	<0.20	<0.20	<0.20	0.035	<0.0050	<0.20	<0.10	<0.010	332	<0.010	<0.010	<0.010	<0.030	<0.050	0.022	248	0.0502	<0.030	0.355	<0.30	5.7	<0.20	3.90	<0.010	9.1	1.14	<0.20	<0.030	<0.010	<0.050	3.11		1b		
SRK-GD01	5/25/2006	3130	7.85	34.9	588	<5	1630	<0.2	<0.2	<0.2	0.040	<0.005	<0.2	<0.1	<0.01	343	<0.01	<0.01	<0.01	0.038	<0.05	0.015	289	0.0828	<0.03	0.336	<0.3	8.0	<0.2	3.23	<0.01	11.1	1.19	<0.2	<0.03	<0.01	<0.03	3.10		1b		
SRK-GD01	9/19/2006	2620	7.63	22.5	552	1.23	1320	<0.20	<0.20	<0.20	0.043	<0.0050	<0.20	<0.10	<0.010	317	<0.010	<0.010	<0.010	<0.030	<0.050	0.030	253	0.0449	<0.030	0.334	<0.30	6.9	<0.20	3.83	<0.010	10.0	1.23	<0.20	0.099	<0.010	<0.030	2.76		1b		
SRK-GD01	5/26/2007	2880	7.61	65.0	535	1.28	1460	0.002	0.0009	0.0032	0.033	<0.0002	<0.0002	<0.01	0.00075	328	<0.0002	0.0026	0.0033	0.77	0.0013	0.032	280	0.0300	0.0012	0.337	<0.03	7.2	0.0027	4.57	<0.00005	10.3	1.19	0.0003	<0.0002	0.0005	0.0005	2.59		1b		
SRK-GD01	9/12/2007	2700	7.68	40.3	570	<50	1370	<0.005	0.001	0.0033	0.033	<0.0025	<0.0025	<0.05	0.00123	349	<0.0025	0.00126	0.002	<0.03	0.00153	0.027	274	0.0299	0.0009	0.278	<0.3	7.5	<0.005	4.16	<0.00005	10.3	1.29	<0.0005	<0.0005	<0.01	<0.005	2.60		1b		
SRK-GD01	5/15/2008	2100	8.20	08.9	350	1.40	0890	0.0018	0.0009	0.0028	0.032	<0.00001	<0.000005	<0.05	0.00197	255	<0.0001	0.00183	0.003	0.009	0.00104	0.025	182	0.0236	0.0013	0.213		6.28	0.001	3.59	<0.000005	07.0	0.91	0.000285	<0.00001	<0.0005	0.0287	<0.0002	2.72	0.00	1b	
SRK-GD01	9/15/2008	2700	7.90	58.1	430	1.60	1686	0.003	0.001	0.003	0.028	<0.00005	<0.00003	<0.3	0.00208	355	<0.0005	0.00468	0.0021	0.011	0.00132	0.030	286	0.0593	0.0012	0.411		6.57	0.001	4.05	<0.00003	09.3	1.23	0.00034	<0.00005	0.003	0.0428	<0.001	6.69	0.00	1b	
SRK-GD02	6/11/2002	2430	8.02	19	494	1.8	1100	<0.2	<0.2	<0.2	0.04	<0.005	<0.2	<0.1	<0.01	302	<0.01	<0.01	<0.01	<0.03	<0.05	0.02	206	0.121	<0.03	0.34	<0.3	8	<0.2	3.74	<0.01	10	1.2	<0.2	<0.03	<0.01	<0.03	2.76		1b		
SRK-GD02	9/11/2002	1580	7.56	27	278	0.9	665	<0.2	<0.2	<0.2	0.04	<0.005	<0.4	<0.1	<0.01	335	<0.01	<0.01	<0.01	<0.03	<0.05	0.01	213	0.114	<0.03	0.32	<0.3	7	<0.2	3.89	<0.01	9	1.26	<0.2	<0.03	<0.01	<0.03	2.31		1b		
SRK-GD02	9/14/2003	2580	8.07	16	574	2.4	1340	<0.2	<0.2	<0.2	0.06	<0.005	<0.2	<0.1	<0.01	380	<0.01	<0.01	<0.01	<0.03	<0.05	0.01	251	<0.005	<0.03	0.29	<0.3	8	<0.2	4.45	<0.01	10	1.58	<0.2	<0.03	<0.01	<0.03	2.31		1b		
SRK-GD04	6/11/2002	32																																								

Sample ID	Date Sampled	Cond (uS/cm)	Lab pH	Acidity (to		Alkalinity-		Chloride Cl	Sulphate SO4																													Water Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Sample ID	Date Sampled	Cond (uS/cm)	Lab pH	Acidity (to	Alkalinity-	Chloride	Sulphate																													Water																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
				pH 8.3)	Total			Cl	SO4	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Mo	Ni	P	K	Se	Si	Ag	Na	Sr		Tl	Sn	Ti	U	V	Zn	Zr	Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
				CaCO3	CaCO3			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Sample ID	Date Sampled	Cond		Acidity (to pH 8.3) CaCO3	Alkalinity- Total CaCO3	Chloride Cl	Sulphate SO4																																	Water Type					
		uS/cm	Lab pH					Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Mo	Ni	P	K	Se	Si	Ag	Na	Sr	Tl	Sn	Ti	U	V	Zn		Zr				
		2	0.01					1	0.5	0.5	0.5	0.002	0.0001	0.0002	0.01	0.00001	5E-06	0.01	0.00002	0.05	0.0001	0.00003	0.0005	0.0002	0.0002	0.003	0.1	0.005	0.00005	0.00002	0.03	0.05	0.0002	0.05	0.000005	2	0.3	0.0001	0.00001		0.0002	2E-06	0.0002	0.005	0.0001
		Min. detection level	Units					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L
SRK-VD10	5/29/2004	5490	5.71	1370	88.2	2.11	4700	<1	<1	<1	<0.05	<0.025	<1	<0.5	0.28	476	<0.05	2.89	<0.05	106	<0.25	<0.05	499	138	<0.15	3.89	<1.5	16	<1	8.38	<0.05	13	1.52	<1	<0.15	<0.05		<0.15	707		3				
SRK-VD10	9/26/2004	13500	4.95	5390	28	<250	15300	<2	<2	<2	<0.1	<0.05	<2	<1	<0.1	530	<0.1	7.19	<0.3	1100	<0.5	0.24	1820	1130	<0.3	4.85	<3	28	<2	12.6	<0.1	<20	2.12	<2	<0.3	<0.1		<1	1750		3				
SRK-VD10	5/17/2005	6430	3.98	2460	<2.0	<25	5420	0.60	<0.40	<0.40	<0.020	<0.010	<0.40	<0.20	0.218	431	0.053	3.12	<0.020	191	<0.10	0.063	565	201	<0.060	4.02	<0.60	10.0	<0.40	9.13	<0.020	10.2	1.29	<0.40	<0.060	<0.020		0.068	811		3				
SRK-VD10	9/17/2005	14800	5.49	5900	84.0	<10	15000	<2.0	<2.0	<2.0	<0.10	<0.050	<2.0	<1.0	<0.10	469	<0.10	8.70	<0.10	1380	<0.50	0.23	2260	1310	<0.30	5.73	<3.0	<20	<2.0	13.4	<0.10	<20	1.97	3.0	<0.30	<0.10		0.80	2540		3				
SRK-VD10	5/28/2006	07910	6.47	4250	14.2	<50	07310	<1	<1	<1	<0.05	<0.025	<1	<0.5	0.182	449	<0.05	4.17	<0.05	0342	<0.25	0.10	0879	0338	<0.15	4.97	<1.5	14	<1	10.8	<0.05	15	1.67	<1	<0.15	<0.05		<0.15	1300		3				
SRK-VD10	5/27/2007	08740	4.12	2150	<0.5	<4	06340	2.25	<0.001	0.005	0.01	<0.001	<0.001	<0.05	0.27	372	<0.001	3.24	0.032	0180	0.004	0.08	0619	0186	0.021	4.17	<0.15	12.3	0.014	10.4	0.0029	13.3	1.49	0.0	<0.001	<0.001		<0.001	958		3				
SRK-VD10	9/18/2008	16000	4.70	8800	<0.5	<5	19650	0.506	<0.004	<0.004	0.015	<0.002	<0.001	<10	0.303	508	<0.02	8.66	<0.01	1830	0.003	0.14	1990	1120	<0.01	6.61		14	0.019	<20	0.004	<2	2.15	0.0	<0.002	<0.1	0.003	<0.04	2920	<0.02	3				
SRK-VD12	5/17/2005	3240	3.03	734	<2.0	<5.0	2230	17.2	<0.20	0.43	0.022	0.0064	<0.20	<0.10	0.210	287	0.013	1.30	2.60	104	0.263	0.077	243	33.6	<0.030	1.66	0.32	4.0	<0.20	5.53	<0.010	2.6	0.928	<0.20	<0.030	<0.010		<0.030	211		3				
SRK-VD12	9/18/2008	23000	2.60	24600	<0.5	10	37800	494.0	0.108	47.80	0.028	0.0820	<0.003	<30	6.510	368	0.573	29.50	62.40	4000	0.204	1.050	3330	856.0	<0.03	38.00		<5	0.1	<50	0.021	<5	1.520	0.002	0.006	0.364	0.914	0.211	6730	<0.05	3				

Appendix B
Pit Seepage Monitoring Results

Summary.Table.Pit Seep Quality.2008

Sample ID	Date Sampled	Field Parameters					Physical Tests		Dissolved Anions				Dissolved Metals																																
		pH	Cond uS/cm	Temp °C	ORP mV	Flow L/min	Cond uS/cm	pH	Acidity (to pH 8.3) mg CaCO3/L	Alkalinity-Total mg CaCO3/L	Cl mg/L	SO4 mg/L	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Tl mg/L	Sn mg/L	Ti mg/L	U	V	Zn mg/L	Zr mg/L
03-GP01	6/9/2003	8.05	1928	12.7	635	2	1850	7.8	37	373	<0.5	989	<0.2	<0.2	<0.2	0.01	<0.005	<0.2	<0.1	<0.01	239	<0.01	0.01	<0.01	<0.03	<0.05	0.02	167	0.015	<0.03	0.51	<0.3	3	<0.2	2.37	<0.01	6	1.14	<0.2	<0.03	<0.01	<0.03	<0.03	<0.03	6.69
03-GP02	6/9/2003	7.28	1456	13.7	622	Trace	1550	7.51	51	189	<0.5	932	<0.2	<0.2	<0.2	0.01	<0.005	<0.2	<0.1	<0.01	197	<0.01	0.1	<0.01	<0.03	<0.05	0.02	112	0.224	<0.03	1.03	<0.3	3	<0.2	3.46	<0.01	8	1.41	<0.2	<0.03	<0.01	<0.03	<0.03	<0.03	14.3
03-GP04	6/9/2003	8.21	1896	15.4	617	1	1780	8.08	20	266	<0.5	1050	<0.2	<0.2	<0.2	0.01	<0.005	<0.2	<0.1	<0.01	268	<0.01	0.02	<0.01	<0.03	<0.05	0.03	144	0.013	0.06	0.17	<0.3	5	<0.2	1.94	<0.01	6	1.78	<0.2	<0.03	<0.01	<0.03	<0.03	0.073	
03-GP05	6/9/2003	7.88	1289	3.7	586	3	1240	7.65	36	223	<0.5	627	<0.2	<0.2	<0.2	0.01	<0.005	<0.2	<0.1	<0.01	158	<0.01	0.02	<0.01	<0.03	<0.05	0.03	96.9	<0.005	<0.03	0.07	<0.3	3	<0.2	1.78	<0.01	5	1.47	<0.2	<0.03	<0.01	<0.03	<0.03	0.03	
03-GP06	6/9/2003	8.36	1755	11.2	462	Trace	1660	8.13	11	264	2.7	995	<0.2	<0.2	<0.2	0.01	<0.005	<0.2	<0.1	<0.01	90	<0.01	<0.01	<0.01	<0.03	<0.05	0.05	235	<0.005	<0.03	<0.05	<0.3	4	<0.2	1.21	<0.01	5	0.403	<0.2	<0.03	<0.01	<0.03	<0.03	<0.005	
04-GP01	5/31/2004	7.81	946	12	349	Trace	935	8.29	<1.0	139	0.78	359	<0.2	<0.2	<0.2	0.014	<0.0050	<0.2	<0.1	<0.01	94.9	<0.01	<0.01	<0.01	<0.03	<0.05	0.023	70.9	<0.0050	<0.03	0.092	<0.3	2.9	<0.2	0.949	<0.01	<2	0.465	<0.2	<0.03	<0.01	<0.03	<0.03	0.0188	
04-GP02	5/31/2004	7.96	1174	8.6	360	15	1190	8.29	<1.0	210	2.3	456	<0.2	<0.2	<0.2	0.011	<0.0050	<0.2	<0.1	<0.01	117	<0.01	<0.01	<0.01	<0.03	<0.05	0.017	97.1	<0.0050	<0.03	0.108	<0.3	3.9	<0.2	0.879	<0.01	3	0.498	<0.2	<0.03	<0.01	<0.03	<0.03	0.0238	
04-GP03	5/31/2004	8	764	5.5	337	15	757	8.31	<1.0	187	0.86	225	<0.2	<0.2	<0.2	0.017	<0.0050	<0.2	<0.1	<0.01	64.8	<0.01	<0.01	<0.01	<0.03	<0.05	0.02	59.6	<0.0050	<0.03	0.08	<0.3	3.6	<0.2	1.11	<0.01	<2	0.289	<0.2	<0.03	<0.01	<0.03	<0.03	<0.005	
04-GP04	5/31/2004	7.95	341	4.3	354	60	346	8.28	<1.0	145	<0.50	34.7	<0.2	<0.2	<0.2	0.109	<0.0050	<0.2	<0.1	<0.01	46	<0.01	<0.01	<0.01	<0.03	<0.05	<0.01	9.78	<0.0050	<0.03	<0.05	<0.3	<2	<0.2	5.72	<0.01	6.9	0.314	<0.2	<0.03	<0.01	<0.03	<0.03	<0.005	
04-GP05	5/31/2004	7.87	1097	17.4	300	Trace	1190	7.87	3.3	99.2	0.76	590	<0.2	<0.2	<0.2	0.342	<0.0050	<0.2	<0.1	<0.01	185	<0.01	<0.01	<0.01	<0.03	<0.05	<0.01	34.8	0.0252	<0.03	<0.05	<0.3	5.2	<0.2	1.4	<0.01	14.7	0.745	<0.2	<0.03	<0.01	<0.03	<0.03	<0.005	
04-GP06	6/1/2004	7.41	1744	12.4	296	0.1	1770	7.96	2.3	297	1.5	853	<0.2	<0.2	<0.2	0.011	<0.0050	<0.2	<0.1	<0.01	103	<0.01	<0.01	<0.01	<0.03	<0.05	0.036	206	0.0149	<0.03	0.056	<0.3	3.8	<0.2	1.33	<0.01	4.1	0.516	<0.2	<0.03	<0.01	<0.03	<0.03	<0.005	
04-GP07	6/1/2004	8.09	1059	8	310	5	1090	8.14	<1.0	245	0.84	403	<0.2	<0.2	<0.2	0.024	<0.0050	<0.2	<0.1	<0.01	83.9	<0.01	<0.01	<0.01	<0.03	<0.05	0.03	98.2	0.0083	<0.03	<0.05	<0.3	2.5	<0.2	0.887	<0.01	<2	0.418	<0.2	<0.03	<0.01	<0.03	<0.03	<0.005	
04-GP08	6/1/2004	8.34	1206	7.9	294	Trace	1280	8.04	3.7	268	0.61	513	<0.2	<0.2	<0.2	0.015	<0.0050	<0.2	<0.1	<0.01	144	<0.01	0.011	<0.01	<0.03	<0.05	0.022	89.3	0.0168	<0.03	0.052	<0.3	2.9	<0.2	1.58	<0.01	4	1.37	<0.2	<0.03	<0.01	<0.03	<0.03	0.0133	
04-GP10	6/1/2004	8.45	1518	7.3	300	9	1520	7.92	5.8	273	<0.50	716	<0.2	<0.2	<0.2	0.011	<0.0050	<0.2	<0.1	<0.01	173	<0.01	0.022	<0.01	<0.03	<0.05	<0.01	109	0.0216	<0.03	0.418	<0.3	2.7	<0.2	1.44	<0.01	2.7	0.805	<0.2	<0.03	<0.01	<0.03	<0.03	7.5	
04-GP11	6/1/2004	7.5	1442	10.8	324	0.25	1480	7.61	13.4	217	<0.50	733	<0.2	<0.2	<0.2	0.014	<0.0050	<0.2	<0.1	<0.01	176	<0.01	0.101	<0.01	<0.03	<0.05	0.022	99.6	0.158	<0.03	1.03	<0.3	3	<0.2	3.06	<0.01	5.8	1.25	<0.2	<0.03	<0.01	<0.03	<0.03	12	
04-GP12	01-Jun-04	7.94	1709	14.6	306	0	1680	8.05	4	280	0.63	849	<0.2	<0.2	<0.2	0.018	<0.0050	<0.2	<0.1	<0.01	216	<0.01	0.018	<0.01	<0.03	<0.05	0.019	121	0.0102	0.046	0.13	<0.3	4.8	<0.2	1.74	<0.01	4.8	1.45	<0.2	<0.03	<0.01	<0.03	<0.03	0.0326	
04-GP13	01-Jun-04	8.28	789	12.8	306	0.1	775	8.29	<1.0	91.8	0.74	350	<0.2	<0.2	<0.2	0.043	<0.0050	<0.2	<0.1	<0.01	103	<0.01	<0.01	<0.01	<0.03	<0.05	0.011	34.3	0.558	<0.03	<0.05	<0.3	2.9	<0.2	0.726	<0.01	8.3	0.35	<0.2	<0.03	<0.01	<0.03	<0.03	0.0307	
04-GP14	01-Jun-04	6.78	1371	3.9	259	15	1340	6.67	173	285	1.18	782	<0.2	<0.2	0.34	0.03	<0.0050	<0.2	<0.1	0.098	113	<0.01	0.529	1.73	72	0.074	0.025	66.9	17.4	<0.03	0.65	<0.3	<2	<0.2	5.57	<0.01	16	0.552	<0.2	<0.03	<0.01	<0.03	<0.		

Date		Field Parameters						Physical Tests		Dissolved Anions				Dissolved Metals																															
Sample ID	Sampled	pH	Cond uS/cm	Temp °C	ORP mV	Flow L/min	Cond uS/cm	pH	Acidity (to pH 8.3) mg CaCO3/L	Alkalinity- Total mg CaCO3/mg/L	Cl mg/L	SO4 mg/L	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Mo mg/L	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Tl mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L
04-VP01	5/31/2004	7.27	181	8.4	385	6	174	8.04	1.3	59.5	<0.50	23.3	<0.20	<0.2	<0.2	0.025	<0.005	<0.2	<0.1	<0.010	27	<0.010	<0.010	<0.010	<0.030	<0.050	<0.010	2.33	<0.0050	<0.030	<0.050	<0.30	<2.0	<0.20	3.92	<0.01	<2.0	0.087	<0.20	<0.03	<0.01	<0.03	<0.03	0.0074	
04-VP02	6/1/2004	2.95	1261	14.5	675	15	1240	2.83	408	<1.0	0.57	582	7.38	<0.2	<0.2	0.014	<0.005	<0.2	<0.1	0.025	28.1	<0.010	0.345	4.75	129	0.436	0.011	13.3	7.34	<0.030	0.075	<0.30	<2.0	<0.20	8.53	<0.01	2.1	0.145	<0.20	<0.03	<0.01	<0.03	<0.03	12.1	
04-VP03	6/1/2004	7.57	405	20.5		0.25	405	8.17	<1.0	201	0.62	25.1	<0.20	<0.2	<0.2	0.034	<0.005	<0.2	<0.1	<0.010	52.8	<0.010	<0.010	<0.010	<0.030	<0.050	<0.010	14.7	0.0084	<0.030	<0.050	<0.30	<2.0	<0.20	5.89	<0.01	6	0.304	<0.20	<0.03	<0.01	<0.03	<0.005		
04-VP04	6/1/2004	3.96	7390	17.8	483	2	7410	3.61	4370	<1.0	<0.50	7070	45.6	<2.0	<2.0	<0.10	<0.050	<2.0	<1.0	3.21	221	<0.10	4.65	41.3	1410	2.49	<0.10	226	168	<0.30	2.11	<3.0	<2.0	<2.0	15.7	<0.10	<2.0	0.258	<2.0	<0.30	<0.10	<0.30	1530		
04-VP05	6/1/2004	5.58	2810	8.3	257	Trace	2750	5.14	643	10.6	0.75	1930	<0.40	<0.40	<0.40	0.021	<0.010	<0.40	<0.20	0.059	232	<0.020	0.844	0.025	166	<0.10	0.103	131	90	<0.060	0.65	<0.60	7.9	<0.40	5.88	<0.02	5.1	0.807	<0.40	<0.06	<0.02	<0.06	229		
04-VP06	6/1/2004	2.7	12.9	10210	715	Trace	10100	2.74	3270	<1.0	<0.50	11139	19.1	<2.0	<2.0	<0.10	<0.050	<2.0	<1.0	1.08	404	<0.10	9.14	11.9	421	<0.50	0.33	918	924	<0.30	3.77	<3.0	<2.0	<2.0	13.5	<0.10	<2.0	1.11	<2.0	<0.30	<0.10	<1.0	1550		
04-VP07	6/1/2004	3.15	5750	11.3	619	1	5830	2.89	2070	<1.0	1.02	5110	54.6	<0.60	<0.60	<0.030	<0.015	<0.60	<0.30	0.823	363	<0.030	3.34	8.64	492	0.91	0.2	326	312	<0.090	1.69	<0.90	9.5	<0.60	19.7	<0.03	<6.0	0.946	<0.60	<0.09	<0.03	<0.30	558		
04-VP08	6/2/2004	2.84	9110	6.9	610	Trace	8350	3.08	3570	<1.0	1.19	8080	12.1	<2.0	<2.0	<0.10	<0.050	<2.0	<1.0	1.13	455	<0.10	4.25	1.77	860	<0.50	0.35	675	559	<0.30	3.34	<3.0	<2.0	<2.0	24	<0.10	<2.0	1.52	<2.0	<0.30	<0.10	<1.0	1550		
04-VP09	6/2/2004	5.62	1033	4.4	329	2	940	6.55	115	24.1	<0.50	485	<0.20	<0.2	<0.2	0.018	<0.005	<0.2	<0.1	0.045	98.6	<0.010	0.187	<0.010	50	<0.050	0.03	32.7	21.4	<0.030	0.076	<0.30	2.2	<0.20	5.08	<0.01	4.9	0.488	<0.20	<0.03	<0.01	<0.03	48.1		
04-VP10	6/2/2004	6.33	809	13.3	357	Trace	1400	3.67	356	<1.0	<0.50	797	4	<0.2	<0.2	0.017	<0.005	<0.2	<0.1	0.322	105	<0.010	0.355	1.54	6.14	0.685	0.048	55.6	16.1	<0.030	0.603	<0.30	<2.0	<0.20	8.99	<0.01	<2.0	0.447	<0.20	<0.03	<0.01	<0.03	180		
04-VP11	6/2/2004	3.44	1465	11.9	669	90	773	7.32	17.4	150	<0.50	286	<0.20	<0.2	<0.2	0.018	<0.005	<0.2	<0.1	<0.010	129	<0.010	0.05	<0.010	1.4	<0.050	<0.010	29	0.698	<0.030	0.125	<0.30	<2.0	<0.20	5.76	<0.01	3	1.38	<0.20	<0.03	<0.01	<0.03	5.19		
04-VP12	6/2/2004	7.18	1372	12.6	434	Trace	1330	7.24	8	8.4	216	<0.50	600	<0.20	<0.2	<0.2	0.015	<0.005	<0.2	<0.1	<0.010	199	<0.010	<0.010	<0.010	<0.030	<0.050	0.045	77.2	0.245	<0.030	0.087	<0.30	2.4	<0.20	2.02	<0.01	2.3	1.05	<0.20	<0.03	<0.01	<0.03	2.86	
04-VP13	6/2/2004	6.82	2080	12	458	Trace	2020	7.24	87.5	14	1.37	1370	<0.20	<0.2	<0.2	0.011	<0.005	<0.2	<0.1	<0.010	324	<0.010	0.113	<0.010	<0.030	<0.050	0.157	91.8	31.7	<0.030	0.646	<0.30	3.1	<0.20	3.14	<0.01	2.4	1.18	<0.20	<0.03	<0.01	<0.03	42		
04-VP14	6/2/2004	7.18	583	12.6	446	0.25	568	7.46	35	90	<0.50	212	<0.20	<0.2	<0.2	0.041	<0.005	<0.2	<0.1	0.036	70.2	<0.010	0.072	<0.010	<0.030	<0.050	0.01	21.6	4.13	<0.030	0.183	<0.30	<2.0	<0.20	4.39	<0.01	2.1	0.334	<0.20	<0.03	<0.01	<0.03	19.9		
04-VP15	6/2/2004	7.1	1243	12.8	461	Trace	1230	7.4	75	15.5	<0.50	684	<0.20	<0.2	<0.2	0.011	<0.005	<0.2	<0.1	0.036	166	<0.010	0.144	<0.010	<0.030	0.101	0.072	44.5	15	<0.030	0.745	<0.30	<2.0	<0.20	3.52	<0.01	2.3	0.794	<0.20	<0.03	<0.01	<0.03	37.7		
04-VP16	6/2/2004	3.71	2980	15.1	637	0.1	2920	4.08	766	<1.0	1.08	2200	49.3	<0.2	0.2	<0.010	0.0132	<0.2	<0.1	0.284	298	<0.010	1.41	2.37	4.17	1.85	0.309	147	51.9	<0.030	2.51	<0.30	4.2	<0.20	20.9	<0.01	5.2	1.23	0.2	<0.03	<0.01	<0.03	238		
05-VP01	17-May-05	2.7	1950	12.5	619		405	8.3	<1	3.5	<0.5	473	0.27	<0.2	0.2	0.221	<0.005	<0.2	<0.1	0.075	117	<0.01	0.134	1.59	20.8	<0.05	<0.01	35.1	11.7	<0.03	0.168	<0.3	<2	<0.2	5.48	<0.01	<2	0.331	<0.2	<0.03	<0.01	<0.03	32.3		
05-VP02	17-May-05	7.94	408	15.1	258		405	8.39	<1	213	<0.5	25	<0.2	<0.2	<0.2	0.04	<0.005	<0.2	<0.1	<0.01	65.6	<0.01	<0.01	<0.01	<0.03	<0.05	<0.01	15.1	0.0184	<0.05	<0.05	<0.3	<2	<0.2	6.19	<0.01	6.1	0.305	<0.2	<0.03	<0.01	<0.2	0.0094		
05-VP03	17-May-05	2.82	1369	6.8	350		1170	2.82	401	<2	<0.5	448	9.04	<0.2	<0.2	0.015	<0.005	<0.2	<0.1	0.021	36.1	0.016	0.278	3.35	91.1	0.466	0.019	15.7	5.57	<0.03	0.068	<0.3	<2	<0.2	11.2	<0.01	2.9	0.162	<0.2	<0.03	<0.01	<0.03	11.2		
05-VP04	17-May-05	3.32	7040	8	544		6780	2.94	4230	<2	<25	6960	64.9	<0.4	1.15	<0.02	<0.01	<0.4	<0.2	2.13	218	0.113	3.72	111	1620	1.56	0.111	159	148	<0.1	1.79	<0.6	<4	<0.4	16.5	<0.02	<4	0.295	<0.4	<0.06	<0.02	<0.06	1230		
05-VP05	17-May-05	5.06	1420	7.2	398		1360	6.89	221	3.6	<0.5	799	<0.2	<0.2	<0.2	0.012	<0.005	<0.2	<0.1	0.119	168	<0.01	0.236	0.08	70.3	<0.05	0.033	49.8	36.1	<0.03	0.117	<0.3	2.5	<0.2	5.84	<0.01	7.2	0.729	<0.2	<0.03	<0.01	<0.03	75		
05-VP06	17-May-05	5.41	2000	7.6	298		1990	6.44	276	5.6	<5	1230	1.19	<0.2	<0.2	<0.01	<0.005	<0.2	<0.1	0.31	190	<0.01	1.36	0.102	3.9	1.35	0.101	154	55.5	<0.03	2.84	<0.3	3.2	<0.2	5.35	<0.01	<2	0.516	<0.2	<0.03	<0.01	<0.03	126		
05-VP07	17-May-05	4.06	3290	7.2	472		3310	3.67	876	<2	<10	2220	24.4	<0.2	<0.2	<0.01	<0.005	<0.2	<0.1	0.651	249	0.018	1.66	1.21	29.2	2.16	0.153	261	47.8	<0.03	2.35	<0.3	<2	<0.2	13.7	<0.01	<2	0.436	<0.2	<0.03	<0.01	0.044	235		
05-VP09	19-May-05	2.91	11560	6.6	685		11000	2.7	10800	<2	<50	14000	151	<1	31.7	<0.05	<0.025	<1	<0.5	2.9	38																								

Appendix C

Thermal and Pore Gas Monitoring Results

Location: **Faro**
Hole ID: **60M1**

Date		19-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	26-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	1-Jun-08	18-Sep-08
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	19.6	17.1	18.9	19.2	7.6	18.6	10.1	5.7	19.6	15.5	15.4	20	17	13	19.3	16.8	6.9
0.7	0.7B	19.6	16.9	18.9	19.2	7.5	18.6	10	5.2	19.6	15.9	15.3	20	17	13.6	19.2	17.1	6.8
1.4	1.4A	19.7	17.1	19.1	18.3	6.7	18.6	10.6	5.1	19.7	14.9	16	20	17	10.4	19.7	16.9	6.3
1.4	1.4B	19.7	17.5	19.1	18.3	6.6	18.6	10.6	5.1	19.8	14.9	16	20	17	10.4	19.7	16.9	6.3
2.8	2.8A	18.5	15.7	15.3	17.2	5.9	15.1	8.1	1.8	17.4	13.7	12.1	17.9	15.8	8.9	17.4	15.4	-
2.8	2.8B	18.5	15.7	15	17.3	5.9	14.7	7.8	2.2	17.4	13.5	12	17.8	15.7	8.9	17.5	15.3	4
5.6	5.6A	14.9	15.7	13.4	15.5	6	14.5	6.4	3.9	17.5	12.4	12.4	18.2	15.3	9.7	17.8	15.4	7.2
5.6	5.6B	15.6	15.5	13.2	15.2	6.3	14.3	5.7	4	17.5	12.3	12.1	18.3	15.5	9.7	17.9	15	7.4
10	10B ⁽¹⁾	17	12.2	11.1	14	9.2	10.7	7.7	4.2	13.6	10.4	10.4	14.9	17.8	8.4	14.3	15.9	6.9
10	20 ⁽¹⁾	16.8	12.2	11.1	14.1	9.3	10.7	7.3	3.7	13.2	11.4	10.6	14.9	16.2	7.8	14.3	16.8	6.9
20	10A ⁽¹⁾	10	5.5	5.8	6.4	3.7	6.9	2.8	1.7	15.1	3.8	9.3	16.2	3.9	9.2	15.7	12	11
30	30	20.9	9.5	8.4	8.9	9	8.5	9.7	11.3	blocked	11.2	10.1	10.5	11.2	10.3	11.8	12.1	11.4
40	40	19.8	19.8	19	19.5	19.3	19.3	19.5	19.2	19.3	19.3	19.4	19.5	19.4	19.4	19.9	20.5	19.4
60	60	19.8	19.4	17.6	18.8	18.9	18.3	18.6	18.1	19.6	18.4	18.1	20.2	17.6	17.8	19.4	20.1	18.7

Note: (1) Port 20 and Port 10 A labels reversed

Location: **Faro**
Hole ID: **30M1**

Date		19-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	26-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	1-Jun-08	18-Sep-08
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	19.4	16.6	16.8	17.4	16.4	19	17.8	16	19.4	16.8	16.9	20.9	16.9	15.5	18.3	18.1	-
0.7	0.7B	19.4	16.6	16.8	plugged	16.4	19	17.8	15.9	19.4	16.8	16.9	20.9	16.9	15.5	18.4	18.2	17.9
1.4	1.4A	19.3	16.6	16.7	plugged	16.4	19	17.8	16	blocked	16.8	16.9	19.9	17	15.6	18.4	18.6	18.5
1.4	1.4B	19.3	16.6	16.8	plugged	16.4	19	18	16	19.4	16.8	16.9	20	17	15.5	18.4	18.6	-
2.8	2.8A	19.3	16.6	16.8	17.3	16.6	19	17.9	16.1	blocked	17	17	20	17.2	15.6	18.4	18	18.5
2.8	2.8B	19.3	16.6	16.8	17.3	16.6	19	17.9	16.1	19.5	17	17	20.8	17.2	15.6	18.4	18	-
5.6	5.6A	19.7	17	17.6	17.3	17.9	19.4	17.8	16.4	19.6	17.4	16.8	20.2	18	15.9	18.7	17.8	18.9
5.6	5.6B	19.7	17	17.6	plugged	17.9	19.4	17.8	16.4	19.7	17.4	16.8	20.1	18	15.9	18.7	17.7	18.8
10	10A	19.4	16.1	17.6	17	16.9	19.1	16.2	16.3	19.5	16.1	16.8	19.8	16.4	15.7	18.4	16.7	21
10	10B	19.4	16.1	17.7	plugged	16.9	19.1	16.2	16.3	19.5	16.1	16.8	19.8	16.4	15.7	18.4	16.7	21
20	20	20.2	16.1	19.7	plugged	16.4	19.3	14.8	18.4	19.9	17.2	20	20.2	17.4	18.1	17.7	16.6	21
30	30	12.9	7.4	12.7	10.1	6.7	9.1	not recorded	9.2	13.3	7.4	13.1	12.2	7.8	10.6	9.1	7.4	17.9

Notes : ** indicates suspect value
 -grey cells indicate monitoring points that were found to be plugged during February 2006 or subsequent monitoring

Location: Grum
Hole ID: 10M2

Date		20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7	20.6	20.1	20.6	Not recorded	20.6	20.6	20.3	17.7	20.6	20.4	20.6	20.4	20.4	20.1	20.6	20.5	20.3
1.4	1.4A	14.8	10	10.2	Not recorded	*0.2	14.3	10.3	14.1	7.8	0	15.2	4.8	12.3	17.2	17.7	11.7	16.1
1.4	1.4B	10	8.8	9.8	Not recorded	20.3	13.2	10	14	7.3	blocked	blocked	blocked	blocked	blocked	blocked	blocked	blocked
2.8	2.8A	0.6	14.7	2.5	Not recorded	*0.2	3.5	2.3	3.1	0.3	blocked				blocked	blocked	blocked	blocked
2.8	2.8B	3.4	11.6	2.5	Not recorded	3.5	3.5	2.1	3.1	0.3	blocked				blocked	blocked	blocked	blocked
5.6	5.6A	1	10.9	12.7	Not recorded	10.2	10.4	7.5	12.4	0.5	7.6	11.8	1.6	blocked	14.6	4.1	9.6	13.8
5.6	5.6B	1	11.1	12.7	Not recorded	10.2	10.4	7.5	12.4	blocked	blocked	blocked	blocked	blocked	blocked	blocked	blocked	blocked
10	10	1.3	15.1	12.3	Not recorded	15.2	9.6	not recorded	13.1	1	blocked	blocked	blocked	blocked	blocked	blocked	blocked	blocked

Location: Grum
Hole ID: 10M3

Date		20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	20.6	20.6	20.5	20.6	20.7	20.7	20.6	20.7	20.6	20.9	20.7	19.2	20.7	20.7	20.8	20.7	20.9
0.7	0.7B	20.6	20.6	20.5	20.6	20.7	20.7	20.6	20.7	20.6	20.9	20.7	19.3	20.7	20.7	20.9	20.7	20.9
1.4	1.4A	19	18.9	20.1	20.5	20.1	19.7	20.2	18.7	18.3	blocked	blocked	blocked	blocked	blocked	blocked	blocked	blocked
1.4	1.4B	18.9	18.7	20.1	plugged	20	19.5	20.2	18.8	18.2	blocked	blocked	blocked	blocked	blocked	blocked	blocked	blocked
2.8	2.8A	16.3	16	13.7	16.1	16.6	13.1	20.4	14.4	15.7	15.5	14.7	16.2	blocked	15.3	16.3	blocked	14
2.8	2.8B	15.9	16	13.7	16.2	16.6	13.2	17.2	14.4	15.6	15.5	14.7	16.4	blocked	15.2	16.3	blocked	14
5.6	5.6A	13.7	15	14.6	plugged	15.8	14.2	18.8	17.1	blocked	16	15.7	15.7	blocked	19.3	21	blocked	18.1
5.6	5.6B	13.7	15	14.6	14.4	15.8	14.2	16	17	blocked		15.7	15.7	blocked	19.2	21	blocked	18
10	10A	16	13.5	14.5	15.7	14.1	14.4	20.9	17.3	blocked		15.5	17.9	blocked	19.7	21	blocked	17.1
10	10B	16	14.1	14.5	15.7	*18.2	14.4	20.9	17	blocked	blocked		blocked	blocked	blocked	blocked	blocked	blocked

Location: Grum
Hole ID: 30M3

Date		20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	18.4	20.7	20.5	plugged	20.7	20.3	20.6	20.5	19.2	not recorded	20.8	20.1	20.8	20.4	20.3	20.8	20.4
0.7	0.7B	18.4	20.7	20.5	20.6	20.7	20.4	20.6	20.5	19.3	not recorded	20.8	20.1	20.8	20.4	20.3	20.9	20.4
1.4	1.4A	19.1	20.8	20.5	plugged	20.7	20.3	20.7	20.5	19.2	not recorded	20.7	20.1	20.8	20.3	20	20.8	20.3
1.4	1.4B	19	20.6	20.4	20.4	20.7	20.3	20.6	20.2	19.1	not recorded	20.7	20.1	20.8	20.3	20	20.8	20.3
2.8	2.8A	17.5	20.5	19.8	20.2	20.5	19.9	20.4	19.8	18.7	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
2.8	2.8B	17.5	20.5	19.8	20.2	20.5	19.9	20.4	19.7	18.7	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
5.6	5.6A	15.6	20.5	19.3	20.2	20.5	19.5	20.3	19.7	17.2	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
5.6	5.6B	15.5	20.5	19.3	20.2	20.5	19.5	20.3	19.7	17.2	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
10	10A	5.7	15.6	5.4	plugged	18	0	12.1	11.2	9.2	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
10	10B	5.5	15.9	5.4	0	18	0	12.1	11.4	9.3	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
20	20A	4.9	4	0	0	0.3	0.4	1.3	0	3.3	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
20	20B	4.9	3.7	0	0	0.3	0.4	1.3	0	3.4	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
30	30A	3.7	0.6	0.4	plugged	0.9	1	0.2	1.1	4.6	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked
30	30B	3.8	0.6	0.4	0	0.9	1	0.2	1.1	4.6	not recorded	blocked	blocked	blocked	blocked	blocked	blocked	blocked

Notes : * indicates suspect value
 -grey cells indicate monitoring points that were found to be plugged during February 2006 or subsequent monitoring

Location: Vangorda
Hole ID: 10M4

Date		20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7	20.6	18.6	19.6	19	18.4	19.8	18.3	18.3	20.8	19.1	19.6	20.8	19.5	18.7	20.5	18.9	18
1.4	1.4	20.9	20.3	20.6	19.9	20.3	20.7	20.1	19.7	20.9	20	20.5	20.8	20.3	20	20.4	20.2	20.5
2.8	2.8A	21	20.7	20.8	20	20.7	20.8	20.3	19.6	20.9	20	20.7	20.8	20.6	20.3	20.4	20.4	21
2.8	2.8B	21	20.7	20.8	20	20.7	20.8	20.3	19.6	20.9	20.1	20.7	20.8	20.6	20.3	21	20.4	21
5.6	5.6A	20.8	20.6	20	19.8	20.7	20.1	20.1	18	20.8	19.4	20.1	20.6	20.6	20	20.9	20.5	20.3
5.6	5.6B	20.8	20.7	20	19.8	20.7	20.1	20.1	18	20.8	19.4	20.1	20.6	20.6	20	20	20.5	20.3
10	10	20.2	19.3	19.3	17.9	20.1	19.4	Not recorded	17.3	20.5	19.1	19.8	19.7	20.5	19.9	19.5	20.1	20.3

Location: Vangorda
Hole ID: 30M4

Date		20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	0	19.9	0.8	2.8	19.3	*2.2	17.4	1.7	0	9.8	9.2	0	9.2	17.5	0.04	19.8	17.9
0.7	0.7B	0	20	1.1	3.1	19.5	*2.7	17.5	7.9	blocked	10	9.2	0.1	9.2	17.4	0.04	19.8	18
1.4	1.4A	0	17.4	0	0.1	14.6	0	6.4	0	blocked	0.5	0.2	*20.9	0.2	12.8	0	17.2	6.3
1.4	1.4B	0	17.6	0	0.1	14.7	0	8	0.3	blocked	0.5	0.3	0.2	0.3	12.5	0	15.8	6.7
2.8	2.8A	0	0	0	0	0.1	0	0	0	0	0	0	0.2	0	0.1	0	**0	2.7
2.8	2.8B	2.4	15.4	2.3	plugged	*18.6	*8.7	20.8	20.8	blocked	blocked	blocked	blocked	blocked	blocked	blocked	blocked	blocked
5.6	5.6A	2.4	2.8	2.3	2.1	1.7	1.8	2.3	1.4	2.9	1.4	3.3	0.5	3.3	4.2	0.07	2.6	4.8
5.6	5.6B	2.3	1	2.3	2.1	1.7	1.8	2.3	1.4	3	1.4	3.4	0.5	3.4	3.9	0.07	3.7	4.8
10	10A	2.3	6.9	2.2	plugged	*4.4	*2	*2.4 to 17.4	20.9	8.4	5.1	9	10.1	9	5.9	6.1	7.3	blocked
10	10B	8.3	6.9	6.4	plugged	*7.5	*6.9	8.1	4.3	8.4	5.2	8.9	10.1	8.9	5.8	6.1	7.3	8.3
20	20	0.2	0	0	0	0	0	0	0	0.4	0.09	0	1.3	0	0.2	0.05	**0	6.1
30	30	14.9	0.4	4.4	2.7	0.7	4.9	0.2	0	14.3	1.3	4	14.5	4	0.4	Not recorded	**0	7.2

Notes : ** indicates suspect value
 -grey cells indicate monitoring points that were found to be plugged during February 2006 or subsequent monitoring

Location: **Faro**
Hole ID: **60M1**

Date	20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	26-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	1-Jun-08	18-Sep-08	
Bead Depth (m)	Correction factor	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)
0.7	0	3.2	13.5	9.4	4.7	15	7.8	12.2	12.2	0.5	10.1	11.6	-1.2	10.9	13.1	3.4	12	10.4
1.4	-0.1	7.9	14.3	15.6	7.5	14.9	13.6	13.4	15.8	5.9	10.8	15.1	4.2	11	16.2	7.1	12.6	13.5
2.8	0.1	16.9	18.6	23	14.9	17.8	22.5	16.7	22.7	15.6	15.7	22.1	14	14.9	21.5	14.6	15.6	19.3
5.6	0	29.2	28.1	30.7	27.2	26.6	30.7	26.4	29.2	27.5	26.4	29	26.6	24.7	27.4	25.6	24.2	26.6
10	-0.1	41.8	41.3	40.6	40.1	39.8	39.3	39.2	38.4	38.8	38.4	37.8	38.1	37.4	36.5	36.5	35.7	36.2
20	0.1	49.1	49	48.8	48.2	48.1	48.3	49	48.7	48.7	48.8	48.4	47.7	47.6	47.1	45.9	45.6	47.3
30	-0.1	36	36.3	36.4	36.8	36.8	37.2	37.4	37.7	37.9	38	38.1	38.2	38.1	38.1	38.1	37.9	40.0
40	-0.1	24.2	24.6	24.9	25.5	35.6	25.9	26.3	26.6	27	27.2	27.5	27.8	27.9	28.1	28.4	28.4	28.9
60	-0.1	6.3	6.5	7	7	7.1	7.7	7.7	8.3	8.3	8.5	9.1	9	9.2	9.9	9.9	9.9	10.9

Location: **Faro**
Hole ID: **30M1**

Date	20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	26-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	1-Jun-08	18-Sep-08	
Bead Depth (m)	Correction factor	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)
0.7	0.1	1.7	7.4	11.2	3.4	11.2	9.6	8.2	12.6	2.8	5.9	11.5	2.3	6.6	13.5	4.8	9.6	11.9
1.4	-0.1	4	7.2	12.9	5.4	12.9	12.3	7.8	13.8	5.1	6	13.2	4.8	6.5	14.7	6.8	9.2	13.5
2.8	0.1	8.5	8.5	14.5	9.4	14.5	15.6	10.3	16.1	10.4	9.6	16	10	9.6	16.5	11.3	11.4	15.9
5.6	0.1	17.3	16.8	18.6	18.3	18.6	20.1	19	20.4	19.9	19.1	20.7	20	19.2	20.7	20.4	19.9	21.8
10	-0.1	27	27.4	27.4	28.4	27.4	28	28.8	28.5	29.3	29.3	29.1	29.7	29.5	29.2	30	29.8	30.2
20	0.2	34.5	35.5	35.8	34.7	35.8	36	36.3	37.1	35.8	36	37.5	35.4	36.3	37.8	35.6	36.8	38.0
30	0	34.6	34.2	34.7	34.6	34.7	35.2	35	35.8	36.3	36.1	36.6	37.2	37	37.1	37.4	37.1	38.0

Location: Grum
Hole ID: 10M2 Outside PVC

Date	20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06
Bead Depth (m)	Correction factor	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)
0.7	0.1	-4.8	5	4.1	-0.6	5.3	2.9	3.9	8.7
1.4	0.2	-0.2	-0.2	6.6	-0.3	-0.1	5.4	2.4	10
2.8	0.2	1.2	0.3	6.2	0.7	0.5	6	1.6	8.3
5.6	0	3	2	3.9	2.4	2.1	5.2	2.7	5.8
10	0.1	3.3	3.1	2.9	3.3	3.2	3.1	3.8	4.4

Location: Grum
Hole ID: 10M2 Inside PVC

Date	20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08	
Bead Depth (m)	Correction factor	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)
0.7	0.1	-3.3	3.7	4.9	Not recorded	3.6	3.2	2.3	7.6	-1.4	1.8	6.2	-2.8	1.7	8.8	-0.8	6	6.2
1.4	0.2	-0.3	-0.4	6.6	Not recorded	-0.3	5.1	0.7	8.2	0.1	0.4	6.8	-0.3	-0.1	8.7	0.1	3.6	6.6
2.8	0.2	1.2	0.3	6	Not recorded	0.6	6.6	1.4	7.8	1.8	1.2	7.1	1.4	0.9	7.3	1.6	1.8	6.6
5.6	0	3.1	2	3.8	Not recorded	2.1	5.1	2.6	5.1	3.5	2.6	4.9	3.2	2.4	4.1	3.3	2.5	4.7
10	0.1	3.4	3.1	3	Not recorded	3.2	3.1	3.7	3.6	4.1	4	3.8	4	4	3.7	4	3.9	3.7

Location: Grum
Hole ID: 10M3

Date	20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08	
Bead Depth (m)	Correction factor	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)
0.7	0.2	-4.9	6.1	6.5	-0.9	7.3	4.2	3.8	8.5	-7.5	2.2	7	-7.4	3	9.8	9.8	5.7	6.9
1.4	0.2	-1.9	2.1	7.9	-1	3	5.9	0.3	8.9	-3.6	-0.1	7.3	-4.2	0	9.7	9.7	1.9	7.3
2.8	0.2	1.1	0	6.8	0.2	0.3	7.1	0.9	8	0.7	0.2	6.7	0.4	0	7.3	7.3	0.4	6.6
5.6	0	3.8	2.2	4.8	2.6	2.2	5.8	2.6	5.3	3.4	2	4.5	3	1.7	4.1	4.1	2	4.7
10	0.1	5	4.6	4.3	4.5	4.3	4.3	4.7	4.5	4.9	4.5	4.1	4.4	4.2	3.9	3.9	4.1	4.0

Location: Grum
Hole ID: 30M3

Date	20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08	
Bead Depth (m)	Correction factor	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	
0.7	-0.1	-4.6	5.2	7	-1.3	5.5	4.6	3	8.1	-6.6	1.7	6.4	-7.9	2.3	9.4	-4.9	4.5	6.6
1.4	0	-1.4	1.8	8	-1	2.1	6.5	0.2	8.8	-2.4	0.3	7.1	-3.7	-0.2	9.7	-3	1.7	7.3
2.8	0.1	2	1	7.5	1.2	1.4	8	1.8	8.6	2.1	1.4	7.9	1.5	0.9	8.5	1.1	1.6	7.3
5.6	-0.1	6.1	4.7	6.9	5.4	4.7	7.8	5.1	7.6	6.4	5.1	7.4	6.3	5	7.3	6.3	5.1	7.3
10	0.1	9.8	9.4	9.6	10.3	9.3	9.5	10.1	10.2	10.8	10.4	10.3	10.7	10.8	10.6	11	10.5	10.4
20	0.1	11.8	12	11.8	12.3	12.2	12.2	12.3	12.2	12.3	12.7	12.5	12.5	13.1	13	12.9	12.9	12.9
30	0.1	10	9.9	9.8	10.1	10	10	10.3	10.1	10.4	10.5	10.4	10.6	10.9	10.8	11	11	10.9

Location: Vangorda
Hole ID: 10M4

Date	20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08	
Bead Depth (m)	Correction factor	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	
0.7	0.1	-0.7	13	10.2	3.3	14	6.8	10.5	12	-6.8	8.9	10	-6.7	8.6	12.8	-3.7	19	8.6
1.4	0	3.7	12.9	15.3	5.6	12.7	11.5	11.1	15.1	-0.9	8.6	12.5	-2.8	7.1	14.4	-2.4	8.5	10.4
2.8	0.2	7.5	12.7	18.4	9	12.2	15.3	11.5	18.5	3.8	9.8	15.3	0.9	7.4	15.6	0.2	6.9	12.4
5.6	-0.1	16.7	15.2	22.6	14.1	14.4	20.8	13.8	20.8	11.8	12.6	18.2	8.4	9.2	15.7	6.5	7.1	12.9
10	0	31.6	29.3	29.5	27	27.3	27.6	27.2	27.6	25.8	23.7	23.1	21	18.7	18.8	16.5	15.4	16.5

Location: Vangorda
Hole ID: 30M4

Date	20-Feb-03	7-Jun-03	16-Sep-03	27-Apr-04	7-Jun-04	30-Sep-04	19-May-05	16-Sep-05	27-Feb-06	28-May-06	22-Sep-06	26-Feb-07	25-May-07	10-Sep-07	10-Mar-08	6-Jun-08	18-Sep-08	
Bead Depth (m)	Correction factor	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)	Corrected Temp (°C)
0.7	-0.1	-5.3	8.6	7.4	-1.3	10.4	5.4	6.7	9.8	-6.6	5.6	8.3	-6.3	5.1	11.7	-3.4	8	8.2
1.4	0	-1.3	6	10.3	-0.6	7.2	8.2	5.4	11.4	-1.5	3.9	10.1	-2.3	3.2	12.9	-1.6	6.5	9.5
2.8	0	3.7	4.5	11.7	3.1	5.5	11.9	4.9	12.6	4	4	12.1	3.5	3.3	13	3.6	5.5	11.4
5.6	-0.1	11.7	9.9	12.5	10.7	10.2	14	10.8	13.4	12.1	10.7	13.5	11.9	10.4	13	11.9	10.7	13.5
10	-0.1	16	16	15.6	16.5	16.4	16.2	16.7	16.4	17.3	17.2	16.8	17.7	17.5	17	17.9	17.6	17.9
20	-0.2	17.3	17.6	17.6	18.4	18.5	18.5	18.9	19	19.4	19.7	18.8	20.4	20.4	20.7	21.2	21	21.8
30	0	13.5	13.8	13.8	14.7	14.7	15	15.7	15.8	16.3	16.5	16.5	17.1	17.3	17.4	17.9	18	18.6