

Geochemical Studies of Waste Rock at the Anvil Range Mining Complex

Phase 3 Report

Prepared for:

DELOITTE & TOUCHE INC.
*Interim Receiver of Anvil Range Mining Corporation
Suite 1900, 79 Wellington Street West
Toronto, ON M5K 1B9*

Prepared by:



*Project Reference Numbers:
SRK 1CD003.11.610*

June 2004



GEOCHEMICAL STUDIES OF WASTE ROCK AT THE ANVIL RANGE MINING COMPLEX

PHASE 3 REPORT

Report Prepared for
Deloitte & Touche

Report Prepared by



June 2004

GEOCHEMICAL STUDIES OF WASTE ROCK AT THE ANVIL RANGE MINING COMPLEX

PHASE 3 REPORT

Deloitte & Touche

Suite 1900, 79 Wellington Street West
Toronto, ON M5K 1B9
Canada

SRK Project Number 1CD003.11.610

Steffen Robertson and Kirsten (Canada) Inc.
Suite 800, 1066 West Hastings Street
Vancouver, B.C. V6E 3X2

Tel: 604.681.4196 Fax: 604.687.5532
E-mail: vancouver@srk.com Web site: www.srk.com

SRK Contact
Stephen Day: sday@srk.com

June 2004

Compiled by:

Stephen Day, P.Geo.

Table of Contents

1	Introduction	1
1.1	Background	1
1.2	Terms of Reference	1
1.3	Project Design	2
1.4	Acknowledgements	2
2	Site Description.....	4
2.1	General	4
2.2	Faro Site.....	4
2.2.1	Geology and Mineralogy of Waste Rock.....	4
2.2.2	Waste Rock Operating Practices	5
2.2.3	Composition of Waste Rock	5
2.3	Vangorda Plateau Site	6
2.3.1	Geology and Mineralogy of Waste Rock.....	6
2.3.2	Waste Rock Operating Practices	6
2.3.3	Composition of Waste Rock.....	7
3	Methods	8
3.1	Historical Information	8
3.1.1	Introduction.....	8
3.1.2	Rock Geochemical Characterization.....	9
3.1.3	Seepage Monitoring	10
3.2	Field Activities and Sampling Methods	12
3.2.1	Surface Waste Rock Mapping.....	12
3.2.2	Test Pits and Trenches	13
3.2.3	Waste Rock Drilling	14
3.2.4	Gas and Thermal Monitoring of Waste Rock	16
3.2.5	Seep Surveys	17
3.3	Laboratory Testing	17
3.3.1	Selection of Samples for Testing	17
3.3.2	Sample Preparation.....	18
3.3.3	Static Geochemical Methods.....	18
3.3.4	Extraction Tests.....	19
3.3.5	Humidity Cell Tests	19
3.3.6	Site-Specific Kinetic Test.....	20
3.3.7	Analysis of Seepage Samples.....	21
4	Results	22
4.1	Faro Site.....	22
4.1.1	Composition of Waste Rock Dumps	22
4.1.2	Static Geochemical Characteristics	22

4.1.3	Short Term Extraction Tests.....	29
4.1.4	Kinetic Geochemical Characteristics.....	31
4.1.5	Thermal and Gas Monitoring.....	35
4.1.6	Seepage Monitoring	36
4.2	Vangorda Plateau Site	44
4.2.1	Composition of Waste Rock Dumps	44
4.2.2	Static Geochemical Characteristics	44
4.2.3	Extraction Tests.....	50
4.2.4	Kinetic Geochemical Characteristics.....	52
4.2.5	Thermal and Gas Monitoring.....	56
4.2.6	Seepage Monitoring	57
4.3	Vangorda Plateau Haul Road	65
4.3.1	Geological Composition	65
4.3.2	Geochemical Characteristics.....	65
5	Interpretation and Discussion	66
5.1	Correlation of Static Geochemistry with Mineralogy	66
5.1.1	Sulphur Mineralogy	66
5.1.2	Carbonate Mineralogy	66
5.1.3	Heavy Metal Speciation.....	67
5.2	Kinetic Testing.....	68
5.2.1	Depletion Calculations.....	68
5.2.2	ARD Classification Criteria.....	69
5.2.3	Correlation of Kinetic Release Rates with Static Geochemical Characteristics.....	71
5.3	ARD Classification of Rock Types	71
5.4	In Situ Behaviour of Waste Rock	72
5.4.1	Introduction.....	72
5.4.2	Geochemical Behaviour of Rock Type Mixtures	72
5.4.3	Thermal and Gas Flux.....	74
5.5	Seepage Chemistry.....	75
5.5.1	Spatial Variability	75
5.5.2	Seasonal Effects	76
5.5.3	Long Term Effects	76
5.5.4	Controls on Water Chemistry	78
6	Conclusions	79
7	References.....	81

List of Tables

Table 3.1	Summary of Historical Geochemical Testing Methods.....	10
Table 3.2	Routine Seepage Sampling Stations.....	12
Table 3.3	Borehole Locations.....	14
Table 4.1	Summary of Metal Concentrations by Rock Type – Faro.....	24
Table 4.2	Summary of Acid-Base Accounting Characteristics by Rock Type – Faro.....	26
Table 4.3	Summary of Field Contact Test Results for Surface Samples - Faro.....	27
Table 4.4	Summary of Results for Extraction Tests in the ICAP Dataset – Faro	30
Table 4.5	Characteristics of Historical Kinetic Test Samples	32
Table 4.6	Characteristics of SRK Humidity Cell Samples	33
Table 4.7	Characteristics of Faro Water Types	40
Table 4.8	Seepage Stations Classified by Water Type	41
Table 4.9	Geochemical Modelling Results – Faro.....	43
Table 4.10	Summary of Metal Concentrations by Rock Type	45
Table 4.11	Summary of Acid-Base Accounting Characteristics by Rock Type	48
Table 4.12	Summary of Field Contact Test Results for Surface Samples	49
Table 4.13	Summary of Results for Extraction Tests in the ICAP Database - Vangorda Plateau .	51
Table 4.14	Characteristics of Historical Kinetic Test Samples – Vangorda Plateau	54
Table 4.15	Characteristics of SRK Humidity Cell Samples – Vangorda Plateau	55
Table 4.16	Characteristics of Grum Water Types	59
Table 4.17	Geochemical Modelling Results - Grum.....	60
Table 4.18	Characteristics of Vangorda Water Types.....	63
Table 4.19	Geochemical Modelling Results – Vangorda	64
Table 5.1	Speciation of Heavy Elements	68
Table 5.2	ARD Classification by Rock Type.....	72
Table 5.3	Summary of Estimated Rates of Heat Generated from Sulphide Oxidation and Corresponding Rates of Oxidation	74

List of Figures

- Figure 1.1 Location Map
- Figure 2.1 Generalized Stratigraphy of the Mining Areas
- Figure 3.1 Seep Survey Location – Faro Dump
- Figure 3.2 Seep Survey Locations - Vangorda Plateau
- Figure 3.3 Identification and Leaching Sequence for Test Samples Used for Site Specific Kinetic Test
- Figure 4.1 Comparison of Total Sulphur and Sulphur as Sulphate
- Figure 4.2 Comparison of Paste pH and Sulphur as Sulphate
- Figure 4.3 Comparison of Neutralization Potential and Carbonate Content
- Figure 4.4 Results of Analysis of Size Fractions
- Figure 4.5 Geochemical Profiles in Drill Holes – Faro Site
- Figure 4.6 Results of Site Specific Kinetic Test – Faro Site
- Figure 4.7 Results of Temperature and Oxygen Monitoring – Faro Site
- Figure 4.8 Faro Seepage Station X23 (Equivalent to SRK-FD10, 12 and 31)
- Figure 4.9 Faro Seepage Station X26 (Zone II Pit Sump)
- Figure 4.10 Faro Seepage Stations FCO and A30 (equivalent to SRK-FD40)
- Figure 4.11 Faro Seepage Station SP5-6 (equivalent to SRK-FD26)
- Figure 4.12 Faro Seepage Stations NE1, NE2 and W5 (equivalent to SRK-FD05 and 06)
- Figure 4.13 Faro Seepage Stations W8 (equivalent to SRK-FD16) and W10 (upstream of W8)
- Figure 4.14 Geochemical Profiles in Drill Holes – Grum Site
- Figure 4.15 Geochemical Profiles in Drill Holes – Vangorda Site
- Figure 4.16 Results of Site Specific Kinetic Test – Grum Site
- Figure 4.17 Results of Site Specific Kinetic Test – Vangorda Site
- Figure 4.18 Results of Temperature and Oxygen Monitoring – Grum Site
- Figure 4.19 Results of Temperature and Oxygen Monitoring – Vangorda Site
- Figure 4.20 Grum Seepage Stations V2 and V2A
- Figure 4.21 Grum Seepage Station V15
- Figure 4.22 Vangorda Seepage Station V30 (equivalent to SRK-VD03 or Drain 3)
- Figure 4.23 Vangorda Seepage Station V32 (equivalent to SRK-VD04 or Drain 5)
- Figure 4.24 Vangorda Seepage Station V33 (equivalent to SRK-VD05 or Drain 6)
- Figure 4.25 Vangorda Surface Water Sampling Station V27
- Figure 5.1a/b Sulphate Release Rates
- Figure 5.2 Zinc Release Rates

List of Appendices

APPENDIX A Terms of Reference

- A.1 Scope of Work Letter
- A.2 Scope of Work for Reporting
- A.3 Project Design

APPENDIX B Description of Faro Area

- B.1 Rock Type Nomenclature (ICAP)
- B.2 Map of Dumps and Nomenclature (ICAP)
- B.3 Geological Composition of Waste Rock (ICAP)

APPENDIX C Description of Vangorda Plateau Area

- C.1 Rock Type Nomenclature
- C.2 Map of Dumps and Nomenclature

APPENDIX D Historical Geochemical Database

- D.1 Historical Static Testing Database
- D.2 ICAP Extraction Test Results
- D.3 Schedule D Humidity Cell Test Charts
- D.4 IEE Humidity Cell Data and Charts
- D.5 ICAP Leach Column Data and Charts
- D.6 Inventory of Historical Seepage Monitoring

APPENDIX E SRK Test Pit Program

- E.1 Location of SRK Test Pits and Trenches
- E.2 Detailed SRK Sample Descriptions and Results of Field Contact Tests
- E.3 Selection of Samples for Testing
- E.4 Results of Static Geochemical Testing on SRK Test Pit Samples
- E.5 Results of Extraction Tests on SRK Test Pit Samples
- E.6 Results of SRK Conventional Kinetic Testing
- E.7 Results of SRK Site-Specific Kinetic Testing Method

APPENDIX F SRK Drill Hole Program

- F.1 Location of SRK Drill Holes
- F.2 Drill Hole Logs
- F.3 Results of Thermal and Gas Monitoring for SRK Drill Holes
- F.4 Results of Static Geochemical Testing on SRK Drill Hole Samples

APPENDIX G Detailed Description of Seep Sampling Results

1 Introduction

1.1 Background

The Anvil Range Mining Complex (ARMC), located in Faro, Yukon, ceased operations in January 1998 when Anvil Range Mining Corporation filed for creditor protection under the Companies' Creditor Arrangement Act. Deloitte & Touche Inc. was appointed Interim Receiver of Anvil Range Mining Corporation ("Interim Receiver") on April 21, 1998. The Interim Receiver has overseen the management of the property.

The ARMC is composed of two main mining areas: the Faro Site and the Vangorda Plateau site (Figure 1.1). Mining in both areas was dominantly by open pit. At the Faro Site, three adjacent pits or zones were mined starting in 1968 and ending in 1997. An estimated 258 million tonnes were placed in 31 waste rock dumps, fill areas and stockpiles. At the Vangorda Plateau site two separate ore bodies (Grum and Vangorda) were mined in the 1990s. These pits were smaller and produced roughly 12 millions tonnes of waste rock. Both areas involved significant pre-stripping of overburden and rock, and ongoing waste rock stripping as mining proceeded.

Waste rock in both areas is composed of rock types with a wide range of geochemical characteristics. These include rock types that are already locally generating acid rock drainage (ARD), rock types that have the potential to generate ARD at some time in the future, rock types that are releasing high concentrations of zinc under non-acidic conditions, rock types that are naturally acid neutralizing, and rock types that have low reactivity. Drainage monitoring at the sites indicates that most of the seepage water is non-acidic with some exceptions but often contains elevated concentrations of zinc and cadmium. The long-term trend in drainage chemistry is an important consideration for remedial planning. Should drainage chemistry worsen, primarily by depression of pH, the type of remediation measures are likely to be significantly different from those currently in place. The objectives of this project are therefore to evaluate the current sources of contaminant loadings from the site and evaluate how these sources might change in the long term.

1.2 Terms of Reference

The initial terms of reference for this project were detailed in a letter dated August 8, 2002 from SRK Consulting (SRK) to Deloitte & Touche, Inc (Appendix A.1) and was based on requirements for Tasks 3.2 and 4.2 presented in the report on the Closure Alternatives Workshop (Deloitte & Touche, April 2002). The project includes the following general items:

Phase 1 – Review of Existing Information and Identification of Data Gaps.

Phase 2 – Initial Data Collection and Instrumentation of Waste Rock Dumps.

Phase 3 – Laboratory Testing and on-going monitoring.

To ensure that all relevant information from the many closure-related investigations was taken into account, an initial review of all existing information was planned. Although it was intended that Phase 1 would be completed entirely prior to Phase 2, Phase 2 was designed and started before Phase 1 was completed, prior to the onset of winter conditions at the site in September 2002.

A subsequent terms of reference for continuation of studies and reporting was provided in a memorandum dated July 18, 2003 (Appendix A.2). This report completes the scope of work provided in the memorandum.

Findings from Phases 1 and 2, and partial results from Phase 3 were detailed in an earlier report (SRK 2003). Appendices in SRK (2003) contain detailed results from the review task and logs from field activities conducted for Phase 2.

1.3 Project Design

The project was designed based on the facilities present at each site and the geochemical and geotechnical data needed to evaluate typical generic remedial measures. The planning process for the project design is summarized in Appendix A.3. These tables contain the following headings:

- Facilities (eg. pit, waste rock).
- The issues for each facility.
- A list of possible remedial options for each facility.
- The information needs for each remedial option.
- The studies that could be implemented to collect the necessary information.

For example, at Faro, closure of the acid generating low grade ore and oxide fines could involve several measures including disposal in the flooded Faro Pit. In order to assess these measures, it would be necessary to determine the stored acidity in the material, the requirement of lime addition during backfilling to limit impacts to the pit water, the actual capacity of the pit to accept the waste, and the possible reaction of the pit water with the waste. The studies required would include collection of surface and sub-surface samples and laboratory testing.

1.4 Acknowledgements

This project was coordinated by SRK Consulting with involvement from the following organizations:

- Access Consulting Group (Whitehorse) – Compilation and review of documents for Phase 1.
- Midnight Sun Drilling (Whitehorse) – Waste rock dump boreholes.
- Gartner Lee Limited (Burnaby, British Columbia) – Assistance with seepage sampling, management of routine water sampling data.
- Mine site personnel – Site logistics, assistance with many aspects of fieldwork.
- Tom Moon (Ross River) – Excavator operator.

- Canadian Environmental and Metallurgical Inc – Geochemical testing.
- ALS Environmental – Water analyses

The final draft includes responses to comments provided by reviewers representing the regulatory agencies (Environment Canada, Indian and Northern Affairs, and Yukon Government).

2 Site Description

2.1 General

For the purpose of geochemical characterization, the Anvil Range Mining Complex was considered as two separate mining areas (Faro Site and Vangorda Plateau Site) due to differences in geology and timing of mining. The Vangorda Plateau Haul Road connecting the two areas was constructed using waste rock from the Faro Site, but is discussed as a separate component of the Faro Site due to its potential for separate impacts.

2.2 Faro Site

2.2.1 Geology and Mineralogy of Waste Rock

Geological information for the Faro Site is summarized in the following sections. Detailed information on the geological setting, deposit geology and the ore deposit genesis for all ARMC deposits is provided by Jennings and Jilson (1986).

The Faro Deposit (Yukon Minfile 105K 061) is one of five major synsedimentary, stratiform lead-zinc-silver deposits which occur in an arcuate belt along the south flank of the Anvil Batholith. The deposits occur in a 150 m stratigraphic interval straddling the contact between the non-calcareous phyllite and schist of the Cambrian Mount Mye Formation and calcareous phyllite and calc-silicate of the Cambrian to Ordovician Vangorda Formation (Figure 2.1). The deposits are considered to be submarine exhalites formed when hot metalliferous brines discharged into seawater from synsedimentary faults.

Major host rock assemblages, unit designation and iron sulphide (primarily pyrite) contents are summarized in Appendix B.1.

The Faro deposit lies approximately 100 m below the Mount Mye-Vangorda Formations contact. The deposit is relatively close to the Anvil Batholith and therefore the Mount Mye Formation rocks are metamorphosed to biotite-andalusite-muscovite schist, and the overlying Vangorda Formation has become banded calc-silicate. The Anvil Batholith was not intersected by mining but hornblende-biotite quartz diorite dykes and sills were encountered during mining and intrude the entire stratigraphic section shown in Figure 2.1.

Seven different types of sulphide rock types have been recognized (Appendix B.1). These are generally quartzose with pyrite as the dominant sulphide. The major ore minerals were sphalerite and galena. The other significant sulphide minerals were pyrrhotite (for example, 2A and 2H), chalcopyrite and marcasite. Traces of tetrahedrite $(\text{Cu,Fe})_{12}\text{Sb}_4\text{S}_{13}$, bournonite PbCuSbS_3 and

arsenopyrite (FeAsS) were also present. Gangue minerals included barite, magnetite and Ba-Fe-Mg carbonates. Carbonate minerals on the whole were not abundant.

Not all sulphide rock types were ore. Units 2A (graphitic quartzite), 2CD (pyritic quartzite) and 2E (massive pyritic sulphides) were important component of the waste rock..

The entire stratigraphic sequence shown in Figure 2.1 is intruded by hornblende biotite quartz diorite (Unit 10E) and quartz feldspar as dykes originating from the Anvil Batholith.

Structurally, the deposit and host rocks are complex. Polyphase structural deformation has occurred; however, the sequence has been flattened and appears to be structurally simple. As a result, the deposit appears to occur in a simple, gently dipping layered sequence.

2.2.2 Waste Rock Operating Practices

During the document review stage of the project, SRK attempted to find information on the methods used to manage waste rock. The documents reviewed did not indicate the operational procedures for management of waste rock and particularly the segregation of sulphide rock. SRK contacted former mine personnel to attempt to obtain information not in the project files but no additional data were provided.

It is known that sulphide waste rock was placed selectively at two different locations in the Main and Intermediate Dumps between the late 1970s and 1990 (Appendix B.2); however, the basis for segregation (visual vs chemical testing) is not known. Anecdotal information suggests that even during this period, sulphide waste rock was not exclusively placed at these locations.

2.2.3 Composition of Waste Rock

The Integrated Closure and Abandonment Plan (ICAP) (Robertson GeoConsultants Inc. 1996) prepared for the Anvil Range Mining Corporation included an unusually detailed effort to evaluate the composition of the waste rock at the Faro Site using historical mining records. The composition of 31 dump components, fill areas and stockpiles was estimated (Appendix B.3). Then acid-base accounting determinations and metal analyses were used to estimate the “acid generation potential” of each pile. The proportion estimates concluded that the sulphide rock content of the dumps varied from 0 to 100% (average 13%), but only four dumps (accounting for less than 10% of the 258 million tonnes of waste rock) were expected to contain no sulphide rock.

A limitation of these estimates is that the mining records do not indicate where within each dump the rock was placed, and therefore the degree to which mixing of the various rock types occurred during mining. This is an important consideration because it determines the degree to which acid generated internally can be attenuated along flow paths prior to emerging as ARD. Surface waste rock mapping at the Faro Site completed in 1991 by Curragh (Rock Types in the Faro Minsite Waste

Dumps; Fieldwork completed September 9-14, 1991; Report #WH9201) showed that sulphide rock types were repeatedly dumped at the same location either inadvertently as a result of dump truck scheduling or deliberately to create the segregated sulphide waste rock dumps. This general observation suggests the mining approach resulted in significant large pockets of sulphide rock rather than well mixed waste rock dumps.

2.3 Vangorda Plateau Site

2.3.1 Geology and Mineralogy of Waste Rock

The Grum Deposit is one of the group of five major lead-zinc-silver deposits that include the main Faro orebody. The deposit consists of three to five massive sulphide lenses hosted by graphitic phyllite and quartz-sericite phyllite. The most important mineralized horizon occurs immediately beneath the carbonaceous unit at the base of the Vangorda Formation (Yukon Minfile 105K 056) (Figure 2.1). Ore minerals include sphalerite, galena, pyrite, and minor chalcopryrite, arsenopyrite and sulphosalts in a gangue of quartz and barite. Pyrrhotite and magnetite occur in small quantities. Basal and lateral contacts with the surrounding phyllite are gradational but the tops are sharp. Muscovite and chlorite occur in the alteration halo.

The Vangorda Deposit is a single flat-lying sulphide lens layer about 40 to 120 m below the carbonaceous layer at the base of the Vangorda Formation (Yukon Minfile 105K 055) (Figure 2.1). Minor sulphide layers occur above the contact but are not economically important and therefore were mixed with waste rock. Ore minerals are pale yellow sphalerite and galena. Minor amounts of chalcopryrite, tetrahedrite, bournonite, and arsenopyrite are present. Lead, zinc, silica and barite concentrations increase towards the top of the deposit. The lower part of the orebody is a competent pyritic quartzite that grades downwards into siliceous phyllite.

The host stratigraphic sequence for Vangorda and Grum Deposits is the same as the Faro Deposit, but a different naming system was used for the main rock types. Different lithological units are also recognized due to the higher grade of metamorphism at Faro. The following general rock units are equivalent:

- **Mount Mye Formation.** Schists (Unit 1) at Faro are equivalent to non-calcareous phyllite (Unit 3) at Vangorda Plateau. Sulphide rock (Unit 2) at Faro is equivalent to sulphide rock (Unit 4) at Vangorda Plateau.
- **Vangorda Formation.** Calc-silicate rock (Unit 3) at Faro is equivalent to calcareous phyllite (Unit 5B) and chloritic phyllite (Unit 5D) at Vangorda Plateau.

2.3.2 Waste Rock Operating Practices

Sulphide waste rock was segregated in the Grum Pit and placed in two sulphide waste rock cells or lifts encapsulated by phyllite waste rock in the Main Dump, as a condition of the Water Licence. The

original construction design was modified by Anvil Range Mining Corporation (1996) and would have resulted in a single sulphide cell constructed in four lifts. The need for internal till layers was abandoned in favour a final 3 m till cover. Operations ceased before the cover was completed and sulphide waste rock remains exposed in places on top of the Main Dump.

As a result of the high proportion of sulphide waste rock relative to other types of waste rock at the Vangorda Pit, a detailed plan was developed to manage sulphide waste rock. The waste rock management plan included toe dykes to ensure that waste rock was retained, underdrains to capture poor quality seepage, an upland area for segregated sulphide waste rock with downslope phyllite, and a final till cover. In practice, modifications were made to the plan to address changing conditions at the site. In particular, the quantity of till available for capping was less than required, and the final cover was not constructed as originally proposed.

2.3.3 Composition of Waste Rock

The actual composition of the waste rock dumps at the Grum and Vangorda Pits was not determined as part of the ICAP assessment and no records have been located that indicate the percentages of the various rock types in the waste. However, Curragh Resources Inc. Water Licence Application (1989) describes the estimated of tonnages of each major rock for each pit calculated using waste rock block models and provides an indication of the relative proportions of waste rock.

A total 150 million tonnes of waste rock was planned for the Grum Pit, divided according to rock type as follows:

- Calcareous Phyllite – 122 million tonnes
- Non-calcareous Phyllite – 22 million tonnes
- Sulphide Rock – 6 million tonnes

SRK has estimated that the actual volume of waste rock is about 28 million tonnes. It is not known whether the proportions of waste rock indicated in the IEE can be extrapolated to this much smaller volume. Based on anecdotal information, the actual proportion of rock classified as sulphide was larger than would be indicated by the above proportions due to dilution effects during mining.

For the smaller Vangorda Pit, sulphide rock was a much higher proportion of the total 8 million tonnes of waste rock:

- Calcareous Phyllite – 0.5 million tonnes
- Non-calcareous Phyllite – 4.9 million tonnes
- Sulphide Rock – 2.6 million tonnes

SRK estimates that the actual volume of rock in the waste rock dump is about 9.6 million tonnes.

3 Methods

3.1 Historical Information

3.1.1 Introduction

The review phase of this project reported by SRK (2003) found that the historical geochemical database consisted primarily of results of various surveys to characterise rock and water at the site.

Rock geochemical data has been collected at various times:

- **1988. Faro Mine Abandonment Plan (Curragh Resources Inc 1988).** This document includes acid-base accounting results for 20 samples of rock for use in construction purposes. The rock types were calc-silicate breccia and biotite-muscovite-andalusite schist.
- **1989. Documents in support of the Initial Environmental Evaluation (IEE) and Water License Application for the Vangorda Plateau Development (Curragh Resources Inc 1989).** Sixty-nine rock core samples were submitted for analysis of acid-base accounting parameters. Twelve samples were tested for short term leachability. Two composite samples representing phyllites and sulphides were tested in humidity cells. Petrographic reports were also produced,
- **1992. Summary Report on Schedule D to Water License #IN89-001 (SRK 1992).** This report is the first documented major effort to compile information on the geochemical characteristics of waste rock at the Faro site. It includes acid-base accounting data collected in 1975, 1987, 1989 and 1990. Results for acid-base accounting on 53 rock samples, and 12 humidity cells (conducted on six samples) are provided.
- **1996. Integrated Comprehensive Abandonment Plan (ICAP) (RGC 1996).** This report provides results for 160 samples of waste rock from Faro and Vangorda Plateau tested for acid-base accounting parameters, metal concentrations and leachability. The samples were collected from surface and test pits. Fourteen composite samples were tested in leach columns for 23 weeks.
- **2000. Interim Report on the Feasibility of Reclaiming Vangorda Pit as a Clean Water System (SRK 2000).** This report contains results for 14 samples of waste rock and pit wall talus from the Vangorda Pit. Samples were tested for metals, acid-base accounting parameters, leachable metals and mineralogical characteristics.

The water database contains results of routine and specific monitoring programs conducted at the mine since 1987. These data have been compiled into a single EQWin database.

3.1.2 Rock Geochemical Characterization

Rock geochemical testing has included acid-base accounting, metal analysis, short term leachability (shake flask tests) and long term leachability (kinetic tests) though each of the projects indicated above used different testing protocols. Table 3.1 summarises the methods used for each project. For comparison, the method used in the current study is also shown

Static test methods have followed two published protocols generally referred to as the “Sobek” (Sobek et al. 1978) and “modified Sobek” methods. The difference between the protocols is primarily in the method used to determine neutralization potential. The Sobek method requires boiling of the sample in acid for 1 hour, whereas the modified Sobek method occurs at room temperature over 24 hours. For each method, the appropriate acid strength is selected using the “fizz test”. The modified Sobek method is generally considered to give a better indication of field neutralization potential because it is less aggressive towards silicates. In Table 3.1, the use of the modified Sobek method also included the analysis of sulphur forms such as sulphate and sulphide, and carbonate forms.

As shown, short term leachability testing has been performed using a number of protocols. All tests were performed using deionized water but the ratio of liquid to solid varied from 2:1 to 20:1, and the leach duration varied from 24 hours to 96 hours. These protocols represent various modifications of methods such as US EPA 1312 (20:1, 24 hours), and British Columbia Ministry of Energy and Mines (3:1, 24 hours). Difference in solution volumes affect the degree to which mineral solubility is limited by saturation, and the pH of the leachate (and therefore the solubility of the minerals). The differences in leach times affect the dissolution of minerals that are weakly soluble and the modification of leachate chemistry by reaction with the solids.

Likewise, a number of different long term leachability (kinetic) tests have been completed. The Sobek et al (1978) method involves leaching of relatively small samples in a shallow plastic container. The early testing used modifications of this method. Recent programs (including this project) have tended to use various modifications of the method described by MEND (1991). The testing container is a plastic column. Difference in sample size, leach volume and leaching cycle all affect the interpretation of the tests in the same way that they affect interpretation of the leach flask tests.

Table 3.1 Summary of Historical Geochemical Testing Methods

Report	Area	Static Test Methods	Short Term Leachability	Long Term Leachability
1988. Faro Mine Abandonment Plan	Faro only	B.C. Research Initial Test	No testing	No testing.
1989. Documents in support of the Initial Environmental Evaluation (IEE)	Vangorda Plateau only	Probably Sobek et al 1978.	No testing	Modification of Sobek et al 1978. (1000 g sample, 500 mL leach water)
1992. Summary Report on Schedule D to Water License #IN89-001.	Faro only	Sobek et al 1978.	No testing	Modification of Sobek et al 1978. (200 g sample, 200 mL leach water).
1996. Integrated Comprehensive Abandonment Plan (ICAP).	Faro and Vangorda	Modified Sobek including S species	Site specific procedure. (250 g sample, 500 mL leach water, 24 hours).	Site specific procedure. (9 to 30 kg sample, 1.5 L leach water, variable leach cycle)
2000. Interim Report on the Feasibility of Reclaiming Vangorda Pit as a Clean Water System	Vangorda Pit only	Modified Sobek, including S species and carbonate. Metals by ICP following aqua regia digestion.	Site specific procedure. (75 g sample, 1500 mL leach water, 96 hours)	No testing
2002. This study	Faro and Vangorda	Modified Sobek, including S species and carbonate. Metals by ICP following aqua regia digestion.	Site specific procedure. (250 g sample, 750 mL leach water, 96 hours)	Site specific procedure. (2 kg sample, 800 mL leach water, one week leach cycle)

The main implication of the use of different test methods is that care must be taken when attempting to compare different datasets.

The historical geochemical database is provided in Appendix D.

3.1.3 Seepage Monitoring

Waste rock seep surveys have been completed both by the operator and by various regulatory authorities since approximately 1986 at the routine sample locations shown in Figures 3.1 and 3.2. A list of the seep stations and the frequency of monitoring is provided in Table 3.2. The seep data were compiled in an EQWin database by Robertson GeoConsultants Inc. as part of the 1996 ICAP (RGC 1996). Deloitte and Touche have continued to collect seep samples on a regular basis as part of their water licence monitoring programs. The EQWin database is currently maintained by Gartner Lee Limited, and results are reported in the annual monitoring reports (e.g. GLL 2002).

In recent years, the routine seepage samples have been collected by the environmental technicians at the site. Field sampling protocols are consistent with the other routine surface water sampling programs (GLL 2002). Field pH, conductivity, temperature and flow readings are taken at each station. Sample bottles are rinsed 3 times in the seep, and then filled to the shoulder. The samples are brought back to the on-site laboratory, packed in coolers with ice, and shipped to Cavendish Laboratories in Vancouver for further preparation and analysis. Samples are submitted for TSS, acidity and/or alkalinity, sulphate, ammonia, phosphorus, and a full suite of total and dissolved metals by ICP, although the suite of analyses varies by site and sampling event.

A detailed review of quality control/quality assurance protocols has not been completed as part of this review. GLL currently reviews the incoming data as it is imported into the EQWin database. From 1996 to 2000 when GLL took over management of the database, the on-site environmental coordinator was responsible for this activity. Data quality protocols for samples collected prior to 1996 were not always available, and a decision was made to include any reasonably traceable data in the database unless there were any obvious problems. Two data quality issues identified during our review were:

1. Large differences between total and dissolved iron concentrations, coupled with apparent high TSS concentrations in some of the samples (despite very clear water at the sampling stations), suggest that iron precipitation occurred during transit to the laboratory. As a result, dissolved iron and metal concentrations for the routine samples may be higher than reported, and where available, the total metal data is considered to be more accurate. Field filtration of the high iron samples would help to resolve this issue in the future.
2. Silver, beryllium and cadmium concentrations in the 2002 data were reported in units of ppm, but were actually in units of ppb. We understand that this was caused by a change in laboratory protocols, and that GLL had already taken steps to correct the database. These corrections have been made to all of the data presented in this report.

Table 3.2 Routine Seepage Sampling Stations

Station	Description	Frequency
Faro		
A30	Below Faro Valley Dump	Annual
FCO	Immediately upstream of Faro Valley Dump	Annual
W8	Guardhouse Creek downstream of NW Dump	Annual
W10	Guardhouse Creek upstream of NW Dump	Annual
NE1/NE2	Seeps below NE Dump (at road)	Annual
SP5/6	Seeps below NE Dump (along haul road)	Annual
X23	Seepage downstream of ore stockpiles near original Faro Creek channel	Monthly
X26	Zone II pit sump (operated seasonally)	Monthly (when operating)
Vangorda		
V30	Drain 3	Annual
V32	Drain 5	Annual
V33	Drain 6	Annual
Grum		
V2	Grum Creek main channel below road	Quarterly
V2A	Grum Creek – Moose Pad Pond Diversion	Quarterly
V15	Below sediment collection pond	Quarterly

3.2 Field Activities and Sampling Methods

3.2.1 Surface Waste Rock Mapping

Prior to starting the surface mapping program, mapping methods were developed based on two days of initial mapping at Faro, Grum and Vangorda. Waste dumps were then mapped at a scale of 1:5,000. Areas of similar lithology were first defined at a distance, using colour and textural differences. Dumps were then mapped by traversing along their toes or crests, depending on slope stability and access. Most areas consisted of a mixture of rock types. These mixtures were estimated and their relative abundance noted. Rock types were mapped using mine rock units established by Anvil Range (see Appendix B.1)¹. Specimens of the common rock types and mine rock units were collected for reference as mapping progressed. Samples of waste dump fines were collected at irregular intervals, depending on availability, to estimate contact (or rinse) pH and conductivity. Approximately 100 to 200 grams of –2 mm material was screened in the field. In the evenings, sufficient fines were added to 40 ml of distilled water to make a volume of approximately 70 mL. Measurements of pH and conductivity were carried out after samples were agitated and sediment settled out.

¹ It should be noted that Anvil Range established different non-interchangeable rock type nomenclature for the Faro and Vangorda Plateau areas. These conventions have been used for this project.

All sampling locations and selected major contacts were surveyed in the field by GPS. Survey accuracy was usually better than ± 10 m. However, the lack of a base map at the Grum Site limited accuracy of the field maps.

Results of the field mapping program are provided in SRK (2003).

3.2.2 Test Pits and Trenches

Test pits and trenches were excavated in waste rock dumps at Faro, Grum and Vangorda, between September 17 and 29, 2002 (Appendix E.1). Forty-one pits and nine trenches were completed at Faro, 23 pits and six trenches were completed at Grum, and 15 pits and one trench were excavated at Vangorda. An additional five pits were dug along the 12 km of the Vangorda Plateau haul road for a project total of 16 trenches and 84 test pits.

At Faro and along the Vangorda Plateau haul road, a Cat 320 excavator, owned and operated by Tim Moon of Ross River, Yukon was used. This equipment was capable of digging to depth of approximately 7 metres. A sampling assistant was also provided by the mine.

A Link-Belt 460LX hydraulic excavator, operated by minesite personnel was used at Vangorda Plateau. This equipment was also capable of digging to a depth of approximately 7 metres, but this depth was not attained in any pits because of poor pit wall stability. Typical pit depths ranged from 3 to 5 metres. All trenches were dug to a 1 metre depth and varied in length from 30 to 35 metres.

A typical test pit was excavated at incremental depth intervals of about 50 cm. Variations in colour or lithology in the upper metre were examined in place. At greater depths, representative samples of distinct layers were set aside by the equipment operator for later examination and sampling. Test pits were terminated primarily when pit walls failed or less compacted material at depth, undercut the pit walls. Less commonly, excavations ended by encountering large boulders, or material sloughed in at the same rate as removal and at one site by the inflow of ground water.

Pit depth, lithological and colour boundaries were measured and sketched. Trenches were laid out perpendicular to the dump crests and excavated to a depth of approximately 1 metre. Strata were measured, mapped and sampled in place. Representative samples, weighing approximately 2 kg, were collected by screening out the +1 cm fraction. An approximately 200-g sub-sample was collected by further screening of the -1 cm fraction to -2 mm. This finer sub-sample was tested in the field with 10% HCl to estimate calcium carbonate content, and retained for later pH and conductivity contact tests (Appendix E.2). The abundance of rock fragments of the various lithologies in the waste piles were determined and noted. Reference samples of common rock types were also collected.

Locations of all test pits were surveyed using a GPS. Survey accuracy was usually better than ± 10 m.

3.2.3 Waste Rock Drilling

Location Selection

Ten drill sites were initially chosen in areas of interest within the waste piles (Table 3.3). These location selections were prioritized because it was expected that not all holes could be drilled within the available time frame. As shown in Table 3.3, only two of the holes had to be dropped from the program.

The locations were also selected based on access considerations for the truck-mounted rig. Access roads to each site required some grading or levelling, but in general the vehicle was able to negotiate the sites without difficulty.

Equipment

Waste rock drilling was carried out using a truck mounted T685H Schramm drill using an ODEX style casing advance system to install 152mm (6”) steel casing. The drillhole was produced using a downhole hammer and compressed air to clear cuttings from the hole. All steel casing was retrieved from the drillhole during monitoring equipment installation.

Table 3.3 Borehole Locations

General Area	Depth (m)	Designation	Rationale
Faro NW	10	10M-1*	Old waste rock
Faro Intermediate	60	60M-1	Sulphide cell
Faro Intermediate	60	30M-1	Comparison with 60M-1 and edge effects
Faro Main	60	60M-2*	Suspected waste sulphide rock cell
Grum	10	10M-2	Sulphide cell
Grum	30	30M-3	Sulphide cell
Grum	10	10M-3	Non-sulphide cell for comparison with 10M-2 and 30M-3
Vangorda	10	10M-4	General characterization
Vangorda	30	30M-4	General characterization

Note: * Indicates hole not drilled. See Appendix F.1 for locations and drill hole logs.

Lithological Logging

The drilling method returned mostly fines with lesser amounts of chips up to 3 cm making lithological identification difficult. For the purpose of logging, chips were separated from fines with a 1 cm mesh and rinsed with water to remove the fines. Rock type, color, and chip morphology was

then logged. Color and moisture content (dry vs. moist) of fines were also noted for the unwashed chips. Reaction with dilute HCl was recorded.

Sample Collection and Shipment

Sampling interval was determined based on the anticipated full depth of the borehole. For the 10-m holes, 1.5 to 2 kg samples were collected at 1 m intervals; and for the 30 and 60 m holes samples were collected at 2 m intervals. In addition, 2 to 3 kg composite samples were collected. The composite sampling interval for the 10 m holes was 5 m (0-5 m, 5-10 m); and for the 30 m and 60 m holes was 6 m (0-6 m, 6-12 m, etc.).

Samples were collected from the cyclone. A 1-cm mesh screen and a 20 L plastic pail were used to capture the coarse and fine fractions, respectively. A subsample of the +1 cm coarse fraction was reserved for logging purposes as described above. Fines were homogenized by mixing several times between two pails. A sample was collected from the homogenized fines and placed in a 30 cm x 45 cm plastic sample bag, to which a portion of the coarse fraction was added.

Following collection, samples were stored in a warehouse at the Faro mine site prior to being trucked to Canadian Environmental and Metallurgical in Vancouver for chemical analysis.

Monitoring Instruments

Monitoring instruments for installation in the boreholes were manufactured, or supplied, by RST Instruments of Coquitlam, British Columbia and consisted of the following:

- 51 mm (2") ID, schedule 40 PVC casing, equipped with 3 m long #10 slot screens in installations where water was anticipated in the drillhole. Screen sections are indicated on the drill logs (see Appendix F);
- Plastic "gas collection" tubing (5 mm ID) taped to the outside of the PVC;
- Multi-point thermistor strings either attached to the outside of the PVC (borehole 10M-2) or hung vertically inside the PVC. Drillhole logs indicate the thermistors as "inside" or "outside" depending on installation (Appendix F.2).

Instrumentation was installed by taping the gas collection tubes and thermistors strings to the outside of the PVC casing as it was lowered into the casing. Duct tape was used in the 7 to 10 m screened zone in well 10M-2. All subsequent installations used electrician's tape.

Because tubing may be pinched during installation, many of the gas sampling tubes were installed in duplicate. Duplicate tubing could not be installed in every monitoring zone due to limited tubing supplies.

Deep installations (30 m and 60 m) utilized a lifting apparatus on the drill hoist to prevent possibly dropping the PVC during installation due to excessive weight. This prevented potential damage and was considered the safest method of installing the materials.

Once all of the PVC casing had been installed, the drill casing was pulled back in stages, typically 0.25 to 0.4 m, and sand, bentonite chips, or backfill poured down the annulus to act as backfill. Graded silica sand was used in all monitoring zones (ie; wherever a screened section or gas tube was located), and bentonite was placed above and below this to restrict vertical movement of water or gas along the backfill. Drill logs indicate the placement of backfill in each drillhole. Some sections of the drillholes required significant volumes of backfill in order to fill the void space. This indicated that void spaces within the waste rock exist in these areas and have therefore, been noted on the drill logs to assist with interpretation of gas sampling results.

The gas sampling tubing was truncated at surface at a custom built aluminium wellhead fitted with “swagelock” fittings to terminate each tube. Tube connections for gas probe attachment were equipped with 3/8” (12.3 mm) diameter NPT fittings. Each termination fitting was marked on the aluminium plate with the corresponding depth of the tubing (datum used was ground surface). Markings were both inscribed in the aluminium and marked with indelible ink.

Wellheads were protected by plywood boxes, approximately 1.3 m high by 0.8 m by 0.8 m. The boxes had two 2’ by 4’s fixed to the bottom of the box; and these protrude beyond the edge of the box a length of 0.3 m. When accessing the wellhead, the plywood box is tipped over with the 2’ by 4’s acting as cantilevers; this will allow clearance of accumulated snow by the box and facilitate replacement of box following data collection. Additionally, the 2’ by 4’s were anchored by four sand bags, one at each corner, to stabilize the structure. A 3.3 m pole was fixed to each box. Orange flagging tape attached to the top of this pole will allow the wellhead to be located in the event of drifting snow, as well as increase the visibility of the installation and minimize the likelihood of accidental vehicular damage.

3.2.4 Gas and Thermal Monitoring of Waste Rock

Oxygen concentrations were measured using a Servomex Oxygen Analyser. This unit requires a two point calibration using ambient air (20.9% oxygen) and pure nitrogen gas (0% oxygen). The analyzer was calibrated at each monitoring station.

Temperature measurements were made using an Omega ohmmeter , which provides a direct temperature readout.

Monitoring results are tabulated in Appendix F.3.

3.2.5 Seep Surveys

Four seep surveys were conducted by SRK as part of field activities in June and September of 2002 and 2003.

Sample locations were established in June 2002 by walking the toes of all waste rock dumps, where the rock rests on original ground, and collecting water samples from any flowing seeps that emerged from these areas. Additional seeps were located by slowly driving along accessible roads and ramps in the Faro Pit complex that were below waste rock dumps or ore stockpiles. Most of the seeps were flowing, or had been recently flowing based on observations of moisture along flow paths, or because ponds were filled to their spill points. These stations were revisited in the September 2002, and June and September 2003 seepage surveys, and sampled where there was sufficient flow. Some of the smaller seeps flow intermittently and provide sampling opportunities only after heavy rainfall. As a result, some additional sites were identified in the subsequent surveys, while other sites were too dry to sample. Seep samples were also collected in the Grum Pit in June 2003, and further down-gradient from the Grum waste dumps in September 2003.

The seep surveys covered a broader range of sampling sites compared to the routine sampling programs, including more discrete flows from individual dumps, smaller ephemeral seeps, and seeps that internal to the waste management facilities. However, samples were also collected from the routine sampling sites to ensure a complete dataset within each survey. Exceptions included: NE1 and NE2 (below the NE dump), and V2, V2A and V15 (below the Grum dump), which were sampled much closer to the toe of the dump than they are in the routine surveys; FCO and W10, which represented conditions upstream of the Faro Valley dump and NW dumps respectively; and, X26, which does not operate on a continuous basis.

Field pH, conductivity, oxidation-reduction potential (ORP), temperature measurements were taken at each station using a WTW meter. Flow estimates were made using the bucket and stopwatch method, by estimating the velocity and cross sectional area of the seep, or by visual estimation.

The samples were filtered and preserved in the field for subsequent analysis according to standard methods for collection of environmental samples.

3.3 Laboratory Testing

3.3.1 Selection of Samples for Testing

Sample testing for this project was conducted in three parts, roughly as follows:

- **Part 1 – Screening Analysis.** This part involved testing of:

- a range of test pit samples representing different lithologies to evaluate any significant particle size effects and the obtain data on carbonate neutralization potential to determine appropriate methods for subsequent testing; and
 - all chip samples from drill holes were analyzed to obtain geochemical profiles within the waste rock dump.
-
- **Part 2 – Additional Analysis of Test Pit Samples.** Samples were selected to expand the database for individual rock types and provide a basis selection of samples for subsequent kinetic testing. All samples were from test pits and were selected using field measurements of pH and conductivity as a guide to ensure a range of weathering conditions were analyzed conditions. The samples selected and the tests performed are shown in Appendix E.3.
 - **Part 3 – Kinetic Testing and Alkali Amendment Tests.** Using the Part 2 results, samples were selected for kinetic testing. Samples were also selected for alkali amendment tests.

3.3.2 Sample Preparation

Drill hole chip samples were sieved at the laboratory to produce a -2 mm fraction for determination of rinse pH and electrical conductivity. A separate split was crushed and pulverized for chemical analysis.

For Part 1, the -10 mm field test pit samples were sieved to produce two fractions (-10+2 mm and -2 mm) using a 2 mm screen. Both fractions were analyzed. Based on the finding that no significant partitioning was observed between the fine and coarse fractions, subsequent field -1 mm samples were analyzed whole with sieving.

3.3.3 Static Geochemical Methods

Static geochemical testing consisted of acid-base accounting by the modified Sobek method (total sulphur, sulphur as sulphate, neutralization potential, total inorganic carbon, paste pH) and metal analysis using an aqua regia digestion with ICP-ES finish. Samples containing greater than 10,000 mg/kg (1%) lead or zinc, which is the upper reporting limit for ICP were re-analyzed using atomic adsorption. Selected samples were analyzed for total barium (using lithium metaborate fusion) due to the presence of barite (BaSO_4) in the rock.

Due to the complexity of the sulphur chemistry in the rock, metal concentrations were used to estimate the speciation of sulphur between the various mineralogical forms as has been used at other similar sites (Day et al 2000). Zinc, lead and barium were used to estimate the concentrations of sulphur associated with the minerals sphalerite, galena and barite. The sulphur concentrations associated with iron sulphide (pyrite and pyrrhotite) was estimated from the total sulphur concentrations, less sulphur in other forms:

$$S_{Fe}(\%) = \text{Total S}(\%) - 32.15 \times (\text{Zn}(\%)/65.4 + \text{Pb}(\%)/207 + \text{Ba}(\%)/137) - S_{SO4}(\%)$$

Results are provided in Appendix E.4 for test pit samples and Appendix F.4 for drill hole samples.

3.3.4 Extraction Tests

Leach extraction tests were performed using a variation of the test described by Price (1997). The extraction was performed using deionized water mixed with the sample at a ratio of three parts water to one part solid. Rather than the 24 hour leaching period recommended in the standard procedure, the samples were leached for 96 hours. The procedure was modified based on SRK's experience and the observation from the earlier ICAP extractions tests which showed that leachate chemistry changed significantly between 3 and 24 hours.

Leachates from the extraction tests were analyzed for pH, Eh (ORP), electrical conductivity, total alkalinity, acidity (to pH 4.5 and 8.3), sulphate and dissolved metals (ICP-OES scan).

Results are provided in Appendix E.5.

3.3.5 Humidity Cell Tests

Laboratory Methods

Eleven humidity cell tests were performed on previously characterized -1 cm 2-kg test pit samples in 10 cm diameter plastic columns, approximately 30 cm high. The cells were operated on a weekly cycle as follows:

- 3 days dry air;
- 3 days humid air;
- 800 mL of deionized water added to top of column on 7th day of the cycle, allowed to stand for 1 hour, then drained.

Leachates from the extraction tests were analyzed for pH, Eh (ORP), electrical conductivity, total alkalinity, acidity (to pH 4.5 and 8.3), sulphate and dissolved metals (ICP-OES scan).

Test data were reviewed to determine the duration of the tests. Nine of the tests were stopped after 28 weeks based on the stability of results obtained in the overall framework of the project. The remaining two tests were stopped after 40 weeks.

Results are provided in Appendix E.6.

Data Reduction

Loadings were calculated and graphed for each chemical component in mg/kg/week using the concentration in leachate, volume of leachate recovered and the mass of sample. The weekly loadings obtained were also used to estimate average stable release rates and depletion of components. Average release rates and release rate ratios were compared to bulk chemical characteristics.

3.3.6 Site-Specific Kinetic Test

A kinetic test was designed to evaluate the ability of waste rock containing acid buffering minerals to consume acid produced by highly sulphidic waste rock. The test involved generation of acidic leachate, which was then used as the feed solution for columns containing acid consuming waste rock from Faro, Grum and Vangorda. The leachate from these columns was then in turn used as the feed solution for additional acid generating rock. The overall scheme and identification of samples used in the test are shown in Figure 3.3. The sulphide composite was prepared from four test pit samples (FTP-23A, -34B, -35N and 46A) collected from the Faro area. For the Faro area, the Stage 2 and 3 samples were not the same due to the lack of a large enough sample for both stages. The mass of sample in each stage was decreased to maintain a consistent water to rock ratio in each stage.

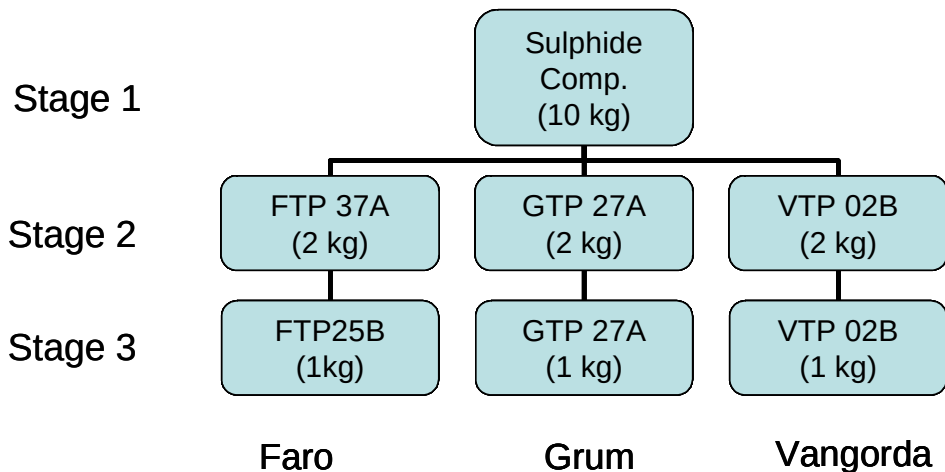


Figure 3.3 Identification and Leaching Sequence for Test Samples Used for Site Specific Kinetic Test

The Stage 1 sample was used to generate 6.2 L of leachate per week, of which 3.6 L was split into three parts (1.2 L) and applied to the Stage 2 samples. A portion of the unused leachate was analyzed. The resulting leachate from each Stage 2 sample was then split into two 600 mL parts. One part was applied to the Stage 3 sample, and one part was analyzed. All the leachate obtained from the Stage 3 samples was analyzed.

Leachates were analyzed for the same suite of parameters as the humidity cells.

The test was stopped after 20 weeks because the Stage 3 samples were all producing acid leachate. Results are provided in Appendix E.7.

3.3.7 Analysis of Seepage Samples

As discussed in Section 3.2.5, seepage samples were collected for analyses of routine parameters (pH, conductivity, acidity, alkalinity, chloride and sulphate), and dissolved metals (dissolved metals by ICP-OES).

Results are provided in Appendix G.

4 Results

4.1 Faro Site

4.1.1 Composition of Waste Rock Dumps

As described in Section 2.2.3, the previous ICAP studies (RGC 1996) involved a detailed effort to estimate the composition of the waste rock dumps based on mining records. The partial surface waste rock mapping completed by SRK supplements this work by indicating areas of rock exposed to full atmospheric conditions.

SRK's maps of the Main and Intermediate Dumps indicated the dominant exposed rock type is schist of the type porphyroblastic biotite muscovite andalusite schist (Unit 1D). Significant deposits of sulphide rock (Unit 2) were found in the location of the sulphide waste rock cell along the boundary between the dumps (Appendix B.2), in the lower lift along the east edge, and at least six other locations unrelated to known sulphide rock disposal. A large area of free-dumped calc-silicate schist (Unit 3D0) was located on the middle lift surface in the northern part of the Main Dump.

Porphyroblastic biotite muscovite andalusite schist (Unit 1D) was also an important component of the Zone II and Northeast Dump but it was also intimately mixed with calc-silicate schist. Less sulphide rock was observed in this area, consistent with the lower proportion of sulphide rock reported in the ICAP (RGC 1996).

The exposed rock in the lower Northwest Dump was mixed Unit 1D, Unit 10 and Unit 5 (overburden). The middle and upper Northwest Dump had significant exposures of sulphide rock mixed with Units 1D and 10. These findings were not consistent with ICAP proportions which indicated 7 to 10% sulphide rock throughout the Northwest Dump, though this may indicate that the sulphide rock was placed late in the history of construction but that the overall average is correct.

The Faro Valley Dump was not mapped as part of the same program but inspection during the seepage sampling program indicated that it is composed mainly of oxidized schist or sulphide.

4.1.2 Static Geochemical Characteristics

Introduction

As noted in Section 3.1.2 a variety of different methods have been used to evaluate the acid generation potential of the rock units. The use of different methods limits the ability to compare different datasets, therefore the datasets are generally described separately.

ICAP and SRK Test Pit Static Geochemical Databases

- **Form of Sulphur**

The geochemical database and geological description indicate that elevated barium, lead and zinc concentrations are primarily associated with ore and sulphide waste rock rather than the host rock types (Table 4.1). Some differences between results obtained for the ICAP and this project are apparent but are believed to represent the natural variability of waste rock characteristics rather than any differences in the methods used. Median lead and zinc concentrations are typically near or below 500 mg/kg in the host rock schists, calc-silicates and intrusives, corresponding to <0.01% sulphur associated with galena and 0.02% sulphur associated with sphalerite. Therefore, there is no need to consider these forms of sulphur in these waste rock types as a correction for non-acid generating components of total sulphur. In the sulphide waste, these minerals are significant, but iron sulphides dominate and therefore lead and zinc sulphides do not affect the overall acid-base account.

Sulphate analyses conducted as part of the ICAP and this project indicated that the proportion of sulphate averages around 10% of total sulphur but that it ranges from near 1% to near 100% (Figure 4.1). The correlation between total sulphur and sulphate sulphur is positive but weak. The majority of the higher sulphate concentrations are contained in the sulphide waste rock samples. Sulphate concentrations in the sulphide waste rock though are bimodal. A cluster of sulphide waste samples have high total sulphur concentrations (>10%) with relatively low sulphur as sulphate concentrations (<0.4%). Other sulphide waste samples show higher sulphur as sulphate concentrations scattered over a wide total sulphur range.

The relative proportion of sulphate appeared to be greater for the calc-silicates (Unit 3) and intrusives (Unit 10) when compared to the schists.

The correlation between paste pH and sulphur as sulphate concentrations is very strong indicating that the sulphate component in the waste rock is most likely present as stored acid sulphate salts (Figure 4.2). The SRK database shows a break in slope for the relationship at 0.1% sulphur as sulphate. Below this level, sulphate may be present as gypsum.

Table 4.1 Summary of Metal Concentrations by Rock Type – Faro

Doc	Rock Type	n	Ag (mg/kg)					As (mg/kg)					Cd (mg/kg)					Cu (mg/kg)					Fe (%)					Pb (mg/kg)					Zn (mg/kg)					
			P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s						
ICAP	1	Schist	19	0.1	0.8	3.8	9.2	11.1	1	1	67	214	166	0.1	0.1	0.1	0.1	0.0	34	127	246	601	447	2.0	5.1	4.8	6.0	1.4	82	219	680	2541	1031	137	373	1544	8186	2672
SRK 2002	1	Schist	6	1.0	1.7	3.1	8.2	3.3	72	91	281	784	335	-1	0	1	1	1	60	194	225	466	170	6.0	6.8	7.4	10.0	1.8	289	715	1860	5623	2494	217	584	2674	10030	5029
ICAP	2	Sulphide	43	0.7	16.1	17.4	35.4	12.6	1	315	408	922	344	0.1	0.1	1.6	10.5	6.1	170	1142	1343	3277	985	4.4	15.0	11.5	15.0	4.3	540	8504	7042	10000	3399	439	10000	6901	10000	4038
SRK 2002	2	Sulphide	4	11.6	28.3	22.3	43.8	16.3	109	764	667	1655	764	-1	1	6	23	13	446	842	1023	2725	1196	9.3	20.1	15.3	27.7	9.4	12611	21554	19286	39178	13574	20322	29093	26399	51143	15596
ICAP	3	Calc-Silicate	13	0.2	1.5	1.3	2.6	1.0	1	1	1	1	0	0.1	0.1	0.1	0.1	0.0	21	42	50	97	29	3.3	3.5	3.7	4.5	0.4	108	286	351	785	254	231	416	528	1065	335
SRK 2002	3	Calc-Silicate	6	0.2	0.4	1.0	2.4	1.0	7	20	53	145	63	-1	0	2	7	4	47	89	129	275	100	5.2	6.1	5.9	6.4	0.6	206	347	652	1786	763	199	449	1039	3157	1420
ICAP	10	Intrusive	10	0.1	1.2	2.0	6.6	2.5	1	1	3	13	7	0.1	0.1	0.1	0.1	0.0	10	105	173	485	180	0.6	3.4	3.4	5.5	1.7	58	419	716	2128	796	83	542	938	3084	1150
SRK 2002	10	Intrusive	4	-0.1	0.3	0.3	0.6	0.3	-4	10	15	33	18	-1	0	3	9	5	36	60	61	85	23	3.4	4.6	4.4	5.2	0.9	229	437	491	827	290	557	749	2984	8542	4611

- **Form of Neutralization Potential**

SRK tested for carbonate as a potential indicator of neutralization potential. A comparison of carbonate with modified Sobek neutralization potential (NP) (Figure 4.3) shows that the carbonate content exceeds NP by at least a factor of two in most samples. The calc-silicate and intrusive units showed the lowest carbonate to NP ratio. The schist and sulphide units had much higher ratios. The results are consistent with the presence of iron carbonates in the host rock and ore bodies, and indicate that carbonate is not a good indicator of neutralization potential. In the subsequent interpretations, neutralization potential is used in the acid-base account. Neutralization potential may over-estimate actual acid buffering capacity. Comparison of paste pH and neutralization potential indicate that NP below about 10 kg CaCO₃/t is ineffective and probably should not be included in the acid-base account.

- **Size Fraction Analysis**

Analysis of the two size fractions showed a slight but not significant tendency for sulphur concentrations to be enriched in the finer size fraction primarily at sulphur concentrations below 1% (Figure 4.4). NP in both size fractions was comparable, and as a result, NP/AP was lower in the finer fraction at higher NP/AP. Review of humidity results (presented later) shows that net acid generation potential at the site is indicated by an NP/AP of about 1. Using this threshold, no samples had NP/AP below 1 in the fine fraction but about 1 in the coarse fraction.

Zinc concentrations were not significantly different in the two size fractions

Based on these findings it was not considered necessary to prepare size fractions of test pit samples for subsequent testing.

Characteristics by Rock Type

Table 4.2 summarizes acid-base accounting statistics by rock type for all sources of data including the early 1990s Curragh databases, the ICAP database and the current SRK database. Table 4.3 summarizes SRK's field test results (rinse pH and electrical conductivity) on a rock type basis. Data were grouped according to major rock types (schist, sulphide waste, calc-silicate and intrusives) because classification to the sub-type level was not done or was not possible for most datasets. To allow direct comparison of datasets, only total sulphur concentrations are shown. Comments on each rock type are provided below:

Table 4.2 Summary of Acid-Base Accounting Characteristics by Rock Type – Faro

			S,%						NP					NNP					NP/AP			Paste pH					
Doc	Sample	Rock Type	n	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	P95	P5	P50	Mean	P95	s	
Sched D	Core	1	Schist	31	0.1	0.3	0.5	1.6	0.5	10	20	39	113	41	-34	18	23	102	41	0.3	3.4	14.4	6.7	8.2	8.1	9.2	0.8
Closure Plan	Core	1		10	0.1	0.3	0.3	0.5	0.1	31	40	60	115	35	22	34	51	103	33	3.2	6.8	13.9	7.6	8.3	8.3	8.8	0.4
ICAP	WRD	1		19	0.2	1.0	1.1	2.5	0.9	-5	6	10	37	17	-73	-20	-24	8	34	-0.6	0.3	1.4	4.8	6.6	6.7	8.3	1.2
SRK 2002	WRD	1		6	0.5	0.9	6.0	7.4	3.4	6	0	13	6	31	-202	-13	6	14	103	0.3	0.9	0.9	4.6	7.3	6.0	7.8	1.5
Sched D	Core	2	Sulphide	19	0.3	18.0	24.9	56.0	23.1	3	18	27	61	21	-1724	-517	-752	49	726	-1.0	0.0	5.5	4.3	5.4	6.0	8.8	1.7
ICAP	WRD	2		43	0.9	16.4	17.9	37.3	13.6	-37	0	-3	10	25	-1161	-509	-561	-29	419	-0.1	0.0	0.1	2.4	4.9	4.7	6.8	1.4
SRK 2002	WRD	2		5	8.3	18.6	18.6	27.8	8.5	-64	0	-13	21	38	-848	-561	-551	-230	268	-0.1	-0.1	0.1	1.7	4.3	3.7	5.4	1.7
Sched D	Core	3	Calc-silicate	16	0.0	0.3	0.4	1.0	0.4	46	90	89	135	40	31	75	77	123	42	1.7	15.7	68.3	8.2	9.0	8.9	9.3	0.4
Closure Plan	Core	3		10	0.0	0.1	0.2	0.7	0.3	56	81	79	99	16	48	75	73	97	18	3.5	27.7	100.3	8.8	9.1	9.1	9.3	0.2
ICAP	WRD	3		13	0.2	0.4	0.4	0.6	0.1	15	64	63	130	37	2	50	50	116	37	1.2	4.8	9.4	7.4	8.5	8.3	8.7	0.5
SRK 2002	WRD	3		6	0.4	0.7	1.1	2.6	1.0	22	36	43	82	27	-30	9	13	68	41	0.6	1.5	3.4	5.6	7.5	7.2	8.3	1.1
Sched D	Core	10	Intrusive	8	0.2	0.3	0.3	0.7	0.3	8	13	19	35	12	0	4	9	26	11	1.1	1.7	4.1	6.5	8.5	8.2	9.2	1.1
ICAP	WRD	10		8	0.1	0.4	0.6	1.6	0.6	-10	3	12	51	22	-60	-6	-8	38	33	-0.2	0.3	4.2	3.9	7.0	6.3	8.0	1.5
SRK 2002	WRD	10		4	0.4	0.7	0.7	1.1	0.4	0	12	16	39	19	-10	1	1	14	12	0.0	1.1	0.7	4.0	7.1	6.4	7.9	2.0

Note:

1. SRK Paste pHs are field rinse pH measurements

2. NP - Neutralization Potential, AP - Acid Potential; NNP = NP-AP

Table 4.3 Summary of Field Contact Test Results for Surface Samples - Faro

Area(s)	Waste Rock Dumps	Primary Rock Type	Statistic	pH* s.u.	EC mS/cm
Faro	Main, Intermediate, NW	1D (Schist)	Minimum	8.2	0.1
			Median	7.3	0.9
			Maximum	2.6	5.2
			Number	18	18
Faro	Main, Intermediate, NW	2 (Sulphide Rock Types)	Minimum	5.4	1.0
			Median	2.8	2.6
			Maximum	2.3	5.0
			Number	7	7
Faro	Main, Intermediate, NW, NE	3DO (Calc-Silicate Schist)	Minimum	8.2	0.0
			Median	7.4	0.3
			Maximum	3.6	3.6
			Number	5	5
Faro	NE	5 (Glacial Till)	Minimum	7.5	0.2
			Median	6.5	5.4
			Maximum	3.5	5.6
			Number	3	3
Faro	Main, NW, NE	10F (Quartz Feldspar Porphyry)	Minimum	8.5	0.1
			Median	7.5	0.2
			Maximum	3.1	0.5
			Number	5	5

*pH minimum and maximum are reversed to reflect hydrogen ion concentration.

• Schist – Unit 1

All four datasets indicate that the schist has relatively low sulphur concentrations (median less than equal to 1%). The ICAP and SRK test pit databases imply that sulphur concentrations were greater than the earlier sampling campaigns. However, this is an artefact of the sampling method. The earlier programs sampled core and were able to “cleanly” sample individual rock types. The test pit databases reflect some samples that were probably mixtures of rock types. This explains the higher averages, P95 and standard deviation statistics.

The ICAP and SRK datasets not only indicated higher sulphur concentrations but also much lower NPs. This again possibly reflects the effect of rock mixtures but may also be a result of the aging. As a result, the ICAP and SRK databases indicate that the schists have median NP/AP less than 1, and therefore that the rock is potentially acid generating. The paste pH results indicate that a small proportion of the rock was already acidic. This was confirmed by the field contact tests (Table 4.3) which indicated that the rock was on average non-acidic but that some samples had pH below 3.

- **Sulphide Rock – Unit 2**

All three datasets indicate that the sulphur content of the sulphide waste rock is high, NP is relatively low, and therefore that sulphide rock has a high potential for acid generation. Paste pH readings in both ICAP and SRK datasets indicate that the majority of the rock of this type is already acidic. The field contact tests also indicated the same conclusion.

- **Calc-Silicate – Unit 3**

The calc-silicate unit has consistently low sulphur concentrations (median less than 1.1%) though again the effect of mixed waste rock types is apparent, particularly in the small SRK dataset. The NP of this unit is consistently elevated resulting in NP/AP generally above 1. There is greater consistency of NP/AP in the three larger historical datasets. This unit has low potential for acid generation, though mixing with potentially acid generating rock types may result in locally acid generating mixtures, as shown by a contact test result for this rock type.

- **Intrusive – Unit 10**

The sulphur contents of the intrusive units are comparable to the calc-silicate (median less than 0.7%) but the neutralization potential is also low. The pure form of this rock probably has low potential for acid generation as shown by the Schedule D dataset and field observations. However, the presence of small amounts of sulphide waste may raise the acid generation potential and result in potential for acid generation. Paste pH readings in both the ICAP and SRK datasets, and SRK contact test results indicate that this is the case.

Deep In Situ Characteristics

Drill holes were advanced at two locations:

- 60M-1 was drilled in the area of segregated sulphide rock disposal (Appendix F.1). Siliceous sulphide rock (up to an estimated 20%) was encountered almost immediately to a depth of 26 metres, and sulphur concentrations were variable but elevated (Figure 4.5). Rinse pH was correlated with sulphur content, and varied from less than 3 to more than 7. The sulphide rock was mixed with calc-silicate schist (Unit 3) and grey schist (1D). From 26 m to 60 m, sulphide rock was not noted and generally calc-silicate schist was the most abundant rock type. Sulphur concentrations at depth were less than 1% and pHs were near 7.
- 30M-1 was drilled near the edge of Intermediate Dump in an area of extensive surface exposures of schist. Above 24 m, the dominant rock type was calc-silicate gneiss with sulphur concentrations less than 1%. At 24.5 m, hard ground (possibly a traffic surface) was encountered and below this variable amounts (5% to 50%) of sulphide rock were encountered

resulting in sulphur concentrations up to 14%, a rinse pHs of 4. Rinse EC also increased to 4000 μ S.

4.1.3 Short Term Extraction Tests

Due to the difference in method used for extraction tests in the ICAP and SRK datasets, the results cannot be compared directly. Comments are provided below on the databases separately.

ICAP Database (n=48)

The ICAP database provided in Appendix D.2 contains results for 15 schist samples, 20 sulphide samples, seven calc-silicates samples, and six intrusive samples (Table 4.4). Leachates from the four rock types reflected the typical characteristics of these rock types. Sulphide rock leachates were acidic (pH<5.8, median pH 2.8 and yielded the highest sulphate concentrations (median 3400 mg/L) and titratable acidity concentrations (median 1600 mg CaCO_3 /L). In contrast, leachates from the calc-silicate samples were consistently slightly alkaline with low sulphate concentrations (52 mg/L). Leachates from the schist and calc-silicates samples were mostly non-acidic but some samples yielded pHs below or near 3. Sulphate was also elevated and correlated with the low pH leachates.

The ICAP extraction tests indicated the following:

- Zinc concentrations ranged from 0.01 to 2110 mg/L representing highly soluble zinc.
- Metal concentrations were negatively correlated with pH for Al, Cd, Cu, Fe, Mn (weak), Ni (weak), Co, Zn.
- Metal concentrations were positively correlated with sulphate for Ca, Fe (sulphate greater than 1000 mg/L) and zinc (sulphate greater than 1000 mg/L).
- Lead concentrations (up to 3 mg/L) were weakly negatively correlated with sulphate.
- Strong inter-element correlations were indicated for Ca, Mg and SO_4 ; Mn, Zn and Cd; and Co and Ni.

SRK Database (n=13)

The smaller SRK database (Appendix E.5) primarily emphasized testing of schist (4 samples) and calc-silicate (5 samples). One sample of sulphide rock and two samples of intrusive were tested. Except for one sample of schist, leachates from all samples had near neutral pH. All leachates had pH greater than 5. The one sample of sulphide rock had 7% total sulphur, but NP was 24 kg CaCO_3 /t. Due to the lack of a wide range of pH variation, strong correlations with pH were only apparent for zinc and manganese, and these elements were inter-correlated. Leachate sulphate, magnesium and calcium concentrations were also inter-correlated. Zinc concentrations were lower than the ICAP dataset (33 mg/L).

Table 4.4 Summary of Results for Extraction Tests in the ICAP Dataset – Faro

	24 hr pH su	Eh mV	Total Acidity mgCaCO ₃ /L	Alkalinity mgCaCO ₃ /L	SO ₄ mg/L	Al mg/L	As mg/L	Cd mg/L	Ca mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Mg mg/L	Mn mg/L	Ni mg/L	K mg/L	Si mg/L	Na mg/L	Zn mg/L
Schist n=15																				
P5	2.51	165	3	0	24	-0.20	-0.44	-0.01	8.79	-0.01	-0.01	-0.03	-0.07	1.67	-0.01	-0.02	-5.80	0.03	-5.80	-0.01
P50	6.99	357	12	11	183	-0.20	-0.20	-0.01	32.80	-0.01	-0.01	0.04	-0.05	47.30	0.06	-0.02	3.00	0.66	-2.00	0.02
Mean	6.27	335	363	20	795	18.89	0.63	0.15	65.83	1.03	0.68	29.60	0.25	81.96	19.55	0.71	4.20	1.14	8.80	63.30
P95	8.03	523	2000	53	3019	93.95	1.60	0.82	189.00	5.18	3.38	208.40	1.05	265.80	113.80	3.68	6.60	3.76	30.80	396.20
Sulphide n=20																				
P5	2.09	183	126	0	524	-0.24	-2.00	0.03	11.18	0.04	0.01	0.03	-0.50	12.36	0.89	-0.11	-20.00	-0.22	-20.00	12.92
P50	2.84	463	1645	0	3445	11.00	-0.20	0.64	80.65	0.80	10.03	89.85	0.90	103.45	28.75	0.35	-10.00	1.55	-10.00	464.00
Mean	3.40	424	3366	1	4152	71.18	1.06	1.17	105.96	1.25	25.49	856.61	1.33	142.62	46.01	0.87	8.35	2.87	8.20	673.28
P95	5.71	567	8318	3	9551	228.35	2.53	3.32	249.95	4.80	88.62	2877.50	2.91	362.20	123.35	3.22	-1.65	9.72	-2.00	1939.00
Calc-Silicate n=7																				
P5	7.45	110	1	34	26	-0.20	-0.20	-0.01	20.21	-0.01	-0.01	-0.03	-0.05	3.92	0.00	-0.02	2.30	0.86	-2.00	-0.01
P50	7.78	369	4	45	52	-0.20	-0.20	-0.01	25.70	-0.01	-0.01	-0.03	-0.05	7.79	0.01	-0.02	3.00	1.32	-2.00	0.01
Mean	7.82	272	4	45	66	0.20	0.20	0.01	30.44	0.01	0.01	0.03	0.05	8.55	0.02	0.02	3.57	1.27	3.29	0.01
P95	8.19	403	9	54	132	-0.20	-0.20	-0.01	52.60	-0.01	-0.01	0.02	-0.05	14.08	0.05	-0.02	5.40	1.77	7.10	0.02
Intrusives n=6																				
P5	3.05	170	3	1	52	-0.20	-0.20	-0.01	22.95	-0.01	-0.01	-0.03	-0.05	9.38	0.00	-0.02	-2.00	0.37	-2.00	0.00
P50	6.36	414	45	20	568	-0.20	-0.20	0.08	123.45	0.01	0.00	0.01	-0.05	49.70	3.42	0.01	4.50	1.99	-2.00	22.32
Mean	5.81	385	401	20	1011	17.83	0.20	0.11	179.75	0.28	2.30	54.31	0.19	51.78	5.03	0.15	4.67	2.21	2.17	36.39
P95	7.59	542	1655	41	2922	79.45	-0.20	0.28	424.75	1.04	10.23	243.93	0.63	104.33	11.73	0.54	7.75	4.71	1.75	101.43

4.1.4 Kinetic Geochemical Characteristics

As indicated in Table 3.1, three rounds of kinetic testing have been conducted on samples from the Faro area (Schedule D, ICAP, and this study) each using different testing protocols. The results of these programs are discussed in the following sections separately, and any comparisons are drawn in the conclusions. The characteristics of all samples tested in humidity cells are provided in Table 4.5.

Schedule D Tests (SRK 1992)

Ten samples were tested to represent the major lithologies including important sub-types. Three samples were schists (Units 1CD, 1DO, 1D4), five samples were sulphide waste (2A Comp, 2B, 2CE, 2C0, 2C0+2E0), one sample was calc-silicate (Unit 3) and one sample was intrusive. Based on the typical characteristics of the rock types in Table 4.2, the samples tested were representative.

The samples of schist and intrusive were each tested in two cells with and without *Thiobacillus ferrooxidans* inoculation. Details of the inoculation procedure are not known, but it is apparent from the leachate chemistry that the culture was leached from the cells and had no effect on chemistry beyond the first few weeks. All but one of the tests was operated for about 20 weeks. The cells containing rock type 1D4 (ore zone alteration envelope) were operated for a year.

A major limitation of the testwork was that the characterization of the test materials did not include metals, sulphur as sulphate or carbonate.

The schist samples yielded pH neutral leachate throughout the test (Appendix D.3). Sulphate release decreased initially then increased. The increasing trend was continuing when the tests were stopped. The longer term 1D4 test showed the same effect, but showed a steady decrease after peaking at over 100 mgSO₄/kg/week. Low levels of zinc and lead release occurred.

The sulphide waste samples all yielded acidic leachate within a few weeks of starting the test. The highest pH (greater than 4 and up to 5) was shown by a sample of unit 2CD (pyritic quartzite). This sample also showed the lowest sulphate release (less than 15 mg/kg/week after initial decrease). The sample labelled Unit 2CE (a type of quartz rich massive pyrite) also yielded pH near 4 and relatively low sulphate release (about 20 mg/kg/week). Both of these rock types are described as “hard” due to the high quartz content and the samples contained very high sulphur concentrations (more than 20%). One sample was a mixture of 2CD and 2ED (pyritic quartzite and massive pyrite) and yielded a slightly lower pH than the above samples and release sulphate at a rate of near 60 mg/kg/week. The sample was effectively pure pyrite (total sulphur of 44%). The samples identified as 2A (graphitic quartzite) and 2B (quartzite) yielded the lowest pHs (between 3 and 4), and the highest sulphate (near 80 mg/kg/week). 2A in particular is identified as a soft slaking rock type containing graphite. The sulphur content of these rock types was relatively low compared to the other samples (Table 4.5).

Table 4.5 Characteristics of Historical Kinetic Test Samples

Year	Sample ID	Rock Type	Total S %	NP kg CaCO ₃ /t	AP kg CaCO ₃ /t	NNP kg CaCO ₃ /t	NP/AP	As ppm	Cd ppm	Cu ppm
1991	1CD	1CD	0.33	19	10	9	1.88	-	-	-
1991	1D0	1D0	0.25	16	8	8	2.03	-	-	-
1991	1D4	1D4	1.41	16	44	-28	0.37	-	-	-
1991	10E	10E	0.27	14	9	5	1.59	-	-	-
1991	2A Comp	2A	11.61	13	363	-350	0.04	-	-	-
1991	2B	2B	4.26	18	134	-116	0.13	-	-	-
1991	2CE	2CE	36.00	18	1124	-1106	0.02	-	-	-
1991	2C0	2C0	24.17	5	755	-750	0.01	-	-	-
1991	2C0+2E0	2C0+2E0	44.10	11	1376	-1365	0.01	-	-	-
1991	3D	3D	0.29	99	9	90	11.00	-	-	-
1991	1CD	1CD	0.33	20	10	10	1.98	-	-	-
1991	1D0	1D0	0.25	17	8	9	2.15	-	-	-
1991	1D4	1D4	1.41	17	44	-27	0.39	-	-	-
1991	10E	10E	0.27	14	9	5	1.59	-	-	-
1996	DR/10	2	1.30	12	41	-29	0.30	80.50	0.10	366.50
1996	FV/17	2	11.00	0	344	-344	0.00	228.00	0.10	419.50
1996	LG/28	2	35.00	1	1094	-1093	0.00	635.00	0.10	3624.00
1996	LG/29+32	2	21.00	0	656	-656	0.00	969.50	0.10	822.50
1996	NW/25	2, 4	9.20	0	288	-288	0.00	238.50	0.10	1248.00
1996	SC/04	2	33.80	3	1056	-1053	0.00	573.00	0.10	1616.50
1996	ZT/42	2, 1	22.60	6	706	-700	0.01	125.00	0.10	2205.00
1996	SC/08	3, ±1	0.50	86	16	70	5.48	1.00	0.10	18.00
1996	MD/33	1	2.10	12	66	-53	0.19	88	0.1	204

Notes

1. NP – Neutralization Potential, AP – Acid Potential; NNP = NP-AP

Table 4.6 Characteristics of SRK Humidity Cell Samples

LAB ID	Field ID	Location	Rock Type	Paste pH	S(T) %	S(SO4) %	S(S2-) %	S in ZnS %	S in PbS %	S in CaSO4 %	S in FeS2 %	AP kg CaCO3/t	NP kg CaCO3/t	NNP kg CaCO3/t	NP/AP	TIC %	Carbonate NP	CO3NP/AP	As ppm	Cd ppm	Cu ppm	Zn ppm
Cell 1	70865	FTP25A	3		0.56	0.04	0.51	0.01	0.00	0.04	0.50	16	34	18	2.1	0.8	68	4.26	10	1	43	285
Cell 2	70919	FTP50A	3	8.3	0.62	0.01	0.61	0.03	0.01	0.01	0.58	19	38	19	2.0	1.0	86	4.50	10	1	77	554
Cell 3	70855	FTP19A	10	8.2	0.89	0.02	0.87	0.03	0.00	0.02	0.84	27	43	16	1.6	0.7	62	2.27	15	<1	66	542
Cell 4	70813	FTP09A	Till	7.7	0.44	0.05	0.39	0.01	0.00	0.05	0.38	12	18	6	1.5	1.3	108	8.89	35	<1	59	170
Cell 6	70893	FTP40B	3+1	7.6	0.74	0.14	0.60	0.01	0.00	0.14	0.59	19	19	0	1.0	0.6	53	2.84	30	<1	100	170
Cell 8	70920	FTP50B	3+1	8	1.25	0.04	1.21	0.02	0.00	0.04	1.19	38	31	-6	0.8	0.7	59	1.56	100	<1	59	344
S Comp	Comp			3.00	20.30	2.40	17.90	0.49	0.15	2.40	17.26	559	-29	-589	-0.1	0.0	1	0.00	465	<1	1605	10000
F2	70887	FTP37A	1	5.2	0.45	-0.01	0.44	0.02	0.01	-0.01	0.44	14	15	1	1.1	1.6	137	9.43	88	1	52	425
F3	70866	FTP25B	1D4	7.9	0.78	0.06	0.72	0.04	0.01	0.06	0.67	23	9	-13	0.4	0.9	76	3.37	95	<1	84	744

Notes

1. NP – Neutralization Potential, AP – Acid Potential; NPP = NP-AP
2. TIC – Total Inorganic Carbon

The calc-silicate sample (total sulphur 0.29%) yielded pH neutral, alkaline leachate and very low sulphate (2 mg/kg/week). In contrast, the intrusive sample with similar sulphur (0.27%) yielded pH neutral leachate, but sulphate release increased to more than 40 mg/kg/week at the end of the test.

The lack of metal analysis on the test samples prevents a detailed consideration of metal release. Zinc release was generally below 0.1 mg/kg/week for the non-sulphide waste samples, with the exception of the 1D4 sample which briefly increased above 0.2 mg/kg/wk. Highest zinc release (near 10 mg/kg/week) was indicated by the sulphide samples 2A, 2CD and 2CD+2ED. Zinc release decreased rapidly for 2B and 2CE. Lead release was highest for the sulphide waste samples (typically exceeding 1 mg/kg/week except for 2B) but decreased to near 0.001 mg/kg/week for all sample except for the calc-silicate which remained steady near 0.025 mg/kg/week.

ICAP Tests

Nine tests were run in duplicate for the ICAP study of which seven were samples of sulphide type wastes, or mixtures containing sulphides. One sample of schist and calc-silicate each were tested, though the schist sample had a sulphur concentration of 2.1% indicating that it probably contained some mingled sulphide waste. The calc-silicate sample appeared to be relatively pure.

Reproducibility of duplicate tests was excellent. The tests were run for the relatively short period of 13 weeks. Data and charts are provided in Appendix D.5.

The schist and calc-silicate samples did not generate acid, and sulphate release rates were low (19 and 3 mg/kg/week, respectively). Zinc release was also low (<0.01 mg/kg/week).

All sulphide samples generated acidic leachate (pH<5) with the exception of the low sulphur sample DR/10 which began acidic then increased to near 7 by the conclusion of the test. The lowest pH (1.6) was generated by FV-17A. No relationship between pH and initial sulphur concentration was apparent. Sulphate release was initially rapid for all tests then decreased and then either stabilized or slowly increased. Again, no apparent relationship between sulphur concentration and sulphate release was apparent. The two highest sulphate release rates (about 700 mg/kg/week) were obtained for the samples with the lowest sulphur concentration (with the exception of DR/10). Zinc release followed the same pattern as sulphate. The sulphide waste samples yielded the highest concentrations followed by the low sulphur sample (DR/10) and the schist and calc-silicate samples. Zinc release for the sulphide waste samples varied from 2 to 200 mg/kg/week and was positively correlated with the zinc content of the rock.

Molar ratios of zinc to sulphur, sulphur to iron and iron to zinc were examined. Iron to sulphur ratios were always below 0.5, and zinc to iron ratios varied from 0.01 for FV-17, which was the most acidic sample to near 1 for LG-29+32A to greater than 1 for sulphide waste samples NW-25 and SC-04A (1.3 and 36, respectively).

SRK Conventional Tests

SRK ran six humidity cells on low sulphur rock mixtures from test pits including one sample of glacial till. Sulphur concentrations varied from 0.4% (glacial till) to 1.3% (calc-silicate and schist). Two tests had NP/AP greater than 2, two were between 1 and 2, and two were less than 1.

All six tests produced pH neutral leachate (Appendix E.6). Sulphate release decreased as the test proceeded and in most cases eventually stabilized. Calcium and magnesium were the other parameters consistently detected in leachate. Zinc, cadmium and manganese concentrations decreased to near the detection limit as the test proceeded.

SRK Sequential Columns

The feed sulphide composite produced low pH (less 3) very rapidly and this was accompanied by initial acidity of nearly 18,000 mg CaCO₃/L (Figure 4.6 and Appendix E.7). Acidity then decreased rapidly to less than 1000 mg CaCO₃/L, after which it increased to nearly 6000 mg CaCO₃/L. These variations in acidity were accompanied by fluctuations in pH with final pHs near 2.

The pH of both sequential columns decreased very rapidly accompanied by extensive precipitation of iron in the column. As the acidity of the feed water decreased, the pH of the column effluents increased. The Stage 3 column recovered to near 6 but then quickly decreased to below 3. Thereafter, a slight decrease in acidity was observed for the columns compared to the feed water, but pH remained below 3.

As the acidic water passed through the columns, sulphate, copper and zinc concentrations did not change significantly. Iron and aluminium decreased. Manganese concentrations increased from about 4 mg/L in the acidic water to 18 mg/L in the final effluent. Lead concentrations increased significantly. Lead in the acidic water decreased from 1 mg/L to 0.2 mg/L, whereas in the Stage 2 column, the effluent remained stable between 0.6 and 0.8 mg/L. The Stage 3 effluent had lead concentrations between 1 and 1.5 mg/L.

4.1.5 Thermal and Gas Monitoring

Two boreholes were instrumented in the Faro Intermediate dump. The Faro 60M1 borehole is located in the sulphide cell, and the Faro 30M1 borehole is located nearer the edge of the dump in an area outside the sulphide cell. The gas and temperature monitoring results are provided in Appendix F.3 and are illustrated in Figure 4.7

Changes in the temperature profile of the 60M1 borehole are observed for winter, summer and late fall in the near surface results, to a depth of about 5.6 m. These variations are affected by summer heating and winter cooling and are normal temporal changes. At depth the temperature increases to a maximum of about 50 °C at a depth of about 20 m. Below that, the temperature decreases rapidly to

constant temperature of about 6 °C at the bottom of the borehole. The oxygen concentration profile for the borehole decreases from atmospheric conditions to a low of about 5 % at a depth of 5 m as measured in the June and September events. The February measurement at this depth was higher at about 10 %. Considering the elevated temperature (i.e. high oxidation rate) the oxygen profile is indicative of advective flow of air through the waste rock dump. This is also consistent with the fumaroles observed in the vicinity of the boreholes, as shown in Appendix F.3.

In the 30M1 borehole, located outside the sulphide cell, the temperature profile is similar to that observed within the sulphide cell, with temporal effects observed to a depth of about 5.6 m (Figure 4.7). Similar to the 60M1 borehole profile, the maximum temperature is observed at a depth of 20 m. The maximum temperature however is lower at about 36 °C. The results further show that the temperature at a depth 20 m is increasing. It has increased from 34.7 °C in February 2003 to 36 °C in September 2003 (an increase of 1.3 °C). In comparison, the temperature at a depth of 10 m increased by 0.4 °C and at a depth of 30 m the increase was 0.1 °C over the corresponding period. The oxygen concentration remains elevated within the oxidation zone (15 to 20 %), which is consistent with advective flow of air through the dump.

4.1.6 Seepage Monitoring

Historical Data

Locations of the routine seepage monitoring stations are shown in Figure 3.1. Data for these stations are available in the EQwin database maintained by GLL. Graphs of key parameters are provided in Figures 4.8 to 4.13.

Station X23

Station X23 is located east of the mill, in the original Faro Creek channel, below the East Main Dump, the Oxide Fines Stockpile, and the Medium Grade Stockpile. 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 4.8. Results from SRK's seepage samples FD10, FD12 and FD31, which are located immediately upstream of X23 were included in these graphs.

Sulphate concentrations increased in stages, from less than 2000 mg/L in 1986 to approximately 6000 mg/L in 2000/2001, and then decreased to approximately 4000 mg/L in 2002 and 2003 (Figure 4.8). The peak in sulphate concentrations corresponded to a slight decrease in pH from an average of approximately 7 to an average of approximately 6.5, changes in the major ion chemistry from calcium dominated to magnesium dominated, and peak concentrations of iron (200 mg/L), zinc (1000 mg/L), and several other metals (e.g. aluminum, cadmium, cobalt, and copper). Metal

concentrations have since decreased slightly (e.g. zinc 200 mg/L, iron 40 mg/L). However, continued monitoring is needed to evaluate whether the seepage chemistry has stabilized.

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. Results from this station are shown in Figure 4.9.

Monitoring data showed an initial decrease in sulphate concentrations over the first two years of monitoring (1991 to 1993), followed by a gradual and relatively steady increase over the past 10 years of monitoring. pH's have been relatively stable, in the range of 6 to 6.5. Zinc concentrations have increased from approximately 50 to 100 mg/L, and iron concentrations have followed a similar trend. Concentrations of cadmium and copper appear to have decreased slightly over the last few years.

There is a weak 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 likely that there is some stratification of concentrations in the flooded zone of the pit.

Station FCO/A30

Station A30 (SRK-FD40) is located along the north wall of the pit, below the Faro Valley Dump. The current location is accessed by hiking down from the Faro Valley Dump. In earlier years, the station was a sump, which may have received drainage from other seepage along the pit walls. 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, which contact rock along the base of the pile. Results for these two stations (including data from SRK-FD40) are provided in Figure 4.10.

Sulphate concentrations in Station A30 increased from approximately 200 mg/L in 1989 to 600 mg/L in 1997, remained in this range to 2001, and then decreased to approximately 300 mg/L in the last two years of monitoring. pH's decreased from pH 7.5 in 1989 to pH 3 in 1998. More recent samples have had erratic pH's, ranging from 3 to 7.5. Zinc and iron concentrations followed similar trends to sulphate, reaching peaks of approximately 100 mg/L and 10 mg/L respectively in 1998. Continued monitoring is needed to evaluate whether the seepage chemistry has stabilized.

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 are thought to be due to leakage from the Faro Creek Diversion. Results for this station are provided in Figure 4.11.

Sulphate concentrations range from 200 mg/L to 1000 mg/L, and have been variable, without any trends throughout the monitoring period (1989 to 2003). Zinc concentrations have ranged from approximately 2 mg/L to 10 mg/L, and calcium, magnesium, and zinc concentrations have been strongly correlated with sulphate. Variations in concentrations appear to be weakly related to flows, with lower concentrations occurring in the June samples, and higher concentrations occurring in the fall samples.

Station 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 was probably sampled close to the toe of the dump. Therefore, it is likely that this station is equivalent to SRK-FD05 and 06. 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 till in that area. Results for all three stations are provided in Figure 4.12. Data from SRK-FD05 and FD06 are shown in the W5 graphs.

Sulphate concentrations in W5 have increased from approximately 300 mg/L in 1989 to 800 mg/L in 2002. Zinc concentrations have increased from approximately 1 mg/L in 1987/88 to approximately 3 mg/L in 2002/03. pH's during this period were neutral, and concentrations of other metals were generally low.

Sulphate concentrations in NE2 have increased from approximately 100 mg/L in 1997 to approximately 600 mg/L in 2003. Metal concentrations at this station have been low 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 FD 16), and W10 are provided in Figure 4.13.

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

2002/2003 Data

The results of the 2002 and 2003 seepage surveys are presented in Appendix G. Select parameters (ranges of pH, conductivity, flow, sulphate and zinc concentrations for the period of record) are provided in Figure 3.1.

Seeps associated with the Faro Waste Rock Dumps showed a wide range of pH and zinc concentrations. For convenience, seepage data from the Faro Waste Rock Dumps were divided into three distinct types on the basis of pH and zinc concentrations.

- Type 1 seeps had pH's of greater than 6.5 (typically greater than 7), and zinc concentrations of less than 5 mg/L. Other trace metals (eg. aluminum, iron, manganese) were low or below detection limits.
- Type 2 seeps had pH's typically between 6 and 7, and variable zinc concentrations ranging from 4 to 595 mg/L. Cadmium, cobalt, iron, manganese, and nickel were also elevated in several of the samples.
- Type 3 seeps typically had pH's of less than 6, zinc concentrations typically greater than 40 mg/L, and as high as 10,900 mg/L. Aluminum, cadmium, cobalt, copper, iron, manganese, and nickel concentrations were also high in several of these samples.

These water types are shown in coloured boxes in Figure 3.1. Statistical summaries of the data within each of these grouping are presented in Table 4.6. Table 4.7 lists the seepage stations by each of the above types. It should be recognized that these seepage types are somewhat transitional and some overlap between the categories is possible. Further discussion of the significance of the water types is provided in Section 5.5.

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

Table 4.7 Characteristics of Faro Water Types

Parameter	Detection Limits	Type 1					Type 2					Type 3				
		Average	Median	Min	Max	N	Average	Median	Min	Max	N	Average	Median	Min	Max	N
pH		7.85	7.85	7.32	8.37	25	7.14	7.32	4.86	7.76	36	4.02	3.51	2.33	7.32	28
Acidity pH 8.3	mg/L	11	11	1	29	25	204	61	15	2160	36	6272	545	27	49500	28
Alkalinity Total as Chloride	mg/L	137	155	30	242	25	167	84	4	407	36	12	1	1	92	28
Sulphate	mg/L	1.3	1.1	0.5	2.7	25	4.4	1.8	0.5	17.5	36	51.3	0.6	0.5	1050	28
	mg/L	467	382	5	2470	25	2280	1905	334	4600	36	7701	2190	69	59000	28
Calcium	mg/L	105	104	10.0	263	25	344	311	49	628	36	225	240	6.5	504	28
Magnesium	mg/L	74	53	1.5	378	25	307	215	37	694	36	384	201	3.8	3210	28
Potassium	mg/L	4.9	3.0	2	24	25	9.3	9.0	2	17	36	6.9	5.0	2	20	23
Sodium	mg/L	19.2	6.0	2	122	25	25	17	3	122	36	11	5.5	2	50	24
Aluminum	mg/L	0.2	0.2	0.2	0.2	25	0.3	0.2	0.2	1.6	36	90	9.2	0.2	986	28
Cadmium	mg/L	0.01	0.01	0.01	0.01	25	0.07	0.02	0.01	0.62	36	2.6	0.23	0.01	15.5	28
Cobalt	mg/L	0.01	0.01	0.01	0.01	25	0.15	0.06	0.01	0.53	36	2.1	0.3	0.01	20	28
Copper	mg/L	0.01	0.01	0.01	0.01	25	0.05	0.02	0.01	0.5	36	39	2.4	0.03	559	27
Iron	mg/L	0.03	0.03	0.03	0.03	25	11	1.16	0.03	89.9	36	1136	37	0.03	15100	28
Lead	mg/L	0.05	0.05	0.05	0.15	25	0.07	0.05	0.05	0.23	36	0.52	0.27	0.05	2	24
Manganese	mg/L	0.07	0.01	0.005	0.42	25	16	3.8	0.04	54	36	159	13	0.16	2360	28
Nickel	mg/L	0.05	0.05	0.05	0.09	25	0.29	0.16	0.05	0.9	36	1.9	0.53	0.05	15	27
Zinc	mg/L	1.6	1.3	0.01	5	25	91	29	3.88	595	36	1740	140	2.2	10900	28

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

2) Detection limits were used for statistical purposes when values were less than detection. Where detection limits were elevated due to high ionic strength, non-detect results were excluded from statistical calculations.

Table 4.8 Seepage Stations Classified by Water Type

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

The Type 2 seeps included samples from several different areas, including ore and low grade ore stockpiles (FD01, 10, 12, 31 and 38), the West Main Dump (FD10, 12, 30 and 31), the Lower Northwest Dump (FD19), seeps entering the pit below the Northeast Dumps (FD21, 22, 23, 24, 26 and 27; spring survey only), and seeps in the mill area (FD32 and 35). A common element of all these areas is the presence of sulphides or oxidized schist. Samples from below the Low Grade Stockpile C (FD38, Zn = 595 mg/L), and from the mill area (FD32, Zn = 581 mg/L) contained the highest zinc concentrations. Samples from along the original Faro Creek channel (FD10, 12 and 31) had zinc concentrations in the range of 220 mg/L, and were likely influenced in part by ore stockpiles upstream of this location. Type 2 samples outside of the influence of the ore stockpiles and mill area had zinc concentrations typically below 30 mg/L.

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

Geochemical equilibrium modelling was completed on a few seeps representing each of the above water types. The purpose of the equilibrium modelling was to identify whether the seepage chemistry is controlled by equilibrium with secondary minerals. Results of the modelling are provided in Table 4.8. Saturation indices (SI) of greater than zero indicate the water is chemically saturated with respect to a given secondary mineral (i.e that it could be present along the flowpath, or could form given sufficient time), SI's close to zero indicate the water is in chemical equilibrium, and SI's of less than zero indicate that the mineral is unlikely to form. General observations from the Faro modelling were as follows:

- Type 1 seeps were saturated with respect to several aluminum hydroxide minerals, barite and ferrihydrite. Calcite was saturated in one of the samples and close to saturation in the other. Zinc carbonate was slightly undersaturated in both samples.
- Type 2 seeps were saturated with respect to several of the aluminum hydroxide and sulphate minerals, barite (barium sulphate), gypsum (CaSO_4), ferrihydrite, rhodochrosite (manganese carbonate), potassium jarosite, and zinc carbonates. Cadmium, copper, and lead minerals were notably undersaturated.
- The Type 3 seeps were saturated with respect to potassium jarosite and barite. Gypsum was slightly undersaturated in three of the samples.

Table 4.9 Geochemical Modelling Results – Faro

Parameter	Units	Type 1		Type 2			Type 3			
		FD06 6/12/2002	FD14 9/12/2002	FD10 6/12/2002	FD19 6/6/2003	FD24 6/13/2002	FD13 9/12/2002	FD36 9/11/2002	FD37 9/11/2002	FD40 6/6/2003
pH	mg/L	7.21	7.78	6.17	7.32	6.95	4.52	2.75	2.44	3.35
Redox	mV	217	275	87	444	71	400	521	438	738
Alkalinity Total as CaCO3	mg/L	209	137	350	407	88	12	-1	-1	-1
Sulphate	mg/L	382	2470	4380	3670	710	2090	2810	16500	379
Aluminum	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	0.3	38.9	117	4.1
Barium	mg/L	0.02	-0.01	0.02	0.04	-0.01	-0.01	-0.01	-0.3	0.03
Cadmium	mg/L	-0.01	-0.01	0.05	-0.01	0.03	0.1	0.23	12.6	0.06
Calcium	mg/L	112	263	538	584	138	268	250	268	23.2
Copper	mg/L	-0.01	-0.01	-0.01	-0.01	0.03	0.12	4.2	133	0.53
Iron	mg/L	-0.03	-0.03	37	0.07	2.47	0.45	274	1780	3.91
Lead	mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	0.31	1.17	-2	0.08
Magnesium	mg/L	85.3	378	686	536	90.4	319	120	310	47.1
Manganese	mg/L	0.036	0.014	54	16.1	2.46	12.6	13.6	166	3.19
Nickel	mg/L	-0.05	0.09	0.66	0.27	0.11	0.76	1.05	5	0.1
Potassium	mg/L	4	21	17	9	4	13	5	-60	-2
Sodium	mg/L	7	119	69	18	4	36	6	-60	2
Strontium	mg/L	0.466	3.75	3.86	2.95	0.449	1.01	0.7	0.5	0.118
Zinc	mg/L	2.79	4.95	215	40.8	26.8	96.5	151	6130	38.9
NAME	Components	Sat. Index								
ARAGONITE	Ca, CO3	-0.563	-0.137	-1.139	0.138	-1.046	-4.083			
CALCITE	Ca, CO3	-0.32	0.062	-0.916	0.382	-0.842	-3.878			
DOLOMITE (O)	Ca, Mg, CO3	-0.819	0.412	-1.685	0.683	-1.763	-7.575			
MAGNESITE	Mg, CO3	-0.962	-0.174	-1.261	-0.16	-1.438	-4.212			
STRONTIANITE	Sr, CO3	-2.204	-1.286	-2.556	-1.41	-2.833	-5.802			
GYPSUM	Ca, SO4	-1.016	-0.296	0.061	0.096	-0.758	-0.318	-0.545	-0.2	-1.621
BARITE	Ba, SO4	0.378	0.181	0.588	0.95	0.077	0.183	0.11	1.725	0.613
CELESTITE	Sr, SO4	-1.74	-0.459	-0.41	-0.535	-1.568	-1.063	-1.428	-1.233	-1.256
ALOH3(A)	Al	0.412	-0.471	-0.522	0.29	0.313	-3.993	-8.222	-8.658	-6.919
BOEHMITE	Al	2.532	1.685	1.615	2.409	2.465	-1.842	-6.083	-6.496	-4.8
Al2O3	Al	2.769	-0.176	0.387	2.556	1.537	-7.031	-15.105	-16.645	-11.879
GIBBSITE(MC)	Al	1.988	1.06	1.034	1.867	1.849	-2.455	-6.67	-7.131	-5.343
ALOH3O4	Al, SO4	-1.047	-3.048	0.588	-0.655	-0.911	-0.422	-0.578	-0.283	-0.6
AL4(OH)10SO4	Al, SO4	11.646	5.226	9.705	11.717	9.934	-2.43	-14.696	-16.722	-9.878
ALUNITE	Al, SO4	5.674	2.557	7.757	6.72	6.04	0.939	-6.209	-5.001	-4.922
FERRIHYDRITE	Fe3+	2.525	2.274	1.83	2.946	3.067	0.811	-0.923	-1.788	-0.412
FE3(OH)8	Fe3+	0.422	-1.924	1.739	1.454	4.801	-5.501	-10.934	-11.665	-10.052
JAROSITE H	Fe3+, SO4	-10.124	-10.705	-6.02	-7.895	-5.916	-3.188	-1.024	-0.786	-3.407
JAROSITE K	Fe3+, SO4, K	-1.649	-1.52	1.74	0.993	1.825	2.821	2.722	3.412	0.924
SIDERITE (P)	Fe2+, CO3	-4.345	-6.95	-0.437	-4.072	-0.984	-5.48			
SIDERITE (C)	Fe2+, CO3	-3.727	-6.394	0.154	-3.452	-0.421	-4.915			
RHODOCHRO(C)	Mn, CO3	-1.341	-1.679	0.626	1.326	-0.059	-2.643			
RHODOCHR(SY)	Mn, CO3	-1.992	-2.361	-0.038	0.677	-0.738	-3.32			
CD(OH)2 (C)	Cd	-6.635	-5.826	-8.476	-6.839	-6.759	-10.893	-14.583	-13.739	-13.545
OTAVITE	Cd, CO3	-1.161	-1.228	-1.851	-1.277	-1.32	-4.157			
CU(OH)2	Cu	-3.188	-2.469	-4.755	-3.247	-2.551	-6.144	-8.776	-7.83	-8.263
TENORITE	Cu	-2.167	-1.448	-3.734	-2.226	-1.531	-5.124	-7.755	-6.807	-7.242
MALACHITE	Cu	-3.516	-3.195	-5.605	-3.542	-2.49	-8.369			
NI(OH)2	Ni	-1.642	-1.177	-2.58	-0.975	-2.04	-5.44	-9.153	-9.607	-8.226
PB(OH)2 (C)	Pb	-2.687	-1.503	-4.33	-2.797	-2.527	-5.951	-9.463	-9.983	-9.185
CERRUSITE	Pb, CO3	-0.5	-0.612	-1.175	-0.511	-0.743	-2.854			
ANGLESITE	Pb, SO4	-2.886	-2.589	-1.859	-2.488	-2.288	-0.927	-0.44	-0.098	-1.608
ZN(OH)2 (E)	Zn	-1.868	-0.759	-2.408	-0.851	-1.418	-5.474	-9.341	-8.577	-8.321
SMITHSONITE	Zn, CO3	-0.916	-0.587	-0.264	0.186	-0.417	-3.179			
ZNCO3, 1H2O	Zn, CO3	-0.382	-0.151	0.227	0.721	0.031	-2.728			

4.2 Vangorda Plateau Site

4.2.1 Composition of Waste Rock Dumps

The main finding from SRK's surface mapping of the Grum Waste Dump (SRK 2003) was that the various phyllites are dominant but mixed sulphide rock occasionally occurs up to a few percent on surface. Mapping along the upper lift in the general location of the sulphide cell indicated local exposures of high concentrations of sulphide rock (10% to 100%). This suggests either that the sulphide cell was not completely encapsulated or that segregation of rock types was not efficient.

Limited surface mapping and test pits in the Vangorda Dump confirmed the widespread presence of blocky siliceous massive to semi-massive sulphide waste rock. Carbonates in this rock were iron stained. A small area of the dump contains "baritic fines", which comprise strongly acidic fines screened from the oxidized part of the ore zone.

4.2.2 Static Geochemical Characteristics

ICAP and SRK Test Pit Static Geochemical Databases

- **Form of Sulphur**

Metal analysis for samples collected during the ICAP and SRK sampling programs indicate that elevated lead and zinc concentrations are primarily associated with the sulphide waste types. In the other rock types, median concentrations are less than 500 mg/kg (Table 4.10) indicating that sulphur concentrations associated with these minerals are relatively insignificant when compared to sulphur associated with pyrite.

The proportion of sulphate relative to total sulphur is relatively low (between 0.1% and 10%) with the majority between 1% and 10% (Figure 4.1). The correlation between pH and sulphate sulphur content is weak mainly because the pH of most samples is between 6 and 8. Sulphide waste samples showed that pH and sulphate concentrations are correlated.

Table 4.10 Summary of Metal Concentrations by Rock Type

Doc	Area	Rock Type	n	Ag (mg/kg)					As (mg/kg)					Cd (mg/kg)					Cu (mg/kg)					Fe (%)					Pb (mg/kg)					Zn (mg/kg)					
				P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	
ICAP	Grum	4	Sulphide	4	3.0	13.6	14.0	25.5	11.8	81	407	410	741	315	0.1	12.5	13.0	26.5	14.9	122	194	213	331	103	4.8	5.4	5.5	6.3	0.7	2280	6354	6228	10000	4360	4360	10000	8341	10000	3318
SRK 2002	Grum	4	Sulphide	3	10.3	28.0	29.9	50.7	22.5	601	1030	1448	2587	1161	-1	1	4	10	6	178	442	833	1762	943	6.1	8.4	9.8	14.3	4.7	7728	18600	19307	31380	13150	16070	35900	38089	61640	25387
ICAP	Grum	5A	Carb Phyllite	4	0.8	0.9	2.2	5.4	2.7	1	108	146	344	178	0.1	0.1	0.1	0.1	0.0	29	52	79	166	73	3.6	3.9	4.2	5.4	0.9	56	60	672	2143	1226	97	115	2581	8518	4946
ICAP	Grum	5B+5D	Calcs+Chlor Phyllite	9	0.1	0.1	1.4	5.6	2.7	1	87	121	415	186	0.1	0.1	0.1	0.1	0.0	24	31	42	95	33	2.7	3.1	3.5	5.0	0.9	56	92	460	2076	1090	89	150	1300	6257	3267
SRK 2002	Grum	5B+5D	Calcs+Chlor Phyllite	8	-0.2	0.0	0.7	3.5	1.9	15	35	57	184	70	-1	-1	1	1	1	29	45	49	107	32	3.9	4.2	4.1	5.8	0.8	70	182	571	2614	1288	161	326	1085	4855	2293
SRK 2002	Grum+Van	5A	Carb Phyllite	3	0.2	0.2	1.2	2.9	1.7	8	39	123	296	176	-1	2	3	4	3	46	73	81	122	42	3.7	5.0	4.7	5.4	0.9	95	607	979	2123	1172	755	2903	3532	6750	3375
ICAP	Vangorda	4	Sulphide	3	13.1	16.7	16.6	20.1	3.9	4	27	446	1182	748	0.1	0.1	7.8	21.0	13.4	841	2488	1884	2503	1061	9.1	15.0	12.8	15.0	3.8	7738	8504	8719	9850	1188	8939	10000	9607	10000	681
SRK 2002	Vangorda	4	Sulphide	3	3.9	8.8	13.1	25.4	12.5	421	740	943	1609	683	-1	-1	1	1	1	824	1418	2630	5284	2691	8.9	12.3	11.9	14.7	3.3	3434	8381	10722	19648	9233	8120	10948	13085	19545	6611

- **Form of Neutralization Potential**

Total neutralization potential and carbonate content are positively correlated but carbonate content exceeds neutralization potential in all but one sample (Figure 4.3). The average difference between the two measurements is about 50 kg CaCO₃/t but the difference is unrelated to total NP and varies from near 0 to over 100 kg CaCO₃/t.

Comparison of NP and paste pH shows that pH is below 5 for samples with NPs as high as 23 kg CaCO₃/t, though a more typical value is 14 kg CaCO₃/t.

- **Size Fraction Analysis**

Analysis of size fractions for test pit samples showed that sulphur was not preferentially fractionated into either the coarse or fine size fraction (Figure 4.4). However, NP in the coarse fraction was greater than in the fine size fraction at NP greater than 100 kg CaCO₃/t (Figure 4.4). At lower NP, the difference between fractions decreased. This did not appear to affect the overall classification in terms of acid generation for individual materials (Figure 4.4) but this difference may be a factor in assessing the overall neutralization potentials of waste rock mixtures.

Characteristics by Rock Type

Table 4.10 summarizes acid-base accounting statistics by rock type for all historical data including the core sampling for the IEE, the ICAP database and the current SRK database. Table 4.11 summarizes SRK's field test results (rinse pH and electrical conductivity) on a rock type basis. Data were grouped according to major rock types (non-calcareous phyllite, sulphide waste, and calcareous phyllite. Where possible, the latter group was also sub-divided according to the minor groups chloritic phyllite and carbonaceous or graphitic phyllite.

To allow direct comparison of datasets, only total sulphur concentrations are shown. Comments on each rock type are provided below:

- **Non-Calcareous Phyllite – Unit 3**

Sampling of the non-calcareous phyllite (Unit 3) has been limited. Core samples collected for the IEE showed that this unit contains low uniform sulphur concentrations (median 0.4%) and neutralization potential (median 14 kg CaCO₃/t). At least in theory, this unit has marginal potential for acid generation. Five samples collected from test pits during the ICAP and SRK surveys indicated variable characteristics. Two samples indicated sulphur concentrations consistent with the IEE, but higher NP. Three samples showed higher concentrations (1 to 2%) and variable NP. A field contact pH of 2.2 was obtained for one sample containing some sulphide waste but other pHs were near 7 (Table 4.8).

- **Sulphide Waste – Unit 4**

The IEE database indicated consistent elevated sulphur concentrations of around 5%, with some samples up to near 50% indicating massive pyrite. The database includes results for ribbon-banded graphitic sulphide, quartz-rich sulphide and altered phyllite. The sulphide waste contains highly variable NP when fresh (Table 4.7) but is consistently potentially acid generating. Test pit samples confirmed these characteristics. Field contact pHs ranged from 2.2 to 7.0 with a median of 5.3. Laboratory paste pHs showed consistent median pHs above 5 and low values not exceeding 4.0.

- **Carbonaceous Phyllite – Unit 5A**

Carbonaceous phyllite is a distinctive black shale unit with the lighter grey and green calcareous phyllite. Median total sulphur concentrations were consistently between 1 and 2% but sulphur concentrations typically exceed 2%. NP in the unit is elevated (median around 30 kg CaCO₃/t) but overall the unit is potentially acid generating. Contact tests indicated that some components of the waste are already acidic, but the unit is mostly non-acidic.

- **Calcareous Phyllite – Unit 5B**

The IEE dataset for Grum contains twelve results for calcareous phyllite. The sulphur content of the unit is low (median 0.3%) and the NP is high (median 125 kg CaCO₃/t) indicating that it is not potentially acid generating but has significant acid buffering capacity. One low field contact pH reading was obtained but this sample contained some sulphide waste.

- **Chloritic Phyllite – Unit 5D**

Due to the nature of the unit it is not easily distinguished from calcareous phyllite in waste rock. Statistics were therefore grouped. The median sulphur content of this unit is low (less than 0.6%) and the NP is typically high (near 100 kg CaCO₃/t). The results for samples from the Vangorda Pit area showed much lower NP (median 8 kgCaCO₃/t). The geological description in the database for these samples was vague and suggests that in fact the samples were non-calcareous phyllite (Unit 3).

Table 4.11 Summary of Acid-Base Accounting Characteristics by Rock Type

Doc	Area	Sample	Rock Type	S,%							NP					NNP					NP/AP			Paste pH				
				n	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	Mean	P95	s	P5	P50	P95	P5	P50	Mean	P95	s	
IEE	Grum	Core	3	Non-calc Phyllite	7	0.1	0.4	0.4	0.6	0.2	12	16	28	54	19	-5	1	16	46	23	0.8	1.1	44.4	7.7	7.9	8.0	8.3	0.2
ICAP	Grum	WRD	3		1																							
SRK 2002	Grum	WRD	3		1																							
SRK 2002	Vangorda	WRD	3		3	0.4	0.4	0.9	1.7	0.8	19	64	54	81	36	-25	54	31	70	56	0.9	6.1	3.8	4.8	8.7	7.5	9.4	2.7
IEE	Grum	Core	4	Sulphide	20	0.3	4.5	14.7	47.5	18.7	4	26	28	69	20	-1477	-99	-431	7	582	0.0	0.2	2.0	5.4	7.3	7.0	8.4	1.1
IEE	Vangorda	Core	4		11	0.5	5.8	10.9	33.7	12.6	4	8	26	111	61	-944	-178	-316	-6	352	0.0	0.1	0.6	5.6	6.6	6.8	8.0	0.9
ICAP	Grum	WRD	4		4	2.8	4.7	4.6	6.2	1.8	19	28	33	52	17	-167	-113	-111	-52	61	0.1	0.2	0.5	5.8	6.4	6.4	6.8	0.5
ICAP	Vangorda	WRD	4		3	9.6	22.6	19.5	27.3	10.2	-34	-25	20	106	87	-746	-731	-590	-334	259	-0.1	0.0	0.1	5.4	5.5	5.9	6.7	0.8
SRK 2002	Grum	WRD	4		3	3.4	8.0	11.8	22.9	11.3	4	14	20	41	21	-702	-231	-343	-63	368	0.1	0.3	0.3	5.5	5.7	6.1	7.0	0.9
SRK 2002	Vangorda	WRD	4		3	4.4	9.3	11.1	19.1	8.3	0	25	18	31	18	-578	-261	-318	-99	271	0.1	0.2	0.1	4.0	5.9	5.4	6.4	1.4
IEE	Grum	Core	5A	Carb Phyllite	7	0.5	1.4	1.3	2.3	0.7	14	29	27	37	9	-45	-7.5	-14	14	24	0.3	0.8	1.9	7.3	7.4	7.6	8.2	0.4
IEE	Vangorda	Core	5A		3	1.7	1.8	1.9	2.1	0.2	31	34	35	40	5	-31	-25	-23	-14	10	0.5	0.5	0.7	7.8	7.8	7.9	8.0	0.1
ICAP	Grum	WRD	5A		4	0.6	0.7	1.6	3.8	1.9	11	32	58	139	67	-74	-9	8	114	92	0.4	0.6	6.8	7.4	7.7	7.7	7.9	0.2
SRK 2002	Grum+Var	WRD	5A		3	1.0	1.2	1.3	1.6	0.4	18	29	33	50	18	-29	-7	-3	25	30	0.4	0.8	0.9	6.7	6.8	7.2	8.0	0.8
IEE	Grum	Core	5B	Calc±Chlor Phyllite	12	0.0	0.3	0.3	0.8	0.3	12	125	114	229	76	-8	118	104	227	82	1.0	14.7	140.7	7.9	8.3	8.2	8.6	0.3
IEE	Vangorda	Core	5B+5D		9	0.2	0.6	0.6	1.1	0.3	3	8	26	107	54	-23	-9.2	7	100	60	0.2	0.4	56.4	5.5	7.5	7.3	8.3	1.2
ICAP	Grum	WRD	5B+5D		9	0.3	0.4	0.7	1.9	0.8	49	166	145	191	58	6	146	123	179	68	1.0	11.5	17.1	7.5	7.9	7.8	8.1	0.2
SRK 2002	Grum	WRD	5B+5D		9	0.2	0.3	0.9	2.6	1.0	20	87	73	107	33	-53	64	45	97	58	0.5	8.2	4.8	6.8	7.8	7.7	8.2	0.6

Note:

1. SRK Paste pHs are field rinse pH measurements

2. NP - Neutralization Potential, AP - Acid Potential; NNP = NP-AP

Table 4.12 Summary of Field Contact Test Results for Surface Samples

Area(s)	Primary Rock Type	Statistic	pH s.u.	EC mS/cm
Grum, Vangorda	3G0 (Non-Calcareous Phyllite)	Minimum	7.8	0.4
		Median	7.2	2.0
		Maximum	2.2	5.8
		Number	5	5
Grum, Vangorda	4 (Sulphide Rock Types)	Minimum	7.0	0.2
		Median	5.3	2.0
		Maximum	2.2	7.7
		Number	7	7
Grum, Vangorda	5A0 (Carbonaceous Phyllite)	Minimum	8.6	0.1
		Median	7.2	0.9
		Maximum	4.3	3.6
		Number	8	8
Grum, Vangorda	5B0 (Calcareous Phyllite)	Minimum	8.5	0.1
		Median	7.6	1.0
		Maximum	3.5	3.0
		Number	10	10
Grum	5D (Chlorite Phyllite)	Minimum	8.7	0.1
		Median	8.4	0.3
		Maximum	8.0	1.1
		Number	6	6
Vangorda	Till	Result	3.2	2.5
		Number	1	1

Deep In Situ Characteristics

Three holes were drilled in the Grum waste rock dumps. Hole 30M3 was targeted to intersect the sulphide waste rock cell. Within 4 m of the surface, sulphide waste rock was encountered with a total sulphur concentration of the 3.27% (Figure 4.14). Sulphur concentrations of up to 11.7% were present but typical sulphur concentrations were between 3 and 5%. Rinse pHs were typically near 7 except as low as 3.4 where sulphur concentrations were greatest. These zone also showed an increase of rinse from levels below 2000 $\mu\text{S/cm}$ to nearly 6000 $\mu\text{S/cm}$.

Hole 10M2 was also intended to intersect the sulphide cell, but sulphur concentrations were very low and indicated that the cell was not intersected. The hole could not be accurately spotted due to the lack of recent survey data.

Hole 10M3 was drilled at a location where only phyllite waste rock was expected. The results were very similar to 10M2. Sulphur concentrations were uniformly low (<0.6%) and rinse pHs were above 7. Rinse ECs were generally less than 1000 $\mu\text{S}/\text{cm}$ except at one location (1600 $\mu\text{S}/\text{cm}$).

Two holes were drilled in the Vangorda waste rock dump. Hole 10M4 intersected sulphide waste with sulphur concentrations of between 16 and 21% for 10 m (Figure 4.15). However, rinse pHs were consistently between 6 and 7 except for one interval with pH of 5.7 and one with pH of 7.4. Rinse ECs were very close to 2500 $\mu\text{S}/\text{cm}$ except at the end of the hole where they increased to 4050 $\mu\text{S}/\text{cm}$.

Hole 30M4 intersected several different types of waste rock including pyritic quartzite, non-calcareous phyllite, chloritic phyllite, calcareous phyllite and carbonaceous phyllite. Pyrrhotite was commonly present in the fines. Granitic material was intersected though this was not encountered in the Vangorda Pit suggesting that glacial till may have been present. Sulphur concentrations likewise varied from 12% in sulphide waste intersects to less than 2% where phyllites were dominant. Sulphur concentrations increased near the base of the hole along with a decrease in pH from near 8 to 4. The decrease in pH coincides with a decrease in sulphur content. However, the drill hole logs indicate abundant magnetic sulphides (ie pyrrhotite).

4.2.3 Extraction Tests

ICAP Database (n=18)

The ICAP database contains results for 11 phyllite samples, 2 sulphide samples and 5 chloritic phyllite samples. 15 schist samples, 20 sulphide samples, seven calc-silicates samples, and six intrusive samples (Table 4.13). Final leachates from all tests had pHs greater than 6. The phyllite samples release similar median sulphate concentrations near 300 mg/L and maximum concentrations around 1000 mg/L. The two sulphide rock samples yielded sulphate concentrations of 1500 and 2400 mg/L. The main difference in metal release was that the chloritic phyllite samples produced median zinc concentrations of 5 mg/L compared to 0.01 mg/L for phyllite. Zinc concentrations were much higher (up to 450 mg/L) for the sulphide rock types. Lead release was elevated (up to 6 mg/L) for the chloritic phyllite and sulphide samples.

The ICAP extraction tests indicated the following:

- Metal concentrations were negatively correlated with pH for Co, Pb, Mn, Zn, Ni,
- Strong inter-element correlations were indicated for Ca and SO_4 ; Mn, Zn and Cd; and Co and Ni.

Table 4.13 Summary of Results for Extraction Tests in the ICAP Database - Vangorda Plateau

Rock Type	24 hr pH su	24 hr EC uS/cm	Eh mV	Total Acidity mgCaCO3/L	Alkalinity mgCaCO3/L	SO4 mg/L	As mg/L	Cd mg/L	Ca mg/L	Pb mg/L	Mg mg/L	Ag mg/L	Zn mg/L
Chloritic Phyllite n=5													
P5	6.18	499	336	4.6	6.5	205	-0.20	-0.01	65	-0.03	20	-0.01	0.34
P50	6.85	704	358	12.0	10.0	387	-0.20	-0.01	93	0.12	38	-0.01	4.78
Mean	6.98	797	361	82.6	14.0	498	0.20	0.12	88	0.77	44	0.01	53.68
P95	7.80	1308	382	291.6	27.4	1033	-0.20	0.44	111	2.32	77	-0.01	197.00
Phyllite n=11													
P5	6.80	352	306	1	26	99	-0.20	-0.01	22	-0.05	16	-0.01	0.00
P50	7.87	540	321	3	29	283	-0.20	-0.01	68	-0.05	30	-0.01	0.01
Mean	7.65	645	357	4	38	367	0	0	99	0	39	0	1.66
P95	8.09	1449	427	11	61	1120	-0.20	0.03	310	0.13	95	-0.01	6.14
Sulphide n=2													
P5	6.10	1696	291	32.25	4.63	1511	-0.17	0.13	301	0.22	34	-0.02	26.19
P50	6.87	1997	305	277.50	14.75	1949	0.15	0.78	360	0.92	103	-0.02	226.94
Mean	6.87	1997	305	277.50	14.75	1949	0.35	0.78	360	0.92	103	0.02	226.94
P95	7.63	2297	318	522.75	24.88	2386	0.47	1.43	419	1.62	173	-0.01	427.69

SRK Database (n=13)

The SRK database includes one sample of till, two samples of non-calcareous phyllite, four samples of sulphide rock and five samples of calcareous phyllite (including carbonaceous and chloritic types) (Appendix E.5).

All samples except for one sample of sulphide rock fines (VTP11A) and one sample oxidized non-calcareous phyllite yielded near neutral pH water. Rock type comparisons are limited to sulphide rock and calcareous phyllite due to the limited number of non-calcareous phyllite samples.

Sulphide rock samples yielded higher concentrations than the phyllites for sulphate Al, Cd, Co, Cu, Fe, Pb, Mn, Ni and Zn.

Although leachate from the till sample was non-acidic, zinc and lead concentrations were elevated (3.6 mg/L, and 0.1 mg/L, respectively).

The extraction tests indicated the following:

- Metal concentrations were negatively correlated with pH for Co, Cu, Fe, Ni and Zn.
- Strong inter-element correlations were indicated for Ca and SO₄; and Mn, Zn and Cd.

4.2.4 Kinetic Geochemical Characteristics

IEE Dataset

A composite core sample each of phyllite and sulphide waste were tested for the IEE. The phyllite sample had an atypical sulphur concentration of 1.8% and a low NP (27 kg CaCO₃/t), indicating that the sample was potentially acid generating (Table 4.12). The sulphide sample had a typical sulphur concentration (16%) but a high NP (97 kg CaCO₃/t). No other characteristics are available for the samples. Each sample was tested with and without *Thiobacillus ferrooxidans* inoculation.

The non-inoculated phyllite sample showed erratic decrease in pH from 7.3 to 4.5 by the end of the test (Appendix D.4). This trend was accompanied by sulphate release that increased from near 100 to more than 200 mg/kg/week, then decreased to 80 mg/kg/week. Zinc release decreased through the test from 6 to 0.2 mg/kg/week. Lead release followed the same trend as sulphate and peaked at 0.4 mg/kg/week. The effect of inoculation was to produce a final pH near 3.5, and higher zinc and sulphate release. Lead release however was lower (between 0.01 and 0.1 mg/kg/week).

The non-inoculated sulphide sample showed a slow decline in pH from near 6 to 4.3. Sulphate release was generally lower than the phyllite sample, and generally remained near 100 mg/kg/week. Zinc release was between 10 and 100 mg/kg/week and lead release increased from less than 1 to a maximum of 2.6 mg/kg/week before declining to near 1 mg/kg/week. Inoculation resulted in a rapid

drop in pH from above 4 to 2.2, followed by a slow increase to near 3. Sulphate release peaked over 4000 mg/kg/week before declining to 42 mg/kg/week at the end of the test. Zinc declined from 341 to 1.7 mg/kg/week. Lead release was less than 0.001 mg/kg/week.

ICAP Dataset

Three samples were tested. Two samples were sulphide rock types with high sulphur concentrations. Sample VP/010 contained no neutralization potential. Sample GD/205+206 had a high NP of 108 kg CaCO₃/t. G1/03 was mixed sulphide rock and phyllite with total sulphur of 3.4% and neutralization potential of 56 kg CaCO₃/t. All three samples had NP/AP of less than 1 and were therefore potentially acid generating.

All three samples produced non-acidic leachate throughout the thirteen weeks of the test. Sulphate release decreased as the test proceeded in each case but the two sulphide waste rock samples stabilized at just below 100 mg/kg/week. The mixed sample (G1/03) stabilized near 20 mg/kg/week. Zinc release also decreased and stabilized in the range 0.3 to 0.8 mg/kg/week for all three tests. Release of other parameters declined as the test proceeded.

SRK Conventional Tests

SRK tested four test pit samples from the Grum Pit waste rock dumps and one sample from the Vangorda Pit waste rock dumps (Table 4.15). One sample was non-calcareous phyllite (GTP19A), two samples were carbonaceous phyllite (GTP19B, VTP06B), one sample was chloritic phyllite (GTP16B) and one sample was sulphide rock (GTP12A) with relatively low sulphur concentrations. Four samples had NP/AP less than 1. GTP16B had NP/AP of 1.1. Theoretically, all samples were potentially acid generating.

Four tests were stopped after 28 weeks. Sample VTP06B continued for 40 weeks.

All five samples generated leachates with pH generally above 7.5. Sample GTP16B showed increasing pH as the test advanced reaching 8.3 at the end of the test whereas the others remained below 8. This sample had the highest NP/AP and lowest sulphur concentration. Sulphate release decreased in all cases but stabilized by about the 10th week.

Parameters detected in the leachates frequently included Ba, Ca, K, Mg, Mn, Sr and Zn. Cadmium was only detected in the early stages of GTP12A. Concentrations of zinc and manganese typically decreased as the test proceeded.

Table 4.14 Characteristics of Historical Kinetic Test Samples – Vangorda Plateau

Year	Area	Sample ID	Rock Type	Total S %	NP kg CaCO ₃ /t	AP kg CaCO ₃ /t	NNP kg CaCO ₃ /t	NP/AP	As ppm	Cd ppm	Cu ppm	Zn ppm
1989	Vangorda	Sulphide Composite	Sulphide	15.59	97	487	-390	0.20	-	-	-	-
1989	Vangorda	Phyllite Composite	Phyllite	1.83	27	57	-30	0.48	-	-	-	-
1996	Vangorda	VP/010	2	22.60	0	706	-706	0.00	3960.00	0.10	2860.00	9652
1996	Grum	G1/03	Mixed S and Phyllite	3.40	56	106	-50	0.53	394	0.1	193	13600
1996	Grum	GD/205+206	?	9.20	208	288	-80	0.72	323	5.8	436	8891

1. NP - Neutralization Potential, AP - Acid Potential; NNP = NP-AP

Table 4.15 Characteristics of SRK Humidity Cell Samples – Vangorda Plateau

LAB ID	Field ID	Location	Rock Type	Feed Water	Duration weeks	Paste pH	S(T) %	S(SO4) %	S(S2-) %	S in ZnS %	S in PbS %	S in CaSO4 %	S in FeS2 %	AP kg CaCO3/t	NP kg CaCO3/t	NNP kg CaCO3/t	NP/AP	TIC %	Carbonate NP	CO3NP/AP	As ppm	Cd ppm	Cu ppm	Zn ppm
Cell 5	70999	GTP16B	5D	DI	25	8	1.10	0.03	1.07	0.02	0.00	0.03	1.05	33	35	2	1.1	1.7	142	4.24	140	<1	92	335
Cell 7	70783	GTP19A	3	DI	25	7.9	1.85	0.03	1.82	0.32	0.05	0.03	1.45	57	50	-7	0.9	1.1	90	1.58	551	1	114	6607
Cell 9	70784	GTP19B	5A	DI	25	7.9	1.17	0.03	1.13	0.03	0.00	0.03	1.11	35	29	-7	0.8	0.9	77	2.18	5	2	43	516
Cell 10	70993	GTP12A	4	DI	25	7.7	2.86	0.05	2.81	0.68	0.10	0.05	2.03	88	44	-44	0.5	1.3	112	1.27	553	1	149	13867
Cell 11	70961	VTP06B	5A	DI	25	7.5	1.67	0.10	1.57	0.35	0.04	0.10	1.18	49	17	-32	0.4	0.5	42	0.85	325	<1	127	7177
S Comp				DI	20	3.00	20.30	2.40	17.90	0.49	0.15	2.40	17.26	559	-29	-589	-0.1	0.0	1	0.00	465	<1	1605	10000
G2	70799	GTP27A	5B	SC	20	8.2	0.22	-0.01	0.21	0.02	0.00	-0.01	0.21	7	54	47	7.5	0.8	63	8.70	35	<1	29	431
G3	70799	GTP27A	5B	G2	20	8.2	0.22	-0.01	0.21	0.02	0.00	-0.01	0.21	7	54	47	7.5	0.8	63	8.70	35	<1	29	431
V2	70953	VTP02B	5A	SC	20	7.7	0.99	0.22	0.77	0.14	0.01	0.22	0.62	24	28	4	1.2	1.6	136	5.61	39	5	73	2903
V3	70953	VTP02B	5A	V2	20	7.7	0.99	0.22	0.77	0.14	0.01	0.22	0.62	24	28	4	1.2	1.6	136	5.61	39	5	73	2903

Notes

1. NP - Neutralization Potential, AP - Acid Potential; NNP = NP-AP

2. TIC - Total Inorganic Carbon

SRK Sequential Columns

Results for the Grum sequential column constructed using chloritic phyllite showed that the first stage column receiving the acidic water from the sulphide composite initially produced pH 8 water but quickly decreased to near 3 (compared to 2.5 for the acidic water) but then recovered to 7.8 as the acidity of the acidic feed water decreased (Figure 4-16). The highest pH occurred as the acidity of the feed water began to increase again. The third stage column showed a less pronounced pH decrease and longer recovery. However, as the acidity of the feed water increased further the pH of both receiving columns decreased below 3 and were only marginally above the feed water. The increase in pH in the second stage column did not coincide with a significant difference in the zinc concentration leaving the second stage. The third stage however did show a decrease in zinc from over 500 mg/L to less than 200 mg/L. This difference decreased as the pH of the final effluent decreased. A similar pattern was observed for sulphate. Manganese increased as the acidic water passed through the columns. Initially, lead concentrations in the effluents from the receiving columns were lower than the feed acidic water but later in the test, lead concentrations were greater in the final effluent compared to both the acidic water and final effluent,

The Vangorda column was constructed using carbonaceous phyllite. Results were similar to the Grum test though the initial recovery of pH in the receiving columns was weaker reaching only 6 before decreased to less than 3 (Figure 4-17). The receiving columns did not show any change in zinc concentrations though manganese increased with passage through the columns. The effect on lead concentrations was comparable to Grum except that the highest lead concentrations were observed in the second stage column.

4.2.5 Thermal and Gas Monitoring

Grum Waste Rock

Three boreholes in the Grum waste rock dump were instrumented for pore gas and temperature monitoring. Boreholes 10M2 and 30M3 were installed in areas suspected to be within the sulphide cell, and borehole 10M3 was located outside the sulphide cell. The gas and temperature monitoring results are provided in Appendix F.3 and are illustrated in Figure 4-18

The temperature results for borehole 30M3 indicated temporal effects down to a depth of about 5.6 m. The maximum temperature of about 12 °C occurs at a depth of about 20 m. The oxygen concentration in the pore gas decreases with depth, to less than 5 % at or below a depth of 20 m, which corresponds with the maximum observed temperature.

The temperature in both the 10M2 and 10M3 boreholes is less than 5 °C below the temporal influence zone. The oxygen in the pore gas is depleted to less than 15 % at a depth greater than about 3 m, which, together with the low temperatures at depth, is indicative of a low rate of oxidation in the waste rock in the vicinity of these boreholes.

Vangorda Waste Rock

The two boreholes located in the Vangorda waste rock, 10M4 and 30M4, were instrumented to depths of 10 and 30 m respectively. The monitoring results are provided in Appendix F.3, and are illustrated in Figure 4-19

The temperature results indicate temporal effects to a depth of about 6 m. The maximum temperature recorded for the 30M4 borehole was about 17 °C at a depth of 20 m. Although oxygen concentrations in pore gas decreases to below 5 % at a depth of 5.6 m, it increases to above 5 % at a depth of 10 m. This increase suggests lateral advective flow of air into the dump that enters from the side of the dump. The oxygen concentration is almost completely depleted at a depth of 20 m, which coincides with the highest temperature. Increased oxygen concentrations in the pore gas below this depth again verify advective airflow into the waste rock dump.

The highest temperature in the 10M4 borehole was detected at the bottom of the borehole. Based on the observed thermal gradient, the maximum temperature in this region is likely well above 30 °C, which was detected at the base of the borehole. The oxygen concentration in the poregas remained elevated throughout the borehole, which is indicative of a high rate of advective airflow through the waste rock in this area. The borehole was established in an area where rock has been 'free dump' and it appears that very little trafficking had occurred in the area. The location is also in close proximity of the edge of the dump, which explains the well aerated conditions in this area.

4.2.6 Seepage Monitoring

Grum

Historical Dataset

The routine monitoring stations at Grum are shown in Figure 3.2. Station V2 has been monitored on a regular basis since 1988, at V2A since 1997, and at V15 since 1995. The routine stations are located along the road access and are between 200 and 800 metres below the toe of the dumps, where dilution by surface water and interaction with soils along the flow-paths could be expected. As such, results from these stations are not directly comparable to seepage at the toes of the dumps. The routine seepage monitoring data are available in the EQwin database maintained by GLL. Graphs of key parameters are provided in Figures 4.20 and 4.21.

Stations V2 and V2A

Stations V2 and V2A represent the more significant seepage flows that originate at the toe of the dump in the original Grum Creek channel (downstream of SRK-GD01 and SRK-GD02). Station V2 is located upstream of Vangorda Creek in the original Grum Creek channel, while Station V2A

represents water diverted from this channel into Moose Pond. Results for these stations are provided in Figure 4.20.

Sulphate concentrations increased from less than 50 in the late 1980's (i.e. prior to dump construction) to approximately 150 mg/L in 1998. In 1998, concentrations in both stations increased rapidly, reaching 400 to 600 mg/L by 2002/2003. pH's have been in the range of 7 to 8 throughout this period. The increase in sulphate concentrations was accompanied by an increase in both calcium and magnesium concentrations. Calcium is still the dominant cation at both locations.

Zinc concentrations at these stations were highly variable at these stations, with typical concentrations ranging from less than 0.01 to 0.1 mg/L prior to 1998, and from 0.1 to 1 mg/L since 1998.

Station V15

Station V15 represents runoff and possibly a small amount of seepage from the dump. Samples at this location are in close contact with soil and sediments, and interaction with the soils is likely significant. Results are provided in Figure 4.21

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. The increase in sulphate concentrations corresponded to increases in calcium and magnesium concentrations. pH's were stable in the range of 7.5 throughout the monitoring period.

Metal concentrations (e.g. cadmium, iron, cobalt, copper and zinc) were variable, but generally low, and did not change significantly over time.

2002/2003 Data

The results of the 2002 and 2003 seepage surveys are presented in Appendix G. Select parameters (ranges of pH, conductivity, flow, sulphate and zinc concentrations for the period of record) are provided in Figure 3.2.

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

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

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

Table 4.15 provides a summary of key characteristics for each of the above seepage types.

Geochemical equilibrium modelling was completed on a few seeps representing each of the above water types. The purpose of the equilibrium modelling was to identify whether the seepage chemistry is controlled by equilibrium with secondary minerals. Results of the modelling are provided in Table 4.14. An explanation of saturation indices (SI) is provided in Section 4.???. General observations from the modelling of the Grum seeps are as follows:

- The Type 1a seep (SRK-GD-13) was saturated with respect to several aluminum hydroxide minerals, barite, calcite and ferrihydrite.
- The Type 1b seeps were saturated with respect to several of the aluminum hydroxide and sulphate minerals, barite (barium sulphate), calcite, ferrihydrite, and zinc carbonate. Both seeps were slightly below saturation with respect to gypsum.

Table 4.16 Characteristics of Grum Water Types

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

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

Table 4.17 Geochemical Modelling Results - Grum

Parameter	Units	Type 1		
		GD01 6/4/2003	GD05 6/11/2002	GD13 9/12/2002
pH	mg/L	6.93	7.74	7.8
Redox	mV	488	273	201
Alkalinity Total as CaCO ₃	mg/L	534	527	388
Sulphate	mg/L	1320	1220	386
Aluminum	mg/L	-0.2	-0.2	-0.2
Barium	mg/L	0.05	0.03	0.11
Cadmium	mg/L	-0.01	-0.01	-0.01
Calcium	mg/L	316	358	168
Copper	mg/L	-0.01	-0.01	-0.01
Iron	mg/L	-0.03	-0.03	-0.03
Lead	mg/L	-0.05	-0.05	-0.05
Magnesium	mg/L	223	211	71.4
Manganese	mg/L	0.044	0.189	0.007
Nickel	mg/L	0.43	0.59	-0.05
Potassium	mg/L	8	8	3
Sodium	mg/L	10	14	3
Strontium	mg/L	1.3	1.52	0.823
Zinc	mg/L	4.58	3.54	0.028
NAME	Components	Sat. Index		
ARAGONITE	Ca, CO ₃	-0.166	0.704	0.52
CALCITE	Ca, CO ₃	0.072	0.937	0.744
DOLOMITE (O)	Ca, Mg, CO ₃	-0.04	1.628	1.128
MAGNESITE	Mg, CO ₃	-0.583	0.214	-0.105
STRONTIANITE	Sr, CO ₃	-1.814	-0.935	-1.068
GYP SUM	Ca, SO ₄	-0.34	-0.319	-0.878
BARITE	Ba, SO ₄	0.921	0.666	1.035
CELESTITE	Sr, SO ₄	-1.064	-1.026	-1.523
ALOH ₃ (A)	Al	0.479	-0.146	-0.248
BOEHMITE	Al	2.603	1.982	1.886
Al ₂ O ₃	Al	2.765	1.409	0.977
GIBBSITE(MC)	Al	2.049	1.421	1.309
ALOH ₂ SO ₄	Al, SO ₄	-0.097	-2.437	-3.144
AL ₄ (OH) ₁₀ SO ₄	Al, SO ₄	12.589	8.216	6.86
ALUNITE	Al, SO ₄	7.69	3.246	1.491
FERRIHYDRITE	Fe ³⁺	2.263	2.667	2.591
FE ₃ (OH) ₈	Fe ³⁺	-1.015	-0.7	0.303
JAROSITE H	Fe ³⁺ , SO ₄	-8.863	-10.863	-11.837
JAROSITE K	Fe ³⁺ , SO ₄ . K	-0.46	-1.697	-3.112
SIDERITE (P)	Fe ²⁺	-4.578	-5.88	-4.828
SIDERITE (C)	Fe ²⁺	-3.967	-5.275	-4.235
RHODOCHRO(C)	Mn, CO ₃	-1.321	0.035	-1.304
RHODOCHR(SY)	Mn, CO ₃	-1.975	-0.622	-1.967
CD(OH) ₂ (C)	Cd	-7.403	-5.768	-5.479
OTAVITE	Cd, CO ₃	-1.262	-0.446	-0.282
CU(OH) ₂	Cu	-3.72	-2.963	-2.836
TENORITE	Cu	-2.7	-1.943	-1.816
MALACHITE	Cu	-3.943	-3.269	-3.186
NI(OH) ₂	Ni	-1.47	-0.502	-1.574
PB(OH) ₂ (C)	Pb	-3.351	-2.435	-2.243
CERRUSITE	Pb, CO ₃	-0.545	-0.486	-0.5
ANGLESITE	Pb, SO ₄	-2.64	-3.418	-3.786
ZN(OH) ₂ (E)	Zn	-2.415	-1.14	-3.035
SMITHSONITE	Zn, CO ₃	-0.785	-0.32	-2.322
ZNCO ₃ , 1H ₂ O	Zn, CO ₃	-0.263	0.193	-1.827

Vangorda

Historical

The routine seepage monitoring stations at Vangorda are the three drains shown in Figure 3-2. Results for these stations are available in the EQwin database maintained by GLL. Graphs of key parameters are provided in Figures 4.22 to 4.25

Drains 3, 4 and 5 (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 (Drain 1,2 and 4) have been consistently dry. Results are shown in Figures 4.22 to 4.24.

Results for station V30 (Drain 3, SRK-VD03) are provided in Figure 4.22. Seepage from this station had pH's close to 6 throughout the monitoring period. Sulphate concentrations increased from 2500 in 1994 to 4000 mg/L in 2002 and 2003, and were correlated with magnesium. Zinc concentrations were highly variable in the range of 200 to 500 mg/L, and increased slightly over time.

Results for station V32 (Drain 5, SRK-VD04) are provided in Figure 4.23. pH's at this station have decreased from approximately 5 in 1994 to 3.5 in 2000. Sulphate concentrations increased substantially during this period from approximately 5000 mg/L in 1994 to 35,000 mg/L in the 2002/2003 data. The high sulphate concentrations were supported by a similar magnitude of increase in magnesium concentrations as well as substantial increases in iron, manganese and zinc concentrations. Recent iron, manganese and zinc concentrations were in the range of 1200 mg/L, 2400 mg/L, and 6500 mg/L respectively. Concentrations of aluminum (30 mg/L), cobalt (20 mg/L), copper (0.3 mg/L), cadmium (7 mg/L), and nickel (15 mg/L) also increased through the monitoring period.

Results from Station V33 (Drain 6, SRK-FD05) are provided in Figure X.24. pH's were in the range of 6 to 7 from 1994 to 1999, but have remained close to 6 in the 2000 to 2002 samples. Sulphate concentrations were in the range of 2000 to 5000 mg/L from 1994 to 2000, and then increased to approximately 20,000 mg/L by September 2002. Concentrations of magnesium, iron, zinc and several other metals also increased between 2000 and 2003, with zinc concentrations in the range of 2000 to 5000 mg/L in recent years. Drain 6 was not flowing during either June or September sampling rounds in 2003, therefore, no samples were collected.

Flows at all three stations have been generally very low for a dump of this size. Further investigations on the water balance (Janowicz et al., 2004) and on the potential for groundwater seepage have been indicated.

Station V27

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 may indicate that some water is leaving the system via the subsurface. Station V27 is the first routine monitoring station in Vangorda Creek downstream of the Vangorda and Grum Waste Rock dumps, and is sufficiently lower in elevation that it could be reasonably expected to pick-up any contaminants that are transported via the groundwater system. However, flows are very large, so significant changes in loading would be needed before any changes from the dumps could be observed. Results for this station are presented in Figure 4.25.

Results for this station indicate consistently neutral pH's, and low sulphate concentrations, with no increases in sulphate, calcium, or magnesium that would be indicative of early arrival of oxidation products from either of the waste rock dumps. Metal concentrations are generally very low, and have not increased over time. However, copper and zinc concentrations in Vangorda Creek are above CCME guidelines for aquatic life, and detection limits for several other parameters are too high to evaluate whether they meet CCME criteria.

2002/2003 Data

The results of the 2002 and 2003 seepage surveys are presented in Appendix G. Select parameters (ranges of pH, conductivity, flow, sulphate and zinc concentrations for the period of record) are provided in Figure 3.2.

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

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

Table 4.15 provides a summary of key characteristics for each of the above seepage types.

Geochemical equilibrium modelling was completed on a few seeps representing each of the above water types. Results of the modelling are provided in Table 4.16. An explanation of saturation indices (SI) is provided in Section 4.2.5. General observations from the modelling of the Vangorda seeps are as follows:

- The Type 2 seeps were saturated with respect to several aluminum hydroxide minerals, barite, gypsum, ferrihydrite, siderite, rhodochrosite, and zinc carbonate.
- The Type 3 seeps were saturated with respect to barite, gypsum and potassium jarosite.

Table 4.18 Characteristics of Vangorda Water Types

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

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

Table 4.19 Geochemical Modelling Results – Vangorda

Parameter	Units	Type 2			Type 3	
		VD02 6/6/2003	VD03 6/6/2003	VD05 6/10/2002	VD04 6/6/2003	VD09 6/11/2002
pH	mg/L	6.56	6.14	6.21	3.25	5.64
Redox	mV	352	242	15	538	145
Alkalinity Total as CaCO3	mg/L	258	184	160	-1	11
Sulphate	mg/L	2690	4390	13700	33400	3550
Aluminum	mg/L	-0.2	-0.4	-2	30	-0.4
Barium	mg/L	0.02	-0.02	-0.1	-0.4	-0.02
Cadmium	mg/L	0.12	0.08	0.7	6.8	0.83
Calcium	mg/L	436	423	442	428	444
Copper	mg/L	-0.01	-0.02	-0.2	-0.4	0.37
Iron	mg/L	0.21	71.3	243	1270	35.3
Lead	mg/L	-0.05	-0.1	-0.5	-2	0.1
Magnesium	mg/L	329	563	1880	3090	371
Manganese	mg/L	42.2	137	1000	2280	79.7
Nickel	mg/L	1.98	4.7	7.2	15	2.8
Potassium	mg/L	12	12	-20	-80	11
Sodium	mg/L	10	11	-20	-80	-4
Strontium	mg/L	1.61	1.74	2.15	0.9	1.78
Zinc	mg/L	83.4	351	1650	6070	499
NAME	Components	Sat. Index				
ARAGONITE	Ca, CO3	-0.601	-1.375	-1.661		-3.127
CALCITE	Ca, CO3	-0.431	-1.194	-1.481		-2.912
DOLOMITE (O)	Ca, Mg, CO3	-0.751	-2.068	-2.132		-5.83
MAGNESITE	Mg, CO3	-0.878	-1.42	-1.198		-3.42
STRONTIANITE	Sr, CO3	-2.385	-3.091	-3.303		-4.806
GYPSUM	Ca, SO4	-0.096	-0.053	0.072	0.189	-0.042
BARITE	Ba, SO4	0.363	0.442	1.21	1.988	0.551
CELESTITE	Sr, SO4	-0.833	-0.746	-0.543	-0.792	-0.762
ALOH3(A)	Al	0.176	0.039	0.699	-7.375	-1.465
BOEHMITE	Al	2.361	2.213	2.875	-5.221	0.678
Al2O3	Al	0.181	0.288	1.582	-13.751	-1.709
GIBBSITE(MC)	Al	1.671	1.549	2.207	-5.836	0.083
ALOH3O4	Al, SO4	-0.432	0.614	1.382	-0.13	0.536
AL4(OH)10SO4	Al, SO4	8.378	9.583	12.285	-12.24	6.511
ALUNITE	Al, SO4	7.386	8.725	11.188	-2.647	6.095
FERRIHYDRITE	Fe3+	1.529	0.905	1.399	-1.471	1.345
FE3(OH)8	Fe3+	-0.417	0.087	1.613	-9.403	-0.243
JAROSITE H	Fe3+, SO4	-7.093	-7.373	-5.617	-2.753	-5.267
JAROSITE K	Fe3+, SO4, K	0.203	-0.355	1.647	2.503	1.691
SIDERITE (P)	Fe2+	-2.134	-0.223	0.024		-2.326
SIDERITE (C)	Fe2+	-1.629	0.302	0.548		-1.747
RHODOCHRO(C)	Mn, CO3	1.079	0.868	1.443		-1.091
RHODOCHR(SY)	Mn, CO3	0.372	0.17	0.745		-1.761
CD(OH)2 (C)	Cd	-7.206	-8.349	-7.546	-11.756	-8.245
OTAVITE	Cd, CO3	-0.885	-1.832	-1.321		-2.519
CU(OH)2	Cu	-3.6	-4.138	-3.082	-8.974	-3.973
TENORITE	Cu	-2.58	-3.117	-2.059	-7.949	-2.952
MALACHITE	Cu	-3.923	-4.727	-2.911		-4.982
NI(OH)2	Ni	-2.355	-2.475	-2.274	-7.471	-2.961
PB(OH)2 (C)	Pb	-3.227	-3.73	-3.064	-8.799	-4.791
CERRUSITE	Pb, CO3	-0.945	-1.117	-0.754		-2.609
ANGLESITE	Pb, SO4	-2.161	-1.555	-0.775	-0.107	-1.388
ZN(OH)2 (E)	Zn	-1.963	-2.271	-1.691	-7.278	-3.019
SMITHSONITE	Zn, CO3	0.009	-0.133	0.157		-1.756
ZNCO3, 1H2O	Zn, CO3	0.368	0.256	0.543		-1.283

4.3 Vangorda Plateau Haul Road

4.3.1 Geological Composition

The Vangorda Plateau Haul Road was constructed using segregated non-sulphide waste rock from the Faro mine though records of the material used are not available. Five test pits were excavated along the haul road. Samples recovered from these pits included calc-silicates, biotite schist, chloritic schist, quartz porphyry, till, and phyllite mixed with sulphides. Significant amounts of sulphide were observed in one of the pits, and minor amounts of sulphides were observed in two others. Most of the samples had rinse pH's in the neutral to slightly alkaline range. However, the sample with significant amounts of sulphide had a rinse pH of 5.9. Rinse conductivities ranged from 200 to 3,200 $\mu\text{S}/\text{cm}$.

4.3.2 Geochemical Characteristics

Four test pit samples from the Haul Road were tested for acid-base account and metal concentrations. Two samples were dominantly schist and two were calc-silicate. The schist samples had sulphur concentrations of 1.1 and 1.4% whereas both the calc-silicate samples had sulphur concentrations of 0.4%. The schist samples were potentially acid generating to marginally acid generating based on NP/APs of 0.7 and 1.5. The schist sample with the higher sulphur concentration and lower NP/AP also contained elevated zinc and lead concentrations. The calc-silicate samples were non-acid generating.

A shake flask test on the potentially acid generating schist sample produced leachate with pH of 7.8, sulphate of 966 mg/L and zinc of 0.2 mg/L. Chloride concentrations were elevated at 5 mg/L compared to other shake flask tests.

5 Interpretation and Discussion

5.1 Correlation of Static Geochemistry with Mineralogy

5.1.1 Sulphur Mineralogy

Sulphur mineralogy in the ore and waste rock in both areas is dominated by pyrite. Sulphide waste rock also contains significant amounts of sphalerite, galena and barite, all of which contribute to total sulphur but are relatively insignificant when compared to pyrite which forms a large component of the ore. Pyrrhotite is also present in some of the ore types at Faro and is present at Grum and Vangorda. It is not expected to be a significant factor in the reactivity of sulphur in different types of ores or waste rock because pyrite is more abundant. Marcasite has also been described but its significance is not clear.

Other sulphide minerals are tetrahedrite, bournonite and arsenopyrite. These minerals are relatively minor and do not contribute significantly to the sulphur balance. The former two minerals are potentially sources of dissolved antimony. The latter is a source of arsenic. Shake flask tests on sulphide wastes show arsenic concentrations up to 1 mg/L.

Analyses of sulphur as sulphate and extraction tests indicate that waste rock in the Faro area contains significant concentrations of leachable sulphate. Gypsum is likely to be present in the rock as shown by the strong correlation of calcium with sulphate in shake flask leachates and saturation indices near 0 in seep waters. In the more acidic samples, jarosite may be present along with zinc sulphates. Anglesite is likely present as an oxidation product of galena but is probably not a major sulphur component. Anglesite is also not readily soluble and would not contribute significant leachable sulphate.

In conclusion, total sulphur analyses are primarily an indicator of pyrite content except in highly oxidizable materials in which soluble sulphates may be present. Sulphur as sulphate is probably present primarily as gypsum but it is also may be present as acidic salts.

5.1.2 Carbonate Mineralogy

The actual ability of rock to neutralize acid formed by sulphide oxidation is usually estimated using NP (Neutralization Potential). NP determined under laboratory conditions by using reactions with weak acid is a combination of mineral forms:

$$NP_{\text{Total}} = NP_{\text{Ca,Mg Carbonate}} + NP_{\text{Silicate}}$$

Under field conditions, the NP_{Silicate} component is not usually significant unless the silicate minerals are strongly reactive under cold neutral pH conditions. NP_{total} therefore tends to over-estimate actual neutralization potential. For this reason, carbonate is often preferred as a conservative indicator of neutralization potential. Carbonate is determined as “Total Inorganic Carbon”) and includes all carbonate forms present in the rock:

$$TIC = IC_{\text{Ca,Mg,Sr Carbonate}} + IC_{\text{HM Carbonate}}$$

Where $IC_{\text{HM Carbonate}}$ is inorganic carbon associated with heavy metals such as iron, manganese, copper and zinc. TIC can be misleading because carbonates of iron in particular do not neutralize acid due to the release of iron.

At the ARMC, calcium, magnesium, barium and iron carbonate minerals occur in the ore and host rocks. The presence of rapid dilute hydrochloric reaction with most of the rock host rocks indicates that calcite is common. However, the presence of iron carbonate weathering colours, and the abundance of carbonate over total neutralization potential indicates that iron carbonates are also present. This indicates that carbonate cannot be used to indicate acid neutralization potential.

In this report, tests of reactive neutralization potential were used to indicate acid buffering capacity. This may over-estimate available neutralization potential due to the presence of micaceous and clay silicates. To address this concern, SRK and the ICAP Studies used the “modified Sobek” method to estimate neutralization potential. This method is performed at room temperature (compared to boiling conditions used for the original Sobek Method).

5.1.3 Heavy Metal Speciation

The speciation of metals amongst various primary and oxidized forms can be estimated. The main leachable heavy elements indicted by testwork and monitoring are antimony, arsenic, barium, cadmium, cobalt, copper, iron, lead, manganese, nickel and zinc. The speciation of these metals is summarized in Table 5.1.

Table 5.1 Speciation of Heavy Elements

Element	Primary Minerals		Oxidation Products	
	Major Source	Minor Source	Major Sink	Minor Sink
Antimony	Tetrahedrite, bournonite		Co-precipitate with ferric oxyhydroxides	
Arsenic	Arsenopyrite, pyrite	Tetrahedrite, boulangerite	Co-precipitate with ferric oxyhydroxides	
Barium	Barite	Witherite	Barite	
Cadmium	Sphalerite		Zinc carbonate	Otavite
Cobalt	Pyrite	Pyrrhotite	Co-precipitate with ferric oxyhydroxides	
Copper	Pyrite, sphalerite, chalcopyrite	Tetrahedrite, bournonite	Co-precipitate with ferric oxyhydroxides	Malachite
Iron	Pyrite, ankerite.	Pyrrhotite, sulphides	Ferric oxyhydroxides	Iron sulphates, iron carbonates
Lead	Galena	Bournonite	Anglesite	
Manganese	Sphalerite, ankerite		Co-precipitate with ferric oxyhydroxides	Manganese carbonates
Nickel	Pyrite	Pyrrhotite	Co-precipitate with ferric oxyhydroxides	
Zinc	Sphalerite		Co-precipitate with ferric oxyhydroxides, zinc carbonates	Zinc sulphates

5.2 Kinetic Testing

5.2.1 Depletion Calculations

Depletion of critical components for prediction of acid generation onset (sulphide and neutralization potential) was reviewed to evaluate the time frame for acid generation components.

Most kinetic tests on sulphide rock core samples from Faro generated acidic leachate almost immediately upon exposure to oxidized conditions despite the presence of neutralization potentials up to 18 kg CaCO₃/t. Assuming that these core samples were not previously weathered, the neutralization potential in these rock types appears to be ineffective because none of the tests indicated that all of the neutralization potential was depleted (except where NP was found to be zero). Likewise samples of weathered rock from test pits also generated acid immediately.

Some types of sulphide rock in the Vangorda Plateau area behaves differently. The three samples tested for the ICAP project produced pH greater than 7 despite being partially weathered material (at least five years) from test pits. Two of these samples had much higher NP than sulphide waste rock at Faro, though one sample had zero NP and 22% sulphur. Based on the rate of NP depletion, the sample may have contained a small amount of NP that would explain the lack of acidic conditions. These tests indicate that the time frame for depletion of NP is three to four decades for some types of

sulphide rock at Vangorda Plateau, though as shown by seepage from the Vangorda Pit waste rock dump, some sulphide components have generated acid in less than a decade

Contact tests and paste pH determinations for sulphide rock in the Vangorda Plateau area are consistent with the kinetic test results. While some sulphide waste was strongly acidic ($\text{pH} < 3$), most of the rock in the Grum sulphide cell was non-acidic ($\text{pH} > 7$), and contact tests showed median pHs of 5.3.

The difference between the behaviour of Faro and Vangorda Plateau sulphide rock may include:

- The siliceous nature of some of the sulphide rock at Vangorda Plateau which prevents the rock from disintegrating and exposing sulphide to oxidation.
- The presence of iron carbonate which buffers leachate pH between 5 and 6. The effect was also seen in the IEE sulphide composite sample.
- Inclusion of small amounts of calcareous phyllite that results in addition of buffering capacity not present in the sulphide rock.
- Differences in age. The Vangorda Plateau sulphide waste has been exposed for less time than at Faro.

Kinetic tests on non-sulphide rock types (schists, intrusives, phyllites and calc-silicates) during any of the programs did not result in acidic leachate, with the exception of the phyllite sample tested for the Vangorda Plateau IEE. The pH of leachates were generally above 7 with some variation. Depletion calculations on these tests indicates that the timeframe to deplete all neutralization potential from these types of materials is probably of the order of decades under laboratory conditions, and under field conditions would be much longer due to low temperature effects. Low temperatures would be expected to persist under non-acidic conditions.

It is unclear why the IEE phyllite sample generated weakly acidic leachate, and when inoculated produced leachate pH below 4. The characteristics of the sample were comparable to other phyllites in terms of NP and sulphur concentration, but it oxidized relatively rapidly.

5.2.2 ARD Classification Criteria

Kinetic tests can provide an indication of ARD classification criteria (in terms of NP/AP) even in the absence of observed acidic leachate. The molar ratio of the rates of release of components from NP depletion to components from iron sulphide mineral oxidation indicates the NP/AP at which acid generation can theoretically be expected to occur (for example as described by Day et al. 1997 for the Kudzu Ze Kayah Project). There are a number of limitations to this calculation including:

- The effect of temperatures on reaction rates.
- Possible differences in particle size between laboratory and field.
- The artificially high leaching rate in laboratory tests which removes NP more rapidly than in the field but possibly also dilutes the acid produced by sulphide oxidation.
- The effect of leaching of components that are not unambiguously associated with depletion of NP and sulphide. For example, leaching of gypsum releases calcium and sulphate.
- Storage of reaction products. For example, gypsum and iron sulphates.

The SRK humidity cell samples were selected specifically to be suitable for this calculation. Non-sulphide rock types were selected with NP/APs near 1. The earlier testwork did not include suitable analytical parameters and the ICAP database kinetic testing method was not suitable for the calculation.

Release rates for neutralization potential were based on calcium and magnesium. The combined molar release rate (mmol/kg/week) was calculated from:

$$R_{NP} = R_{Ca}/40.1 + R_{Mg}/24.3$$

Sulphide depletion was indicated by sulphate and the molar release rate calculated from:

$$R_{sulphide} = R_{sulphate}.96$$

The ratio $R_{NP}/R_{sulphide}$ indicates the relative depletion of neutralization potential and iron sulphide minerals. If the ratio is greater than the sample NP/AP, the test material theoretically can be expected to generate acidic leachate at some time in the future. Conversely, if the ratio is less than the NP/AP, the test material will probably always generate pH neutral leachate buffered by carbonate minerals.

Figure 5.1(a) shows average values for the ratio for each test compared to sulphate release. Cells 6 and 11 were probably affected by gypsum leaching and are not shown. The chart indicates that the ratio decreases as the sulphate release rate increases, and that the relationship is not affected by mixing of these rock types from Faro and Vangorda Plateau. At low sulphate release, NP depletion is mostly driven by simple dissolution of carbonate minerals by the leach water, and NP is therefore depleted artificially rapidly. In the humidity cells, as sulphate release increases, NP depletion occurs in response to acid generated from sulphide oxidation. Under field conditions, depletion of NP by infiltrating water in waste rock insignificant because the infiltrating water becomes saturated with respect to carbonate.

Samples with higher oxidation rates (greater than 10 mgSO₄/kg/week) have values of the ratio between 1.1 and 2.0. This is consistent with dissolution of carbonate minerals in which the ratio varies from 1 to 2 depending on whether the final product of neutralization is carbonic acid (H₂CO₃⁰) or bicarbonate (HCO₃⁻), respectively.

Based on these results, the theoretical criteria for uniformly mixed acid generating materials is an NP/AP near 1.1.

5.2.3 Correlation of Kinetic Release Rates with Static Geochemical Characteristics

Release rates observed in kinetic tests were compared to static geochemical characteristics to allow extrapolation of release rates determined on a few samples to the broader characteristics of waste rock dumps estimated by static geochemical tests.

As discussed in section 3.1.2, the use of different testing protocols limits comparison of test data collected for different studies. A consistent finding for all datasets is that sulphate release under non-acidic conditions for non-sulphide rock is strongly correlated with sulphur content for both Faro and Vangorda Plateau (Figure 5.1(b)). The regression equation shown in Figure 5.1:

$$\text{Log } R_{\text{sulphate}} = 1.08 \text{ Log } S_{\text{sulphide}} + 2.54$$

is for the SRK Dataset and excludes Cells 6 and 11 which were affected by gypsum leaching and leaching rate for the acidic sulphide composite used for the sequential columns. Natural logs are used to calculate the regression equation.

Zinc release is correlated with bulk zinc concentration for the SRK dataset (neutral pH). In the ICAP database, zinc release is correlated with bulk zinc concentration for sulphide waste rock samples (Figure 5.2).

5.3 ARD Classification of Rock Types

Using the site specific NP/AP criteria and indications of acid generation onset and metal release from the kinetic tests, Table 5.2 summarizes characteristics for pure rock types (ie without inclusion of other rock types that affect the classification). In this table, the following terminology is used:

- Non-acid generating indicates that the rock type is not expected to generate acid.
- Theoretically potentially acid generating means that acid-base accounting predicts that the rock will generate acid, but the sulphide content is low and NP/AP is close to 1 indicating that acid generation may occur but only at a low rate if at all.
- Potentially acid generating means that the rock will very likely generate acid in the future.
- Acid generating means that the rock generates acid immediately upon exposure.
- Acid consuming means that rock has significant amounts of carbonate and is therefore expected to consume acid under field conditions

Table 5.2 ARD Classification by Rock Type

Area	Rock Type (Unit Number)	Overall Classification	Acid Onset Time Frame	Metal Leaching
Faro	Schist (1D)	Non-acid generating unless mixed with sulphide	-	-
	Alteration Envelope (1D4)	Acid generating	Immediate	Zn, Cd, Mn, Cu, Fe, Ni.
	Sulphide Rock Types (2)	Potentially acid generating	Immediate	Zn, Cd, Mn, Cu, Fe, Ni.
	Calc-Silicate (3)	Acid consuming	-	None
	Intrusive (10)	Theoretically potentially acid generating	Delayed (decades)	Zn
	Till	Components are theoretically potentially acid generating	Delayed (decades)	Zn
Vangorda Plateau	Non-calcareous Phyllite (3)	Acid consuming unless mixed with sulphide	-	Zn
	Sulphide Rock Types (4)	Potentially acid generating	Immediate to delayed (decades)	Zn, Cd, Mn, Cu, Fe, Ni.
	Carbonaceous Phyllite (5A)	Potentially acid generating	Delayed (years to decades)	Zn
	Calcareous Phyllite (5B)	Acid consuming	-	Zn
	Chloritic Phyllite (5D)	Acid consuming	-	Zn

5.4 In Situ Behaviour of Waste Rock

5.4.1 Introduction

The overall objective of these studies is to provide input data to scale-up calculations for prediction of water quality. The following sections describe the influence of characteristics that occur at larger scales and will affect overall leachate chemistry. These characteristics are the scale of geochemical mixing of rock types and thermal effects.

5.4.2 Geochemical Behaviour of Rock Type Mixtures

At both Faro and Vangorda Plateau, rock types can be reduced to two major types:

- Sulphide waste rock with high acid generation potential.
- Host schists and phyllites with low potential for acid generation, and in some cases significant acid buffering capacity.

While the behaviour of these individual materials has been well-documented by previous and current studies, the behaviour of mixtures of these materials will control seepage chemistry from the waste rock dumps. Mixtures can occur at a variety of scales varying from intimate (grain-scale) to very large scale (Day and Hockley 1998). At both Faro and Vangorda Plateau, the latter is largely a result

of deliberate segregation to create sulphide waste rock cells. Between these extremes are smaller-scale mixtures resulting from day-to-day dumping. The controlling effects at each scale are described below.

- **Grain-Scale Mixing.** At the grain-scale, the behaviour of the mixture can reasonably be predicted using the acid-base account and any adjustment for distribution of mineral particles into different size fractions and mineralogical effects. Most schist and phyllite can be considered as grain scale mixtures of the various minerals. These mixtures vary from potentially acid generating to acid consuming, and the reaction time frame for acid generation is at least in the order of decades.
- **Medium Scale Mixing.** This scale of mixing is of the order of centimetres to a few metres. End-dumped rock over high faces results in layering of rock types several centimetres thick. Free- (or plug-) dumping produces mixtures that are typically a few metres thick in any direction. At this scale, individual rock masses behave according to their own characteristics, but leachate moving through the mixed rock mass significantly influences the other rock components. For example, alkaline porewater infiltrating sulphide rock will at least partially neutralize the products of sulphide oxidation. Rough calculations of this effect based on typical sulphide oxidation rates and dissolved alkalinity indicates that sulphide rock masses up to 10 to 20 cm in thickness might be maintained in a non-acid condition by dissolved alkalinity from upstream schists and phyllites. This indicates that single end-dumped sulphide rock layers might not generate acid, but that plug-dumped sulphide rock would likely become acidic and potentially behave like large scale segregated rock masses, as described below.
- **Large Scale Segregated Sulphide.** Large sulphide masses are not likely to be significantly influenced by water from surrounding calcareous rock types but will generate acid and influence non-sulphide rock along the flow path. The SRK sequential kinetic test provided an indication of effects that might occur. Acidic water generated by the sulphide rock contains high iron concentrations. Reaction of the acidic water with the non-sulphide rock results in several processes including:
 - Dissolution of carbonate minerals, releasing calcium, magnesium, iron and manganese;
 - Increase in pH;
 - Precipitation of gypsum due to release of calcium;
 - Precipitation of iron hydroxides, and other metal hydroxides and carbonates depending on the pH.
 - Sealing of carbonate mineral surfaces by precipitates.

The sequential test showed that sealing of flow paths possibly forced the acid water to start a new flow path, which allowed the pH along the flow path to increase. Once all available flow paths had been sealed, the pH remained low. Variations in the pH of acidic leachate possibly also

resulted in reactivation of the carbonate minerals by dissolution of previously formed coatings. This process results in re-mobilization of precipitated metals and potentially re-precipitation further along the flow path.

Overall, it is apparent that the acid neutralizing capacity of rock along the flow path is negligible compared to the neutralization potential. Once sulphide waste rock cells produce acidic pore waters, seepage from the waste rock is likely to be acidic relatively rapidly. The actual time frame will depend on factors such as the strength of acidic pore water generated by the sulphide, the flow rate and the length of the flow path. This implies that the Grum Main Dump will produce strongly acidic seepage once the sulphide waste rock becomes acid generating.

5.4.3 Thermal and Gas Flux

The oxygen profiles in general indicate the primary mechanism for oxygen entry into the Faro and Vangorda waste rock dumps is by thermal convection. The results for the sulphide cell in the Grum waste rock dump however suggest that oxygen may be limited by diffusion where there is less temperature gradient.

The thermal profiles were used to estimate the rates at which heat is being generated from oxidation, and then to estimate the rates of oxidation. The results are summarized in Table 5.2.

Table 5.3 Summary of Estimated Rates of Heat Generated from Sulphide Oxidation and Corresponding Rates of Oxidation

Borehole	Estimated Heat Production ($\text{J m}^{-3} \text{s}^{-1}$)	Estimated Oxidation Rate ($\text{kg O}_2 \text{m}^{-3} \text{s}^{-1}$)	Comment
Faro 60M1	> 0.17	1.6E-08	Oxygen and temperature data show evidence of thermal convection.
Faro 30M1	0.15	1.4E-08	Oxygen suggests non-uniform diffusion or advection
Grum 30M3	0.08	7.7E-09	Oxygen shows some advection, but diffusion dominant.
Grum 10M3	~ 0.01	9.6E-10	Very slight warming, may be due to surface only.
Grum 10M2	< 0.01	9.6E-10	Temperature data shows no clear evidence of heating.
Vangorda 30M4	> 0.11	1.1E-08	Oxygen data suggest some advection.
Vangorda 10M4	> 0.15	1.4E-08	Hole is shallow so estimate is questionable, likely low.

5.5 Seepage Chemistry

5.5.1 Spatial Variability

The seepage chemistry at Faro, Grum and Vangorda was strongly influenced by the geochemical characteristics of the waste rock found in the dumps. Seeps draining from waste rock dumps with relatively small amounts of acid generating rocks or where large flows interacted with relatively small amounts of rock tended to have neutral pH's and low metals concentrations (i.e. Type 1 seeps), while seeps draining from strongly mineralized waste rock dumps tended to have lower pH's and/or higher metal concentrations (Type 2 and 3). The highest metal concentrations tended to occur in seeps associated with the low-grade ore stockpiles at Faro, and in seepage from the Vangorda dump.

Type 1 seeps at Faro originated from the toe of the Northeast dump, the Upper Parking Lot dump, and the Ranch Zone Dump, which contain relatively low proportions of sulphide waste rock, and higher proportions of calc-silicates or intrusives compared to other parts of the Faro Dump. Type 1 seeps also were observed where relatively large stream flows that interacted with a relatively small amount of rock, for example, at the Upper Northwest dump at Faro. All of the seeps at Grum were Type 1 with neutral pH's and relatively low metal concentrations compared to Faro and Vangorda.

Type 2 seeps originated from several different areas at the Faro site, including ore and low grade ore stockpiles, the West Main Dump, the Lower Northwest Dump, seeps in the mill area, and on occasion, seeps entering the pit below the Northeast Dumps. A common element of all these areas is the presence of sulphides or oxidized schist. Type 2 seeps were also found at the Vangorda dump, which contains a large amount of sulphide waste rock.

Type 3 seeps at Faro were associated with low grade ore stockpiles, the mill area, the West Main Dump, the Intermediate Dump, the Faro Creek Diversion Dyke, the Faro Valley Dump, and, on occasion, seeps entering the pit below the Northeast Dumps. Portions of the waste rock in all of the above areas contained sulphides or oxidized schist. Type 3 seeps were also found in the Vangorda dump.

Seeps located at some distance from the waste rock piles, for example NE1, NE2, V2, V2A, and V15 generally had much lower zinc concentrations compared to seeps collected from the toes of the dumps. Lower zinc concentrations at these locations may be due to attenuation of zinc along the seepage flow path.

Seeps at the Vangorda waste rock dump have had extremely small flows throughout the monitoring period. It has been suggested that infiltrating water may be leaving the dump as groundwater, which would eventually daylight in Vangorda Creek. However, review of data from Station V27 in Vangorda Creek indicates there have been no increases in sulphate, calcium, or magnesium that would be indicative of early arrival of oxidation products from either of the waste rock dumps.

However, copper and zinc concentrations in Vangorda Creek are above CCME guidelines for aquatic life, and detection limits for several other parameters are too high to evaluate whether they meet CCME criteria. The elevated concentrations of copper and zinc were evident as early as 1991 (i.e. prior to dump construction), and are therefore likely due to natural mineralization along the creek.

5.5.2 Seasonal Effects

Although there was substantial variability in the chemistry observed at many of the seep stations, there were no consistent seasonal differences. Exceptions are as follows:

- Seeps influenced by streams flowing underneath dumps tended to have higher concentrations and lower pH's immediately following infiltrations from rain or snowmelt, and lower concentrations when the flows were limited to the lateral stream flows along the base of the dumps. Examples of this include A30 (FD40), which is influenced by leakage from the Faro Creek diversion passing under the Faro Valley Dump, W8 (FD-17, 18 and 19) which is influenced by Next Creek flows, and GD01, which is influenced by Grum Creek flows.
- Several of the seeps draining towards the pit in the NE Dump area (FD-22, 23, and 27) tended to have lower pH's and higher concentrations during the fall. This may be due to flushing of stored oxidation products when these seeps are reactivated in the fall.

The spring and fall surveys were timed to take advantage of wet conditions. Therefore, when seeps were present, it was generally because there had been some rain on site. In some cases, the seeps lasted for less than 24 hours after a precipitation event, so the only seasonal difference would be the amount of time that had elapsed since the previous flush. In general, conditions during the 2002 surveys were wetter than during the 2003 surveys, and the year to year variations in flow may have been a more significant influence on the seepage chemistry than the seasonal differences in flows.

5.5.3 Long Term Effects

There is currently 15 years of seepage data available for the Faro dumps and 10 years of seepage data available for the Vangorda and Grum dumps. Results of the routine seepage monitoring programs for all three areas have generally shown stable or increasing trends in sulphate and metal concentrations, with either stable or decreasing pH's at most of the seeps. One possible exception to this is Station A30 (FD-40), representing drainage from the Faro Valley Dump, which is currently showing signs of partial depletion of sulphate and metals, and erratic, but generally increasing pH's. However, further monitoring is needed to evaluate whether this is a true trend.

As well as reflecting variable geochemical characteristics in the source rocks, the range of seeps covered by the seep surveys represent several different stages in the geochemical evolution of the waste rock.

The early stages of weathering and oxidation are represented by the Type 1b seeps below the Grum dump, where there was relatively recent deposition of sulphides over rocks with excess neutralization potential. Data from the routine monitoring stations (V2, V2A and V15 showed increasing trends in sulphate concentrations, and seeps at the toe of the dump (GD01, 02, 04, 05, 06) had zinc concentrations in the range of 2 to 5 mg/L. Calcium was the dominant cation and the seepage chemistry reflected complete buffering of any acidity by calcium carbonate minerals.

The next stage of weathering and oxidation is represented by the Type 2 seeps at Faro and Vangorda, including X23 (FD10, 12, and 31), X26, V30 (VD03), and V33 (VD05). These seeps tend to have slightly lower pH's, higher magnesium and higher sulphate concentrations. However, the chemistry is still indicative of partial buffering by carbonate and silicate minerals along the flowpath. Concentrations of several other metals, including iron, manganese, zinc also increase until they reach equilibrium with secondary minerals. The chemistry at X23 (Figure 4.8) is a good example of the changes that can occur in this stage of weathering. As indicated in Figure 4.8, sulphate and metal concentrations tended to increase in a stepwise fashion, reflecting depletion or blinding of different sources of buffering along the flow path. The peak in sulphate and metal concentrations in 1999/2000 may have been due to remobilization of secondary minerals as the pH dropped from approximately 7 to approximately 6. Pseudo-stable concentrations since that time reflect a new stage of equilibrium with these minerals. Similar changes have occurred in V33 (VD05) at Vangorda.

As the neutralization potential is depleted, pH's start decrease and acidic conditions begin to develop. The Type 3 seeps at Faro and Vangorda including FD04, FD13, FD33, FD34, FD36, FD37, VD07, VD08, VD09, and V32 (VD04) represent this stage of the evolution. V32 (VD04) (Figure 4.23) is the only seep of this type to progress from a Type 2 seep to a Type 3 seep during the monitoring period. The change was accompanied by a significant increase in sulphate, magnesium, and metal concentrations, reflecting both dissolution of secondary minerals in the rock and release of oxidation products from on-going oxidation of the sulphides.

In the most advanced stages of oxidation, sulphate and metals may become somewhat depleted and the removal of the residual oxidation products will depend on the extent of flushing by infiltrating water. Although SRK expects it will take hundreds of years for the most of the waste rock dumps at Faro to reach this stage, the Faro Valley dump (A30 or FD40) and a seep along the Faro Valley Diversion (FD20) are showing signs of local depletion along the flow paths, and may be indicative of this stage of evolution. The trends in the A30 data are indicative of the development of strongly acidic conditions in the piles coupled with significant dilution along the base of the pile. The recent decrease in concentrations should be interpreted with caution because higher flows through the base of the pile (due for example to increased flow through the diversion) could also result in lower concentrations. Higher pH's and lower concentrations in recent years seem to be occurring during dry periods, when the downward flux of contaminants would be at a minimum, but inflows along the base of the pile would continue to supply flow.

Finally, the seepage chemistry may also be influenced by flow-path effects, such as reactions between acidic seepage and carbonate minerals, or attenuation of metals by oxide minerals along the flowpaths. Although these effects have been minimized by collecting seeps as close to the source as possible, it is possible that these effects are slowing the apparent breakthrough of metals and acidity in some seeps.

5.5.4 Controls on Water Chemistry

The geochemical equilibrium modelling results presented in Sections 4.1.6 and 4.2.6 indicate that there were controls on aluminum, barium, and iron concentrations in the Type 1 (neutral pH, low Zn) seeps. Concentrations of trace metals associated with the oxidation of sulphides (e.g. manganese and zinc) were low, and therefore below saturation with secondary minerals. Some of the samples were close to equilibrium with calcite, suggesting that reactive carbonate minerals were present along the flowpaths. Precipitates were typically not observed at these locations, indicating that any secondary minerals remain inside the dumps.

In the Type 2 (neutral pH, high Zn) seeps, manganese and zinc concentrations were significantly higher, and were controlled by equilibrium with manganese and zinc carbonate minerals. Controls on aluminum, barium and iron concentrations were similar to the Type 1 seeps and sulphate concentrations were controlled by or close to equilibrium with gypsum. Calcite was also identified in some of the seeps. Concentrations of other trace metals (e.g. cadmium, copper, and lead) were consistently below saturation with respect to secondary minerals. Concentrations of these metals may be controlled by sorption to secondary iron and manganese minerals, which are known to be excellent scavengers for these metals. Many of the Type 2 seeps had thick accumulations of iron precipitates along their flowpaths, indicating that the formation of secondary iron minerals extends outside of the dump footprint. Accumulation of secondary minerals in the waste rock is consistent with the results of numerous leach extraction tests, which indicate there is a substantial accumulation of stored oxidation products in the waste rock.

In the acidic Type 3 seeps (acidic seeps), concentrations of most metals were significantly higher, and the only controls were barite and potassium jarosite. In several of these seeps, iron stains or precipitates occurred along the seepage flowpath, or along the margins of the flowpath. However, one ephemeral seep with extremely high concentrations (SRK-FD37) showed no evidence of secondary mineral precipitates. The relative lack of secondary mineral controls in the acidic seeps is consistent with the observation of highly soluble sulphate salts in acidic source rocks.

6 Conclusions

The following are concluded regarding major geochemical controls on water chemistry from the Faro and Vangorda Plateau areas:

- **Rock Type.**
 - The current main source of acidity and metals in both areas is the oxidation of sulphide waste rock.
 - In the Faro area, sulphide rock generates acid almost immediately upon exposure in humidity cells. Sulphide rock cells are probably already generating acid.
 - In the Vangorda area, acid generation in siliceous sulphide waste rock is delayed, possibly in the time frame of several decades.
 - The major rock type in the Faro area is schist. Due to the presence of sulphides and relatively low carbonate, this rock type is potentially acid generating. The time frame for acid generation is several decades.
 - Non-calcareous, calcareous and chloritic phyllites in the Vangorda Plateau are non-acid generating. Carbonaceous schists are potentially acid generating.
- **Rock Mixtures**
 - Medium- to large-scale segregations of sulphide wastes placed either as deliberate cells or small areas of end- or free-dumped sulphide rock waste are probably currently the dominant source of acidity and metals in seepage in both areas.
 - Large scale sulphide waste masses are likely to remain well-oxygenated due to heating and advection of air into the waste rock.
 - In the future, delayed acid generation in well-mixed rock types with low sulphur content may become a source of metals.
- **Source and Mobilization of Metals**
 - The dominant elements of concern for the site are zinc, cadmium, manganese and copper. The former three elements are relatively mobile under non-acidic conditions.
 - Pyrite is the dominant iron sulphide in the waste rock and is the main source of iron, acidity and sulphate. It also a possible source of arsenic, cobalt and nickel. The latter may also be sourced from pyrrhotite.
 - Zinc and cadmium are released mainly from oxidation of sphalerite and form readily soluble sulphates at the point of oxidation. Both elements may be precipitated in response to pH changes. Zinc may be precipitated as carbonate, with co-precipitation of cadmium. Both metals may be adsorbed to iron hydroxides.
 - Manganese may be released from oxidation of sphalerite or dissolution of carbonates. It may be re-precipitated as carbonate or oxyhydroxide, or co-precipitated with iron hydroxides.

- Arsenic and antimony are present in a variety of sulphosalts. These elements are locally present in highly acidic waters but are not currently a major issue for the site.
- **Seepage Chemistry Evolution**
 - In the first stage of seepage chemistry, pH is well above 7, sulphate and metal concentrations are low and water chemistry is dominated by dissolution of calcium and magnesium carbonates.
 - As sulphide oxidation becomes important, pH may decrease to near 7 and sulphate and zinc concentrations start to increase. Water chemistry at this stage may be controlled by dissolution of Ca and Mg carbonates, and formation of gypsum, and carbonates of zinc, manganese and copper. Other metals may be controlled by sorption to iron hydroxides.
 - Depression of pH may occur initially seasonally and then permanently result in seepage with pH below 4, with high concentrations of iron, aluminum, zinc, cadmium and sulphate, along with copper and nickel. Concentrations of aluminum and iron may be controlled by the solubility of hydroxides and sulphates but solubility of other metals is very high. The exception is lead which is controlled by the low solubility of anglesite.
 - In the waning stages, pH may begin to increase along with decreasing sulphate and most metals. Under these conditions, lead solubility may increase due to dissolution of anglesite resulting from lower sulphate concentrations.

7 References

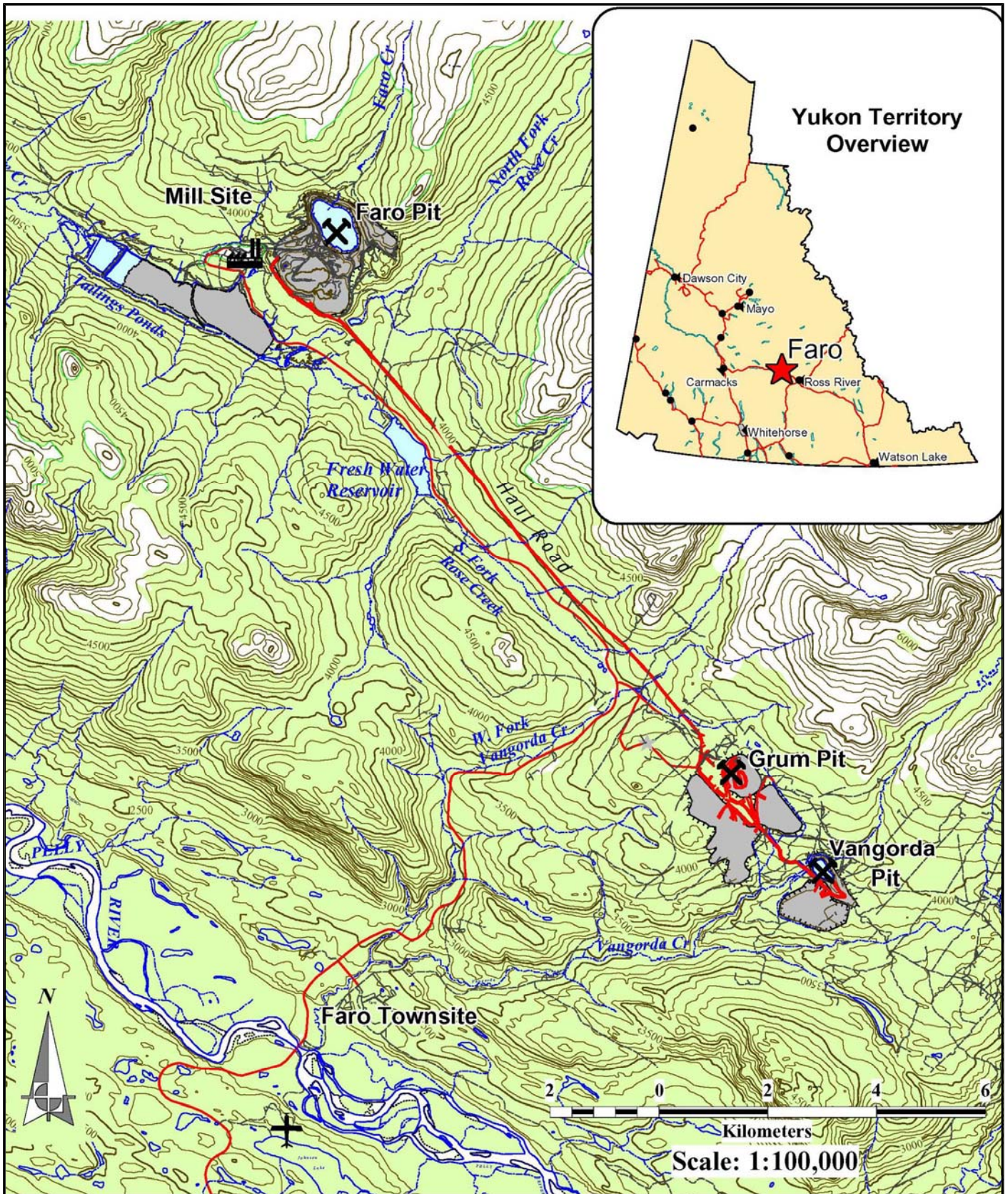
- Allison, J.D., Brown, D.S., and Novo-Gradac, K.J. (1991), MINTEQA2/PRODEFA2, A Geochemical Assessment Model for Environmental Systems: Version 3.0 User's Manual, EPA/600/3-91/021. U.S. Environmental Protection Agency, Environ. Res. Lab., Athens, Ga.
- Curragh Resources Inc., 1988. Faro Mine Abandonment Plan.
- Curragh Resources Inc., 1989. IEE
- Day, S.J., G. Hope and W. Kuit. 1997. Waste Rock Management Planning for the Kudz Ze Kayah Project, Yukon Territory: 1. Predictive Static and Kinetic Test Work.. In: Proceedings of the Fourth International Conference on Acid Rock Drainage, Vancouver, B.C., May 31 to June 6, 1997
- Day, S. and D. Hockley. 1998. Risk Assessment and Management Associated with Blending Waste Rock. In: Proceedings of the 5th Annual BC MEM – MEND 2000 Metal Leaching and ARD Workshop, Vancouver, B.C., December 9-10, 1998.
- Day, S., Coulter, G. and Falutsu, M. 2000. Red Dog Pb-Zn Mine Closure Planning: Phase 1 Geochemical Studies – Characterization of Complex Sulfur Mineralogy. ICARD 2000.
- Gartner Lee Limited, 2002. Vangorda Plateau Annual Environmental Report, Water Licence IN89-002. Report Number GLL 22943, prepared for Yukon Territory Water Board on behalf of Deloitte & Touche Inc.(Interim Receiver for Anvil Range Mining Corporation). March, 2003.
- Janowicz, J.R., N.R.Hedstrom, and R.J. Granger, 2004. Investigation of Anvil Range Mining Corporation (Faro) Waste Dump Water Balances. Preliminary Water Balance. Prepared for SRK Consulting on behalf of Deloitte & Touche Inc., Interim Receiver of Anvil Range Mining Corporation. June 2004.
- Jennings, D.S. and Jilson, G.A. (1986). Geology and sulphide deposits of the Anvil Range, Yukon. In: Morin, J.A. (ed) Mineral Deposits of the Northern Cordillera, Canadian Institute of Mining and Metallurgy, Special Volume 37, pp. 319-361.
- Price, W. 1997. Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia. Reclamation Section, British Columbia Ministry of Energy and Mines. April 1997.

Robertson GeoConsultants Inc., 1996. Anvil Range Mining Complex, Integrated Comprehensive Abandonment Plan (ICAP). Report No. 033001/3, prepared for Anvil Range Mining Corporation. November 1996.

Sobek A A, Schuller W A, Freeman J R, and Smith R M., 1978, Field and laboratory methods applicable to overburden and minesols. USEPA Report No. 600/2-78-054, 203 pp.

Steffen Robertson & Kirsten (BC) Inc., 1992. Summary Report - Schedule D to Water Licence #IN89-001, Faro Mine, Yukon Territory. Prepared for Curragh Resources Inc., August 1992.

Steffen Robertson & Kirsten (Canada) Inc., 2000. Interim Report on the Feasibility of Reclaiming Vangorda Pit as a Clean Water System. Prepared for Deloitte & Touche Inc, October 2000.



Dwg Ref: Regional Loc Map.dwg



Deloitte & Touche Inc.

FARO-VANGORDA PLATEAU MINE SITES

LOCATION MAP

PROJECT NO.	DATE	APPROVED	FIGURE
1CD003.37	Dec. 2003		1.1

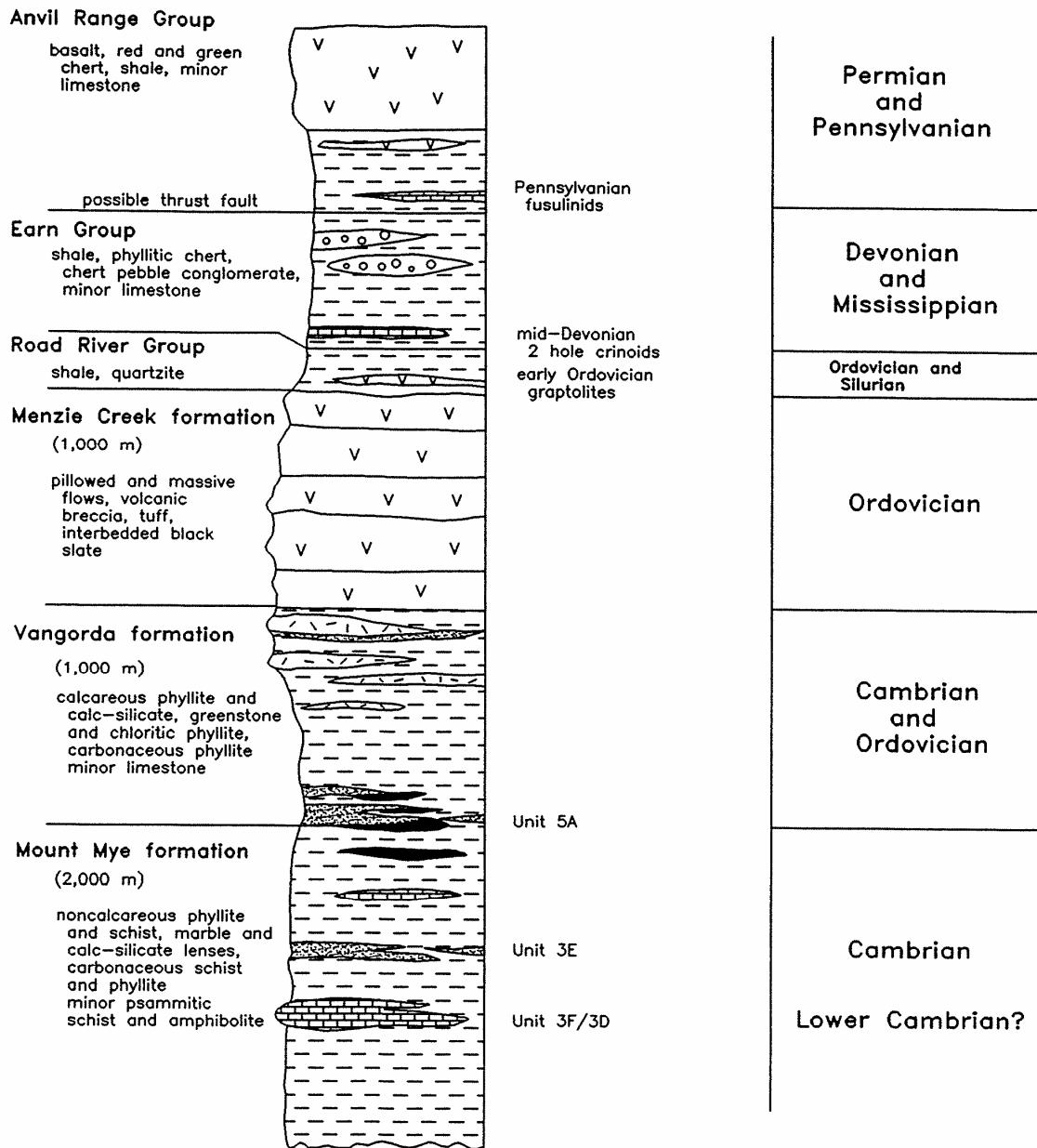


Figure 2. Schematic stratigraphic section for Anvil District. Vangorda and Mt. Mye formations contain carbonaceous phyllite (dark stipple—units 5A, 3E) interbanded with sulphide horizons (black). Sulphides form massive and disseminated beds through a 200 metre stratigraphic interval straddling the Mt. Mye–Vangorda contact. Upper Vangorda formation is characterized by abundant dark green greenstone lenses (hatchure pattern).

Drawing taken from Access Mining, 1996.



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

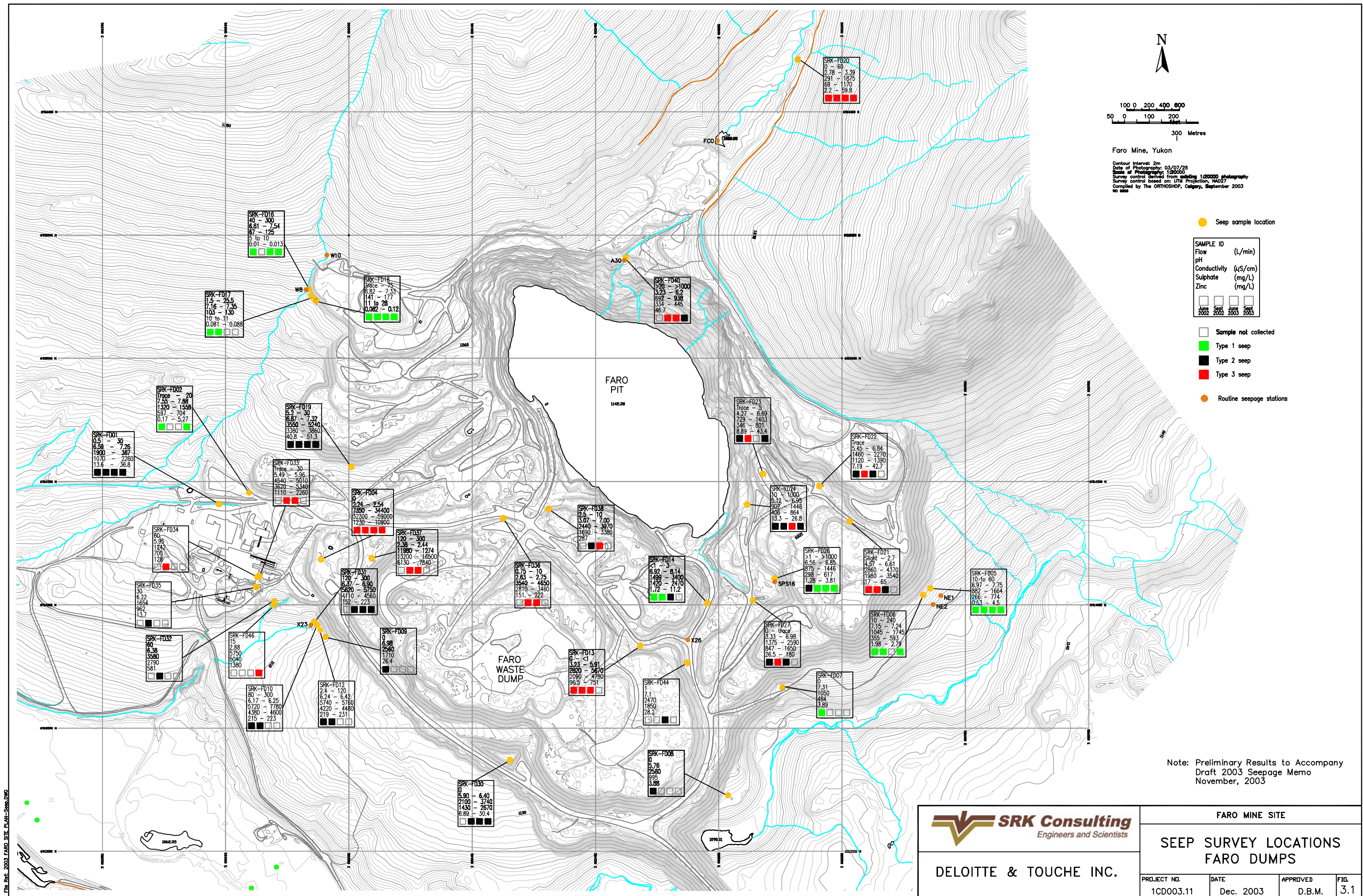
**Generalized Stratigraphy of the Mining
Areas**

Project
1CD003.11.610

Date
June 2004

Approved

Figure
2.1



File Ref: 2003 FARO SITE PLAN- Seep.DWG



SRK Consulting
Engineers and Scientists

FARO MINE SITE

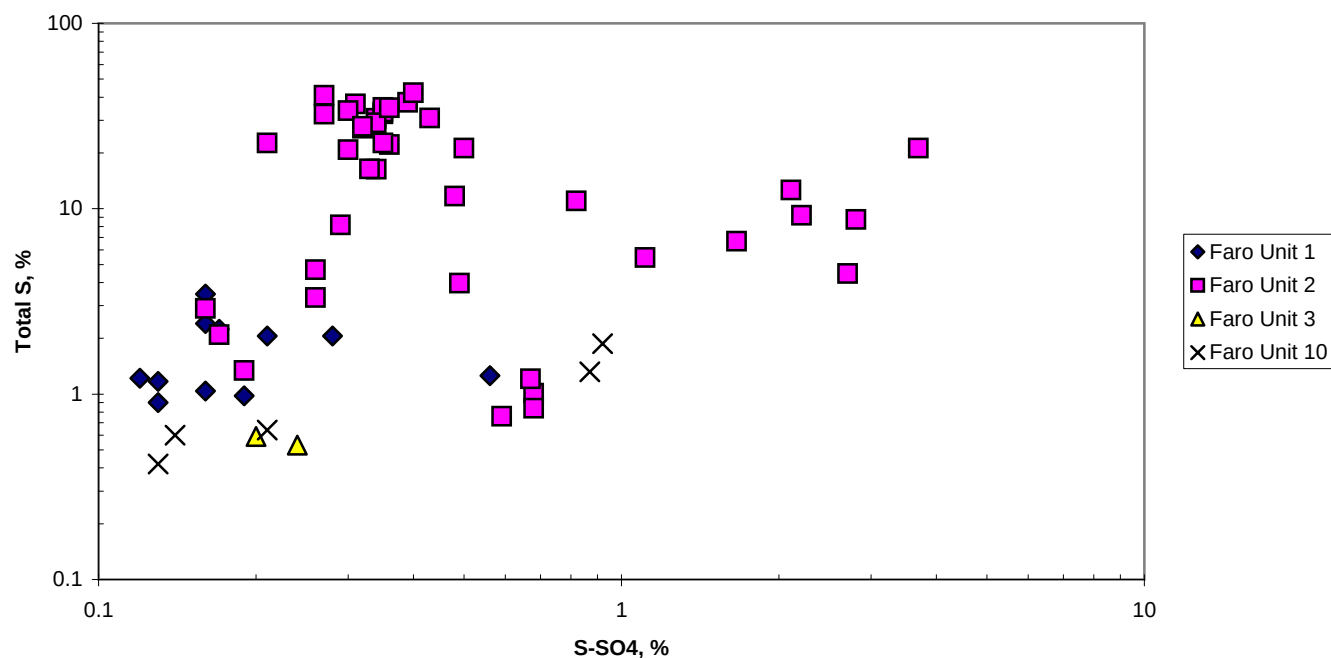
**SEEP SURVEY LOCATIONS
FARO DUMPS**

DELOITTE & TOUCHE INC.

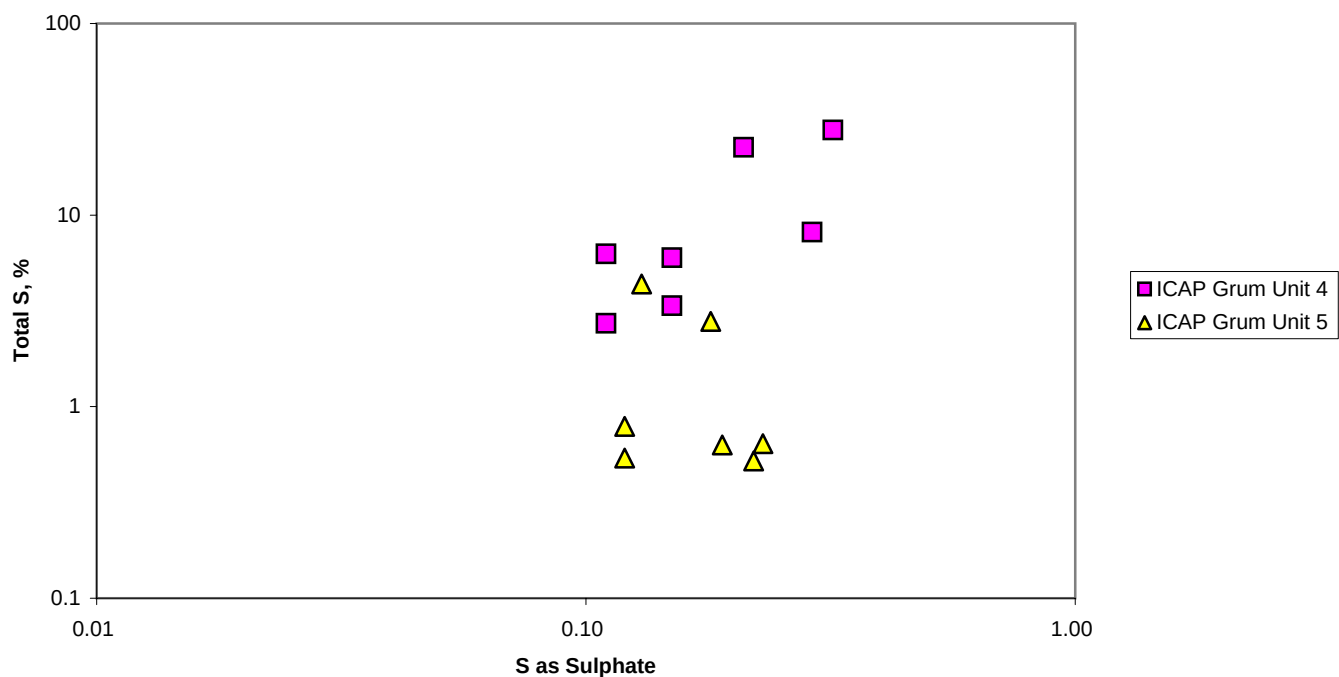
PROJECT NO.	DATE	APPROVED	FIG.
1CD003.11	Dec. 2003	D.B.M.	3.1

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

(a) Faro - ICAP Dataset



(b) Vangorda Plateau - ICAP Dataset



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

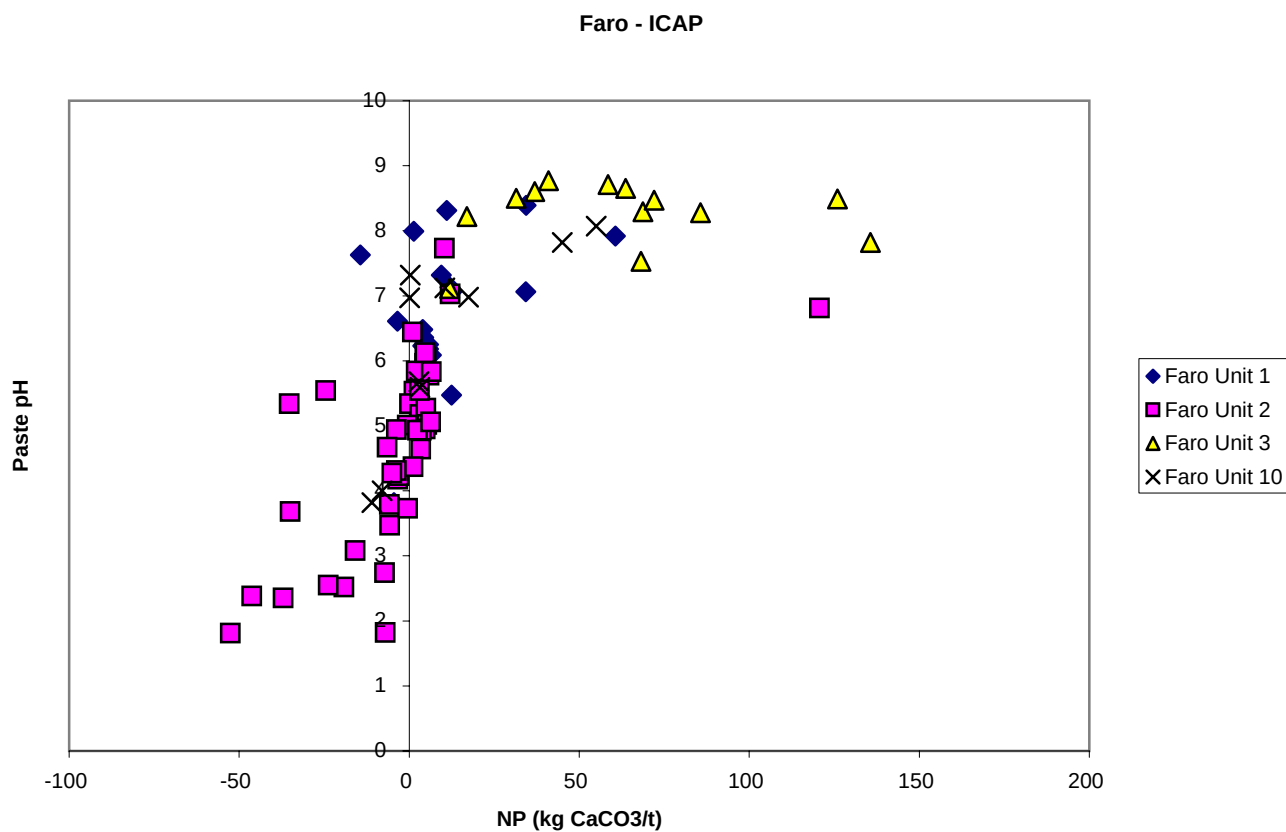
**Comparison of Total Sulphur and Sulphur
as Sulphate**

Project
1CD003.11.610

Date
June 2004

Approved

Figure
4.1



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

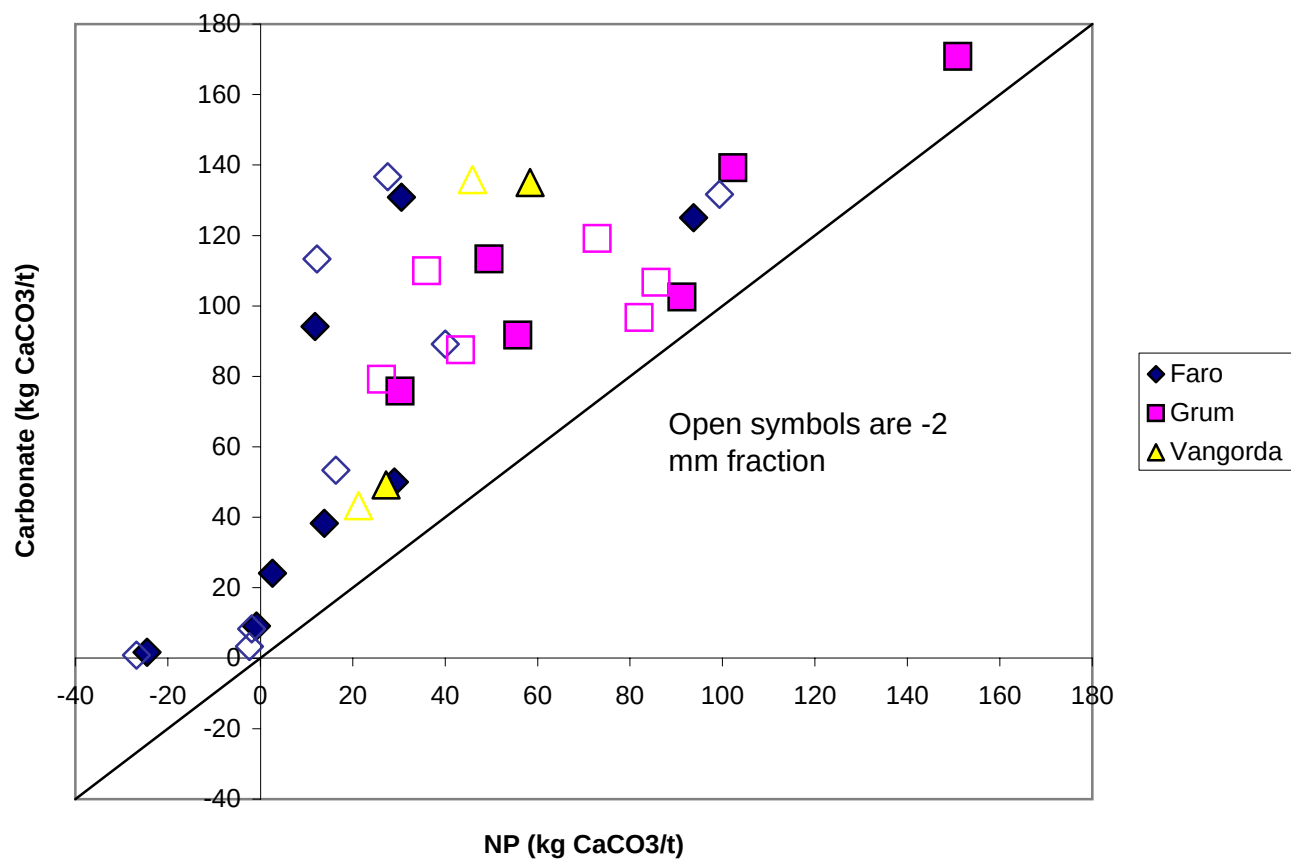
**Comparison of Paste pH and Sulphur as
Sulphate**

Project
1CD003.11.610

Date
June 2004

Approved

Figure
4.2

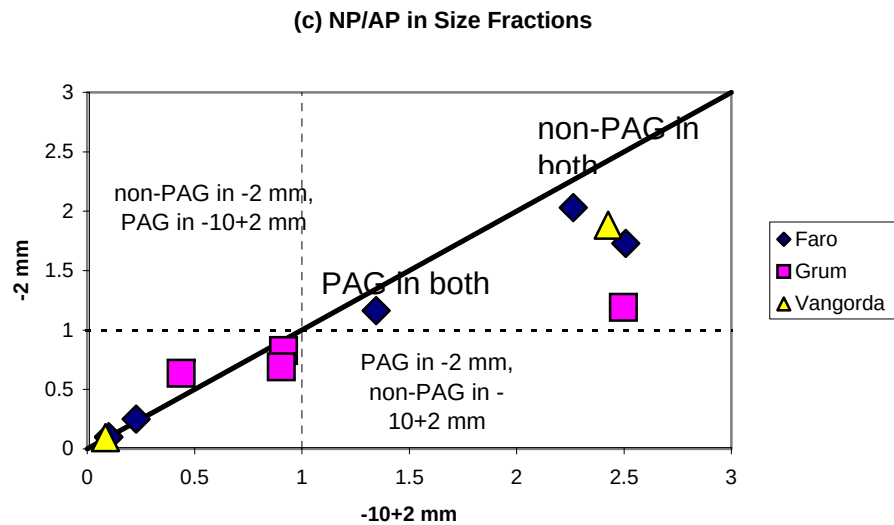
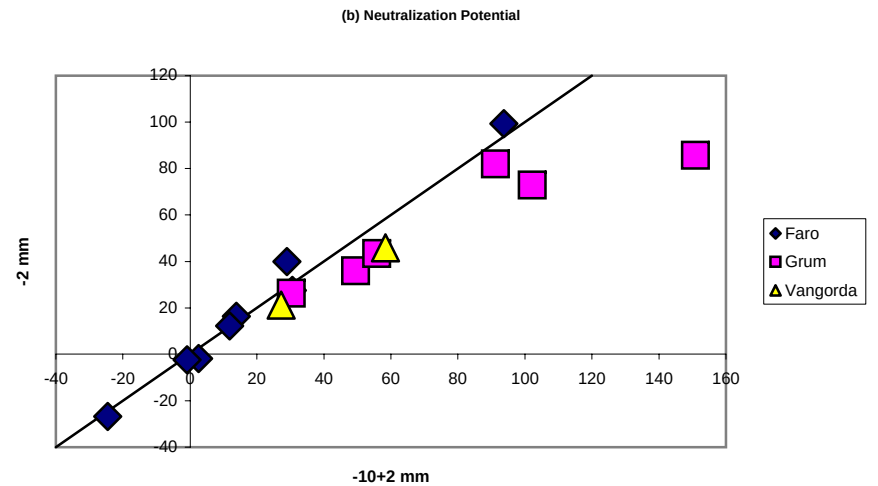
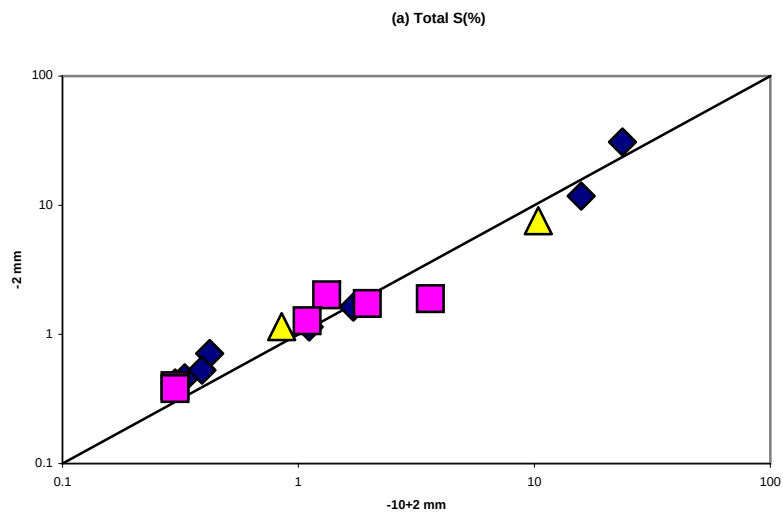


DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

Comparison of Neutralization Potential and Carbonate Content

Project	Date	Approved	Figure
1CD003.11.610	June 2004		4.3



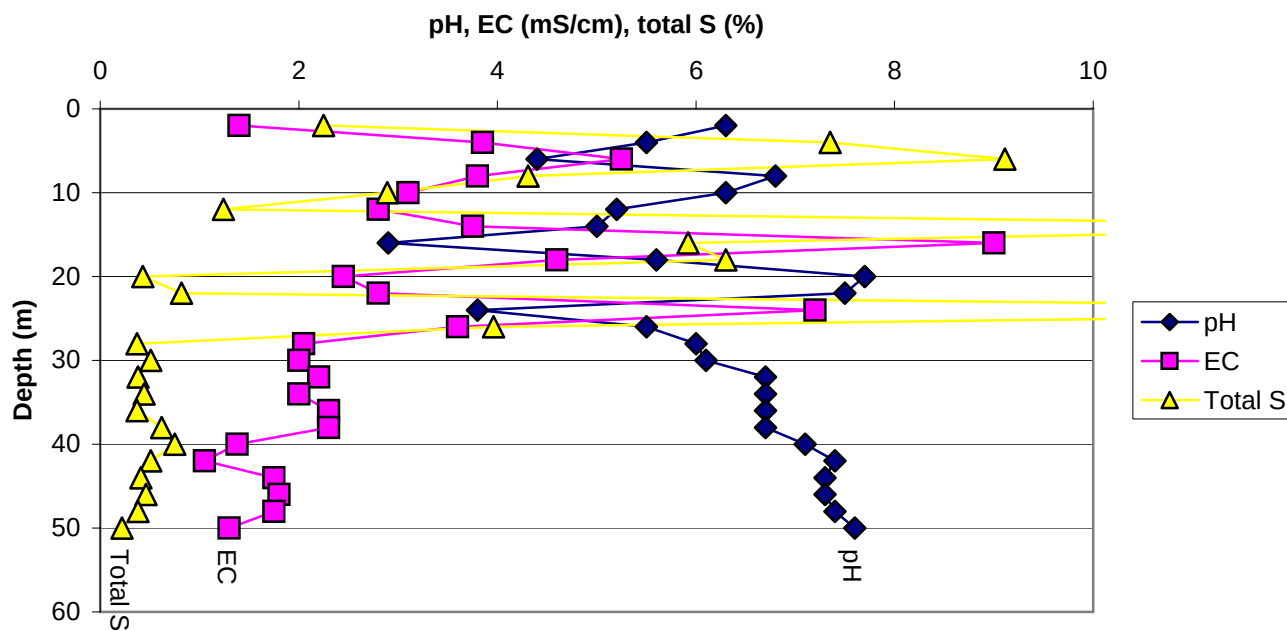
DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

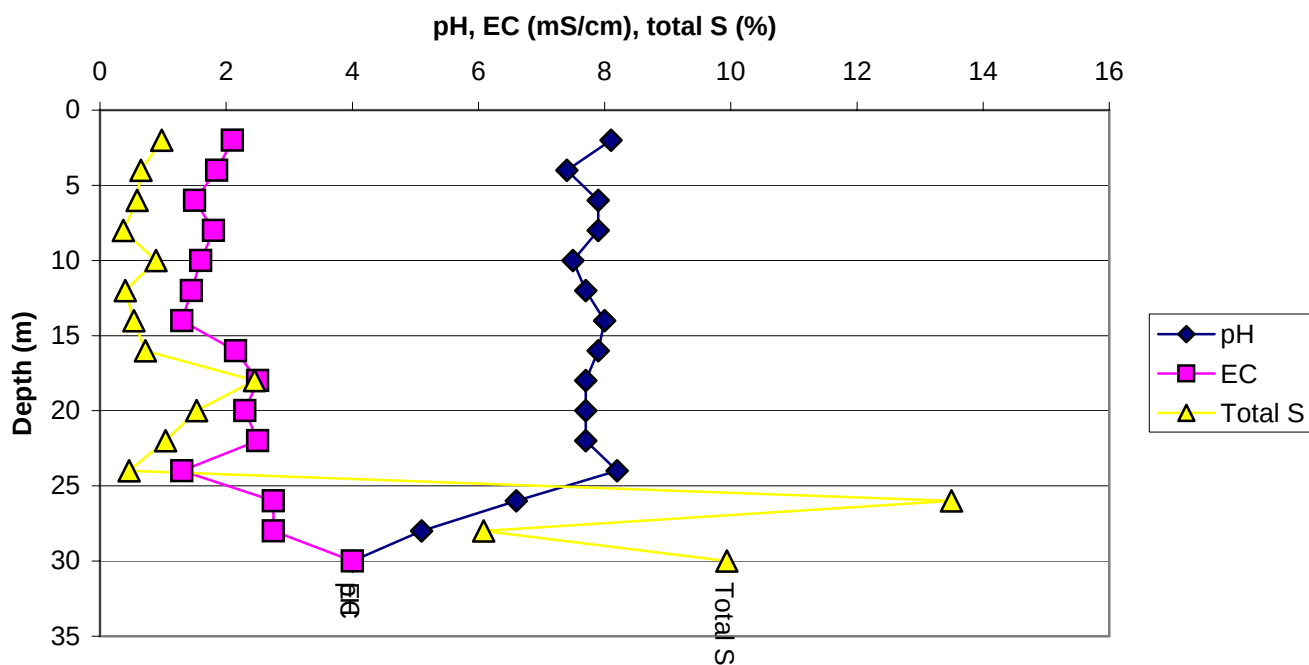
Results of Analysis of Size Fractions

Project	Date	Approved	Figure
1CD003.11.610	June 2004		4.4

Faro Intermediate Dump Sulphide Cell 60M1



Faro Intermediate Dump 30M1



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

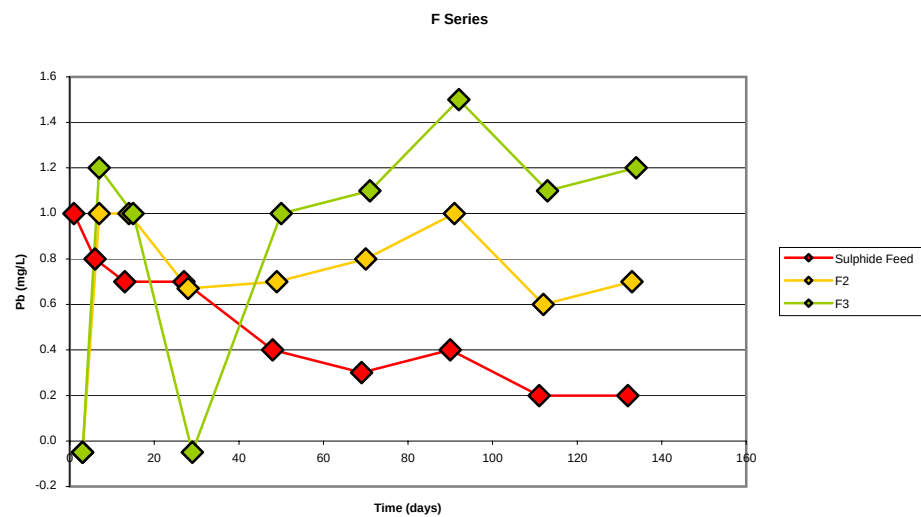
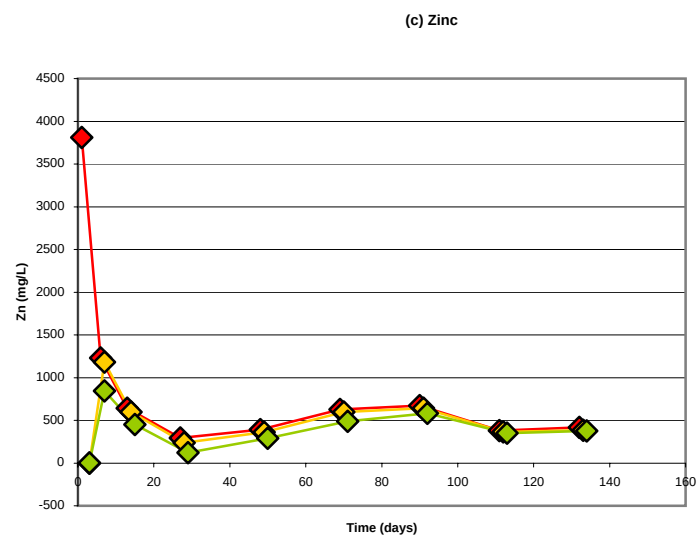
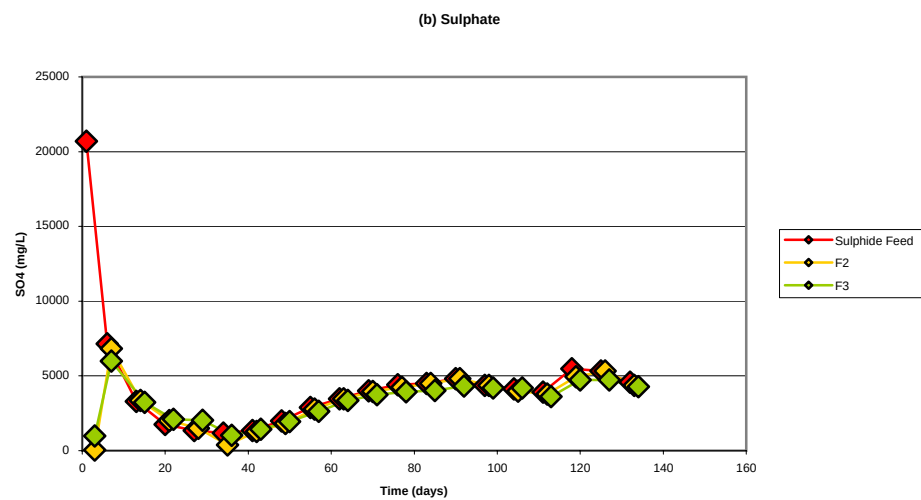
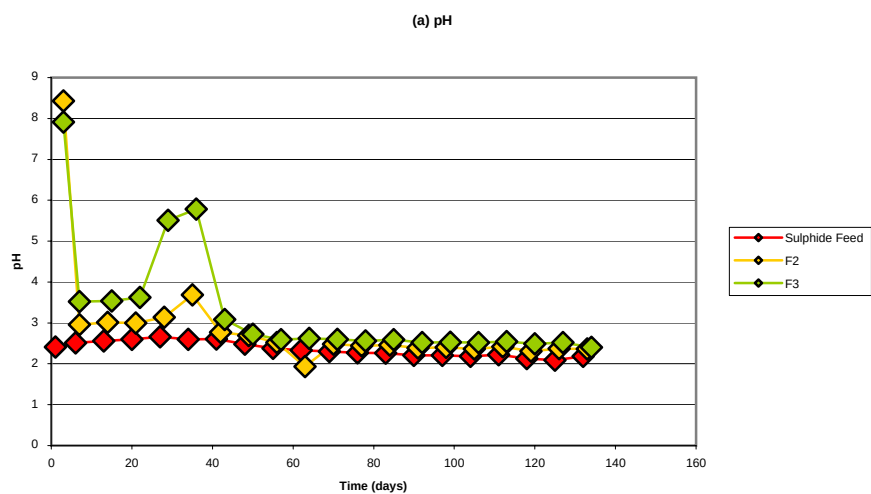
**Geochemical Profiles in Drill Holes – Faro
Site**

Project
1CD003.11.610

Date
June 2004

Approved

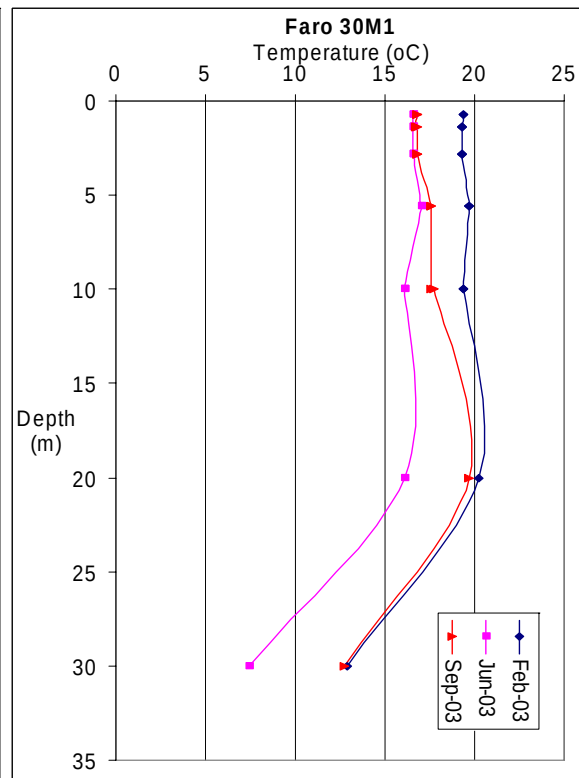
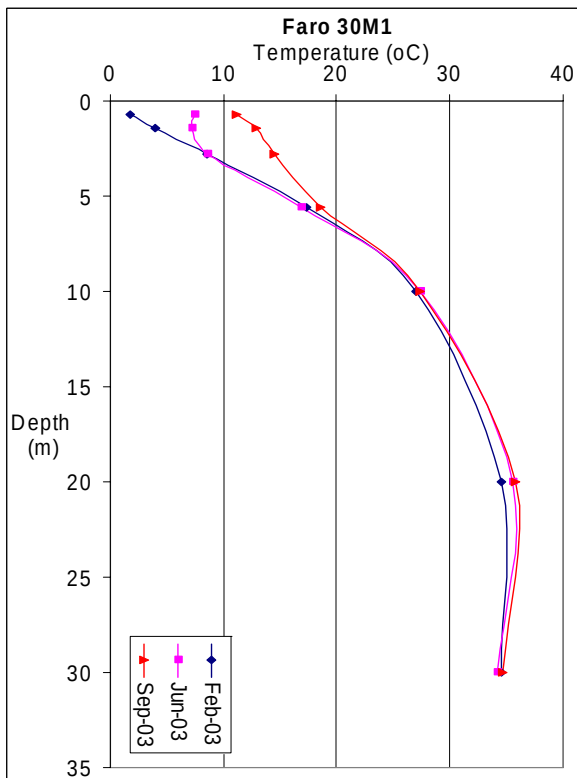
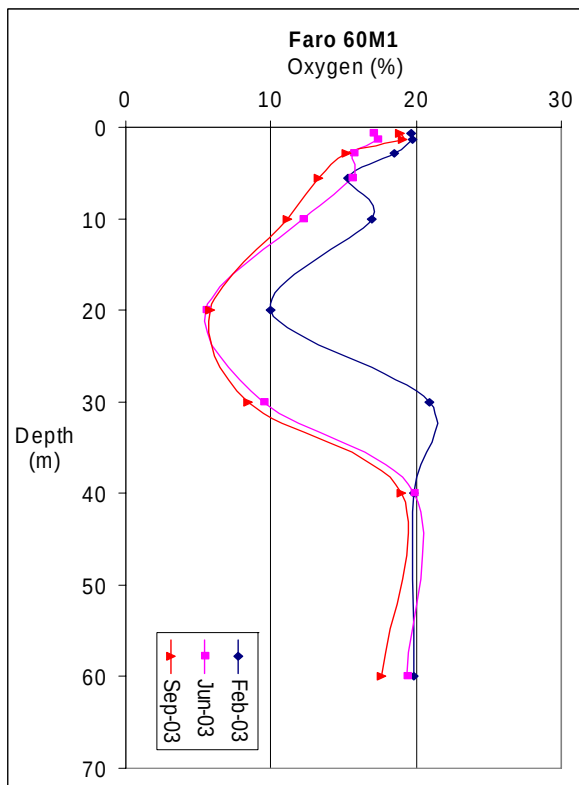
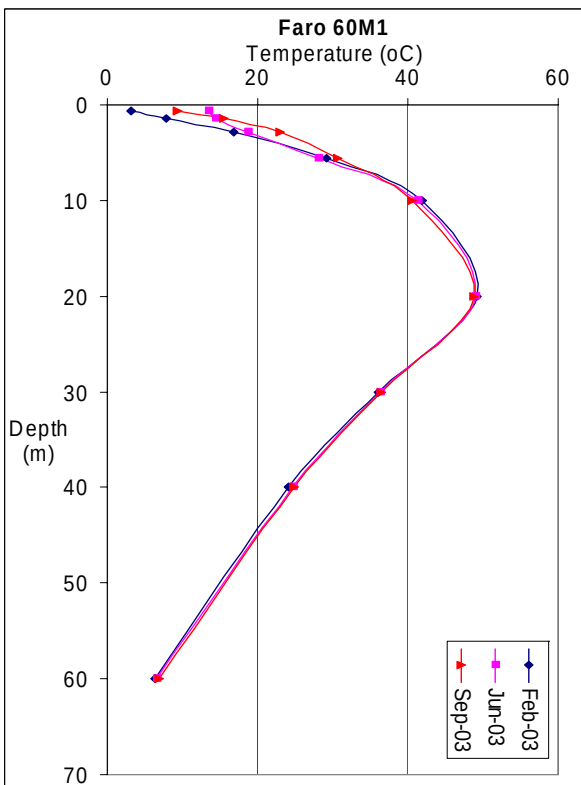
Figure
4.5



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex
**Results of Site Specific Kinetic Test –
Faro Site**

Project	Date	Approved	Figure
1CD003.11.610	June 2004		4.6



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

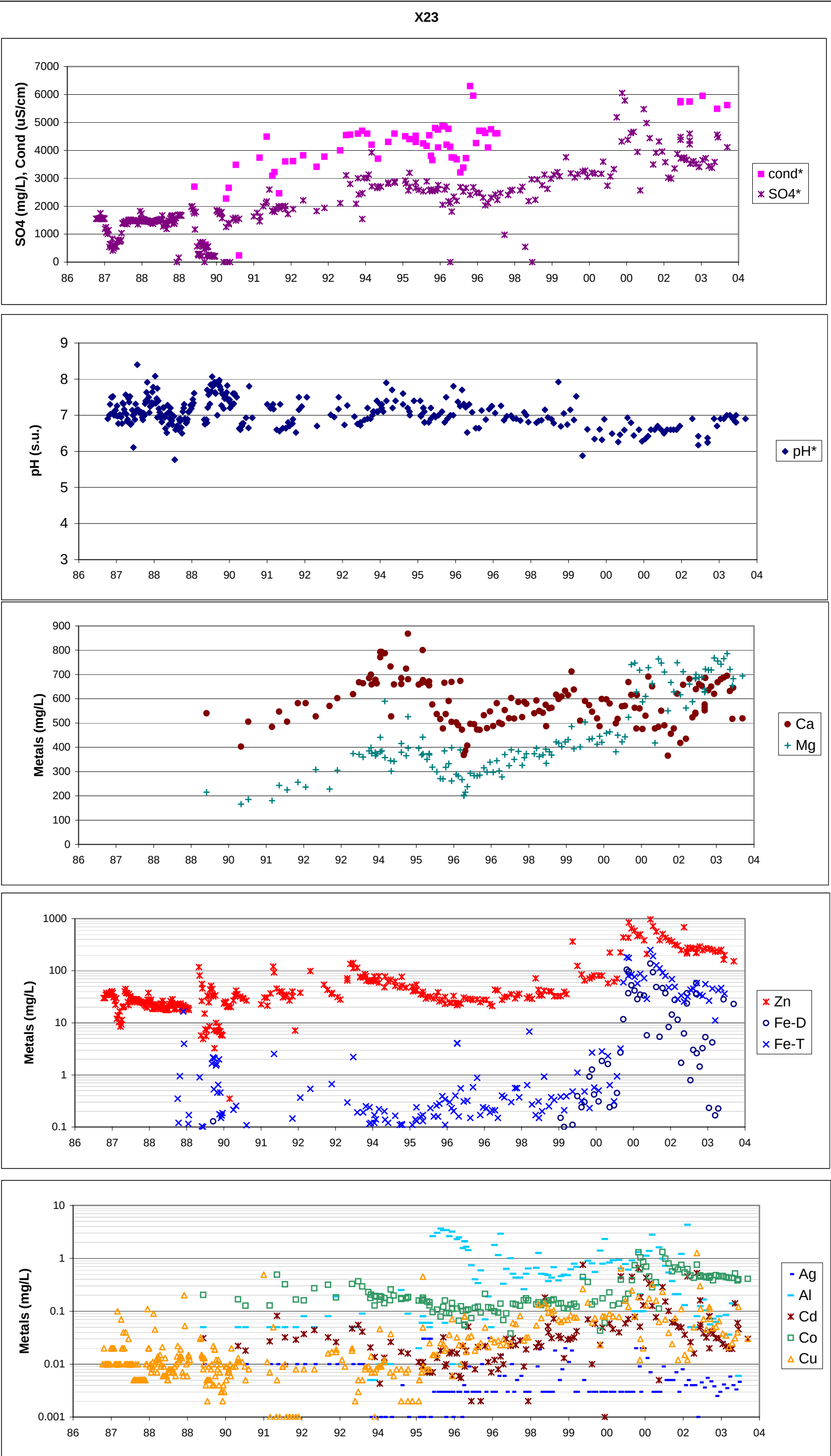
Results of Temperature and Oxygen Monitoring – Faro Site

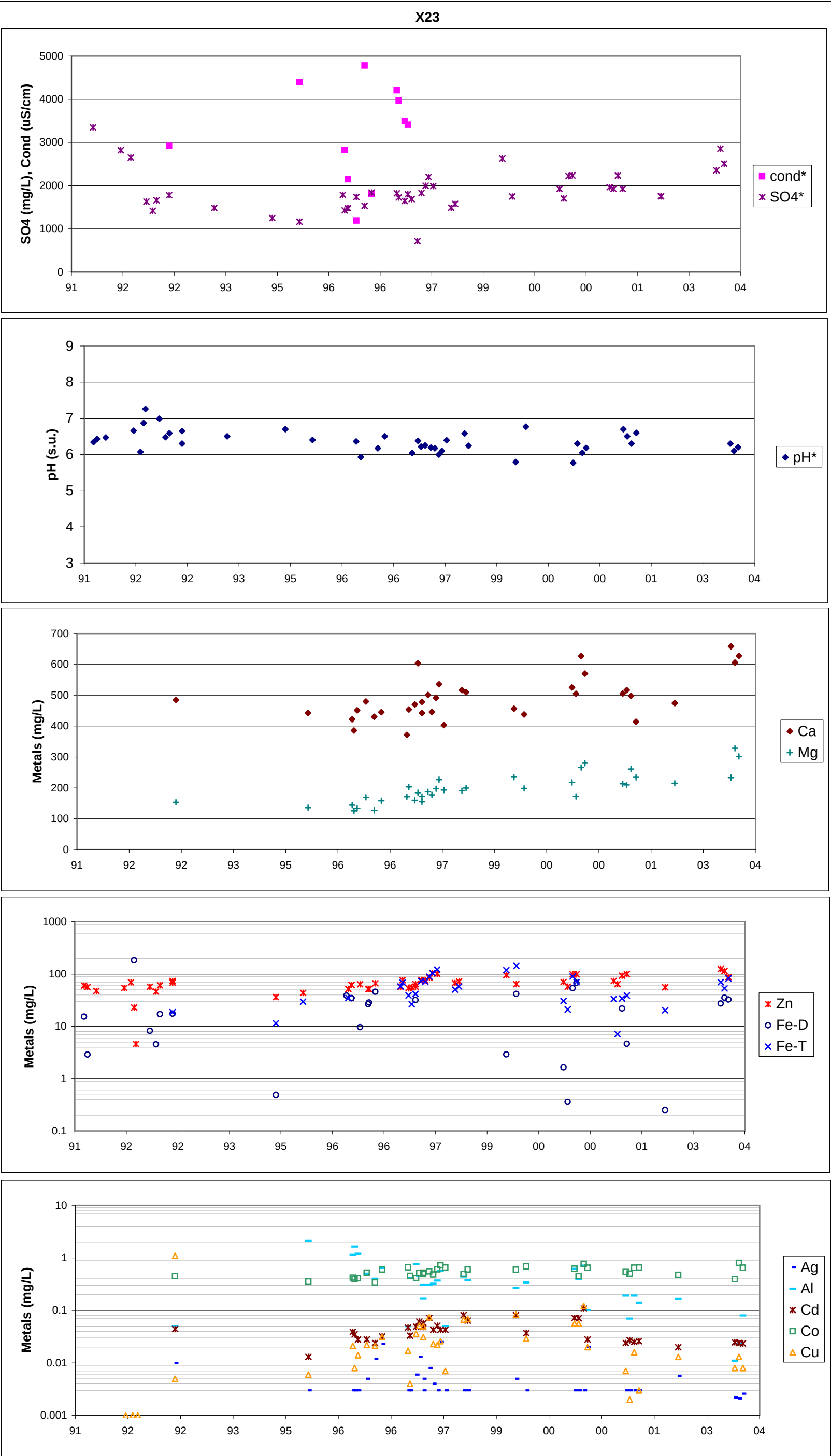
Project
1CD003.11.610

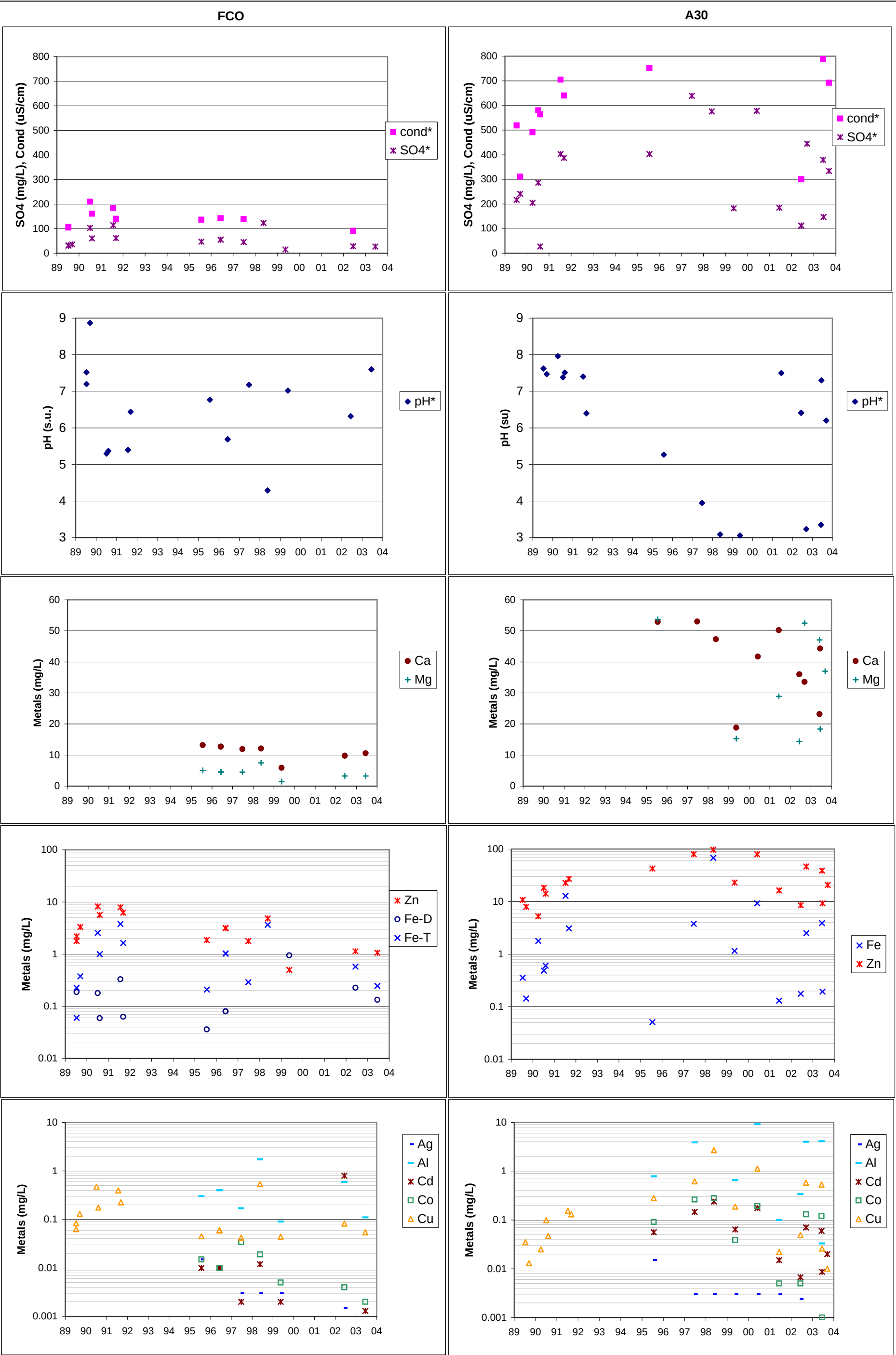
Date
June 2004

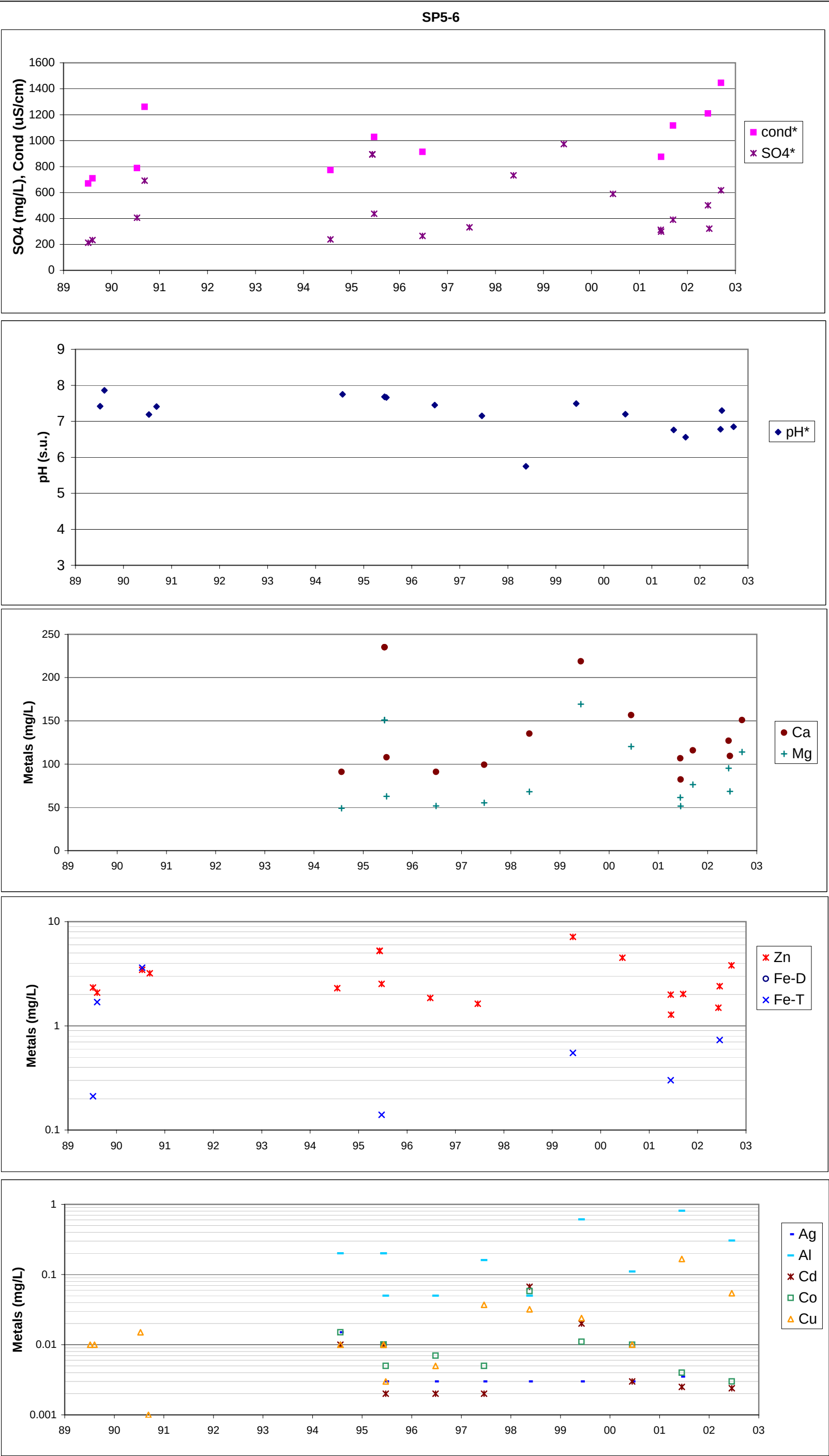
Approved

Figure
4.7









DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

Faro Seepage Station
SP5-6

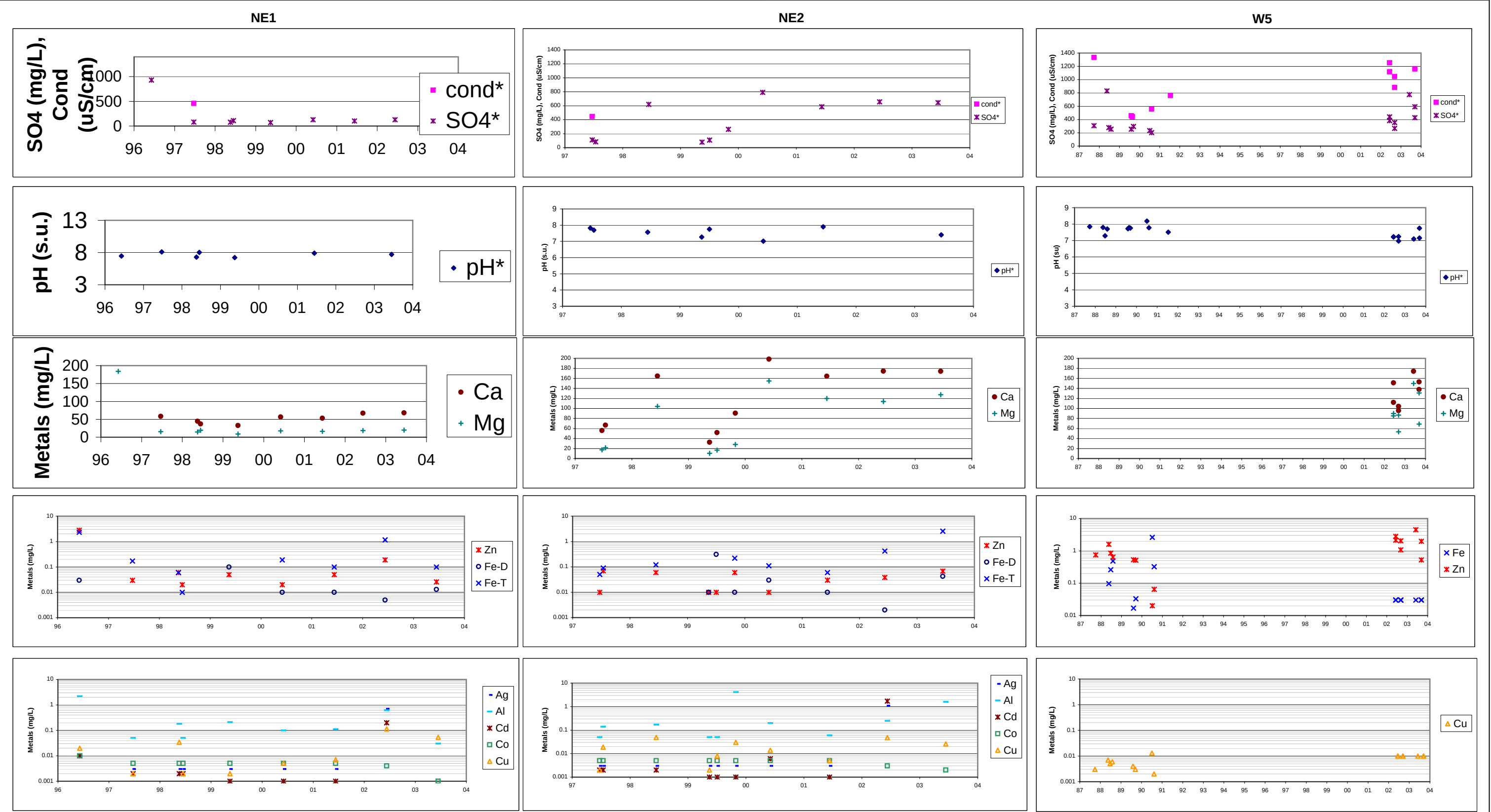
PROJECT
1D003.11.610

DATE
June 2004

APPROVED

FIGURE

4.11



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

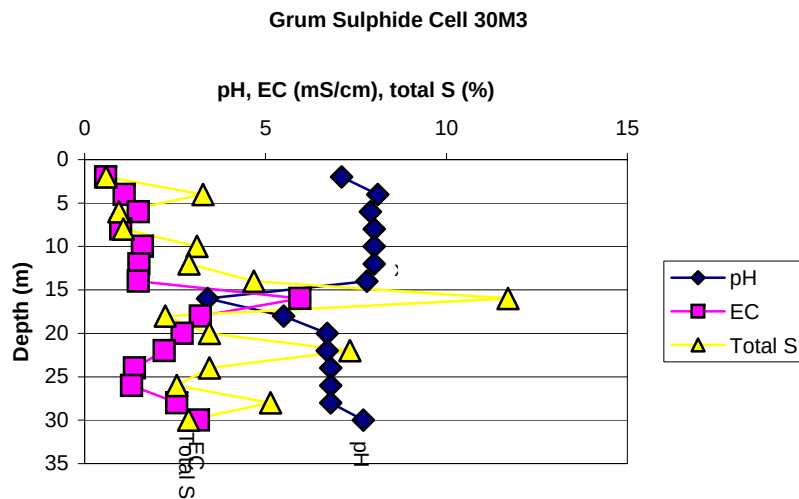
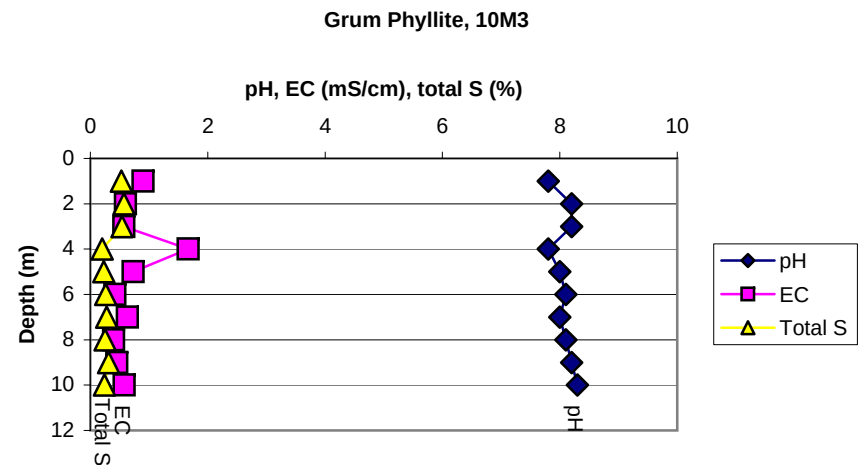
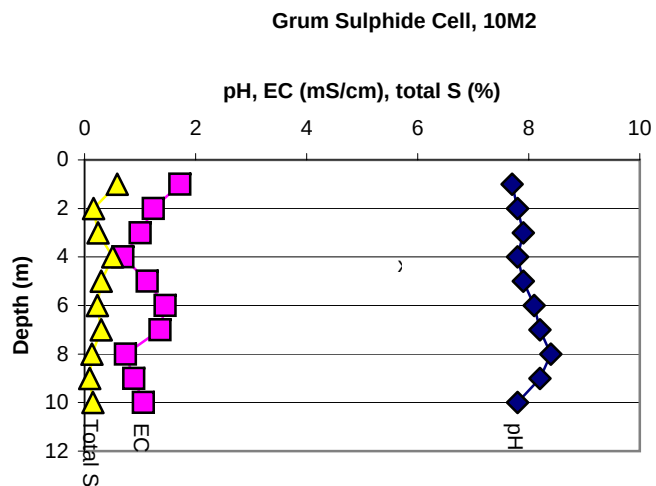
Faro Seepage Stations
NE1, NE2, and W5

PROJECT
1CD003.11.6

DATE
June 2004

APPROVED

FIGURE
4.12



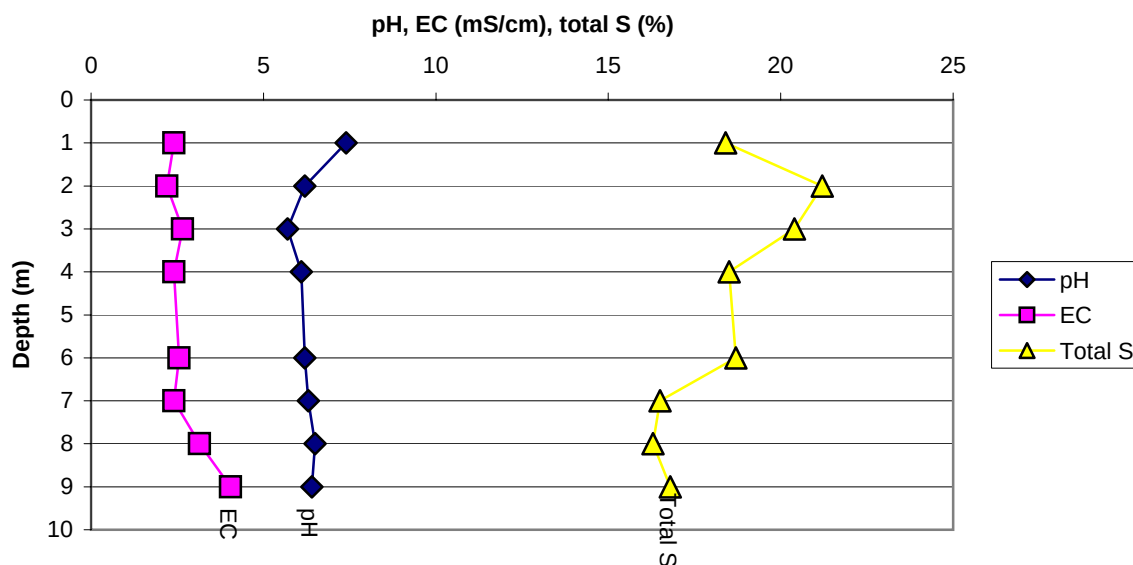
DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

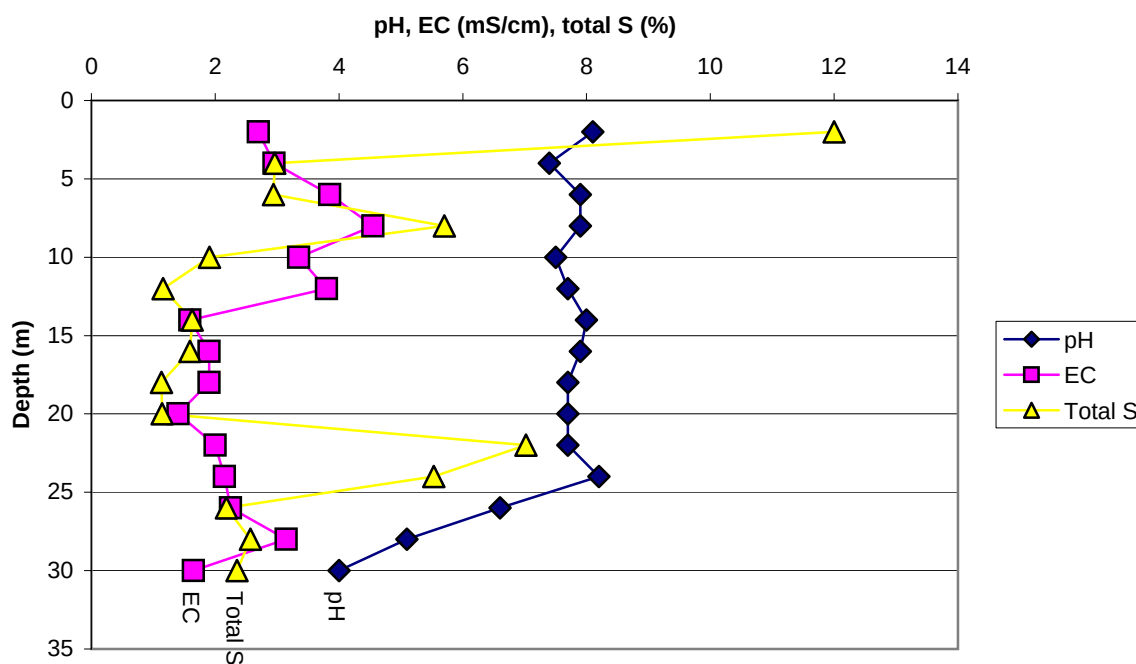
**Geochemical Profiles in Drill Holes –
Grum Site**

Project	Date	Approved	Figure
1CD003.11.610	June 2004		4.14

Vnagorda, 10M4



Vangorda 30M4



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

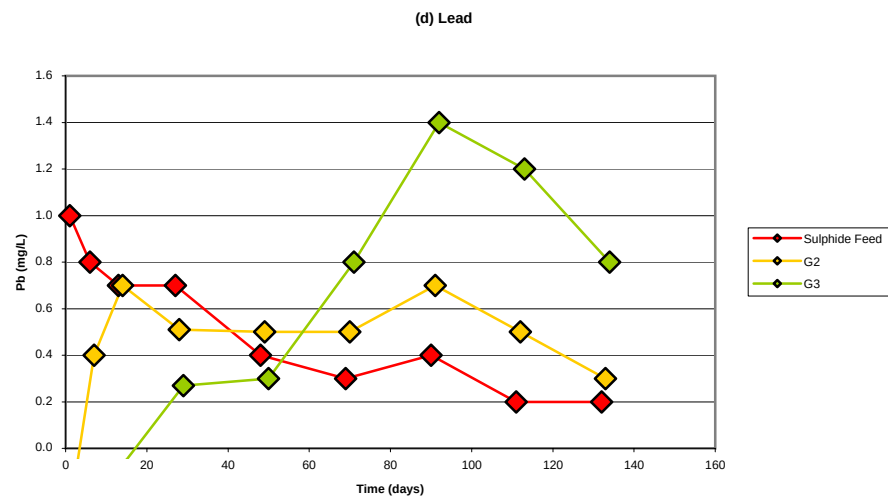
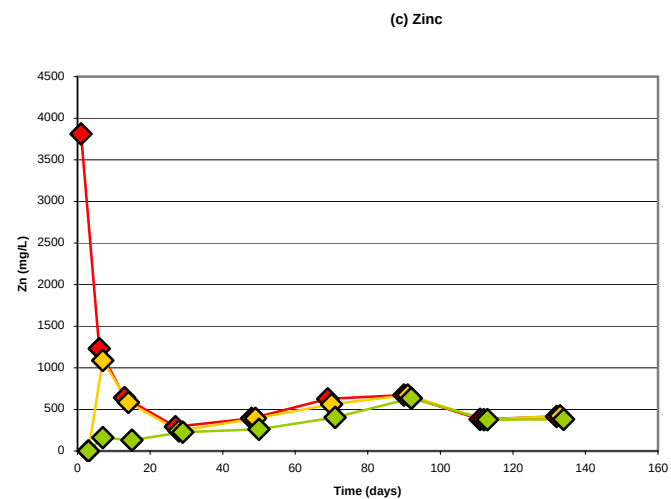
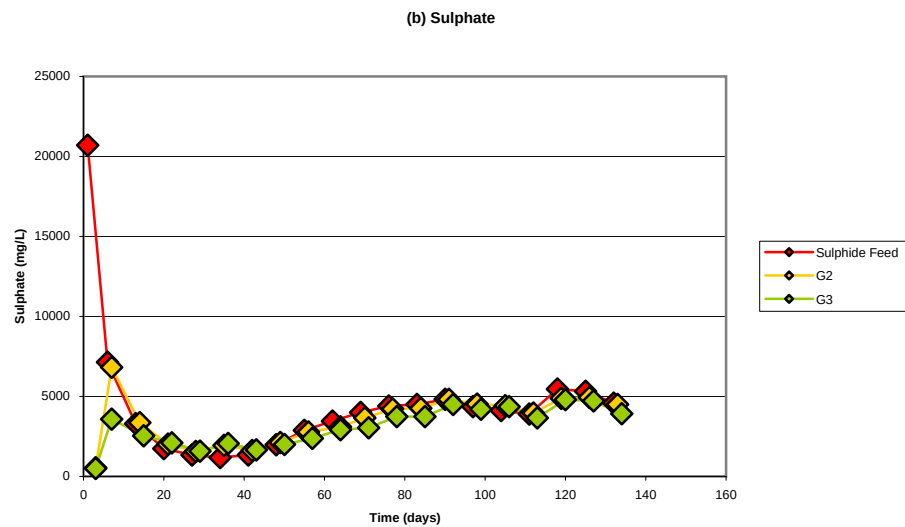
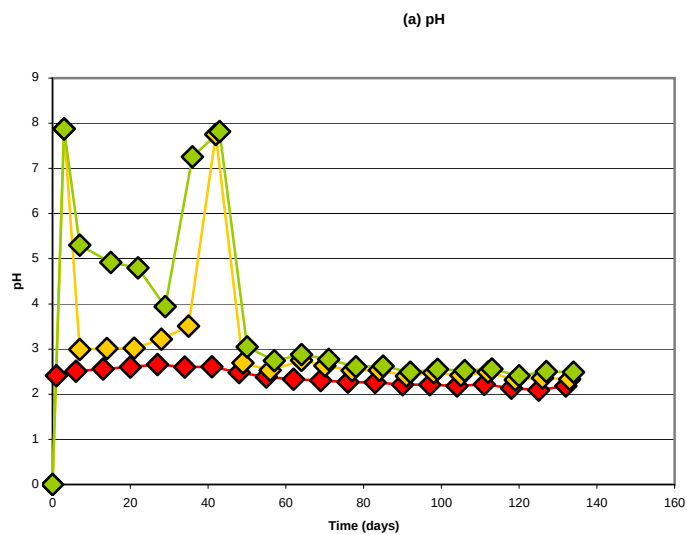
Geochemical Profiles in Drill Holes – Vangorda Site

Project
1CD003.11.610

Date
June 2004

Approved

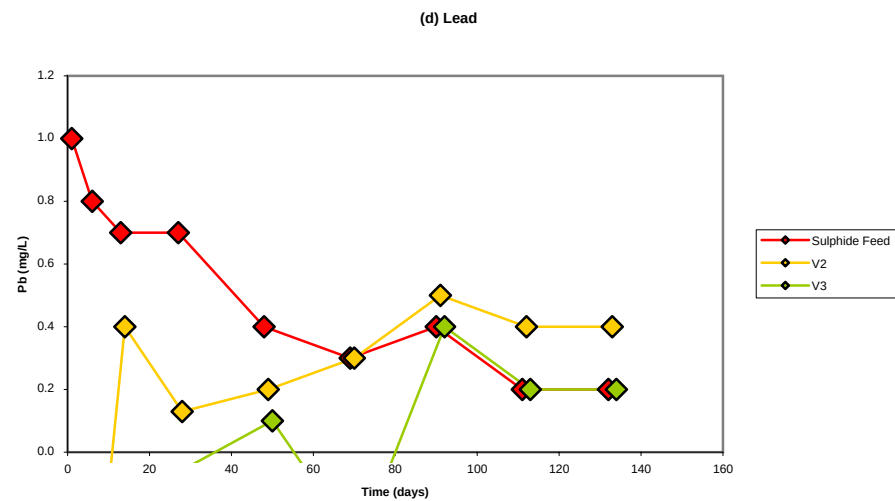
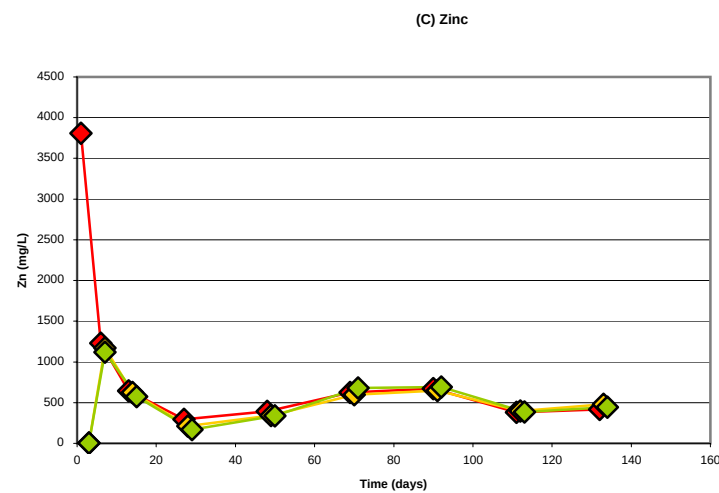
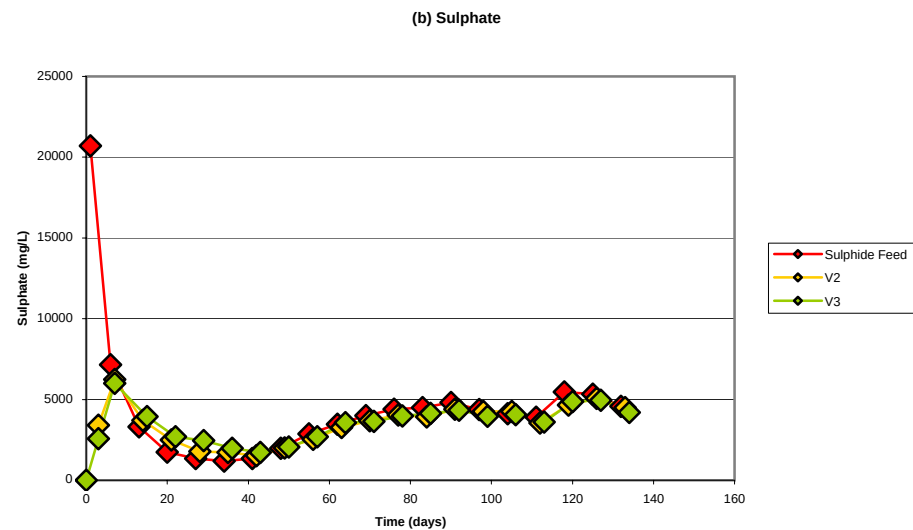
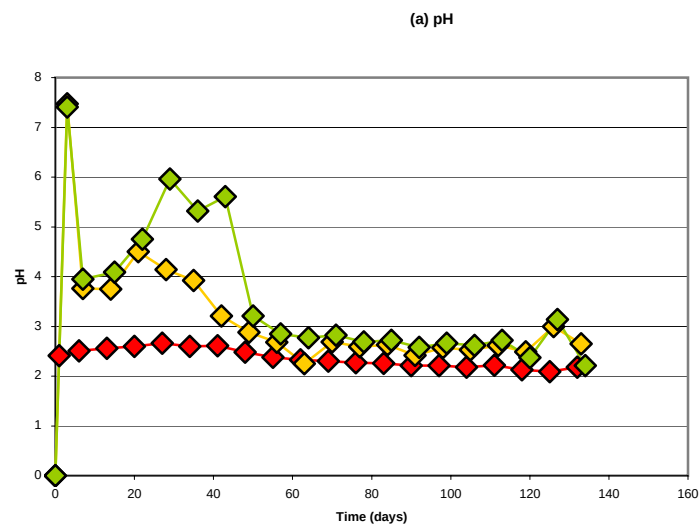
Figure
4.15



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex
Results of Site Specific Kinetic Test –
Grum Site

Project	Date	Approved	Figure
1CD003.11.610	June 2004		4.16

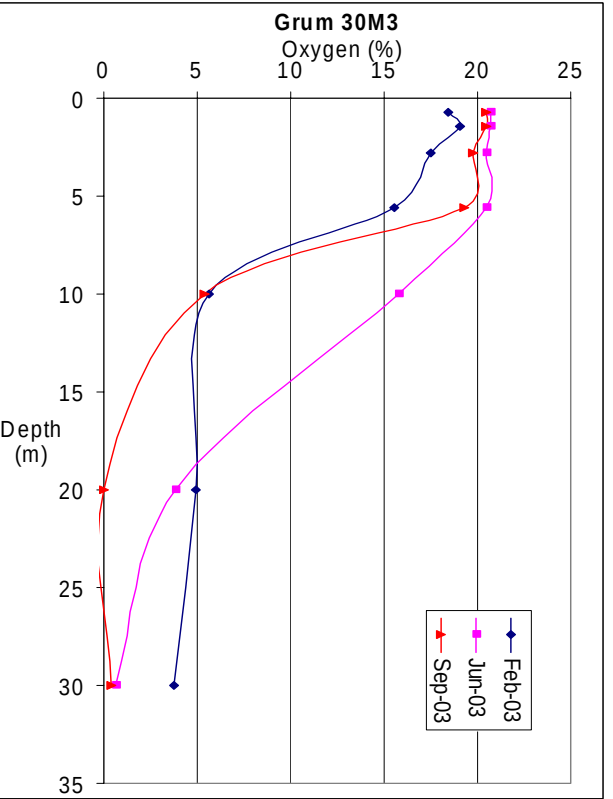
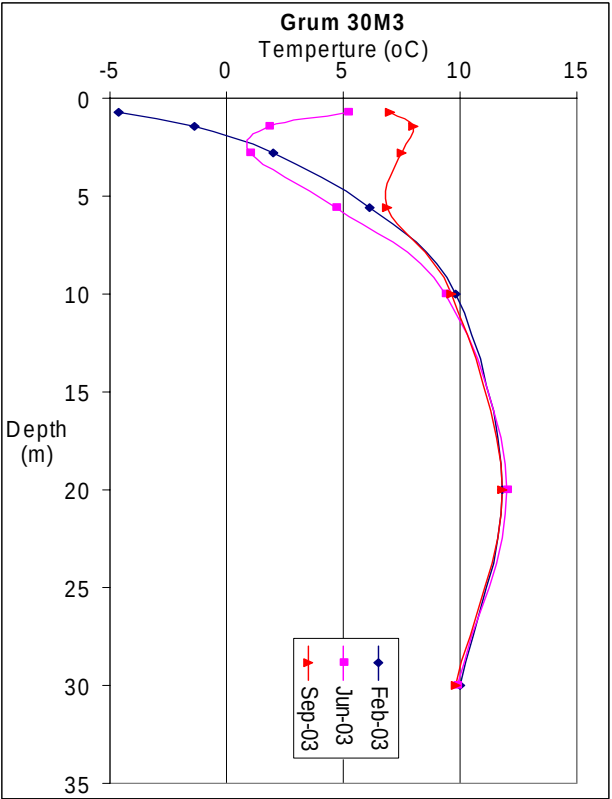
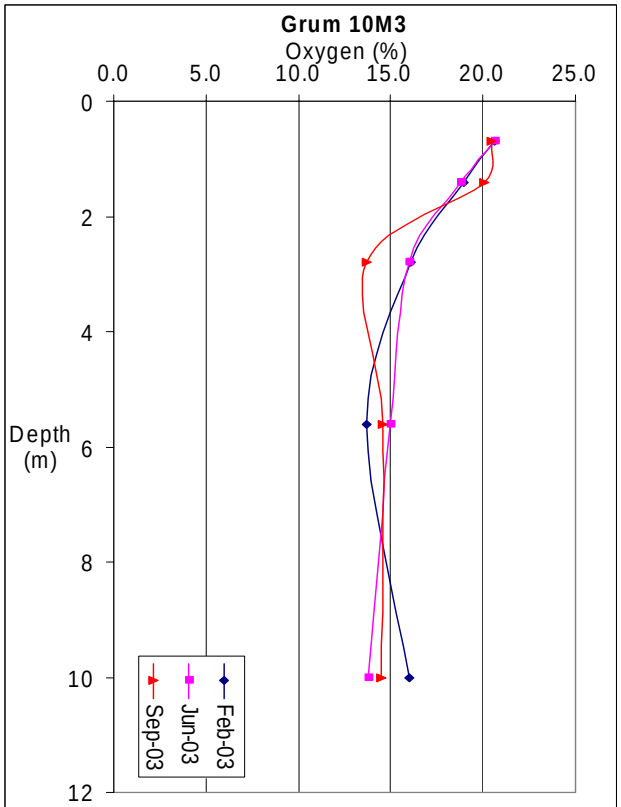
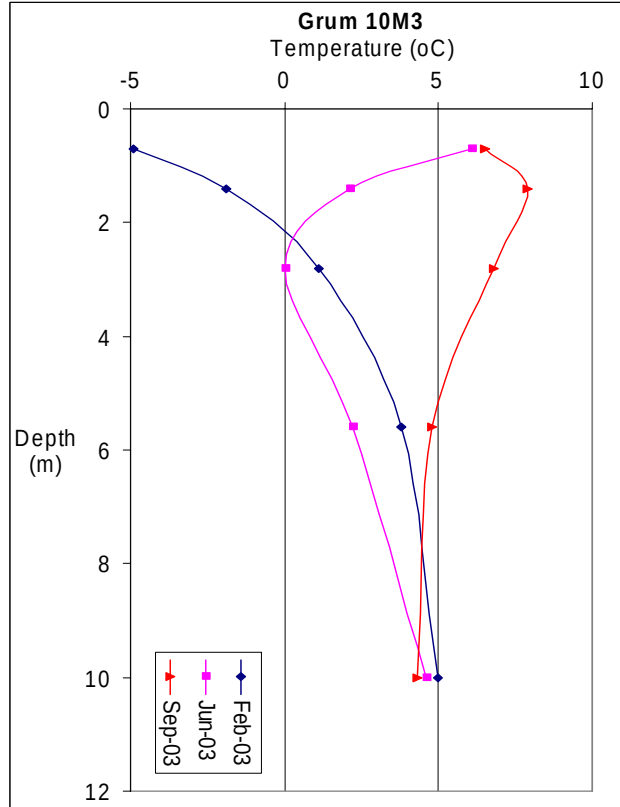
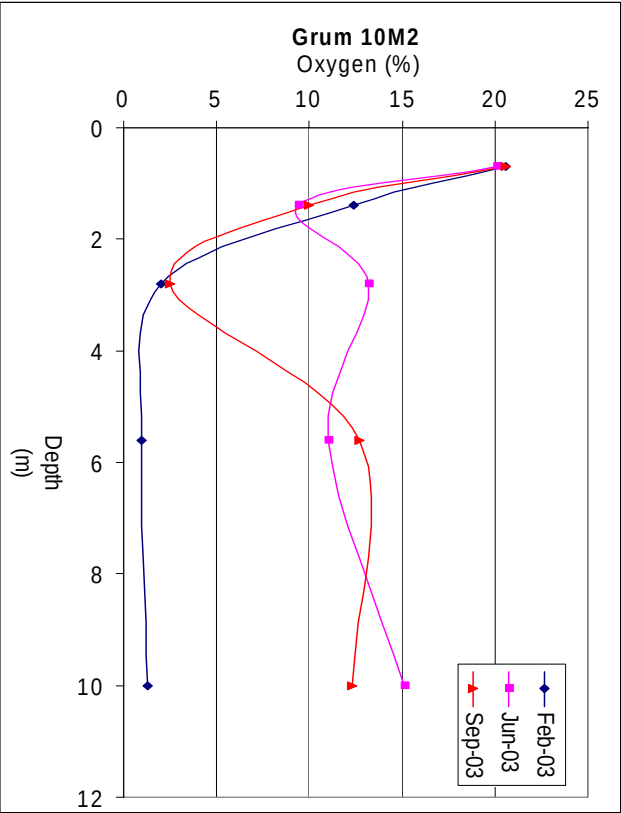
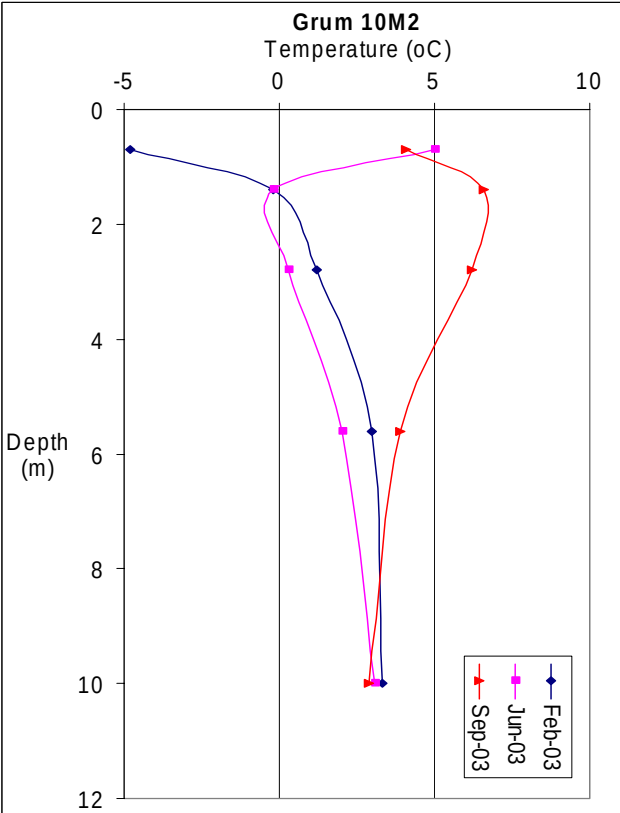


DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

**Results of Site Specific Kinetic Test –
Vangorda Site**

Project	Date	Approved	Figure
1CD003.11.610	June 2004		4.17

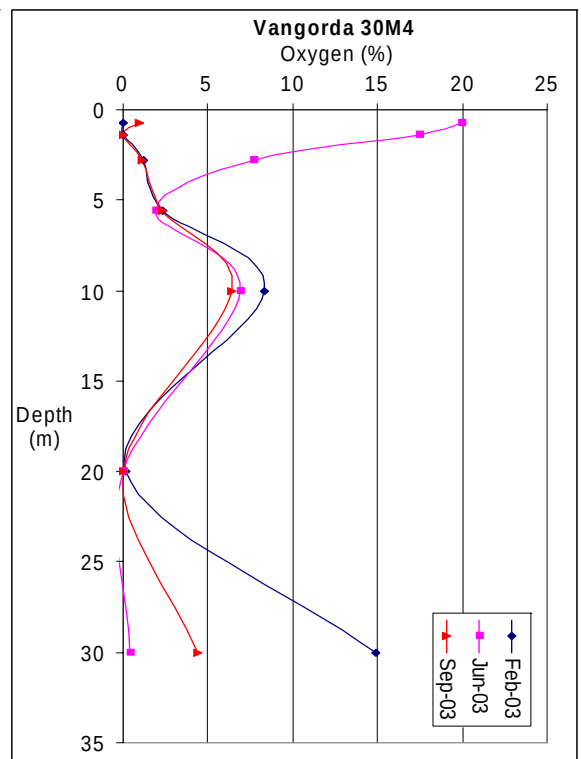
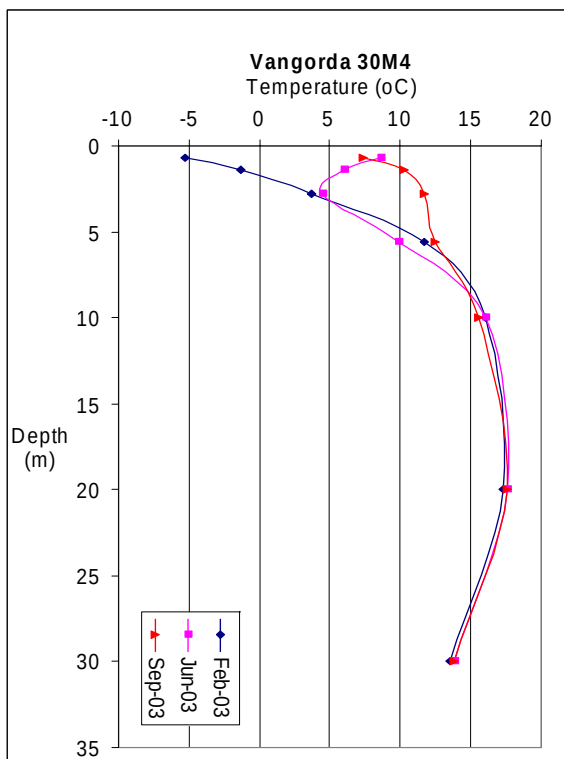
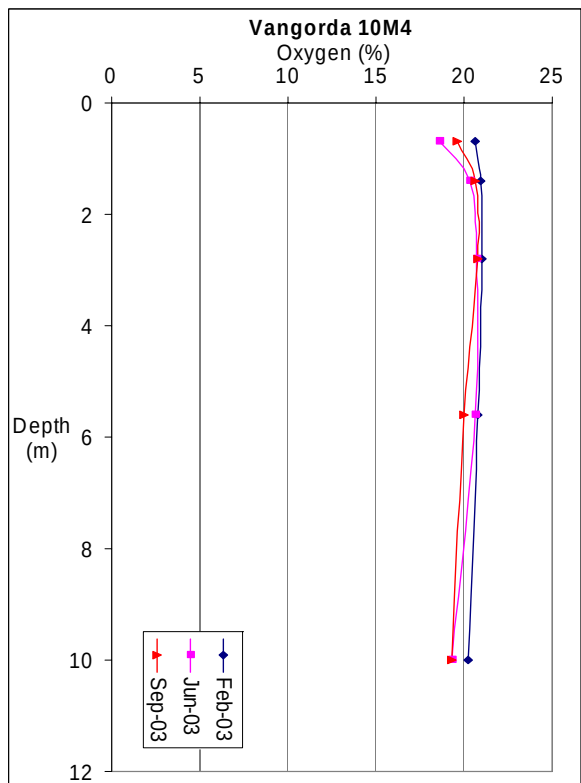
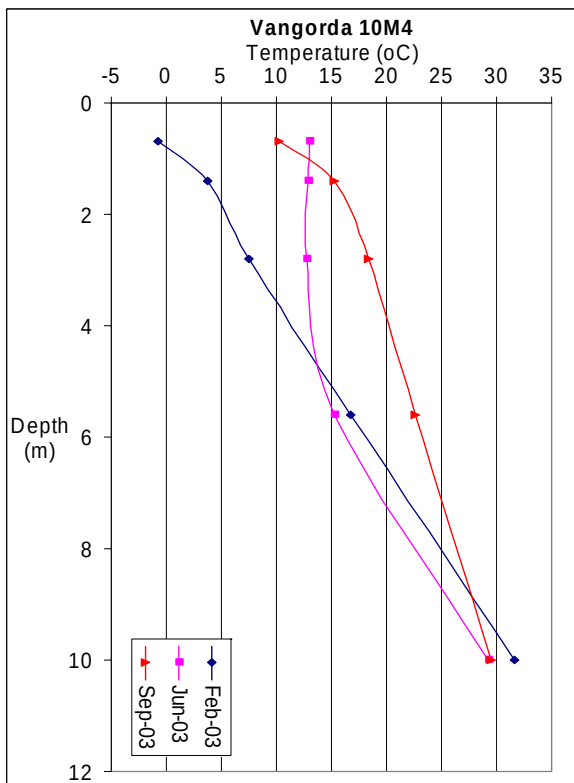


Sulphide Cell Drill Holes



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the Anvil Range Mining Complex			
Results of Temperature and Oxygen Monitoring – Grum Site			
Project	Date	Approved	Figure
1CD003.11.610	June 2004		4.18

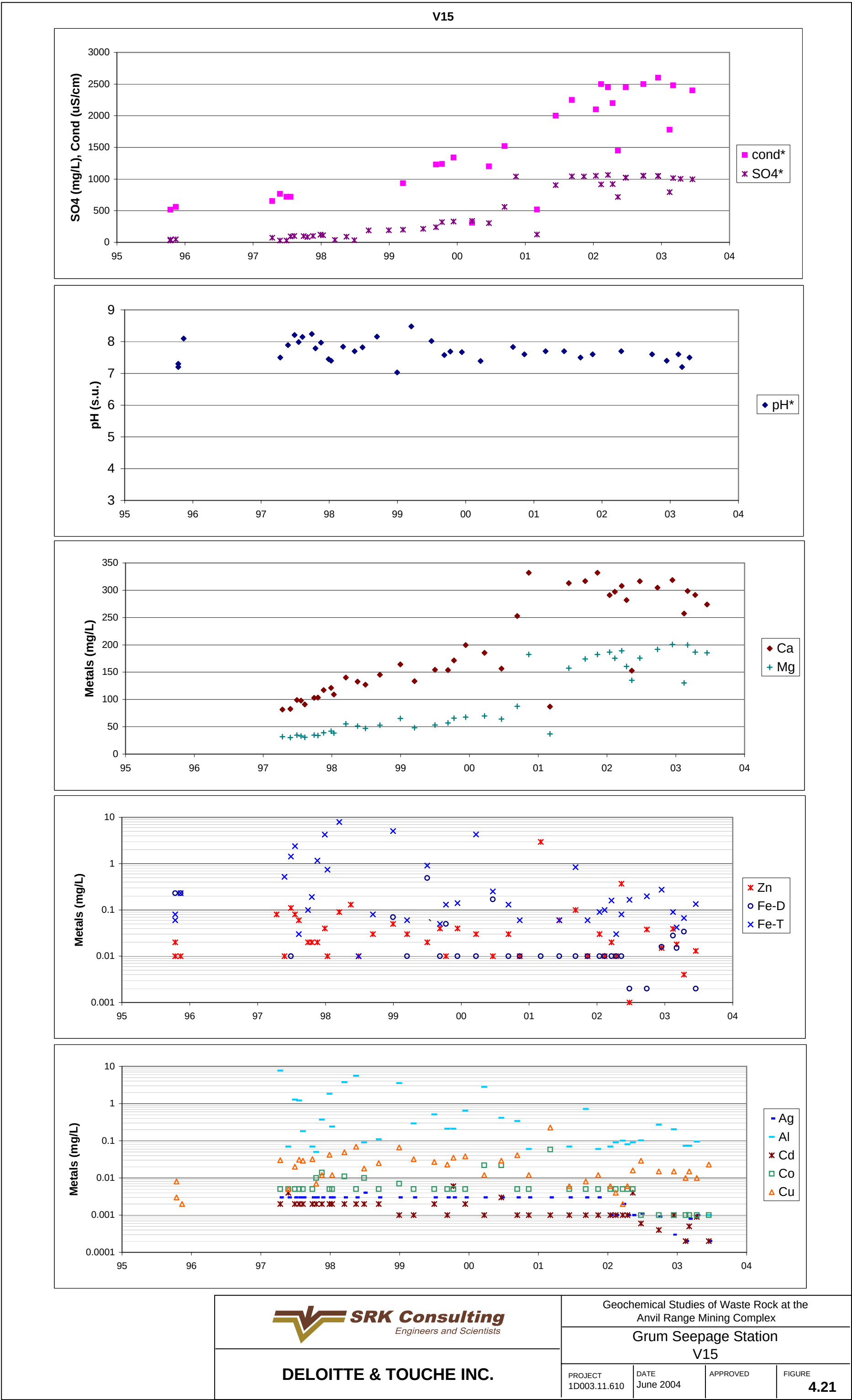


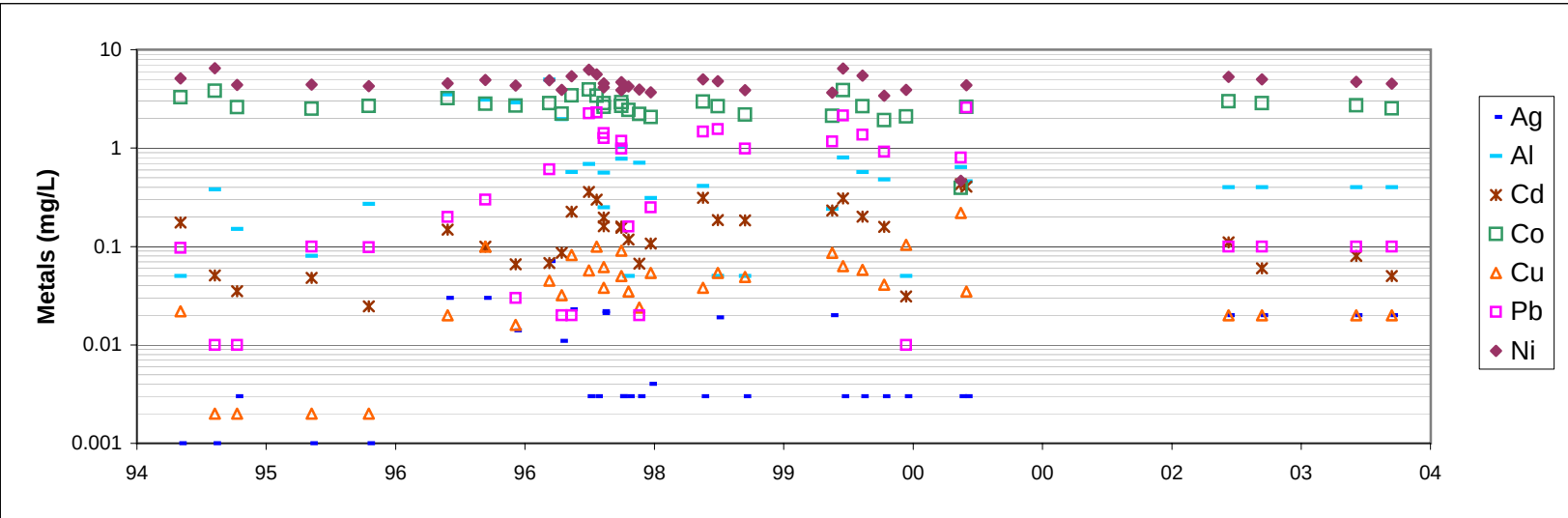
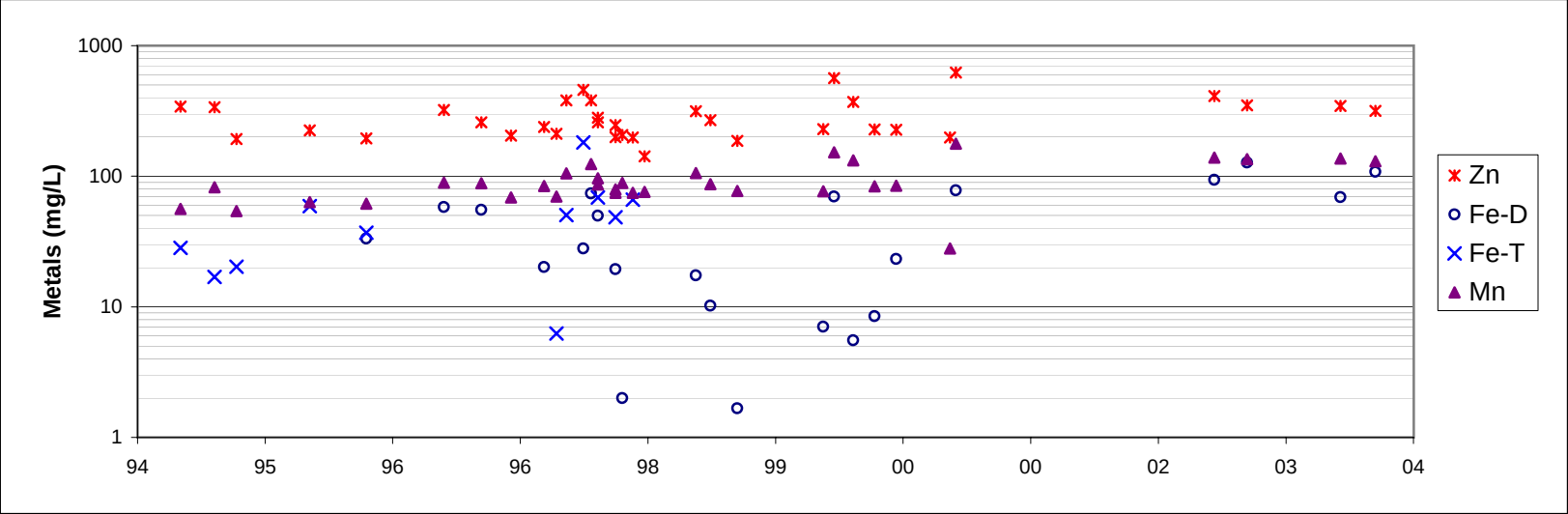
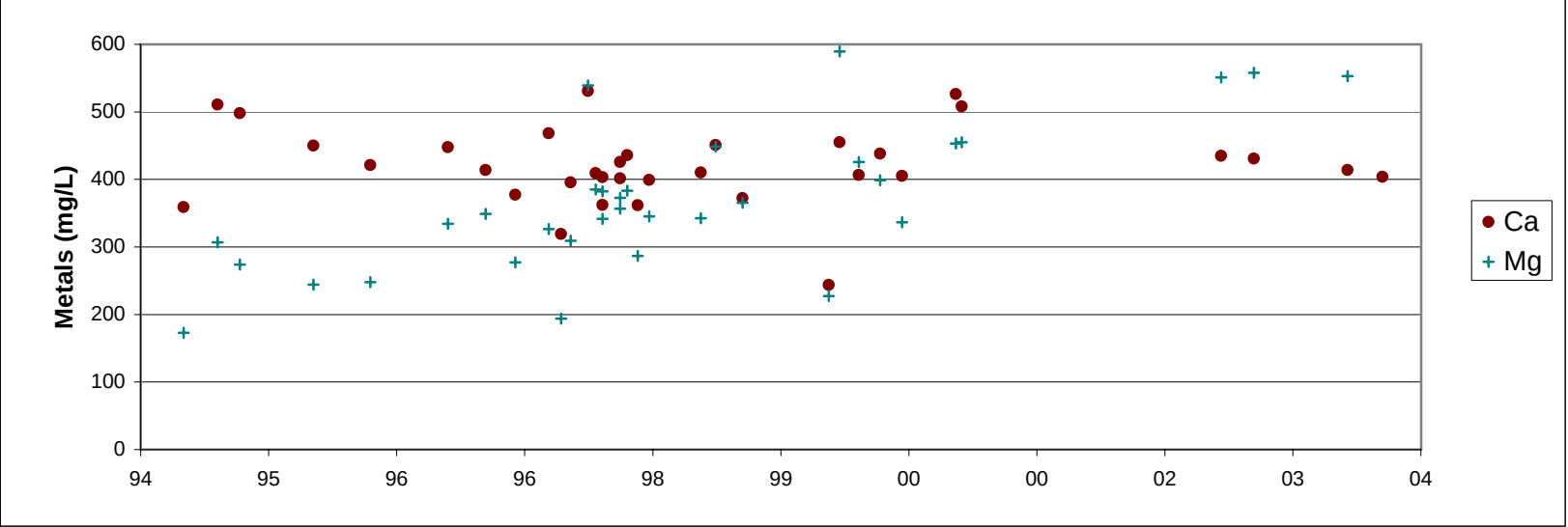
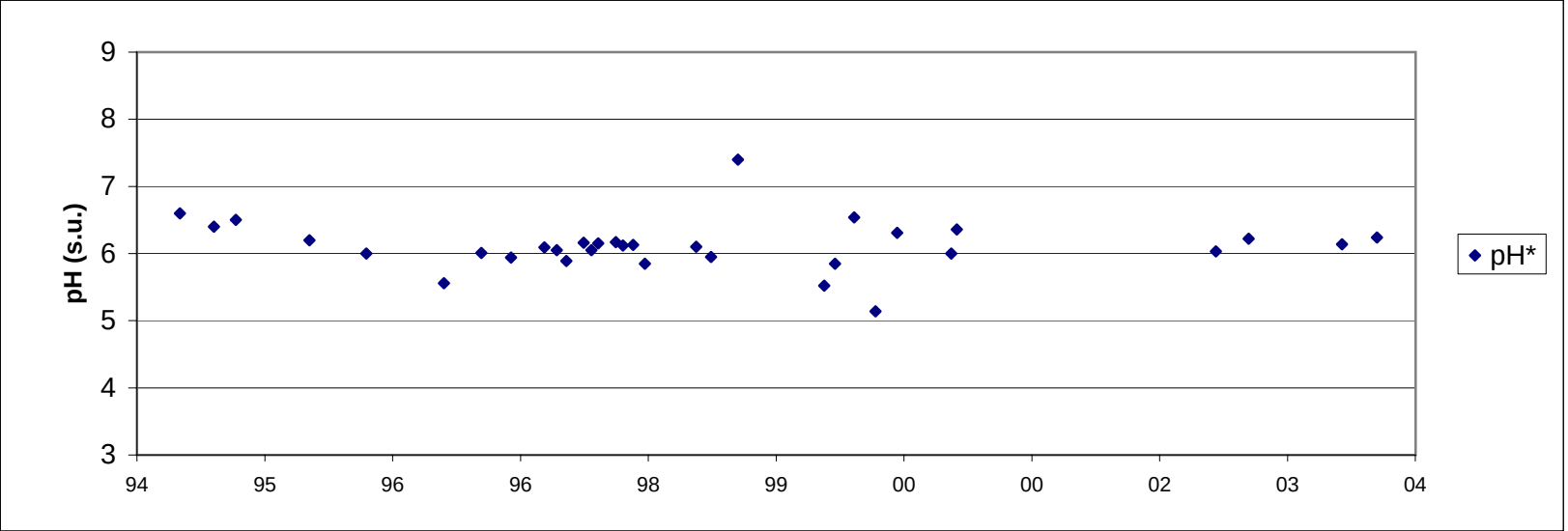
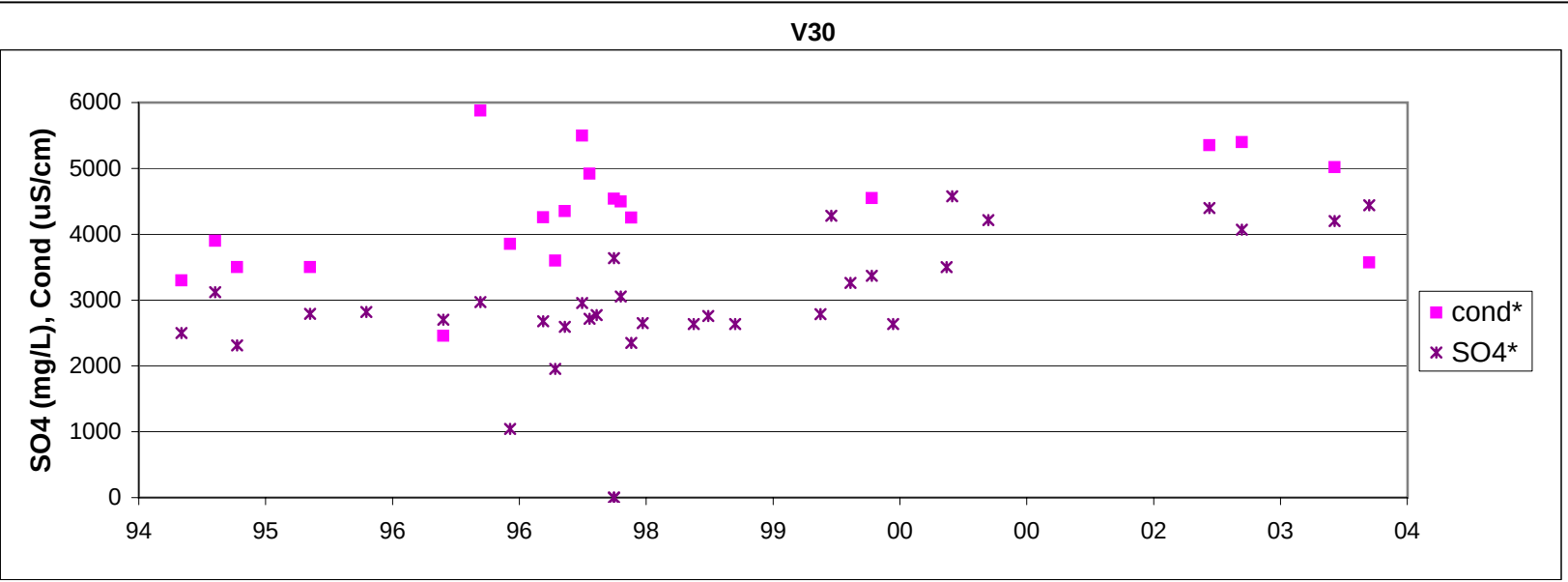
DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

**Results of Temperature and Oxygen
Monitoring – Vangorda Site**

Project	Date	Approved	Figure
1CD003.11.610	June 2004		4.19





DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

Vangorda Seepage Station
V30

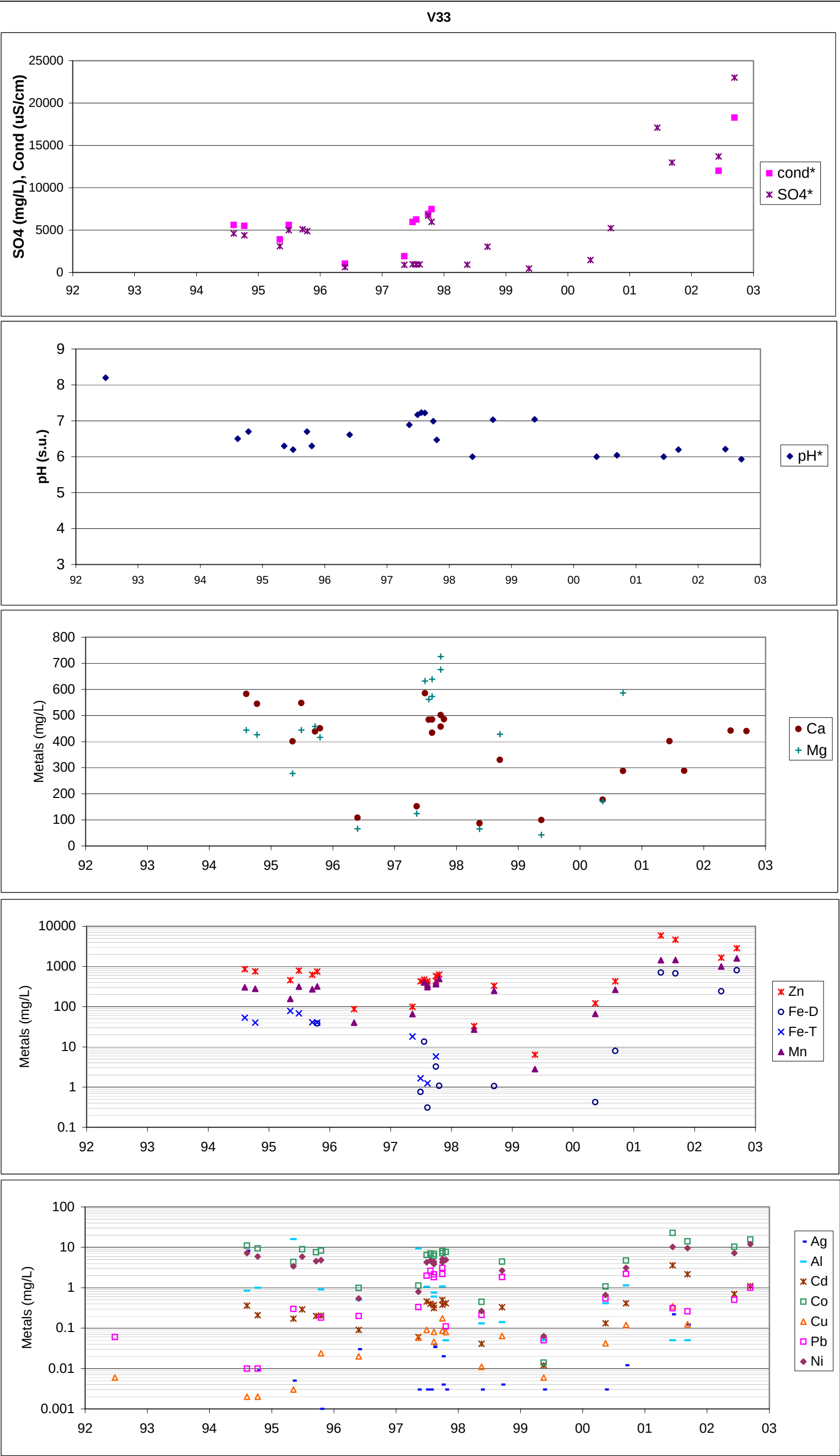
PROJECT
1D003.11.610

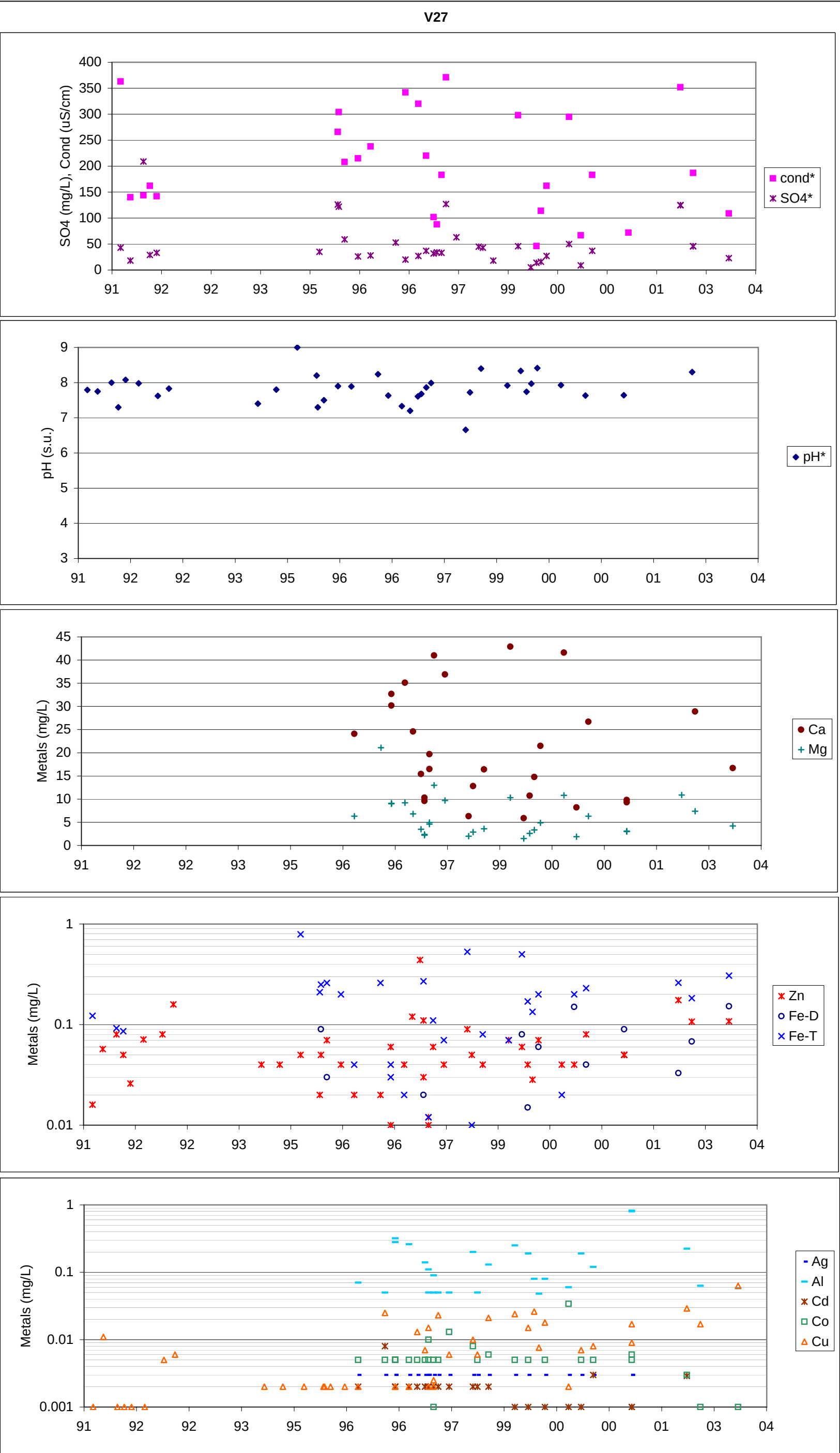
DATE
June 2004

APPROVED

FIGURE

4.22





DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

Vangorda Water Sampling Station
V27

PROJECT
1D003.11.610

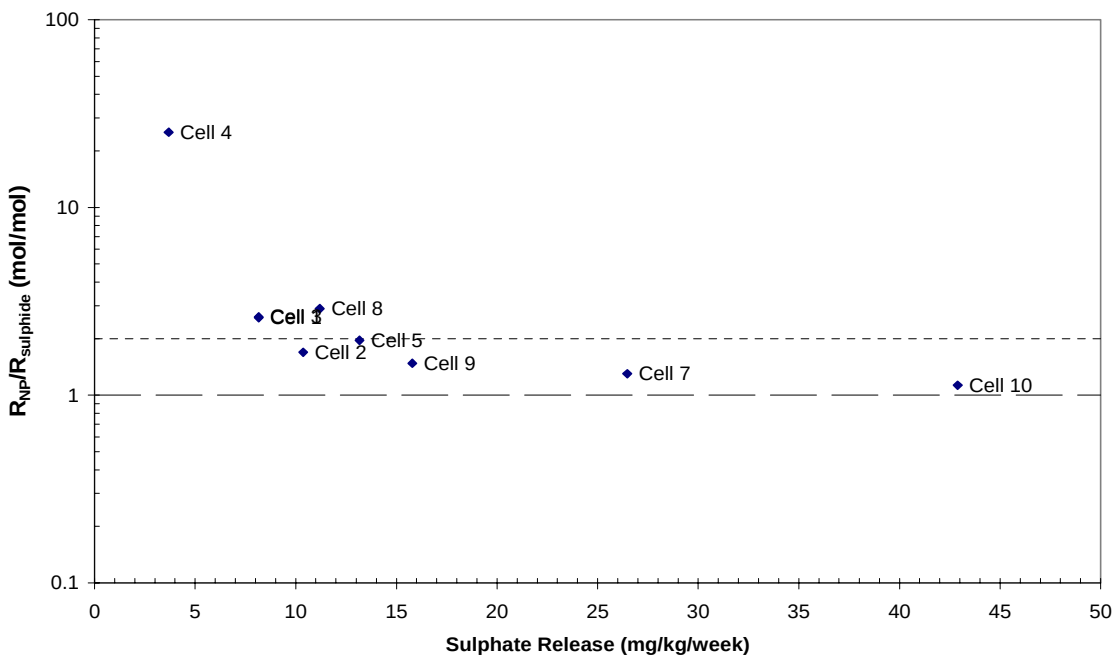
DATE
June 2004

APPROVED

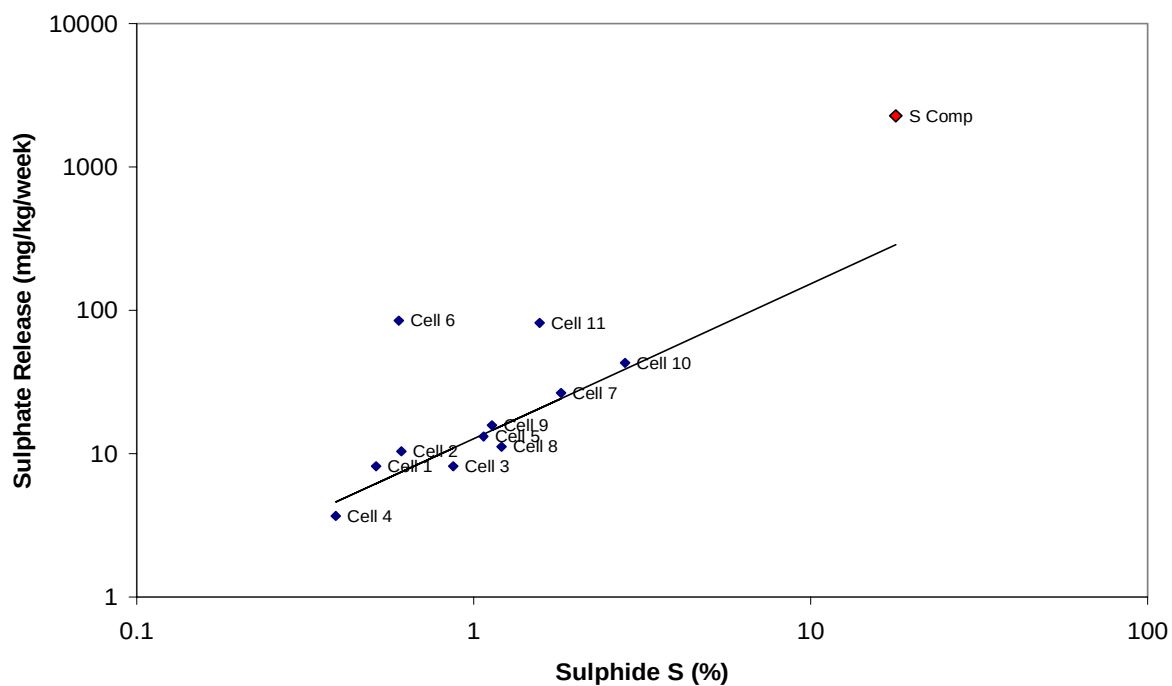
FIGURE

4.25

(a) Sulphate Release vs Ratio of Release



(b) Sulphide vs Sulphate Release



DELOITTE & TOUCHE INC.

Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

Sulphate Release Rates

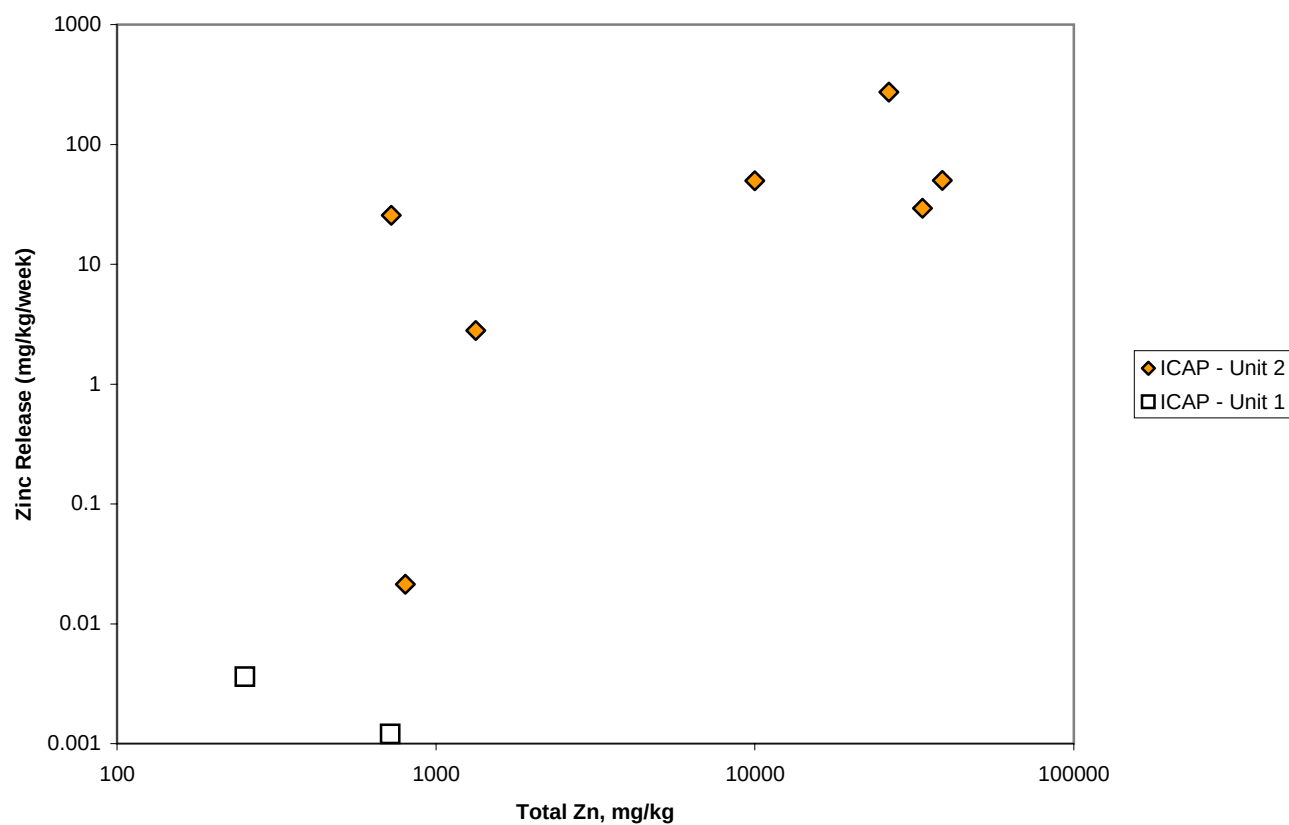
Project
1CD003.11.610

Date
June 2004

Approved

Figure
5.1

Faro Kinetic Tests



Geochemical Studies of Waste Rock at the
Anvil Range Mining Complex

Zinc Release Rates

DELOITTE & TOUCHE INC.

Project
1CD003.11.610

Date
June 2004

Approved

Figure
5.2

APPENDIX A
Terms of Reference

Appendix A.1
Scope of Work Letter



Steffen Robertson and Kirsten (Canada.) Inc.
800, 580 Hornby Street
Vancouver, BC.
Canada
V6C 3B6

email: vancouver@srk.com
URL: <http://www.srk.com>
Tel: 604.681.4196
Fax: 604.687.5532

August 8, 2002

Project Number: 1CD003.13

Deloitte & Touche Inc.
Suite 1400, BCE Place
181 Bay Street
Toronto, ON M5J 2V1

Attention: Valerie Chort
National Leader, Environment, Health & Safety Practice

Dear Ms. Chort:

Re: Tasks 3.2 & 4.2 – Geochemical Studies of Faro and Vangorda/Grum Waste Rock

SRK Consulting Inc. is pleased to submit this proposal to lead Tasks 3.2 and 4.2 of the work plan presented in the report on the Closure Alternatives Workshop, (Deloitte & Touche, April 2002). The task descriptions provided in the workshop report are:

Task 3.2, Characterize Faro Waste Rock ARD Status & Potential - "Compile all previous studies of Faro acid rock drainage (ARD) and complete gap analysis. Subject to priorities arising from Task 3.1, carry out the following investigations to define current conditions and future ARD potential. Complete drillholes to sample waste rock and install temperature and gas monitoring devices. Sample rock from drillholes and test to confirm ARD potential mapped in the 1996 ICAP. Complete additional test pits to investigate changes since 1996 ICAP, characterize unmapped areas or dumps, and obtain samples for laboratory testing. Review all available seepage water quality data and carry out additional seep surveys. Carry out laboratory tests to determine acid-base accounts, stored soluble contaminant loads, and contaminant leaching rates. Include grain size analyses, permeability, compaction and other testing for geotechnical classification of selected samples. Prepare report summarizing geochemical tests. Prepare data report summarizing geotechnical testing."

Task 4.2, Characterize Vangorda/Grum Waste Rock ARD Status & Potential –

“Compile previous ARD studies and complete gap analysis. Subject to priorities arising from Task 4.1, carry out the following investigations to define current conditions and future acid generation potential. Complete drillholes to sample waste rock and install temperature and gas monitoring devices. Sample rock from drillholes and test to confirm ARD potential mapped in the 1996 ICAP and 1999 SRK pit lake study. Complete additional test pits to investigate changes, characterize unmapped areas (including the ore transfer area), and obtain samples for laboratory testing. Review all available seepage water quality data and carry out additional seep surveys. Carry out laboratory tests to determine acid-base accounts, stored soluble contaminant loads, and contaminant leaching rates. Include grain size analyses, permeability, compaction and other testing for geotechnical classification of selected samples. Include agricultural testing of Grum overburden. Prepare report summarizing geochemical tests. Prepare data report summarizing geotechnical testing.

The work plan has been developed based on information needs defined for conceptual management plans for the various areas. These are being refined by Tasks 3.1 and 4.1 (Scoping Studies), however, for the purpose of the Work Plan, the conventional remedial options considered were (i) “do nothing”; (ii) re-locate; (iii) cover; and (iv) collect and treat. The main objective of the geochemical studies will be to predict source water chemistry effects for each of the remedial approaches. The information obtained will provide input into other tasks including 3.5 and 4.5 (Water Quality Predictions), 3.7 and 4.7 (Waste Rock Cover Tests), and 3.9 and 4.9 in combination with results from tasks 3.4 and 4.4 (Water Balances).

The remainder of this letter presents our proposed work plan followed by a proposed schedule and cost estimate. To avoid repetition, subtasks that are parallel among the three tasks are combined in the description.

The sub-tasks are grouped into three phases.

Proposed Work Plan

Phase 1 - Review of Existing Information

Subtasks 3.2.1, 4.2.1 - Review of Existing Information

The objective of these sub-tasks is to review all the information currently available, most of which is contained in the documents supporting the Integrated Closure and Abandonment Plan (ICAP). Other sources of information are: site files, documents produced by various consultants and governments.

This review will need to be critical to ensure that full use is made of all the existing data, and that any data gaps are identified and addressed in subsequent phases. Particular aspects include:

- The adequacy of the existing geochemical database. This includes the degree to which sampling sufficiently represented the geological and geochemical variability, and the appropriateness of sampling and testing methods.
- The operational procedures used to segregate different rock types and possible sources of classification error.
- The inventory of rock types in each waste rock dumps and to what degree the rock types were mixed by operational handling (Faro and Vangorda).
- The loading of acidity and metals from various sources.

We recommend that key regulatory agencies also be contacted in the course of Phase 1, and asked to identify their concerns with previous ARD studies at the site. The engineer leading this task will be travelling to Whitehorse to review DIAND files, and could try to arrange meetings with DIAND, DFO, Environment Canada or other groups with an interest in this work. That step will initiate a consultative approach to the project.

Phase 1 will also include collection of local contractor bids for support of the subsequent field investigations, and development of a detailed plan for Phase 2.

Phase 2 – Initial Data Collection and Instrumentation of Waste Rock Dumps

Phase 2 will be initiated in September 2002. The objective will be to complete drilling and installation of monitoring instruments prior to freeze-up. However, depending on the results of Phase 1, it may prove more cost-effective to further subdivide Phase 2 (into 2a and 2b) and complete only the most critical items in September, with further field work deferred until next year, after the laboratory studies are completed.

Sub Tasks 3.2.2 and 4.2.2 - Seep Surveys

An initial detailed seep survey was completed in June 2002 immediately following spring freshet. A second seep survey would be completed in the early fall to characterize water chemistry under base flow conditions and maximum thawing of the active zone. Permanent flow monitoring stations may be installed to provide input to an update of the site load balance.

Sub Tasks 3.2.3 and 4.2.3 - Surface Waste Rock Mapping

Surface waste rock mapping and field geochemical characterization (pH, leachable metals and acidity) will provide an initial indication of the accuracy of the waste rock inventory reported in the ICAP and the weathering status of the various waste rock types (i.e. which rock types have begun to generate acid or are sources of leachable metals).

This work will be carried by two geochemists. They will start by defining the rock types of interest and examining each type until they can recognize them visually and/or with simple field tests. They will then walk along the crest and toes of waste rock piles and record the rock types on a map. For large flat areas, they will walk transects. The result will be a map showing what type of rock is on the surface of each area.

The process of mapping will also give the geochemists an opportunity to examine how each rock type has behaved under exposure to air and precipitation - *i.e.* which rock has become acidic, which has remained neutral, which has broken down and which has remained competent. That information is helpful in interpreting how the rock that is more deeply buried (and less exposed to air and precip) will affect future water quality.

Sub Tasks 3.2.4 and 4.2.4 - Shallow Test Pits

Locations for test pits will be selected strategically to answer specific questions rather than to attempt to obtain statistically representative data. Information needs addressed by test pits include:

- *Collection of subsurface samples to investigate weathering status.* Samples will be collected for laboratory testing of acid generation potential
- *Estimate of the stored acidity and metal load in waste rock.* This information will be needed to determine how much lime might need to be added to waste rock when backfilled into flooded pits, and to estimate the potential for of contaminants from any re-sloping of the dumps.
- *Further evaluation of the accuracy of the waste rock inventory reported in the ICAP.*
- *Investigation of the degree of mixing of different rock types.* This information is needed to see if there are large pods of reactive rock, or whether the reactive rock has been thoroughly mixed with acid consuming rock. This is a factor in the potential for long term degradation of water quality and opportunities for segregation of waste rock during re-handling.

Test pits will be excavated by a small rub-tired equipment, under supervision of an SRK geologist. If it is possible and convenient for the site staff, site equipment will be used. Otherwise a local contractor will be arranged.

Sub Tasks 3.2.5 and 4.2.5 - Deep Large Scale Trenches

Shallow test pits are limited by their depth and the scale of the opening. A few large scale trenches will be considered to evaluate degree of mixing. The larger test pits will probably require site equipment or a contractor with a track-mounted backhoe, again under supervision of an SRK geologist.

Sub Tasks 3.2.6 and 4.2.6 - Waste Rock Drilling

Waste rock drilling will be used to extend the subsurface investigation to greater depths but will be limited by the cost and nature of drilling and small size of the opening. Specific information gathered by drilling will include:

- *Evidence of chemical layering effects such as decrease in degree of oxidation at depth.*
- *Variation of geochemical characteristics within the waste rock.*
- *Evidence of perched water and ice formation*

Drillholes will also allow installation of piezometers, oxygen monitors and thermistor strings. These will indicate, for example, whether oxidation is occurring deep within the waste rock and the possible effects of propagation of permafrost into the waste rock. The instrumentation will be designed to collect the additional information needed for the dump water balances.

Drilling will be completed by a contractor probably using air rotary or a hammer drill, under supervision of SRK.

Sub Tasks 3.2.7 and 4.2.7 - Collection of Bulk Water Samples

As part of the investigation of backfilling of waste rock into pits, bulk water samples will be collected for experiments to characterize the reaction of pit water with waste rock

Sub Tasks 3.2.8 and 4.2.8 - Reporting

A progress report will be prepared to describe the complete results of Phase 1 and available results from Phase 2.

PHASE 3 – Laboratory Testing

Sub Tasks 3.2.9 and 4.2.9 - Testing

Laboratory testing will continue through the late fall of 2002 and winter of 2002-2003. Planned testing includes:

- Analysis of water samples

- Tests of acid generation potential.
- Tests of stored acid and metal load in waste rock.
- Determination of alkali requirements for stored acid and metal load in waste rock.
- Investigation of field testing methods to be used when re-handling waste rock.
- Reaction of backfill with pit water.
- Kinetic tests.

Laboratory tests will be designed by SRK and bids to carry out the tests will be requested from at least two Vancouver-area laboratories that specialize in ARD studies.

Cost Estimate

A cost estimate for the project is shown in Table 1.

Only the cost estimate for Phase 1 (Subtask .1) is firm. The estimates for the field and laboratory programs (Phases 2 and 3, Subtasks .2 through .9) are provided only to demonstrate that it will be possible to meet the project objectives in the budgeted amount. All contractor and laboratory costs have been included. More detailed estimates will be prepared during Phase 1, once the particulars of the field program are defined and subcontractor quotes are available.

The estimate does not include GST.

Project Personnel

The project will be coordinated by Daryl Hockley. Other participants in the tasks will include:

- Stephen Day, P.Geo., a Senior Geochemist with SRK who has over 13 years of experience in mine waste geochemistry and 17 years of experience in geochemistry.
- John Chapman, P.Eng, a Senior Chemical Engineer with SRK who has over 15 years of experience in mine waste geochemistry
- Kelly Sexsmith, P.Geo. a Senior Environmental Geochemist with SRK who has six years of experience in mine waste geochemistry.

Field work will be completed with the assistance of staff or contract geologists coordinated by the above SRK personnel. The cost estimate also allows for the above geoscientists and

engineers to be assisted by technical or support staff, for example for copying documents and preparing drawings.

Proposed Schedule

Phase 1 will be initiated in mid-August 2002. Phase 2 activities are primarily slated for September. The Phase 1 and 2 report (Subtask 3.2.8/4.2.8) will be completed by mid-October. Phase 3 analytical work will be completed mostly in October but longer term testing will proceed through to December 2002. Longer term testing and long term monitoring of the instrumentation are not included in this proposal. (They are covered by separate tasks in the plan developed at the Closure Alternatives Workshop.)

Thank you for the opportunity to present this proposal.

Sincerely,

STEFFEN ROBERTSON AND KIRSTEN (CANADA) INC.

A handwritten signature in black ink, appearing to read 'D. Hockley', with a large, sweeping underline.

Daryl Hockley, P.Eng.
Principal

Appendix A.2

Scope of Work for Reporting

MEMORANDUM

DATE: July 18, 2003

TO: Cam Scott

FROM: Stephen Day

CC: John Chapman
Kelly Sexsmith

PROJECT: 1CD003.24

**RE: Faro Site – ARD-Related Tasks for 2003-04
Task 10 Scope and Cost Estimate**

This memo provides a Scope of Work and costing for the ARD-Related Task 10.

I understand that the overall objective of this year's work is to provide predictions water chemistry from the waste rock dumps for input into the site wide water and load balance being produced by Gartner Lee.

1. **Seepage Survey and Instrument Monitoring.** Seepage surveys of the same sites established by SRK in 2002 will be completed in June and September 2003. Kelly Sexsmith (SRK) would familiarize Dylan Macgregor (SRK) with the sites so that he can complete any subsequent surveys. A locally-employed assistant is requested for the fall seepage survey (approximately four days).

Task 10 indicated a single seep sampling round in 2003. However, SRK recommended that a fall 2003 sampling round also be completed because the 2002 monitoring showed that the quality of some seeps worsened in the fall. A late summer sampling round also provides an indication of more stable "base flow" conditions as compared to the erratic chemistry produced by rapidly changing conditions in the spring. We understand the Deloitte & Touche has accepted this recommendation.

Instrument monitoring would include a check for water (and sampling if possible), measurement of temperature profiles from thermistor strings, and measurement of oxygen concentrations in drill holes and drivepoint piezometers installed in the Vangorda Waste Rock Dump soil cover. Three rounds of instrument monitoring are proposed for

June, early September and February (2004) to complement the single round of data obtained to date in February 2003. The June monitoring round will be combined with seepage monitoring.

2. Continuation of Lab Studies

Eleven stand-alone humidity cells and seven humidity cells in a sequential leaching arrangement were started in February and March, 2003, respectively. The emphasis in the standalone tests was to fill gaps in the database indicated during Phase 1 in 2002. The sequential tests are evaluating leaching effects caused by sulphide waste rock hotspots. Initial data from the standalone tests suggests that some of the tests should probably be run for several months (eight months for budgeting purposes), whereas the sequential tests may be complete within a few months. The costing assumes that these tests will be terminated after six months, but that additional tests may be started to replace them.

3. Additional Field/Lab Studies

Other than the proposal that seepage monitoring take place twice in 2003, no additional field (drilling or trenching) studies are planned.

No additional static or short term leaching tests are planned.

Review of results from the ongoing laboratory kinetic tests (particularly the sequential humidity cells) may indicate modifications or addition of new kinetic tests (see discussion of contingency budget under Cost Estimate, below).

4. Other Data Needs

SRK has previously recommended that the site water quality monitoring database be converted to the most recent version of EQWin. An essential component of the final predictions required as part of this task will be the review of a coherent historical dataset to provide calibration for the predictions. It is therefore essential that conversion of the database take place during 2003. This was not included in SRK's scope and has therefore not been costed.

5. Reporting

A report will be prepared containing the following:

- Follow-up to any items outstanding from the Phase 1 review.
- Description of instrument nest monitoring results.
- Seepage monitoring results.
- Geochemical data.
 - Description of historical geochemical data compiled as part of Phase 1 and summary of the approach used to select samples and procedures for the current test program.
 - Presentation and description of static geochemical data, short term leach test data and kinetic test data.
- Prediction of water chemistry for waste rock dumps.

6. Cost Estimate

Table 1 provides the cost estimate on a task-by-task basis. As discussed with Deloitte & Touche, the cost estimate includes a 10% contingency amount of about \$18,000 to cover possible additional laboratory testing needs. At the present time, the current testing program is believed to be adequate; however, as the program proceeds, kinetic test progress reports are being reviewed to determine if any additional kinetic tests are required. In the event that the contingency budget is required, a justification will be provided to Deloitte & Touche.

SCOPE FOR FARO GEOCHEMICAL STUDIES

7/31/2002 16:19

FACILITY	ISSUE	REMEDIAL OPTION	INFO NEEDED	STUDIES
Underground	flooded	Do nothing	Evaluate S & B for water treatment	Groundwater Monitoring
Pits	PAG walls, particularly highwall	Collect and treat	Loading study to determine significance	Loading study
			Water quality of pit	Review previous predictions New predictions if warranted
		Cover	Feasibility	Source of cover materials Geotechnics
Waste rock	AG LGO and Oxide lines	Backfill to Pit	Stored acidity/lime reqt	Trenching/Drilling/Lab tests
			Field tests for lime reqt	Lab tests on samples from drilling etc.
			Pit capacity	Hydrology study
			Reaction of backfill with pit water	Lab tests on samples from drilling etc.
		Covers	Oxidation rates	O ₂ , T monitoring in situ Review existing kinetic tests New kinetic tests
			Infiltration rates	Hydrogeology study
		Consolidate at one location	Site selection	Engineering
			Engineering design	Engineering
		Processing	Metallurgy	Review existing studies Metallurgy Marketability
		Water Treatment	Water quality prediction	Above studies
			Treatment process	Lab tests on water samples
	PAG and marginal PAG waste rock	All	Will acid generation occur	Review existing data and methods (CAP) Drilling/Trenching to follow-up Large scale trenching New kinetic tests
			Is acid generation occurring already	Seepage monitoring Groundwater monitoring
			When will acid generation occur	
			Chemistry of drainage	
			Contribution of different sources to prioritize	Loading study
			Rate of pore water	Groundwater Monitoring
		Backfill to Pit	Stored acidity/lime reqt	Trenching/Drilling/Lab tests
			Segregation opportunities	Review of rock handling practices Large scale trenching/mapping to determine in situ character
			Field tests for segregation, lime reqt	Lab tests on samples from drilling etc.
			Pit capacity	Hydrology study
			Reaction of backfill with pit water	Lab tests on samples from drilling etc.
		Covers	Oxidation rates	O ₂ , T monitoring in situ Review existing kinetic tests New kinetic tests
			Infiltration rates	Hydrogeology study
		Water Treatment	Water quality prediction	Above studies
			Treatment requirement	

SCOPE FOR GRUM GEOCHEMICAL STUDIES

7/31/2002 16:19

FACILITY	ISSUE	REMEDIAL OPTION	INFO NEEDED	STUDIES
Pit	Mostly till in walls Pit water quality good so far	Do nothing	Confirm water quality	Review existing data Review geology and geochem characteristics of wall Water balance
Waste rock	Most waste rock is calcareous phyllite	All	Confirm characteristics of rock	Review existing data and methods (CAP) Drilling/Trenching to follow-up
			Water quality	Seep survey Groundwater monitoring
		Do nothing	Confirm waste rock is adequately mixed to prevent further water degradation	Review of rock handling and segregation practices Large scale trenching and surface mapping to determine in situ character
			Backfill to Pit	Trenching/Drilling/Lab tests
		Backfill to Pit	Segregation opportunities	Review of rock handling practices Large scale trenching/mapping to determine in situ character
			Field tests for segregation, lime reqt	Lab tests on samples from drilling etc.
			Pit (Grum/Vangorda) capacity	Hydrology study
			Reaction of backfill with pit water	Lab tests on samples from drilling etc.
		Covers	Oxidation rates	O ₂ , T monitoring in situ Review existing kinetic tests New kinetic tests
			Infiltration rates	Hydrogeology study
		Water Treatment	Water quality prediction	Above studies
			Treatment requirement	Lab tests
	Sulphide cell	All	Confirm characteristics of rock	Review existing data and methods (CAP) Drilling/Trenching to follow-up
		Do nothing	Determine whether cell is oxidizing or releasing water	Review construction methods Drilling and instrumentation to evaluate existing conditions Review existing kinetic tests New kinetic tests
			Backfill to Pit	Drilling/Lab tests
		Backfill to Pit	Field tests for segregation, lime reqt	Lab tests on samples from drilling etc.
			Pit (Grum/Vangorda) capacity	Hydrology study
			Reaction of backfill with pit water	Lab tests on samples from drilling etc.
		Blend with phyllite	Overall ABA balance	Existing data and methods (CAP) Drilling/Trenching to follow-up
		Covers	Oxidation rates	O ₂ , T monitoring in situ Review existing kinetic tests New kinetic tests
			Infiltration rates	Hydrogeology study
		Water Treatment	Water quality prediction	Above studies
			Treatment requirement	Lab tests

SCOPE FOR VANGORDA GEOCHEMICAL STUDIES

7/31/2002 16:19

FACILITY	ISSUE	REMEDIAL OPTION	INFO NEEDED	STUDIES
Pit	pH Neutral, Elevated iron (current)	Water Treatment	Water quality prediction	Ongoing data review Alkalinity balance
	Decreasing pH, other metals (predicted)	Water Treatment	Alkalinity Depletion rates	Review existing kinetic tests New kinetic tests
			Water quality prediction	Ongoing data review Alkalinity balance
		Cover walls	Feasibility	Source of cover materials Geotechnics
		Backfill with calcareous waste rock	Water quality prediction Reaction of backfill with pit water	Iron above Lab tests on samples from drilling etc.
Waste rock	All rock is PAG, phyllite is non-calcareous. Oxide fines are acidic. Seepage less significant than expected	All	Confirm characteristics of rock	Review existing data and methods (CAP) Drilling/Trenching to follow-up
			Water quality	Seep survey Groundwater monitoring
		Do nothing (if insignificant water releases from dump)	Confirm no water release	Hydrogeology study
		Backfill to Pit	Stored acidity/lime reqt	Trenching/Drilling/Lab tests
			Segregation opportunities	Review of rock handling practices Large scale trenching/mapping to determine in situ character
			Field tests for segregation, lime reqt	Lab tests on samples from drilling etc.
			Pit (Grum/Vangorda) capacity Reaction of backfill with pit water	Hydrology study Lab tests on samples from drilling etc.
		Covers	Oxidation rates	O ₂ , T monitoring in situ Review existing kinetic tests New kinetic tests
			Infiltration rates	Hydrogeology study
		Water Treatment	Water quality prediction Treatment requirement	Above studies Lab studies

APPENDIX B
Description of Faro Area

Appendix B.1
Rock Type Nomenclature (ICAP)

Table 4.1
Major rock assemblages of the Faro mine area

Assemblage	Rock unit	Rock Type	Fe sulphide	Carbonates
1 <i>NH Map</i>	1C	tan to brown, coarse, quartz muscovite biotite staurolite garnet schist	.5 to 2 % py	nil
	1D	grey, fine graind, prophyroblastic, biotite muscovite andalusite schist	.5 to 2 % py	nil
	1CD	intermediate between 1C and 1D, biotite muscovite andalusite schist	.5 to 2 % py	nil
	1C6	Clotted biotite muscovite andalusite schist, clots are dark irregular andalusite biotite amsses along the foliation	.5 to 2 % py	nil
1* <i>Over Zone a. Berta</i>	1D2	black, graphitic mica schist, commonly with chistiolitic andalusite	1 to 5% py	nil - local calcite
	1D4	White mica envelope, pale altered quartz muscovite schist, minor marcasite pyrite	1 to 7% py mc	nil
	sulphide s	massive and disseminated pyritic sulphides, 5 to 95 % pyrite	5-95% py, po	nil - local carbonates
3 <i>Vergada</i>	3D0	calc-silicate and related schist, amphibolite and quartz diorite, calc-silicate breccia	.5 to 1% py/po	10 - 30 % calcite
4 <i>Fish Lake</i>	10E	hornblende biotite quartz diorite	nil	nil
	10F	quartz feldspar porphyry	nil	nil
5	overburden	gravel and till, largely excavated from the Faro Creek valley and over parts of Zone 2		

Table 4.2
Sulphide rock types at the Faro Minesite

Unit	Name	Description	% pyrite	other sulphides	gangue	remarks
2A	Ribbon banded graphitic quartzite	bands of quartz and pyrite separated by graphitic schist to quartzite	5% to 30%	sphalerite, galena, minor pyrrhotite	quartz graphite	basal and peripheral ore type, considerable is sulphide waste, moderately soft, tendency to slake
2B	Quartzite	grey quartzite with minor sulphides, no graphite	0%	galena sphalerite	quartz	minor rock, main occurrence being a 1 to 3 m. thick layer across the top of the deposit
2CD	Pyritic quartzite	weakly banded grey quartzite, no carbon	10 to 60%	galena sphalerite chalcocopyrite	quartz magnetite	hard quartz rich rock, abundant along north-east edge of the deposit, major component of sulphide waste
2E	Massive pyritic sulphides	massive pyrite with minor galena-sphalerite, weakly banded	60% to 100%	galena sphalerite	quartz barite magnetite	hard barren quartzose variety along the north-east edge of pit is major part of sulphide waste,
2F	Buckshot massive sulphid	massive sulphides, pyrite rich but high grade	60% to 90%	galena sphalerite chalcocopyrite	quartz barite	characteristic texture on 1 mm pyrite porphyroblasts in galena-sphalerite matrix, high grade
2G	Baritic massive sulphides	slightly banded dense massive barite - sulphide rock, generally high grade	30% to 75%	galena sphalerite	barite Ba-Fe-Mg carbonates	locally with magnetite
2H	Pyrrhotitic massive sulphides		50% to 85%	pyrrhotite galena sphalerite	quartz	irregular bodies of massive pyrrhotite tend to occur most frequently along the south-west side of the pit, fine grained, common augen texture.
1D4	White mica alteration	muscovite quartz feldspar schist w/ minor marcasite	0 to 5%	pyrite, galena, sphalerite	quartz feldspar FeMg carbonate	soft slaking rock type, minor sulphides but acid generating component readily available, forms an irregular halo around the sulphide deposit, 10's m. thick

Appendix B.2
Map of Dumps and Nomenclature (ICAP)



Legend

- ×14 Rock Sampling site – grab sample
- ▬ Rock Sampling site – trench sample
- ▭ Outline of Rock Dump areas
- ID Identification Code for Dump Area
- 44342 Surface Area of Dump in ft²
- ▨ Areas of major Sulphide deposition and Dumps

1 911 000 E

MAPPING COMPILED BY THE ORTHOSHOP, CALGARY, ALBERTA, JANUARY, 1991. BASED ON AERIAL PHOTOGRAPHY, SEPTEMBER 17, 1990, AT A SCALE OF 1 : 10 000. SURVEY CONTROL WAS SUPPLIED BY CURRAGH RESOURCES INC.
COORDINATES ARE UTM IN FEET.
ELEVATIONS ARE RELATIVE TO GEODETIC (SEA LEVEL) DATUM (NAD27)

feet 300 0 600 1200 1800 feet

CONTOUR INTERVAL 10 ft

Scale 1 inch = 1000 feet



ROBERTSON GEOCONSULTANTS INC.
Consulting Geotechnical and Environmental Engineers

Anvil Range Mining Corporation

Anvil Complex Closure Plan

**Faro Dumps
Sampling Sites and Dump
Classification**

PROJECT NO. 033001 DATE Oct. 1996 APPROVED FIGURE 4-5

Table 4.12
Period of Construction of Faro Waste Rock Dumps

Symbol	Name	Age of Dump	
		start	end
NWU	Upper Northwest Dump	1968	1969
NWM	Middle Northwest Dump	1969	1970
NWL	Lower Northwest Dump	1970	1971
UPL	Upper Parking Lot Dump	1975	1976
LPL	Lower Parking Lot Dump	1975	1976
FVN	Faro Valley North	1968	1970
FVS	Faro Valley South	1968	1975
MDW	Main Dump West	1974	1990
MDE	Main Dump East	1972	1990
ID	Intermediate Dump	1979	1990
NEU	Upper Northeast Dump	1974	1977
NEL	Lower Northeast Dump	1975	1979
NEO	Outer Northeast Dump	1975	1980
ZIIW	Zone 2 West	1987	1990
ZIIE	Zone 2 East	1980	1985
RZD	Ramp Zone Dump	1989	1990
RD	Ranch Dump	1989	1990
SWPWD	Southwest Pit Wall Dump	1990	1991
LGSPA	Low Grade Stockpile A	1987	1990
LGSPC	Low Grade Stockpile C	1987	1990
FTW	Fuel Tank Dump W	1969	1971
FTE	Fuel Tank Dump E	1969	1971
MMW	Mt. Mungly West	1969	1970
MME	Mt. Mungly East	1969	1970
SPB	Stock Piles Base	1969	1975
OXSP	Oxide Fines Stockpile	1969	1974
MGSP	Medium Grade Stockpile		active
CHSP	Crusher Stockpile		active
OHRW	Outer Haul Road West	1987	1989
OHRE	Outer Haul Road East	1983	1989
NFRD	North Fork Rock Drain	1988	1988

Appendix B.3
Geological Composition of Waste Rock

Table 4.14
Rock Type Composition, Percentage of Dumps

Symbol	Name	Tonnage (tonnes)	Proportion of rock types					
			MTMg sulphides	Varagorda schist	calc-sil	intru	OB	Total
NWU	Upper Northwest Dump	2,665,666	7%	15%	8%	65%	5%	100%
NWM	Middle Northwest Dump	5,723,496	10%	30%	40%	15%	5%	100%
NWL	Lower Northwest Dump	6,558,131	8%	37%	30%	15%	10%	100%
UPL	Upper Parking Lot Dump	2,222,855	5%	25%	70%	0%	0%	100%
LPL	Lower Parking Lot Dump	677,080	10%	5%	85%	0%	0%	100%
FVN	Faro Valley North	3,514,051	15%	50%	10%	15%	10%	100%
FVS	Faro Valley South	607,166	0%	65%	0%	30%	5%	100%
MDW	Main Dump West	25,133,886	10%	75%	10%	0%	5%	100%
MDE	Main Dump East	67,669,051	15%	40%	35%	5%	5%	100%
ID	Intermediate Dump	52,322,473	20%	20%	54%	1%	5%	100%
NEU	Upper Northeast Dump	15,785,561	5%	25%	30%	10%	30%	100%
NEL	Lower Northeast Dump	22,528,492	5%	30%	30%	10%	25%	100%
NEO	Outer Northeast Dump	198,423	0%	40%	40%	10%	10%	100%
ZIWW	Zone 2 West	6,006,008	10%	50%	20%	10%	10%	100%
ZIIE	Zone 2 East	16,304,843	0%	75%	20%	5%	0%	100%
RZD	Ramp Zone Dump	2,182,144	2%	30%	68%	0%	0%	100%
RD	Ranch Dump	525,195	5%	85%	0%	10%	0%	100%
SWPWD	Southwest Pit Wall Dump	1,619,962	45%	50%	0%	5%	0%	100%
LGSPA	Low Grade Stockpile A	911,003	100%	0%	0%	0%	0%	100%
LGSPC	Low Grade Stockpile C	786,069	100%	0%	0%	0%	0%	100%
FTW	Fuel Tank Dump W	86,615	100%	0%	0%	0%	0%	100%
FTE	Fuel Tank Dump E	2,479,775	2%	60%	35%	3%	0%	100%
MMW	Mt. Mungly West	251,853	50%	10%	20%	0%	20%	100%
MME	Mt. Mungly East	882,728	30%	40%	20%	10%	0%	100%
SPB	Stock Piles Base	2,832,056	0%	70%	10%	0%	20%	100%
OXSP	Oxide Fines Stockpile	322,670	100%	0%	0%	0%	0%	100%
MGSP	Medium Grade Stockpile	-	100%	0%	0%	0%	0%	100%
CHSP	Crusher Stockpile	-	100%	0%	0%	0%	0%	100%
OHRW	Outer Haul Road West	12,570,923	2%	78%	10%	10%	0%	100%
OHRE	Outer Haul Road East	4,481,826	10%	70%	0%	5%	15%	100%
NFRD	North Fork Rock Drain	-	0%	0%	100%	0%	0%	100%
	Total	257,850,000	13%	42%	31%	6%	8%	

Sulphide cell
Sulphide cell

APPENDIX C
Description of Vangorda Plateau Area

Appendix C.1
Rock Type Nomenclature

APPENDIX C.1 – Rock Type Symbols for Surface Mapping

Units		Symbols Used on Field Maps
<i>Vangorda Formation</i>		
5C	Poorly foliated greenstone	
5D	Chlorite phyllite, calcareous	5D0, 5D4
5B0	Calcareous phyllite, silver to dark grey	5B
5A0	Carbonaceous phyllite, weakly calcareous	5A
<i>Mount Mye Formation</i>		
3G0	Non-calcareous phyllite	3G
4EC	Undifferentiated massive and disseminated sulphides	
4E	Massive pyritic sulphides (60 to 100% pyrite)	
4C	Pyritic quartzite (<30% pyrite)	
4L0	Bleached phyllite, commonly pyritic	4L

Modifiers

ca	Calcareous
py	Pyritic
ox	Oxidized
st	Visible salts (describe type in notes)
gn	Galena
sl	Sphalerite
bl	Blocky (describe in notes)
sk	Slaking (describe in notes)
ms	Massive sulphide

Clast sizes

m>cm:	Coarse
cm/m:	Mixed metre and centimetre scale
mm>cm>>m	Fine Frained

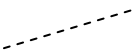
Mapping Conventions

3D0ox/10Fsk About equal quantities.

10% 3D0ox/90% 10Fsk Proportions indicated

Symbols

 Distinct contact

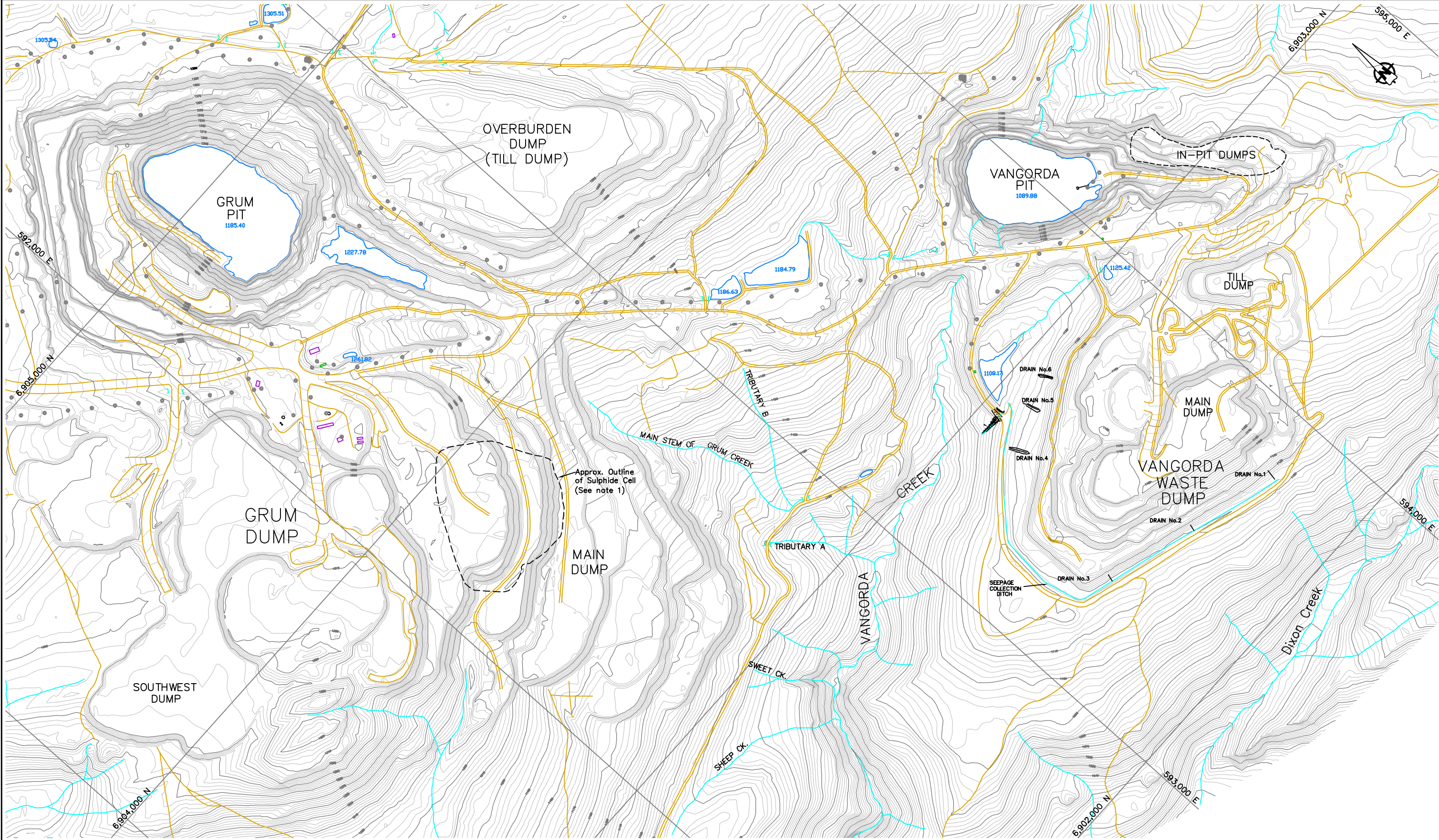
 Indistinct contact

 FD – Free dumped area

* Small cluster of sulphide boulders

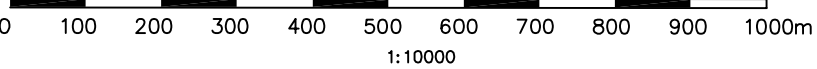
- GUS-01 Fine screened sample location for contact test

Appendix C.2
Map of Dumps and Nomenclature



Map Scale: 1:2500
Contour Interval: 2m
Date of Photography: 03/07/25
Scale of Photography: 1:20000
Survey control derived from existing 1:20000 photography
Survey control based on: UTM Projection, NAD27
Compiled by The ORTHOSHOP, Calgary, September 2003
WO 8856

Note 1:
Sulphide cell outline from as-built drawing, Feb. 1996, as reported in Figure 1, Anvil Range Mining Corporation, May 1996.



DELOITTE & TOUCHE

VANGORDA PLATEAU MINE

VANGORDA SITE PLAN

PROJECT NO.	DATE	APPROVED	FIG.
1CD003.11	DEC. 2003		

APPENDIX D
Historical Geochemical Database

Appendix D.1

Historical Static Testing Database

Dump	DDH	Start	Finish	Sample Type	Document #	Rock	Rock Code	Rock Type	Paste	NP	AP	NNP	NP/																P	PB	SB	SN	SR	TH	TI	U	V	W	ZN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
						Major			Detail				Description	pH	Total S	SO4	NP	AP	NNP	AG	AL	AS	BA	BE	BI	CA	CD	CO												CR	CU	FE	GA	K	LI	MG	MN	MO	NA	NI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

[illegible]

Dump	DDH	Start	Finish	Sample Type	Document #	Rock Code	Rock Code	Rock Type	Paste			NP/			AG	AL	AS	BA	BE	BI	CA	CD	CO	CR	CU	FE	GA	K	LI	MG	MN	MO	NA	NI	P	PB	SB	SN	SR	TH	TI	U	V	W	ZN					
									pH	Total S	SO4	NP	AP	NNP																																				
												Major	Detail	Description	s.u.	%S	S%	kgCaC O3/t	kgCaC O3/t	kgCaC O3/t	PPM	%	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
Causeway	76-13		340'		109	1	1D0	Biotite muscovite andalusite schist	7.9	0.28		29.8	8.8	21.1	3.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Causeway	77-16		340'		109	1	1D0	Biotite muscovite andalusite schist	8.2	0.296		42.5	9.3	33.3	4.6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Causeway	80-02		280'		109	1	1D0	Biotite muscovite andalusite schist	8.7	0.215		94.8	6.7	88.1	14.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Causeway	80-02		320'		109	1	1D0	Biotite muscovite andalusite schist	8.3	0.124		31.9	3.9	28.0	8.2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Causeway	80-08		220'		109	1	1D0	Biotite muscovite andalusite schist	7.4	0.381		67.9	11.9	56.0	5.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Causeway	80-08		300'		109	1	1D0	Biotite muscovite andalusite schist	8.7	0.087		36.8	2.7	34.1	13.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Causeway	81-10		240'		109	1	1D0	Biotite muscovite andalusite schist	8.2	0.246		91.7	7.7	84.0	11.9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Causeway	84F-24		240'		109	1	1D0	schist	8.2	0.354		34.4	11.1	23.3	3.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Rock Drain	76-04		250'		109	3	3DBx	Calc-silicate breccia	9.1	0.048		76.2	1.5	74.7	50.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Rock Drain	76-04		280'		109	3	3DBx	Calc-silicate breccia	8.8	0.067		87.4	2.1	85.3	41.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Rock Drain	77-01		280'		109	3	3DBx	Calc-silicate breccia	8.9	0.111		99.3	3.5	95.8	28.6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Rock Drain	77-09		210'		109	3	3DBx	Calc-silicate breccia	9.1	0.035		82.5	1.1	81.4	75.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Rock Drain	80-03		100'		109	3	3DBx	Calc-silicate breccia	9.2	0.121		79.3	3.8	75.5	21.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Rock Drain	80-03		140'		109	3	3DBx	Calc-silicate breccia	9	0.628		63.3	19.6	43.7	3.2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Rock Drain	80-04		280'		109	3	3DBx	Calc-silicate breccia	9.1	0.07		57	2.2	54.8	26.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Rock Drain	82F-01		270'		109	3	3DBx	Calc-silicate breccia	9.2	0.791		95	24.7	70.3	3.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A											

D1.Historical_ABA_db.xls,All Historical data,12/18/2003

Appendix D.2

ICAP Extraction Test Results

ID	Dump	Rock Type	Weight g	Water mL	2 hr pH su	3 hr pH su	24 hr pH su	3 hr EC uS/cm	24 hr EC uS/cm	Eh mV	Acidity to pH 4.5 mgCaCO3/L	Total Acidity mgCaCO3/L	Alkalinity mgCaCO3/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	Ti mg/L	Sn mg/L	Tl mg/L	V mg/L	Zn mg/L
AR/SC/04 top	Faro	Sulphide	250	500	4.48	4.47	4.65	1336	1727	238	0.0	850.0	2.5	1431	<1	<1	<1	<0.05	<0.02	<0.5	<0.5	0.74	43.1	<0.05	0.21	0.39	0.90	2.60	<0.05	109.00	46.40	<0.1	0.20	<1	<10	<1	<0.2	<0.05	<10	<0.005	<0.5	<0.1	<0.05	<0.1	514.00
AR/SC/04 bottom	Faro	Sulphide	250	500	4.38	4.36	5.60	1479	1850	186	0.0	395.0	1.5	1601	<0.2	<0.2	<0.2	<0.01	<0.005	0.20	<0.1	0.31	73.9	<0.01	0.30	0.36	1.31	2.36	0.02	203.00	67.10	<0.03	0.32	<0.3	<2	<0.2	0.16	<0.01	<2	0.027	0.10	<0.03	<0.01	<0.03	185.00
AR/SC/05 comp.	Faro	Sulphide	250	500	2.75	2.72	2.63	3300	3820	397	385.0	1580.0	0.0	3410	9.60	<0.4	0.60	<0.02	0.03	0.40	<0.2	0.53	146.00	0.02	2.50	8.46	224.00	0.50	0.05	239.00	282.00	<0.06	1.76	<0.6	<4	<0.4	0.80	<0.02	<4	0.044	0.40	<0.06	<0.02	0.10	359.00
AR/SC/06 comp.	Faro	Schist	250	500	5.43	5.45	6.13	713	1056	143	0.0	75.0	6.5	716	<0.2	<0.2	<0.2	0.03	<0.005	<0.1	<0.1	0.01	97.5	<0.01	0.06	<0.01	0.21	0.39	0.04	90.90	4.98	<0.03	<0.02	<0.3	6.00	<0.2	0.66	<0.01	<2	0.170	0.10	<0.03	<0.01	<0.03	20.10
AR/SC/08 A	Faro	Calc-silicate	250	500	8.86	8.70	7.50	174	247	108	0.0	10.0	54.0	65	<0.2	<0.2	<0.2	0.05	<0.005	<0.1	<0.1	<0.01	23.7	<0.01	0.01	<0.01	<0.03	<0.05	0.02	10.40	0.03	<0.03	<0.02	<0.3	3.00	<0.2	0.89	<0.01	5.00	0.348	<0.1	<0.03	<0.01	<0.03	0.02
AR/SC/08 shallow comp.	Faro	Calc-silicate	250	500	8.90	8.77	7.72	133	200	113	0.0	7.0	45.0	48	<0.2	<0.2	<0.2	0.06	<0.005	<0.1	<0.1	<0.01	20.7	<0.01	<0.01	<0.01	<0.03	<0.05	0.02	7.79	0.01	<0.03	<0.02	<0.3	4.00	<0.2	0.84	<0.01	<2	0.216	<0.1	<0.03	<0.01	<0.03	0.01
AR/DR/10 comp. 1	Faro	Sulphide	250	500	6.99	7.25	7.84	364	652	128	0.0	6.0	14.0	358	<0.2	<0.2	<0.2	0.02	<0.005	<0.1	<0.1	<0.01	81.6	<0.01	<0.01	<0.01	<0.03	<0.05	0.02	35.10	0.06	<0.03	<0.02	<0.3	5.00	<0.2	0.61	<0.01	<2	0.211	<0.1	<0.03	<0.01	<0.03	0.04
AR/DR/12 comp.	Faro	Calc-silicate	250	500	8.61	8.60	7.43	130	200	127	0.0	6.0	32.5	52	<0.2	<0.2	<0.2	0.03	<0.005	<0.1	<0.1	<0.01	25.7	<0.01	<0.01	<0.01	<0.03	<0.05	0.01	4.85	0.01	<0.03	<0.02	<0.3	3.00	<0.2	1.32	<0.01	<2	0.112	<0.1	<0.03	<0.01	<0.03	<0.005
AR/DR/14 comp.	Faro	Sulphide	250	500	3.00	2.97	2.78	1711	2300	493	490.0	1140.0	0.0	1609	106.00	<0.2	<0.2	0.02	0.04	0.10	<0.1	0.25	79.7	0.07	0.83	1.96	9.91	0.66	0.24	138.00	10.0	<0.03	0.75	<0.3	<2	<0.2	2.23	<0.01	<2	0.107	0.10	<0.03	<0.01	<0.03	61.60
AR/FV/16 comp. 1,2	Faro	Schist	250	500	6.76	6.80	6.99	113	184	296	0.0	8.0	11.0	69	<0.2	<0.2	<0.2	0.04	<0.005	<0.1	<0.1	<0.01	17.1	<0.01	<0.01	<0.01	<0.03	<0.05	0.01	7.93	<0.005	<0.03	<0.02	<0.3	2.00	<0.2	0.48	<0.01	<2	0.251	<0.1	<0.03	<0.01	<0.03	0.01
AR/FV/17 comp. 2	Faro	Sulphide	250	500	2.57	2.54	2.27	4470	5710	453	5700.0	8150.0	0.0	8005	184.00	<0.4	2.50	<0.02	0.02	<0.2	<0.2	0.49	95.60	0.29	1.98	21.0	2760.00	1.10	0.16	97.90	8.07	<0.06	0.37	10.0	<4	<0.4	1.80	<0.02	<4	0.070	0.50	<0.06	0.39	0.61	356.00
AR/FV/20	Faro	Intrusive	250	500	9.09	8.25	6.30	81	137	118	0.0	24.0	28.5	17	<0.2	<0.2	<0.2	0.09	<0.005	<0.1	<0.1	<0.01	11.6	<0.01	<0.01	<0.01	0.04	<0.05	0.02	7.77	<0.005	<0.03	<0.02	<0.3	<2	<0.2	0.30	<0.01	<2	0.446	<0.1	<0.03	<0.01	<0.03	<0.005
AR/FV/21	Faro	Schist	250	500	6.68	6.58	6.45	586	870	174	0.0	29.0	5.5	520	<0.2	<0.2	<0.2	0.02	<0.005	<0.1	<0.1	<0.01	66.2	<0.01	<0.01	<0.01	0.04	<0.05	0.02	89.70	0.04	<0.03	<0.02	<0.3	4.00	<0.2	0.37	<0.01	<2	0.170	<0.1	<0.03	<0.01	<0.03	<0.005
AR/FV/24	Faro	Schist	250	500	7.56	7.29	7.64	62	109	183	0.0	8.0	14.0	25	<0.2	<0.2	<0.2	0.10	<0.005	<0.1	<0.1	<0.01	9.5	<0.01	<0.01	<0.01	<0.03	<0.05	<0.01	5.06	<0.005	<0.03	<0.02	<0.3	<2	<0.2	0.56	<0.01	<2	0.043	<0.1	<0.03	<0.01	<0.03	<0.005
AR/NW/25 A,B	Faro	Sulphide	250	500	2.20	1.84	2.08	5160	6640	467	5400.0	7350.0	0.0	9376	130.00	<0.2	0.60	0.02	0.02	0.10	<0.1	1.59	235.00	1.04	1.71	26.30	2010.00	0.48	0.12	140.00	12.70	<0.03	1.06	1.80	<2	<0.2	9.49	<0.01	<2	0.074	0.90	<0.03	0.14	<0.03	935.00
AR/NW/25 comp.	Faro	Sulphide	250	500	2.16	1.86	2.09	4160	5530	491	3250.0	6300.0	0.0	5849	58.00	<1	1.00	<0.05	<0.02	<0.5	<0.5	1.71	79.4	0.27	1.20	20.90	1360.00	0.80	<0.05	45.90	9.80	<0.1	0.40	2.00	<10	<1	5.80	<0.05	<10	0.065	0.60	<0.1	<0.05	<0.1	922.00
AR/LG/29 comp. surface	Faro	Sulphide	250	500	3.05	2.58	3.27	2820	3080	385	100.0	1450.0	0.0	3088	3.00	<1	<1	<0.05	<0.02	<0.5	<0.5	1.37	93.3	<0.05	0.60	6.93	23.50	2.20	<0.05	314.00	52.10	<0.1	0.50	<1	<10	<1	1.10	<0.05	<10	0.045	<0.5	<0.1	<0.05	<0.1	835.00
AR/LG/30	Faro	Schist	250	500	5.44	5.57	7.60	752	852	241	0.0	4.0	28.5	500	<0.2	<0.2	<0.2	0.03	<0.005	<0.1	<0.1	<0.01	54.2	<0.01	0.01	<0.01	0.16	<0.05	0.02	89.40	0.06	<0.03	<0.02	<0.3	3.00	<0.2	0.06	<0.01	5.00	0.312	0.10	<0.03	<0.01	<0.03	0.28
AR/LG/31 comp.	Faro	Sulphide	250	500	3.56	3.14	4.24	2620	3060	302	3.0	1090.0	0.0	3480	3.00	<1	<1	<0.05	0.02	<0.5	<0.5	0.91	210.00	<0.05	1.00	0.46	18.70	2.50	0.12	356.00	46.80	<0.1	1.70	<1	<10	<1	0.80	<0.05	<10	0.065	<0.5	<0.1	<0.05	<0.1	808.00
AR/MD/33 comp.	Faro	Schist	250	500	5.40	5.25	7.39	891	1066	224	0.0	14.0	10.0	716	<0.2	<0.2	<0.2	0.02	<0.005	0.10	<0.1	<0.01	75.70	<0.01	<0.01	<0.01	<0.03	<0.05	0.04	124.00	0.27	<0.03	<0.02	<0.3	2.00	<0.2	<0.05	<0.01	<2	0.086	<0.1	<0.03	<0.01	<0.03	0.02
AR/MD/34 comp.	Faro	Schist	250	500	6.65	6.60	7.91	202	263	206	0.0	2.0	44.5	78	<0.2	<0.2	<0.2	0.05	<0.005	<0.1	<0.1	<0.01	29.60	<0.01	<0.01	<0.01	<0.03	<0.05	0.03	11.30	<0.005	<0.03	<0.02	<0.3	4.00	<0.2	0.90	<0.01	<2	0.201	<0.1	<0.03	<0.01	<0.03	<0.005
AR/MD/35 comp.	Faro	Schist	250	500	2.36	2.13	2.52	2670	3150	466	500.0	850.0	0.0	2304	4.50	<0.2	<0.2	0.02	0.04	0.20	<0.1	0.07	144.00	0.01	1.29	2.08	191.00	0.07	0.04	258.00	112.00	<0.03	1.17	<0.3	<2	<0.2	0.72	<0.01	<2	0.064	0.30	<0.03	<0.01	<0.03	25.70
AR/MD/36 comp.	Faro	Sulphide	250	500	4.56	4.45	5.50	756	875	328	0.0	132.0	2.0	533	<0.2	<0.2	<0.2	0.02	<0.005	<0.1	<0.1	0.12	31.50	<0.01	0.04	0.01	0.03	2.57	0.02	65.20	35.70	<0.03	0.02	<0.3	<2	<0.2	0.18	<0.01	<2	0.040	<0.1	<0.03	<0.01	<0.03	74.30
AR/MD/37 comp.	Faro	Schist	250	500	2.38	2.18	2.50	2790	3310	533	875.0	1725.0	0.0	2696	27.50	<0.4	5.80	<0.02	0.04	0.30	<0.2	0.51	113.00	0.04	11.40	6.42	249.00	<0.1	0.03	190.00	118.00	<0.06	6.91	<0.6	<4	<0.4	0.90	<0.02	<4	<0.002	0.30	<0.06	<0.02	<0.06	314.00
AR/ZT/41 comp.	Faro	Schist	250	500	6.72	6.97	7.66	431	506	357	0.0	3.0	49.0	162	<0.2	<0.2	<0.2	0.03	<0.005	<0.1	<0.1	<0.01	9.33	<0.01	<0.01	<0.01	0.05	<0.05	0.02	3.80	0.02	<0.03	<0.02	<0.3	5.00	<0.2	1.03	<0.01	91.00	0.193	<0.1	<0.03	<0.01	<0.03	0.02
AR/ZT/42	Faro	Sulphide	250	500	3.18	2.94	4.09	1948	2390	283	10.0	1152.0	0.0	2304	3.00	<1	<1	<0.05	0.02	<0.5	<0.5	0.95	86.0	<0.05	0.27	2.84	83.80	2.40	0.07	204.00	115.00	<0.1	0.50	<1	<10	<1	1.60	<0.05	<10	0.045	<0.5	<0.1	<0.05	<0.1	562.00
AR/MP/43 surface @ toe	Faro	#N/A	250	500	5.81	5.93	6.54	69	112	250	0.0	25.0	19.0	9	<0.2	<0.2	<0.2	0.05	<0.005	<0.1	<0.1	<0.01	0.48	<0.01	<0.01	<0.01	0.04	<0.05	0.05	0.23	0.02	<0.03	<0.02</												

Appendix D.3
Schedule D Humidity Cell Test Charts

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: ICD

Date	Week	Input	Output	pH	Eh	Cond	Sulphate	Acidity To pH 4.5	Total Acidity	Alkalinity	Magnesium	Calcium	Iron	Copper	Zinc	Lead	Sulphate	Acidity To pH 4.5	Total Acidity	Alkalinity	Magnesium	Calcium	Iron	Copper	Zinc	Lead
		(mL)	(mL)		(mV)	(umhos/ cm)	(mg/l)	(mg CaCO3/L)	(mg CaCO3/L)	(mg CaCO3/L)	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/kg/wk	mg/kg/wk	mg/kg/wk	mg/kg/wk	mg/kg/wk	mg/kg/wk	mg/kg/wk	mg/kg/wk	mg/kg/wk	mg/kg/wk
Jan 05	1	200	148	7.4	355	320	110	#N/A	3	33	#N/A	#N/A	0.023	0.0032	0.03	0.012	81.4	#N/A	2.22	24.42	#N/A	#N/A	0.01702	0.002368	0.0222	0.00888
Jan 12	2	200	140	7.2	420	227	88	#N/A	6	15	#N/A	#N/A	0.011	0.0021	0.0079	0.004	61.6	#N/A	4.2	10.5	#N/A	#N/A	0.0077	0.00147	0.00553	0.0028
Jan 19	3	200	148	6.7	390	141	53	#N/A	4	9	#N/A	#N/A	0.16	0.0017	0.0072	0.079	39.22	#N/A	2.96	6.66	#N/A	#N/A	0.1184	0.001258	0.005328	0.05846
Jan 26	4	200	152	7	440	150	50	#N/A	5	19	#N/A	#N/A	0.003	0.005	0.002	0.02	38	#N/A	3.8	14.44	#N/A	#N/A	0.00228	0.0038	0.00152	0.0152
Feb 02	5	200	146	7.2	445	141	45	#N/A	4	26	#N/A	#N/A	0.005	0.0008	0.0087	0.005	32.85	#N/A	2.92	18.98	#N/A	#N/A	0.00365	0.000584	0.006351	0.00365
Feb 09	6	200	146	7.2	405	114	32	#N/A	2	23	#N/A	#N/A	0.006	0.0007	0.0021	0.003	23.36	#N/A	1.46	16.79	#N/A	#N/A	0.00438	0.000511	0.001533	0.00219
Feb 16	7	200	150	7.5	435	85	22	#N/A	2	19	#N/A	#N/A	0.009	0.0022	0.0018	0.005	16.5	#N/A	1.5	14.25	#N/A	#N/A	0.00675	0.00165	0.00135	0.00375
Feb 23	8	200	164	7.4	450	125	32	#N/A	2	31	#N/A	#N/A	0.032	0.005	0.002	0.02	26.24	#N/A	1.64	25.42	#N/A	#N/A	0.02624	0.0041	0.00164	0.0164
Mar 02	9	200	148	7.2	390	75	14	#N/A	2	16	#N/A	#N/A	0.009	0.0022	0.013	0.003	10.36	#N/A	1.48	11.84	#N/A	#N/A	0.00666	0.001628	0.00962	0.00222
Mar 09	10	200	146	7.1	220	81	17	#N/A	2	17	#N/A	#N/A	0.005	0.0027	0.0074	0.003	12.41	#N/A	1.46	12.41	#N/A	#N/A	0.00365	0.001971	0.005402	0.00219
Mar 16	11	200	152	6.9	245	115	31	#N/A	3	13	#N/A	#N/A	0.2	0.0179	0.11	0.019	23.56	#N/A	2.28	9.88	#N/A	#N/A	0.152	0.013604	0.0836	0.01444
Mar 23	12	200	158	7.3	205	83	22	#N/A	2	15	#N/A	#N/A	0.005	0.0037	0.097	0.004	17.38	#N/A	1.58	11.85	#N/A	#N/A	0.00395	0.002923	0.07663	0.00316
Mar 30	13	200	160	7.4	230	100	18	#N/A	1	27	#N/A	#N/A	0.005	0.0012	0.0009	0.002	14.4	#N/A	0.8	21.6	#N/A	#N/A	0.004	0.00096	0.00072	0.0016
Apr 06	14	200	152	7.3	220	83	24	#N/A	2	17	#N/A	#N/A	0.005	0.0005	0.0047	0.001	18.24	#N/A	1.52	12.92	#N/A	#N/A	0.0038	0.00038	0.003572	0.00076
Apr 13	15	200	146	7.6	210	87	28	#N/A	1	14	#N/A	#N/A	0.007	0.0027	0.0024	0.002	20.44	#N/A	0.73	10.22	#N/A	#N/A	0.00511	0.001971	0.001752	0.00146
Apr 20	16	200	154	7.4	155	90	37	#N/A	2	14	#N/A	#N/A	0.017	0.0005	0.0018	0.001	28.49	#N/A	1.54	10.78	#N/A	#N/A	0.01309	0.000385	0.001386	0.00077
Apr 27	17	200	158	7.8	170	105	36	#N/A	1	13	#N/A	#N/A	0.006	0.0026	0.0015	0.001	28.44	#N/A	0.79	10.27	#N/A	#N/A	0.00474	0.002054	0.001185	0.00079
May 04	18	200	156	7.8	200	106	39	#N/A	1	12	#N/A	#N/A	0.005	0.0024	0.0017	0.001	30.42	#N/A	0.78	9.36	#N/A	#N/A	0.0039	0.001872	0.001326	0.00078
May 11	19	200	150	7.6	220	98	36	#N/A	2	12	#N/A	#N/A	0.005	0.0014	0.0024	0.002	27	#N/A	1.5	9	#N/A	#N/A	0.00375	0.00105	0.0018	0.0015
May 18	20	200	160	7.7	210	118	42	#N/A	2	14	#N/A	#N/A	0.005	0.001	0.0005	0.001	33.6	#N/A	1.6	11.2	#N/A	#N/A	0.004	0.0008	0.0004	0.0008
May 25	21	200	156	7.7	240	110	38	#N/A	1	15	#N/A	#N/A	0.005	0.0029	0.0015	0.001	29.64	#N/A	0.78	11.7	#N/A	#N/A	0.0039	0.002262	0.00117	0.00078
Average Stable Loads																	23.13706	#N/A	1.432941	13.43941	#N/A	#N/A	0.014916	0.002277	0.011732	0.003367

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: ICD Inoculated

Date	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond (umhos/ cm)	Sulphate (mg/l)	Acidity To pH 4.5 (mg Ca CO3/L)	Total Acidity (mg Ca CO3/L)	Alkalinity (mg Ca CO3/L)	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/ wk	Acidity To pH 4.5 mg/kg/ wk	Total Acidity mg/kg/ wk	Alkalinity mg/kg/ wk	Magnesium mg/kg/ wk	Calcium mg/kg/ wk	Iron mg/kg/ wk	Copper mg/kg/ wk	Zinc mg/kg/ wk	Lead mg/kg/ wk
Jan 05	1	200	148	7.2	350	323	119	#N/A	10	33	#N/A	#N/A	0.35	0.0055	0.16	0.11	88.06	#N/A	7.4	24.42	#N/A	#N/A	0.259	0.00407	0.1184	0.0814
Jan 12	2	200	138	7.1	450	357	162	#N/A	4	16	#N/A	#N/A	0.008	0.0023	0.0012	0.003	111.78	#N/A	2.76	11.04	#N/A	#N/A	0.00552	0.00159	0.00083	0.00207
Jan 19	3	200	148	7.4	405	238	100	#N/A	4	14	#N/A	#N/A	0.01	0.0016	0.012	0.003	74	#N/A	2.96	10.36	#N/A	#N/A	0.0074	0.00118	0.00888	0.00222
Jan 26	4	200	146	7	430	191	73	#N/A	4	18	#N/A	#N/A	0.003	0.005	0.002	0.02	53.29	#N/A	2.92	13.14	#N/A	#N/A	0.00219	0.00365	0.00146	0.0146
Feb 02	5	200	147	7.1	440	179	66	#N/A	4	23	#N/A	#N/A	0.013	0.0016	0.036	0.01	48.51	#N/A	2.94	16.905	#N/A	#N/A	0.00956	0.00118	0.02646	0.00735
Feb 09	6	200	144	7.4	415	121	38	#N/A	2	22	#N/A	#N/A	0.007	0.0012	0.018	0.005	27.36	#N/A	1.44	15.84	#N/A	#N/A	0.00504	0.00086	0.01296	0.0036
Feb 16	7	200	146	7.5	450	98	26	#N/A	2	18	#N/A	#N/A	0.005	0.0028	0.043	0.006	18.98	#N/A	1.46	13.14	#N/A	#N/A	0.00365	0.00204	0.03139	0.00438
Feb 23	8	200	144	7.2	475	107	24	#N/A	2	20	#N/A	#N/A	0.006	0.005	0.026	0.02	17.28	#N/A	1.44	14.4	#N/A	#N/A	0.00432	0.0036	0.01872	0.0144
Mar 02	9	200	146	7.2	385	77	16	#N/A	2	15	#N/A	#N/A	0.011	0.0031	0.019	0.005	11.68	#N/A	1.46	10.95	#N/A	#N/A	0.00803	0.00226	0.01387	0.00365
Mar 09	10	200	147	7	220	85	19	#N/A	3	14	#N/A	#N/A	0.013	0.0045	0.0174	0.008	13.965	#N/A	2.205	10.29	#N/A	#N/A	0.00956	0.00331	0.01279	0.00588
Mar 16	11	200	140	7.2	245	90	22	#N/A	2	18	#N/A	#N/A	0.009	0.0019	0.018	0.008	15.4	#N/A	1.4	12.6	#N/A	#N/A	0.0063	0.00133	0.0126	0.0056
Mar 23	12	200	154	7.2	220	78	19	#N/A	1	15	#N/A	#N/A	0.005	0.0074	0.017	0.005	14.63	#N/A	0.77	11.55	#N/A	#N/A	0.00385	0.0057	0.01309	0.00385
Mar 30	13	200	164	7.3	240	77	20	#N/A	1	12	#N/A	#N/A	0.005	0.002	0.0042	0.001	16.4	#N/A	0.82	9.84	#N/A	#N/A	0.0041	0.00164	0.00344	0.00082
Apr 06	14	200	152	7.1	230	79	16	#N/A	2	14	#N/A	#N/A	0.014	0.0014	0.0135	0.001	12.16	#N/A	1.52	10.64	#N/A	#N/A	0.01064	0.00106	0.01026	0.00076
Apr 13	15	200	154	7.4	210	89	30	#N/A	1	13	#N/A	#N/A	0.016	0.0018	0.0112	0.003	23.1	#N/A	0.77	10.01	#N/A	#N/A	0.01232	0.00139	0.00862	0.00231
Apr 20	16	200	152	7.4	160	94	40	#N/A	2	17	#N/A	#N/A	0.024	0.0015	0.0033	0.003	30.4	#N/A	1.52	12.92	#N/A	#N/A	0.01824	0.00114	0.00251	0.00228
Apr 27	17	200	148	7.7	170	116	40	#N/A	1	13	#N/A	#N/A	0.016	0.0043	0.004	0.002	29.6	#N/A	0.74	9.62	#N/A	#N/A	0.01184	0.00318	0.00296	0.00148
May 04	18	200	154	7.7	185	98	35	#N/A	1	13	#N/A	#N/A	0.007	0.0028	0.0062	0.003	26.95	#N/A	0.77	10.01	#N/A	#N/A	0.00539	0.00216	0.00477	0.00231
May 11	19	200	150	7.6	220	91	30	#N/A	2	12	#N/A	#N/A	0.006	0.003	0.0053	0.005	22.5	#N/A	1.5	9	#N/A	#N/A	0.0045	0.00225	0.00398	0.00375
May 18	20	200	150	7.6	215	118	49	#N/A	2	13	#N/A	#N/A	0.005	0.003	0.0028	0.002	36.75	#N/A	1.5	9.75	#N/A	#N/A	0.00375	0.00225	0.0021	0.0015
May 25	21	200	154	7.7	250	107	40	#N/A	2	13	#N/A	#N/A	0.006	0.006	0.0042	0.002	30.8	#N/A	1.54	10.01	#N/A	#N/A	0.00462	0.00462	0.00323	0.00154
Average Stable Loads																	23.3215	#N/A	1.39971	11.6162	#N/A	#N/A	0.00739	0.00235	0.01081	0.00385

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: 1DO

Farm EE-100																										
Date	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond (umhos/ cm)	Sulphate (mg/l)	Acidity To pH 4.5 (mg Ca CO3/L)	Total Acidity (mg Ca CO3/L)	Alkalinity Magnesium (mg Ca CO3/L)	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg /wk	Acidity To pH 4.5 mg/kg /wk	Total Acidity mg/kg /wk	Alkalinity Magnesium mg/kg /wk	Calcium mg/kg /wk	Iron mg/kg /wk	Copper mg/kg /wk	Zinc mg/kg /wk	Lead mg/kg /wk		
Jan 05	1	200	152	7.4	360	314	131	#N/A	7	29	#N/A	#N/A	0.01	0.0087	0.03	0.007	99.56	#N/A	5.32	22.04	#N/A	#N/A	0.0076	0.00661	0.0228	0.00532
Jan 12	2	200	177	7.2	415	277	94	#N/A	4	27	#N/A	#N/A	0.008	0.0022	0.02	0.005	83.19	#N/A	3.54	23.895	#N/A	#N/A	0.00708	0.00195	0.0177	0.00443
Jan 19	3	200	150	6.8	390	109	38	#N/A	6	11	#N/A	#N/A	0.025	0.002	0.0066	0.01	28.5	#N/A	4.5	8.25	#N/A	#N/A	0.01875	0.0015	0.00495	0.0075
Jan 26	4	200	158	7.3	410	112	35	#N/A	5	16	#N/A	#N/A	0.003	0.005	0.002	0.02	27.65	#N/A	3.95	12.64	#N/A	#N/A	0.00237	0.00395	0.00158	0.0158
Feb 02	5	200	153	7.3	430	103	34	#N/A	3	19	#N/A	#N/A	0.025	0.0013	0.0075	0.004	26.01	#N/A	2.295	14.535	#N/A	#N/A	0.01913	0.00099	0.00574	0.00306
Feb 09	6	200	148	7	395	77	24	#N/A	4	16	#N/A	#N/A	0.011	0.0007	0.0012	0.002	17.76	#N/A	2.96	11.84	#N/A	#N/A	0.00814	0.00052	0.00089	0.00148
Feb 16	7	200	152	7.3	420	69	17	#N/A	2	15	#N/A	#N/A	0.22	0.11	0.022	0.017	12.92	#N/A	1.52	11.4	#N/A	#N/A	0.1672	0.0836	0.01672	0.01292
Feb 23	8	200	149	7.3	445	77	16	#N/A	1	16	#N/A	#N/A	0.004	0.005	0.002	0.02	11.92	#N/A	0.745	11.92	#N/A	#N/A	0.00298	0.00373	0.00149	0.0149
Mar 02	9	200	158	7.2	375	67	12	#N/A	1	13	#N/A	#N/A	0.015	0.0026	0.011	0.003	9.48	#N/A	0.79	10.27	#N/A	#N/A	0.01185	0.00205	0.00869	0.00237
Mar 09	10	200	154	7	235	65	15	#N/A	2	12	#N/A	#N/A	0.04	0.0015	0.0068	0.003	11.55	#N/A	1.54	9.24	#N/A	#N/A	0.0308	0.00116	0.00524	0.00231
Mar 16	11	200	156	7.1	240	68	14	#N/A	2	14	#N/A	#N/A	0.009	0.001	0.0102	0.004	10.92	#N/A	1.56	10.92	#N/A	#N/A	0.00702	0.00078	0.00796	0.00312
Mar 23	12	200	158	7.3	200	82	13	#N/A	2	12	#N/A	#N/A	0.005	0.0021	0.0043	0.003	10.27	#N/A	1.58	9.48	#N/A	#N/A	0.00395	0.00166	0.0034	0.00237
Mar 30	13	200	180	7.3	240	62	17	#N/A	1	13	#N/A	#N/A	0.005	0.0011	0.0019	0.001	15.3	#N/A	0.9	11.7	#N/A	#N/A	0.0045	0.00099	0.00171	0.0009
Apr 06	14	200	162	7.2	240	71	22	#N/A	2	14	#N/A	#N/A	0.005	0.0005	0.002	0.001	17.82	#N/A	1.62	11.34	#N/A	#N/A	0.00405	0.00041	0.00162	0.00081
Apr 13	15	200	176	7.2	215	74	26	#N/A	2	11	#N/A	#N/A	0.005	0.0005	0.0024	0.002	22.88	#N/A	1.76	9.68	#N/A	#N/A	0.0044	0.00044	0.00211	0.00176
Apr 20	16	200	172	7.2	155	81	28	#N/A	1	12	#N/A	#N/A	0.008	0.001	0.0022	0.001	24.08	#N/A	0.86	10.32	#N/A	#N/A	0.00688	0.00086	0.00189	0.00086
Apr 27	17	200	158	7.7	185	89	27	#N/A	1	12	#N/A	#N/A	0.006	0.0016	0.0023	0.001	21.33	#N/A	0.79	9.48	#N/A	#N/A	0.00474	0.00126	0.00182	0.00079
May 04	18	200	158	7.7	210	90	33	#N/A	1	13	#N/A	#N/A	0.005	0.0021	0.001	0.0022	26.07	#N/A	0.79	10.27	#N/A	#N/A	0.00395	0.00166	0.00079	0.00174
May 11	19	200	154	7.7	230	71	24	#N/A	1	11	#N/A	#N/A	0.024	0.0022	0.0005	0.001	18.48	#N/A	0.77	8.47	#N/A	#N/A	0.01848	0.00169	0.00039	0.00077
May 18	20	200	154	7.6	210	81	28	#N/A	1	12	#N/A	#N/A	0.005	0.002	0.0005	0.001	21.56	#N/A	0.77	9.24	#N/A	#N/A	0.00385	0.00154	0.00039	0.00077
May 25	21	200	160	7.8	230	71	23	#N/A	2	11	#N/A	#N/A	0.005	0.0016	0.0005	0.001	18.4	#N/A	1.6	8.8	#N/A	#N/A	0.004	0.00128	0.0004	0.0008
Average Stable Loads																18.022	#N/A	1.48889	10.64139	#N/A	#N/A	0.01713	0.00603	0.00349	0.00375	

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: 1D0 Inoculated

Date Jun 13	Week	Input (mL)	Output (mL)	pH	Eh (mV) μmhos/cm	Cond	Sulphate (mg/l)	Acidity To pH 4.5 CaCO ₃ /L	Total Acidity CaCO ₃ /L	Alkalinity CaCO ₃ /L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Jan 05	1	200	150	7.3	360	355	155	#N/A	8	30	#N/A	#N/A	0.027	0.0052	0.04	0.008	116.25	#N/A	6	22.5	#N/A	#N/A	0.02025	0.0039	0.03	0.006
Jan 12	2	200	142	7	415	344	168	#N/A	4	20	#N/A	#N/A	0.008	0.0025	0.016	0.004	119.28	#N/A	2.84	14.2	#N/A	#N/A	0.00568	0.001775	0.01136	0.00284
Jan 19	3	200	151	6.9	400	223	94	#N/A	4	14	#N/A	#N/A	0.01	0.0011	0.0022	0.001	70.97	#N/A	3.02	10.57	#N/A	#N/A	0.00755	0.000831	0.001661	0.000755
Jan 26	4	200	150	7	440	148	53	#N/A	5	14	#N/A	#N/A	0.003	0.005	0.002	0.02	39.75	#N/A	3.75	10.5	#N/A	#N/A	0.00225	0.00375	0.0015	0.015
Feb 02	5	200	147	7.3	435	178	69	#N/A	4	16	#N/A	#N/A	0.005	0.0009	0.0089	0.004	50.715	#N/A	2.94	11.76	#N/A	#N/A	0.003675	0.000662	0.006542	0.00294
Feb 09	6	200	148	7.1	400	121	44	#N/A	2	14	#N/A	#N/A	0.005	0.0007	0.0015	0.002	32.56	#N/A	1.48	10.36	#N/A	#N/A	0.0037	0.000518	0.00111	0.00148
Feb 16	7	200	148	7.3	430	107	26	#N/A	2	13	#N/A	#N/A	0.11	0.0055	0.038	0.029	19.24	#N/A	1.48	9.62	#N/A	#N/A	0.0814	0.00407	0.02812	0.02146
Feb 23	8	200	148	7.2	450	103	26	#N/A	2	14	#N/A	#N/A	0.003	0.005	0.002	0.02	19.24	#N/A	1.48	10.36	#N/A	#N/A	0.00222	0.0037	0.00148	0.0148
Mar 02	9	200	146	7.2	380	84	16	#N/A	1	15	#N/A	#N/A	0.017	0.0021	0.011	0.004	11.68	#N/A	0.73	10.95	#N/A	#N/A	0.01241	0.001533	0.00803	0.00292
Mar 09	10	200	146	7	220	85	25	#N/A	3	12	#N/A	#N/A	0.006	0.0015	0.007	0.003	18.25	#N/A	2.19	8.76	#N/A	#N/A	0.00438	0.001095	0.00511	0.00219
Mar 16	11	200	148	7.1	245	92	22	#N/A	3	14	#N/A	#N/A	0.017	0.0018	0.0161	0.007	16.28	#N/A	2.22	10.36	#N/A	#N/A	0.01258	0.001332	0.011914	0.00518
Mar 23	12	200	158	7.3	210	91	26	#N/A	2	12	#N/A	#N/A	0.005	0.0033	0.008	0.004	20.54	#N/A	1.58	9.48	#N/A	#N/A	0.00395	0.002607	0.00632	0.00316
Mar 30	13	200	160	7.3	240	86	31	#N/A	1	11	#N/A	#N/A	0.006	0.0015	0.0019	0.001	24.8	#N/A	0.8	8.8	#N/A	#N/A	0.0048	0.0012	0.00152	0.0008
Apr 06	14	200	158	7.4	220	74	24	#N/A	2	14	#N/A	#N/A	0.007	0.0005	0.0046	0.001	18.96	#N/A	1.58	11.06	#N/A	#N/A	0.00553	0.000395	0.003634	0.00079
Apr 13	15	200	148	7.5	215	81	28	#N/A	1	11	#N/A	#N/A	0.006	0.0005	0.0027	0.002	20.72	#N/A	0.74	8.14	#N/A	#N/A	0.00444	0.00037	0.001998	0.00148
Apr 20	16	200	160	7.3	155	77	30	#N/A	2	12	#N/A	#N/A	0.01	0.0013	0.0024	0.001	24	#N/A	1.6	9.6	#N/A	#N/A	0.008	0.00104	0.00192	0.0008
Apr 27	17	200	152	7.7	180	97	33	#N/A	1	11	#N/A	#N/A	0.011	0.0021	0.0025	0.001	25.08	#N/A	0.76	8.36	#N/A	#N/A	0.00836	0.001596	0.0019	0.00076
May 04	18	200	154	7.7	200	88	33	#N/A	1	11	#N/A	#N/A	0.005	0.0025	0.0025	0.0017	25.41	#N/A	0.77	8.47	#N/A	#N/A	0.00385	0.001925	0.001925	0.001309
May 11	19	200	152	7.8	230	79	27	#N/A	2	9	#N/A	#N/A	0.005	0.0016	0.0005	0.002	20.52	#N/A	1.52	6.84	#N/A	#N/A	0.0038	0.001216	0.00038	0.00152
May 18	20	200	152	7.5	210	99	37	#N/A	1	11	#N/A	#N/A	0.005	0.0012	0.0005	0.001	28.12	#N/A	0.76	8.36	#N/A	#N/A	0.0038	0.000912	0.00038	0.00076
May 25	21	200	154	7.8	240	92	34	#N/A	1	10	#N/A	#N/A	0.009	0.002	0.0005	0.001	26.18	#N/A	0.77	7.7	#N/A	#N/A	0.00693	0.00154	0.000385	0.00077
Average Stable Loads																	24.55806	#N/A	1.508333	9.415556	#N/A	#N/A	0.009782	0.001637	0.004676	0.00434

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: 1D4

Date	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond (µmhos/cm)	Sulphate (mg/l)	Acidity To pH 4.5 CaCO ₃ /L	Total Acidity CaCO ₃ /L	Alkalinity CaCO ₃ /L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Jan 05	1	200	149	4.8	255	634	365	#N/A	66	8	#N/A	#N/A	2.6	0.0048	4.7	0.25	271.925	#N/A	49.17	5.96	#N/A	#N/A	1.937	0.003576	3.5015	0.18625
Jan 12	2	200	176	7.1	450	355	165	#N/A	7	9	#N/A	#N/A	0.011	0.0038	0.05	0.002	145.2	#N/A	6.16	7.92	#N/A	#N/A	0.00968	0.003344	0.044	0.00176
Jan 19	3	200	150	6.4	420	300	129	#N/A	4	5	#N/A	#N/A	0.13	0.0058	0.11	0.007	96.75	#N/A	3	3.75	#N/A	#N/A	0.0975	0.00435	0.0825	0.00525
Jan 26	4	200	150	6.5	410	243	106	#N/A	5	8	#N/A	#N/A	0.09	0.006	0.064	0.02	79.5	#N/A	3.75	6	#N/A	#N/A	0.0675	0.0045	0.048	0.015
Feb 02	5	200	152	7.1	450	214	87	#N/A	3	10	#N/A	#N/A	0.005	0.0044	0.07	0.01	66.12	#N/A	2.28	7.6	#N/A	#N/A	0.0038	0.003344	0.0532	0.0076
Feb 09	6	200	148	6.9	430	158	61	#N/A	3	10	#N/A	#N/A	0.006	0.004	0.072	0.007	45.14	#N/A	2.22	7.4	#N/A	#N/A	0.00444	0.00296	0.05328	0.00518
Feb 16	7	200	144	7.1	475	116	33	#N/A	3	12	#N/A	#N/A	0.15	0.16	0.33	0.015	23.76	#N/A	2.16	8.64	#N/A	#N/A	0.108	0.1152	0.2376	0.0108
Feb 23	8	200	152	7	480	153	58	#N/A	3	6	#N/A	#N/A	0.015	0.011	0.086	0.02	44.08	#N/A	2.28	4.56	#N/A	#N/A	0.0114	0.00836	0.06536	0.0152
Mar 02	9	200	153	6.8	390	153	53	#N/A	2	10	#N/A	#N/A	0.01	0.0095	0.06	0.008	40.545	#N/A	1.53	7.65	#N/A	#N/A	0.00765	0.007268	0.0459	0.00612
Mar 09	10	200	152	6.7	235	156	55	#N/A	2	10	#N/A	#N/A	0.005	0.0059	0.051	0.008	41.8	#N/A	1.52	7.6	#N/A	#N/A	0.0038	0.004484	0.03876	0.00608
Mar 16	11	200	151	6.8	250	170	63	#N/A	2	9	#N/A	#N/A	0.008	0.0044	0.072	0.008	47.565	#N/A	1.51	6.795	#N/A	#N/A	0.00604	0.003322	0.05436	0.00604
Mar 23	12	200	162	6.7	240	167	69	#N/A	2	7	#N/A	#N/A	0.018	0.031	0.081	0.007	55.89	#N/A	1.62	5.67	#N/A	#N/A	0.01458	0.02511	0.06561	0.00567
Mar 30	13	200	176	6.9	250	164	73	#N/A	1	7	#N/A	#N/A	0.006	0.0042	0.034	0.004	64.24	#N/A	0.88	6.16	#N/A	#N/A	0.00528	0.003696	0.02992	0.00352
Apr 06	14	200	158	6.6	160	232	108	#N/A	2	7	#N/A	#N/A	0.57	0.0038	0.15	0.003	85.32	#N/A	1.58	5.53	#N/A	#N/A	0.4503	0.003002	0.1185	0.00237
Apr 13	15	200	162	6.7	230	251	114	#N/A	1	4	#N/A	#N/A	0.71	0.0092	0.16	0.007	92.34	#N/A	0.81	3.24	#N/A	#N/A	0.5751	0.007452	0.1296	0.00567
Apr 20	16	200	160	7.3	190	262	121	#N/A	3	3	#N/A	#N/A	1.1	0.0116	0.2	0.024	96.8	#N/A	2.4	2.4	#N/A	#N/A	0.88	0.00928	0.16	0.0192
Apr 27	17	200	160	7.1	190	282	111	#N/A	2	3	#N/A	#N/A	0.44	0.021	0.15	0.012	88.8	#N/A	1.6	2.4	#N/A	#N/A	0.352	0.0168	0.12	0.0096
May 04	18	200	162	6.8	190	262	124	#N/A	2	3	#N/A	#N/A	1.4	0.0051	0.15	0.033	100.44	#N/A	1.62	2.43	#N/A	#N/A	1.134	0.004131	0.1215	0.02673
May 11	19	200	154	5.6	260	255	126	#N/A	4	3	#N/A	#N/A	1.3	0.0279	0.14	0.063	97.02	#N/A	3.08	2.31	#N/A	#N/A	1.001	0.021483	0.1078	0.04851
May 18	20	200	162	7.4	225	283	138	#N/A	2	6	#N/A	#N/A	0.006	0.0067	0.05	0.004	111.78	#N/A	1.62	4.86	#N/A	#N/A	0.00486	0.005427	0.0405	0.00324
May 25	21	200	154	7.2	270	250	114	#N/A	2	4	#N/A	#N/A	0.14	0.0419	0.15	0.019	87.78	#N/A	1.54	3.08	#N/A	#N/A	0.1078	0.032263	0.1155	0.01463
Jun 01	22	200	154	6	250	219	99	#N/A	5	2	#N/A	#N/A	1.11	0.018	0.18	0.018	76.23	#N/A	3.85	1.54	#N/A	#N/A	0.8547	0.01386	0.1386	0.01386
Jun 08	23	200	158	7.1	280	234	119	#N/A	4	2	#N/A	#N/A	0.71	0.024	0.18	0.015	94.01	#N/A	3.16	1.58	#N/A	#N/A	0.5609	0.01896	0.1422	0.01185
Jun 15	24	200	158	4.6	243	247	118	#N/A	10	1	#N/A	#N/A	2.4	0.034	0.34	0.069	93.22	#N/A	7.9	0.79	#N/A	#N/A	1.896	0.02686	0.2686	0.05451
Jun 22	25	200	154	5.1	240	232	107	#N/A	7	1	#N/A	#N/A	3	0.03	0.23	0.11	82.39	#N/A	5.39	0.77	#N/A	#N/A	2.31	0.0231	0.1771	0.0847
Jun 29	26	200	158	4.9	282	225	110	#N/A	7	1	#N/A	#N/A	2.8	0.027	0.16	0.54	86.9	#N/A	5.53	0.79	#N/A	#N/A	2.212	0.02133	0.1264	0.4266
Jul 06	27	200	166	4.8	260	264	133	#N/A	11	1	#N/A	#N/A	1.4	0.0111	0.2	0.022	110.39	#N/A	9.13	0.83	#N/A	#N/A	1.162	0.009213	0.166	0.01826
Jul 13	28	200	157	5.5	260	226	98	#N/A	5	2	#N/A	#N/A	1.2	0.0206	0.17	0.033	76.93	#N/A	3.925	1.57	#N/A	#N/A	0.942	0.016171	0.13345	0.025905
Jul 20	29	200	156	6.5	275	162	71	#N/A	2	3	#N/A	#N/A	0.6	0.0191	0.08	0.004	55.38	#N/A	1.56	2.34	#N/A	#N/A	0.468	0.014898	0.0624	0.00312
Jul 27	30	200	154	7.4	260	156	70	#N/A	2	3	#N/A	#N/A	0.37	0.0064	0.05	0.004	53.9	#N/A	1.54	2.31	#N/A	#N/A	0.2849	0.004928	0.0385	0.00308
Aug 03	31	200	158	6.8	252	175	82	#N/A	4	4	#N/A	#N/A	0.88	0.016	0.06	0.004	64.78	#N/A	3.16	3.16	#N/A	#N/A	0.6952	0.01264	0.0474	0.00316
Aug 10	32	200	162	7.4	210	217	98	#N/A	2	5	#N/A	#N/A	0.157	0.0043	0.026	0.001	79.38	#N/A	1.62	4.05	#N/A	#N/A	0.12717	0.003483	0.02106	0.00081
Aug 17	33	200	163	7.8	275	203	94	#N/A	1	6	#N/A	#N/A	0.007	0.0005	0.027	0.001	76.61	#N/A	0.815	4.89	#N/A	#N/A	0.005705	0.000408	0.022005	0.000815
Aug 24	34	200	163	6.9	185	172	75	#N/A	1	5	#N/A	#N/A	0.14	0.0024	0.025	0.001	61.125	#N/A	0.815	4.075	#N/A	#N/A	0.1141	0.001956	0.020375	0.000815
Aug 31	35	200	160	7.3	262	223	96	#N/A	2	9	#N/A	#N/A	0.005	0.0005	0.005	0.001	76.8	#N/A	1.6	7.2	#N/A	#N/A	0.004	0.0004	0.004	0.0008
Sep 07	36	200	156	7	165	136	62	#N/A	1	7	#N/A	#N/A	0	0.0086	0.01	0.001	48.36	#N/A	0.78	5.46	#N/A	#N/A	0	0.006708	0.0078	0.00078
Sep 14	37	200	154	7.8	#N/A	132	61	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	46.97	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Sep 21	38	200	164	7.7	#N/A	166	70	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	57.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Sep 28	39	200	161	7.4	#N/A	166	79	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	63.595	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Oct 05	40	200	158	7.3	#N/A	163	68	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.0005	0.0077	0.001	53.72	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.000395	0.006083	0.00079
Oct 12	41	200	159	6.7	#N/A	124	50	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	39.75	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Oct 19	42	200	158	6.9	#N/A	130	61	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	48.19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Oct 26	43	200	158	6.9	#N/A	145	61	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	48.19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Nov 02	44	200	156	6.2	#N/A	136	53	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.0005	0.0047	0.001	41.34	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.00039	0.003666	0.00078
Nov 09	45	200	157	6.5	#N/A	117	45	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	35.325	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Nov 16	46	200	154	6.5	#N/A	150	57	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	43.89	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Nov 23	47	200	152	7.9	#N/A	212	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	45.6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Nov 30	48	200	154	7.1	#N/A	191	52	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.0006	0.0082	0.001	40.04	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.000462	0.006314	0.00077
Dec 07	49	200	154	7.3	#N/A	182	57	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	43.89	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Dec 14	50	200	153	6.5	#N/A	172	53	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	40.545	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Dec 21	51	200	154	6.4	#N/A	205	48	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	36.96	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Dec 27	52	200	142	7.8	#N/A	168	42	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.0029	0.036	0.003	29.82	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.002059	0.02556	0.00213
Jan 03	53	200	150	7.7	#N/A	190	50	#N/A	#N/A																	

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: 1D4 Inoculated

Date Jun 13	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond (µmhos/cm)	Sulphate (mg/l)	Acidity To pH 4.5 CaCO3/L	Total Acidity CaCO3/L	Alkalinity CaCO3/L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Jan 05	1	200	150	4.6	280	623	365	#N/A	71	3	#N/A	#N/A	26	0.03	4.4	0.3	273.75	#N/A	53.25	2.25	#N/A	#N/A	19.5	0.0225	3.3	0.225
Jan 12	2	200	152	7	470	564	308	#N/A	4	10	#N/A	#N/A	0.1	0.003	0.19	0.008	234.08	#N/A	3.04	7.6	#N/A	#N/A	0.076	0.00228	0.1444	0.00608
Jan 19	3	200	170	6.7	440	331	146	#N/A	3	4	#N/A	#N/A	0.25	0.0021	0.24	0.082	124.1	#N/A	2.55	3.4	#N/A	#N/A	0.2125	0.001785	0.204	0.0697
Jan 26	4	200	146	6.5	420	267	124	#N/A	5	5	#N/A	#N/A	0.088	0.022	0.134	0.03	90.52	#N/A	3.65	3.65	#N/A	#N/A	0.06424	0.01606	0.09782	0.0219
Feb 02	5	200	150	7	475	235	99	#N/A	3	10	#N/A	#N/A	0.005	0.0041	0.21	0.1	74.25	#N/A	2.25	7.5	#N/A	#N/A	0.00375	0.003075	0.1575	0.075
Feb 09	6	200	150	7.2	455	153	61	#N/A	2	8	#N/A	#N/A	0.005	0.0036	0.07	0.011	45.75	#N/A	1.5	6	#N/A	#N/A	0.00375	0.0027	0.0525	0.00825
Feb 16	7	200	145	7.1	490	147	45	#N/A	3	14	#N/A	#N/A	0.072	0.079	0.22	0.005	32.625	#N/A	2.175	10.15	#N/A	#N/A	0.0522	0.057275	0.1595	0.003625
Feb 23	8	200	152	6.9	520	155	50	#N/A	3	12	#N/A	#N/A	0.003	0.005	0.197	0.02	38	#N/A	2.28	9.12	#N/A	#N/A	0.00228	0.0038	0.14972	0.0152
Mar 02	9	200	150	6.7	422	112	38	#N/A	2	8	#N/A	#N/A	0.027	0.013	0.21	0.008	28.5	#N/A	1.5	6	#N/A	#N/A	0.02025	0.00975	0.1575	0.006
Mar 09	10	200	150	6.7	240	147	47	#N/A	3	7	#N/A	#N/A	0.006	0.0172	0.13	0.008	35.25	#N/A	2.25	5.25	#N/A	#N/A	0.0045	0.0129	0.0975	0.006
Mar 16	11	200	152	6.9	245	146	51	#N/A	3	10	#N/A	#N/A	0.098	0.0046	0.17	0.017	38.76	#N/A	2.28	7.6	#N/A	#N/A	0.07448	0.003496	0.1292	0.01292
Mar 23	12	200	160	6.9	235	115	40	#N/A	2	7	#N/A	#N/A	0.034	0.033	0.11	0.004	32	#N/A	1.6	5.6	#N/A	#N/A	0.0272	0.0264	0.088	0.0032
Mar 30	13	200	170	6.9	250	145	62	#N/A	2	6	#N/A	#N/A	0.037	0.012	0.05	0.007	52.7	#N/A	1.7	5.1	#N/A	#N/A	0.03145	0.0102	0.0425	0.00595
Apr 06	14	200	154	6.6	240	196	90	#N/A	7	7	#N/A	#N/A	0.45	0.0157	0.13	0.002	69.3	#N/A	5.39	5.39	#N/A	#N/A	0.3465	0.012089	0.1001	0.00154
Apr 13	15	200	164	7.1	240	225	100	#N/A	2	6	#N/A	#N/A	0.005	0.013	0.06	0.001	82	#N/A	1.64	4.92	#N/A	#N/A	0.0041	0.01066	0.0492	0.00082
Apr 20	16	200	160	7.2	200	189	91	#N/A	2	5	#N/A	#N/A	1.8	0.0139	0.15	0.02	72.8	#N/A	1.6	4	#N/A	#N/A	0.0041	0.01112	0.12	0.016
Apr 27	17	200	156	7	200	259	108	#N/A	3	3	#N/A	#N/A	0.6	0.0198	0.1	0.01	84.24	#N/A	2.34	2.34	#N/A	#N/A	0.468	0.015444	0.078	0.0078
May 04	18	200	158	4.1	325	285	124	#N/A	2	6	#N/A	#N/A	1	0.011	0.13	0.018	97.96	#N/A	1.58	4.74	#N/A	#N/A	0.79	0.00869	0.1027	0.01422
May 11	19	200	156	5.5	260	261	126	#N/A	4	3	#N/A	#N/A	0.9	0.0192	0.12	0.059	98.28	#N/A	3.12	2.34	#N/A	#N/A	0.702	0.014976	0.0936	0.04602
May 18	20	200	156	5.3	260	269	136	#N/A	4	1	#N/A	#N/A	1.01	0.0379	0.13	0.033	106.08	#N/A	3.12	0.78	#N/A	#N/A	0.7878	0.029562	0.1014	0.02574
May 25	21	200	156	5.9	305	252	128	#N/A	3	3	#N/A	#N/A	0.35	0.0419	0.15	0.019	99.84	#N/A	2.34	2.34	#N/A	#N/A	0.273	0.032682	0.117	0.01482
Jun 01	22	200	154	5.4	250	225	104	#N/A	6	2	#N/A	#N/A	1.03	0.042	0.11	0.013										
Jun 08	23	200	156	6.1	296	246	121	#N/A	7	1	#N/A	#N/A	0.88	0.027	0.12	0.008										
Jun 15	24	200	160	4.8	240	228	108	#N/A	10	1	#N/A	#N/A	2.5	0.059	0.28	0.049										
Jun 22	25	200	158	6.6	265	220	109	#N/A	9	1	#N/A	#N/A	3.4	0.068	0.15	0.11										
Jun 29	26	200	160	4.9	280	204	101	#N/A	7	1	#N/A	#N/A	2.9	0.028	0.14	0.33										
Jul 06	27	200	162	4.9	270	240	120	#N/A	10	1	#N/A	#N/A	1.1	0.0148	0.12	0.006										
Jul 13	28	200	157	5.4	260	226	102	#N/A	5	1	#N/A	#N/A	1.3	0.0113	0.12	0.018										
Jul 20	29	200	158	6.6	240	192	82	#N/A	2	4	#N/A	#N/A	0.41	0.0151	0.06	0.002										
Jul 27	30	200	152	6.7	255	191	88	#N/A	3	5	#N/A	#N/A	0.17	0.0038	0.025	0.001										
Aug 03	31	200	156	4.9	288	199	85	#N/A	24	1	#N/A	#N/A	0.81	0.035	0.09	0.15										
Aug 10	32	200	160	7.6	210	267	120	#N/A	3	6	#N/A	#N/A	0.21	0.0047	0.032	0.001										
Aug 17	33	200	153	7.8	276	250	121	#N/A	1	8	#N/A	#N/A	0.009	0.0005	0.013	0.001										
Aug 24	34	200	163	6.8	196	219	99	#N/A	2	6	#N/A	#N/A	0.12	0.0031	0.038	0.002										
Aug 31	35	200	160	7.1	270	188	83	#N/A	1	7	#N/A	#N/A	0.005	0.0007	0.016	0.001										
Sep 07	36	200	152	7.4	268	147	65	#N/A	1	6	#N/A	#N/A	0	0.023	0.026	0.002										
Sep 14	37	200	150	7.9	144	64	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Sep 21	38	200	164	7.9	195	82	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Sep 28	39	200	161	7.5	164	79	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Oct 05	40	200	158	7.5	173	74	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.0005	0.016	0.001										
Oct 12	41	200	161	6.8	138	56	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Oct 19	42	200	158	7	136	62	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Oct 26	43	200	156	6.5	148	61	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Nov 02	44	200	156	6	144	63	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.0005	0.011	0.001										
Nov 09	45	200	156	6.5	118	49	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Nov 16	46	200	153	6.7	156	57	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Nov 23	47	200	152	8	204	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Nov 30	48	200	154	7.2	190	55	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.0005	0.0095	0.001										
Dec 07	49	200	154	7.3	172	53	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Dec 14	50	200	154	6.4	175	56	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Dec 21	51	200	154	6.4	210	47	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Dec 27	52	200	145	8	182	45	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0	0.0013	0.06	0.001										
Jan 03	53	200	150	7.9	200	58	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Jan 08	54	200	150	7.8	200	50	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										
Average Stable Loads																	63.38031	#N/A	2.275938	5.104375	#N/A	#N/A	0.314219	0.016359	0.102401	0.011757

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: 10E

Date Jun 13	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond µmhos/cm	Sulphate (mg/l)	Acidity To pH 4.5 CaCO ₃ /L	Total Acidity CaCO ₃ /L	Alkalinity CaCO ₃ /L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Jan 05	1	200	155	7.4	362	254	98	#N/A	12	34	#N/A	#N/A	0.008	0.0028	0.03	0.007	75.95	#N/A	9.3	26.35	#N/A	#N/A	0.0062	0.00217	0.02325	0.005425
Jan 12	2	200	145	7	410	329	159	#N/A	3	14	#N/A	#N/A	0.009	0.0032	0.12	0.13	115.275	#N/A	2.175	10.15	#N/A	#N/A	0.006525	0.00232	0.087	0.09425
Jan 19	3	200	151	7	390	108	88	#N/A	4	14	#N/A	#N/A	0.009	0.0011	0.0032	0.001	66.44	#N/A	3.02	10.57	#N/A	#N/A	0.006795	0.000831	0.002416	0.000755
Jan 26	4	200	158	7	430	99	29	#N/A	5	17	#N/A	#N/A	0.003	0.005	0.002	0.02	22.91	#N/A	3.95	13.43	#N/A	#N/A	0.00237	0.00395	0.00158	0.0158
Feb 02	5	200	156	7.4	420	114	33	#N/A	4	19	#N/A	#N/A	0.02	0.0012	0.0056	0.003	25.74	#N/A	3.12	14.82	#N/A	#N/A	0.0156	0.000936	0.004368	0.00234
Feb 09	6	200	152	7.1	375	84	27	#N/A	2	14	#N/A	#N/A	0.008	0.0007	0.002	0.002	20.52	#N/A	1.52	10.64	#N/A	#N/A	0.00608	0.000532	0.00152	0.00152
Feb 16	7	200	156	7.4	415	90	20	#N/A	2	15	#N/A	#N/A	0.11	0.086	0.012	0.015	15.6	#N/A	1.56	11.7	#N/A	#N/A	0.0858	0.06708	0.00936	0.0117
Feb 23	8	200	156	7.3	445	99	21	#N/A	2	13	#N/A	#N/A	0.003	0.005	0.002	0.02	16.38	#N/A	1.56	10.14	#N/A	#N/A	0.00234	0.0039	0.00156	0.0156
Mar 02	9	200	161	7.1	375	81	19	#N/A	2	13	#N/A	#N/A	0.011	0.0023	0.0093	0.004	15.295	#N/A	1.61	10.465	#N/A	#N/A	0.008855	0.001852	0.007487	0.00322
Mar 09	10	200	158	6.7	235	68	18	#N/A	1	9	#N/A	#N/A	0.009	0.0011	0.0047	0.002	14.22	#N/A	0.79	7.11	#N/A	#N/A	0.00711	0.000869	0.003713	0.00158
Mar 16	11	200	160	6.9	250	112	31	#N/A	2	13	#N/A	#N/A	0.032	0.0009	0.018	0.006	24.8	#N/A	1.6	10.4	#N/A	#N/A	0.0256	0.00072	0.0144	0.0048
Mar 23	12	200	162	7.2	215	63	17	#N/A	2	8	#N/A	#N/A	0.007	0.05	0.0062	0.003	13.77	#N/A	1.62	6.48	#N/A	#N/A	0.00567	0.0405	0.005022	0.00243
Mar 30	13	200	168	7.1	250	81	26	#N/A	1	8	#N/A	#N/A	0.005	0.002	0.0087	0.001	21.84	#N/A	0.84	6.72	#N/A	#N/A	0.0042	0.00168	0.007308	0.00084
Apr 06	14	200	166	7.1	240	73	25	#N/A	2	9	#N/A	#N/A	0.005	0.001	0.0086	0.001	20.75	#N/A	1.66	7.47	#N/A	#N/A	0.00415	0.00083	0.007138	0.00083
Apr 13	15	200	184	7.4	225	95	36	#N/A	1	7	#N/A	#N/A	0.007	0.0175	0.005	0.001	33.12	#N/A	0.92	6.44	#N/A	#N/A	0.00644	0.0161	0.0046	0.00092
Apr 20	16	200	166	7.2	165	78	40	#N/A	1	7	#N/A	#N/A	0.009	0.0027	0.0081	0.001	33.2	#N/A	0.83	5.81	#N/A	#N/A	0.00747	0.002241	0.006723	0.00083
Apr 27	17	200	170	7.6	210	103	37	#N/A	1	4	#N/A	#N/A	0.005	0.002	0.008	0.001	31.45	#N/A	0.85	3.4	#N/A	#N/A	0.00425	0.0017	0.0068	0.00085
May 04	18	200	166	7.5	230	107	45	#N/A	1	4	#N/A	#N/A	0.007	0.016	0.002	0.004	37.35	#N/A	0.83	3.32	#N/A	#N/A	0.00581	0.01328	0.00166	0.00332
May 11	19	200	166	7.4	245	106	44	#N/A	1	4	#N/A	#N/A	0.025	0.0026	0.0152	0.003	36.52	#N/A	0.83	3.32	#N/A	#N/A	0.02075	0.002158	0.012616	0.00249
May 18	20	200	168	7.4	240	150	71	#N/A	2	4	#N/A	#N/A	0.009	0.0052	0.0188	0.001	59.64	#N/A	1.68	3.36	#N/A	#N/A	0.00756	0.004368	0.015792	0.00084
May 25	21	200	162	7.5	250	118	51	#N/A	2	2	#N/A	#N/A	0.028	0.0105	0.0321	0.002	41.31	#N/A	1.62	1.62	#N/A	#N/A	0.02268	0.008505	0.026001	0.00162
Average Stable Loads																	26.91194	#N/A	1.521667	7.591389	#N/A	#N/A	0.013485	0.009511	0.007647	0.003974

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: 10E Innoculated

Date Jun 13	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond µmhos/cm	Sulphate (mg/l)	Acidity To pH 4.5 CaCO ₃ /L	Total Acidity CaCO ₃ /L	Alkalinity CaCO ₃ /L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Jan 05	1	200	154	7.5	365	292	113	#N/A	12	33	#N/A	#N/A	0.01	0.0049	0.03	0.008	87.01	#N/A	9.24	25.41	#N/A	#N/A	0.0077	0.003773	0.0231	0.00616
Jan 12	2	200	178	7.1	410	191	83	#N/A	6	19	#N/A	#N/A	0.01	0.0013	0.05	0.007	73.87	#N/A	5.34	16.91	#N/A	#N/A	0.0089	0.001157	0.0445	0.00623
Jan 19	3	200	152	6.8	395	165	62	#N/A	4	13	#N/A	#N/A	0.027	0.0021	0.0069	0.004	47.12	#N/A	3.04	9.88	#N/A	#N/A	0.02052	0.001596	0.005244	0.00304
Jan 26	4	200	176	7	435	164	64	#N/A	4	16	#N/A	#N/A	0.003	0.005	0.002	0.02	56.32	#N/A	3.52	14.08	#N/A	#N/A	0.00264	0.0044	0.00176	0.0176
Feb 02	5	200	152	7.2	420	152	50	#N/A	4	16	#N/A	#N/A	0.03	0.0016	0.01	0.004	38	#N/A	3.04	12.16	#N/A	#N/A	0.0228	0.001216	0.0076	0.00304
Feb 09	6	200	152	7.1	395	112	38	#N/A	3	13	#N/A	#N/A	0.009	0.0008	0.0028	0.003	28.88	#N/A	2.28	9.88	#N/A	#N/A	0.00684	0.000608	0.002128	0.00228
Feb 16	7	200	156	7.2	420	93	28	#N/A	2	12	#N/A	#N/A	0.18	0.11	0.022	0.014	21.84	#N/A	1.56	9.36	#N/A	#N/A	0.1404	0.0858	0.01716	0.01092
Feb 23	8	200	156	7.2	450	126	32	#N/A	2	11	#N/A	#N/A	0.003	0.005	0.002	0.02	24.96	#N/A	1.56	8.58	#N/A	#N/A	0.00234	0.0039	0.00156	0.0156
Mar 02	9	200	160	7.1	380	90	27	#N/A	1	13	#N/A	#N/A	0.015	0.0023	0.012	0.004	21.6	#N/A	0.8	10.4	#N/A	#N/A	0.012	0.00184	0.0096	0.0032
Mar 09	10	200	154	6.8	245	95	28	#N/A	2	9	#N/A	#N/A	0.029	0.0013	0.0083	0.004	21.56	#N/A	1.54	6.93	#N/A	#N/A	0.02233	0.001001	0.006391	0.00308
Mar 16	11	200	153	6.9	250	96	25	#N/A	2	12	#N/A	#N/A	0.12	0.002	0.046	0.009	19.125	#N/A	1.53	9.18	#N/A	#N/A	0.0918	0.00153	0.03519	0.006885
Mar 23	12	200	160	7	215	94	30	#N/A	2	9	#N/A	#N/A	0.005	0.043	0.0073	0.004	24	#N/A	1.6	7.2	#N/A	#N/A	0.004	0.0344	0.00584	0.0032
Mar 30	13	200	170	7	250	85	22	#N/A	1	8	#N/A	#N/A	0.005	0.0012	0.0029	0.001	18.7	#N/A	0.85	6.8	#N/A	#N/A	0.00425	0.00102	0.002465	0.00085
Apr 06	14	200	160	7.1	240	87	32	#N/A	2	12	#N/A	#N/A	0.005	0.0009	0.0072	0.001	25.6	#N/A	1.6	9.6	#N/A	#N/A	0.004	0.00072	0.00576	0.0008
Apr 13	15	200	166	7.3	225	109	41	#N/A	2	7	#N/A	#N/A	0.005	0.0011	0.0058	0.002	34.03	#N/A	1.66	5.81	#N/A	#N/A	0.00415	0.000913	0.004814	0.00166
Apr 20	16	200	164	7.3	160	107	48	#N/A	2	8	#N/A	#N/A	0.011	0.0005	0.0079	0.001	39.36	#N/A	1.64	6.56	#N/A	#N/A	0.00902	0.00041	0.006478	0.00082
Apr 27	17	200	158	7.4	200	110	39	#N/A	1	6	#N/A	#N/A	0.007	0.0021	0.0082	0.001	30.81	#N/A	0.79	4.74	#N/A	#N/A	0.00553	0.001659	0.006478	0.00079
May 04	18	200	158	7.4	225	116	49	#N/A	1	5	#N/A	#N/A	0.005	0.0117	0.001	0.0016	38.71	#N/A	0.79	3.95	#N/A	#N/A	0.00395	0.009243	0.00079	0.001264
May 11	19	200	160	7.5	250	106	44	#N/A	1	3	#N/A	#N/A	0.06	0.0031	0.0188	0.002	35.2	#N/A	0.8	2.4	#N/A	#N/A	0.048	0.00248	0.01504	0.0016
May 18	20	200	156	7.3	235	158	69	#N/A	2	4	#N/A	#N/A	0.011	0.0036	0.031	0.002	53.82	#N/A	1.56	3.12	#N/A	#N/A	0.00858	0.002808	0.02418	0.00156
May 25	21	200	160	7.5	250	134	61	#N/A	2	3	#N/A	#N/A	0.029	0.0053	0.0302	0.002	48.8	#N/A	1.6	2.4	#N/A	#N/A	0.0232	0.00424	0.02416	0.0016
Average Stable Loads																	32.29528	#N/A	1.595556	7.397222	#N/A	#N/A	0.023102	0.008788	0.009855	0.004264

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: 2A COMPOSITE

Date Jun 13	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond µmhos/cm	Sulphate (mg/l)	Acidity To pH 4.5 CaCO ₃ /L	Total Acidity CaCO ₃ /L	Alkalinity CaCO ₃ /L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Feb 12	1	200	144	4	240	675	377	5	367	0	5.9	25	130	0.054	12	1.5	271.44	3.6	264.24	0	4.248	18	93.6	0.03888	8.64	1.08
Feb 19	2	200	148	4	345	675	505	18	280	0	7.9	66	110	0.11	15	1.9	373.7	13.32	207.2	0	5.846	48.84	81.4	0.0814	11.1	1.406
Feb 26	3	200	142	3.8	360	468	240	8	152	0	3.9	45	44	0.055	8.9	2.5	170.4	5.68	107.92	0	2.769	31.95	31.24	0.03905	6.319	1.775
Mar 05	4	200	145	3.6	380	542	267	18	150	0	5.6	38	59	0.13	16	2.1	193.575	13.05	108.75	0	4.06	27.55	42.775	0.09425	11.6	1.5225
Mar 12	5	200	148	3.6	405	548	270	19	148	0	6.2	31	52	0.096	19	1.9	199.8	14.06	109.52	0	4.588	22.94	38.48	0.07104	14.06	1.406
Mar 19	6	200	138	3.7	362	512	250	13	155	0	6.8	26	52	0.11	24	2.4	172.5	8.97	106.95	0	4.692	17.94	35.88	0.0759	16.56	1.656
Mar 26	7	200	142	3.5	320	432	185	15	120	0	5.3	17	40	0.069	18	2.8	131.35	10.65	85.2	0	3.763	12.07	28.4	0.04899	12.78	1.988
Apr 02	8	200	140	3.5	360	440	186	23	113	0	5.1	11	42	0.11	13	2.6	130.2	16.1	79.1	0	3.57	7.7	29.4	0.077	9.1	1.82
Apr 09	9	200	140	3.3	380	497	222	25	149	0	6	9.9	62	0.16	17	2.5	155.4	17.5	104.3	0	4.2	6.93	43.4	0.112	11.9	1.75
Apr 16	10	200	138	3.6	370	480	236	19	160	0	6.6	7.4	66	0.13	16	3	162.84	13.11	110.4	0	4.554	5.106	45.54	0.0897	11.04	2.07
Apr 23	11	200	146	3.5	370	385	158	19	125	0	4.5	4.9	50	0.14	9.6	2.7	115.34	13.87	91.25	0	3.285	3.577	36.5	0.1022	7.008	1.971
Apr 30	12	200	138	3.9	350	308	123	9	127	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	84.87	6.21	87.63	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 07	13	200	146	3.6	360	389	164	13	169	0	0.24	0.79	-0.02	-0.0041	9.3	7	119.72	9.49	123.37	0	0.1752	0.5767	-0.0146	-0.00299	6.789	5.11
May 14	14	200	148	3.6	330	314	115	12	142	0	#N/A	#N/A	#N/A	-0.0041	#N/A	#N/A	85.1	8.88	105.08	0	#N/A	#N/A	#N/A	-0.00303	#N/A	#N/A
May 21	15	200	148	3.5	360	303	109	14	120	0	0.13	0.39	0.025	-0.0041	5.8	6.6	80.66	10.36	88.8	0	0.0962	0.2886	0.0185	-0.00303	4.292	4.884
May 28	16	200	150	3.6	320	290	89	11	98	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	66.75	8.25	73.5	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 04	17	200	146	3.7	318	350	103	10	110	0	0.12	0.25	-0.02	-0.0041	6	6.7	75.19	7.3	80.3	0	0.0876	0.1825	-0.0146	-0.00299	4.38	4.891
Jun 11	18	200	150	3.4	350	282	100	12	103	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	75	9	77.25	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 18	19	200	143	3.5	360	310	107	11	117	0	4.4	3.6	48	0.068	1.4	3.3	76.505	7.865	83.655	0	3.146	2.574	34.32	0.04862	1.001	2.3595
Jun 25	20	200	147	3.7	370	280	102	9	104	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	74.97	6.615	76.44	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jul 02	21	200	143	3.9	350	290	95	6	107	0	4.2	3.8	44	0.11	1	2.8	67.925	4.29	76.505	0	3.003	2.717	31.46	0.07865	0.715	2.002

Average Stable Loads

110.2424 10.14824 91.72059 0 2.60425 5.558788 24.32116 0.050454 7.300125 3.197125

Curragh Waste Rock — Humidity Cells (60640)

SAMPLE: 2B

Date Jun 13	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond µmhos/cm	Sulphate (mg/l)	Acidity To pH 4.5 CaCO3/L	Total Acidity CaCO3/L	Alkalinity CaCO3/L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Feb 12	1	200	146	3.7	300	1220	730	6	786	0	13	26	320	0.48	3.3	1	532.9	4.38	573.78	0	9.49	18.98	233.6	0.3504	2.409	0.73
Feb 19	2	200	140	3.7	390	1220	935	76	556	0	22	60	330	1.1	5.2	1.3	654.5	53.2	389.2	0	15.4	42	231	0.77	3.64	0.91
Feb 26	3	200	138	3.2	395	790	384	45	330	0	11	31	120	0.81	2	1.5	264.96	31.05	227.7	0	7.59	21.39	82.8	0.5589	1.38	1.035
Mar 05	4	200	142	3.2	450	1030	464	62	313	0	17	33	170	0.85	2.8	0.97	329.44	44.02	222.23	0	12.07	23.43	120.7	0.6035	1.988	0.6887
Mar 12	5	200	146	3.2	460	780	353	60	230	0	12	16	110	0.54	1.6	1	257.69	43.8	167.9	0	8.76	11.68	80.3	0.3942	1.168	0.73
Mar 19	6	200	150	3.4	405	570	267	33	163	0	9.8	12	81	0.24	1	1	200.25	24.75	122.25	0	7.35	9	60.75	0.18	0.75	0.75
Mar 26	7	200	146	3.3	365	442	186	23	115	0	7.6	7.4	53	0.13	0.53	1.3	135.78	16.79	83.95	0	5.548	5.402	38.69	0.0949	0.3869	0.949
Apr 02	8	200	142	3.3	392	470	166	37	93	0	6.9	4.6	48	0.24	0.31	1.3	117.86	26.27	66.03	0	4.899	3.266	34.08	0.1704	0.2201	0.923
Apr 09	9	200	172	3.9	320	370	173	4	65	0	20	13	29	0.0095	0.14	0.46	148.78	3.44	55.9	0	17.2	11.18	24.94	0.00817	0.1204	0.3956
Apr 16	10	200	190	4.4	285	435	231	2	43	0	32	18	16	-0.0025	0.04	0.49	219.45	1.9	40.85	0	30.4	17.1	15.2	-0.00238	0.038	0.4655
Apr 23	11	200	148	4.3	280	365	176	2	20	0	29	15	4	0.0088	0.012	0.46	130.24	1.48	14.8	0	21.46	11.1	2.96	0.006512	0.00888	0.3404
Apr 30	12	200	144	4.1	330	375	185	4	32	0	#N/A	#N/A	#N/A	#N/A	#N/A	0.46	133.2	2.88	23.04	0	#N/A	#N/A	#N/A	#N/A	#N/A	0.3312
May 07	13	200	150	3.7	330	350	143	11	61	0	16	9	20	0.014	0.034	3	107.25	8.25	45.75	0	12	6.75	15	0.0105	0.0255	2.25
May 14	14	200	146	3.6	330	322	121	13	75	0	#N/A	#N/A	#N/A	#N/A	#N/A	3	88.33	9.49	54.75	0	#N/A	#N/A	#N/A	#N/A	#N/A	2.19
May 21	15	200	152	3.4	380	310	108	16	83	0	5.8	3	24	-0.0041	0.041	2.1	82.08	12.16	63.08	0	4.408	2.28	18.24	-0.00312	0.03116	1.596
May 28	16	200	156	3.6	360	330	101	14	88	0	#N/A	#N/A	#N/A	#N/A	#N/A	2.1	78.78	10.92	68.64	0	#N/A	#N/A	#N/A	#N/A	#N/A	1.638
Jun 04	17	200	152	3.6	380	320	102	16	85	0	5.4	2.3	27	-0.0041	0.025	2.5	77.52	12.16	64.6	0	4.104	1.748	20.52	-0.00312	0.019	1.9
Jun 11	18	200	152	3.3	370	310	103	16	87	0	#N/A	#N/A	#N/A	#N/A	#N/A	2.5	78.28	12.16	66.12	0	#N/A	#N/A	#N/A	#N/A	#N/A	1.9
Jun 18	19	200	148	3.5	380	335	115	16	91	0	8	3.5	44	0.045	-0.0065	2.3	85.1	11.84	67.34	0	5.92	2.59	32.56	0.0333	-0.00481	1.702
Jun 25	20	200	153	3.6	400	310	113	14	91	0	#N/A	#N/A	#N/A	#N/A	#N/A	2.3	86.445	10.71	69.615	0	#N/A	#N/A	#N/A	#N/A	#N/A	1.7595
Jul 02	21	200	153	4	390	305	103	10	88	0	7.1	3.2	39	0.066	-0.0065	1.8	78.795	7.65	67.32	0	5.4315	2.448	29.835	0.05049	-0.00497	1.377
Jul 19	22	200	148	3.7	435	250		10	63		#N/A	#N/A	#N/A	#N/A	#N/A	1.8										

Average S 13.29412

123.8724 12.74412 67.17265 0 9.373176 5.903529 28.77824 0.061932 0.168421 1.246894

Curragh Waste Rock — Humidity Coils (60640)

SAMPLE: 2CE

Date	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond (µmhos/cm)	Sulphate (mg/l)	Acidity To pH 4.5 CaCO ₃ /L	Total Acidity CaCO ₃ /L	Alkalinity CaCO ₃ /L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Feb 26	1	200	156	4.6	230	500	274	0	69	1	31	27	7.6	0.057	20	1.5	213.72	0	53.82	0.78	24.18	21.06	5.928	0.04446	15.6	1.17
Mar 05	2	200	160	4.9	340	432	229	0	25	4	26	30	0.13	0.047	7.9	2.3	183.2	0	20	3.2	20.8	24	0.104	0.0376	6.32	1.84
Mar 12	3	200	156	4.7	370	248	117	0	18	2	11	14	0.31	0.031	3.8	3.9	91.26	0	14.04	1.56	8.58	10.92	0.2418	0.02418	2.964	3.042
Mar 19	4	200	154	4.6	345	205	88	0	15	1	7.8	12	0.52	0.012	3.4	4.4	67.76	0	11.55	0.77	6.006	9.24	0.4004	0.00924	2.618	3.388
Mar 26	5	200	154	4.2	325	160	49	1	19	0	4.3	8.9	0.46	0.0087	2.3	4.8	37.73	0.77	14.63	0	3.311	6.853	0.3542	0.006699	1.771	3.696
Apr 02	6	200	159	4.2	345	138	40	1	12	0	3.5	5.3	0.54	0.085	1.7	5.8	31.8	0.795	9.54	0	2.7825	4.2135	0.4293	0.067575	1.3515	4.611
Apr 09	7	200	156	4.1	375	152	46	2	13	0	4.3	7.3	1	0.026	1.8	5.3	35.88	1.56	10.14	0	3.354	5.694	0.78	0.02028	1.404	4.134
Apr 16	8	200	157	4.1	350	140	44	2	15	0	3.3	5.2	1.6	0.018	1.8	5.9	34.54	1.57	11.775	0	2.5905	4.082	1.256	0.01413	1.413	4.6315
Apr 23	9	200	162	4.1	350	120	32	2	13	0	2.6	3.5	1.5	0.023	1.2	5.6	25.92	1.62	10.53	0	2.106	2.835	1.215	0.01863	0.972	4.536
Apr 30	10	200	156	4.1	370	100	22	2	14	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	17.16	1.56	10.92	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 07	11	200	160	4.2	350	128	36	1	15	0	3.3	3.3	1.4	0.0047	0.84	5	28.8	0.8	12	0	2.64	2.64	1.12	0.00376	0.672	4
May 14	12	200	158	4.1	320	115	29	3	14	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	22.91	2.37	11.06	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 21	13	200	154	4	330	118	14	2	14	0	2.3	1.7	1.4	-0.0041	0.38	5	10.78	1.54	10.78	0	1.771	1.309	1.078	-0.00316	0.2926	3.85
May 28	14	200	160	4	330	120	25	3	14	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	20	2.4	11.2	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 04	15	200	162	4	360	110	22	2	14	0	2.2	1.1	1	-0.0041	0.21	4.6	17.82	1.62	11.34	0	1.782	0.891	0.81	-0.00332	0.1701	3.726
Jun 11	16	200	160	3.8	350	105	24	2	9	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	19.2	1.6	7.2	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 18	17	200	159	4.1	360	115	26	2	12	0	3.4	1.6	1.8	0.031	0.21	5.7	20.67	1.59	9.54	0	2.703	1.272	1.431	0.024645	0.16695	4.5315
Jun 25	18	200	162	4.1	360	108	26	2	10	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	21.06	1.62	8.1	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jul 02	19	200	164	4.4	350	100	25	1	9	0	3.1	1.3	1.2	0.045	0.083	4.1	20.5	0.82	7.38	0	2.542	1.066	0.984	0.0369	0.06806	3.362
Jul 09	20	200	160	4.5	360	97	0	8			0	0	0	0	0	0	0	0	6.4	0	0	0	0	0	0	0

Average Stable Loads

30.81118 1.307941 10.68971 0.137059 3.035647 3.423147 0.9131 0.016376 0.896054 3.939853

Curragh Waste Rock — Humidity Cells (60640)
SAMPLE: 2C0

Date	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond (µmhos/cm)	Sulphate (mg/l)	Acidity To pH 4.5 CaCO ₃ /L	Total Acidity CaCO ₃ /L	Alkalinity CaCO ₃ /L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Feb 26	1	200	150	6.5	200	242	107	0	32	2	4	26	2.3	0.0023	8.4	0.6	80.25	0	24	1.5	3	19.5	1.725	0.001725	6.3	0.45
Mar 05	2	200	154	5.2	310	258	110	0	26	1	4.1	24	-0.023	0.0029	7.8	4.5	84.7	0	20.02	0.77	3.157	18.48	0.01771	0.002233	6.006	3.465
Mar 12	3	200	150	4.6	345	198	77	0	36	1	2.3	15	0.58	-0.003	13	7.2	57.75	0	27	0.75	1.725	11.25	0.435	0.00225	9.75	5.4
Mar 19	4	200	152	5.1	330	165	60	0	39	1	1.4	10	-0.014	-0.003	15	7.7	45.6	0	29.64	0.76	1.064	7.6	0.01064	0.00228	11.4	5.852
Mar 26	5	200	154	5.1	305	132	36	0	33	0	0.79	5.8	-0.014	-0.003	13	7.7	27.72	0	25.41	0	0.6083	4.466	0.01078	0.00231	10.01	5.929
Apr 02	6	200	154	4.8	320	118	29	0	32	0	0.52	3.1	0.099	-0.003	12	11	22.33	0	24.64	0	0.4004	2.387	0.07623	0.00231	9.24	8.47
Apr 09	7	200	158	4.9	345	110	28	0	34	0	0.45	2	0.18	0.0078	14	9.3	22.12	0	26.86	0	0.3555	1.58	0.1422	0.006162	11.06	7.347
Apr 16	8	200	162	4.9	340	98	24	0	28	2	0.35	1.7	0.12	-0.0025	12	9.2	19.44	0	22.68	1.62	0.2835	1.377	0.0972	0.002025	9.72	7.452
Apr 23	9	200	157	5	320	86	18	0	23	1	0.27	1.2	0.069	-0.0025	11	7.3	14.13	0	18.055	0.785	0.21195	0.942	0.054165	0.001963	8.635	5.7305
Apr 30	10	200	154	4.9	360	84	18	0	32	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	13.86	0	24.64	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 07	11	200	158	5.1	350	88	19	0	26	0	0.24	0.79	-0.02	-0.0041	9.3	7	15.01	0	20.54	0	0.1896	0.6241	0.0158	0.003239	7.347	5.53
May 14	12	200	160	5.1	290	78	15	0	22	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	12	0	17.6	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 21	13	200	152	5.1	320	70	14	0	20	0	0.13	0.39	0.025	-0.0041	5.8	6.6	10.64	0	15.2	0	0.0988	0.2964	0.019	0.003116	4.408	5.016
May 28	14	200	164	5.1	320	75	14	0	19	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	11.48	0	15.58	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 04	15	200	150	5.1	350	74	14	0	19	1	0.12	0.25	-0.02	-0.0041	6	6.7	10.5	0	14.25	0.75	0.09	0.1875	0.015	0.003075	4.5	5.025
Jun 11	16	200	154	4.8	340	76	15	0	20	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	11.55	0	15.4	1.54	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 18	17	200	155	4.9	360	80	16	0	21	0	0.22	0.59	-0.017	-0.0018	8.2	8.2	12.4	0	16.275	0	0.1705	0.45725	0.013175	0.001395	6.355	6.355
Jun 25	18	200	158	4.9	380	74	14	0	19	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	11.06	0	15.01	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jul 02	19	200	158	4.7	400	78	17	0	18	0	0.19	0.47	0.067	0.023	7	8.2	13.43	0	14.22	0	0.1501	0.3713	0.05293	0.01817	5.53	6.478
Jul 09	20	200	152	5	400	139	0	0	26		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0	0	19.76	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Average Stable Loads																	19.47176	0	20.17647	0.344722	0.355685	1.969124	0.062237	0.004546	7.417353	6.058147

Curragh Waste Rock — Humidity Cells (60640)
 SAMPLE: COMPOSITE 2C0 AND 2E0

Date	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond (µmhos/cm)	Sulphate (mg/l)	Acidity To pH 4.5 CaCO3/L	Total Acidity CaCO3/L	Alkalinity CaCO3/L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Feb 26	1	200	160	4.3	245	350	164	1	143	0	8	12	42	0.015	20	5.5	131.2	0.8	114.4	0	6.4	9.6	33.6	0.012	16	4.4
Mar 05	2	200	166	5.4	300	288	123	0	49	0	9	16	0.59	0.019	20	5.1	102.09	0	40.67	0	7.47	13.28	0.4897	0.01577	16.6	4.233
Mar 12	3	200	165	4.3	340	225	86	1	54	0	6.2	8.6	1.9	0.038	20	7.5	70.95	0.825	44.55	0	5.115	7.095	1.5675	0.03135	16.5	6.1875
Mar 19	4	200	38	4.7	315	202	80	0	50	1	4.3	5.6	3	0.051	20	8.1	15.2	0	9.5	0.19	0.817	1.064	0.57	0.00969	3.8	1.539
Mar 26	5	200	158	4	315	194	64	3	57	0	3.3	3.8	3.8	0.1	17	9	50.56	2.37	45.03	0	2.607	3.002	3.002	0.079	13.43	7.11
Apr 02	6	200	157	3.9	345	200	61	4	53	0	3.5	2.9	4.2	0.085	16	9.5	47.885	3.14	41.605	0	2.7475	2.2765	3.297	0.066725	12.56	7.4575
Apr 09	7	200	152	4	350	198	69	2	58	0	4.2	4.6	3.1	0.049	19	8.9	52.44	1.52	44.08	0	3.192	3.496	2.356	0.03724	14.44	6.764
Apr 16	8	200	162	4.1	345	162	46	3	44	0	2.9	2.8	3	0.036	13	12	37.26	2.43	35.64	0	2.349	2.268	2.43	0.02916	10.53	9.72
Apr 23	9	200	164	4	340	140	41	3	31	0	2.2	1.9	2.6	0.034	8.5	13	33.62	2.46	25.42	0	1.804	1.558	2.132	0.02788	6.97	10.66
Apr 30	10	200	158	3.9	380	148	45	4	35	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	35.55	3.16	27.65	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 07	11	200	162	4	350	190	69	3	46	0	4.1	2.8	5.9	0.04	9.3	9.5	55.89	2.43	37.26	0	3.321	2.268	4.779	0.0324	7.533	7.695
May 14	12	200	163	3.9	310	155	44	4	36	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	35.86	3.26	29.34	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 21	13	200	151	3.9	340	172	54	5	36	0	2.9	1.7	4.9	0.047	4.1	8.7	40.77	3.775	27.18	0	2.1895	1.2835	3.6995	0.035485	3.0955	6.5685
May 28	14	200	164	3.9	330	180	46	5	35	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	37.72	4.1	28.7	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 04	15	200	160	3.8	360	196	60	6	37	0	3.7	2	6	0.14	4.2	9.4	48	4.8	29.6	0	2.96	1.6	4.8	0.112	3.36	7.52
Jun 11	16	200	162	3.6	350	220	76	7	39	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	61.56	5.67	31.59	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 18	17	200	164	3.6	370	230	74	8	42	0	5.6	3.3	9.7	0.16	5	8	60.68	6.56	34.44	0	4.592	2.706	7.954	0.1312	4.1	6.56
Jun 25	18	200	166	3.7	380	216	71	8	39	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	58.93	6.64	32.37	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jul 02	19	200	165	4	350	210	73	6	35	0	6	3.3	8.2	0.13	5.1	7.9	60.225	4.95	28.875	0	4.95	2.7225	6.765	0.10725	4.2075	6.5175
Jul 09	20	200	164	3.9	380	194	5	39	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		4.1	31.98	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Average Stable Loads																	47.24118	3.455	32.51941	0.010556	3.215088	2.465853	4.197029	0.065748	7.224824	7.009412

Curragh Waste Rock — Humidity Cells (60640)

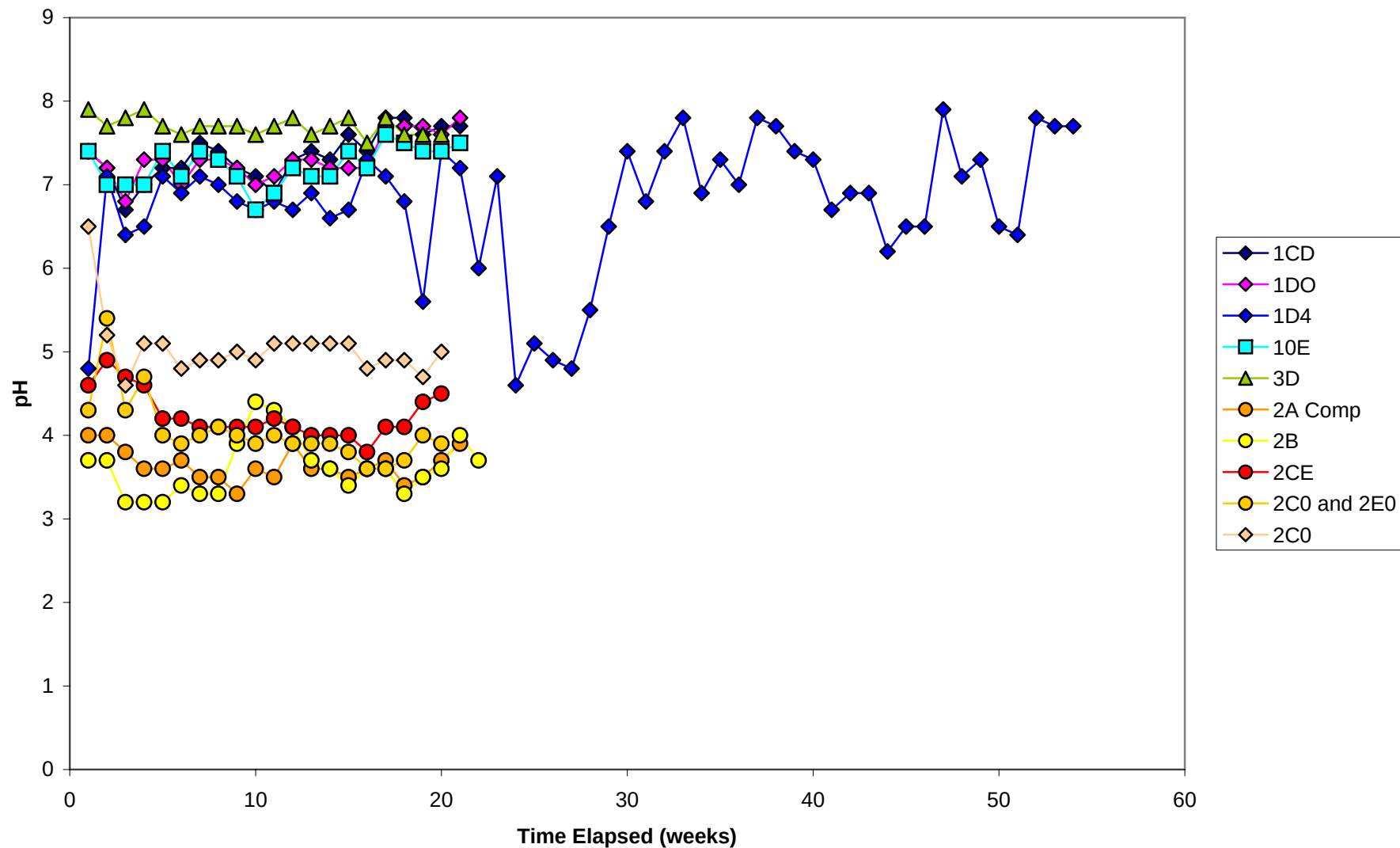
SAMPLE: COMPOSITE 3D

Date	Week	Input (mL)	Output (mL)	pH	Eh (mV)	Cond (µmhos/cm)	Sulphate (mg/l)	Acidity To pH 4.5 CaCO ₃ /L	Total Acidity CaCO ₃ /L	Alkalinity CaCO ₃ /L	Magnesium mg/L	Calcium mg/L	Iron mg/L	Copper mg/L	Zinc mg/L	Lead mg/L	Sulphate mg/kg/wk	Acidity To pH 4.5 mg/kg/wk	Total Acidity mg/kg/wk	Alkalinity mg/kg/wk	Magnesium mg/kg/wk	Calcium mg/kg/wk	Iron mg/kg/wk	Copper mg/kg/wk	Zinc mg/kg/wk	Lead mg/kg/wk
Feb 26	1	200	128	7.9	320	236	66	0	1	38	6.8	21	-0.023	0.0023	0.11	0.033	42.24	0	0.64	24.32	4.352	13.44	0.01472	0.001472	0.0704	0.02112
Mar 05	2	200	135	7.7	355	222	66	0	3	34	6.4	19	-0.023	0.0034	0.071	0.052	44.55	0	2.025	22.95	4.32	12.825	0.015525	0.002295	0.047925	0.0351
Mar 12	3	200	136	7.8	360	160	36	0	2	35	4.8	13	-0.014	0.0057	0.63	0.076	24.48	0	1.36	23.8	3.264	8.84	0.00952	0.003876	0.4284	0.05168
Mar 19	4	200	132	7.9	315	138	22	0	2	35	3.8	11	-0.014	-0.003	0.036	0.034	14.52	0	1.32	23.1	2.508	7.26	0.00924	0.00198	0.02376	0.02244
Mar 26	5	200	136	7.7	250	120	12	0	4	32	3	8.1	-0.014	-0.003	0.045	0.033	8.16	0	2.72	21.76	2.04	5.508	0.00952	0.00204	0.0306	0.02244
Apr 02	6	200	138	7.6	220	110	6	0	2	31	2.8	7.6	-0.014	-0.003	0.03	0.034	4.14	0	1.38	21.39	1.932	5.244	0.00966	0.00207	0.0207	0.02346
Apr 09	7	200	136	7.7	325	110	6	0	3	35	2.9	8.5	-0.012	-0.0025	0.025	0.029	4.08	0	2.04	23.8	1.972	5.78	0.00816	0.0017	0.017	0.01972
Apr 16	8	200	139	7.7	330	106	5	0	2	34	2.8	8.3	-0.012	-0.0025	0.023	0.045	3.475	0	1.39	23.63	1.946	5.7685	0.00834	0.001738	0.015985	0.031275
Apr 23	9	200	138	7.7	350	96	3	0	1	31	2.3	6.7	0.016	-0.0025	0.0094	0.052	2.07	0	0.69	21.39	1.587	4.623	0.01104	0.001725	0.006486	0.03588
Apr 30	10	200	137	7.6	360	90	3	0	3	26	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.055	0	2.055	17.81	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 07	11	200	144	7.7	360	95	5	0	2	29	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.6	0	1.44	20.88	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 14	12	200	140	7.8	260	95	5	0	2	31	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.5	0	1.4	21.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
May 21	13	200	146	7.6	280	88	3	0	4	26	1.8	6	0.093	-0.0041	0.054	0.034	2.19	0	2.92	18.98	1.314	4.38	0.06789	0.002993	0.03942	0.02482
May 28	14	200	144	7.7	260	120	4	0	3	44	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.88	0	2.16	31.68	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 04	15	200	142	7.8	270	96	3	0	3	27	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.13	0	2.13	19.17	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 11	16	200	142	7.5	320	90	3	0	3	25	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.13	0	2.13	17.75	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jun 18	17	200	142	7.8	360	92	3	0	3	28	2.2	7.1	-0.017	-0.0018	-0.0065	0.039	2.13	0	2.13	19.88	1.562	5.041	0.01207	0.001278	0.004615	0.02769
Jun 25	18	200	144	7.6	350	88		0	2	25	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0	0	1.44	18	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jul 02	19	200	140	7.6	300	88	3	0	2	25	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.1	0	1.4	17.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Jul 09	20	200	140	7.6	310	78		0	4		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		0	2.8	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

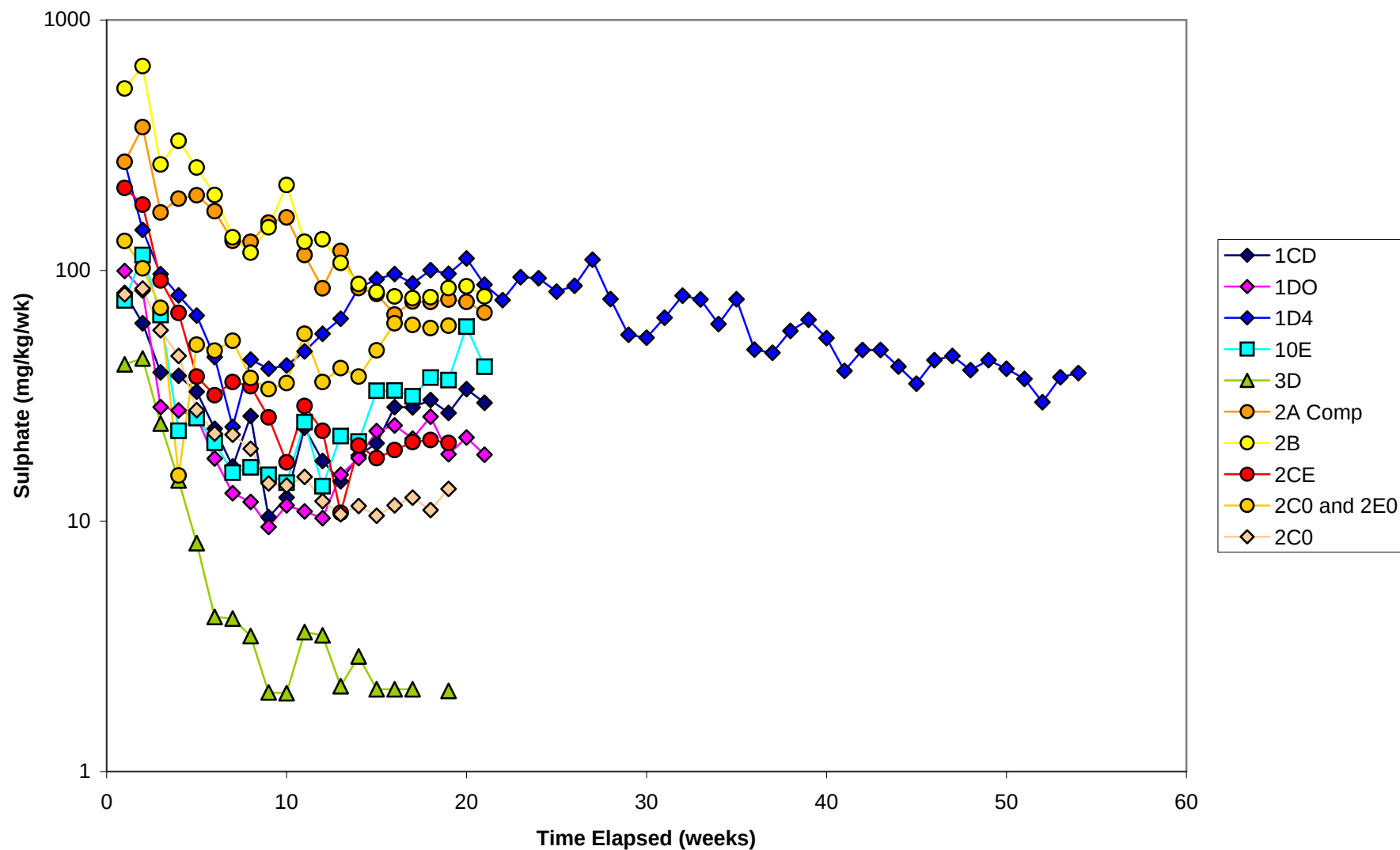
Average Stable Loads

4.92 0 1.770882 20.12333 1.573706 4.7475 0.022666 0.001895 0.042298 0.024526

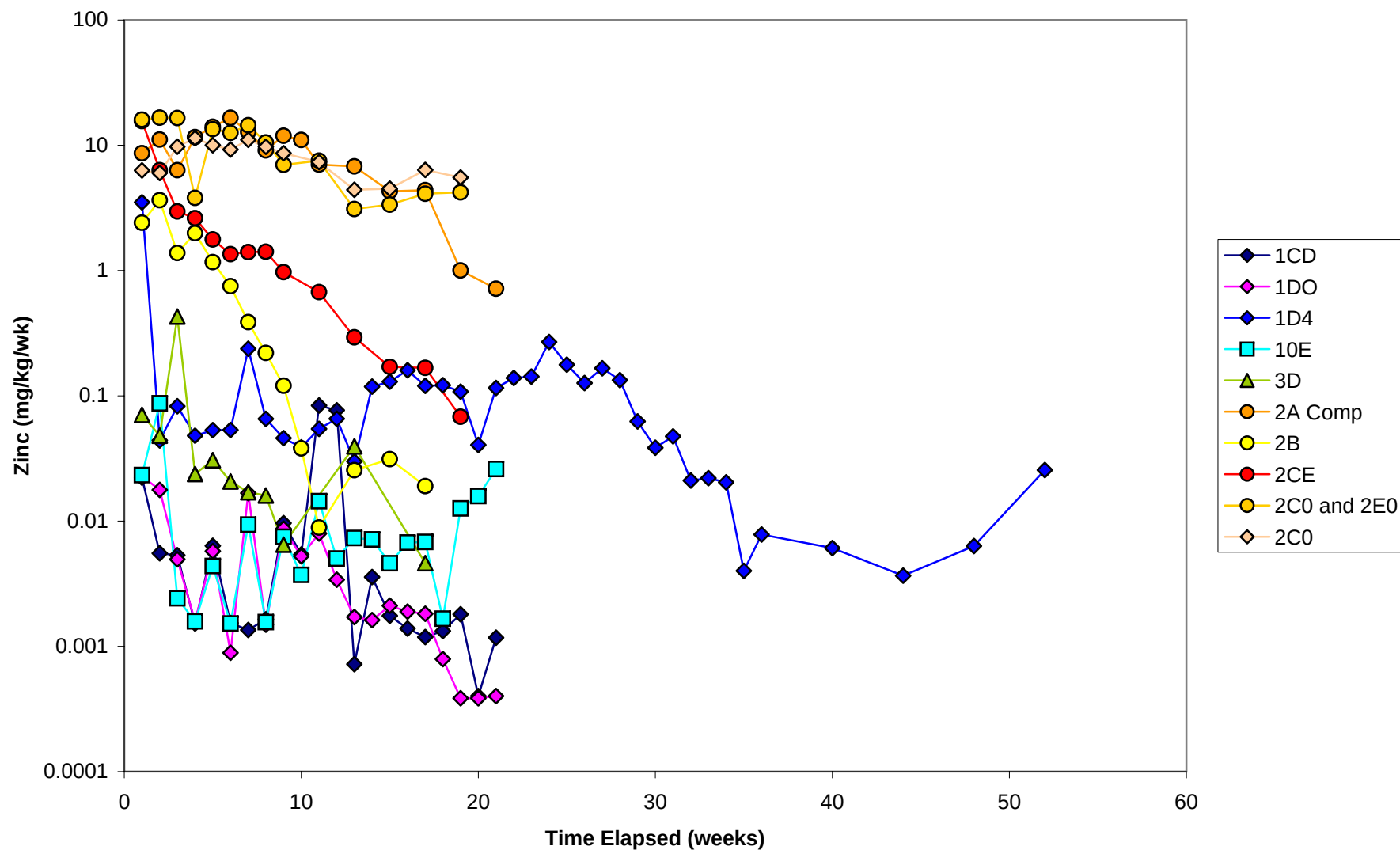
Schedule D Humidity Cells



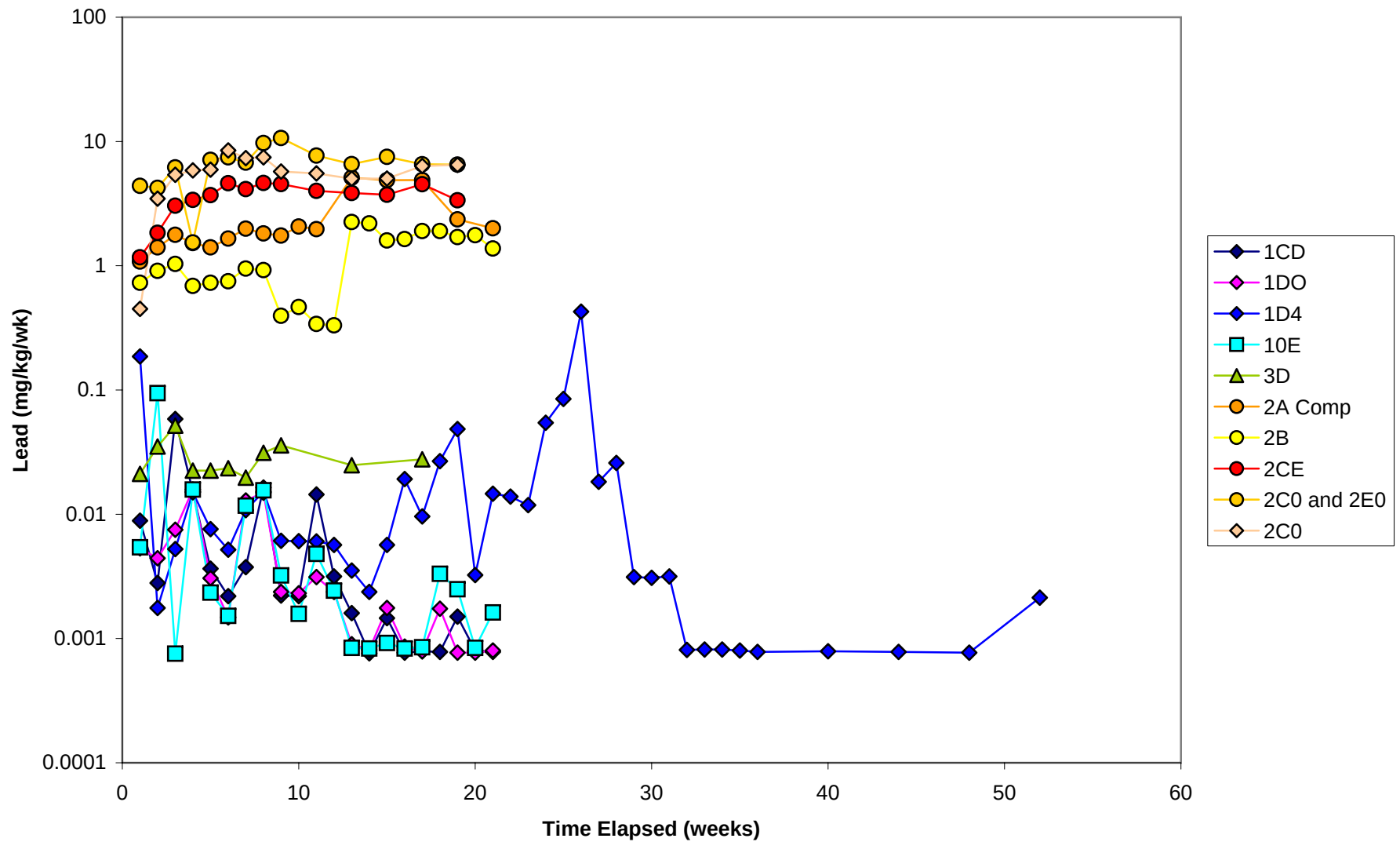
Schedule D Humidity Cells



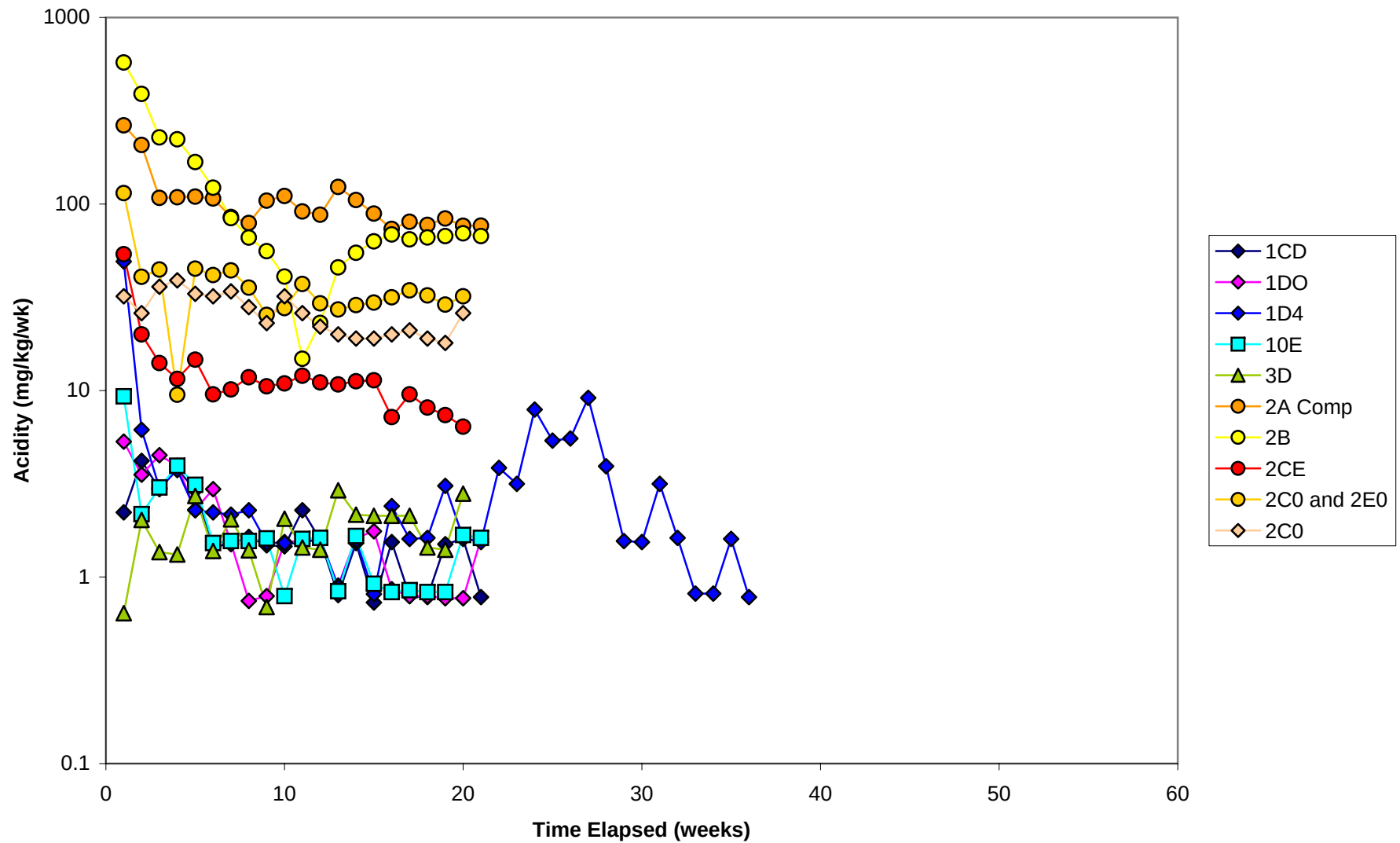
Schedule D Humidity Cells



Schedule D Humidity Cells



Schist, Calc-Silicate and Intrusive



Appendix D.4

IEE Humidity Cell Data and Charts

TABLE A-8
ROBINSON SRK CURRAGH
HUMIDITY CELL TEST

SULPHIDE COMPOSITE

[illegible]

TABLE A-10
ROBINSON SRK CURRAGH
HUMIDITY CELL TEST

SULPHIDE COMPOSITE II (Inoculated)

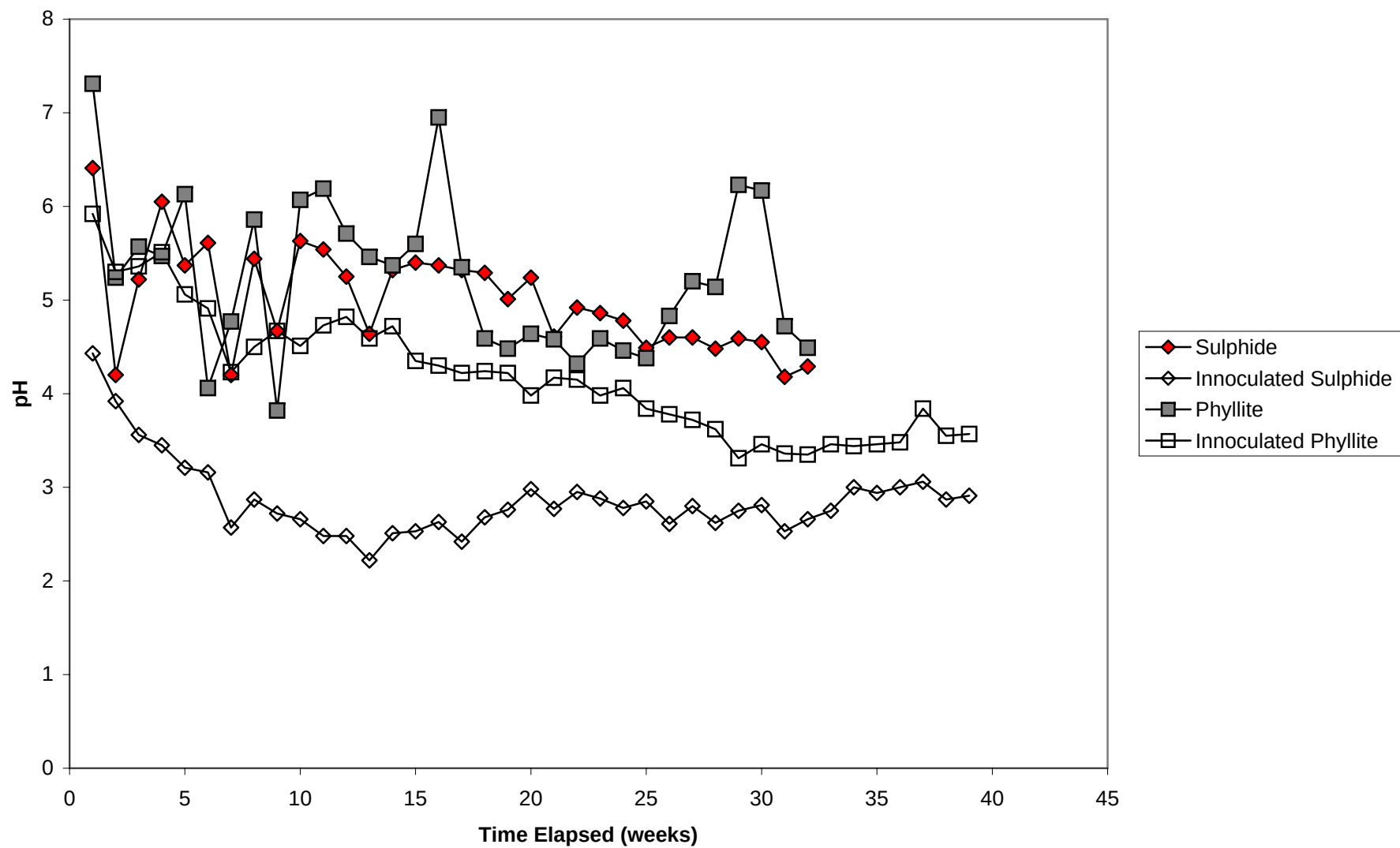
[illegible]

TABLE A-14
ROBINSON SRK - CURRAGH
HUMIDITY CELL TEST

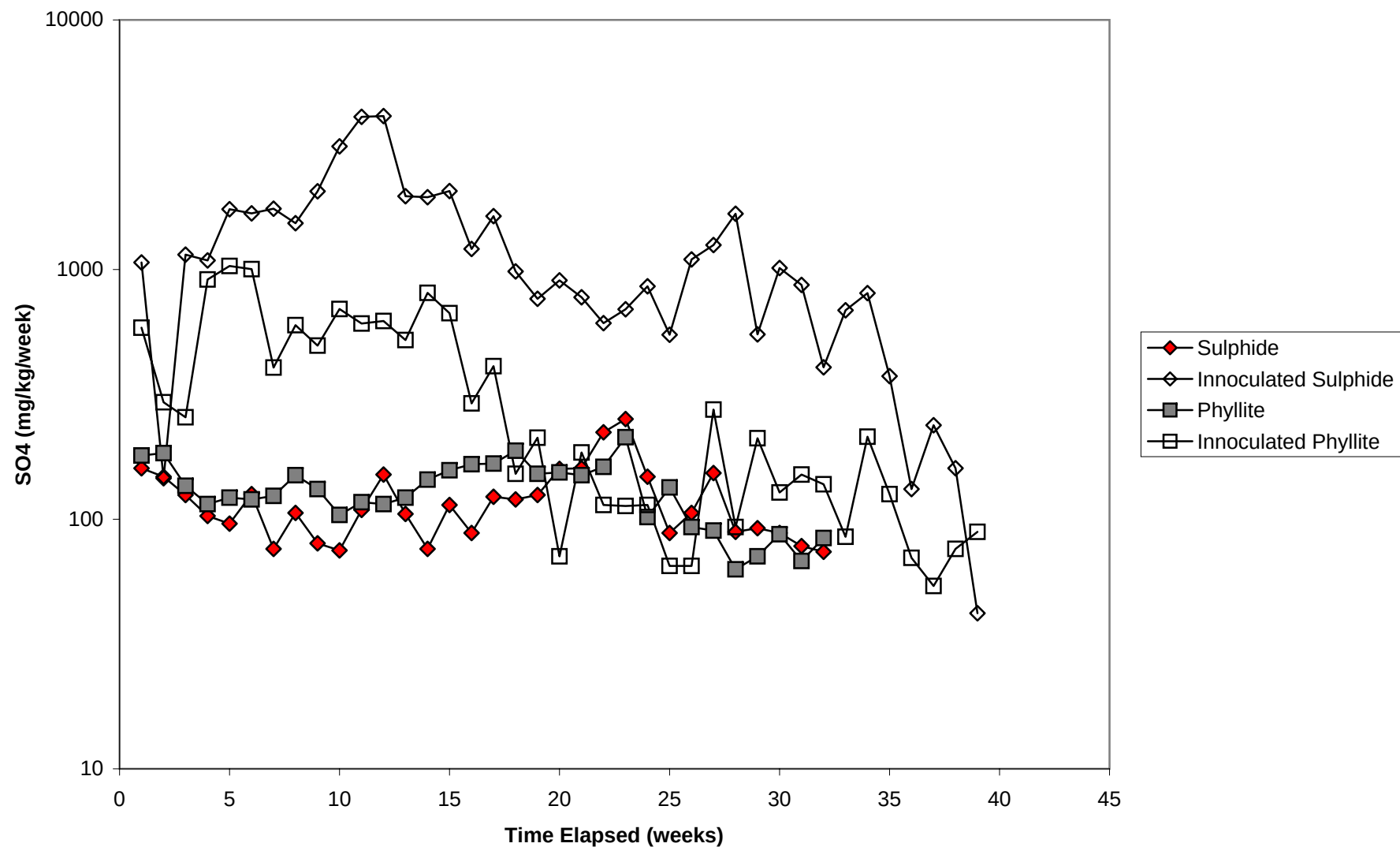
PHYLLITE COMPOSITE II (InocuLated)

[illegible]

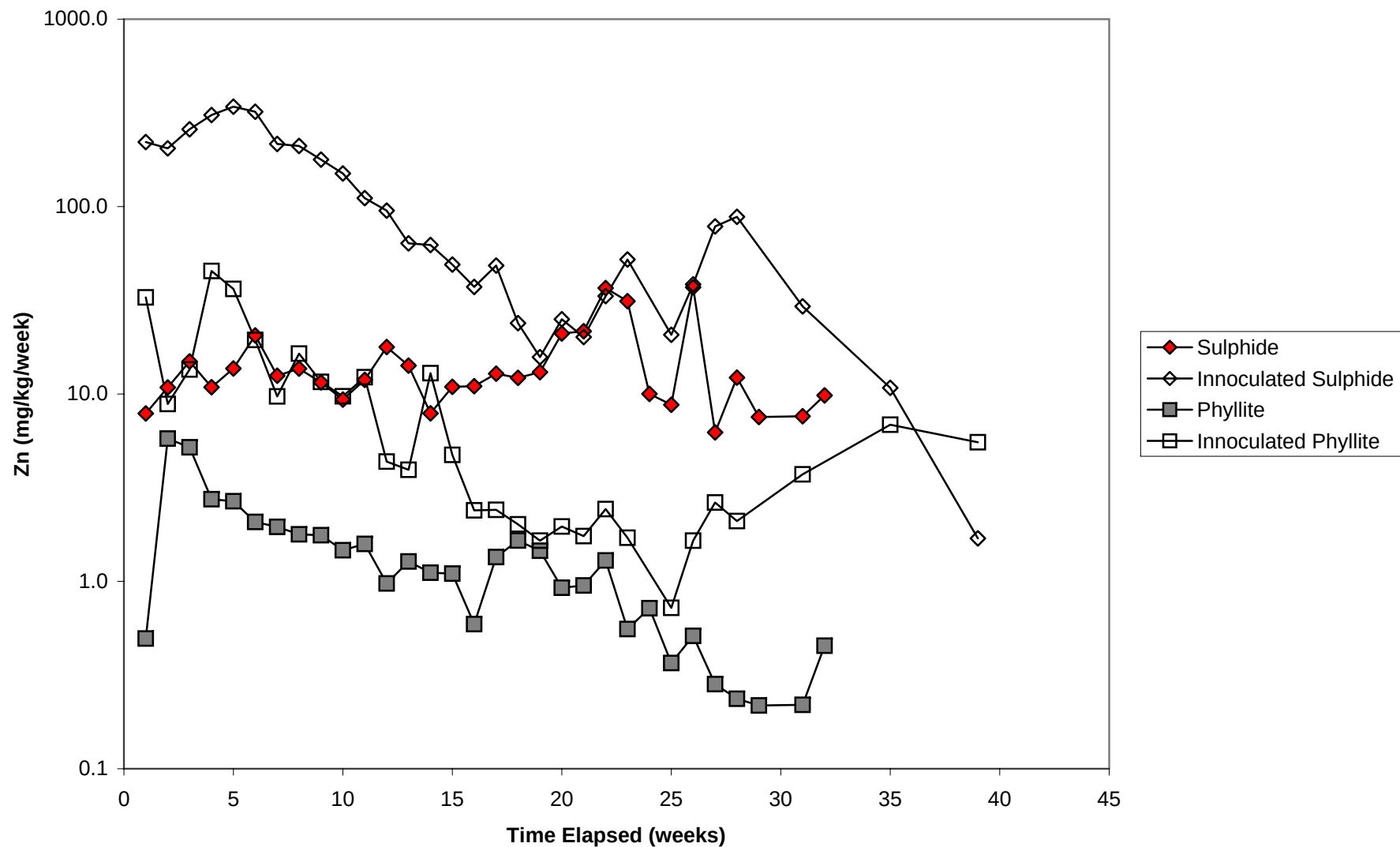
Vangorda Plateau IEE

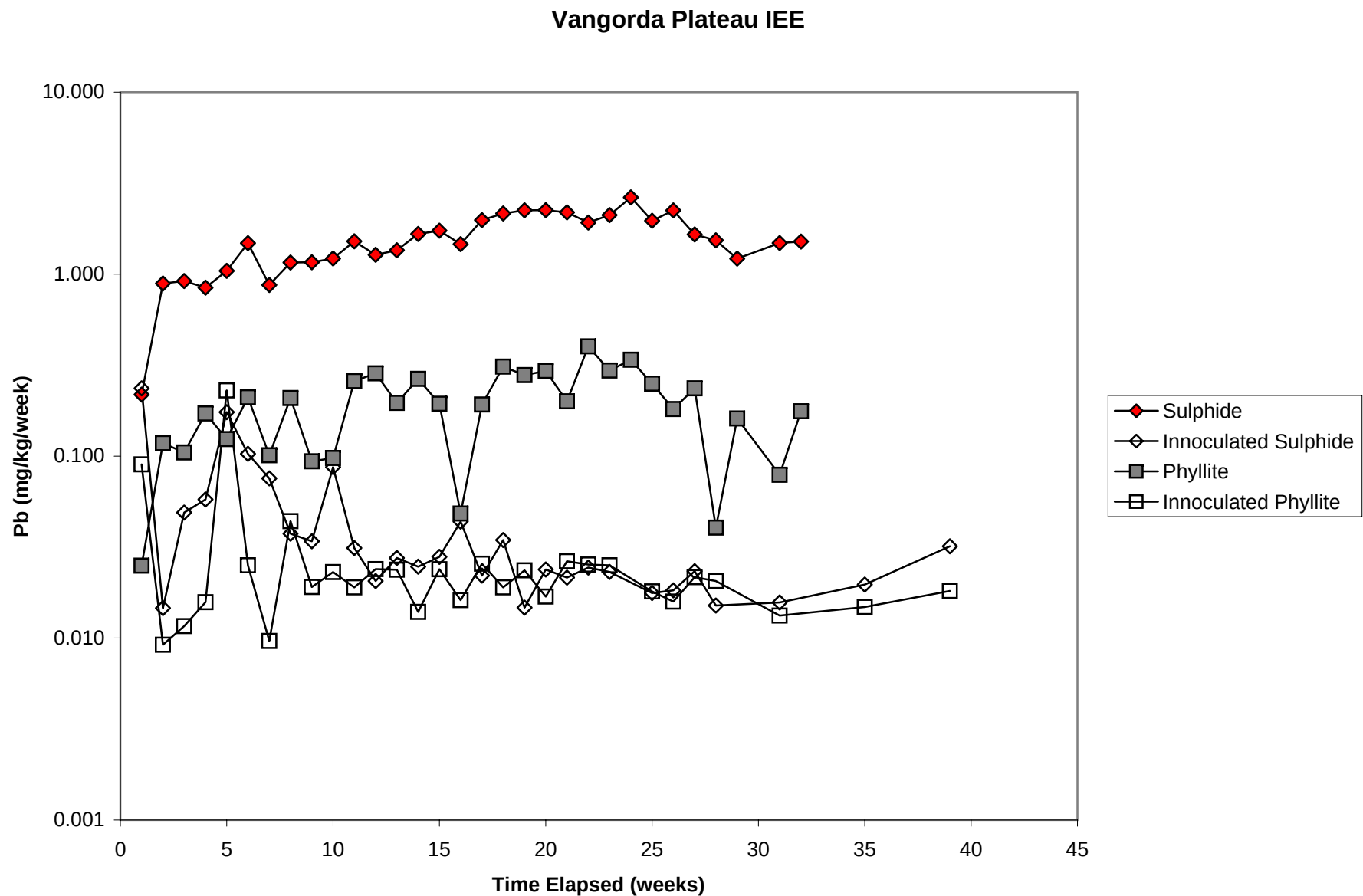


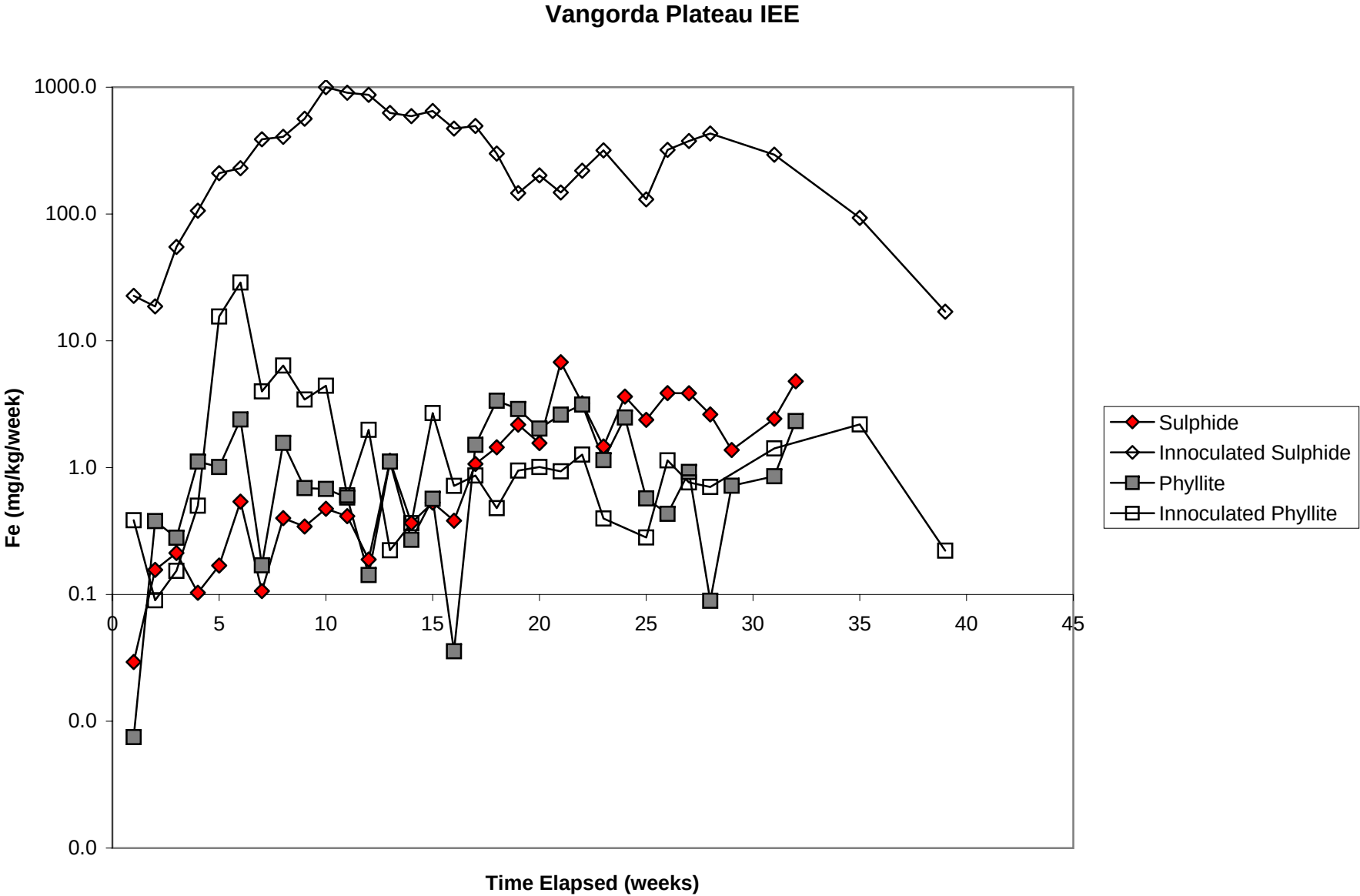
Vangorda Plateau IEE

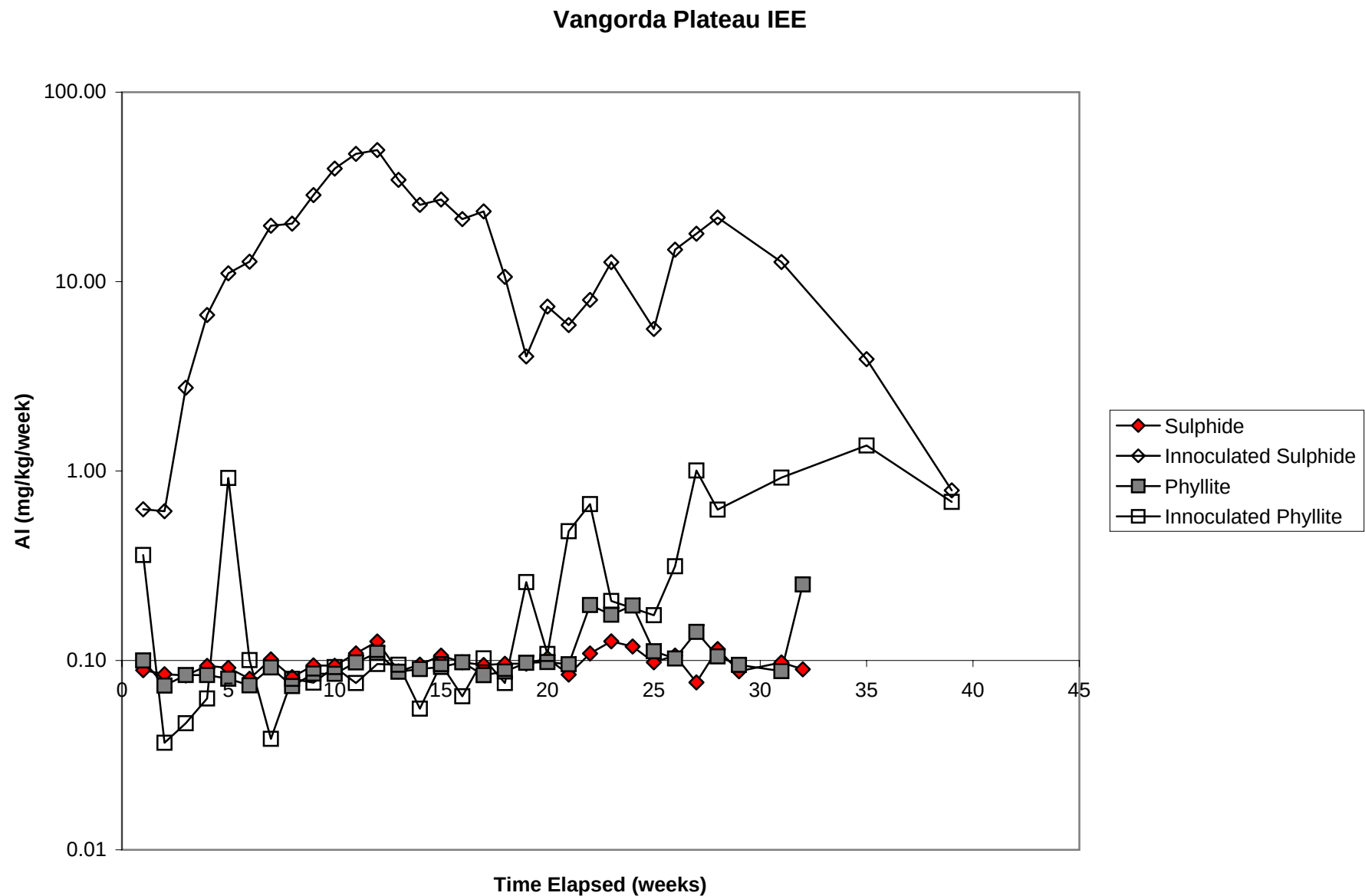


Vangorda Plateau IEE









Appendix D.5
ICAP Leach Column Data and Charts

COLUMN LEACH
PROJECT
COLUMN C1A
SAMPLE WT.

CYCLE	DAYS	Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk	Molar Ratios Zn/S	Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd
1	1	0.01575	0.00709	0.23632	0.03939	0.13391	356.06	0.00394	0.36236	1.51245	1.06344	0.07877	0.28358	403.32	33.63621	0.01182	0.44113	0.11816	7.87733	0.07877	10.31931	0.00394	7.87733	1.34702	0.15755	0.01182	0.00394	0.01182	29.30368	1.68E-02	7.12E-04	2.35E+01	1.05E+00	3.76E+02
2	2	0.00595	0.00149	0.17864	0.02977	0.07146	275.11	0.00298	0.14887	0.42278	0.07741	0.05359	0.17864	270.34	20.18632	0.00893	0.23819	0.08932	6.55013	0.05955	6.78832	0.00298	4.76373	0.97061	0.05955	0.00893	0.00298	0.00893	13.57664	1.14E-02	7.58E-05	1.50E+02	1.02E+00	3.27E+02
3	3	0.00530	0.00133	0.15904	0.02651	0.05301	245.45	0.00265	0.08482	0.23856	0.03181	0.04241	0.14314	207.28	14.94976	0.00795	0.17494	0.07952	5.30133	0.05301	5.67243	0.00265	3.18080	0.78460	0.10603	0.01590	0.00265	0.00795	8.74720	8.36E-03	3.56E-05	2.35E+02	1.09E+00	2.84E+02
4	4	0.00582	0.00146	0.17472	0.02912	0.04659	283.05	0.00291	0.06989	0.20384	0.00874	0.03494	0.14560	184.62	14.15232	0.00874	0.15725	0.08736	5.82400	0.05824	6.05696	0.00291	2.32960	0.80371	0.05824	0.00874	0.00582	0.00874	7.97888	7.83E-03	1.00E-05	7.80E+02	1.06E+00	2.94E+02
5	5	0.01120	0.00140	0.11200	0.02800	0.03920	257.04	0.00280	0.04480	0.12880	0.00840	0.01400	0.11760	141.12	10.64000	0.00840	0.11760	0.08400	5.04000	0.05600	5.00640	0.00280	1.68000	0.68320	0.02800	0.00840	0.01680	0.00840	5.47680	5.72E-03	1.03E-05	5.57E+02	1.20E+00	2.40E+02
6	8	0.00371	0.00046	0.03708	0.00927	0.00927	84.18	0.00093	0.01113	0.03152	0.00278	0.00464	0.03708	40.61	3.02238	0.00278	0.03152	0.02781	1.85422	0.01854	1.65026	0.00093	0.37084	0.21138	0.00927	0.00278	0.00556	0.00278	1.43146	5.40E-03	1.23E-05	4.40E+02	1.08E+00	2.65E+02
7	9	0.01053	0.00132	0.10528	0.02632	0.02106	233.72	0.00263	0.02106	0.04211	0.00790	0.01316	0.08949	98.44	6.68528	0.00790	0.06317	0.07896	4.73760	0.05264	4.34806	0.00263	1.05280	0.52061	0.02632	0.00790	0.01579	0.00790	2.53198	3.68E-03	1.34E-05	2.74E+02	1.07E+00	2.07E+02
8	11	0.00562	0.00070	0.05619	0.01405	0.00843	110.13	0.00140	0.00843	0.01686	0.00421	0.00702	0.03652	38.77	2.59582	0.00421	0.02528	0.04214	2.24747	0.02809	2.21375	0.00140	#N/A	0.22250	0.01405	0.00421	0.00843	0.00421	0.93551	3.11E-03	1.64E-05	1.90E+02	1.06E+00	1.91E+02
9	16	0.00205	0.00026	0.01023	0.00511	0.00205	35.90	0.00051	0.00205	0.00307	0.00153	0.00256	0.01228	11.66	0.68127	0.00153	0.00614	0.01534	0.81835	0.01023	0.79687	0.00051	0.10229	0.06976	0.00511	0.00153	0.00051	0.00153	0.20049	1.87E-03	1.67E-05	1.12E+02	1.19E+00	1.68E+02
10	18	0.00545	0.00068	0.01363	0.01363	0.00545	74.95	0.00136	0.00273	0.00545	0.00409	0.00681	0.02725	24.01	1.24275	0.00409	0.01090	0.04088	1.90773	0.02725	2.12031	0.00136	0.27253	0.15207	0.01363	0.00409	0.00136	0.00409	0.35702	1.87E-03	2.50E-05	7.46E+01	1.02E+00	1.13E+02
11	23	0.00100	0.00025	0.01004	0.00502	0.00100	24.50	0.00050	0.00050	0.00100	0.00151	0.00251	0.00803	7.52	0.32840	0.00151	0.00502	0.01506	0.60256	0.01004	0.75621	0.00050	0.10043	0.05031	0.00502	0.00151	0.00050	0.00151	0.09520	1.31E-03	2.42E-05	5.40E+01	1.21E+00	1.63E+02
12	26	0.00387	0.00048	0.01935	0.00968	0.00097	41.02	0.00097	0.00097	0.00387	0.00290	0.00484	0.01355	12.19	0.44121	0.00290	0.00581	0.02903	1.16107	0.01935	1.50552	0.00097	0.19351	0.08244	0.00968	0.00290	0.00097	0.00290	0.13739	1.28E-03	3.18E-05	4.04E+01	1.07E+00	2.44E+02
13	30	0.00260	0.00033	0.01302	0.00651	0.00065	26.43	0.00065	0.00065	0.00065	0.00195	0.00326	0.00911	7.62	0.21874	0.00195	0.00130	0.01953	0.78120	0.01302	1.07285	0.00065	0.13020	0.05273	0.00651	0.00195	0.00065	0.00195	0.07226	1.14E-03	3.62E-05	3.16E+01	9.94E-01	1.91E+02
14	33	0.00356	0.00044	0.00890	0.00890	0.00089	31.50	0.00089	0.00089	0.00089	0.00267	0.00445	0.01246	9.02	0.22244	0.00267	0.00178	0.02669	1.24569	0.01780	1.49127	0.00089	0.17796	0.06513	0.00890	0.00267	0.00089	0.00267	0.08133	1.21E-03	4.65E-05	2.60E+01	8.88E-01	1.57E+02
15	37	0.00135	0.00034	0.00677	0.00677	0.00068	21.92	0.00068	0.00068	0.00068	0.00203	0.00338	0.00812	6.36	0.12897	0.00203	0.00135	0.02030	0.81200	0.01353	1.18687	0.00068	0.13533	0.04615	0.00677	0.00203	0.00068	0.00203	0.05021	9.78E-04	4.63E-05	2.11E+01	9.71E-01	1.28E+02
16	40	0.00357	0.00045	0.00893	0.00893	0.00089	23.93	0.00089	0.00089	0.00357	0.00268	0.00446	0.00893	6.55	0.12054	0.00268	0.00179	0.02679	0.89289	0.01786	1.54291	0.00089	0.17858	0.05018	0.00893	0.00268	0.00089	0.00268	0.05482	9.76E-04	5.58E-05	1.75E+01	9.92E-01	1.06E+02
17	44	0.00243	0.00030	0.00607	0.00607	0.00061	14.68	0.00061	0.00061	0.00061	0.00182	0.00303	0.00607	4.05	0.06637	0.00182	0.00121	0.01820	0.60667	0.01213	1.08351	0.00061	0.12133	0.03300	0.00607	0.00182	0.00061	0.00182	0.03276	9.44E-04	6.14E-05	1.54E+01	9.96E-01	9.28E+01
18	47	0.00385	0.00048	0.00961	0.00961	0.00096	19.80	0.00096	0.00096	0.00096	0.00288	0.00481	0.00961	5.42	0.09248	0.00288	0.00192	0.02884	0.96133	0.01923	1.87845	0.00096	0.19227	0.04576	0.00961	0.00288	0.00096	0.00288	0.04826	9.86E-04	6.89E-05	1.43E+01	1.04E+00	8.63E+01
19	51	0.00258	0.00032	0.00644	0.00644	0.00064	13.01	0.00064	0.00064	0.00064	0.00193	0.00322	0.00773	3.74	0.05951	0.00193	0.00129	0.01932	0.64400	0.01288	1.40392	0.00064	0.12880	0.03104	0.00644	0.00193	0.00064	0.00193	0.03581	1.11E-03	7.01E-05	1.58E+01	1.03E+00	9.56E+01
20	58	0.00166	0.00021	0.00416	0.00416	0.00042	9.48	0.00042	0.00042	0.00083	0.00125	0.00208	0.00416	2.78	0.03736	0.00125	0.00083	0.01248	0.41600	0.00832	0.84032	0.00042	0.08320	0.02246	0.00416	0.00125	0.00042	0.00125	0.01955	8.36E-04	6.24E-05	1.34E+01	1.02E+00	8.08E+01
21	65	0.00159	0.00020	0.00399	0.00399	0.00040	9.25	0.00040	0.00040	0.00159	0.00120	0.00199	0.00399	2.77	0.03141	0.00120	0.00159	0.01196	0.47840	0.00797	0.90099	0.00040	0.07973	0.02248	0.00399	0.00120	0.00040	0.00120	0.01969	8.53E-04	6.07E-05	1.41E+01	1.02E+00	8.49E+01
22	72	0.00162	0.00020	0.00405	0.00405	0.00041	8.84	0.00041	0.00041	0.00081	0.00122	0.00203	0.00324	2.80	0.02294	0.00122	0.00081	0.01216	0.40533	0.00811	0.85120	0.00041	0.08107	0.02164	0.00405	0.00122	0.00041	0.00122	0.01540	6.89E-04	6.37E-05	1.08E+01	1.02E+00	6.53E+01
23	79	0.00158	0.00020	0.00396	0.00396	0.00040	9.35	0.00040	0.00040	0.00040	0.00119	0.00198	0.00396	3.03	0.02431	0.00119	0.00079	0.01188	0.47520	0.00792	1.02960	0.00040	0.07920	0.02352	0.00396	0.00119	0.00040	0.00119	0.02297	9.97E-04	6.04E-05	1.65E+01	9.85E-01	9.97E+01
24	86	0.00159	0.00020	0.00397	0.00397	0.00040	9.38	0.00040	0.00040	0.00079	0.00119	0.00199	0.00397	2.95	0.01939	0.00119	0.00079	0.01192	0.47680	0.00795	1.00128	0.00040	0.07947	0.02281	0.00397	0.00119	0.00040	0.00119	0.02305	9.68E-04	5.86E-05	1.65E+01	1.03E+00	9.97E+01
25	93	0.00162	0.00020	0.00404	0.00404	0.00040	8.97	0.00040	0.00040	0.00040	0.00121	0.00202	0.00404	2.94	0.01761	0.00121	0.00081	0.01212	0.48480	0.00808	1.01000	0.00040	0.08080	0.02214	0.00404	0.00121	0.00040	0.00121	0.01947	8.72E-04	6.35E-05	1.37E+01	9.91E-01	8.28E+01
		0.00170	0.000212	0.00424	0.00424	0.000424	9.54	0.000424	0.000424	0.000791	0.00127	0.00212	0.00423	2.95	0.0285	0.00127	0.000969	0.0127	0.472	0.00848	0.979	0.000424	0.0848	0.0233	0.00424	0.00127	0.000424	0.00127	0.02140					

COLUMN LEACH
PROJECT
COLUMN C2A
SAMPLE WT.

CYCLE	DAYS	Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk	Molar Ratios Zn/S	Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd
1	1	0.25065	0.12533	2.50651	2.50651	5.51432	296.27	0.25065	16.54297	150.89193	#####	2.50651	1.50391	746.94	70.18229	0.75195	2.50651	101.26302	50.13021	5.01302	21.55599	1.00260	50.13021	0.65169	9.02344	0.75195	4.51172	8.02083	#####	7.94E-02	6.88E-02	1.15E+00	1.92E+01	1.18E+03
2	2	0.07201	0.03600	0.72005	0.72005	1.15208	363.63	0.07201	4.46432	41.76302	#####	2.01615	0.50404	198.01	18.43333	0.21602	0.57604	15.84115	14.40104	1.44010	21.38555	0.43203	14.40104	0.36003	3.60026	0.21602	0.86406	1.87214	972.07031	6.84E-02	5.22E-01	1.31E-01	1.26E+01	1.45E+03
3	3	0.03236	0.01618	0.32357	0.32357	0.32357	342.98	0.03236	1.16484	10.87188	#####	1.42370	0.12943	49.25	4.27757	0.09707	0.12943	0.97070	6.47135	0.64714	15.14297	0.03236	6.47135	0.26533	0.32357	0.09707	0.12943	0.32357	243.97005	6.53E-02	4.66E-01	1.40E-01	5.40E+00	1.30E+03
4	4	0.03270	0.01635	0.32699	0.32699	0.06540	346.60	0.03270	0.32699	2.94287	354.45247	1.37334	0.03270	12.23	1.01366	0.09810	0.06540	0.98096	6.53971	0.65397	10.92132	0.03270	6.53971	0.24851	0.32699	0.09810	0.03270	0.09810	57.54948	3.63E-02	2.62E-01	1.39E-01	2.65E+00	1.51E+03
5	5	0.00645	0.00161	0.03224	0.03224	0.03224	318.56	0.00322	0.12252	1.44448	156.70020	1.31551	0.01290	5.22	0.40948	0.00967	0.01935	0.09673	0.64486	0.06449	7.60931	0.00322	0.64486	0.21538	0.03224	0.09673	0.05159	0.00967	23.60176	1.96E-02	1.52E-01	1.29E-01	2.26E+00	1.26E+03
6	8	0.00448	0.00056	0.01120	0.01120	0.00896	122.79	0.00112	0.02913	0.33834	40.78016	0.51984	0.00448	1.14	0.08671	0.00336	0.00448	0.03361	0.22407	0.02241	2.80084	0.00112	0.22407	0.08246	0.01120	0.03361	0.01568	0.00336	4.99669	1.38E-02	1.32E-01	1.05E-01	1.78E+00	9.58E+02
7	9	0.00665	0.00166	0.03327	0.06654	0.01996	326.69	0.00333	0.08650	0.91820	123.75781	1.45049	0.01331	2.67	0.20027	0.00998	0.00665	0.09980	0.66536	0.06654	12.84154	0.00333	0.66536	0.22290	0.03327	0.09980	0.03992	0.00998	11.51081	1.03E-02	1.29E-01	7.95E-02	2.07E+00	9.91E+02
8	11	0.00167	0.00084	0.01675	0.01675	0.01005	156.76	0.00167	0.04354	0.40865	62.97266	0.79051	0.00670	1.02	0.07905	0.00502	0.00335	0.05024	0.33496	0.03350	6.79971	0.00167	0.33496	0.10183	0.01675	0.02010	0.02345	0.00502	4.38799	8.91E-03	1.50E-01	5.95E-02	1.91E+00	7.50E+02
9	16	0.00064	0.00032	0.00638	0.00638	0.00383	50.28	0.00255	0.02424	0.23096	44.27865	0.28583	0.00383	0.45	0.03241	0.00191	0.00128	0.01914	0.12760	0.01276	3.73880	0.00064	0.12760	0.03267	0.02552	0.00191	0.00638	0.00638	1.95234	7.83E-03	2.08E-01	3.77E-02	3.00E+00	8.77E+02
10	18	0.00167	0.00083	0.01669	0.01669	0.01001	114.17	0.00668	0.07010	0.73441	145.54622	0.80117	0.01001	1.21	0.08112	0.00501	0.00334	0.05007	0.33382	0.03338	10.78244	0.00167	0.33382	0.07745	0.13353	0.00501	0.02003	0.02671	4.84041	7.63E-03	2.69E-01	2.84E-02	3.35E+00	8.31E+02
11	23	0.00134	0.00034	0.00672	0.00672	0.00403	37.91	0.00134	0.02823	0.35492	85.77279	0.29039	0.00269	0.52	0.03563	0.00202	0.00134	0.02017	0.13444	0.01344	4.35586	0.00067	0.13444	0.02675	0.00672	0.00202	0.01076	0.01479	1.90905	6.56E-03	3.45E-01	1.90E-02	4.61E+00	8.13E+02
12	26	0.00224	0.00056	0.01120	0.01120	0.00672	60.50	0.00448	0.05378	0.71253	156.62272	0.57585	0.00672	0.92	0.06207	0.00336	0.00224	0.03361	0.22407	0.02241	7.88715	0.00112	0.22407	0.04392	0.01120	0.00336	0.02017	0.02913	3.20416	6.71E-03	3.84E-01	1.75E-02	4.72E+00	8.19E+02
13	30	0.00166	0.00041	0.00829	0.00829	0.00497	34.65	0.00332	0.04144	0.60175	138.08765	0.40117	0.00497	0.72	0.04691	0.00249	0.00166	0.02487	0.16577	0.01658	6.01750	0.00083	0.16577	0.02553	0.00829	0.00249	0.01658	0.02652	2.35396	5.64E-03	3.87E-01	1.46E-02	7.15E+00	8.13E+02
14	33	0.00112	0.00056	0.01117	0.01117	0.00893	34.61	0.00447	0.05359	0.92673	200.08333	0.57390	0.00670	0.96	0.05962	0.00335	0.00223	0.03350	0.22331	0.02233	8.15072	0.00112	0.22331	0.02836	0.01117	0.00335	0.02456	0.04243	3.10397	6.50E-03	4.91E-01	1.33E-02	8.09E+00	5.97E+02
15	37	0.00161	0.00040	0.00806	0.01612	0.00484	19.99	0.00322	0.04030	0.76254	170.88704	0.40142	0.00645	0.75	0.04772	0.00242	0.00161	0.02418	0.16121	0.01612	5.86820	0.00081	0.16121	0.01661	0.00806	0.00242	0.01935	0.03063	2.33761	6.21E-03	5.31E-01	1.17E-02	1.09E+01	8.31E+02
16	40	0.00235	0.00059	0.01177	0.01177	0.00706	22.75	0.00471	0.05651	1.13963	237.81467	0.59336	0.00706	1.03	0.06522	0.00353	0.00471	0.03532	0.23546	0.02355	8.38238	0.00235	0.23546	0.02119	0.01177	0.00353	0.02826	0.04238	3.36708	6.36E-03	5.26E-01	1.21E-02	1.33E+01	8.19E+02
17	44	0.00171	0.00086	0.01715	0.01715	0.00171	14.42	0.00514	0.04458	0.96537	178.32682	0.42867	0.00514	0.81	0.04801	0.00514	0.00343	0.05144	0.34294	0.03429	6.41291	0.00171	0.34294	0.01560	0.05144	0.00514	0.02058	0.03258	2.60632	6.29E-03	5.04E-01	1.25E-02	1.61E+01	2.61E+03
18	47	0.00229	0.00115	0.02294	0.02294	0.00229	15.46	0.00229	0.05276	1.24785	225.94293	0.55052	0.00688	1.01	0.05964	0.00688	0.00459	0.06882	0.45877	0.04588	8.32663	0.00229	0.45877	0.01399	0.02294	0.00688	0.02753	0.04358	3.21137	6.06E-03	4.99E-01	1.21E-02	1.90E+01	2.41E+03
19	51	0.00173	0.00086	0.01726	0.01726	0.00345	11.00	0.00518	0.04315	1.06154	210.58105	0.41426	0.00690	0.98	0.06214	0.00518	0.00345	0.05178	0.34521	0.03452	6.86978	0.00345	0.34521	0.00984	0.01726	0.00518	0.02589	0.03625	3.29680	7.05E-03	5.27E-01	1.34E-02	2.27E+01	1.64E+03
20	58	0.00102	0.00051	0.01016	0.01016	0.00305	7.84	0.00508	0.03758	1.00648	177.73438	0.25391	0.00508	0.86	0.04773	0.00305	0.00203	0.10156	0.20313	0.02031	5.60625	0.00102	0.20313	0.00752	0.01016	0.00305	0.02539	0.03555	2.52891	6.54E-03	5.38E-01	1.22E-02	2.56E+01	1.43E+03
21	65	0.00096	0.00048	0.00960	0.02881	0.02689	6.78	0.00576	0.05282	1.04671	186.29557	0.22087	0.00576	1.13	0.06818	0.00288	0.10083	0.12484	0.19206	0.01921	5.84814	0.00096	0.19206	0.00845	0.06722	0.00288	0.03073	0.04513	2.52555	5.91E-03	5.10E-01	1.16E-02	3.03E+01	1.61E+02
22	72	0.00247	0.00099	0.02466	0.02466	0.00247	7.49	0.00690	0.05326	1.36113	218.96484	0.26631	0.00888	1.37	0.06510	0.00493	0.00493	0.19727	0.49316	0.04932	7.64404	0.00247	0.49316	0.00957	0.14795	0.00493	0.04636	0.04932	2.91953	6.06E-03	5.32E-01	1.14E-02	3.03E+01	2.03E+03
23	79	0.00250	0.00100	0.02498	0.02498	0.00250	7.14	0.00799	0.06096	1.40908	235.84635	0.25983	0.00899	1.54	0.07295	0.00500	0.00500	0.19987	0.49967	0.04997	8.06475	0.00250	0.49967	0.01039	0.07995	0.00500	0.04997	0.05996	2.98805	5.67E-03	5.24E-01	1.08E-02	3.34E+01	2.06E+03
24	86	0.00246	0.00098	0.02458	0.02458	0.00688	6.64	0.00688	0.06292	1.44512	268.37891	0.27526	0.00786	1.59	0.07963	0.00492	0.00492	0.19861	0.49154	0.04915	8.18900	0.00246	0.49154	0.00865	0.02458	0.00492	0.05407	0.05898	2.98854	5.67E-03	5.96E-01	9.51E-03	3.49E+01	7.46E+02
25	93	0.00251	0.00101	0.02515	0.02515	0.00251	5.70	0.00905	0.06438	1.56914	275.60547	0.27158	0.00805	1.58	0.07946	0.00503	0.00503	0.20117	0.50293	0.05029	8.40898	0.00251	0.50293	0.00835	0.02515	0.00503	0.05733	0.05029	3.12822	5.96E-03	6.15E-01	9.70E-03	3.87E+01	2.14E+03
		0.00180	0.000712	0.01594	0.01797	0.006151	20.49	0.005364	0.049436	1.035450	191.87865	0.35098	0.00660	1.08	0.0604	0.00393	0.011718	0.1045	0.319	0.03188	6.918	0.001721	0.3188	0.0173	0.04176	0.00393	0.031753	0.03940	2.79973					

COLUMN LEACH
PROJECT
COLUMN C4A
SAMPLE WT.

CYCLE	DAYS	Molar Ratios																												Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd	
		Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk					
1	1	0.22178	0.11089	2.21785	2.21785	10.20210	181.86	0.22178	2.21785	86.05247	953.67431	1.10892	0.22178	869.40	647.61139	0.66535	1.33071	6.65354	44.35694	4.43569	6.20997	0.22178	44.35694	0.02218	2.21785	0.66535	0.22178	0.66535	#####	7.09E-01	1.06E-01	6.72E+00	4.01E+00	1.26E+03
2	2	0.11695	0.04678	1.16948	1.16948	4.49080	236.23	0.11695	0.74847	50.98929	603.45125	0.93558	0.11695	363.47	271.31917	0.23390	0.93558	2.33896	23.38958	2.33896	5.61350	0.11695	9.35583	0.01169	1.16948	0.23390	0.11695	0.23390	#####	6.26E-01	1.48E-01	4.23E+00	3.51E+00	1.14E+03
3	3	0.02271	0.02725	0.22708	0.22708	1.04458	206.65	0.02271	0.18167	18.84792	260.69167	1.13542	0.02271	86.75	68.12500	0.06813	0.13625	0.68125	4.54167	0.45417	3.17917	0.02271	4.54167	0.05450	9.31042	0.06813	0.02271	0.06813	622.20833	3.77E-01	1.85E-01	2.04E+00	2.90E+00	1.02E+03
4	4	0.01113	0.01335	0.11127	0.11127	0.42728	166.91	0.01113	0.06231	10.86003	125.51350	1.11271	0.01113	41.97	30.22116	0.02225	0.04451	0.22254	2.22542	0.22254	2.31443	0.01113	2.22542	0.04006	0.11127	0.02225	0.01113	0.02225	240.79008	2.84E-01	1.73E-01	1.64E+00	2.20E+00	9.69E+02
5	5	0.00444	0.00887	0.04436	0.04436	0.27501	108.23	0.00444	0.03992	6.74226	90.04460	1.10892	0.00444	28.17	21.64619	0.11089	0.03105	0.13307	0.88714	0.08871	1.86299	0.00444	0.88714	0.03061	0.08871	0.13307	0.00444	0.01331	149.48290	2.51E-01	1.77E-01	1.42E+00	2.36E+00	9.34E+02
6	8	0.00076	0.00038	0.01524	0.00762	0.07315	27.13	0.00076	0.01067	1.84402	23.16452	0.39166	0.00152	8.47	6.44644	0.03810	0.01372	0.00000	0.01524	0.01524	0.58368	0.00076	0.15240	0.00914	0.00762	0.02286	0.00076	0.00229	39.16632	2.39E-01	1.65E-01	1.44E+00	2.45E+00	9.20E+02
7	9	0.00428	0.00857	0.08569	0.04284	0.29133	80.12	0.00428	0.05141	4.66989	80.11651	1.07108	0.00857	40.40	31.27543	0.21422	0.04713	0.12853	0.85686	0.08569	2.01362	0.00428	0.85686	0.02699	0.04284	0.12853	0.00428	0.01285	174.37124	2.78E-01	1.50E-01	1.86E+00	2.62E+00	1.03E+03
8	11	0.00228	0.00228	0.04557	0.02278	0.11848	24.83	0.00228	0.02051	2.13942	29.84708	0.59238	0.00228	17.20	12.30338	0.00684	0.02278	0.06835	0.45568	0.04557	0.93415	0.00228	0.45568	0.01413	0.02278	0.00684	0.00228	0.00684	73.36457	3.03E-01	1.44E-01	2.10E+00	2.79E+00	1.06E+03
9	16	0.00213	0.00085	0.02135	0.02135	0.07428	9.48	0.00213	0.01366	0.91360	13.83210	0.23054	0.00213	10.33	7.82111	0.00128	0.01708	0.04269	0.42692	0.04269	0.46107	0.00213	0.42692	0.00632	0.02135	0.00427	0.00213	0.00427	47.38775	3.79E-01	1.30E-01	2.93E+00	2.89E+00	1.10E+03
10	18	0.00220	0.00220	0.02195	0.02195	0.15805	14.99	0.00220	0.02634	2.26099	26.56118	0.59269	0.00220	19.73	15.12451	0.00329	0.02634	0.06585	0.43903	0.04390	1.09757	0.00220	0.43903	0.01295	0.02195	0.00659	0.00220	0.00659	96.80563	3.97E-01	1.28E-01	3.11E+00	3.14E+00	1.05E+03
11	23	0.00087	0.00174	0.00869	0.00869	0.06691	5.49	0.00087	0.01217	0.95587	9.64559	0.21724	0.00087	8.08	6.19577	0.00130	0.00869	0.02607	0.17379	0.01738	0.42580	0.00087	0.17379	0.00495	0.00869	0.00261	0.00087	0.00261	42.49274	4.35E-01	1.16E-01	3.76E+00	3.18E+00	1.09E+03
12	26	0.00148	0.00148	0.01479	0.01479	0.09019	6.77	0.00148	0.01626	1.64121	13.44015	0.39921	0.00148	10.10	7.89554	0.00222	0.01331	0.04436	0.29571	0.02957	0.66535	0.00148	0.29571	0.00798	0.02957	0.00444	0.00148	0.00444	58.99474	4.31E-01	1.15E-01	3.75E+00	3.58E+00	1.12E+03
13	30	0.00108	0.00108	0.02157	0.01079	0.06795	4.93	0.00108	0.01294	1.20808	9.02827	0.28045	0.00108	7.94	6.02963	0.00162	0.01079	0.03236	0.21573	0.02157	0.48539	0.00108	0.21573	0.00507	0.01079	0.00324	0.00108	0.00324	45.30313	4.22E-01	9.85E-02	4.29E+00	3.65E+00	1.15E+03
14	33	0.00146	0.00146	0.02927	0.01463	0.09512	6.51	0.00146	0.01902	1.81465	12.52693	0.42439	0.00146	10.46	8.04884	0.00220	0.01317	0.04390	0.29269	0.02927	0.68781	0.00146	0.29269	0.00717	0.01463	0.00439	0.00146	0.00439	64.09806	4.87E-01	1.11E-01	4.37E+00	3.39E+00	1.16E+03
15	37	0.00109	0.00109	0.02180	0.01090	0.07303	4.45	0.00109	0.01308	1.44970	8.27310	0.29430	0.00109	7.25	5.63530	0.00327	0.01417	0.03270	0.21800	0.02180	0.50140	0.00109	0.21800	0.00578	0.01090	0.00327	0.00109	0.00327	48.17800	4.70E-01	9.45E-02	4.98E+00	3.83E+00	1.13E+03
16	40	0.00150	0.00150	0.01499	0.01499	0.08693	4.95	0.00150	0.01499	1.94838	9.90674	0.40466	0.00150	8.23	6.47460	0.00450	0.01199	0.04496	0.29975	0.02998	0.62948	0.00150	0.29975	0.00719	0.01499	0.00450	0.00150	0.00450	58.15150	4.87E-01	9.71E-02	5.01E+00	3.95E+00	1.15E+03
17	44	0.00106	0.00106	0.01056	0.01056	0.06019	3.38	0.00106	0.01162	1.31992	6.84248	0.27454	0.00106	5.68	4.46662	0.00317	0.00950	0.03168	0.21119	0.02112	0.44349	0.00106	0.21119	0.00486	0.01056	0.00317	0.00106	0.00317	41.07597	4.53E-01	8.84E-02	5.13E+00	4.36E+00	1.17E+03
18	47	0.00151	0.00151	0.01509	0.01509	0.09053	4.66	0.00151	0.01660	1.97658	10.24504	0.42248	0.00151	8.12	6.39749	0.00453	0.01207	0.04527	0.30177	0.03018	0.66389	0.00151	0.30177	0.00604	0.01509	0.00453	0.00151	0.00453	62.31520	4.89E-01	9.41E-02	5.20E+00	4.33E+00	1.18E+03
19	51	0.00114	0.00114	0.01135	0.01135	0.06699	3.55	0.00114	0.01249	1.27167	8.06146	0.28385	0.00114	6.07	4.80281	0.00341	0.00908	0.03406	0.22708	0.02271	0.53365	0.00114	0.22708	0.00318	0.01135	0.00341	0.00114	0.00341	45.98438	4.68E-01	9.61E-02	4.87E+00	4.44E+00	1.18E+03
20	58	0.00170	0.00068	0.01703	0.01703	0.05723	3.24	0.00170	0.01158	0.97419	6.15850	0.19075	0.00170	5.65	4.47581	0.00341	0.00681	0.03406	0.34063	0.03406	0.37469	0.00170	0.34063	0.00198	0.01703	0.00341	0.00170	0.00341	43.32750	5.19E-01	8.63E-02	6.01E+00	4.08E+00	1.30E+03
21	65	0.00163	0.00065	0.01633	0.01633	0.06270	3.10	0.00163	0.01306	0.92092	6.19825	0.16328	0.00163	5.58	4.44785	0.00327	0.00653	0.03266	0.32657	0.03266	0.36576	0.00163	0.32657	0.00327	0.01633	0.00327	0.00163	0.00327	45.06631	5.45E-01	8.77E-02	6.21E+00	4.12E+00	1.24E+03
22	72	0.00164	0.00066	0.01644	0.01644	0.06903	3.35	0.00164	0.01446	1.01249	6.90333	0.17094	0.00164	6.05	4.86521	0.00329	0.01315	0.03287	0.32873	0.03287	0.40763	0.00164	0.32873	0.00322	0.01644	0.00329	0.00164	0.00329	51.28190	5.90E-01	9.30E-02	6.35E+00	4.00E+00	1.28E+03
23	79	0.00162	0.00065	0.01622	0.01622	0.06488	2.84	0.00162	0.01427	0.98619	6.11179	0.15571	0.00162	5.39	4.23673	0.00324	0.00649	0.03244	0.32440	0.03244	0.39577	0.00162	0.32440	0.00285	0.01622	0.00324	0.00162	0.00324	48.46607	5.17E-01	7.64E-02	6.77E+00	4.90E+00	1.28E+03
24	86	0.00162	0.00065	0.01622	0.01622	0.07396	3.15	0.00162	0.01492	1.14839	7.07202	0.18167	0.00162	5.74	4.59357	0.00324	0.00649	0.03244	0.32440	0.03244	0.42173	0.00162	0.32440	0.00221	0.01622	0.00324	0.00162	0.00324	52.81310	6.16E-01	9.66E-02	6.38E+00	4.17E+00	1.23E+03
25	93	0.00166	0.00066	0.01660	0.01660	0.07237	2.95	0.00166	0.01394	1.27478	6.90506	0.18591	0.00166	5.33	4.43518	0.00332	0.00664	0.03320	0.33197	0.03320	0.43821	0.00166	0.33197	0.00259	0.01660	0.00332	0.00166	0.00332	53.04948	6.48E-01	9.88E-02	6.56E+00	4.27E+00	1.26E+03
		0.00149	0.000874	0.01688	0.01493	0.070024	3.64	0.001493	0.013852	1.230374	7.49702	0.23321	0.00149	6.33	5.0131	0.00325	0.009084	0.0345	0.299	0.02986	0.457	0.001493	0.2986	0.0037	0.01493	0.00345	0.001493	0.00345	49.75956					

COLUMN LEACH
PROJECT
COLUMN C5A
SAMPLE WT.

CYCLE	DAYS	Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk	Molar Ratios		Fe/S	Zn/Fe	S/(Ca+Mg)	Zn/Cd
																														Zn/S	Fe/S				
1	1	0.04750	0.00237	0.18998	0.04750	0.01900	311.57	0.00475	0.63645	0.00475	0.49396	0.69344	0.03800	281.18	3.25823	0.01425	1.58637	0.14249	15.19875	0.09499	1.35839	0.00475	5.69953	0.86538	0.18998	0.01425	0.00475	0.01425	18.04852	1.44E-02	4.61E-04	3.12E+01	9.93E-01	1.63E+03	
2	2	0.08291	0.00296	0.23689	0.05922	0.01184	310.33	0.00592	0.42641	0.00592	0.11845	0.53301	0.02369	119.63	1.89515	0.01777	1.05418	0.17767	10.66023	0.11845	1.64641	0.00592	1.18447	0.65857	0.05922	0.01777	0.00592	0.01777	13.50296	1.76E-02	1.81E-04	9.74E+01	9.26E-01	1.96E+03	
3	3	0.07799	0.00279	0.05571	0.05571	0.00557	110.96	0.00557	0.16712	0.00557	0.01671	0.25624	0.00557	38.44	0.70857	0.01671	0.42336	0.16712	4.45642	0.11141	1.11411	0.00557	1.11411	0.30415	0.05571	0.01671	0.00557	0.01671	5.75993	1.83E-02	6.23E-05	2.94E+02	1.10E+00	1.79E+03	
4	4	0.10660	0.00296	0.05922	0.05922	0.00592	56.97	0.00592	0.10660	0.00592	0.07107	0.21320	0.00592	22.15	0.49392	0.01777	0.27243	0.17767	3.55341	0.11845	1.13709	0.00592	1.18447	0.22268	0.05922	0.01777	0.00592	0.01777	4.13380	3.07E-02	6.18E-04	4.97E+01	8.83E-01	1.20E+03	
5	5	0.10590	0.00294	0.05883	0.05883	0.00588	50.24	0.00588	0.08237	0.00588	0.01765	0.14120	0.00588	21.30	0.42477	0.01765	0.22356	0.17650	2.35330	0.11767	0.98839	0.00588	1.17665	0.23886	0.05883	0.01765	0.00588	0.01765	3.12989	2.41E-02	1.59E-04	1.51E+02	9.32E-01	9.14E+02	
6	8	0.03127	0.00098	0.01955	0.01955	0.00195	14.54	0.00195	0.01955	0.00195	0.00586	0.05473	0.00195	6.18	0.10946	0.00586	0.06255	0.05864	0.78183	0.03909	0.27364	0.00195	0.39091	0.07115	0.01955	0.00586	0.00195	0.00586	0.80919	2.10E-02	1.78E-04	1.18E+02	9.57E-01	7.12E+02	
7	9	0.06520	0.00272	0.05434	0.05434	0.00543	55.21	0.00543	0.06520	0.00543	0.01630	0.11954	0.00543	24.89	0.30755	0.01630	0.16301	0.16301	2.17348	0.10867	0.70638	0.00543	1.08674	0.27060	0.05434	0.01630	0.00543	0.01630	2.37996	1.68E-02	1.35E-04	1.25E+02	9.01E-01	7.53E+02	
8	11	0.04118	0.00147	0.02942	0.02942	0.00294	27.06	0.00294	0.02942	0.00294	0.00882	0.07060	0.00294	12.06	0.15296	0.00882	0.07060	0.08825	0.58833	0.05883	0.40595	0.00294	0.58833	0.13414	0.02942	0.00882	0.00294	0.00882	1.17077	1.80E-02	1.59E-04	1.13E+02	8.48E-01	6.84E+02	
9	16	0.01083	0.00054	0.01083	0.01083	0.00108	12.26	0.00108	0.01083	0.00108	0.00325	0.01949	0.00108	5.85	0.04894	0.00325	0.01949	0.03248	0.21657	0.02166	0.12994	0.00108	0.21657	0.05782	0.01083	0.00325	0.00108	0.00325	0.39848	1.07E-02	1.02E-04	1.05E+02	1.04E+00	6.32E+02	
10	18	0.02775	0.00139	0.02775	0.02775	0.00278	22.54	0.00278	0.02220	0.00278	0.00833	0.05551	0.00278	11.16	0.09159	0.00833	0.03886	0.08326	0.55510	0.05551	0.30530	0.00278	0.55510	0.11380	0.02775	0.00833	0.00278	0.00833	0.71608	1.15E-02	1.56E-04	7.35E+01	9.34E-01	4.43E+02	
11	23	0.01071	0.00054	0.01071	0.01071	0.00107	8.05	0.00107	0.00643	0.00107	0.00321	0.01500	0.00107	4.13	0.02913	0.00321	0.01071	0.03213	0.21422	0.02142	0.09640	0.00107	0.21422	0.04113	0.01071	0.00321	0.00107	0.00321	0.24850	9.57E-03	1.45E-04	6.61E+01	1.07E+00	3.99E+02	
12	26	0.01915	0.00096	0.01915	0.01915	0.00192	12.80	0.00192	0.00766	0.00192	0.00575	0.03448	0.00192	6.44	0.04827	0.00575	0.01915	0.05746	0.38310	0.03831	0.19155	0.00192	0.38310	0.06704	0.01915	0.00575	0.00192	0.00575	0.41757	1.29E-02	2.08E-04	6.21E+01	8.47E-01	3.75E+02	
13	30	0.01349	0.00067	0.01349	0.01349	0.00135	9.44	0.00135	0.00539	0.00135	0.00405	0.02158	0.00135	4.86	0.03345	0.00405	0.01618	0.04046	0.26973	0.02697	0.12947	0.00135	0.26973	0.04882	0.01349	0.00405	0.00135	0.00405	0.29670	1.46E-02	2.32E-04	6.27E+01	7.17E-01	3.78E+02	
15	37	0.00796	0.00040	0.00796	0.00796	0.00080	4.98	0.00080	0.00318	0.00080	0.00239	0.01432	0.00080	2.61	0.01719	0.00239	0.00796	0.02387	0.15916	0.01592	0.07003	0.00080	0.15916	0.02594	0.00796	0.00239	0.00080	0.00239	0.16234	1.36E-02	2.34E-04	5.81E+01	7.87E-01	3.51E+02	
16	40	0.02267	0.00094	0.01889	0.01889	0.00189	10.28	0.00189	0.00756	0.00189	0.00567	0.03401	0.00189	5.18	0.04081	0.00567	0.01889	0.05668	0.37788	0.03779	0.16627	0.00189	0.37788	0.05593	0.01889	0.00567	0.00189	0.00567	0.40434	1.87E-02	3.07E-04	6.09E+01	7.04E-01	3.68E+02	
17	44	0.01583	0.00066	0.01319	0.01319	0.00132	8.10	0.00132	0.00528	0.00132	0.00396	0.01847	0.00132	4.04	0.02797	0.00396	0.01319	0.03958	0.26387	0.02639	0.11346	0.00132	0.26387	0.04301	0.01319	0.00396	0.00132	0.00396	0.26914	1.44E-02	2.48E-04	5.81E+01	7.76E-01	3.51E+02	
18	47	0.02345	0.00098	0.01955	0.01955	0.00195	9.69	0.00195	0.00782	0.00195	0.00586	0.02345	0.00195	5.04	0.03831	0.00586	0.01955	0.05864	0.39091	0.03909	0.17591	0.00195	0.39091	0.05277	0.01955	0.00586	0.00195	0.00586	0.38153	1.77E-02	3.18E-04	5.56E+01	7.34E-01	3.35E+02	
19	51	0.02039	0.00073	0.01456	0.01456	0.00146	9.96	0.00146	0.00582	0.00146	0.00437	0.02621	0.00146	4.86	0.02854	0.00437	0.00874	0.04368	0.29123	0.02912	0.13105	0.00146	0.29123	0.05126	0.01456	0.00437	0.00146	0.00437	0.23036	8.87E-03	1.97E-04	4.51E+01	8.86E-01	2.72E+02	
20	58	0.01267	0.00045	0.00905	0.00905	0.00090	8.03	0.00090	0.00362	0.00090	0.00271	0.01809	0.00090	4.00	0.02226	0.00271	0.00724	0.02714	0.18094	0.01809	0.08504	0.00090	0.18094	0.03872	0.00905	0.00271	0.00090	0.00271	0.22255	1.09E-02	1.55E-04	7.01E+01	8.57E-01	4.23E+02	
21	65	0.01025	0.00043	0.00854	0.00854	0.00085	6.80	0.00085	0.00342	0.00085	0.00256	0.01538	0.00085	3.42	0.01777	0.00256	0.00684	0.02563	0.17089	0.01709	0.07177	0.00085	0.17089	0.03298	0.00854	0.00256	0.00085	0.00256	0.17089	9.66E-03	1.70E-04	5.70E+01	8.72E-01	3.44E+02	
22	72	0.00838	0.00042	0.00838	0.00838	0.00084	7.27	0.00084	0.00335	0.00084	0.00251	0.01675	0.00084	3.69	0.02580	0.00251	0.00838	0.02513	0.16753	0.01675	0.08377	0.00084	0.16753	0.03351	0.00838	0.00251	0.00084	0.00251	0.26973	1.74E-02	1.90E-04	9.17E+01	7.13E-01	5.53E+02	
23	79	0.00681	0.00043	0.00852	0.00852	0.00085	5.69	0.00085	0.00341	0.00085	0.00255	0.01363	0.00085	3.07	0.02197	0.00255	0.00681	0.02555	0.17033	0.01703	0.08005	0.00085	0.17033	0.02708	0.00852	0.00255	0.00085	0.00255	0.26230	1.77E-02	2.01E-04	8.77E+01	8.47E-01	5.29E+02	
24	86	0.00677	0.00042	0.00846	0.00846	0.00085	6.35	0.00085	0.00338	0.00085	0.00254	0.01523	0.00085	3.30	0.02098	0.00254	0.00677	0.02538	0.16921	0.01692	0.07276	0.00085	0.16921	0.02978	0.00846	0.00254	0.00085	0.00254	0.24028	1.75E-02	2.17E-04	8.09E+01	7.13E-01	4.88E+02	
25	93	0.00863	0.00043	0.00863	0.00863	0.00086	7.28	0.00086	0.00345	0.00086	0.01726	0.01553	0.00086	3.81	0.02433	0.00259	0.00690	0.02588	0.17256	0.01726	0.08455	0.00086	0.17256	0.03417	0.00863	0.00259	0.00086	0.00259	0.27955	1.86E-02	1.34E-03	1.38E+01	6.80E-01	5.57E+02	
		0.01171	0.000539	0.01077	0.01077	0.001077	7.65	0.001077	0.004452	0.001077	0.00460	0.01838	0.00108	3.91	0.0259	0.00323	0.009800	0.0323	0.215	0.02155	0.099	0.001077	0.2155	0.0381	0.01077	0.00323	0.001077	0.00323	0.25722						

COLUMN LEACH
PROJECT
COLUMN C6A
SAMPLE WT.

CYCLE	DAYS	Molar Ratios																												Zn/S	Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd				
		Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk									
1	1	0.01863	0.00932	0.74540	0.18635	0.01863	174.42	0.01863	0.07454	0.01863	0.05590	0.09317	0.11181	488.23	2.13556	0.05590	0.03727	0.55905	16.39870	0.37270	0.33543	0.01863	8.94475	0.44724	0.18635	0.05590	0.01863	0.05590	14.05071	1.18E-02	5.49E-05	2.15E+02	7.47E-01	1.30E+03				
2	2	0.00484	0.00121	0.09672	0.02418	0.03385	215.19	0.00242	0.08221	0.00242	0.01451	0.13057	0.07737	379.61	2.59684	0.00725	0.07254	0.07254	16.44182	0.04836	0.50293	0.00242	6.28658	0.44345	0.09672	0.00725	0.00242	0.00725	16.00660	1.26E-02	1.34E-05	9.43E+02	9.26E-01	8.13E+02				
3	3	0.00853	0.00107	0.12798	0.02133	0.02133	195.81	0.00213	0.04266	0.00213	0.01706	0.07252	0.03413	178.32	1.50163	0.00640	0.03413	0.06399	10.23841	0.04266	0.28156	0.00213	2.13300	0.33275	0.04266	0.00640	0.00213	0.00640	7.59349	9.44E-03	2.48E-05	3.80E+02	1.01E+00	6.12E+02				
4	4	0.00979	0.00122	0.09795	0.02449	0.02449	283.07	0.00245	0.04897	0.00245	0.00735	0.10285	0.02938	135.66	1.67492	0.00735	0.03428	0.07346	10.77435	0.04897	0.38690	0.00245	0.97949	0.42216	0.09795	0.00735	0.00245	0.00735	8.61948	1.06E-02	1.06E-05	1.00E+03	9.81E-01	6.05E+02				
5	5	0.00927	0.00116	0.04636	0.02318	0.01854	240.59	0.00232	0.02781	0.00232	0.00695	0.06953	0.01854	76.02	1.17745	0.00695	0.02781	0.06953	7.41699	0.04636	0.28741	0.00232	0.46356	0.35509	0.02318	0.06953	0.01854	0.00695	5.60910	8.88E-03	1.29E-05	6.89E+02	1.06E+00	5.20E+02				
6	8	0.00310	0.00039	0.01550	0.00775	0.00620	85.42	0.00078	0.00930	0.00078	0.00233	0.02481	0.00465	17.21	0.33332	0.00233	0.00620	0.02326	1.86041	0.01550	0.08837	0.00078	0.15503	0.11255	0.00775	0.00233	0.00620	0.00233	1.62786	8.12E-03	1.36E-05	5.98E+02	1.08E+00	4.51E+02				
7	9	0.00436	0.00109	0.04358	0.02179	0.01743	236.66	0.00218	0.02615	0.00218	0.00654	0.05666	0.01308	39.84	0.80195	0.00654	0.01743	0.06538	3.92257	0.04358	0.26150	0.00218	0.43584	0.31729	0.02179	0.00654	0.01743	0.00654	4.53274	8.35E-03	1.41E-05	5.92E+02	1.10E+00	4.47E+02				
8	11	0.00235	0.00059	0.01174	0.01174	0.00939	139.51	0.00117	0.01409	0.00117	0.00352	0.03288	0.00470	16.93	0.40866	0.00352	0.01174	0.03523	2.11375	0.02349	0.14561	0.00117	0.23486	0.17309	0.01174	0.00352	0.01174	0.00352	2.55999	8.51E-03	1.37E-05	6.21E+02	1.10E+00	4.68E+02				
9	16	0.00175	0.00022	0.00437	0.00437	0.00350	46.71	0.00044	0.00437	0.00044	0.00131	0.01137	0.00262	5.90	0.11722	0.00131	0.00262	0.01312	0.69981	0.00875	0.05074	0.00044	0.08748	0.06377	0.00437	0.00131	0.00044	0.00131	0.86426	7.93E-03	1.41E-05	5.63E+02	1.18E+00	4.25E+02				
10	18	0.00221	0.00055	0.01105	0.01105	0.00884	114.70	0.00111	0.01105	0.00111	0.00332	0.02652	0.00442	12.91	0.25415	0.00332	0.00663	0.03315	1.32600	0.02210	0.12376	0.00111	0.22100	0.15669	0.01105	0.00332	0.00111	0.00332	1.98237	7.84E-03	1.53E-05	5.11E+02	1.14E+00	3.85E+02				
11	23	0.00084	0.00021	0.00420	0.00420	0.00252	42.72	0.00042	0.00336	0.00042	0.00126	0.01093	0.00168	4.72	0.08661	0.00126	0.00420	0.01261	0.42044	0.00841	0.04541	0.00042	0.08409	0.06088	0.00420	0.00126	0.00042	0.00126	0.77781	7.99E-03	1.52E-05	5.27E+02	1.18E+00	5.30E+02				
12	26	0.00313	0.00039	0.00783	0.00783	0.00470	85.80	0.00078	0.00626	0.00078	0.00235	0.02035	0.00313	7.97	0.15438	0.00235	0.00470	0.02349	0.78287	0.01566	0.09081	0.00078	0.15657	0.11352	0.00783	0.00235	0.00078	0.00235	1.49841	8.52E-03	1.56E-05	5.45E+02	1.09E+00	5.48E+02				
13	30	0.00217	0.00027	0.00543	0.00543	0.00434	59.39	0.00054	0.00434	0.00054	0.00163	0.01520	0.00217	5.39	0.09631	0.00163	0.00434	0.01629	0.43430	0.01086	0.06189	0.00054	0.10858	0.07937	0.00543	0.00163	0.00054	0.00163	1.02278	8.70E-03	1.62E-05	5.37E+02	1.06E+00	4.05E+02				
15	37	0.00063	0.00016	0.00314	0.00314	0.00188	31.23	0.00031	0.00251	0.00031	0.00094	0.00752	0.00125	2.88	0.04515	0.00094	0.00125	0.00941	0.18811	0.00627	0.03449	0.00031	0.06270	0.04345	0.00314	0.00094	0.00031	0.00094	0.53987	8.78E-03	1.79E-05	4.90E+02	1.05E+00	4.93E+02				
16	40	0.00294	0.00037	0.00734	0.00734	0.00440	64.16	0.00073	0.00440	0.00073	0.00220	0.01175	0.00147	5.89	0.09367	0.00220	0.00440	0.02202	0.29364	0.01468	0.07928	0.00073	0.14682	0.09323	0.00734	0.00220	0.00073	0.00220	1.20833	9.59E-03	2.05E-05	4.69E+02	1.05E+00	4.71E+02				
17	44	0.00199	0.00025	0.00499	0.00499	0.00299	41.98	0.00050	0.00299	0.00050	0.00150	0.01097	0.00100	4.27	0.05714	0.00150	0.00399	0.01496	0.29916	0.00997	0.05086	0.00050	0.09972	0.06452	0.00499	0.00150	0.00050	0.00150	0.75189	8.86E-03	2.06E-05	4.29E+02	1.06E+00	4.32E+02				
18	47	0.00316	0.00040	0.00791	0.00791	0.00474	60.72	0.00079	0.00474	0.00079	0.00237	0.01581	0.00158	6.29	0.08997	0.00237	0.00158	0.02372	0.31623	0.01581	0.09329	0.00079	0.15811	0.09740	0.00791	0.00237	0.00079	0.00237	1.24120	1.01E-02	2.26E-05	4.47E+02	1.06E+00	4.50E+02				
19	51	0.00209	0.00026	0.00522	0.00522	0.00313	37.77	0.00052	0.00313	0.00052	0.00157	0.01461	0.00209	4.30	0.08952	0.00157	0.00417	0.01565	0.20868	0.01043	0.08452	0.00052	0.10434	0.06469	0.00522	0.00157	0.00052	0.00157	1.29382	1.61E-02	2.28E-05	7.06E+02	1.10E+00	7.10E+02				
20	58	0.00142	0.00018	0.00354	0.00354	0.00142	25.43	0.00035	0.00213	0.00035	0.00106	0.00708	0.00142	3.65	0.05356	0.00106	0.00213	0.01063	0.14169	0.00708	0.04251	0.00035	0.07084	0.04839	0.00354	0.00106	0.00035	0.00106	0.62555	1.07E-02	2.13E-05	5.03E+02	1.14E+00	7.59E+02				
21	65	0.00033	0.00017	0.00331	0.00331	0.00132	18.94	0.00033	0.00132	0.00033	0.00099	0.00662	0.00132	3.38	0.03556	0.00099	0.00199	0.00993	0.06622	0.00662	0.03311	0.00033	0.06622	0.03920	0.00331	0.00099	0.00033	0.00099	0.45893	9.17E-03	2.32E-05	3.95E+02	1.25E+00	5.96E+02				
22	72	0.00067	0.00017	0.00337	0.00337	0.00135	25.11	0.00034	0.00135	0.00034	0.00101	0.00875	0.00135	4.78	0.04188	0.00101	0.00202	0.01010	0.13465	0.00673	0.03905	0.00034	0.06732	0.05440	0.00337	0.00101	0.00034	0.00101	0.52041	1.02E-02	2.32E-05	4.40E+02	9.46E-01	6.64E+02				
23	79	0.00066	0.00017	0.00330	0.00330	0.00132	21.78	0.00033	0.00132	0.00033	0.00099	0.00792	0.00132	4.48	0.04000	0.00099	0.00264	0.00990	0.06600	0.00660	0.03762	0.00033	0.06600	0.04858	0.00330	0.00099	0.00033	0.00099	0.53727	9.88E-03	2.13E-05	4.64E+02	1.14E+00	6.99E+02				
24	86	0.00066	0.00017	0.00330	0.00330	0.00198	22.64	0.00033	0.00198	0.00033	0.00099	0.00858	0.00132	4.63	0.06217	0.00099	0.00330	0.00990	0.13201	0.00660	0.05016	0.00033	0.06600	0.05142	0.00330	0.00099	0.00033	0.00099	0.89764	1.68E-02	2.17E-05	7.75E+02	1.08E+00	7.79E+02				
25	93	0.00136	0.00017	0.00339	0.00339	0.00203	23.99	0.00034	0.00203	0.00034	0.00339	0.00813	0.00136	4.92	0.06146	0.00102	0.00271	0.01016	0.06776	0.00678	0.04879	0.00034	0.06776	0.00678	0.04879	0.00034	0.06776	0.05529	0.00339	0.00102	0.00034	0.00102	0.83349	1.69E-02	8.03E-05	2.10E+02	9.43E-01	7.05E+02
		0.00129	0.000211	0.00422	0.00422	0.002335	34.48	0.000422	0.002578	0.000422	0.00149	0.00992	0.00151	4.55	0.0640	0.00126	0.002871	0.0126	0.208	0.00843	0.051	0.000422	0.0843	0.0592	0.00422	0.00126	0.000422	0.00126	0.78532									

COLUMN LEACH
PROJECT
COLUMN C7A
SAMPLE WT.

CYCLE	DAYS																													Molar Ratios					Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd
		Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk									
1	1	0.21981	0.10990	2.19809	2.19809	10.99046	134.52	0.21981	3.07733	571.50400	#####	1.09905	0.21981	195.19	61.98620	0.65943	0.43962	6.59428	43.96185	4.39618	6.59428	0.21981	43.96185	0.02198	2.19809	0.65943	0.21981	0.65943	#####	7.67E-01	3.34E-01	2.29E+00	1.45E+01	1.29E+03				
2	2	0.04987	0.00125	1.24668	1.24668	5.33579	92.75	0.12467	1.49602	247.83983	#####	0.49867	0.12467	94.25	30.02004	0.24934	0.49867	2.49336	24.93358	2.49336	3.98937	0.12467	24.93358	0.01247	1.24668	0.24934	0.12467	0.24934	#####	7.05E-01	2.85E-01	2.48E+00	1.34E+01	1.23E+03				
3	3	0.01193	0.00477	0.11934	0.11934	0.52508	19.86	0.01193	0.12411	25.87220	156.09244	0.28641	0.01193	10.31	3.36530	0.02387	0.02387	0.23867	2.38673	0.23867	1.47978	0.01193	2.38673	0.03103	0.28641	0.02387	0.01193	0.02387	359.44223	5.61E-01	2.85E-01	1.97E+00	1.07E+01	1.18E+03				
4	4	0.01230	0.00492	0.12303	0.12303	0.24113	10.83	0.01230	0.04921	12.15512	83.65874	0.59053	0.01230	5.36	1.75683	0.02461	0.02461	0.24606	2.46055	0.24606	1.23028	0.01230	2.46055	0.02461	0.12303	0.02461	0.01230	0.02461	164.85692	5.78E-01	3.43E-01	1.68E+00	8.89E+00	1.17E+03				
5	5	0.00978	0.00122	0.02444	0.02444	0.13198	6.50	0.00244	0.02933	6.94138	57.19305	0.78702	0.00244	3.25	1.04610	0.00733	0.00489	0.00000	0.48883	0.04888	1.17319	0.00244	0.48883	0.01662	0.02444	0.07332	0.00244	0.00733	83.10101	3.50E-01	2.82E-01	1.24E+00	1.23E+01	1.08E+03				
6	8	0.00327	0.00041	0.00817	0.00817	0.03433	2.03	0.00082	0.00817	1.99458	18.80134	0.42344	0.00082	1.03	0.31390	0.00245	0.00163	0.00000	0.16349	0.01635	0.42998	0.00082	0.16349	0.00572	0.00817	0.02452	0.00082	0.00245	21.90765	3.63E-01	3.65E-01	9.95E-01	9.92E+00	1.10E+03				
7	9	0.00472	0.00118	0.02362	0.02362	0.11811	5.86	0.00236	0.03307	6.94466	59.05323	0.86926	0.00236	4.00	1.21413	0.00709	0.00472	0.00000	0.47243	0.04724	1.99364	0.00236	0.47243	0.01606	0.02362	0.07086	0.00236	0.00709	76.06056	3.23E-01	2.93E-01	1.10E+00	1.16E+01	1.11E+03				
8	11	0.00244	0.00061	0.01218	0.01218	0.04872	2.48	0.00122	0.01462	3.36160	30.93651	0.62117	0.00122	1.74	0.54565	0.00365	0.00244	0.03654	0.24359	0.02436	0.87450	0.00122	0.24359	0.00780	0.01218	0.00365	0.00122	0.00365	33.37245	3.03E-01	3.28E-01	9.22E-01	1.26E+01	1.18E+03				
9	16	0.00093	0.00023	0.00464	0.00464	0.03342	1.14	0.00046	0.01114	2.42325	17.54767	0.16991	0.00046	1.05	0.33517	0.02321	0.00186	0.00000	0.09284	0.00928	0.58214	0.00046	0.09284	0.00306	0.00928	0.00139	0.00046	0.00139	22.09706	3.21E-01	2.98E-01	1.08E+00	1.47E+01	1.14E+03				
10	18	0.00235	0.00059	0.01173	0.01173	0.06333	1.88	0.00117	0.02346	5.13714	41.51934	0.48322	0.00117	1.79	0.57236	0.05864	0.00235	0.00000	0.23457	0.02346	1.16348	0.00117	0.23457	0.00657	0.04691	0.00352	0.00117	0.00352	43.63049	3.41E-01	3.80E-01	8.98E-01	1.62E+01	1.18E+03				
11	23	0.00090	0.00022	0.00899	0.00449	0.02607	0.63	0.00045	0.00899	2.15741	16.63004	0.16270	0.00045	0.67	0.21934	0.00135	0.00090	0.01348	0.08989	0.00899	0.46115	0.00045	0.08989	0.00252	0.00449	0.00135	0.00045	0.00135	18.51778	2.91E-01	3.06E-01	9.51E-01	2.25E+01	1.22E+03				
12	26	0.00164	0.00041	0.00820	0.00820	0.03609	0.79	0.00082	0.01312	2.93626	26.08184	0.33135	0.00082	0.85	0.28378	0.00246	0.00164	0.00000	0.16404	0.01640	0.60694	0.00082	0.16404	0.00394	0.00820	0.00246	0.00082	0.00246	25.58973	2.95E-01	3.52E-01	8.38E-01	2.44E+01	1.22E+03				
13	30	0.00116	0.00029	0.00582	0.00582	0.02679	0.49	0.00058	0.01048	2.17792	18.86751	0.18052	0.00058	0.61	0.20265	0.00175	0.00116	0.01747	0.11647	0.01165	0.45538	0.00058	0.11647	0.00245	0.00582	0.00175	0.00058	0.00175	19.44984	2.53E-01	2.87E-01	8.81E-01	3.15E+01	1.25E+03				
14	33	0.00159	0.00040	0.00796	0.00796	0.03660	0.63	0.00080	0.01432	3.16640	29.75462	0.31028	0.00080	0.77	0.25936	0.00239	0.00477	0.02387	0.15912	0.01591	0.62692	0.00080	0.15912	0.00398	0.01591	0.00239	0.00080	0.00239	26.25408	2.99E-01	3.96E-01	7.54E-01	2.85E+01	1.23E+03				
15	37	0.00059	0.00030	0.01181	0.00591	0.03071	0.47	0.00059	0.01299	2.62196	24.21182	0.22086	0.00059	0.62	0.21023	0.00177	0.00118	0.01772	0.11811	0.01181	0.49250	0.00059	0.11811	0.00272	0.01181	0.00177	0.00059	0.00177	21.96780	2.94E-01	3.80E-01	7.75E-01	3.05E+01	1.23E+03				
16	40	0.00157	0.00039	0.00787	0.00787	0.03464	0.51	0.00157	0.01417	2.97628	29.92030	0.31967	0.00079	0.66	0.22834	0.00236	0.00157	0.02362	0.15748	0.01575	0.57164	0.00079	0.15748	0.00362	0.00787	0.00236	0.00079	0.00236	25.19604	2.96E-01	4.12E-01	7.19E-01	3.25E+01	1.25E+03				
17	44	0.00116	0.00029	0.00578	0.00578	0.03238	0.44	0.00058	0.01388	2.70611	27.06114	0.21857	0.00058	0.60	0.21048	0.00173	0.00347	0.01735	0.11565	0.01156	0.52735	0.00058	0.11565	0.00289	0.00578	0.00173	0.00058	0.00173	23.47612	2.95E-01	3.98E-01	7.41E-01	3.39E+01	1.25E+03				
18	47	0.00161	0.00040	0.00807	0.00807	0.03226	0.45	0.00081	0.01452	2.87119	31.45404	0.32261	0.00081	0.61	0.21453	0.00242	0.00161	0.00000	0.16130	0.01613	0.57101	0.00081	0.16130	0.00306	0.00807	0.00242	0.00081	0.00242	23.71151	2.64E-01	4.10E-01	6.44E-01	3.79E+01	1.26E+03				
19	51	0.00124	0.00031	0.00619	0.00619	0.02972	0.46	0.00062	0.01362	2.51411	28.60883	0.27618	0.00062	0.58	0.20311	0.00186	0.00248	0.00000	0.12385	0.01238	0.56722	0.00062	0.12385	0.00272	0.00619	0.00186	0.00062	0.00186	22.04490	2.69E-01	4.09E-01	6.58E-01	3.55E+01	1.27E+03				
20	58	0.00076	0.00019	0.00381	0.00381	0.03123	0.42	0.00076	0.01219	2.54997	22.16254	0.15156	0.00038	0.54	0.19268	0.00114	0.00076	0.00000	0.07616	0.00762	0.47905	0.00038	0.07616	0.00183	0.00762	0.00114	0.00038	0.00114	21.78174	2.86E-01	3.40E-01	8.40E-01	3.57E+01	1.20E+03				
21	65	0.00073	0.00037	0.00731	0.00731	0.03217	0.35	0.00073	0.01243	2.55166	22.88453	0.13160	0.00073	0.51	0.19156	0.00219	0.00146	0.02193	0.14623	0.01462	0.45330	0.00073	0.14623	0.00227	0.00731	0.00219	0.00073	0.00219	23.76189	3.36E-01	3.79E-01	8.87E-01	3.63E+01	1.27E+03				
22	72	0.00074	0.00037	0.00736	0.00736	0.03753	0.38	0.00147	0.01398	3.04630	27.22541	0.13981	0.00074	0.57	0.20603	0.00221	0.00147	0.02207	0.14716	0.01472	0.53715	0.00074	0.14716	0.00221	0.00736	0.00221	0.00074	0.00221	28.54989	3.52E-01	3.93E-01	8.96E-01	3.74E+01	1.31E+03				
23	79	0.00072	0.00036	0.00722	0.00722	0.03537	0.30	0.00144	0.01299	2.78600	24.17902	0.11548	0.00072	0.50	0.17394	0.00217	0.00289	0.02165	0.14435	0.01444	0.46915	0.00072	0.14435	0.00224	0.00722	0.00217	0.00072	0.00217	26.41648	3.32E-01	3.55E-01	9.33E-01	4.34E+01	1.28E+03				
24	86	0.00144	0.00072	0.01439	0.01439	0.03957	0.32	0.00144	0.01511	3.08630	28.12925	0.11511	0.00144	0.55	0.19568	0.00360	0.00288	0.00000	0.28777	0.02878	0.51079	0.00144	0.28777	0.00201	0.01439	0.00360	0.00144	0.00360	28.99256	3.54E-01	4.02E-01	8.81E-01	4.09E+01	1.26E+03				
25	93	0.00074	0.00037	0.00736	0.00736	0.03900	0.32	0.00074	0.01472	3.00951	29.35930	0.11773	0.00074	0.52	0.19867	0.00221	0.00147	0.00000	0.14716	0.01472	0.50036	0.00074	0.14716	0.00199	0.00736	0.00221	0.00074	0.00221	28.84422	3.45E-01	4.11E-01	8.39E-01	4.36E+01	1.27E+03				
		0.00119	0.000378	0.00808	0.00756	0.035725	0.67	0.000929	0.013370	2.810661	25.63031	0.21417	0.00076	0.72	0.2448	0.00470	0.001948	0.0108	0.151	0.01511	0.551	0.000756	0.1511	0.0030	0.00946	0.00369	0.000756	0.00221	25.65113									

COLUMN LEACH
PROJECT
COLUMN C8A
SAMPLE WT.

CYCLE	DAYS																													Molar Ratios				
		Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk	Zn/S Zn/S	Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd
1	1	0.02528	0.01264	1.51674	0.25279	0.02528	197.18	0.02528	0.02528	0.02528	0.07584	0.12639	0.30335	1223.50	0.44491	0.07584	0.05056	0.75837	5.05579	0.50558	0.12639	0.02528	10.61716	0.25785	0.25279	0.07584	0.02528	0.07584	0.16077	5.26E-05	2.91E-05	1.81E+00	8.45E-01	1.09E+01
2	2	0.02726	0.01363	1.09029	0.27257	0.02726	239.86	0.02726	0.02726	0.02726	0.08177	0.13629	0.21806	872.23	0.34889	0.08177	0.05451	0.81772	5.45146	0.54515	0.13629	0.02726	5.45146	0.28893	0.27257	0.08177	0.02726	0.08177	0.06487	2.55E-05	3.76E-05	6.78E-01	9.30E-01	4.09E+00
3	3	0.01319	0.00165	0.19784	0.03297	0.00330	182.01	0.00330	0.00330	0.00330	0.27038	0.01649	0.09892	290.16	0.14508	0.00989	0.00659	0.09892	4.61616	0.06595	0.01649	0.00330	2.63780	0.18728	0.06595	0.00989	0.00330	0.00989	0.16882	1.68E-04	3.15E-04	5.33E-01	9.34E-01	8.80E+01
4	4	0.02044	0.00170	0.20443	0.03407	0.00341	240.55	0.00341	0.00341	0.00341	0.01022	0.01704	0.08177	192.85	0.13561	0.01022	0.00681	0.10221	4.77003	0.06814	0.05451	0.00341	2.04430	0.23373	0.03407	0.01022	0.00341	0.01022	0.02998	3.67E-05	1.47E-05	2.51E+00	8.97E-01	1.51E+01
5	5	0.01297	0.00162	0.06485	0.03242	0.00324	142.01	0.00324	0.00324	0.00324	0.00973	0.01621	0.05188	97.27	0.08625	0.00973	0.00648	0.09727	2.59384	0.06485	0.05188	0.00324	0.64846	0.15498	0.03242	0.09727	0.00648	0.00973	0.02270	4.02E-05	2.01E-05	1.99E+00	1.15E+00	1.20E+01
6	8	0.00662	0.00055	0.02205	0.01103	0.00110	38.38	0.00110	0.00110	0.00110	0.00331	0.00551	0.01544	25.80	0.02580	0.00331	0.00221	0.03308	0.88220	0.02205	0.01764	0.00110	0.22055	0.04720	0.01103	0.03308	0.00110	0.00331	0.01037	9.75E-05	3.64E-05	2.68E+00	8.06E-01	1.62E+01
7	9	0.01222	0.00153	0.12222	0.03055	0.00306	96.55	0.00306	0.00306	0.00306	0.00917	0.01528	0.05500	80.05	0.09655	0.00917	0.00611	0.09166	3.05546	0.06111	0.05500	0.00306	0.61109	0.12527	0.06111	0.09166	0.00306	0.00917	0.14788	4.54E-04	3.30E-05	1.38E+01	8.73E-01	8.32E+01
8	11	0.01022	0.00085	0.03407	0.01704	0.00170	38.50	0.00170	0.00170	0.00170	0.00511	0.00852	0.02044	33.02	0.04259	0.00511	0.00341	0.05111	1.36287	0.03407	0.02726	0.00170	0.34072	0.05554	0.01704	0.00511	0.00341	0.00511	0.01499	1.08E-04	4.31E-05	2.51E+00	9.15E-01	1.51E+01
9	16	0.00246	0.00031	0.01231	0.00615	0.00062	12.56	0.00062	0.00062	0.00062	0.00185	0.00308	0.01108	13.17	0.01526	0.00185	0.00123	0.01846	0.61549	0.01231	0.00985	0.00062	0.12310	0.02019	0.00615	0.00185	0.00062	0.00185	0.00185	3.65E-05	4.27E-05	8.54E-01	9.06E-01	5.16E+00
10	18	0.00646	0.00081	0.03231	0.01616	0.00162	23.36	0.00162	0.00162	0.00162	0.00485	0.00808	0.02585	29.73	0.03878	0.00485	0.00323	0.04847	1.61566	0.03231	0.02585	0.00162	0.32313	0.04459	0.01616	0.00485	0.00162	0.00485	0.01131	1.28E-04	6.45E-05	1.99E+00	7.46E-01	1.20E+01
11	23	0.00249	0.00031	0.02488	0.00622	0.00062	7.34	0.00062	0.00062	0.00062	0.00187	0.00311	0.00746	10.53	0.01219	0.00187	0.00124	0.01866	0.37325	0.01244	0.00746	0.00062	0.12442	0.01568	0.00622	0.00187	0.00062	0.00187	0.00286	8.57E-05	6.54E-05	1.31E+00	8.29E-01	7.91E+00
12	26	0.00670	0.00056	0.02235	0.01117	0.00112	12.07	0.00112	0.00112	0.00112	0.00335	0.00559	0.01341	17.97	0.02145	0.00335	0.00223	0.03352	0.89392	0.02235	0.01788	0.00112	0.22348	0.02726	0.01117	0.00335	0.00112	0.00335	0.00268	6.25E-05	9.14E-05	6.83E-01	6.31E-01	4.12E+00
13	30	0.00315	0.00039	0.01577	0.00789	0.00079	5.87	0.00079	0.00079	0.00079	0.00237	0.00394	0.00789	9.46	0.00931	0.00237	0.00158	0.02366	0.31544	0.01577	0.00789	0.00079	0.15772	0.01483	0.00789	0.00237	0.00079	0.00237	0.00142	5.03E-05	9.80E-05	5.13E-01	8.07E-01	3.09E+00
14	33	0.00646	0.00054	0.01077	0.01077	0.00108	8.88	0.00108	0.00108	0.00108	0.00323	0.00539	0.01077	14.33	0.01594	0.00323	0.00215	0.03231	0.86168	0.02154	0.01508	0.00108	0.21542	0.02434	0.01077	0.00323	0.00108	0.00323	0.00129	4.54E-05	1.33E-04	3.42E-01	5.37E-01	2.06E+00
15	37	0.00475	0.00040	0.01583	0.00791	0.00079	5.92	0.00079	0.00079	0.00079	0.00237	0.00396	0.00791	10.56	0.00918	0.00237	0.00158	0.02374	0.47480	0.01583	0.00950	0.00079	0.15827	0.01614	0.00791	0.00237	0.00079	0.00237	0.00040	1.84E-05	1.29E-04	1.42E-01	5.67E-01	8.59E-01
16	40	0.00648	0.00054	0.01081	0.01081	0.00108	7.57	0.00108	0.00108	0.00108	0.00324	0.00540	0.00865	13.19	0.01254	0.00324	0.00216	0.03242	0.64846	0.02162	0.01081	0.00108	0.21615	0.02226	0.01081	0.00324	0.00108	0.00324	0.00054	2.04E-05	1.43E-04	1.42E-01	5.54E-01	8.59E-01
17	44	0.00420	0.00035	0.01401	0.00701	0.00070	5.18	0.00070	0.00070	0.00070	0.00210	0.00350	0.00701	9.22	0.00743	0.00210	0.00140	0.02102	0.56053	0.01401	0.00841	0.00070	0.14013	0.01485	0.00701	0.00210	0.00070	0.00210	0.00035	2.07E-05	1.46E-04	1.42E-01	5.08E-01	8.59E-01
18	47	0.00891	0.00056	0.01114	0.01114	0.00111	9.00	0.00111	0.00111	0.00223	0.00334	0.00557	0.00891	14.90	0.01359	0.00334	0.00223	0.03341	0.66824	0.02227	0.01782	0.00111	0.22275	0.02495	0.01114	0.00334	0.00111	0.00334	0.00223	7.98E-05	1.40E-04	5.70E-01	5.10E-01	3.44E+00
19	51	0.00635	0.00040	0.00794	0.00794	0.00079	5.69	0.00079	0.00079	0.00159	0.00238	0.00397	0.00794	10.64	0.01096	0.00238	0.00159	0.02382	0.47645	0.01588	0.01588	0.00079	0.15882	0.01668	0.00794	0.00238	0.00079	0.00238	0.00079	1.45E-04	1.70E-04	8.54E-01	4.34E-01	5.16E+00
20	58	0.00394	0.00025	0.00986	0.00493	0.00049	3.78	0.00049	0.00049	0.00049	0.00148	0.00247	0.00493	7.09	0.00651	0.00148	0.00099	0.01479	0.29581	0.00986	0.00690	0.00049	0.09860	0.01035	0.00493	0.00148	0.00049	0.00148	0.00118	1.14E-04	1.67E-04	6.83E-01	4.10E-01	4.12E+00
21	65	0.00372	0.00023	0.00465	0.00465	0.00046	3.67	0.00046	0.00046	0.00046	0.00139	0.00232	0.00465	7.26	0.00502	0.00139	0.00093	0.01394	0.27885	0.00930	0.00651	0.00046	0.09295	0.01004	0.00465	0.00139	0.00046	0.00139	0.00139	1.30E-04	1.53E-04	8.54E-01	4.19E-01	5.16E+00
22	72	0.00282	0.00023	0.00939	0.00469	0.00047	3.33	0.00047	0.00047	0.00047	0.00141	0.00235	0.00469	6.57	0.00347	0.00141	0.00094	0.01408	0.18779	0.00939	0.00563	0.00047	0.09389	0.00883	0.00469	0.00141	0.00047	0.00141	0.00075	7.12E-05	1.56E-04	4.56E-01	4.56E-01	2.75E+00
23	79	0.00374	0.00023	0.00936	0.00468	0.00047	3.55	0.00047	0.00047	0.00047	0.00140	0.00234	0.00468	7.07	0.00281	0.00140	0.00094	0.01404	0.28074	0.00936	0.00561	0.00047	0.09358	0.00926	0.00468	0.00140	0.00047	0.00140	0.00159	1.51E-04	1.56E-04	9.68E-01	4.24E-01	5.84E+00
24	86	0.00281	0.00023	0.00936	0.00468	0.00047	3.59	0.00047	0.00047	0.00094	0.00140	0.00234	0.00468	7.14	0.00271	0.00140	0.00094	0.01404	0.28074	0.00936	0.00561	0.00047	0.09358	0.00898	0.00468	0.00140	0.00047	0.00140	0.00075	7.53E-05	1.65E-04	4.56E-01	3.97E-01	2.75E+00
25	93	0.00288	0.00024	0.00961	0.00480	0.00048	3.93	0.00048	0.00048	0.00048	0.00144	0.00240	0.00480	8.10	0.00298	0.00144	0.00096	0.01441	0.28827	0.00961	0.00673	0.00048	0.09609	0.00990	0.00480	0.00144	0.00048	0.00144	0.00154	1.42E-04	1.56E-04	9.11E-01	3.83E-01	5.50E+00
		0.00332	0.000237	0.00870	0.00474	0.000474	3.64	0.000474	0.000474	0.000552	0.00142	0.00237	0.00474	7.21	0.0039	0.00142	0.000948	0.0142	0.269	0.00948	0.006	0.000474	0.0948	0.0096	0.00474	0.00142	0.000474	0.00142	0.00120					

COLUMN LEACH
PROJECT
COLUMN C9A
SAMPLE WT.

CYCLE	DAYS	Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk	Molar Ratios Zn/S	Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd
1	1	0.28799	0.14400	2.87991	2.87991	35.71093	324.85	0.28799	14.97555	85.82144	#####	1.43996	0.57598	829.42	139.38784	0.86397	5.75983	8.63974	57.59828	5.75983	29.37512	0.28799	57.59828	0.51838	8.63974	0.86397	0.28799	0.86397	#####	3.49E-01	5.48E-01	6.36E-01	1.07E+01	4.93E+02
2	2	0.16033	0.06413	1.60325	1.60325	14.62165	336.68	0.16033	6.22061	17.05859	#####	0.64130	0.16033	356.56	61.69310	0.32065	3.20650	3.20650	32.06502	3.20650	23.08682	0.16033	32.06502	0.32065	3.20650	0.32065	0.16033	0.32065	#####	3.53E-01	5.28E-01	6.69E-01	7.82E+00	4.89E+02
3	3	0.02830	0.01415	0.56609	0.28304	4.64191	253.61	0.07359	2.15113	1.92469	#####	0.33965	0.11322	138.69	26.09657	0.08491	1.01896	0.84913	5.66086	0.56609	15.51076	0.02830	5.66086	0.16416	0.28304	0.08491	0.02830	0.08491	#####	2.91E-01	5.25E-01	5.55E-01	6.42E+00	5.45E+02
4	4	0.01598	0.00639	0.38359	0.15983	2.17369	228.24	0.01598	1.02291	0.76079	#####	0.51146	0.04475	76.08	14.00113	0.03197	0.63932	0.31966	3.19661	0.31966	13.87327	0.01598	3.19661	0.13426	0.95898	0.03197	0.01598	0.03197	735.21929	2.61E-01	4.88E-01	5.34E-01	4.89E+00	5.81E+02
5	5	0.01484	0.00594	0.14845	0.14845	1.35386	187.05	0.01484	0.65318	0.38003	807.56353	0.59380	0.01484	49.94	10.27268	0.44535	0.35628	0.29690	2.96898	0.29690	12.41035	0.01484	2.96898	0.12292	0.14845	0.02969	0.01484	0.02969	516.00934	2.55E-01	4.68E-01	5.46E-01	4.60E+00	6.55E+02
6	8	0.00503	0.00201	0.05034	0.05034	0.31614	50.74	0.00503	0.15706	0.10068	178.60904	0.24164	0.00503	12.50	2.65799	0.10068	0.10068	0.10068	1.00682	0.10068	3.96685	0.00503	1.00682	0.03765	0.14095	0.10068	0.00503	0.01007	130.88599	2.67E-01	4.27E-01	6.26E-01	4.21E+00	7.12E+02
7	9	0.01504	0.00602	0.15043	0.15043	1.17936	148.02	0.01504	0.60773	0.42722	433.83579	0.90257	0.03610	47.60	11.01137	0.45129	0.42120	0.30086	3.00857	0.30086	13.89959	0.01504	3.00857	0.12455	0.15043	0.30086	0.01504	0.03009	528.30489	3.52E-01	3.39E-01	1.04E+00	4.06E+00	7.70E+02
8	11	0.00742	0.00297	0.07422	0.07422	0.58489	58.49	0.00742	0.29987	0.19595	153.79335	0.44535	0.00742	22.80	5.10665	0.22267	0.23752	0.14845	1.48449	0.14845	6.85835	0.00742	1.48449	0.05968	0.07422	0.01484	0.00742	0.01484	271.95889	3.90E-01	2.58E-01	1.51E+00	4.45E+00	7.99E+02
9	16	0.00598	0.00299	0.05978	0.05978	0.38256	24.39	0.00598	0.19128	0.13151	64.19893	0.21519	0.00598	12.55	3.16810	0.00179	0.13151	0.17933	1.19551	0.11955	3.40721	0.00598	1.19551	0.02989	0.05978	0.01793	0.00598	0.01793	191.28171	5.20E-01	2.04E-01	2.55E+00	5.00E+00	8.59E+02
10	18	0.01494	0.00747	0.14944	0.14944	1.01618	46.33	0.01494	0.47820	0.35865	136.58710	0.53798	0.01494	28.63	7.32250	0.00448	0.38854	0.44832	2.98878	0.29888	8.69734	0.01494	2.98878	0.06874	0.14944	0.04483	0.01494	0.04483	490.15939	7.10E-01	2.32E-01	3.07E+00	4.52E+00	8.29E+02
11	23	0.00548	0.00274	0.05483	0.05483	0.65793	16.12	0.00548	0.33993	1.05268	47.69969	0.14255	0.00548	11.51	3.03743	0.00164	0.24124	0.16448	1.09654	0.10965	3.55280	0.00548	1.09654	0.02522	0.05483	0.01645	0.00548	0.01645	230.27436	6.23E-01	1.51E-01	4.12E+00	6.46E+00	6.02E+02
12	26	0.00960	0.00480	0.09600	0.09600	1.01757	21.31	0.00960	0.57598	1.99674	82.55754	0.19199	0.00960	16.11	4.37747	0.00288	0.38399	0.28799	1.91994	0.19199	6.02862	0.00960	1.91994	0.04032	0.09600	0.02880	0.00960	0.02880	355.18940	5.70E-01	1.55E-01	3.68E+00	7.99E+00	6.00E+02
13	30	0.00680	0.00340	0.06804	0.06804	0.84369	14.70	0.00680	0.50349	2.39498	73.34626	0.10886	0.00680	12.68	3.38835	0.00204	0.32659	0.20412	1.36078	0.13608	4.72192	0.00680	1.36078	0.02858	0.06804	0.02041	0.00680	0.02041	285.76467	5.66E-01	1.70E-01	3.33E+00	8.70E+00	5.82E+02
14	33	0.00943	0.00472	0.09435	0.09435	1.07556	16.85	0.00943	0.64156	3.26443	99.25378	0.18870	0.00943	15.91	4.15130	0.00283	0.41513	0.28304	1.88695	0.18870	6.69869	0.00943	1.88695	0.03585	0.09435	0.02830	0.00943	0.02830	364.18212	6.35E-01	2.03E-01	3.13E+00	8.16E+00	5.82E+02
15	37	0.00693	0.00346	0.06928	0.06928	0.85903	12.07	0.00693	0.48493	3.08972	83.54720	0.11084	0.00693	12.32	3.21442	0.02078	0.34638	0.20783	1.38553	0.13855	5.19572	0.00693	1.38553	0.03048	0.06928	0.02078	0.00693	0.02078	290.96039	6.26E-01	2.10E-01	2.98E+00	8.81E+00	5.82E+02
16	40	0.00940	0.00470	0.09402	0.09402	1.01539	13.63	0.00940	0.58291	4.04277	103.98370	0.20684	0.00940	14.74	3.79832	0.02821	0.39487	0.28205	1.88036	0.18804	6.73168	0.00940	1.88036	0.03949	0.09402	0.02821	0.00940	0.02821	344.10519	6.05E-01	2.14E-01	2.83E+00	9.19E+00	5.82E+02
17	44	0.00698	0.00349	0.06977	0.06977	0.76748	9.50	0.00698	0.43258	3.16761	83.02763	0.11163	0.00698	11.33	2.84666	0.02093	0.27908	0.20931	1.39542	0.13954	5.14911	0.00698	1.39542	0.02930	0.06977	0.02093	0.00698	0.02093	262.33939	5.35E-01	1.98E-01	2.70E+00	1.07E+01	5.87E+02
18	47	0.00986	0.00493	0.09864	0.09864	0.94691	12.03	0.00986	0.55236	3.33390	126.25438	0.19727	0.00986	14.85	3.68900	0.02959	0.35509	0.29591	1.97272	0.19727	7.39772	0.00986	1.97272	0.02367	0.09864	0.02959	0.00986	0.02959	347.19953	5.81E-01	2.47E-01	2.35E+00	1.00E+01	6.30E+02
19	51	0.00735	0.00367	0.07348	0.07348	0.63195	8.74	0.00735	0.33802	1.70479	105.52064	0.17636	0.00735	12.11	2.82172	0.02204	0.23514	0.22045	1.46965	0.14696	6.05495	0.00735	1.46965	0.01764	0.07348	0.02204	0.00735	0.02204	255.71855	5.46E-01	2.64E-01	2.07E+00	1.00E+01	6.95E+02
20	58	0.00440	0.00220	0.04397	0.04397	0.52763	6.89	0.00440	0.26382	2.13690	79.14462	0.09673	0.00440	10.90	2.47107	0.01319	0.19346	0.13191	0.87938	0.08794	4.22105	0.00440	0.87938	0.01319	0.04397	0.01319	0.00440	0.01319	214.56986	5.65E-01	2.44E-01	2.32E+00	9.36E+00	6.99E+02
21	65	0.00430	0.00215	0.04298	0.04298	0.55873	6.92	0.00430	0.29226	2.69912	101.43179	0.08596	0.00430	11.78	2.62175	0.01289	0.24069	0.12894	0.85959	0.08596	4.27217	0.00430	0.85959	0.01461	0.04298	0.01289	0.00430	0.01289	222.63418	5.17E-01	2.76E-01	1.88E+00	1.00E+01	6.85E+02
22	72	0.00857	0.00428	0.08568	0.08568	0.68828	7.37	0.01714	0.34271	3.69265	137.93898	0.04284	0.00857	13.88	2.91300	0.02570	0.23989	0.25703	1.71353	0.17135	4.86642	0.00857	1.71353	0.01799	0.08568	0.02570	0.00857	0.02570	275.87795	5.31E-01	3.11E-01	1.71E+00	1.05E+01	7.09E+02
23	79	0.00845	0.00423	0.08455	0.08455	0.65100	6.76	0.00845	0.34664	4.44708	142.03617	0.04227	0.00845	13.61	2.72236	0.02536	0.23673	0.25364	1.69091	0.16909	4.60772	0.00845	1.69091	0.01353	0.08455	0.02536	0.00845	0.02536	263.78146	4.41E-01	2.78E-01	1.59E+00	1.25E+01	6.96E+02
24	86	0.00860	0.00430	0.08596	0.08596	0.66189	6.93	0.01719	0.36962	4.57303	177.07583	0.04298	0.00860	14.36	2.89682	0.02579	0.25788	0.25788	1.71918	0.17192	4.95984	0.00860	1.71918	0.01375	0.08596	0.02579	0.00860	0.02579	280.22681	4.93E-01	3.64E-01	1.35E+00	1.14E+01	7.28E+02
25	93	0.00440	0.00220	0.04397	0.04397	0.73868	6.59	0.01759	0.42210	6.39313	201.37909	0.07914	0.00879	14.95	3.00750	0.01319	0.27261	0.00000	0.87938	0.08794	5.32907	0.00440	0.87938	0.01231	0.04397	0.01319	0.00440	0.01319	306.90524	4.60E-01	3.54E-01	1.30E+00	1.31E+01	7.14E+02
		0.00716	0.003530	0.07162	0.07162	0.701713	15.62	0.009577	0.382338	2.894258	120.46452	0.14202	0.00775	14.13	3.2776	0.02831	0.265045	0.1993	1.432	0.14324	5.165	0.007162	1.4324	0.0251	0.07471	0.02714	0.007162	0.02098	274.00124					

COLUMN LEACH
PROJECT
COLUMN C10A
SAMPLE WT.

CYCLE	DAYS	Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk	Molar Ratios		Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd
																														Zn/S	Fe/Zn				
1	1	0.14019	0.07009	1.40189	1.40189	4.20566	129.53	0.14019	1.96264	1.40189	1.68226	0.70094	0.14019	1143.94	409.35065	0.42057	2.52339	4.20566	28.03772	2.80377	0.70094	0.14019	28.03772	0.01402	1.40189	0.42057	0.14019	0.42057	#####	5.14E-01	3.03E-04	1.69E+03	1.97E+00	1.36E+03	
2	2	0.04510	0.02255	1.35293	0.45098	2.88625	214.67	0.04510	1.21764	1.03725	2.52547	1.17254	0.04510	689.99	257.50787	0.13529	1.35293	1.35293	9.01954	0.90195	0.94705	0.04510	9.01954	0.00451	0.90195	0.13529	0.04510	0.13529	#####	4.46E-01	6.42E-04	6.96E+02	2.09E+00	1.22E+03	
3	3	0.02173	0.01087	0.21733	0.21733	1.21704	159.09	0.02173	0.47812	0.39119	2.26023	1.17358	0.02173	272.53	100.40617	0.06520	0.60852	0.65199	4.34659	0.43466	0.43466	0.02173	4.34659	0.04781	0.21733	0.06520	0.02173	0.06520	786.73236	4.63E-01	1.56E-03	2.97E+02	1.71E+00	1.11E+03	
4	4	0.01153	0.00461	0.27682	0.11534	0.80277	106.57	0.01153	0.30911	0.26298	1.06113	1.38408	0.01153	176.70	65.05195	0.02307	0.36909	0.23068	2.30681	0.23068	0.32295	0.01153	2.30681	0.03691	0.11534	0.02307	0.01153	0.02307	498.27026	4.06E-01	1.01E-03	4.01E+02	1.89E+00	1.07E+03	
5	5	0.01116	0.00447	0.11163	0.11163	0.59835	88.86	0.01116	0.21433	0.17861	1.20562	1.29493	0.01116	112.52	45.09918	0.22326	0.22326	0.22326	2.23263	0.22326	0.22326	0.01116	2.23263	0.03304	0.11163	0.22326	0.01116	0.02233	349.63031	3.88E-01	1.57E-03	2.48E+02	2.01E+00	1.00E+03	
6	8	0.00149	0.00074	0.04465	0.01488	0.14140	25.01	0.00149	0.04465	0.04168	0.31555	0.46141	0.00149	24.11	9.68963	0.07442	0.04465	0.04465	0.29768	0.02977	0.05954	0.00149	0.29768	0.00938	0.01488	0.04465	0.00149	0.00447	71.89078	3.35E-01	1.72E-03	1.95E+02	2.03E+00	8.74E+02	
7	9	0.00447	0.00223	0.17861	0.04465	0.39741	68.77	0.00447	0.13396	0.09824	1.92453	1.29493	0.00447	67.87	28.66701	0.22326	0.15182	0.13396	0.89305	0.08931	0.26792	0.00447	0.89305	0.02456	0.04465	0.13396	0.00447	0.01340	208.08139	3.60E-01	3.90E-03	9.24E+01	1.96E+00	9.00E+02	
8	11	0.00225	0.00112	0.04495	0.02247	0.16407	26.74	0.00225	0.05169	0.04495	0.71919	0.62929	0.00225	27.64	10.90022	0.00674	0.06742	0.06742	0.44949	0.04495	0.13485	0.00225	0.44949	0.01169	0.04495	0.00674	0.00225	0.00674	83.15630	3.40E-01	3.44E-03	9.88E+01	2.08E+00	8.71E+02	
9	16	0.00089	0.00045	0.02670	0.00890	0.07477	10.68	0.00089	0.02670	0.01424	0.63107	0.25813	0.00089	13.17	5.67875	0.00134	0.03115	0.02670	0.17802	0.01780	0.06231	0.00089	0.17802	0.00374	0.02670	0.00267	0.00089	0.00267	40.85496	3.59E-01	6.48E-03	5.53E+01	2.16E+00	9.39E+02	
10	18	0.00225	0.00113	0.04510	0.02255	0.18039	22.05	0.00225	0.06314	0.05412	1.94371	0.67647	0.00225	29.31	12.87539	0.00338	0.07892	0.06765	0.45098	0.04510	0.15784	0.00225	0.45098	0.00857	0.02255	0.00676	0.00225	0.00676	96.05810	4.31E-01	1.02E-02	4.22E+01	1.94E+00	9.15E+02	
11	23	0.00086	0.00043	0.02590	0.00863	0.07511	8.63	0.00086	0.02590	0.02763	0.97562	0.24175	0.00086	12.43	5.51702	0.00130	0.03367	0.02590	0.17268	0.01727	0.06907	0.00086	0.17268	0.00311	0.01727	0.00259	0.00086	0.00259	41.26974	4.13E-01	1.14E-02	3.61E+01	2.10E+00	9.44E+02	
12	26	0.00156	0.00078	0.04673	0.01558	0.11059	12.99	0.00156	0.03894	0.07009	1.54830	0.45172	0.00156	18.22	8.36459	0.00234	0.04829	0.04673	0.31153	0.03115	0.12461	0.00156	0.31153	0.00467	0.01558	0.00467	0.00156	0.00467	64.48675	4.08E-01	1.15E-02	3.56E+01	2.25E+00	1.00E+03	
13	30	0.00111	0.00056	0.03338	0.01113	0.07788	8.82	0.00111	0.02670	0.05674	1.15711	0.31153	0.00111	13.02	5.91907	0.00167	0.02782	0.03338	0.22252	0.02225	0.10013	0.00111	0.22252	0.00323	0.01113	0.00334	0.00111	0.00334	46.84079	4.15E-01	1.20E-02	3.46E+01	2.29E+00	1.03E+03	
14	33	0.00155	0.00077	0.01548	0.01548	0.10989	11.65	0.00155	0.03560	0.07584	1.56324	0.47981	0.00155	16.87	7.84715	0.00232	0.04179	0.04643	0.30955	0.03096	0.13930	0.00155	0.30955	0.00418	0.01548	0.00464	0.00155	0.00464	64.54163	4.67E-01	1.33E-02	3.53E+01	2.14E+00	1.01E+03	
15	37	0.00112	0.00056	0.02240	0.01120	0.07616	7.04	0.00112	0.02352	0.06944	1.05730	0.32481	0.00112	11.42	5.32012	0.00336	0.03024	0.03360	0.22401	0.02240	0.10080	0.00112	0.22401	0.00381	0.01120	0.00336	0.00112	0.00336	46.48104	4.88E-01	1.30E-02	3.76E+01	2.26E+00	1.05E+03	
16	40	0.00145	0.00073	0.01454	0.01454	0.08723	7.95	0.00145	0.02762	0.10758	0.95951	0.42160	0.00145	12.95	6.16414	0.00436	0.03053	0.04361	0.29076	0.02908	0.13084	0.00145	0.29076	0.00422	0.01454	0.00436	0.00145	0.00436	55.09930	4.80E-01	9.78E-03	4.91E+01	2.40E+00	1.09E+03	
17	44	0.00103	0.00052	0.01035	0.01035	0.06829	5.55	0.00103	0.02069	0.09416	0.69534	0.28972	0.00103	9.93	4.68731	0.00310	0.02173	0.03104	0.20695	0.02069	0.10347	0.00103	0.20695	0.00300	0.01035	0.00310	0.00103	0.00310	43.04457	4.33E-01	8.19E-03	5.29E+01	2.78E+00	1.08E+03	
18	47	0.00147	0.00073	0.01469	0.01469	0.09546	6.86	0.00147	0.02790	0.14833	1.15582	0.45528	0.00147	12.73	6.08018	0.00441	0.02644	0.04406	0.29373	0.02937	0.16155	0.00147	0.29373	0.00397	0.01469	0.00441	0.00147	0.00441	60.80179	5.07E-01	1.13E-02	4.49E+01	2.64E+00	1.09E+03	
19	51	0.00113	0.00057	0.01135	0.01135	0.07604	5.81	0.00113	0.02270	0.10100	1.37318	0.32911	0.00113	10.69	5.17496	0.00340	0.02383	0.03405	0.22697	0.02270	0.12483	0.00113	0.22697	0.00148	0.01135	0.00340	0.00113	0.00340	50.16081	4.64E-01	1.49E-02	3.12E+01	2.83E+00	1.13E+03	
20	58	0.00165	0.00066	0.01648	0.01648	0.05866	3.93	0.00165	0.01845	0.08173	0.85681	0.19773	0.00165	8.44	4.20498	0.00330	0.01977	0.03295	0.32954	0.03295	0.08568	0.00165	0.32954	0.00099	0.01648	0.00330	0.00165	0.00330	42.77479	5.67E-01	1.33E-02	4.27E+01	2.59E+00	1.25E+03	
21	65	0.00161	0.00064	0.01611	0.01611	0.05992	3.46	0.00161	0.01933	0.10437	0.92128	0.19328	0.00161	8.25	4.17476	0.00322	0.02577	0.03221	0.32213	0.03221	0.09664	0.00161	0.32213	0.00225	0.01611	0.00322	0.00161	0.00322	43.55149	5.34E-01	1.32E-02	4.04E+01	2.93E+00	1.25E+03	
22	72	0.00163	0.00065	0.01627	0.01627	0.06311	3.25	0.00163	0.01952	0.11516	0.93037	0.19518	0.00163	8.98	4.42415	0.00325	0.01952	0.03253	0.32531	0.03253	0.09759	0.00163	0.32531	0.00016	0.01627	0.00325	0.00163	0.00325	48.86086	5.54E-01	1.24E-02	4.49E+01	2.99E+00	1.33E+03	
23	79	0.00161	0.00064	0.01605	0.01605	0.06871	3.04	0.00161	0.02055	0.13485	0.95036	0.18622	0.00161	9.18	4.46925	0.00321	0.01926	0.03211	0.32107	0.03211	0.10274	0.00161	0.32107	0.00016	0.01605	0.00321	0.00161	0.00321	52.20546	5.94E-01	1.27E-02	4.69E+01	2.96E+00	1.31E+03	
24	86	0.00162	0.00065	0.01621	0.01621	0.07069	2.92	0.00162	0.02075	0.15629	1.01165	0.18806	0.00162	8.82	4.36435	0.00324	0.01945	0.03242	0.32425	0.03242	0.10376	0.00162	0.32425	0.00016	0.01621	0.00324	0.00162	0.00324	52.26841	5.89E-01	1.33E-02	4.41E+01	3.12E+00	1.27E+03	
25	93	0.00164	0.00066	0.01642	0.01642	0.07358	2.79	0.00164	0.02037	0.18986	1.31394	0.19709	0.00164	8.54	4.42797	0.00328	0.01971	0.03285	0.32848	0.03285	0.11825	0.00164	0.32848	0.00016	0.01642	0.00328	0.00164	0.00328	55.64522	6.25E-01	1.73E-02	3.62E+01	3.24E+00	1.30E+03	
		0.00144	0.000631	0.01862	0.01444	0.073882	5.41	0.001444	0.023026	0.108065	1.06108	0.26343	0.00144	10.54	5.0642	0.00306	0.025178	0.0342	0.289	0.02888	0.106	0.001444	0.2888	0.0019	0.01501	0.00342	0.001444	0.00342	50.05853						

COLUMN LEACH
PROJECT
COLUMN C12A
SAMPLE WT.

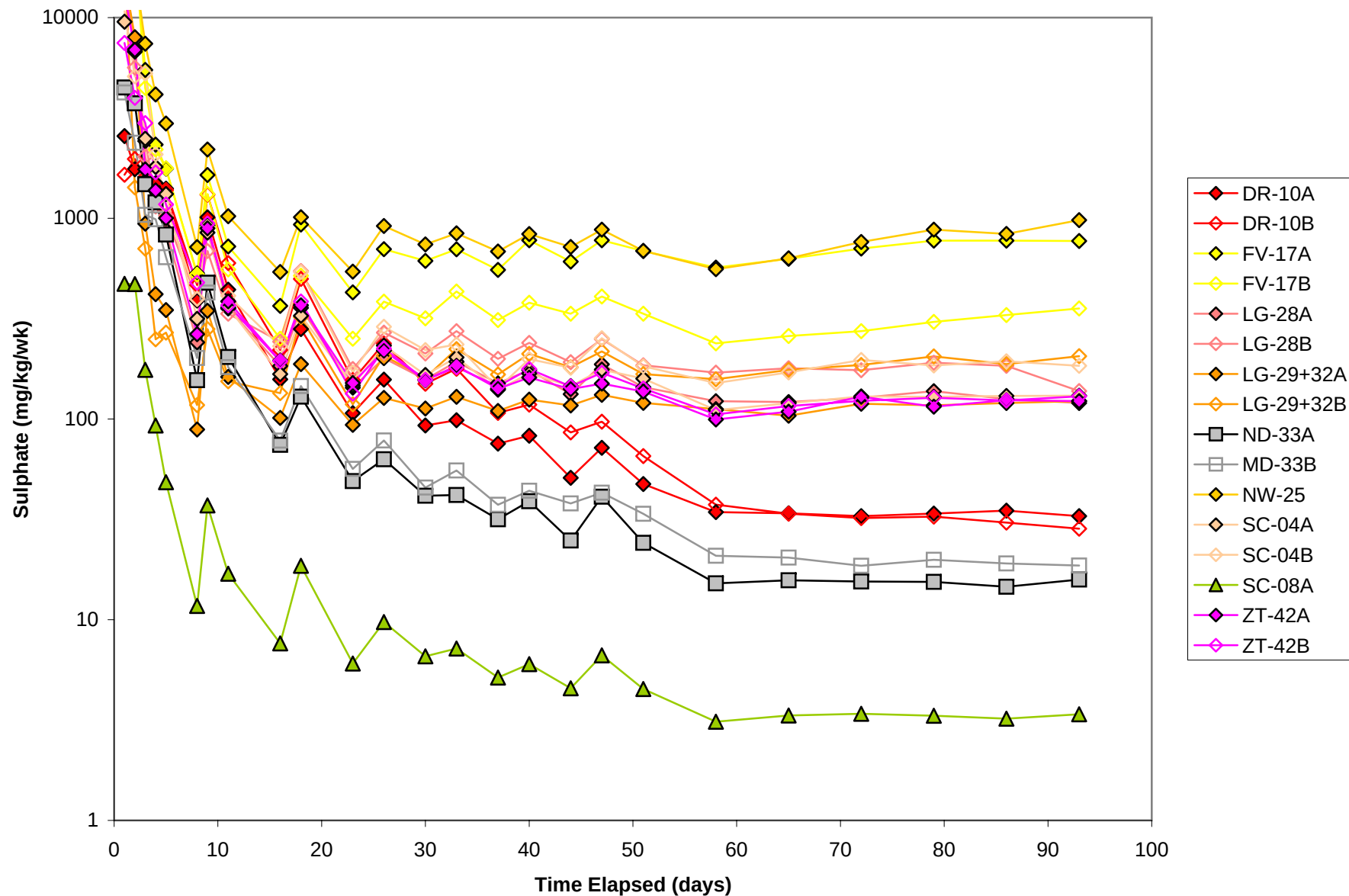
CYCLE	DAYS	Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk	Molar Ratios					
																														Zn/S	Fe/S	Zn/Fe	S/(Ca+Mg)	Zn/Cd	
1	1	0.01407	0.00088	0.07037	0.01759	0.00176	122.10	0.00176	0.00176	0.00176	0.00528	0.00880	0.06334	53.84	0.03624	0.00528	0.00352	0.05278	4.92613	0.03519	0.81985	0.00176	14.77840	1.44969	0.01759	0.00528	0.00176	0.00528	0.13301	4.14E-04	1.92E-05	2.15E+01	9.34E-01	1.30E+02	
2	2	0.00682	0.00085	0.06819	0.01705	0.00170	96.83	0.00170	0.00170	0.00170	0.00511	0.00852	0.04773	43.30	0.01568	0.00511	0.00341	0.05114	4.09136	0.03409	0.64098	0.00170	12.27408	1.13535	0.03409	0.00511	0.00170	0.00511	0.06001	1.87E-04	1.87E-05	1.00E+01	1.17E+00	6.05E+01	
3	3	0.00585	0.00073	0.02924	0.01462	0.00146	41.52	0.00146	0.00146	0.00146	0.00439	0.00731	0.02924	18.66	0.01257	0.00439	0.00292	0.04386	2.63172	0.02924	0.54096	0.00146	7.31033	0.49125	0.01462	0.00439	0.00146	0.00439	0.07603	6.35E-04	4.29E-05	1.48E+01	1.02E+00	8.94E+01	
4	4	0.01190	0.00099	0.01984	0.01984	0.00198	27.50	0.00198	0.00198	0.00198	0.00595	0.00992	0.03174	12.10	0.00674	0.00595	0.00397	0.05951	2.77732	0.03968	0.82526	0.00198	7.14168	0.33804	0.01984	0.00595	0.00198	0.00595	0.02896	4.58E-04	1.10E-04	4.16E+00	8.17E-01	2.51E+01	
5	5	0.01456	0.00091	0.01820	0.01820	0.00182	16.60	0.00182	0.00182	0.00182	0.00546	0.00910	0.02548	7.68	0.00328	0.00546	0.00364	0.05460	2.18400	0.03640	0.77168	0.00182	5.46000	0.22422	0.01820	0.00546	0.00182	0.00546	0.01929	5.85E-04	1.94E-04	3.02E+00	6.91E-01	1.82E+01	
6	8	0.00651	0.00033	0.00651	0.00651	0.00065	5.38	0.00065	0.00065	0.00065	0.00195	0.00326	0.00912	2.49	0.00130	0.00195	0.00130	0.01953	0.78139	0.01302	0.27739	0.00065	1.82324	0.07215	0.00651	0.00195	0.00065	0.00195	0.00547	6.85E-04	2.86E-04	2.39E+00	5.16E-01	1.44E+01	
7	9	0.01656	0.00083	0.01656	0.01656	0.00166	16.16	0.00166	0.00166	0.00166	0.00497	0.00828	0.02319	7.45	0.00497	0.00497	0.00331	0.04969	1.98744	0.03312	0.77179	0.00166	4.96860	0.21729	0.01656	0.00497	0.00166	0.00497	0.02252	8.92E-04	2.30E-04	3.87E+00	5.44E-01	2.34E+01	
8	11	0.00974	0.00049	0.00974	0.00974	0.00097	9.02	0.00097	0.00097	0.00097	0.00292	0.00487	0.01363	4.25	0.00195	0.00292	0.00195	0.02921	1.16844	0.01947	0.47906	0.00097	3.11584	0.12113	0.00974	0.00292	0.00097	0.00292	0.00818	7.09E-04	2.96E-04	2.39E+00	4.42E-01	1.44E+01	
9	16	0.00363	0.00018	0.00363	0.00363	0.00036	3.64	0.00036	0.00036	0.00036	0.00109	0.00181	0.00580	1.68	0.00116	0.00109	0.00073	0.01088	0.43534	0.00726	0.18357	0.00036	1.08836	0.04963	0.00363	0.00109	0.00036	0.00109	0.00392	7.55E-04	2.46E-04	3.08E+00	4.97E-01	1.86E+01	
10	18	0.01125	0.00047	0.00937	0.00937	0.00094	10.07	0.00094	0.00094	0.00094	0.00281	0.00469	0.01687	4.69	0.00319	0.00281	0.00187	0.02812	1.31222	0.01875	0.52489	0.00094	2.99936	0.14060	0.00937	0.00281	0.00094	0.00281	0.00694	5.49E-04	2.60E-04	2.11E+00	4.36E-01	1.27E+01	
11	23	0.00332	0.00017	0.00332	0.00332	0.00033	3.05	0.00033	0.00033	0.00033	0.00100	0.00166	0.00465	1.42	0.00100	0.00100	0.00066	0.00997	0.33245	0.00665	0.15559	0.00033	0.86438	0.04382	0.00332	0.00100	0.00033	0.00100	0.00246	5.97E-04	2.83E-04	2.11E+00	4.70E-01	1.27E+01	
12	26	0.00769	0.00032	0.00641	0.00641	0.00064	6.63	0.00064	0.00064	0.00064	0.00192	0.00321	0.01026	3.05	0.00218	0.00192	0.00128	0.01923	0.76925	0.01282	0.35001	0.00064	1.66672	0.09257	0.00641	0.00192	0.00064	0.00192	0.00603	9.08E-04	3.39E-04	2.68E+00	3.49E-01	1.62E+01	
13	30	0.00548	0.00023	0.00457	0.00457	0.00046	4.81	0.00046	0.00046	0.00046	0.00137	0.00228	0.00730	2.18	0.00155	0.00137	0.00091	0.01370	0.54782	0.00913	0.24652	0.00046	1.09564	0.06656	0.00457	0.00137	0.00046	0.00137	0.00466	1.04E-03	3.58E-04	2.90E+00	3.26E-01	1.75E+01	
14	33	0.00730	0.00030	0.00609	0.00609	0.00061	5.81	0.00061	0.00061	0.00061	0.00183	0.00304	0.00852	2.65	0.00329	0.00183	0.00122	0.01826	0.73043	0.01217	0.30678	0.00061	1.33912	0.08181	0.00609	0.00183	0.00061	0.00183	0.01059	2.17E-03	4.37E-04	4.96E+00	2.95E-01	2.99E+01	
15	37	0.00551	0.00023	0.00460	0.00460	0.00046	4.10	0.00046	0.00046	0.00046	0.00138	0.00230	0.00643	1.96	0.00129	0.00138	0.00092	0.01379	0.55146	0.00919	0.21875	0.00046	0.91910	0.05652	0.00460	0.00138	0.00046	0.00138	0.00377	1.08E-03	4.60E-04	2.34E+00	2.93E-01	1.41E+01	
16	40	0.00841	0.00030	0.00601	0.00601	0.00060	5.36	0.00060	0.00060	0.00060	0.00180	0.00300	0.00721	2.46	0.00168	0.00180	0.00120	0.01802	0.60060	0.01201	0.28949	0.00060	1.08108	0.07495	0.00601	0.00180	0.00060	0.00180	0.00432	1.06E-03	5.16E-04	2.05E+00	2.66E-01	1.24E+01	
17	44	0.00580	0.00021	0.00414	0.00414	0.00041	3.89	0.00041	0.00041	0.00041	0.00124	0.00207	0.00497	1.79	0.00124	0.00124	0.00083	0.01242	0.49686	0.00828	0.20537	0.00041	0.74529	0.05358	0.00414	0.00124	0.00041	0.00124	0.00306	9.88E-04	4.69E-04	2.11E+00	2.78E-01	1.27E+01	
18	47	0.00912	0.00033	0.00651	0.00651	0.00065	6.03	0.00065	0.00065	0.00065	0.00195	0.00326	0.00781	2.76	0.00182	0.00195	0.00130	0.01953	0.78139	0.01302	0.32818	0.00065	1.04185	0.08491	0.00651	0.00195	0.00065	0.00195	0.00443	9.79E-04	5.06E-04	1.94E+00	2.62E-01	1.17E+01	
19	51	0.00645	0.00020	0.00403	0.00403	0.00040	3.76	0.00040	0.00040	0.00040	0.00081	0.00121	0.00202	0.00565	1.76	0.00121	0.00121	0.00081	0.01210	0.48412	0.00807	0.22673	0.00040	0.64549	0.05358	0.00403	0.00121	0.00040	0.00121	0.00242	7.87E-04	4.60E-04	1.71E+00	2.83E-01	1.03E+01
20	58	0.00435	0.00014	0.00272	0.00272	0.00027	2.80	0.00027	0.00027	0.00027	0.00082	0.00136	0.00327	1.30	0.00087	0.00082	0.00054	0.00816	0.32656	0.00544	0.14586	0.00027	0.43541	0.03902	0.00272	0.00082	0.00027	0.00082	0.00250	1.19E-03	4.52E-04	2.62E+00	2.63E-01	1.58E+01	
21	65	0.00359	0.00013	0.00257	0.00257	0.00026	2.34	0.00026	0.00026	0.00026	0.00205	0.00128	0.00308	1.12	0.00082	0.00077	0.00051	0.00770	0.25653	0.00513	0.14263	0.00026	0.35915	0.03299	0.00257	0.00077	0.00026	0.00077	0.00195	8.59E-04	1.06E-03	8.12E-01	3.32E-01	1.31E+01	
22	72	0.00412	0.00013	0.00257	0.00257	0.00026	2.67	0.00026	0.00026	0.00026	0.00077	0.00129	0.00309	1.25	0.00088	0.00077	0.00051	0.00772	0.30888	0.00515	0.13333	0.00026	0.36036	0.03671	0.00257	0.00077	0.00026	0.00077	0.00278	1.20E-03	3.91E-04	3.08E+00	3.00E-01	1.86E+01	
23	79	0.00358	0.00013	0.00256	0.00256	0.00026	2.62	0.00026	0.00026	0.00026	0.00077	0.00128	0.00307	1.24	0.00087	0.00077	0.00051	0.00767	0.35793	0.00511	0.13141	0.00026	0.35793	0.03610	0.00256	0.00077	0.00026	0.00077	0.00215	9.49E-04	3.97E-04	2.39E+00	2.98E-01	1.44E+01	
24	86	0.00363	0.00013	0.00259	0.00259	0.00026	2.70	0.00026	0.00026	0.00026	0.00078	0.00130	0.00311	1.24	0.00088	0.00078	0.00052	0.00777	0.31096	0.00518	0.12957	0.00026	0.31096	0.03695	0.00259	0.00078	0.00026	0.00078	0.00202	9.24E-04	4.16E-04	2.22E+00	2.83E-01	1.34E+01	
25	93	0.00364	0.00013	0.00260	0.00260	0.00026	2.62	0.00026	0.00026	0.00026	0.00078	0.00130	0.00312	1.25	0.00099	0.00078	0.00052	0.00780	0.31200	0.00520	0.13104	0.00026	0.31200	0.03666	0.00260	0.00078	0.00026	0.00078	0.00567	2.46E-03	3.97E-04	6.21E+00	3.01E-01	3.75E+01	
		0.00498	0.000187	0.00375	0.00375	0.000375	3.68	0.000375	0.000375	0.000394	0.00123	0.00187	0.00507	1.71	0.0012	0.00112	0.000749	0.0112	0.446	0.00749	0.193	0.000375	0.7283	0.0512	0.00375	0.00112	0.000375	0.00112	0.000375	0.00112	0.000375	0.00112	0.000375	0.00112	0.000375

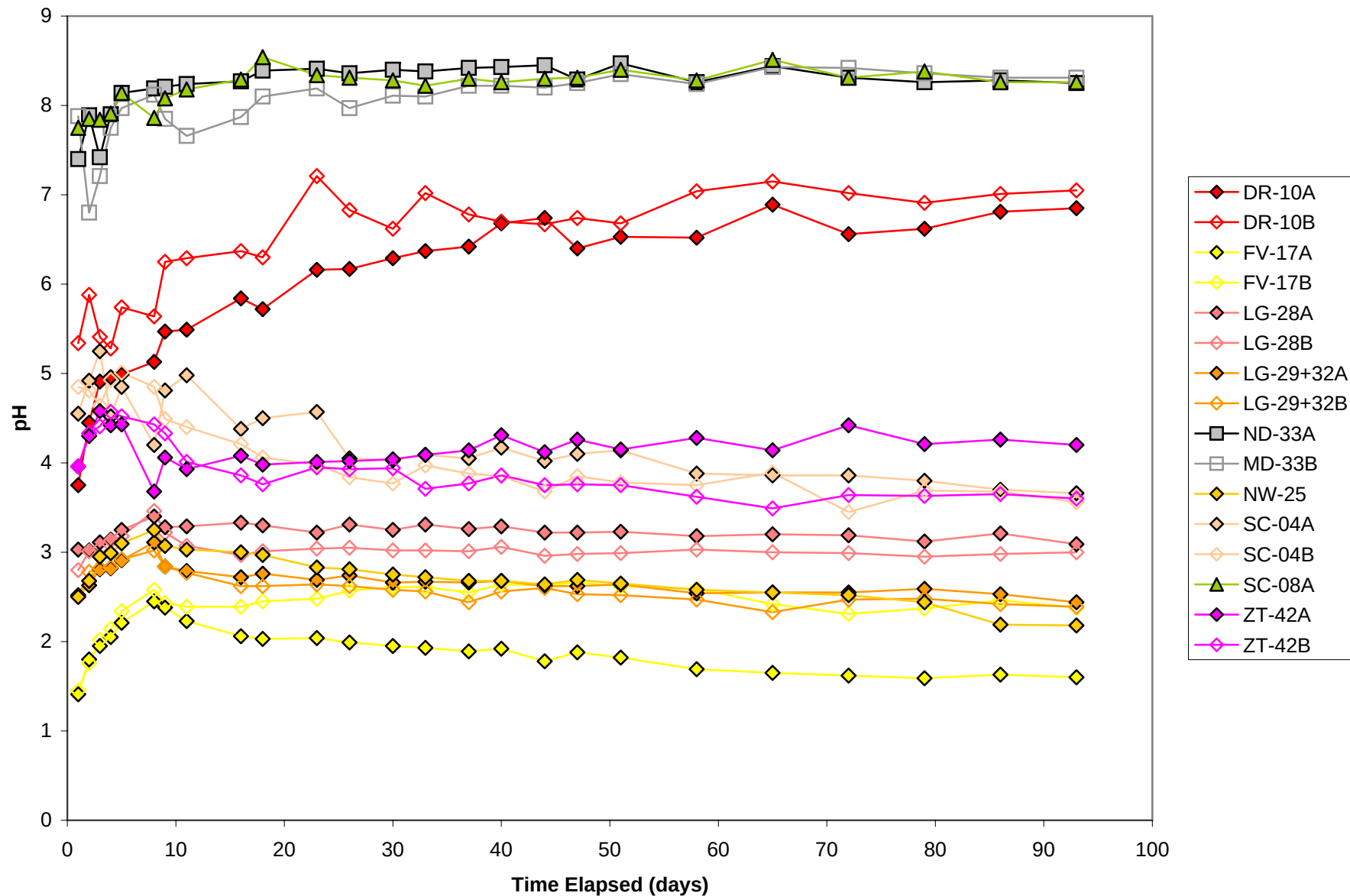
COLUMN LEACH
PROJECT
COLUMN C13A
SAMPLE WT.

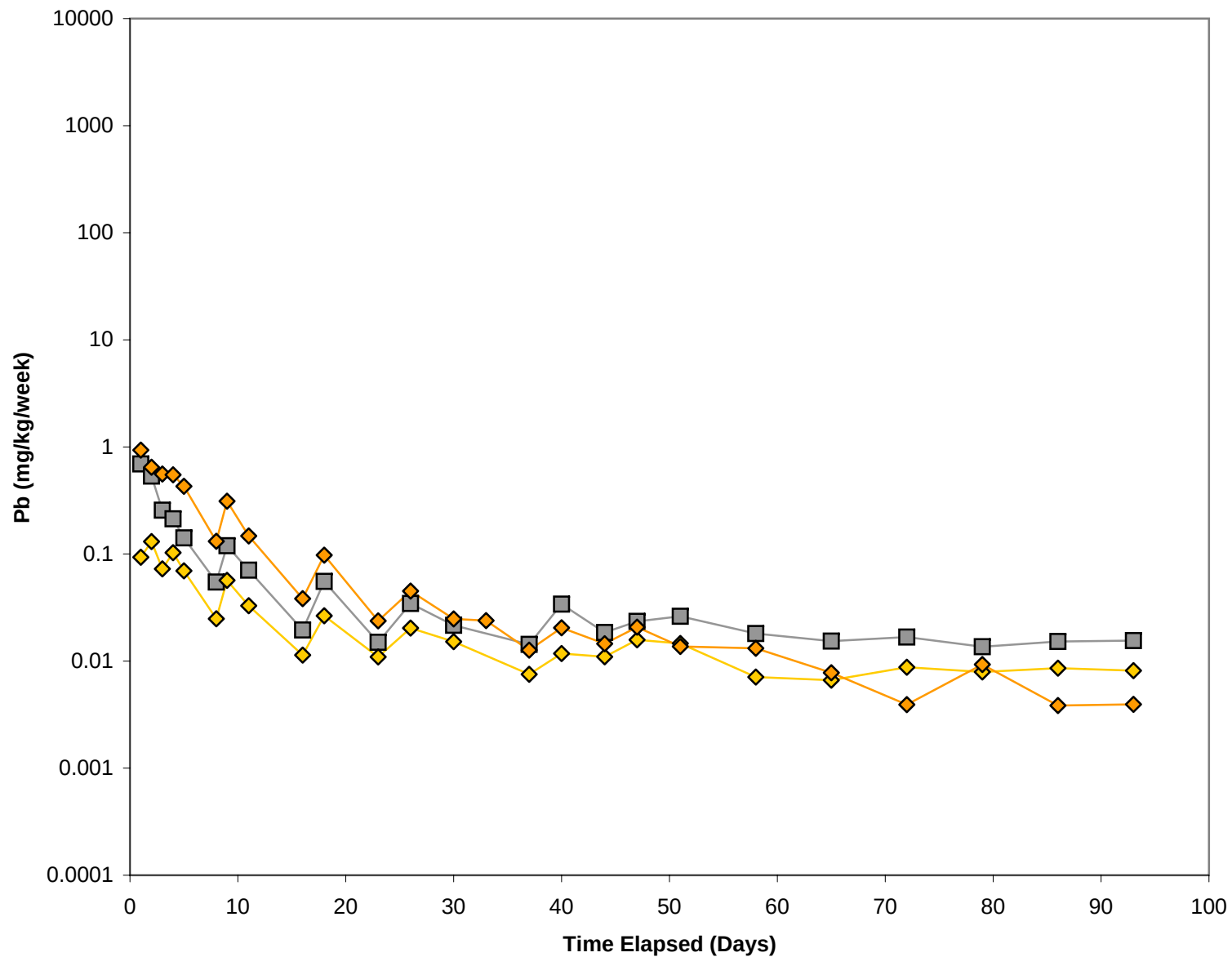
CYCLE	DAYS	Molar Ratios																												Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd	
		Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk					
1	1	0.04664	0.02332	1.86562	0.46641	0.55969	423.50	0.04664	1.86562	0.04664	0.13992	0.93281	0.18656	1240.64	318.08833	0.13992	0.74625	1.39922	19.58902	0.93281	1.30593	0.04664	9.32810	1.12870	0.46641	0.13992	0.04664	0.13992	182.83083	4.73E-02	4.23E-05	1.12E+03	9.60E-01	5.61E+02
2	2	0.01873	0.00234	0.28091	0.04682	0.44009	461.63	0.00468	1.08619	0.01873	0.01405	0.64610	0.19664	523.43	172.29221	0.01405	0.45882	0.14046	14.98193	0.09364	1.20792	0.00468	7.49097	1.41392	0.18727	0.01405	0.00468	0.01405	107.68263	4.59E-02	7.01E-06	6.55E+03	1.09E+00	4.21E+02
3	3	0.02065	0.00258	0.10325	0.05163	0.27878	570.97	0.00516	0.55755	0.01033	0.01549	0.55755	0.11358	139.39	77.43750	0.01549	0.26845	0.15488	9.29250	0.10325	1.15640	0.00516	1.03250	1.69330	0.05163	0.01549	0.01033	0.01549	67.42225	4.84E-02	1.30E-05	3.72E+03	1.07E+00	4.16E+02
4	4	0.02193	0.00274	0.05483	0.05483	0.26318	657.95	0.00548	0.47153	0.02193	0.01645	0.54829	0.09869	82.02	58.66736	0.01645	0.24125	0.16449	8.77269	0.10966	1.28301	0.00548	1.09659	1.83130	0.05483	0.01645	0.02193	0.01645	55.92590	4.18E-02	1.44E-05	2.90E+03	1.03E+00	3.65E+02
5	5	0.02143	0.00268	0.05358	0.05358	0.20362	581.91	0.00536	0.34293	0.02143	0.01607	0.42867	0.06430	55.30	42.65222	0.01607	0.17147	0.16075	6.42998	0.10717	1.06095	0.00536	1.07166	1.65036	0.05358	0.01607	0.04287	0.01607	42.11639	3.12E-02	1.39E-05	2.24E+03	1.23E+00	3.55E+02
6	8	0.00710	0.00089	0.01774	0.01774	0.06032	208.65	0.00177	0.09226	0.00177	0.00532	0.13129	0.01774	13.80	11.35513	0.00532	0.04613	0.05323	1.41939	0.03548	0.33001	0.00177	0.35485	0.53937	0.01774	0.00532	0.01419	0.00532	11.70997	2.69E-02	1.43E-05	1.88E+03	1.15E+00	3.34E+02
7	9	0.02072	0.00259	0.05180	0.05180	0.15541	569.83	0.00518	0.23829	0.00518	0.11397	0.31082	0.04144	49.52	31.91066	0.01554	0.13469	0.15541	4.14424	0.10361	0.93245	0.00518	1.03606	1.74058	0.05180	0.01554	0.04144	0.01554	29.83854	2.42E-02	1.08E-04	2.24E+02	1.16E+00	3.30E+02
8	11	0.01054	0.00132	0.02635	0.02635	0.06850	310.36	0.00263	0.09485	0.00527	0.00790	0.14754	0.01581	19.18	12.38288	0.00790	0.05269	0.07904	2.10772	0.05269	0.46897	0.00263	0.52693	0.83782	0.02635	0.00790	0.02635	0.00790	12.38288	2.05E-02	1.53E-05	1.34E+03	1.08E+00	3.11E+02
9	16	0.00403	0.00050	0.01008	0.01008	0.02015	97.13	0.00101	0.03023	0.00101	0.00302	0.03829	0.00605	10.22	4.03031	0.00302	0.01209	0.03023	0.80606	0.02015	0.13905	0.00101	0.20152	0.31436	0.01008	0.00302	0.00101	0.00302	3.46607	1.41E-02	1.44E-05	9.80E+02	1.32E+00	2.96E+02
10	18	0.01025	0.00128	0.02563	0.02563	0.05127	275.83	0.00256	0.06665	0.00256	0.00769	0.09741	0.01538	23.07	8.61319	0.00769	0.03076	0.07690	1.53807	0.05127	0.37939	0.00256	0.51269	0.80492	0.02563	0.00769	0.00256	0.00769	7.89542	1.56E-02	1.78E-05	8.77E+02	9.89E-01	2.65E+02
11	23	0.00396	0.00049	0.00990	0.00990	0.01188	80.57	0.00099	0.01782	0.00099	0.00297	0.02375	0.00198	7.23	2.13792	0.00297	0.00594	0.02969	0.59387	0.01980	0.10294	0.00099	0.19796	0.24348	0.00990	0.00297	0.00099	0.00297	1.97955	1.01E-02	1.78E-05	5.70E+02	1.30E+00	2.86E+02
12	26	0.00693	0.00087	0.01733	0.01733	0.02079	137.92	0.00173	0.03119	0.00173	0.00520	0.04505	0.00693	10.88	3.41689	0.00520	0.01733	0.05198	0.69308	0.03465	0.21139	0.00173	0.34654	0.40545	0.01733	0.00520	0.00173	0.00520	3.53471	1.27E-02	2.19E-05	5.81E+02	1.10E+00	2.92E+02
13	30	0.00495	0.00062	0.01237	0.01237	0.01237	89.57	0.00124	0.01485	0.00124	0.00371	0.02474	0.00247	7.37	1.76922	0.00371	0.00990	0.03712	0.24744	0.02474	0.12620	0.00124	0.24744	0.26229	0.01237	0.00371	0.00124	0.00371	1.75190	9.90E-03	2.46E-05	4.03E+02	1.07E+00	2.43E+02
14	33	0.00681	0.00085	0.01703	0.01703	0.01362	106.61	0.00170	0.01703	0.00170	0.00511	0.02384	0.00341	8.89	1.93805	0.00511	0.00341	0.05109	0.34061	0.03406	0.16690	0.00170	0.34061	0.31710	0.01703	0.00511	0.00170	0.00511	2.05726	1.04E-02	3.03E-05	3.44E+02	9.97E-01	2.60E+02
15	37	0.00506	0.00063	0.01264	0.01264	0.00758	73.56	0.00126	0.01011	0.00126	0.00379	0.01264	0.00126	8.09	1.18303	0.00379	0.00253	0.03792	0.25278	0.02528	0.11375	0.00126	0.25278	0.23003	0.01264	0.00379	0.00126	0.00379	1.24623	7.70E-03	2.74E-05	2.81E+02	1.14E+00	2.82E+02
16	40	0.00681	0.00085	0.01703	0.01703	0.01022	100.82	0.00170	0.01362	0.00170	0.00511	0.02044	0.00341	10.32	1.44076	0.00511	0.00681	0.05109	0.34061	0.03406	0.15668	0.00170	0.34061	0.31574	0.01703	0.00511	0.00170	0.00511	1.66556	7.89E-03	2.83E-05	2.79E+02	1.10E+00	2.80E+02
17	44	0.00726	0.00061	0.01211	0.01211	0.00726	67.30	0.00121	0.00968	0.00121	0.00363	0.01453	0.00242	6.63	0.84494	0.00363	0.00484	0.03632	0.24210	0.02421	0.10653	0.00121	0.24210	0.20264	0.01211	0.00363	0.00121	0.00363	0.89336	7.13E-03	3.39E-05	2.10E+02	9.82E-01	2.11E+02
18	47	0.00691	0.00086	0.01727	0.01727	0.00691	89.45	0.00173	0.01381	0.00173	0.00518	0.02072	0.00345	9.39	1.06714	0.00518	0.00345	0.05180	0.34535	0.03454	0.16232	0.00173	0.34535	0.28595	0.01727	0.00518	0.00173	0.00518	1.28471	7.08E-03	3.34E-05	2.12E+02	1.06E+00	3.20E+02
19	51	0.00548	0.00069	0.01371	0.01371	0.00822	78.68	0.00137	0.01097	0.00137	0.00411	0.01371	0.00137	7.98	0.89646	0.00411	0.00274	0.04112	0.27415	0.02741	0.14804	0.00137	0.27415	0.23960	0.01371	0.00411	0.00137	0.00411	0.98693	6.28E-03	3.06E-05	2.05E+02	1.05E+00	2.06E+02
20	58	0.00329	0.00041	0.00821	0.00821	0.00329	46.00	0.00082	0.00493	0.00082	0.00246	0.01314	0.00082	5.72	0.51750	0.00246	0.00164	0.02464	0.16428	0.01643	0.09036	0.00082	0.16428	0.13816	0.00821	0.00246	0.00082	0.00246	0.62592	7.17E-03	3.31E-05	2.17E+02	9.66E-01	3.27E+02
21	65	0.00156	0.00039	0.00778	0.00778	0.00311	37.51	0.00078	0.00311	0.00078	0.00233	0.00778	0.00156	5.28	0.37820	0.00233	0.00156	0.02335	0.15564	0.01556	0.07938	0.00078	0.15564	0.11408	0.00778	0.00233	0.00078	0.00233	0.43734	5.50E-03	3.44E-05	1.60E+02	1.06E+00	2.41E+02
22	72	0.00313	0.00039	0.00783	0.00783	0.00157	32.74	0.00078	0.00313	0.00078	0.00235	0.00392	0.00078	5.00	0.29138	0.00235	0.00157	0.02350	0.15666	0.01567	0.06893	0.00078	0.15666	0.09822	0.00783	0.00235	0.00078	0.00235	0.35874	5.10E-03	3.91E-05	1.30E+02	1.05E+00	3.94E+02
23	79	0.00309	0.00039	0.00773	0.00773	0.00309	35.56	0.00077	0.00309	0.00077	0.00232	0.00928	0.00077	6.06	0.37727	0.00232	0.00155	0.02319	0.15462	0.01546	0.09123	0.00077	0.15462	0.11179	0.00773	0.00232	0.00077	0.00232	0.47932	6.90E-03	3.91E-05	1.77E+02	9.36E-01	2.66E+02
24	86	0.00307	0.00038	0.00768	0.00768	0.00307	30.57	0.00077	0.00307	0.00077	0.00230	0.00384	0.00154	5.39	0.30567	0.00230	0.00154	0.02304	0.15360	0.01536	0.08448	0.00077	0.15360	0.09907	0.00768	0.00230	0.00077	0.00230	0.37786	6.24E-03	4.45E-05	1.40E+02	9.41E-01	2.11E+02
25	93	0.00315	0.00039	0.00788	0.00788	0.00158	29.17	0.00079	0.00315	0.00079	0.00237	0.00394	0.00158	5.52	0.28066	0.00237	0.00158	0.02365	0.15767	0.01577	0.08199	0.00079	0.15767	0.09681	0.00788	0.00237	0.00079	0.00237	0.35161	5.77E-03	4.54E-05	1.27E+02	9.77E-01	3.83E+02
		0.00288	0.000393	0.00785	0.00785	0.002618	35.26	0.000785	0.003415	0.000785	0.00236	0.00698	0.00117	5.49	0.3584	0.00236	0.001571	0.0236	0.157	0.01571	0.083	0.000785	0.1571	0.1097	0.00785	0.00236	0.000785	0.00236	0.43847					

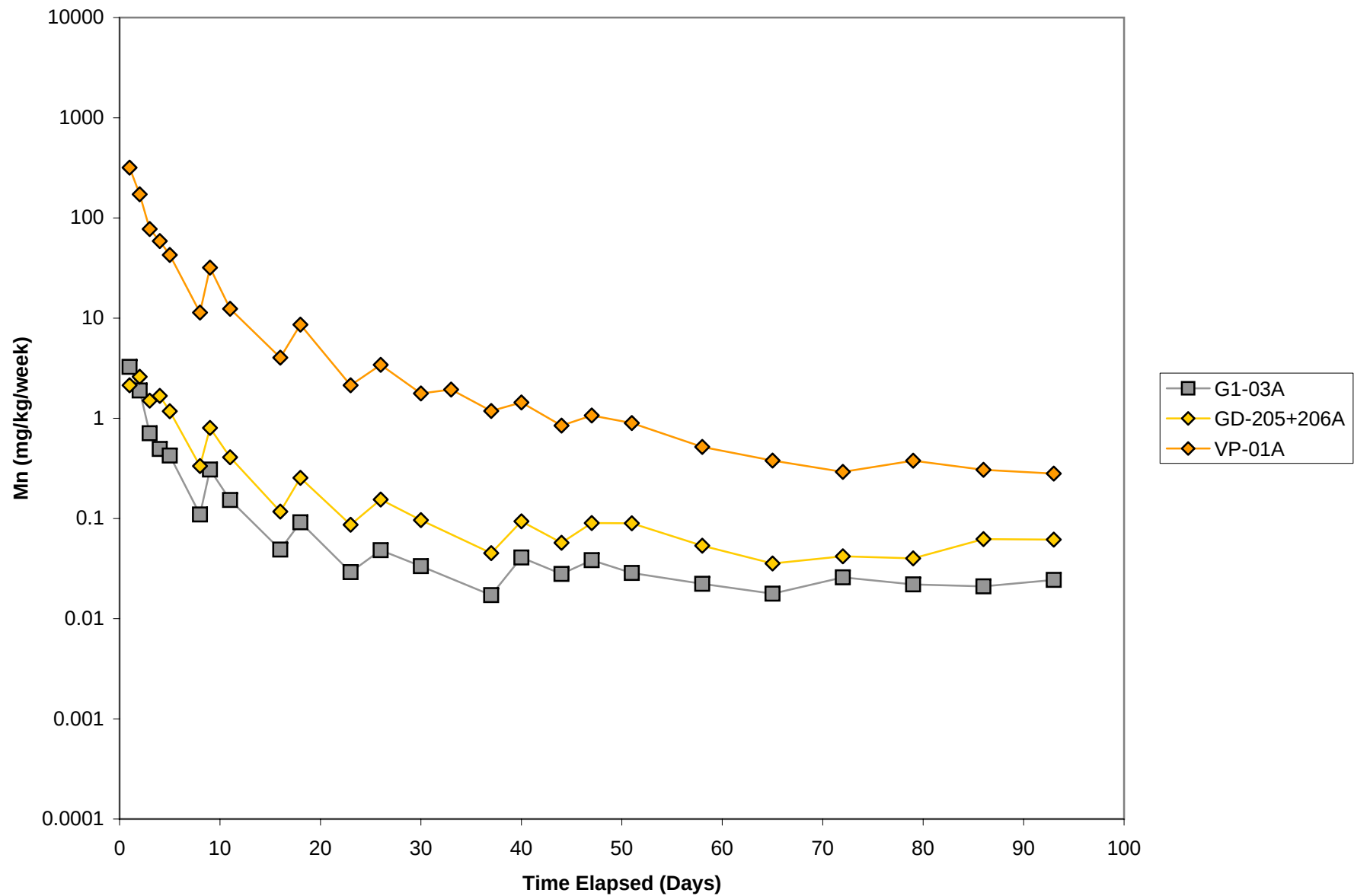
COLUMN LEACH
PROJECT
COLUMN C14A
SAMPLE WT.

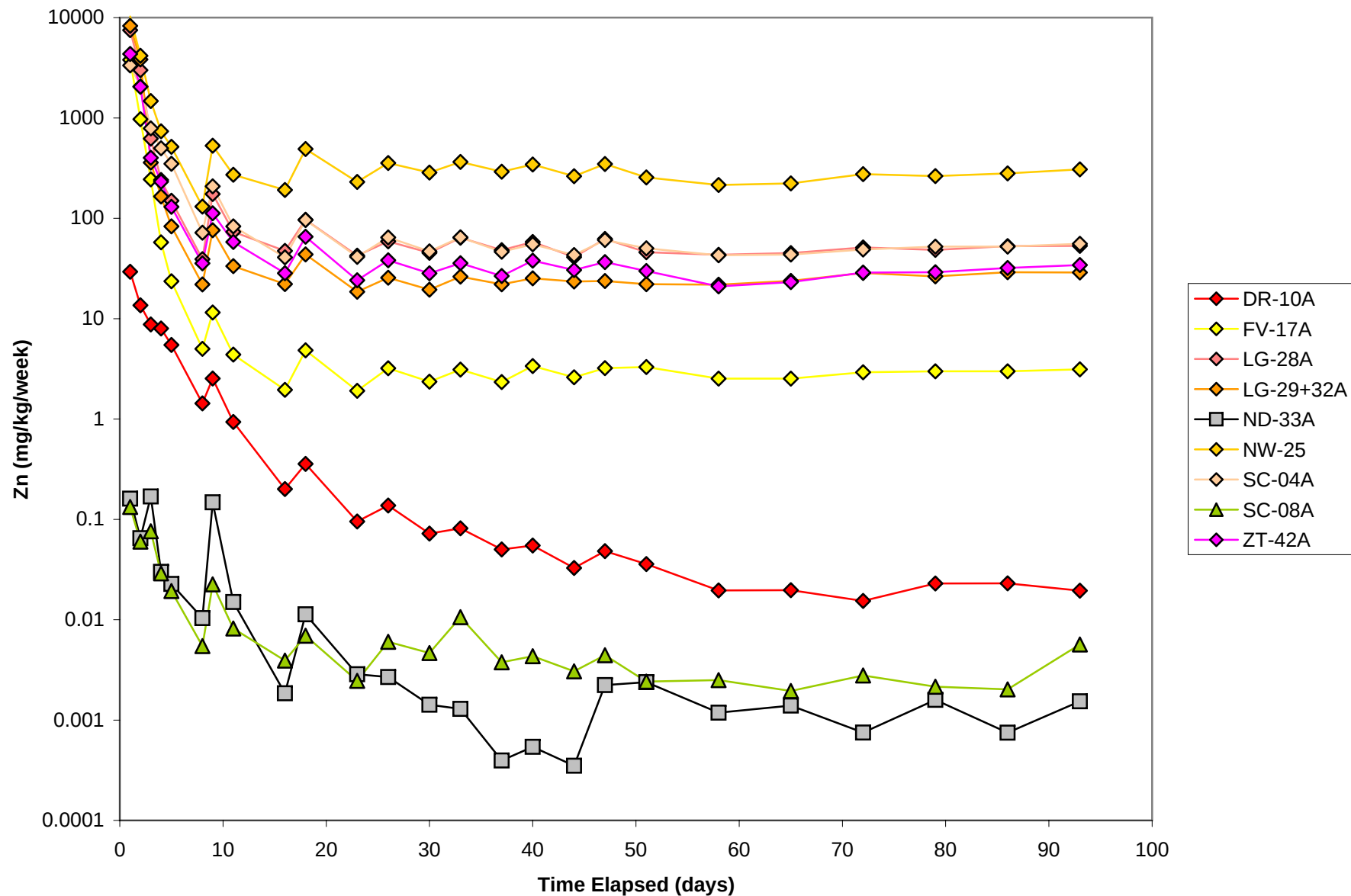
CYCLE	DAYS																													Molar Ratios		Fe/S	Zn/Fe	Si/(Ca+Mg)	Zn/Cd
		Ba mg/kg /wk	Be mg/kg /wk	Bi mg/kg /wk	B mg/kg /wk	Cd mg/kg /wk	Ca mg/kg /wk	Cr mg/kg /wk	Co mg/kg /wk	Cu mg/kg /wk	Fe mg/kg /wk	Pb mg/kg /wk	Li mg/kg /wk	Mg mg/kg /wk	Mn mg/kg /wk	Mo mg/kg /wk	Ni mg/kg /wk	P mg/kg /wk	K mg/kg /wk	Se mg/kg /wk	Si mg/kg /wk	Ag mg/kg /wk	Na mg/kg /wk	Sr mg/kg /wk	Tl mg/kg /wk	Sn mg/kg /wk	Ti mg/kg /wk	V mg/kg /wk	Zn mg/kg /wk	Zn/S					
1	1	0.23531	0.11765	2.35307	2.35307	5.64736	207.07	0.23531	1.88245	1.41184	152.94936	1.17653	0.23531	1473.02	837.69191	0.70592	2.35307	7.05920	47.06134	4.70613	1.17653	0.23531	47.06134	0.02353	2.35307	0.70592	0.23531	0.70592	#####	4.84E-01	2.00E-02	2.43E+01	2.09E+00	1.32E+03	
2	2	0.05752	0.02876	0.57519	0.57519	3.39365	255.96	0.05752	0.86279	0.40264	74.20005	1.38047	0.34512	684.48	404.93671	0.17256	1.38047	1.72558	11.50388	1.15039	4.42900	0.05752	11.50388	0.10353	1.15039	0.17256	0.05752	0.17256	#####	4.34E-01	1.85E-02	2.35E+01	2.08E+00	1.03E+03	
3	3	0.01312	0.00525	0.26239	0.13119	0.90261	252.42	0.01312	0.16268	0.07347	51.95236	1.10202	0.09446	135.92	81.33956	0.02624	0.31486	0.26239	2.62386	0.26239	2.25652	0.01312	2.62386	0.06822	0.31486	0.02624	0.01312	0.02624	401.45006	3.36E-01	5.10E-02	6.60E+00	1.54E+00	7.64E+02	
4	4	0.01447	0.00579	0.14473	0.14473	0.59051	264.57	0.01447	0.08105	0.03474	35.25679	1.33154	0.04631	76.42	46.43012	0.02895	0.17368	0.28946	2.89465	0.28946	2.02625	0.01447	2.89465	0.08684	0.14473	0.02895	0.01447	0.02895	231.57169	2.47E-01	4.40E-02	5.61E+00	1.47E+00	6.74E+02	
5	5	0.00274	0.00137	0.05472	0.02736	0.37756	178.93	0.00274	0.05472	0.02736	29.76667	1.20927	0.03830	47.71	30.20442	0.00821	0.10396	0.08208	2.73591	0.05472	1.63607	0.00274	0.54718	0.06183	0.02736	0.00821	0.01094	0.00821	130.22919	1.91E-01	5.11E-02	3.74E+00	1.62E+00	5.93E+02	
6	8	0.00182	0.00046	0.01824	0.00912	0.10396	43.41	0.00091	0.01459	0.00547	9.90398	0.44686	0.01277	14.21	8.84610	0.00274	0.03283	0.02736	0.72958	0.01824	0.51800	0.00091	0.18239	0.02079	0.00912	0.02736	0.00365	0.00274	35.56680	1.97E-01	6.44E-02	3.07E+00	1.65E+00	5.88E+02	
7	9	0.00534	0.00134	0.10682	0.02671	0.29376	99.88	0.00267	0.05341	0.02136	49.51189	1.12163	0.04273	60.89	36.42623	0.00801	0.12285	0.08012	2.67054	0.05341	1.47414	0.00267	0.53411	0.04593	0.05341	0.00801	0.00534	0.00801	112.16287	1.85E-01	9.54E-02	1.94E+00	1.86E+00	6.56E+02	
8	11	0.00279	0.00070	0.05584	0.01396	0.14797	36.02	0.00140	0.03071	0.01396	21.80500	0.67844	0.02234	31.55	19.09682	0.00419	0.05584	0.04188	1.67516	0.02792	0.80128	0.00140	0.27919	0.02596	0.05584	0.00419	0.00140	0.00419	58.07220	2.21E-01	9.73E-02	2.28E+00	1.83E+00	6.74E+02	
9	16	0.00105	0.00052	0.02092	0.01046	0.06170	14.01	0.00105	0.01569	0.00105	8.45013	0.24054	0.00941	16.21	10.17571	0.00157	0.03242	0.03137	0.62748	0.02092	0.35557	0.00105	0.20916	0.00701	0.03137	0.00314	0.00105	0.00314	28.34139	2.13E-01	7.43E-02	2.87E+00	2.00E+00	7.89E+02	
10	18	0.00269	0.00067	0.05378	0.01345	0.14791	28.24	0.00134	0.03765	0.01882	19.38927	0.65079	0.02420	37.11	24.28365	0.06723	0.07799	0.04034	1.88245	0.02689	0.90358	0.00134	0.26892	0.01990	0.01345	0.00403	0.00134	0.00403	65.61696	2.62E-01	9.05E-02	2.89E+00	1.72E+00	7.62E+02	
11	23	0.00054	0.00027	0.03216	0.00536	0.05145	8.99	0.00054	0.01286	0.00429	5.56344	0.23905	0.00750	12.86	8.66138	0.00161	0.02680	0.01608	0.53598	0.01072	0.32373	0.00054	0.10720	0.00611	0.01072	0.00161	0.00054	0.00161	24.11894	2.34E-01	6.33E-02	3.70E+00	2.09E+00	8.06E+02	
12	26	0.00184	0.00046	0.03685	0.00921	0.08107	12.38	0.00092	0.02027	0.00553	8.93668	0.42012	0.01106	18.41	12.58505	0.00276	0.04054	0.02764	0.73705	0.01843	0.52699	0.00092	0.18426	0.01253	0.03685	0.00276	0.00092	0.00276	38.14210	2.55E-01	7.01E-02	3.65E+00	2.14E+00	8.09E+02	
13	30	0.00068	0.00034	0.02736	0.00684	0.05882	8.96	0.00068	0.01505	0.00410	7.00392	0.30779	0.00821	13.82	9.50728	0.00205	0.03009	0.02052	0.54718	0.01368	0.40355	0.00068	0.13680	0.00821	0.02736	0.00205	0.00068	0.00205	28.31664	2.67E-01	7.72E-02	3.45E+00	2.05E+00	8.27E+02	
14	33	0.00179	0.00045	0.03573	0.00893	0.07146	10.20	0.00089	0.01787	0.00536	7.25355	0.40913	0.00893	15.95	11.14831	0.00268	0.03395	0.02680	0.71464	0.01787	0.51811	0.00089	0.17866	0.01143	0.01787	0.00268	0.00089	0.00268	35.73176	2.85E-01	6.78E-02	4.21E+00	2.10E+00	8.59E+02	
15	37	0.00067	0.00033	0.02671	0.00668	0.05341	7.12	0.00067	0.01469	0.00534	4.60669	0.29910	0.00668	11.94	8.21192	0.00200	0.02403	0.02003	0.53411	0.01335	0.39791	0.00067	0.13353	0.00734	0.01335	0.00200	0.00067	0.00200	26.57192	2.76E-01	5.59E-02	4.93E+00	2.20E+00	8.55E+02	
16	40	0.00185	0.00046	0.01849	0.00924	0.07395	9.26	0.00092	0.01849	0.00370	6.13814	0.45851	0.00740	14.86	10.76024	0.00277	0.03513	0.02773	0.55465	0.01849	0.56390	0.00092	0.18488	0.01091	0.00924	0.00277	0.00092	0.00277	37.90119	3.46E-01	6.56E-02	5.28E+00	1.99E+00	8.81E+02	
17	44	0.00069	0.00035	0.01382	0.00691	0.05804	7.38	0.00069	0.01520	0.00276	5.14089	0.36069	0.00691	11.93	8.66489	0.00207	0.02764	0.02073	0.55278	0.01382	0.46019	0.00069	0.13820	0.00829	0.02764	0.00207	0.00069	0.00207	30.54132	3.18E-01	6.27E-02	5.08E+00	2.18E+00	9.04E+02	
18	47	0.00095	0.00048	0.00952	0.00952	0.06858	8.13	0.00095	0.01714	0.00762	5.56220	0.45145	0.00762	13.45	9.73385	0.00286	0.02857	0.02857	0.57146	0.01905	0.60765	0.00095	0.19049	0.01086	0.00952	0.00286	0.00095	0.00286	36.57339	3.58E-01	6.37E-02	5.62E+00	2.07E+00	9.17E+02	
19	51	0.00072	0.00036	0.01443	0.00721	0.05626	6.79	0.00072	0.01443	0.00577	4.61649	0.37509	0.00577	11.08	8.15100	0.00216	0.02164	0.02164	0.43280	0.01443	0.52224	0.00072	0.14427	0.00851	0.00721	0.00216	0.00072	0.00216	29.86294	3.20E-01	5.79E-02	5.53E+00	2.28E+00	9.12E+02	
20	58	0.00041	0.00021	0.01643	0.00411	0.04109	5.21	0.00041	0.01068	0.00411	1.75023	0.21200	0.00411	8.87	6.27783	0.00123	0.01643	0.01233	0.24651	0.00822	0.31964	0.00041	0.08217	0.00329	0.00822	0.00123	0.00041	0.00123	20.95350	3.09E-01	3.03E-02	1.02E+01	2.09E+00	8.77E+02	
21	65	0.00081	0.00040	0.00806	0.00806	0.04109	5.22	0.00081	0.01128	0.00564	1.57111	0.19337	0.00483	9.02	6.47782	0.00242	0.01773	0.02417	0.32228	0.01611	0.32228	0.00081	0.16114	0.00330	0.00806	0.00242	0.00081	0.00242	23.12355	3.12E-01	2.48E-02	1.26E+01	2.26E+00	9.67E+02	
22	72	0.00080	0.00040	0.00798	0.00798	0.04786	5.84	0.00080	0.01276	0.00718	1.65123	0.20740	0.00558	10.53	7.46643	0.00239	0.01835	0.02393	0.15954	0.01595	0.38289	0.00080	0.15954	0.00319	0.01595	0.00239	0.00080	0.00239	28.79679	3.27E-01	2.20E-02	1.49E+01	2.33E+00	1.03E+03	
23	79	0.00080	0.00040	0.00800	0.00800	0.04802	5.40	0.00080	0.01281	0.00560	1.60073	0.19209	0.00560	9.84	6.93915	0.00240	0.01761	0.02401	0.32015	0.01601	0.36817	0.00080	0.16007	0.00336	0.00800	0.00240	0.00080	0.00240	29.05318	3.70E-01	2.39E-02	1.55E+01	2.22E+00	1.04E+03	
24	86	0.00080	0.00040	0.01601	0.00800	0.05362	5.86	0.00080	0.01361	0.00640	1.68076	0.20809	0.00480	10.24	7.37935	0.00240	0.01681	0.02401	0.16007	0.01601	0.40819	0.00080	0.16007	0.00296	0.00800	0.00240	0.00080	0.00240	32.01452	3.79E-01	2.33E-02	1.63E+01	2.28E+00	1.03E+03	
25	93	0.00081	0.00041	0.00814	0.00814	0.05615	5.74	0.00081	0.01383	0.01139	1.80642	0.21156	0.00488	9.68	7.47792	0.00244	0.01953	0.02441	0.16274	0.01627	0.43126	0.00081	0.16274	0.00334	0.01627	0.00244	0.00081	0.00244	34.25687	4.09E-01	2.53E-02	1.62E+01	2.36E+00	1.05E+03	
		0.00085	0.000372	0.01659	0.00744	0.054179	6.92	0.000744	0.013971	0.005897	3.56512	0.27140	0.00615	11.40	8.1101	0.00223	0.022764	0.0223	0.377	0.01488	0.414	0.000744	0.1488	0.0058	0.01371	0.00223	0.000744	0.00223	29.38934						

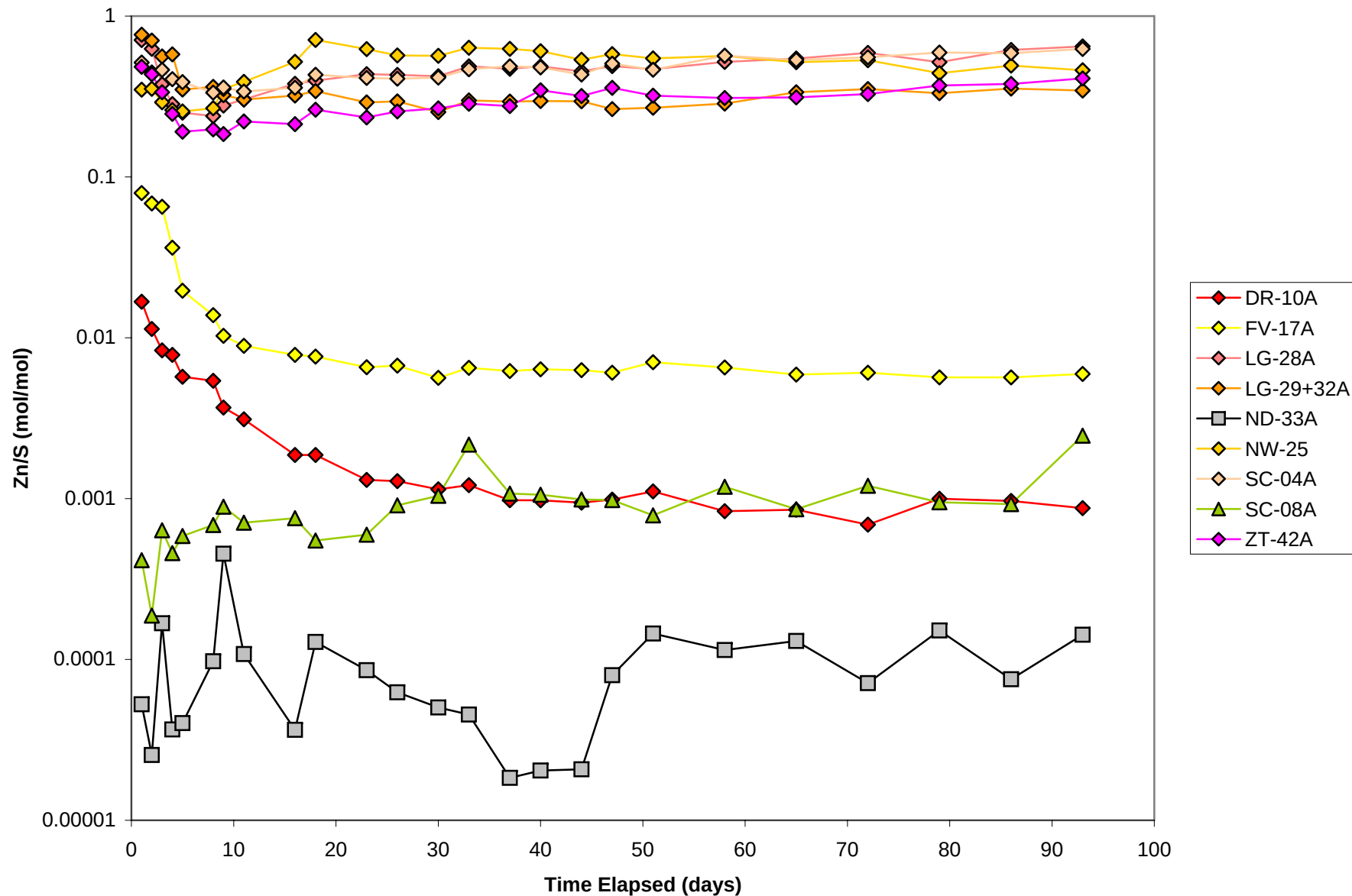


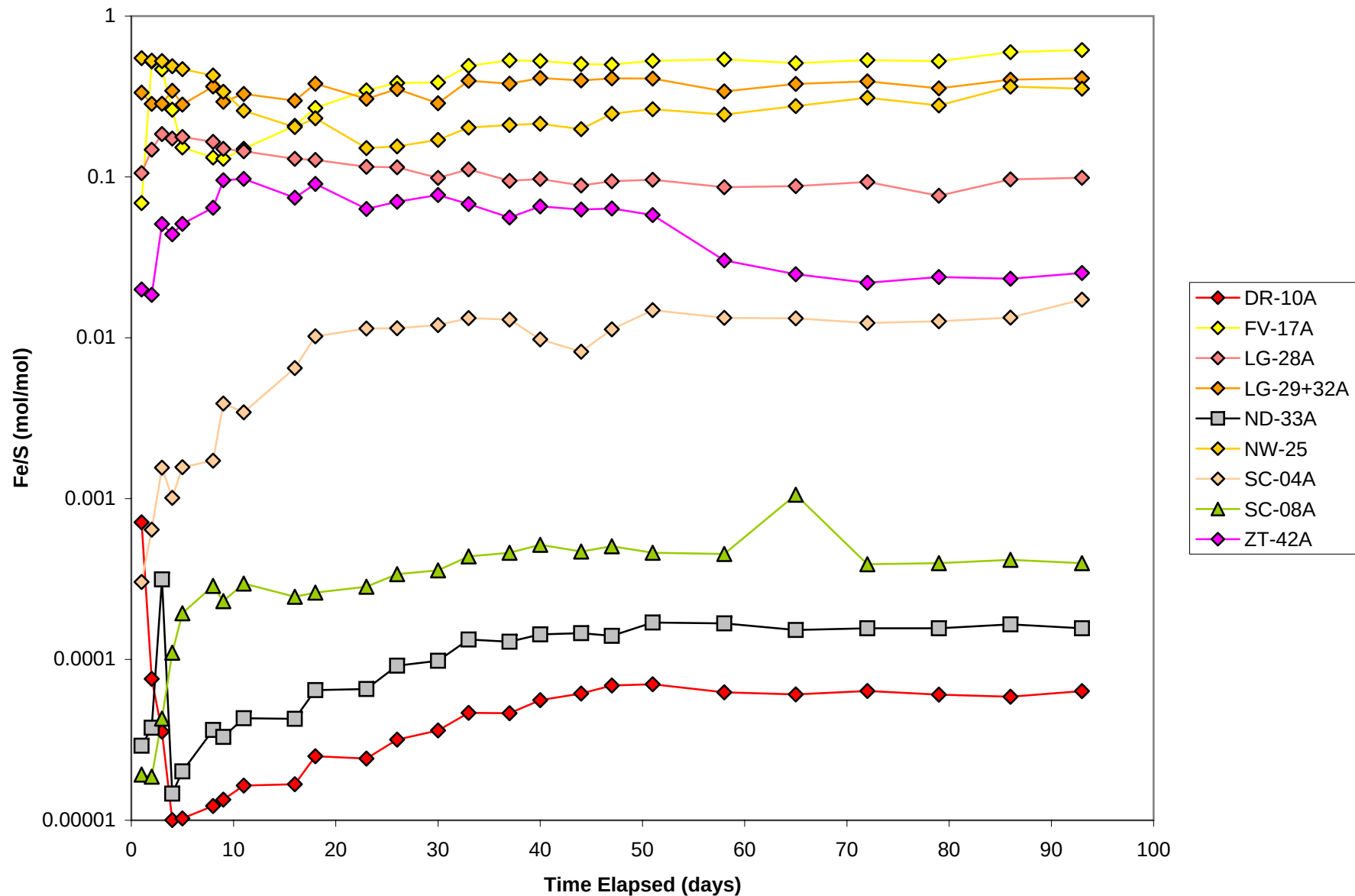


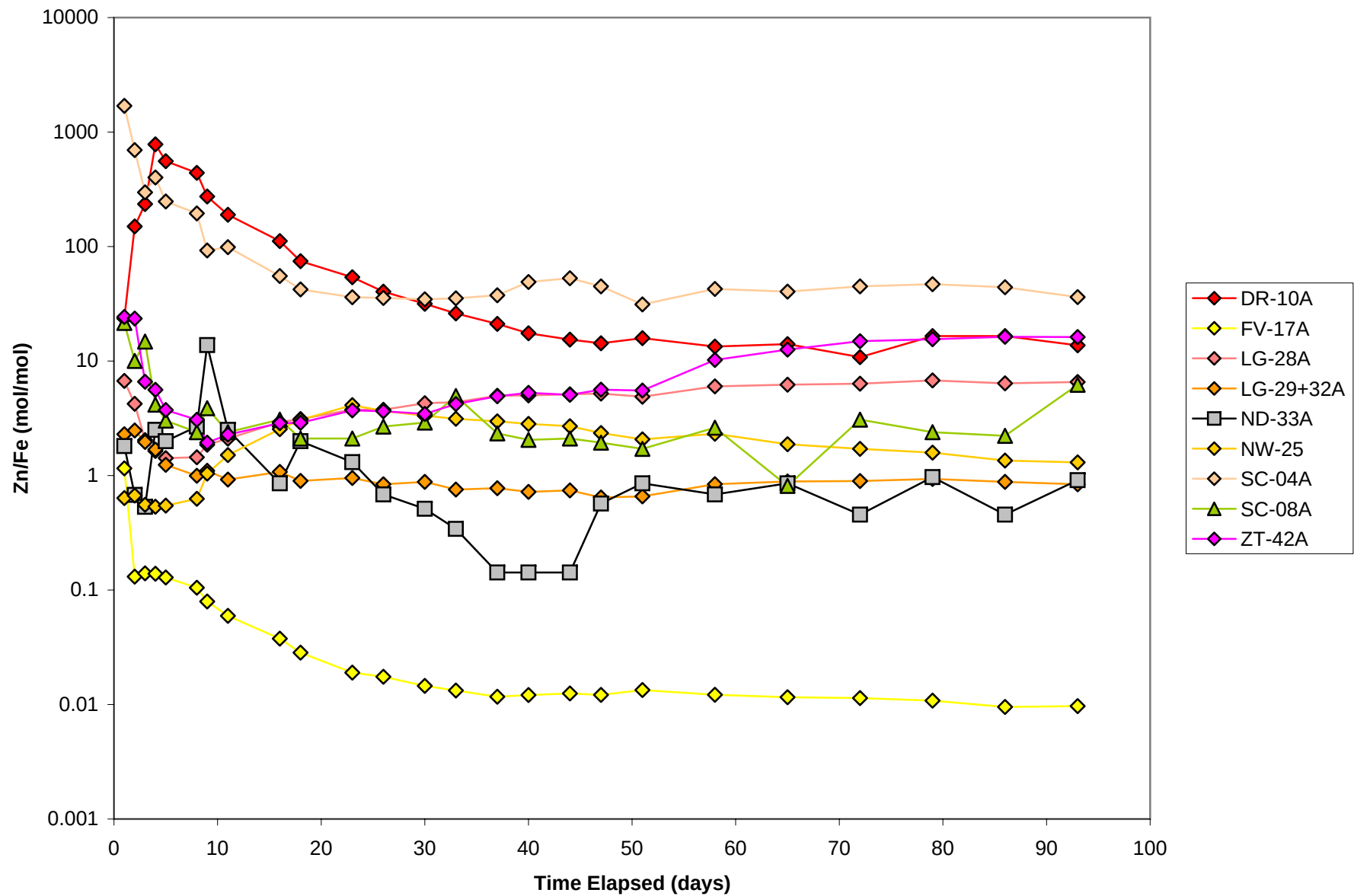


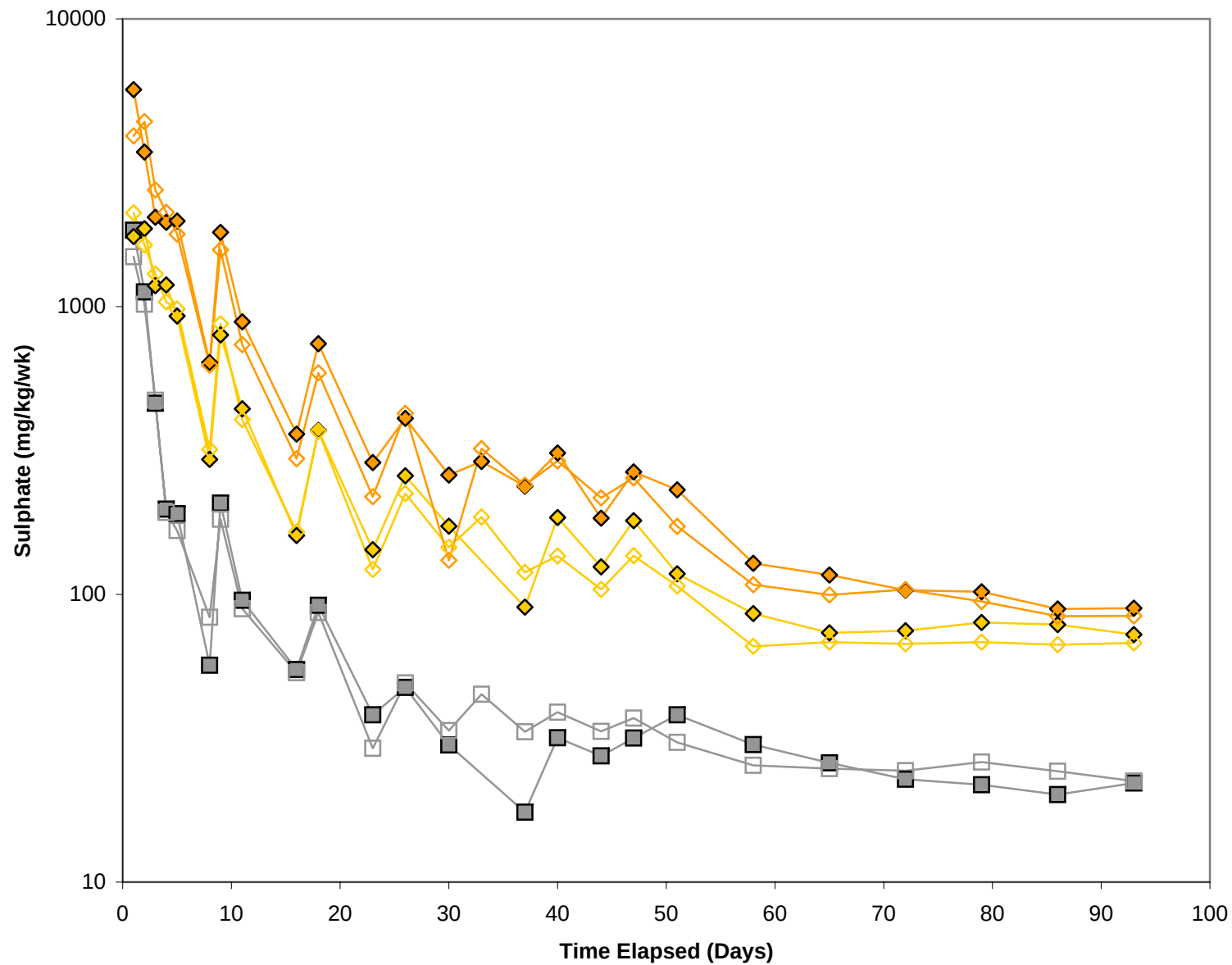


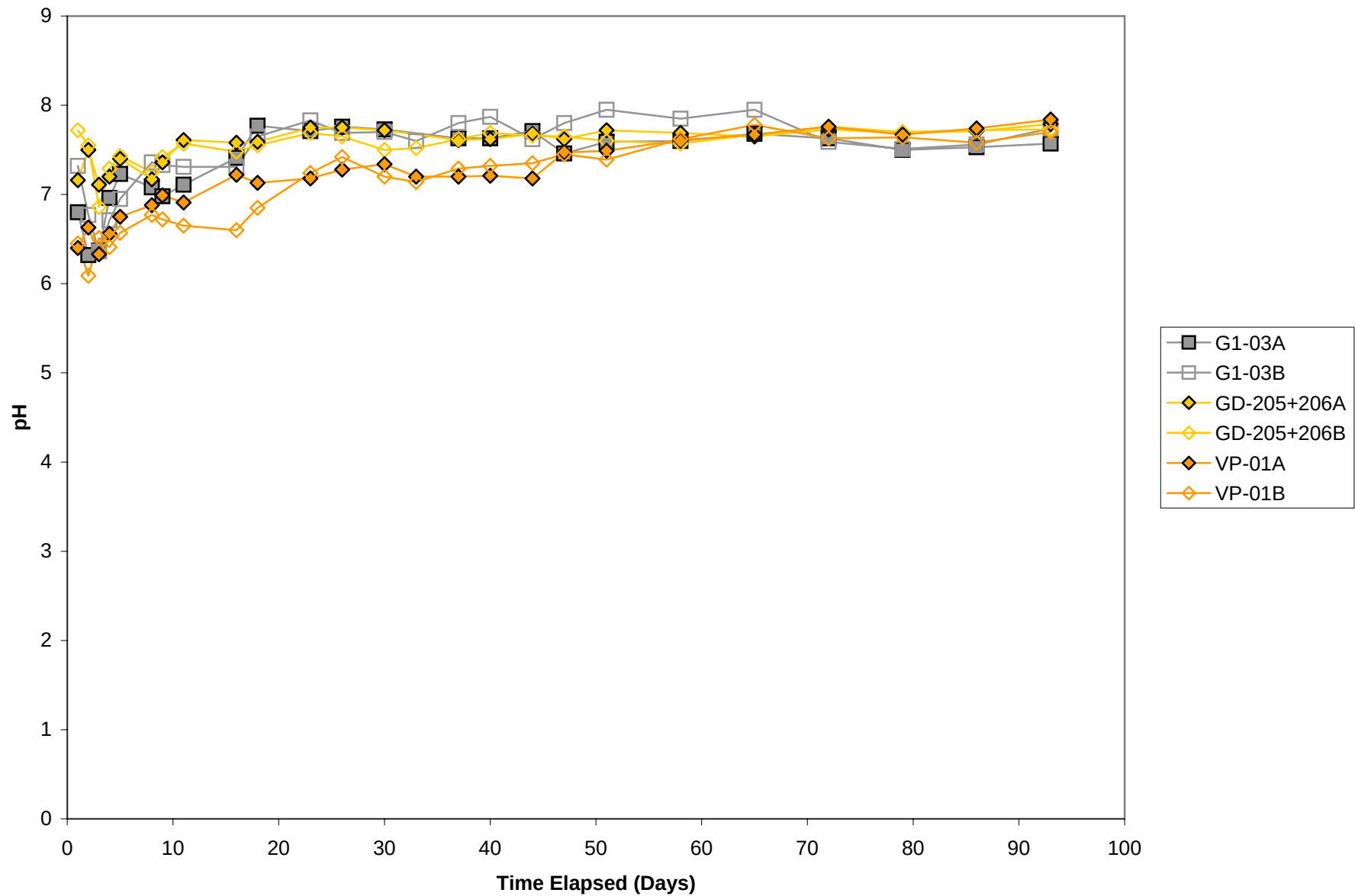


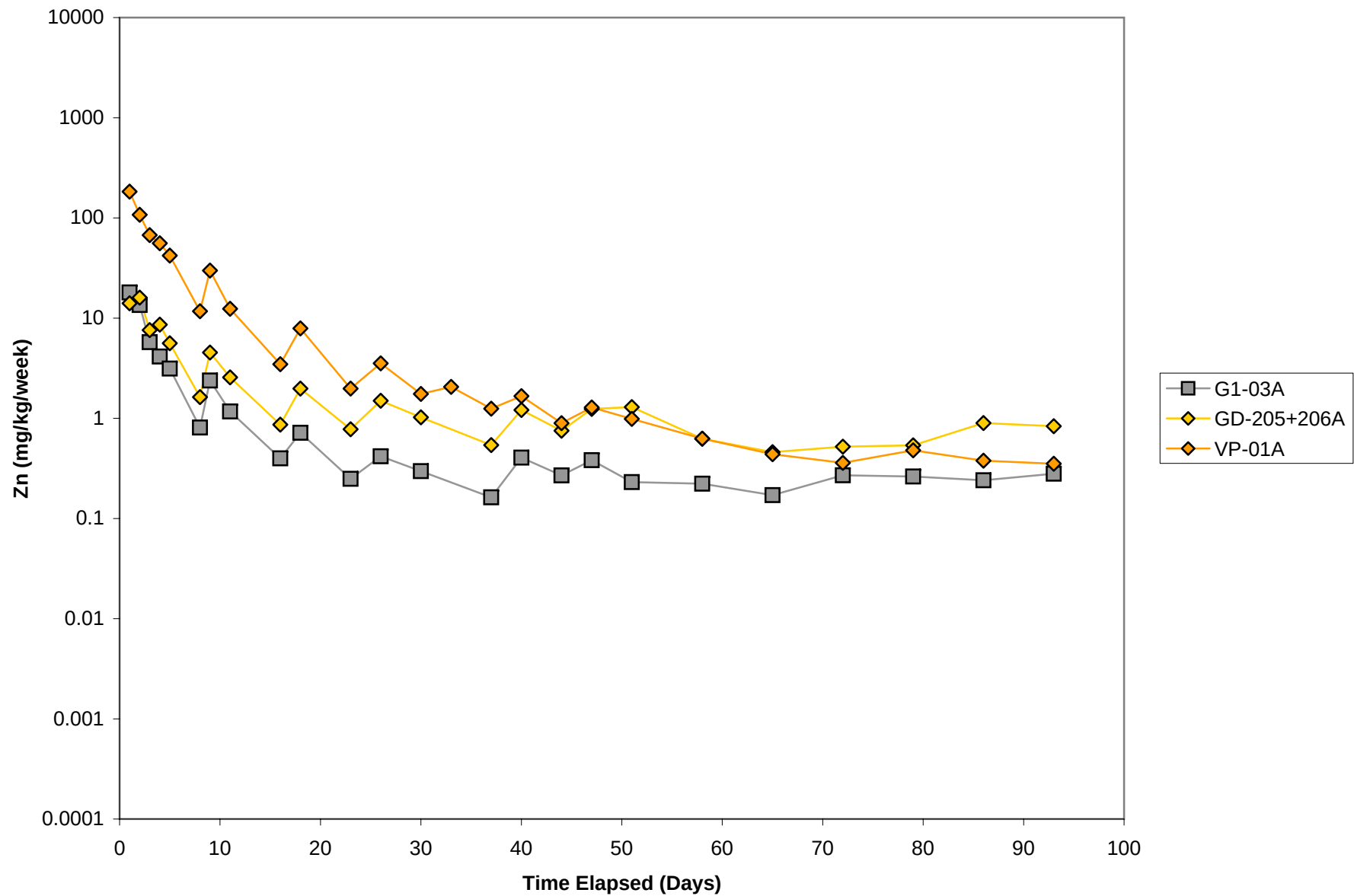


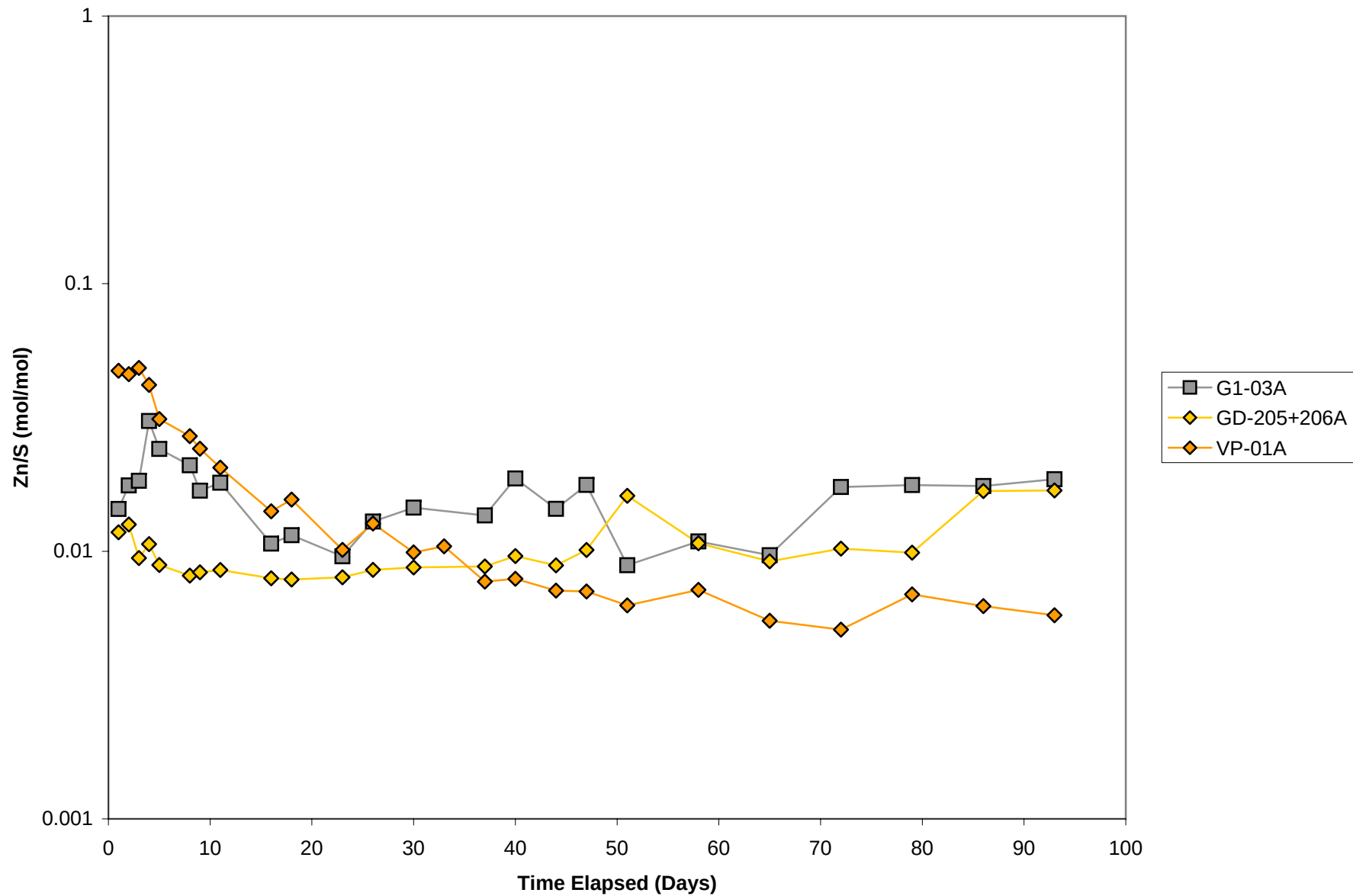


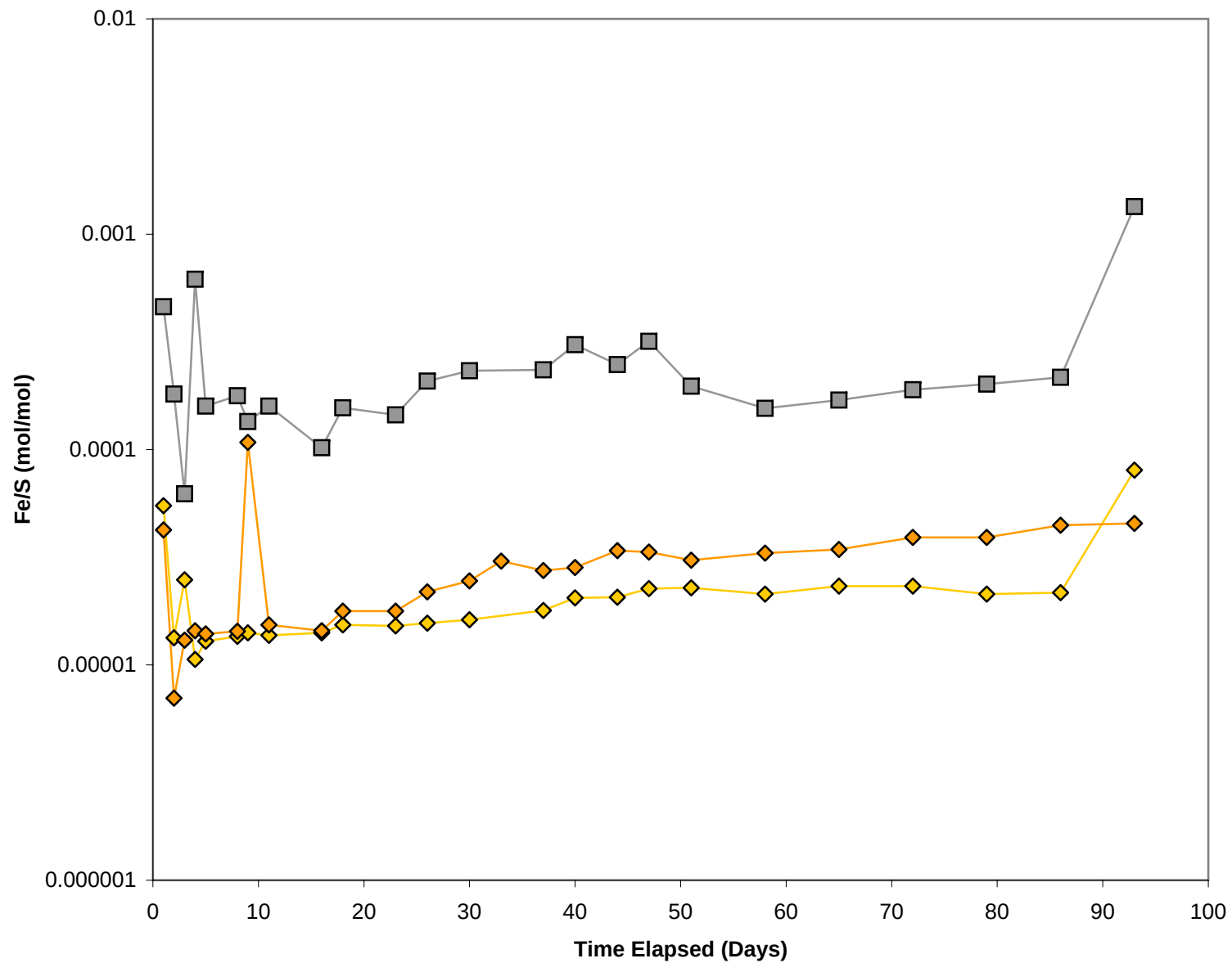


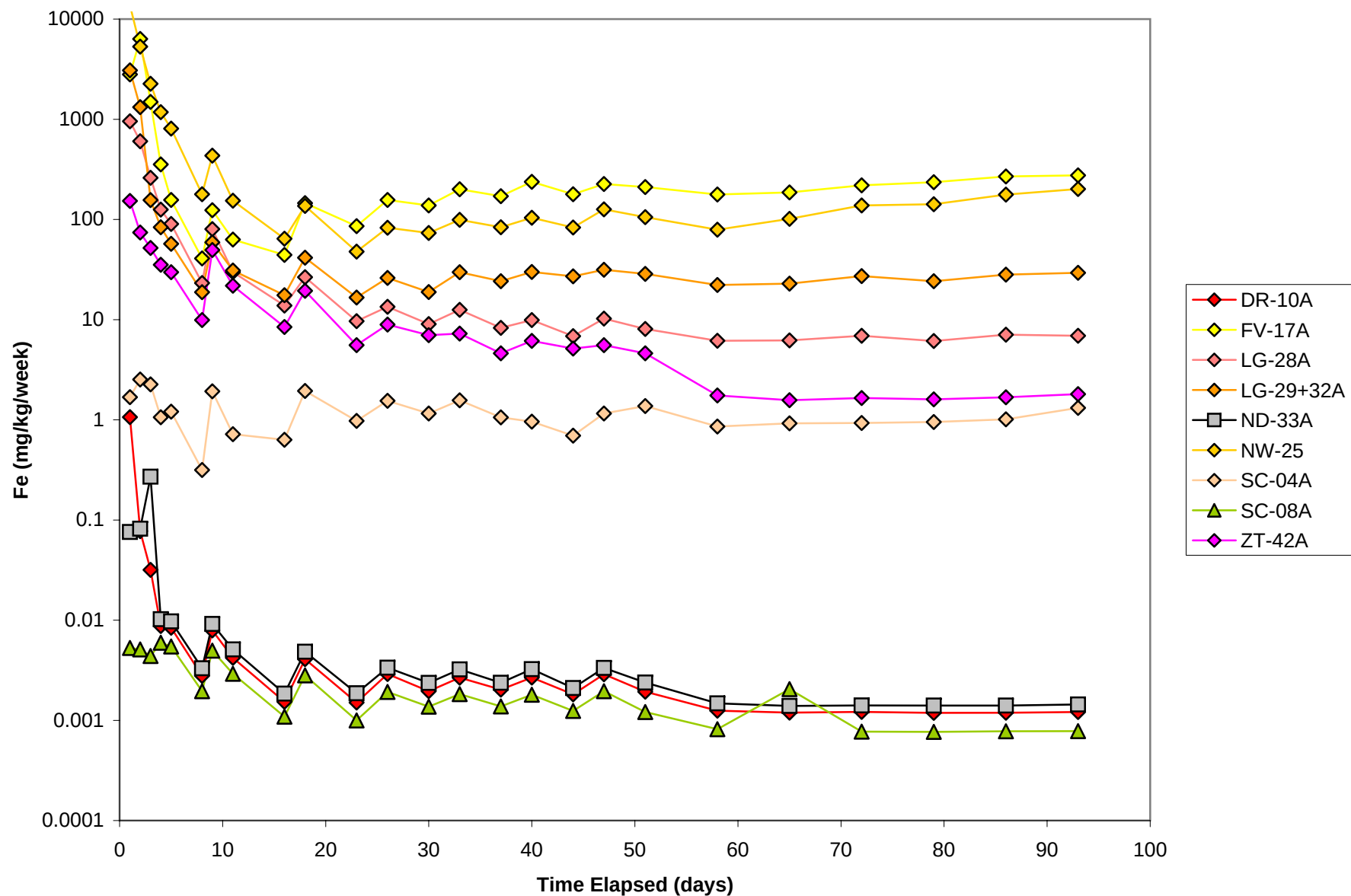


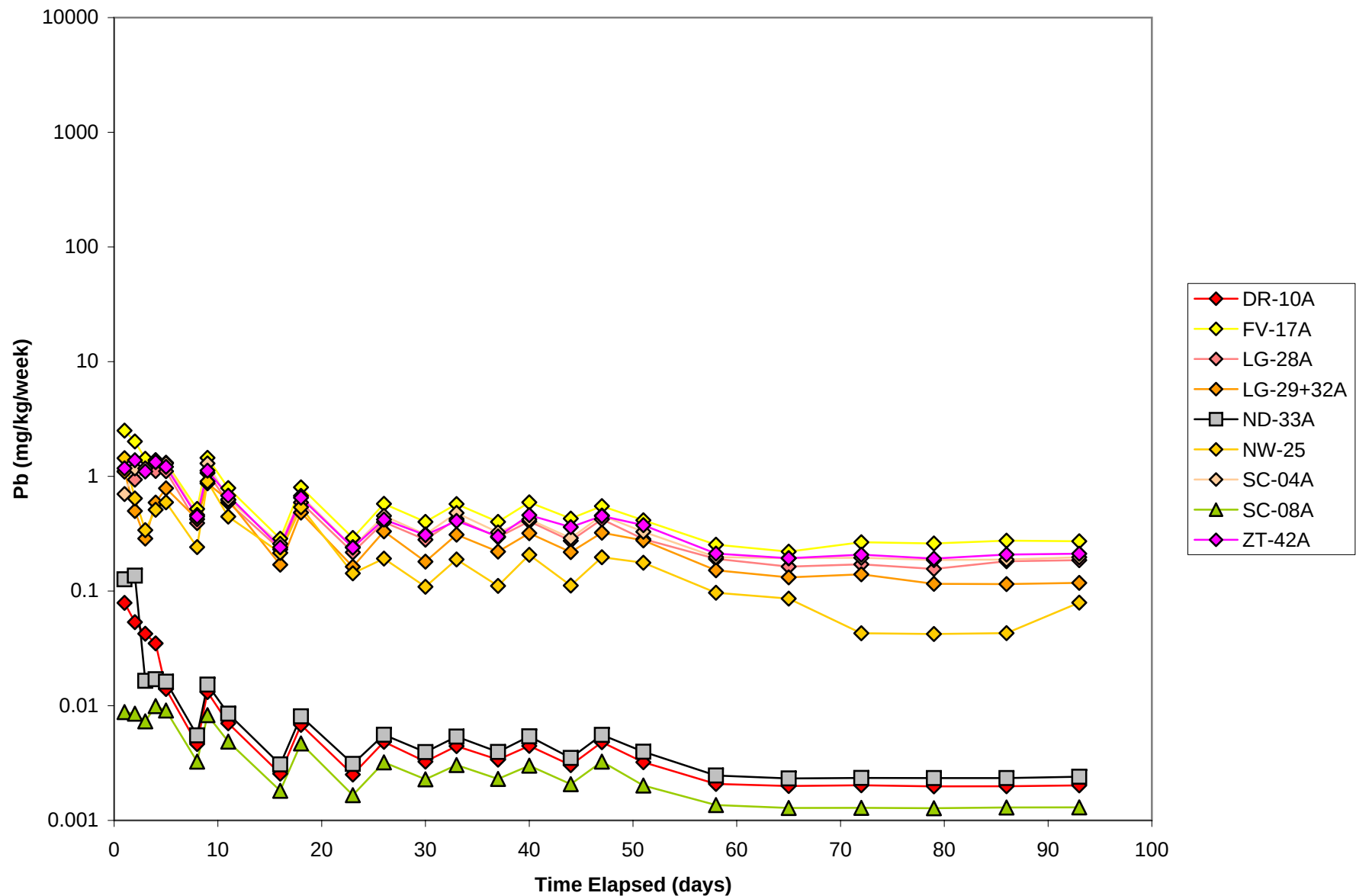




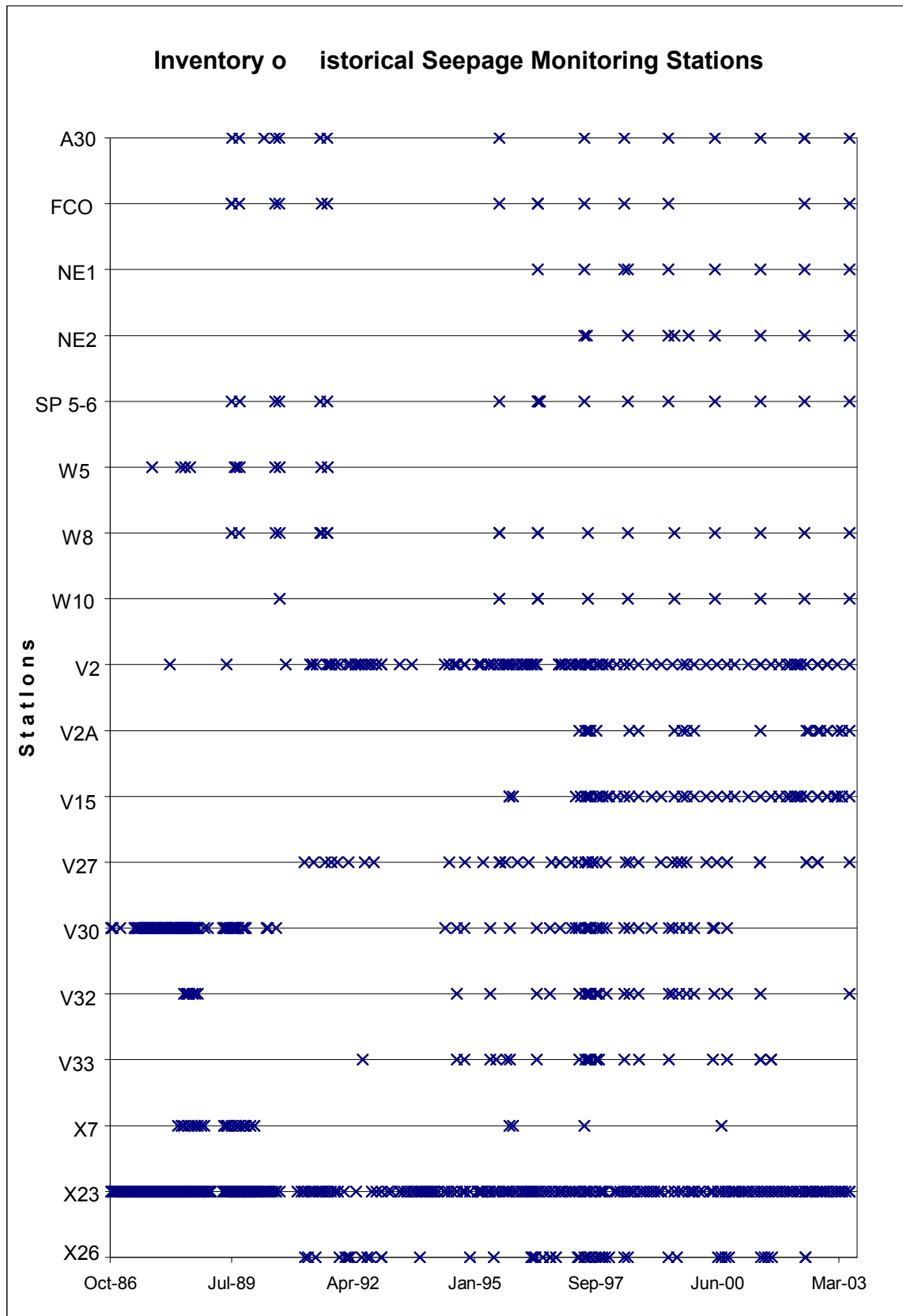








Appendix D.6
Inventory of Historical Seepage Monitoring



APPENDIX E
SRK Test Pit Program

Appendix E.1
Location of SRK Test Pits and Trenches

File Ref: Sample-Plan-NAD27.dwg

NAD 27 DATUM
Contour Interval = 10ft.



DELOITTE & TOUCHE INC.

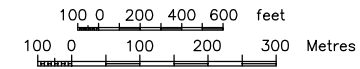
FARO MINE SITE

TEST PIT LOCATIONS
FARO DUMPS

PROJECT NO.	DATE	APPROVED	FIGURE
1CD003.11	Oct, 2002	KS	E.1



FARO PIT
Yukon Territory
Topographic Map

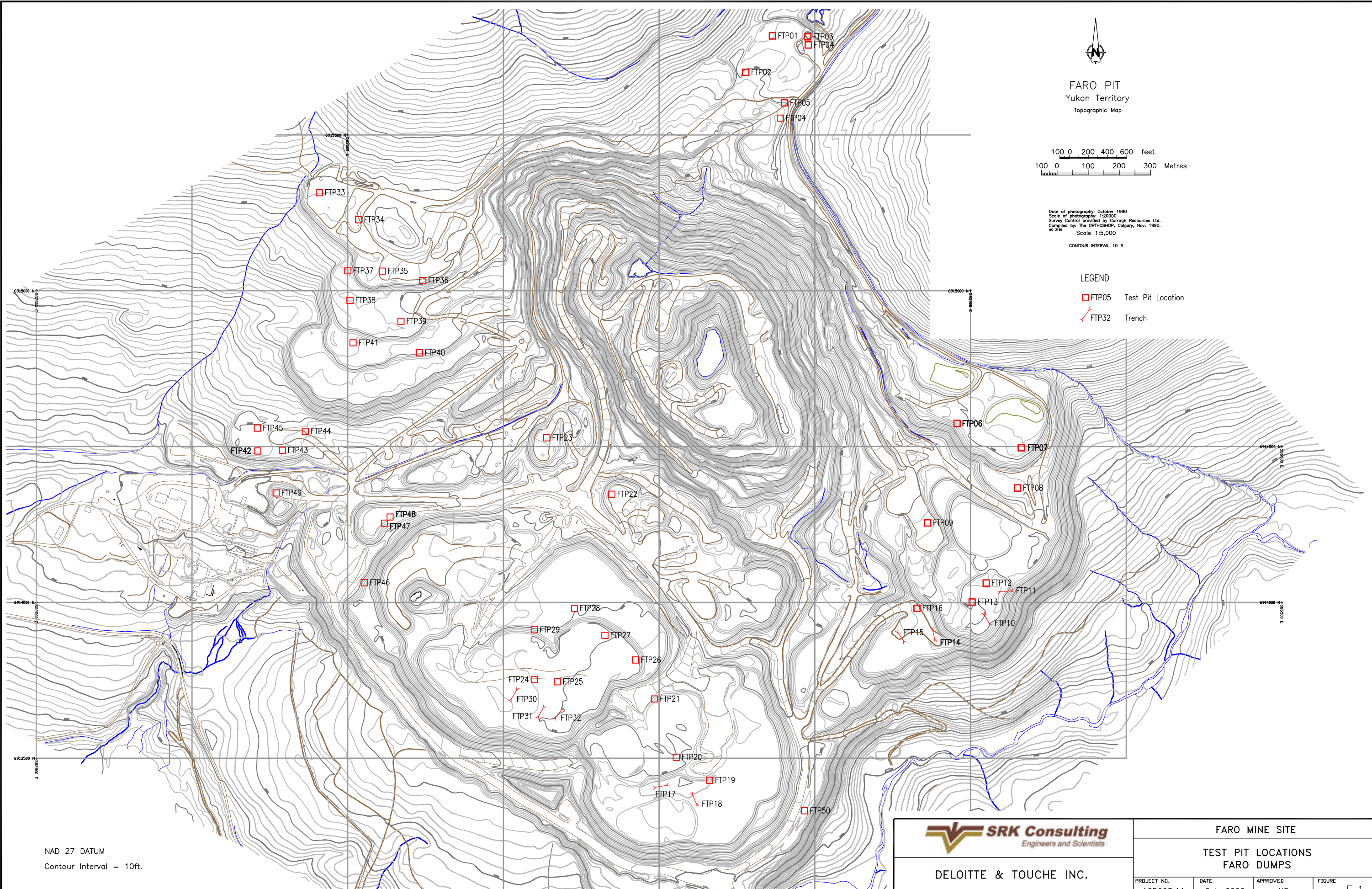


Date of photography: October 1990
Scale of photography: 1:20000
Survey Control provided by Curragh Resources Ltd.
Compiled by: The ORTHOSHOP, Calgary, Nov. 1990.
Scale 1:5,000

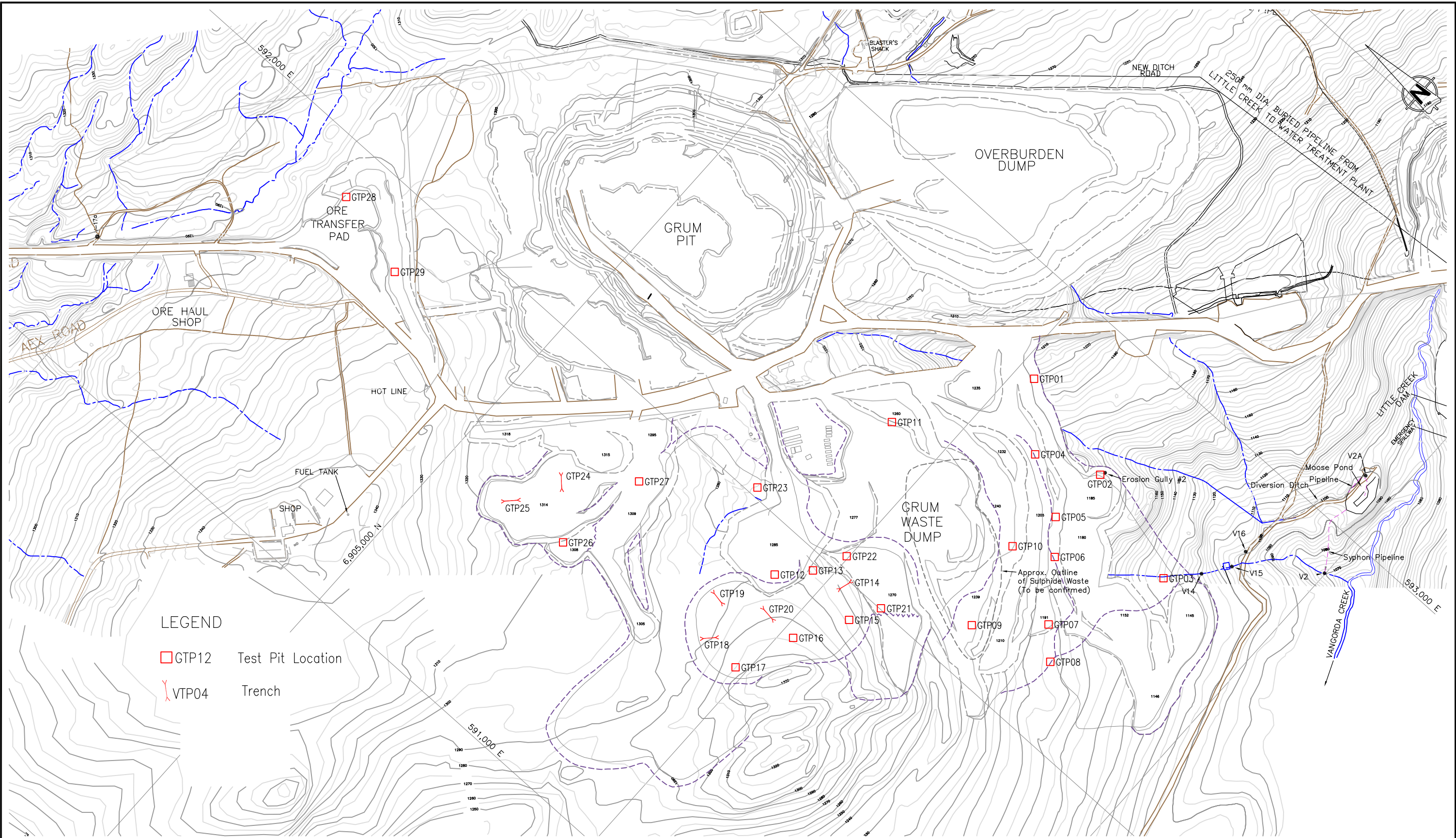
CONTOUR INTERVAL 10 ft

LEGEND

-  FTP05 Test Pit Location
-  FTP32 Trench

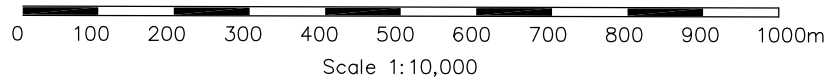


File Ref: Sample_plan-NAD27.dwg



LEGEND

- GTP12 Test Pit Location
- Y VTP04 Trench



NAD 27 DATUM

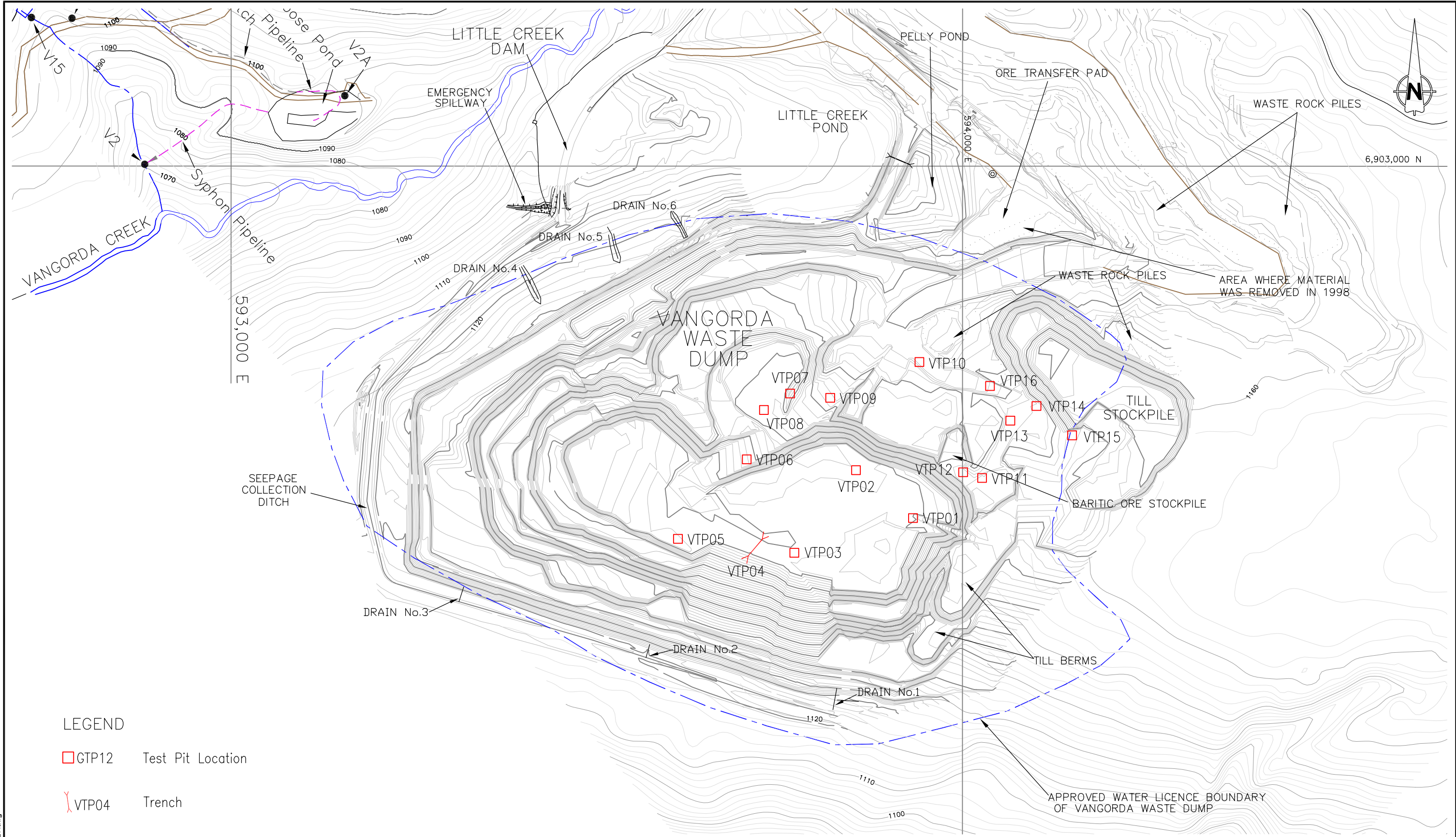


DELOITTE & TOUCHE INC.

VANGORDA PLATEAU MINE

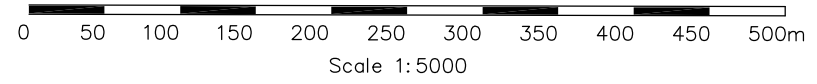
TEST PIT LOCATIONS
GRUM WASTE DUMP

PROJECT NO.	DATE	APPROVED	FIGURE
1CD003.11	Oct, 2002		E.2



LEGEND

- VTP01-VTP16 Test Pit Location
- VTP04 Trench



 SRK Consulting Engineers and Scientists	VANGORDA PLATEAU MINE			
	TEST PIT LOCATIONS VANGORDA DUMP			
DELOITTE & TOUCHE INC.	PROJECT NO. 1CD003.11	DATE Oct, 2002	APPROVED	FIGURE E.3

File Ref: Sample_plan-NAD27.dwg

Appendix E.2
Detailed SRK Sample Descriptions
and Results of Field Contact Tests

Test Pit Sample Log																			
		Location					Sample Info					Grain size				Field Measurements			
Pit	Date	Area	Easting	Northing	Elevation	Acc (m)	Sample	Tag No	Notes	Rock Type	Sample Description	% > 1 cm	% < 1 cm	Fines description	Photo	pH	Cond (µS	Fizz	Colour
FTP01	23-Sep	FVN	584864	6915818	1305.8		FTP01A	70801	50 cm	Oxidized Qtz musc phyllite	Orange, oxidized fragments of pale grey to grey-green qtz musc phyllite, some frags have 5% diss py in qtz layers, frags subangular blocky	40	60	non-calc fines	845	4.5	2070	none	orangish brown
							FTP01B	70802	150 cm	Oxidized schist	Pale orange brown to beige subangular blocky frags of weathered schist	50	50	non-calc fines		3.3	2480	none	light orange
FTP02	23-Sep	FVN	584778	6915701	1296.9		FTP02A	70803	50 cm	Oxidized phyllite	Pale orange brown oxidized phyllite with qtz musc phyll; small wedge of strongly oxidized material, red-brown	15	85	orange brown non-calc fines	846	3.5	372	none	orangish brown
							FTP02B	70804	150 cm	Weathered granite	Pale beige sandy waste with blocky altered granitic frags; granite has broken down to feldspathic sand, subang frags of biot-qtz granodiorite to 20 cm	30	70	sandy fines, strongly calc		7.4	579	moderate t	light brown
FTP03	23-Sep	FVN	584977	6915815	1296		FTP03A	70805	200 cm	Oxidiized Qtz musc phyllite	Med greenish grey weakly oxidized qtz musc phyll, non-calc, platy and blocky frags 2-9 cm	50	50	pale orange brown fines, non-calc	847	5.2	315	none	brownish orange
FTP04	23-Sep	FVS	584979	6915789	1290.4		FTP04A	70806	200-300 cm	Oxidized Sulphides	Med orange weathering oxidized material, fines are non-calc, 10-20% mixed sulphide frags in the 10-15 cm range, massive po (2H), mass py, banded pyritic qtz sericite schist, py sph, gn in granular qtz matrix; biot qtz granodiorite (10E)	25	75	med-orange brown non-calc fines	848	2.0	6430	none	medium orange
FTP05	23-Sep	FVS	584903	6915603	1290.4		FTP05A	70807	0-50 cm	Brown till	Pale orange brown mixed till and waste frags of qtz musc schist	20	80	non-calc fines	849, 850	2.0	4800	none	brownish orange
							FTP05B	70808	50-80 cm	Oxidized waste	Red-brown oxidized overburden waste, biot granite frags in oxidized gritty matrix, minor qtz musc schist; 2 boulders of py sph (20 cm) in gritty matrix					2.4	4920	none	light orange
FTP06	23-Sep	NEU	585656	6914490	1281.1		FTP06A	70809	100-150 cm	Sandy pebbly till	Med reddish brown sandy pebbly till, rare subang platy frags 2-4 cm, minor white qtz porphyry and qtz musc phyll	30	70	non-calc fines	851	4.7	280	none	light orange
FTP07	23-Sep	NEU	585663	6914496	1286.8		FTP07A	70810	100-200 cm	Qtz porphyry	Ang granitic material 'smoky qtz porphyry' (10F)	60	40	pale brown weakly calc fines	852	7.4	418	moderate	medium brown
FTP08	23-Sep	NEU	585651	6914367	1259.4		FTP08A	70811	20-30 cm	Qtz musc phyllite	subangular blocky qtz musc phyll, pyritic sericite schist	50	50	non-calc fines		2.9	3990	none	orangish brown
							FTP08B	70812	100-150 cm	Qtz porphyry	Smoky qtz porphyry' (10F), qtz phyll	40	60	dark grey non-calc fines		3.5	4750	none	greenish brown
FTP09	24-Sep	NEL	585362	6914255	1227.7		FTP09A	70813	300-370 cm	Till	Clay rich talcose overburden, 20% cobbles, 10% platy schist; test pit did not penetrate sulphide cell	40	60	non-calc fines	853	6.6	266	weak	light brown
FTP10	24-Sep	NEL	585560	6913933	1256.3		FTP10A	70818	100 cm deep 8 m along trench	Calc-silicate	Pale grey banded and brecciated calc-silicate, mixed with lesser pale greenish grey biot qtz porphyry ,60% (10E)?/40% (3DO)	40	60	pale olive brown fines, highly calc	854	8.2	213	strong	medium brown
							FTP10B	70815	100 cm deep 22 m along trench	Biot porphyry	Iron stained biotite porphyry, with lesser orange brown weathering pyritic calc-silicate	40	60	med orange brown fines, non-calc	855	6.5	2210	weak	orangish brown
FTP11	24-Sep	NEL	585629	6914037	1260.4		FTP11A	70816	100 cm deep 6 m along trench	Calc-silicate	Med greenish grey calc silicate (3D), calcareous, minor (1D) biot-musc schist			pale greenish grey sandy fines, highly calc	858	8.4	353	strong	brownish grey
							FTP11B	70817	100 cm deep 30 m along trench	Brown schist	Med olive brown schist, with biot musc phyll (1D) and pale silvery talcose musc-biot schist, calcareous platy frags	40	60	pale brown sand sized talcose fines, very calcareous	859	8.4	182	moderate t	light brown
FTP12	24-Sep	NEL	585550	6914062	1259.2		FTP12A	70818	200 cm	Calc-silicate	2-4 cm blocky calcareous calc-silicate frags	30	70	pale greenish grey fines, highly calc	861	8.2	207	strong	brownish grey
FTP13	24-Sep	NEL	585505	6914001	1253.2		FTP13A	70819	200cm	Calc-silicate	2-4 cm blocky calcareous calc-silicate frags, minor porphyry frags	40	60	pale olive brown fines, stronly calc	863	8.2	391	strong	light brown
FTP14	24-Sep	ZIIE	585385	6913882	1246		FTP14A	70820	100 cm deep 28 m along trench	Sericite schist	Pale grey to beige altered sericite schist, frags 2-4 cm	50	50	Pale beige non-calc fines	866	7.8	1228	none	light brown
							FTP14B	70821	100 cm deep17 m along trench	Calc-silicate	Med olive grey highly calcareous calc-silicate, 2-3 cm frags	40	60			8.4	256	strong	light brownish grey
FTP15	25-Sep	ZIIE	585267	6913903	1218.1		FTP15A	70822	100 cm	Musc schist	Pale grey-brown to beige musc-biot-qtz schist (1D), > 10 cm fraction 40%	50	50			7.8	481	weak	light brown
FTP16	25-Sep	ZIIE	585328	6913981	1217.6		FTP16A	70823	100-120 cm	Qtz porphyry	Smoky qtz porphyry (10F), white with beige granular matrix, 2-3 cm blocky	50	50	pale brown non-calc fines	868	7.6	296	weak to m	light brown
							FTP16B	70824	200-300 cm	Andalusite schist	Greenish grey andalusite biot musc schist (1D), rare calc-sil frags	50	50	Med grey brown non-calc fines + schist frags		6.0	2050	none	light brown
FTP17	25-Sep	ID	584489	6913407	1218.8		FTP17A	70825	30 cm deep 7 m along trench	Biot musc schist	Greenish grey biot musc schist (1D)	50	50	Red brown granular non-calc fines	869	4.0	4570	none	brownish orange
							FTP17B	70851	50 cm deep 18 m along trench	Musc biot schist	Greenish grey biot musc schist (1D)	40	60	Pale greenish grey non-calc fines		7.4	956	weak	brownish grey
							FTP17C	70852	50 cm deep 24 m along trench	Biot QFP	Biotite QFP (10E), minor calc-silicate, minor biot schist, minor py and gn	40	60	Bright orange brown non-calc fines		2.7	3400	none	medium orange
FTP18	25-Sep	ID	584620	6913353	1219.5		FTP18A	70853	100 cm deep 29 m along trench	Sulfides	Blocky, subrounded py frags, lesser QFP (10E)	40	60	orange brown granular non-calc fines	870	6.5	1977	weak	brownish grey
							FTP18B	70854	100 cm deep10 m along trench	sulfides	Med grey blocky pyritic sph/gn frags, 2-4 cm, minor schist frags			Med grey granular fines, non-calc		3.5	7240	none	brownish orange
FTP19	25-Sep	ID	584662	6913429	1221.2	6	FTP19A	70855	200-230 cm	Biot QFP	Greenish-grey biot QFP (10E)70%, weakly calc med grey-green schist/calc-silicate (3D0) 30%	50	50	pale greenish grey weakly calc fines	871	8.0	650	strong	brownish grey
FTP20	25-Sep	ID	584555	6913503	1223.6	6	FTP20A	70856	400-450 cm	Calc-silicate	Grey green calc-silicate (3D0), 2-7 cm frags	60	40	clay rich matrix, balling up on sieve, highly calc	872	7.3	482	moderate	greenish grey
FTP21	25-Sep	ID	584485	6913690	1217.1	6	FTP21A	70857	75-100 cm	Sulfides	Mass and diss py (2E), minor gn, sph, frags 2-6 cm	60	40	red brown granular fines, non-calc	873	2.4	7550	none	brownish orange
							FTP21B	70858	200-260 cm	sulfides	Rounded massive py frags, 1-4 cm	50	50	dark grey pyritic sands		4.3	5200	none	medium brown

Test Pit Sample Log																			
		Location					Sample Info					Grain size				Field Measurements			
Pit	Date	Area	Easting	Northing	Elevation	Acc (m)	Sample	Tag No	Notes	Rock Type	Sample Description	% > 1 cm	% < 1 cm	Fines description	Photo	pH	Cond (µs	Fizz	Colour
FTP22	25-Sep	GSPC	584348	6914347	1199.8	6	FTP22A	70859	30 cm	Sulfides	Oxidized sulfides, pale reddish brown, diss to mass banded, siliceous py frags	50	50	pale brown fines non-calcareous	874	2.0	5720	none	brownish orange
							FTP22B	70860	200 cm	Pyritic sand	Med grey pyritic sand and pyritic phyllite frags	60	40	red-brown non-calc fines		2.4	9750	none	brownish orange
FTP23	26-Sep	GSPA	584139	6914528	1234.7		FTP23A	70861	50-100 cm	Sulfides	2-4 cm frags of mass py	50	50	red brown non-calc fines	876	2.2	6870	none	brownish orange
							FTP23B	70862	150-200 cm	Sulfides	Pale grey brown sulfide waste to greenish brown py sand w/ 20% rounded mass py frags of 2-4 cm	30	70	brown non-calc fines		2.1	7260	none	brownish orange
							FTP23C	70863	300-320 cm	Sulfides	Pale orange brown sulfide; pyrite sand with 30% rounded frags, rare schists and silica-rich frags to 20 cm	30	70	pale brown non-calc fines		2.5	6760	none	orangish brown
FTP24	26-Sep	MDE	584099	6913752	1308.2		FTP24A	70864	100-200 cm	Calc-silicate	50% calc-silicate (3D0), 50% (1D) biot-musc qtz schist, 3-5 cm blocky frags	50	50	pale grey brown sandy, talcose fines, highly calc	877	8.0	558	strong	brownish grey
FTP25	26-Sep	MDE	584173	6913745	1303.7		FTP25A	70865	150 cm	Calc-silicate	Angular blocky calc -silicate frags, 1-3 cm, rare schist and biot QFP (10E)	50	50	pale greenish grey highly calc granular fines	878	7.6	1118	strong	light grey
							FTP25B	70866	300-400 cm	Qtz sericite schist	20% talcose qtz sericite schist, 15% (1D) biot musc schist, 10% hbl-biot QFP (10E), 5% py in banded qtz schist, sph,gn			pale brown talcose sandy fines, highly calc		7.8	1492	moderate t	brownish grey
FTP26	26-Sep	MDE	584424	6913815	1254.4		FTP26A	70867	200-300 cm	Biot musc schist	Pale greenish grey (1D) biot musc andalusite schist, biot musc qtz schist, 10% quartz frags; frags angular + blocky, 2-6 cm	50	50	pale green ganular calc fines	879	7.1	2650	moderate	greenish grey
FTP27	26-Sep	MDE	584326	6913894	1250.6	7	FTP27A	70868	0-20 cm	Calc-silicate + sulphides	70% calc silicate (3D0), 10% qtz porphyry (10F); py-qtz, fine grained mass py frags	40	60	red-brown non-calc sandy fines	880	5.2	2430	weak	brownish orange
							FTP27B	70869	100-200 cm	1D schist	Pale olive brown to med greenish grey biot musc chl schist, pyritic qtz phyllite, 10% mass py frags; frags 2-5 cm angular + blocky			pale brown to beige calc fines		7.4	1774	moderate	light brown
FTP28	26-Sep	MDE	584228	6913981	1242.6	6	FTP28A	70870	200-300 cm	Qtz sericite schist	75% qtz sericite schist (1D4), 20 % QFP (10F), 5% mass and diss fine grained py, pyritic qtzite	50	50	pale greenish grey sandy matrix	881	7.6	666	weak	orange brown
FTP29	26-Sep	MDE	584099	6913912	1244.5	6	FTP29A	70871	50-100 cm	Talcose schist	90% med grey crenulated talcose schist, 10% qtz sericite schist (1D4); subangular frags 2-7 cm, minor py	50	50	pale brown non-calc fines	882	6.2	1511	weak to no	medium brown
							FTP29B	70872	300-350 cm	Talcose schist	Med grey musc talcose schist 70%, qtz sericite schist (1D4)30% pyritic in part, rounded frags 1-5 cm	50	50	pale orange brown non-calc fines		4.9	5940	none	orangish brown
FTP30	26-Sep	MDE	584025	6913689	1321.2		FTP30A	70873	50 cm deep, 12 m along trench	Qtz porphyry	Hbl biot qtz porphyry (10E) , dark grey phyll and graphitic phyll, (1D) biot musc qtz schist	40	60	pale grey granular fines	883	7.6	763	weak	greenish grey
							FTP30B	70874	50 cm deep, 22 m along trench	Qtz sericite schist	Qtz sericite schist, med grey talcose schist, mass sulphide sph, py, 1D biot musc qtz schist	50	50	pale orange brown granular fines non-calc		6.9	579	weak	light orange
FTP31	26-Sep	MDE	584112	6913634	1239.3	5	FTP31A	70875	100 cm deep 23 m along trench	Calc-silicate	60% calc-silicate (3D0), 30% hbl biot qtz porphyry (10E), 10% dark grey crenulated phyll	50	50	pale greenish grey highly calc fines	884	8.4	306	strong	light grey
							FTP31B	70876	100 cm deep 2 m along trench	Ox QFP	100% oxidized QFP (10F), pale orange brown	40	60	pale brown granular calc fines		8.2	223	moderate	light brown
FTP32	26-Sep	MDE	584167	6913629	1240.2	6	FTP32A	70877	100 cm deep, 9 m along trench	Ox 1D schist	Pale orange brown pyritic qtz sercite schist; 80% oxidized (1D) schist, 20 % ferricrete	40	60	pale orange brown granular fines	885	2.3	7360	none	dark orange
							FTP32B	70878	100 cm deep, 27 m along trench	Biot musc schist	Med grey 90% biot musc schist (1D), 10% dark green feldspar porphyry (10E)	40	60	pale greenish grey granular fines weakly calc		6.5	932	weak to med	light brown
FTP33	27-Sep	NWU	583409	6915315	1301	8	FTP33A	20879	50-100 cm	Hbl biot granodiorite	Subangular hbl biot granodiorite frags, 1-3 cm; some frags are breaking down to sand	30	70	pale brown non-calc granular fines		7.1	511	weak to med	orangish brown
							FTP33B	20880	200-300 cm	Hbl biot granodiorite	Subangular hbl biot granodiorite frags, 1-3 cm; some frags are breaking down to sand	30	70	pale brown non-calc granular fines		6.7	583	none	orangish brown
FTP34	27-Sep	NWU	583535	6915228	1308.2	6	FTP34A	70881	30-60 cm	Siliceous phyllite	Pale orange to yellow brown oxide zone, siliceous phyllite w/ sulfides	30	70	pale yellow brown to beige non calc clay fines (fines ball up during screening), weathered sulfides (py) and qtz	886	1.8	6020	none	brownish orange
							FTP34B	70882	150 cm	Mass sulfides	Dark brown coarse angular material, massive po, mass sph w/ gn, dark very fine grained heavy sooty angular frags 2-7 cm			grey brown non-calc fines, form clay balls		2.2	5480	none	medium brown
							FTP34C	70883	250 cm	Hbl biot granodiorite	Weathered hbl biot qtz granodiorite (10E), rounded	30	70	Brown granular non-calc fines, form clay balls		3.5	4030	none	orangish brown
FTP35	27-Sep	NWU	583611	6915063	1304.9	6	FTP35A	70884	30-50 cm	Sulfides	Banded siliceous pyritic rocks with sph, gn - disintegrating; massive py + po frags, sulphates in voids	40	60	Pale yellow brown fines, clay balls - non calc	887	1.6	14780	none	dark orange
							FTP35B	70885	80-170 cm	Sulfides	Med grey sulfides; porphyry (10E); pale green salt precipitate	30	70	Pale grey fines "pyrite sand" and non-calc clay balls		1.6	14080	none	orangish brown
							FTP35C		80-170 cm	Pale green crystals	Pale green transparent elongate crystals 2mm								
FTP36	27-Sep	NWU	583741	6915033	1297.4	6	FTP36A	70886	50-90 cm	Biot hbl granodiorite	Angular blocks of biot hbl qtz granodiorite (10E), pale greenish grey	40	60	Pale brown granular non-calc fines	888	7.2	946	moderate	light brown

Test Pit Sample Log																			
		Location					Sample Info					Grain size				Field Measurements			
Pit	Date	Area	Easting	Northing	Elevation	Acc (m)	Sample	Tag No	Notes	Rock Type	Sample Description	% > 1 cm	% < 1 cm	Fines description	Photo	pH	Cond (µs	Fizz	Colour
FTP37		NWM	583500	6915064	1261.8	8	FTP37A	70887	50-100 cm	Musc biot schist	Musc biot qtz schist (1D), 2-5 cm blocky angular frags	40	60	Pale greenish grey weakly calc sandy fines	889	7.2	444	weak to med	light brown
							FTP37B	70888	200 cm	Musc biot schist	Med grey biot musc qtz schist, pyritic qtz sericite schist, talcose schist, oxidized on surface, mixed platy and blocky frags	50	50	pale orange brown sandy matrix		6.6	2530	weak	light brown
FTP38	27-Sep	NWM	583507	6914969	1259.9	8	FTP38A	70889	150 cm	Calc-silicate	90% calc-silicate (3D0), 10% oxidized pyritic chl schist, amphibole schist	50	50	pale brown calc fines	890	7.5	618	strong	light brown
FTP39	27-Sep	NWM	583671	6914902	1254.9	8	FTP39A	70890	100 cm	Biot musc schist	Oxidized biotite musc qtz schist, minor qtz sericite schist	50	50	pale brown non-calc fines	891	2.4	1805	none	light orange
							FTP39B	70891	200-300 cm	Biot musc schist	Oxidized biotite musc qtz schist, minor qtz sericite schist; minor talcose and chl schist	50	50	pale brown non-calc fines		5.8	999	none	orangish brown
FTP40	28-Sep	NWM	583730	6914801	1244.3	8	FTP40A	70892	100 cm	Calc-silicate	Pale grey-brown to beige calc silicate, frags 2-3 cm subang	50	50	pale brown granular fines, weakly calc	892	6.9	700	weak	pale gry-brown
							FTP40B	70893	300 cm	Calc-silicate, schist	40% calc-silicate (3D0), 40% biot musc schist (1D), 20% dark grey phyllite	50	50	pale brown non-calc fines		6.8	2500	moderate	pale gry-brown
FTP41	28-Sep	NWM	583517	6914833	1245.7	7	FTP41A	70894	50-100 cm	Qtz sericite schist	Oxidized qtz sericite schist (1D4), ferricrete	50	50	oragne brown fines	893	3.1	2500	none	pale orange brown
							FTP41B	70895	250-300 cm	Qtz sericite schist	Pale greenish grey horizon, qtz sericite schist + pyritic banded qtzite, frags subang and blocky, 2-4 cm	50	50	pale brown fines		4.5	4200	none	pale orange brown
FTP42	28-Sep	UPL	583211	6914486	1193.8	7	FTP42A	70896	200 cm	Calc-silicate	88% pale greenish grey calc-silicate (3D0), 9% schist, 3% qtz; frags angular, platy + blocky, 2-6 cm			pale grey-brown calc fines	no photo	6.9	500	strong	pale grey
FTP43	28-Sep	UPL	583290	6914488	1187.6	7	FTP43A	70897	200 cm	Calc-silicate	Calc-silicate (3D0), minor biot musc schist; ang platy + blocky frags, 2-8 cm	50	50	pale greenish grey granular fines, highly calc	894	6.9	600	strong	pale grey
FTP44	28-Sep	UPL	583364	6914549	1185.7	6	FTP44A	70898	100-150 cm	Calc-silicate	Pale greenish grey blocky calc-silicate (3D0), 60% > 10 cm	65	35	pale greenish grey granular fines, highly calc		7.4	300	strong	pale grey
							FTP44B	70899	200-280 cm	Till	Med brown overburden + 10% organics	20	80	med brown non-calc fines		6.9	100	none	med grey brown
FTP45	28-Sep	UPL	583210	6914559	1185.9	9	FTP45A	70900	250 cm	Calc-silicate	Pale greenish grey blocky calc-silicate (3D0)91%, Biot QFP (10E)9%	50	50	pale greenish grey highly calc fines	6	7.4	300	strong	pale green grey
FTP46	28-Sep	OXSP	583553	6914063	1168.1	8	FTP46A	70901	50-100 cm	Sulfides	Oxidized rounded to sub ang py + po, with sph and gn (2E, 2H)	30	70	pale orange-brown fines, mainly clay balls , non-calc	7	2.0	11200	none	pale yellow brown
							FTP46B	70902	200-250 cm	Sulfides	Blocky dark brown to red-brown sulfide frags; mass blocky py + po, also sph, gn, diss py, banded sph gn py	40	60	pale greenish grey clay matrix		1.9	7000	none	pale yellow brown
FTP47	28-Sep	MGSP	583618	6914254	1176.8	7	FTP47A	70903	100 cm	Sulfides	Dark red-brown oxidized frags, black graphitic qtz phyll with py + sph + gn (2A), mass sulfide, fine grained py, banded sph +gn (2E)	50	50	Med grey fines	8	2.3	8500	none	med grey
							FTP47B	70904	200-260 cm	Sulfides	Dark grey green horizon, fewer oxidized frags	50	50	Med grey fines		2.7	9400	none	med grey
FTP48	28-Sep	MGSP	583636	6914274	1175.6	7	FTP48A	70905	150 cm	Sulfides	Sub ang frags of sulfides w/ dark brown oxide coatings 60%; dark grey to black banded siliceous phyllite with diss sulfides, py, sph, gn (2A) , also fine grained mass py and fine grained py with banded sph + gn (2E)	50	50	Pale greenish grey fines	9	2.2	9200	none	light greenish grey
FTP49	28-Sep	CHSP	583270	6914351	1167.9	7	FTP49A	70906	50-75 cm	Sulfides	Dark grey horizon, mainly (2A)- graphitic ribbon banded quartzite, py + sph + gn; minor (2B) quartzite	50	50	Dark grey non-calc fines	10	5.5	2400	none	dark grey
							FTP49B	70907	200-250 cm	Sulfides	Mass py + sph + gn (2E), minor graphitic banded (2A)	60	40	Dark olive green granular non-calc fines		4.8	4800	weak	med greenish grey
FTP50	29-Sep	OHRE	584967	6913331	1175.1	5	FTP50A	70919	100 cm	Calc-silicate	Med greenish grey calc-silicate (3D0)	50	50	pale grey granular fines, weakly calc		8.0	400	weak	pale green grey
							FTP50B	70920	250 cm	Calc-sil + biot schist	50% calc-silicate schist (3D0), 50% biot-musc qtz schist	50	50	pale grey granular fines, weakly calc		7.4	1900	weak to med	pale green grey

Test Pit Sample Log																			
Pit	Date	Location	Easting	Northing	Elevation	Acc (m)	Sample Info		Notes	Rock Type	Sample Description	Grain size			Photo	Field Measurements			
		Area					Sample	Tag No				% > 1 cm	% < 1 cm	Fines description		pH	Cond (µS	Fizz	Colour
GTP01	19-Sep	Grum	592749	6903947	1224.4	6	GTP01A	70977	20-130 cm	Grey phyllite	Med grey non-calc phyllite > (5D) chloritic phyllite, platy frags, 40 % 3-15 cm	40	60	calc fines	803	8.2	475	moderate	light grey
GPT02	19-Sep	Grum	592674	6903637	1199.4	5	GTP02A	70978	10 to 70 cm	Grey phyllite	Pale silver grey coated med grey non-calc greasy phyllite, 1-7 cm platy frags	40	60	weakly calc fines	804	7.6	413	moderate	medium grey
	19-Sep						GPT02B	70979	300-400 cm	Green grey phyllite	Pale greenish grey mix of (5D) calc chl phyllite/ med grey non-calc phyllite (50/50); higher % (5D) in coarser fractions, platy frags 2-5 cm	40	60	weakly calc fines		7.9	865	weak	medium grey
GPT03	19-Sep	Grum	592578	6903320	1172.9	5	GPT03A	70980	130 cm	Grey phyllite	Med grey calc phyllite, pale greenish grey fines, platy frags 2-5 cm, weakly calc, clay balls for fines	50	50	weakly calc fines	805	7.8	471	strong	light brown
GPT04	19-Sep	Grum	592597	6903807	1228.7	6	GPT04A	70981	200-300 cm	Talcosc phyllite	Med grey talcosc (greasy) non-calc phyllite (70%) + chloritic calc phyllite (30%), rare qtz, higher % chloritic phyllite in larger frags	60	40		806	8.0	745	weak to m	medium grey
GTP05	19-Sep	Grum	592507	6903651	1216.7	7	GTP05A	70982	30-200 cm	Chloritic phyllite	Pale grey-green chloritic phyll + dark grey calc and non-calc phyllite	60	40	weakly calc fines	807	7.6	1017	weak to m	medium grey
	19-Sep						GTP05B	70983	400-450 cm	Mixed phyllites and sulphides	10% sulfide frags, banded pyritic dark grey phyll, massive f.g. py, chloritic phyll + dark grey phyll, 3-14 cm platy and blocky frags			weakly calc fines		6.9	2450	weak	medium grey
GTP06	19-Sep	Grum	592424	6903580	1215.9	7	GPT06A	70984	100 cm	Grey phyllite	Pale grey to greenish grey calc phyll (50/50 5D/5BO), larger frags (5D)>(5BO); 60% of frags 10 to 30 cm, frags platy	60	40	fines mod calc	808	8.4	369	moderate	medium grey
	19-Sep						GPT06B	70985	300-500 cm	Talcosc phyllite	Pale olive brown to med grey talcosc phyllite (5BO); frags platy	40	60	fines highly calc		8.0	636	moderate t	greyish brown
GTP07	19-Sep	Grum	592275	6903470	1216.4	7	GPT07A	70986	200 cm	Talcosc phyllite	Pale grey talcosc calcareous phyllite, 3-5 cm platy frags	50	50	calc fines	809	8.0	825	moderate	medium grey
GTP08	19-Sep	Grum	592202	6903398	1218.1	6	GPT08A	70987	200 cm	Chloritic phyllite	Greenish grey platy chloritic calcareous phyllite (5D)	40	60	fines strongly calc	810	8.2	907	strong	medium grey
	19-Sep						GPT08B	70988	400 cm	Mixed waste	Interbanded pale brown and pale greenish grey (5D + altered 5D)	50	50			7.7	1540	weak to m	medium grey
GTP09	20-Sep	Grum	592134	6903625	1248.9	8	GTP09A	70989	500 cm	Grey phyllite	Med grey non-calc phyllite, minor qtz (3GO), larger frags mix of (5BO/3GO)	60	40	pale grey non-calc fines	811	8.1	1190	weak	medium grey
GPT10	20-Sep	Grum	592369	6903686	1252	7	GTP10A	70990	300 cm	Grey phyllite	Med grey and green-grey mixed non-calc phyllite (3GO/5D 70/30), 20% frags 15-25 cm	50	50	pale greenish grey non-calc fines	812	7.3	1390	weak	light grey
GPT11	20-Sep	Grum	592402	6904157	1283	8	GTP11A	70991	150 cm	Green-grey phyllite	Pale greenish grey talcosc calcareous chloritic phyllite (5D)	50	50	non-calc fines	813, 814	7.8	744	weak to m	light grey
	20-Sep						GTP11B	70992	370 cm	Grey phyllite	Med grey non-calc phyllite (3GO), minor pyritic med grey phyll	60	40	non-calc fines		6.4	1825	weak	brownish grey
GTP12	20-Sep	Grum	591878	6904118	1313	6	GTP12A	70993	300-370 cm	Phyllite + sulphides	Chloritic phyllite, grey phyllite, waste pile 10-20% mass sulfides	40	60	talcosc non-calc fines, med grey	815	7.1	1103	weak	medium grey
GTP13	20-Sep	Grum	591956	6904048	1311.4	6	GTP13A	70994	200 cm	Chloritic phyllite	Coarse med olive green calc chloritic phyllite, paler beige altered frags near bottom, >1 cm fraction chloritic phyllite/ grey calc phyllite	50	50	pale greenish grey talcosc fines, weakly calc	816	8.3	412	weak to m	light grey
GTP14	20-Sep	Grum	591998	6903952	1319	6	GTP14A	70995	20-100 cm deep, 2 m along trench	Chloritic phyllite	Pale brown to beige platy talcosc calcareous chloritic phyllite and grey phyllite	50	50	plae olive green fines, weakly calc	818, 819	8.3	345	weak	light brown
	20-Sep					6	GTP14B	70996	60 cm deep, 23 m along trench	Chloritic schist (ox)	Pale orange brown, red-brown to beige platy altered (5D) chloritic schist, minor grey phyllite	40	60	talcosc non-calc fines	817	7.2	477	weak	brownish grey
GTP15	20-Sep	Grum	591921	6903884	1317.6	6	GTP15A	70997	300 cm	Chloritic schist	Platy greenish gray chloritic schist, 2-10 cm frags (5D)	50	50	pale greenish grey frags, mod calc	820	8.2	680	weak to m	light grey
GTP16	20-Sep	Grum	591783	6903965	1322.6	6	GTP16A	70998	100 cm	Chloritic schist	Olive grey chloritic schist (5D) and altered (5D) minor dark grey phyllite	60	40	Pale olive grey highly calcareous	821	8.1	772	moderate	light grey
	20-Sep						GTP16B	70999	350 cm	Chloritic phyllite	2-7 cm grey non-calc phyllite and chloritic phyllite, >10 cm calc chloritic phyllite	60	40	pale olive grey non-calc fines		7.6	1023	weak	light grey
GTP17	20-Sep	Grum	591618	6904029	1326	6	GTP17A	7100	300 cm	Chloritic phyllite	Chloritic and grey phyllite, minor pyritic phyllite, coarse fraction 60% 5 to 30 cm; larger frags are chloritic phyllite, smaller frags are mix of chl phyll and med grey non-calc crenulated phyllite	50	50	pale grenish grey non-calc fines	822	7.4	1005	weak	light grey
GTP18	20-Sep	Grum	591619	6904147	1325.8	7	GTP18A	70781	100 cm deep 2m along trench	Chloritic phyllite	2-6 cm altered (5D), 'fault gouge', spotty mariposite, trace py	50	50	fines weakly calc	825	8.1	645	moderate	light grey
	20-Sep					7	GTP18B	70782	100 cm deep 21 m along trench	Grey phyllite	Platy med grey non-calc phyllite, larger frags contain py	50	50	non-calc fines	824	7.8	542	weak	medium grey
GTP19	20-Sep	Grum	591730	6904207	1325.8	7	GTP19A	70783	70 cm deep 2 m along trench	Grey phyllite	Med grey non-calc phyll with trace py, mixed chl phyll (5D) and altered beige (5D)	50	50	med-grey fines, weakly calcareous		7.4	660	weak	dark grey
	20-Sep					7	GTP19B	70784	70 cm deep 30 m along trench	Graphitic phyllite	2-6 cm platy black graphitic phyllite, 5% py	40	60	black graphitic non-calc fines		8.1	495	weak	dark grey

Test Pit Sample Log																			
		Location					Sample Info					Grain size				Field Measurements			
Pit	Date	Area	Easting	Northing	Elevation	Acc (m)	Sample	Tag No	Notes	Rock Type	Sample Description	% > 1 cm	% < 1 cm	Fines description	Photo	pH	Cond (µs	Fizz	Colour
GTP 20	20-Sep					7	GPT20A	70785	20 cm deep 4 m along trench	Chloritic schist	Pale orange brown altered chloritic schist (5D), 2-8 cm subangular blocky frags, minor mariposite	50	50	Fines non-calc	826-829	6.2	566	weak	light brown
	21-Sep	Grum	591788	6904079	1322.9	7	GTP20B	70786	70 cm deep 11 m along trench	Chloritic phyllite	Pale olive green platy chloritic phyllite altered chl phyll and talcose med grey phyll, minor S2 qtz, frags 2-5cm	40	60	non-calc fines	830	7.8	540	weak to med	greenish grey
	21-Sep						GTP20C	70787	100 cm deep 26 m along trench	Chloritic phyllite	Pale greenish grey chloritic phyllite and med grey talcose phyllite	40	60	non-calc fines	831	7.4	612	weak to med	medium grey
GTP21	21-Sep						GTP21A	70788	250 cm	Oxidized phyllite and sulphides	Pale orange to pale olive brown mixed oxidized material, 2 to 5 cm angular to subangular fragments consisting of py in banded dark grey phyllite, diss to massive py, med grey phyllite	50	50		832-835	4.9	1897	weak	medium grey
GTP22	21-Sep	Grum	592003	6903840	1304.6	7	GTP22A	70789	100-170 cm	Grey phyllite	Pale greenish grey to dark grey noncalc phyllite, frags 2-8 cm platy and blocky,	50	50	non-calc fines	836	7.6	655	weak to med	greenish grey
	21-Sep	Grum	592047	6904005	1307.3	7	GTP22B	70790	200-300 cm	Grey phyllite	Med grey phyllite, non- to weakly-calc, minor altered (5D) chl phyll	40	60	pale greenish grey fines, weakly calc		6.6	786	moderate	medium grey
GTP23	21-Sep					6	GTP23A	70791	100-200 cm	Graphitic phyllite	Dark grey graphitic pyritic phyllite, narrow lenses of altered chl phyll	40	60	non-calc fines	837	7.0	871	weak	medium grey
	21-Sep	Grum	592024	6904312	1308.5		GTP23B	70792	300-400 cm	Pyritic phyllite	Dark grey banded pyritic phyllite, non-calc, minor altered chl phyll	50	50	weakly calc		7.4	848	moderate	dark grey
GTP24	21-Sep					6	GTP24A	70793	70 cm	Chloritic phyllite	Greenish grey calcareous chloritic phyllite, frags platy, 3-9 cm	30	70	pale orange brown fines, strongly calc	838	7.8	379	strong	yellowish brown
	21-Sep	Grum	591692	6904732	1323.6	6	GTP24B	70794	70 cm	Grey phyllite	Silver grey oxidized calcareous phyllite	50	50	pale grey brown fines,strongly calc	839	7.4	998	strong	medium brown
GTP25	21-Sep	Grum	591536	6904800	1325.3	6	GTP25A	70795	70 cm	Grey phyllite	Med grey calc phyllite with oxide coatings on fracture (combined oxidized and slightly oxidized material in sample); frags platy, 2-7 cm	40	60	pale to orange brown calc fines	840 841	7.9	403	strong	medium brown
	21-Sep						GTP25B	70796	70 cm	Chloritic phyllite	Pale greenish grey calc chloritic phyllite, smaller platy frags include pale grey phyllite	40	60	pale greenish grey	842	7.8	307	strong	medium grey
GTP26	21-Sep	Grum	591558	6904608	1321.7	6	GTP26A	70797	10-150 cm	Grey phyllite	Med grey platy and blocky calcareous phyllite, trace pyrite, frags 3-9 cm	50	50	pale greenish grey calc fines	843	6.7	460	strong	medium grey
	21-Sep						GTP26B	70798	300 cm	Brown phyllite	Pale oxidized greenish brown phyllite, frags 3-9 cm, minor grey phyllite	60	40	pale olive brown fines, strongly calc		7.4	324	moderate to	brownish grey
GTP27	21-Sep	Grum	591821	6904564	1309.7	6	GTP27A	70799	200-300 cm	Grey phyllite	Med grey phyllite frags, mixed with medium olive brown till	50	50	med olive brown fines, strongly calcareous	844	7.7	3787	moderate	brownish grey
GTP28	29-Sep	Grum - OT	591867	6905679	1313.3		GTP28A	70908	70-100 cm	Sulfides	Pale to med grey interbanded (2A) 'ribbon banded graph qtzite', (2CD) 'pyritic qtzite', (2E) 'massive py'	60	40	pale grey fines		5.5	3100	none	med grey
							GTP28B	70909	120-190 cm	Sulfides	Grey-brown w/ pale orange-brown (2A) 'ribbon banded graph qtzite', (2CD) 'pyritic qtzite', (2E) 'massive py'	60	40	med grey fines		5.5	4000	none	dark grey
GTP29	29-Sep	Grum - OT	591803	6905443	1320.7		GTP29A	70910	50-100 cm	Sulfides	30% (2E) py w/ sph, 20% pale grey crenulated non-calc phyll, 50% fines	50	50	med grey non-calc fines		5.7	1300	none	med grey
							GTP29B	70911	250-300 cm	Sulfides	50% (2E) mass py w/ sph + gn,40% med to pale grey crenulated non-calc phyll, 10% (2CD) py qtzite	50	50	dark grey non-calc fines		5.7	2900	none	dark grey

Test Pit Sample Log																				
		Location					Sample Info					Grain size				Field Measurements				
Pit	Date	Area	Easting	Northing	Elevation	Acc (m)	Sample	Tag No	Notes	Rock Type	Sample Description	% > 1 cm	% < 1 cm	Fines description	Photo	pH	Cond (µS	Fizz	Colour	
VTP01	17-Sep	Vangorda	593933	6902518	1188.8	11	VTP01A	70951	250cm	Oxidized phyllite	strongly oxidized orange brown, clots of oxidized clay rich material	40	60		92	4.4	4400	v. weakly	brown	
VTP02	17-Sep	Vangorda	593854	6902583	1180.4	7	VTP02A	70952	40cm	Oxidized phyllite	orange red brown strongly oxidized sericitic non-calc phyllite	30	70		91	3.1	4300	none	rusty brown	
							VTP02B	70953	250cm	Graphitic phyllite	black graphitic weakly calc phyllite, 10% sercite schist	50	50			6.7	3200	weakly	black	
VTP03	17-Sep	Vangorda	593771	6902471	1178.9	7	VTP03A	70954	150cm	Oxidized phyllite	Pale grey non-calc siliceous phyllite	50	50		89	5.4	2300	none	rusty brown	
VTP04	17-Sep	Vangorda	593707	6902466	1174.6	5	VTP04A	70955	0-5m along trench, 100cm deep	dark grey phyllite	Dark grey non-calc phyllite, occasionally greasy	40	60		87	5.0	3700		brownish grey	
							VTP04B	70956	6-8m along trench	Greenish phyllite	>1cm fraction 90% platy black non-calc phyllite up to 4 cm (KS note - the greenish colour was a surface coating - probably ppt.)	30	70		86	3.6	5900	none	med grey	
							VTP04C	70957	28-30m along trench	Graphitic phyllite	Black weakly calc phyllite, resistant sulfide clasts observed nearby				85	6.9	3200	weakly	black	
VTP05	17-Sep	Vangorda	593611	6902489	1176	7	VTP05A	70958	0-20cm	Oxidized phyllite	Med to dark red-brown oxide horizon with grey green patches, 'oxide front?', massive pyrite frags, diss py in grey qtz phyllite, ferricrete in cobble size patches (30% in sample), pyrite 30%	50	50		82	3.2	3800		brownish grey	
							VTP05B	70959	100-170cm	Pyritic phyllite	Black, graphitic, weakly calcareous pyritic phyllite, pale olive green non-calc phyllite, rare massive po, massive py frags	25	75			5.9	2900	weakly	brownish grey	
VTP06	17-Sep	Vangorda	593705	6902598	1165.5	6	VTP06A	70960	100cm	Pyritic phyllite	Black pyritic phyllite, greasy crenulated, pyritic qtzite, 60% larger frags 15-40 cm	60	40		81	6.4	2000		dark grey	
							VTP06B	70961	100cm	Graphitic phyllite	Tan / grey, non-calc black graphitic phyllite/pyritic quartzite/grey phyllite/sericite schist, 50% > 5cm, up to 30-40 cm	60	40			6.8	1700	none	dark grey	
VTP 07	18-Sep	Vangorda	593764	6902687	1159	6	VTP07A	70962	100cm	Sulfides	Med olive brown w/ patches of red-brown, f g diss py, f g massive py	40	60	Fines non-calc	780	5.7	2690	weak	yellowish brown	
	18-Sep						VTP07B	70963	250cm	Sulfides	Coarse grey f g diss py w/ patches of red-brown, 30% of surface mainly sulfides and qtz sulfides	50	50		781	6.4	2690	moderate	medium brown	
VTP08	18-Sep	Vangorda	593728	6902665	1161.6	6	VTP08A	70964	100cm	Sulfides	Med grey-green fines, coarse boulders to 1 m no stratification, rare patches of orange brown oxide, massive sulphide boulders	50	50	non-calc med grey-green fines	782	6.4	2350	moderate	medium brown	
VTP09	18-Sep	Vangorda	593819	6902682	1158.5	6	VTP09A	70965	150cm	Phyllite + till	20% rounded cobbles, 20% med grey talcose qtz phyllite frags, 1 cobble of diss py			non-calc fines	783	4.4	1552	weak	yellowish brown	
VTP10	18-Sep	Vangorda	593941	6902730	1151.5	6	VTP10A	70966	20-40cm	grey phyllite	Silver to steel grey clay rich horizon w/ silvery phyllite and banded sulfide frags, talcose phyllite > 50%, 10% sulfides	60	40	non-calc fines	787	7.1	2170	weak	brownish grey	
	18-Sep						VTP10B	70967	40-60cm	Sulphides in clay rich horizon	Pale olive-brown clay rich horizon, ~20% mass fine grained py pebbles to 7 cm	40	60	wet clay forms balls on screening		6.1	2110	weak	greyish brown	
	18-Sep						VTP10C	70968	140-200cm	Talcose phyllite	Grey-green talcose phyllite with trace pyrite, water at 200 cm	40	60			6.1	1934	weak	medium grey	
VTP11	18-Sep	Vangorda	594027	6902572	1159.7	6	VTP11A	70969	100cm	Sulfide fines	Dark olive green massive sulfide fines, red-brown oxide to 25 cm	15	85		788, 789,790	3.8	4610	none	greenish grey	
VTP12	18-Sep	Vangorda	594002	6902580	1163.1	6	VTP12A	70970	100cm	Sulfide fines	Dark grey to dark olive green sulfide fines, coarse fraction to 5 cm	40	60	non-calc fines	791	4.1	6390	none	greenish grey	
VTP13	18-Sep	Vangorda	594066	6902651	1160.4		VTP13A	70971	100cm	Talcose phyllite	Platy dark grey talcose phyllite, 30 % f g diss py	65	35	dark olive grey sandy gritty matrix, non-calc fines	792, 793	5.6	2300	weak	greyish brown	
VTP14	18-Sep	Vangorda	594101	6902671	1162.1	7	VTP14A	70972	0-100cm	Grey green till	Upper till layer, 10% > 1cm includes balls of clay, med-grey green, pebbly till with cobbles up to 1 m	10	90	strongly calcareous	794, 795, 796, 797, 795, 798	7.8	402	strong	medium grey	
	18-Sep						VTP14B	70973	100cm	Orange brown oxide horizon	Lower till, pale orange brown, 1-3 cm exotic pebbles w/ oxidized clay coatings	30	70	weakly calc		2.9	2610	none	brownish yellow	
VTP15	18-Sep	Vangorda	594151	6902630	1167.6	5	VTP15A	70974	70cm	Olive green till	Pale olive green till, >1 cm fraction includes clay balls	10	90	clay fines strongly calcareous	799, 800	7.8	1642	strong	medium brown	
	18-Sep						VTP15B	70975	100cm	Oxidized till	Oxidized till with mixed angular frags, oxide coated siliceous pyritic phyllite, non-calc	40	60	non-calc		5.1	4670	none	greyish brown	
	18-Sep						VTP15ox		20cm	Oxide front in till	Lower till, oxidation front separating greenish grey till from oxidized till					3.4	4750	none	greenish grey	
VTP16	18-Sep	Vangorda	594037	6902698	1158.5	5	VTP16A	70976	100cm	Black phyllite	Platy black non calc phyllite	50	50	non-calc fines	801, 802	6.6	1182	weak	medium grey	

Test Pit Sample Log																			
		Location					Sample Info					Grain size				Field Measurements			
Pit	Date	Area	Easting	Northing	Elevation	Acc (m)	Sample	Tag No	Notes	Rock Type	Sample Description	% > 1 cm	% < 1 cm	Fines description	Photo	pH	Cond (µs	Fizz	Colour
H RTP01	29-Sep	Haul Road	590797	6906632	1259.4	6	H RTP01A	70912	30-100 cm	grey phyllite + sulfides	30% dark grey crenulated phyllite, 10% (2E) mass py, sph, gn, 10% (2CD) py qtzite sph, 50% fines	50	50	med grey non-calc granular fines		5.9	2300	weak	med grey
							H RTP01B	70913	180-220 cm	grey phyllite + sulfides	Dark grey phyllite, 15% (2E), 5% (2CD)	50	50	dark grey granular fines		6.4	1000	weak	dark grey
H RTP02	29-Sep	Haul Road	589226	6908138	1225.1	6	H RTP02A	70914	150 cm	Till + calc-silicate	Pale olive brown till w/ rounded cobbles + angular calc-silicate schist			Pale olive rey-brown granular non-calc fines		6.9	200	strong	med green grey
H RTP03	29-Sep	Haul Road	587779	6909742	1231.8	5	H RTP03A	70915	200 cm	Calc-silicate	Pale green calc-silicate schist, 2-4 cm blocky	40	60	Pale greenish granular calc fines		8.7	500	strong	med green grey
H RTP04	29-Sep	Haul Road	586553	6911176	1190	6	H RTP04A	70916	200-300 cm	Chl schist	Mixed waste, chl schist, dark grey phyllite, calc-silicate schist, biot-musc qtz schist, rare fg mass py, pyritic quartzite with sph gn, qtzite w/ cpy	40	60	Pale greenish-grey non-calc fines		6.7	3200	weak	pale green grey
H RTP05	29-Sep	Haul Road	585291	6912509	1135.2	6	H RTP05A	70917	150 cm	Ox qtz porphyry	Pale orange brown oxidized qtz porphyry (10F)	40	60	Pale orange brown granular fines weakly calc		7.6	500	moderate	pale olive brown
							H RTP05B	70918	220 cm	Calc-silicate schist	Calc-silicate schist frags (3D0), rare dark grey phyllite, rare py in calc-silicate schist	40	60	Med greenish grey clay balls, calc		9.5	600	strong	pale green grey

Appendix E.3
Selection of Samples for Testing

MEMORANDUM

DATE: January 21, 2003
TO: Sohan Basra
FROM: John Chapman
RE: **Faro Testing Program – Part II**

Sohan,

The attached spreadsheet outlines the samples we would like submitted for additional static testing. We hope to finalize our initial selections of samples for kinetic testing early next week and should be ready to start some of the kinetic tests at that time. Specific procedures are outlined as follows:

ABA - Samples should be tested following the modified Sobek procedure with sulphur speciation and total inorganic carbon for determination of carbonate NP. The tests should be completed on a crushed portion of the “as-received” (<1cm) material.

ICP – Samples (prepared as above) should be submitted for a solids ICP scan following standard protocols.

ICP, TIC, S, SO₄ – Samples (prepared as above) should be submitted for an ICP scan, total inorganic carbon and sulphur speciation.

Leach Extraction Tests – The leach extraction tests should be completed on 250 grams of *uncrushed* “as-received” material. The tests should be completed at a water to solids ratio of 3:1 (i.e with 750 mL of deionized water). The solids should be contacted for a total of 96 hours, then filtered and submitted for analysis of pH, conductivity, acidity and/or alkalinity (as appropriate), sulphate, chloride, and a metals scan by ICP-OES. Prior to filtration, a redox measurement should be taken. Please retain the leach residues in a sealed plastic bag in cold storage. We may need to do additional testing on these residues. Please call if you have any questions regarding this phase of testing.

If I am unavailable, Kelly should also be able to answer any questions.

New Samples for Static Testing

Location	Tag	ID	pH	Cond.	Fizz	Description	ABA	ICP	ICP+TIC+S+SO4	L/Extr'n
Vangorda	70951	VTP01A	4.4	4400	v. weakly	Oxidized phyllite	1	1		1
	70956	VTP04B	3.6	5900	none	Greenish phyllite			1	
	70959	VTP05B	5.9	2900	weakly	Pyritic phyllite	1	1		
	70961	VTP06B	6.8	1700	none	Graphitic phyllite	1	1		1
	70976	VTP16A	6.6	1182	weak	Black phyllite			1	
	70962	VTP07A	5.7	2690	weak	Sulfides			1	
	70969	VTP11A	3.8	4610	none	Sulfide fines	1	1		1
Grum	70975	VTP15B	5.1	4670	none	Oxidized till	1	1		1
	70979	GPT02B	7.9	865	weak	Green grey phyllite			1	
	70989	GTP09A	8.1	1190	weak	Grey phyllite	1	1		1
	70999	GTP16B	7.6	1023	weak	Chloritic phyllite	1	1		
	70793	GTP24A	7.8	379	strong	Chloritic phyllite	1	1		
	70798	GTP26B	7.4	324	moderate to strong	Brown phyllite			1	
	70799	GTP27A	7.7	3787	moderate	Grey phyllite	1	1		1
	70909	GTP28B	5.5	4000	none	Sulfides	1	1		1
	70910	GTP29A	5.7	1300	none	Sulfides			1	
	70911	GTP29B	5.7	2900	none	Sulfides	1	1		1
	70997	GTP15A	8.2	680	weak to moderate	Chloritic schist	1	1		
	70785	GPT20A	6.2	566	weak	Chloritic schist			1	
Faro	70877	FTP32A	2.3	7360	none	Ox 1D schist			1	1
	70872	FTP29B	4.9	5940	none	Talcose schist	1	1		1
	70867	FTP26A	7.1	2650	moderate	Biot musc schist			1	
	70866	FTP25B	7.8	1492	moderate to strong	Qtz sericite schist	1	1		1
	70822	FTP15A	7.8	481	weak	Musc schist	1	1		
	70881	FTP34A	1.8	6020	none	Siliceous phyllite			1	1
	70801	FTP01A	4.5	2070	none	Oxidized Qtz musc phyllite	1	1		
	70812	FTP08B	3.5	4750	none	Qtz porphyry			1	1
	70815	FTP10B	6.5	2210	weak	Biot porphyry	1	1		1
	70855	FTP19A	8	650	strong	Biot QFP	1	1		
	70868	FTP27A	5.2	2430	weak	Calc-silicate + sulphides	1	1		1
	70893	FTP40B	6.8	2500	moderate	Calc-silicate, schist	1	1		
	70920	FTP50B	7.4	1900	weak to moderate	Calc-sil + biot schist	1	1		1
	70919	FTP50A	8	400	weak	Calc-silicate	1	1		
	70885	FTP35B	1.6	14080	none	Sulfides			1	1
	70901	FTP46A	2	11200	none	Sulfides			1	
	70861	FTP23A	2.2	6870	none	Sulfides			1	1
	70904	FTP47B	2.7	9400	none	Sulfides			1	1
	70907	FTP49B	4.8	4800	weak	Sulfides	1	1		
	70906	FTP49A	5.5	2400	none	Sulfides	1	1		1
	70807	FTP05A	2	4800	none	Brown till			1	1
	70813	FTP09A	6.6	266	weak	Till	1	1		
Haul Road	70915	H RTP03A	8.7	500	strong	Calc-silicate	1	1		
	70918	H RTP05B	9.5	600	strong	Calc-silicate schist	1	1		
	70916	H RTP04A	6.7	3200	weak	Chl schist	1	1		1
	70913	H RTP01B	6.4	1000	weak	grey phyllite + sulfides	1	1		
Samples from Part I Testing for further tests										
Faro	70858	FTP21B	4.3	5200	none	sulfides				1
	70882	FTP34B	2.2	5480	none	Mass sulfides				1
	70883	FTP34C	3.5	4030	none	Hbl biot granodiorite				1
Vangorda	70953	VTP02B	6.7	3200	weakly	Graphitic phyllite				1
	70964	VTP08A	6.4	2350	moderate	Sulfides				1
Total Number of Tests (Part II)							29	29	16	27

MEMORANDUM

DATE: February 27, 2003

TO: Sohan Basra

FROM: John Chapman, Steve Day, Kelly Sexsmith

RE: **Faro Testing Program – Part III**

Sohan,

Table 1 outlines the samples we would like submitted for additional static testing and for kinetic testing. Specific procedures are as follows:

ABA - Samples should be tested following the modified Sobek procedure with sulphur speciation and total inorganic carbon for determination of carbonate NP. The tests should be completed on a crushed portion of the “as-received” (<1cm) material.

Leach Extraction Tests – The leach extraction tests should be completed on 250 grams of *uncrushed* “as-received” material. The tests should be completed at a water to solids ratio of 3:1 (i.e with 750 mL of deionized water). The solids should be contacted for a total of 96 hours, then filtered and submitted for analysis of pH, conductivity, acidity and/or alkalinity (as appropriate), sulphate, chloride, and a metals scan by ICP-OES. Prior to filtration, a redox measurement should be taken. Please retain the leach residues in a sealed plastic bag in cold storage. We may need to do additional testing on these residues.

NAP Tests

Please follow the Net Acid Production procedure described in the MEND “*Acid Rock Drainage Prediction Manual*”, (MEND Project 1.16.1b, March 1991).

Kinetic Tests

Two test methods will be used as follows.

Single Test Method

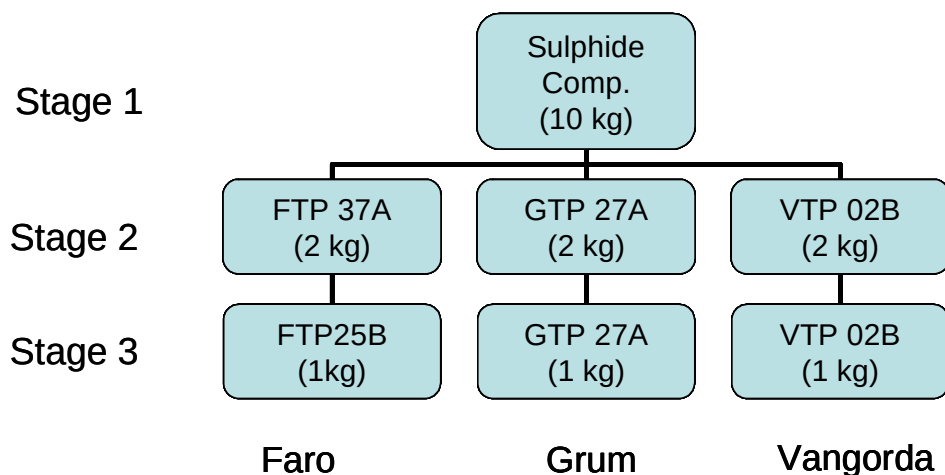
All samples designated as “H” in the table would be tested according to the humidity cell testing procedure described in the MEND manual with the following exceptions to sample handling and operating parameters:

- o Tests are to be completed in 4 inch diameter, 10 inch high cells (fill height estimated at about 6 inches).
- o Tests to be completed on as received samples (i.e. < 1cm).
- o Tests to be completed on 2 kg samples.
- o Flush volume of 800 ml to be used.

The analytical schedule for leachate samples is summarized in Table 2.

Sequential Method

The sequential test procedure would entail a three stage humidity cell test, as shown below. The first stage would generate an acidic solution that would be used as the leachant for the second stage, the second stage would feed the third stage. Samples would be collected from each stage of the test.



Test set up would be as follows:

First stage:

- o The first stage of the test is to be completed in an 8 inch diameter, 22 inch high cells (fill height about 8 inches).
- o The test will be completed on an equal weighted composite of the following samples, using “as-received” (-1cm) material.

70882	FTP34B
70861	FTP23A
70885	FTP35B
70901	FTP46A

- o The test is to be completed on a 10 kg sample.
- o The cell will be flushed with 6.2 L of deionized water. 3.6 litres will be used for the subsequent stages, the remainder will be used for analysis. (Note: The first flush will **not** be applied to the subsequent steps of the test. The volume of water may be adjusted depending on the acidity of this first flush.)

Second stage:

- o The second stage of the test is to be completed in three 4 inch diameter, 10 inch high cells, each with 2 kg of sample in an as-received condition (estimated fill height about 6 inches). The Faro series will use sample FTP37A, the Grum series will use GTP27A, and the Vangorda Series will use sample VTP02B.
- o The first cycle of each test will be flushed with 1200 ml of deionized water.
- o The second and subsequent cycles will be flushed with 1200 mL of water from the first stage of the test. 600 mL of this water will be submitted for analyses, and the remaining 600 mL will be applied to the third stage of the test.

Third stage:

- o The third stage of the test is to be completed in three 4 inch diameter, 10 inch high cells, each with 1 kg of sample in an as-received condition (estimated fill height about 3 inches). The Faro series will use sample FTP25B, the Grum series will use GTP27A, and the Vangorda Series will use sample VTP02B.
- o The first cycle of each test will be flushed with 600 ml of deionized water.

- o The second and subsequent cycles will be flushed with 600 mL of water from the second stage of the test.

The analytical schedule for leachate samples from all stages of the test are summarized in Table 2.

Alkali Amendment Test

The alkali amendment tests comprise a series of leach extraction tests to assess alkali demand for the neutralization of acidity contained in the samples.

Reagent requirements are as follows:

- o Milk of lime (Hydrated lime Ca(OH)_2 at 10 g/L).
- o Calcite (98% or better CaCO_3) crushed to 75 % less than 75 μm .
- o Normalised sulphuric acid (0.1 molar; 0.2 molar).
- o Normalised NaOH (0.1 molar)

Titrate 10 mL of the 10 g/L Ca(OH)_2 to an endpoint pH of 7 to determine the molarity of the solution.

To assess the available CaCO_3 in the calcite, add 55 ml of 0.2 molar sulphuric acid to 1.00 g of calcite. Allow reaction to proceed to completion and ensure that the pH has decreased to below 3.5. Titrate to an endpoint pH of 7 with 0.1 molar NaOH.

The test procedure for each sample is as follows.

- o Mix the sample well.
- o Into each of 6 shake flasks, labelled L1, L2 and L3 (for lime amended tests) and C1, C2, and C3 (for calcite amended tests) and weigh out a 200 g of sample in each flask.
- o Label 6 beakers (each of 500 ml in size) correspondingly L1, L2, L3, C1, C2 and C3.
- o To the beakers labelled L1, L2 and L3 add the corresponding volume of milk of lime given in Table 3, then add distilled or de-ionised water to bring the volume to 400 ml. Add the diluted milk of lime to the corresponding flasks containing the samples and place on a shaker for 24 hours.

- o To the beakers labelled C1, C2 and C3 added the weight of calcite given in Table 3. Add 400 ml of distilled or de-ionised water and add to the corresponding shake flask and place on a shaker for 24 hours.
- o After 24 hours let the solids settle, measure the final pH and conductivity and redox.
- o Decant an aliquot as required to complete alkalinity / acidity measurements as required and a sulphate analysis.
- o Decant and filter a 100 mL aliquot from each test and preserve with nitric acid and place in cold storage. (Samples will be selected for detailed analysis after above results have been reviewed.)

Table 1
Sample Selection for further Testing

Tag	ID	ABA	L/Extr'n	NAG	Kinetic (Single Stage)	Alkali Amend.
70883	FTP34C	1	1	1	1	1
70865	FTP25A				1	
70919	FTP50A				1	
70855	FTP19A				1	
70813	FTP09A				1	
70999	GTP16B				1	
70893	FTP40B				1	
70783	GTP19A				1	
70920	FTP50B				1	
70784	GTP19B		1	1	1	
70993	GTP12A		1	1	1	
70961	VTP06B		1	1		
70951	VTP01A			1		
70851	FTP17B				1	
70964	VTP08A				1	
70785	GPT20A				1	
70807	FTP05A			1		
70881	FTP34A			1		
70904	FTP47B			1		
	N	1	9	14	11	5

Tag	ID	ABA	L/Extr'n	NAG	Kinetic (Sequential)
70882	FTP34B	1 (on Composite)	1 (on Composite)		Feed Composite
70861	FTP23A				Feed Composite
70885	FTP35B				Feed Composite
70901	FTP46A				Feed Composite
70887	FTP37A		1	1	Faro – Stage 2
70866	FTP25B			1	Faro – Stage 3
70953	VTP02B				Vangorda – Stages 2 and 3
70799	GTP27A				Grum – Stages 2 and 3

Table 2
Analytical Frequency

Single and Sequential Humidity Cells																				
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Parameters																				
pH	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Redox	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
EC	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SO4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Alk/Acid	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Metals (ICP)	x	x	x		x			x			x			x			x			x

Table 3
Alkali Amendment Tests

Sample	Weight CaCO ₃ (g)			Volume Ca(OH) ₂ (mL)		
Test	C1	C2	C3	L1	L2	L3
70951	0.175	0.218	0.262	12.9	16.2	19.4
70883	0.715	0.894	1.073	52.9	66.2	79.4
70807	0.874	1.092	1.310	64.6	80.8	97.0
70881	1.478	1.848	2.218	109.4	136.8	164.1
70904	2.938	3.672	4.406	217.4	271.7	326.1

Appendix E.4
Results of Static Geochemical Testing
on SRK Test Pit Samples

SIZE FRACTION ANALYSIS

Client : SRK Consulting
 Project : Faro
 CEMI Project : 0248
 Test Date : December 4, 2002

Sample	Size Fraction	Weight (g)	Weight (%)
70821	- 10 mm + 2mm	2337.5	74.9
	- 2 mm	785.4	25.1
	TOTAL	3122.9	100.0
70823	- 10 mm + 2mm	2207.4	55.7
	- 2 mm	1755.9	44.3
	TOTAL	3963.3	100.0
70851	- 10 mm + 2mm	2123.4	51.9
	- 2 mm	1970.4	48.1
	TOTAL	4093.8	100.0
70858	- 10 mm + 2mm	1762.2	30.6
	- 2 mm	4002.9	69.4
	TOTAL	5765.1	100.0
70865	- 10 mm + 2mm	2115.5	53.0
	- 2 mm	1875.8	47.0
	TOTAL	3991.3	100.0
70882	- 10 mm + 2mm	2184.6	72.7
	- 2 mm	821.8	27.3
	TOTAL	3006.4	100.0
70883	- 10 mm + 2mm	1822.6	49.1
	- 2 mm	1891.9	50.9
	TOTAL	3714.5	100.0
70887	- 10 mm + 2mm	1934.8	54.4
	- 2 mm	1618.6	45.6
	TOTAL	3553.4	100.0
70980	- 10 mm + 2mm	2503.4	79.9
	- 2 mm	631.7	20.1
	TOTAL	3135.1	100.0
70982	- 10 mm + 2mm	1983.7	51.4
	- 2 mm	1876.4	48.6
	TOTAL	3860.1	100.0
70987	- 10 mm + 2mm	2411.5	50.8
	- 2 mm	2338.1	49.2
	TOTAL	4749.6	100.0
70993	- 10 mm + 2mm	2722.8	55.7
	- 2 mm	2163.1	44.3
	TOTAL	4885.9	100.0
70783	- 10 mm + 2mm	2454.9	50.8
	- 2 mm	2374.0	49.2
	TOTAL	4828.9	100.0
70784	- 10 mm + 2mm	2102.4	57.4
	- 2 mm	1563.3	42.6
	TOTAL	3665.7	100.0
70953	- 10 mm + 2mm	1516.2	52.2
	- 2 mm	1388.3	47.8
	TOTAL	2904.5	100.0
70964	- 10 mm + 2mm	2632.9	62.2
	- 2 mm	1598.3	37.8
	TOTAL	4231.2	100.0

Client : SRK Consulting
Project : Faro
CEMI Project : 0248
Test : Modified Sobek Method Acid-Base Accounting
Date : December 10, 2002

DRAFT COPY

SAMPLE	Paste pH	S(T) %	S(SO4) %	AP	NP	Net NP	NP/AP	TIC %	Carbonate NP
70821 -10 + 2mm	8.6	0.30	<0.01	9.4	93.8	84.4	10.0	1.50	125.0
70821 -2mm	8.5	0.42	<0.01	13.1	99.4	86.3	7.6	1.58	131.7
70823 -10 + 2mm	8.5	0.33	<0.01	10.3	13.9	3.6	1.3	0.46	38.3
70823 -2mm	8.5	0.46	0.01	14.1	16.4	2.3	1.2	0.64	53.3
70851 -10 + 2mm	7.7	1.71	0.04	52.2	11.9	-40.3	0.2	1.13	94.2
70851 -2mm	7.9	1.63	0.06	49.1	12.3	-36.8	0.2	1.36	113.3
70858 -10 + 2mm	6.2	23.6	0.31	727.8	2.6	-725.2	<0.1	0.29	24.2
70858 -2mm	5.3	30.9	0.42	952.5	-1.9	-954.4	<0.1	0.10	8.3
70865 -10 + 2mm	8.4	0.42	0.01	12.8	29.0	16.2	2.3	0.60	50.0
70865 -2mm	8.0	0.71	0.08	19.7	40.0	20.3	2.0	1.07	89.2
70882 -10 + 2mm	2.6	15.8	2.19	425.3	-24.5	-449.8	<0.1	0.02	1.7
70882 -2mm	2.4	11.8	1.33	327.2	-26.8	-353.9	<0.1	<0.01	0.8
70883 -10 + 2mm	5.3	1.11	0.66	14.1	-0.8	-14.9	<0.1	0.11	9.2
70883 -2mm	5.2	1.14	0.92	6.9	-2.4	-9.2	<0.1	0.04	3.3
70887 -10 + 2mm	8.2	0.39	<0.01	12.2	30.6	18.4	2.5	1.57	130.8
70887 -2mm	8.4	0.53	0.02	15.9	27.6	11.6	1.7	1.64	136.7
70980 -10 + 2mm	8.5	0.30	<0.01	9.4	91.3	81.9	9.7	1.23	102.5
70980 -2mm	8.1	0.40	0.04	11.3	82.0	70.8	7.3	1.16	96.7
70982 -10 + 2mm	8.6	1.32	0.01	40.9	102.3	61.3	2.5	1.67	139.2
70982 -2mm	8.0	2.02	0.06	61.3	72.9	11.6	1.2	1.43	119.2
70987 -10 + 2mm	8.7	0.30	<0.01	9.4	150.9	141.6	16.1	2.05	170.8
70987 -2mm	8.2	0.38	0.03	10.9	85.6	74.7	7.8	1.28	106.7
70993 -10 + 2mm	8.0	3.63	0.02	112.8	49.5	-63.3	0.4	1.36	113.3
70993 -2mm	7.7	1.89	0.08	56.6	36.0	-20.6	0.6	1.32	110.0
70783 -10 + 2mm	8.4	1.96	0.01	60.9	55.8	-5.2	0.9	1.10	91.7
70783 -2mm	7.9	1.73	0.05	52.5	43.4	-9.1	0.8	1.05	87.5
70784 -10 + 2mm	8.3	1.09	0.02	33.4	30.3	-3.2	0.9	0.91	75.8
70784 -2mm	7.9	1.27	0.05	38.1	26.3	-11.9	0.7	0.95	79.2
70953 -10 + 2mm	8.0	0.85	0.08	24.1	58.4	34.3	2.4	1.62	135.0
70953 -2mm	7.7	1.15	0.37	24.4	45.9	21.5	1.9	1.63	135.8
70964 -10 + 2mm	7.5	10.4	0.11	321.6	27.3	-294.3	0.1	0.59	49.2
70964 -2mm	7.6	7.59	0.31	227.5	21.3	-206.3	0.1	0.52	43.3
70821 -10 + 2mm RE	8.6	0.32	<0.01	10.0	92.8	82.8	9.3	1.47	122.5
70982 -10 + 2mm RE	8.7	1.37	0.02	42.2	102.5	60.3	2.4	1.68	140.0
70858 -2mm RE	5.0	30.5	0.41	940.3	-2.2	-942.5	<0.1	0.10	8.3

AP = Acid potential in tonnes CaCO₃ equivalent per 1000 tonnes of material. AP is determined from calculated sulphide sulphur content:

$S(T) - S(SO_4)$, assuming total conversion of sulphide to sulphate.

NP = Neutralization potential in tonnes CaCO₃ equivalent per 1000 tonnes of material.

NET NP = Net neutralization potential = Tonnes CaCO₃ equivalent per 1000 tonnes of material.

NOTE: Where S(T) is reported as <0.01%, a S(T) value of 0.01% is used for the AP calculation.

Where S(SO₄) is reported as <0.01%, it is assumed to be zero for the AP calculation. (ie. if S(SO₄) is less than 0.01% or is not analyzed, AP is calculated from S(T) only)

TIC = Total Inorganic Carbon as %C.

Carboante NP calculated from total inorganic carbon (TIC) assay. TIC value of 0.01 is used in calculation if TIC <0.01%.

RE = Replicate.

Client : SRK Consulting
Project : Faro
CEMI Project : 0248
Test : Metal Scan by ICP
Date : December 16, 2002

DRAFT COPY

Sample:		70821	70821	70823	70823	70851	70851	70858	70858	70865
		-10 + 2mm	-2mm	-10 + 2mm	-2mm	-10 + 2mm	-2mm	-10 + 2mm	-2mm	-10 + 2mm
Element										
Ag	ppm	2.2	3.4	<0.2	<0.2	1.2	2.4	12.4	9.6	<0.2
Al	%	1.88	1.69	1.21	1.21	0.39	0.38	0.64	0.38	1.81
As	ppm	<5	10	30	45	60	100	310	380	5
Ba	ppm	230	340	290	370	90	100	60	60	320
Be	ppm	1.5	1.5	2.0	2.0	1.0	1.0	0.5	0.5	1.5
Bi	ppm	5	10	<5	5	10	20	25	35	<5
Ca	%	3.14	3.29	0.89	0.89	0.39	0.44	0.37	0.26	1.36
Cd	ppm	9	8	<1	<1	<1	<1	6	<1	<1
Co	ppm	13	17	7	11	25	22	61	49	14
Cr	ppm	111	106	104	84	114	70	124	94	125
Cu	ppm	187	200	49	62	171	199	1012	633	43
Fe	%	5.09	5.15	2.79	3.71	6.29	6.87	>15.00	>15.00	4.69
K	%	0.32	0.31	0.35	0.37	0.18	0.18	0.16	0.13	0.47
Mg	%	1.68	1.58	0.45	0.59	0.66	0.79	0.44	0.26	1.22
Mn	ppm	970	1010	355	425	790	965	575	340	680
Mo	ppm	2	<2	2	2	2	<2	<2	<2	2
Na	%	0.07	0.05	0.05	0.04	0.03	0.03	0.04	0.03	0.06
Ni	ppm	55	62	18	26	47	45	26	20	42
P	ppm	520	550	180	220	480	500	460	420	1410
Pb	ppm	566	820	552	396	530	1008	>10000	>10000	210
Sb	ppm	5	<5	<5	5	5	5	15	10	5
Sc	ppm	6	6	2	3	2	3	1	1	5
Sn	ppm	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sr	ppm	118	119	61	70	<1	1	<1	<1	43
Ti	%	0.01	0.01	0.01	0.01	<0.01	0.01	0.03	0.03	0.05
V	ppm	55	54	17	22	25	28	47	46	64
W	ppm	40	40	10	10	20	20	440	360	<10
Y	ppm	15	17	88	83	5	6	4	3	10
Zn	ppm	994	1047	670	605	1344	1501	>10000	>10000	230
Zr	ppm	14	17	32	34	12	14	15	17	13

Client : SRK Consulting
Project : Faro - Part 2
CEMI Project : 0248
Test : Modified Sobek Method Acid-Base Accounting
Date : January 31, 2003

SAMPLE	Paste pH	S(T) %	S(SO4) %	AP	NP	Net NP	NP/AP	TIC %	Carbonate NP
70793	8.1	0.22	0.02	6.3	79.6	73.3	12.7	0.99	82.5
70799	8.2	0.22	<0.01	6.9	60.8	53.9	8.8	0.75	62.5
70801	4.5	0.82	0.47	10.9	0.0	-10.9	<0.1	0.05	4.2
70813	7.7	0.44	0.05	12.2	18.4	6.2	1.5	1.30	108.3
70815	6.4	0.46	0.13	10.3	8.9	-1.4	0.9	0.12	10.0
70822	7.8	0.99	0.03	30.0	14.0	-16.0	0.5	0.83	69.2
70855	8.2	0.89	0.02	27.2	43.1	15.9	1.6	0.74	61.7
70866	7.9	0.78	0.06	22.5	31.6	9.1	1.4	0.91	75.8
70868	6.9	3.09	0.51	80.6	42.4	-38.3	0.5	0.53	44.2
70872	5.0	9.28	1.03	257.8	1.1	-256.7	<0.1	0.42	35.0
70893	7.6	0.74	0.14	18.8	19.1	0.3	1.0	0.64	53.3
70906	6.9	6.71	0.10	206.6	24.8	-181.8	0.1	1.13	94.2
70907	5.7	18.6	0.40	568.8	7.8	-560.9	<0.1	0.67	55.8
70909	6.1	8.03	0.22	244.1	13.6	-230.5	0.1	0.88	73.3
70911	6.4	24.5	0.25	757.8	3.4	-754.4	<0.1	0.73	60.8
70913	8.0	1.05	0.02	32.2	48.3	16.1	1.5	1.35	112.5
70915	8.5	0.36	0.02	10.6	64.4	53.8	6.1	0.80	66.7
70916	7.7	1.44	0.12	41.3	27.7	-13.6	0.7	1.22	101.7
70918	8.9	0.37	0.01	11.3	82.8	71.5	7.4	0.91	75.8
70919	8.3	0.62	0.01	19.1	37.6	18.6	2.0	1.03	85.8
70920	8.0	1.25	0.04	37.8	31.4	-6.4	0.8	0.71	59.2
70951	5.3	1.83	0.31	47.5	13.8	-33.8	0.3	0.55	45.8
70959	6.7	3.81	0.23	111.9	31.1	-80.8	0.3	1.02	85.0
70961	7.5	1.67	0.10	49.1	17.4	-31.7	0.4	0.50	41.7
70969	4.5	20.2	0.68	610.0	-2.7	-612.7	<0.1	0.19	15.8
70975	6.4	2.56	0.30	70.6	6.9	-63.8	0.1	0.10	8.3
70989	8.2	0.77	0.02	23.4	87.4	63.9	3.7	1.67	139.2
70997	8.5	0.34	<0.01	10.6	87.0	76.4	8.2	1.37	114.2
70999	8.0	1.10	0.03	33.4	35.1	1.7	1.1	1.70	141.7
70951 RE	5.3	1.84	0.30	48.1	13.6	-34.5	0.3	0.57	47.5
70989 RE	8.3	0.78	0.03	23.4	87.8	64.4	3.7	1.68	140.0
70916 RE	7.7	1.46	0.12	41.9	27.1	-14.8	0.6	1.20	100.0

AP = Acid potential in tonnes CaCO₃ equivalent per 1000 tonnes of material. AP is determined from calculated sulphide sulphur content: S(T) - S(SO₄), assuming total conversion of sulphide to sulphate.

NP = Neutralization potential in tonnes CaCO₃ equivalent per 1000 tonnes of material.

NET NP = Net neutralization potential = Tonnes CaCO₃ equivalent per 1000 tonnes of material.

NOTE: Where S(T) is reported as <0.01%, a S(T) value of 0.01% is used for the AP calculation.

Where S(SO₄) is reported as <0.01%, it is assumed to be zero for the AP calculation. (ie. if S(SO₄) is less than 0.01% or is not analyzed, AP is calculated from S(T) only)

TIC = Total Inorganic Carbon as %C.

Carbonate NP calculated from total inorganic carbon (TIC) assay. TIC value of 0.01 is used in calculation if TIC <0.01%.

RE = Replicate.

Client : SRK Consulting
Project : Faro - Part 2
CEMI Project : 0248
Test : Metal Scan by ICP(select elements (*) assayed by A.A.),
 Sulphur Speciation, Total Inorganic Carbon Assay
Date : January 30, 2003

Sample:		70951	70956	70959	70961	70976	70962	70969	70975	70979
Element										
Ag	ppm	1.6	4.8	3.4	3.2	2.0	24.2	27.2	25.6	<0.2
Al	%	1.02	1.25	1.42	1.07	1.81	0.65	0.55	0.63	1.48
As	ppm	290	670	385	325	105	865	1705	1475	45
Ba	ppm	100	50	50	120	80	70	50	60	310
Be	ppm	<0.5	<0.5	0.5	0.5	<0.5	<0.5	<0.5	<0.5	0.5
Bi	ppm	<5	<5	<5	<5	<5	20	30	<5	<5
Ca	%	0.51	0.11	0.97	0.57	0.53	0.80	0.17	0.52	1.22
Cd	ppm	<1	9	<1	<1	<1	2	<1	<1	<1
Co	ppm	26	24	62	21	23	66	129	14	14
Cr	ppm	171	82	172	88	115	90	115	163	91
Cu	ppm	150	1260	758	127	180	2758	5714	582	56
Fe	%	5.84	5.38	8.52	5.39	5.94	>15.00	>15.00	6.15	4.86
K	%	0.14	0.09	0.14	0.31	0.13	0.10	0.10	0.09	0.15
Mg	%	0.94	0.59	1.44	0.71	2.01	0.54	0.24	0.43	1.45
Mn	ppm	1110	220	1655	985	980	3000	1170	185	645
Mo	ppm	6	2	2	2	6	<2	2	12	2
Na	%	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02
Ni	ppm	86	47	85	49	58	28	27	31	41
P	ppm	530	550	580	450	770	480	520	380	520
Pb	ppm	1582	4532	2884	2292	1604	>10000	>10000	7068	306
Pb	%	-	-	-	-	-	2.10	2.09	-	-
Sb	ppm	10	40	15	5	10	45	65	70	5
Sc	ppm	3	3	4	2	3	1	1	1	2
Sn	ppm	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sr	ppm	27	19	26	19	30	<1	<1	22	47
Ti	%	0.01	<0.01	0.01	0.02	<0.01	0.01	0.01	0.01	<0.01
V	ppm	30	23	45	19	56	34	34	25	22
W	ppm	110	100	130	120	60	480	390	50	10
Y	ppm	4	2	4	4	4	4	2	4	12
Zn	ppm	6474	5747	7806	7177	3477	>10000	>10000	2714	607
Zn	%	-	-	-	-	-	2.64	2.05	-	-
Zr	ppm	13	12	11	12	14	15	16	10	13
S(T)	%	1.83	3.51	3.81	1.67	2.45	16.9	20.2	2.56	0.69
S(SO4)	%	0.31	0.36	0.23	0.10	0.10	0.46	0.68	0.30	0.03
TIC	%	0.55	0.04	1.02	0.50	0.36	0.93	0.19	0.10	0.86

TIC = Total Inorganic Carbon as %C.

Client : SRK Consulting
Project : Faro - Part 3
CEMI Project : 0248
Test : Modified Sobek Method Acid-Base Accounting
Date : February 24, 2003

DRAFT COPY

SAMPLE	Paste pH	S(T) %	S(SO4) %	AP	NP	Net NP	NP/AP	TIC %	Carbonate NP
70785	6.4	3.22	0.06	98.8	10.1	-88.6	0.1	2.33	194.2
70885	2.5	24.1	3.96	629.4	-73.3	-702.7	<0.1	<0.01	0.8
70785 RE	6.4	3.32	0.06	101.9	11.1	-90.8	0.1	2.32	193.3
Sulphide Composite	3.0	20.3	2.40	559.4	-29.4	-588.8	<0.1	0.01	0.8

AP = Acid potential in tonnes CaCO₃ equivalent per 1000 tonnes of material. AP is determined from calculated sulphide sulphur content: S(T) - S(SO₄), assuming total conversion of sulphide to sulphate.

NP = Neutralization potential in tonnes CaCO₃ equivalent per 1000 tonnes of material.

NET NP = Net neutralization potential = Tonnes CaCO₃ equivalent per 1000 tonnes of material.

NOTE: Where S(T) is reported as <0.01%, a S(T) value of 0.01% is used for the AP calculation.

Where S(SO₄) is reported as <0.01%, it is assumed to be zero for the AP calculation. (ie. if S(SO₄) is less than 0.01% or is not analyzed, AP is calculated from S(T) only)

TIC = Total Inorganic Carbon as %C.

Carbonate NP calculated from total inorganic carbon (TIC) assay. TIC value of 0.01 is used in calculation if TIC <0.01%.

RE = Replicate.

Client : SRK Consulting
Project : Faro - Part 3
CEMI Project : 0248
Test : Metal Scan by ICP
Date : March 18, 2003 **DRAFT COPY**

Sample: Sulphide Composite		
Element		
Ag	ppm	50
Al	%	0.25
As	ppm	465
Ba	ppm	20
Be	ppm	0.5
Bi	ppm	30
Ca	%	0.11
Cd	ppm	<1
Co	ppm	64
Cr	ppm	99
Cu	ppm	1605
Fe	%	>15.00
K	%	0.08
Mg	%	0.03
Mn	ppm	130
Mo	ppm	6
Na	%	0.01
Ni	ppm	23
P	ppm	600
Pb	ppm	>10000
Sb	ppm	40
Sc	ppm	1
Sn	ppm	<10
Sr	ppm	<1
Ti	%	<0.01
V	ppm	44
W	ppm	270
Y	ppm	1
Zn	ppm	>10000
Zr	ppm	15

Client : SRK Consulting
Project : Faro - Part 3
CEMI Project : 0248
Test : Net Acid Production
Date : February 26, 2003

DRAFT COPY

SAMPLE	pH After Reaction	Net AP
70865	5.2	5.4
70887	6.6	0.2
70919	6.3	0.8
70855	6.3	1.0
70813	6.0	1.1
70866	3.1	11.1
70999	4.3	3.5
70893	4.4	4.8
70783	4.9	6.2
70920	3.6	6.1
70784	2.6	13.3
70993	2.8	17.2
70961	2.2	21.4
70851	2.0	21.3
70964	2.4	36.5
70785	1.9	46.8
70865 RE	5.0	5.1
70855 RE	5.9	1.4
70893 RE	4.1	5.4
70993 RE	3.0	17.0

Net AP = Net acid potential in kg CaCO₃ equivalent per tonne.

RE = Replicate.

Appendix E.5
Results of Extraction Tests on SRK Test Pit Samples

Client : SRK Consulting
Project : Faro - Part 2
CEMI Project : 0248
Test : 96 Hour Leach Extraction Test
Date : January 28, 2003

SAMPLE	DISTILLED WATER VOLUME (mL)	SAMPLE WEIGHT (g)	pH	REDOX. (mV)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO3/L)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	SULPHATE (mg/L)
70951	750	250	5.30	346	1822	2.8	0.0	364.0	1870
70961	750	250	7.78	283	1127	23.5	0.0	2.0	821
70969	750	250	3.73	413	2530	0.0	20.0	1240.0	2540
70975	750	250	7.71	284	1374	36.5	0.0	3.0	1090
70989	750	250	8.03	280	597	46.5	0.0	1.3	302
70799	750	250	8.26	281	263	64.8	0.0	0.0	84
70909	750	250	6.40	353	1340	4.3	0.0	270.5	1160
70911	750	250	6.77	361	721	5.5	0.0	239.5	495
70877	750	250	2.41	507	5330	0.0	1440.0	2410.0	3980
70872	750	250	5.27	391	2756	1.8	0.0	1675.0	4950
70866	750	250	8.08	286	723	54.0	0.0	1.0	386
70881	750	250	2.03	552	6020	0.0	2220.0	3080.0	3380
70812	750	250	3.80	411	2180	0.0	12.5	270.5	1760
70815	750	250	6.88	323	1161	5.5	0.0	2.0	821
70868	750	250	7.63	306	1680	33.8	0.0	4.5	1360
70920	750	250	8.01	291	767	53.8	0.0	1.8	441
70885	750	250	2.14	440	9590	0.0	4180.0	19400.0	23000
70861	750	250	2.52	449	4800	0.0	350.0	2500.0	3220
70904	750	250	3.26	440	4880	0.0	130.0	4060.0	6100
70906	750	250	7.04	333	950	9.5	0.0	31.3	651
70807	750	250	2.14	606	5260	0.0	1420.0	1820.0	3140
70916	750	250	7.79	310	1404	30.0	0.0	1.5	966
70858	750	250	5.11	510	2370	2.5	0.0	795.0	2660
70882	750	250	2.34	488	6350	0.0	1750.0	6120.0	6880
70883	750	250	5.78	399	2550	4.5	0.0	1490.0	3320
70953	750	250	7.79	364	2270	48.0	0.0	3.5	2250
70964	750	250	7.65	359	2120	29.0	0.0	4.0	1880

Client : SRK Consulting
Project : Faro - Part 2
CEMI Project : 0248
Test : 96 Hour Leach Extraction Test
Date : January 28, 2003

Leachate Analysis By ICP-OES

Sample Name:		70951	70961	70969	70975	70989	70799	70909	70911	70877	70872	70866	70881	70812	70815	70868	70920	70885	70861	70904	70906	70807	70916	70858	70882	70883	70953	70964
Dissolved Metals	(mg/L)																											
Aluminum	Al	<0.2	<0.2	18	<0.2	<0.2	<0.2	<0.2	<0.2	87.3	<1	<0.2	49.0	3.0	<0.2	<0.2	<0.2	119	14	68	<0.2	72.6	<0.2	<1	164	<1	<0.2	<0.2
Antimony	Sb	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<1	<3	<0.2	<0.2	<0.2	<1	<1	<1	<0.2	<0.2
Arsenic	As	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<1	<3	<0.2	<0.2	<0.2	<1	<1	<1	<0.2	<0.2
Barium	Ba	<0.01	0.01	<0.05	0.02	0.03	0.08	0.02	0.01	0.01	<0.05	0.02	<0.01	<0.01	<0.01	0.01	0.02	<0.1	<0.05	<0.2	0.03	<0.01	0.02	<0.05	<0.05	<0.05	0.04	0.02
Beryllium	Be	<0.005	<0.005	<0.03	<0.005	<0.005	<0.005	<0.005	<0.005	0.060	<0.03	<0.005	0.005	0.012	<0.005	<0.005	<0.005	<0.05	<0.03	<0.08	<0.005	<0.005	<0.005	<0.03	0.23	<0.03	<0.005	<0.005
Bismuth	Bi	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<1	<3	<0.2	<0.2	<0.2	<1	<1	<1	<0.2	<0.2
Boron	B	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.5	<2	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.1	<0.1
Cadmium	Cd	0.36	<0.01	4.40	<0.01	<0.01	<0.01	2.63	0.41	0.07	1.89	<0.01	0.32	0.82	0.01	0.04	<0.01	2.8	1.24	5.3	0.06	0.02	<0.01	0.48	4.50	2.45	0.02	0.03
Calcium	Ca	243	248	202	319	77.8	39.7	208	37.0	361	437	91.9	78.6	125	249	390	90.6	164	209	166	204	499	217	489	192	491	538	557
Chromium	Cr	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.18	<0.05	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	0.9	0.07	<0.2	<0.01	0.09	<0.01	<0.05	0.25	<0.05	<0.01	<0.01
Cobalt	Co	1.47	0.03	4.04	0.03	<0.01	<0.01	0.58	0.31	1.13	1.34	<0.01	0.29	3.04	0.01	0.07	<0.01	4.2	0.33	1.9	0.08	0.21	0.02	1.05	9.81	1.05	0.03	0.03
Copper	Cu	0.02	<0.01	73.0	0.02	<0.01	<0.01	0.03	0.04	1.82	0.25	<0.01	5.03	2.58	<0.01	<0.01	<0.01	91.6	21.9	34.3	0.02	2.34	<0.01	0.16	217	<0.05	<0.01	0.01
Iron	Fe	1.49	<0.03	20.2	<0.03	<0.03	<0.03	<0.03	<0.03	603	3.8	<0.03	634	57.6	<0.03	<0.03	<0.03	9950	464	39.2	<0.03	301	<0.03	0.2	1720	<0.2	<0.03	<0.03
Lead	Pb	0.67	<0.05	1.7	0.18	<0.05	<0.05	1.53	2.45	<0.05	1.8	<0.05	1.89	1.68	<0.05	<0.05	<0.05	<0.5	1.7	<0.8	0.50	1.82	<0.05	2.2	2.6	<0.3	<0.05	<0.05
Lithium	Li	0.05	0.02	0.06	0.02	<0.01	<0.01	0.04	0.01	0.17	0.24	0.05	0.12	0.05	0.03	0.03	0.03	<0.1	<0.05	<0.2	<0.01	0.12	0.07	<0.05	<0.05	0.16	0.04	0.02
Magnesium	Mg	152	34.9	92.2	36.8	39.2	10.6	49.7	17.7	224	341	52.7	20.7	250	32.7	52.1	34.9	20	15.5	91	27.8	24.6	77.2	96.8	30.6	18.0	185	71.6
Manganese	Mn	49.9	1.57	124	2.39	0.034	0.010	3.55	6.16	23.2	71.5	0.029	2.68	21.3	2.36	3.31	0.019	17.2	11.9	42.9	0.952	1.41	0.326	33.0	10.1	37.0	4.27	5.88
Molybdenum	Mo	<0.03	<0.03	<0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.3	<0.2	<0.5	<0.03	<0.03	<0.03	<0.2	<0.2	<0.2	<0.03	<0.03
Nickel	Ni	2.92	<0.05	1.4	<0.05	<0.05	<0.05	1.19	0.22	2.29	2.2	<0.05	0.14	1.34	0.12	<0.05	<0.05	1.6	0.4	1.8	0.10	0.11	<0.05	0.9	2.2	0.3	<0.05	<0.05
Phosphorous	P	<0.3	<0.3	<2	<0.3	<0.3	<0.3	<0.3	<0.3	1.1	<2	<0.3	1.2	<0.3	<0.3	<0.3	<0.3	14	<2	<5	<0.3	<0.3	<0.3	<2	<2	<2	<0.3	<0.3
Potassium	K	<2	7	<10	<2	4	3	3	<2	<2	<10	11	<2	<2	3	7	8	<20	<10	<30	3	<2	14	<10	<10	22	14	7
Selenium	Se	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<1	<3	<0.2	<0.2	<0.2	<1	<1	<1	<0.2	<0.2
Silicon	Si	4.95	3.39	10.4	6.26	4.91	1.20	6.01	3.98	6.87	6.1	4.18	13.3	5.65	5.60	10.1	4.31	14.2	5.4	11.1	4.14	15.3	3.62	5.1	19.2	7.7	5.70	5.38
Silver	Ag	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.2	<0.05	<0.2	<0.01	<0.02	<0.01	<0.05	<0.05	<0.05	<0.02	<0.01
Sodium	Na	<2	<2	<10	<2	<2	<2	<2	<2	<2	<10	5	<2	<2	<2	<2	16	<20	<10	<30	<2	<2	7	<10	<10	<10	<2	3
Strontium	Sr	0.944	0.620	0.20	0.888	0.381	0.159	0.160	0.022	0.213	0.49	0.763	0.124	0.224	0.438	0.766	0.407	0.35	0.10	0.17	0.265	0.434	1.86	0.27	0.14	0.75	2.15	0.581
Thallium	Tl	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<4	<1	<3	<0.2	<0.3	<0.2	<1	<2	<1	<0.2	<0.2
Tin	Sn	<0.03	<0.03	<0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.3	<0.2	<0.5	<0.03	<0.03	<0.03	<0.2	<0.2	<0.2	<0.03	<0.03
Titanium	Ti	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	0.13	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.2	<0.01	0.57	<0.01	<0.05	<0.05	<0.05	<0.01	<0.01
Vanadium	V	<0.03	<0.03	<0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.2	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	1.8	<0.2	<0.5	<0.03	<0.03	<0.03	<0.2	<0.2	<0.2	<0.03	<0.03
Zinc	Zn	212	2.47	803	3.60	0.127	0.006	201	183	31.1	1280	0.024	208	59.8	0.880	7.67	0.018	2200	922	2570	32.8	20.6	0.210	620	1160	1070	0.823	1.20
Dissolved Anions	(mg/L)																											
Chloride	Cl	<0.5	<0.5	0.6	0.7	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	5.0	0.5	<0.5	<0.5	2.7	0.9

Note - Detection limits for certain dissolved metals were increased due to matrix interferences encountered during analysis.

Client : SRK Consulting
Project : Faro - Part 3
CEMI Project : 0248
Test : 96 Hour Leach Extraction Test
Test Date : February 24, 2003

DRAFT COPY

SAMPLE	DISTILLED WATER VOLUME (mL)	SAMPLE WEIGHT (g)	pH	REDOX. (mV)	CONDUCTIVITY (uS/cm)	ALKALINITY (mg CaCO ₃ /L)	ACIDITY (pH 4.5) (mg CaCO ₃ /L)	ACIDITY (pH 8.3) (mg CaCO ₃ /L)	SULPHATE (mg/L)
70865	750	250	7.16	287	633	60.3	0.0	0.8	298
70887	750	250	8.39	267	253	90.8	0.0	0.0	51
70919	750	250	8.23	270	320	72.5	0.0	0.3	99
70855	750	250	8.28	278	448	72.0	0.0	0.0	181
70813	750	250	7.94	296	976	38.5	0.0	1.3	458
70999	750	250	7.98	298	538	43.5	0.0	1.5	261
70893	750	250	7.94	293	1391	40.0	0.0	1.8	1057
70783	750	250	7.87	308	565	36.0	0.0	1.5	300
70784	750	250	7.95	303	561	37.0	0.0	1.3	300
70993	750	250	7.90	306	676	35.8	0.0	1.5	363
Sulphide Comp.	750	250	2.35	439	7540	0.0	1352.5	7675.0	9570

Client : SRK Consulting
Project : Faro - Part 3
CEMI Project : 0248
Test : 96 Hour Leach Extraction Test
Test Date : February 24, 2003

Leachate Analysis By ICP-OES**DRAFT COPY**

Sample Name:		70865	70887	70919	70855	70813	70999	70893	70783	70784	70993	Sulphide Composite
Dissolved Metals	(mg/L)											
Aluminum	Al	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	82
Antimony	Sb	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
Arsenic	As	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
Barium	Ba	0.03	0.06	0.05	0.04	0.04	0.03	0.02	0.04	0.03	0.03	<0.1
Beryllium	Be	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.06
Bismuth	Bi	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
Boron	B	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1
Cadmium	Cd	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	2.8
Calcium	Ca	69.3	14.3	27.1	39.3	86.0	56.7	246	81.4	66.3	138	230
Chromium	Cr	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.3
Cobalt	Co	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.04	3.1
Copper	Cu	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.01	79.6
Iron	Fe	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	3190
Lead	Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
Lithium	Li	0.04	0.01	0.02	0.04	0.04	<0.01	0.02	0.01	<0.01	0.01	<0.1
Magnesium	Mg	42.7	24.6	17.8	31.9	61.6	40.6	130	38.0	50.9	22.9	34
Manganese	Mn	0.022	0.017	0.005	<0.005	0.021	0.086	0.114	0.217	0.046	0.412	18.7
Molybdenum	Mo	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.14	<0.03	<0.3
Nickel	Ni	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.2
Phosphorous	P	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<3
Potassium	K	12	3	4	7	10	3	8	6	3	7	<20
Selenium	Se	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
Silicon	Si	4.59	3.16	3.63	3.85	3.54	3.02	3.57	3.67	3.94	4.55	10.1
Silver	Ag	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1
Sodium	Na	5	<2	12	6	2	<2	<2	<2	<2	<2	<20
Strontium	Sr	0.718	0.061	0.312	0.342	0.414	0.289	0.390	0.219	0.393	0.296	0.18
Thallium	Tl	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
Tin	Sn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.3
Titanium	Ti	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1
Vanadium	V	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.5
Zinc	Zn	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	<0.005	0.620	0.043	0.818	1540
Dissolved Anions	(mg/L)											
Chloride	Cl	0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5

Appendix E.6
Results of SRK Conventional Kinetic Testing

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70865
Dry Weight: 2 kg
Cell 1

DRAFT ONLY - SUBJECT TO CHANGE

* less than signs have been replaced with negatives

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate 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	V	Zn				
		days	L	s.u.	L	s.u.	mV	µS/cm				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
Detection Limits													0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01				0.03	0.05	0.3		0.2	0.01	2		0.2	0.03	0.01	0.03				
1	27-Feb-03	0	0.400	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
2	5-Mar-03	6	0.800	5.70	0.840	6.01	105	1480	0.0	82.3	14.0	1320	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	0.01	230	-0.01	0.04	-0.01	19.9	-0.05	0.13	149	0.915	-0.03	-0.05	-0.3	30	-0.2	4.03	-0.01	17	2.26	-0.2	-0.03	-0.01	-0.03	11.5			
3	12-Mar-03	13	0.800	5.54	0.795	7.70	315	1054	0.0	4.0	72.8	665	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	137	-0.01	-0.01	-0.01	-0.03	-0.05	0.09	80.1	0.432	-0.03	-0.05	-0.3	16	-0.2	4.66	-0.01	8	1.26	-0.2	-0.03	-0.01	-0.03	0.206			
4	19-Mar-03	20	0.800	5.68	0.785	7.89	300	852	0.0	3.0	88.5	462	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	125	-0.01	-0.01	-0.01	-0.03	-0.05	0.07	65.1	0.249	-0.03	-0.05	-0.3	15	-0.2	1.19	-0.01	5	1.08	-0.2	-0.03	-0.01	-0.03	0.092			
5	26-Mar-03	27	0.800	5.45	0.800	8.00	309	576	0.0	2.8	103.5	259	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
6	2-Apr-03	34	0.800	5.58	0.800	8.05	237	389	0.0	1.8	116.5	117	0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	48.5	-0.01	-0.01	-0.01	-0.03	-0.05	0.04	23.5	0.068	-0.03	-0.05	-0.3	9	-0.2	1.04	-0.01	3	0.448	-0.2	-0.03	-0.01	-0.03	0.024			
7	9-Apr-03	41	0.800	5.57	0.805	8.19	201	322	0.0	1.0	121.0	61	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
8	16-Apr-03	48	0.800	5.54	0.755	8.13	302	179	0.0	0.5	114.5	37	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
9	23-Apr-03	55	0.800	5.68	0.785	8.06	328	141	0.0	0.8	40.0	25	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	13.4	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	7.3	0.010	-0.03	-0.05	-0.3	3	-0.2	0.41	-0.01	-2	0.137	-0.2	-0.03	-0.01	-0.03	0.079			
10	30-Apr-03	62	0.800	5.63	0.765	8.06	316	162	0.0	0.8	57.3	26	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
11	7-May-03	69	0.800	5.57	0.775	8.11	317	174	0.0	0.5	59.0	31	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	14-May-03	76	0.800	5.56	0.760	8.00	302	147	0.0	0.8	48.8	25	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	15.7	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	8.8	0.010	-0.03	-0.05	-0.3	4	-0.2	0.38	-0.01	-2	0.165	-0.2	-0.03	-0.01	-0.03	0.007			
13	21-May-03	83	0.800	5.54	0.760	8.02	312	148	0.0	0.8	47.0	24	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	28-May-03	90	0.800	5.53	0.760	8.00	377	140	0.0	0.8	43.5	24	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	4-Jun-03	97	0.800	5.80	0.750	7.98	327	133	0.0	1.0	45.0	20	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	13.0	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	8.1	0.006	-0.03	-0.05	-0.3	3	-0.2	0.36	-0.01	-2	0.145	-0.2	-0.03	-0.01	-0.03	0.019			
16	11-Jun-03	104	0.800	5.60	0.755	8.02	330	135	0.0	0.8	45.5	20	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	18-Jun-03	111	0.800	5.59	0.760	7.99	361	123	0.0	0.8	38.8	20	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	25-Jun-03	118	0.800	5.62	0.745	7.98	366	115	0.0	0.8	36.5	21	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	10.9	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	7.2	0.005	-0.03	-0.05	-0.3	3	-0.2	0.33	-0.01	-2	0.121	-0.2	-0.03	-0.01	-0.03	-0.005			
19	2-Jul-03	125	0.800	5.68	0.740	8.09	352	112	0.0	0.8	35.8	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	9-Jul-03	132	0.800	#N/A	0.790	7.87	340	113	0.0	1.0	32.3	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
21	16-Jul-03	139	0.800	5.41	0.790	8.11	320	108	0.0	0.5	32.5	19	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	9.55	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	6.3	-0.005	-0.03	-0.05	-0.3	2	-0.2	0.30	-0.01	-2	0.107	-0.2	-0.03	-0.01	-0.03	-0.005			
22	23-Jul-03	146	0.800	5.70	0.785	8.16	332	109	0.0	0.3	27.5	21	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
23	30-Jul-03	153	0.800	5.73	0.795	8.22	348	114	0.0	0.3	33.5	18	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24	6-Aug-03	160	0.800	5.57	0.780	8.11	341	117	0.0	0.5	33.8	20	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	10.1	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	7.0	0.005	-0.03	-0.05	-0.3	-2	-0.2	0.34	-0.01	-2	0.117	-0.2	-0.03	-0.01	-0.03	0.007			
25	13-Aug-03	167	0.800	5.53	0.780	8.03	345	115	0.0	0.5	34.3	21	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
26	20-Aug-03	174	0.800	5.65	0.785	8.08	324	114	0.0	0.5	34.5	22	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
27	27-Aug-03	181	0.800	5.44	0.770	7.93	334	133	0.0	1.3	46.3	18	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	10.7	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	8.3	0.005	-0.03	-0.05	-0.3	2	-0.2	0.33	-0.01	-2	0.130	-0.2	-0.03	-0.01	-0.03	-0.005			
28	3-Sep-03	188	0.800	5.51	0.795	8.06	325	107	0.0	0.5	37.3	16	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A																								

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70919
Dry Weight 2 kg
Cell 2

* less than signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate 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	V	Zn				
		days	L	s.u.	L	s.u.	mV	µS/cm				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
Detection Limits													0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01				0.03	0.05	0.3		0.2	0.01	2		0.2	0.03	0.01	0.03				
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
2	5-Mar-03	6	0.800	5.70	0.800	8.01	310	494	0.0	1.0	29.5	238	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	40.9	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	30.8	0.042	-0.03	-0.05	-0.3	5	-0.2	2.83	-0.01	23	0.458	-0.2	-0.03	-0.01	-0.03	-0.005			
3	12-Mar-03	13	0.800	5.54	0.800	7.95	313	373	0.0	1.3	34.3	154	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	25.6	-0.01	-0.01	-0.01	-0.03	-0.05	0.03	20.9	0.012	-0.03	-0.05	-0.3	3	-0.2	3.43	-0.01	14	0.297	-0.2	-0.03	-0.01	-0.03	0.007			
4	19-Mar-03	20	0.800	5.68	0.800	8.10	214	347	0.0	0.8	44.5	139	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	28.9	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	22.6	0.013	-0.03	-0.05	-0.3	4	-0.2	0.36	-0.01	14	0.33	-0.2	-0.03	-0.01	-0.03	-0.005			
5	26-Mar-03	27	0.800	5.45	0.800	8.05	224	277	0.0	1.0	46.5	104	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
6	2-Apr-03	34	0.800	5.58	0.800	8.08	254	187	0.0	0.5	32.0	62	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	14.2	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	10.5	0.005	-0.03	-0.05	-0.3	-2	-0.2	0.19	-0.01	6	0.166	-0.2	-0.03	-0.01	-0.03	-0.005			
7	9-Apr-03	41	0.800	5.57	0.785	7.93	233	155	0.0	0.8	22.0	52	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
8	16-Apr-03	48	0.800	5.54	0.710	8.08	310	209	0.0	0.5	25.3	78	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
9	23-Apr-03	55	0.800	5.68	0.775	8.04	333	153	0.0	0.8	29.8	46	-0.2	-0.2	-0.2	0.06	-0.005	-0.2	-0.1	-0.01	11.1	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	9.1	0.006	-0.03	-0.05	-0.3	2	-0.2	0.18	-0.01	4	0.135	-0.2	-0.03	-0.01	-0.03	-0.005			
10	30-Apr-03	62	0.800	5.63	0.760	8.06	383	153	0.0	0.5	30.3	44	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
11	7-May-03	69	0.800	5.57	0.760	8.09	321	136	0.0	0.8	25.0	40	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	14-May-03	76	0.800	5.56	0.765	7.74	318	122	0.0	1.5	19.8	39	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	8.20	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	7.4	0.005	-0.03	-0.05	-0.3	2	-0.2	0.10	-0.01	3	0.111	-0.2	-0.03	-0.01	-0.03	0.005			
13	21-May-03	83	0.800	5.54	0.750	7.94	328	141	0.0	0.8	26.3	42	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	28-May-03	90	0.800	5.53	0.780	8.01	378	114	0.0	0.5	23.5	30	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	4-Jun-03	97	0.800	5.80	0.760	8.01	356	124	0.0	0.8	28.8	33	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	8.87	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	8.6	-0.005	-0.03	-0.05	-0.3	2	-0.2	0.17	-0.01	2	0.117	-0.2	-0.03	-0.01	-0.03	-0.005			
16	11-Jun-03	104	0.800	5.60	0.760	7.87	364	99	0.0	0.8	20.0	24	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	18-Jun-03	111	0.800	5.59	0.750	8.00	378	138	0.0	1.0	26.8	41	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	25-Jun-03	118	0.800	5.62	0.800	7.93	368	98	0.0	0.8	25.3	24	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	6.80	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	6.9	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.15	-0.01	-2	0.091	-0.2	-0.03	-0.01	-0.03	-0.005			
19	2-Jul-03	125	0.800	5.68	0.785	8.07	352	109	0.0	0.5	28.5	26	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	9-Jul-03	132	0.800	#N/A	0.800	8.17	336	110	0.0	0.3	28.5	22	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
21	16-Jul-03	139	0.800	5.41	0.820	8.25	306	99	0.0	0.0	26.3	21	-0.2	-0.2	-0.2	0.06	-0.005	-0.2	-0.1	-0.01	6.91	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	6.6	-0.005	-0.03	-0.05	-0.3	2	-0.2	0.15	-0.01	-2	0.091	-0.2	-0.03	-0.01	-0.03	-0.005			
22	23-Jul-03	146	0.800	5.70	0.810	8.09	329	115	0.0	0.5	27.5	29	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
23	30-Jul-03	153	0.800	5.73	0.825	8.05	354	96	0.0	0.5	23.5	21	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
24	6-Aug-03	160	0.800	5.57	0.815	8.13	345	94	0.0	0.5	24.5	20	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	6.45	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	6.6	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.15	-0.01	-2	0.090	-0.2	-0.03	-0.01	-0.03	-0.005			
25	13-Aug-03	167	0.800	5.53	0.800	7.81	340	73	0.0	0.8	20.0	17	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
26	20-Aug-03	174	0.800	5.65	0.805	8.07	337	88	0.0	0.5	23.8	20	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
27	27-Aug-03	181	0.800	5.44	0.810	7.82	346	82	0.0	0.8	20.8	19	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	5.17	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	6.2	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.13	-0.01	-2	0.073	-0.2	-0.03	-0.01	-0.03	-0.005			
28	3-Sep-03	188</																																												

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70855
Dry Weight 2 kg
Cell 3

* less than signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate 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	V	Zn							
		days	L	s.u.	L	s.u.	mV	µS/cm				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L							
Detection Limits													0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01				0.03	0.05	0.3		0.2	0.01	2		0.2	0.03	0.01	0.03							
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A						
2	5-Mar-03	6	0.800	5.70	0.795	7.99	309	968	0.0	0.8	34.3	572	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	98.8	-0.01	-0.01	-0.01	-0.03	-0.05	0.08	90.5	0.017	-0.03	-0.05	-0.3	14	-0.2	3.52	-0.01	16	0.724	-0.2	-0.03	-0.01	-0.03	0.016						
3	12-Mar-03	13	0.800	5.54	0.810	8.05	315	533	0.0	0.8	37.0	270	-0.2	-0.2	-0.2	0.06	-0.005	-0.2	-0.1	-0.01	43.7	-0.01	-0.01	-0.01	-0.03	-0.05	0.05	41.1	-0.005	-0.03	-0.05	-0.3	7	-0.2	4.25	-0.01	8	0.354	-0.2	-0.03	-0.01	-0.03	-0.005						
4	19-Mar-03	20	0.800	5.68	0.805	8.18	206	373	0.0	0.8	41.0	155	-0.2	-0.2	-0.2	0.07	-0.005	-0.2	-0.1	-0.01	32.5	-0.01	-0.01	-0.01	-0.03	-0.05	0.03	28.7	-0.005	-0.03	-0.05	-0.3	7	-0.2	0.4	-0.01	5	0.267	-0.2	-0.03	-0.01	-0.03	-0.005						
5	26-Mar-03	27	0.800	5.45	0.800	8.14	234	294	0.0	0.8	42.3	114	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
6	2-Apr-03	34	0.800	5.58	0.805	8.12	250	246	0.0	1.0	46.8	85	-0.2	-0.2	-0.2	0.08	-0.005	-0.2	-0.1	-0.01	19.2	-0.01	-0.01	-0.01	-0.03	-0.05	0.04	16.5	-0.005	-0.03	-0.05	-0.3	4	-0.2	0.33	-0.01	4	0.171	-0.2	-0.03	-0.01	-0.03	-0.005						
7	9-Apr-03	41	0.800	5.57	0.805	8.16	229	226	0.0	0.8	52.8	68	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
8	16-Apr-03	48	0.800	5.54	0.800	8.15	306	205	0.0	0.3	53.0	53	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
9	23-Apr-03	55	0.800	5.68	0.795	8.17	331	198	0.0	0.5	56.8	43	-0.2	-0.2	-0.2	0.1	-0.005	-0.2	-0.1	-0.01	14.6	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	13.5	-0.005	-0.03	-0.05	-0.3	4	-0.2	0.34	-0.01	2	0.151	-0.2	-0.03	-0.01	-0.03	0.051						
10	30-Apr-03	62	0.800	5.63	0.790	8.21	372	174	0.0	0.3	51.3	37	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
11	7-May-03	69	0.800	5.57	0.780	8.11	392	142	0.0	0.5	39.8	30	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
12	14-May-03	76	0.800	5.56	0.765	8.02	305	141	0.0	0.5	35.3	34	-0.2	-0.2	-0.2	0.10	-0.005	-0.2	-0.1	-0.01	9.83	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	9.4	-0.005	-0.03	-0.05	-0.3	4	-0.2	0.21	-0.01	-2	0.116	-0.2	-0.03	-0.01	-0.03	-0.005						
13	21-May-03	83	0.800	5.54	0.750	8.08	323	144	0.0	0.8	37.8	32	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
14	28-May-03	90	0.800	5.53	0.755	8.17	376	147	0.0	0.5	40.3	30	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
15	4-Jun-03	97	0.800	5.80	0.755	8.21	354	124	0.0	0.3	35.3	25	-0.2	-0.2	-0.2	0.10	-0.005	-0.2	-0.1	-0.01	8.96	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	9.0	-0.005	-0.03	-0.05	-0.3	4	-0.2	0.25	-0.01	-2	0.106	-0.2	-0.03	-0.01	-0.03	-0.005						
16	11-Jun-03	104	0.800	5.60	0.750	8.12	356	129	0.0	0.5	37.5	22	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
17	18-Jun-03	111	0.800	5.59	0.750	8.14	371	131	0.0	0.5	37.0	24	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
18	25-Jun-03	118	0.800	5.62	0.745	8.09	378	126	0.0	0.5	40.0	24	-0.2	-0.2	-0.2	0.09	-0.005	-0.2	-0.1	-0.01	8.50	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	9.2	-0.005	-0.03	-0.05	-0.3	3	-0.2	0.26	-0.01	-2	0.103	-0.2	-0.03	-0.01	-0.03	-0.005						
19	2-Jul-03	125	0.800	5.68	0.735	8.25	355	130	0.0	0.0	42.0	22	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
20	9-Jul-03	132	0.800	#N/A	0.745	8.25	334	147	0.0	0.0	48.0	24	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
21	16-Jul-03	139	0.800	5.41	0.750	8.25	323	133	0.0	0.0	44.5	21	-0.2	-0.2	-0.2	0.10	-0.005	-0.2	-0.1	-0.01	8.83	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	9.5	-0.005	-0.03	-0.05	-0.3	3	-0.2	0.29	-0.01	-2	0.110	-0.2	-0.03	-0.01	-0.03	-0.005						
22	23-Jul-03	146	0.800	5.70	0.755	8.33	342	128	0.0	0.0	43.8	20	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
23	30-Jul-03	153	0.800	5.73	0.755	8.11	357	127	0.0	0.5	41.3	16	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
24	6-Aug-03	160	0.800	5.57	0.750	8.26	344	134	0.0	0.3	43.5	20	-0.2	-0.2	-0.2	0.13	-0.005	-0.2	-0.1	-0.01	8.89	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	9.4	-0.005	-0.03	-0.05	-0.3	3	-0.2	0.32	-0.01	-2	0.114	-0.2	-0.03	-0.01	-0.03	-0.005						
25	13-Aug-03	167	0.800	5.53	0.755	8.15	342	124	0.0	0.5	40.0	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
26	20-Aug-03	174	0.800	5.65	0.745	8.18	337	132	0.0	0.8	44.8	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
27	27-Aug-03	181	0.800	5.44	0.755	7.99	344	123	0.0	0.8	40.3	16	-0.2	-0.2	-0.2	0.09	-0.005	-0.2	-0.1	-0.01	7.77	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	8.8	-0.005	-0.03	-0.05	-0.3	3	-0.2	0.27	-0.01	-2	0.100	-0.2	-0.03	-0.01	-0.03	-0.005						
28																																																	

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70999
Dry Weight 2 kg
Cell 5

* less than signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate Al	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	V	Zn		
		days	L	s.u.	L	s.u.	mV	µS/cm				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
Detection Limits														0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01						0.2		0.01	2		0.2	0.03	0.01	0.03			
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
2	5-Mar-03	6	0.800	5.70	0.795	7.44	323	759	0.0	1.3	12.8	452	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	71	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	74.7	0.086	-0.03	-0.05	-0.3	6	-0.2	2.88	-0.01	3	0.343	-0.2	-0.03	-0.01	-0.03	0.073		
3	12-Mar-03	13	0.800	5.54	0.800	7.61	325	732	0.0	2.8	29.3	421	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	61.8	-0.01	-0.01	0.02	-0.03	-0.05	0.01	70	0.091	-0.03	-0.05	-0.3	4	-0.2	3.56	-0.01	2	0.296	-0.2	-0.03	-0.01	-0.03	0.078		
4	19-Mar-03	20	0.800	5.68	0.800	7.74	269	416	0.0	1.3	24.3	203	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	37.2	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	35.1	0.034	-0.03	-0.05	-0.3	2	-0.2	0.19	-0.01	-2	0.17	-0.2	-0.03	-0.01	-0.03	0.017		
5	26-Mar-03	27	0.800	5.45	0.800	7.86	211	530	0.0	1.5	34.0	300	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
6	2-Apr-03	34	0.800	5.58	0.805	7.80	259	370	0.0	1.0	27.5	175	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	34.3	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	28.5	0.013	-0.03	-0.05	-0.3	2	-0.2	0.15	-0.01	-2	0.156	-0.2	-0.03	-0.01	-0.03	0.007		
7	9-Apr-03	41	0.800	5.57	0.790	7.82	250	328	0.0	1.3	36.0	158	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
8	16-Apr-03	48	0.800	5.54	0.785	7.91	314	393	0.0	1.3	30.3	192	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
9	23-Apr-03	55	0.800	5.68	0.765	7.89	335	263	0.0	2.3	37.0	102	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	21.1	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	20.9	0.006	-0.03	-0.05	-0.3	2	-0.2	0.13	-0.01	-2	0.11	-0.2	-0.03	-0.01	-0.03	0.024		
10	30-Apr-03	62	0.800	5.63	0.760	7.96	381	233	0.0	1.3	35.3	87	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
11	7-May-03	69	0.800	5.57	0.755	7.84	398	184	0.0	1.0	22.8	64	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	14-May-03	76	0.800	5.56	0.750	7.70	368	167	0.0	1.3	22.3	59	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	11.2	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	13.1	-0.005	-0.03	-0.05	-0.3	-2	-0.2	-0.05	-0.01	-2	0.066	-0.2	-0.03	-0.01	-0.03	-0.005		
13	21-May-03	83	0.800	5.54	0.750	7.87	333	178	0.0	1.0	27.3	63	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
14	28-May-03	90	0.800	5.53	0.750	8.04	373	160	0.0	0.8	27.3	50	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
15	4-Jun-03	97	0.800	5.80	0.760	8.03	350	175	0.0	0.8	39.0	54	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	8.84	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	17.3	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.10	-0.01	-2	0.059	-0.2	-0.03	-0.01	-0.03	-0.005		
16	11-Jun-03	104	0.800	5.60	0.760	8.04	355	152	0.0	0.8	33.8	46	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
17	18-Jun-03	111	0.800	5.59	0.750	8.05	372	156	0.0	0.5	30.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
18	25-Jun-03	118	0.800	5.62	0.765	8.06	369	157	0.0	0.8	42.8	42	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	6.97	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	16.5	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.11	-0.01	-2	0.046	-0.2	-0.03	-0.01	-0.03	-0.005		
19	2-Jul-03	125	0.800	5.68	0.755	8.10	350	164	0.0	0.8	43.3	43	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20	9-Jul-03	132	0.800	#N/A	0.750	8.10	330	160	0.0	0.5	46.8	37	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
21	16-Jul-03	139	0.800	5.41	0.780	8.24	330	103	0.0	0.3	28.5	21	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	3.73	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	9.6	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.08	-0.01	-2	0.031	-0.2	-0.03	-0.01	-0.03	-0.005		
22	23-Jul-03	146	0.800	5.70	0.770	8.20	340	108	0.0	0.3	27.3	25	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
23	30-Jul-03	153	0.800	5.73	0.795	8.07	351	100	0.0	0.5	28.0	19	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24	6-Aug-03	160	0.800	5.57	0.750	8.20	338	172	0.0	0.3	65.5	37	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	5.32	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	18.2	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.11	-0.01	-2	0.050	-0.2	-0.03	-0.01	-0.03	-0.005		
25	13-Aug-03	167	0.800	5.53	0.785	8.26	341	120	0.0	0.3	34.8	27	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
26	20-Aug-03	174	0.800	5.65	0.770	8.29	320	100	0.0	0.0	30.3	21	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
27	27-Aug-03	181	0.800	5.44	0.780	8.16	336	120	0.0	0.3	33.0	26	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	3.06	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	12.3	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.09	-0.01	-2	0.026	-0.2	-0.03	-0.01	-0.03	-0.005		
28	3-Sep-03	188	0.800	5.51	0.805	8.28	330	129	0.0	0.0	39.3	31	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
28	10-Sep-03	195	0.800	5.58	0.805	8.30	312	141	0.0	0.0	49.5																																		

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70893
Dry Weight 2 kg
Cell 6

DRAFT ONLY - SUBJECT TO CHANGE

* less than signs have been replaced with negatives

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5	Total Acidity	Alkalinity	Sulphate 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	V	Zn						
		days	L	s.u.	L	s.u.	mV	µS/cm	mg Ca CO ₃ /L	mg Ca CO ₃ /L	mg Ca CO ₃ /L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L						
Detection Limits													0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01				0.03	0.05	0.3		0.2		0.01	2		0.2	0.03	0.01	0.03					
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
2	5-Mar-03	6	0.800	5.70	0.725	7.65	327	980	0.0	1.3	15.0	631	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	122	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	95.7	0.112	-0.03	-0.05	-0.3	5	-0.2	2.83	-0.01	-2	0.226	-0.2	-0.03	-0.01	-0.03	0.017					
3	12-Mar-03	13	0.800	5.54	0.805	7.51	333	767	0.0	1.5	16.3	481	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	76.2	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	80.2	0.04	-0.03	-0.05	-0.3	6	-0.2	3.68	-0.01	-2	0.171	-0.2	-0.03	-0.01	-0.03	0.007					
4	19-Mar-03	20	0.800	5.68	0.790	7.66	279	712	0.0	1.5	18.3	430	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	76.6	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	70.1	0.029	-0.03	-0.05	-0.3	4	-0.2	0.34	-0.01	-2	0.159	-0.2	-0.03	-0.01	-0.03	-0.005					
5	26-Mar-03	27	0.800	5.45	0.805	7.68	223	614	0.0	1.3	13.5	394	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
6	2-Apr-03	34	0.800	5.58	0.795	7.43	284	563	0.0	1.3	12.8	350	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	61.9	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	47.7	0.013	-0.03	-0.05	-0.3	4	-0.2	0.23	-0.01	-2	0.128	-0.2	-0.03	-0.01	-0.03	0.02					
7	9-Apr-03	41	0.800	5.57	0.765	7.48	316	574	0.0	2.0	15.8	392	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
8	16-Apr-03	48	0.800	5.54	0.760	7.61	330	890	0.0	1.8	16.5	681	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
9	23-Apr-03	55	0.800	5.68	0.770	7.53	342	490	0.0	1.8	17.3	263	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	49.6	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	43.5	0.010	-0.03	-0.05	-0.3	4	-0.2	0.26	-0.01	-2	0.104	-0.2	-0.03	-0.01	-0.03	0.006					
10	30-Apr-03	62	0.800	5.63	0.760	7.58	391	478	0.0	1.5	14.3	287	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
11	7-May-03	69	0.800	5.57	0.760	7.56	418	524	0.0	1.8	14.3	280	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	14-May-03	76	0.800	5.56	0.745	7.56	404	517	0.0	2.0	17.8	288	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	54.6	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	47.4	0.006	-0.03	-0.05	-0.3	4	-0.2	0.22	-0.01	-2	0.118	-0.2	-0.03	-0.01	-0.03	-0.005					
13	21-May-03	83	0.800	5.54	0.745	7.67	417	630	0.0	1.8	22.0	339	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	28-May-03	90	0.800	5.53	0.750	7.80	383	711	0.0	1.3	25.3	428	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	4-Jun-03	97	0.800	5.80	0.750	7.78	370	595	0.0	1.3	18.0	358	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	55.6	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	56.6	-0.005	-0.03	-0.05	-0.3	4	-0.2	0.27	-0.01	-2	0.117	-0.2	-0.03	-0.01	-0.03	-0.005					
16	11-Jun-03	104	0.800	5.60	0.750	7.83	364	566	0.0	1.0	25.0	311	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	18-Jun-03	111	0.800	5.59	0.750	7.78	372	453	0.0	1.3	20.8	251	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	25-Jun-03	118	0.800	5.62	0.785	7.64	383	387	0.0	1.3	16.3	215	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	40.2	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	28.6	-0.005	-0.03	-0.05	-0.3	4	-0.2	0.25	-0.01	-2	0.084	-0.2	-0.03	-0.01	-0.03	-0.005					
19	2-Jul-03	125	0.800	5.68	0.755	7.63	360	384	0.0	1.0	15.3	201	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	9-Jul-03	132	0.800	#N/A	0.770	7.47	350	401	0.0	1.3	15.5	207	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
21	16-Jul-03	139	0.800	5.41	0.775	7.66	345	342	0.0	1.0	16.3	175	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	33.4	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	22.5	-0.005	-0.03	-0.05	-0.3	3	-0.2	0.21	-0.01	-2	0.067	-0.2	-0.03	-0.01	-0.03	-0.005					
22	23-Jul-03	146	0.800	5.70	0.780	7.64	358	323	0.0	1.0	13.8	167	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
23	30-Jul-03	153	0.800	5.73	0.770	7.70	362	355	0.0	1.0	18.5	162	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24	6-Aug-03	160	0.800	5.57	0.765	7.65	355	350	0.0	1.3	17.0	169	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	35.6	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	22.5	-0.005	-0.03	-0.05	-0.3	2	-0.2	0.24	-0.01	-2	0.077	-0.2	-0.03	-0.01	-0.03	-0.005					
25	13-Aug-03	167	0.800	5.53	0.790	7.61	364	303	0.0	1.0	13.8	133	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A																		

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70783
Dry Weight 2 kg
Cell 7

* less than signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate 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	V	Zn				
		days	L	s.u.	L	s.u.	mV	µS/cm				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
Detection Limits													0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01						0.2		0.01	2		0.2	0.03	0.01	0.03					
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
2	5-Mar-03	6	0.800	5.70	0.780	7.34	330	900	0.0	1.8	12.8	552	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	94.2	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	89	0.189	-0.03	-0.05	-0.3	9	-0.2	2.83	-0.01	-2	0.302	-0.2	-0.03	-0.01	-0.03	0.906			
3	12-Mar-03	13	0.800	5.54	0.795	7.33	344	741	0.0	4.0	20.8	469	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	102	-0.01	0.03	0.02	-0.03	-0.05	0.02	69.8	0.372	-0.03	-0.05	-0.3	7	-0.2	4.21	-0.01	-2	0.295	-0.2	-0.03	-0.01	-0.03	2.08			
4	19-Mar-03	20	0.800	5.68	0.795	7.62	281	860	0.0	2.8	27.0	548	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	127	-0.01	0.03	-0.01	-0.03	-0.05	0.02	70.6	0.298	-0.03	-0.05	-0.3	8	-0.2	0.58	-0.01	-2	0.336	-0.2	-0.03	-0.01	-0.03	1.79			
5	26-Mar-03	27	0.800	5.45	0.790	7.49	253	426	0.0	1.8	16.5	221	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
6	2-Apr-03	34	0.800	5.58	0.810	7.50	291	388	0.0	1.8	16.3	216	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	49.4	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	22.4	0.026	-0.03	-0.05	-0.3	3	-0.2	0.23	-0.01	-2	0.123	-0.2	-0.03	-0.01	-0.03	0.3			
7	9-Apr-03	41	0.800	5.57	0.795	7.30	324	279	0.0	1.3	14.0	138	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
8	16-Apr-03	48	0.800	5.54	0.790	7.58	331	235	0.0	1.5	15.8	108	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
9	23-Apr-03	55	0.800	5.68	0.800	7.52	348	221	0.0	1.8	16.3	92	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	24.1	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	12	0.012	-0.03	-0.05	-0.3	-2	-0.2	0.15	-0.01	-2	0.062	-0.2	-0.03	-0.01	-0.03	0.137			
10	30-Apr-03	62	0.800	5.63	0.770	7.62	390	215	0.0	1.3	17.3	90	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
11	7-May-03	69	0.800	5.57	0.770	7.70	403	288	0.0	1.5	21.3	126	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
12	14-May-03	76	0.800	5.56	0.765	7.74	394	269	0.0	1.8	33.5	107	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	31.3	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	16.1	0.015	-0.03	-0.05	-0.3	2	-0.2	0.18	-0.01	-2	0.084	-0.2	-0.03	-0.01	-0.03	0.185			
13	21-May-03	83	0.800	5.54	0.775	7.65	406	204	0.0	1.8	20.5	83	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	28-May-03	90	0.800	5.53	0.760	7.78	378	204	0.0	1.3	26.3	75	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	4-Jun-03	97	0.800	5.80	0.765	7.68	365	136	0.0	1.3	20.8	45	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	13.0	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	8.4	0.006	-0.03	-0.05	-0.3	-2	-0.2	0.10	-0.01	-2	0.040	-0.2	-0.03	-0.01	-0.03	0.091			
16	11-Jun-03	104	0.800	5.60	0.770	7.66	361	162	0.0	1.5	17.3	61	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	18-Jun-03	111	0.800	5.59	0.755	7.83	368	179	0.0	1.0	22.3	100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	25-Jun-03	118	0.800	5.62	0.765	7.97	371	255	0.0	1.3	48.0	92	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	27.7	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	16.8	0.011	-0.03	-0.05	-0.3	-2	-0.2	0.22	-0.01	-2	0.079	-0.2	-0.03	-0.01	-0.03	0.147			
19	2-Jul-03	125	0.800	5.68	0.760	8.03	352	199	0.0	1.0	43.0	59	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	9-Jul-03	132	0.800	#N/A	0.770	7.68	340	213	0.0	1.3	35.0	72	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
21	16-Jul-03	139	0.800	5.41	0.770	7.72	347	121	0.0	1.0	20.8	40	-0.2	-0.2	-0.2	-0.01	-0.005	-0.2	-0.1	-0.01	10.3	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	7.1	0.006	-0.03	-0.05	-0.3	-2	-0.2	0.09	-0.01	-2	0.033	-0.2	-0.03	-0.01	-0.03	0.065			
22	23-Jul-03	146	0.800	5.70	0.755	7.78	361	128	0.0	1.0	22.5	41	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
23	30-Jul-03	153	0.800	5.73	0.770	7.81	353	177	0.0	1.0	24.5	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24	6-Aug-03	160	0.800	5.57	0.760	7.75	362	177	0.0	1.0	25.8	58	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	15.2	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	11.7	0.013	-0.03	-0.05	-0.3	-2	-0.2	0.12	-0.01	-2	0.053	-0.2	-0.03	-0.01	-0.03	0.114			
25	13-Aug-03	167	0.800	5.53	0.765	7.83	352	171	0.0	1.3	27.5	51	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
26	20-Aug-03	174	0.800	5.65	0.760	7.74	350	145	0.0	1.3	22.0	51	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
27	27-Aug-03	181	0.800	5.44	0.775	7.65	355	153	0.0	1.0	20.0	53	-0.2	-0.2	-0.2	-0.01	-0.005	-0.2	-0.1	-0.01	10.9	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	10.7	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.09	-0.01	-2	0.036	-0.2	-0.03	-0.01	-0.03	0.037			
28	3-Sep-03	188	0.800	5.51	0.770	7.75	340	174	0.0	1.3	33.0	58	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
29	10-Sep-03	195	0.800	5.58	0.805	7.72																																								

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70920
Dry Weight 2 kg
Cell 8

* less than signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate Al	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	V	Zn		
		days	L	s.u.	L	s.u.	mV	µS/cm				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
Detection Limits														0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01						0.2		0.01	2		0.2	0.03	0.01	0.03			
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
2	5-Mar-03	6	0.800	5.70	0.855	7.78	319	1478	0.0	2.0	38.8	1120	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	218	-0.01	-0.01	-0.01	-0.03	-0.05	0.08	116	0.087	-0.03	-0.05	-0.3	17	-0.2	3.24	-0.01	63	1.03	-0.2	-0.03	-0.01	-0.03	0.055		
3	12-Mar-03	13	0.800	5.54	0.795	7.87	324	1156	0.0	3.3	63.0	747	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	190	-0.01	-0.01	-0.01	-0.03	-0.05	0.08	99	0.041	-0.03	-0.05	-0.3	14	-0.2	4.64	-0.01	35	0.904	-0.2	-0.03	-0.01	-0.03	0.054		
4	19-Mar-03	20	0.800	5.68	0.785	7.97	273	885	0.0	1.8	60.5	505	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	129	-0.01	-0.01	-0.01	-0.03	-0.05	0.05	59	0.018	-0.03	-0.05	-0.3	8	-0.2	0.52	-0.01	15	0.568	-0.2	-0.03	-0.01	-0.03	0.021		
5	26-Mar-03	27	0.800	5.45	0.780	7.99	241	514	0.0	1.0	33.3	270	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
6	2-Apr-03	34	0.800	5.58	0.785	7.85	276	445	0.0	1.0	29.0	240	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	56.8	-0.01	-0.01	-0.01	-0.03	-0.05	0.03	24.9	0.007	-0.03	-0.05	-0.3	4	-0.2	0.26	-0.01	6	0.25	-0.2	-0.03	-0.01	-0.03	-0.005		
7	9-Apr-03	41	0.800	5.57	0.780	7.87	304	394	0.0	1.3	41.3	190	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
8	16-Apr-03	48	0.800	5.54	0.780	8.10	309	395	0.0	1.0	51.3	180	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
9	23-Apr-03	55	0.800	5.68	0.770	8.04	331	293	0.0	1.0	50.5	111	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	33.8	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	15.7	0.007	-0.03	-0.05	-0.3	4	-0.2	0.33	-0.01	2	0.173	-0.2	-0.03	-0.01	-0.03	-0.005		
10	30-Apr-03	62	0.800	5.63	0.765	7.97	372	201	0.0	1.0	34.5	70	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
11	7-May-03	69	0.800	5.57	0.760	7.99	393	193	0.0	1.0	31.0	64	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	14-May-03	76	0.800	5.56	0.750	7.90	388	162	0.0	1.3	31.3	49	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	17.6	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	8.5	-0.005	-0.03	-0.05	-0.3	3	-0.2	0.18	-0.01	-2	0.091	-0.2	-0.03	-0.01	-0.03	-0.005		
13	21-May-03	83	0.800	5.54	0.745	8.13	399	238	0.0	0.8	51.0	71	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
14	28-May-03	90	0.800	5.53	0.760	8.27	365	299	0.0	0.0	85.5	73	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
15	4-Jun-03	97	0.800	5.80	0.775	8.27	356	282	0.0	0.0	105.0	53	-0.2	-0.2	-0.2	0.07	-0.005	-0.2	-0.1	-0.01	30.1	-0.01	-0.01	-0.01	-0.03	-0.05	0.04	18.9	-0.005	-0.03	-0.05	-0.3	5	-0.2	0.58	-0.01	-2	0.208	-0.2	-0.03	-0.01	-0.03	-0.005		
16	11-Jun-03	104	0.800	5.60	0.765	8.27	332	203	0.0	0.0	75.5	31	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	18-Jun-03	111	0.800	5.59	0.760	8.20	352	176	0.0	0.0	54.5	37	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	25-Jun-03	118	0.800	5.62	0.765	8.23	364	199	0.0	0.0	77.3	34	-0.2	-0.2	-0.2	0.07	-0.005	-0.2	-0.1	-0.01	19.2	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	13.3	-0.005	-0.03	-0.05	-0.3	4	-0.2	0.40	-0.01	-2	0.143	-0.2	-0.03	-0.01	-0.03	0.006		
19	2-Jul-03	125	0.800	5.68	0.755	8.36	345	239	0.0	0.0	90.5	39	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20	9-Jul-03	132	0.800	#N/A	0.760	8.26	325	159	0.0	0.0	57.5	22	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
21	16-Jul-03	139	0.800	5.41	0.770	8.10	350	160	0.0	1.0	57.5	25	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	13.9	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	10.5	-0.005	-0.03	-0.05	-0.3	2	-0.2	0.30	-0.01	-2	0.109	-0.2	-0.03	-0.01	-0.03	-0.005		
22	23-Jul-03	146	0.800	5.70	0.765	8.09	362	137	0.0	0.8	49.0	22	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
23	30-Jul-03	153	0.800	5.73	0.755	7.99	354	127	0.0	1.0	47.0	17	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24	6-Aug-03	160	0.800	5.57	0.755	7.99	343	129	0.0	1.0	42.0	20	-0.2	-0.2	-0.2	0.05	-0.005	-0.2	-0.1	-0.01	10.9	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	8.3	-0.005	-0.03	-0.05	-0.3	3	-0.2	0.24	-0.01	-2	0.090	-0.2	-0.03	-0.01	-0.03	0.008		
25	13-Aug-03	167	0.800	5.53	0.765	7.92	348	122	0.0	1.0	40.0	20	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
26	20-Aug-03	174	0.800	5.65	0.765	7.96	344	117	0.0	0.8	31.0	26	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
27	27-Aug-03	181	0.800	5.44	0.770	8.08	336	216	0.0	0.8	69.5	41	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	-0.1	-0.01	17.2	-0.01	-0.01	-0.01	-0.03	-0.05	0.03	16.3	-0.005	-0.03	-0.05	-0.3	4	-0.2	0.4	-0.01	-2	0.147	-0.2	-0.03	-0.01	-0.03	-0.005		
28	3-Sep-03	188	0.800	5.51	0.770	8.00	336	137	0.0	1.0	50.5	22	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
28	10-Sep-03	19																																											

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70784
Dry Weight 2 kg
Cell 9

* less than signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate 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	V	Zn					
		days	L	s.u.	L	s.u.	mV	µS/cm				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					
Detection Limits													0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01		0.03	0.05	0.3		0.2	0.01	2		0.2	0.03	0.01	0.03							
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
2	5-Mar-03	6	0.800	5.70	0.785	7.43	328	1100	0.0	1.8	15.0	856	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	112	-0.01	0.01	-0.01	-0.03	-0.05	0.01	140	0.236	0.15	0.07	-0.3	7	-0.2	2.74	-0.01	-2	0.689	-0.2	-0.03	-0.01	-0.03	0.255				
3	12-Mar-03	13	0.800	5.54	0.800	7.51	338	737	0.0	2.8	25.3	445	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	93.3	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	75.4	0.064	0.08	-0.05	-0.3	4	-0.2	3.8	-0.01	-2	0.487	-0.2	-0.03	-0.01	-0.03	0.174				
4	19-Mar-03	20	0.800	5.68	0.785	7.71	289	616	0.0	2.0	29.8	359	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	77	-0.01	-0.01	-0.01	-0.03	-0.05	0.02	51.5	0.034	0.07	-0.05	-0.3	3	-0.2	0.27	-0.01	-2	0.36	-0.2	-0.03	-0.01	-0.03	0.098				
5	26-Mar-03	27	0.800	5.45	0.780	7.64	236	398	0.0	1.5	19.0	211	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
6	2-Apr-03	34	0.800	5.58	0.780	7.63	285	337	0.0	1.5	19.3	172	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	34.3	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	23.3	-0.005	0.08	-0.05	-0.3	-2	-0.2	0.12	-0.01	-2	0.171	-0.2	-0.03	-0.01	-0.03	0.012				
7	9-Apr-03	41	0.800	5.57	0.770	7.63	307	263	0.0	1.3	18.5	122	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
8	16-Apr-03	48	0.800	5.54	0.775	7.79	324	277	0.0	1.0	23.0	124	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
9	23-Apr-03	55	0.800	5.68	0.770	7.71	351	171	0.0	1.3	22.3	57	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	13.8	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	12.1	-0.005	0.05	-0.05	-0.3	-2	-0.2	0.11	-0.01	-2	0.082	-0.2	-0.03	-0.01	-0.03	0.009				
10	30-Apr-03	62	0.800	5.63	0.750	7.78	378	169	0.0	1.0	21.0	60	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
11	7-May-03	69	0.800	5.57	0.755	7.64	390	137	0.0	1.5	19.0	47	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
12	14-May-03	76	0.800	5.56	0.750	7.58	386	133	0.0	1.8	19.0	49	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	9.36	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	10.0	-0.005	0.06	-0.05	-0.3	-2	-0.2	0.06	-0.01	-2	0.061	-0.2	-0.03	-0.01	-0.03	-0.005				
13	21-May-03	83	0.800	5.54	0.740	7.72	409	141	0.0	1.3	21.3	50	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	28-May-03	90	0.800	5.53	0.740	7.88	362	150	0.0	1.3	24.3	48	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	4-Jun-03	97	0.800	5.80	0.740	7.93	353	134	0.0	0.8	28.5	38	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	8.35	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	11.9	-0.005	0.05	-0.05	-0.3	-2	-0.2	0.09	-0.01	-2	0.057	-0.2	-0.03	-0.01	-0.03	-0.005				
16	11-Jun-03	104	0.800	5.60	0.740	7.85	349	124	0.0	0.8	22.5	37	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	18-Jun-03	111	0.800	5.59	0.750	7.95	342	125	0.0	0.5	22.3	40	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	25-Jun-03	118	0.800	5.62	0.805	7.87	361	145	0.0	1.3	26.3	47	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	9.63	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	12.0	-0.005	0.04	-0.05	-0.3	-2	-0.2	0.10	-0.01	-2	0.068	-0.2	-0.03	-0.01	-0.03	-0.005				
19	2-Jul-03	125	0.800	5.68	0.770	7.76	342	93	0.0	1.3	18.8	27	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	9-Jul-03	132	0.800	#N/A	0.785	7.60	341	108	0.0	1.3	19.8	31	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
21	16-Jul-03	139	0.800	5.41	0.785	7.81	354	108	0.0	1.0	20.3	32	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	5.85	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	8.6	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.07	-0.01	-2	0.034	-0.2	-0.03	-0.01	-0.03	-0.005				
22	23-Jul-03	146	0.800	5.70	0.795	7.83	363	110	0.0	0.8	19.0	36	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
23	30-Jul-03	153	0.800	5.73	0.755	7.78	363	114	0.0	0.8	21.8	32	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24	6-Aug-03	160	0.800	5.57	0.780	7.78	337	109	0.0	1.0	20.0	30	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	5.46	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	9.1	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.08	-0.01	-2	0.045	-0.2	-0.03	-0.01	-0.03	-0.005				
25	13-Aug-03	167	0.800	5.53	0.765	7.78	348	113	0.0	0.8	22.5	33	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
26	20-Aug-03	174	0.800	5.65	0.760	7.76	351	106	0.0	1.0	20.5	39	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
27	27-Aug-03	181	0.800	5.44	0.785	7.64	358	101	0.0	0.8	18.5	29	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	4.47	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	9.0	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.07	-0.01	-2	0.031	-0.2	-0.03	-0.01	-0.03	-0.005				
28	3-Sep-03	188	0.800	5.51	0.790	7.70	352	106	0.0	0.8	20.3	34	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A																			

SINGLE TEST METHOD HUMIDITY CELL

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70993
Dry Weight 2 kg
Cell 10
* less than signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate mg/L	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	V	Zn				
		days	L	s.u.	L	s.u.	mV	µS/cm																																							
Detection Limits														0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01				0.03	0.05	0.3		0.2		0.01	2		0.2	0.03	0.01	0.03			
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
2	5-Mar-03	6	0.800	5.70	0.855	7.46	330	1533	0.0	3.3	25.3	1220	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	0.06	324	-0.01	0.07	-0.01	-0.03	-0.05	0.03	84.9	0.755	-0.03	0.08	-0.3	25	-0.2	3.29	-0.01	5	0.774	-0.2	-0.03	-0.01	-0.03	2.37				
3	12-Mar-03	13	0.800	5.54	0.800	7.53	335	927	0.0	3.5	30.5	580	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	0.1	0.04	207	-0.01	0.06	-0.01	-0.03	-0.05	0.02	33.6	0.632	-0.03	0.05	-0.3	9	-0.2	4.39	-0.01	-2	0.427	-0.2	-0.03	-0.01	-0.03	1.56				
4	19-Mar-03	20	0.800	5.68	0.780	7.66	299	704	0.0	1.8	27.0	412	-0.2	-0.2	-0.2	0.04	-0.005	-0.2	0.1	0.02	153	-0.01	0.02	-0.01	-0.03	-0.05	-0.01	19.5	0.309	-0.03	-0.05	-0.3	4	-0.2	0.51	-0.01	-2	0.265	-0.2	-0.03	-0.01	-0.03	0.79				
5	26-Mar-03	27	0.800	5.45	0.780	7.66	272	489	0.0	1.5	22.3	280	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
6	2-Apr-03	34	0.800	5.58	0.795	7.51	293	338	0.0	1.5	16.8	163	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	60.6	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	8.4	0.032	-0.03	-0.05	-0.3	2	-0.2	0.21	-0.01	-2	0.106	-0.2	-0.03	-0.01	-0.03	0.188				
7	9-Apr-03	41	0.800	5.57	0.795	7.57	325	344	0.0	2.0	18.5	181	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
8	16-Apr-03	48	0.800	5.54	0.790	7.60	333	289	0.0	1.3	16.8	140	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
9	23-Apr-03	55	0.800	5.68	0.785	7.57	354	309	0.0	1.8	18.8	150	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	45.6	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	12.4	0.010	-0.03	-0.05	-0.3	-2	-0.2	0.21	-0.01	-2	0.099	-0.2	-0.03	-0.01	-0.03	0.193				
10	30-Apr-03	62	0.800	5.63	0.775	7.71	368	341	0.0	1.3	21.8	174	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
11	7-May-03	69	0.800	5.57	0.775	7.52	400	240	0.0	1.8	15.8	105	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
12	14-May-03	76	0.800	5.56	0.775	7.63	391	297	0.0	1.5	20.0	134	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	37.6	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	15.6	0.007	-0.03	-0.05	-0.3	-2	-0.2	0.15	-0.01	-2	0.093	-0.2	-0.03	-0.01	-0.03	0.116				
13	21-May-03	83	0.800	5.54	0.775	7.63	412	228	0.0	1.8	18.8	94	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	28-May-03	90	0.800	5.53	0.760	7.83	365	330	0.0	1.0	28.3	143	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	4-Jun-03	97	0.800	5.80	0.755	7.98	354	277	0.0	1.0	30.0	123	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	29.3	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	18.6	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.20	-0.01	-2	0.084	-0.2	-0.03	-0.01	-0.03	0.061				
16	11-Jun-03	104	0.800	5.60	0.765	7.79	343	219	0.0	0.8	24.0	84	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	18-Jun-03	111	0.800	5.59	0.760	7.89	352	245	0.0	1.0	26.3	101	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	25-Jun-03	118	0.800	5.62	0.775	7.84	358	237	0.0	1.0	26.3	103	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	21.1	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	17.2	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.17	-0.01	-2	0.062	-0.2	-0.03	-0.01	-0.03	0.053				
19	2-Jul-03	125	0.800	5.68	0.935	7.67	355	154	0.0	1.3	18.5	57	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	9-Jul-03	132	0.800	#N/A	0.780	7.87	341	302	0.0	1.0	35.0	130	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
21	16-Jul-03	139	0.800	5.41	0.785	7.85	355	200	0.0	0.8	23.0	78	-0.2	-0.2	-0.2	0.01	-0.005	-0.2	-0.1	-0.01	14.5	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	14.6	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.17	-0.01	-2	0.046	-0.2	-0.03	-0.01	-0.03	0.041				
22	23-Jul-03	146	0.800	5.70	0.785	7.77	370	186	0.0	0.8	19.5	70	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
23	30-Jul-03	153	0.800	5.73	0.790	7.77	363	212	0.0	0.8	19.3	67	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24	6-Aug-03	160	0.800	5.57	0.785	7.73	352	231	0.0	1.0	20.3	89	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	15.5	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	17.5	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.14	-0.01	-2	0.055	-0.2	-0.03	-0.01	-0.03	0.062				
25	13-Aug-03	167	0.800	5.53	0.785	7.75	354	200	0.0	1.0	16.3	82	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
26	20-Aug-03	174	0.800	5.65	0.785	7.71	355	193	0.0	1.0	15.8	113	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
27	27-Aug-03	181	0.800	5.44	0.785	7.60	359	208	0.0	1.3	19.0	86	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	12.8	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	18.4	-0.005	-0.03	-0.05	-0.3	-2	-0.2	0.13	-0.01	-2	0.040	-0.2	-0.03	-0.01	-0.03	0.067				
28	3-Sep-03	188	0.800	5.51	0.780	7.72	350	210	0.0	1.0	21.0	91	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A										

SINGLE TEST METHOD HUMIDITY CELL

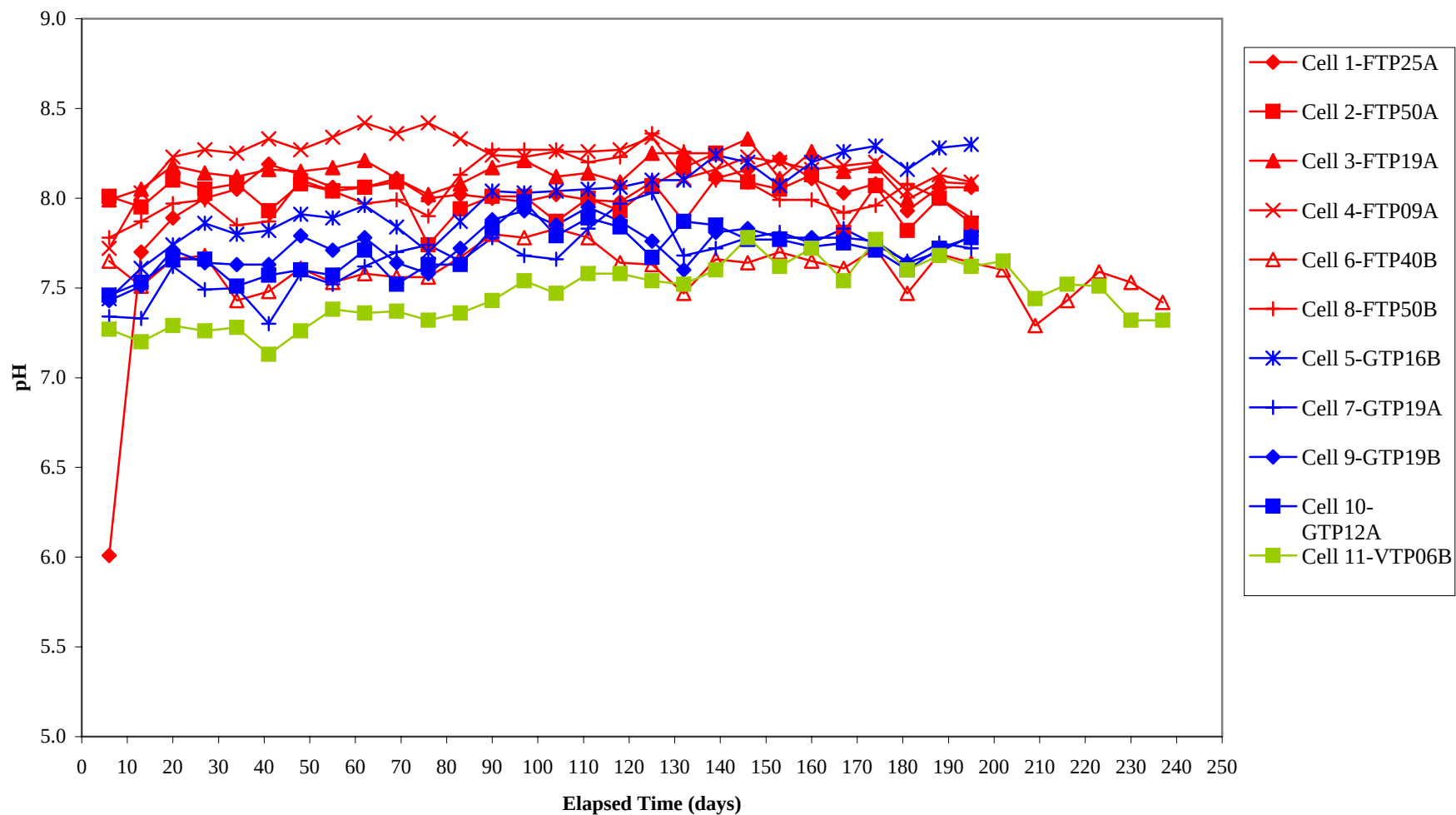
Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70961
Dry Weight 2 kg
Cell 11

DRAFT ONLY - SUBJECT TO CHANGE

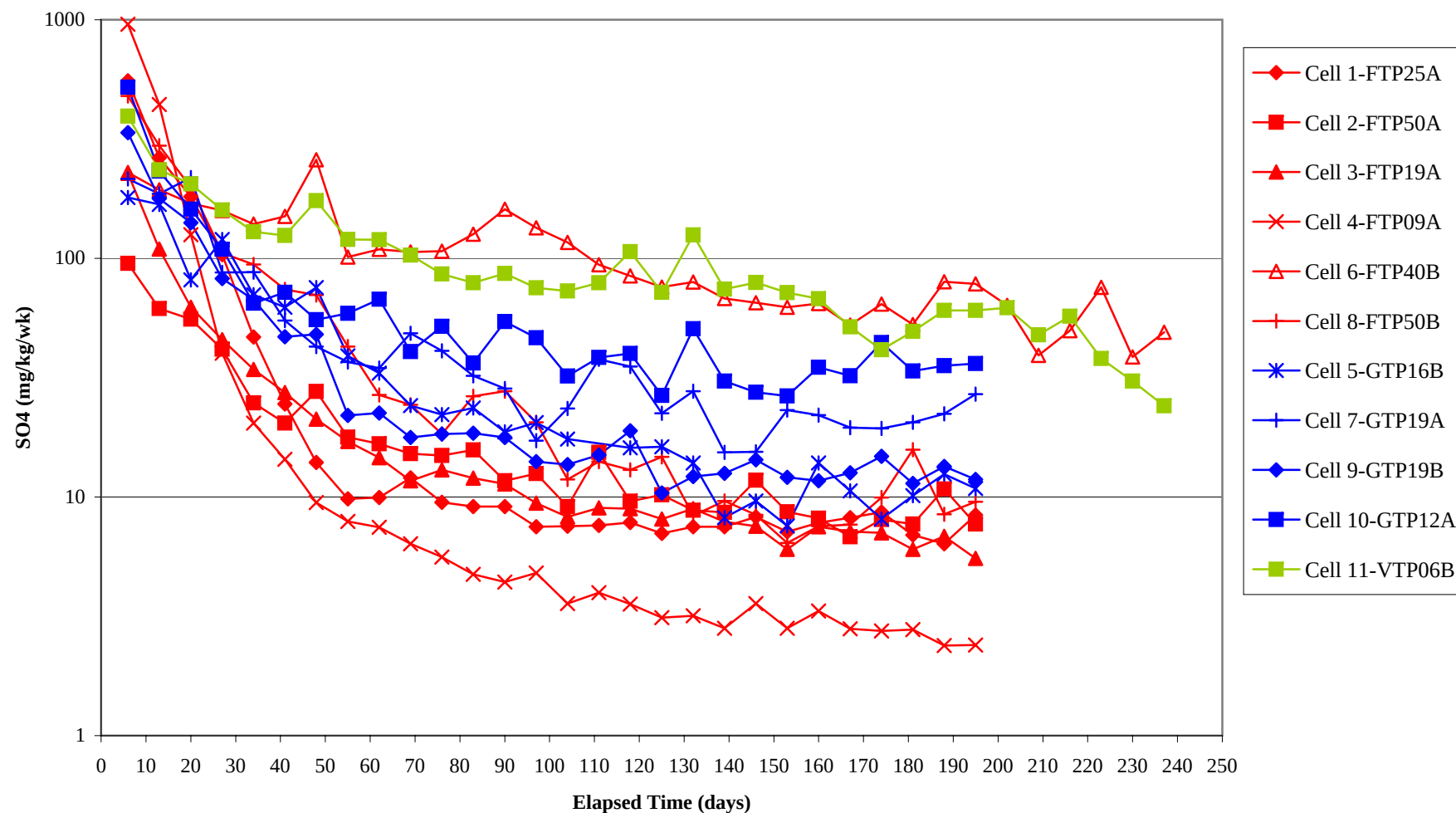
* less than signs have been replaced with negatives

Cycle	Date	Accumulated Time	Water Added	pH Water Added	Leachate Collected	pH	Redox	Cond	Acidity to pH 4.5 mg Ca CO ₃ /L	Total Acidity mg Ca CO ₃ /L	Alkalinity mg Ca CO ₃ /L	Sulphate 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	V	Zn						
		days	L	s.u.	L	s.u.	mV	µS/cm				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L						
Detection Limits													0.2	0.2	0.2		0.005	0.2	0.1	0.01		0.01	0.01	0.01	0.03	0.05	0.01				0.03	0.05	0.3		0.2	0.01	2		0.2	0.03	0.01	0.03						
1	27-Feb-03	0	0.300	5.60	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
2	5-Mar-03	6	0.800	5.70	0.800	7.27	335	1287	0.0	2.8	13.3	986	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	205	-0.01	0.03	-0.01	-0.03	-0.05	0.02	97.3	1.6	-0.03	-0.05	-0.3	15	-0.2	2.73	-0.01	2	0.789	-0.2	-0.03	-0.01	-0.03	2.99					
3	12-Mar-03	13	0.800	5.54	0.810	7.20	353	899	0.0	4.5	15.0	580	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	159	-0.01	0.04	0.01	-0.03	-0.05	0.03	63	2.66	-0.03	-0.05	-0.3	9	-0.2	3.96	-0.01	-2	0.643	-0.2	-0.03	-0.01	-0.03	3.61					
4	19-Mar-03	20	0.800	5.68	0.800	7.29	312	805	0.0	3.0	15.5	513	-0.2	-0.2	-0.2	0.03	-0.005	-0.2	-0.1	-0.01	149	-0.01	0.02	-0.01	-0.03	-0.05	0.02	40	1.88	-0.03	-0.05	-0.3	7	-0.2	0.37	-0.01	-2	0.518	-0.2	-0.03	-0.01	-0.03	2.18					
5	26-Mar-03	27	0.800	5.45	0.810	7.26	291	625	0.0	2.3	11.3	394	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
6	2-Apr-03	34	0.800	5.58	0.820	7.28	283	517	0.0	0.8	8.5	315	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	99.5	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	15.8	0.513	-0.03	-0.05	-0.3	3	-0.2	0.18	-0.01	-2	0.278	-0.2	-0.03	-0.01	-0.03	0.525					
7	9-Apr-03	41	0.800	5.57	0.790	7.13	337	512	0.0	1.8	8.3	316	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
8	16-Apr-03	48	0.800	5.54	0.785	7.26	346	667	0.0	1.8	9.8	444	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
9	23-Apr-03	55	0.800	5.68	0.780	7.38	363	517	0.0	2.5	14.8	308	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	92.0	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	19.3	0.431	-0.03	-0.05	-0.3	2	-0.2	0.19	-0.01	-2	0.254	-0.2	-0.03	-0.01	-0.03	0.549					
10	30-Apr-03	62	0.800	5.63	0.760	7.36	387	531	0.0	1.8	11.5	315	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
11	7-May-03	69	0.800	5.57	0.755	7.37	409	516	0.0	1.8	12.3	273	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	14-May-03	76	0.800	5.56	0.760	7.32	394	437	0.0	1.5	11.3	226	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	73.8	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	13.7	0.106	-0.03	-0.05	-0.3	2	-0.2	0.08	-0.01	-2	0.188	-0.2	-0.03	-0.01	-0.03	0.166					
13	21-May-03	83	0.800	5.54	0.745	7.36	416	414	0.0	2.8	12.5	212	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	28-May-03	90	0.800	5.53	0.755	7.43	385	432	0.0	1.8	12.3	229	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	4-Jun-03	97	0.800	5.80	0.745	7.54	354	384	0.0	2.0	20.5	202	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	58.3	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	14.2	0.075	-0.03	-0.05	-0.3	-2	-0.2	0.13	-0.01	-2	0.145	-0.2	-0.03	-0.01	-0.03	0.178					
16	11-Jun-03	104	0.800	5.60	0.745	7.47	354	385	0.0	1.5	15.0	196	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	18-Jun-03	111	0.800	5.59	0.775	7.58	370	390	0.0	1.0	15.0	204	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	25-Jun-03	118	0.800	5.62	0.850	7.58	371	456	0.0	1.3	16.5	251	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	74.6	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	14.9	0.052	-0.03	-0.05	-0.3	2	-0.2	0.12	-0.01	-2	0.164	-0.2	-0.03	-0.01	-0.03	0.086					
19	2-Jul-03	125	0.800	5.68	0.800	7.54	362	340	0.0	1.5	15.0	180	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	9-Jul-03	132	0.800	#N/A	0.755	7.52	354	581	0.0	1.5	14.5	332	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
21	16-Jul-03	139	0.800	5.41	0.825	7.60	369	351	0.0	1.3	16.5	180	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	54.0	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	12.3	0.028	-0.03	-0.05	-0.3	-2	-0.2	0.12	-0.01	-2	0.118	-0.2	-0.03	-0.01	-0.03	0.049					
22	23-Jul-03	146	0.800	5.70	0.800	7.78	378	376	0.0	1.5	29.0	198	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
23	30-Jul-03	153	0.800	5.73	0.840	7.62	370	352	0.0	1.0	16.0	171	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24	6-Aug-03	160	0.800	5.57	0.760	7.72	353	398	0.0	1.5	29.0	178	-0.2	-0.2	-0.2	0.02	-0.005	-0.2	-0.1	-0.01	53.9	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	19.0	0.032	-0.03	-0.05	-0.3	-2	-0.2	0.13	-0.01	-2	0.125	-0.2	-0.03	-0.01	-0.03	0.082					
25	13-Aug-03	167	0.800	5.53	0.820	7.54	362	296	0.0	1.5	15.8	126	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A															

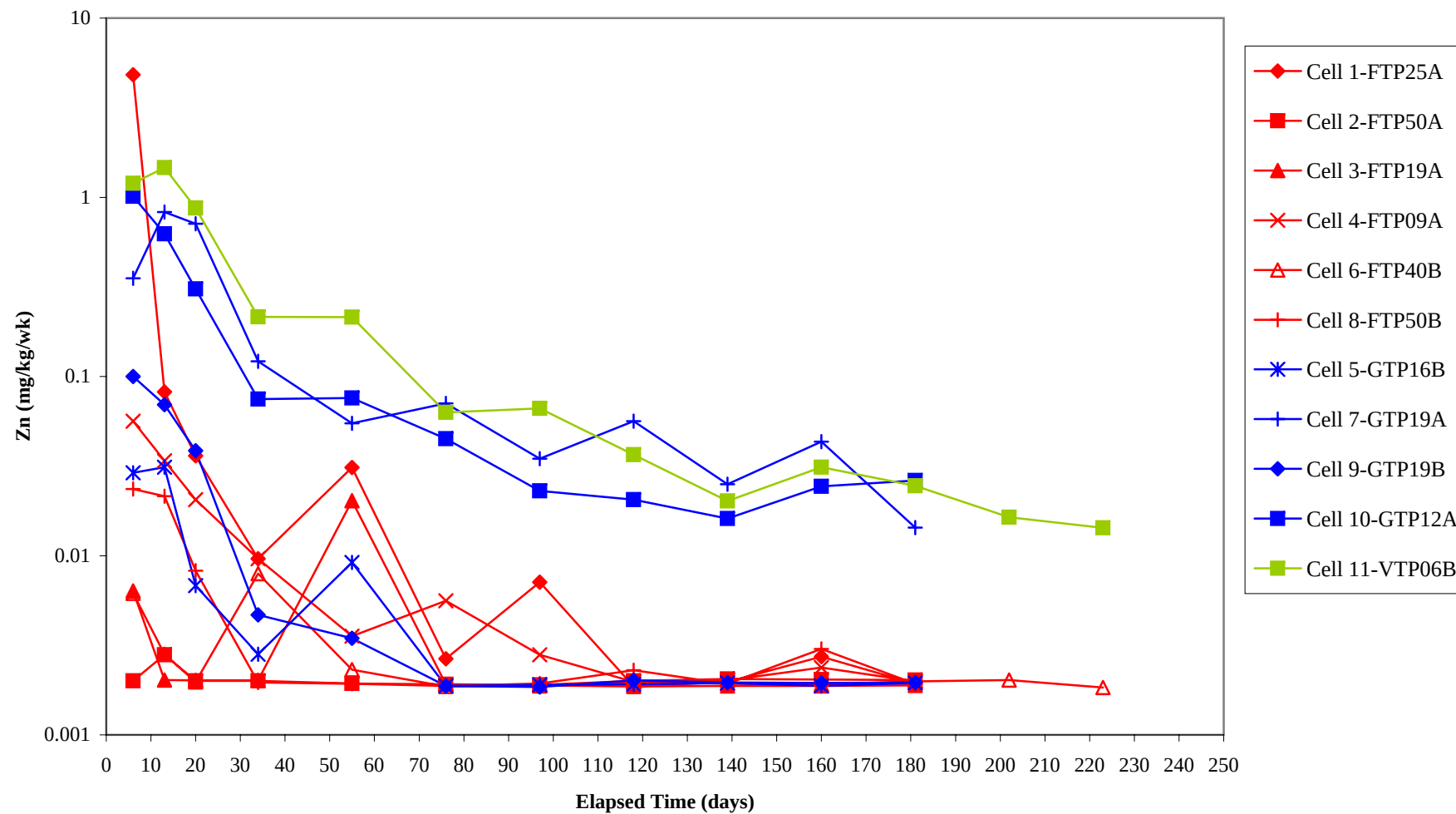
Single Stage Humidity Cells



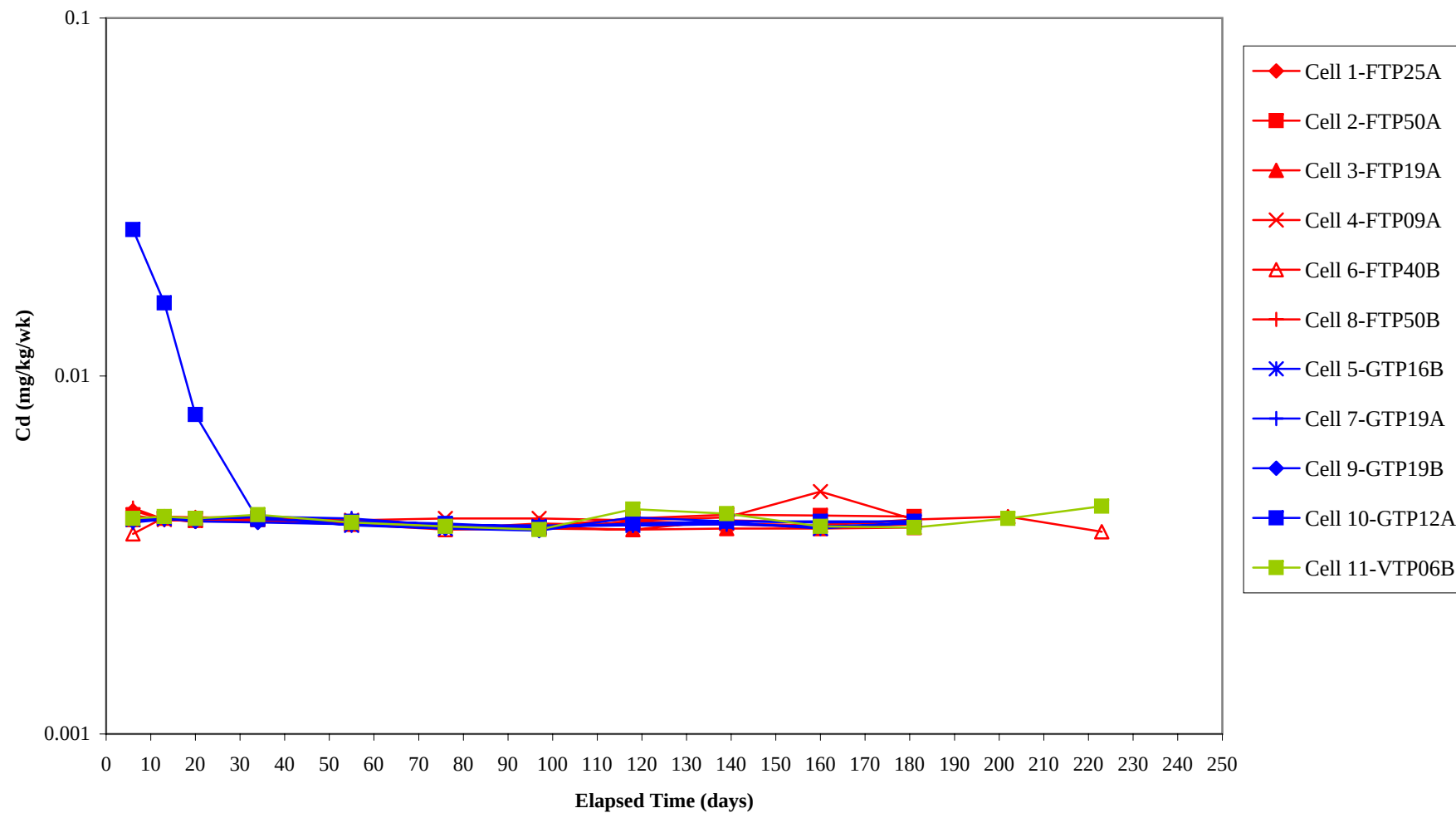
Single Stage Humidity Cells



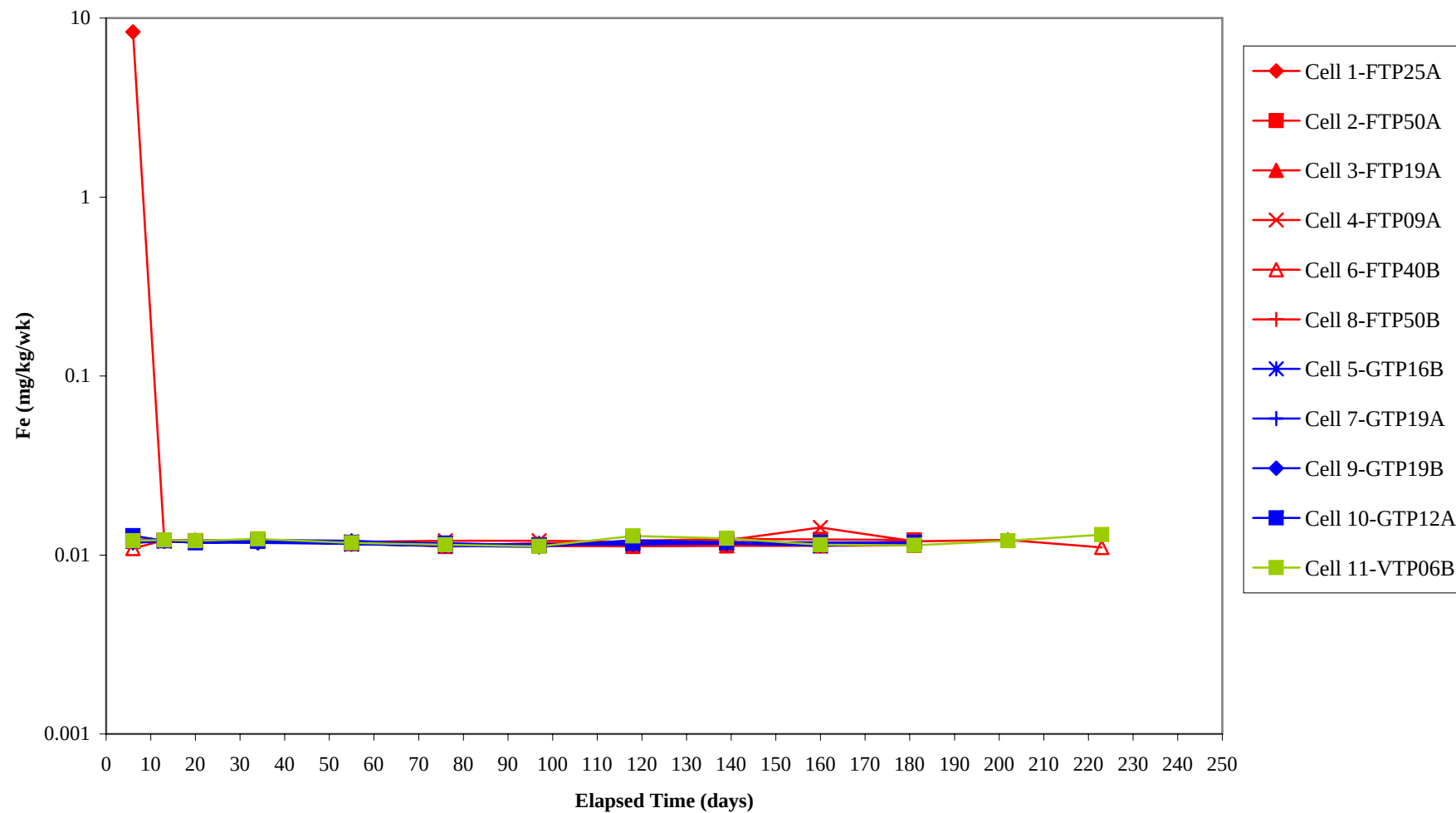
Single Stage Humidity Cells



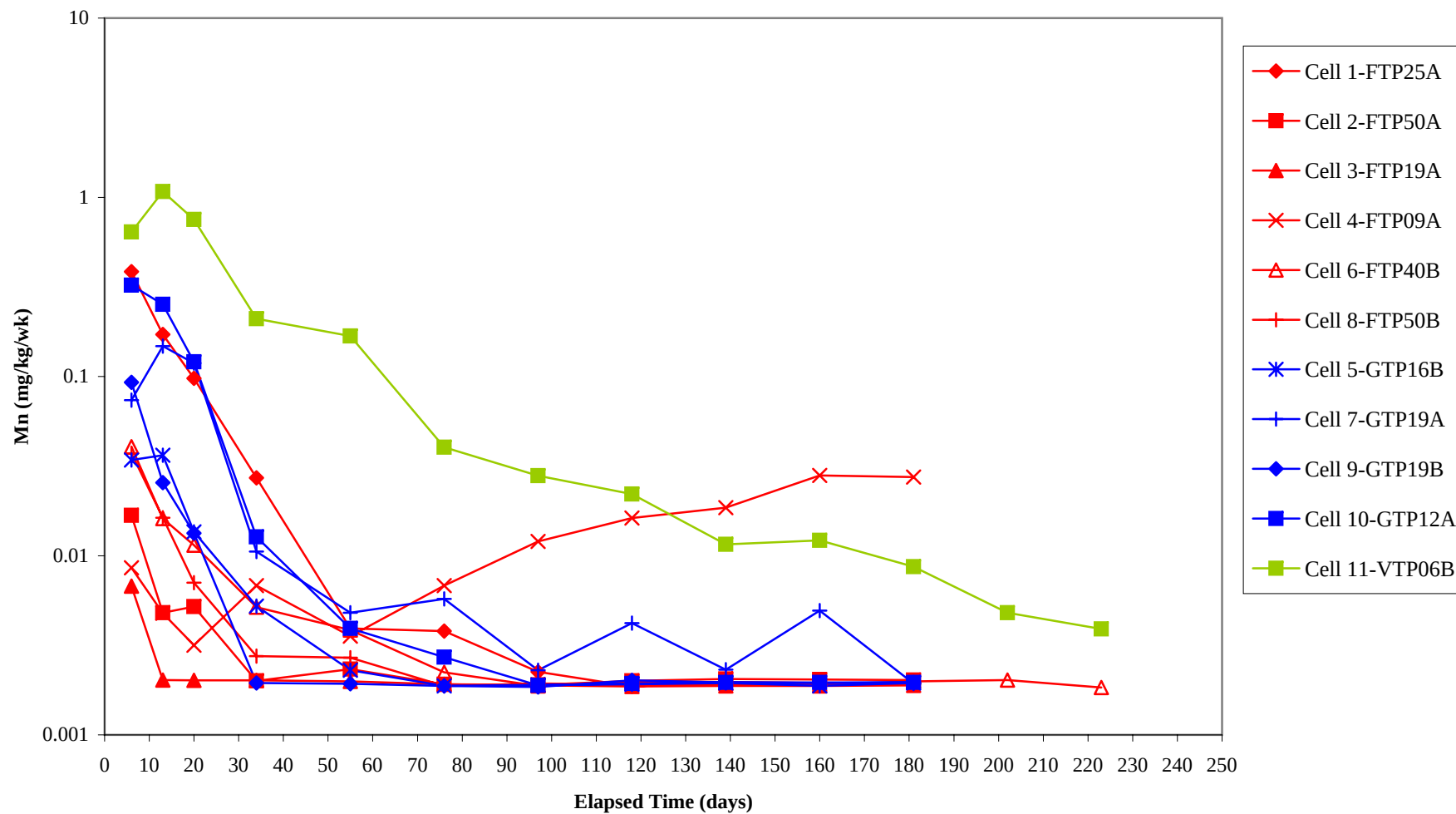
Single Stage Humidity Cells



Single Stage Humidity Cells



Single Stage Humidity Cells



Appendix E.7
Results of SRK Site-Specific Kinetic Testing Method

SEQUENTIAL METHOD HUMIDITY CELL TEST

Client:
Project:
CEMI Project No.
Sample:
Dry Weight:

SRK Consulting
Faro - Part 3
0248
Sulphide Composite
10 kg

Cell SC

DRAFT ONLY - SUBJECT TO CHANGE

*less than signs have been replaced with negatives

CYCLE	DATE	ACCUMULATED DAYS	LEACHANT ADDED	WATER ADDED (L)	pH WATER ADDED	LEACHATE COLLECTED (L)	pH	REDOX. (mV)	COND (µS/cm)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	ALKALINITY (mg CaCO3/L)	SULPHATE (mg/L)	Alumini Al mg/L	Antimoni Sb mg/L	Arsenic As mg/L	Barium Ba mg/L	Beryllium Be mg/L	Bismuth Bi mg/L	Boron B mg/L	Cadmium Cd mg/L	Calcium Ca mg/L	Chromium Cr mg/L	Cobalt Co mg/L	Copper Cu mg/L	Iron Fe mg/L	Lead Pb mg/L	Lithium Li mg/L	Magnesium Mg mg/L	Manganese Mn mg/L	Molybdenum Mo mg/L	Nickel Ni mg/L	Phosphorus P mg/L	Potassium K mg/L	Selenium Se mg/L	Silicon Si mg/L	Silver Ag mg/L	Sodium Na mg/L	Strontium Sr mg/L	Thallium Tl mg/L	Tin Sn mg/L	Titanium Ti mg/L	Vanadium V mg/L	Zinc Zn mg/L				
1	11-Mar-03	0	Water	1.650	5.54	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
2	12-Mar-03	1	Water	6.200	5.54	6.565	2.41	444	8640	3380.0	17670.0	0.00	20700	206	-4	5	-0.2	0.2	-4	-2	7	214	0.7	8.2	203	6270	1	-0.2	89	47.9	-0.6	3	-6	-40	-4	7	-0.2	-40	-0.1	-4	-0.6	-0.2	1.4	3810				
3	17-Mar-03	6	Water	6.200	5.68	6.140	2.51	427	5500	825.0	5950.0	0.00	7150	85	-2	-2	-0.1	0.07	-2	-1	2.4	146	0.2	2.8	69.4	2100	0.8	-0.1	29	15.2	-0.3	1	-3	-20	-2	16.9	-0.1	-20	0.13	-2	-0.3	-0.1	0.4	1230				
4	24-Mar-03	13	Water	6.200	5.45	6.050	2.56	434	3620	487.5	2725.0	0.00	3300	42	-1	-1	-0.05	0.03	-1	-0.5	1.3	134	0.09	1.35	36	846	0.7	-0.05	15.3	7.91	-0.2	0.5	-2	-10	-1	15.7	-0.05	-10	0.11	-1	-0.2	-0.05	-0.2	644				
5	31-Mar-03	20	Water	6.200	5.58	6.055	2.60	463	2690	312.5	1375.0	0.00	1750	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
6	7-Apr-03	27	Water	6.200	5.57	6.055	2.66	466	2370	235.0	990.0	0.00	1344	12.7	-0.4	-0.4	0.03	-0.01	-0.4	-0.2	0.5	90.2	0.02	0.41	14.6	194	0.7	-0.02	5.7	2.77	-0.06	0.2	-0.6	-4	-0.4	10.9	-0.02	-4	0.07	-0.4	-0.06	-0.02	-0.06	294				
7	14-Apr-03	34	Water	6.200	5.54	6.010	2.60	483	2140	247.5	932.5	0.00	1184	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
8	21-Apr-03	41	Water	6.200	5.68	6.000	2.61	496	2220	360.0	1060.0	0.00	1350	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
9	28-Apr-03	48	Water	6.200	5.63	6.000	2.48	507	2700	720.0	1725.0	0.00	1980	13.7	-0.4	-0.4	-0.02	-0.01	-0.4	-0.2	0.58	53.8	-0.02	0.46	15.6	402	0.4	-0.02	3.2	2.660	-0.06	0.1	-0.6	-4	-0.4	10.4	-0.02	-4	0.05	-0.4	-0.06	-0.02	-0.06	392				
10	5-May-03	55	Water	6.200	5.57	5.980	2.38	520	3730	1285.0	2585.0	0.0	2880	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
11	12-May-03	62	Water	6.200	5.56	6.000	2.33	518	3900	1570.0	3250.0	0.0	3460	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	19-May-03	69	Water	6.200	5.54	5.985	2.30	521	4640	1920.0	3670.0	0.0	4010	16	-1	-1	-0.05	-0.03	-1	-0.5	0.9	24.9	0.05	0.75	16.1	991	0.3	-0.05	2.9	3.9	-0.2	0.3	-2	-10	-1	9.3	-0.05	-10	0.04	-1	-0.2	-0.05	-0.2	626				
13	26-May-03	76	Water	6.200	5.53	5.965	2.27	527	3870	2100.0	3860.0	0.0	4400	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	2-Jun-03	83	Water	6.200	5.80	5.970	2.26	521	3970	2040.0	4000.0	0.0	4500	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	9-Jun-03	90	Water	6.200	5.60	6.000	2.21	519	4540	2490.0	4570.0	0.0	4820	20	-1	-1	-0.05	-0.03	-1	-0.5	0.92	22	0.07	0.85	16.4	1350	0.4	-0.05	3.5	4.2	-0.2	-0.3	-2	-10	-1	10.1	-0.05	-10	0.05	-1	-0.2	-0.05	-0.2	674				
16	16-Jun-03	97	Water	6.200	5.59	5.995	2.21	524	4750	2450.0	4260.0	0.0	4370	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	23-Jun-03	104	Water	6.200	5.62	5.950	2.18	527	4330	2570.0	4410.0	0.0	4130	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	30-Jun-03	111	Water	6.200	5.68	5.950	2.22	527	3930	2160.0	3680.0	0.0	3910	13.3	-0.4	1	-0.02	-0.01	-0.4	-0.2	0.53	13.2	0.06	0.6	8.88	1140	0.2	-0.02	2.7	2.46	-0.06	0.2	-0.6	-4	-0.4	7.1	-0.02	-4	0.04	-0.4	-0.06	-0.02	0.17	381				
19	7-Jul-03	118	Water	6.200	#N/A	6.010	2.13	512	5090	2650.0	4850.0	0.0	5470	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	14-Jul-03	125	Water	6.200	5.41	5.960	2.09	509	4270	3060.0	5220.0	0.0	5320	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	21-Jul-03	132	Water	6.200	5.70	6.035	2.18	513	4650	2510.0	4570.0	0.0	4580	19.6	-0.4	1.1	-0.02	-0.01	-0.4	-0.2	0.58	19.7	0.08	0.73	10.4	1590	0.2	-0.02	4.2	2.7	-0.06	0.1	-0.6	-4	-0.4	10.5	-0.02	-4	0.05	-0.4	-0.06	-0.02	0.23	416				

terminated

SEQUENTIAL METHOD HUMIDITY CELL TEST

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70887 Cell F2
Dry Weight 2 kg

DRAFT ONLY - SUBJECT TO CHANGE

*less than signs have been replaced with negatives

CYCLE	DATE	ACCUMULATED DAYS	LEACHANT ADDED	LEACHANT ADDED (L)	LEACHANT ADDED pH	LEACHATE COLLECTED (L)	pH	REDOX. (mV)	COND (µS/cm)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	ALKALINITY (mg CaCO3/L)	SULPHATE (mg/L)	Alumin Al mg/L	Antim Sb mg/L	Arseni As mg/L	Barium Ba mg/L	Beryll Be mg/L	Bismu Bi mg/L	Boron B mg/L	Cadm Cd mg/L	Calciu Ca mg/L	Chrom Cr mg/L	Cobalt Co mg/L	Coppe Cu mg/L	Iron Fe mg/L	Lead Pb mg/L	Lithium Li mg/L	Magne Mg mg/L	Manga Mn mg/L	Molybd Mo mg/L	Nickel Ni mg/L	Phosph P mg/L	Potass K mg/L	Seleni Se mg/L	Silicon Si mg/L	Silver Ag mg/L	Sodiur Na mg/L	Stronti Sr mg/L	Thalli Tl mg/L	Tin Sn mg/L	Titaniu Ti mg/L	Vanad V mg/L	Zinc Zn mg/L										
1	11-Mar-03	0	Water	0.250	5.54	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A						
2	14-Mar-03	3	Water	1.200	5.54	1.120	8.43	268	144	0.0	0.0	32.0	42	-0.2	-0.2	-0.2	0.03	-0.01	-0.2	-0.1	-0.01	5.05	-0.01	-0.01	-0.01	-0.03	-0.05	0.01	13	-0.01	-0.03	-0.05	-0.3	3	-0.2	2.67	-0.01	-2	0.024	-0.2	-0.03	-0.01	-0.03	-0.01	-0.03	-0.01	-0.03	-0.01						
3	18-Mar-03	7	SC-2	1.200	2.51	1.085	2.96	409	4680	510.0	5600.0	0.0	6830	73	-2	-2	-0.1	0.07	-2	-1	2.3	229	0.2	3.1	61.4	1950	1	-0.1	127	27.8	-0.3	1.2	-3	-20	-2	16.8	-0.1	-20	0.42	-2	-0.3	-0.1	-0.3	-0.1	-0.3	1180								
4	25-Mar-03	14	SC-3	1.200	2.56	1.140	3.01	420	3110	240.0	2450.0	0.0	3360	34	-1	-1	-0.05	-0.03	-1	-0.5	1.23	191	0.07	1.46	30.9	735	1	0.06	101	13.9	-0.2	0.4	-2	-10	-1	15.3	-0.05	-10	0.31	-1	-0.2	-0.05	-0.2	596										
5	1-Apr-03	21	SC-4	1.200	2.60	1.150	3.00	444	2330	155.0	1090.0	0.0	2020	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
6	8-Apr-03	28	SC-5	1.200	2.66	1.170	3.14	439	2010	85.0	755.0	0.0	1500	8.5	-0.2	-0.2	0.03	0.009	-0.2	-0.1	0.43	137	0.01	0.41	11.2	146	0.67	0.03	76.8	4.9	-0.03	0.17	-0.3	3	-0.2	9.9	-0.01	-2	0.206	-0.2	-0.03	-0.01	-0.03	239										
7	15-Apr-03	35	SC-6	1.200	2.60	1.165	3.69	424	701	12.5	137.5	0.0	391	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
8	22-Apr-03	42	SC-7	1.200	2.61	1.175	2.77	558	1942	310.0	790.0	0.0	1290	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
9	29-Apr-03	49	SC-8	1.200	2.48	1.170	2.69	543	2390	640.0	1335.0	0.0	1830	10.7	-0.4	-0.4	0.04	-0.01	-0.4	-0.2	0.53	106	-0.02	0.47	13.8	275	0.7	-0.02	60.4	4.83	-0.06	0.2	-0.6	-4	-0.4	10.3	-0.02	-4	0.18	-0.4	-0.06	-0.02	-0.06	361										
10	6-May-03	56	SC-9	1.200	2.38	1.150	2.52	549	3110	1130.0	2110.0	0.0	2780	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
11	13-May-03	63	SC-10	1.200	2.33	1.150	1.93	528	3530	1860.0	3000.0	0.0	3460	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
12	20-May-03	70	SC-11	1.200	2.30	1.145	2.48	533	3850	1700.0	3150.0	0.0	3960	14	-1	-1	-0.05	-0.03	-1	-0.5	0.9	95.2	-0.05	0.78	15	822	0.8	-0.05	79.4	7.55	-0.2	0.3	-2	-10	-1	10.1	-0.05	-10	0.19	-1	-0.2	-0.05	-0.2	596										
13	27-May-03	77	SC-12	1.200	2.27	1.160	2.44	534	3880	1920.0	3470.0	0.0	4230	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
14	3-Jun-03	84	SC-13	1.200	2.26	1.180	2.46	518	3440	1850.0	3550.0	0.0	4500	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
15	10-Jun-03	91	SC-14	1.200	2.21	1.170	2.39	523	3990	2040.0	3760.0	0.0	4820	17	-1	-1	-0.05	-0.03	-1	-0.5	0.95	110	0.06	0.89	15.2	1110	1	-0.05	109	9.7	-0.2	0.3	-2	-10	-1	11	-0.05	-10	0.24	-1	-0.2	-0.05	-0.2	641										
16	17-Jun-03	98	SC-15	1.200	2.21	1.180	2.40	528	3890	2040.0	3540.0	0.0	4370	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
17	24-Jun-03	105	SC-16	1.200	2.18	1.180	2.36	535	3860	2130.0	3470.0	0.0	3980	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
18	1-Jul-03	112	SC-17	1.200	2.22	1.150	2.42	534	3270	1890.0	3070.0	0.0	3790	11.4	-0.4	0.6	0.02	-0.01	-0.4	-0.2	0.54	90.6	0.04	0.61	8.1	861	0.6	0.03	120	7.52	-0.06	0.2	-0.8	-4	-0.4	7.8	-0.02	-4	0.24	0.6	-0.06	-0.02	0.08	365										
19	8-Jul-03	119	SC-18	1.200	2.13	1.180	2.31	515	4530	2300.0	4140.0	0.0	4950	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A			
20	15-Jul-03	126	SC-19	1.200	2.09	1.170	2.37	504	3930	2220.0	4180.0	0.0	5320	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20	22-Jul-03	133	SC-20	1.200	2.18	1.165	2.36	513	3970	2110.0	3800.0	0.0	4360	16.8	-0.4	0.8	-0.02	-0.01	-0.4	-0.2	0.56	92.3	0.05	0.7	9.06	1320	0.7	0.03	124	7.99	-0.06	0.2	0.7	-4	-0.4	10.7	-0.02	-4	0.25	-0.4	-0.06	-0.02	0.17	383										

CEMI Project No. 0248
Sample: 70866 Cell F3
Dry Weight 1 kg
*less than signs have been replaced with negatives

CYCLE	DATE	ACCUMULATED DAYS	LEACHANT	LEACHANT	LEACHANT	LEACHATE COLLECTED (L)	pH	REDOX (mV)	COND (µS/cm)	ACIDITY	ACIDITY	ALKALINITY (mg CaCO3/L)	SULPHATE (mg/L)	Alumir	Antimd	Arseni	Barium	Beryllia	Bismul	Boron	Cadm	Calciu	Chrom	Cobalt	Coppe	Iron	Lead	Lithiun	Magne	Manga	Molybd	Nickel	Phosph	Potass	Seleni	Silicon	Silver	Sodiur	Stronti	Thalli	Tin	Titaniu	Vanad	Zinc				
			ADDED	ADDED	ADDED					(pH 4.5)	(pH 8.3)			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	V	Zn				
			(L)	pH	(mg CaCO3/L)					(mg CaCO3/L)	mg/L			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	11-Mar-03	0	Water	0.200	5.54	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
2	14-Mar-03	3	Water	0.600	5.54	0.600	7.91	283	1261	0.0	1.3	35.0	986	-0.2	-0.2	-0.2	0.05	-0.01	-0.2	-0.1	-0.01	152	-0.01	-0.01	-0.01	-0.03	-0.05	0.13	128	0.04	-0.03	-0.05	-0.3	26	-0.2	5	-0.01	15	1.53	-0.2	-0.03	-0.01	-0.03	0.049				
3	18-Mar-03	7	F2-2	0.600	2.96	0.565	3.52	354	3580	90.0	3740.0	0.0	6000	41	-2	-2	-0.1	-0.05	-2	-1	1.6	458	-0.1	2.3	38.9	1300	1.2	0.1	275	23.2	-0.3	1	-3	22	-2	12.9	-0.1	-20	2.69	-2	-0.3	-0.1	-0.3	846				
4	26-Mar-03	15	F2-3	0.600	3.01	0.515	3.54	358	2840	40.0	1650.0	0.0	3240	18	-1	-1	-0.05	-0.03	-1	-0.5	0.95	352	-0.05	1.17	20.2	477	1	0.12	188	15.2	-0.2	0.3	-2	19	-1	12.8	-0.05	-10	1.65	-1	-0.2	-0.05	-0.2	451				
5	2-Apr-03	22	F2-4	0.600	3.00	0.530	3.62	388	2120	15.0	620.0	0.0	2100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
6	9-Apr-03	29	F2-5	0.600	3.14	0.545	5.51	237	1491	0.0	262.5	5.3	2040	0.8	-0.2	-0.2	0.03	-0.01	-0.2	-0.1	0.23	373	-0.01	0.27	2.64	27	-0.05	0.11	202	6.74	-0.03	0.11	-0.3	22	-0.2	5.54	-0.01	3	2.08	-0.2	-0.03	-0.01	-0.03	122				
7	16-Apr-03	36	F2-6	0.600	3.69	0.540	5.78	269	1027	0.0	45.8	3.5	1020	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
8	23-Apr-03	43	F2-7	0.600	2.77	0.580	3.08	518	2040	87.5	440.0	0.0	1430	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
9	30-Apr-03	50	F2-8	0.600	2.69	0.540	2.72	584	2500	330.0	800.0	0.0	1950	7.5	-0.4	-0.4	0.04	0.01	-0.4	-0.2	0.45	255	-0.02	0.42	10.5	92.9	1	0.05	118	6.29	-0.06	0.2	-0.6	10	-0.4	9.6	-0.02	-4	0.96	-0.4	-0.06	-0.02	-0.06	290				
10	7-May-03	57	F2-9	0.600	2.52	0.550	2.59	608	3250	715.0	1460.0	0.0	2640	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
11	14-May-03	64	F2-10	0.600	1.93	0.555	2.62	566	3430	1020.0	2000.0	0.0	3360	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
12	21-May-03	71	F2-11	0.600	2.48	0.545	2.60	568	3960	1135.0	2115.0	0.0	3740	11	-0.4	-0.4	0.03	0.02	-0.4	-0.2	0.81	295	-0.02	0.74	13.4	462	1.1	0.06	151	12.3	-0.06	0.4	-0.6	10	-0.4	10.6	-0.02	-4	1.04	-0.4	-0.06	-0.02	-0.06	490				
13	28-May-03	78	F2-12	0.600	2.44	0.550	2.56	554	3730	1220.0	2280.0	0.0	3930	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	4-Jun-03	85	F2-13	0.600	2.46	0.575	2.59	528	3330	1200.0	2420.0	0.0	4030	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	11-Jun-03	92	F2-14	0.600	2.39	0.555	2.52	532	3630	1410.0	2720.0	0.0	4330	13	-1	-1	-0.05	-0.03	-1	-0.5	0.91	311	-0.05	0.88	13.1	684	1.5	0.08	174	17.9	-0.2	0.4	-2	-10	-1	12.2	-0.05	-10	0.94	-1	-0.2	-0.05	-0.2	582				
16	18-Jun-03	99	F2-15	0.600	2.40	0.560	2.53	538	3590	1380.0	2480.0	0.0	4200	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	25-Jun-03	106	F2-16	0.600	2.36	0.545	2.52	543	3580	1410.0	2440.0	0.0	4190	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	2-Jul-03	113	F2-17	0.600	2.42	0.540	2.54	541	3200	1340.0	2130.0	0.0	3610	10.9	-0.4	-0.4	0.03	0.02	-0.4	-0.2	0.57	267	0.02	0.67	7.07	508	1.1	0.1	208	16.8	-0.06	0.4	-0.6	9	-0.4	10.1	-0.02	-4	0.87	-0.4	-0.06	-0.02	-0.06	352				
19	9-Jul-03	120	F2-18	0.600	2.31	0.570	2.49	517	4640	1640.0	3240.0	0.0	4730	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	16-Jul-03	127	F2-19	0.600	2.37	0.600	2.52	511	3650	1500.0	3080.0	0.0	4730	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20	23-Jul-03	134	F2-20	0.600	2.36	0.575	2.40	516	3600	1820.0	2920.0	0.0	4290	18.3	-0.4	-0.4	0.02	0.02	-0.4	-0.2	0.58	266	0.05	0.78	7.69	721	1.2	0.12	219	17.9	-0.06	0.4	-0.6	11	-0.4	13.7	-0.02	-4	0.82	0.4	-0.06	-0.02	-0.06	376				

terminated

ENTIAL METHOD HUMIDITY CELL TEST

t: SRK Consulting
Project No. Faro - Part 3
e: 0248
eight 70799 Cell G2
2 kg
an signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

DATE	ACCUMULATED DAYS	LEACHANT ADDED	LEACHANT ADDED	LEACHANT ADDED	LEACHATE COLLECTED	pH	REDOX. (mV)	COND. (µS/cm)	ACIDITY (pH 4.5)	ACIDITY (pH 8.3)	ALKALINITY (mg CaCO3/L)	SULPHATE (mg/L)	Alumini Al mg/L	Antim Sb mg/L	Arseni As mg/L	Barium Ba mg/L	Berylliu Be mg/L	Bismut Bi mg/L	Boron B mg/L	Cadmi Cd mg/L	Calciu Ca mg/L	Chrom Cr mg/L	Cobalt Co mg/L	Coppe Cu mg/L	Iron Fe mg/L	Lead Pb mg/L	Lithium Li mg/L	Magne Mg mg/L	Manga Mn mg/L	Molybd Mo mg/L	Nickel Ni mg/L	Phosph P mg/L	Potass K mg/L	Seleni Se mg/L	Silicon Si mg/L	Silver Ag mg/L	Sodium Na mg/L	Stronti Sr mg/L	Thalli Tl mg/L	Tin Sn mg/L	Titaniu Ti mg/L	Vanad V mg/L	Zinc Zn mg/L					
11-Mar-03	0	Water	0.250	5.54	-	-	-	-	-	-	-		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
14-Mar-03	3	Water	1.200	5.54	1.080	7.88	287	900	0.0	2.0	53.0	532	-0.2	-0.2	-0.2	0.03	-0.01	-0.2	-0.1	-0.01	136	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	46.4	0.007	-0.03	-0.05	-0.3	7	-0.2	5.4	-0.01	7	0.333	-0.2	-0.03	-0.01	-0.03	0.107					
18-Mar-03	7	SC-2	1.200	2.51	1.100	2.99	409	4810	390.0	5345.0	0.0	6830	74	-1	-1	0.12	0.05	-1	-0.5	2.13	293	0.19	2.76	60.5	1840	0.4	0.08	47.7	20.5	-0.2	1.2	-3	-10	-1	17.2	-0.05	-10	0.62	-1	-0.2	-0.05	0.3	1090					
25-Mar-03	14	SC-3	1.200	2.56	1.115	3.01	416	3050	220.0	2350.0	0.0	3360	35	-1	-1	-0.05	-0.03	-1	-0.5	1.2	288	0.09	1.33	30.3	720	0.7	-0.05	44	11.6	-0.2	0.6	-2	-10	-1	15.7	-0.05	-10	0.54	-1	-0.2	-0.05	-0.2	586					
1-Apr-03	21	SC-4	1.200	2.60	1.115	3.02	444	2210	155.0	1115.0	0.0	2020	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
8-Apr-03	28	SC-5	1.200	2.66	1.095	3.22	429	2030	80.0	745.0	0.0	1570	9.5	-0.2	-0.2	0.04	0.007	-0.2	-0.1	0.43	227	0.01	0.38	10.9	140	0.51	0.02	38.4	3.86	-0.03	0.17	-0.3	3	-0.2	10.4	-0.01	-2	0.423	-0.2	-0.03	-0.01	-0.03	241					
15-Apr-03	35	SC-6	1.200	2.60	1.080	3.51	436	1975	37.5	420.0	0.0	1940	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
22-Apr-03	42	SC-7	1.200	2.61	1.170	7.75	324	1402	0.0	75.5	155.3	1620	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
29-Apr-03	49	SC-8	1.200	2.48	1.125	2.69	562	2350	725.0	1475.0	0.0	2130	14.6	-0.4	-0.4	0.03	-0.01	-0.4	-0.2	0.58	146	0.02	0.49	16.4	307	0.5	-0.02	16.7	3.36	-0.06	0.2	-0.6	-4	-0.4	11.6	-0.02	-4	0.28	-0.4	-0.06	-0.02	-0.06	394					
6-May-03	56	SC-9	1.200	2.38	1.100	2.53	570	3020	1310.0	2330.0	0.0	2780	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
14-May-03	64	SC-10	1.200	2.33	1.045	2.75	570	3370	620.0	1370.0	0.0	3110	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20-May-03	70	SC-11	1.200	2.30	1.105	2.63	543	3570	1140.0	2270.0	0.0	3660	18	-1	-1	-0.05	-0.03	-1	-0.5	0.84	367	-0.05	0.78	14.7	506	0.5	-0.05	65.2	8.07	-0.2	0.4	-2	-10	-1	12.9	-0.05	-10	0.99	-1	-0.2	-0.05	-0.2	563					
27-May-03	77	SC-12	1.200	2.27	1.105	2.52	539	3550	1650.0	2960.0	0.0	4230	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
3-Jun-03	84	SC-13	1.200	2.26	1.115	2.53	522	3260	1630.0	3220.0	0.0	4270	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
10-Jun-03	91	SC-14	1.200	2.21	1.095	2.40	527	3810	2180.0	3860.0	0.0	4820	25	-1	-1	-0.05	-0.03	-1	-0.5	0.97	186	0.07	0.92	17.1	1100	0.7	-0.05	48.6	6.31	-0.2	0.5	-2	-10	-1	13.6	-0.05	-10	0.6	1	-0.2	-0.05	-0.2	675					
17-Jun-03	98	SC-15	1.200	2.21	1.085	2.47	529	3600	1880.0	3310.0	0.0	4520	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
24-Jun-03	105	SC-16	1.200	2.18	1.085	2.42	537	3670	1830.0	3120.0	0.0	4430	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
1-Jul-03	112	SC-17	1.200	2.22	1.055	2.49	535	3110	1530.0	2670.0	0.0	3970	21.8	-0.4	-0.4	0.02	-0.01	-0.4	-0.2	0.56	265	0.05	0.67	8.94	667	0.5	0.03	85	5.51	-0.06	0.4	-0.6	-4	-0.4	13.1	-0.02	-4	0.92	-0.4	-0.06	-0.02	-0.06	377					
8-Jul-03	119	SC-18	1.200	2.13	1.085	2.32	514	4540	2330.0	4310.0	0.0	4880	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
15-Jul-03	126	SC-19	1.200	2.09	1.155	2.36	508	3770	2260.0	4090.0	0.0	4950	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
22-Jul-03	133	SC-20	1.200	2.18	1.115	2.33	517	3780	2140.0	3830.0	0.0	4510	26.4	-0.4	0.7	-0.02	-0.01	-0.4	-0.2	0.58	155	0.1	0.8	10.5	1350	0.3	0.03	61.8	4.93	-0.06	0.4	-0.6	-4	-0.4	15	-0.02	-4	0.6	-0.4	-0.06	-0.02	0.19	425					

ated

SEQUENTIAL METHOD HUMIDITY CELL TEST

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70799 Cell G3
Dry Weight 1 kg

DRAFT ONLY - SUBJECT TO CHANGE

*less than signs have been replaced with negatives

CYCLE	DATE	ACCUMULATED DAYS	LEACHANT ADDED	LEACHANT ADDED (L)	LEACHANT ADDED pH	LEACHATE COLLECTED (L)	pH	REDOX. (mV)	COND (µS/cm)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	ALKALINITY (mg CaCO3/L)	SULPHATE (mg/L)	Alumini Al mg/L	Antimono Sb mg/L	Arsenic As mg/L	Bariun Ba mg/L	Berylliu Be mg/L	Bismu Bi mg/L	Boron B mg/L	Cadmium Cd mg/L	Calciu Ca mg/L	Chrom Cr mg/L	Cobalt Co mg/L	Coppe Cu mg/L	Iron Fe mg/L	Lead Pb mg/L	Lithium Li mg/L	Magne Mg mg/L	Manga Mn mg/L	Molyb Mo mg/L	Nickel Ni mg/L	Phosph P mg/L	Potass K mg/L	Seleni Se mg/L	Silicon Si mg/L	Silver Ag mg/L	Sodium Na mg/L	Stronti Sr mg/L	Thalli Tl mg/L	Tin Sn mg/L	Titaniu Ti mg/L	Vanadi V mg/L	Zinc Zn mg/L						
1	11-Mar-03	0	Water	0.200	5.54	-	-	-	-	-	-	-		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
2	14-Mar-03	3	Water	0.600	5.54	0.590	7.87	290	859	0.0	2.0	50.3	493	-0.2	-0.2	-0.2	0.03	-0.01	-0.2	-0.1	-0.01	125	-0.01	-0.01	-0.01	-0.03	-0.05	-0.01	43.1	0.005	-0.03	-0.05	-0.3	6	-0.2	5.46	-0.01	7	0.29	-0.2	-0.03	-0.01	-0.03	0.091						
3	18-Mar-03	7	G2-2	0.600	2.99	0.575	5.30	162	2270	0.0	528.5	8.8	3590	-0.4	-0.4	-0.4	0.17	-0.01	-0.4	-0.2	0.26	848	-0.02	1.09	2.3	102	-0.1	-0.02	175	38.7	-0.06	0.8	-0.6	15	-0.4	7	-0.02	-4	2.2	-0.4	-0.06	-0.02	-0.06	163						
4	26-Mar-03	15	G2-3	0.600	3.01	0.535	4.92	263	1941	0.0	326.5	8.3	2540	-0.2	-0.2	-0.2	0.05	-0.01	-0.2	-0.1	0.21	656	-0.01	0.8	0.34	29.8	-0.05	0.02	96.1	38.3	-0.03	0.5	-0.3	12	-0.2	6.24	-0.01	-2	1.86	-0.2	-0.03	-0.01	-0.03	131						
5	2-Apr-03	22	G2-4	0.600	3.02	0.540	4.80	285	1535	0.0	290.0	1.3	2100	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
6	9-Apr-03	29	G2-5	0.600	3.22	0.560	3.94	365	1686	10.0	642.5	0.0	1580	7.4	-0.2	-0.2	0.04	0.007	-0.2	-0.1	0.41	328	-0.01	0.39	9.39	110	0.27	0.02	52.3	5.6	-0.03	0.18	-0.3	4	-0.2	10	-0.01	-2	0.672	-0.2	-0.03	-0.01	-0.03	228						
7	16-Apr-03	36	G2-6	0.600	3.51	0.545	7.26	268	1559	0.0	84.5	19.8	2060	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
8	23-Apr-03	43	G2-7	0.600	7.75	0.590	7.82	321	1411	0.0	40.8	108.8	1670	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
9	30-Apr-03	50	G2-8	0.600	2.69	0.585	3.05	556	2290	100.0	530.0	0.0	2010	7.4	-0.4	-0.4	0.05	-0.01	-0.4	-0.2	0.39	460	-0.02	0.38	8.1	17.4	0.3	-0.02	70.4	5.14	-0.06	0.3	-0.6	6	-0.4	10.6	-0.02	-4	1.06	-0.4	-0.06	-0.02	-0.06	260						
10	7-May-03	57	G2-9	0.600	2.53	0.550	2.74	609	3040	415.0	1095.0	0.0	2390	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
11	14-May-03	64	G2-10	0.600	2.75	0.560	2.88	567	3200	230.0	765.0	0.0	2930	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	21-May-03	71	G2-11	0.600	2.63	0.565	2.77	604	3530	475.0	1195.0	0.0	3050	13.7	-0.4	-0.4	0.03	-0.01	-0.4	-0.2	0.65	512	-0.02	0.66	11.2	141	0.8	0.03	113	8.4	-0.06	0.4	-0.6	6	-0.4	12.5	-0.02	-4	1.53	-0.4	-0.06	-0.02	-0.06	402						
13	28-May-03	78	G2-12	0.600	2.52	0.550	2.61	600	3430	980.0	2010.0	0.0	3750	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	4-Jun-03	85	G2-13	0.600	2.53	0.560	2.62	546	3070	1060.0	2210.0	0.0	3740	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	11-Jun-03	92	G2-14	0.600	2.40	0.560	2.49	546	3750	1460.0	2720.0	0.0	4510	27	-1	-1	-0.05	-0.03	-1	-0.5	0.94	373	-0.05	0.93	17.2	658	1.4	-0.05	113	8.52	-0.2	0.6	-2	-10	-1	16.1	-0.05	-10	1.33	-1	-0.2	-0.05	-0.2	634						
16	18-Jun-03	99	G2-15	0.600	2.47	0.555	2.55	555	3430	1340.0	2460.0	0.0	4200	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	25-Jun-03	106	G2-16	0.600	2.42	0.550	2.52	552	3480	1310.0	2370.0	0.0	4370	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	2-Jul-03	113	G2-17	0.600	2.49	0.545	2.56	550	3060	1060.0	1960.0	0.0	3670	27.6	-0.4	-0.4	-0.02	0.01	-0.4	-0.2	0.6	383	0.04	0.72	10.3	396	1.2	0.04	151	6.93	-0.06	0.7	-0.6	5	-0.4	16.2	-0.02	-4	1.45	-0.4	-0.06	-0.02	-0.06	378						
19	9-Jul-03	120	G2-18	0.600	2.32	0.570	2.41	522	4350	1730.0	3320.0	0.0	4810	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20	16-Jul-03	127	G2-19	0.600	2.36	0.595	2.50	520	3460	1550.0	3150.0	0.0	4730	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
21	23-Jul-03	134	G2-20	0.600	2.33	0.600	2.49	519	3480	1920.0	2850.0	0.0	3920	27.6	-0.4	-0.4	-0.02	-0.01	-0.4	-0.2	0.58	308	0.06	0.77	9.72	697	0.8	0.04	134	6.27	-0.06	0.6	-0.6	-4	-0.4	16.2	-0.02	-4	1.31	0.5	-0.06	-0.02	-0.06	381						

SEQUENTIAL METHOD HUMIDITY CELL TEST

Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70953 Cell V2
Dry Weight 1.4 kg
*less than signs have been replaced with negatives

DRAFT ONLY - SUBJECT TO CHANGE

CYCLE	DATE	ACCUMULATED DAYS	LEACHANT ADDED	LEACHANT ADDED (L)	LEACHANT ADDED pH	LEACHATE COLLECTED (L)	pH	REDOX (mV)	COND (µS/cm)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	ALKALINITY (mg CaCO3/L)	SULPHATE (mg/L)	Alumini Al mg/L	Antimoni Sb mg/L	Arsenic As mg/L	Barium Ba mg/L	Beryllium Be mg/L	Bismuth Bi mg/L	Boron B mg/L	Cadmium Cd mg/L	Calcium Ca mg/L	Chromium Cr mg/L	Cobalt Co mg/L	Copper Cu mg/L	Iron Fe mg/L	Lead Pb mg/L	Lithium Li mg/L	Magnesium Mg mg/L	Manganese Mn mg/L	Molybdenum Mo mg/L	Nickel Ni mg/L	Phosphorus P mg/L	Potassium K mg/L	Selenium Se mg/L	Silicon Si mg/L	Silver Ag mg/L	Sodium Na mg/L	Strontium Sr mg/L	Thallium Tl mg/L	Tin Sn mg/L	Titanium Ti mg/L	Vanadium V mg/L	Zinc Zn mg/L				
1	11-Mar-03	0	Water	0.150	5.54	-	-	-	-	-	-	-		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
2	14-Mar-03	3	Water	0.840	5.54	0.790	7.47	302	2300	0.0	3.0	21.8	3410	-0.2	-0.2	-0.2	0.03	-0.01	-0.6	-0.1	0.03	393	-0.01	0.07	-0.01	-0.03	-0.05	0.04	517	4.19	-0.03	0.08	-0.3	11	-0.2	4.03	-0.01	2	2.16	-0.2	-0.03	-0.01	-0.03	2.86				
3	18-Mar-03	7	SC-2	0.840	2.51	0.740	3.76	319	4100	22.0	3530.0	0.0	6240	5	-2	-2	-0.1	-0.05	-2	-1	2.7	468	-0.1	4.7	7.1	1060	-0.5	0.1	267	100	-0.3	4.3	-3	-20	-2	11.2	-0.1	-20	3.3	-2	-0.3	-0.1	-0.3	1170				
4	25-Mar-03	14	SC-3	0.840	2.56	0.800	3.75	345	2630	25.0	1660.0	0.0	3710	14	-1	-1	-0.05	-0.03	-1	-0.5	1.47	418	-0.05	1.99	15.4	474	0.4	0.07	196	40	-0.2	1.2	-2	-10	-1	10.5	-0.05	-10	1.62	-1	-0.2	-0.05	-0.2	623				
5	1-Apr-03	21	SC-4	0.840	2.60	0.800	4.50	335	1888	0.0	535.0	0.0	2490	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
6	8-Apr-03	28	SC-5	0.840	2.66	0.820	4.14	348	1809	10.0	560.0	0.0	1780	4	-0.2	-0.2	0.04	0.005	-0.2	-0.1	0.46	317	-0.01	0.51	6.07	72.4	0.13	0.02	78.1	10.8	-0.03	0.24	-0.3	-2	-0.2	6.38	-0.01	-2	1.1	-0.2	-0.03	-0.01	-0.03	213				
7	15-Apr-03	35	SC-6	0.840	2.60	0.810	3.92	404	1697	10.0	330.0	0.0	1730	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
8	22-Apr-03	42	SC-7	0.840	2.61	0.790	3.21	521	1933	62.5	460.0	0.0	1520	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
9	29-Apr-03	49	SC-8	0.840	2.48	0.785	2.88	554	2310	285.0	840.0	0.0	2010	7.5	-0.4	-0.4	0.05	-0.01	-0.4	-0.2	0.61	313	-0.02	0.57	10	91	0.2	-0.02	58	8.36	-0.06	0.3	-0.6	-4	-0.4	8	-0.02	-4	1.14	-0.4	-0.06	-0.02	-0.06	342				
10	6-May-03	56	SC-9	0.840	2.38	0.760	2.68	548	3050	610.0	1480.0	0.0	2540	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
11	13-May-03	63	SC-10	0.840	2.33	0.755	2.25	522	3320	985.0	2070.0	0.0	3260	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	20-May-03	70	SC-11	0.840	2.30	0.740	2.69	532	3660	845.0	1970.0	0.0	3690	11	-1	-1	-0.05	-0.03	-1	-0.5	0.97	294	-0.05	0.91	11.7	384	0.3	-0.05	148	13.2	-0.2	0.5	-2	-10	-1	8.8	-0.05	-10	1.18	-1	-0.2	-0.05	-0.2	597				
13	27-May-03	77	SC-12	0.840	2.27	0.775	2.59	528	3480	1220.0	2595.0	0.0	4050	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
14	3-Jun-03	84	SC-13	0.840	2.26	0.780	2.63	514	3070	1160.0	2760.0	0.0	3920	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	10-Jun-03	91	SC-14	0.840	2.21	0.775	2.42	520	3520	1620.0	3250.0	0.0	4390	16	-1	-1	-0.05	-0.03	-1	-0.5	1.03	201	-0.05	0.93	13.7	890	0.5	-0.05	152	12.4	-0.2	0.4	-2	-10	-1	10.2	-0.05	-10	0.88	-1	-0.2	-0.05	-0.2	647				
16	17-Jun-03	98	SC-15	0.840	2.21	0.790	2.57	523	3400	1270.0	2600.0	0.0	4260	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	24-Jun-03	105	SC-16	0.840	2.18	0.785	2.53	529	3400	1450.0	2710.0	0.0	4250	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	1-Jul-03	112	SC-17	0.840	2.22	0.795	2.62	516	2950	1050.0	1970.0	0.0	3550	9	-0.4	-0.4	0.02	-0.01	-0.4	-0.2	0.72	259	-0.02	0.74	5.81	463	0.4	0.03	228	14.1	-0.06	0.4	-0.6	-4	-0.4	7.6	-0.02	-4	1.09	0.5	-0.06	-0.02	-0.06	397				
19	8-Jul-03	119	SC-18	0.840	2.13	0.760	2.49	505	4080	1480.0	3260.0	0.0	4660	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	15-Jul-03	126	SC-19	0.840	2.09	0.820	3.00	443	2980	280.0	2220.0	0.0	5080	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20	22-Jul-03	133	SC-20	0.840	2.18	0.795	2.65	484	3170	690.0	2210.0	0.0	4490	10.4	-0.4	-0.4	0.03	0.01	-0.4	-0.2	0.96	335	0.03	1	5.52	529	0.4	0.04	312	24.4	-0.06	0.7	-0.6	-4	-0.4	10.7	-0.02	-4	1.3	0.6	-0.06	-0.02	-0.06	479				

terminated

SEQUENTIAL METHOD HUMIDITY CELL TEST

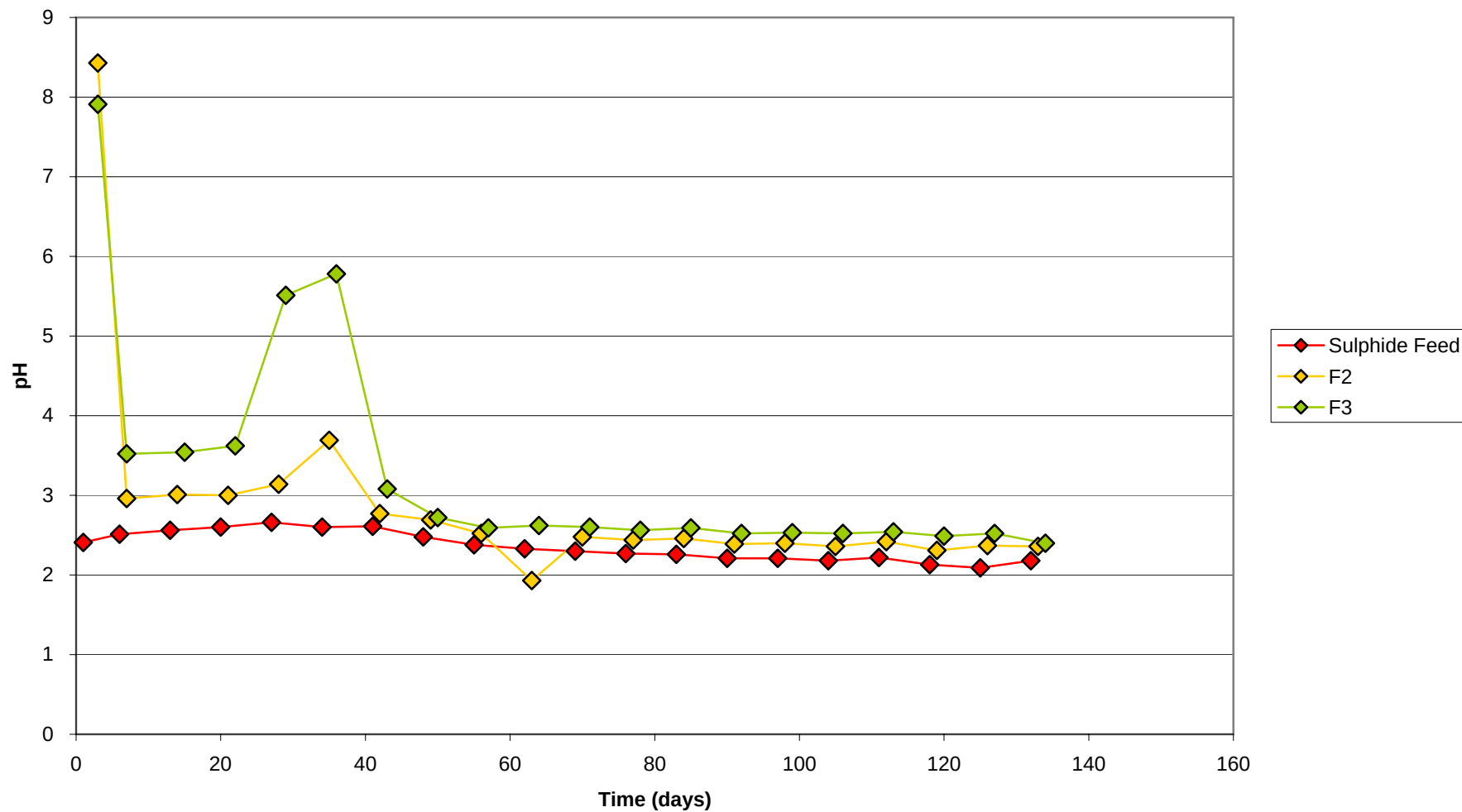
Client: SRK Consulting
Project: Faro - Part 3
CEMI Project No. 0248
Sample: 70953 Cell V3
Dry Weight 0.7 kg
*less than signs have been replaced with negatives

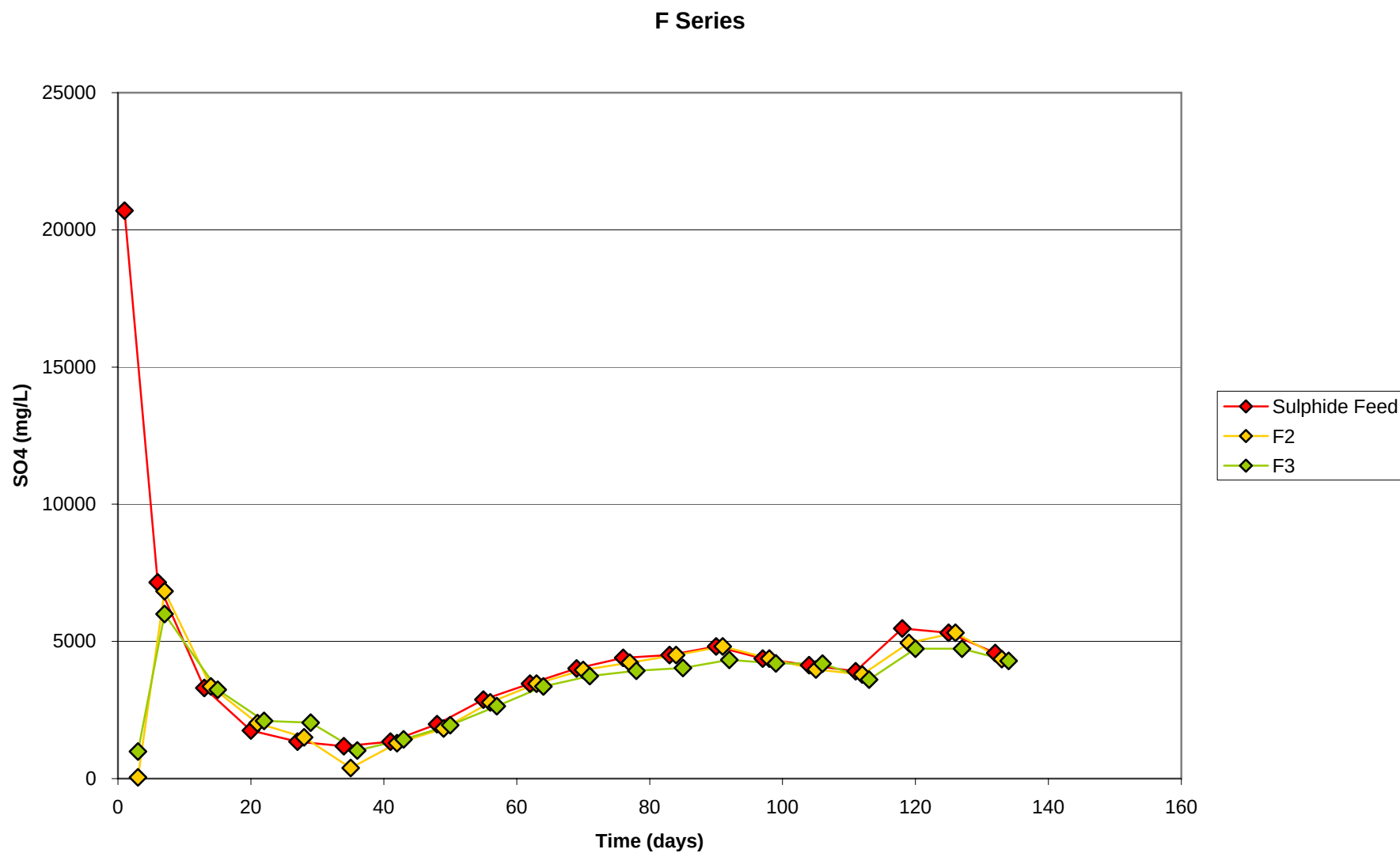
DRAFT ONLY - SUBJECT TO CHANGE

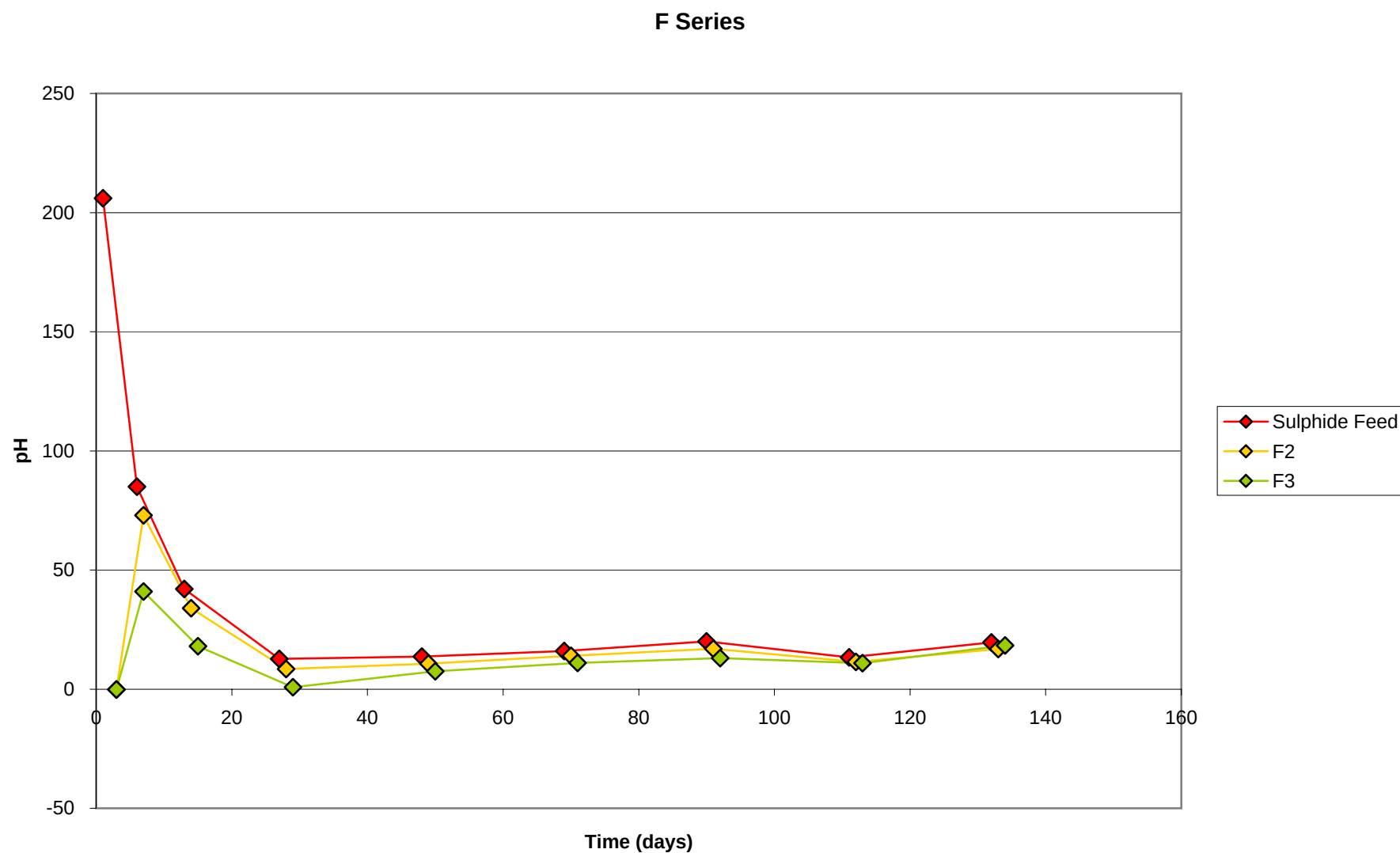
CYCLE	DATE	ACCUMULATED DAYS	LEACHANT ADDED	LEACHANT ADDED (L)	LEACHANT ADDED pH	LEACHATE COLLECTED (L)	pH	REDOX (mV)	COND (µS/cm)	ACIDITY (pH 4.5) (mg CaCO3/L)	ACIDITY (pH 8.3) (mg CaCO3/L)	ALKALINITY (mg CaCO3/L)	SULPHATE (mg/L)	Alumini Al mg/L	Antimoni Sb mg/L	Arsenic As mg/L	Barium Ba mg/L	Beryllium Be mg/L	Bismuth Bi mg/L	Boron B mg/L	Cadmium Cd mg/L	Calcium Ca mg/L	Chromium Cr mg/L	Cobalt Co mg/L	Copper Cu mg/L	Iron Fe mg/L	Lead Pb mg/L	Lithium Li mg/L	Magnesium Mg mg/L	Manganese Mn mg/L	Molybdenum Mo mg/L	Nickel Ni mg/L	Phosphorus P mg/L	Potassium K mg/L	Selenium Se mg/L	Silicon Si mg/L	Silver Ag mg/L	Sodium Na mg/L	Strontium Sr mg/L	Thallium Tl mg/L	Tin Sn mg/L	Titanium Ti mg/L	Vanadium V mg/L	Zinc Zn mg/L				
1	11-Mar-03	0	Water	0.100	5.54	-	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
2	14-Mar-03	3	Water	0.420	5.54	0.400	7.41	360	1997	0.0	3.3	18.5	2570	-0.2	-0.2	-0.2	0.03	-0.01	-0.4	-0.1	0.03	235	-0.01	0.05	-0.01	-0.03	-0.05	0.03	374	2.99	-0.03	0.06	-0.3	6	-0.2	3.77	-0.01	-2	1.36	-0.2	-0.03	-0.01	-0.03	3.48				
3	18-Mar-03	7	V2-2	0.420	3.76	0.410	3.95	313	3100	30.0	3030.0	0.0	6000	2	-2	-2	-0.1	-0.05	-2	-1	2.6	467	-0.1	4.9	3.4	866	-0.5	0.1	390	112	-0.3	4.4	-3	-20	-2	9.1	-0.1	-20	3.53	-2	-0.3	-0.1	-0.3	1120				
4	26-Mar-03	15	V2-3	0.420	3.75	0.410	4.09	300	2500	15.0	1400.0	0.0	3940	6	-1	-1	-0.05	-0.03	-1	-0.5	1.42	454	-0.05	2.07	8.42	328	-0.3	0.05	258	48.9	-0.2	1.3	-2	-10	-1	8.2	-0.05	-10	2.1	-1	-0.2	-0.05	-0.2	572				
5	2-Apr-03	22	V2-4	0.420	4.50	0.400	4.75	311	1861	0.0	380.0	1.0	2690	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
6	9-Apr-03	29	V2-5	0.420	4.14	0.390	5.96	258	1723	0.0	253.5	4.5	2450	0.2	-0.2	-0.2	0.04	-0.01	-0.2	-0.1	0.43	448	-0.01	0.68	0.74	7.15	-0.05	0.06	220	19.6	-0.03	0.3	-0.3	6	-0.2	3.63	0.01	2	2.09	-0.2	-0.03	-0.01	-0.03	170				
7	16-Apr-03	36	V2-6	0.420	3.92	0.410	5.32	289	1505	0.0	251.5	2.5	1980	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
8	23-Apr-03	43	V2-7	0.420	3.21	0.390	5.61	413	1514	0.0	333.0	3.0	1730	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
9	30-Apr-03	50	V2-8	0.420	2.88	0.380	3.21	548	2190	60.0	575.0	0.0	2070	5.9	-0.4	-0.4	0.07	-0.01	-0.4	-0.2	0.66	420	-0.02	0.71	7.77	5.71	0.1	0.03	79.7	11.4	-0.06	0.6	-0.6	-4	-0.4	7.2	-0.02	-4	1.72	-0.4	-0.06	-0.02	-0.06	339				
10	7-May-03	57	V2-9	0.420	2.68	0.365	2.85	594	2910	235.0	1020.0	0.0	2700	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
11	14-May-03	64	V2-10	0.420	2.25	0.370	2.77	581	3280	490.0	1475.0	0.0	3560	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
12	21-May-03	71	V2-11	0.420	2.69	0.355	2.82	589	3680	420.0	1430.0	0.0	3640	10	-1	-1	0.08	-0.03	-1	-0.5	1.25	432	-0.05	1.25	12	134	-0.3	-0.05	222	21.3	-0.2	0.9	-2	-10	-1	10	-0.05	-10	1.92	-1	-0.2	-0.05	-0.2	678				
13	28-May-03	78	V2-12	0.420	2.59	0.365	2.69	556	3530	750.0	1870.0	0.0	3990	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
14	4-Jun-03	85	V2-13	0.420	2.63	0.385	2.72	525	3150	730.0	1940.0	0.0	4150	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
15	11-Jun-03	92	V2-14	0.420	2.42	0.380	2.58	524	3450	980.0	2360.0	0.0	4330	14	-1	-1	0.07	-0.03	-1	-0.5	1.24	350	-0.05	1.19	13.2	490	0.4	-0.05	234	19.5	-0.2	0.8	-2	-10	-1	10.8	-0.05	-10	1.57	-1	-0.2	-0.05	-0.2	690				
16	18-Jun-03	99	V2-15	0.420	2.57	0.385	2.66	531	3310	810.0	1900.0	0.0	3970	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
17	25-Jun-03	106	V2-16	0.420	2.53	0.385	2.62	531	3310	960.0	2070.0	0.0	4070	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
18	2-Jul-03	113	V2-17	0.420	2.62	0.380	2.72	508	2900	500.0	1420.0	0.0	3610	7.4	-0.4	-0.4	0.04	-0.01	-0.4	-0.2	0.76	327	-0.02	0.78	4.96	266	0.2	0.05	303	17.6	-0.06	0.5	-0.6	-4	-0.4	7.6	-0.02	-4	1.42	-0.4	-0.06	-0.02	-0.06	386				
19	9-Jul-03	120	V2-18	0.420	2.49	0.415	2.37	504	4140	1120.0	2760.0	0.0	4880	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
20	16-Jul-03	127	V2-19	0.420	3.00	0.415	3.14	435	2770	120.0	1820.0	0.0	4960	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20	23-Jul-03	134	V2-20	0.420	2.65	0.420	2.21	474	3080	940.0	1740.0	0.0	4190	8.1	-0.4	-0.4	0.04	-0.01	-0.4	-0.2	0.93	371	-0.02	0.96	4.61	366	0.2	0.04	376	25.1	-0.06	0.7	-0.6	-4	-0.4	9.8	-0.02	-4	1.56	0.7	-0.06	-0.02	-0.06	444				

terminated

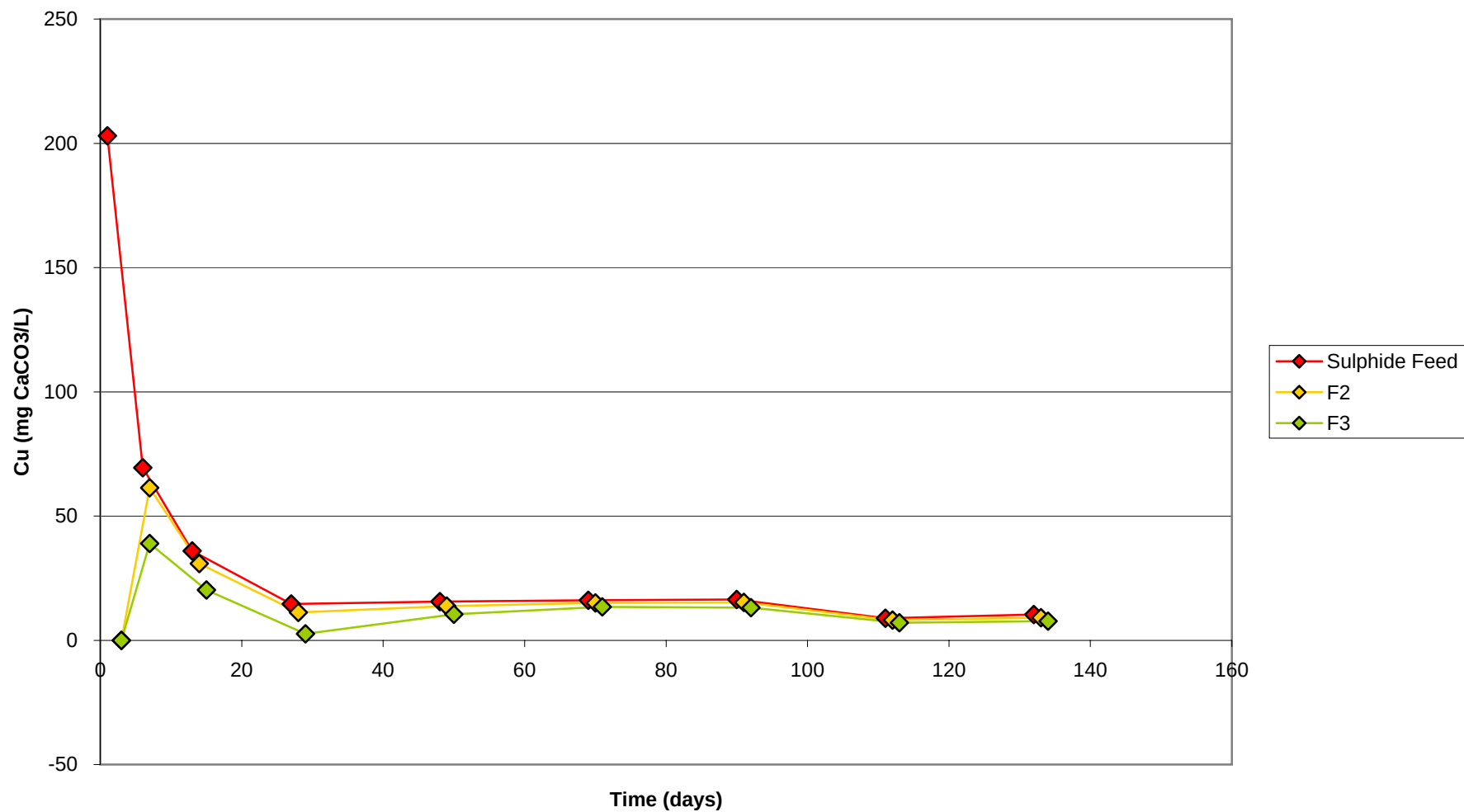
F Series



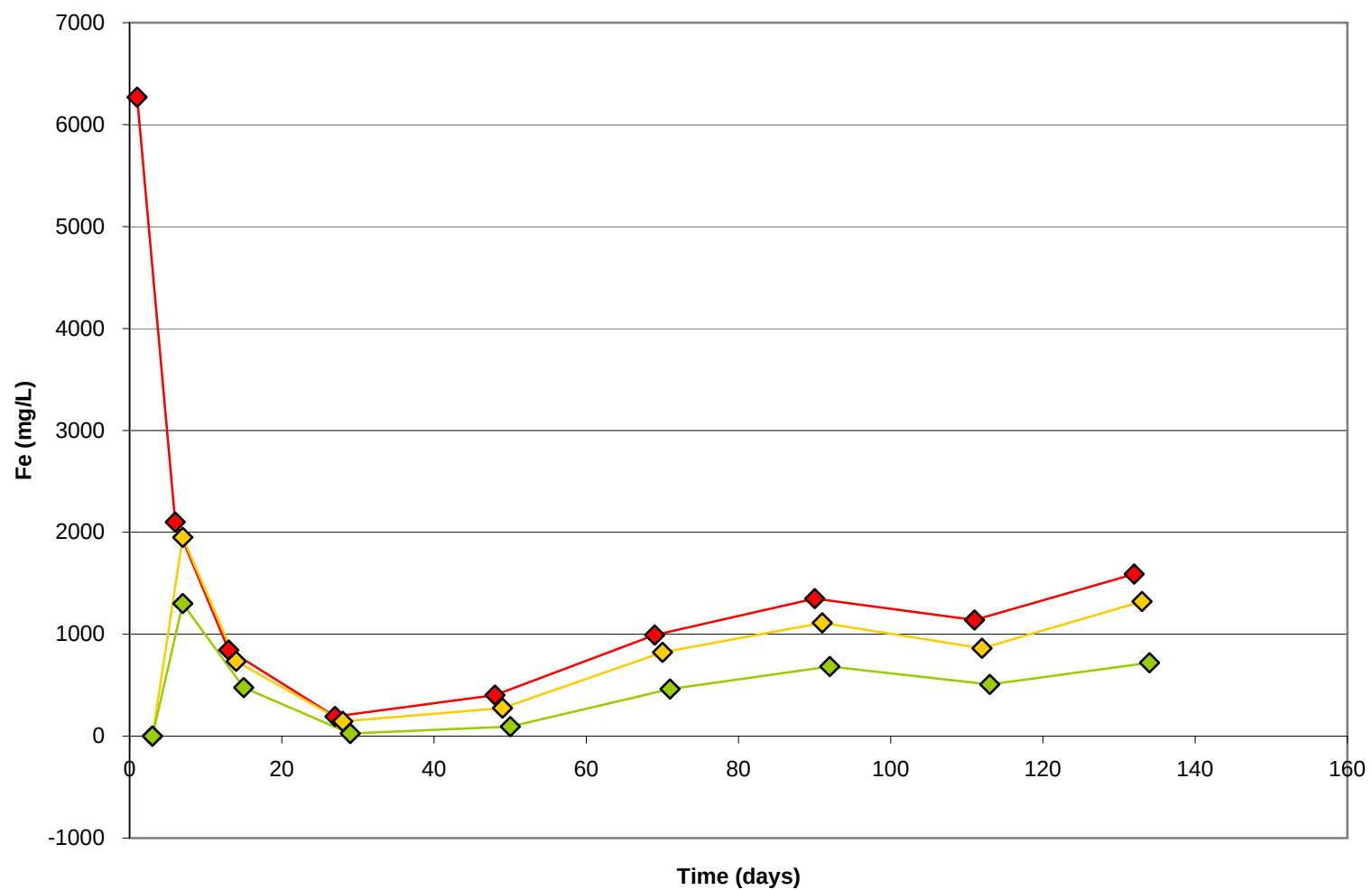


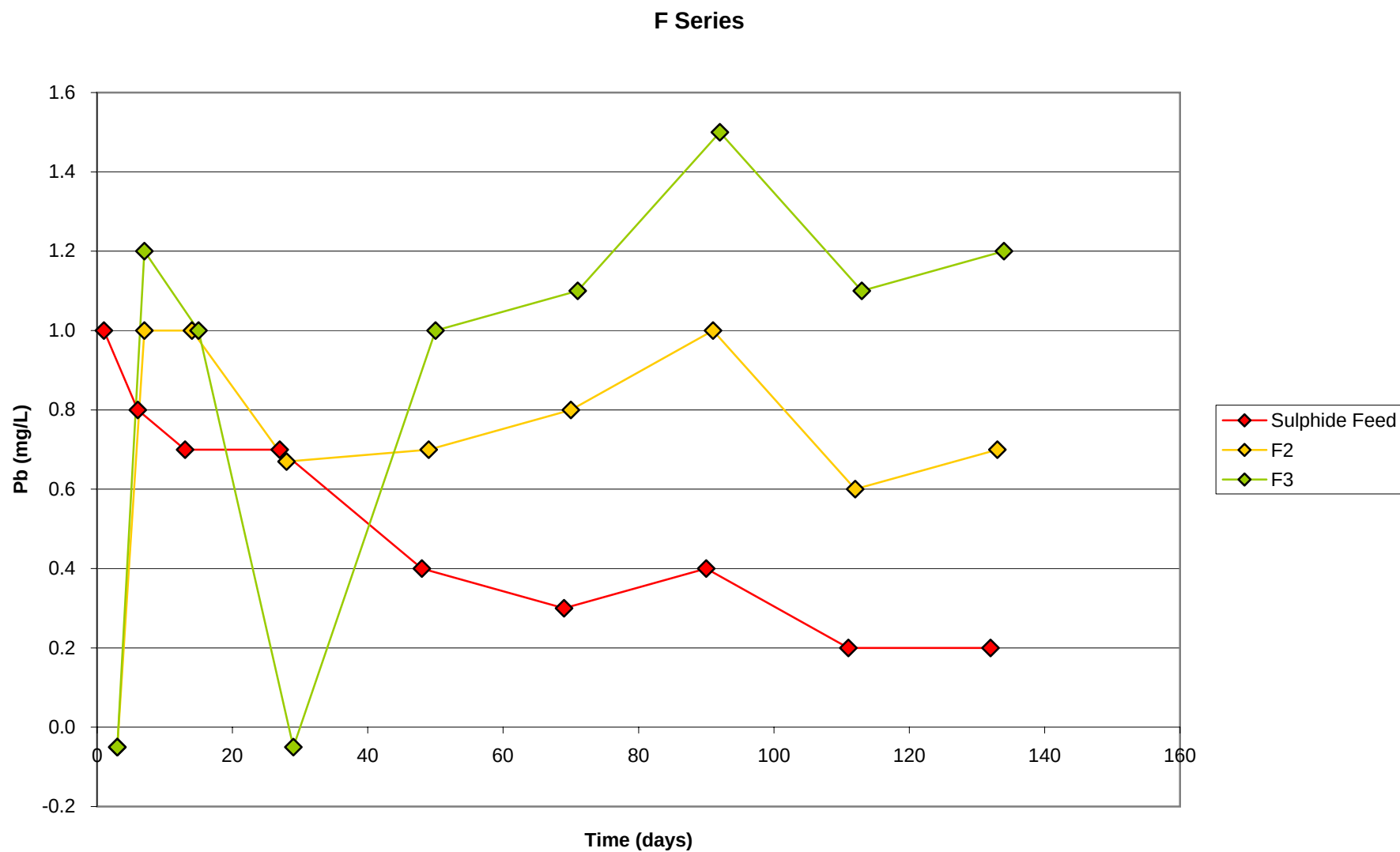


F Series

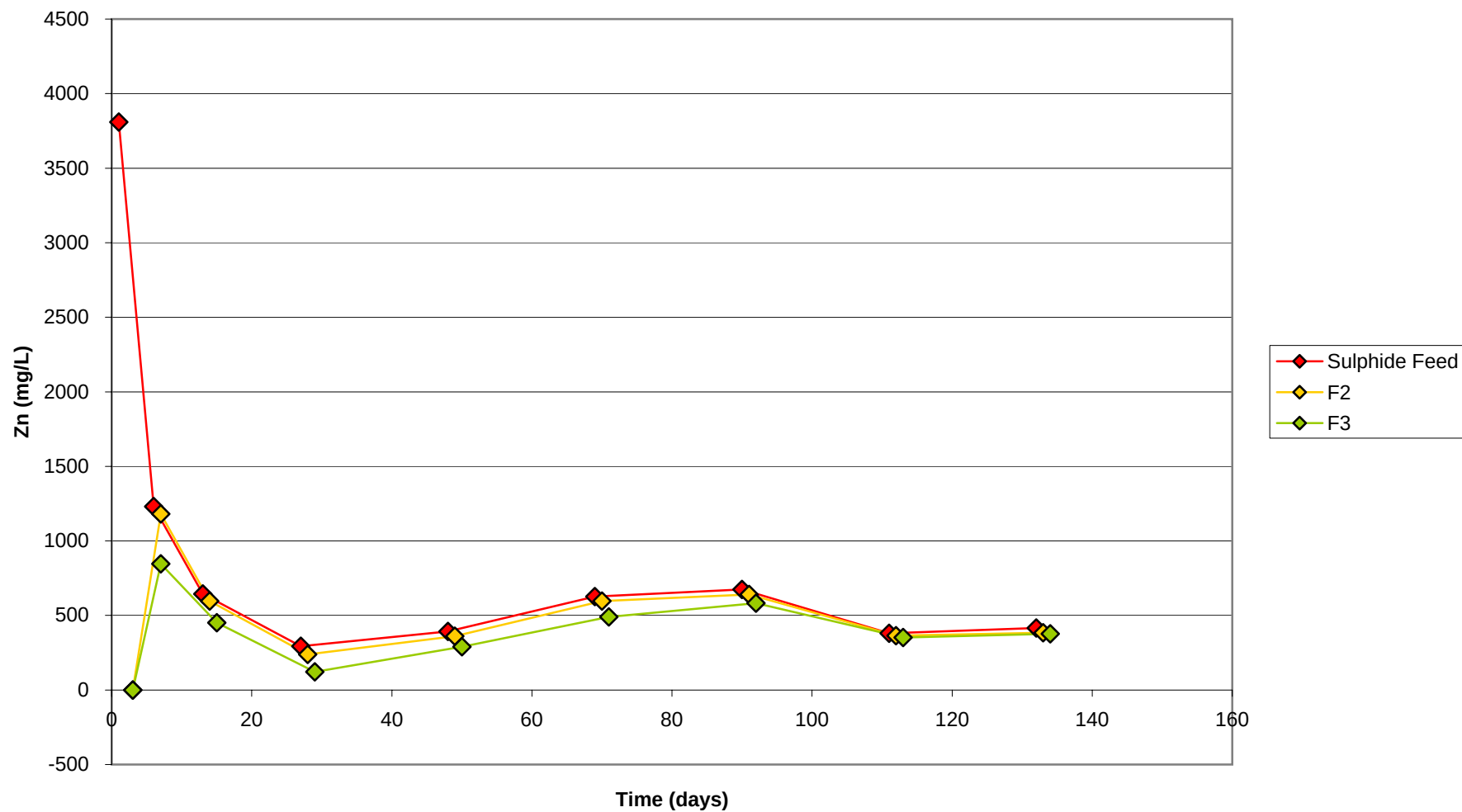


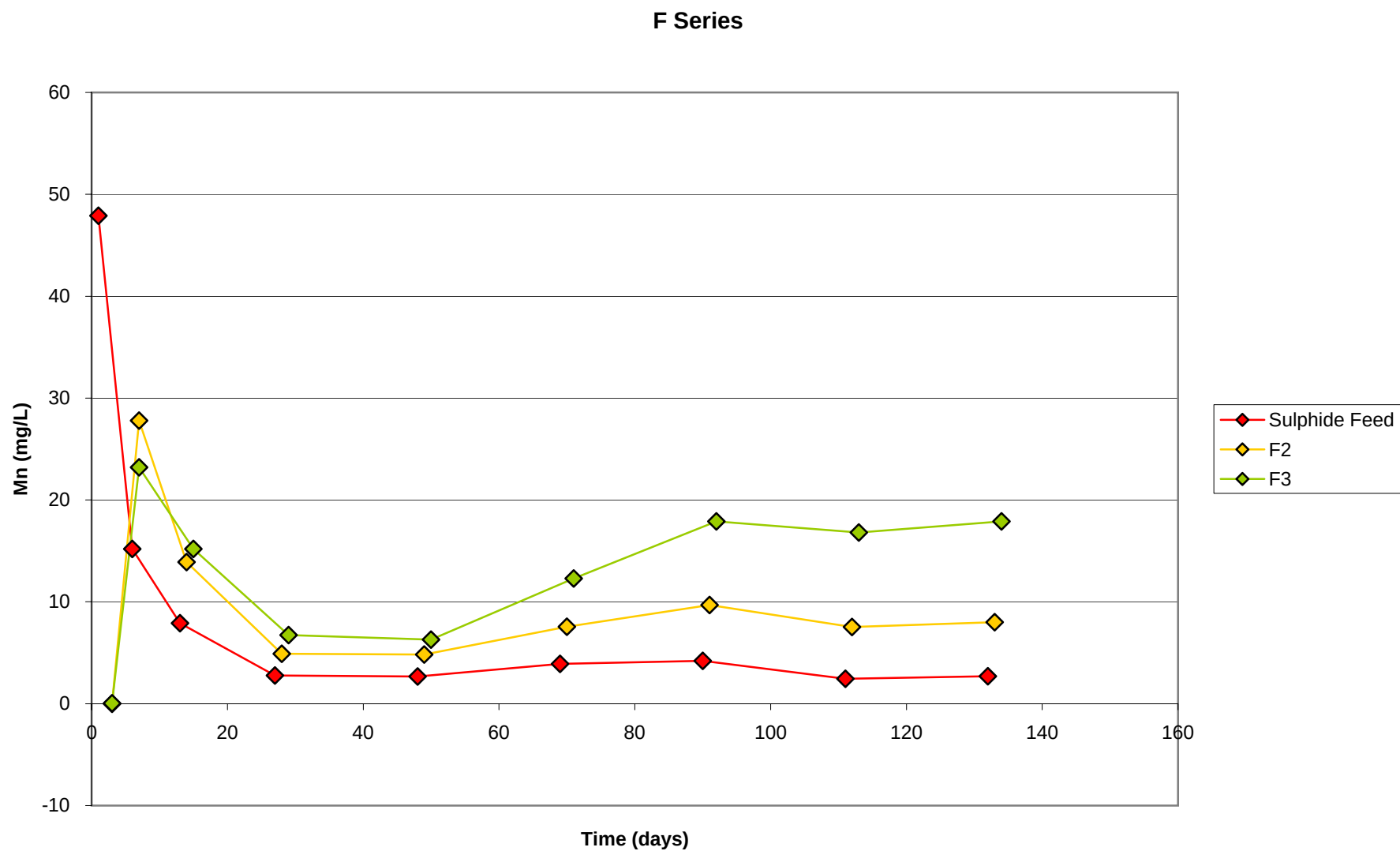
F Series



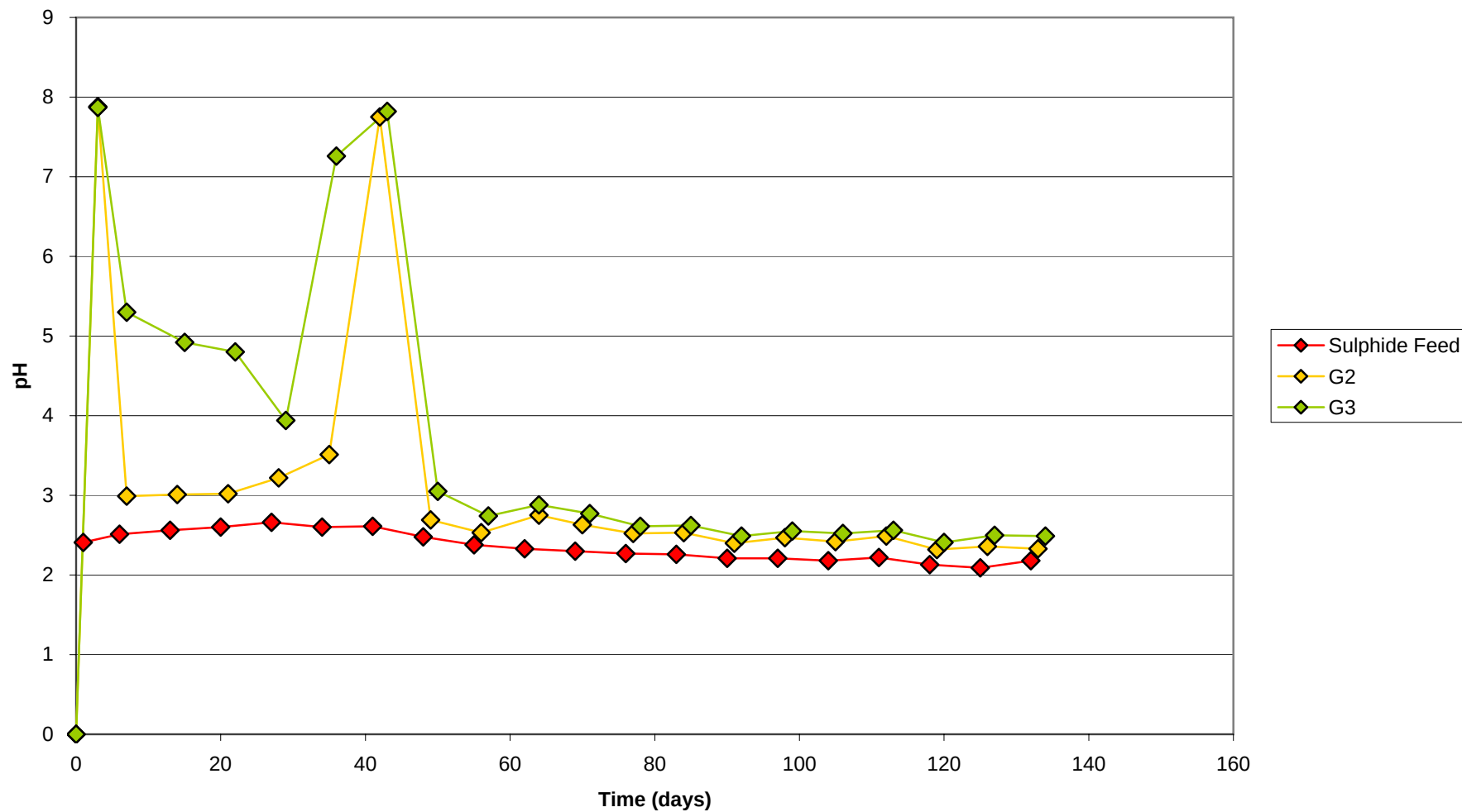


F Series

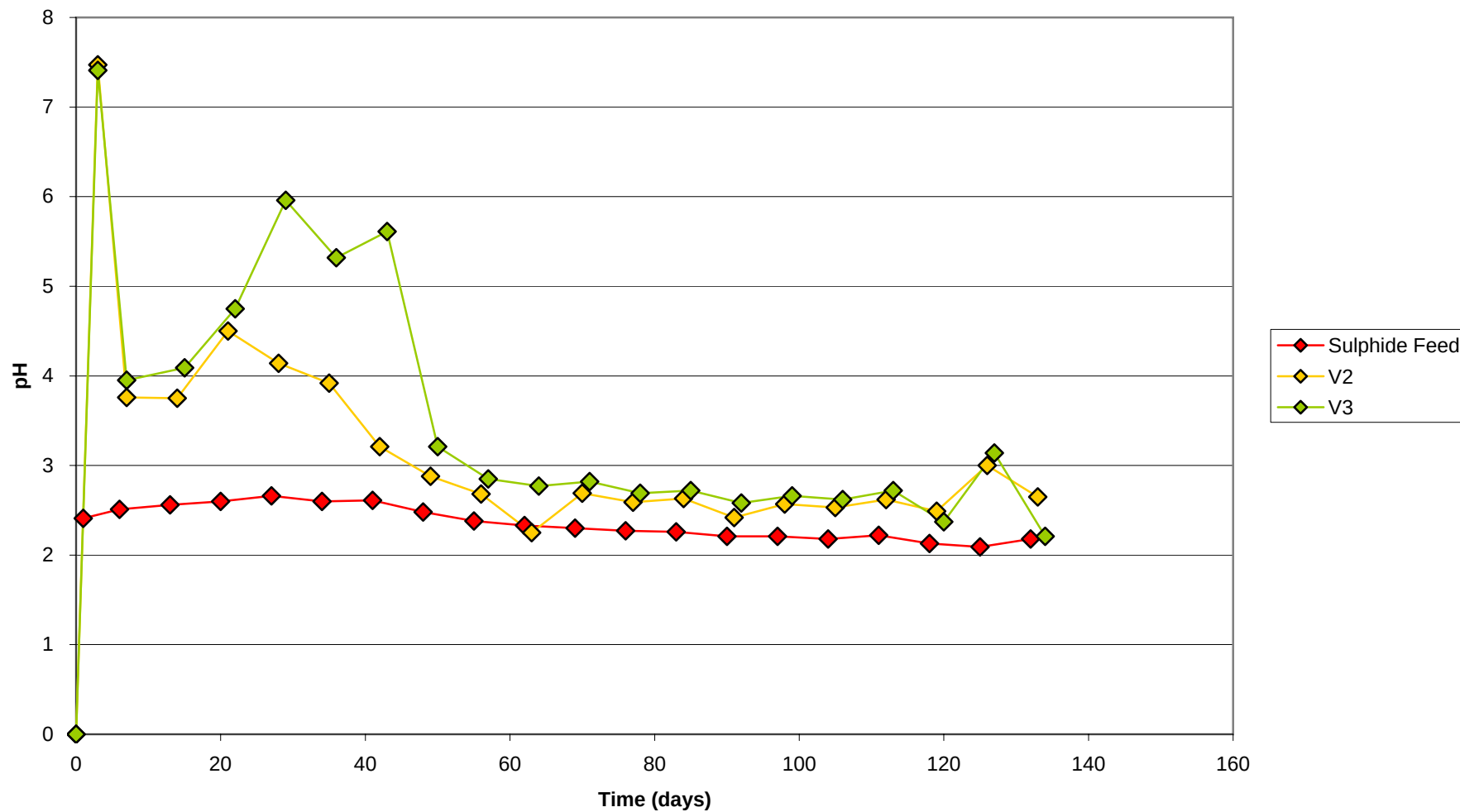


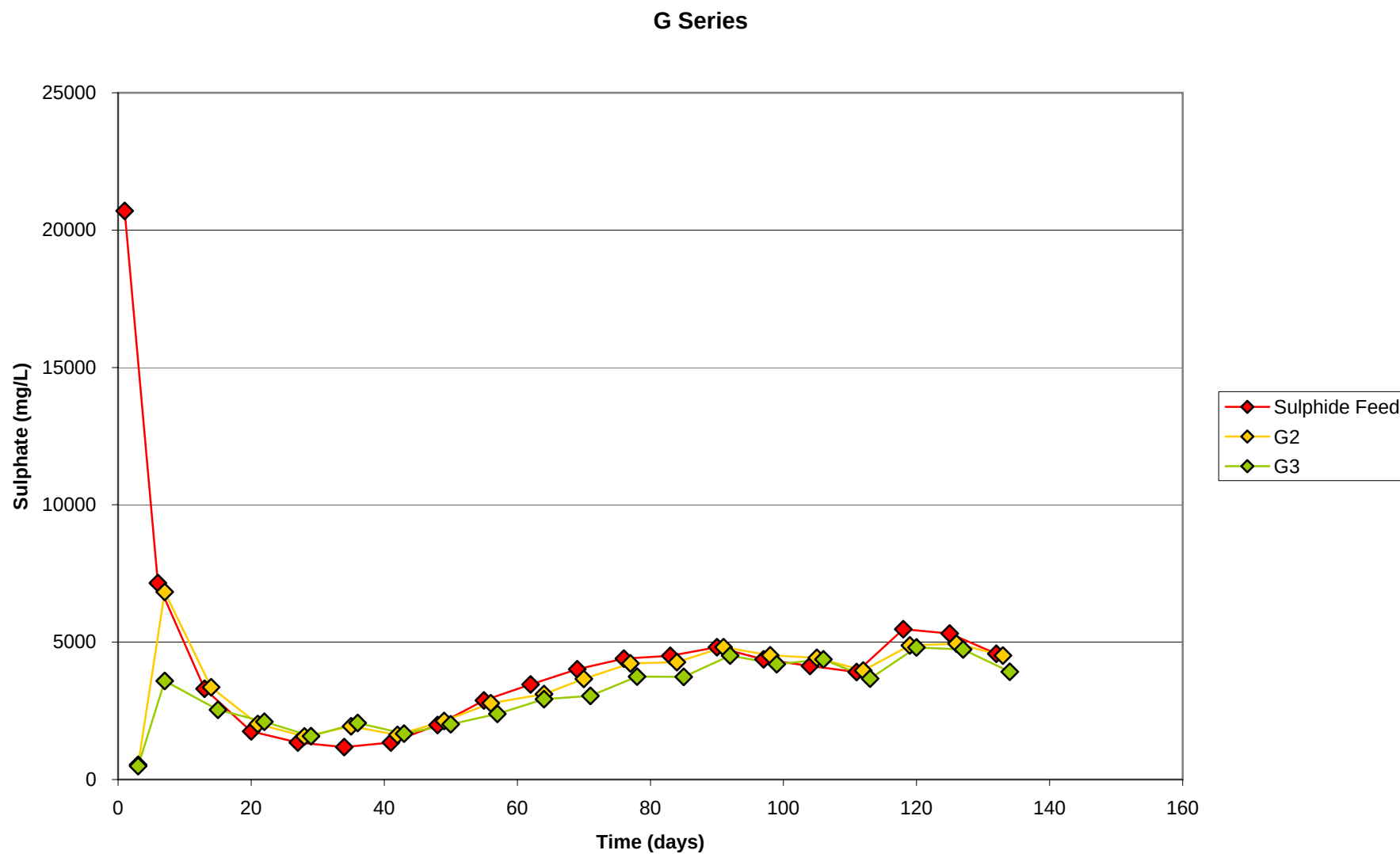


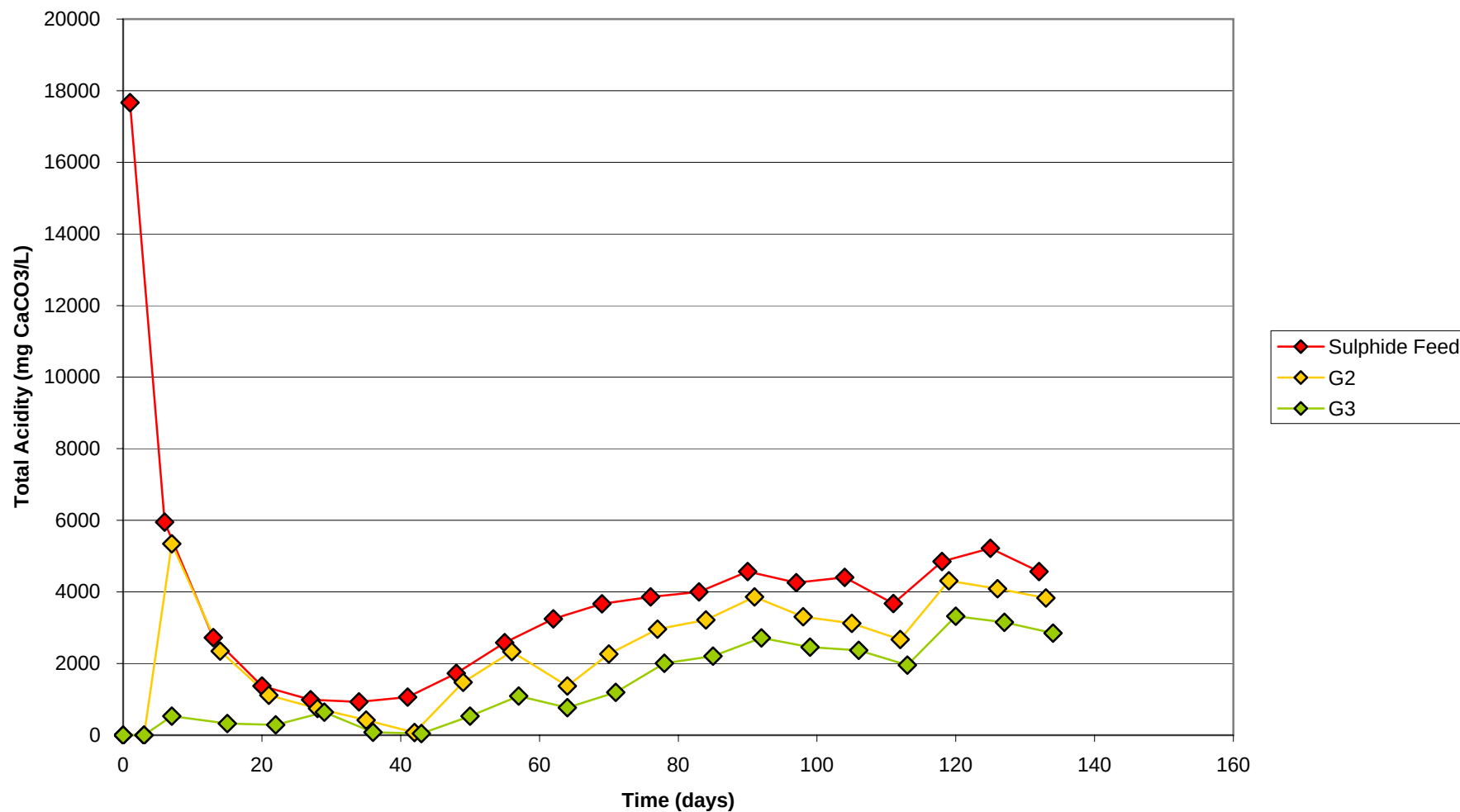
G Series

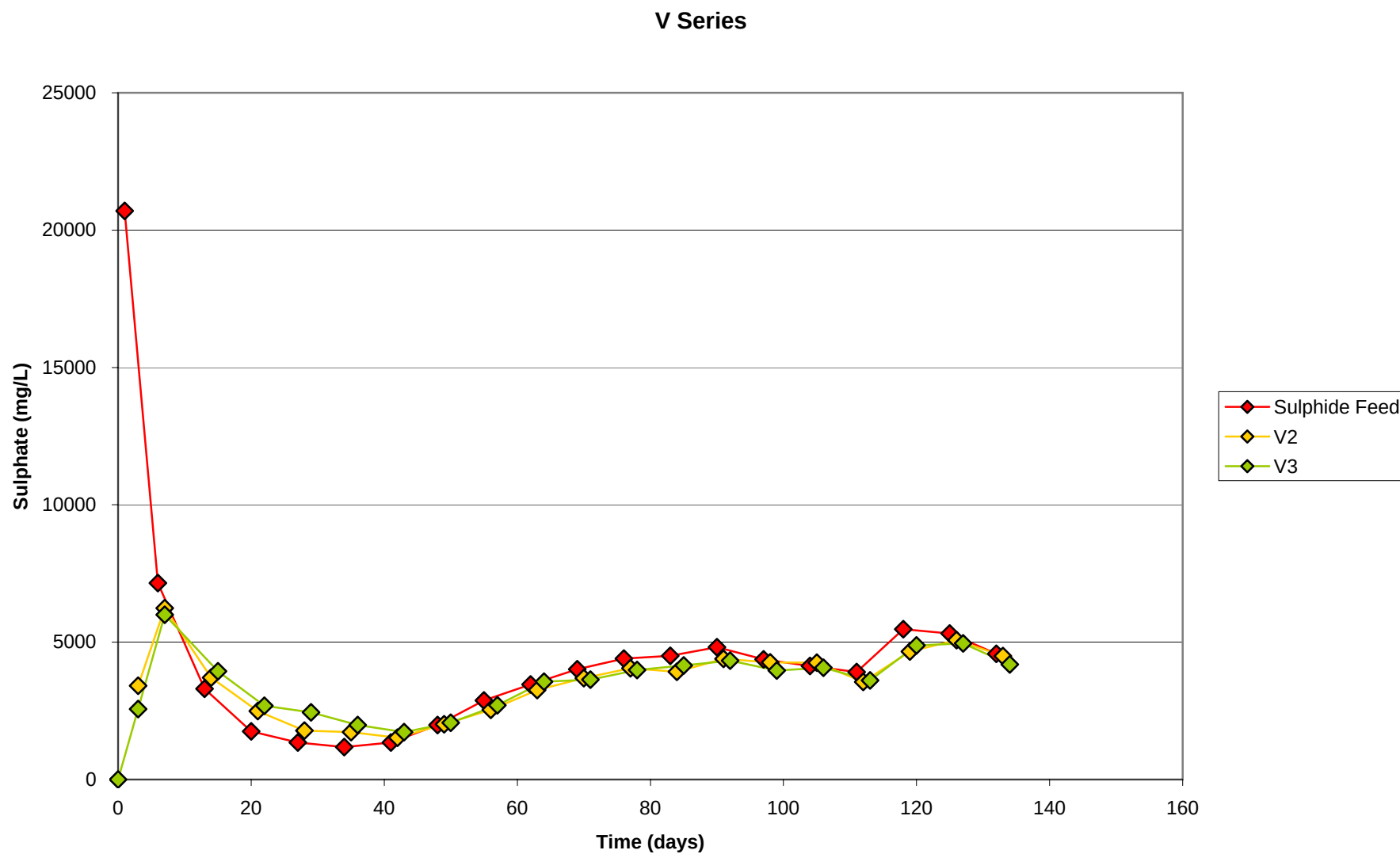


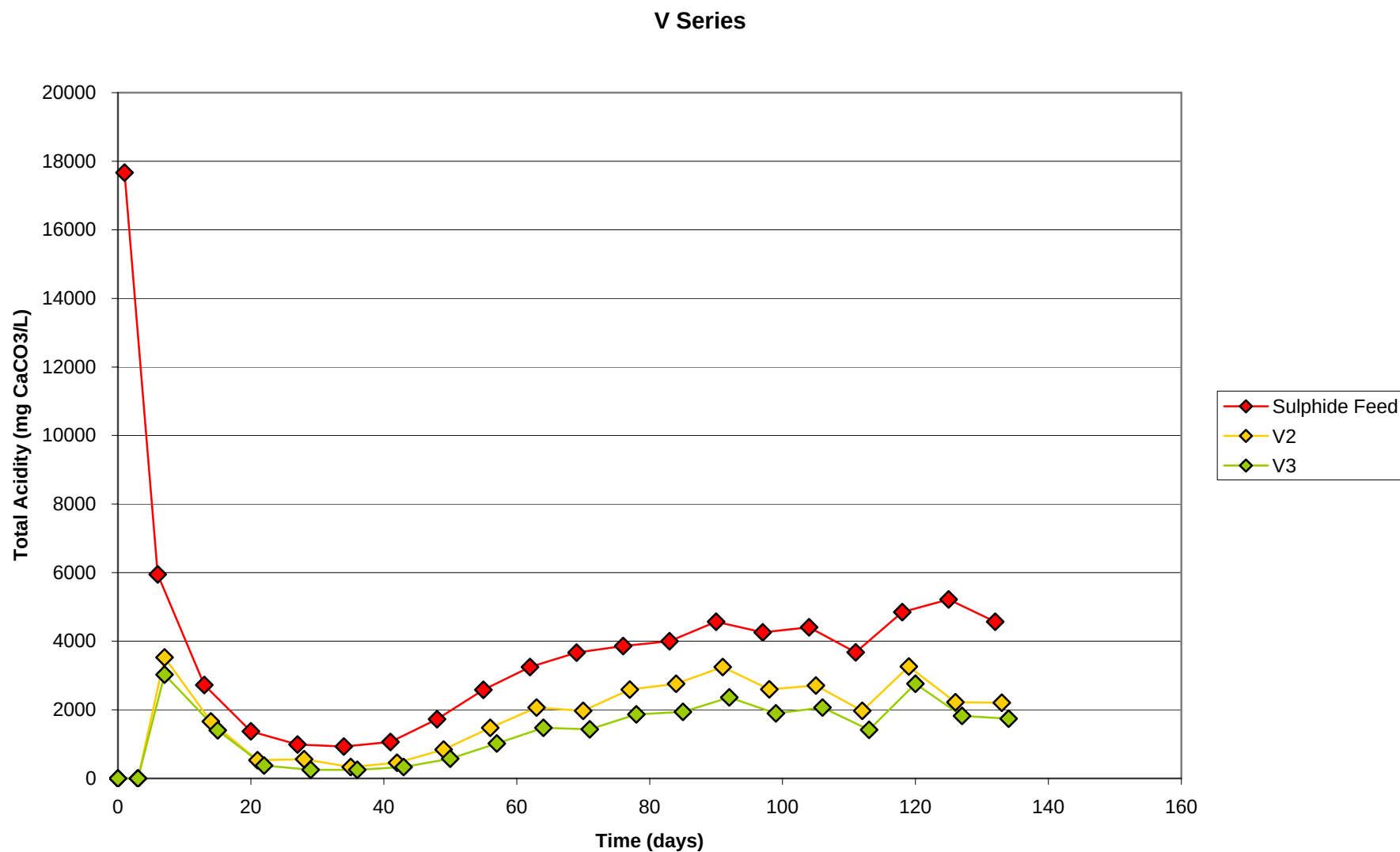
V Series

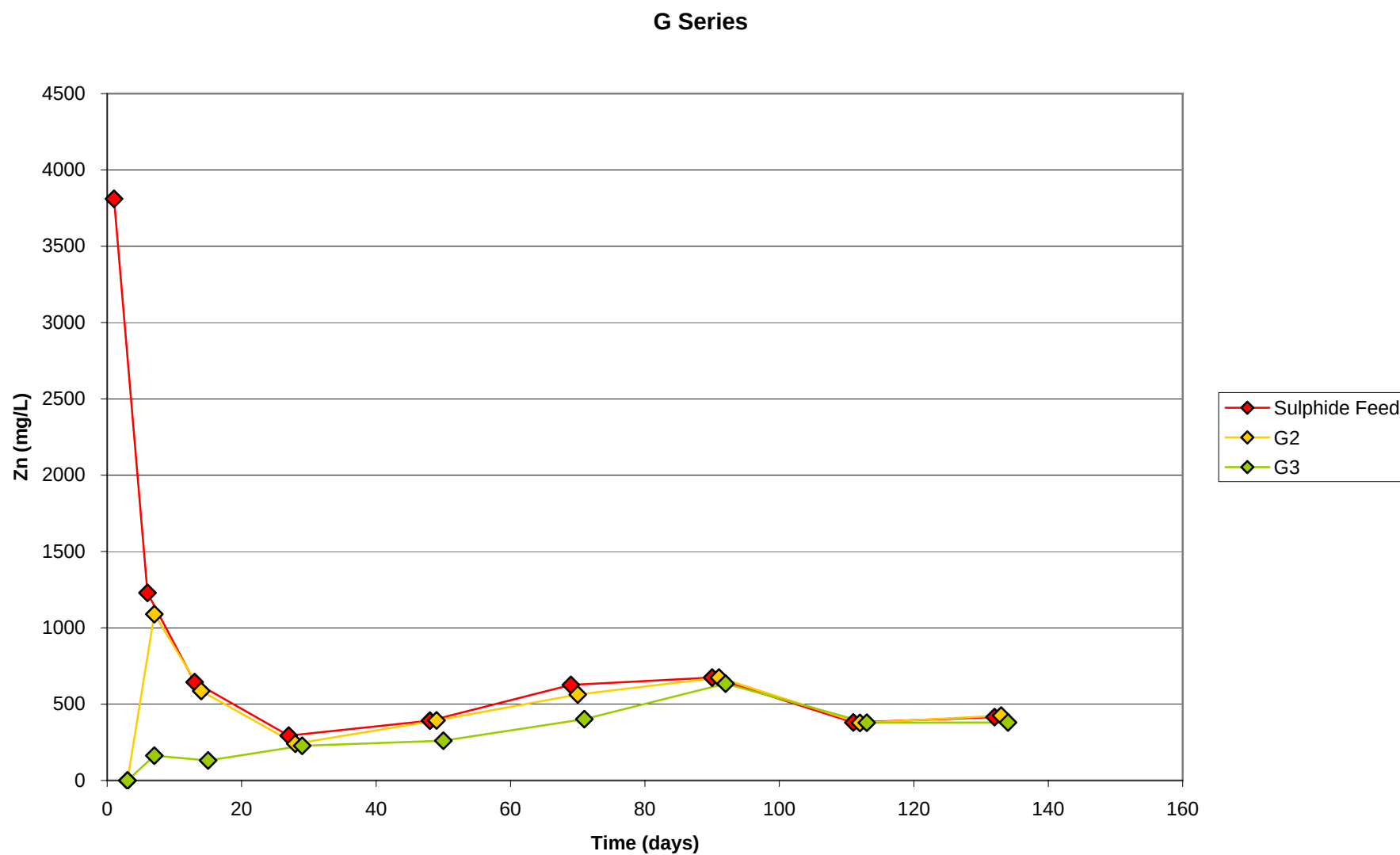




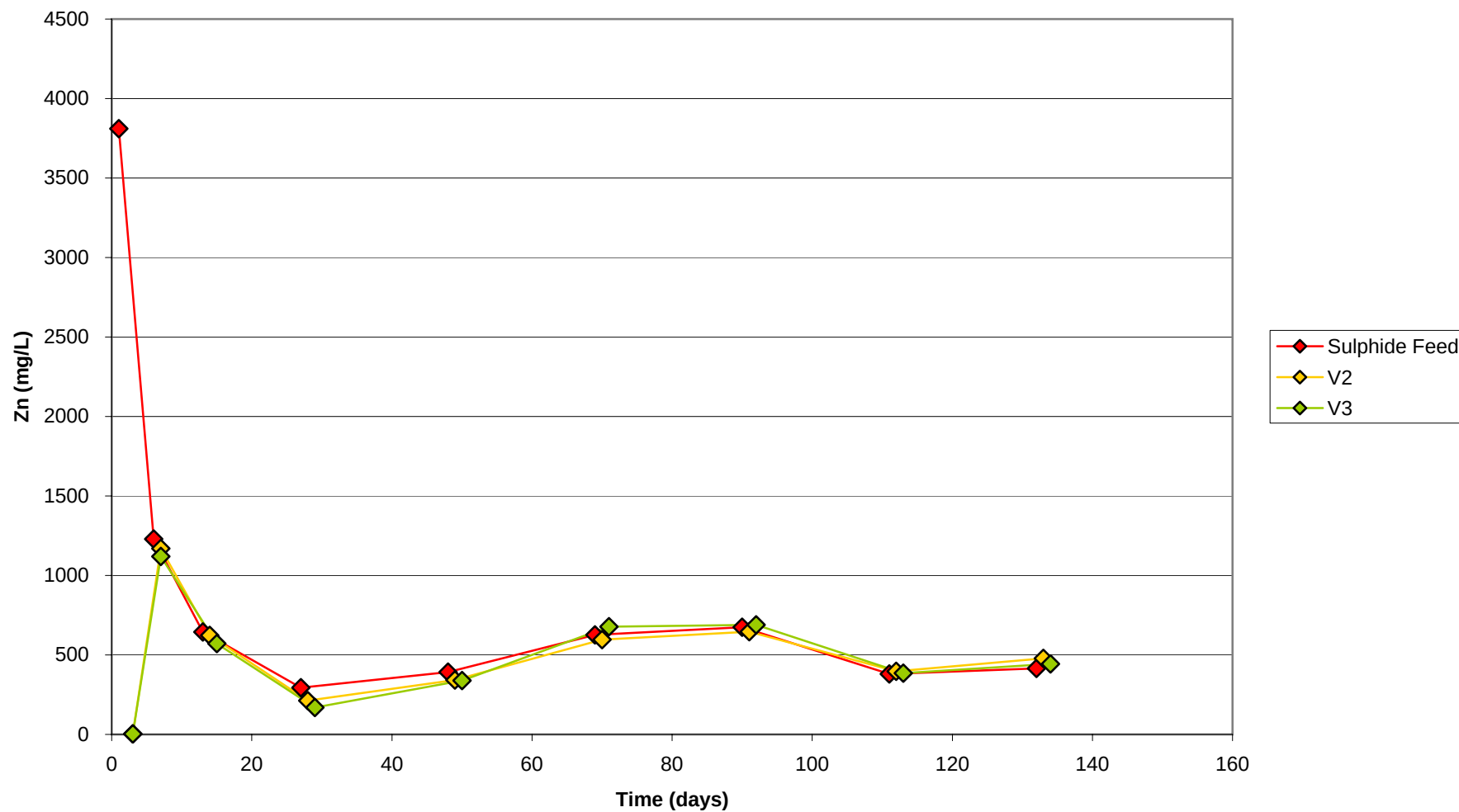
G Series



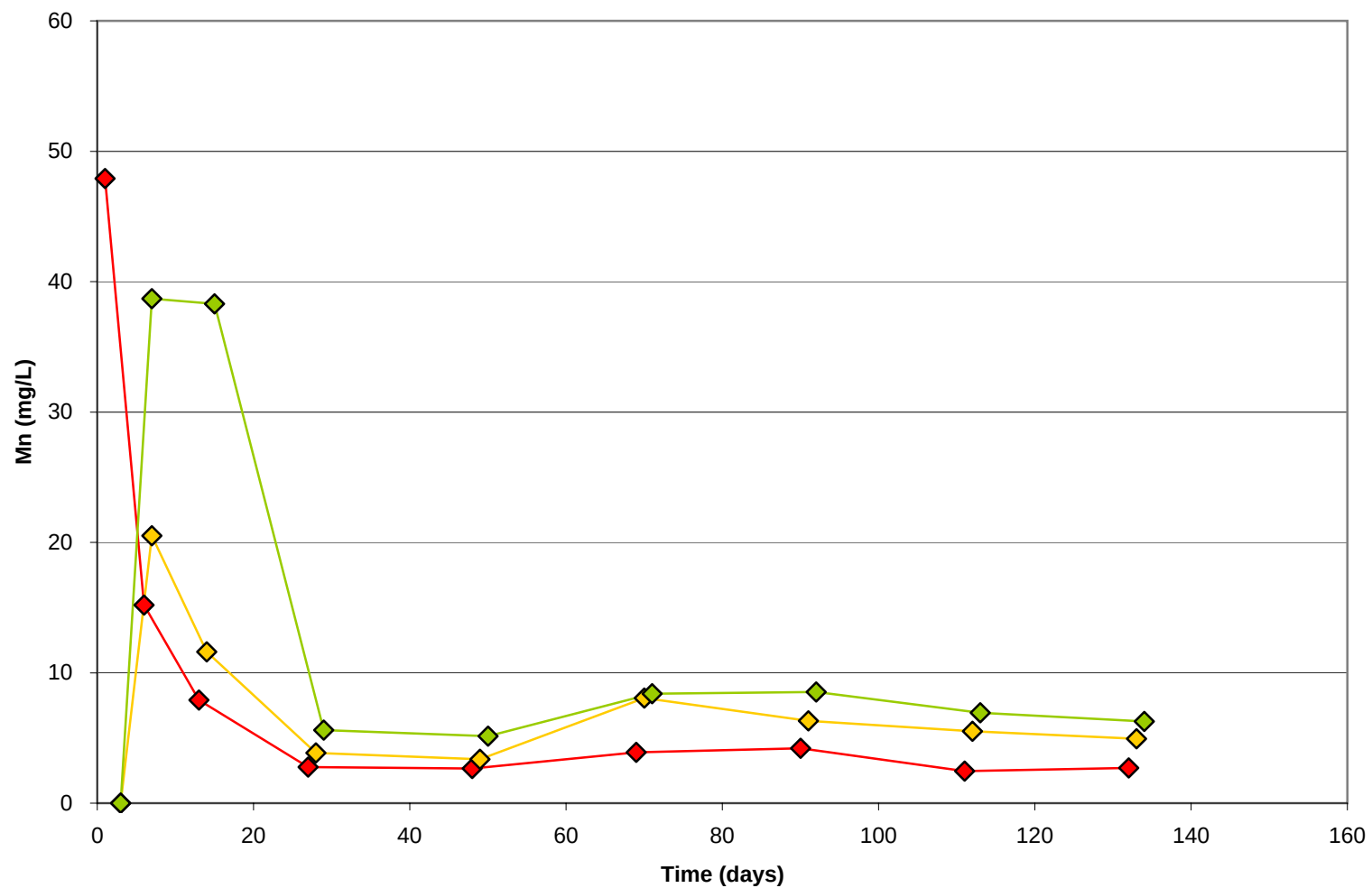




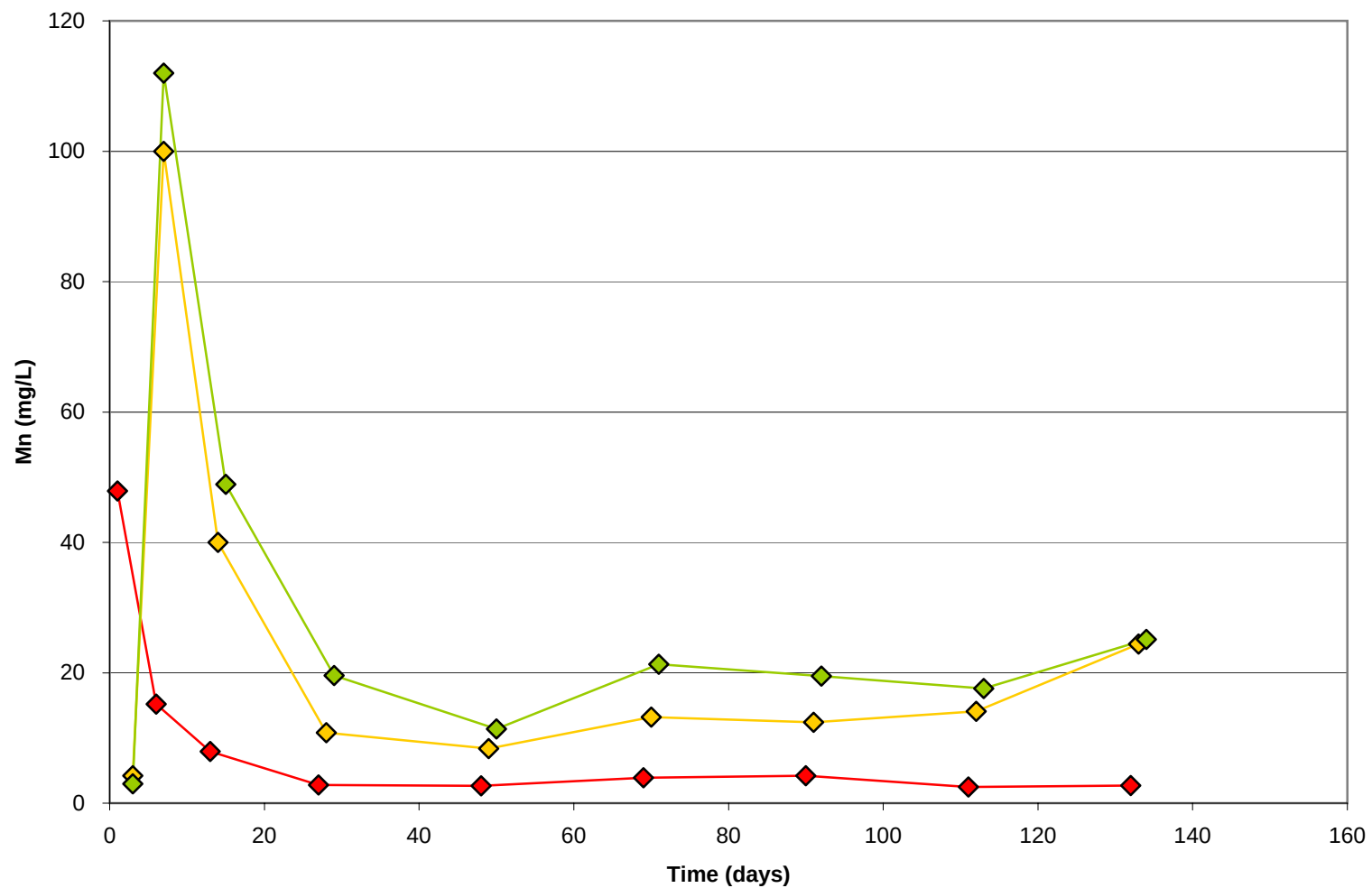
V Series



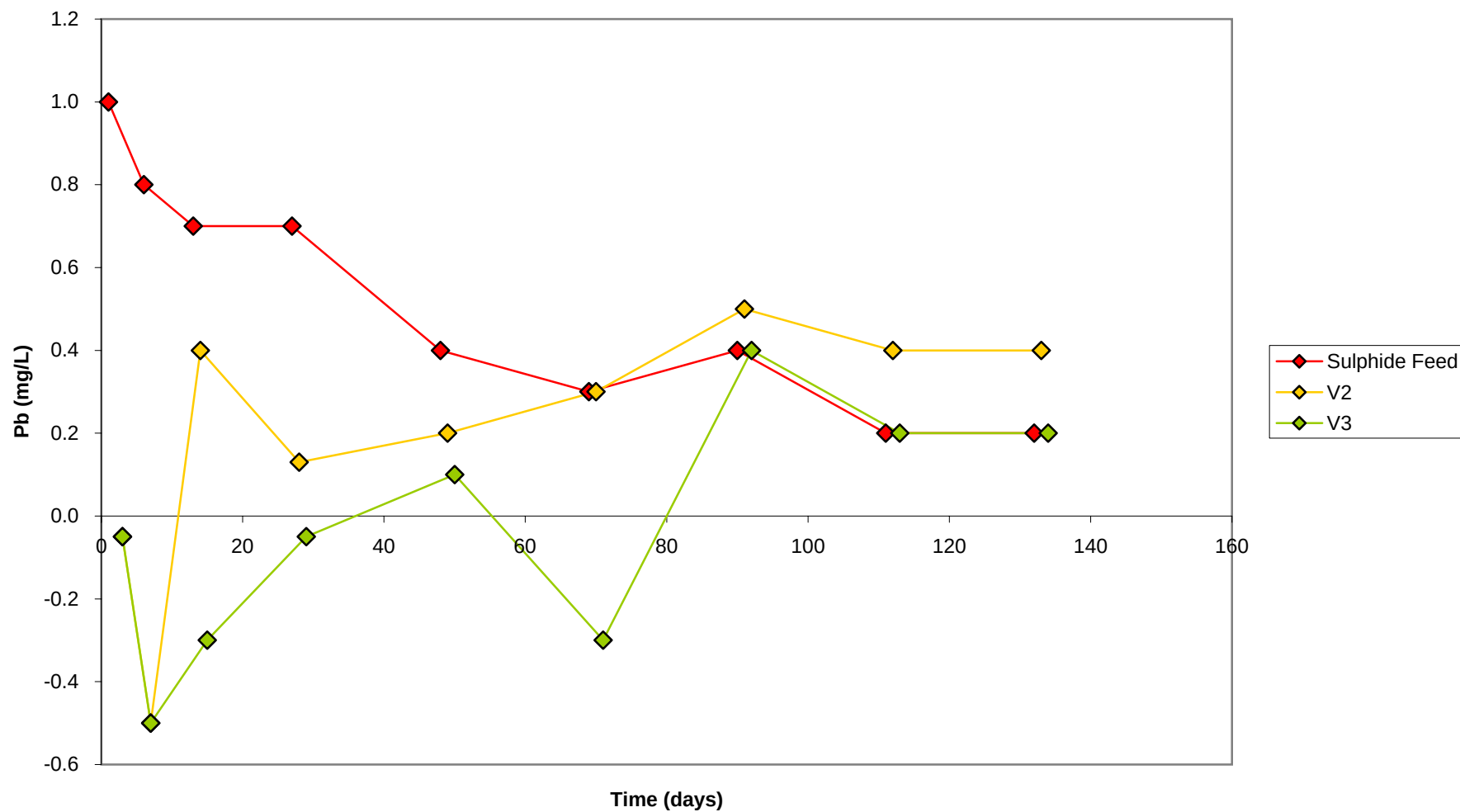
G Series

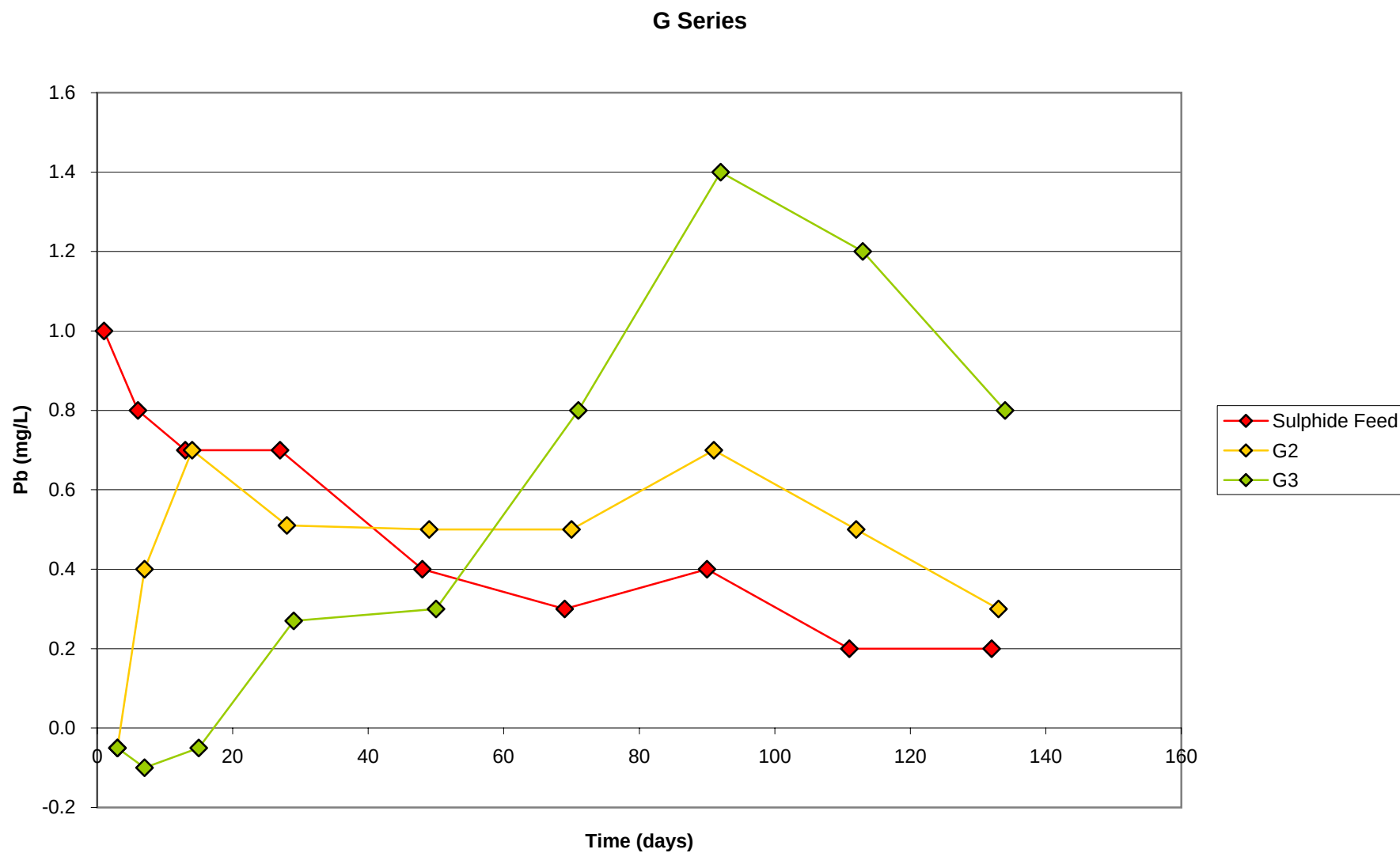


V Series



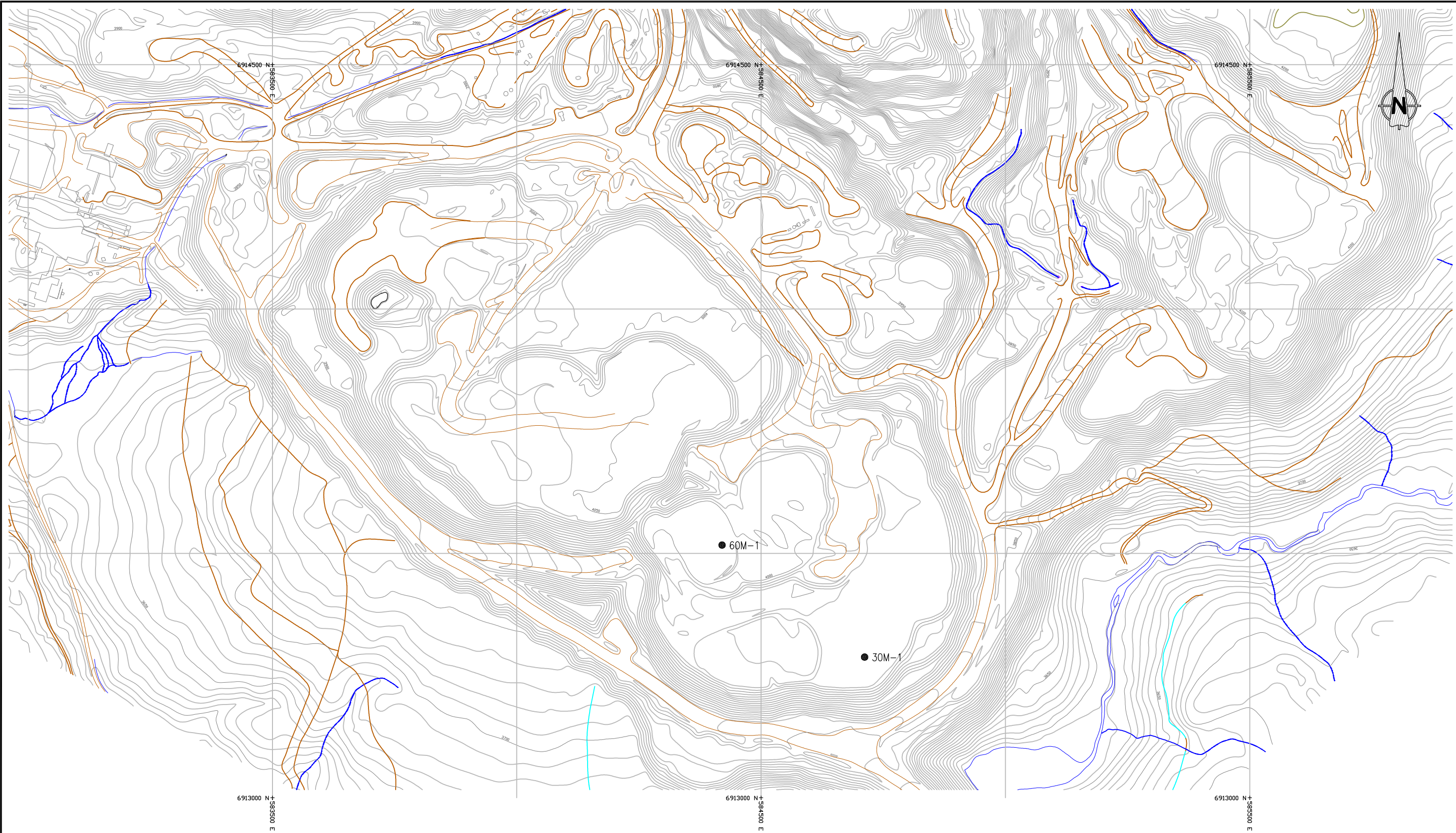
V Series





APPENDIX F
SRK Drill Hole Program

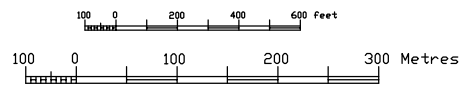
Appendix F.1
Location of SRK Drill Holes



NAD 27 DATUM
Contour Interval = 10 ft.

Legend

● 60M-1 Borehole Location



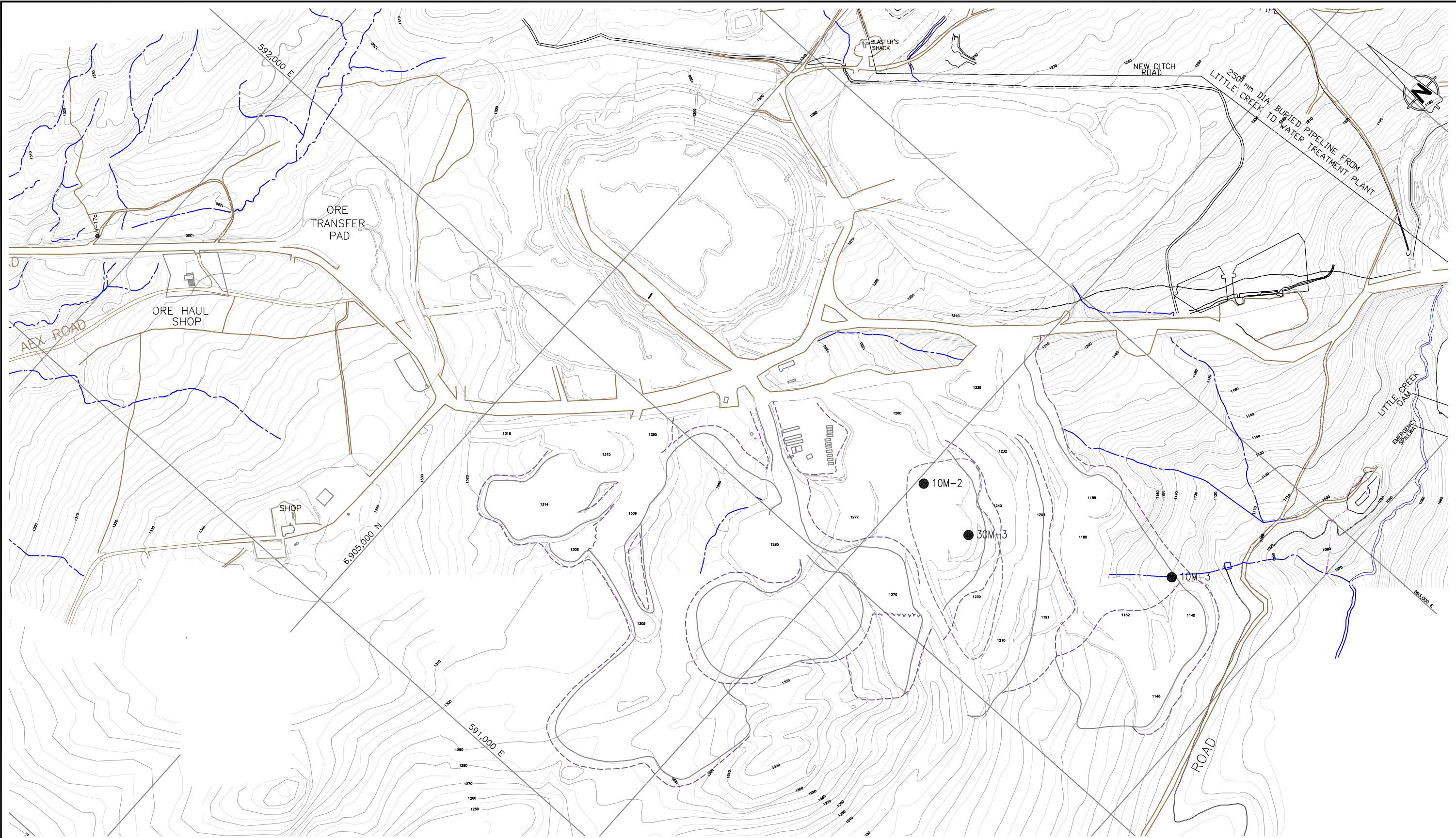
DELOITTE & TOUCHE INC.

FARO MINE SITE

LOCATION OF BOREHOLES
FARO SITE

PROJECT NO.	DATE	APPROVED	FIGURE
1CD003.11	Nov, 2002		4.1

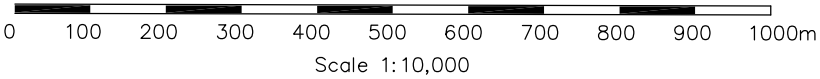
File Ref: Sample_plan-NAD27.dwg



LEGEND

● 10M-2 Borehole Location

NAD 27 DATUM

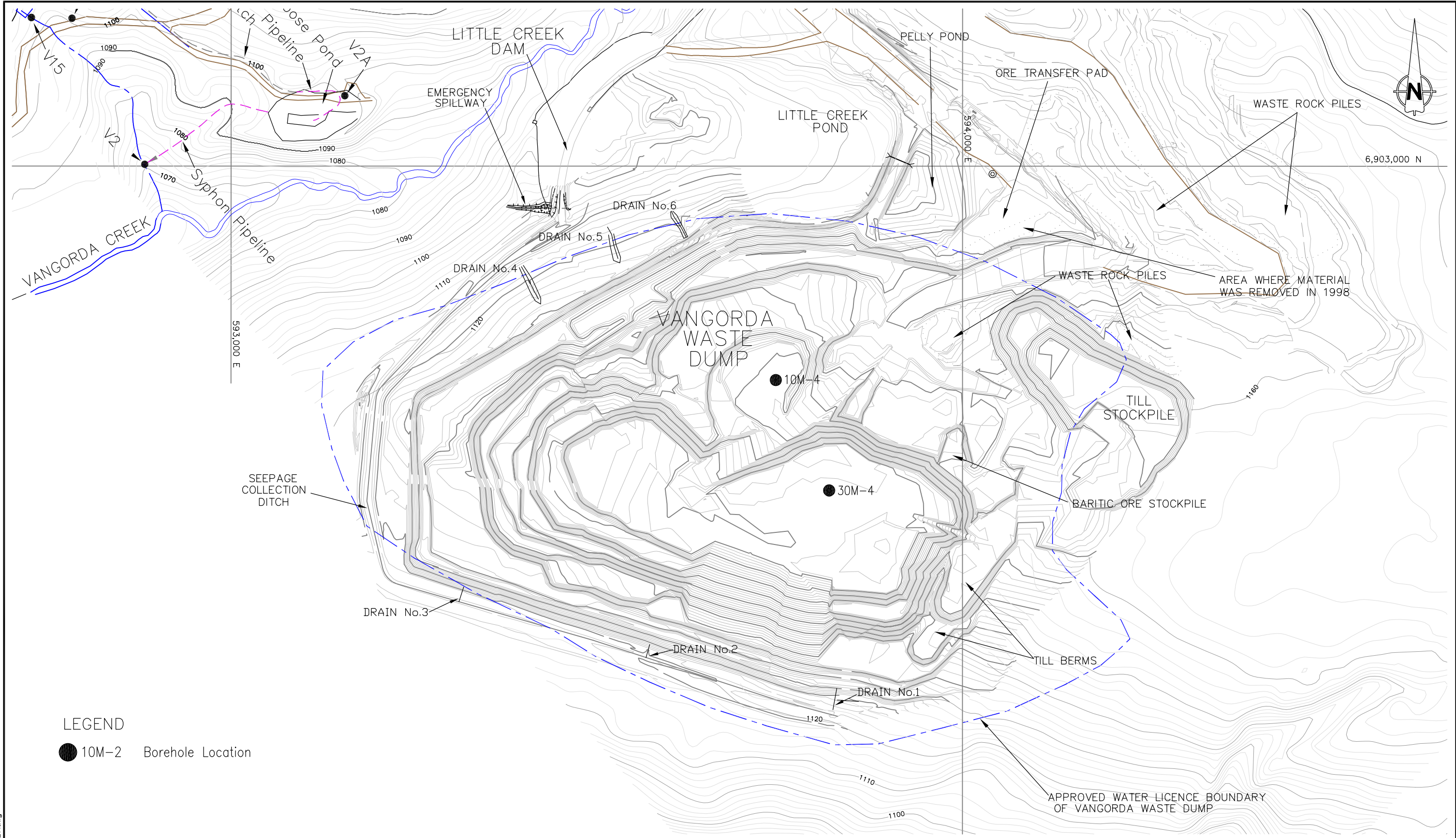


DELOITTE & TOUCHE INC.

VANGORDA PLATEAU MINE

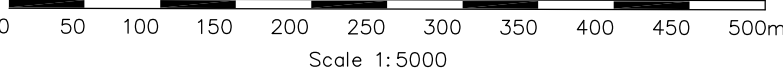
LOCATION OF BOREHOLES
GRUM WASTE DUMP

PROJECT NO.	DATE	APPROVED	FIGURE
1CD003.11	Nov, 2002		4.2



LEGEND

● 10M-2 Borehole Location



NAD 27 DATUM



DELOITTE & TOUCHE INC.

VANGORDA PLATEAU MINE

LOCATION OF BOREHOLES
VANGORDA DUMP

PROJECT NO.	DATE	APPROVED	FIGURE
1CD003.11	Nov, 2002		4.3

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Faro Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6913518 EASTING: 584420 LOGGED BY: Uwe Schmidt			OLE NO: 60M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 7, 2002 DATE AND TIME FINISHED: Oct 8, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pieometer	Installations
1	65% pale grey brown weathering biotite muscovite schist (1D), 15% quartz porphyry (10), 10% quartz, 10% dark grey biotite schist/ calc silicate, blocky >> platy, beige fines non-calcareous		60M1-2 0-2 m		0.7m Gas Ports (2) Thermistor Bead (inside)
2	75% med grey biotite muscovite schist (1D), 10% porphyry (10), 10% pyrite (2E), 5% med grey quartz biotite pyritic quartzite, blocky >> platy, pale brown fines non-calcareous				1.4m Gas Ports (2) Thermistor Bead (inside)
3			60M1-4 2-4 m		2.8m Gas Ports (2) Thermistor Bead (inside)
4	65% biotite muscovite schist (1D), 15% calc-silicate schist (3D0), 10% pyritic quartzite, 10% quartz, blocky > platy, pale grey brown fines non-calcareous		60M1-0/6 0-6 m		
5			60M1-6 4-6 m		
6	60% biotite muscovite schist (1D), 15% calc-silicate (3D0), 15% quartz sericite schist (1D4), 10% pyritic quartzite (2A), blocky				5.6m Gas Ports (2) Thermistor Bead (inside)
7			60M1-8 6-8 m		
8	60% calc-silicate (3D0), 15% pyritic quartzite (2CD), 15% biotite muscovite schist (1D), 10% grey feldspar porphyry (10E), blocky, pale grey brown fines				
9	As above, with void space indicated by lack of sample return and air exiting casing on backfill.		60M1-10 8-10 m		
10			60M1-6/12 6-12 m		10m Gas Ports (2) Thermistor Bead (inside)

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: aro Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6913518 EASTING: 584420 LOGGED B : Uwe Schmidt			OLE NO: 60M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 7, 2002 DATE AND TIME FINIS ED: Oct 8, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
11	55% calc-silicate (3D0), 30% biotite muscovite schist (1D), 15% silver to pale green muscovite schist, 5% quartz, blocky, pale brown fines Void space indicated by air exiting casing on backfill.		60M1-12 10-12 m		
12					
13	40% calc-silicate (3D0), 30% pale silver grey muscovite schis (1D)t, 5% pyritic quartzite (2CD), 10% pyrite (2E), 15% dark grey pyritic phyllite, blocky > plate, 10% of fragments have bright red oxide coating, pale green fines		60M1-14 12-14 m		
14					
15	50% Biotite muscovite quartzite (1D), 20% silver grey schist, 10% pyrite (2E), 10% dark grey phyllite, 5% pyritic quartzite (2CD), 5% quartz, rare po (2), red brown oxide coatings prevalent, blocky, pale red brown fines Void space indicated by air exiting casing on backfill.		60M1-16 14-16 m		
16					
17	80% calc-silicate (3D0), 10% 2 CD pyritic quartzite, 10% biotite muscovite schist (1D), rare po (2), blocky, no 1 cm sulphides observed, pale grey warm fines Void space indicated by air exiting casing on backfill. Poor sampel return 16.5 to 17 m.		60M1-12/18 12-18 m		
18					
19	100% calc-silicate (3D0), blocky, pale grey fines		60M1-18 16-18 m		
20			60M1-20 18-20 m		
20m Gas Ports (2) Thermistor Bead (inside)					

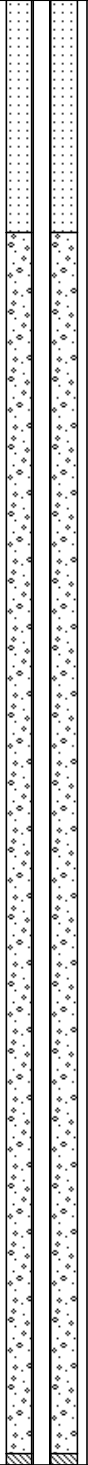
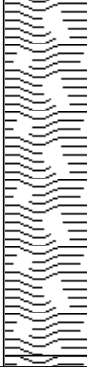
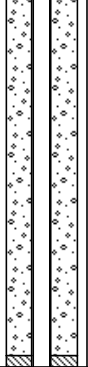


SRK Consulting
Engineers and Scientists

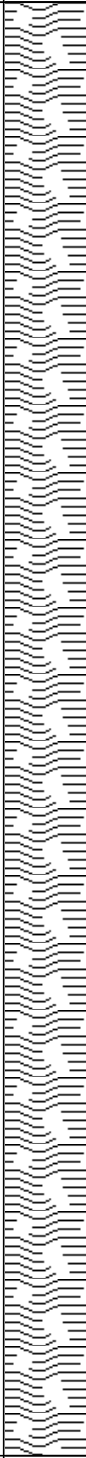
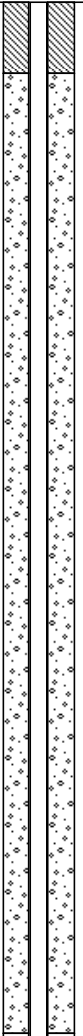
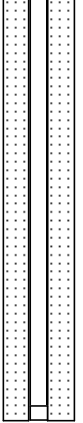
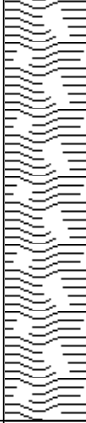
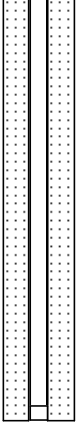
Sheet 2 o 6

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: aro Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6913518 EASTING: 584420 LOGGED B : Uwe Schmidt			OLE NO: 60M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 7, 2002 DATE AND TIME FINIS ED: Oct 8, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
21	93% calc-silicate (3D0), 1% 2E pyrite, 5% quartz, 1% 1D4 muscovite schist, blocky, pale grey brown warm fines Void space indicated by air exiting casing on backfill.		60M1-22 20-22 m		
22	ed brown oxides at 22 m		60M1-18/24 18-24 m		
23	30% calc-silicate (3D0), 24% 1D schist, 15% quartz, 10% quartz sericite schist (1D4), 10% pyrite (2E), 10% 2CD pyritic quartzite, 1% galena quartz, blocky, pale grey brown warm fines		60M1-24 22-24 m		
24	Sulphides from 24 to 25 m Poor recovery				
25	60% calc-silicate (3D0), 20% biotite muscovite schist (1D), 10% sericite schist (1D4), 10% pyrite (2E), blocky, beige slightly warm fines		60M1-26 24-26 m		
26	70% biotite muscovite schist (1D), 15% calc-silicate (3D0). 15% quartz porphyry (10), blocky, beige slightly warm fines				
27	Void space indicated by air exiting casing on backfill.		60M1-28 26-28 m		
28	60% biotite muscovite schist (1D), 20% calc-silicate, 10% quartz, 10% quartz porphyry, blocky, pale brown fines		60M1-24/30 24-30 m		
29			60M1-30 28-30 m		
30					30 m Gas Port Thermistor Bead (inside)

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: aro Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6913518 EASTING: 584420 LOGGED B : Uwe Schmidt			OLE NO: 60M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 7, 2002 DATE AND TIME FINIS ED: Oct 8, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
31	65% biotite muscovite schist-oxidized (1D), 20% calc-silicate (3D0), 10% quartz, 5% quartz sericite schist (1D4), blocky, pale brown fines Void space indicated by air exiting casing on backfill.		60M1-32 30-32 m		
32					
33	75% biotite muscovite schist (1D), 20% calc-silicate (3D0), 5% quartz, blocky > platy, beige fines		60M1-34 32-34 m		
34	50% calc-silicate (3D0), 45% biotite muscovite schist-oxidized (1D), 5% quartz, blocky > platy, pale brown slightly warm fines Void space indicated by air exiting casing on backfill.		60M1-30/36 30-36 m		
35			60M1-36 34-36 m		
36					
37	75% biotite muscovite schist (1D), 20% calc-silicate (3D0), 3% quartz, 2% oxidized fragments, blocky > platy, pale brown slightly warm fines Void space indicated by air exiting casing on backfill.		60M1-38 36-38 m		
38					
39	97% calc-silicate (3D0), 3% quartz, blocky > platy, pale gret-brown slightly warm fines Void space indicated by air exiting casing on backfill.		60M1-40 38-40 m		
40			60M1-36/42 36-42 m		40 m Gas Port Thermistor Bead (inside)

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: aro Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6913518 EASTING: 584420 LOGGED B : Uwe Schmidt			OLE NO: 60M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 7, 2002 DATE AND TIME FINIS ED: Oct 8, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
41	100% calc-silicate (3D0), lots of 1 cm chips, blocky > platy, pale grey slightly warm fines		60M1-42 40-42 m		
	Void space indicated by air exiting casing on backfill.				
42	99% calc-silicate (3D0), 1% quartz, blocky > platy, pale grey brown fines				
43			60M1-44 42-44 m		
44	99% calc-silicate (3D0), 1% quartz, blocky, beige fines				
45			60M1-46 44-46 m		
46	100% calc-silicate (3D0), blocky, beige fines		60M1-42/48 42-48 m		
47			60M1-48 46-48 m		
48	99% calc-silicate (3D0), 1% pale grey muscovite quartz schist, blocky >> platy, pale green grey fines, damp clay at 49 m.				
49			60M1-50 48-50 m		
50					

PRO ECT: Faro ARD Assessment			OLE NO: 60M1		
PRO ECT NO: 1CD003.11			OLE DIAMETER: 6"		
LOCATION: aro Dumps			DATE AND TIME STARTED: Oct 7, 2002		
SURFACE (COLLAR) ELEVATION:			DATE AND TIME FINIS ED: Oct 8, 2002		
NORT ING: 6913518 EASTING: 584420			DRILL CONTRACTOR: Midnight Sun		
LOGGED B : Uwe Schmidt			DRILLING MET OD: Odex, conventional air circulation		

Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations	
	99% calc-silicate (3D0), 1% quartz, blocky, pale grey slightly warm fines		60M1-48/54 48-54 m			
51	Void space indicated by air exiting casing on backfill.					
52	100% calc-silicate (3D0), blocky >> platy, pale grey slightly warm fines					
53			60M1-54/60 54-60 m			
54	90% calc-silicate (3D0), 10% biotite muscovite andalusite schist (1D), blocky > platy, pale grey brown fines					
55						
56	90% calc-silicate (3D0), 10% biotite muscovite andalusite schist, blocky platy, pale green grey fines		60M1-54/60 54-60 m			
57						
58	85% calc-silicate (3D0), 10% biotite muscovite andalusite schist, 5% quartz, blocky > platy, pale grey fines					
59						
60						

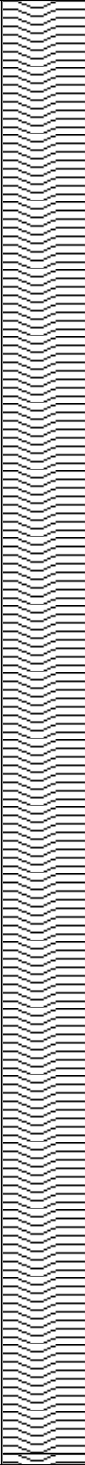
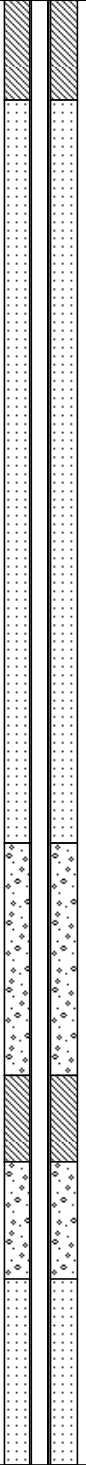


SRK Consulting
Engineers and Scientists

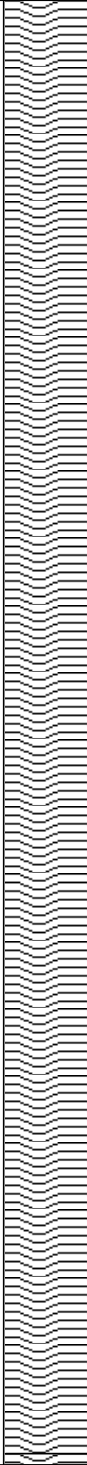
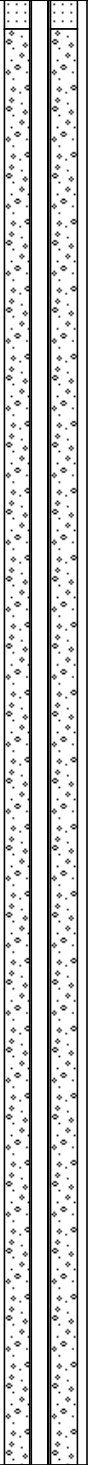
60 m Gas Port
Thermistor Bead
(inside)

Sheet 6 o 6

60 m Gas Port
Thermistor Bead
(inside)

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: aro Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6913288 EASTING: 584712 LOGGED B : Uwe Schmidt OLE NO: 30M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 10, 2002 DATE AND TIME FINIS ED: Oct 10, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation					
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
1	60% calc-silicate (3D0), 35% biotite muscovite schist (1D), 2%quartz sericite schist (1D4), 1% quartz, 2% other, blocky > platy, medium grey brown moist fines (from surface)		30M1-2 0-2 m		0.7m Gas Ports (2) Thermistor Bead (inside)
2					1.4m Gas Ports (2) Thermistor Bead (inside)
3	70% calc-silicate (3D0), 30% biotite muscovite schist (1D), 1% quartz, platy > blocky, pale grey fines		30M1-4 2-4 m		2.8m Gas Ports (2) Thermistor Bead (inside)
4					
5			30M1-0/5 0-5 m 30M1-6 4-6 m		

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Faro Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6913288 EASTING: 584712 LOGGED BY: Uwe Schmidt			OLE NO: 30M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 10, 2002 DATE AND TIME FINISHED: Oct 10, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
6	50% 3DO calc-silicate, 35% 1D biotite muscovite schist, 10% 1D4 quartz sericite schist		30M1-8 6-8 m		5.6m Gas Ports (2) Thermistor Bead (inside)
7					
8			30M1-10 8-10 m		10m Gas Ports (2) Thermistor Bead (inside)
9	60% biotite muscovite schist (1D), 25% calc-silicate (3D0), 5% quartz sericite schist (1D4), 10% quartz, blocky > platy, pale grey fines		30M1-5/10 5-10 m		
10					

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Faro Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6913288 EASTING: 584712 LOGGED BY: Uwe Schmidt OLE NO: 30M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 10, 2002 DATE AND TIME FINISHED: Oct 10, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation					
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
11	85% calc-silicate (3D0), 15% biotite muscovite schist (1D), blocky > platy, pale grey brown fines		30M1-12 10-12 m		
12	70% calc-silicate (3D0), 25% biotite muscovite schist (1D), 5% quartz, blocky > platy, pale grey brown fines				
13			30M1-14 12-14 m		
14					
15			30M1-10/15 10-15 m 30M1-16 14-16 m		

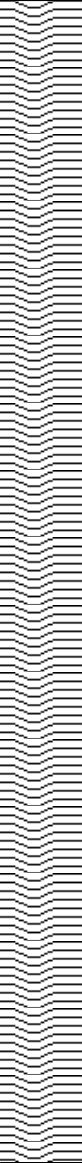
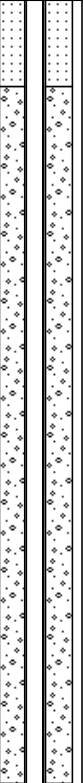
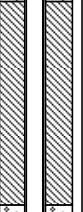
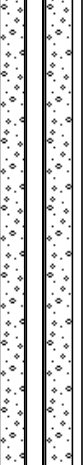
PRO ECT: Faro ARD Assessment			OLE NO: 30M1		
PRO ECT NO: 1CD003.11			OLE DIAMETER: 6"		
LOCATION: aro Dumps			DATE AND TIME STARTED: Oct 10, 2002		
SURFACE (COLLAR) ELEVATION:			DATE AND TIME FINIS ED: Oct 10, 2002		
NORT ING: 6913288 EASTING: 584712			DRILL CONTRACTOR: Midnight Sun		
LOGGED B : Uwe Schmidt			DRILLING MET OD: Odex, conventional air circulation		

Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations	
16	84% calc-silicate (3D0), 15% biotite muscovite schist (1D), 1% quartz, blocky > platy, pale grey brown fines brown horizon at 16 m		30M1-18 16-18 m			
17	84% calc-silicate (3D0), 10% biotite muscovite schist (1D), 1% quartz, 5% pyritic quartzite (2CD), rare pyrite (2E), blocky platy, pale grey brown fines					
18	90% calc-silicate (3D0), 5% biotite muscovite schist (1D), 5% quartz, blocky, pale grey brown fines		30M1-20 18-20 m			
19						
20			30M1-15/20 15-20 m		20m Gas Ports (2) Thermistor Bead (inside)	

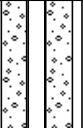
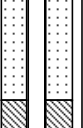
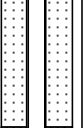
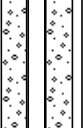
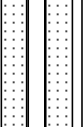
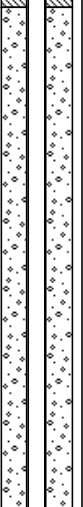


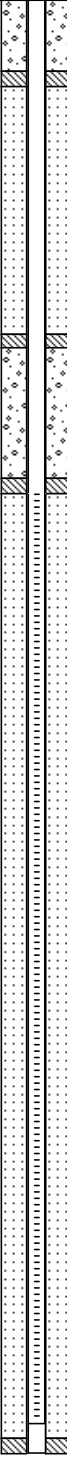
SRK Consulting
Engineers and Scientists

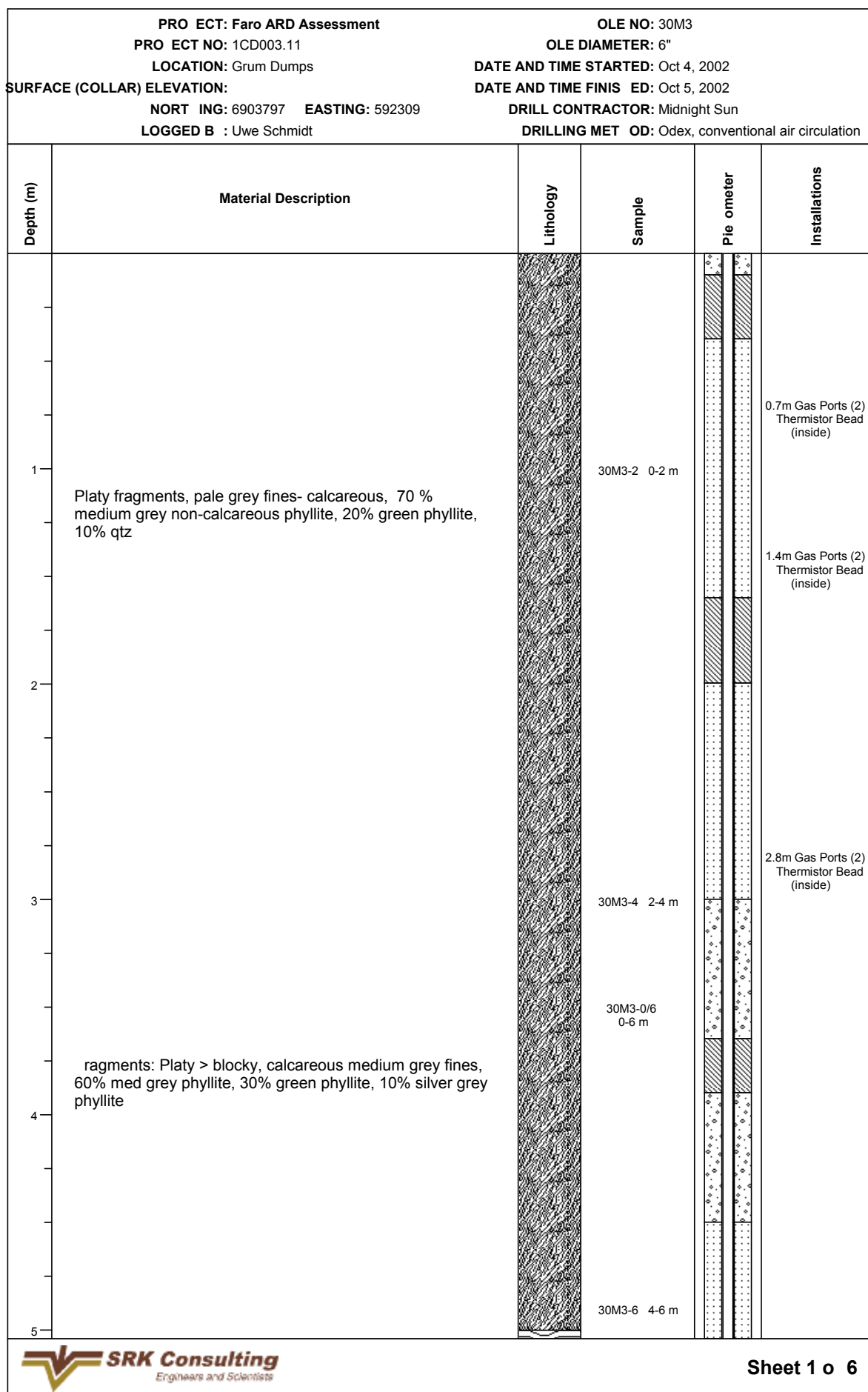
Sheet 4 o 6

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Faro Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6913288 EASTING: 584712 LOGGED BY: Uwe Schmidt					
OLE NO: 30M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 10, 2002 DATE AND TIME FINISHED: Oct 10, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: ODex, conventional air circulation					
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
21	94% calc-silicate (3D0), 5% biotite muscovite schist (1D), 1% quartz porphyry (10), blocky platy, pale grey brown fines		30M1-22 20-22 m		
22	80% calc-silicate (40% pyritic) (3D0), 20% quartz porphyry (10), blocky > platy, pale grey brown fines				
23			30M1-24 22-24 m		
24	ard ground at 24.5 m		30M1-20/25 20-25 m		
25	50% pyrite (2E), 40% 1D () grey schist, 5% pyritic quartzite (2CD), 5% calc-silicate (3D0), rare sphalerite and galena, medium grey brown fines		30M1-26 24-26 m		

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Faro Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6913288 EASTING: 584712 LOGGED BY: Uwe Schmidt			OLE NO: 30M1 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 10, 2002 DATE AND TIME FINISHED: Oct 10, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
26					
27	Brown horizon at 26.5 m 80% biotite muscovite schist (1D), 15% quartz, 5% pyrite (2CD/2E) 20% is red-oxide stained, pale grey brown fines		30M1-28 26-28 m		
28	72% biotite muscovite schist (1D), 10% quartz porphyry (10E), 10% sericite schist (1D4), 5% pyrite (2E), 3% pyritic quartzite (2CD), medium brown fines				
29	Sulphides from 28-29 m Pale grey fines at 30 m		30M1-30 28-30 m		
30			30M1-25/30 25-30 m		30 m Gas Port Thermistor Bead (inside)

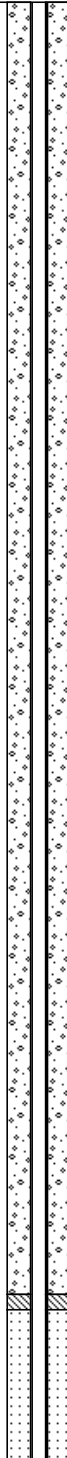
PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6903981 EASTING: 592332 LOGGED B : Uwe Schmidt			OLE NO: 10M2 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 4, 2002 DATE AND TIME FINIS ED: Oct 4, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
1	Non-calcareous grey phyllite, platy > blocky, fines non-calcareous		0-1 m 10M2-1		0.7 m Gas Port Thermistor Bead (inside outside PVC)
			1-2 m 10M2-2		
2			2-3 m 10M2-3		1.4 m Gas Port (2) Thermistor Bead (inside outside PVC)
3			3-4 m 10M2-4		2.8 m Gas Port (2) Thermistor Bead (inside outside PVC)
4			4-5 m 10M2-5		
5			0-5 m 10M2-0/5		

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6903981 EASTING: 592332 LOGGED BY: Uwe Schmidt			OLE NO: 10M2 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 4, 2002 DATE AND TIME FINISHED: Oct 4, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
6	Non-calcareous medium grey phyllite, pale greenish grey phyllite, blocky > platy, fines calcareous		5-6 m 10M2-6		5.6 m Gas Port (2) Thermistor Bead (inside outside PVC)
			6-7 m 10M2-7		
7			7-8 m 10M2-8		
8			8-9 m 10M2-9		
9			9-10 m 10M2-10		10 m Gas Port Thermistor Bead (inside outside PVC)
10			5-10 m 10M2-6/10		



PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6903797 EASTING: 592309 LOGGED B : Uwe Schmidt			OLE NO: 30M3 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 4, 2002 DATE AND TIME FINIS ED: Oct 5, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
6	ragments: blocky platy, pale green grey fines- weakly calcareous, 50% pale greenish grey non-calcareous phyllite, 40% medium grey phyllite, 10% qtz				5.6m Gas Ports (2) Thermistor Bead (inside)
7	ragments with calcareous talcose coating, platy blocky, pale green-grey fines- weakly calcareous, 70% medium grey phyllite, 30% green phyllite		30M3-8 6-8 m		
8					
9	100% darkgrey non-calcareous pyritic graphitic phyllite, platy blocky, dark grey to black graphitic fines- weakly calcareous, fragments coated in graphite		30M3-10 8-10 m		
10			30M3-6/12 6-12 m		10m Gas Ports (2) Thermistor Bead (inside)

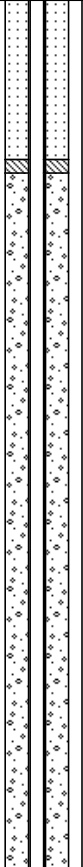
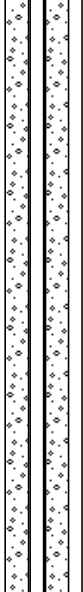
PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6903797 EASTING: 592309 LOGGED B : Uwe Schmidt		OLE NO: 30M3 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 4, 2002 DATE AND TIME FINIS ED: Oct 5, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation			
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
11	Platy blocky, dark gre to black fines- non-calcareous, fragments coated in graphite, 70% dark grey non-calcareous pyritic graphitic phyllite, 25% green phyllite, 5% massive sulphide (po)		30M2-12 10-12 m		
12	Blocky >> platy, pale grey non-calcareous fines, 60% dark grey non-calcareous phyllite, 30% pale green chloritic phyllite, 10% quartz				
13			30M3-14 12-14 m		
14	Blocky fragments, medium grey brown non-calcareous granular fines, 70% dark grey non-calcareous pyritic phyllite, 20% oxidized massive pyrite, 10% quartz sericite schist				
15			30M3-16 14-16 m		

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6903797 EASTING: 592309 LOGGED B : Uwe Schmidt			OLE NO: 30M3 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 4, 2002 DATE AND TIME FINIS ED: Oct 5, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
16	ragments: blocky platy, pale grey brown non-calcareous silty fines, 50% dark grey phyllite, 30% pale grey non-calcareous phyllite, 20% oxidized grey phyllite		30M3-12/18 12-18 m		
17			30M3-18 16-18 m		
18					
19	Platy > blocky, pale green-grey fines- strongly calc, 60% med to silver grey phyllite, 40% pale green phyllite (non-calcareous)		30M3-20 18-20 m		
20					
20m Gas Ports (2) Thermistor Bead (inside)					



SRK Consulting
Engineers and Scientists

Sheet 4 o 6

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6903797 EASTING: 592309 LOGGED B : Uwe Schmidt		OLE NO: 30M3 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 4, 2002 DATE AND TIME FINIS ED: Oct 5, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation			
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
21	ragments: blocky > platy, medium grey moist calcareous fines, coated medium grey pyritic non-calcareous phyllite		30M3-22 20-22 m		
22			30M3-18/24 18-24 m		
23	ragments: blocky > platy, 40% dark grey pyritic phyllite, 30% pale grey phyllite, 25% green phyllite, 5% quartz, medium grey brown non-calcareous fines		30M3-24 22-24 m		
24			30M3-26 24-26 m		
25					

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6903797 EASTING: 592309 LOGGED BY: Uwe Schmidt			OLE NO: 30M3 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 4, 2002 DATE AND TIME FINISHED: Oct 5, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pieometer	Installations
26	fragments: blocky > platy, 50% green phyllite with mariposite, 30% med grey pyritic phyllite, 5% quartz, trace massive pyrite and beige altered phyllite, pale grey non-calcareous fines				
27	fragments: blocky > platy, 30% med grey pyritic phyllite, 30% green phyllite, 10% quartz, 10% silver-grey phyllite, 10% oxidized pyrite, 10% grey brown phyllite, pale grey non-calcareous fines		30M3-28 26-28 m		
28			30M3-24-30 24-30 m		
29	Blocky > platy fragments, 50% dark grey phyllite, 15% silver-grey phyllite, 10% quartz, 10% oxidized pyrite, 15% pale green phyllite		30M3-30 28-30 m		
30					30m Gas Ports (2) Thermistor Bead (inside)

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6903307 EASTING: 592593 LOGGED B : Uwe Schmidt			OLE NO: 10M3 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 6, 2002 DATE AND TIME FINIS ED: Oct 6, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
1	90% med to silver grey phyllite, 10% quartz chips, dark grey fines, non-calcareous		10M3-1 0-1 m		0.7 m Gas Port (2) Thermistor Bead (inside PVC)
	60% med grey phyllite, 35% dark grey to black phyllite, 5% quartz, dark grey fines non-calcareous		10M3-2 1-2 m		
2	60% med silver-grey phyllite, 35% black phyllite, 5% altered chloritic phyllite, dark grey fines non-calcareous, fragments: platy > blocky		10M3-3 2-3 m		1.4 m Gas Port (2) Thermistor Bead (inside PVC)
3	Overburden: 40% dark grey-brown clay balls, 10% rounded pebbles, exotic gneiss fragments, minor phyllite, blocky > platy, dark grey brown fines strongly calc		10M3-4 3-4 m		2.8 m Gas Port (2) Thermistor Bead (inside PVC)
4	70% med silver grey phyllite, 10 % dark grey phyllite, 15% oxidized green grey phyllite, 5% quartz, platy > blocky, pale grey fines strongly calcareous		10M3-5 4-5 m		
			10M3-0/5 m		
5					

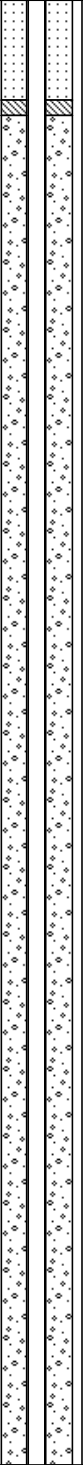
PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Grum Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6903307 EASTING: 592593 LOGGED B : Uwe Schmidt			OLE NO: 10M3 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 6, 2002 DATE AND TIME FINIS ED: Oct 6, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
6	65% med silver grey phyllite, 30% pale green phyllite, 5% quartz, rare pyrite, platy > blocky, pale grey calcareous fines		10M3-6 5-6 m		5.6 m Gas Port (2) Thermistor Bead (inside PVC)
	75% med silver grey phyllite, 20% pale green phyllite, 5% quartz, rare pyrite, pale grey calcareous fines, platy blocky		10M3-7 6-7 m		
7	65% medium silver grey phyllite, 25% pale green oxidized phyllite, 10% quartz, platy blocky, pale grey calcareous fines		10M3-8 7-8 m		
	65% medium grey to silver grey phyllite, 20% pale green oxidized phyllite, 10% black phyllite, 5% quartz, platy blocky, pale grey non-calcareous fines		10M3-9 8-9 m		
	75% medium grey to silver grey phyllite, 15% pale green phyllite, 10% quartz, platy >> blocky, pale grey calcareous fines		10M3-10 9-10 m		10 m Gas Port (2) Thermistor Bead (inside PVC)
			10M3-6/10 5-10 m		
10					

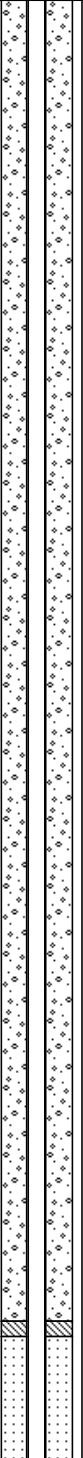
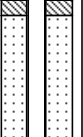
PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Vangorda Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6902706 EASTING: 593745 LOGGED BY: Uwe Schmidt OLE NO: 10M4 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 1, 2002 DATE AND TIME FINISHED: Oct 1, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation					
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
1	35% massive fine grained pyrite (4E), 26% pyritic quartzite (4C), 17% undifferentiated magnetic sulfides (4EC), dark grey to olive green fines, weakly calcareous, 65% > 1 cm, fragments blocky > platy		10M4-1 0-1 m		0.7 m Gas Port and Thermistor Bead (inside PVC)
2	64% massive pyritic sulfides (4E), 36% undifferentiated magnetic sulfides (4EC), dark grey to olive green fines, weakly calcareous, poor chip recovery, 11% > 1 cm, fragments blocky		10M4-2 1-2 m		1.4 m Gas Port and Thermistor Bead (inside PVC)
3	Dark olive brown sulfide fines, noncalcareous, no chips recovered		10M4-3 2-3 m		2.8 m Gas Port and Thermistor Bead (inside PVC)
4	No fines or chips recovered		No sample		
	1 m to 5.2 m: Large voids requiring addition of large volumes of backfill. Sloughing of backfill into voids- may have some bearing on gas sampling.				
5	Dark olive brown sulfide fines, noncalcareous, no chips recovered, no fizz		10M4-0/5 0-4 m		

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Vangorda Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6902706 EASTING: 593745 LOGGED BY: Uwe Schmidt			OLE NO: 10M4 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 1, 2002 DATE AND TIME FINISHED: Oct 1, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
6	36% undifferentiated magnetic sulfides (4EC), 16% massive fine grained pyrite (4E), 16% pyritic quartzite (4C), 16% chloritic phyllite (5D), 16% carbonaceous phyllite (5A0), dark olive brown fines, weakly calcareous, no chips recovered		10M4-6 5-6 m		5.6 m Gas Port and Thermistor Bead (inside PVC)
7	42% undifferentiated magnetic sulfides (4EC), 33% pyritic quartzite (4C), 9% carbonaceous phyllite (5A0), 7% noncalcareous phyllite (3G0), 4% bleached phyllite (4L0), 5% quartz, medium olive brown fines, noncalcareous, 25% > 1 cm, fragments blocky > platy		10M4-7 6-7 m		
8	42% pyritic quartzite (4C), 34% undifferentiated magnetic sulfides (4EC), 10% massive fine grained pyrite (4E), 9% noncalcareous phyllite (3G0), 4% bleached phyllite (4L0), 1% quartz, medium olive brown fines, noncalcareous, 81% > 1 cm, fragments blocky > platy		10M4-8 7-8 m		
9	46% pyritic quartzite (4C), 16% noncalcareous phyllite (3G0), 16% carbonaceous phyllite (5A0), 13% massive fine grained pyrite (4E), 7% undifferentiated magnetic sulfides (4EC), 2% quartz, dark olive brown fines, noncalcareous, 45% > 1 cm, fragments blocky > platy		10M4-9 8-9 m		
10	No fines or chips recovered		10M4-6/10 5-9 m		10 m Gas Port and Thermistor Bead (inside PVC)

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Vangorda Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6902555 EASTING: 593818 LOGGED BY: Uwe Schmidt			OLE NO: 30M4 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 2, 2002 DATE AND TIME FINISHED: Oct 2, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
1	38% pyritic quartzite (4C), 20% noncalcareous phyllite (3G0), 18% chloritic phyllite (5D), 11% pyritic massive sulfides (4E), 7% quartz, 6% undifferentiated magnetic sulfides, pale grey noncalcareous fines, fragments platy blocky, 71% > 1 cm		30M4-2 0-2 m		0.7m Gas Ports (2) Thermistor Bead (inside) 1.4m Gas Ports (2) Thermistor Bead (inside)
2	67% noncalcareous phyllite (3G0), 17% chloritic phyllite (5D), 16% quartz, pale grey noncalcareous fines, fragments platy > blocky		30M4-4 2-4 m		2.8 m Gas Port and Thermistor Bead
3	62% noncalcareous phyllite (3G0), 28% chloritic phyllite (5D), 10% quartz, pale yellow brown noncalcareous fines, fragments platy > blocky		30M4-0/6 0-6 m		
4			30M4-6 4-6 m		
5					

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Vangorda Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6902555 EASTING: 593818 LOGGED BY: Uwe Schmidt			OLE NO: 30M4 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 2, 2002 DATE AND TIME FINISHED: Oct 2, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
6	37% noncalcareous phyllite (3G0), 33% chloritic phyllite (5D), 10% pyritic massive sulphides (4E), 10% undifferentiated magnetic sulphides, 10% quartz, pale yellow brown noncalcareous fines, fragments platy > blocky		30M4-8 6-8 m		5.6m Gas Ports (2) Thermistor Bead (inside)
7					
8	92% noncalcareous phyllite (3G0), 5% chloritic phyllite (5D), 3% quartz, pale green grey noncalcareous fines, fragments platy > blocky		30M4-6/12 6-12 m		
9			30M4-10 8-10 m		
10					10m Gas Ports (2) Thermistor Bead (inside)

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Vangorda Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6902555 EASTING: 593818 LOGGED B : Uwe Schmidt					
OLE NO: 30M4 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 2, 2002 DATE AND TIME FINIS ED: Oct 2, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation					
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
11	100% noncalcareous phyllite (3G0), pale grey noncalcareous fines, fragments platy		30M4-12 10-12 m		
12	73% silver to dark grey calcareous phyllite (5B0), 18% carbonaceous phyllite (5A0), 8% quartz, 1% pyritic quartzite (4C), charcoal grey moderately calcareous fines, fragments platy blocky		30M4-14 12-14 m		
13	56% grey calcareous phyllite (5B0), 22% carbonaceous phyllite (5A0), 21% chloritic phyllite (5D), 1% quartz, pale green grey noncalcareous fines, fragments platy > blocky		30M4-16 14-16 m		
14					
15					

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Vangorda Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6902555 EASTING: 593818 LOGGED B : Uwe Schmidt			OLE NO: 30M4 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 2, 2002 DATE AND TIME FINIS ED: Oct 2, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
16	74% noncalcareous phyllite (3G0), 26% quartz, pale grey noncalcareous fines, fragments platy > blocky		30M4-12/18 12-18 m		
17			30M4-18 16-18 m		
18	62% noncalcareous phyllite (3G0), 35% granitic (10E), 3% quartz, pale grey noncalcareous fines, fragments platy blocky				
19			30M4-20 18-20 m		
20					20m Gas Port Thermistor Bead (inside)

PRO ECT: Faro ARD Assessment PRO ECT NO: 1CD003.11 LOCATION: Vangorda Dumps SURFACE (COLLAR) ELEVATION: NORT ING: 6902555 EASTING: 593818 LOGGED B : Uwe Schmidt		OLE NO: 30M4 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 2, 2002 DATE AND TIME FINIS ED: Oct 2, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING MET OD: Odex, conventional air circulation			
Depth (m)	Material Description	Lithology	Sample	Pie o meter	Installations
21	49% granitic (10E), 24% chloritic phyllite (5D), 18% undifferentiated magnetic sulfides (4EC), 9% pyritic massive sulfides (4E), medium grey noncalcareous fines, fragments platy blocky		30M4-22 20-22 m		
			30M4-18/24 18-24 m		
22	43% granitic (10E), 26% chloritic phyllite (5D), 13% pyritic quartzite (4C), 8% carbonaceous phyllite (5A0), 7% undifferentiated magnetic sulfides (4EC), 3% quartz, 2% pyritic massive sulfides (4E), pale green grey noncalcareous fines, fragments platy blocky				
23			30M4-24 22-24 m		
24	35% granitic (10E), 29% chloritic phyllite (5D), 12% pyritic massive sulfides (4E), 8% carbonaceous phyllite (5A0), 8% undifferentiated magnetic sulfides (4EC), 8% quartz, pale green brown noncalcareous fines, fragments platy blocky				
25			30M4-26 24-26 m		

PROJECT: Faro ARD Assessment PROJECT NO: 1CD003.11 LOCATION: Vangorda Dumps SURFACE (COLLAR) ELEVATION: NORTHING: 6902555 EASTING: 593818 LOGGED BY: Uwe Schmidt			OLE NO: 30M4 OLE DIAMETER: 6" DATE AND TIME STARTED: Oct 2, 2002 DATE AND TIME FINISHED: Oct 2, 2002 DRILL CONTRACTOR: Midnight Sun DRILLING METHOD: OD: Odex, conventional air circulation		
Depth (m)	Material Description	Lithology	Sample	Piezometer	Installations
26	49% carbonaceous phyllite (5A0), 21% non-calcareous phyllite (3G0), 12% undifferentiated magnetic sulphides (4EC), 9% chloritic phyllite (5D), 6% pyritic quartzite (4C), 3% quartz, medium grey noncalcareous fines, fragments platy > blocky contains 3 fragments of oxidized sulphides		30M4-28 26-28 m		
27			30M4-24/30 24-30 m		
28	56% granitic (10E), 22% undifferentiated magnetic sulphides, 13% noncalcareous phyllite (3G0), 9% carbonaceous phyllite (5A0), pale grey noncalcareous fines, fragments platy blocky 28.5 to 30 m depth: poor sample recovery, indicating void space adjacent to drill column.		30M4-30 28-30 m		
29					
30					30m Gas Port Thermistor Bead (inside)

Appendix F.3
Results of Thermal and Gas Monitoring
for SRK Drill Holes

C.3 Results of Thermal and Gas Monitoring

Appendix C-1 Gas Monitoring Results

Location: Faro
Hole ID: 60M1

Date		19-Feb-03	07-Jun-03	16-Sep-03
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	19.6	17.1	18.9
0.7	0.7B	19.6	16.9	18.9
1.4	1.4A	19.7	17.1	19.1
1.4	1.4B	19.7	17.5	19.1
2.8	2.8A	18.5	15.7	15.3
2.8	2.8B	18.5	15.7	15.0
5.6	5.6A	14.9	15.7	13.4
5.6	5.6B	15.6	15.5	13.2
10	10B	17.0	12.2	11.1
10	20	16.8	12.2	11.1
20	10A	10.0	5.5	5.8
30	30	20.9	9.5	8.4
40	40	19.8	19.8	19.0
60	60	19.8	19.4	17.6

Note : Port 20 and Port 10 A labels reversed

Location: Faro
Hole ID: 30M1

Date		19-Feb-03	07-Jun-03	16-Sep-03
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	19.4	16.6	16.8
0.7	0.7B	19.4	16.6	16.8
1.4	1.4A	19.3	16.6	16.7
1.4	1.4B	19.3	16.6	16.8
2.8	2.8A	19.3	16.6	16.8
2.8	2.8B	19.3	16.6	16.8
5.6	5.6A	19.7	17.0	17.6
5.6	5.6B	19.7	17.0	17.6
10	10A	19.4	16.1	17.6
10	10B	19.4	16.1	17.7
20	20	20.2	16.1	19.7
30	30	12.9	7.4	12.7

Location: Grum
Hole ID: 10M2

Date		20-Feb-03	07-Jun-03	16-Sep-03
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7	20.6	20.1	20.6
1.4	1.4A	14.8	10.0	10.2
1.4	1.4B	10.0	8.8	9.8
2.8	2.8A	0.6	14.7	2.5
2.8	2.8B	3.4	11.6	2.5
5.6	5.6A	1.0	10.9	12.7
5.6	5.6B	1.0	11.1	12.7
10	10	1.3	15.1	12.3

Location: Grum
Hole ID: 10M3

Date		20-Feb-03	07-Jun-03	16-Sep-03
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	20.6	20.6	20.5
0.7	0.7B	20.6	20.6	20.5
1.4	1.4A	19.0	18.9	20.1
1.4	1.4B	18.9	18.7	20.1
2.8	2.8A	16.3	16.0	13.7
2.8	2.8B	15.9	16.0	13.7
5.6	5.6A	13.7	15.0	14.6
5.6	5.6B	13.7	15.0	14.6
10	10A	16.0	13.5	14.5
10	10B	16.0	14.1	14.5

Location: Grum
Hole: 30M3

Date		20-Feb-03	07-Jun-03	16-Sep-03
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	18.4	20.7	20.5
0.7	0.7B	18.4	20.7	20.5
1.4	1.4A	19.1	20.8	20.5
1.4	1.4B	19.0	20.6	20.4
2.8	2.8A	17.5	20.5	19.8
2.8	2.8B	17.5	20.5	19.8
5.6	5.6A	15.6	20.5	19.3
5.6	5.6B	15.5	20.5	19.3
10	10A	5.7	15.6	5.4
10	10B	5.5	15.9	5.4
20	20A	4.9	4.0	0.0
20	20B	4.9	3.7	0.0
30	30A	3.7	0.6	0.4
30	30B	3.8	0.6	0.4

Location: Vangorda
Hole ID: 10M4

Date		20-Feb-03	07-Jun-03	16-Sep-03
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7	20.6	18.6	19.6
1.4	1.4	20.9	20.3	20.6
2.8	2.8A	21.0	20.7	20.8
2.8	2.8B	21.0	20.7	20.8
5.6	5.6A	20.8	20.6	20.0
5.6	5.6B	20.8	20.7	20.0
10	10	20.2	19.3	19.3

Location: Vangorda
Hole ID: 30M4

Date		20-Feb-03	07-Jun-03	16-Sep-03
Depth	Port Label	Oxygen (%)	Oxygen (%)	Oxygen (%)
0.7	0.7A	0.0	19.9	0.8
0.7	0.7B	0.0	20.0	1.1
1.4	1.4A	0.0	17.4	0.0
1.4	1.4B	0.0	17.6	0.0
2.8	2.8A	0.0	0.0	0.0
2.8	2.8B	2.4	15.4	2.3
5.6	5.6A	2.4	2.8	2.3
5.6	5.6B	2.3	1.0	2.3
10	10A	2.3	6.9	2.2
10	10B	8.3	6.9	6.4
20	20	0.2	0.0	0.0
30	30	14.9	0.4	4.4

Appendix C-2 Thermal Monitoring Results

Location: Faro
Hole ID: 60M1

Date		20-Feb-03		07-Jun-03		16-Sep-03	
Bead	Correction factor	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)
0.7	0.0	3.2	3.2	13.5	13.5	9.4	9.4
1.4	-0.1	7.8	7.8	14.2	14.2	15.5	15.5
2.8	0.1	17.0	17.0	18.7	18.7	23.1	23.1
5.6	0.0	29.2	29.2	28.1	28.1	30.7	30.7
10	-0.1	41.7	41.7	41.2	41.2	40.5	40.5
20	0.1	49.2	49.2	49.1	49.1	48.9	48.9
30	-0.1	35.9	35.9	36.2	36.2	36.3	36.3
40	-0.1	24.1	24.1	24.5	24.5	24.8	24.8
60	-0.1	6.2	6.2	6.4	6.4	6.9	6.9

Location: Faro
Hole ID: 30M1

Date		20-Feb-03		07-Jun-03		16-Sep-03	
Bead	Correction factor	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)
0.7	0.1	1.8	1.8	7.5	7.5	11.3	11.3
1.4	-0.1	3.9	3.9	7.1	7.1	12.8	12.8
2.8	0.1	8.6	8.6	8.6	8.6	14.6	14.6
5.6	0.1	17.4	17.4	16.9	16.9	18.7	18.7
10	-0.1	26.9	26.9	27.3	27.3	27.3	27.3
20	0.2	34.7	34.7	35.7	35.7	36.0	36.0
30	0.0	34.6	34.6	34.2	34.2	34.7	34.7

Location: Grum
Hole ID: 10M2

Date		20-Feb-03		07-Jun-03		16-Sep-03	
Bead	Correction factor	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)
0.7	0.1	-4.7	-4.7	5.1	5.1	4.2	4.2
1.4	0.2	0.0	0.0	0.0	0.0	6.8	6.8
2.8	0.2	1.4	1.4	0.5	0.5	6.4	6.4
5.6	0.0	3.0	3.0	2.0	2.0	3.9	3.9
10	0.1	3.4	3.4	3.2	3.2	3.0	3.0

Location: Grum

Hole ID: 10M2

Date		20-Feb-03		07-Jun-03		16-Sep-03	
Bead	Correction factor	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)
0.7	0.1	-3.2	-3.2	3.8	3.8	5.0	5.0
1.4	0.2	-0.1	-0.1	-0.2	-0.2	6.8	6.8
2.8	0.2	1.4	1.4	0.5	0.5	6.2	6.2
5.6	0.0	3.1	3.1	2.0	2.0	3.8	3.8
10	0.1	3.5	3.5	3.2	3.2	3.1	3.1

Location: Grum

Hole ID: 10M3

Date		20-Feb-03		07-Jun-03		16-Sep-03	
Bead	Correction factor	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)
0.7	0.2	-4.7	-4.7	6.3	6.3	6.7	6.7
1.4	0.2	-1.7	-1.7	2.3	2.3	8.1	8.1
2.8	0.2	1.3	1.3	0.2	0.2	7.0	7.0
5.6	0.0	3.8	3.8	2.2	2.2	4.8	4.8
10	0.1	5.1	5.1	4.7	4.7	4.4	4.4

Location: Grum

Hole ID: 30M3

Date		20-Feb-03		07-Jun-03		16-Sep-03	
Bead	Correction factor	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)
0.7	-0.1	-4.7	-4.7	5.1	5.1	6.9	6.9
1.4	0.0	-1.4	-1.4	1.8	1.8	8.0	8.0
2.8	0.1	2.1	2.1	1.1	1.1	7.6	7.6
5.6	-0.1	6.0	6.0	4.6	4.6	6.8	6.8
10	0.1	9.9	9.9	9.5	9.5	9.7	9.7
20	0.1	11.9	11.9	12.1	12.1	11.9	11.9
30	0.1	10.1	10.1	10.0	10.0	9.9	9.9

Location: Vangorda
Hole ID: 10M4

Date		20-Feb-03		07-Jun-03		16-Sep-03	
Bead	Correction factor	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)
0.7	0.1	-0.6	-0.6	13.1	13.1	10.3	10.3
1.4	0.0	3.7	3.7	12.9	12.9	15.3	15.3
2.8	0.2	7.7	7.7	12.9	12.9	18.6	18.6
5.6	-0.1	16.6	16.6	15.1	15.1	22.5	22.5
10	0.0	31.6	31.6	29.3	29.3	29.5	29.5

Location: Vangorda
Hole ID: 30M4

Date		20-Feb-03		07-Jun-03		16-Sep-03	
Bead	Correction factor	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)	Measured Temp (°C)	Corrected Temp (°C)
0.7	-0.1	-5.4	-5.4	8.5	8.5	7.3	7.3
1.4	0.0	-1.3	-1.3	6.0	6.0	10.3	10.3
2.8	0.0	3.7	3.7	4.5	4.5	11.7	11.7
5.6	-0.1	11.6	11.6	9.8	9.8	12.4	12.4
10	-0.1	15.9	15.9	15.9	15.9	15.5	15.5
20	-0.2	17.1	17.1	17.4	17.4	17.4	17.4
30	0.0	13.5	13.5	13.8	13.8	13.8	13.8

Appendix F.4
Results of Static Geochemical Testing
on SRK Drill Hole Samples

Client: SRK Consulting

Project: Faro

CEMI Project: 0248

Test: Rinse Measurements on -2mm Fraction Total Sulphur

Assay on hole Sample

Date: December 10 2002

	Sample ID	Rinse (-2mm fraction)		S(T)
		p	Conductivity (uS/cm)	
1	10M2-1 0-1 m D	7.7	1720	0.59
2	10M2-10 9-10 m D	7.8	1060	0.15
3	10M2-2 1-2 m D	7.8	1240	0.16
4	10M2-3 2-3 m D	7.9	1000	0.24
5	10M2-4 3-4 m D	7.8	690	0.51
6	10M2-5 4-5 m D	7.9	1130	0.3
7	10M2-6 5-6 m D	8.1	1450	0.23
8	10M2-7 6-7 m D	8.2	1360	0.3
9	10M2-8 7-8 m D	8.4	740	0.13
10	10M2-9 8-9 m D	8.2	890	0.09
11	10M3-1 0-1 m D	7.8	900	0.53
12	10M3-10 9-10 m D	8.3	580	0.24
13	10M3-2 1-2 m D	8.2	600	0.57
14	10M3-3 2-3 m D	8.2	570	0.54
15	10M3-4 3-4 m D	7.8	1670	0.2
16	10M3-5 4-5 m D	8.0	730	0.23
17	10M3-6 5-6 m D	8.1	420	0.26
18	10M3-7 6-7 m D	8.0	630	0.28
19	10M3-8 7-8 m D	8.1	400	0.25
20	10M3-9 8-9 m D	8.2	450	0.31
21	10M4-1 0-1 m D	7.4	2400	18.4
22	10M4-2 1-2 m D	6.2	2200	21.2
23	10M4-3 2-3 m D	5.7	2650	20.4
24	10M4-5 3-4 m D	6.1	2400	18.5
25	10M4-6 5-6 m D	6.2	2550	18.7
26	10M4-7 6-7 m D	6.3	2400	16.5
27	10M4-8 7-8 m D	6.5	3150	16.3
28	10M4-9 8-9 m D	6.4	4050	16.8
29	30M1-10 8-10 m D	7.5	1600	0.89
30	30M1-12 10-12 m D	7.7	1450	0.4
31	30M1-14 12-14 m D	8.0	1300	0.54
32	30M1-16 14-16 m D	7.9	2150	0.72
33	30M1-18 16-18 m D	7.7	2500	2.45
34	30M1-2 0-2 m D	8.1	2100	0.98
35	30M1-20 18-20 m D	7.7	2300	1.53
36	30M1-22 20-22 m D	7.7	2500	1.04
37	30M1-24 22-24 m D	8.2	1300	0.46
38	30M1-26 24-26 m D	6.6	2750	13.5
39	30M1-28 26-28 m D	5.1	2750	6.08
40	30M1-30 28-30 m D	4.0	4000	9.94
41	30M1-4 2-4 m D	7.4	1850	0.65
42	30M1-6 4-6 m D	7.9	1500	0.59
43	30M1-8 6-8 m D	7.9	1800	0.37
44	30M3-12 10-12 m D	8.0	1500	2.88
45	30M3-10 8-10 m D	8.0	1600	3.1
46	30M3-14 12-14 m D	7.8	1490	4.68
47	30M3-16 14-16 m D	3.4	5950	11.7

	Sample ID	Rinse (-2mm raction)		S(T)
		p	Conductivity (uS/cm)	
48	30M3-18 16-18 m D	5.5	3200	2.23
49	30M3-2 0-2 m D	7.1	580	0.59
50	30M3-20 18-20 m D	6.7	2700	3.45
51	30M3-22 20-22 m D	6.7	2200	7.33
52	30M3-24 22-24 m D	6.8	1380	3.45
53	30M3-26 24-26 m D	6.8	1300	2.55
54	30M3-28 26-28 m D	6.8	2550	5.14
55	30M3-30 28-30 m D	7.7	3150	2.87
56	30M3-4 2-4 m D	8.1	1100	3.27
57	30M3-6 4-6 m D	7.9	1490	0.95
58	30M3-8 6-8 m D	8.0	1000	1.07
59	30M4-10 8-10 m D	5.1	3350	1.91
60	30M4-12 10-12 m D	5.8	3800	1.16
61	30M4-12/16 12-18 D	7.8	2000	1.56
62	30M4-14 12-14 m D	7.6	1590	1.63
63	30M4-16 14-16 m D	7.2	1900	1.59
64	30M4-18 16-18 m D	7.2	1900	1.13
65	30M4-2 0-2 m D	6.5	2700	12
66	30M4-20 18-20 m D	6.9	1400	1.14
67	30M4-22 20-22 m D	6.6	2000	7.02
68	30M4-24 22-24 m D	6.4	2150	5.53
69	30M4-26 24-26 m D	6.7	2250	2.18
70	30M4-28 26-28 m D	4.3	3150	2.57
71	30M4-30 28-30 m D	5.4	1650	2.35
72	30M4-4 2-4 m D	5.0	2950	2.96
73	30M4-6 4-6 m D	4.3	3850	2.94
74	30M4-8 6-8 m D	5.0	4550	5.7
75	60M1-10 8-10 m D	6.3	3100	2.89
76	60M1-12 10-12 m D	5.2	2800	1.24
77	60M1-14 12-14 m D	5.0	3750	14.3
78	60M1-16 14-16 m D	2.9	9000	5.92
79	60M1-18 16-18 m D	5.6	4600	6.3
80	60M1-2 0-2 m D	6.3	1400	2.25
81	60M1-20 18-20 m D	7.7	2450	0.43
82	60M1-22 20-22 m D	7.5	2800	0.82
83	60M1-24 22-24 m D	3.8	7200	17.1
84	60M1-26 24-26 m D	5.5	3600	3.96
85	60M1-28 26-28 m D	6.0	2050	0.37
86	60M1-30 28-30 m D	6.1	2000	0.51
87	60M1-32 30-32 m D	6.7	2200	0.38
88	60M1-34 32-34 m D	6.7	2000	0.44
89	60M1-36 34-36 m D	6.7	2300	0.37
90	60M1-38 36-38 m D	6.7	2300	0.62
91	60M1-4 2-4 m D	5.5	3850	7.35
92	60M1-40 38-40 m D	7.1	1380	0.75
93	60M1-42 40-42 m D	7.4	1050	0.51
94	60M1-44 42-44 m D	7.3	1750	0.41
95	60M1-46 44-46 m D	7.3	1800	0.46
96	60M1-48 46-48 m D	7.4	1750	0.38
97	60M1-50 48-50 m D	7.6	1300	0.22
98	60M1-6 4-6 m D	4.4	5250	9.11
99	60M1-6/12 6-12 m D	6.7	3300	3.33
100	60M1-8 6-8 m D	6.8	3800	4.31

APPENDIX G
Detailed Description of Seep Sampling Results

DRAFT MEMORANDUM

DATE: November 7, 2003

TO: File

FROM: Dylan MacGregor, Kelly Sexsmith

RE: **2002/2003 Seepage Surveys**

1. INTRODUCTION

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

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

2. METHODS

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

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

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

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

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

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

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

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

3. RESULTS

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

4. DISCUSSION

4.1 Faro Waste Rock Dumps

4.1.1 Water Types

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

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

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

TABLE 1
Characteristics of Faro Water Types

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

Notes:

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

TABLE 2
Seepage Stations Classified by Water Type

ID	Type 1 (pH >7, Zn <5 mg/L) Location		Type 2 (pH 6 – 7, Zn concentrations ranging from 4 to 595 mg/L) Location		Type 3 (pH <6, Zn typically >40mg/L) ID Location	
	ID	Location	ID	Location	ID	Location
SRK-FD02	SRK-FD01	Upper Parking Lot Dump	SRK-FD01	Ore and Low Grade Ore Stockpiles	SRK-FD04	Oxide Fines Stockpile
SRK-FD05	SRK-FD08	Toe of Northeast Dump	SRK-FD08	East Main Dump	SRK-FD13	Intermediate Dump
SRK-FD06	SRK-FD09	Toe of Northeast Dump	SRK-FD09	Ore and Low Grade Ore Stockpiles;	SRK-FD20	Faro Creek Diversion
SRK-FD07	SRK-FD10	Toe of Northeast Dump	SRK-FD10	West Main Dump	SRK-FD21	Northeast Dumps towards Pit
SRK-FD14	SRK-FD12	Ranch Zone Dump	SRK-FD12	Ore and Low Grade Ore Stockpiles;	SRK-FD22 (Sept/02 only)	Northeast Dumps towards Pit
SRK-FD16	SRK-FD14 (June/03 only)	Upper Northwest Dump	SRK-FD14 (June/03 only)	West Main Dump	SRK-FD23 (Sept/02 only)	Northeast Dumps towards Pit
SRK-FD17	SRK-FD19	Upper Northwest Dump	SRK-FD19	Ranch Zone Dump	SRK-FD24 (Sept/02 only)	Northeast Dumps towards Pit
SRK-FD18	SRK-FD21 (June/02 and June/03 only)	Upper Northwest Dump	SRK-FD21 (June/02 and June/03 only)	Lower Northwest Dump	SRK-FD27 (Sept/02 only)	Northeast Dumps towards Pit
SRK-FD26	SRK-FD22 (June/03 only)	Northeast Dumps towards Pit	SRK-FD22 (June/03 only)	Northeast Dumps towards Pit	SRK-FD33	Mill
	SRK-FD23 (June/02 and June/03 only)		SRK-FD23 (June/02 and June/03 only)	Northeast Dumps towards Pit	SRK-FD34	Mill
	SRK-FD24 (June/02, June and Sept/03 only)		SRK-FD24 (June/02, June and Sept/03 only)	Northeast Dumps towards Pit	SRK-FD36	West Main Dump
	SRK-FD27 (June/02 and June/03 only)		SRK-FD27 (June/02 and June/03 only)	Northeast Dumps towards Pit	SRK-FD37	Medium Grade Stockpile
	SRK-FD30		SRK-FD30	West Main Dump	SRK-FD38 (June/03 only)	Ore and Low Grade Ore Stockpiles
	SRK-FD31		SRK-FD31	Ore and Low Grade Ore Stockpiles,	SRK-FD40	Faro Valley Dump
	SRK-FD32		SRK-FD32	West Main Dump	SRK-FD46	Oxide Fines Stockpile, Mill
	SRK-FD35		SRK-FD35	Mill		
	SRK-FD38 (Sept/02 only)		SRK-FD38 (Sept/02 only)	Ore and Low Grade Ore Stockpiles		
	SRK-FD40 (Sept/03 only)		SRK-FD40 (Sept/03 only)	Faro Valley Dump		
	SRK-FD44		SRK-FD44	Intermediate Dump		

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

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

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

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

4.1.2 Initial Review of Historical Data

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

Station X23

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

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

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

Stations A30

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

Station W5

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

4.2 Grum Waste Rock Dumps

4.2.1 Water Types

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

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

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

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

TABLE 3
Characteristics of Grum Water Types

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

Notes:

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

2) Refer to Figure 2 for quantities of each type of water identified during each sampling round.

4.2.2 Initial Review of Historical Data

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

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

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

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

4.3 Vangorda Waste Rock Dumps

4.3.1 Water Types

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

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

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

TABLE 4
Characteristics of the Vangorda Water Types

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

Notes:

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

4.3.1 Initial Review of Historical Data

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

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

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

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

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

4.4 Grum Pit Seepage

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

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

4.5 Vangorda Creek Valley Seepage

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

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

TABLE 5
Summary of Grum Pit Seepage Water Quality

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

Notes:

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

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

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

5. CONCLUSIONS

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

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

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

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

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

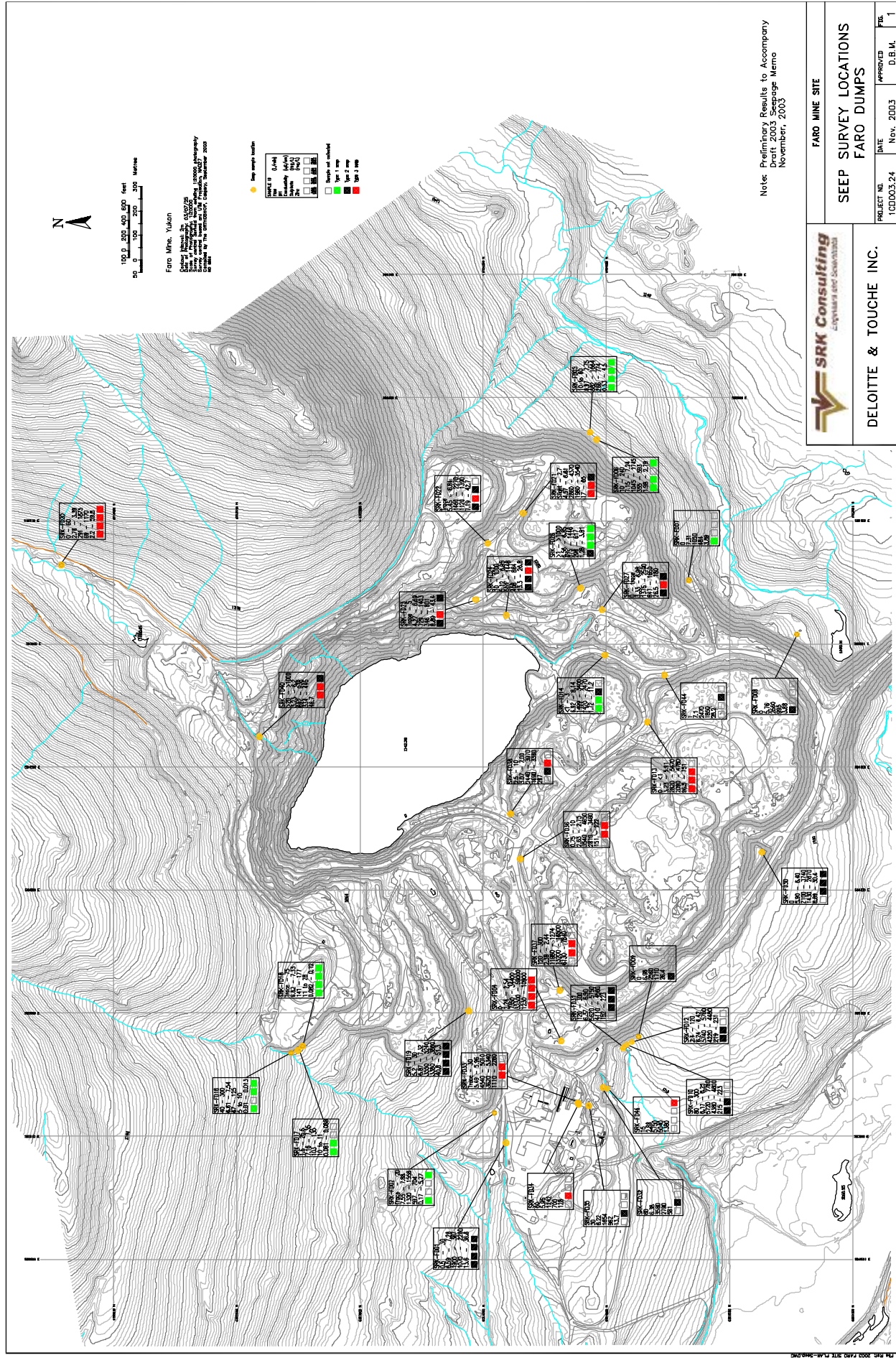
REFERENCES

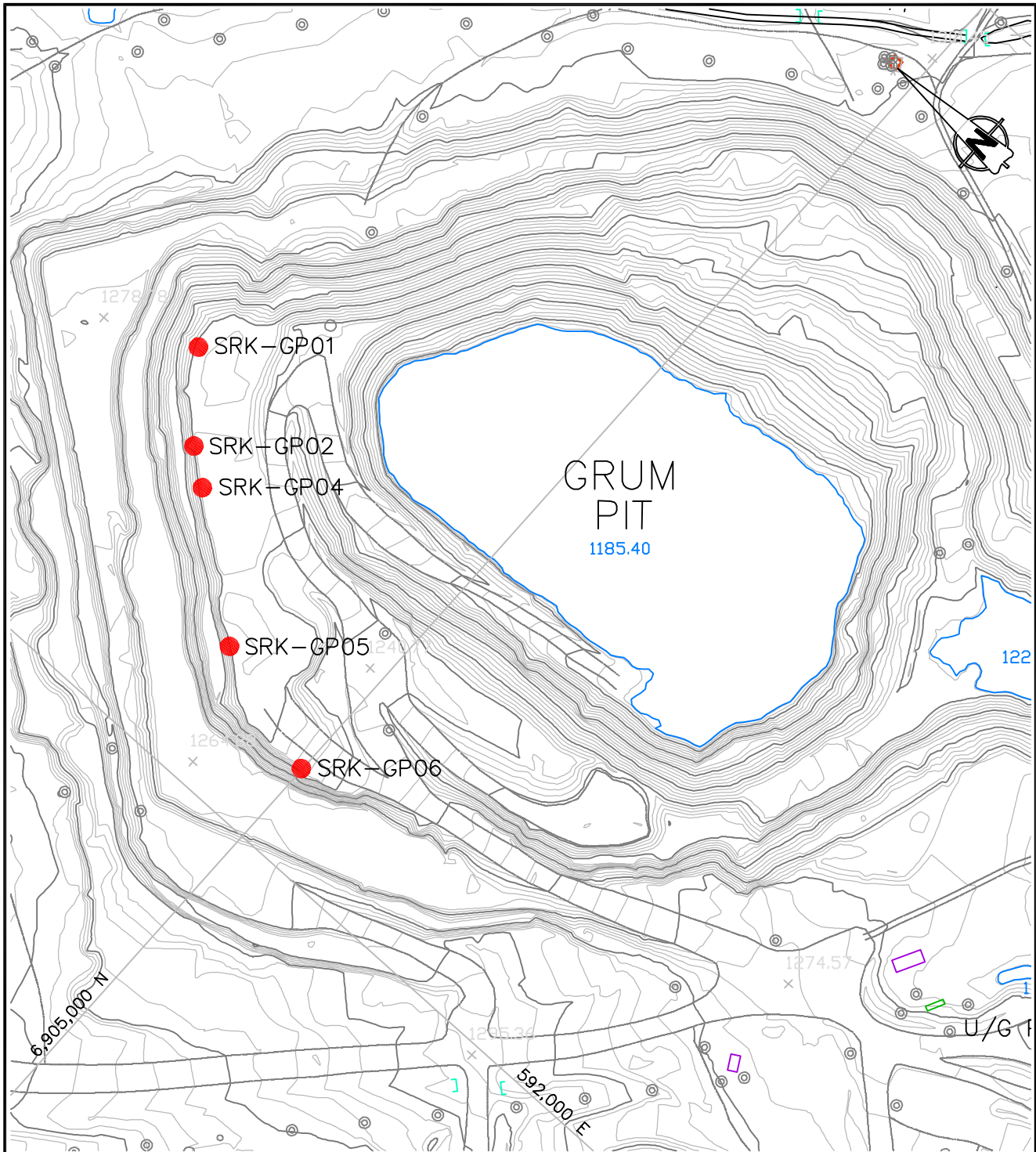
Environment Canada. 2003. "Grum Seeps", September 5, 2003 email memo from Vic Enns (Environment Canada) to Daryl Hockley and Cam Scott, SRK.

Gartner Lee Ltd. 2002. Baseline Studies Report.

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

FIGURES





Faro Mine, Yukon

Map Scale: 1:5000
 Contour Interval: 2m
 Date of Photography: 03/07/25
 Scale of Photography: 1:20000
 Survey control derived from existing 1:20000 photography
 Survey control based on: UTM Projection, NAD27
 Compiled by The ORTHOSHOP, Calgary, September 2003
 NO SALE

0 50 100 150 200 250 metres
 1: 5000

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



DELOITTE & TOUCHE INC.

VANGORDA PLATEAU MINE

SEEP SURVEY LOCATIONS
 GRUM PIT

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

ATTACHMENT A

Seep Survey Results

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

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

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

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

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

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

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

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

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

Sample ID	FARO DUMP										GRUM DUMP	
	SRK-FD37	SRK-FD37	SRK-FD38	SRK-FD38B	SRK-FD40	SRK-FD40	SRK-FD40 (A30)	SRK-FD44	SRK-FD46	SRK-GD01		
Label Sample ID	SRK-FD37		SRK-FD38			10	SRK-FD40		19			
Date	11-Sep-02	8-Jun-03	12-Sep-02	8-Jun-03	6-Jun-03	12-Sep-03	13-Sep-02	8-Jun-03	13-Sep-03	11-Jun-02		
Label Date	09/11/2002		09/12/2002				09/13/2002					
Time	10:40		16:55				8:45			10:10		
Field Parameters												
pH		2.44	2.38	7	3.07	3.35	6.2	3.23	7.1	2.88	6.69	
Conductivity	μS/cm	12740	11980	3970	2440	789	692	938	2470	5750	2170	
Redox	mV	438	663	313	689	738	494	540	621	652	272	
Temp	°C	10.1	7.8	8.6	6.8	1.4	3.1	4.9	7.7	5.6	1.8	
Flow	L/min	300	120	2.5	10	Abundant	120	>1000	1	15	100	
Notes												
Easting		583591		584310				na				
Northing		6914218		6914389				na				
Photo		yes		yes (x2)								
Laboratory Parameters												
pH		2.66	2.59	6.83	3.21	3.5	7.24	3.52	6.84	2.8	7.66	
Conductivity	μS/cm	12700	10300	3830	2240	780	676	877	2290	5670	2080	
Dissolved Anions												
Acidity pH 8.3	mg/L	12500	10900	792	740	117	43	135	99	6550	38	
Alkalinity Total as CaCO3	mg/L	-1	-1	83	-1	-1	29	-1	83	-1	337	
Chloride	mg/L	-0.5	-0.5	0.7	-0.5	0.7	0.5	-0.5	-0.5	5.5	1.7	
Sulphate	mg/L	16500	13200	3380	1690	379	334	445	1850	5040	1220	
Dissolved Metals*												
Aluminum	mg/L	117	71.1	-0.6	9.1	4.1	-0.2	4	-0.2	71	-0.2	
Antimony	mg/L	-6	0.3	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2	
Arsenic	mg/L	28	9.7	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2	
Barium	mg/L	-0.3	-0.01	-0.03	-0.01	0.03	0.02	0.02	0.01	-0.1	0.03	
Beryllium	mg/L	-0.2	0.009	-0.02	0.005	-0.005	-0.005	-0.005	-0.005	-0.05	-0.005	
Bismuth	mg/L	-6	-0.2	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2	
Boron	mg/L	-3	0.5	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	-1	-0.1	
Cadmium	mg/L	12.6	10	0.62	0.45	0.06	0.02	0.07	0.04	1.8	-0.01	
Calcium	mg/L	268	216	504	235	23.2	69.7	33.6	300	190	283	
Chromium	mg/L	-0.3	-0.01	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	-0.1	-0.01	
Cobalt	mg/L	4.8	3.23	0.53	0.26	0.12	-0.01	0.13	0.12	1.2	-0.01	
Copper	mg/L	133	120	0.06	2.38	0.53	0.01	0.58	-0.01	7.8	-0.01	
Iron	mg/L	1780	1040	-0.09	33.8	3.91	-0.03	2.51	0.04	385	-0.03	
Lead	mg/L	-2	0.6	-0.2	1.78	0.08	-0.05	0.1	-0.05	0.9	-0.05	
Lithium	mg/L	-0.3	0.13	0.13	0.06	0.01	0.01	0.02	0.16	0.2	0.02	
Magnesium	mg/L	310	235	215	67.9	47.1	37	52.5	215	293	141	
Manganese	mg/L	166	132	44.4	16	3.19	0.037	3.79	5.73	78.4	0.059	
Molybdenum	mg/L	-0.9	-0.03	-0.09	-0.03	-0.03	-0.03	-0.03	-0.03	-0.3	-0.03	
Nickel	mg/L	5	3.17	0.9	0.32	0.1	0.06	0.12	0.16	1.5	0.26	
Phosphorus	mg/L	-9	3.2	-0.9	-0.3	-0.3	-0.3	-0.3	-0.3	-3	-0.3	
Potassium	mg/L	-60	-2	10	4	-2	-2	-2	15	-20	5	
Selenium	mg/L	-6	0.7	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2	
Silicon	mg/L	29	16.7	6.3	5.51	5.82	9.25	8.02	1.18	3.7	3.98	
Silver	mg/L	-0.3	0.1	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	-0.1	-0.01	
Sodium	mg/L	-60	-2	11	3	2	3	3	11	-20	7	
Strontium	mg/L	0.5	0.283	1.78	0.499	0.118	0.19	0.154	1.68	0.33	0.914	
Thallium	mg/L	-6	0.6	-0.6	-0.2	-0.2	-0.2	-0.2	-0.2	-2	-0.2	
Tin	mg/L	-0.9	-0.03	-0.09	-0.03	-0.03	-0.03	-0.03	-0.03	-0.3	-0.03	
Titanium	mg/L	-0.3	-0.01	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	0.1	-0.01	
Vanadium	mg/L	-0.9	-0.03	-0.09	-0.03	-0.03	-0.03	-0.03	-0.03	-0.3	-0.03	
Zinc	mg/L	6130	7840	595	287	38.9	20.7	46.7	28.2	1380	5.07	
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.												
anions (meq)		344	275	72	35	8	7	9	40	105	31	
cations (meq)		347	340	65	30	7	8	9	36	110	27	
%diff		-0.4%	-10.5%	5.3%	7.9%	3.7%	-0.6%	4.1%	5.6%	-2.2%	6.8%	
Type		3	3	2	3	3	2	3	2	3	1b	

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

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

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

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

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

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

Sample ID	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
	SRK-Field Blank (SRK)	SRK-Field Blank (SRK)	SRK-GD12	Travel Blank A*	Travel Blank B*	Travel Blank C*	Travel Blank*	Blank	Blank	Method Blank
Label Sample ID										
Date	11-Jun-02	13-Jun-02	13-Jun-02	Sept	Sept	June	Sept	SRK-VD10 12-Sep-02 09/12/2002 10:45	SRK-GD14 12-Sep-02 09/11/2002 13:10	SRK-FD39 12-Sep-02 09/12/2002 17:45
Label Date										
Time	14:30	8:30	19:00							
Field Parameters										
pH	7.85	-	-	-	-	-	-	-	-	-
Conductivity $\mu\text{S}/\text{cm}$	555	-	-	-	-	-	-	-	-	-
Redox mV	235	-	-	-	-	-	-	-	-	-
Temp $^{\circ}\text{C}$	0.8	-	-	-	-	-	-	-	-	-
Flow L/min	1	-	-	-	-	-	-	-	-	-
Notes										
Easting										
Northing										
Photo										
Laboratory Parameters										
pH	8.31	8.2	8.31	6.7	6.09	-	-	6.14	7.75	7.88
Conductivity $\mu\text{S}/\text{cm}$	542	-2	-2	-2	877	-	-	2	-2	-2
Dissolved Anions										
Acidity pH 8.3	mg/L	-1	-1	-1	-1	-	-	-1	11	2
Alkalinity Total as CaCO_3	mg/L	209	-1	-1	-1	-	-	1	1	1
Chloride	mg/L	2.3	-0.5	-0.5	-0.5	-	-	-0.5	-0.5	-0.5
Sulphate	mg/L	88	-1	2	-1	-1	-	-1	-1	-1
Dissolved Metals*										
Aluminum	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Antimony	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Arsenic	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Barium	mg/L	0.08	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Beryllium	mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Bismuth	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Boron	mg/L	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Cadmium	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Calcium	mg/L	75.3	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Chromium	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cobalt	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Copper	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Iron	mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Lead	mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Lithium	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Magnesium	mg/L	26.8	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Manganese	mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Molybdenum	mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Nickel	mg/L	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Phosphorus	mg/L	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Potassium	mg/L	-2	-2	-2	-2	-2	-2	-2	-2	-2
Selenium	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Silicon	mg/L	3.64	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05
Silver	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Sodium	mg/L	-2	-2	-2	-2	-2	-2	-2	-2	-2
Strontium	mg/L	0.365	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Thallium	mg/L	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Tin	mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Titanium	mg/L	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Vanadium	mg/L	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Zinc	mg/L	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Results are expressed as milligrams per litre except where noted. '-' indicates a value that is less than the detection limit.										
anions (meq)										
cations (meq)										
%diff										
Note: * Travel blank results are for total metals										
Type										

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

ATTACHMENT B

Grum Pit Seepage Results

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

ATTACHMENT C

Vangorda Creek Valley Seepage Results

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

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

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